

A TAXONOMIC REVISION OF TAXA IN *STYRAX* SERIES *CYRTA* (STYRACACEAE) WITH VALVATE COROLLAS

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ABSTRACT

Several taxonomic treatments of *Styrax* (Styracaceae) exist in regional floras of Asia, but the Asian species of the genus have not been comprehensively revised since 1907. A treatment of the Asian taxa of *S. series Cyрта* with imbricate floral aestivation was accomplished in 2003. To complete the taxonomic revision of *S. series Cyрта*, we conducted a taxonomic revision of the species of the series with valvate aestivation of the corolla lobes. Our revision comprises 11 species with a combined distribution from eastern India through southern China and Malesia, Melanesia, and Micronesia, although the group is absent from the Philippines. We resurrected *S. bracteolatus*, *S. rubifolius*, and *S. warburgii* as species to be recognized, and we corrected the misapplication of *S. finlaysonianus*, previously used for a species in *S. series Benzoin*. *Styrax finlaysonianus* and *S. warburgii* are segregated from the broader concept of *S. agrestis* recognized in prior treatments. The circumscriptions of the heretofore poorly delimited species *S. confusus*, *S. faberi*, and *S. fortunei* are clarified and their possible introgressants discussed. We observed unique combinations of characters in some problematic specimens whose taxonomic status remains unresolved because only single specimens with either flowers or fruits were available; at least some of these may represent undescribed species. Lectotypes are designated for *Cyрта agrestis*, *S. argyi*, *S. bracteolatus*, *S. calvescens*, *S. casearifolius*, *S. confusus* var. *microphyllus*, *S. dasyanthus*, *S. dasyanthus* var. *cinerascens*, *S. faberi*, *S. finlaysonianus*, *S. formosanus*, *S. fortunei*, *S. fukiensis*, *S. henryi*, *S. henryi* var. *microcalyx*, *S. iopilius*, *S. philadelphoides*, *S. rostratus*, *S. rubifolius*, *S. serrulatus* var. *agrestis*, and *S. virgatus*. A neotype is designated for *S. warburgii*. Keys, descriptions, distribution maps, and conservation assessments are provided for all species. *Styrax agrestis*, *S. bracteolatus*, and *S. rubifolius* are rare endemics of conservation concern, with highly restricted distributions.

KEY WORDS: Asia, Styracaceae, *Styrax*, taxonomy

RESUMEN

Existen varios tratamientos taxonómicos de *Styrax* (Styracaceae) en floras regionales de Asia, pero las especies asiáticas del género no han sido revisadas en profundidad desde 1907. Se realizó un tratamiento de los taxa asiáticos de *S. series Cyрта* con estivación imbricada en 2003. Para completar la revisión taxonómica de *S. series Cyрта*, hicimos una revisión taxonómica de las especies de la serie con estivación valvar de la corola. Nuestra revisión comprende 11 especies con una distribución combinada desde el este de India hasta el sur de China Malasia, Melanesia y Micronesia, aunque el grupo está ausente de Filipinas. Recuperamos *S. bracteolatus*, *S. rubifolius*, y *S. warburgii* como especies reconocidas, y corregimos la mala aplicación de *S. finlaysonianus*, previamente usad para una especie en *S. series Benzoin*. *Styrax finlaysonianus* y *S. warburgii* son segregadas del amplio concepto de *S. agrestis* reconocido en tratamientos anteriores. Se clarifican las circunscripciones de las hasta ahora pobremente delimitadas especies *S. confusus*, *S. faberi*, y *S. fortunei* y se discuten sus posibles introgresores. Observamos combinaciones únicas de caracteres en algunos especímenes problemáticos cuyo estatus taxonómico queda sin resolver porque solo estuvieron disponibles especímenes únicos en los que estaban disponibles las flores o los frutos; al menos algunos de estos pueden representar especies no descritas. Se designan lectotipos par *Cyрта agrestis*, *S. argyi*, *S. bracteolatus*, *S. calvescens*, *S. casearifolius*, *S. confusus* var. *microphyllus*, *S. dasyanthus*, *S. dasyanthus* var. *cinerascens*, *S. faberi*, *S. finlaysonianus*, *S. formosanus*, *S. fortunei*, *S. fukiensis*, *S. henryi*, *S. henryi* var. *microcalyx*, *S. iopilius*, *S. philadelphoides*, *S. rostratus*, *S. rubifolius*, *S. serrulatus* var. *agrestis*, y *S. virgatus*. Se designa un neotipo para *S. warburgii*. Se aportan claves, descripciones, mapas de distribución, y evaluaciones de conservación para todas las especies. *Styrax agrestis*, *S. bracteolatus*, y *S. rubifolius* son endemismos raros de preocupación por su conservación, con distribuciones altamente restringidas.

INTRODUCTION

Styrax L. (Styracaceae) is a genus of about 140 species of trees and shrubs distributed in the Mediterranean region, eastern Asia (broadly considered here as encompassing South, East, and Southeast Asia through Melanesia and Micronesia), and the Americas (Fritsch 2015). This range is typical of many other genera of plants distributed among the refugia of Tertiary mixed-mesophytic forests in the Northern Hemisphere,

except that *Styrax* also has a large Neotropical component extending south to the southern Andes, northern Argentina, and Uruguay (Fritsch 1999, 2001). *Styrax* is the largest of the 12 genera comprising the Styracaceae. Characters that distinguish *Styrax* from the other genera in the family include a high (vs. low) attachment of the staminal tube on the corolla, the presence (vs. absence) of placental obturators, bitegmic (vs. unitegmic) ovules, and a thick (vs. thin) seed coat. The combination of the following characters serves to further distinguish *Styrax* from other genera of the Styracaceae: absence of bud scales, presence of pseudoterminal fertile shoots, non-articulated pedicels, a short hypanthium, glossy trichomes that are circular in cross-section on the staminal filaments, a 3-carpellate ovary, presence of mesocarp, and a seed-to-carpel ratio ≤ 1 (Fritsch et al. 2001; Fritsch 2004). Like the other genera in the family, *Styrax* has a vestiture of stellate trichomes (sometimes modified into peltate scales or simple trichomes), generally twice the number of stamens as corolla lobes, and introrsely dehiscent anthers with a large, linear connective (Fritsch et al. 2001; Fritsch 2004).

In the last worldwide monograph of the genus, Perkins (1907) divided *Styrax* into two sections, *Styrax* and *Foveolaria* (Ruiz & Pav.) Perkins, based on the number of ovules in the gynoecium. *Styrax* section *Styrax* was further divided into two series, *Styrax* and *Valvatae* (Gürke) Perkins, on the basis of imbricate and valvate corolla aestivation, respectively. Despite using the latter for infrageneric classification, Perkins recognized that there were certain species in *S. series Valvatae* with subvalvate aestivation, an apparently intermediate state between valvate and imbricate aestivation wherein the corolla lobes are contiguous but oblique in cross section. On this basis, Steenis (1932), in a revision of the Malesian species of *Styrax*, disregarded corolla aestivation, instead combining together several different species of imbricate and subvalvate *Styrax* into *S. serrulatus* Roxb., a strictly subvalvate species in our view.

Fritsch (1999) conducted a morphological phylogenetic analysis of *Styrax* and on this basis recircumscribed the infrageneric classification of the genus. *Styrax* section *Styrax* (about 33 species) was recircumscribed to include all the deciduous species. This was supported by the presence of young shoots with scattered stalked stellate trichomes distinct from the rest of the vestiture (vs. without stalked trichomes unless accompanied by a dense tomentum of the same type of vestiture) and membranaceous (vs. subcoriaceous) corolla lobes. *Styrax* section *Valvatae* Gürke (about 97 species) was recircumscribed to include species with valvate (vs. imbricate or subvalvate) corolla aestivation, the evergreen (vs. deciduous) condition, straight (vs. convex) sides of the corolla in bud, and concave (vs. planar) staminal filaments. Within section *Styrax*, *S. series Styrax* (three species) is supported by strictly pseudoterminal (vs. pseudoterminal and lateral) inflorescences, and *S. series Cyrtia* (Lour.) P.W. Fritsch (about 30 species) is supported by glandular-serrate (vs. entire) laminar margins. Fritsch's reclassification of *Styrax* reflected Perkins's recognition of the difference between the truly valvate species of *Styrax*, all in *S. section Valvatae*, and the subvalvate species of *Styrax*, now under *S. series Cyrtia*. A molecular phylogenetic analysis (Fritsch 2001) corroborates this infrageneric classification.

The taxonomy of the species in *Styrax series Cyrtia* had been poorly understood because a comprehensive study of specimens was lacking. Although several regional floristic treatments of *Styrax* in eastern Asia were produced (Steenis 1932, 1949; Croft 1981; Svengsuksa & Vidal 1992; Hwang & Grimes 1996; Li 1998), they generally did not appear to incorporate specimens from outside their geographic range of interest and sometimes did not include the study of types from herbaria for which access to specimens is difficult, in such cases often leading to misapplication of the names regarding the specimens included in the treatments. Part of *S. series Cyrtia* has been recently revised by Huang et al. (2003). This revision encompasses 17 eastern Asian species of *Cyrtia*, all with imbricate corolla aestivation, along with a key that includes all 21 species of the series with imbricate corolla aestivation, (i.e., including the four in North America, treated taxonomically in more depth in Fritsch 1997, 2009). Although imbricate vs. valvate aestivation has been shown to poorly reflect monophyly in *S. series Cyrtia* (Fritsch 2001), corolla aestivation is, without exception, species-specific in that series. As such, even if not indicating monophyly, corolla aestivation served as a means of providing a practical limit to the scope of Huang et al.'s (2003) treatment.

Still to be revised taxonomically were the remaining species in *Styrax series Cyrtia*, i.e., those with valvate corolla aestivation, henceforth referred to as the valvate members of *S. series Cyrtia*. From our preliminary

investigation, such a treatment is needed, as based on apparent problems such as the synonymization of *S. rubifolius* Guillaumin under *S. dasyanthus* Perkins in the treatment of the genus in the *Flora of China* (Hwang & Grimes 1996), the omission of *S. bracteolatus* Guillaumin from that treatment, and the misapplication of names in the treatment of *Styrax* in the *Flore du Cambodge, du Laos, et du Viêt Nam* (Svengsuksa & Vidal 1992). A related problem lies in the lack of study concerning species variation across the borders of different areas covered by floristic treatments, typically those separating countries. Here we provide a taxonomic revision of the remaining valvate species of *S. series Cyrta* to complement the work of Huang et al. (2003). In combination, these treatments complete the taxonomic revision of the series.

GEOGRAPHIC DISTRIBUTION

A more general discussion of *Styrax* series *Cyrta* and the imbricate members of the group, as well as a discussion of the differences between *S. series Cyrta* and *S. ser. Benzoin* P.W. Fritsch, the other series of *Styrax* in eastern Asia, is included in the treatment of the imbricate members of *S. series Cyrta* by Huang et al. (2003).

The valvate members of *Styrax* series *Cyrta* occur exclusively in eastern Asia, ranging from Jiangsu, China, south to the Solomon Islands and from Orissa, India, east to Kosrae, Micronesia. Most of the species in this group overlap geographically with at least one other species in the group; the two exceptions are *S. warburgii* Perkins, distributed throughout Indonesia to the Solomon Islands, and *S. serrulatus*, which extends from the eastern region of the Indian subcontinent through the border of Myanmar and China, to northern Laos and Thailand. *Styrax finlaysonianus* Wall. ex G. Don is also notably disjunct between Hainan, China, northern Vietnam, and central Vietnam, and similarly, *S. agrestis* (Lour.) G. Don is disjunct between northern Vietnam and central Vietnam. The most common and widespread species in the group, in more or less relative order, are *S. serrulatus*, *S. fortunei* Hance, *S. faberi* Perkins, *S. confusus* Hemsl., and *S. warburgii*. Species that can be considered narrowly distributed endemics are *S. agrestis*, *S. bracteolatus*, *S. rubifolius*, and *S. wuyuanensis* S.M. Hwang, which together account for 36% of the species in the group (Table 1).

MORPHOLOGY AND TAXONOMIC CHARACTERS

Below we discuss the principal diagnostic characters used in the systematics of the species of *Styrax* series *Cyrta* with valvate corolla lobes.

Habit

All species included in this treatment are deciduous shrubs or trees. The tree species are all <20 m tall. *Styrax wuyuanensis* is only known as a shrub, and *S. agrestis* is only known as a tree. All other species in this treatment can be shrubs or trees.

Leaves

Leaves are generally alternate except for the two most proximal leaves on each shoot. Two general patterns of phyllotaxis occur. One has the leaves consistently alternate (*Styrax agrestis*, *S. finlaysonianus*, *S. serrulatus*, and *S. warburgii*), whereas the other has the two most proximal leaves of each shoot from an axillary bud opposite or subopposite (the rest of the species). This feature is more or less consistent within species. Petiolar length can vary within and among species, although it can be a useful diagnostic character in some species. *Styrax faberi* has some of the shortest petioles among the valvate members of *S. series Cyrta*, and the leaves can even be sessile. Generally, *S. agrestis*, *S. finlaysonianus*, *S. serrulatus*, and *S. warburgii* have longer petioles than the other species, but considerable overlap can occur. The margins of the laminae are almost always serrulate or serrate, with each tooth tipped by a gland. The only exception occurs in *Styrax finlaysonianus*, which usually has subentire leaves. Rarely, there will be two or three weak to strong lobes on a single leaf of an individual, but this is only consistent in *S. bracteolatus*. The size and shape of the leaves vary within most species. *Styrax formosanus* Matsum. and *S. wuyuanensis* have consistently rhombic leaves. The tertiary veins in most species are generally reticulate, although in *S. serrulatus* and *S. warburgii* they are consistently parallel and perpendicular to the secondary veins.

TABLE 1. Distribution, richness, and endemism of the species of *Styrax* series *Cyrta* with valvate corolla aestivation, by country. * = endemic.

Country	No. species/no. endemics	Species
Bangladesh	1/0	<i>S. serrulatus</i>
Bhutan	1/0	<i>S. serrulatus</i>
China	9/7	* <i>S. bracteolatus</i> , * <i>S. confusus</i> , * <i>S. faberi</i> , <i>S. finlaysonianus</i> , * <i>S. formosanus</i> , * <i>S. fortunei</i> , * <i>S. rubifolius</i> , <i>S. serrulatus</i> , * <i>S. wuyuanensis</i>
India	1/0	<i>S. serrulatus</i>
Indonesia	1/0	<i>S. warburgii</i>
Laos	1/0	<i>S. serrulatus</i>
Micronesia	1/0	<i>S. warburgii</i>
Myanmar	1/0	<i>S. serrulatus</i>
Nepal	1/0	<i>S. serrulatus</i>
Palau	1/0	<i>S. warburgii</i>
Papua New Guinea	1/0	<i>S. warburgii</i>
Solomon Islands	1/0	<i>S. warburgii</i>
Thailand	1/0	<i>S. serrulatus</i>
Vietnam	2/1	* <i>S. agrestis</i> , <i>S. finlaysonianus</i>

Vestiture

Different types of trichomes and the density of trichomes can be useful characters in identifying some species, but in other species they can exhibit high variation (Fritsch 1996, 1997, 2004). Some general trends in laminar pubescence can be observed within the species of this group. In most leaves, the midvein and the area around it tend to have the densest amount of pubescence, as well as the largest trichomes. Many specimens also have domatia formed by large trichomes in the axils of the secondary veins, especially proximal ones. Within most species, the density and branch length of trichomes on the abaxial surface of leaves vary more or less continuously, without clear gaps and with no discernable geographical pattern. *Styrax fortunei* is the only species that can have the abaxial surface of the leaves completely covered by trichomes, but it can also have leaves that are only sparsely covered with trichomes. *Styrax formosanus* var. *hirtus* S.M. Hwang is distinguished by the ubiquitous simple trichomes that cover the plant.

Pubescence on the petiole can be a useful diagnostic character for several species. Short-armed, spider mite-like trichomes on the abaxial surface of the petiole near the junction of the petiole and the lamina are usually present in *Styrax agrestis*, *S. finlaysonianus*, *S. serrulatus*, and *S. warburgii*, whereas trichomes of this sort are not usually present in the other valvate members of *S. series Cyrta*. In combination with other characters, they can be used to distinguish these four species from the rest of the group.

Pubescence on reproductive parts can vary in location, color, and density and can be used as a diagnostic character in several species. Features of calyx trichomes can be used to identify species, i.e., color (e.g., *S. faberi*), density, and location (e.g., *S. formosanus*). *Styrax wuyuanensis* is unique among the species of the group in the nearly complete lack of trichomes on the calyx. Presence of trichomes on the seeds can be used as a diagnostic character for some species as well (*S. agrestis*, *S. finlaysonianus*, and *S. warburgii*).

Inflorescences

All inflorescences of the valvate members of *Styrax* series *Cyrta* are produced pseudoterminally and laterally on the shoots of the current growing season. Occasionally, only pseudoterminal inflorescences are produced on a fertile shoot in some specimens, but lateral inflorescences can always occur on other shoots. Pseudoterminal inflorescences are racemose or paniculate with the exception of *S. bracteolatus*, which has solitary or rarely two-flowered inflorescences. Many species have racemose inflorescences that have some pairs of flowers with pedicels originating from a common point arising from a very short shoot off the rachis, making such inflorescences subpaniculate; nonetheless, for simplicity we refer to these as racemose. Lateral inflorescences are 1- or 2-flowered or racemose except for *S. fortunei*, which can have panicles. Lateral inflorescences are always

shorter and less floriferous than pseudoterminal inflorescences and occur in the axils of leaves below the pseudoterminal inflorescence. The range in the number of flowers per inflorescence is usually relatively consistent within species apart from *S. fortunei*, which can have substantially lower numbers of flowers in the inflorescence than is typical. As such, the lower end of the range of flowers per inflorescence of *S. fortunei* overlaps that of *S. confusus* and of *S. faberi*. It is still a generally useful character for this group, however, especially when used in conjunction with other characters.

Flowers

All flowers are bisexual and actinomorphic with a short hypanthium adnate to the basal third or less of the ovary wall. Flower length (ranging from 0.7–2.2 cm) is generally not a useful diagnostic character apart from separating *Styrax confusus* from *S. fortunei* in conjunction with other characters. Pedicel length (ranging from 3–22 mm) is not a useful diagnostic character for which to delimit species. *Styrax* has a calyx with the sepals fused and reduced to teeth. Except in *S. wuyuanensis*, which is notably subglabrous, the species in the study group have a calyx with the abaxial surface completely covered by stellate trichomes, with trichome density occasionally becoming less dense towards the margin (apex), in which case the less dense part can appear in dried specimens as a marginal green to brown band. Variation in the pubescence on the abaxial surface of the calyx is a useful diagnostic character, e.g., presence (vs. absence) of reddish brown trichomes (*S. faberi*) and the width of the band formed by the pubescence on the calyx becoming sparser towards the margin (*S. formosanus*). The margin of the calyx can be undulate or toothed. Calyces of *S. bracteolatus* can have notably longer teeth (up to 3 mm long) than those of other species, along with notably deep sinuses that can reach to near the base of the calyx.

The species have a gamopetalous corolla that is white or rarely light yellow and is always completely covered with stellate pubescence on its adaxial surface. Occasionally in *Styrax finlaysonianus* and *S. warburgii* this pubescence becomes sparser towards the tube. Pubescence on the adaxial surface of the lobes is usually limited to the apex and margins but can occasionally occur throughout. The tube of the corolla is always shorter than the lobes, ranging from 1.2–6.9 mm.

The stamens are adnate to the corolla tube proximally and free distally, their number being generally twice that of the corolla lobes. The corolla lobes and stamens generally become free at approximately the same point along the floral axis. Filaments are 1.7–6.3 mm long and are all more or less equal in length within a flower. Some species have filaments that are flexuous at mid-length (*Styrax agrestis*, *S. bracteolatus*, *S. finlaysonianus*, and *S. serrulatus*). The filaments of most species are equal in width throughout, but some are wider basally (*S. faberi* and *S. formosanus*) or medially (*S. finlaysonianus* and *S. serrulatus*). The filaments are proximally pubescent and distally glabrous except in *S. warburgii*, which on occasion has pubescence extending along nearly the whole length of the filament. Anthers are 2–7.4 mm long and wider than the filament at the widest point. The connectives are usually sparsely or occasionally densely stellate pubescent.

The ovary shows little taxonomic utility in distinguishing among species; it is always apically pubescent. The style is filiform and 0.7–1.9 cm in length. It is densely pubescent with stellate trichomes basally and glabrous otherwise except rarely extending to half the length of the style in *S. agrestis*.

Fruits

The fruit in the valvate members of *Styrax* series *Cyrta* is dry—nut-like when indehiscent, or capsular when dehiscent (usually by three valves), and typically with one seed but occasionally with two or three. The mature fruit is important for reliable species identification in this group of *Styrax*. Ideally, when collecting specimens of *Styrax*, mature flowers or fruits should be obtained and the tree or shrub tagged for a return trip to obtain the other. The fruit shape in the study group is usually narrowly ellipsoid, subglobose, ellipsoid, or ovoid. The apex can be rounded, pointed (e.g., *S. serrulatus*), thick-rostrate (*S. finlaysonianus*), or narrowly rostrate (*S. agrestis*, *S. formosanus*, and *S. warburgii*). Fruits range from 0.6–4 cm long and 0.5–2.5 cm wide. The outer surface of the pericarp is completely covered by yellowish brown or grayish stellate trichomes. The inner surface is usually smooth or rugose but is notably reticulate-pitted in *S. rubifolius*. The inner surface of the pericarp is also

usually glabrous but is sparsely to densely stellate pubescent in *S. agrestis*, *S. finlaysonianus*, *S. serrulatus*, and *S. warburgii*. These four species are also the only species with fruits that are nut-like, being dry and indehiscent. *Styrax serrulatus* can also have dehiscent single-seeded capsules that dehisce by three valves, like the other valvate members of *S. series* *Cyrta*. The thickness of the pericarp wall is also a key diagnostic character, with the walls of *S. confusus* and *S. finlaysonianus* uniquely thicker (> 0.6 mm) than those of the other species. This character is also key in differentiating *S. agrestis* from *S. warburgii*.

Seeds

The seeds are ellipsoid, ovoid, or obovoid, ranging from tan to dark brown and with smooth to longitudinally fissured or rugose testa. *Styrax rubifolius* has strongly tuberculate seeds. The seed coats of *S. agrestis*, *S. finlaysonianus*, and *S. warburgii* are also consistently pubescent with at least sparse stellate trichomes.

Chromosome Numbers

The only species in our revision for which a chromosome number is documented is *Styrax serrulatus* ($n = 8$; Mehra & Bawa 1969; Mehra 1976). From this count and other counts for species of *Styrax*, the base number of *Styrax* is inferred to be $x = 8$ (Fritsch 2001).

ECOLOGY AND ECONOMIC IMPORTANCE

From the data on the labels of specimens, the range of elevation among all species of the valvate group of *Styrax* series *Cyrta* is 0–2450 m. Most species in the group occur at \geq ca. 1500 m except *S. rubifolius* and *S. wuyuanensis*. The range of *S. rubifolius* is 800–1500 m whereas that of *S. wuyuanensis* is 450–540 m, although this narrow range may be a sampling artifact based on the few collections of this rare species with elevation data. Because the few specimens of *S. agrestis* and *S. bracteolatus* that we examined lack elevation data, we have no hard evidence of elevation ranges for these species. Most species occur in a wide variety of mesic habitats, including forests, thickets, mountain slopes, roadsides, riversides, and successional areas.

Huang et al. (2003) discuss pollination and breeding systems for *Styrax* in general. Few data exist on fruit dispersal of *Styrax* in our group. After the fruit wall has detached, the seeds of the riparian species *S. faberi* remain attached to the calyx by the hilum. The seeds, which would otherwise sink, can thus be transported in water by the floating infructescence (P. Fritsch, pers. obs.). The retention of the seed on the calyx after fruit dehiscence occurs in other dehiscent members of the study group, including *S. confusus*, *S. formosanus*, *S. fortunei*, and *S. rubifolius*. The retention of the seed may also occur in *S. wuyuanensis*, although we did not see it on the specimens we examined, perhaps because of the low number of collections available.

One of the major economic products derived from *Styrax* is benzoin, also referred to as gum benjamin, a balsamic resin exuded from the bark and wood tissues after the cambium is injured. The resin is composed mainly of coniferyl cinnamate, cinnamyl cinnamate (styracin), and coniferyl benzoate, as well as minor traces of fragrant benzaldehyde, vanillin, and styrene. It is used as a flavoring agent and a fragrance fixative, as well as in medicine as an antiseptic and expectorant. The best known source of benzoin is *S. benzoin*, a species in *S. series* *Benzoin*, but several species in *S. series* *Cyrta* are also known to produce benzoin, such as *S. subpaniculatus* and *S. tonkinensis*. Of the species in our group, *S. serrulatus* is known to produce benzoin, but it is regarded as lower quality than the resin produced by other species of *Styrax* (Burkill 1966; Langenheim 2003).

Similar to several species in the imbricate group of *Styrax* series *Cyrta*, the oil extracted from seeds of *S. confusus*, *S. faberi*, and *S. fortunei* is used as a soap and a machine lubricant. The seed oil from *S. fortunei* can also be used to produce lacquer and that from *S. confusus* for making printing ink (Hwang 1987a; Liu 1991). Recent research has also been undertaken to investigate the use of *S. confusus* seed oil for biodiesel synthesis, because of its widespread distribution and the high oil content of the seeds (up to 50%; Wang et al. 2015). The wood from *S. serrulatus* can be used for construction materials, furniture, and tools (Yin 1990), and has potential value as a fuel, having high calorific value and producing a low amount of ash (Bhatt et al. 2016). The wood of *S. confusus* and *S. fortunei* can also be used for tools (Liu 1989; Ding & Wang 1997). The leaves of *S. fortunei* are used in traditional Chinese herbal medicine as a cough suppressant and expectorant (Liu 1991). Although

species of *S.* series *Cyrta* from eastern Asia have horticultural value as ornamental plants, the most important belong to the imbricate group of the series (*S. japonicus* and *S. obassia*). Several valvate species in *S.* series *Cyrta* are, however, occasionally used in horticulture, including *S. confusus*, *S. formosanus*, and *S. fortunei* (Yang 1984; Ding & Wang 1997; Lobdell 2013).

Most species of *Styrax* in eastern Asia are primary hosts to gall-forming aphids of the family Hormaphididae (tribe Cerataphidini), including probably all the species in the study group. Further discussion on the galls commonly occurring on the species of *S.* series *Cyrta* is included in Huang et al. (2003).

MATERIALS AND METHODS

Nearly 1900 specimens from 30 herbaria (A, AAU, BM, BO, BR, BRIT, C, CAS, DS, E, FI, G, GH, HBG, HHBG, IBK, IBSC, K, KUN, KYO, L, LBG, MO, NAS, P, PE, TAI, TI, US, and W) were examined for this study. We followed the materials and methods laid out in the treatment of the imbricate members of *Styrax* series *Cyrta* (Huang et al. 2003), with the following modifications. All descriptions were derived from the examination of herbarium specimens except for *S. wuyuanensis*, which was described with a combination of herbarium specimens and the original description due to the lack of material available to us for study. In addition to measurements of leaves taken from fertile branches, an upward range for leaves from sterile branches was recorded. Observations and measurements were made either manually or observed digitally through the use of a Zeiss AxioCam ICc5 microscope camera attached to a dissecting microscope (maximum magnification = 100×) and measured with ZEN 2012 Blue Edition (Zeiss). For specimens that we examined only via digital images, we gained access to them through various online resources. Many important specimens of our study group are stored in European herbaria, and images are available from JSTOR (<https://plants.jstor.org/>) or the online database of the herbarium; of particular note for our study are the online databases for G (<http://www.ville-ge.ch/musinfo/bd/cjb/chg/index.php?lang=en>), K (<http://apps.kew.org/herbcat/gotoHomePage.do>), and P (<https://science.mnhn.fr/institution/mnhn/collection/p/item/search>), where we found many critical type specimens. Other important specimens stored in Chinese herbaria were accessed via images stored on the Chinese Virtual Herbarium (<http://www.cvh.ac.cn>). For these digital images, we used ImageJ (Schneider et al. 2012) to measure macroscopic characters.

The points in the distribution maps are based on the specimens cited in this revision (see Taxonomic Treatment and Appendix 2). For collections in which geographic coordinates are not indicated on specimen labels (most collections), we estimated coordinates based on the locality information from the labels and placed these estimates within brackets in the specimens cited sections of species entries. Estimates were derived from a variety of published maps, atlases, and gazetteers, especially Google Maps. Mapped localities were resolved at least to the second-level administrative divisions of each country whenever possible. Geographic information provided on labels, especially from older specimens, is often insufficient for a reasonable estimation of locality; in such cases, the collection was not mapped. When locality information was not specified within a particular geographical division [e.g., xian (Chinese county)], we provide coordinates for that division as provided by Google Maps, or else leave it unestimated as to coordinates. Oftentimes, the locality names are outdated and not in current use; we put the assumed current name of the locality in brackets after the verbatim names. Chinese political boundaries are those used in the *Flora of China* series. A Specify (Specify Collections Consortium) database of all collection information used in this revision, including geographic coordinates linked to geographic information system software (ArcView, ESRI, Inc.), is available from the authors upon request. Appendix 3 provides an alphabetical listing of species in the Taxonomic Treatment, including synonyms and excluded names.

Each species entry includes a preliminary conservation assessment. All assessments are based on the IUCN conservation ratings system (IUCN Standards and Petitions Subcommittee 2017). As part of the assessment, the extent of occurrence (EOO) and area of occurrence (AOO) were estimated with the georeferenced database of collections in GeoCAT, an online geospatial analysis tool (Bachman et al. 2011).

TAXONOMIC TREATMENT

For descriptions of *Styrax* and *S. series Cyrta*, refer to Huang et al. (2003).

KEY TO SPECIES OF THE VALVATE GROUP OF STYRAX SERIES CYRTA

1. Calyx and pedicel subglabrous _____ **11. *S. wuyuanensis***
1. Calyx and pedicel completely covered by stellate trichomes, occasionally becoming less dense towards calyx margin
 2. Calyx subtended by single large deltoid or oblong bracteole; corolla lobe apex often bifurcated; calyx often divided nearly to base by at least one sinus per calyx; inflorescence 1- or 2-flowered; at least one leaf blade on each individual bilobed _____ **2. *S. bracteolatus***
 2. Calyx not subtended by bracteoles or occasionally subtended by a small linear bracteole; corolla lobe apex acute; calyx with shallow sinuses between teeth; inflorescence usually more than 2-flowered; leaves without lobes (rarely bilobed).
 3. Seed and interior surface of pericarp with stellate trichomes; fruit apex rostrate and leaves obovate, elliptic, or lanceolate.
 4. Pericarp wall > 0.6 mm thick; fruit obliquely ovoid to obliquely ellipsoid; fruit width usually > half the length; corolla subcoriaceous; calyx 5–6(–7) × 5–6 mm; leaves entire to weakly serrulate towards apex _____ **5. *S. finlaysonianus***
 4. Pericarp wall < 0.35 mm thick; fruit obliquely and narrowly ellipsoid; fruit width usually < half the length; corolla chartaceous; calyx 3–5 × 3–5 mm; leaves serrulate.
 5. Pericarp wall 0.23–0.35 mm thick (Borneo, Indonesia to Solomon Islands, Micronesia) _____ **10. *S. warburgii***
 5. Pericarp wall 0.09–0.13 mm thick (Vietnam) _____ **1. *S. agrestis***
 3. Seed and interior surface of pericarp without stellate trichomes; fruit apex usually pointed to rounded OR if fruit rostrate, leaves rhomboid
 6. Seed strongly tuberculate; interior of pericarp wall reticulately pitted; rachis proximally chestnut brown and glabrous, distally completely covered with stellate trichomes _____ **8. *S. rubifolius***
 6. Seed smooth to rugose; interior of pericarp wall smooth to slightly rugose; rachis sparsely to completely covered with stellate trichomes throughout
 7. Calyx abaxially with trichomes becoming less dense within 1–2 mm of margin; leaves usually rhomboid; fruit usually rostrate _____ **6. *S. formosanus***
 7. Calyx abaxially with trichomes evenly dense across whole surface or becoming less dense within 1 mm of margin; leaves ovate, ellipsoid, lanceolate, or obovate; fruit pointed to rounded
 8. Calyx abaxially with long-armed reddish brown trichomes overtopping grayish yellow or rarely yellow basal pubescence; flowers per pseudoterminal inflorescence (1)–3–5(–11) _____ **4. *S. faberi***
 8. Calyx abaxially without long-armed reddish brown trichomes, basal pubescence usually yellow or golden yellow; flowers per pseudoterminal inflorescence usually 5 or more
 9. Two most proximal leaves on each shoot alternate; fruit indehiscent or dehiscent, ellipsoid; petiole with short-armed trichomes on abaxial surface near junction of blade and petiole (eastern Nepal and India through border region of Myanmar and Yunnan, China to northern Laos and Thailand) _____ **9. *S. serrulatus***
 9. Two most proximal leaves on each shoot subopposite or opposite; fruit always dehiscent, usually not ellipsoid OR if fruit ellipsoid, petiole without short-armed trichomes on abaxial surface near junction of blade and petiole (eastern Yunnan and Sichuan to Zhejiang)
 10. Fruit wall ≥ 0.7 mm thick; corolla subcoriaceous; mature leaves subcoriaceous; pseudoterminal inflorescence racemose; flowers per inflorescence (4)–5–11(–12) (coastal southeastern China from Guangxi to Jiangsu and further inland to Jiangxi) _____ **3. *S. confusus***
 10. Fruit wall ≤ 0.5 mm thick; corolla chartaceous; mature leaves usually chartaceous, occasionally subcoriaceous; pseudoterminal inflorescence usually paniculate; flowers per inflorescence (5)–12 or more (inland China from eastern Yunnan and Sichuan to Jiangsu and Zhejiang) _____ **7. *S. fortunei***

1. *Styrax agrestis* (Lour.) G. Don, Gen. Hist. 4:5. 1837 [as *S. "agreste"*]. *Cyrta agrestis* Lour. Fl. Cochinch. 1:278. 1790.

TYPE: VIETNAM: Cochinchina, *J. de Loureiro s.n.* (LECTOTYPE, designated by Svengsuksa & Vidal (1992): BM!— photograph at A!).

Styrax annamensis Guillaumin, Bull. Soc. Bot. France 70:882. 1924. TYPE: VIETNAM. [Tinh Bac Kan]: [Huyen] Cho Moi, [21.880°N, 105.779°E], 7 Aug 1917, P.A. Eberhardt 3952 (LECTOTYPE, designated by Svengsuksa & Vidal (1992): P!).

Trees to 10 m tall. Young branchlets yellowish brown, nearly glabrous to densely pubescent with yellow stellate trichomes; older branchlets brown, subglabrous. Petiole 3–6(–8) mm long, with tightly appressed stellate trichomes on abaxial surface, trichome arms up to 0.06–0.12 mm long. Two most proximal leaves on each shoot alternate. Lamina of fertile shoots 3.7–6.9(–8) × 1.8–3.5 cm, those of sterile shoots to 10.5 × 4.2 cm, 1.7–2.7 × as long as wide, chartaceous, elliptic to elliptic-lanceolate; abaxial surface grayish green to greenish brown when dry, with sparse yellow stellate trichomes, trichome arms up to 0.09–0.27 mm long, pubescence scattered on whole surface, trichomes usually denser and larger in axils of midvein and secondary veins; adaxial surface dark brown when dry, nearly glabrous or with very sparse yellow stellate trichomes, trichome

arms up to 0.07–0.13 mm long, pubescence mostly along midvein and rarely elsewhere; base acute, occasionally rounded; margin serrulate; apex short-acuminate to acute, rarely shallowly 2- or 3-lobed; secondary veins 4 to 6 on each side of midvein, abaxially prominent, adaxially plane or sunken, tertiary veins reticulate, abaxially prominent, adaxially plane. Fertile shoots 4.5–7.4(–10.6) cm long, 2- to 3-leaved. Lateral inflorescences racemose, 1–2.2 cm long, 1- or 2-flowered; pseudoterminal inflorescences racemose, with well-spaced nodes, 2.2–3.8 cm long, 3- to 9-flowered, rachis completely covered with yellowish brown stellate trichomes. Pedicel 3–6 mm long, completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellowish brown erect stellate trichomes; bracteoles 0.6–3.8 mm long, linear or subulate, positioned at base of pedicels, rarely at middle. Flowers 1.2–1.9 cm long. Calyx 4–5 × 3–5 mm, cupuliform; abaxial surface slightly striate and completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellowish brown trichomes, occasionally trichomes becoming less dense towards calyx margin, trichome arms up to 0.16–0.3 mm long; adaxial surface yellowish brown to brown with 2- or 3-armed trichomes along margin; margin rarely undulate or with 5 evenly distributed defined teeth 0.5–1(–1.5) mm long; marginal teeth deltoid or obtuse, contiguous, densely pubescent on both surfaces. Corolla 0.8–1.4 cm long, white, tube 1.9–3.3 mm long, abaxial surface proximally glabrous and distally scattered with stellate trichomes, lobes 5, 8.4–10.4 × 2.5–2.9(–3.9) mm, chartaceous, oblong to lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, adaxially glabrous except margins. Stamens 10; filaments 2.3–3.4 mm long, flexuous, of equal width throughout, proximal half dense with stellate trichomes, distal half glabrous; anthers (3.2)–3.8–5.1 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes, connective with sparse yellow stellate trichomes. Style 0.7–1.3 cm long, proximally dense with stellate trichomes, rarely extending to midpoint of style, distally glabrous; stigma 0.2–0.5 mm wide, punctiform or capitate. Fruiting calyx 5 × 3–5 mm, funnellform. Fruit 1.7–2.1 × 0.7–0.9 cm, indehiscent, oblique-ellipsoid, apex rostrate or rarely stoutly rostrate, rostrum up to 8 mm long; pericarp dry, 0.09–0.16 mm thick, outside smooth, with dense yellowish brown appressed stellate trichomes, inside densely pubescent with stellate trichomes, smooth. Seeds brown, obliquely narrow-ellipsoid, slightly grooved, with dense stellate trichomes.

Illustrations.—Guillaumin 1933:981, fig. 113 (4–5) (as *S. annamensis*); Svengsuksa & Vidal 1992:173, pl. 31 (4) (as *S. annamensis*).

Phenology.—Flowering: February–April, June–September. Fruiting: April, May, July.

Distribution.—Laos (Xiangkhoang) and Vietnam (Bac Kan, Ha Noi, Phu Tho, Quang Tri, Thai Nguyen, Thua Thien-Hue, and Vinh Phuc); Fig. 1.

Vernacular names.—Cay cau cau (Vietnam; Loureiro 1790); cay don tran (Vietnam, Tinh Thua Thien-Hue; *Bauche* 34); cay ton trau (Vietnam; Guillaumin 1924); cut sat (Vietnam; Guillaumin 1924); do:k ba:y pha: (Laos; Svengsuksa & Vidal 1992); do:k fa:w (Laos, Louangphrabang; Svengsuksa and Vidal 1992); ph'ungx fa:w (Laos, Xiangkhoang; Svengsuksa & Vidal 1992).

Conservation assessment.—*Styrax agrestis* is known to us from 11 geographic localities in northern and central Vietnam. The EOO is 39,955 km² and AOO is 44 km². Only one of the known collections appears to be from a protected area, Ba Vi National Park. The most recent collection was made in 1940 from Thuong An, Huyen Phong Dien by *Bauche*. The distribution of the species is split between two regions. Eight of the localities are in northern Vietnam around Hanoi, one of the most heavily developed regions in Vietnam, and six of the eight localities in that region have been greatly altered by urban development. The other three localities are in central Vietnam near Hue, where much urban development has occurred as well. We therefore propose these two regions that are under a common threat in their respective areas as two locations. In conjunction with the two subpopulations not currently under threat, we propose four locations in total for this species and classify it as Endangered (EN): B2ab(iii).

Discussion.—The names *Styrax annamensis*, *S. finlaysonianus*, *S. subcrenatus* Hand.-Mazz., and *S. warburgii* are all involved in the confused taxonomic history of *S. agrestis*; together we refer to this collection of names as the *S. agrestis* complex. *Styrax agrestis* was originally published as *Cyrta agrestis* by Loureiro (1790). Don

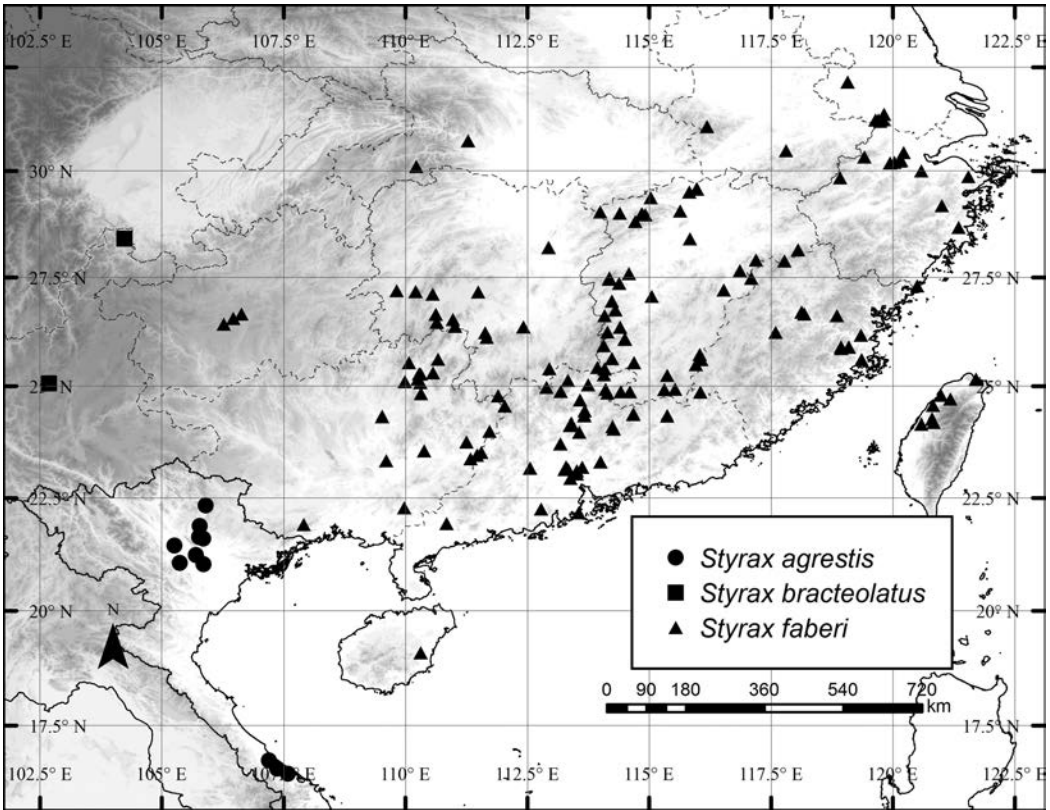


FIG. 1. Geographic distribution of *Styrax agrestis*, *S. bracteolatus*, and *S. faberi*.

(1837) did not recognize more than one genus in his concept of the Styracaceae and moved *C. agrestis* into *Styrax*. In the same publication, he validly published *S. finlaysonianus*, a name in Wallich's (1828) catalogue, basing his description on a specimen with only flowers and maturing flower buds. Perkins (1907) distinguished the Malesian species *S. warburgii* from the Indochinese species *S. agrestis* by the sparse stellate pubescence on the abaxial surface of the leaf (vs. the glabrous leaf of *S. agrestis*) and a purported difference in the number of leaf veins. Perkins also recognized *S. finlaysonianus*. Although she apparently did not see any fruit of the species, she grouped it with species that have fruit without a rostrum in her key. Apparently not having seen the type of *S. agrestis*, Guillaumin (1924) misapplied the name *S. agrestis* to several large-fruited specimens with subentire leaves that we recognize as *S. finlaysonianus*. Instead, he published a new species, *S. annamensis*, based on several flowering specimens. Handel-Mazzetti (1931) published *S. subcrenatus* in an article describing several other species new to China. He likely did not compare the material he examined for describing *S. subcrenatus* with any material from Indochina, and instead compared *S. subcrenatus* to *S. confusus*. Steenis (1932) only treated Malesian specimens, but did examine *S. agrestis* from Vietnam. Discerning no difference in fruit morphology (or other characters), van Steenis considered *S. warburgii* and *S. agrestis* to be a single species. Svengsuksa & Vidal (1992) treated species from Cambodia, Laos, and Vietnam. They extensively examined specimens of both *S. agrestis* and *S. finlaysonianus*, recognizing clear differences between the two species. However, apparently because they lacked access to the type specimens of these species, they misapplied the names: following Guillaumin, they applied *S. agrestis* to the large-fruited species *S. finlaysonianus* sensu our revision, and *S. annamensis* to the narrowly ellipsoid-fruited species that we recognize as *S.*

agrestis. They also applied *S. finlaysonianus* to a species in *S. series Benzoin*. Perhaps because they did not examine Malesian material for their flora, they did not assess the Malesian species *S. warburgii*. Hwang & Grimes (1996), treating only the material with these names from China (specifically, only from Hainan), apparently did not examine the material from Vietnam or Malesia in detail, and so they applied the name *S. agrestis* to the Chinese material; they also included *S. subcrenatus* as a synonym under this name.

From our comprehensive assessment of the species involved with the taxonomic history of *Styrax agrestis*, we distinguish three species within this complex. *Styrax agrestis* occurs in northern and central Vietnam, *S. finlaysonianus* has a range that mostly overlaps that of *S. agrestis* in Vietnam and China (Hainan), and *S. warburgii* is distributed from Borneo east to the Solomon Islands with outliers in Palau and Micronesia. All three species of the complex along with *S. serrulatus* can be distinguished from the other species in the study group by their generally short-armed trichomes on the abaxial surface of the petiole, especially apparent on the junction of the petiole and blade. Also, in these four species the two most proximal leaves on each shoot are alternate (vs. opposite or subopposite).

Styrax agrestis can be distinguished from *S. finlaysonianus* by the size and shape of the fruit, having strongly thin-rostrate obliquely narrow-ellipsoid (vs. thick-rostrate ovoid) fruits that are mostly 0.9 cm wide (vs. usually > 1 cm). *Styrax agrestis* can also be distinguished from *S. finlaysonianus* by consistently serrulate laminar margins (vs. usually subentire) and thin corolla lobes (vs. thick).

Styrax agrestis is more difficult to distinguish from *S. warburgii*. The two species share a similar fruit shape but *S. agrestis* has a thinner fruit wall (0.09–0.13 mm) than *S. warburgii* (0.23–0.35 mm). Although this character works well to separate the species, only three fruiting specimens of *S. agrestis* were available to us for examination; more collections will be needed to test the distinctness of the two species. The large geographical distance between the ranges of the two entities, however, lends ancillary support for two species rather than one (Figs. 1, 8).

The type specimen of *Styrax annamensis* has thin corolla lobes and serrulate leaves, like the type of *S. agrestis*, and is similar to *S. agrestis* in all other respects. We therefore synonymize *S. annamensis* and *S. agrestis*.

On initial examination, the collections *A.C. d'Alleizette s.n.* [L69998] and *E. Poilane 18971* and *19080* resemble *Styrax agrestis*. However, these specimens differ from this species in several key characters. Unlike *S. agrestis*, they have paniculate pseudoterminal inflorescences (vs. racemose). Also, the pseudoterminal and lateral inflorescences are much longer and have many more flowers than is typical for *S. agrestis*. They also have thick subcoriaceous leaves with entire margins, vs. the chartaceous serrulate leaves of *S. agrestis*. These specimens potentially represent an undescribed species of *S. series Cyrta*. Because we lack fruiting specimens with these characters, however, we have refrained from describing a distinct species. We have excluded them from the description of *S. agrestis*.

The collection *A.F.G. Kerr 20830* seems to represent an intermediate between *Styrax agrestis* and *S. finlaysonianus* in the size and shape of the fruit. The fruit is narrower and the rostrum longer than in typical *S. finlaysonianus*, but the fruit is larger and wider and the rostrum thicker than in typical *S. agrestis*. Most of the fruits on the specimen are immature. We opened one of the few fruits that appear close to maturity to examine the seeds and found that they are atypical of any in the study group. In this group of *Styrax*, usually only one ovule per ovary matures into a seed, or rarely two or even three ovules will mature. This fruit has three seeds that are maturing and the seeds are also oddly shaped, being triangular prisms with tapering ends, as opposed to the ovoid, obovoid, or ellipsoid seeds of most members of this group. It is possible that the odd shape is due to the drying and pressing process. We have excluded this specimen from the *S. agrestis* description.

W.T. Tsang 27113 and *T. Chen & P. Fritsch 9704109* are atypical specimens related to the *Styrax agrestis* complex but do not fit any of the species in this group; they appear to combine features of *S. serrulatus* and *S. finlaysonianus*. Like *S. serrulatus*, they have dehiscent ellipsoid fruits with smooth seeds. However, the leaves are entire and the seeds are stellate pubescent, like *S. finlaysonianus*. These specimens likely represent an undescribed species. The material we have is limited to fruiting material with only sterile leaves, and there is only

one inflorescence on the A specimen of *W.T. Tsang 27113*, which is incomplete. Flowering material and more collections in general of *Styrax* with this morphology will be needed before further considering the taxonomic status of these specimens.

Svensuksa & Vidal (1992) cite J. de Loureiro s.n. as the holotype of *Styrax agrestis*. In the protologue of *Cyrta agrestis*, however, Loureiro does not cite any specimens. Because of this, the term holotype would be incorrect, and we are recognizing the citation in the *Flore du Cambodge, du Laos, et du Viêtنام* as a lectotype designation.

Additional specimens examined. **VIETNAM. Bac Kan:** [Huyen Bach Thong], Phu Thong Hoa [=Phu Thong], [22.333°N, 105.9°E], Sep 1919 (fl), *P.A. Eberhardt 4715* (K, P). **Ha Noi:** Ninh Thai, in the woods of the hill Muou Lang, [21.028°N, 105.854°E], 17 Mar 1890 (fl), *H.-F. Bon 4303* (P[2]); [Huyen Ba Vi], Village of [Bip?], at the western base of Mont Bavi, [21.058°N, 105.366°E], 31 Mar 1887 (fl), *B. Balansa 4357* (P[2]). **Phu Tho:** [Thi xa Phu Tho], Phu Ho, [21.44°N, 105.26°E], Mar 1925 (fl), *P.A. Petelot 1860* (A, P). **Quang Tri:** locality unknown, [16.747°N, 107.194°E], Apr 1922 (fl), *M. Pirey 2* (P[2]). **Thai Nguyen:** [Huyen Phu Luong], between Thai Nguyen and Phan Me, [21.633°N, 105.761°E], May 1933 (fr), *P.A. Petelot 4806* (P[2]); [Thanh Pho Thai Nguyen], environs of Thai Nguyen, [21.6°N, 105.85°E], Apr 1933 (fl), *P.A. Petelot 4688* (P[2]). **Thua Thien-Hue:** Huyen Phong Dien, Thuong An, [16.575°N, 107.367°E], 17 Apr 1940 (fl), *Bauche 34* (P[2]); Thanh Pho Hue, environs of Hue, [16.467°N, 107.583°E], 28 Jun 1916 (fl), *P.A. Eberhardt 3296* (P). **Vinh Phuc:** Thi Xa Phuc Yen, edge of Song Con downstream of Phu Yen [=Phuc Yen], [21.233°N, 105.7°E], 29 Jul 1929 (fr), *E. Poilane 16500* (P[3]).

2. *Styrax bracteolatus* Guillaumin, Bull. Soc. Bot. France 70:883. 1924 [as S. "*bracteolata*"] (**Fig. 2**). TYPE: CHINA.

YUNNAN: [Shuifu Xian], Tchen fong chan [= Cheng Feng Shan], [28.410°N, 104.233°E], 17 May 1901, *F. Ducloux 2137* (LECTOTYPE, designated here: P [barcode 00219502]!).

Shrubs or small trees. Young branchlets light brown, with sparse or evenly distributed yellowish brown or rusty red stellate trichomes; older branchlets chestnut brown or brown, glabrous or with sparse stellate trichomes. Petiole 3–5 mm long. Two most proximal leaves on each shoot alternate or subopposite. Lamina of fertile shoots 6.2–10.5 × 2.8–4 cm, those of sterile shoots to 16.3 × 7.6 cm, 2.1–2.6 × as long as wide, chartaceous, oblong-elliptic to lanceolate, sometimes leaves subtending inflorescence highly reduced and asymmetrical; abaxial surface grayish brown, with sparse yellow or reddish brown stellate trichomes, trichome arms up to 0.2–0.4 mm long, pubescence on veins, occasionally on whole surface; adaxial surface brown, with sparse yellow or rusty red simple or 2- or 3-armed trichomes, trichome arms up to 0.1–0.3 mm long, pubescence along midvein and rarely on proximal secondary veins; base cuneate, rarely rounded; margin subentire to serrulate; apex acuminate, rarely acute, occasionally bifurcate; secondary veins 8 to 12 on each side of midvein, abaxially prominent, adaxially prominent, tertiary veins reticulate, abaxially prominent, adaxially prominent. Fertile shoots 3.7–5.9(–13.7) cm long, 3- to 6-leaved, branchlets often slightly flattened. Inflorescences solitary, rarely two-flowered, 1.5–2.1 cm long. Flowers subsessile to pedicellate; pedicel 5–7 mm long, with dense erect stellate trichomes with reddish brown centers and yellowish arms; bracteoles 3.6–7.2 mm long, deltoid or oblong, brown or yellow, subtending calyx. Flowers 1.2–1.5 cm long. Calyx 3–4 × 5–8 mm, cupuliform, often divided nearly to base; abaxially with dense yellowish appressed stellate trichomes, trichome arms up to 0.3–0.4 mm long; adaxially glabrous except margins; margin with 5 well defined unevenly distributed teeth 1.2–3 mm long; marginal teeth deltoid, contiguous, abaxially densely pubescent, adaxially pubescent. Corolla 0.95–1.35 cm long, white, tube 1.2–1.4 mm long, abaxial surface proximally glabrous and distally covered with stellate trichomes, lobes (3 to)5(or 11), 8.1–12.1 × 2.5–4.1 mm, chartaceous, oblong, apex acute or slightly bifurcated to bifurcated, abaxially dense with pale yellow appressed stellate trichomes, adaxially glabrous except margins. Stamens (6 to)10(or 17); filaments 1.7–3.5 mm long, slightly flexuous at middle, of equal width throughout, proximally dense with stellate trichomes, distally glabrous; anthers 4.7–5.9 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with sparse yellow stellate trichomes. Style 0.7–1.1 cm long, glabrous, with stellate trichomes at base; stigma about 0.3 mm wide, capitate or punctiform. Fruit unknown.

Illustrations.—None previously published.

Phenology.—Flowering: May, June. Fruiting: unknown.

Distribution.—China (Yunnan). Fig. 1.

Habitat.—In forests.

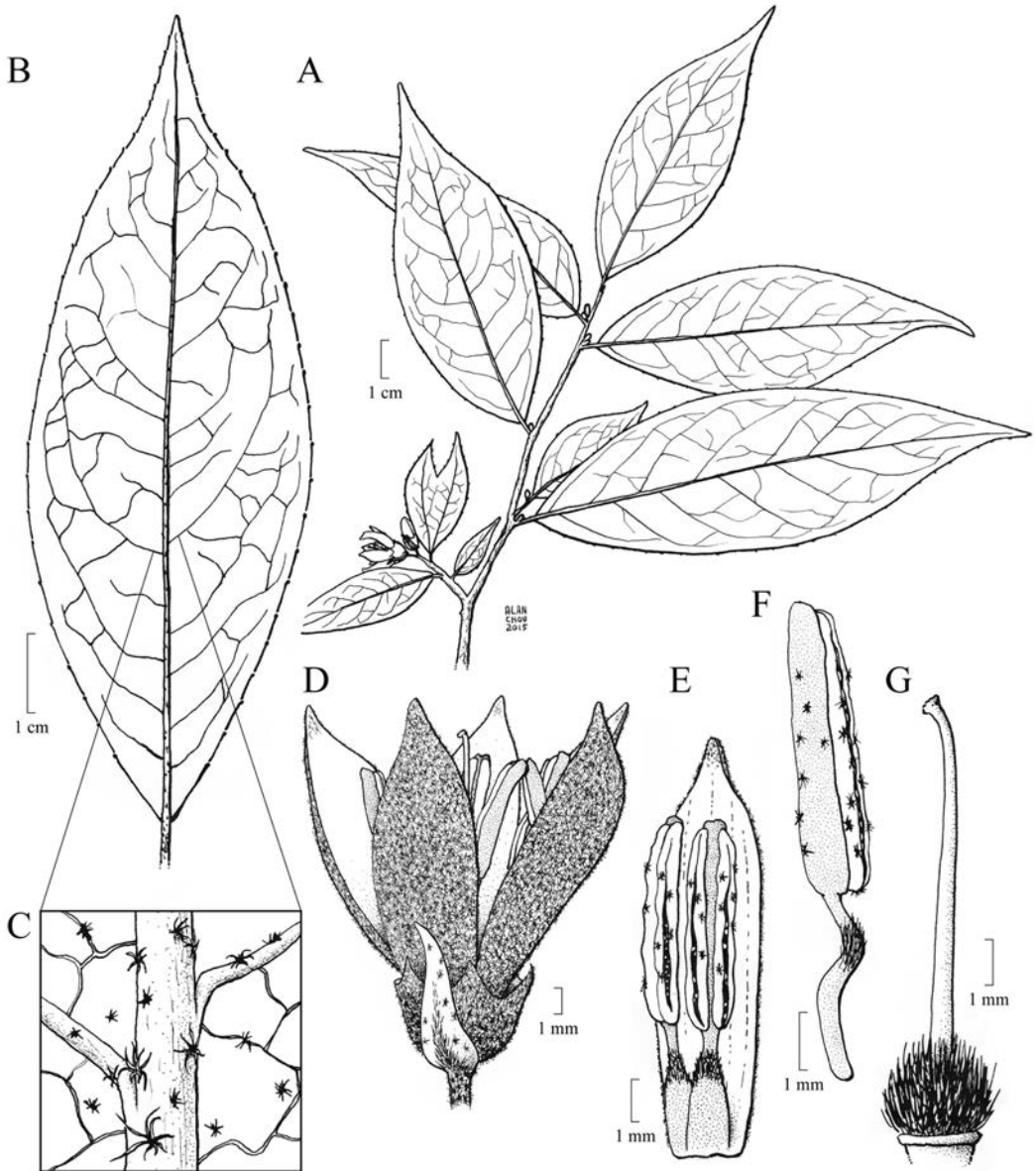


FIG. 2. *Styrax bracteolatus*. A. Flowering branch; note presence of bifurcating leaf. B. Leaf, abaxial view. C. Leaf surface, abaxial view; note trichomes sparsely distributed over surface. D. Flower; note large persistent bracteole subtending calyx. E. Single lobe of corolla and androecium; more of corolla not illustrated due to paucity of material. F. Stamen, lateral view. G. Gynoecium. Based on *Ducoux 2137* (P00219502).

Vernacular names.—Ju-bao-ye-mo-li (China, Yunnan; Ming 1983).

Conservation assessment.—*Styrax bracteolatus* is only known to us from only two localities in China, both in Yunnan. Because we only know of two localities, we cannot calculate an EOO for this species. None of the known subpopulations appear to be in a protected area. The last known collection of this species was made in 1908 by A.C. d'Alleizette. Without additional data on the species, we are unable to further assess the conservation status of *S. bracteolatus*, and assign a status of Data Deficient (DD).

Discussion.—*Styrax bracteolatus* is endemic to Yunnan and can easily be distinguished from the other members of *S. series* *Cyrta* with valvate corolla aestivation by the presence of a large deltoid bracteole subtending the calyx. The 1- or 2-flowered inflorescences distinguish it from both *S. fortunei* and *S. rubifolius*, whose distributions overlap the distribution of *S. bracteolatus*. The species has been rarely collected throughout its range and is only known from sterile and flowering collections.

Styrax bracteolatus was synonymized with *S. roseus* Dunn (= *S. hookeri* C.B. Clarke) in the *Flora Reipublicae Popularis Sinicae* (Hwang 1987b). However, it clearly has valvate aestivation, vs. the imbricate aestivation of *S. hookeri*. *Styrax bracteolatus* does not appear anywhere in the treatment of *Styrax* in the *Flora of China*.

In the protologue of *Styrax bracteolatus*, two collections (syntypes) are cited by Guillaumin (1924): *F. Ducloux 2137* and *J.M. Delavay s.n.* We designated *F. Ducloux 2137* as the lectotype over *J.M. Delavay s.n.* because *F. Ducloux 2137* has flowering material, whereas *J.M. Delavay s.n.* does not, and *F. Ducloux 2137* is better preserved, with stems that have the leaves less crowded vs. *J.M. Delavay s.n.*, allowing the petioles and alternate leaf arrangement to be seen.

Additional specimens examined. **CHINA. Yunnan:** reg. de Yunnan Fou [=Kunming Shi], [25.067°N, 102.683°E], Jun 1908 (fl), A.C. d'Alleizette s.n. (L); [Shuifu Xian], Tchen fong chan [=Cheng Feng Shan], [28.410°N, 104.233°E], year 1893–1895 (st), *J.M. Delavay s.n.* (P); [Shuifu Xian], Tchen fong chan [=Cheng Feng Shan], [28.410°N, 104.233°E], Jul 1894 (st), *J.M. Delavay s.n.* (P12).

3. *Styrax confusus* Hemsl., Bull. Misc. Inform. Kew 1906:162. 1906 [as *S. "confusa"*]. TYPE: CHINA. HONG KONG: Lantau [= Lantau] Island, [22.271°N, 113.953°E], May 1888, *Native Collector of C. Ford* 28 (HOLOTYPE: K!).

Styrax serrulatus var. *vestitus* Hemsl., J. Linn. Soc. Bot. 26:77. 1889 [as *S. "serrulatum* var. *vestitum"*]. *Styrax mollis* Dunn, Bull. Misc. Inform. Kew 1911:273. 1911. TYPE: CHINA. GUANGDONG: [Boluo Xian], Lo Fau Shan [= Luofu Shan], [23.300°N, 114.000°E], 273 m, 11 Aug 1883, *C. Ford 105* [collector from protologue] (HOLOTYPE: K not seen—digital image [barcode 000728977]!).

Styrax philadelphoides Perkins in Engl., Pflanzenr. IV. 241 (Heft 30):32. 1907. TYPE: CHINA. ZHEJIANG: Ning Po Hills [= Ningbo Shi], [29.867°N, 121.550°E], May 1844, *R. Fortune A32* (LECTOTYPE, designated here: P [barcode 00597864]!; ISOLECTOTYPES: BM!, G[4] not seen—digital images [barcodes 00358909, 00358910, 00358911, and 00358912]!), K!, MO!, P[3]!).

Styrax fukiensis W.W. Sm. & Jeffrey, Notes Roy. Bot. Gard. Edinburgh 9:130. 1916. TYPE: CHINA. FUJIAN: in the northwest of the province, 1914, *J. de La Touche 149* (LECTOTYPE, designated here: E!; ISOLECTOTYPE: K!).

Styrax jucundus Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9:198. 1924 [as *S. "jucunda"*]. TYPE: CHINA. ZHEJIANG: Hu Chow [= Huzhou Shi], [30.867°N, 120.100°E], *T.S. Chang 68* (HOLOTYPE: B, destroyed—photograph and fragment at A!).

Styrax philadelphoides var. *superbus* Chun, Sunyatsenia 1:296. 1934. *Styrax confusus* var. *superbus* (Chun) S.M. Hwang, Acta Phytotax. Sin. 18:161. 1980. TYPE: CHINA. Guangdong: Yingtak [= Yingde Shi], Watsui Shan [= Huashui Shan], [24.441°N, 113.673°E], 6 May 1930, *S.P. Ko [X.P. Gao] 50472* (HOLOTYPE: IBSC not seen—digital image [barcode 0454617]!; ISOTYPES: KUN!, NAS not seen—digital image [barcode 00072209]!), PE not seen).

Shrubs or trees to 9(–20) m tall. Young branchlets yellowish brown to reddish brown, with dense light yellow stellate trichomes, occasionally glabrous; older branchlets reddish brown, glabrous. Petiole (2–)3–6 mm long, dense with yellow stellate trichomes, rarely sparse, trichome arms to 0.07–0.76 mm long. Two most proximal leaves on each shoot subopposite, rarely alternate. Lamina of fertile shoots 3.5–8.2(–11) × 1.5–5.1 cm, those of sterile shoots to 13.5 × 5.7 cm, 1.5–3 × as long as wide, subcoriaceous, ovate to elliptic, occasionally elliptic-ovate to elliptic-lanceolate, rarely rhombic; abaxial surface yellowish brown when dry, with yellow stellate trichomes, trichome arms to 0.17–0.69 mm long, scattered to dense on whole surface, denser along veins and in axils of midveins and secondary veins; adaxial surface brown to dark brown when dry, with yellow stellate trichomes, occasionally with sparse simple trichomes, trichomes or trichome arms to 0.13–0.67 mm long, pubescence sparse to scattered on whole surface, trichomes denser along midvein, rarely only along veins; base acute to cuneate, occasionally rounded; margin serrulate or serrate; apex short-acuminate to acute, rarely rounded; secondary veins 4 to 7 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins reticulate, abaxially prominent, adaxially plane. Fertile shoots 5–15.5 cm long, 4- to 6-leaved. Lateral inflorescences racemose, 1.2–4 cm long, 1- to 6-flowered; pseudoterminal inflorescences racemose, with well-spaced nodes, rarely fascicled, 2.3–8.4 cm long, (4- to) 5- to 11- (to 12-)flowered, rachis light brown, dense to completely covered with yellow stellate trichomes. Pedicel 7–17 mm long, (0.87–)1–1.93 mm wide, completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed golden yellow stellate

trichomes; bracteoles 0.9–5.4 mm long, linear or subulate, at base or on basal half of pedicel, rarely at base of calyx. Flowers (1.3–)1.5–1.9(–2.2) cm long. Calyx 5–8(–10) × 4–7 mm, cupuliform; abaxially completely covered with short-armed yellow appressed stellate trichomes and scattered to dense long-armed golden yellow stellate trichomes, with trichomes occasionally becoming less dense within 1 mm of calyx margin, margin brown and scarious, arms of trichomes to 0.26–0.79(–0.9) mm long; adaxially yellowish brown to brown with stellate trichomes growing denser towards margins; margin glandular with 5 to 7 evenly distributed teeth 0.6–1.6 mm long; marginal teeth deltoid to lanceolate, not contiguous, pubescent on both surfaces. Corolla 1.2–1.6 cm long, white or rarely light yellow, tube 2.3–3.7 mm long, abaxial surface proximally glabrous and distally covered with stellate trichomes, lobes 5(or 6), 8.4–13 × 2–3.1(–4.1) mm, subcoriaceous, lanceolate or oblong, apex acute, abaxially completely covered with yellow appressed stellate trichomes, adaxially glabrous except apex and margins, rarely sparse with 2- or 3- armed trichomes, denser at apex. Stamens 9 or 10; filaments 3–4.7 mm long, straight, of equal width throughout, proximally dense with stellate trichomes, distally glabrous; anthers 4.2–7.2 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with dense yellow stellate trichomes. Style 1.2–1.9 cm long, glabrous, with stellate trichomes at base; stigma 0.3–0.6 mm wide, punctiform or capitate. Fruiting calyx 4–8(–9) × 7–11(–13) mm, funnellform to salverform. Fruit 0.8–1.6 × 0.7–1.3 cm, dehiscent, ovoid to subglobose, apex pointed to slightly rostrate; pericarp dry, 0.7–1.64 mm thick, outside smooth to slightly rugose, with dense yellowish erect long-armed stellate trichomes, inside glabrous, smooth. Seeds light brown, ovoid to obovoid, slightly rugose with shallow longitudinal grooves and deep longitudinal fissures, glabrous.

Illustrations.—Dan et al. 1959:580, fig. 937 (as *S. philadelphoides*); Anonymous 1974:339, fig. 4632; Yang 1984:544, fig. 232 (4); Hwang 1987a:391, fig. 425; Hwang 1987b:117, pl. 40 (1–7); Zheng 1989:94, fig. 5-125; Liu 1989:353, fig. 286; Liu 1991:68, fig. 1772; Wu & Raven 2000:209, fig. 209 (1–7); Fu 2002:334, fig. 1978; Hwang 2005:145, fig. 90; He 2006:892, fig. 1271; Xia & Deng 2007:289, fig. 222; Yu 2010:33, fig. 3-43.

Phenology.—Flowering: March–June. Fruiting: March, May–October.

Distribution.—China (Anhui, Fujian, Guangdong, Guangxi, Hong Kong, Hunan, Jiangsu, Jiangxi, Shanghai, and Zhejiang); Fig. 3.

Habitat.—In mixed forests and thickets, on hillside slopes and summits, along streams and roadsides, on sandy or clay soils; 20–1750 m.

Vernacular names.—Baihualong (China, Hunan; *L.B. Luo* 998); bai-shan-long (China, Anhui; Liu 1991); chan shue (China, Guangdong; *W.T. Tsang* 28688); gou-gan-chai (China, Hong Kong; Xia & Deng 2007); hua-li-sai-shan-mei (China; Hwang & Grimes 1996); huazanshu (China, Guangdong; *F.A. McClure* 133); hung lat kai shue [hong-la-ji-shu] (China, Guangdong; *W.T. Tsang* 20485); meng-gu-zi (China, Guangdong; Hwang 1987a); sai-shan-mei (China; Hwang & Grimes 1996); tsat shing tsz shue [qi-xing-zi-shu] (China, Guangdong; *W.T. Tsang* 21385); wenzushu (China, Guangdong; *F.A. McClure* 78); wu-wen-zi (China, Guangdong; Hwang 1987a).

Conservation assessment.—*Styrax confusus* is one of three of the common and widespread Chinese endemic species in *S. series Cyrta* with valvate corolla aestivation. Collections have been made from > 180 geographic localities in a broad area (EOO = ca. 798,805 km²) covering eastern and southeastern China. There appears to be a significant amount of suitable habitat for *S. confusus* throughout its distribution and the species is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., *R.C. Ching* 3053). This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this species as Least Concern (LC).

Discussion.—The range of *Styrax confusus* almost completely overlaps that of *S. faberi*. *Styrax confusus* can be distinguished from *S. faberi* by its usually thicker leaves, buds, corolla lobes, pedicels, and fruit walls. Also, the pseudoterminal inflorescences of *S. confusus* can have more flowers than *S. faberi*, with *S. confusus* usually having 5 to 11 flowers per inflorescence, vs. 3 to 5 in *S. faberi*. Moreover, *S. confusus* usually has yellow or golden yellow trichomes overtopping the basal pubescence of the calyx, in contrast with the reddish brown trichomes of *S. faberi*.

The range of *Styrax confusus* also overlaps with that of *S. fortunei*, mostly in eastern China. These two

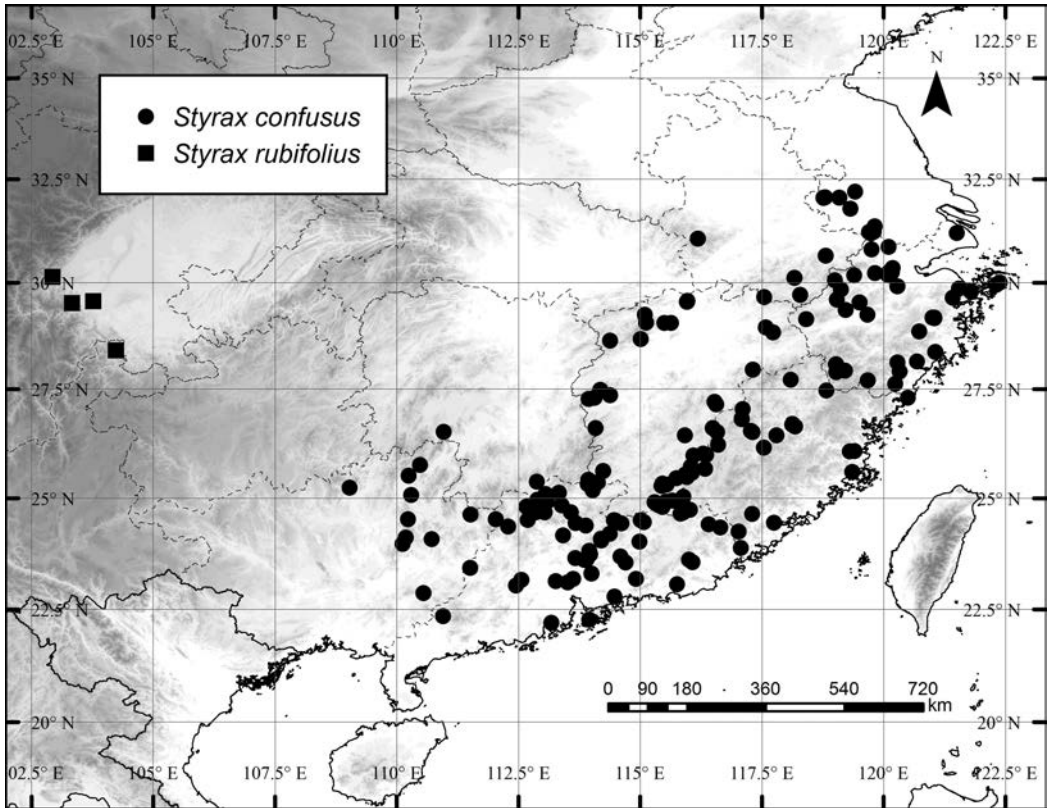


FIG. 3. Geographic distribution of *Styrax confusus* and *S. rubifolius*.

species can sometimes be difficult to distinguish, especially without mature fruits, but can be reliably distinguished with mature fruits because *S. confusus* has much thicker fruit walls than *S. fortunei*. *Styrax confusus* also has thicker flower buds, corolla lobes, and pedicels. The two species can also be distinguished by the structure and number of flowers of the pseudoterminal inflorescences. *Styrax confusus* has racemes with 4 to 12 flowers per inflorescence, whereas *S. fortunei* always has panicles, usually with > 11 flowers per inflorescence. Also, the flowers of *S. confusus* are usually > 1.5 cm long (vs. usually < 1.4 cm).

Styrax confusus var. *superbus* was distinguished from *S. confusus* by having larger flowers than is typical for the species, and more strongly serrate leaves. From our inspection of *S. confusus*, flower size is not strongly correlated with the degree of serration of the leaves. Leaves ranging from serrulate to serrate appear throughout the range of *S. confusus* without any discernable geographical pattern. Furthermore, although the specimens of *S. confusus* with the largest flowers appear to come from around Shaoguan City, Guangdong, specimens with smaller flowers have been collected from that area as well. On this basis, we consider these differences to represent taxonomically trivial variation within the species.

Although *Styrax confusus* usually has fruits with thick fruit walls, the collection B.Z. Xiao 3712, from Mt. Mangshan along the border of Hunan and Guangdong, China, is atypical in its very thin, rugose fruit walls. However, the specimen has far too many fruits per infructescence to be *S. faberi* or *S. formosanus*, the other two species that occur near the collection locality. The specimen may represent an undescribed species. More collections from Mt. Mangshan, especially those with flowers, could help confirm this.

The collection C.S. Ye 621 is atypical for *Styrax confusus* in its unusually dense pubescence on the leaves of

the fertile shoot. The fertile shoot is also unusually long and possesses many more leaves than is typical. The specimen was difficult to identify because it is only in flower bud. However, the pubescence on the leaf matches that of *C.S. Ye 581*, a fruiting specimen of *S. confusus* collected nearby. The sterile leaves on this specimen are densely pubescent like the fertile leaves of *C.S. Ye 621*. Because of the odd structure of the fertile shoot of *C.S. Ye 621* and the dense pubescence on the leaves, we suspect that the shoot was somehow abnormally converted from sterile to fertile.

Two flowering specimens (*W.R. Carles s.n.* [E105545] and *W. Hancock 28*) appear to represent intermediates between *Styrax confusus* and *S. fortunei*, having corolla lobes too thick and flowers too few per pseudoterminal inflorescence for *S. fortunei*, but flowers too small for *S. confusus*. Based on the thickness of the corolla lobes, we have assigned them to *S. confusus*.

In the protologue of *Styrax philadelphoides*, two collections (syntypes) are cited by Perkins (1907): *O. Warburg 6634* and *R. Fortune A32*. We designated *R. Fortune A32* as the lectotype, for several reasons. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that both *O. Warburg 6634* and *R. Fortune A32* at B were destroyed then. Although we have been able to find a photograph of the destroyed syntype and a duplicate of *O. Warburg 6634* stored at A, *R. Fortune A32* is more widely distributed, with many duplicates stored in various herbaria, as well as a flower fragment and photograph of the B specimen stored at A. Three extant sheets of *R. Fortune A32* bear Perkins's annotation label, with two stored at G and one stored at P. Of these three sheets, we were able to examine only P597864 in person. Furthermore, this specimen is the only one that has a label bearing the exact collection data of the specimen. For these reasons, we have chosen the P597864 sheet of *R. Fortune A32* as the lectotype of *S. philadelphoides*.

In the protologue of *Styrax fukienensis*, Smith & Jeffrey (1916) cite *J. de La Touche 149* as original material but do not state clearly in which herbarium the specimen is deposited. As discussed by McNeill (2014), the definition of original material includes duplicates, even if they were not explicitly examined by the authors, and thus duplicates must be considered syntypes if there is no clear indication of the herbarium in which the type is deposited. We designated the E duplicate of *J. de La Touche 149* as the lectotype because this is the herbarium of Smith. Furthermore, someone has written on the E duplicate that the specimen was a type of *S. fukienensis*, unlike on the K duplicate.

Additional specimens examined. **CHINA. Anhui:** Chien Shan Hsien [=Qianshan Qu], Tien Chu Shan [=Tianzhu Shan], [31.062°N, 116.188°E], 900 m, 24 Jun 1936 (fl), *C.S. Fan & Y.Y. Li 219* (A, L); Huangshan Shi, Huangshan, South Anhui, [30.125°N, 118.167°E], 2000 ft, 20 Jul 1925 (fr), *R.C. Ching 3053* (A); Hwangshan [=Huangshan Shi], Chuishihlin to Tzekwangsze, [29.717°N, 118.283°E], 7 Aug 1935 (fr), *T.N. Liou & P.C. Tsong 2277* (KUN[2]); Qimen Xian, Cha-wan Forest Farm [=Chawan Cun?], [29.666°N, 117.547°E], 400 m, 7 Jul 1993 (fr), *X.Y. Dong 93510* (CAS); Wangshan [=Huangshan Shi], locality unknown, [30.125°N, 118.167°E], year 1973 (fr), *K.S. Chow 147* (A, AAU); [Xuanzhou Qu], Xikou Zhen, Baijian Shan, [30.655°N, 118.812°E], 350 m, 17 May 2006 (fr), *M.D. Liu & H.M. Lin A60133* (KUN). **Fujian:** Changting Xian, E of Wuni Cun, [25.584°N, 116.064°E], 1150 m, 12 Sep 1958 (fr), *Anonymous 3656* (KUN); Changting Xian, locality unknown, [25.683°N, 116.333°E], 12 Sep 1958 (fr), *Botanical Resource Investigation Team 84627* (KUN); Foochow [=Fuzhou Shi], locality unknown, [26.076°N, 119.306°E], 11 Apr 1928 (fl), *H.H. Chung 8423* (A); Hok-Chiang [=Fuqing Shi], Ling-Soik Temple [=Linshi Temple?] and vicinity, [25.607°N, 119.356°E], 21 May 1927 (fl), *S.G. Tang 15016* (A); Hok-Chiang [=Fuqing Shi], Ling-Soik Temple [=Linshi Temple?], Ching Ka Ni [=Qingxili Xiang], [25.607°N, 119.356°E], 25 May 1927 (fl), *S.G. Tang 15115* (A); Jiangle Xian, Longxi Shan, outer hills, [26.551°N, 117.277°E], 370–520 m, 26 Jun 1991 (fr), *Longxi Mt. Exped. 1648* (CAS); Jiangle Xian, Longxi Shan, Yujiaping, [26.52°N, 117.306°E], 770–890 m, 17 Jun 1991 (fr), *Longxi Mt. Exped. 1435* (CAS); Jiangle Xian, Longxi Shan, Yujiaping, [26.52°N, 117.306°E], 790–900 m, 15 Sep 1991 (fr), *Longxi Mt. Exped. 2046* (CAS); Jin'an Qu, Kuliang [=Guling Xiang], [26.086°N, 119.403°E], 10 Jul 1927 (fr), *H.H. Chung 6416* (A); [Longhai Shi], White Cloud Hill [=Baiyunyan], [24.449°N, 117.751°E], 26 Mar 1923 (fl), *H.H. Chung 1111* (A); Nanjing Xian, Daling and Dangluping, Shudou Shan, [24.65°N, 117.3°E], 620 m, 16 Apr 1932 (fr), *Xiamen Collection Team 1307* (KUN); Nanping Shi, 3800 kan, [26.65°N, 118.183°E], 300 m, 15 Apr 1993 (fl), *G.S. He 5115* (MO); Nanping Shi, 3800 kan, [26.65°N, 118.183°E], 300 m, 8 Jun 1993 (fr), *G.S. He 5247* (MO); Ninghua Xian, locality unknown, [26.233°N, 116.6°E], 18 Aug 1958 (fr), *Botanical Resource Investigation Team 226* (KUN[2]); Pinghe Xian, Jiufeng Shan, [24.247°N, 117.018°E], 600 m, 22 Aug 1993 (fr), *G.S. He 6427* (MO); Pinghe Xian, Jiufeng Shan, [24.247°N, 117.018°E], 500 m, 22 Aug 1993 (fr), *G.S. He 6460* (MO); [Sanyuan Qu], Shenkou [Cun], [26.162°N, 117.54°E], 7 Jun 1978 (fr), *G.L. Cai 254* (KUN); [Sha Xian], Yantou Liukeng, [26.45°N, 117.8°E], 16 Aug 1958 (st), *Botanical Resource Investigation Team 57584* (KUN); Sha Xian, locality unknown, [26.45°N, 117.8°E], 16 Apr 1932 (fl), *D.S. Wang 395* (KUN); [Songxi Xian], Yenping, Cha-ping [=Chaping], [27.473°N, 118.825°E], 730 m, 30 Jul 1924 (st), *H.H. Chung 2827* (A); Taining Xian, Xinqiao Gongshe, [27.042°N, 117.107°E], 1400 m, 17 Jun 1978 (fr), *G.L. Cai 501* (KUN); [Taining Xian], Yangkouzi, [26.817°N, 117.083°E], 24 Apr 1931 (fl), *Y. Liu 194* (KUN); [Taining Xian], locality unknown, [26.817°N, 117.083°E], 17 Jul 1959 (fl), *J. He 2699* (KUN); Wuyishan Shi, Aotou, [27.723°N, 118.092°E], 26 Aug 1984 (fr), *H.Y. Zou 20201*

(MO); [Yanping Qu], Mangdang Shan, [26.694°N, 118.126°E], 300 m, 1 Jun 1992 (fr), *G.S. He 4427* (MO); [Yanping Qu], Mangdang Shan, [26.694°N, 118.126°E], 300 m, 17 May 1999 (fl), *G.S. He 9437* (CAS); [Yanping Qu], Mangdang Shan, [26.694°N, 118.126°E], 500 m, 21 May 1999 (fr), *G.S. He 9580* (CAS); [Zhao'an Xian], Yuanshan, [23.88°N, 117.07°E], 28 Mar 1923 (fl), *H.H. Chung 1186* (A); locality unknown, (fr), *Zhao 781* (KUN); locality unknown. (fr), *Zhao 829* (KUN); locality unknown, (fr), *Zhao 899* (KUN). **Guangdong:** [Boluo Xian], Loh Fau Mountain [=Luofu Shan], [23.3°N, 114°E], 9–27 Aug 1917 (fr), *E.D. Merrill 10733* (A, CAS); [Boluo Xian], Loh Fau Mountain [=Luofu Shan], [23.3°N, 114°E], 9–27 Aug 1917 (fr), *E.D. Merrill 11030* (CAS); [Conghua Qu], Lutian, Sanjiao Shan, [23.812°N, 113.954°E], 23 Apr 1959 (fl), *K. Liang 70653* (MO); [Dinghu Qu], Dinghu Shan, [23.159°N, 112.557°E], 600 m, 27 May 1965 (fr), *G.Q. Ding 2394* (MO); [Dinghu Qu], near Dinghu Reservoir, [23.159°N, 112.557°E], 500–800 m, 21 Jun 1963 (fr), *G.Q. Ding & G.L. Shi 623* (AAU, L); [Dongyuan Xian], Zengtian Xiang [=Zengtian Zhen], [24.018°N, 114.987°E], 500 m, 29 Jun 1958 (fr), *Z.F. Wei 120724* (KUN); [Doumen Qu], Taai Yeung Shaan [=Dayang Shan], [22.2°N, 113.175°E], 600 m, 20 Jul 1921 (st), *F.A. McClure 78* (A); [Doumen Qu], Taai Yeung Shaan [=Dayang Shan], [22.2°N, 113.175°E], 600 m, 21 Jul 1921 (fr), *F.A. McClure 133* (K); Fengchuan Xian [=Fengkai Xian], near Jiangkou Zhen, [23.429°N, 111.511°E], 240 m, 9 Jun 1958 (fr), *C. Huang 164222* (KUN); Gaoyao Shi, Guangli Gongshe, Jiukeng Nantian Dadui, Huanglong Keng, [23.033°N, 112.45°E], 275 m, 17 Apr 1980 (fl), *Z.L. Chen 30579* (KUN); Guangzhou Shi, Canton and vicinity, [23.133°N, 113.267°E], 15 Aug 1917 (fr), *C.O. Levine 1461* (A); Heping Xian, Xialongshi [Cun], Dachakeng, [24.508°N, 115.012°E], 440 m, 3 Jun 1958 (fr), *Z.F. Wei 120283* (KUN); Heping Xian, Youzhen Xiang, SE of Mulong, Rongjiachang, [24.465°N, 115.076°E], 360 m, 9 Jun 1958 (fr), *Z.F. Wei 120440* (KUN); [Huangpu Qu], Lung Tau Mountain [=Longtou Shan], near Lu, [23.102°N, 113.512°E], 22 May–5 Jul 1924 (fr), *K.P. To et al. 12589* (E); Huidong Xian, Songkeng [Cun] facing Xi She, [23.179°N, 114.916°E], 450 m, 31 Jul 1958 (fr), *Z.F. Wei 121034* (KUN); Huiyang Xian, Changan Xiang, Jiehuang She, [22.789°N, 114.472°E], 180 m, 7 Sep 1958 (fr), *Z.F. Wei 121646* (KUN); Jen-hwa District [=Renhua Xian], Man Chi Shan [=Wanchi Shan], Shek Pik Ha Village [=Shibixia Cun], [25.428°N, 113.933°E], 1–10 May 1936 (st), *W.T. Tsang 26317* (A); Jen-hwa District [=Renhua Xian], Man Chi Shan [=Wanchi Shan], Shek Pik Ha Village [=Shibixia Cun], [25.428°N, 113.933°E], 11–20 May 1936 (fl), *W.T. Tsang 26324* (A); [Jiexi Xian], Thai-Yong [=Dayang Xiang], 60 mi W from the Port of Swatow [=Shantou], [23.615°N, 116.002°E], 2000 ft, (fr), *J.M. Dalziel s.n.* (E); [Jiexi Xian], Wu-King-Fu [=Wujingfu Zhen], 60 mi W and inland from Swatow [=Shantou], [23.562°N, 116.074°E], Apr 1901 (fl), *J.M. Dalziel s.n.* (E); Lechang Shi, Yanggu [Ping], Tianzhong Shan, [25.103°N, 113.057°E], 19 May 1934 (fl), *X.P. Gao 54550* (KUN); Lian Xian [=Lianzhou Shi], Longping Xiang, Dadong Shan, Renzishi, [24.818°N, 112.666°E], 950 m, 12 Oct 1958 (fr), *P.X. Tan 59746* (KUN); Liannan Yaozu Zizhixian, Baimang Xiang, Bandong, Longguizhai, [24.362°N, 112.284°E], 850 m, 11 Aug 1958 (fr), *P.X. Tan 58944* (KUN); Lianping Xian, Huangniu Shi Linchang, [24.505°N, 114.458°E], 2 Aug 1985 (fr), *X.B. Ye 35040* (MO); Lianping Xian, Julian Xiang, Julian Shan, [24.199°N, 114.377°E], 250 m, 18 May 1958 (fr), *Z.F. Wei 120023* (KUN); Lianping Xian, Modaokeng Linchang, [24.5°N, 114.483°E], 17 Apr 1984 (fl), *G.Z. Chen 23646* (MO); Lianping Xian, Modaokeng Linchang, [24.5°N, 114.483°E], 2 Oct 1985 (fr), *X.B. Ye 35040* (MO); Lianping Xian, Zhongxin Qu, Dashui Xiang, Julian Shan, [24.433°N, 114.617°E], 1 May 1957 (fl), *Y.G. Liu 104* (AAU); Lianshan Zhuangzu Yaozu Zizhixian, Daxu Shan, Sharenchong, [24.528°N, 112.037°E], 490 m, 30 May 1958 (fr), *P.X. Tan 58189* (KUN); Lienping [=Lianping Xian], in forest SW of “jugi Tsatmukngao” near Lienping, [24.5°N, 114.483°E], 500–800 m, 15 Jul 1920 (fr), *R.E. Mell 673* (A); Lok Chong [=Lechang Shi], Sei Hien, [25.133°N, 113.333°E], 9 May 1929 (fl), *C.L. Tso 20331* (A); Longmen Xian, Nankun Shan, [23.623°N, 113.904°E], 3 Apr 1981 (fl), *G.Z. Chen 70954* (MO); Lufeng Shi, Bawan Xiang, Huanghujiang Cun [=Huangfugang], [23.06°N, 115.757°E], 17 Aug 1958 (fr), *Z.F. Wei 121263* (KUN); Mei [Kaying [=Jiaying] District [=Meixian Qu], Yam Na Shan [Yit Nga Shan] [=Yinna Shan], [24.416°N, 116.405°E], 4–31 Aug 1932 (fr), *W.T. Tsang 21385* (K, P); Nanxiong Shi, Baishun Xiang [=Baishun Zhen], Baiyun She, Shanpeng Shan, [25.187°N, 114.028°E], 500 m, 30 May 1958 (fr), *L. Deng 6290* (KUN); Pingyuan Xian, Hetou Xiang, Xiangya Qu, [24.677°N, 115.877°E], 20 May 1992 (fr), *Z.J. Feng 84119* (MO); Pingyuan Xian, Sishui Qu [=Sishui Zhen], [24.743°N, 116.023°E], 20 Jun 1986 (fr), *Z.Y. Li 1085* (MO); Pingyuan Xian, Zhongxing Xiang, Guankeng, [24.658°N, 115.831°E], 11 May 1992 (fr), *Z.J. Feng 83632* (MO); Pingyuan Xian, Zouhuang Xiang, Muxi Cun, Dashuikeng, [24.863°N, 115.848°E], 350 m, 12 Apr 1957 (fr), *L. Deng 4239* (KUN); Pok-lo District [=Boluo Xian], Loh-Fau Shan [=Luofu Shan], [23.3°N, 114°E], 4100 ft, Mar–Apr 1932 (fl), *T.M. Tsui 31* (K); Qujiang Qu, Longtou Shan, [24.689°N, 113.579°E], 31 Mar 1930 (fl), *X.P. Gao 50245* (MO); Renhua Xian, Changjiang Xiang [=Changjiang Zhen], Shishi She, Fanzi Shan, Doudu Keng, [25.331°N, 113.922°E], 700–900 m, 30 Aug 1958 (fr), *L. Deng 7326* (KUN); Ruyuan Yaozu Zizhixian, Huoshao Ling, [24.843°N, 113.389°E], 8 May 1934 (fl), *X.P. Gao 54268* (KUN); Ruyuan Yaozu Zizhixian, Luoyang Zhen, Tianjing Shan, [24.686°N, 113.037°E], 22 Jun 1957 (fr), *Y.G. Liu 497* (MO); Ruyuan Yaozu Zizhixian, Ruyang Forestry Bureau, Laopenger Dui, [24.921°N, 113.087°E], 900 m, 29 Apr 1980 (fl), *Z.K. Chen 30616* (KUN); Sin-fung District [=Xinfeng Xian], Ch'a-P'ing Village [=Chaping Cun], Ah P'o Kai Shan [=Yunji Mountain], [24.084°N, 114.195°E], 1–24 May 1938 (fr), *Y.W. Taam 633* (CAS, P); Sin-fung District [=Xinfeng Xian], Fuk Lung Monastery [=Fulong Si], Hau T'ong Shan [=Houtang Shan], [24.05°N, 114.2°E], 1–19 Jun 1938 (fr), *Y.W. Taam 781* (CAS, P); Sin-fung District [=Xinfeng Xian], Lo-Lo-ha Village [=Laoluxia Cun], Sha Lo Shan [=Shaluo Shan], [24.05°N, 114.2°E], 6–25 Jul 1938 (fr), *Y.W. Taam 954* (CAS, P); Sunyi [=Xinyi Shi], Tai Ping, [22.35°N, 110.95°E], 17 Jul 1931 (fr), *S.P. Ko 51615* (A); Tapu District [=Dabu Xian], Tai Mo Shan [=Damao Shan], [24.34°N, 116.643°E], 16 Jul 1932 (fr), *W.T. Tsang 21201* (A, P); Tsengshing District [=Zengcheng Qu], Naam Kwan Shan [=Nankun Shan], [23.606°N, 113.855°E], 22 Apr 1932 (fl), *W.T. Tsang 20301* (A, KUN); Tsungfa [=Conghua Qu], Sam Kok Shan [=Sanjiao Mountain], [23.738°N, 113.97°E], 16 May 1932 (fr), *W.T. Tsang 20485* (A, P); Tsungfa [=Conghua Qu], Sam Kok Shan [=Sanjiao Mountain], [23.738°N, 113.97°E], 16 May 1932 (fr), *W.T. Tsang 20485a* (L); Ts'ung-hwa (Tsung-fa District [=Conghua Qu], Sam Kok Shan [=Sanjiao Shan], Ch'an Woh T'ung Village [=Chenhedong Cun], [23.65°N, 113.667°E], 1–25 May 1935 (fl), *W.T. Tsang 25168* (CAS); Ts'ung-hwa (Tsung-fa District [=Conghua Qu], Sam Kok Shan [=Sanjiao Shan], Ch'an Woh Tung Village [=Chenhedong Cun], [23.65°N, 113.667°E], 1–25 May 1935 (fl), *W.T. Tsang 25200* (CAS); Wengyuan Xian, Diyi Qu, Yanyuan Xiang, right middle of Shungmiao Shan, [24.384°N, 113.88°E], 29 Apr 1935 (fr), *X.Q. Liu 24626* (KUN); Yangshan Xian, Dier Qu, Wuyuan Xiang [=Wuyuan Cun], Zhaotian, Shi Shan summit, [24.686°N, 112.852°E], 1750 m, 1 Jun 1956 (fl), *L. Deng 1158* (KUN); Yangshan Xian, Lutian Xiang, Yangjiaokeng, [24.512°N, 112.69°E], 19 Sep 1985 (fr), *Nanling Expedition 1536* (CAS); Ying-tak [=Yingde Xian], locality

unknown, [24.167°N, 113.417°E], 31 Jul 1929 (fr), W.K. Wang 2883 (A); [Yuancheng Qu], Kwai Shan [=Gui Shan], Tsing-lo-long Village [=Jinglaojiang Cun], [23.688°N, 114.597°E], 1–12 Apr 1938 (fl), W.T. Tsang 28688 (CAS, P); [Zengcheng Qu], Longtau Shan [=Longtou Shan], Lu Village and Yeung Uk Village [=Yangwu Cun], Lingnan, [23.183°N, 113.621°E], 26 Jun 1924 (fr), K.P. To et al. 12589 (BM, P); Zijin Xian, Huangxiang Xiang, Lianhua Shan, [23.554°N, 114.699°E], 480 m, 29 Jun 1958 (fr), Z.F. Wei 120812 (KUN); locality unknown, 26 Mar 1923 (fr), N.K. Chun 40805 (CAS). **Guangxi:** Chuen Yuen, 18 Jun 1937 (fr), T.S. Tsoong 81993 (A); Damiaoshan [=Rongshui Miaozu Zizhixian], near Zhongzhai [Cun], [25.247°N, 109.03°E], 28 Apr 1955 (fl), S.Q. Chen 8789 (KUN); Hing On District [=Xing'an Xian], Wah Kong [=Huijiang Xiang], [25.769°N, 110.477°E], 29 Aug 1937 (fr), T.S. Tsoong 83651 (A); Jinxiu [=Jinxiu Yaozu Zizhixian], Yao Shan [=Dayao Shan], [23.97°N, 110.117°E], 6 Oct 1936 (fr), C.M. Wang 39999 (A); [Jinxiu Yaozu Zizhixian], Dayao Shan, [Jinwang?] to Luomeng, [23.97°N, 110.117°E], 900 m, 22 Apr 1964 (fl), N.N. Wei 638 (MO); Jinxiu Yaozu Zizhixian, Dayao Shan, Jinxiu Lao Shan, [23.97°N, 110.117°E], 1250 m, 4 Jun 1958 (fr), Y.K. Li 400153 (MO); Jinxiu Yaozu Zizhixian, Guzhenwuzhi Shan, [24.117°N, 110.183°E], 900 m, 17 May 1964 (fr), F.N. Wei 844 (MO); Lingchuan Xian, Yang-wu Village [=Yangwu Cun] & vicinity, Ta-ling [=Dalingtou], [25.522°N, 110.244°E], 21–30 Jul 1937 (fr), W.T. Tsang 27934 (A); Lipu Xian, Pulu Commune [Pulu Xiang], [24.531°N, 110.234°E], 22 Jul 1979 (fr), Q.H. Lu 121 (MO); Shuen-yuen, 12 May 1936 (fl), T.S. Tsoong 81545 (A); Yanshan Qu, Yanshan Botany Research Institute [CAS Guilin], back mountain, [25.085°N, 110.298°E], 310 m, 4 Jun 1983 (fr), D.D. Tao 83073 (KUN); Yung Hsien [=Rong Xian], Ta Tseh Tsuen, [22.867°N, 110.55°E], 320 m, 4 Aug 1933 (fr), A.N. Steward & H.C. Cheo 748 (A, P); Zhaoxing Xian, Danao Shan, Huanglian Forestry Station, [24.077°N, 110.717°E], 900 m, 28 Sep 1979 (fr), Q.H. Lu 5031 (MO); [Zhongshan Xian], He Xian [=Hezhou City], hill behind Gupo Shan Forestry Center, [24.636°N, 111.514°E], 600 m, 19 Sep 1979 (fr), Q.H. Lu 5015 (MO); Zhongshan Xian, He Xian [=Hezhou City], near Gupo Shan Forestry Center, [24.636°N, 111.514°E], 850 m, 17 Sep 1979 (fr), Q.H. Lu 5003 (MO). **Hong Kong:** Lantau Island, [22.271°N, 113.953°E], May 1889 (fl), C. Ford 143 (K). **Hunan:** Xinning Xian, Huanglong Zhen, Baimao Jiang, [26.531°N, 110.966°E], 700 m, 9 Aug 1995 (fr), L.B. Luo 998 (CAS); Yizhang Xian, Mang Shan, [24.976°N, 112.888°E], 1050 m, 1 Aug 1964 (fr), L.H. Liu 10579 (KUN); Yizhang Xian, Mang Shan, [Dakuwangkeng?], [24.976°N, 112.888°E], 1200 m, 17 Jul 1964 (fr), L.H. Liu 10489 (KUN); Yizhang Xian, Mt. Mangshan, [24.976°N, 112.888°E], 1650 m, 13 May 2004 (fl), B.Z. Xiao 3484 (CAS, P); Yizhang Xian, Mt. Mangshan, [24.976°N, 112.888°E], 1200 m, 20 Jul 2004 (fr), B.Z. Xiao 3712 (CAS); [Yizhang Xian], Yanzhu Shan [border of Hunan and Guangdong], [25.38°N, 112.876°E], 27 Jul 1930 (fr), X.P. Gao 50675 (KUN). **Jiangsu:** Chinking [=Zhenjiang Shi], locality unknown, [32.2°N, 119.417°E], year 1880 (fl), W.R. Carles s.n. (E); [Gulou Qu], Tsing Ling Temple [=Qingliang Si], [32.047°N, 118.767°E], 18 Aug 1926 (fr), Wang 2632 (A); Jurong Shi, Mao Shan, [31.785°N, 119.32°E], 9 Oct 1956 (fr), M.B. Deng et al. 3447 (KUN); Jurong Shi, Niumu Gang, 32°03'15.87"N, 119°05'28.18"E, 80 m, 25 Aug 2007 (fr), Z.Y. Wang & B.C. Wu SCSB-JS0179 (KUN[2]); Nanjing Shi, locality unknown, [32.06°N, 118.796°E], 350 m, 27 Jun 1926 (fr), Tso 1332 (A); Nanking [=Nanjing Shi], Kih shan, S. Nanking [=Nanjing], [32.05°N, 118.767°E], 5 May 1928 (fr), Y.L. Keng 1477 (A); Nanking [=Nanjing Shi], locality unknown, [32.05°N, 118.767°E], 28 Jun 1926 (fr), R.C. Ching & C.L. Tso 1316 (A); Nanking [=Nanjing Shi], locality unknown, [32.05°N, 118.767°E], 19 Sep 1929 (fr), W.C. Cheng 259 (P); Pagode de Doh-Dinh, [western Jiangsu], 28 Sep 1876 (fr), H. de Poli s.n. (P); Yixing Shi, Hai Nei, S of I-shing [=Yixing], Lung-ge, [31.36°N, 119.815°E], 16 May 1926 (fl), R.C. Ching & C.L. Tso 485 (A); Yixing Shi, Hufu Gongshe [=Hufu Zhen], Gangxia Dadui, Shizi Shan, [31.189°N, 119.738°E], 17 Sep 1962 (fr), S.H. Mao 261 (KUN); Yixing Shi, Longchi Shan, [31.22°N, 119.698°E], 23 Jun 1962 (fr), S.H. Mao 51 (KUN); Yixing Shi, Wu-fu [=Hufu Zhen], Longtou Shan, [31.229°N, 119.797°E], 130 m, 5 Aug 1926 (fr), K. Ling 2557 (GH). **Jiangxi:** Anfu Xian, Wugong Shan Farm, [27.483°N, 114.183°E], 190 m, 10 Aug 1959 (fr), S.S. Lai 1755 (KUN); Anfu Xian, Wugong Shan Farm, Yantian [Cun], [27.358°N, 114.381°E], 190 m, 9 Aug 1959 (fr), S.S. Lai 1687 (KUN[2]); Anfu Xian, Wugong Shan, Wenjia, [27.483°N, 114.183°E], 300 m, 2 Aug 1963 (st), J.S. Yue 2858 (KUN); Anyuan Qu, Banshi [Zhen], Ge'ao [Forest Farm], [25.288°N, 115.436°E], 2 Jun 1958 (fr), C.M. Hu 2301 (KUN[3]); Anyuan Qu, Caifang, [25.301°N, 115.453°E], 12 Jun 1958 (fr), C.M. Hu 2646 (KUN[2]); Anyuan Qu, Caifang, [25.301°N, 115.453°E], 1 Jun 1958 (fr), Lushan Botanical Garden 2245 (KUN); Anyuan Qu, Dazhuyuan, [25.319°N, 115.545°E], 600 m, 9 Jun 1958 (fr), C.M. Hu 2518 (KUN); Anyuan Qu, Dujiang Xiang, Huang Di, [25.338°N, 115.459°E], 600 m, 15 Jun 1958 (fr), Anonymous 2646 (KUN); Anyuan Qu, Dujiang Xiang, Huang Di, [25.338°N, 115.459°E], 600 m, 17 Jun 1958 (fr), Anonymous 2732 (KUN); Anyuan Qu, Dujiang Xiang, Huang Di, [25.338°N, 115.459°E], 600 m, 17 Jun 1958 (fr), C.M. Hu 2732 (KUN); Anyuan Qu, from Caifang to Dujiang, [25.319°N, 115.456°E], 550 m, 6 Jun 1958 (fr), Anonymous 2384 (KUN); Anyuan Qu, from Caifang to Dujiang, [25.319°N, 115.456°E], 550 m, 6 Jun 1958 (fr), C.M. Hu 2384 (KUN); Anyuan Qu, from Caifang to Dujiang, [25.319°N, 115.456°E], 9 Jun 1958 (fr), C.M. Hu 2518 (KUN[2]); Anyuan Qu, Ge'ao [Forest Farm], [25.288°N, 115.436°E], 1 Jun 1958 (fr), Anonymous 2245 (KUN); Anyuan Qu, Kongtian Xiang, Xialong [Cun], Gangdongxia Shan, [24.919°N, 115.298°E], 650 m, 18 May 1958 (fr), C.M. Hu 2023 (KUN[2]); Anyuan Qu, Kongtian Xiang, Xialong [Cun], Gangdongxia Shan, [24.919°N, 115.298°E], 650 m, 18 May 1958 (fr), C.M. Hu 2089 (KUN); Chongyi Xian, Mixi Gongshe [=Mixi Cun], Xikengwe, [25.627°N, 114.237°E], 750 m, 9 Jun 1965 (fr), M.X. Nie et al. 8790 (KUN); Dayu Xian, Neiliang [Xiang], Shixi [Cun], [25.371°N, 114.132°E], 580 m, 9 Jul 1965 (fr), M.X. Nie et al. 9372 (KUN); De-xin [=Dexing Shi], locality unknown, [28.946°N, 117.579°E], 400 m, Jun 1991 (fr), K. Yao 11609 (CAS); Dexing Shi, Damao Shan (eastern mine), [28.827°N, 117.73°E], 30 Sep 1958 (fr), M.X. Nie & S.S. Lai 5228 (KUN); Fengxin Xian, near Shangfu, [28.673°N, 115.01°E], 5 May 1965 (fl), S.L. Liu et al. 1025 (KUN); Guangchang Xian, Tangfang Xiang, Xiyao She, Shahe, [26.619°N, 116.488°E], 26 Sep 1958 (fr), C.M. Hu 5139 (KUN); Guixi Shi, Tianhua Shan (North Shore), [27.956°N, 117.315°E], 400 m, 23 Jul 1958 (fr), M.X. Nie & S.S. Lai 3721 (KUN[2]); Huichang Xian, Fucheng Xiang, Bankeng She, [25.547°N, 115.928°E], 11 Jul 1958 (fr), Anonymous 3450 (KUN); Huichang Xian, Fucheng Xiang, Bankeng She, [25.547°N, 115.928°E], 10 Jul 1958 (fr), C.M. Hu 3450 (KUN); Huichang Xian, Panjing Xiang, [25.495°N, 115.957°E], 6 Jul 1958 (fr), Anonymous 3202 (KUN); Huichang Xian, Panjing Xiang, [25.495°N, 115.957°E], 6 Jul 1958 (fr), Anonymous 3205 (KUN); Huichang Xian, Panjing Xiang, [25.495°N, 115.957°E], 6 Jul 1958 (fr), C.M. Hu 3202 (KUN); Huichang Xian, W of river, [25.463°N, 115.743°E], Jun 1958 (fr), C.M. Hu 2901 (KUN); Jinggongshan Shi, Zizhu Bade, [26.617°N, 114.083°E], 1500 m, 15 Jun 1965 (fl), S.S. Lai 4158 (KUN); Jingkou Xiang [=Jingkou Cun], in Qiling, [25.995°N, 116.354°E], 21 Aug 1958 (fr), Anonymous 4507 (KUN); Jingkou Xiang [=Jingkou Cun], in Qiling Chang Keng, [25.995°N, 116.354°E], 25 Aug 1958 (fr), Anonymous 4693 (KUN); Jingkou Xiang [=Jingkou Cun], in Qiling

Chang Keng, [25.995°N, 116.354°E], 25 Aug 1958 (fr), *Anonymous 4694* (KUN); Jingkou Xiang [=Jingkou Cun], Shangke, [26.026°N, 116.297°E], 23 Aug 1958 (fr), *C.M. Hu 4694* (KUN); Kiangsi oriental, year 1873 (fr), *J.P.A. David s.n.* (P); Lianhua Xian, Fanglou [Zhen], [27.271°N, 113.942°E], 350 m, 17 Jul 1959 (fr), *S.S. Lai 1333* (KUN); Lianhua Xian, Miaoqian Gongshe, Jinglong, [27.304°N, 114.063°E], 600 m, 4 Jun 1983 (fr), *S.S. Lai 1611* (KUN); [Lianxi Qu], Lu Shan, Huang Yen Ssu, [29.573°N, 115.973°E], 15 Aug 1932 (fr), *H.C. Cheo 107* (CAS); [Lianxi Qu], Lushan, Huanglongtan, [29.55°N, 115.965°E], 15 May 1977 (fl), *Z.Y. Wu L-35* (KUN); [Lianxi Qu], Lushan, Longshouyan [=Longshouya], [29.556°N, 115.955°E], 15 May 1977 (fl), *Z.Y. Wu L-76* (KUN); Nanfeng Xian, Wu Qu (Zhicun Qu), [27.209°N, 116.531°E], 25 Sep 1958 (fl), *M.X. Nie & S.S. Lai 2366* (KUN); Nanfeng Xian, Zhoujiabao, Sangtian Xiang, Shuibe Xiang, [27.151°N, 116.56°E], 14 Apr 1958 (fl), *M.X. Nie & S.S. Lai 2159* (KUN); Ningdu Xian, Lienhwa-schan [=Lianhua Shan], [26.452°N, 115.917°E], 700 m, 7 Aug 1921 (fr), *T.H. Wang 467* (A, C); Ruijin Shi, Diwu Qu, Buquan Xiang [=Buquan Cun], [25.727°N, 116.039°E], 25 Jul 1958 (fr), *Anonymous 3907* (KUN); Ruijin Shi, Diwu Qu, Buquan Xiang [=Buquan Cun], [25.727°N, 116.039°E], 25 Jul 1958 (fr), *C.M. Hu 3918* (KUN); Ruijin Shi, Diwu Qu, Buquan Xiang [=Buquan Cun], [25.727°N, 116.039°E], 25 Jul 1958 (st), *C.M. Hu 3918* (KUN); Ruijin Shi, Liantang She, Longwang Qu, [25.981°N, 116.091°E], 9 Aug 1958 (fr), *Anonymous 4163* (KUN); Ruijin Shi, Lishu Pai, Qingxi Xiang, Liantang She, Wujiao Keng, [25.981°N, 116.091°E], 8 Aug 1958 (fr), *Anonymous 4119* (KUN); Tonggu Xian, Xiangtan, Caozili, [28.633°N, 114.383°E], 800 m, 24 Sep 1963 (fr), *S.S. Lai 3736* (KUN); Wuning Xian, Huangduan Village Ball Court, [Xinning Zhen], [29.247°N, 115.095°E], 230 m, 23 Aug 1995 (fl), *C.S. Ye 621* (MO); [Wuning Xian], Maozhu Linchang, Yangang Shan, [29.06°N, 115.121°E], 400 m, 11 Aug 1995 (fr), *C.S. Ye 581* (MO); Xunwu Xian, Guizhumao Forestry Center, [24.93°N, 115.533°E], 600 m, 10 May 1958 (fr), *C.M. Hu 1825* (KUN); Xunwu Xian, Guizhumao Forestry Center, northwest valley, [24.93°N, 115.533°E], 700 m, 7 May 1958 (fr), *Anonymous 1720* (KUN); Xunwu Xian, Guizhumao Forestry Center, northwest valley, [24.93°N, 115.533°E], 600 m, 6 May 1958 (fr), *C.M. Hu 1744* (KUN); Xunwu Xian, Guizhumao Forestry Center, southeast valley, [24.93°N, 115.533°E], 600 m, 5 May 1958 (fr), *Anonymous 1667* (KUN); Xunwu Xian, Guizhumao Forestry Center, southeast valley, [24.93°N, 115.533°E], 600 m, 5 May 1958 (st), *C.M. Hu 1667* (KUN); Xunwu Xian, Guizhumao Kenzhi Ground, [24.849°N, 115.376°E], 580 m, 1 May 1958 (fr), *Anonymous 1431* (KUN); Xunwu Xian, Guizhumao Kenzhi Ground, [24.849°N, 115.376°E], 580 m, 1 May 1958 (fr), *C.M. Hu 1431* (KUN); Xunwu Xian, Nanxie to Tieshi, [24.954°N, 115.662°E], 600 m, 7 May 1958 (fr), *Anonymous 1744* (KUN); Xunwu Xian, Shanbei Gongshe, Shangyunzhu, [25.042°N, 115.887°E], 650 m, 16 Aug 1962 (fr), *J.S. Yue 1947* (KUN[2]); Xunwu Xian, Tai Au Hong, SW of Sungwu [=Xunwu], S. Kiangxi [=Jiangxi], [24.954°N, 115.662°E], 555 m, 5 Jul 1936 (fr), *J.L. Gressitt 1593* (A); Xunwu Xian, Zhonghe Xiang to Guizhumao Forestry Center, [24.81°N, 115.457°E], 300 m, (fl), *C.M. Hu 1245* (KUN); Yongxiu Xian, Yunshan, [29.056°N, 115.633°E], 1100 m, 21 May 1963 (fl), *S.S. Lai 2266* (KUN); Yongxiu Xian, Yunshan Farm, Yanshan Annex Farm, [29.052°N, 115.498°E], 180 m, 4 Jun 1983 (fl), *S.S. Lai 2039* (KUN); Zhengping Xiang, Jinhua Shan, [26.521°N, 116.579°E], 18 Sep 1958 (fr), *Anonymous 5003* (KUN). **Shanghai:** locality unknown, [31.2°N, 121.5°E], year 1915 (fl), *D. Macgregor 5* (A); locality unknown, [31.2°N, 121.5°E], year 1915 (fr), *D. Macgregor 34* (A). **Zhejiang:** (Tsing-tien [=Qingtian Xian], locality unknown, [28.123°N, 120.283°E], 28 Jul 1926 (fr), *Y.L. Keng 213* (A); [Anji Xian], Meiki [=Meixi], [30.803°N, 119.754°E], 19 Aug 1924 (fr), *R.C. Ching 4910* (A); [Anji Xian], Meiki [=Meixi], [30.803°N, 119.754°E], 9 Aug 1924 (fr), *R.C. Ching 4931* (A); Chun'an Xian, Linqi Town, Hongkeng, [29.848°N, 119.12°E], 24 May 1959 (fl), *Zhejiang Bot. Resource Team 27347* (MO); Chun'an Xian, locality unknown, [29.603°N, 119.039°E], 2 Jul 1927 (fr), *Y.L. Keng 661* (A); Fenghua Xian, Shangu Cun, [29.65°N, 121.417°E], 340 m, 2 Jul 1958 (fr), *S.Y. Chang 456* (MO); [Gongshu Qu], Pan shan [=Ban Shan], [30.358°N, 120.188°E], 29 Jun 1915 (fr), *F.N. Meyer 1487* (A); Hang Chow [=Hangzhou Shi], locality unknown, [30.25°N, 120.167°E], Jun 1922 (fr), *E.D. Merrill 11293* (A); Hangchow [=Hangzhou Shi], locality unknown, [30.25°N, 120.167°E], 200 ft, year 1921 (fl), *A. Allison 55* (GH); Hangzhou Shi, near Han-chow [=Hangzhou], [30.25°N, 120.167°E], Jun 1907 (fr), *F.N. Meyer 440* (DS); Jiande Shi, Meicheng, Wushitang [=Wushitan], [29.541°N, 119.504°E], 20 m, 10 Apr 1997 (fl), *T. Chen & P.W. Fritsch 9704082* (CAS); Jiande Shi, Meicheng, Wushitang [=Wushitan], [29.541°N, 119.504°E], 20 m, 10 Apr 1997 (fl), *T. Chen & P.W. Fritsch 9704083* (CAS); [Jiande Shi], Shouchang [Zhen], Bajiaowu Zhongkeng, [29.359°N, 119.222°E], 7 Jul 1958 (fr), *S.Y. Chang 29506* (MO); Kaihua Xian, Chawan Ding, [29.144°N, 118.411°E], 28 May 1959 (fl), *Zhejiang Bot. Resource Team 26134* (MO); Kaihua Xian, locality unknown, [29.144°N, 118.411°E], 30 Jul 1997 (fr), *S.Y. Chang 29710* (MO); [Lanxi Shi], Mt. Pei-shan [=Bei Shan], [29.25°N, 119.667°E], 5 May 1935 (fl), *H. Migo s.n.* (A); [Lin'an Shi], Changhua, Daming Shan, [30.066°N, 118.998°E], 28 May 1956 (fl), *Y.Y. Ho 23287* (MO); [Lin'an Shi], Hengshan, [30.233°N, 119.826°E], 31 May 1958 (fr), *S.Y. Zhang 2618* (KUN); [Lin'an Shi], Yu-tsien Hsien [=Yuqian Zhen], [30.182°N, 119.396°E], 26 Jun 1927 (fr), *Y.L. Keng 432* (A); Longquan Shi, Cukeng to Datianping, [27.895°N, 119.023°E], 1200 m, 16 Aug 1958 (fr), *R.H. Dan 5730* (KUN); [Longquan Shi], Fengyang Mountain, [27.933°N, 119.21°E], 120 m, 21 Apr 1980 (fl), *H.Y. Zou 51* (A); Longquan Shi, Jinqi [=Jinxi Xian?], [28.083°N, 119.016°E], 22 May 1959 (fr), *S.Y. Zhang 6983* (KUN); Longquan Shi, near Jinxi [Zhen], [28.08°N, 119.023°E], 450 m, 6 Aug 1958 (fr), *R.H. Dan 5637* (KUN); Ningbo Shi, western hills, [29.867°N, 121.55°E], 13 May 1877 (fl), *W. Hancock 28* (K); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], year 1908 (fl), *D. Macgregor s.n.* (A[2]); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], year 1908 (fr), *D. Macgregor s.n.* (A); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], year 1874 (fl), *F.B. Forbes 968* (BM); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], year 1887 (fl), *O. Warburg 6634* (A); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], 13 May 1877 (fl), *W. Hancock s.n.* (BM); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], (fl), *W.M. Cooper s.n.* (GH); Pingyang Xian, Jugu Xiaogu, [27.3°N, 120.5°E], 7 Feb 1957 (fr), *S.Y. Zhang 5945* (KUN); Pingyang Xian, Nanyan, S of Pang Yang [=Pingyang], [27.626°N, 120.236°E], 200 ft, 5 Jul 1924 (fr), *R.C. Ching 2010* (A, P); Putuo Qu, Pootoo [=Mount Putuo], [30.01°N, 122.385°E], Jul 1881 (fr), *W.R. Carles 193* (K); Putuo Qu, Pootoo [=Mount Putuo], [30.01°N, 122.385°E], 31 Jul 1887 (fr), *W.R. Carles 193* (E); Putuo Qu, P'u t'o shan [=Mt. Putuo], Chusan [=Zhoushan] Archipel., [30.01°N, 122.385°E], Jun 1908 (fl), *A.K. Schindler 289* (E, L); Putuo Qu, Putuo Middle School, back side, [29.958°N, 122.316°E], 31 Jul 1959 (fr), *S.Y. Chang 1337* (MO); Rui'an Shi, Shiyang, [27.913°N, 120.329°E], 28 Jun 1959 (fr), *S.Y. Zhang 6515* (KUN); [Taishun Xian], Wuyan Ling, above Waijin Keng, [27.706°N, 119.675°E], 7 Jun 1951 (fr), *S.Y. Zhang 5612* (KUN); [Taishun Xian], Wuyanling National Nature Reserve, Yeshan Road, [27.706°N, 119.675°E], 5 Jun 1959 (fr), *S.Y. Chang 5537* (MO); [Taishun Xian], Wuyanling National Nature Reserve, Yeshan Road, [27.706°N, 119.675°E],

5 Jun 1959 (fr), S.Y. Zhang 5537 (KUN); [Tiantai Xian], Tien Tai Shan [=Mount Tiantai], Kwochchingsze [=Guoqing Temple], [29.168°N, 121.046°E], 500 ft, 17 Jul 1927 (fr), C.Y. Chiao 14232 (A); [Tiantai Xian], Tien Tai Shan [=Mount Tiantai], Kwochchingsze [=Guoqing Temple], [29.168°N, 121.046°E], 400 ft, 22 Jul 1927 (fr), C.Y. Chiao 14545 (A); [Tiantai Xian], Tien Tai Shan [=Tiantai Shan], [29.179°N, 121.042°E], 1800 ft, 9 Aug 1920 (fr), H.H. Hu 305 (A); Tiantai Xian, locality unknown, [29.178°N, 121.005°E], year 1958 (fr), G.R. Chen 2362 (KUN); Xianju Xian, locality unknown, [28.854°N, 120.731°E], 14 May 1960 (fl), S.Y. Chang 7841 (MO); [Xihu Qu], hillside above Hangchow Hotel, [30.254°N, 120.139°E], 20 May 1979 (fl), C.R. Lancaster s.n. (BM); [Xihu Qu], Jingudong, [30.261°N, 120.137°E], 19 Jun 1958 (fr), S.Y. Chang 392 (MO); [Xihu Qu], Jiuxi [Cun], [30.186°N, 120.119°E], 22 Sep 1958 (fr), S.Y. Chang 1011 (MO); [Xihu Qu], Jiuxi [Cun], [30.186°N, 120.119°E], 22 Sep 1958 (fr), S.Y. Zhang 1011 (KUN); [Xihu Qu], Ling Feng [=Lingfeng Tanmei?], [30.258°N, 120.116°E], 15 May 1959 (fl), S.Y. Zhang 2156 (KUN); [Xihu Qu], Ling Feng [=Lingfeng Tanmei?], [30.258°N, 120.116°E], 22 May 1959 (fl), S.Y. Zhang 2210 (KUN); [Xihu Qu], Ling Feng [=Lingfeng Tanmei?], [30.258°N, 120.116°E], 6 Jun 1959 (fr), S.Y. Zhang 2388 (KUN); [Xihu Qu], Ling Ying Sze [=Lingyin Temple], [30.241°N, 120.102°E], 20 Jun 1922 (fr), A.N. Steward 2395 (A); Xihu Qu, Lingfeng Shan, [30.259°N, 120.11°E], 9 May 2003 (fl), Q.G. Zhu 515 (CAS); Xihu Qu, Westlake, [30.246°N, 120.138°E], 13 Jun 1927 (fr), H.H. Hu 1495 (A); [Xihu Qu], Yunqi [Si], [30.19°N, 120.092°E], 25 May 1959 (fr), S.Y. Zhang 2468 (KUN); [Yinzhou Qu], Tiantong Temple, [29.794°N, 121.792°E], 18 Jul 1959 (fr), S.Y. Chang 1027 (MO); Yongjia Xian, locality unknown, [28.15°N, 120.683°E], (fl), Anonymous 196 (A); Yueqing Shi, Yandang [Shan], Neikeng, [28.37°N, 121.06°E], 2 Jun 1959 (fr), S.Y. Zhang 5320 (KUN); Yueqing Shi, Yandang Shan, Yanxia, [28.37°N, 121.06°E], 9 Jun 1951 (st), S.Y. Zhang 5388 (KUN); Yueqing Shi, Yandangshan, [28.37°N, 121.06°E], 7 Jun 1959 (fr), S.Y. Chang 5386 (MO); [Zhuji Shi], hills near Meichi, [29.917°N, 120.283°E], 17 Apr 1881 (fl), W.R. Carles & F.B. Forbes s.n. (BM); locality unknown, (fr), R.C. Ching 4828 (A); locality unknown, (fl), S.P. Barchet s.n. (MO). **Province unknown:** Tattoo Lake, See doong ding san, 28 Apr 1874 (fl), F.B. Forbes 274 (BM); Apr 1900 (fl), W.R. Carles 4 of 51 (E).

4. *Styrax faberi* Perkins in Engl., Pflanz. IV. 241 (Heft 30):33. 1907. TYPE: CHINA. GUANGDONG: [Baiyun Qu], in montibus Pakwan supra Cantonem [= Baiyun Mountain, above Guangzhou], [23.186°N, 113.294°E], Mar 1870, H.F. Hance 13738 (LECTOTYPE, designated here: P [barcode 00550872]!; ISOLECTOTYPES: GH!, K!, P3)! [barcode 00550874]!).

Styrax rugosus var. *formosanus* Matsum. Bot. Mag. (Tokyo) 15:70. 1901 [as S. "*rugosum* var. *formosanum*"]. *Styrax matsumuraei* Perkins in Engl., Pflanz. IV. 241 (Heft 30):34. 1907. *Styrax formosanus* var. *matsumuraei* (Perkins) Y.C. Liu, Ligneous Pl. Taiwan 244. 1972 [as S. "*formosana* var. *matsumurai*"]. *Styrax faberi* var. *formosanus* (Matsum.) S.M. Hwang, Novon 4:254. 1994. TYPE: CHINA. TAIWAN: Byolitsu [= Miaoli Xian], [24.563°N, 120.826°E], 30 Aug 1896, K. Honda 31 (LECTOTYPE, designated by Hwang (1994): TI!).

Styrax confusus var. *microphyllus* Perkins in Engl., Pflanz. IV. 241 (Heft 30):34. 1907. TYPE: CHINA. HUBEI: Ichang [= Yichang Shi], [30.717°N, 111.283°E], A. Henry 3450 (LECTOTYPE, designated here: P [barcode 552367]!; ISOLECTOTYPES: BM!, K not seen—digital image [barcode 000728955]!).

Styrax argyi H. Lév., Repert. Spec. Nov. Regni Veg. 11:64. 1912. TYPE: CHINA. JIANGSU, C. *d'Argy* s.n. (LECTOTYPE, designated here: E [barcode 00105262]!; ISOLECTOTYPES: A!, E [barcode 00105261]!, K!).

Styrax ioplinus Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9:1028. 1926 [as S. "*iopilina*"]. TYPE: CHINA. JIANGXI: Swe-Chuen [= Suichuan Xian], [26.350°N, 114.400°E], 610 m, H.H. Hu 861 (LECTOTYPE, designated here: A [barcode 00018432]!).

Styrax faberi var. *amplexifolius* Chun & F.C. How ex S.M. Hwang, Acta Phytotax. Sin. 18:161. 1980. TYPE: CHINA. HUNAN: Dongkou Xian, Xuefeng Shan Qu, [27.112°N, 110.554°E], 17 Jul 1954, Z.T. Li 2673 (HOLOTYPE: IBSC not seen; ISOTYPE: PE not seen—digital image [barcode 00882017]!).

Shrubs or trees to 9 m tall. Young branchlets light brown, subglabrous to densely pubescent with yellowish brown or rarely reddish brown stellate trichomes; older branchlets grayish brown, glabrous to densely pubescent with stellate trichomes. Leaf petiolate, rarely subsessile, petiole 1–4(–5) mm long, sparse to dense with appressed short-armed and erect long-armed stellate trichomes, occasionally subglabrous, trichome arms to 0.06–0.69 mm long. Two most proximal leaves on each shoot subopposite, very rarely alternate. Lamina of fertile shoots 1.8–6.4 × (0.8–)1.2–4.5 cm, those of sterile shoots to 13.9 × 6.5 cm, 1.1–2.4(–2.9) × as long as wide, chartaceous, rarely subcoriaceous, ovate to elliptic-lanceolate, occasionally elliptic-obovate, rarely orbicular or lanceolate; abaxial surface yellowish brown when dry, subglabrous or with yellow to yellowish brown stellate trichomes, rarely with sparse reddish brown stellate trichomes, trichome arms to 0.07–0.7 mm long, sparse to dense on whole surface, denser on midvein; adaxial surface dark brown when dry, subglabrous or with yellow stellate trichomes, rarely with sparse simple trichomes, trichomes or trichome arms to 0.09–0.7 mm long, pubescence scattered on whole surface, trichomes denser on midvein; base acute to rounded, rarely weakly auriculate; margin serrulate or subserrate; apex acuminate to acute, occasionally rounded; secondary veins 3 to 6 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins reticulate, abaxially prominent, adaxially plane. Fertile shoots 3.6–10.5(–12.3) cm long, 3- to 6- (to 8-)leaved. Lateral inflorescences racemose, 1–2.8 cm long, 1- or 2- (or 3-) flowered; pseudoterminal inflorescences racemose, with well-spaced nodes, 2.5–4.9 cm long, 3- to 5- (to 11-)flowered, rachis brown, subglabrous to completely covered with yellow stellate trichomes. Pedicel 3–13(–16) mm long, completely covered with short-armed yellowish brown

appressed stellate trichomes and scattered long-armed reddish brown stellate trichomes; bracteoles 0.7–2.8 (–5.1) mm long, linear or subulate, at base of pedicel or on pedicel, occasionally on calyx. Flowers 0.7–2 cm long. Calyx (2–)4–7 × 3–7 mm, cupuliform to funnellform; abaxially completely covered with short-armed grayish yellow or rarely yellow appressed stellate trichomes and scattered long-armed reddish brown stellate trichomes, with trichomes usually becoming less dense within 1 mm of calyx margin, margin brown and scarious, arms of trichomes to 0.1–0.74 mm long; adaxially brown with dense 2- or 3-armed trichomes at margins; margin glandular with 5 to 8 evenly distributed teeth 0.4–1.8 mm long; marginal teeth lanceolate, rarely deltoid, not contiguous, pubescent on both surfaces. Corolla 0.9–1.7 cm long, white, tube (1.3–)2.3–4.4 mm long, abaxial surface proximally glabrous and distally covered with stellate trichomes, lobes 5 (or 6), 6.7–14.6 × 1.4–3(–4.5) mm, chartaceous, lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, adaxially glabrous except apex. Stamens (9 or)10; filaments 2.6–5.6 mm long, straight, widest at base, proximally dense with stellate trichomes, distally glabrous; anthers 3.4–6.7 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with sparse or rarely dense yellow stellate trichomes. Style 1.1–1.7 cm long, glabrous, with stellate trichomes at base; stigma 0.2–0.5 mm wide, punctiform. Fruiting calyx 3–6 × 5–10 mm, funnellform to salverform. Fruit 0.6–1.1 × 0.5–1.2 cm, dehiscent by three valves at base, ovoid to subglobose, apex pointed to rounded; pericarp dry, 0.13–0.55(–1.25) mm thick, outside slightly rugose to rugose, rarely smooth, with dense grayish brown appressed stellate trichomes, inside glabrous, smooth, occasionally rugose. Seeds light brown, ovoid, slightly rugose to rugose, rarely smooth, with shallow longitudinal grooves and deep longitudinal fissures, glabrous.

Illustrations.—Hayata 1912:121, pl. 22 (as *S. "matsumureana"*); Hou 1956:475, fig. 260; Liu 1962:1041, pl. 866; Tai & Pan 1981:430, fig. 167 (paniculate inflorescences with too many flowers for *S. faberi*; possibly *S. fortunei*); Yang 1984:546, fig. 233 (paniculate inflorescences with too many flowers for *S. faberi*; possibly *S. fortunei*); Hwang 1987a:392, fig. 426; Hwang 1987b:120, pl. 41 (6–12); Zheng 1989:95, fig. 5-127; Liu 1989:356, fig. 289 (fruiting branch has too many fruits per infructescence); Wu & Raven 2000:210, fig. 210 (7–13); Fu 2002:333, fig. 1977.

Phenology.—Flowering: March–June, August–October. Fruiting: January, April–December.

Distribution.—China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Macau, Taiwan, and Zhejiang); Fig. 1.

Habitat.—In mixed forests and thickets, on hillside slopes, along streams and roadsides, on dry, sandy or clay soils; 60–1420 m.

Vernacular names.—Bai-hua-long (China; Hwang & Grimes 1996); bai-long-tiao (China, Guangdong; Hwang 1987a); bao-jing-bai-hua-long (China; Hwang & Grimes 1996); ch'at ki k'eung [cha-ji-qiang] (China, Guangdong; *K.P. To 12200*); i uen to [er-wan-tao] (China, Jiangxi; *S.K. Lau 3994*); kau nai ch'ai [gou-nai-chai] (China, Guangdong; *K.P. To 12200*); mai tap kong (China, Guangdong; *S.Y. Lau 20132*); mian-zi-shu (China, Guangdong; Hwang 1987a); miao-li-bai-hua-long (China; Hwang & Grimes 1996); sao-zhou-shu (China, Guangdong; Hwang 1987a); tai-wan-ye-mo-li (China, Taiwan; Li 1978); takasago-egonoki (China, Taiwan; Kanehira 1936); xiao-ye-sai-shan-mei (China; Hwang & Grimes 1996).

Conservation assessment.—*Styrax faberi* is one of three Chinese endemic species in *Styrax* series *Cyrta* with valvate corolla aestivation that are common and widespread. It occurs throughout eastern and southeastern China, becoming rarer in western China. There are also small populations in northwestern Taiwan and on Hainan Island. Collections have been made from > 150 geographic localities in a broad area, with an EOO of ca. 1,458,704 km². Even if the EOO were to be reduced to account for the areas where *S. faberi* has not been collected, the geographic distribution would remain large. There appears to be a significant amount of suitable habitat for *S. faberi* throughout its distribution and the species is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., *R.C. Ching 2670*). This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this species as Least Concern (LC).

Discussion.—*Styrax faberi* can usually be identified by the presence of reddish brown trichomes overtopping the gray basal pubescence of the calyx; such trichomes are usually not present in other *Styrax* species in

the group. Other characters that separate *S. faberi* from other members of the group include the shorter petiole, which can be so short that the leaf is subsessile, and the globose to ovoid dehiscent fruit. The geographic range of *S. faberi* almost completely overlaps that of *S. confusus*. *Styrax faberi* can be distinguished from *S. confusus* by the much thinner leaves, buds, corolla lobes, pedicels, and fruit walls. Also, *S. faberi* has 3 to 5 flowers per pseudoterminal inflorescence, vs. usually 5 to 11 in *S. confusus*. The northern range of *S. faberi* also overlaps the southern range of *S. fortunei*. In addition to the distinctive trichomes on the calyx, *S. faberi* can be distinguished from *S. fortunei* by the racemes with 3 to 5 flowers per inflorescence (vs. panicles with usually with > 11 flowers per inflorescence) and never > 3 flowers in each lateral inflorescence (vs. often >> 3).

The Taiwanese populations of *Styrax faberi* have long been treated as either a species or variety. Originally the taxon was published by Matsumura (1901) as *S. rugosus* var. *formosanus*. Perkins (1907) recognized that this taxon did not have the long calyx teeth, imbricate aestivation, and rugose leaves of *S. rugosus* Kurz and so raised it to the species level as *S. matsumuraei*. Liu (1972) moved it back to the varietal level, but as a variety of *S. formosanus*. It is not clear why this was done, because Liu did not justify this taxonomic change. *Styrax faberi* and *S. formosanus* on Taiwan can be easily differentiated by the fruit, which is not rostrate in *S. faberi* and rostrate in all Taiwanese specimens of *S. formosanus*, and the leaf shape, which is elliptic to orbicular in *S. faberi* and rhombic in *S. formosanus*. Hwang (1980) recognized the similarity between the taxon and *S. faberi*, and considered it a variety of *S. faberi*, publishing it as *S. faberi* var. *matsumuraei*. However, because the epithet *formosanus* was still available at the varietal level, *S. faberi* var. *matsumuraei* is an illegitimate name, an error later corrected by Hwang (1994). Hwang distinguished *S. faberi* var. *formosanus* from the nominate variety by its orbicular leaves (vs. elliptic to obovate). Although the Taiwan specimens of *S. faberi* tend to have more orbicular leaves, orbicular leaves also occasionally appear in mainland specimens of *S. faberi*. Because of this, we subsume *S. faberi* var. *formosanus* under *S. faberi*.

Styrax confusus var. *microphyllus* was distinguished from *S. confusus* in the *Flora of China* by its smaller calyx (Hwang & Grimes 1996). However, upon inspection of the type, we did not find any characters to justify varietal status under *S. confusus*. The leaves and corolla lobes are much thinner than are typical for *S. confusus*. It is, however, similar to *S. faberi*, most notably in its reddish brown trichomes on the calyx that overtops the basal pubescence. The only difference between *S. faberi* and *S. confusus* var. *microphyllus* is the basal pubescence of the calyx, which is usually gray in *S. faberi* and yellow in *S. confusus* var. *microphyllus*. On this basis, we subsume *S. confusus* var. *microphyllus* under *S. faberi*.

Styrax argyi was synonymized with *S. dasyanthus* (= *S. fortunei*) in the *Flora of China*, possibly on the presence of a single pseudoterminal infructescence with 11 fruits on the K isolectotype (Hwang & Grimes 1996). However, this appears to be an anomaly, because all other pseudoterminal inflorescences on the type have 3 to 5 flowers per inflorescence, in line with *S. faberi*, and far too few flowers for *S. fortunei*. Reddish brown trichomes are also present on the calyx, although not as distinctly as in most specimens of *S. faberi*. Because of these characters, we synonymize *S. argyi* with *S. faberi*.

Styrax faberi var. *amplexifolius* was differentiated by Hwang (1980) from the nominate variety by the auriculate and amplexicaul base of the leaf. Hwang & Grimes (1996) state that this variety is endemic to Dongkou Xian, Hunan. However, we examined specimens representing a continuous range of variation between petiolate plants and amplexicaul plants throughout the distribution of *S. faberi*, without any geographical pattern to the variation. Because of this, we subsume *S. faberi* var. *amplexifolius* under *S. faberi*.

Although *Styrax faberi* usually has thin fruit walls, two specimens exhibit walls that are relatively thick (H.H. Chung 2067 and Yao 9221). These specimens have far too few fruits per infructescence to be *S. confusus*, and possess the reddish brown trichomes on the calyx, like *S. faberi*. These may represent introgressants with *S. confusus*.

The flowering specimen G.Z. Li 13155 is typical of *Styrax faberi* in its few-flowered inflorescences and small flowers. However, it is atypical in its mostly solitary inflorescences on each branchlet, which is not the case in typical *S. faberi*. The leaves and calyces are also much smaller than is typical for *S. faberi*. The specimen most closely resembles *S. americanus* with its small pinched calyx, narrow acute corolla lobes, and thin new

branchlets. The locality of the specimen is “Yanshan, Guilin, Guangxi”, but the label is not specific as to whether the specimen was collected in Yanshan County or specifically Yanshan Botanical Garden in Yanshan County. Thus this could be a cultivated specimen of *S. americanus* from the botanical garden. Alternatively, it could be a collection of an undescribed species. Given the uncertainty, we excluded this specimen from our treatment. Collecting a fruiting specimen from this area would help to determine the status of the plant.

In the protologue of *Styrax faberi*, four collections (syntypes) are cited by Perkins (1907): *J.-M. Callery 236*, *E.F.L. Faber s.n.*, *H.F. Hance 13738*, and *M.E. Wichura 1663*. We designated *H.F. Hance 13738* as the lectotype, for the following reasons. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that *E.F.L. Faber s.n.* and *M.E. Wichura 1663* were destroyed then. Although *J.-M. Callery 236* and *H.F. Hance 13738* both have extant specimens housed at P with Perkins's annotation attached, *H.F. Hance 13738* has more extant duplicates than *J.-M. Callery 236*. *H.F. Hance 13738* is composed of two collections: one of flowering material collected in March 1870 from Baiyun Mountain, Guangzhou, and the other of fruiting material collected in September 1866 from Feilai Temple in Qingcheng District, Qingyang City, Guangdong. Perkins cites the flowering collection from Baiyun Mountain in the protologue, so we have lectotypified on that collection (and the fruiting collection, being collected on a different date and thus regarded as a separate collection, is not considered type material). Of the six sheets comprising the flowering collection of *H.F. Hance 13738*, we chose P550872 as the lectotype over the other sheets because it is the only one that possesses Perkins's annotation.

In the protologue of *Styrax confusus* var. *microphyllus*, two collections (syntypes) are cited by Perkins (1907): *E.F.L. Faber s.n.* and *A. Henry 3450*. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that both *E.F.L. Faber s.n.* and *A. Henry 3450* at B were destroyed then. We have not been able to find any extant material of *E.F.L. Faber s.n.*, so we have designated *A. Henry 3450* as the lectotype. Other than a photograph and fragment of the destroyed holotype at A, we have seen four extant specimens of *A. Henry 3450*. The P specimen with accession number P552366 does not resemble the other specimens in this collection; it instead appears to be an atypical specimen of *S. fortunei* with smaller calyces and abaxial laminar surfaces completely covered by stellate trichomes. This specimen should not be considered part of the type collection. Of the three remaining extant specimens, we were able to see two in person. Of these, we designate the P specimen with accession number P552367 as the lectotype because it matches attached detailed illustrations of the floral parts.

In the protologue of *Styrax argyi*, Lévillé (1912) cited *C. d'Argy s.n.* as the type, but two sheets of this specimen are housed at E, where Lévillé's original herbarium is housed. Although both sheets have both flower buds and fruiting branches, collection dates, which would clarify whether the specimens are from one or more separate gatherings, are not provided. We designated E105262 as the lectotype over the other sheet because it possesses what is presumably Lévillé's original label.

Diels (1926) clearly indicates *H.H. Hu 861* as the holotype of *Styrax iopilinus* in the protologue. However, much of the material Diels examined was located at B and destroyed during World War II; we presume that the specimen of *H.H. Hu 861* at B was destroyed then. All that remains of the B holotype specimen is a photograph of the holotype stored at A. We have designated the duplicate specimen of *H.H. Hu 861*, also stored at A, as the lectotype, because it is the only duplicate we were able to find and examine.

Additional specimens examined. **CHINA. Anhui:** Chien Shan Hsien [=Qianshan Qu], Tien Chu Shan [=Tianzhu Shan], [31.062°N, 116.188°E], 200 m, 13 Jun 1936 (fr), *C.S. Fan & Y.Y. Li 78* (A, L); [Qingyang Xian], Chu Hwa Shan [=Jiuhua Shan], [30.482°N, 117.804°E], 2 May 1925 (fl), *R.C. Ching 2670* (A). **Fujian:** central Fokien [=Fujian], Apr–Jun 1905 (fl), *S.T. Dunn 2899* (A); [Changting Xian], Guilong Shan, [25.606°N, 116.068°E], 21 Jul 1958 (fr), *C.M. Hu 3800* (KUN); Hok-Chiang [=Fuqing Shi], Ling-Soik Temple [=Linshi Temple?] and vicinity, [25.607°N, 119.356°E], 21 May 1927 (fr), *S.G. Tang 15035* (A); Hok-Chiang [=Fuqing Shi], Ling-Soik Temple [=Linshi Temple?] and vicinity, [25.607°N, 119.356°E], 27 May 1927 (fr), *S.G. Tang 15148* (A); Inghok Hsien [=Yongtai Xian], Tahshian [=Tashan], [25.859°N, 118.942°E], 18 Apr 1924 (fl), *H.H. Chung 2622* (A, K); Inghok [=Yongtai Xian], Fang-Quang-Yen [=Fangguang Yan], [25.887°N, 119.098°E], 10 May 1928 (fr), *H.H. Chung 7976* (A); IngHok [=Yongtai Xian], Huong-guong Nang [=Fangguang Yan], Temple near Gak-liang [=Geling], [25.892°N, 119.093°E], 19 Mar 1927 (fl), *S.G. Tang 13194* (A); IngHok [=Yongtai Xian], Huong-guong Nang [=Fangguang Yan], Temple near Gak-liang [=Geling], [25.892°N, 119.093°E], 4 Oct 1927 (fr), *S.G. Tang 16502* (A); Inghok [=Yongtai Xian], locality unknown, [25.9°N, 118.933°E], 21 Apr 1925 (fl), *H.H. Chung 3170* (E); Inghok [=Yongtai Xian], locality unknown, [25.9°N, 118.933°E], 11 May 1928 (fr), *H.H. Chung 7696* (A);

Inhok [=Yongtai Xian], Fung Huang Se [=Fenghuang Si?] & vicinity, Huang-guang-nang [=Fangguang Yan] Monastery, [25.892°N, 119.093°E], 3 May 1936 (fl), *L. Chen 153* (A); Kutien [=Gutian Xian], locality unknown, [26.617°N, 118.85°E], 24 May 1928 (fr), *H.H. Chung 4032* (A); Minhow Hsien [=Minhou Xian], Pehling [=Beilingtou?], [26.165°N, 119.343°E], 3 Aug 1923 (fr), *H.H. Chung 2067* (A, K); Nanping Shi, 3800 kan, [26.65°N, 118.183°E], 150 m, 28 Mar 1993 (fl), *G.S. He 5040* (MO); Sanyuan Qu, locality unknown, [26.233°N, 117.595°E], 25 Apr 1931 (fr), *Y.C. Lin 204* (KUN); [Yanping Qu], Mangdang Shan, [26.694°N, 118.125°E], 300 m, 1 Jun 1992 (fr), *G.S. He 4446* (MO); locality unknown, (fl), *Zhao 339* (KUN); locality unknown, (fl), *Zhao 578* (KUN). **Guangdong:** [Baiyun Qu], Baiyun Shan, [23.187°N, 113.295°E], 15 Apr 1929 (fl), *J.L. Zuo 20010* (MO); [Baiyun Qu], Baiyun Shan, [23.187°N, 113.295°E], 18 Jun 1931 (st), *Z.B. Liu 339* (KUN); [Baiyun Qu], in montibus Packwan [=Baiyun Mountain], [23.187°N, 113.295°E], Mar 1870 (fl), *H.F. Hance 39* (P); [Baiyun Qu], infra verticem Pakwan supra Cantonem [=below the top of Baiyun Mountain, above Guangzhou], [23.187°N, 113.295°E], Mar 1868 (fl), *G.T. Sampson s.n.* (BM); [Baiyun Qu], near Chee Kiang Ken, Peiyunshan [=Baiyun Shan], [23.187°N, 113.295°E], 16 Mar 1928 (fl), *Y. Tsiang 25* (A); [Baiyun Qu], Peiyunshan [=Baiyun Mountain], [23.187°N, 113.295°E], 19 Mar 1929 (fl), *Y.K. Wang 556* (E); Baiyun Qu, Peiyunshan [=Baiyun Shan], [23.187°N, 113.295°E], 14 May 1928 (fr), *Y. Tsiang 382* (A); [Boluo Xian], ad So-lin-kun ingi Lo-fau-shan [=Luofu Shan], [23.3°N, 114°E], Aug 1883 (fr), *C. Ford s.n.* (BM); [Boluo Xian], Luo-fu Shan, [23.3°N, 114°E], 26 Apr 1978 (fr), *Ktung 78 5888* (L); [Boluo Xian], Luo-fu Shan, [23.3°N, 114°E], 6 May 1978 (fr), *Ktung 78 6047* (CAS, L); Canton [=Guangzhou Shi], Canton and vicinity, [23.133°N, 113.267°E], 15 Aug 1917 (fr), *C.O. Levine 1461* (E); Canton [=Guangzhou Shi], Canton or Hainan, (fl), *W.R. Carles s.n.* (E); Canton [=Guangzhou Shi], Canton vicinity, [23.133°N, 113.267°E], 20 Mar 1917 (fl), *C.O. Levine 467* (A); Canton [=Guangzhou Shi], locality unknown, [23.133°N, 113.267°E], Mar 1884 (fl), *G.T. Sampson 402* (BM); Canton [=Guangzhou Shi], locality unknown, [23.133°N, 113.267°E], 3 Jul 1887 (fr), *G.T. Sampson 402* (BM); Canton [=Guangzhou Shi], locality unknown, [23.133°N, 113.267°E], Mar 1884 (fl), *G.T. Sampson s.n.* (K); Canton [=Guangzhou Shi], locality unknown, [23.133°N, 113.267°E], 7 Jun 1885 (fr), *G.T. Sampson s.n.* (K); Cantone [=Guangzhou Shi], locality unknown, [23.133°N, 113.267°E], Mar 1887 (fl), *B.C. Henry 13738* (BM); [Dinghu Qu], Dinghu Shan, [23.159°N, 112.557°E], 9 Jul 1957 (fr), *B.H. Liang 89243* (MO); [Dinghu Qu], Dinghu Shan, [23.159°N, 112.557°E], 28 Jun 1985 (fr), *C.J. Liao 15179* (A); [Dinghu Qu], Dinghu Shan, [23.159°N, 112.557°E], 60 m, 6 Mar 1963 (fl), *G.Q. Ding & G.L. Shi 121* (AAU, MO); [Dinghu Qu], Dinghu Shan, [23.159°N, 112.557°E], 7 Sep 1953 (fr), *J.Y. Xiao 20916* (MO); [Dinghu Qu], Dinghu Shan, Dazhukeng, [23.159°N, 112.557°E], 8 Jun 1963 (fr), *G.Q. Ding & G.L. Shi 527* (AAU, MO); [Dinghu Qu], Ting Woo Shan [=Dinghu Shan], [23.159°N, 112.557°E], 22–29 Jul 1932 (fr), *S.Y. Lau 20132* (A, L); [Dinghu Qu], Ting Wu Shan [=Dinghu Shan], [23.159°N, 112.557°E], 4 May 1928 (fr), *W.Y. Chun 6283* (A); [Dinghu Qu], Ting Wu Shan [=Dinghu Shan], [23.159°N, 112.557°E], 4 Jul 1928 (fr), *Y. Tsiang 776* (A); East River Region, [23.033°N, 113.517°E], 3–30 Apr 1930 (fr), *C.L. Tso 21642* (MO); Fengkai Xian, 1 km. from seven stars town [=Qixing Zhen], [23.45°N, 111.467°E], 18 Apr 1999 (fr), *T. Chen & P.W. Fritsch 9704110* (CAS); Fengkai Xian, Dazhou [Zhen], [23.517°N, 111.553°E], 27 Jun 1987 (fr), *Z.Y. Li 1621* (MO); Fengkai Xian, Huikue Xiang, Shanci Shan, [23.45°N, 111.467°E], 29 May 1958 (fr), *C. Huang 164129* (KUN); Fogang Xian, Guanyin Mountain, [23.969°N, 113.564°E], 200 m, 15 Mar 1987 (fl), *J.Q. Lin 28413* (MO); Gaoyao Shi, Dinghu Shan foothills, [23.159°N, 112.557°E], 10 Aug 1958 (fl), *C. Huang 162710* (KUN); Guangzhou Shi, locality unknown, [23.133°N, 113.267°E], 28 Mar 1964 (fl), *L. Tang 10425* (AAU, L); [Huangpu Qu], Lung Tau Mountain [=Longtou Shan], near Iu, [23.102°N, 113.512°E], 22 May–5 Jul 1924 (fr), *K.P. To et al. 12200* (E); Jen-hwa District [=Renhua Xian], Man Chi Shan [=Wanchi Shan], Shek Pik Ha Village [=Shibixia Cun], [25.428°N, 113.933°E], 11–20 Apr 1936 (fl), *W.T. Tsang 26184* (A); Kochow [=Gaozhou Shi], Yun Lu, [21.924°N, 110.842°E], 18 Aug 1928 (fr), *Y. Tsiang 997* (A); Kochow [=Gaozhou Shi], locality unknown, [21.924°N, 110.842°E], Feb–Mar 1931 (fr), *A.J. Paschang 4* (A); Lianping Xian, Jiulian Xiang, Jiaojiao, [24.371°N, 114.674°E], 260 m, 21 May 1958 (fr), *Z.F. Wei 120112* (KUN); Lianshan Zhuangzu Yaozu Zizhixian, Sanshuikou [Cun] to Hecang, [24.547°N, 112.033°E], 270 m, 23 May 1958 (fr), *P.X. Tan 58001* (KUN); Lokchong District [=Lechang Shi], locality unknown, [25.133°N, 113.333°E], 30 May 1929 (fr), *C.L. Tso 20854* (P); Lokchong District [=Lechang Shi], locality unknown, [25.133°N, 113.333°E], 3 Jun 1929 (fr), *C.L. Tso 20928* (A); Longchuan Xian, locality unknown, [24.333°N, 115.367°E], 29 Apr 1940 (fr), *J.L. Zuo 21642* (KUN); Nanxiang Shi, Baishun Xiang [=Baishun Zhen], Dongdi She, Shiquanli, [25.259°N, 114.068°E], 600–700 m, 15 Oct 1958 (fr), *L. Deng 6157* (KUN); Pingyuan Xian, Chagan Xiang [=Chagan Zhen], Xianshuan Cunkou [=Xianshuan Menkou] to roadside under Jianfeng, [24.867°N, 116.048°E], 500–800 m, 25 Apr 1957 (fr), *L. Deng 4430* (KUN, MO); Poon Yue District [=Panyu Qu], locality unknown, [22.936°N, 113.384°E], 30 Oct 1918 (fr), *C.O. Levine 3154* (A); [Qingcheng Qu], in silvis circa monasterium Fi Lo Tsz [=Feilai Si], secus fl. North River [=Beiji River], [23.708°N, 113.175°E], 18 Sep 1866 (fr), *H.F. Hance 13738* (BM); Qujiang Qu, Longtou Shan, Xi'ao, [24.689°N, 113.579°E], 6 Apr 1930 (fl), *X.P. Gao 50316* (KUN); [Renhua Xian], Danxia Shan summit, [25.032°N, 113.746°E], 23 Jul 1930 (fr), *X.P. Gao 50631* (KUN, MO); [Renhua Xian], Tan Hsia Shan [=Mount Danxia], [25.032°N, 113.746°E], 8 Dec 1927 (fr), *W.Y. Chun 5571* (A); Ruyuan Yaozu Zizhixian, locality unknown, [24.883°N, 113.183°E], 2 Nov 1956 (fr), *C. Wang 42518* (MO); San-ning City [=Taishan Shi], San-ning City [=Taishan], [22.25°N, 112.783°E], May 1875 (fr), *J. Lamont 1071* (BM); Shixing Xian, Yaozu Xiang [=Yao Cun?], [24.932°N, 114.107°E], 300 m, 15 Oct 1958 (fr), *L. Deng 6889* (KUN); Shixing Xian, locality unknown, [24.843°N, 114.144°E], 350 m, 29 Jun 1982 (fr), *X.W. Wang 141* (A); Shixing Xian, locality unknown, [24.843°N, 114.144°E], 420 m, 30 May 1983 (fr), *X.W. Wang 640* (A); Sim-fung District [=Xinfeng Xian], Ngok Shing Shan [=Yuecheng Shan], Sai-lin-shan Village [=Xilianshan Cun], [24.097°N, 114.246°E], 1–16 Apr 1938 (fl), *Y.W. Taam 466* (CAS); Tianhe Qu, Shipai, Big Forest Nursery, [23.131°N, 113.34°E], 9 Apr 1951 (fl), *S.Q. Chen 7184* (KUN); Tsze pui hang, road back to village, 25 Aug 1931 (fr), *W.Y. Chun 7226* (A); West River, (fr), *J. Lamont s.n.* (L); Xinfeng Xian, Huangpi Xiang, Lugushe Shanbei [=Lugu River Nature Reserve?], [24.043°N, 114.275°E], 650 m, 15 Oct 1958 (fr), *L. Deng 8141* (KUN); Xinfeng Xian, Huangpi Xiang, Lugushe Shanjiao [=Lugu River Nature Reserve?], [24.043°N, 114.275°E], 650 m, 15 Oct 1958 (fr), *L. Deng 8151* (KUN); Yingde Shi, Baojing Gong, [24.124°N, 113.369°E], 31 May 1985 (fr), *Z.Y. Li 468* (MO); Yingde Shi, Huashui Shan, [Kengchun Xiang?], [24.441°N, 113.673°E], 10 Aug 1958 (fr), *C. Huang 163508* (KUN); [Yingde Shi], Wentang Shan, Peikeng, [24.342°N, 113.671°E], 25 Aug 1931 (fr), *H.Y. Chen 7225* (KUN, MO); Ying-tak District [=Yingde Shi], locality unknown, [24.167°N, 113.4°E], 27 Mar 1929 (fl), *Y. Tsiang 570* (A, P); Yu-yuen [=Ruyuan Yaozu Zizhixian], locality unknown, [24.883°N, 113.183°E], 12 May 1933 (fr), *S.P. Ko 52545* (A); [Zengcheng Qu], Iu Village and Yeung Uk Village

[=Yangwu Cun], Lung Tau Shan [=Longtou Shan], [23.183°N, 113.621°E], 28 May 1924 (fr), K.P. To et al. 12200 (K); [Zengcheng Qu], Lung Tau Mountain [=Longtou Mountain], near Yueng uk [=Yangwu Cun], [23.183°N, 113.621°E], 6–11 Jul 1924 (st), K.P. To et al. 12689 (E); locality unknown, (fr), C. Ford 355 (A). **Guangxi:** [Babu Qu], Po Yam Shan [=Buyin Shan], near Tai Chung Village [=Dachong Cun], Sun-to District [=Xindu Zhen], [23.991°N, 111.725°E], 16 Oct 1933 (st), W.T. Tsang 23004 (P); Bobai Xian, Luofu Xiang, [22.276°N, 109.972°E], 15 Nov 1965 (fr), Z.Y. Chen 149 (MO); Cangwu Xian, Sinian Xiang [=Sinian Cun], [23.375°N, 111.332°E], 19 Sep 1956 (fr), S.Q. Zhong A60960 (KUN); Cangwu Xian, Tongluo Shan, [23.75°N, 111.25°E], 22 Jul 1956 (fr), S.Q. Chen 9973 (KUN); Cangwu Xian, Tongluo Shan, near Ganghe Cun, [23.75°N, 111.25°E], 21 Jul 1956 (fr), S.Q. Chen 9920 (KUN); fl. Fuh ho [=Fuh Ho river?], Mar 1879 (fl), W. Mesny 13738 (BM); [Gangbei Qu], Guixian [=Guigang], Longshan Qu [=Gangbei Qu?], Tanyang Xiang, by Tanyang Cun, [23.334°N, 109.6°E], 320 m, 21 Jun 1957 (fr), S.Z. Chen 50682 (KUN); [Lingchuan Xian], Lung-mu-an [=Longmu An] & vicinity, Hai-yang shan [=Haiyang Shan], [25.306°N, 110.566°E], 8–12 Jul 1937 (fr), W.T. Tsang 27806 (A); Lingui Qu, near Yanshan [Xian], [25.17°N, 110.249°E], 17 Apr 1956 (fl), S.Q. Zhong A60311 (KUN); Lingui Qu, Wantian [Xiang], [25.535°N, 110.069°E], 5 Apr 1955 (fl), C.F. Liang 31682 (KUN); Luzhai Xian, Mt. Guting, [24.323°N, 109.517°E], 260 m, 25 Apr 2005 (fl), Y.M. Wang 81 (P); Pingnan Xian, Yao Shan, [23.55°N, 110.383°E], 3000 ft, 16 Apr 1936 (fl), C. Wang 39012 (A); Pingnan Xian, locality unknown, [23.55°N, 110.383°E], 22 May 1936 (fr), C. Wang 39253 (MO); [Qixing Qu], Yueya Shan [in Qixing Park], [25.273°N, 110.312°E], 2 Jun 1964 (fr), F.N. Wei 154 (MO); Shang-sze District [=Shangsi Xian], Shap Man Taai Shan [=Shiwan Dashan], near Ping Hoh Village, SW of Shang Sze [=Shangsi], Kwangtung border, [21.907°N, 107.909°E], 25–31 Mar 1933 (fl), W.T. Tsang 21977 (A, P); Xing'an Xian, Jinshi, [25.617°N, 110.667°E], 16 Jul 1979 (fr), Q.H. Lu 104 (MO); [Xiufeng Qu], Xishan Park, [25.282°N, 110.278°E], 16 Apr 1992 (fl), Yunnan-Guizhou Team 90045 (KUN); Yangshuo Xian, Dashuitian, [24.833°N, 110.314°E], 10 Jun 1960 (fr), L.Q. Chen 10230 (MO); [Yanshan Qu], Yanshan Gongshe [=Yanshan Zhen], [25.079°N, 110.306°E], 6 Jun 1984 (fr), HGB 70284 (MO); Yanshan Qu, locality unknown, [25.079°N, 110.306°E], 220 m, 17 Oct 1993 (fr), G.Z. Li 13128 (MO); Yanshan Qu, locality unknown, [25.079°N, 110.306°E], 130 m, 17 Oct 1993 (fl), G.Z. Li 13155 (MO); [Yongfu Xian], Chang-liu-shui Village, Dabu, [25.107°N, 109.987°E], 290 m, 7 Apr 1982 (fl), Guilin Expedition 70038 (CAS); [Yongfu Xian], Shoutan Village, Dabu, [25.107°N, 109.987°E], 4 Jun 1984 (fr), Guilin Expedition 70284 (CAS); locality unknown, (fr), H.Y. Liang 69937 (A). **Guizhou:** Kouy-yang [=Guiyang Shi], environs de Kouy-yang [=Guiyang], [26.65°N, 106.633°E], Apr 1898 (fl), E.M. Bodinier 2222 (E); Rte Pin-Fa [=Pingba Xian], Rte Pin-fa [=Pingba Xian?] Kouy-yang [=Guiyang], [26.417°N, 106.267°E], 10 May 1906 (fl), J. Cavalerie 2841 (E, P[2]); Tsching Dschen [=Qingzhen Shi], prope oppidum Tsching Dschen [=near town of Qingzhen], [26.55°N, 106.467°E], 1200 m, 26 Jun 1917 (fr), H.F. Handel-Mazzetti 130 (A); Tsching Dschen [=Qingzhen Shi], prope oppidum Tsching Dschen [=near town of Qingzhen], [26.55°N, 106.467°E], 1200 m, 26 Jun 1917 (fr), H.F. Handel-Mazzetti 10457 (E). **Hainan:** [Qionghai Shi], Lehui, Nantai, Nankai Ling, [19.083°N, 110.31°E], 80–100 m, 5 Apr 1954 (fr), Hainan Botanical Expedition Team 83 (KUN); [Qionghai Shi], Lehui, near Zhongjiu Farm, [19.083°N, 110.31°E], 90–135 m, 5 May 1954 (fr), Hainan Botanical Expedition Team 307 (KUN). **Hubei:** Hefeng Xian, Xima Gongshe, Baiguo Ping, Sunjia Ping, [30.108°N, 110.217°E], 8 May 1959 (fl), H.J. Li 322 (KUN); Ichang [=Yichang Shi], locality unknown, [30.717°N, 111.283°E], Sep 1886 (fl), A. Henry 1155 (K); Ichang [=Yichang Shi], locality unknown, [30.717°N, 111.283°E], Oct 1887 (fl), A. Henry 3450a (GH); Ichang [=Yichang Shi], locality unknown, [30.717°N, 111.283°E], Sep 1886 (fl), A. Henry 11551 (P); locality unknown, 1885–1888 (fl), A. Henry 1155 (A); locality unknown, 1885–1888 (fr), A. Henry 4524 (GH, P). **Hunan:** Changning Hsien [=Changning Shi], I-Chia-Ao, [26.351°N, 112.417°E], 220 m, 25 Jun 1935 (fr), C.S. Fan & Y.Y. Li 38 (BM, L, P); [Chengbu Miaoou Zizhixian], Hunan austro-occid., in monte Yun-schan prope urbem Wukang [=Yun Shan, near Wukang], [26.643°N, 110.62°E], 400–1420 m, Apr 1919 (fl), T.H. Wang 81 (A, E); Daxiang Qu, locality unknown, [27.16°N, 111.489°E], 300 m, 6 Aug 2003 (fr), L.D. Duan 20020587 (CAS); Dong'an Xian, Mt. Shunhuangshan, [26.365°N, 111.015°E], 270 m, 25 Apr 2004 (fl), J.K. Liu 470 (CAS, P); Jianghua Yaozu Zizhixian, Daxi Xiang, Limu Cun, Guanchong, 24°46'59.1"N, 111°54'4.6"E, 524 m, 2 Aug 2007 (fr), K.M. Liu et al. SCSB-HN-0831 (KUN[2]); Lingling Qu, Meiming Shan, below Ma'an [Shan], [26.112°N, 111.667°E], 250 m, 4 Apr 1942 (fl), S.Q. Chen 367 (KUN); Lingling Qu, locality unknown, [26.222°N, 111.63°E], 250 m, 4 Apr 1942 (fl), S.H. Chen 367 (AAU); Sinning Hsien [=Xinning Xian], Ma-Ling-Tung [=Malin Cun?], [26.46°N, 110.643°E], 600 m, 7 Sep 1935 (fr), C.S. Fan & Y.Y. Li 445 (A, L, P); Xinning Xian, Shuichong, [Yuanhua Chang?], [26.529°N, 110.969°E], 350 m, 20 Jun 1994 (fr), L.B. Luo 17 (CAS, P); Yi Chang District [=Yizhang Xian], P'ing T'ou Shan [=Pingtou Shan], Pai Mu Village [=Baimu Cun], [25.398°N, 112.948°E], 21–29 Mar 1934 (fl), W.T. Tsang 23457 (A); Yi Chang District [=Yizhang Xian], P'ing T'ou Shan [=Pingtou Shan], Tang Wan Village [=Tangwan Cun], [25.398°N, 112.948°E], 17–30 Apr 1934 (fl), W.T. Tsang 23573 (A); Yi Chang District [=Yizhang Xian], P'ing T'ou Shan [=Pingtou Shan], Tang Wan Village [=Tangwan Cun], [25.398°N, 112.948°E], 1–13 May 1934 (fr), W.T. Tsang 23776 (BM); Yizhang Xian, Mt. Mangshan, [24.976°N, 112.888°E], 460 m, 8 Jun 2004 (fr), B.Z. Xiao 3592 (CAS); [Yuelu Qu], montis Yolu-schan [=Yuelu Shan], [28.19°N, 112.929°E], 70–250 m, 28 Apr 1918 (fl), H.F. Handel-Mazzetti 11697 (A); Yuelu Qu, Yuelu Shan, 28°11'32.8"N, 112°56'4.5"E, 198 m, 17 Sep 2006 (fr), K.M. Liu & L.X. Xiao SCSB-HN-0328 (KUN[2]). **Jiangsu:** E-shing [=Yixing Shi], locality unknown, [31.36°N, 119.815°E], 3 Aug 1924 (fr), R.C. Ching 4861 (A); I-hsing [=Yixing Shi], Wu-fu [=Hufu Zhen], [31.229°N, 119.797°E], 300 ft, 1 Aug 1926 (fr), K. Ling 2454 (GH); I-shing [=Yixing Shi], Lung Ge, [31.36°N, 119.815°E], 8 May 1926 (fl), R.C. Ching & C.L. Tso 369 (A); Ishing [=Yixing Shi], Lungchi Shan [=Longchi Shan], [31.22°N, 119.698°E], 31 Jul 1924 (fr), W.C. Cheng et al. 4825 (K); [Jurong Shi], Baohua Shan, [32.135°N, 119.073°E], 350 m, 7 Aug 1995 (fr), X.Q. Wang & Y.N. Xiong 232 (MO); [Jurong Shi], Bau Hwa Shan [=Baohua Shan], [32.135°N, 119.073°E], 10 May 1924 (fl), A.N. Steward 5458 (A); Yixing Shi, Hufu Gongshe [=Hufu Zhen], Gangxia Dadui Daka, [31.189°N, 119.738°E], 25 Jun 1962 (fr), S.H. Mao 291 (KUN); Yixing Shi, Longchi Shan, [31.22°N, 119.698°E], 25 Jun 1962 (fr), S.H. Mao 90 (KUN, MO); Yixing Shi, Mingling, [31.217°N, 119.641°E], 200 m, 25 Jun 1962 (fr), W.Z. Fang 181 (KUN); Yixing Shi, locality unknown, [31.36°N, 119.815°E], 31 Jul 1924 (fr), R.C. Ching 4825 (A). **Jiangxi:** An Yüan Hsien [=Anyuan Qu], locality unknown, [25.246°N, 115.371°E], 7 Jan 1921 (fr), H.H. Hu 1089 (A); Anfu Xian, Wugong Shan Farm, Yantian [Cun], [27.358°N, 114.381°E], 190 m, 5 Apr 1955 (fl), C.F. Liang 31682 (KUN); Anfu Xian, Wugong Shan Farm, Yantian [Cun], [27.358°N, 114.381°E], 190 m, 9 Aug 1959 (fr), S.S. Lai 1686 (KUN); Anfu Xian, Wugong Shan, Wenjia, [27.483°N, 114.183°E],

320 m, 2 Aug 1963 (fr), *J.S. Yue* 2895 (KUN); Anfu Xian, Wugong Shan, Wenjia, Meiyuanzhong, [27.483°N, 114.183°E], 6 Aug 1963 (fr), *J.S. Yue* 3060 (KUN); Anyuan Qu, Kongtian Dike, [24.923°N, 115.31°E], 500 m, 16 May 1958 (fr), *Anonymous* 1964 (KUN); Anyuan Qu, Kongtian Dike, [24.923°N, 115.31°E], 500 m, 16 May 1958 (fr), *C.M. Hu* 1964 (KUN[2]); Chongyi Xian, Mixi Forest Farm, [25.629°N, 114.236°E], 4 Jun 1965 (fr), *M.X. Nie et al.* 8487 (KUN); Chongyi Xian, Mixi Forest Farm, [25.629°N, 114.236°E], 650 m, 5 Jun 1965 (fr), *M.X. Nie et al.* 8573 (KUN); Dayu Xian, Neiliang [Xiang], [25.389°N, 114.086°E], 480 m, 1 Jun 1962 (fr), *J.S. Yue* 1040 (KUN); Dayu Xian, Neiliang Xu [=Neiliang Xiang], [25.389°N, 114.086°E], 550 m, 5 Jul 1965 (fr), *M.X. Nie et al.* 9125 (KUN); Fenyi Xian, Dagangshan, [27.59°N, 114.585°E], 250 m, 26 Aug 1985 (fr), *K. Yao* 9221 (CAS, P); Guixi Shi, Lengshui Xiang, [27.908°N, 117.19°E], 250 m, 19 Jul 1958 (fr), *M.X. Nie & S.S. Lai* 3564 (KUN); Hsiushui [=Xiushui Xian], Dove-woods, Shui-shueng Hsien, [29.002°N, 114.395°E], 2 Aug 1947 (fr), *Y.K. Hsiung* 5479 (A); Huichang Xian, Panjing Xiang, northeast, [25.495°N, 115.957°E], 6 Jul 1958 (fr), *C.M. Hu* 3197 (KUN); Jinggangshan Shi, Nashan [Xiang], [26.745°N, 114.303°E], 400 m, 14 Aug 1965 (fr), *S.S. Lai et al.* 4696 (KUN); Jinggangshan Shi, Zihuachayuan Shanxiang, [26.617°N, 114.083°E], 3 Jul 1958 (fr), *M.X. Nie & S.S. Lai* 3153 (KUN); Jiujiang Xian, Minshan [Xiang], [29.498°N, 115.825°E], 290 m, 20 Sep 1992 (fr), *C.M. Tan* 92053 (MO); Jiujiang Xian, Minshan [Xiang], [29.498°N, 115.825°E], 195 m, 23 May 1993 (fr), *C.M. Tan* 93124 (CAS, KUN); Sai Hang Cheung [=Xikengzhang], near Tung Lei Village [=Dongli Xiang], [24.87°N, 114.415°E], 1–29 Aug 1934 (fr), *S.K. Lau* 3994 (A); [Lianxi Qu], Hwang Yen Sze, Lu Shan, [29.573°N, 115.973°E], 600 m, 15 Aug 1932 (fr), *A.N. Steward & H.C. Cheo* 151 (A); [Lianxi Qu], Kuling [=Guling Zhen], [29.569°N, 115.982°E], 4000 ft, 28 Jul 1907 (fr), *E.H. Wilson* 1732 (A); [Lianxi Qu], Lu-shan, [29.573°N, 115.973°E], Dec 1878 (fl), *C. Maries* s.n. (K); [Lianxi Qu], Lushan Mts., [29.573°N, 115.973°E], 700–800 m, 3 Jul 1933 (fr), *H.H. Chung & S.C. Sun* 288 (A); [Lianxi Qu], Lushan Mts., [29.573°N, 115.973°E], 700–800 m, 10 Jul 1933 (fr), *H.H. Chung & S.C. Sun* 486 (A); [Lianxi Qu], Yun Lun Feng, Lushan, [29.573°N, 115.973°E], 19 Sep 1983 (fr), *K. Yao* 8552 (CAS, P); Lichuan Xian, Dayuan Farm, [27.477°N, 117.094°E], 16 May 1958 (fr), *M.X. Nie & S.S. Lai* 2544 (KUN); Lichuan Xian, Dayuan Farm, [27.477°N, 117.094°E], 28 May 1958 (fr), *M.X. Nie & S.S. Lai* 2544 (KUN); Longnan Xian, Anji Shan, [24.87°N, 114.606°E], 400 m, 27 Apr 1996 (fl), *C.M. Tan* 9604194 (CAS); [Luxi Xian], Wu Gong Shan, [27.455°N, 114.173°E], 270 m, 29 Apr 1984 (fl), *X.M. Gao* 1535 (MO); [Luxi Xian], Wu Gong Shan, [27.455°N, 114.173°E], 270 m, 7 May 1984 (fr), *X.M. Gao* 1593 (MO); Nanchang Xian, Sang-su-ling, near Shih-cha-chieh [=Shichajie], Kan River [=Gan River], about 60 li S of Nanchang, [28.397°N, 115.835°E], 28 Aug 1920 (fr), *H.H. Chung* 14 (A); Nanfeng Xian, E of river, [27.209°N, 116.531°E], 12 Apr 1958 (fl), *M.X. Nie & S.S. Lai* 2090 (KUN); Nankang Qu, Fushi Gongshe, Dashannao [Linchang], [25.536°N, 114.69°E], 500 m, 2 Aug 1965 (fr), *M.X. Nie et al.* 6782 (KUN); Nankang Qu, Fushi Gongshe, Dashannao [Linchang], [25.536°N, 114.69°E], 550 m, 2 Aug 1965 (fr), *M.X. Nie et al.* 9797 (KUN); [Qingyuan Qu], Chinyuen Shan [=Qingyuan Shan], [27.059°N, 115.052°E], 1200 ft, 15 Apr 1921 (fl), *H.H. Hu* 652 (A); Ruijin Shi, Buquan Xiang [=Buquan Cun], [25.727°N, 116.039°E], 23 Jul 1958 (fr), *Anonymous* 3822 (KUN); Ruijin Shi, Buquan Xiang [=Buquan Cun], [25.727°N, 116.039°E], 23 Jul 1958 (fr), *C.M. Hu* 3800 (KUN); Shangrao Xian, Wufu Shan, [28.139°N, 118.053°E], 800 m, 10 Sep 1958 (fr), *M.X. Nie & S.S. Lai* 4870 (KUN); Shangyou Xian, Guanggu Shan, Xia Shan, [25.924°N, 114.063°E], 710 m, 23 May 1965 (fr), *M.X. Nie et al.* 7397 (KUN); Shangyou Xian, Ziyang Gongshe [=Ziyang Xiang], Daping, [26.08°N, 114.501°E], 250 m, 30 Apr 1963 (fl), *M.X. Nie et al.* 8003 (KUN); Shangyou Xian, Ziyang Gongshe [=Ziyang Xiang], Daping, [26.08°N, 114.501°E], 250 m, 2 Aug 1965 (fl), *M.X. Nie et al.* 8003 (KUN); Shangyou Xian, Ziyang [Xiang], Miaobei, Ziyang Shan, [26.073°N, 114.502°E], 320 m, 4 May 1965 (fr), *M.X. Nie et al.* 8061 (KUN[2]); Suichuan Xian, Dafen Qu, Linyang Shali [=Linyangxian?], [26.24°N, 114.14°E], 700 m, 20 Sep 1963 (fr), *J.S. Yue* 4029 (KUN); Swe-Chuen [=Suichuan Xian], locality unknown, [26.35°N, 114.4°E], 1800 ft, 13 May 1921 (fr), *H.H. Hu* 879 (A); Wuning Xian, Shimen [=Shimenlou Zhen, Shimen Cun], [28.968°N, 114.86°E], 450 m, 20 Apr 1997 (fl), *C.M. Tan* 97475 (CAS); Wuning Xian, Shimen [Zhen], Yinlu [Cun], [28.988°N, 114.842°E], 450 m, 5 May 1994 (fl), *C.S. Ye* 161 (MO); Wuning Xian, Shimen, Jingyuan [Cun], [28.963°N, 114.922°E], 450 m, 20 Apr 1997 (fl), *C.M. Tan* 97475 (KUN); Wuning Xian, Yishan [Xiang], [29.366°N, 115.034°E], 150 m, 9 Jun 1963 (fr), *S.S. Lai* 2374 (KUN); [Xiushui Xian], Fenshui [Shan], [29.028°N, 113.992°E], 170 m, 11 Jun 1997 (fr), *C.M. Tan* 97838 (KUN); Xiushui Xian, Huangshagang, Shawo, [28.81°N, 114.712°E], 300 m, 28 Aug 1963 (fr), *S.S. Lai* 3245 (KUN); Xunwu Xian, Guizhumao Forestry Center, [24.93°N, 115.533°E], 650 m, 10 May 1958 (fr), *C.M. Hu* 1857 (KUN); [Yanshan Xian], Si-ho [=Xihel], Hwang Kan Shan Mt. [=Huanggang Shan], [27.882°N, 117.777°E], 15 Oct 1947 (fr), *Y.K. Hsiung* 6448 (A); Yongxin Xian, Hezi Shan, [26.95°N, 114.233°E], 500 m, 31 Aug 1965 (fr), *S.S. Lai et al.* 4861 (KUN); Yongxiu Xian, Yunshan, [29.056°N, 115.633°E], 1100 m, 21 May 1963 (fl), *S.S. Lai* 2268 (KUN); Zixi Xian, Chayuanshan Xiang [=Chayuanshan Cun], [27.658°N, 116.861°E], 3 Jul 1958 (fr), *M.X. Nie & S.S. Lai* 3153 (KUN). **Macau:** locality unknown, [22.167°N, 113.55°E], year 1844 (fr), *J.M.M. Callery* 236 (P[2]). **Taiwan:** Keelung [=Jilong Shi], NW of Keelung (Chilung), near Ching-Ren Hu (Lovers Lake), [25.159°N, 121.705°E], 130–150 m, 25 Sep 1989 (fr), *D.E. Boufford et al.* 25076 (CAS); Taichung [=Taizhong Shi], Shin-sheh [=Xinshe District], [24.264°N, 120.8°E], 21 Mar 1985 (fl), *S.Y. Lu* 15388 (A); Taizhong Shi, Damaopu, Ruanpi Keng, [24.194°N, 120.833°E], (fl), *Y. Satake* s.n. (TI); Taizhong Shi, Tatushan Wangkaoliao [=Dadu Shan Wanggaoliao], 24°9'3"N, 120°34'51"E, 235 m, 29 Oct 2007 (fl/fr), *C.I. Huang & G.F. Zhong* 3267 (CAS); Xinzhu Shi, Shibajian Shan, [24.792°N, 120.985°E], 4 Jun 1973 (fr), *L.J. Tu* 49 (TAI); Xinzhu Shi, Shibajian Shan, [24.792°N, 120.985°E], 4 Jun 1984 (fr), *Y.L. Huang* 1 (TAI). **Zhejiang:** Chun'an Xian, Laoya Jianjiao, [Wangfu Xiang], [29.836°N, 118.918°E], 2 Sep 1958 (fr), *S.Y. Chang* 30251 (MO); Hang Chow [=Hangzhou Shi], locality unknown, [30.25°N, 120.167°E], Jun 1922 (fr), *E.D. Merrill* 11296 (A); Hangchow [=Hangzhou Shi], locality unknown, [30.25°N, 120.167°E], 30 Apr 1921 (fl), *L.F. Tsu* 1719 (K); [Lin'an Shi], Tien moo shan [=Tianmu Shan], [30.333°N, 119.417°E], 22 Aug 1924 (fr), *R.C. Ching* 5191 (A); Ningpo [=Ningbo Shi], locality unknown, [29.867°N, 121.55°E], year 1908 (fl), *D. Macgregor* s.n. (A); Pingyang Xian, Jugou Xiaogu, [27.3°N, 120.5°E], 24 Jun 1959 (fr), *S.Y. Zhang* 5881 (KUN); Shaoxing Shi, montagnes de Shao-schin [=Shaoxing], [30°N, 120.583°E], (fl), *A.R. Franchet* s.n. (P); Taichow [=Taizhou Shi], locality unknown, [28.667°N, 121.35°E], 30 Apr 1924 (fl), *R.C. Ching* 1273 (A, P); Tiantai Xian, locality unknown, [29.178°N, 121.005°E], year 1958 (fr), *G.R. Chen* 2338 (KUN); [Xihu Qu], Westlake, [30.237°N, 120.141°E], 15 Jun 1927 (fr), *H.H. Hu* 1480 (A); [Xihu Qu], Xiaohu Shan, [30.203°N, 120.031°E], 26 Jun 1959 (fl), *S.Y. Zhang* 2127 (KUN); [Yuhang Qu], Chao Shan, [30.442°N, 120.219°E], 10 Jun 1959 (fr), *S.Y. Zhang* 2356 (MO); [Yuhang Qu], west [=western Zhejiang?], Siqian [=Siqian Xian], [30.192°N, 119.943°E], 19 Jul 1922 (fr), *Anonymous* 517 (A). **Province unknown:** (fl), *J. de La Touche* s.n. (E).

5. *Styrax finlaysonianus* Wall. ex G. Don, Gen. Hist. 4:5. 1837 [as *S. "Finlaysonianum"*]. *Cyrta finlaysoniana* (Wall. ex G. Don) Miers, Ann. Mag. Nat. Hist. ser. 3, 3:278. 1859. TYPE: *G. Finlayson s.n.* [cited in protologue as *Wallich 4403*] (LECTOTYPE, designated by Svengsuksa & Vidal (1992): BM!; ISOLECTOTYPES: G not seen—digital image [barcode 00142592]!, K not seen—photograph at P!, digital image [barcode 001038931]!).

Styrax subcrenatus Hand.-Mazz., Oesterr. Bot. Z. 80:342. 1931 [as *S. "subcrenata"*]. TYPE: CHINA. HAINAN: [Baoting Lizu Miao zu Zizhixian], Siebenfingerberg [= Qizhi Ling], [18.724°N, 109.704°E], Oct–Nov 1929, *G. Fenzl 210* (HOLOTYPE: W not seen—digital image [accession no. 1931-0006506]!).

Shrubs or trees to 12(–15) m tall. Young branchlets yellowish, scattered with yellow stellate trichomes; older branchlets dark brown, glabrous. Petiole 7–17 mm long, with tightly appressed stellate trichomes on abaxial surface, trichome arms up to 0.05–0.14 mm long. Two most proximal leaves on each shoot alternate. Lamina of fertile shoots 4.9–12.5 × 2.6–5.5 cm, those of sterile shoots to 17.4 × 8.6 cm, 1.5–2.5(–2.9) × as long as wide, subcoriaceous, obovate to elliptic, occasionally narrowly elliptic, rarely ovate; abaxial surface yellowish green when dry, with sparse yellow stellate trichomes, trichome arms up to 0.06–0.3 mm long, pubescence dense in axils of midvein and secondary veins and sparse on whole surface, with largest trichomes along midvein; adaxial surface brown to brownish green when dry, nearly glabrous or with very sparse yellow stellate trichomes, trichome arms up to 0.05–0.23 mm long, pubescence situated along midvein and rarely on proximal secondary veins; base cuneate to broadly cuneate, occasionally slightly oblique; margin entire to weakly serrulate or crenate towards apex; apex acute, occasionally slightly acuminate, occasionally slightly oblique, rarely emarginate; secondary veins 5 to 7 on each side of midvein, abaxially prominent, adaxially plane or sunken, tertiary veins reticulate, abaxially prominent, adaxially plane. Fertile shoots 7.5–15.5(–18.6) cm long, 2- to 4-leaved. Lateral inflorescences racemose, 1.5–3.1 cm long, 1- to 5-flowered; pseudoterminal inflorescences racemose, rarely subpaniculate, with well-spaced nodes, 3.6–7.6 cm long, 4- to 10-(to 14)-flowered, rachis yellow, completely covered with stellate trichomes. Pedicel (5)–7–14(–18) mm long, with dense short-armed yellow appressed stellate trichomes and scattered long-armed yellowish brown erect stellate trichomes; bracteoles 1.8–4.3 mm long, linear or subulate, positioned on basal half of pedicels. Flowers 1.6–2.1 cm long. Calyx 5–6(–7) × 5–6 mm, cupuliform, rarely funnelliform; abaxially faintly striate with dense short-armed yellow appressed stellate trichomes and scattered long-armed yellowish brown erect stellate trichomes, usually with trichomes becoming less dense towards calyx margin, trichome arms up to 0.12–0.28(–0.4) mm long; adaxially brown with scattered 2- or 3-armed trichomes; margin with 5(or 6) evenly distributed teeth 0.2–0.8 mm long; marginal teeth deltoid or obtuse, contiguous, densely pubescent on both surfaces. Corolla 1.2–1.9 cm long, white, tube (1.5)–3.3–6.9 mm long, abaxial surface proximally glabrous and distally with stellate trichomes, lobes 5(or 6), 8.6–14.4 × 2.7–3.4(–4.5) mm, subcoriaceous, oblong to lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, occasionally becoming sparser towards tube, adaxially glabrous except margins or with sparse 2- or 3-armed trichomes. Stamens 10(or 11); filaments 2–5.3 mm long, flexuous, widest at middle, proximally dense with stellate trichomes, distally glabrous; anthers 4.2–7.4 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with yellow stellate trichomes. Style 1.3–1.6 cm long, proximally dense with white stellate trichomes, distally glabrous; stigma 0.2–0.5 mm wide, punctiform. Fruiting calyx 4–8 × 6–13 mm, funnelliform, rarely cupuliform. Fruit 1.4–4 × 0.6–2.5 cm, indehiscent or rarely showing signs of partial dehiscence at base of fruit (dried material), oblique-ovoid to oblique-ellipsoid, rarely ovoid to ellipsoid, apex pointed to rostrate, rostrum up to 10 mm long, rarely obtuse; pericarp dry, 0.6–2 mm thick, outside smooth to rugose, with dense yellowish brown appressed stellate trichomes, inside rugose, with scattered stellate trichomes. Seeds light brown to brown, ovoid, rugose, with stellate trichomes.

Illustrations.—Guillaumin 1933:981, fig. 113 (1–3) (as *S. agrestis*); Anonymous 1974:340, fig. 4633 (as *S. agrestis*); Chen 1974:182, fig. 652; Hwang 1987a:390, fig. 424 (as *S. agrestis*); Hwang 1987b:114, pl. 39 (1–6) (as *S. agrestis*); Svengsuksa & Vidal 1992:173, pl. 31 (7–9) (as *S. agrestis* var. *agrestis*); Wu & Raven 2000:208, fig. 208 (1–6) (as *S. agrestis*).

Phenology.—Flowering: March–May, July, September–December. Fruiting: January–October.

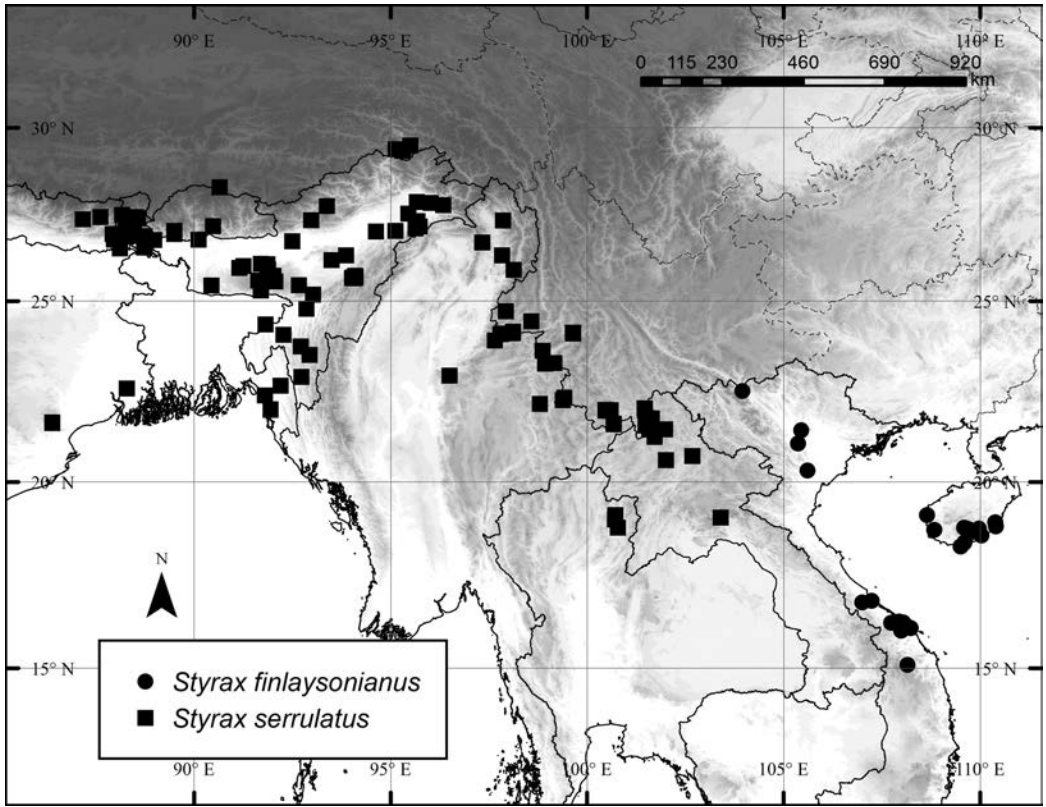


Fig. 4. Geographic distribution of *Styrax finlaysonianus* and *S. serrulatus*.

Distribution.—China (Hainan) and Vietnam (Da Nang, Ha Noi, Lao Cai, Ninh Binh, Quang Nam, Quang Tri, Thua Thien-Hue, and Vinh Phuc); Fig. 4.

Habitat.—In a variety of forests, growing on poor schistose, sandy, or granitic soils; 90–1500 m.

Vernacular names.—Cay lim (Vietnam; Guillaumin 1924); cay lo nghe (Vietnam, Thua Thien-Hue; *E. Poilane* 27691); cay ne (Vietnam, Ha Son Binh; Svengsuksa & Vidal 1992); cay o rep (Vietnam, Da Nang; *E. Poilane* 1588); chi-nian (China, Hainan; Chen 1974); deng dao (Vietnam, Ha Son Binh; Svengsuksa & Vidal 1992); do:k kaux (Laos, Xiangkhoang; Svengsuksa & Vidal 1992); hui-guo-an-xi-xiang (China; Hwang & Grimes 1996); nan-yue-ye-mo-li (China; Anonymous 1974); o rep (Vietnam, Quang Nam-Da Nang; Svengsuksa & Vidal 1992); po loi co (Vietnam, Binh Tri Thien; Svengsuksa & Vidal 1992); tat rung (Vietnam, Quang Nam-Da Nang; Svengsuksa & Vidal 1992); van tac (Vietnam, Binh Tri Thien; Svengsuksa & Vidal 1992).

Conservation assessment.—*Styrax finlaysonianus* occurs in northern and central Vietnam and the southern side of Hainan, China. Collections have been made from > 20 geographic localities in a broad area, with an EOO of ca. 202,510 km². Even if the EOO were to be reduced to take into account areas in which *S. finlaysonianus* has not been collected, the geographic distribution would remain large. There appears to be a significant amount of suitable habitat for *S. finlaysonianus* throughout its distribution. This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this species as Least Concern (LC).

Discussion.—*Styrax finlaysonianus* is the only member of the valvate species of *S.* series *Cyrta* with subentire to entire leaves. The fruits are also distinctly larger than any others in this group, attaining a size of as

much as 4×2.5 cm (vs. at most, 2×1.3 cm). Its range overlaps that of *S. agrestis* but it can be distinguished from this species by its larger ovoid fruits with walls usually > 0.6 mm thick (vs. smaller, narrow-ellipsoid, and fruit walls < 0.2 mm thick). *Styrax finlaysonianus* also usually has subentire leaves (vs. serrulate). Further differences between the two species and their shared taxonomic history are discussed under *S. agrestis*.

The distinctive thick-rostrate ovoid fruit of *Styrax finlaysonianus* readily distinguishes it from *S. faberi*, which also occurs rarely on Hainan but which has a smaller globose or ellipsoid fruit that lacks a rostrum. The seed of *S. finlaysonianus* is also densely stellate pubescent, vs. the glabrous seeds of *S. faberi*. Furthermore, the petiole of *S. finlaysonianus* is longer than that of *S. faberi* (> 7 mm vs. < 5 mm). *Styrax finlaysonianus* can rarely have fruit that resembles *S. serrulatus* in shape but can be distinguished from this species by its rugose, stellate-pubescent seeds (vs. smooth and glabrous). Furthermore, the fruit of *S. finlaysonianus* is indehiscent, whereas that of *S. serrulatus* can be dehiscent or indehiscent.

The name *Styrax finlaysonianus* was originally coined by Wallich (1828) in his catalogue of herbarium specimens that he distributed on behalf of the British East India Company. Lacking any descriptive information in the catalogue, the name was validly published by Don (1837). The description was slightly inaccurate, however, because the specimen is not notably canescent on the abaxial side of the leaves. The fruit is an important feature for the taxonomy of this species, but the type lacks fruiting material. This resulted in a vague protologue description that was easy to misinterpret. Perhaps because they did not have access to type material, Svengsuksa & Vidal (1992) misapplied the name to a species in *S. series Benzoin*, apparently based purely on the description of Don. From our inspection of the type material, it is clear that the type is a specimen from *S. series Cyrtia*: it has chartaceous leaves that are not likely to be evergreen. Furthermore, the type has stamens with pubescence only covering the proximal half of the filament, vs. later collections under this name that have pubescence covering the whole filament. The *S. series Benzoin* specimens considered to be *S. finlaysonianus* sensu Svengsuksa & Vidal (1992) should be re-evaluated for its species status because they appear to have a uniquely shaped fruit versus others in the series, which may warrant the recognition of a distinct species.

The locality for the type of *Styrax finlaysonianus* was indicated neither on the sheet nor in Wallich's catalogue. Don's (1837) protologue only mentions that the species is a "native of the East Indies." Clarke (1882) cites the type as probably from Cambodia, but provides no clarification as to why it was thought to be from there; Perkins (1907) and Svengsuksa & Vidal (1992) repeated Clarke's claim. Wallich's list indicates that the specimen originated from the personal herbarium of George Finlayson, a Scottish botanist who collected in Southeast Asia, specifically from Siam (Thailand) to Hue, Vietnam (Finlayson 1826). Thus, Finlayson collected in the vicinity where other specimens of this species were gathered, suggesting that the type was collected from there.

Styrax subcrenatus was described by Handel-Mazzetti (1931) from a specimen collected in Hainan. Handel-Mazzetti compared the species to *S. confusus*, likely noticing the similarly thick corolla lobes and leaves. However, *S. subcrenatus* has subentire leaves, like *S. finlaysonianus* and unlike any other species in the study group. On this basis, we synonymize *S. subcrenatus* and *S. finlaysonianus*.

Fruits of *Styrax finlaysonianus* are generally the largest within the study group (generally > 2 cm long and > 1 cm wide). The fruits of this species also have thick pericarp walls (generally > 1 mm) that are generally smooth. The seeds of *S. finlaysonianus* are often densely covered with stellate trichomes. There are, however, a number of specimens of *S. finlaysonianus* with mature fruits that are smaller and have thinner, rugose pericarp walls. Oftentimes, the seeds in these fruits have stellate trichomes that are very sparsely distributed, requiring some effort to locate. Although most of these specimens occur in Central Vietnam in or around Bach Ma National Park (e.g. *N.T. Cuong et al. HN-NY 401*, *D.S. Penneys et al. 2138*, *E. Poilane 27649* and *27691*), there are also specimens from outside of this region that possess combinations of these characters, including the only fruiting specimen we examined in depth from North Vietnam (*F. Fleury 37821*), as well as a number of other specimens from Hainan (e.g. *H. Fung 2264*, *T. Tuyama et al. 81149*). Two recent collections from Bach Ma National Park (*N.T. Cuong et al. HN-NY 401* and *D.S. Penneys et al. 2138*) have similarly small rugose fruit with relatively thin walls, whereas a third recent collection from the park (*Hai et al. HN-NY 942*), also in mature

fruit, has much larger smooth fruit with much thicker walls, suggesting that two taxonomic entities may currently reside within our concept of *S. finlaysonianus*. We cannot detect any other differences among the specimens, although the leaves of the two rugose-fruited specimens appear to be slightly smaller, and we lack sufficient data to confidently resolve this problem. Of particular help would be field investigation in Bach Ma National Park to observe and collect more fruiting specimens, as well as to tag the plants and return to collect them in flower. Chromosome counts of the two morphs might also uncover a higher ploidy level in the larger-fruited specimens.

The flowering collection *Q.F. Liang 14* has short-armed trichomes on the petiole and entire leaves, as in *Styrax finlaysonianus*, but the flowers are atypically small and the corolla lobes atypically thin for the species. The locality on the specimen label is “Institute of Forestry,” which may be in Guangdong because the specimen label originates from the South China Botanical Garden. If so, then the specimen is an outlier geographically from the rest of *S. finlaysonianus*. The collection is also similar to *S. faberi* in its reddish brown trichomes overtopping the basal pubescence of the calyx, small flowers, and few flowers per inflorescence. However, the alternate leaves at the base of each shoot, short-armed trichomes on the petiole, and entire leaf margins all serve to exclude it from this species. This specimen may represent an undescribed species, but without a more accurate locality it will be difficult to conduct a field search for other plants that resemble it. We have excluded this specimen from our species descriptions.

Svengsuksa & Vidal (1992) cite *Wallich 4403* as the holotype of *Styrax finlaysonianus*. However, in the protologue of *S. finlaysonianus*, Don does not cite in which herbarium the specimen was deposited. As we have discussed under the discussion of the typology *S. fukienensis* (= *S. confusus*), the term holotype would be incorrect, and we are recognizing it as a lectotype designation.

Additional specimens examined. **CHINA. Hainan:** [Baoting Lizu Miaozu Zizhixian], Po-ting [=Baoting], [18.641°N, 109.775°E], 300 ft, 3 Apr 1935 (fr), *F.C. How 71606* (A); [Baoting Lizu Miaozu Zizhixian], Po-ting [=Baoting], [18.641°N, 109.775°E], 400 ft, 3 Apr 1935 (fr), *F.C. How 71614* (A, P); [Baoting Lizu Miaozu Zizhixian], Po-ting [=Baoting], [18.641°N, 109.775°E], 700 ft, 11 Apr 1935 (fl), *F.C. How 71841* (A); [Baoting Lizu Miaozu Zizhixian], Qizhi Shan [=Qizhi Ling], [18.724°N, 109.704°E], 10 Jan 1934 (fr), *Z. Huang 36313* (MO); [Baoting Lizu Miaozu Zizhixian], Seven Finger Mts. [=Qizhi Ling], [18.724°N, 109.704°E], 10 May 1932 (fr), *H.Y. Liang 61784* (A); Chengpo Qi, Dalishang Cun, Wotou Wan [?], 750 m, 8 Dec 1956 (fl), *L. Deng 3601* (KUN, MO); [Dongfang Shi], Ganen, [19.1°N, 108.65°E], 24 Sep 1933 (fl), *X.R. Liang 63097* (KUN); [Dongfang Shi], Ganen, N of Hengpopoli Cun, [19.1°N, 108.65°E], 24 Feb 1933 (fr), *X.R. Liang 65185* (KUN); [Dongfang Shi], Ganen, Shanmanjue, E of Tianzi Cun, [19.1°N, 108.65°E], 17 Oct 1933 (fl), *X.R. Liang 63466* (KUN); [Jiyang Qu], Luofeng [Cun], [18.362°N, 109.601°E], 29 Jul 1933 (fl), *F.C. How 71118* (KUN); [Ledong Lizu Zizhixian], Chim Fung Ling [=Jianfengling] near Sam Mo Watt Village [=Sanmuqu Cun], Kan-en District [=Ganen Xian], [18.707°N, 108.83°E], 16 Apr 1934 (fr), *S.K. Lau 3789* (A); [Ledong Lizu Zizhixian], Chim Fung Mt. [=Jianfengling], near Fong Ngau Po Village, Kan-en District [=Ganen Xian], [18.707°N, 108.83°E], 2–31 Jan 1935 (fr), *S.K. Lau 5241* (CAS); [Ledong Lizu Zizhixian], Janfengling [=Jianfengling], [18.707°N, 108.83°E], 750 m, year 1978 (fl), *K.S. Chow 78441* (A); [Ledong Lizu Zizhixian], Janfengling [=Jianfengling], [18.707°N, 108.83°E], 800 m, year 1978 (fr), *K.S. Chow 78463* (A); Lingshui Lizu Zizhixian, Chim Shan [=Jianling Mountain?], Fan Maan Ts'uen [=Fanwan Cun] and vicinity, [18.74°N, 109.97°E], 3–20 May 1932 (fr), *H. Fung 20180* (A, P); Lingshui Lizu Zizhixian, Nanqiao Qu, Shimei Xiang Beng, [18.55°N, 110.035°E], 19 Oct 1933 (fl), *L. Deng 2718* (KUN); [Sanya Shi], Paai Poon Ts'uen [=Baiben Cun] and vicinity, [18.253°N, 109.504°E], 30 Apr–21 May 1932 (fr), *H. Fung 2264* (A); [Sanya Shi], Paai Poon Ts'uen [=Baiben Cun] and vicinity, [18.253°N, 109.504°E], 30 Apr–21 May 1932 (fr), *H. Fung 20064* (E, P); [Sanya Shi], locality unknown, [18.253°N, 109.504°E], 1400 ft, 5 Apr 1933 (fr), *F.C. How 70504* (A, KUN, P); [Sanya Shi], locality unknown, [18.253°N, 109.504°E], Mar–Jul 1933 (fl), *F.C. How 71118* (A, P); [Sanya Shi], locality unknown, [18.253°N, 109.504°E], 18 Jul 1933 (fr), *H.Y. Liang 62161* (P); [Sanya Shi], locality unknown, [18.253°N, 109.504°E], 24 Sep 1933 (fl), *H.Y. Liang 63077* (P); [Wanning Shi], Long-gun [=Longgun Zhen] - Xiang-long [=Xinglong], [18.908°N, 110.385°E], 29 Jul 1981 (fr), *T. Tuyama et al. 81149* (TI); Wanning Shi, Manning [=Wanning], [18.8°N, 110.4°E], 26 Nov 1936 (fl), *S.K. Lau 28244* (P); [Wuzhishan Shi], Dung Ka [=Tongjia Cun] to Wen Fa Shi [=Zhonghua Minzu Wenhua Cun?], [18.761°N, 109.591°E], 2000 ft, 1932–1933 (fr), *N.K. Chun & C.L. Tso 43805* (A); [Wuzhishan Shi], Dung Ka [=Tongjia Cun] to Wen Fa Shi [=Zhonghua Minzu Wenhua Cun?], [18.761°N, 109.591°E], 14 Jan 1933 (st), *X.R. Liang 64652* (KUN); locality unknown, 22 Jul 1933 (fl/fr), *C. Wang 33222* (A); locality unknown, 24 Sep 1933 (fr), *C. Wang 34220* (A); locality unknown, 15 Nov 1933 (fl), *C. Wang 35033* (A); locality unknown, 10 Jan 1934 (fr), *C. Wang 36313* (A); locality unknown, 11 Jan 1934 (fr), *C. Wang 36384* (A); locality unknown, 13 Jan 1934 (fl), *C. Wang 36606* (P); locality unknown, 3 Nov 1933 (fl), *H.Y. Liang 63613* (A); locality unknown, 3 Nov 1933 (fl), *H.Y. Liang 63618* (K, P); locality unknown, 14 Jan 1934 (fr), *H.Y. Liang 64652* (A); locality unknown, 24 Feb 1934 (fr), *H.Y. Liang 65184* (A); locality unknown, 24 Feb 1934 (fr), *H.Y. Liang 65185* (A); locality unknown, year 1936 (fl/fr), *L. Tang 435* (A).

VIETNAM. Da Nang: [Huyen Hoa Vang], 15 km de Mt. Bana [=Ba Na Hills], [15.996°N, 107.994°E], 20 May 1941 (fr), *J. Vidal 819A* (P); [Huyen Hoa Vang], Ba Na Hills, [15.996°N, 107.994°E], 200 m, 11 Jul 1923 (fr), *E. Poilane 7073* (A, P); [Huyen Hoa Vang], Ba Na Hills, [15.996°N, 107.994°E], 9 Mar 1939 (fr), *E. Poilane 29308* (P[2]); [Huyen Hoa Vang], Bana, [15.996°N, 107.994°E], 14 Jun 1920 (fr), *E. Poilane*

1588 (P); [Huyen Hoa Vang], Mount Bani [=Ba Na], [15.996°N, 107.994°E], May–Jun 1927 (fl/fr), *J. Clemens & M.S. Clemens* 3835 (CAS, P); near Tourane [=Da Nang], [16.067°N, 108.233°E], 1200 m, 18 Sep 1923 (fr), *E. Poilane* 8119 (P); [Quan Lien Chieu], Col des Nuages [=Hai Van Pass], [16.2°N, 108.133°E], 500 m, 1 Sep 1923 (fr), *E. Poilane* 7823 (P[2]); Quan Lien Chieu, locality unknown, [16.124°N, 108.118°E], 500 m, 14 Aug 1923 (fr), *E. Poilane* 7477 (AAU, P); Quan Lien Chieu, locality unknown, [16.124°N, 108.118°E], 500 m, 15 Aug 1923 (fr), *E. Poilane* 7478 (P); Quan Lien Chieu, locality unknown, [16.124°N, 108.118°E], 600 m, 17 Aug 1923 (fr), *E. Poilane* 7573 (A, P); locality unknown, [16.067°N, 108.233°E], Jan 1837 (fr), *M. Gaudichaud* 270 (K, P[2]). **Ha Noi:** [Huyen Ba Vi], Mount Ba Vi, province of Son Tay, [21.058°N, 105.366°E], 800 m, 2 Oct 1940 (fl), *P.A. Petelot* 2586 (A); [Huyen Ba Vi], Province of Sontay, Mont Bavi [=Mount Ba Vi], [21.058°N, 105.366°E], 800–1200 m, 2 Jun 1918 (fr), *F. Fleury* 37821 (P[2]). **Lao Cai:** Thi Xa Lao Cai, Lujie Forestry Center, 34 km S of Laojie [=Lao Cai], [22.483°N, 103.95°E], 120 m, 10 Dec 1964 (fr), *Sino-Vietnam Expedition 600* (KUN). **Ninh Binh:** [Huyen Nho Quan], Cuc Phuong, [20.317°N, 105.608°E], (fr), *Sino-Vietnam Expedition s.n.* (KUN). **Quang Nam:** [Huyen Tra My], between the villages of [Moi de Moo?] and Mang Tra [=Mang Ta?], [15.085°N, 108.149°E], 1200–1500 m, 25 Feb 1941 (fr), *E. Poilane* 31737 (P). **Quang Tri:** [Huyen Trieu Phong], Linh-chieu, [16.792°N, 107.241°E], 14 Jun 1920 (fr), *E. Poilane* 1588 (K, P); [Huyen Trieu Phong], Linh-chieu, [16.792°N, 107.241°E], 14 Jun 1920 (fr), *E. Poilane s.n.* (A, E); Massif de Dong Co Pat, [16.75°N, 107°E], 900 m, 5 Jul 1924 (fr), *E. Poilane* 11194 (P); Massif de Dong Co Pat, [16.75°N, 107°E], 900 m, 5 Jul 1924 (fr), *E. Poilane* 11196 (P[2]). **Thua Thien-Hue:** [Huyen Phu Loc], forest division of Thừa Luru, [16.245°N, 107.938°E], 29 Apr 1918 (fr), *Service Forestier* 38284 (P[2]); [Huyen Phu Loc], Hoi Mit, [16.218°N, 108.037°E], 18 Feb 1920 (fr), *E. Poilane* 1010 (E, K, P[2]); [Huyen Phu Loc], Loc Tri, Bach Ma National Park, 16°12'20.5"N, 107°44'7"E, 1 May 2014 (fr), *D.V. Hai et al. HN-NY 942* (BRIT); [Huyen Phu Loc], Loc Tri, Bach Ma National Park, 16°11'44.6"N, 107°50'56.2"E, 2 Jul 2013 (fr), *N.T. Cuong et al. HN-NY 401* (BRIT); [Huyen Phu Loc], Loc Tri, Bach Ma National Park, Rhododendron Trail, about 1–2 km from waterfall, 16°11'24.6"N, 107°50'59.7"E, 17 Aug 2013 (fr), *D.S. Penneys et al.* 2138 (BRIT, CAS); [Huyen Phu Loc], summit of Bach Ma Mountain, [16.2°N, 107.867°E], 1400–1500 m, 8 Sep 1939 (fr), *E. Poilane* 27691 (P[2]); [Huyen Phu Loc], summit of Bach Ma Mountain, S of Hue, [16.2°N, 107.867°E], 1400–1500 m, 6 Sep 1938 (fr), *E. Poilane* 27649 (P); [Huyen Phu Loc], Thừa Luru, [16.245°N, 107.938°E], 18 Nov 1911 (fl), *H. Lecomte & A.E. Finet* 1317 (P[2]). **Vinh Phuc:** Huyen Lap Thach, Vinhlin Forestry Station, [21.417°N, 105.45°E], 200 m, 10 Feb 1965 (fl), *Sino-Vietnam Expedition 2212* (KUN).

6. *Styrax formosanus* Matsum., *Bot. Mag. (Tokyo)* 15:75. 1901 [as *S. "formosanum"*]. TYPE: CHINA. TAIWAN: [Taizhong Shi], Tooseikaku [=Dongshi Qu], [24.258°N, 120.828°E]. Mar 1896, *A. Tashiro* 81A (LECTOTYPE, designated here: TI!).

Styrax henryi Perkins in Engl., *Pflanzenr.* IV. 241 (Heft 30):33. 1907. TYPE: CHINA. TAIWAN: [Pingdong Xian], Bankenseng [=Wanjin Shan], [22.607°N, 120.630°E], *A. Henry* 394 (LECTOTYPE, designated here: A!).

Styrax henryi var. *microcalyx* Perkins in Engl., *Pflanzenr.* IV. 241 (Heft 30):33. 1907. TYPE: CHINA. TAIWAN: [Pingdong Xian], South Cape [=Eluanbil], [21.902°N, 120.853°E], *A. Henry* 2063 (LECTOTYPE, designated here: E!; ISOLECTOTYPES: A!, P!, US not seen—digital image [barcode 00112554]!).

Styrax funkikensis K. Mori, *Trans. Nat. Hist. Soc. Formosa* 25:414. 1935. TYPE: CHINA. TAIWAN: [Jiayi Shi], Funkiko [=Zhuqi Xiang], Karapin [=Jiaoliping], [23.531°N, 120.643°E], 27 Mar 1928, *B. Hayata s.n.* (PROBABLE HOLOTYPE: TAI not seen).

Styrax suzukii K. Mori, *Trans. Nat. Hist. Soc. Formosa* 25:417. 1935. TYPE: CHINA. TAIWAN: [Yilan Xian], Pianan-anbu [=Siyuan Yakou], [24.397°N, 121.356°E], 3 Jul 1930, *S. Suzuki* 5034 (HOLOTYPE: TAI not seen—digital image [accession no. 119063]!).

Shrubs or trees to 8 m tall. Young branchlets grayish green to brown, with dense yellow to brown stellate trichomes, rarely with scattered erect longer simple or 2- or 3-armed trichomes; older branchlets brown, glabrous. Petiole 3–7 mm long, with dense to occasionally scattered appressed or erect yellow stellate trichomes, rarely with scattered erect longer simple or 2- or 3-armed trichomes, trichomes or trichome arms to 0.06–0.29(–1.1) mm long. Two most proximal leaves on each shoot subopposite, rarely alternate. Lamina of fertile shoots 2.3–6.3 × 1.1–2.7 cm, those of sterile shoots to 9 × 4.7 cm, 1.6–3.2 × as long as wide, chartaceous, rhombic to narrow-rhombic, occasionally obovate; abaxial surface green to greenish brown when dry, with yellow stellate trichomes, rarely with sparse reddish brown stellate trichomes or scattered longer simple or 2- or 3-armed trichomes, trichomes or trichome arms to 0.13–0.5(–0.79) mm long, pubescence scattered on whole surface, trichomes denser and larger in axils of midvein and secondary veins; adaxial surface dark green to brown when dry, with yellow stellate trichomes, rarely with scattered longer simple or 2- or 3-armed trichomes, trichomes or trichome arms to 0.05–0.37(–0.47) mm long, pubescence mostly along veins, occasionally scattered over whole surface; base cuneate to acute; margin serrulate to serrate, occasionally with some teeth much larger than others; apex short-acuminate to acute, occasionally acuminate, rarely rounded or emarginate; secondary veins 3 to 5 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins reticulate, abaxially prominent, adaxially plane. Fertile shoots 2.6–7.4 cm long, 2- to 4-leaved. Lateral inflorescences racemose, 1.2–3.3 cm long, 1- or 2-flowered; pseudoterminal inflorescences racemose, with well-spaced nodes, 1.5–5 cm long, (1- to)3- to 6-flowered, rachis brown, very dense with yellow stellate trichomes, rarely with scattered erect longer simple or 2- or 3-armed trichomes. Pedicel 7–18(–22) mm long,

completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellow stellate trichomes, rarely with scattered erect longer simple or 2- or 3-armed trichomes; bracteoles 0.7–3.2 mm long, linear or subulate, positioned in middle of pedicels, rarely at base. Flowers 0.7–2.1 cm long. Calyx 3–5 × 4–5(–6) mm, cupuliform to funnelform; abaxially completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellow stellate trichomes, rarely with scattered simple or 2- or 3-armed trichomes, with trichomes becoming less dense within 1–2 mm of calyx margin, margin brown and scarious, arms of trichomes to (0.11–)0.28–0.84(–0.95) mm long; adaxially yellowish brown to brown with scattered 2- or 3-armed trichomes; margin with 4 to 7 unevenly distributed teeth with unevenly deep sinuses, or occasionally evenly distributed teeth 0.3–0.9 mm long; marginal teeth deltoid to lanceolate, not contiguous, pubescent on both surfaces. Corolla (0.7–)1.1–1.8 cm long, white, tube 1.5–2.6 mm long, abaxial surface proximally glabrous and distally covered with stellate trichomes, lobes 4 or 5, (5.3–)8.6–15.5 × 2–4.2 mm, chartaceous, oblong to lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, adaxially with pale yellow stellate pubescence, denser at apex. Stamens 8 to 10; filaments 2.9–6.3 mm long, straight, widest at base, proximally dense with stellate trichomes, distally glabrous; anthers 2.9–6.4 mm long, wider than distal portion of filament, with sparse to rarely dense yellow stellate trichomes; connective with sparse yellow stellate trichomes. Style 1.1–1.9 cm long, glabrous, with stellate trichomes at base; stigma 0.2–0.5 mm wide, punctiform, rarely capitate. Fruiting calyx 3–4(–5) × 5–8 mm, funnelform to salverform. Fruit 0.7–1.2 × 0.5–0.8 cm, dehiscent by three valves at base, rarely at apex, ovoid to ellipsoid, apex pointed to rostrate to 5 mm, very rarely rounded; pericarp dry, 0.12–0.47 mm thick, outside slightly rugose, with dense grayish brown appressed stellate trichomes, inside glabrous, occasionally with sparse stellate trichomes at apex, smooth. Seeds tan to brown, ovoid, smooth with shallow longitudinal grooves and deep longitudinal fissures, glabrous.

KEY TO THE VARIETIES OF *STYRAX FORMOSANUS*

- 6a. Long simple or 2- or 3-armed trichomes absent on young branchlets, leaf surfaces, petioles, rachises, pedicels, and calyces; petiole trichome length 0.06–0.29 mm _____ 6a. var. **formosanus**
 6b. Long simple or 2- or 3-armed trichomes present, scattered on young branchlets, leaf surfaces, petioles, rachises, pedicels, and calyces; petiole trichome length 0.61–1.1 mm _____ 6b. var. **hirtus**

6a. *Styrax formosanus* var. *formosanus*

Young branchlets grayish green to brown, with dense yellow to brown stellate trichomes. Petiole with dense to occasionally scattered appressed or erect yellow stellate pubescence, trichome arms to 0.06–0.29 mm long. Lamina abaxial surface green to greenish brown when dry, with yellow stellate trichomes, rarely with sparse reddish brown stellate trichomes, trichome arms to 0.13–0.5 mm long, pubescence scattered on whole surface, trichomes denser and larger in axils of midvein and secondary veins; adaxial surface dark green to brown when dry, with yellow stellate trichomes, trichome arms to 0.05–0.37 mm long, pubescence mostly along veins, occasionally scattered over whole surface. Rachis brown, very dense with yellow stellate trichomes. Pedicel completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellow stellate trichomes. Calyx abaxially completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellow stellate trichomes, arms of trichomes to (0.11–)0.28–0.84 mm long.

Illustrations.—Hayata 1912:120, pl. 21; Hayata 1915:121, fig. 41; Kanehira 1936:605, fig. 562; Liu 1962:1039, pl. 864; Li 1963:752, fig. 602; Li 1978:110, pl. 993; Hwang 1987b:120, pl. 41 (1–5); Liu 1989:355, fig. 288; Li 1998:98, pl. 41; Wu & Raven 2000:210, fig. 210 (1–6).

Phenology.—Flowering: January–May, October–November. Fruiting: April–October.

Distribution.—China (Fujian, Guangdong, Jiangxi, Taiwan, and Zhejiang); Fig. 5.

Habitat.—In broadleaf and mixed forests, on hillside slopes, in exposed sites and roadsides; 0–2350 m.

Vernacular names.—Fen-qi-hu-ye-mo-li (China, Taiwan; Li 1978); funkiko-egonoki (China, Taiwan; Mori 1935); henrii-egonoki (China, Taiwan; Sasaki 1928); hioh-e-peh (China, Taiwan; Sasaki 1928); kasurayun (China, Taiwan; Sasaki 1928); kazimu (China, Taiwan; Sasaki 1928); o-koe-bu (China, Taiwan; Sasaki 1928); kosyun-egonoki (China, Taiwan; Sasaki 1928); o-phe-kiu-kiung (China, Taiwan; Sasaki 1928);

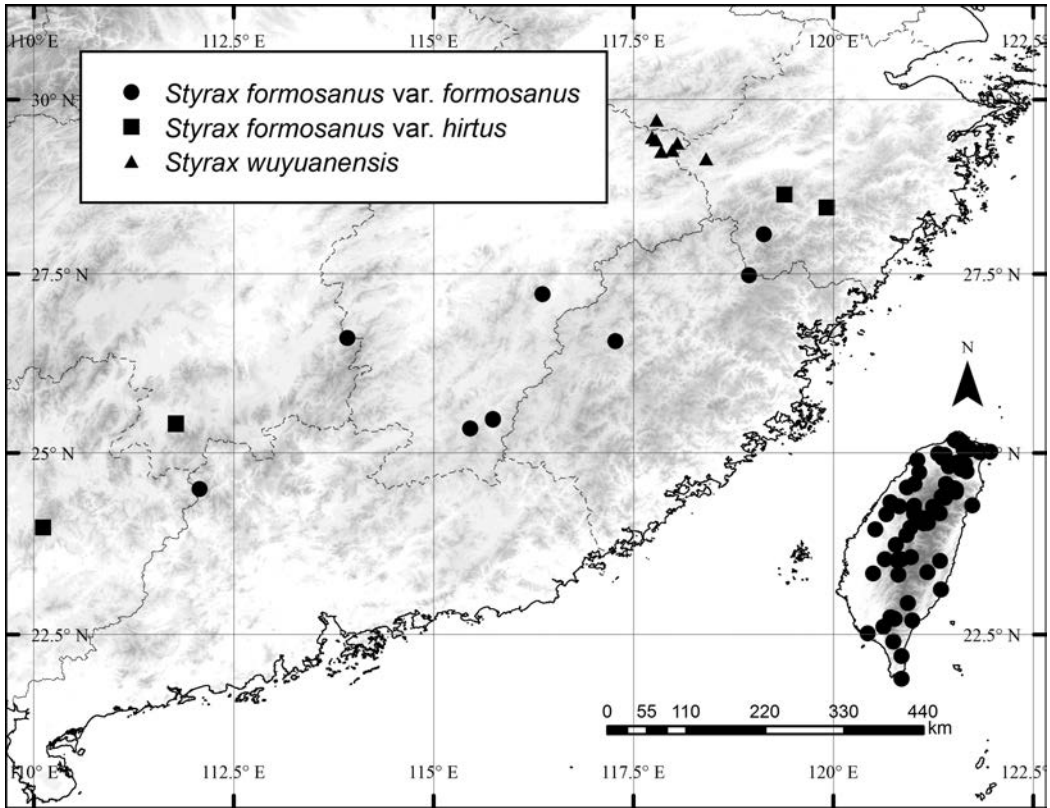


Fig. 5. Geographic distribution of *Styrax formosanus* var. *formosanus*, *S. formosanus* var. *hirtus*, and *S. wuyuanensis*.

peh-chhiu (China, Taiwan; Sasaki 1928); pianan-egonoki (China, Taiwan; Mori 1935); tai-wan-an-xi-xiang (China; Hwang & Grimes 1996); taiwan-egonoki (China, Taiwan; Kanehira 1936); zirai (China, Taiwan; Sasaki 1928); wu-pi-jiu-xiong (China, Taiwan; Li 1978); zyurai (China, Taiwan; Sasaki 1928); zyurai (China, Taiwan; Sasaki 1928).

Conservation assessment.—*Styrax formosanus* var. *formosanus* occurs commonly throughout Taiwan and rarely on mainland China (from Zhejiang southwest to Guangxi). Collections have been made from > 70 geographic localities in a broad area, with an EOO of ca. 391,522 km². Even if the EOO were to be reduced to take into account areas in which *S. formosanus* var. *formosanus* has not been collected, the geographic distribution would remain large. There appears to be a significant amount of suitable habitat for *S. formosanus* var. *formosanus* throughout its distribution and it is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., Y.C. Kao & S.H. Lai 292). This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this variety as Least Concern (LC).

Additional specimens examined. **CHINA. Fujian:** Jiangle Xian, Longxishan Lishan, [26.551°N, 117.277°E], 700–1000 m, 11 Jun 1991 (fr), *Longxi Mt. Exped. 1301* (CAS). **Guangdong:** Lianshan Zhuangzu Yaozu Zizhixian, Daxu Shan, Guanmen Ling boundary, [24.499°N, 112.074°E], 850 m, 3 Jun 1958 (fr), *P.X. Tan 58283* (KUN). **Jiangxi:** Anyuan Qu, Dujiang Xiang, Huang Di, [25.338°N, 115.459°E], 600 m, 17 Jun 1958 (fr), *C.M. Hu 2708* (KUN); Anyuan Qu, Dujiang Xiang, Huang Di, [25.338°N, 115.459°E], 600 m, 17 Jun 1958 (fr), *C.M. Hu 2759* (KUN); Huichang Xian, Shiba Xiang, Chutou Keng, [25.463°N, 115.743°E], 19 Jun 1958 (fr), *Anonymous 2845* (KUN); Jinggangshan Shi, Heng Keng, [26.598°N, 113.923°E], 1200 m, 13 Jul 1965 (fr), *S.S. Lai et al. 4434* (KUN); Nanfeng Xian, Shan Qu (Yi Qu), Junfeng Shan, [27.217°N, 116.364°E], 4 May 1958 (fr), *M.X. Nie & S.S. Lai 2449* (KUN). **Taiwan:** Hsichu [=Xinzhu Xian], Hu-Kou [Xiang], [24.9°N, 121.05°E], 4 Apr 1985 (fl), *M.T. Kao 10075* (MO); Hsinchu Hsien [=Xinzhu Xian], Chienhsieh Hsiang [=Jianshi Xiang]; Yuanyanghu Natural Preserved Area, along the trail of the lake, 24°34'16"N, 121°24'37"E, 1670 m, 8 May 1995 (fl), *H.Y. Shen et al. 741* (MO); Hualien Hsien

[=Hualian Xian], Chohsi Hsiang [=Zhuoxi Xiang]: Yushan National Park, Patungkuang Ancient Trail [=Batongguan], en route from Huangma to Walami, 23°21'17"N, 121°10'42"E, 800–900 m, 13 Jun 1996 (fr), C.C. Liao & Y.Y. Lien 1824 (CAS); Hualien [=Hualian Xian], Hsiulin Hsiang [=Xiulin Xiang]: Taroko National Park, mountain trail between Taroko and Tali, [24.167°N, 121.333°E], 100–200 m, 20 Jul 1992 (fr), W.P. Leu et al. 1432 (E); Hualien [=Hualian Xian], Hungyeh [=Hongye Cun], [23.511°N, 121.337°E], 200 m, 17 Jun 1989 (fr), T.C. Huang & S.F. Huang 14108 (TAI); Ilan County [=Yilan Xian], Taipingshan, [24.494°N, 121.535°E], 1870 m, 14 May 1992 (fl), S.F. Huang 4781 (TAI); I-lan Hsien [=Yilan Xian], Mt. Taiping, [24.494°N, 121.535°E], 26 Aug 1962 (fr), C.C. Chuang et al. 4785 (A); Ilan Hsien [=Yilan Xian], Ssuyuanako [=Siyuanakou] to Nanhutashan [=Nanhu Dashan], [24.378°N, 121.395°E], 1900–2350 m, 3 Jul 1986 (st), J.C. Wang et al. 3597 (A); Ilan Hsien [=Yilan Xian], Ssuyuanako [=Siyuanakou] to Nanhutashan [=Nanhu Dashan], [24.378°N, 121.395°E], 1900–2350 m, 5 Sep 1985 (fr), T.Y.A. Yang & S.O. Ou 2465 (KUN); Ilan Hsien [=Yilan Xian], Tatung Hsiang [=Datong Xiang], Taipingshan-Chienching [=Jianqing], 24°30'30"N, 121°30'59"E, 1880 m, 18 Sep 1996 (fr), C.M. Wang & H.M. Lin 2286 (KUN, P); Ilan Hsien [=Yilan Xian], Yuanshan Hsiang [=Xiang], along the hiking trail to Ayushan, near Tsaopi [=Caopi], 24°46'34"N, 121°36'08"E, 950–1000 m, 28 Aug 2002 (fr), P.J. Lin et al. 35 (CAS); Ilan Hsien [=Yilan Xian], Yuanshan Hsiang [=Yuanshan Xiang], summit of Ayushan, 24°47'13"N, 121°35'34"E, 1420 m, 10 Jul 1998 (fr), Y.C. Kao & Q.D. Huang 621 (CAS); Ilan Hsien [=Yilan Xian], Yuanshan [Xiang], [24.744°N, 121.668°E], 23 Mar 2000 (fl), U. Kurosuo 5 (CAS); Ilan [=Yilan Xian], Ssuyuan-akou [=Siyuan Yaku](Piyanan-anbu) to Nanshan (Piyanan), [24.404°N, 121.367°E], 1500–2200 ft, 17 Jul 1963 (fr), T. Shimizu & C.C. Chuang 20443 (KUN, L); [Jiayi Xian], Arisan [=Ali Shan], [23.517°N, 120.8°E], 2000 m, Jun 1914 (fr), U.J. Faurie 187 (A, P); [Jiayi Xian], Arisan [=Ali Shan], [23.517°N, 120.8°E], 2500 m, Mar 1915 (fl), U.J. Faurie 1745 (A); Kaohsiung Hsien [=Gaixiong Xian], Taoyuan Hsiang [=Xiang]: near road mileage sign 16 km on Meilan Forest Road, 23°19'17"N, 120°48'48"E, 1700 m, 10 May 1994 (fl), T.Y. Liu et al. 447 (E); Karenko [=Hualian Xian], near Gukutsu [=Hezhong], [24.273°N, 121.74°E], 24 Nov 1918 (fl), E.H. Wilson 11082 (A); Miaoli Xian, Shihtan Hsiang [=Shitan Xiang], Shihtan [=Shitan], margin of orange orchard, [24.523°N, 120.923°E], 29 May 1991 (fr), W.P. Leu 927 (CAS); Nan Tow [=Nantou Xian], Nichigetsutan [=Riyue Tan], [23.867°N, 120.917°E], 600 m, 8 Aug 1979 (fr), G. Murata & N. Hisao 39077 (KYO); Nantau Hsien [=Nantou Xian], Jeuai [=Ren'ai Xiang], [24.025°N, 121.131°E], 1000 m, 7 Aug 1969 (fr), Y. Ando et al. 341 (KUN); Nanto [=Nantou Xian], from Nanto [=Nantou] to Noko [=Nenggao Mountain] via Musha [=Ren'ai], [24.046°N, 121.13°E], 500 m, 12 Mar 1918 (fl), E.H. Wilson 10021 (A); Nanto [=Nantou Xian], from Nanto [=Nantou] to Noko [=Nenggao Mountain] via Musha [=Ren'ai], [24.046°N, 121.13°E], 666–1000 m, 3 Mar 1918 (fl), E.H. Wilson 10086 (A); Nanto [=Nantou Xian], round Horisha [=Puli], [23.967°N, 120.967°E], 600–1000 m, 9 Mar 1918 (fl), E.H. Wilson 9933 (A); Nantou Xian, about 100 m E of Chingching Villa, Provincial Highway 14A, between Meifeng and Wushe, Jenai [=Ren'ai Xiang], 24°2'9"N, 121°9'27"E, 1670 m, 22 Apr 1994 (fl), B.J. Conn & W.H. Hu 4066 (MO); Nantou Xian, en route from Tungpu [=Dongpu] Hot Spring to Rainbow Waterfall [=Caihong Pubu], [23.561°N, 120.974°E], 1500–1600 m, 12 Apr 1984 (fl), C.I. Peng 6477 (CAS); Nantou Xian, Jenai Hsiang [=Ren'ai Xiang]: National Chung Hsing University Hui-Sun Experimental Forest, along the forest road to Tangkungpei [=Tanggongbei], 24°5'20"N, 121°2'17"E, 600–800 m, 10 Aug 1995 (fr), S.M. Liu et al. 6 (CAS); Nantou Xian, Jenai Hsiang [=Ren'ai Xiang]: Shouting, on Provincial Highway 14 Jia, at road mileage sign 6 km, 24°5'40"N, 121°9'2"E, 1650 m, (fl), C.I. Peng 15312 (CAS, KUN); [Nantou Xian], Jitsugetsutan [=Riyue Tan], [23.867°N, 120.917°E], 2 Oct 1929 (fl), T. Tanaka 464 (A); [Nantou Xian], Jitsugetsutan [=Riyue Tan], [23.867°N, 120.917°E], 2 Oct 1929 (fr), T. Tanaka 479 (A, C); Nantou Xian, Luku Hsiang [=Lugu Xiang]: Fenghuangku [=Fenghuanggu], on the way from Fenghuang Hostel to Fenghuang Waterfall, 23°43'54"N, 120°47'E, 800 m, 9 Sep 1994 (fr), K.Y. Wang et al. 123 (E); Nantou Xian, Lu-shan, [24.03°N, 121.18°E], 30 Mar 1972 (fl), M.T. Kao 7956 (AAU); Nantou Xian, Shenmu, [23.533°N, 120.855°E], 1000 m, 31 Mar 1992 (fl), S.Y. Shieh et al. 6 (TAI); [Nantou Xian], Sun Moon Lake [=Riyue Tan], [23.867°N, 120.917°E], 700 m, 11 Aug 1966 (fr), C.G.G.J. van Steenis 20792 (L); Nantou Xian, Sun-Moon Lake [=Riyue Tan], [23.867°N, 120.917°E], 730 m, 31 Mar 1970 (fl), C. Hsu & C.S. Kuoh 6936 (A); Nantou Xian, Sun-Moon Lake [=Riyue Tan], [23.867°N, 120.917°E], 20 Apr 1977 (fr), C.M. Kuo 8320 (KYO); Nantou Xian, Sun-moon Lake [=Riyue Tan], [23.867°N, 120.917°E], 20 Mar 1977 (fl), Y.P. Yang 51257 (MO); Nantou Xian, Yu-Chyr [=Yuchi Xiang] to Sun Moon Lake [=Riyue Tan], [23.867°N, 120.917°E], 24 Mar 1985 (fl), S.Y. Lu 15502 (A); [Pingdong Xian], Bankingsing [=Wanjin Shan], [22.607°N, 120.63°E], (fr), A. Henry 554 (A, E); [Pingdong Xian], Bankingsing [=Wanjin Shan], [22.607°N, 120.63°E], Feb 1914 (fl), U.J. Faurie 184 (A, P); [Pingdong Xian], South Cape [=Eluanbi], [21.902°N, 120.853°E], (st), A. Henry 913 (A); [Pingdong Xian], South Cape [=Eluanbi], [21.902°N, 120.853°E], (fr), A. Henry 2064 (P); [Pingdong Xian], Wutaicun, [22.738°N, 120.718°E], 27 Jul 1968 (fr), T. Namba et al. 1238 (TI); Pingtung Hsien [=Pingdong Xian], Chunjih Hsien [=Chunri Xiang], along Tahan Forest Trail [=Dahan Lindao] from Shuitiliao to Tahanshan [=Dahan Shan], [22.408°N, 120.751°E], 22 Sep 1990 (fr), W.P. Leu et al. 629 (CAS); Pingtung Hsien [=Pingdong Xian], Mutan Hsiang [=Mudan Xiang], Shouka-Tungyuan [=Dongyuan], 199 highway, 8.5km., 22°12'33"N, 120°51'11"E, 320 m, 31 Jan 1996 (fl), C.M. Wang & H.M. Lin 2070 (CAS, P); Pingtung Hsien [=Pingdong Xian], Taiwu forest track, [22.517°N, 120.433°E], 700 m, 3 Apr 1996 (fl), T.Y.A. Yang 6474 (KUN); Pingtung Hsien [=Pingdong Xian], Wutai Hsiang [=Xiang]: Forest trail from Ail [=Ali] to Hsiaokueihu, 22°43'N, 120°46'E, 1300 m, 28 Sep 1992 (fr), C.C. Liao et al. 561 (CAS); Prefecture Ilan [=Yilan Xian], Mt. Duli, E of Mt. Taiping, [24.462°N, 121.534°E], 2000 m, 29 Jul 1963 (fr), M. Tamura et al. 21358 (A); Sintiku [=Xinzhu Xian], Zyukirin [=Shuqilin], [24.732°N, 121.075°E], Mar 1916 (fl), S. Sasaki 345 (A); [Taibei Shi], Mt. Taiton [=Datun Shan], Tikusiko [=Zhuzi Hu], [25.169°N, 121.539°E], 26 Apr 1931 (fl), S. Suzuki s.n. (A); Taichung County [=Taizhong Shi], Chinschan, [24.15°N, 120.667°E], 6 Apr 1984 (fl), S.F. Huang 581 (TAI); Taichung [=Taizhong Shi], Kukuan [=Guguan] - Chiapaotai [=Jiabaotai], [24.191°N, 121.013°E], 4 Apr 1984 (fr), W.S. Tang 326 (A); Taichung [=Taizhong Shi], Li-Shan, [24.256°N, 121.25°E], 18 Apr 1977 (fl), C.M. Kuo 51202 (MO); Taichung [=Taizhong Shi], Mt. Ammashan [=Anmashan, Daxueshan National Forest Recreation Area], [24.271°N, 121.012°E], 2300 m, 22 Oct 1957 (fr), T.S. Liu s.n. (A); Taihoku [=Xinbei Shi], around Urai [=Wulai] 20 mi. E of Taihoku [=Taibei], [24.867°N, 121.55°E], 1000 m, 31 Mar 1918 (fl), E.H. Wilson 10266 (A); Taihoku [=Xinbei Shi], near Chosokei [=Shuangxi Qu], [25.01°N, 121.834°E], 27 Mar 1918 (fl), E.H. Wilson 10209 (A); Taihoku-shu [=Xinbei Shi], Sozan [=Yangming Shan], [25.167°N, 121.564°E], 4 May 1932 (fl), T. Tanaka & Y. Shimada 11001 (C, E, L, P[2]); Taipei City [=Taibei Shi], Chishingshan [=Qixing Shan], [25.171°N, 121.552°E], 17 Jun 1984 (fr), S.C. Chen 2 (TAI); Taipei City [=Taibei Shi], Chishingshan [=Qixing

Shan], [25.171°N, 121.552°E], 19 Jun 1984 (fr), S.C. Chen 65 (L); Taipei City [=Taipei Shi], Chishingshan [=Qixing Shan], [25.171°N, 121.552°E], 17 Jun 1984 (fr), S.C. Chen & E.L. Kuo 75 (MO); Taipei City [=Taipei Shi], Mt. Yangming, [25.167°N, 121.564°E], 19 Jul 1983 (fr), T.C. Huang 9713 (TAD); Taipei Hsien [=Xinbei Shi], Hsichih Town [=Xizhi], hiking trail between Chiangtzutoushan [=Jiangzitou Shan] and Chiangtzuliao Shan [=Jiangzilio Shan], 25°31'N, 121°42'34"E, 630 m, 3 Mar 1998 (fl), Y.C. Kao & S.H. Lai 292 (CAS); Taipei Hsien [=Xinbei Shi], Kungliao Hsiang [=Gongliao Xiang], Laolanshan: hiking trail near Kungnankung [=Gongnan Gong], 25°0'54"N, 121°57'57"E, 300 m, 19 Mar 1998 (fl), Y.C. Kao & S.H. Lai 337 (CAS); Taipei Hsien [=Xinbei Shi], Sanhsia [=Sanxia District], Manyuehuan [=Manyuehuan] waterfall, en route from Chengpai Lodge to waterfall, [24.815°N, 121.448°E], 400 m, 16 Jun 1992 (fr), C.C. Liao et al. 391 (MO); Taipei Hsien [=Xinbei Shi], Vicinity of Wulai, along road above the Nanshih Hsi River [=Nanshi Xi], 24°51'N, 121°33'E, 200 m, 19 Mar 1992 (fl), B. Bartholomew & D.E. Boufford 6219 (CAS); Taipei Hsien [=Xinbei Shi], Wanli Hsiang [=Wanli Xiang], along Fushih Historic Road [=Fushi Gudao] to Tachienchih [=Dajian Chi, a pond], 25°9'31"N, 121°36'12"E, 500 m, 24 Mar 2001 (fl), Y.Y. Huang & Y.Z. Qi 279 (CAS); Taipei Hsien [=Xinbei Shi], Wulai [Qu]: Tunghou [=Tonghou], en route from mountain control station to guest house, [24.84°N, 121.647°E], 400 m, 9 Jul 1992 (fr), C.C. Liao et al. 418 (CAS); Taipei [=Taipei Shi], Chihsingshan [=Qixing Shan], [25.171°N, 121.552°E], 25 Apr 1986 (fl), T.C. Wan & K.C. Yang 2000 (A); Taipei [=Taipei Shi], Mt. Sevenstar [=Qixing Shan] - Peitou [=Beitou District], [25.171°N, 121.552°E], 12 Apr 1983 (fl), C.F. Hsieh & W.S. Tang 20 (MO); Taipei [=Taipei Shi], Yangmingshan National Park, [25.167°N, 121.564°E], 700–1000 m, 22 May 1990 (fr), W.P. Liu et al. 487 (MO); Taipei [=Xinbei Shi], Hsichih [=Xizhi District] heng-k'o [=Hengkekou], [25.053°N, 121.627°E], 0–100 m, 16 Mar 1991 (fl), M.J. Wu 1255 (A); Taipei [=Xinbei Shi], mountains above Sanhsia [=Sanxia], [24.933°N, 121.367°E], 500 m, 1 Jun 1996 (fr), J.L. Panero & S.C. Hsiao 6438 (CAS); Taipei [=Xinbei Shi], San-hsia [=Sanxia Qu], [24.933°N, 121.367°E], 400 m, 24 May 1985 (fr), J.C. Wang 3294 (TAI); Taipei [=Xinbei Shi], Ta-tung [=Datun Shan], [25.176°N, 121.521°E], 500 m, 14 May 1958 (fr), J.H. Liu 356 (A); Tai-pei [=Xinbei Shi], Tatushan [=Datun Shan], [25.176°N, 121.521°E], 10 Apr 1981 (fl), Y.F. Chen 2244 (L); Taitung Hsien [=Taidong Xian], Chihpen [=Jihhben National Forest], [22.692°N, 120.99°E], 28 Mar 2000 (st), U. Kurosui 7 (CAS); Taitung [=Taidong Xian], Anton-Tsuhu, Hwaling, in Taitung Mts., [22.933°N, 120.933°E], 30 Aug 1951 (fr), H. Keng & M.T. Kao 2552 (A); Taitung [=Taidong Xian], Chupang, [22.933°N, 120.933°E], 12 Mar 1974 (fl), T. Koyama & M.T. Kao 14243 (GH); Taitung [=Taidong Xian], Sinkong [=Chenggong Zhen], [23.117°N, 121.35°E], 300 m, 1 Sep 1951 (fr), H. Keng & M.T. Kao 2604 (A); [Taizhong Shi], Hassen-zan [=Baxian Shan], [24.154°N, 121.012°E], 3000 ft, 18 Aug 1927 (fr), R. Kanehira 21197 (A); [Taizhong Shi], Korisho [=Houli District], [24.317°N, 120.717°E], Mar 1914 (fl), U.J. Faurie 188 (A, P); Touyun [=Taoyuan Xian], Touyun [=Taoyuan?], [24.991°N, 121.314°E], 3 Apr 1949 (fl), H. Keng 1056 (A); [Xinbei Shi], Okaseki [=Yingge Rock, Yingge District], [24.959°N, 121.36°E], 23 Jun 1903 (fr), U.J. Faurie 51 (A, P[3]); [Xinbei Shi], Okaseki [=Yingge Rock, Yingge District], [24.959°N, 121.36°E], Mar 1914 (fl), U.J. Faurie 189 (A, P); [Xinbei Shi], Sinsyo-gun [=Xinzhuang], Sansikyaku [=Shanzijiao], [24.972°N, 121.394°E], 2 Jun 1935 (fr), S. Suzuki 258 (TAI); [Xinbei Shi], Taitungshan [=Datun Shan], [25.176°N, 121.521°E], 800 m, 18 Jun 1949 (fr), H. Keng & M.T. Kao 1255 (A, L); [Yilan Xian], Taiheisan (Mt. Taihei) [=Taiping Shan], between Taiheisan Club and Minamoto, [24.494°N, 121.535°E], 4880–5500 ft, 28 Sep 1926 (fr), H.H. Bartlett 6036 (GH); [Zhanghua Xian], Sinkwan [=Xinguan], [23.942°N, 120.527°E], 21 Oct 1933 (fl), S. Sasaki s.n. (A); locality unknown, (fl), Anonymous s.n. (A); locality unknown, year 1864 (fr), R. Oldham 294 (K); locality unknown, year 1915 (fr), U.J. Faurie 8371 (CAS); locality unknown, year 1915 (fr), U.J. Faurie 8397 (CAS). **Zhejiang:** Longquan Shi, Longgong, [28.067°N, 119.133°E], 24 Apr 1959 (fr), S.Y. Chang 5076 (MO); [Qingyuan Xian], Longgong, [27.485°N, 118.949°E], 24 Apr 1959 (fr), S.Y. Chang 5076 (KUN).

6b. *Styrax formosanus* var. *hirtus* S.M. Hwang, Acta Bot. Austro Sin. 1:77. 1983. TYPE: CHINA. HUNAN: Dao Xian, Simaqliao Gongshe [=Simaqliao Zhen], [25.401°N, 111.778°E], 800 m, 25 Jun 1959, P.X. Tan 61270 (HOLOTYPE: IBSC not seen—digital image [barcode 0455080]!; ISOTYPE: IBK not seen—digital image [barcode 00090148]!).

Young branchlets brown, scattered with yellowish brown stellate trichomes and erect longer simple or 2- or 3-armed trichomes. Petiole with scattered appressed yellow stellate pubescence and erect longer simple or 2- or 3-armed trichomes, trichome or trichome arms to 0.61–1.1 mm long. Lamina abaxial surface light brown when dry, with yellow stellate trichomes and scattered longer simple or 2- or 3-armed trichomes, trichome or trichome arms to 0.53–0.79 mm long, pubescence scattered on whole surface, trichomes larger along veins; adaxial surface brown when dry, with yellow stellate trichomes and scattered longer simple or 2- or 3-armed trichomes, trichome or trichome arms to 0.27–0.47 mm long, pubescence scattered over whole surface, trichomes denser along midvein. Rachis brown, very dense with brown stellate trichomes and scattered with erect longer simple or 2- or 3-armed trichomes. Pedicel completely covered with short-armed yellow appressed stellate trichomes and scattered erect longer simple or 2- or 3-armed trichomes. Calyx abaxially completely covered with short-armed yellow appressed stellate trichomes and scattered longer simple or 2- or 3-armed trichomes, arms of trichomes to 0.4–0.95 mm long.

Illustrations.—Zheng 1989:92, fig. 5-122; Liu 1991:69, fig. 1774.

Phenology.—Fruiting: June, August, September.

Distribution.—China (Guangxi, Hunan, and Zhejiang); Fig. 5.

Habitat.—On mountain slopes, along roadsides; 800 m.

Vernacular names.—Chang-rou-mao-an-xi-xiang (China; Hwang & Grimes 1996).

Conservation assessment.—*Styrax formosanus* var. *hirtus* is only known from four localities in mainland China: one in Guangxi, one in Hunan, and two in Zhejiang. The EOO is 48,791 km² and AOO is 16 km². All the known collections of this variety were collected in 1959. Although one of the subpopulations appears to occur in a protected area, the Dayaoshan National Nature Reserve, the other three appear to occur in areas that have been heavily altered by deforestation. From satellite imagery in Google Maps, two of the localities are in areas where much land has been converted for agriculture or urban development, whereas the third locality appears to be completely deforested. Therefore, in conjunction with the subpopulation in the protected Dayaoshan National Nature Reserve, we propose four locations for this variety. This variety is noted to be rare in some areas (some specimens have remarks on its rarity, e.g., Q. H. Lu 4103). We therefore categorize this variety as Endangered (EN): B2ab(iii).

Additional specimens examined. **CHINA. Zhejiang:** Lishui Shi, locality unknown, [28.450°N, 119.917°E], 17 Aug 1959 (fr), S.Y. Chang 6395 (MO); [Suichang Xian], Yunfeng [Zhen], [28.634°N, 119.389°E], 17 Aug 1959 (fr), S.Y. Zhang 6395 (KUN).

Discussion.—*Styrax formosanus* occurs commonly throughout Taiwan and rarely on mainland China (from Zhejiang southwest to Guangxi). It can be distinguished from other sympatric species of *S. series Cyrta* with valvate corolla aestivation by the presence of a wide band at the margin of the calyx formed by the basal stellate pubescence progressively becoming sparser towards the margin. Although this band is present inconsistently in other species, it is not as conspicuously wide as in *S. formosanus*. *Styrax formosanus* can be further distinguished from other sympatric species of *Styrax* in the group in its consistently rhombic leaves. This character only appears in *S. formosanus* and *S. wuyuanensis*, and the two can be differentiated by the stellate-pubescent calyx and pedicels in *S. formosanus* (vs. subglabrous in *S. wuyuanensis*). See *S. faberi* for additional comments.

We examined flowers on several specimens of *Styrax formosanus* in which some of the lobes strongly overlap in bud (B.J. Conn & W.H. Hu 4066, S.F. Huang 4781, Y.C. Kao & S.H. Lai 337, C.I. Peng 15312, and T. Tanaka & Y. Shimada 11001). Perkins (1907) mentioned the presence of flowers with some subinduplicate-valvate lobes in both the evergreen and deciduous species of her *S. series Valvatae*, and Steenis (1932) observed some flowers with slightly imbricate lobes but apparently not the strongly imbricate lobes seen here. All specimens of *S. formosanus* that we examined with such partially imbricate flowers are from Taibei, Yilan, and Nantou counties in northeastern Taiwan, near the distribution of *S. japonicus* Siebold & Zucc. in Hualian County in the eastern part of the island. *Styrax formosanus* and *S. japonicus* are recovered as each other's closest relatives in the molecular phylogenetic study of Fritsch (2001). Thus, introgression with *S. japonicus* may be responsible for the partially imbricate flowers in *S. formosanus* in these regions.

In the protologue of *Styrax formosanus*, Matsumura (1901) cited the two collections (syntypes) *A. Tashiro 81A* and *Hiroaka s.n.* We designated the TI specimen of *A. Tashiro 81* as the lectotype because that was the only specimen we were able to locate and examine.

In the protologue of *Styrax henryi*, Perkins (1907) cited two collections (syntypes), *A. Henry 394* and *O. Warburg 10740*. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that *O. Warburg 10740* was destroyed then. We designated the A specimen of *A. Henry 394* as the lectotype because that was the only specimen we were able to locate and examine. The holotype of *S. henryi* var. *microcalyx* housed at B is presumably destroyed as well, although we have examined fragments and a photograph of this specimen at A. We designated the E specimen of *A. Henry 2063* as the lectotype because we have examined that specimen, and it has more material than either the A or P specimens.

Mori (1935) cites *B. Hayata s.n.* as the type of *Styrax funkikensis* and indicates that the collection was stored at the Herbarium of the Department of Forestry of the Government Research Institute Taihoku, Formosa. This was an institution from the period of Japanese rule on Taiwan, and we were unable to find any information on what happened to the collection after the war. It could have been moved back to Japan, or integrated with collections left on Taiwan. We were able to find a digital image of a collection of *B. Hayata s.n.* labeled as a type at the website of TAI. It is not clear if this is the original material examined by Mori, so we refer to it as a probable holotype. The digital image of the specimen is a fragment inside a packet that was not opened

during imaging, so we could not examine it. Li (1963) synonymized the name with *S. formosanus* in the *Woody Flora of Taiwan*, so we assume here that he was correct in doing so and follow his treatment, with the caveat that the type will need thorough examination to confirm this.

Styrax formosanus var. *hirtus* appears to be distinct in having scattered simple or 2- or 3-armed trichomes over both surfaces of the leaves, the petioles, the pedicels, and the calyces, unlike *S. formosanus* from Taiwan. All specimens determined to this variety occur only on the mainland. However, the material of this variety available to us was limited to two fruiting specimens from a single collection (*S.Y. Chang/Zhang* 6395). Although digital images of several other fruiting specimens (*Q.H. Lu* 4013 and *P.X. Tan* 61270) with this name are in the Chinese Virtual Herbarium, the resolution of the images was not high enough for us to clearly discern if they also possess the long trichomes diagnostic for the variety. As such, we decided to retain the current taxonomy but stress that more study is needed to assess the status of the varieties of *S. formosanus*.

We observed two other specimens (*S.Y. Chang/Zhang* 5076 and *Longxishan Exp.* 1301) of putative *Styrax formosanus* from the mainland that differ from those on Taiwan in having much shorter stellate trichomes on the calyx. Although images of specimens identified as *S. formosanus* from the mainland are in the Chinese Virtual Herbarium, the resolution is not high enough for study of the calyx trichomes. Several other mainland specimens (*Anonymous* 2845, *C.M. Hu* 2708, *S.S. Lai et al.* 4434, *Longxishan Exp.* 1301, and *P.X. Tan* 58283), including the specimen of *S. formosanus* var. *hirtus* that we were able to examine (*S.Y. Chang/Zhang* 6395), have atypical fruits in that they lack a rostrum, unlike the specimens from Taiwan. We also lack any flowering specimens of *S. formosanus* from the mainland to compare to flowering material from Taiwan, again highlighting the need for further study of this species, but especially from mainland China.

7. *Styrax fortunei* Hance, *J. Bot.* 20:36. 1882 [as *S. "Fortuni"*]. TYPE: CHINA. JIANGSU: Chinkiang [= Zhenjiang], [32.200°N, 119.417°E], May 1880, *T.L. Bullock* 21229 (LECTOTYPE, designated here: BM!—photograph at A!).

Styrax dasyanthus Perkins, *Bot. Jahrb. Syst.* 31:485. 1902. TYPE: CHINA. HUBEI: Ichang [= Yichang Shih], [30.717°N, 111.283°E], 1885–1888, *A. Henry* 5977 (LECTOTYPE, designated here: G not seen—digital image [barcode 00358903]!; ISOLECTOTYPES: A!, BM!, E!, GH!, K!, MO!, P!, TI!).

Styrax calvescens Perkins in Engl., *Pflanzenr.* IV. 241 (Heft 30):32. 1907. TYPE: CHINA. HUBEI: Patung District [= Badong Xian], [31.017°N, 110.400°E], 1885–1888, *A. Henry* 721 (LECTOTYPE, designated here: K!).

Styrax dasyanthus var. *hypoleucus* Pamp., *Nuovo Giorn. Bot. Ital.*, n.s. 17:688. 1910. TYPE: CHINA. HUBEI: K'iu Ki Kou, 800 m, 21 Jun–4 Jul 1906, *C. Silvestri* 1770 (HOLOTYPE: three sheets, FI not seen—digital image [barcode 016897]!, photograph and fragment at A!).

Styrax dasyanthus var. *cinerascens* Rehder in Sarg., *Pl. Wilson.* 1:289. 1912. TYPE: CHINA. HUBEI: Chang-lo Hsien [= Wufeng Xian], [30.167°N, 110.683°E], 610–914 m, May 1907, *E.H. Wilson* 2571 (LECTOTYPE, designated here: A!; ISOLECTOTYPES: E!, HBG not seen—digital image [barcode 510795]!, K not seen—digital image [barcode 000728948]!).

Shrubs or trees to 12 m tall. Young branchlets yellowish brown to brown, with sparse to dense light yellow stellate trichomes, occasionally glabrous; older branchlets reddish brown, glabrous. Petiole 3–5(–9) mm long, dense with yellowish brown stellate trichomes, rarely sparse to subglabrous, trichome arms to 0.1–0.61 mm long. Two most proximal leaves on each shoot subopposite, rarely alternate. Lamina of fertile shoots 3.5–8.8 (–11.1) × 1.7–4.7(–5) cm, those of sterile shoots to 13.6 × 7.1 cm, 1.1–2.8 × as long as wide, usually chartaceous, occasionally subcoriaceous, elliptic to elliptic-obovate to elliptic-rhombic, occasionally obovate; abaxial surface yellowish brown to grayish brown when dry, with yellowish brown stellate trichomes, trichome arms to 0.1–0.64 mm long, scattered on to completely covering whole surface, denser along veins and in axils of midveins and secondary veins; adaxial surface brown to dark brown when dry, with yellowish brown stellate trichomes, trichome arms to 0.1–0.53 mm long, pubescence sparse to scattered on whole surface, trichomes denser along midvein, rarely subglabrous; base rounded to broadly cuneate; margin serrulate or serrate; apex rounded to acute, rarely acuminate; secondary veins 5 to 9 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins reticulate, abaxially and adaxially plane. Fertile shoots (5.5)–6.5–17.8(–21.5) cm long, 4- to 6-leaved. Lateral inflorescences racemose, rarely paniculate, (1–)1.5–6 cm long, (1- to) 2- to 19-flowered; pseudoterminal inflorescences subpaniculate or paniculate, with fascicled to dense nodes, 2.3–8.8(–10.5) cm long, (5- to) 11- to 42-flowered, rachis brown, dense to completely covered with yellowish brown

stellate trichomes. Pedicel 6–12 mm long, 0.71–1.26(–1.45) mm wide, completely covered with short-armed brownish yellow appressed stellate trichomes and scattered long-armed yellow stellate trichomes; bracteoles 1–4.6(–7.2) mm long, linear or subulate, at base or on basal half of pedicel. Flowers 0.9–1.4(–1.6) cm long. Calyx 3–6 × 3–5 mm, cupuliform; abaxially completely covered with short-armed brownish yellow appressed stellate trichomes and scattered to dense long-armed yellow stellate trichomes, with trichomes usually becoming less dense within 1 mm of calyx margin, margin brown and scarious, arms of trichomes to 0.11–0.82(–1.1) mm long; adaxially brown with stellate trichomes growing denser towards margins, occasionally dense throughout; margin glandular with 5 or 6(to 7) evenly distributed, rarely unevenly distributed teeth 0.4–1.8 mm long; marginal teeth deltoid to obtuse, rarely lanceolate, not contiguous, pubescent on both surfaces. Corolla 0.7–1.3 cm long, white, tube 1.7–3.2 mm long, abaxial surface proximally glabrous and distally covered with stellate trichomes, lobes 5(or 6), 5.4–10.3 × 1.2–3.2 mm, chartaceous, lanceolate, apex acute, abaxially completely covered with yellow appressed stellate trichomes, adaxially glabrous except apex and margins. Stamens 10; filaments 1.8–4.3 mm long, straight, of equal width throughout, proximally dense with stellate trichomes, distally glabrous; anthers 2.7–5.6(–6) mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with scattered to dense yellow stellate trichomes. Style 0.8–1.5 cm long, glabrous, with stellate trichomes at base; stigma 0.2–0.5 mm wide, punctiform or capitate. Fruiting calyx 3–5 × 5–9 mm, funnellform to salverform. Fruit 0.6–1.1 × 0.5–1 cm, dehiscent by three valves, subglobose, occasionally ovoid, apex pointed to slightly rostrate, rarely rostrate to 2 mm; pericarp dry, 0.2–0.5 mm thick, outside smooth to slightly rugose, with yellow long-armed stellate trichomes, inside glabrous, smooth. Seeds brown, ellipsoid to obovoid, slightly rugose, rarely rugose, with shallow longitudinal grooves and deep longitudinal fissures, glabrous.

Illustrations.—Dan et al. 1959:579, fig. 936 (as *S. dasyanthus*); Yang 1984:544, fig. 232 (1–3) (as *S. dasyanthus*); Hwang 1987b:106, pl. 36 (7–11) (as *S. calvescens*); *ibid.*:117, pl. 40 (8–11) (as *S. dasyanthus*); Zheng 1989:90, fig. 5-118 (as *S. calvescens*); *ibid.*:94, fig. 5-126 (as *S. dasyanthus*); Liu 1989:354, fig. 287 (as *S. dasyanthus*); *ibid.*:357, fig. 291 (as *S. calvescens*); Liu 1991:64, fig. 1767 (as *S. calvescens*); *ibid.*:68, fig. 1773 (as *S. dasyanthus*); Ding & Wang 1997:231, fig. 1776 (3–5) (as *S. calvescens*); *ibid.*:231, fig. 1776 (6–8) (as *S. dasyanthus*); Wu & Raven 2000:205, fig. 205 (8–12) (as *S. calvescens*); *ibid.*:209, fig. 209 (8–11) (as *S. dasyanthus*); He 2006:892, fig. 1272 (as *S. dasyanthus*); Yu 2010:33, fig. 3-44 (as *S. dasyanthus*).

Phenology.—Flowering: April–July. Fruiting: January, June–October.

Distribution.—China (Anhui, Chongqing, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, and Zhejiang); Fig. 6.

Habitat.—In mixed forests and thickets, occasionally in open rocky areas, on hillside slopes and valleys, along streams and roadsides; 30–2000 m.

Vernacular names.—Chui zhu hua (China, Jiangxi; *C.M. Tan* 99228); hui-ye-an-xi-xiang (China; Hwang & Grimes 1996); hui-lu-tui (China, Henan; Ding & Wang 1997); hui-ye-ye-mo-li (China, Anhui; Liu 1991); xiao-ye-ying-tian-luo (China, Fujian; Liu 1989).

Conservation assessment.—*Styrax fortunei* is a common and widespread Chinese endemic species. Collections have been made from > 90 geographic localities throughout central China, from Sichuan and eastern Yunnan to Zhejiang, covering a broad area with an EOO of ca. 798,805 km². There appears to be a significant amount of suitable habitat for *S. fortunei* throughout its distribution and it is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., *R.C. Ching* 5963). This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this species as Least Concern (LC).

Discussion.—*Styrax fortunei* has a range that overlaps the northern ranges of *S. faberi* and *S. confusus*. To distinguish *S. fortunei* from *S. confusus* and *S. faberi*, see the discussion under *S. faberi*. *Styrax fortunei* also overlaps geographically with *S. rubifolius*, but can easily be distinguished from it by its smooth fruit wall interior and seeds (vs. reticulately pitted fruit wall interior and strongly tuberculate seeds). For more comments about the two species, see the entry for *S. rubifolius*.

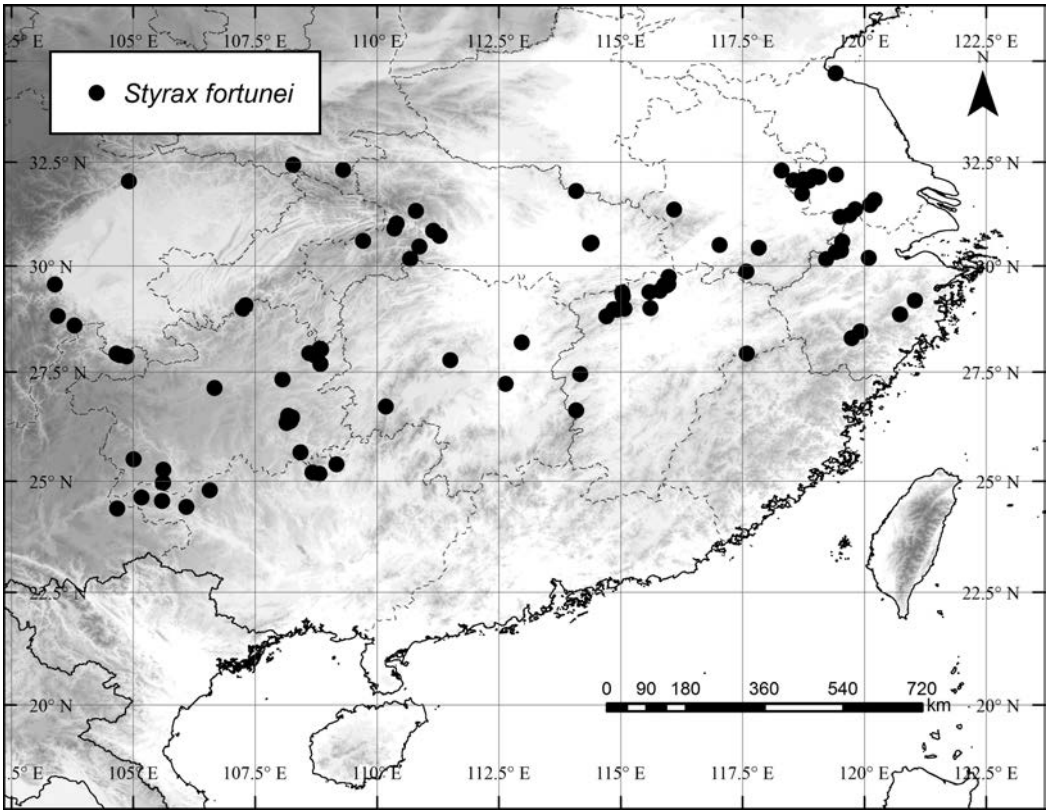


FIG. 6. Geographic distribution of *Styrax fortunei*.

Styrax fortunei has long been treated as two separate species, *S. dasyanthus* and *S. calvescens*. In the *Flora of China*, Hwang and Grimes (1996) differentiate *S. calvescens* from *S. dasyanthus* by the abaxial surface of the leaf being completely covered in dense stellate pubescence (vs. nearly glabrous). However, the density of trichomes on a leaf in *Styrax* can vary considerably within many species, and our examination has revealed a continuous range of pubescence density among these entities, from scattered over the whole surface to completely covering the surface of the leaf. Even the type of *S. calvescens* represents an intermediate between the two extremes, the abaxial surface of the leaf having dense pubescence but not so dense as to completely cover the surface. Unlike some species of *Styrax* in China (e.g., *S. hemsleyanus* Diels; Huang et al. 2003) and North America (e.g., *S. americanus* Lam., and *S. redivivus* (Torr.) L.C. Wheeler; Fritsch 1997), but similar to *S. glabrescens* Benth. in Mexico and Central America (Fritsch 1997), a geographic correlation is not evident: pubescence that completely covers the abaxial surface of the leaf occurs scattered throughout the range of individuals that have leaves with nearly glabrous surfaces. Moreover, there are no obvious elevation or habitat correlations. Because we detected no characters that can reliably differentiate *S. calvescens* from *S. dasyanthus*, we treat them as a single species.

Perkins (1907) excluded *Styrax fortunei* from her treatment because she was not able to see the type specimen; floras and treatments since then have not addressed this problem. We were able to locate the type of *S. fortunei* among the specimens from K. Although the type, having six flowers per pseudoterminal inflorescence, has fewer flowers than is typical for the species, they are too small to be any other species apart from *S. dasyanthus* or *S. faberi*. It is not *S. faberi* because of the lack of reddish brown trichomes overtopping the basal

pubescence of the calyx and the presence of too many flowers on the lateral inflorescences. We therefore synonymize *S. dasyanthus* with *S. fortunei*, the older name.

Styrax dasyanthus var. *hypoaleucus* was not included in the *Flora of China* (Hwang & Grimes 1996), for unknown reasons. From our examination of digital images of the type stored at FI it is clear that it is a specimen of *S. fortunei*, as based on the pubescence that completely covers the abaxial surface of the leaf. We therefore synonymize this name with *S. fortunei*.

Although most specimens of *Styrax fortunei* have > 11 flowers per pseudoterminal inflorescence, several (e.g., W.R. Carles 541, R.C. Ching & C.L. Tso 695, K. Ling 7941, and Tso 1115) have substantially fewer. These specimens all have pseudoterminal inflorescences with 6 to 8 flowers, like *S. confusus*, but fewer than is typical for *S. fortunei*. The flowers are too small and the corolla lobes too thin, however, for typical *S. confusus*. Similarly, R.C. Ching 2866, a fruiting specimen, has too few fruits per pseudoterminal infructescence for typical *S. fortunei*, but fruits too small for typical *S. confusus*. All these specimens were collected from the area in which Jiangsu, Anhui, and Zhejiang meet and where the distributions of *S. confusus* and *S. fortunei* overlap. These specimens may represent introgressants with *S. confusus*.

Regional isolation among populations of *Styrax fortunei* has apparently resulted in geographically correlated morphological trends. Some collections from Guizhou (e.g., Anhui Team 1355, Qiannan Team s.n. [KUN25482], and Sino-American Guizhou Botanical Expedition 4 and 1939) have fertile shoots that are much longer, fertile leaves that are much larger, and leaves that tend to be more strongly rhombic and acuminate than are typical for *S. fortunei*.

Cheng 101 is a fruiting specimen of *Styrax fortunei* that has longer petioles than is typical for the species. However, the fruits are typical of *S. fortunei*, being small and thin-walled. Although they are poorly preserved, the infructescences appear to be paniculate and would appear to have > 11 fruits per infructescence.

As was discussed under *Styrax faberi*, the P duplicate of A. Henry 3450 does not resemble the other duplicates of that collection, and should not be considered part of the type collection of *S. confusus* var. *microphyllus* (= *S. faberi*). It lacks the reddish brown trichomes overtopping the basal pubescence of the calyx, and the calyx is too small for *S. faberi*. Although the small number of flowers is atypical for *S. fortunei*, we assign these specimens to *S. fortunei* based on the abaxial pubescence of the leaves and the small size of the flowers. A. Henry 3943 also resembles these two specimens in the dense pubescence on the abaxial surface of the leaf and small flowers, although the inflorescences have been further reduced to 1 or 2 flowers. However, this specimen is heavily galled, which may have affected the development of the inflorescences. As such, we have excluded the latter specimen from our treatment.

In the protologue of *Styrax fortunei*, Hance (1882) cites T.L. Bullock 21229 as original material but does not state clearly in which herbarium the specimen is deposited. Although we have only located one specimen of T.L. Bullock 21229, we cannot be sure that this is the only specimen of that gathering. Therefore, as we have mentioned in the discussion concerning the typology of *S. fukiensis* (= *S. confusus*), the specimen that we have seen can only be regarded as a syntype. Thus, we designate the BM specimen of T.L. Bullock 21229 as the lectotype because BM is the herbarium where Hance deposited his types; it is the only specimen of the type material that we have seen.

The protologue of *Styrax dasyanthus* only cites A. Henry 5977 as the type. In the introduction to the article in which this species was published, Perkins (1902) indicated that the material examined was located at B; we presume that the holotype was destroyed during World War II. Although we saw nine duplicates of A. Henry 5977, only the specimen at G has Perkins's annotation label to confirm her examination of that specimen. We therefore designate the G specimen as the lectotype.

Perkins (1907) indicates A. Henry 721 as the holotype of *Styrax calvescens* in the protologue, with B and K duplicates cited. Even though Perkins's primary herbarium was B, in this case we can lectotypify on the K specimen of A. Henry 721 because it is specifically mentioned in the protologue with standing equal to the B specimen. We have lectotypified on this specimen because the B sheet was presumably destroyed in World War II and now is represented only by a photograph of the specimen at A, along with a leaf fragment.

The holotype of *Styrax dasyanthus* var. *cinerascens* is *E.H. Wilson 2571* and is stored at A, Rehder's primary herbarium. *E.H. Wilson 2571* at A consists of two sheets, one of flowering material collected in May 1907 and one of fruiting material collected in June 1907. Because of their different collection dates, we must treat these as two separate collections. We designate the May 1907 sheet of *E.H. Wilson 2571* with the flowering material as the lectotype because it has more inflorescences that are more intact, better illustrating the many-flowered inflorescences typical of *S. fortunei*.

Additional specimens examined. **CHINA. Anhui:** Anqing Shi, locality unknown, [30.5°N, 117.033°E], 19 Jun 1941 (fr, *F. Maekawa 2010* (TI); Chu Chow [=Chuzhou Shi], Chu Chow [=Chuzhou], [32.3°N, 118.3°E], Jun 1922 (fr, *E.D. Merrill 11258* (A); Chuchow [=Chuzhou Shi], locality unknown, [32.3°N, 118.3°E], 2 Jun 1935 (fl), *W.C. Cheng 5312* (P); Huoshan Xian, near Mao Shan, [31.351°N, 116.098°E], 30 Jul 1953 (fr), *East China Workstation Team 6629* (KUN); Kimen [=Qimen Xian], locality unknown, [29.867°N, 117.583°E], 19 Aug 1924 (fr), *N.K. Ip 7664* (A); [Qingyang Xian], Wang Si Che [=Huangshi Xi], South Chu Hwa Shan [=Jiuhua Shan], south Anhui, [30.437°N, 117.833°E], 1800 ft, 30 Jun 1925 (fr), *R.C. Ching 2866* (A). **Chongqing:** Nanchuan Qu, Jinfo Shan, [29.067°N, 107.3°E], 1700 m, 17 Jun 1917 (fl), *J.H. Xiong 91483* (KUN); Nanchuan Qu, Jinfo Shan, Lancao Ba, [28.995°N, 107.246°E], 1450 m, 6 Aug 1957 (fr), *G.F. Li 63260* (KUN); Nanchuan Qu, Jinfo Shan, Lancao Ba, Fujiaolou, [28.995°N, 107.246°E], 1480 m, 6 Aug 1957 (fr), *G.F. Li 63260* (KUN); Nanchuan Qu, Jinfo Shan, near Mingfo Dong, [29.067°N, 107.3°E], 1750 m, 31 May 1957 (fl), *Anonymous 91104* (KUN). **Guangxi:** Damiaoshan [=Rongshui Miaozu Zizhixian], Anyou Qu, Xiaoli Xiang, Yuanbao Shan, [25.389°N, 109.168°E], 1200–1500 m, 9 Oct 1958 (fr), *S.Q. Chen 16774* (KUN); Damiaoshan [=Rongshui Miaozu Zizhixian], Jiawan Dashan, Bendong Xiang, Dalugou, [25.173°N, 108.823°E], 1150 m, 27 May 1957 (fl), *S.Q. Chen 410* (KUN); Damiaoshan [=Rongshui Miaozu Zizhixian], Sanfang Qu, Chidong Xiang, Jiawan Shan, Yulong Huangjiawan, [25.203°N, 108.679°E], 900–1100 m, 18 Jun 1958 (fl), *S.Q. Chen 14537* (KUN); Damiaoshan [=Rongshui Miaozu Zizhixian], Sanfang Qu, Chidong Xiang, Jiawan Shan, Yulong to Chidong, [25.203°N, 108.679°E], 900 m, 25 Jun 1958 (fr), *S.Q. Chen 14692* (KUN); Damiaoshan [=Rongshui Miaozu Zizhixian], Sanfang Qu, Chidong Xiang, Jiawan Shan, Zhangjiawan, [25.203°N, 108.679°E], 1300 m, 13 Jul 1958 (fr), *S.Q. Chen 15065* (KUN); Leye Xian, Liuwei Bawang Shan, [24.8°N, 106.567°E], 1500 m, 9 May 1989 (fl), *Hongshui River Expedition 1085* (KUN[2]); Longlin Gezu Zizhixian, De'e, [24.637°N, 105.167°E], 24 May 1980 (fl), *K.F. Shen 2384* (MO); Longlin Gezu Zizhixian, Longhuo Xiang, Daliao, [24.559°N, 105.59°E], 1230 m, 7 Apr 1979 (fl), *M.F. Tan & S.Q. Lin 1948* (MO); [Tianlin Xian], Bin Long, Miu Shan, North Luchen [=Lucheng Xiang], border of Guizhou, [24.423°N, 106.089°E], 4000 ft, 14 Jun 1928 (fl), *R.C. Ching 5963* (A); Xilin Xian, Guzhang Qu [=Guzhang Xiang], Wangzi Shan, [24.386°N, 104.668°E], 1600 m, 19 May 1989 (fl), *Hongshui River Expedition 89-1426* (KUN[2]); locality unknown, 17 Jun 1928 (fl), *R.C. Ching 6079* (A). **Guizhou:** Anlong Xian, Shipan Gongshe, Shihuiyao, [25.271°N, 105.615°E], 1300 m, 15 May 1977 (fl), *Guizhou Team 3012* (KUN); Anlong Xian, Shipan Gongshe, Shihuiyao, [25.271°N, 105.615°E], 1300 m, 15 May 1977 (fl), *Guizhou Team 3034* (KUN); Anlong Xian, Xianheping, [24.978°N, 105.607°E], 1600 m, 4 Jul 1973 (fr), *C.Y. Deng 86012* (KUN[2]); Anlong Xian, Xianheping, [24.978°N, 105.607°E], 1300–1500 m, 12 Oct 1998 (fr), *S.G. Wu et al. 100724* (KUN[2]); Anlong Xian, Xianheping, [24.978°N, 105.607°E], 1300–1500 m, 12 Oct 1998 (fr), *Sino-Japan Expedition 100724* (KUN); [Congjiang Xian], Jiayu Qu [=Jiayu Xiang], Jiaya, [25.669°N, 108.431°E], 28 Jul 1959 (fr), *Qiannan Team 2899* (KUN); Hsufeng [=Xifeng Xian], She-won-san, Hsufeng [=Xifeng County], [27.133°N, 106.667°E], 1 Jul 1936 (fr), *S.W. Teng 90472* (A); [Jiangkou Xian], Fanjing Shan, Gaotong, [27.94°N, 108.614°E], 1100 m, 17 Jul 1959 (fr), *T.P. Zhu & Z.F. Liu 2059* (KUN); [Jiangkou Xian], Fanjing Shan, Macao He, Zaigongping [=Zhaigongping], [27.897°N, 108.756°E], 900 m, 5 Jun 1959 (fl), *T.P. Zhu & Z.F. Liu 576* (KUN); [Jiangkou Xian], Fanjing Shan, Pingzhu Forest Farm, [27.94°N, 108.614°E], 1150 m, 14 May 1959 (fl), *T.P. Zhu & Z.F. Liu 886* (KUN); Jiangkou Xian, Fanjing Shan, Yu'ao He, [27.895°N, 108.717°E], 1100 m, 23 Jun 1988 (fr), *Wuling Shan Expedition 1231* (KUN[2]); Jiangkou Xian, Heiwan River on the SE side of the Fanjing Shan mountain range in the vicinity of ecological station of the Guizhou Academy of Sciences, [27.695°N, 108.843°E], 560 m, 19 Aug 1986 (fr), *Sino-American Guizhou Botanical Expedition 4* (BR, CAS); Leishan Xian, Fangxiang Gongshe, Leigongping, 26°27'20"N, 108°15'27"E, 1820 m, 2 Jul 1965 (fl), *W. Zhang & Y.F. Pang 51137* (KUN); Leishan Xian, Gaoyan Xiang [=Gaoyan Cun], [26.339°N, 108.144°E], 5 Jun 1959 (fl), *Qiannan Team 2149* (KUN); Leishan Xian, Wudong Forest Farm to Getoufanshui Ling western ravine, 26°23'N, 108°13'20"E, 1250 m, 4 Jun 1965 (fl), *W. Zhang & Y.F. Pang 50730* (KUN); Leishan Xian, Wudong to Xumuchang, 26°22'40"N, 108°10'10"E, 1230 m, 23 May 1965 (fl), *W. Zhang & Y.F. Pang 50182* (KUN); [Leishan Xian], Xijiang Gongping [=Xijian Zhen], [26.49°N, 108.178°E], 1100 m, 22 May 1959 (fl), *Qiannan Team 2087* (KUN); Pu'an Xian, Qingshan Gongshe [=Qingshan Zhen], North Forestry Center, [25.509°N, 105.008°E], 1800 m, 7 Sep 1959 (fr), *Anhui Team 1355* (KUN); Pu'an Xian, Qingshan Gongshe [=Qingshan Zhen], North Forestry Center, [25.509°N, 105.008°E], 2000 m, 7 Sep 1959 (fr), *Anhui Team 1613* (KUN); Shiqian Xian, Jiuchashu to Ma Xi, [27.333°N, 108.063°E], 1500 m, 2 Aug 1988 (fr), *Wuling Shan Expedition 2985* (KUN[2]); Songtao Miaozu Zizhixian, Tianma Si, Hejjawan, [28.043°N, 108.828°E], 950 m, 6 Jun 1988 (fl), *Wuling Shan Expedition 141* (KUN[2]); Songtao Miaozu Zizhixian, vicinity of Lengjiaba [Cun] in the vicinity of the confluence of the Xiaohe and Dahe rivers, NE side of the Fanjing Shan mountain range, [27.962°N, 108.791°E], 820–1120 m, 5–9 Oct 1986 (fr), *Sino-American Guizhou Botanical Expedition 1939* (CAS); Songtao Miaozu Zizhixian, Wuluo Qu, Gaodong Xiang, Huangtangping, [28.034°N, 108.854°E], 700 m, 6 Jun 1988 (fr), *Wuling Shan Expedition 613* (KUN); Songtao Miaozu Zizhixian, Wuluo Qu, Gaodong Xiang, Huangtangping, [28.034°N, 108.854°E], 1000–1200 m, 8 Jun 1988 (fl), *Wuling Shan Expedition 675* (KUN[2]); locality unknown, 16 May 1959 (fl), *Qiannan Team s.n.* (KUN). **Henan:** [Shihe Qu], Chikungshan [=Jigongshan], [31.804°N, 114.084°E], 1500–2500 ft, 13 Jun 1917 (fr), *L.H. Bailey s.n.* (A). **Hubei:** Badong Xian, Nanping [Cun], [30.894°N, 110.36°E], 1000 m, 11 Jun 1939 (fr), *T.P. Wang 10903* (KUN); Chang lo Hsien [=Wufeng Tujiazu Zizhixian], Chang lo Hsien [=Wufeng Xian], [30.167°N, 110.683°E], 2000–3000 ft, Jun 1907 (fr), *E.H. Wilson 2571* (A); Changyang Tujiazu Zizhixian, locality unknown, [30.467°N, 110.867°E], Jun 1900 (fl), *E.H. Wilson 1106* (A); Changyang Tujiazu Zizhixian, locality unknown, [30.467°N, 110.867°E], Jun 1900 (fl/fr),

E.H. Wilson 1106 (E, K, P); Chien-Shi [=Jianshi Xian], locality unknown, [30.6°N, 109.717°E], Jul 1900 (fl/fr), *E.H. Wilson 1275* (A, P); Hsing Shan Hsien [=Xingshan Xian], locality unknown, [31.317°N, 110.8°E], 1000–2000 ft, 6 Jun 1907 (fl), *E.H. Wilson 372* (A); Hsing Shan Hsien [=Xingshan Xian], locality unknown, [31.317°N, 110.8°E], 1500 ft, 6 Apr 1909 (fl), *E.H. Wilson 2572* (A); Ichang [=Yichang Shih], locality unknown, [30.717°N, 111.283°E], 1885–1888 (fl), *A. Henry 5977* (TI); Ma-pan-scian, 1000 m, May 1907 (fl), *C. Silvestri 1769* (A, P); [Ta Jon?], western Hubei, 4000 ft, 28 Aug 1922 (fr), *R.C. Ching 3997* (A); W. Hupeh [=western Hubei], May 1900 (fl), *E.H. Wilson 173* (K); Wuchang Qu, Lokiahsan [=Luojia Shan], [30.534°N, 114.371°E], 8 May 1932 (fl), *H.H. Chung 9021* (A); [Wuchang Qu], Mo Shan, [30.553°N, 114.407°E], 5 May 1964 (fl), *Y.M. Wang 1193* (MO); [Wuchang Qu], Mo Shan, [30.553°N, 114.407°E], 31 Jul 1964 (fr), *Y.M. Wang 1324* (MO); Yichang County [=Yiling Xian], Nan-t'o [=Nantuo] and mountains to northward, [30.839°N, 111.152°E], Oct 1887 (fl), *A. Henry 3450* (P); Yichang County [=Yiling Xian], Nan-t'o [=Nantuo] and mountains to northward, [30.839°N, 111.152°E], Oct 1887 (fl), *A. Henry 3943* (E); locality unknown, 1885–1888 (fl), *A. Henry 3928* (E); locality unknown, Aug 1932 (fr), *H.H. Chung 9108* (A). **Hunan:** Changsha Shi, locality unknown, [28.196°N, 112.972°E], year 1927 (fl), *V.M. Grubb 140* (BM); Hsinhwa [=Xinhua Xian], ad minas Hsikwangschan [=Xikuangshan] prope urbem Hsinhwa [=Xinhua County] ad rivum infra vicum Tjilidjjang, [27.782°N, 111.502°E], 550 m, 29 May 1918 (fl), *H.F. Handel-Mazzetti 2474* (A); Nanyue Qu, Hengshan, Fangguang Si, [27.231°N, 112.643°E], 450 m, 5 Jun 1943 (fr), *S.Q. Chen 3508* (KUN); Suining Xian, locality unknown, [26.703°N, 110.183°E], 13 Jun 2004 (fr), *F.J. Huang 10* (CAS). **Jiangsu:** Binhu Qu, Ma Shan [Zhen], Tai Hu, [31.464°N, 120.12°E], 29 May 1926 (fl), *R.C. Ching & C.L. Tso 695* (A); Chinkiang [=Zhenjiang Shi], locality unknown, [32.2°N, 119.417°E], year 1890 (fl), *W.R. Carles 439* (A); Chinkiang [=Zhenjiang Shi], locality unknown, [32.2°N, 119.417°E], May 1890 (fl), *W.R. Carles 439* (E); Chinkiang [=Zhenjiang Shi], locality unknown, [32.2°N, 119.417°E], May 1894 (fl), *W.R. Carles 541* (E); Chinkiang [=Zhenjiang Shi], locality unknown, [32.2°N, 119.417°E], Dec 1895 (fl), *W.R. Carles 541* (K); [Gulou Qu], Zijiang [=Zijin] Shan (Purple Mountain), N extension of Mao Shan; NE of Sun Yat-sen memorial and tomb, slope overlooking Buddhist depository of ancient texts, 32°5'N, 118°45'E, 150–200 m, 22 Jun 1987 (fr), *Sino-American Purple Shan Botanical Expedition Team 45270* (E); [Huishan Qu], Shunke [Cun], [31.584°N, 120.206°E], 80 m, 28 May 1991 (fl), *W.X. Wu 9069* (MO); I-Hing [=Yixing Shi], locality unknown, [31.36°N, 119.815°E], 11 Oct 1979 (fr), *W.Z. Fang 7983* (CAS); I-Shing [=Yixing Shi], Lungche Mountain [=Longchi Mountain], S. I-Shing [=Yixing], [31.219°N, 119.698°E], 16 Aug 1929 (fr), *Y.L. Keng 2381* (A); [Jiangning Qu], Yun Tai Shan [=Yuntai Mountain], south Nanking, [31.737°N, 118.723°E], 16 Aug 1928 (fr), *Y.L. Keng 1644* (A); [Jurong Shi], Paohwashan [=Baohua Shan], [32.135°N, 119.073°E], 28 May 1933 (fl), *W.C. Cheng 4419* (P); Nanking [=Nanjing Shi], Kih shan, S. Nanking [=Nanjing], [32.05°N, 118.767°E], 25 Aug 1928 (fr), *Y.L. Keng 1911* (A); Nanking [=Nanjing Shi], locality unknown, [32.05°N, 118.767°E], May 1925 (fl), *K. Ling 7941* (A); [Pukou Qu], Jiangpu, Shizi Ling, [32.061°N, 118.552°E], 250 m, 11 May 1956 (fr), *M.B. Deng et al. 3811* (KUN); [Qixia Qu], Qi-Xia-Shan, [32.16°N, 118.965°E], 30 May 1985 (fl), *P.P. Ling 105* (AAU); Shenxijie [Cun], [31.178°N, 119.507°E], 160 m, 15 Sep 1956 (fr), *Z.Y. Deng et al. 2773* (KUN); [Xuanwu Qu], Spirit Valley [=Linggu Si], [32.055°N, 118.868°E], May 1926 (fl), *Tso 1115* (A). **Jiangxi:** [De'an Xian], Shasha, Luotuo Shan, [29.381°N, 115.592°E], 30 m, 30 Apr 1997 (fl), *C.M. Tan 97284* (KUN); Jing'an Xian, Shijing [Cun], [28.986°N, 115.08°E], 1100 m, 16 Jul 1997 (fr), *C.M. Tan 971094* (KUN); [Jinggangshan Shi], Gangshang, [26.617°N, 114.083°E], 260 m, 4 May 1963 (fl), *M.X. Nie 6941* (KUN); Jinggangshan Shi, Huyangta, [26.617°N, 114.083°E], 1500 m, 18 Jun 1965 (fl), *S.S. Lai 4191* (KUN); [Jiujiang Shi], Kewkiang Hills [=Jiujiang Hills], [29.738°N, 115.987°E], 15 May 1892 (fl), *W.R. Carles s.n.* (E); Jiujiang Xian, Mingshan [Cun], [29.41°N, 115.807°E], 14 May 1996 (fl), *C.M. Tan 9605086* (CAS); [Lianxi Qu], Kuling [=Guling Zhen], [29.569°N, 115.982°E], 4000 ft, 8 Jan 1907 (fr), *E.H. Wilson 1733* (A); [Lianxi Qu], Lushan, [29.573°N, 115.973°E], 480 m, year 1975 (fr), *Cheng 101* (A); [Lianxi Qu], Lushan, [29.573°N, 115.973°E], 15 May 1977 (fl), *Z.Y. Wu L-77* (KUN); [Lianxi Qu], Lu-Shan, [29.573°N, 115.973°E], Aug 1934 (fr), *H.H. Hu 2588* (A); [Lianxi Qu], Lushan Mts., [29.573°N, 115.973°E], 700–800 m, 29 Jun 1933 (fr), *H.H. Chung & S.C. Sun 210* (A); [Lianxi Qu], Lushan Mts., [29.573°N, 115.973°E], 700–800 m, 6 Jul 1933 (fr), *H.H. Chung & S.C. Sun 394* (A); Lianyung Qu, Sucheng, Xishan (West Mountain), overlooking an exquisite harbor, [34.704°N, 119.412°E], 80 m, 8 Jun 1987 (fl), *Sino-American Yuntai Botanical Expedition Team 45070* (E); Lianyung Qu, Sucheng, Xishan Dong An, Yuntai Nature Reserve, [34.704°N, 119.412°E], 250 m, 8 Jun 1987 (fr), *Sino-American Yuntai Botanical Expedition Team 45045* (E); Lianyung Qu, Sucheng, Xishan Dong An, Yuntai Nature Reserve, [34.704°N, 119.412°E], 100–150 m, 8 Jun 1987 (fl), *Sino-American Yuntai Botanical Expedition Team 45046* (E); Lushan County [=Lianxi Qu], Biyun An [=Biyun Si, Fenghuang Cun], [29.543°N, 115.894°E], 450 m, 14 Jun 1999 (fr), *C.M. Tan 99228* (CAS, KUN); Lushan County [=Lianxi Qu], Maerfeng, [29.573°N, 115.973°E], 680 m, 26 May 1995 (fl), *C.M. Tan 95253* (AAU, CAS); Lushan County [=Lianxi Qu], Muma Chang, [29.541°N, 115.951°E], 600 m, 24 May 1995 (fl), *C.M. Tan 95253* (CAS); [Luxi Xian], Wu Gong Shan, [27.455°N, 114.173°E], 300 m, 3 May 1984 (fl), *X.M. Gao 1554* (MO); Wuling? [=Wuning Xian], Hwang-sai-qu, Stone Sheep Cave, [29.278°N, 115.048°E], 19 Jul 1947 (fr), *Y.K. Hsiung 5411* (A); Wuning Xian, Shimen [=Shimenlou Zhen?], [28.969°N, 114.86°E], 450 m, 7 May 1997 (fl), *C.M. Tan 97549* (CAS); Wuning Xian, Shimen, Jingyuan [Cun], [28.963°N, 114.922°E], 450 m, 7 May 1997 (fl), *C.M. Tan 97549* (KUN); Wuning Xian, Yishan Gongshe [=Yishan Xiang], below Pingkengyan, [29.366°N, 115.034°E], 350 m, 15 Jun 1963 (fr), *S.S. Lai 2457* (KUN); Xiushui Xian, Huangshagang, Xiangjia Ping, Dongxi Keng, [28.81°N, 114.712°E], 700 m, 4 Sep 1963 (fr), *S.S. Lai 3427* (KUN); Yanshan Xian, Wuyi Shan, [27.934°N, 117.587°E], 1200 m, 25 Aug 1958 (fr), *M.X. Nie 4499* (KUN); Yanshan Xian, Wuyi Shan, [27.934°N, 117.587°E], 1200 m, 25 Aug 1958 (fr), *M.X. Nie & S.S. Lai 4499* (KUN); [Yongxiu Xian], Guanshan [=Guang Shan], [29.003°N, 115.608°E], Jun 1919 (fl), *T.Z. Zhang 38* (TI). **Shaanxi:** Pingli Xian, Shizhaishuang Ping, Dapan Xi, [32.312°N, 109.308°E], 1150 m, 11 Jul 1959 (fr), *S.Q. Chen 347* (KUN); [Ziyang Xian], Zuolong Gongshe, Huaba Guanli Qu, [32.44°N, 108.28°E], 1450 m, 6 Aug 1959 (fr), *P.Y. Li 10824* (KUN). **Sichuan:** Emeishan Shi, Emei Shan, Heilongjiang, [29.563°N, 103.395°E], 900 m, 24 May 1957 (fl), *G.H. Yang 54954* (KUN); [Jiangyou Shi], Xianfeng Xiang, Tiziyan, [32.036°N, 104.912°E], 1200 m, 13 May 1959 (fl), *J.Y. Chuan 381* (KUN); Junlian Xian, Minzhu Xiang, Niutouzhai, [27.936°N, 104.656°E], 950 m, 20 Apr 1959 (fl), *J.Y. Chuan 71* (KUN); Ma-pien Hsien [=Mabian Xian], locality unknown, [28.818°N, 103.449°E], May 1931 (fr), *F.T. Wang 22849* (KUN); Pingshan Xian, Laohailong, [28.593°N, 103.797°E], 700 m, 25 Jun 1959 (fr), *J.Y. Chuan 1206* (KUN); locality unknown, 6 Aug 1959 (fl), *J.Y. Chuan 307* (KUN); locality unknown, (fl), *W.J. Zheng 10982* (KUN). **Yunnan:** Weixin Xian, Daxueshan, Linfeng [Xiang], [27.869°N, 104.864°E], 1400 m, 13 May 1974 (fl), *Anonymous s.n.*

(KUN); Yiliang Xian, Haiziping, Zhongchang Cun, Luowang Xiang, 27°53'54"N, 104°43'45"E, 1285 m, 20 May 2016 (fl), *E.D. Liu et al.* 4726 (KUN[2]). **Zhejiang:** [Anji Xian], Xiaofeng, [30.587°N, 119.55°E], 10 Jun 1957 (fl), *Y.Y. Ho* 24375 (MO); [Liandu Qu], Dagangtou [Zhen], Xiaojing, [28.296°N, 119.742°E], 28 Jul 1959 (fr), *S.Y. Zhang* 6027 (KUN); [Lin'an Shi], Changhua Town, Zhikeng, [30.163°N, 119.218°E], 6 Jun 1958 (fl), *Hangzhou Botanical Garden Herbarium* 28902 (MO); [Lin'an Shi], East Tien-mu [=East Tianmu Mountain], [30.362°N, 119.521°E], 2500 ft, 19 Jun 1927 (fl), *H.H. Hu* 1577 (A); [Lin'an Shi], Tianmu Shan, Ligu Wan, [30.333°N, 119.417°E], 10 Jun 1920 (fl), *Y.Y. Ho* 22153 (MO); [Lin'an Shi], Tien Mu Shan [=Tianmu Shan], [30.333°N, 119.417°E], 19 Aug 1924 (fr), *R.C. Ching* 5110 (E); Lishui Shi, locality unknown, [28.45°N, 119.917°E], 28 Jul 1959 (fr), *S.Y. Chang* 6027 (MO); Siachu [=Xianju Xian], Qiujiaping, 50 li N of Siachu [=Xianju], [28.854°N, 120.731°E], 3500 ft, 23 May 1924 (fl), *R.C. Ching* 1618 (A); Tiantai Xian, Tiantai Shan, Ximaopeng, [29.179°N, 121.042°E], 11 Sep 1957 (fr), *Y.Y. Ho* 27970 (MO); [Tiantai Xian], Tien Tai Shan [=Tiantai Shan], [29.179°N, 121.042°E], 1800 ft, 8 Aug 1920 (fr), *H.H. Hu* 306 (A); Xianju Xian, locality unknown, [28.854°N, 120.731°E], 21 May 1960 (fl), *S.Y. Chang* 8066 (MO); [Xihu Qu], Yunqi [Si], [30.19°N, 120.092°E], 25 May 1959 (fr), *S.Y. Zhang* 2470 (KUN).

8. *Styrax rubifolius* Guillaumin, Bull. Soc. Bot. France 70:884. 1924 [as *S. "rubifolia"*] (Fig. 7). TYPE: CHINA.

YUNNAN: [Shuifu Xian], Tchen fong chan [= Cheng Feng Shan], [28.410°N, 104.233°E], 11 May 1901, *F. Ducloux* 2138 (LECTOTYPE, designated here: P [barcode 00562364]!; ISOLECTOTYPES: P [barcode 00219547]!, P [barcode 00562363]!).

Shrubs or small trees to 3 m tall. Young branchlets chestnut brown, glabrous or with sparse stellate trichomes; older branchlets dark brown, glabrous. Petiole (3–)5–6 mm long. Two most proximal leaves on each shoot subopposite or opposite. Lamina of fertile shoots 5.3–6.9 × 2.5–4.8 cm, those of sterile shoots to 10.3 × 6 cm, 1.1–2.5 × as long as wide, chartaceous, oblong-elliptic to elliptic-obovate; abaxial surface grayish brown when dry, with sparse yellow or rusty red 2- or 3-armed or stellate trichomes, trichome arms up to 0.16–0.5(–0.7) mm long, pubescence dense in axils of midvein and secondary veins and sparse on veins; adaxial surface brown when dry, with sparse yellow simple or 2- or 3-armed trichomes, trichome arms up to 0.2–0.5 mm long, pubescence along midvein and rarely on proximal secondary veins; base rounded to acute, rarely cuneate; margin subentire to serrulate; apex short-acuminate to acute; secondary veins 6 to 9 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins parallel, perpendicular to secondary veins, abaxially prominent, adaxially plane or slightly sunken. Fertile shoots (8.8–)11–25 cm long, 2- to 5-leaved. Lateral inflorescences racemose, 2.3–6.7 cm long, 4- to 9-flowered; pseudoterminal inflorescences paniculate with well-spaced nodes, (4.4–)6.5–14.4 cm long, 6- to 18-flowered, rachis proximally chestnut brown, glabrous, distally completely covered with stellate trichomes. Pedicel (4–)8–19 mm long, with dense yellowish brown appressed stellate trichomes, occasionally with scattered reddish brown erect stellate trichomes; bracteoles 2.4–4.5 mm long, linear or subulate, usually positioned at base of pedicels, sometimes in middle, with larger leaf-like ones closer to base of inflorescences, up to 10 mm long. Flowers 0.8–1.7 cm long. Calyx 3–5 × 3–5 mm, cupuliform; abaxially completely covered with short-armed grayish yellow and rarely with scattered long-armed reddish brown stellate trichomes, trichome arms up to 0.4–0.6(–0.8) mm long; adaxially with appressed trichomes in 2 bands, one at attachment of corolla, the other at margin, trichomes white with 2- or 3-arms; margin undulate or with 5(or 6) unevenly distributed teeth 0.1–0.9 mm long; marginal teeth deltoid or obtuse, contiguous, densely pubescent on both surfaces. Corolla 0.6–1.6 cm long, white, tube 1.5–3.3 mm long, abaxial surface glabrous, lobes 5(or 6), 5.8–14 × 2–4 mm, chartaceous, oblong-elliptic to lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, adaxially glabrous except margins. Stamens (9 or)10(to 12); filaments 3–4.8 mm long, straight, of equal width throughout, proximally dense with stellate trichomes, distally glabrous; anthers 4.3–5.9 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with yellow simple trichomes. Style 1–1.4 cm long, glabrous, with stellate trichomes at base; stigma 0.3–0.8 mm wide, capitate or punctiform. Fruiting calyx 4–5 × 7–8 mm, funnellform. Fruit 0.8–1.2 × 0.7–0.9 cm, dehiscent by three valves, ellipsoid to obovoid, apex slightly apiculate; pericarp dry, 0.2–0.8 mm thick, outside slightly rugose, with dense yellowish brown appressed stellate trichomes, inside glabrous, reticulately pitted. Seeds light brown, ovoid with acute apex, strongly tuberculate, glabrous.

Illustrations.—None previously published.

Phenology.—Flowering: May, June. Fruiting: July, August.

Distribution.—China (Sichuan and Yunnan). Fig. 3.

Habitat.—In thickets; 750–1500 m.

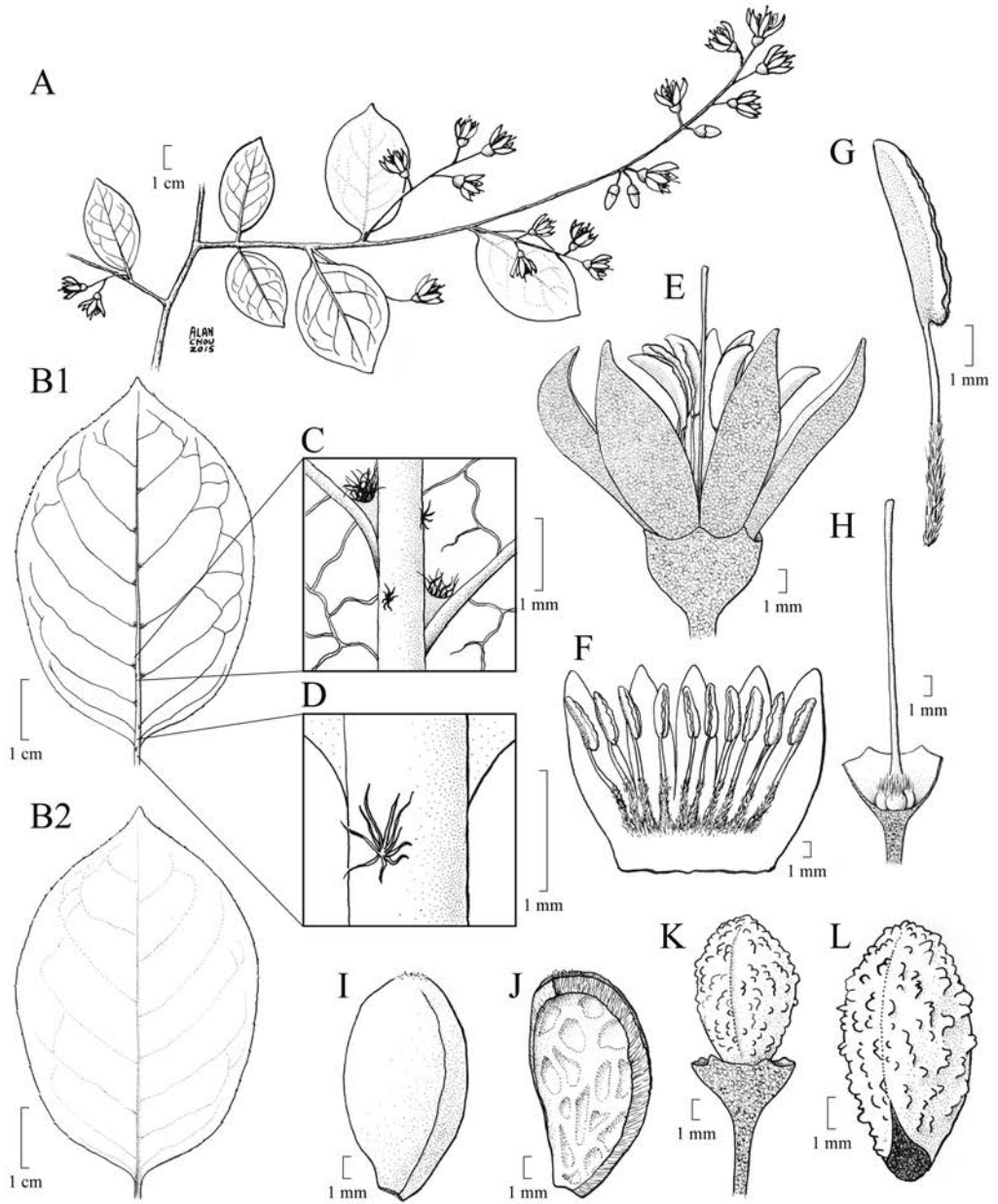


FIG. 7. *Styrax rubifolius*. A. Flowering branch. B. Leaf, abaxial (B1) and adaxial (B2) view. C. Leaf surface, abaxial view; note dense trichomes in axils of veins. D. Stellate trichome from abaxial side of petiole; note asymmetry. E. Flower. F. Part of corolla and androecium, opened by a longitudinal cut down the corolla. G. Stamen, lateral view. H. Calyx and gynoecium, calyx cut in half, ovary left intact. I. Fruit; note valve from dehiscence. J. Fruit wall interior; note rugose texture. K. Seed attached to pedicel and persistent calyx. L. Seed; note asymmetrical hilum. A–H based on *Ducloux 2138* (P00219547); I–L based on *Wang 23581* (A).

Vernacular names.—Hong-ye-ye-mo-li (China, Yunnan; Ming 1983).

Conservation assessment.—*Styrax rubifolius* is a rare Chinese endemic known to us from only four localities: three in Sichuan and one in Yunnan. We were only able to examine ten collections of the species, and the last known collection was made in 1964 by the Yunnan Northeast Team. The EOO is 4,390 km² and AOO is 16 km², and only one of the known subpopulations appears to occur in a protected area: Mount Emei in Sichuan, a protected World Heritage Site. From satellite imagery in Google Maps, two of the other localities appear to be threatened by deforestation. The type locality of Cheng Feng Shan, Yunnan appears to have extensive terrace farming on its slopes. Another collection was made in the hills of Leshan, an area which is now heavily urbanized. We propose to recognize one location for each of these regions. In conjunction with the two subpopulations without any plausible current threat, we propose four locations for this species. We therefore classify this species as Endangered (EN): B2ab(iii).

Discussion.—*Styrax rubifolius* is easily distinguished from the other members of *S. series* *Cyrta* with valvate corolla aestivation by the strongly tuberculate seed and pitted-reticulate interior wall of the pericarp. Even though its distribution overlaps that of *S. fortunei*, *S. rubifolius* can be distinguished from *S. fortunei* by the glabrous, chestnut-colored inflorescence rachis with well-spaced flowers. *Styrax rubifolius* also tends to have longer fertile shoots and inflorescences than the other members of this group. Although *S. rubifolius* was synonymized in *Flora of China* with *S. dasyanthus*, the morphological differences between these two taxa warrant treating them as separate species.

In the protologue of *Styrax rubifolius*, two collections (syntypes) are cited by Guillaumin (1924): *F. Ducloux 2138* and *F. Ducloux 2213*. We designated *F. Ducloux 2138* as the lectotype instead of *F. Ducloux 2213*, for the following reasons. One of the sheets of *F. Ducloux 2138* has a label with a description of the specimen with wording very similar to that in the protologue and in a handwriting we suspect to be Guillaumin's. Furthermore, there are three sheets of *F. Ducloux 2138*, whereas there are only two of *F. Ducloux 2213*. Finally, there is more flowering material on *F. Ducloux 2138*, and it is better preserved. Of the three sheets comprising *F. Ducloux 2138*, we chose P562364 as the lectotype because it is the one with the descriptive label.

Additional specimens examined. **CHINA. Sichuan:** Kiating [=Leshan], [29.567°N, 103.767°E], Jun 1903 (fl), *E.H. Wilson 4066* (A, BM, P); Lo-shan Hsien [=Lushan Xian] & vicinity, [30.144°N, 102.928°E], 800–1500 m, 24 Aug 1931 (fr), *F.T. Wang 23581* (A, P). **Yunnan:** [Shuifu Xian], forests of Tchen fong chan [=Cheng Feng Shan], [28.410°N, 104.233°E], (fl), *E.E. Maire s.n.* (P); [Shuifu Xian], Liangwan Qu [=Liangwan Xiang], Chengfeng Gongshe, Chengfeng Shan, Erfang Shengchan Dui, [28.410°N, 104.233°E], 1000 m, 19 Sep 1964 (fr), *Yunnan Northeast Team 1163* (KUN); [Shuifu Xian], Tchen fong chan [=Cheng Feng Shan], [28.410°N, 104.233°E], May 1901 (fl), *F. Ducloux 2213* (P); [Shuifu Xian], Tchen fong chan [=Cheng Feng Shan], [28.410°N, 104.233°E], 750 m, Jul 1894 (fr), *J.M. Delavay s.n.* (P).

9. *Styrax serrulatus* Roxb., Fl. Ind. 2:415. 1832 [as *S. "serrulata"*]. *Cyrta serrulata* (Roxb.) Miers, Ann. Mag. Nat. Hist. ser. 3, 3:280. 1859. TYPE: INDIA. *W. Roxburgh 2058* (HOLOTYPE: Icones Roxburghianae, no. 2058. 1832, not seen—digital image!).

Styrax virgatus Wall. ex G. Don, Gen. Hist. 4:5. 1837 [as *S. "virgatum"*]. *Cyrta virgata* (Wall. ex G. Don) Miers, Ann. Mag. Nat. Hist. ser. 3, 3:280. 1859. *Styrax serrulatus* var. *virgatus* C.B. Clarke, Fl. Brit. India 3:589. 1882 [as *S. "serrulatum* var. *virgatum"*]. TYPE: INDIA. MEGHALAYA: Mont. Sillet [= Khasi Hills], [25.583°N, 91.633°E], *F. de Silva s.n.* [cited in protologue as *N. Wallich 4400A*] (LECTOTYPE, designated here: BM not seen—digital image [barcode 000641455]!; ISOLECTOTYPE: K not seen—digital image [barcode 001038926]!). *Cyrta luculenta* Miers, Ann. Mag. Nat. Hist. ser. 3, 3:279. 1859. TYPE: INDIA. Assam, *W. Griffith 286* [collector from protologue] (HOLOTYPE: K!).

Styrax serrulatus var. *agrestis* C.B. Clarke, Fl. Brit. India 3:589. 1882. TYPE: INDIA. [Bihar]: Bhatgong [= Bhatgaon], [26.495°N, 88.114°E], 20 Apr 1808, *F. Buchanan-Hamilton 1081-2* [cited in protologue as *N. Wallich 4402B*] (LECTOTYPE, designated here: K not seen—digital image [barcode 001038930]!; ISOLECTOTYPE: E!).

Styrax casearifolius Craib, Bull. Misc. Inform. Kew 1920:304. 1920 [as *S. "casearifolia"*]. TYPE: THAILAND. [Nan]: Doi Wao, [19.104°N, 100.721°E], 914 m, 23 Feb 1912, *A.F.G. Kerr 2432* (LECTOTYPE, designated here: K [loan accession no. H2000/01016-44]!—photograph at P!; ISOLECTOTYPES: BM!, E!, K [loan accession no. H2000/01016-45]!—photograph at P!).

Shrubs or trees to 18.3 m tall. Young branchlets light brown, scattered or occasionally completely covered with yellowish brown stellate trichomes; older branchlets brown to grayish brown, glabrous to sparsely pubescent with yellow stellate trichomes. Petiole 4–8(–11) mm long, with sparse to dense tightly appressed stellate trichomes, occasionally with larger stellate trichomes, trichome arms up to 0.05–0.2(–0.3) mm long. Two most proximal leaves on each shoot alternate. Lamina of fertile shoots 3.1–12(–14) × 1.8–5.6 cm, those of sterile

shoots to 19 × 6.7 cm, 1.3–3.7 × as long as wide, thinly chartaceous to chartaceous, elliptic to lanceolate, occasionally oblong, rarely ovate or obovate; abaxial surface yellowish brown to green when dry, with yellow stellate trichomes, trichome arms up to 0.06–0.36(–0.55) mm long, pubescence scattered on whole surface, trichomes occasionally denser in axils of midvein and secondary veins; adaxial surface dark green to grayish green to brown when dry, nearly glabrous or with sparse yellowish brown stellate trichomes, trichome arms up to 0.09–0.38 mm long, pubescence mostly along midvein, rarely over whole surface; base rounded to broadly cuneate, occasionally acute; margin serrulate to serrate, occasionally with some teeth much larger than others; apex short-acuminate to acute, occasionally acuminate, rarely obtuse; secondary veins 4 to 6 on each side of midvein, abaxially prominent, adaxially plane or sunken, tertiary veins parallel, perpendicular to secondary veins, abaxially and adaxially prominent. Fertile shoots 6.1–17.5 cm long, 3- to 5- (to 6-)leaved. Lateral inflorescences racemose, 0.6–2.8 cm long, 1- to 7-flowered; pseudoterminal inflorescences racemose, with densely spaced nodes, occasionally fascicled, 2.5–8.5 cm long, 5- to 22-flowered, rachis yellow, completely covered with stellate trichomes. Pedicel 5–12 mm long, completely covered with short-armed yellow appressed stellate trichomes and scattered long-armed yellow to yellowish brown erect stellate trichomes; bracteoles 1.2–4.9 mm long, linear or subulate, positioned at base of pedicels, occasionally in middle of pedicels, very rarely at base of calyx, the larger leaf-like ones closer to base of inflorescences, up to 5.6 mm long. Flowers 1–1.7 cm long. Calyx 3–6 × 3–6 mm, cupuliform, rarely funnelform; abaxially with dense short-armed yellow appressed stellate trichomes and scattered long-armed yellow to yellowish brown, rarely brown, erect stellate trichomes, usually with trichomes becoming less dense towards calyx margin, trichome arms up to 0.22–0.74(–0.93) mm long; adaxially brown with scattered 2- or 3-armed trichomes; margin with 5 evenly distributed teeth or unevenly deep sinuses and unevenly distributed teeth 0.3–0.8 mm long; marginal teeth deltoid or obtuse, contiguous or not, densely pubescent on both surfaces. Corolla 0.9–1.6 cm long, white, tube 1.7–4(–4.9) mm long, abaxial surface proximally glabrous and distally scattered with stellate trichomes, lobes 5(or 6), 6.5–11.9(–13.2) × 1.7–3.9 mm, chartaceous, oblong to lanceolate, rarely elliptic, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, adaxially glabrous except margins or with 2- or 3-armed trichomes, denser at apex. Stamens (9 to)10(to 11); filaments 1.6–5.4 mm long, flexuous, wider in middle, proximally dense with stellate trichomes, distally glabrous; anthers (3.2–)3.8–5.9 mm long, wider than distal portion of filament, with sparse yellow stellate trichomes; connective with sparse yellow stellate trichomes. Style 0.9–1.5 cm long, glabrous, with stellate trichomes at base; stigma 0.3–0.7 mm wide, capitate. Fruiting calyx 3–5 × 5–10 mm, funnelform, occasionally nearly salverform. Fruit 0.8–1.5(–2) × 0.5–1.3 cm, indehiscent or dehiscent by three valves, ellipsoid to oblique-ellipsoid, apex rounded to pointed, rarely slightly rostrate; pericarp dry, 0.15–1 mm thick, outside smooth, very rarely rugose, with dense yellowish brown appressed stellate trichomes, inside with scattered to dense stellate trichomes, smooth. Seeds light brown to brown, ovoid, smooth, usually with shallow longitudinal fissures, glabrous.

Illustrations.—Ming 1986:869, fig. 335 (3–4); Hwang 1987b:114, pl. 39 (7–11); Yin 1990:896, fig. 472 (7–9) (as *S. casearifolius*); Svengsuksa & Vidal 1992:173, pl. 31 (5–6); Wu & Raven 2000:208, fig. 208 (7–12).

Phenology.—Flowering: February–September. Fruiting: January–November.

Distribution.—Bangladesh (Chittagong and Sylhet), Bhutan (Chukha and Sarpang), China (Xizang and Yunnan), India (Arunachal Pradesh, Assam, Bihar, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Sikkim, Tripura, and West Bengal), Laos (Louangphrabang, Oudomxai, Phongsali, and Xiangkhoang), Myanmar (Kachin, Mandalay, and Shan), Nepal (Kosi and Mechi), and Thailand (Nan); Fig. 4.

Habitat.—In a variety of forests and jungles, on hillside slopes, in moist soils or by rivers; 0–2438 m.

Vernacular names.—Chi-ye-an-xi-xiang (China; Hwang & Grimes 1996); Chi-ye-ye-mo-li (China, Xizang; Ming 1986); dot bay pha (Laos, Louangphrabang; *E. Poilane* 20611); dot phao (Laos, Louangphrabang; *E. Poilane* 20594); hpun-pyaw-hpun (Myanmar, Kachin; *J. Keenan* 3128); koom-jameva (India; Roxburgh 1832); Jia-ci-ye-ye-mo-li (China, Yunnan; Ming 1983); masine ixat (India, West Bengal; *J.M. Cowan s.n.*); pa-riat (Thailand, Nan; *A.F.G. Kerr* 4986); padong me:w (Laos, Xiangkhoang; Svengsuksa & Vidal 1992); pung foo (Laos, Xiangkhoang; *A.F.G. Kerr* 20917); soh-la-paiet (India, Meghalaya; *L.F. Ruse* 20).

Conservation assessment.—*Styrax serrulatus* is a widespread species that occurs in the highlands of the Eastern Himalaya, the north side of the Arakan Mountains, the border region of Myanmar and Yunnan, China, northern Laos, and northern Thailand. The range of the species extends farther west in eastern Asia than any other species of *S. series Cyrtia*. Collections have been made from > 110 localities throughout this wide area (EOO = ca. 1,264,204 km²). There appears to be a significant amount of suitable habitat for *S. serrulatus* throughout its distribution and it is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., *F. Kingdon Ward 18397*). This species also occurs in several protected areas in parts of its geographic range. We therefore categorize this species as Least Concern (LC).

Discussion.—As discussed under *Styrax agrestis*, *S. serrulatus* and the *S. agrestis* complex both have short-armed trichomes on the abaxial surface of the petiole, especially apparent at the junction of the petiole and blade. Also, in these four species the two most proximal leaves on each shoot are alternate (vs. opposite or subopposite). Fruiting *S. serrulatus* can be easily differentiated from typical members of the *S. agrestis* complex by an ellipsoid fruit that lacks a rostrum and by glabrous seeds, vs. rostrate fruits and stellate-pubescent seeds. *Styrax serrulatus* and *S. rubifolius* both have ellipsoid fruits, but the seeds are distinct: *S. serrulatus* has smooth seeds and *S. rubifolius* has strongly tuberculate seeds. *Styrax fortunei* can be difficult to distinguish from *S. serrulatus*: both tend to have a higher number of flowers per inflorescence than the other members of the study group. The fruits are reliable for distinguishing the two species, with *S. serrulatus* having ellipsoid fruits that can be indehiscent or dehiscent and *S. fortunei* having subglobose fruits that are always dehiscent. The fruits of *S. serrulatus* also tend to be larger, usually being > 1 cm long (vs. usually < 1 cm). *Styrax serrulatus* also has racemose inflorescences (vs. paniculate).

When in flower, *Styrax serrulatus* can be more difficult to distinguish from some of the other species in the study group in nearby areas. *Styrax finlaysonianus* can easily be distinguished from *S. serrulatus* by its thicker corolla lobes. However, *S. agrestis* can be more difficult to distinguish from few-flowered specimens of *S. serrulatus*. Although *S. serrulatus* can have up to 22 flowers per pseudoterminal inflorescence (vs. 9 in *S. agrestis*), it can also have as few as 5 per pseudoterminal inflorescence. Also, although *S. serrulatus* can have pedicels up to 12 mm long (vs. up to 6 mm in *S. agrestis*), it can have pedicels as short as 5 mm. Ultimately, characters of the fruit are those most reliable in distinguishing these two species.

Styrax casearifolius was described from specimens with some old fruits and extremely young flower buds. Craib (1920) described the species as having oblong to ovate-oblong leaves and densely packed flower buds with long pallid subhirsute trichomes. However, specimens of the study group with extremely young buds can be difficult to identify to species, sometimes with only the number of flowers per inflorescence being an obvious difference, and the flowers are likely to become less dense as the inflorescence develops. Moreover, leaf shape can vary extensively in some species of this group. The fruit, although very fragmented, resembles that of *S. serrulatus*. Based on these characters, we synonymize *S. casearifolius* with *S. serrulatus*.

Don (1837) cites *N. Wallich 4400* as the the original material on which the description of *Styrax virgatus* was based. *N. Wallich 4400* is composed of two distinct collections, *N. Wallich 4400A* (collected by Francis De Silva) and *N. Wallich 4400B* (collected by Henry Bruce). However, it is unlikely that Don based his description of *S. virgatus* on *N. Wallich 4400B* because the description of *S. virgatus* describes corolla shape, but the specimens of *N. Wallich 4400B* that we could locate lack corollas. Furthermore, these two specimens were found in the collections of G and K, as opposed to BM, where Don deposited the types he studied. For these reasons, we are lectotypifying on *N. Wallich 4400A*. *N. Wallich 4400A* consists of two sheets with poorly preserved fertile material, with only several buds and some inflorescences with only the rachis and some pedicels. The specimen at BM is likely the one that Don examined, because BM is where Don was based. For this reason, we are lectotypifying on the BM specimen of *N. Wallich 4400A*. This specimen is found on the same sheet as a specimen of *S. hookeri* and a few fragments of flowering material from another specimen of *S. serrulatus*. It is possible that Don described *S. virgatus* using all three specimens found on the sheet. Although the protologue does describe the margin of *S. virgatus* as having denticulations like the specimen of *S. hookeri* on the sheet, all the other parts of the description more closely match the other two specimens on the sheet, e.g., lanceolate corolla lobes and downy branches.

The only other species of *Styrax* known from the type locality of *S. virgatus* [Mont. Sillet (= Khasi Hills)] are *S. hookeri* and *S. serrulatus*. Even though the inflorescences are poorly preserved in the type material of *S. virgatus*, they appear to have more potential flowers than the 2 or 3 flowers most commonly found on the pseudoterminal inflorescences of *S. hookeri*, vs. the racemes of 5–22 flowers in *S. serrulatus*. Furthermore, the leaves of *N. Wallich 4400A* more closely resemble those of *S. serrulatus* in their short-acuminate apices (vs. more strongly acuminate in *S. hookeri*) and more sharply serrulate margins (vs. denticulate in *S. hookeri*). Lastly, Perkins (1907), having presumably seen the flowers on a specimen of *S. virgatus* that we were unable to examine, described the species as having valvate corolla aestivation (like *S. serrulatus*) vs. imbricate (like *S. hookeri*). We thus synonymize *S. virgatus* with *S. serrulatus*.

The collection C.S. Ye 603 was identified on the label as *Styrax confusus*, but the characters of this specimen do not match those for our concept of *S. confusus* and more closely resemble those of *S. serrulatus*. The fruits are ellipsoid, much like those of *S. serrulatus*, and have a wall that is too thin for typical *S. confusus*. The petioles are also too long for *S. confusus*, but within the range of variation for *S. serrulatus*. Nonetheless, the specimen is from Jiangxi, which is far outside the geographic range of *S. serrulatus*. Furthermore, although the infructescences are not completely intact, they may be paniculate, which is never the case in *S. confusus* or *S. serrulatus*. The paniculate inflorescence suggests *S. fortunei*, but if it is this species then the shape of the fruit and length of the petiole are atypical. We therefore have excluded the specimen from our treatment; efforts should be made to recollect the population from which this specimen came.

A.C. d'Alleizette s.n. [P562368] and s.n. [P562367] are the only specimens we examined from southern Vietnam. These specimens are difficult to identify because they only have very immature fruits. They cannot be *Styrax finlaysonianus* because of the distinctly serrulate leaves, and they cannot be *S. agrestis* because the pedicels and inflorescences are too long. They resemble *S. serrulatus* because the fruits appear not to have a rostrum, but because the fruits are immature we cannot confirm whether the seed is glabrous or has stellate trichomes. The two collections are far out of the geographic range of *S. serrulatus*. We have excluded these specimens from the species description of *S. serrulatus*. More collections of plants resembling these specimens need to be collected from the region before any additional insights can be gained as to the taxonomic status of these collections.

The protologue of *Styrax serrulatus* does not indicate a type (Roxburgh 1832). Roxburgh, based at the Botanical Gardens in Calcutta, did not keep specimens of the plants he described, on the presumption that they would not preserve well in the heat and humidity, but instead preferred to have illustrations made. These illustrations are today considered to be the types of the corresponding Roxburgh names (Royal Botanic Gardens, Kew 2006). Svengsuksa & Vidal (1992) may not have been aware of this when they cited *Wallich 4402* as the holotype, and appear to have inadvertently lectotypified *S. serrulatus* on this collection. Furthermore, because they were not able to see *Wallich 4402*, they were not aware that it comprises two separate collections. It is highly unlikely that Roxburgh based the description of *S. serrulatus* on any specimens of this collection. We therefore cite Roxburgh's illustration no. 2058 in *Icones Roxburghianae* as the holotype.

In the protologue of *Styrax casearifolius*, Craib (1920) cited A.F.G. Kerr 2432 as the type, but two sheets of this specimen are housed at K. We designated the K specimen with loan accession number H2000/01016-44 as the lectotype because 1) this sheet has the species name and publication in handwriting we suspect to be Craib's and 2) it contains fruiting material in the packet, which the other specimen lacks.

Clarke (1882) cited *Ham. in Wall. Cat 4402* in the protologue of *Styrax serrulatus* var. *agrestis* as the type, but two different collections from two different localities comprise the *Wallich 4402* entry. We lectotypified on *Wallich 4402B/Buchanan-Hamilton 1081-2* because it most closely matches Clarke's description by having a calyx with spreading brown-hirsute trichomes; *Wallich 4402A/Buchanan-Hamilton 1081-1* is similar to the common version of *S. serrulatus*, lacking the brown-hirsute trichomes. We consider these differences to be taxonomically trivial and thus do not recognize varieties within *S. serrulatus*.

Additional specimens examined. **BANGLADESH. Chittagong:** Chittagong District, Jaldi, [21.984°N, 91.95°E], Feb 1921 (fl), J.M. Cowan 2363 (E); Chittagong District, locality unknown, [22.367°N, 91.8°E], (fr), J.M. Cowan 1058 (E); Chittagong District, locality unknown, [22.367°N, 91.8°E], (fl), J.M. Cowan 2239 (E); Chittagong Hill Tracts, year 1886 (fl), *Dr. King's Collector 324* (L); Chittagong Hill Tracts, year

1886 (fl), *Dr. King's Collector 434* (L, P); Chittagong Hill Tracts, year 1887 (fr), *Dr. King's Collector 449* (P); Rangamati District, Rangamati, [22.633°N, 92.2°E], Mar 1880 (fl), *J.S. Gamble 7950* (K). **Sylhet**: [Moulvibazar District], Lowachara [=Lowachara] to Bhanugach, [24.345°N, 91.82°E], 16 Aug 1976 (fr), *M.S. Khan 4338* (L). **District unknown**: East Bengal, (fl, fr), *W. Griffith 3672* (C, GH, K, P[2]).

BHUTAN. Chhukha: 12 km NE of Phuntsoling between Phuntsoling and Gedu, [26.91°N, 89.5°E], 750 m, 6 Apr 1986 (fl), *B. Bartholomew & D.E. Boufford 3951* (CAS); Mirichoma Timpu [=Marichong Thimphu?], [27°N, 89.5°E], 3500 ft, 2 Jul 1914 (fr), *R.E. Cooper 1049* (E); Mirichona [=Marichong?], [27°N, 89.5°E], 3000 ft, 20 Apr 1915 (fl), *R.E. Cooper 3777* (E). **Sarpang**: Nabzi, Jirgang Chu, [27.133°N, 90.483°E], 5000 ft, 6 May 1937 (fl), *F. Ludlow & G. Sherriff 2994* (E); Phipsoo Khola near Phipsoo, 26°45'N, 90°7'E, 285 m, 15 Mar 1982 (fl), *A.J.C. Grierson & D.G. Long 3723* (E). **District unknown**: (fr), *W. Griffith 928* (BM); (fl), *W. Griffith 2268* (K).

CHINA. Xizang: Motuo Xian, Dijiang Zhan, [29.483°N, 95.5°E], 1300 m, 10 Aug 1974 (fr), *Qinghai-Xizang Expedition 74-1726* (KUN[2]); Motuo Xian, Hanmi, [29.365°N, 95.131°E], 1100 m, 29 Oct 1992 (fr), *H. Sun et al. 968* (KUN[3]); [Motuo Xian], near Medog, [29.483°N, 95.5°E], 1100 m, 17 Jan 1993 (fr), *H. Sun et al. 2919* (KUN[2]); Motuo Xian, near Medog, Dexing [Xiang], [29.322°N, 95.305°E], 1100 m, 28 Apr 1993 (fl), *H. Sun et al. 5884* (KUN[2]); Motuo Xian, near Medog, Dexing [Xiang], [29.322°N, 95.305°E], 1100 m, 28 Apr 1993 (fl), *H. Sun et al. 5891* (KUN[2]); [Shannan Shi], below Karjiang, [28.258°N, 90.647°E], Apr 1850 (fl), *J.D. Hooker s.n.* (K). **Yunnan**: Cangyuan Vazu Zizhixian, Banlao Gongshe [=Banlao Xiang], Shangbanlao, [23.248°N, 98.936°E], 1100–1200 m, 21 Jun 1974 (fr), *Y.H. Li 12429* (KUN[3]); Cangyuan Vazu Zizhixian, Banlao Gongshe [=Banlao Xiang], Xiabanlao [Cun], Longtou Shan, Chahe Hegu, [23.248°N, 98.936°E], 800–900 m, 13 Jun 1974 (fr), *Y.H. Li 11969* (KUN[4]); Cangyuan Vazu Zizhixian, Mengjiao [Xiang] to Banhong [Xiang], [23.259°N, 99.169°E], 1350 m, 15 May 1974 (fr), *Y.H. Li 11437* (KUN[2]); Che-li Hsien [=Jinghong Shi], Maan-bang [=Manbang], Dah-meng-lung [Menglong Zhen], [21.579°N, 100.68°E], 1000 m, Aug 1936 (fr), *C.W. Wang 77422* (A, KUN); [Dehong Daizu Jingpozu Zizhizhou], Hills at the north end of the Kau-ngai valley, [24.433°N, 98.583°E], 3500 ft, Apr 1913 (fl), *G. Forrest 9827* (E); Jenn-yeh Hsien [=Mengla Xian], Meng-bang [=Mengban Zhen], [21.732°N, 101.645°E], 1020 m, Nov 1936 (fr), *C.W. Wang 24626* (KUN); Jenn-yeh Hsien [=Mengla Xian], Meng-bang [=Mengban Zhen], [21.732°N, 101.645°E], 1020 m, Nov 1936 (fr), *C.W. Wang 80805* (A, KUN); [Jinghong Shi], Damenglong [=Menglong Zhen], Manlalan, [21.579°N, 100.68°E], 23 May 1958 (fr), *S.X. Zhao 53* (KUN); [Jinghong Shi], Menglong [Zhen], Xiaojie, [21.579°N, 100.68°E], 650 m, 21 Apr 1955 (fr), *K.M. Feng 20498* (KUN); [Jinghong Shi], Menglong [Zhen], Xiaojie, [21.579°N, 100.68°E], 650 m, 21 Apr 1955 (fr), *K.M. Feng 20543* (KUN); Mang Shi, 18 km W of Bajiao Wo [=Bajiao Wahe?], [24.137°N, 98.113°E], 1140 m, 7 Apr 1961 (fl), *X. Zhou 525* (KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1540 m, May 1936 (fr), *C.W. Wang 73749* (A); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1550 m, May 1936 (fr), *C.W. Wang 73823* (A, KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1540 m, May 1936 (fr), *C.W. Wang 74071* (A, KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1540 m, May 1936 (fr), *C.W. Wang 74147* (A, KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1500 m, Jun 1936 (fr), *C.W. Wang 76225* (A, KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1400 m, Jun 1936 (fr), *C.W. Wang 77139* (KUN); [Menghai Xian], Fo Hai, [21.967°N, 100.467°E], 1400 m, Jun 1936 (fr), *C.W. Wang 77139A* (A); [Menghai Xian, Manpeng, [21.967°N, 100.467°E], 1300 m, 24 Feb 1951 (st), *Sino-Soviet Expedition in Yunnan 5148* (KUN); [Menghai Xian], Nan-chiao [=Nan Qiao], [21.967°N, 100.467°E], 1780 m, Jun 1936 (fr), *C.W. Wang 75288* (A, KUN); [Menghai Xian], Nan-chiao [=Nan Qiao], [21.967°N, 100.467°E], 1300 m, Jun 1936 (fr), *C.W. Wang 76869* (A, KUN); Menghai Xian, Nannuoshan [Cun], [21.958°N, 100.599°E], 1400–1600 m, 10 Nov 1955 (fr), *P.Y. Mao 1278* (KUN); Menghai Xian, Nannuoshan [Cun], [21.958°N, 100.599°E], 30 Mar 1957 (fl), *Sino-Soviet Expedition in Yunnan 44* (KUN); Menghai Xian, Nannuoshan [Cun], [21.958°N, 100.599°E], 1300 m, 1 Mar 1957 (fl), *Sino-Soviet Expedition in Yunnan 5415* (KUN[2]); Menghai Xian, Nannuoshan [Cun], [21.958°N, 100.599°E], 1520 m, 3 Mar 1957 (fl), *Sino-Soviet Expedition in Yunnan 5625* (KUN); Menghai Xian, Nannuoshan [Cun], [21.958°N, 100.599°E], 10 Jan 1960 (st), *Z.W. Lin 205* (KUN); Menghai Xian, locality unknown, [21.967°N, 100.467°E], year 1957 (fl), *B.W. Qiu 56500* (KUN); Menghai Xian, locality unknown, [21.967°N, 100.467°E], 1200 m, 6 Sep 1958 (fr), *K.L. Le 414* (KUN); Mengla Xian, Longlin [Cun], [21.551°N, 101.487°E], 700 m, 19 Oct 1959 (st), *X.T. Cai 59-11023* (KUN[2]); Mengla Xian, Manlai, [21.467°N, 101.583°E], (fr), *Y.H. Li 1224* (KUN); Mengla Xian, Shangyong, [21.24°N, 101.718°E], 800–900 m, 17 Oct 1974 (fr), *Z.H. Yang 10960* (KUN); Mengla Xian, Yiwu [Xiang], [21.978°N, 101.47°E], 1400 m, 22 Sep 1987 (fr), *D.D. Tao 87281* (KUN); [Mengla Xian], Yiwu [Xiang], Manluo Xiang [=Manluo Cun], [22.009°N, 101.465°E], 1200 m, 24 Jun 1961 (fr), *Y.H. Li 3627* (KUN); Menglian Daizu Lahuzu Vazu Zizhixian, Mengma Gongshe [=Mengma Zhen], Lafu Dadui [=Lafu Cun], Bei Shan, [22.229°N, 99.378°E], 1700 m, 26 Jul 1973 (fr), *Menglian Expedition 9729* (KUN); Menglian Daizu Lahuzu Vazu Zizhixian, northeast foothills, [22.3°N, 99.42°E], 1100 m, 4 Jul 1973 (fr), *Menglian Expedition 9495* (KUN); Ruili Shi, besides Mengxiu Health Center, [24.066°N, 97.797°E], 1440 m, 26 Apr 1963 (fr), *Y.Y. Hu & K.Y. Luo HR630143* (KUN); Ruili Shi, Longdao [Dagou], Dengga Xiang, [23.896°N, 97.65°E], 890 m, 25 Nov 1956 (fr), *86 Expedition Team 1208* (KUN); Ruili Shi, Nanjingli, [24.09°N, 97.836°E], 1650 m, 21 Jul 1987 (fr), *S.Y. Bao 885* (KUN[2]); [Ruili Shi], Wanding Zhen, Fangbang Gongshe, Longlong Reservoir to Bajiaoqing, [24.099°N, 98.11°E], 700–1100 m, 19 Aug 1976 (fr), *S.J. Pei 14044* (KUN[2]); southern Yunnan, T'ai Districts, 1935–1936 (fr), *C.W. Wang 154* (KUN[9]); [Yingjiang Xian], Poneshee [=Bangxi], [24.717°N, 97.933°E], 24 Apr 1868 (fl), *J. Anderson s.n.* (K); Yongde Xian, Daxueshan, [24.112°N, 99.64°E], 2200 m, 7 Sep 2002 (fr), *E.D. Liu 6244* (KUN[2]); Yongde Xian, Daxueshan, Manlai, [24.086°N, 99.644°E], 1300 m, 9 Aug 2002 (fr), *E.D. Liu 5678* (KUN); locality unknown, 1935–1936 (fr), *C.W. Wang s.n.* (KUN).

INDIA. Arunachal Pradesh: Chonglong [=Changlang District], locality unknown, [27.13°N, 95.74°E], 5000 ft, 29 Mar 1919 (fl), *G.H. Cave s.n.* (E); East Kameng District, Seppa - Bana, [27.31°N, 92.98°E], 300 m, 20 Apr 1977 (fl), *K.C. Sahni & H.B. Naithani Ser. II 592* (A); [Kurung Kumey District], Nyapin surroundings, [27.719°N, 93.377°E], 23 Nov 1964 (fr), *A.R.K.R. Sastry 40842* (L); [Lohit District], Mishmi Hills, Choukham [=Chowkham], Sadiya plain, [27.808°N, 96.017°E], 600 ft, 11 Mar 1949 (fl), *F. Kingdon Ward 18397* (A); [Lohit District], Mishmi Hills, Glo, Kamlang Valley, [27.739°N, 96.339°E], 3500–4500 ft, 8 Apr 1949 (fl), *F. Kingdon Ward 18495* (A); Tirap District, Khela to Changlang, [27.072°N, 95.636°E], 1800 ft, 16 Mar 1958 (fl), *S.K. Murti 12986* (L). **Assam**: Assam and Khasia Hills, (fl), *C.J. Simons s.n.* (L[2]); Brahmaputra Plains, (fl), *M. Kurz 28* (E); Cachar District, locality unknown, [24.782°N, 92.858°E], Sep 1873 (fr), *R.L. Keenan s.n.* (K); [Dima

Hasao District], Haflang [=Haflong], [25.18°N, 93.03°E], 3000 ft, 22 Apr 1951 (fl/fr), *T.R. Chand 4547* (L); [Dima Hasao District], Lobang, [25.45°N, 92.667°E], 2000–3000 ft, 28 May 1951 (fl), *W.N. Koelz 28110* (L); [Golaghat District], Borpathar [=Barpathar], [26.3°N, 93.87°E], 350 ft, 20 Mar 1896 (fl), *Dr. King's Collector 71* (E); [Kamrup District], Bamanigaon [=Bamunigaon], [25.992°N, 91.258°E], 0 ft, 30 Nov 1949 (fr), *T.R. Chand 2522* (L); Kamrup District, Baradhoba reserve forest 4.5 mi S of Singra, [25.945°N, 91.157°E], 26 Jun 1964 (fr), *A.S. Rao 39152* (L[5]); Kamrup District, Garbhanga forest of South Kamrup, 9 mi south of Gauhati [=Guwahati], [26.055°N, 91.695°E], 13 Jun 1964 (fr), *A.S. Rao 38780* (L); [Karbi Anglong District], Mikir Hills, Aeygrum Village[?], [26.167°N, 93.5°E], 17 May 1957 (fr), *G. Panigrahi 9394* (L); Pani ghat[?], Apr 1893 (fl), *Dr. King's Collector s.n.* (A); [Sivasagar District], Dekho [=Dikhow] hills, [26.98°N, 94.63°E], 1000 ft, 31 Mar 1895 (fl), *G. Watt 11100* (A); [Sivasagar District], Teock Ghat near Tingali Bam [=Tingalibam], [27.001°N, 95.125°E], Oct 1898 (fr), *Dr. Prain's Collector 284* (A); [Sivasagar District], Teock Ghat near Tingali Bam [=Tingalibam], [27.001°N, 95.125°E], Apr 1899 (fl), *M.A. Hock 920* (A); [Sivasagar District], Tingali Bam [=Tingalibam] Jangahl, [27.001°N, 95.125°E], Mar 1899 (fl), *M.A. Hock 804* (E); [Sonitpur District], Dhekiajuli, [26.7°N, 92.5°E], Apr 1902 (fl), *A.C. Chatterjee s.n.* (A, BM, P); [Tinsukia District], Makum, Dihing River, [27.5°N, 95.45°E], 16 Aug 1894 (fl), *G.A. Gammie 10* (L); [Tinsukia District], Margarata [=Margherita], [27.28°N, 95.68°E], Jun 1898 (fr), *Dr. Prain's Collector s.n.* (A); [Tinsukia District], Suddeya [=Sadiyal], [27.83°N, 95.67°E], 2 Jul 1830 (fl), *Anonymous s.n.* (K); Upper Assam, year 1841 (fr), *F. Jenkins s.n.* (K); locality unknown, (fl), *F. Jenkins 3288* (P); locality unknown, year 1845 (fr), *F. Jenkins s.n.* (K); locality unknown, (fl), *F. Jenkins s.n.* (E, L); locality unknown, (fl/fr), *F. Jenkins s.n.* (L, P[4]); locality unknown, (fr), *F. Jenkins s.n.* (L, P); locality unknown, (fl), *M.T. Masters 409* (P); locality unknown, (fl), *M.T. Masters 3288* (P); locality unknown, (fl), *M.T. Masters s.n.* (E, L, P); locality unknown, (fr), *W. Griffith 933* (E). **Manipur:** locality unknown, Sep 1945–Apr 1946 (fr), *A.A. Bullock s.n.* (K, L); locality unknown, 1881–1882 (fr), *G. Watt 7367* (P). **Meghalaya:** Garo Hills District, near Nokrek, [25.443°N, 90.445°E], 4000 ft, 8 Mar 1950 (fl), *T.R. Chand 2768* (L); Khasi Hills District, Barapani [=Umiam], [25.677°N, 91.927°E], 3000 ft, 5–14 Jun 1949 (fr), *T.R. Chand 1626* (L); Khasi Hills District, Barapani [=Umiam], [25.677°N, 91.927°E], 5000 ft, 10 Jun 1949 (fr), *W.N. Koelz 22895* (L); Khasi Hills District, Bhoilasa [=Pynthor?], Khasia, [25.718°N, 92.019°E], 3500 ft, 6 Aug 1886 (fr), *C.B. Clarke 44455A* (K); Khasi Hills District, Burnihat [=Byrnihat], [26.052°N, 91.87°E], 200 ft, 19 May 1949 (fr), *T.R. Chand 1539* (L); [Khasi Hills District], Cherrapunjee [=Sohra], [25.3°N, 91.7°E], 4000 ft, 22 May 1952 (fr), *T.R. Chand 5693* (L); [Khasi Hills District], Cherrapunjee [=Sohra], [25.3°N, 91.7°E], 4000 ft, 20 Jun 1952 (fr), *T.R. Chand 5956* (L); [Khasi Hills District], Cherrapunjee [=Sohra], [25.3°N, 91.7°E], 4000 ft, 1 May 1952 (fl), *W.N. Koelz 29595* (L); [Khasi Hills District], Cherrapunjee [=Sohra], [25.3°N, 91.7°E], 4000 ft, 24 Jul 1952 (fr), *W.N. Koelz 30804* (L); [Khasi Hills District], Cherrapunjee [=Sohra], [25.3°N, 91.7°E], 4000 ft, 14 Apr 1952 (fl), *W.N. Koelz 33566* (L); [Khasi Hills District], Khasia and Jaintia Hills, Umran, [25.77°N, 91.875°E], 2253 ft, 7 Mar 1923 (fl), *L.F. Ruse 20* (A); Khasi Hills District, Mawryngkneng, [25.557°N, 92.064°E], 4000 ft, 13 Sep 1951 (fr), *T.R. Chand 4710* (L); Khasi Hills District, Mawryngkneng, [25.557°N, 92.064°E], 4000 ft, 21 Oct 1951 (fr), *T.R. Chand 5092* (L); Khasi Hills District, Nongpoh, [25.9°N, 91.88°E], 2000 ft, 15 Jun–4 Jul 1949 (fr), *T.R. Chand 1689* (L); Khasi Hills District, Nongpoh, [25.9°N, 91.88°E], 2000 ft, 22 Apr 1949 (fr), *W.N. Koelz 22527* (L); [Khasi Hills District], Sohra [=Cherrapunji], Coal Hill, [25.3°N, 91.7°E], 4500 ft, 26 Nov 1871 (fr), *C.B. Clarke 15198A* (BM); Khasi Hills District, Umran, [25.77°N, 91.875°E], 3000–4000 ft, 11–17 Apr 1949 (fr), *T.R. Chand 1368* (L); Khasi Hills District, Umran, [25.77°N, 91.875°E], 4000 ft, 11 Apr 1949 (fl), *W.N. Koelz 22464* (L); Khasia Hills [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fl), *Native Collectors of Bot. Garden, Calcutta s.n.* (E, L, P[2]); Khasia [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fl/fr), *J.D. Hooker s.n.* (GH); Khasia [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], Oct 1850 (fr), *J.D. Hooker & T. Thomson s.n.* (K); Khasia [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fl), *Native Collector 3288* (P[2]); Khosya [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fl), *T. Lobb s.n.* (K); Mont. Khasia [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fl), *J.D. Hooker & T. Thomson s.n.* (L); Mont. Khasia [=Khasi Hills District], locality unknown, [25.583°N, 91.633°E], (fr), *J.D. Hooker & T. Thomson s.n.* (A, C, L, P[2]). **Mizoram:** Aizawl District, Aijal [=Aizawl], Lushai Hills, [23.727°N, 92.718°E], 3500 ft, Apr 1927 (fl), *A.W. Parry 222* (K); Aizawl District, Aijal [=Aizawl], Lushai Hills, [23.727°N, 92.718°E], 3500 ft, 27 Mar 1951 (fl), *T.R. Chand 4301* (L); Hmuntha, Lushai Hills, [23.494°N, 92.942°E], 5000 ft, 3 Apr 1951 (fr), *W.N. Koelz 27423* (L); Lungleh [=Lunglei District], South Lushai Hills, near Lungleh [=Lunglei], [22.88°N, 92.73°E], year 1899 (fl), *A.T. Gage 238* (A). **Nagaland:** Kohima District, Jotsoma, Naga Hills, [25.673°N, 94.063°E], 6000 ft, May 1886 (fl), *D. Prain s.n.* (P); Kohima District, Kohima to Nerhema, [25.718°N, 94.1°E], 1500 ft, 22 May 1895 (fr), *G. Watt 11639* (E); Kohima District, Kohima, Naga Hills, [25.67°N, 94.108°E], 4500 ft, 1 Nov 1885 (fr), *C.B. Clarke 41495C* (BM); Kohima District, Kohima, Naga Hills, [25.67°N, 94.108°E], 4000 ft, year 1886 (fl), *D. Prain s.n.* (P); Kohima District, Kohima, Naga Hills, [25.67°N, 94.108°E], 4000 ft, year 1886 (fr), *D. Prain s.n.* (L); [Kohima District], Konoma, [25.652°N, 94.023°E], 6000 ft, May 1895 (fl), *G. Watt 11714* (P); [Kohima District], Pulebudze [=Puliebadze], Naga Hills, [25.648°N, 94.073°E], 6000 ft, 1 Apr 1935 (fl), *N.L. Bor 4426* (K). **Orissa:** Mayurbhanj District, Bhanj Basa [=Bhanjbasal], [21.621°N, 86.393°E], 3000 ft, 18 May 1917 (fr), *H.H. Haines 5705* (K). **Sikkim:** [East Sikkim District], Gangtok to Dikchu, [27.366°N, 88.57°E], 2010 ft, 13 May 1945 (fr), *K.P. Biswas 6704* (A); [North Sikkim District], Dikchu, [27.402°N, 88.524°E], 2200 ft, 11 Apr 1948 (fl), *F. Ludlow & G. Sherriff 15843* (E); [South Sikkim District], Singtam, Darjeeling, [27.15°N, 88.38°E], 2000 ft, Aug 1881 (fr), *J.S. Gamble 9631* (K); [West Sikkim District], Phedong [=Phedang], [27.46°N, 88.172°E], 3000 ft, 13 May 1876 (fr), *C.B. Clarke 27913B* (K); locality unknown, (fl/fr), *J.D. Hooker 58* (P); locality unknown, (fl), *J.D. Hooker s.n.* (A, K, L, P[2]); locality unknown, (fl/fr), *J.D. Hooker s.n.* (BM, L); locality unknown, 6000–8000 ft, (fr), *J.D. Hooker s.n.* (E); locality unknown, (fr), *J.D. Hooker s.n.* (K); locality unknown, 5500 ft, (fl/fr), *R.H. Beddome 4968* (BM); locality unknown, (fl), *R.H. Beddome 4969* (BM); locality unknown, (fl), *T. Thomson s.n.* (L). **Tripura:** [North Tripura District], Mumpui [=Purba Hmunpui?], [24.053°N, 92.277°E], 800–1000 ft, 31 Mar 1941 (fl), *K.P. Biswas 4976* (K). **West Bengal:** Calcutta District, Botanical Gardens of Calcutta and Serampore, [22.559°N, 88.291°E], 1834–1841 (fl), *J.O. Voigt 47* (A); Calcutta District, Botanical Gardens of Calcutta and Serampore, [22.559°N, 88.291°E], 1834–1841 (fl), *J.O. Voigt 240* (A); Calcutta District, Botanical Gardens of Calcutta and Serampore, [22.559°N, 88.291°E], 1834–1841 (fr), *J.O. Voigt 422* (A); Calcutta District, Botanical Gardens of Calcutta and Serampore, [22.559°N, 88.291°E], 1834–1841 (fr), *J.O. Voigt 486* (A, P); Darjeeling [=Darjiling District], Sivaloke Hills, [26.853°N, 88.464°E], Dec 1879 (fr), *J.S. Gamble*

7561 (K); Darjeeling [=Darjiling District], locality unknown, [27.05°N, 88.267°E], 2500 ft, 16 Jun 1923 (fr), *J.M. Cowan s.n.* (E); Darjeeling [=Darjiling District], locality unknown, [27.05°N, 88.267°E], (fl), *J.M. Cowan s.n.* (E); Darjiling District, Environs of Darjiling, [27.05°N, 88.267°E], 6000–8000 ft, Jun–Jul 1855 (fl/fr), *H.A.R. von Schlagintweit 12321* (BM); Darjiling District, Environs of Darjiling, [27.05°N, 88.267°E], 6000–8000 ft, Jun–Jul 1855 (fl), *H.A.R. von Schlagintweit 12557* (P); [Darjiling District], Jinglam [Tea Estate], [27.003°N, 88.389°E], 3000 ft, 14 Apr 1913 (fl), *G.H. Cave s.n.* (E); [Darjiling District], Kalimpoong [=Kalimpong], [27.06°N, 88.47°E], 4000 ft, 21 Sep 1869 (fr), *C.B. Clarke 9253A* (BM); Darjiling District, Kurseong, [26.878°N, 88.277°E], 1550 m, 12 Apr 1960 (fl/fr), *M. Togashi 6148* (TI); [Darjiling District], Kursiong [=Kurseong], [26.878°N, 88.277°E], 4500 ft, 5 Jun 1875 (fr), *C.B. Clarke 26636A* (BM); [Darjiling District], Mongpu [=Mangpu], [26.973°N, 88.37°E], 3000 ft, 1 Apr 1912 (fl), *G.H. Cave s.n.* (A, E); [Darjiling District], Pankhabari, [26.833°N, 88.266°E], 2500 ft, 15 Apr 1913 (fl), *C.C. Lacaita H.III.588* (BM, P); [Darjiling District], Sivoke Tarai [=Sivoke Forest], [26.853°N, 88.464°E], 1 Sep 1920 (fl), *G.H. Cave s.n.* (A); Jalpaiguri District, Latagiri [=Lataguri], [26.706°N, 88.766°E], 15 Mar 1932 (fl), *R.N. Parker 3221* (A); [Jalpaiguri District], Mal River, Dumony [?] Terai, E of Teesta [River], [26.85°N, 88.75°E], Mar 1875 (fl), *J.S. Gamble 3146A* (K); Jalpaiguri District, Muraghat [=Maraghat] Sal Forest, [26.735°N, 88.989°E], 7 Apr 1893 (fl), *H.H. Haines 357* (E). **State unknown:** [Baboonie Jh?], Mar 1873 (fl), *J.S. Gamble 3147A* (K); Eastern Himalaya, (fl), *W. Griffith 3672* (P); Eastern Himalaya, Lal, 4000 ft, 2 Jun 1919 (fl), *G.H. Cave s.n.* (A, E); Eastern Himalaya, Mallotar Tarai, 16 Apr 1912 (fl), *G.H. Cave s.n.* (A); Farseng, 4000 ft, 1 Jul 1913 (fr), *G.H. Cave s.n.* (E); Himalaya, (fl/fr), *W. Griffith 3672* (P); Ind. orient., (fr), *J.O. Voigt 263* (C); Ind. orient., (fr), *J.O. Voigt s.n.* (C); Peninsula Indiae Orientalis, (fl), *R. Wight 1709* (K, L, P); Peninsula Indiae Orientalis, (fl), *R. Wight s.n.* (C); locality unknown, 2000 ft, 15 Jun 1850 (fr), *Anonymous s.n.* (K); locality unknown, Mar 1932 (fr), *C.G.G.J. van Steenis s.n.* (L); locality unknown, (fl), *F.J.H. von Mueller s.n.* (C); locality unknown, (fr), *F.M. Liebmann s.n.* (C); locality unknown, (fl), *Simon 66* (K); locality unknown, (fl/fr), *W. Roxburgh s.n.* (P).

LAOS. Louangphrabang: M. Ngoi [=Muang Ngoy], locality unknown, [20.709°N, 102.675°E], 450 m, 2 Apr 1932 (fl), *E. Poilane 20594* (P); M. Ngoi [=Muang Ngoy], locality unknown, [20.709°N, 102.675°E], 450 m, 2 Apr 1932 (fl), *E. Poilane 20611* (L, P[3]). **Oudomxai:** between Boun Tay [=Boun Tay] and B. Long [=Ban Long], [20.605°N, 102.009°E], 500–600 m, 14 May 1936 (fr), *E. Poilane 26100* (P[2]). **Phongsali:** [Muang Boun Tai], Bun Tai, [21.446°N, 101.982°E], 1500 m, 8 May 1936 (fl), *E. Poilane 26010* (P[2]). **Xiangkhoang:** [Muang Thathom], Tawiang [=Thaviang], [19.033°N, 103.401°E], 400 m, 5 Apr 1932 (fl), *A.F.G. Kerr 20907* (BM, K, P); [Muang Thathom], Tawiang [=Thaviang], [19.033°N, 103.401°E], 400 m, 6 Apr 1932 (fl), *A.F.G. Kerr 20917* (K, P).

MYANMAR. Kachin State: Myitkyina District, Tamu–Chipwi Path, [25.884°N, 98.132°E], 700 ft, 25 Mar 1938 (fl), *W.D. Kermod 16640* (K); North Trangle, 3000 ft, 24 Mar 1953 (fl), *F. Kingdon Ward 22072* (A, BM); Pauhkoung, frontier of Tibet and Burma, 1 Apr 1926 (fl), *F. Kingdon Ward 6609* (K); [Putao District], Kajihitu [=Kajitu], 26°18'N, 97°50'E, 23 Apr 1939 (fl), *R. Kaulback 157* (E); Putao District, Naung Mong Township, E of U-rein GA road camp on trail from Atan Ga to Ba Gaw, 27°17'38"N, 97°51'47"E, 575 m, 7 Sep 2001 (fr), *B. Bartholomew et al. 8755* (CAS, KUN); [Putao District], Sumprabum Sub-Division, E of Hpuginhka [=Hpuginhka] Village, 26°40'N, 97°20'E, 4000 ft, 22 Feb 1962 (fr), *J. Keenan et al. 3694* (A); [Putao District], Sumprabum Sub-Division, eastern approaches from Sumprabum to Kumon Range, hills to the N of Hpuginhka [=Hpuginhka], 26°40'N, 97°20'E, 6000–8000 ft, 2 Jan 1962 (fr), *J. Keenan et al. 3128* (A). **Mandalay Division:** [Pyin Oo Lwin District], Mogok, [22.917°N, 96.5°E], Apr 1934 (fl), *F.G. Dickason 3049* (A); [Pyin Oo Lwin District], Mogok, [22.917°N, 96.5°E], May 1934 (fr), *F.G. Dickason 5035* (A). **Shan State:** Kengtung District, Pangwai, Kengtung State, [23.6°N, 98.867°E], 5000 ft, Apr 1938 (fl), *F.G. Dickason 9218* (A, L); [Kengtung District], Pangyang, Manglon State, [22.133°N, 98.8°E], 6000 ft, 16 Apr 1940 (fl), *F.G. Dickason 9763* (A); [Lashio District], northern Shan States, N. Hzenwi [=Hseni] State, Pukiang [?] Village, 2500 ft, 26 Apr 1914 (fl), *C.G. Rogers & E.V. Ellis s.n.* (E). **State/Division unknown:** north Burma, Chisben, 3000–4000 ft, 2 Apr 1939 (fl), *F. Kingdon Ward 474* (A); locality unknown, (fl), *S. Toppin 3041* (E).

NEPAL. Kosi: Sankhuwasabha District, Khandbari, 27°20'N, 87°10'E, 1300 m, 7 Jul 1988 (fr), *M. Suzuki et al. 8860068* (BM). **Mechi:** Ilam District, above Ilam, [26.909°N, 87.927°E], 5500 ft, 6 Jun 1969 (fl), *L.H.J. Williams 417* (BM); Jhapa District, forest by Ganjabari, [26.753°N, 87.966°E], 300 m, 31 Mar 1967 (fl), *D.H. Nicolson 3068* (BM); [Jhapa District], Ganjabari, 26°45'N, 87°58'E, 1000 ft, 1 Apr 1967 (fl), *J.D.A. Stainton 5748* (BM); [Jhapa District], N of Sanichare [=Sanisichare], 26°48'N, 88°0'E, 4000 ft, 23 Apr 1971 (fl), *J.D.A. Stainton 6824* (BM); Taplejung District, Tamur Valley, 27°24'N, 87°37'E, 4000 ft, 17 Apr 1967 (fl), *J.D.A. Stainton 5845* (BM).

THAILAND. Nan: Ban Tin, [18.768°N, 100.782°E], 1000 m, 2 Mar 1921 (fr), *A.F.G. Kerr 4986* (E); Ban Tin, [18.768°N, 100.782°E], 1200 m, 3 Mar 1921 (fl), *A.F.G. Kerr 4986A* (E); Ban Tin, [18.768°N, 100.782°E], 1000 m, 4 Mar 1921 (fl), *A.F.G. Kerr s.n.* (BM); Doi Tiu [=Doi Tio], N of Nan, [18.986°N, 100.71°E], 1100 m, 23 Jul 1992 (fl), *K. Larsen et al. 43489* (P).

COUNTRY UNKNOWN. Chima [?], 20 Jun 1850 (fr), *Anonymous 1141* (K).

10. *Styrax warburgii* Perkins in Engl., Pflanzenz. IV. 241 (Heft 30):27. 1907. TYPE: INDONESIA. [SULAWESI]: Poehara [= Pohara], [3.983°S, 122.391°E], 100 m, 3 Jun 1929, *G. Kjellberg 690* (NEOTYPE, designated here: BO [accession no. 399343]); ISONEOTYPE: BO not seen).

Styrax ledermannii Perkins, Notizbl. Bot. Gart. Berlin 10:457. 1928. TYPE: PAPUA NEW GUINEA: Hügellager am Sepik, 20–30 m, Jul 1913, *C.L. Ledermann 12298* (HOLOTYPE: B destroyed).

Styrax rostratus Hosok., Trans. Nat. Hist. Soc. Formosa 28:65. 1938. TYPE: PALAU. [MELEKEOR]: Ngaldok Colony [= Ngardok], [7.512°N, 134.603°E], 23 Aug 1937, *T. Hosokawa 9044* (LECTOTYPE, designated here: two sheets, TAI not seen—digital images [accession nos. 090264 and 119062]).

Shrubs or trees to 12 m tall. Young branchlets brown, with scattered to dense yellow appressed stellate trichomes; older branchlets reddish brown, glabrous. Petiole 5–10 mm long, with tightly appressed stellate

trichomes on abaxial surface, trichome arms up to 0.05–0.21 mm long. Two most proximal leaves on each shoot alternate. Lamina of fertile shoots 4.4–11.5 × 1.7–4.7 cm, those of sterile shoots to 12.5 × 5 cm, 1.7–3.4 × as long as wide, chartaceous, elliptic to lanceolate, at times oblique, rarely ovate; abaxial surface yellowish brown when dry, rarely olive green, with yellow stellate trichomes, trichome arms up to 0.1–0.4 mm long, pubescence scattered on whole surface, trichomes especially large and dense in axils of midvein and secondary veins, with largest trichomes along midvein; adaxial surface brown when dry, rarely dark green, with yellow stellate trichomes, trichome arms up to 0.05–0.17 mm long, pubescence scattered to nearly glabrous on whole surface, trichomes denser in midvein; base cuneate, occasionally acute; margin undulate and serrulate; apex short-acuminate to acute, occasionally acuminate; secondary veins 5 to 7 on each side of midvein, abaxially prominent, adaxially plane, midvein sunken, tertiary veins parallel, perpendicular to secondary veins, abaxially prominent, adaxially plane. Fertile shoots 5–17 cm long, 3- to 7-(to 10)-leaved. Lateral inflorescences racemose, 1.1–3.9 cm long, 1- to 5-flowered; pseudoterminal inflorescences racemose, rarely subpaniculate, with well-spaced nodes, 1.8–6.1 cm long, 4- to 12-flowered, rachis yellow, completely covered with stellate trichomes. Pedicel 3–10 mm long, with dense long-armed yellowish brown erect stellate trichomes; bracteoles 1.1–3.3 mm long, linear or subulate, positioned on basal half of pedicels. Flowers 0.8–1.6 cm long. Calyx 3–5 × 3–5 mm, cupuliform; abaxially faintly striate with dense short-armed yellow appressed stellate trichomes and scattered long-armed yellow to yellowish brown erect stellate trichomes, occasionally with trichomes becoming less dense towards calyx margin, trichome arms up to 0.11–0.38 mm long; adaxially brown with scattered 2- or 3-armed trichomes; margin with 5(or 6) evenly distributed teeth 0.2–1 mm long; marginal teeth deltoid or obtuse, contiguous, densely pubescent on both surfaces. Corolla 0.9–1.4 cm long, white, tube 2.1–4.5 mm long, abaxial surface proximally glabrous and distally scattered with stellate trichomes, lobes 5(or 6), 6.4–8.9 (–11.4) × 1.7–3 mm, chartaceous, oblong to lanceolate, apex acute, abaxially completely covered with pale yellow appressed stellate trichomes, occasionally becoming sparser towards tube, adaxially glabrous except margins or with sparse 2- or 3-armed trichomes. Stamens 10(or 12); filaments 2.6–3.7 mm long, straight, of equal width throughout, proximally dense with stellate trichomes, distally glabrous, rarely with stellate trichomes extending along nearly whole filament; anthers (2–)2.6–4.9 mm long, wider than distal portion of filament, with yellow stellate trichomes; connective with yellow stellate trichomes. Style 1–1.4 cm long, proximally dense with white stellate trichomes, distally glabrous; stigma 0.2–0.4 mm wide, punctiform, rarely capitate. Fruiting calyx 3–5 × 4–6 mm, funnellform. Fruit 1–2.2 × 0.5–0.8(–1) cm, indehiscent or rarely showing signs of partial dehiscence at base of fruit (dried material), obliquely and narrowly ellipsoid, apex rostrate or rarely pointed, rostrum up to 6 mm long; pericarp dry, 0.23–0.35 mm thick, outside smooth, slightly striate around rostrum, with dense yellowish brown appressed stellate trichomes, inside with scattered stellate trichomes, smooth to rugose. Seeds light brown to brown, ellipsoid, rugose, with dense stellate trichomes.

Illustrations.—Steenis 1932: 222, fig. 3 (4) (as *S. agrestis*); *ibid.*: 242, fig. 5 (as *S. agrestis*); Steenis 1949:51, fig. 2, fruit in top row, second from right, fig. 3 (as *S. agrestis*); Croft 1981:266, fig. 62 (as *S. agrestis*).

Phenology.—Flowering: January–December. Fruiting: January–December.

Distribution.—Indonesia (East Kalimantan, Maluku, Papua, Southeast Sulawesi, and West Papua), Micronesia (Kosrae), Palau (Melekeok), Papua New Guinea (Bougainville, East New Britain, Manus, Milne Bay, Morobe, New Ireland, Southern Highlands, West New Britain, and Western Province), and Solomon Islands (Choiseul, Guadalcanal, Isabel, and Western Province); Fig. 8.

Habitat.—In a variety of dense forests, mountain ridges, swampy forests and rainforests, growing on limestone, schist, or red clay soil; 0–1676 m.

Vernacular names.—Aigasi (Solomon Islands, Guadalcanal Province; *B. Sirute'e* 9885); ai-gasi (Solomon Islands, Guadalcanal Province; *E.J.H. Corner* 78); aingasi (Solomon Islands, Choiseul Province; *I.H. Gafui* 17564); berwewa (Indonesia, Daj. Koetai; Steenis 1949); born-borna (Solomon Islands, Guadalcanal Province; *S.F. Kajewski* 2499); kaju abu (Indonesia, Daj. Koetai; Steenis 1949); kakase (Papua New Guinea, Southern Highlands Province; *W.N. Takeuchi* 9177); kapata (Papua New Guinea, Bougainville Province; *J.H.L. Waterhouse* 565); kaviso (Papua New Guinea, Bougainville Province; *J.H. L. Waterhouse* 692-B); mamagili

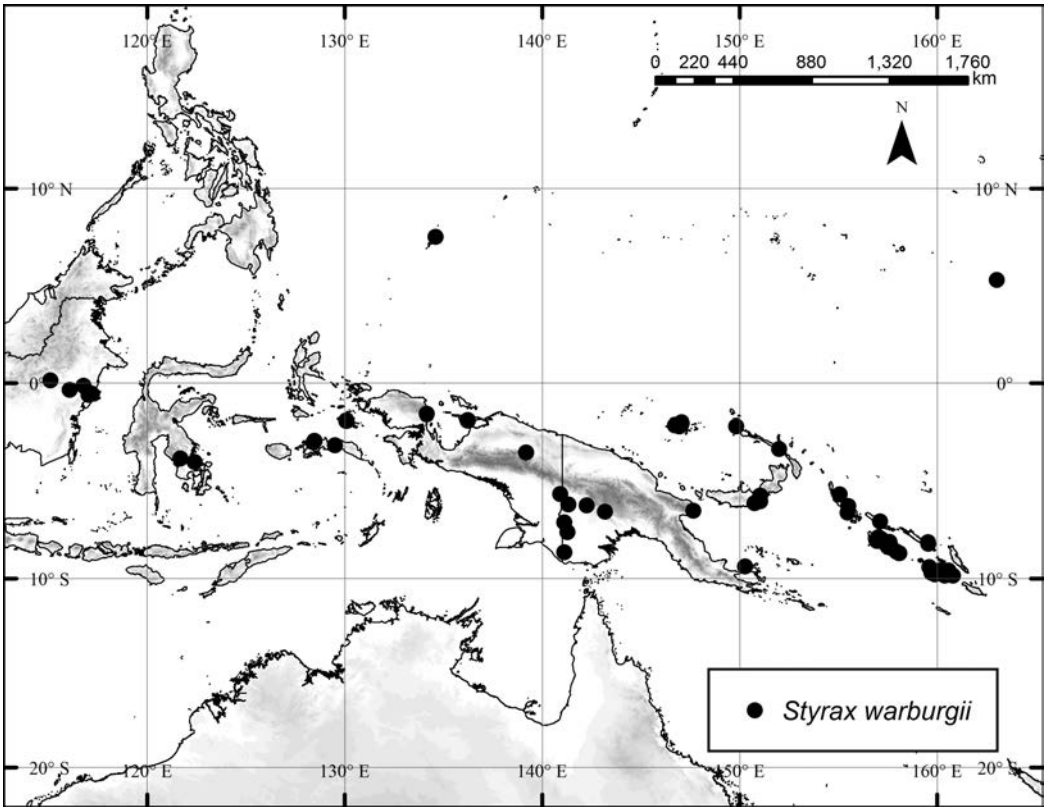


FIG. 8. Geographic distribution of *Styrax warburgii*.

(Solomon Islands, Isabel Province; *L.J. Brass 3261*); mlel (Papua New Guinea, West New Britain Province; *C.D. Sayers 21993*); mor (Indonesia, Provinsi Papua; *Anta 32*); papunti (Indonesia, SE Borneo; *Steenis 1949*).

Conservation assessment.—*Styrax warburgii* is the only species of *S. series* *Cyrta* with valvate corolla aestivation in Malesia. It occurs from Borneo east to the Solomon Islands, with outlier populations in Palau and Kosrae, Micronesia. Collections have been made from > 60 geographic localities spanning an area with an EOO of 7,230,563 km². Even if the EOO were to be reduced to take into account areas where *S. warburgii* has not been collected, the geographic distribution would remain large. There appears to be a significant amount of suitable habitat for *S. warburgii* throughout its distribution and it is also locally abundant in some areas (notes on some specimens remark on its common occurrence, e.g., *D.R. Pleyte 943*). We therefore categorize this species as Least Concern (LC).

Discussion.—*Styrax warburgii* resembles *S. agrestis* in morphology, the main differentiating feature being that *S. warburgii* has slightly thicker fruit walls. For further discussion of the species, see the entry for *S. agrestis*.

Hosokawa (1938) differentiates *Styrax rostratus* from *S. warburgii* by the presence of glabrous 10-veined leaves and larger flowers. Upon inspecting a digital image of the holotype material, however, we do not consider the flowers to be particularly larger. Furthermore, laminar pubescence is highly variable within most species of the study group. Some specimens of *S. warburgii* possess glabrous leaves. Also, the number of veins on *Styrax* leaves always exhibits a range of variation, and so the 10-veined leaves cited as a differentiating

character can be discounted. We therefore synonymize *S. rostratus* with *S. warburgii*, although in-person examination of the holotype is desirable.

In the protologue of *Styrax warburgii*, Perkins (1907) cites *O. Warburg 16364* as the type. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that *O. Warburg 16364* was destroyed then. Because there is no known duplicate of this specimen, we have designated a neotype for this name. The locality of *O. Warburg 16364*, as indicated in the protologue, is Manipi, South Sulawesi. We were unable to examine any specimens from Manipi, but we did examine two other specimens from Sulawesi. Although one of the specimens, *M. Coode 6147*, is from a locality that is slightly closer geographically to Manipi, *G. Kjellberg 690* has both fruits and flowers preserved, so we have selected *G. Kjellberg 690* as the neotype. Two sheets of *G. Kjellberg 690* are housed at BO but we were only able to examine the sheet with accession number BO 399343, so we have selected that specimen as the neotype.

In the protologue of *Styrax ledermannii*, Perkins (1928) cites *C.L. Ledermann 12298* as the type. Much of the material Perkins examined was located at B and destroyed during World War II; we presume that *C.L. Ledermann 12298* was destroyed then. Steenis (1932) describes the Ledermann material as differing only in possessing longer white stellate hairs on the inflorescences. However, van Steenis regards this only as part of continuous variation within the species, noting that specimens representing an intermediate between the two forms of pubescence have been collected; he thus synonymized *S. ledermannii* with *S. agrestis* in *The Styracaceae of Netherlands India*. Van Steenis's concept of *S. agrestis* included *S. warburgii*, whereas we are recognizing these as distinct species, as discussed under *S. agrestis*. Based on van Steenis's justification of synonymy and because the distribution of *S. warburgii* encompasses the locality of the type of *S. ledermannii*, we provisionally place *S. ledermannii* in synonymy of *S. warburgii* until a duplicate of the type of *S. ledermannii* can be located.

In the protologue of *Styrax rostratus*, Hosokawa (1938) cites *T. Hosokawa 9044* as the type but does not state clearly in which herbarium the specimen is deposited. Although we have only located one specimen of *T. Hosokawa 9044*, we cannot be sure that this is the only specimen of that gathering. As we have mentioned in the discussion about the typology of *S. fukienensis* (= *S. confusus*), the specimen we have seen can only be regarded as a syntype. We thus designate the TAI specimen of *T. Hosokawa 9044* as the lectotype because TAI is the herbarium where Hosokawa deposited his types. It is the only specimen of the type material that we have seen.

Additional specimens examined. **INDONESIA. Kalimantan Timur:** a long road Lojanan [=Loa Janan] to Tenggarong of km. 6, [0.586°S, 117.023°E], 26 Oct 1995 (fl/fr), *Ambri et al. 1400* (K, P); Midden Oest Borneo, Ond. Afd., W. Koetei [=Kutai], Sabentoloeng [=Sabintulung], [0.117°S, 116.773°E], 10 m, 20 Jun 1925 (fl), *F.H. Endert 1543* (BO, L, P); Midden Oest Borneo, Ond. Afd., West-Koetei [=Kutai], [0.148°N, 115.092°E], 10 m, 29 Jun 1925 (fr), *F.H. Endert 1741* (A, L); S.O. Borneo, M. Pahu [=Muara Pahu], [0.326°S, 116.06°E], 4 Aug 1908 (fl), *H.J.P. Winkler 3140* (BM, L); Sungai pedang Kota bangun ulu, Samarinda, [0.502°S, 117.154°E], 20 m, 23 Feb 1992 (fr), *Ambri & Arifin 442* (L). **Maluku:** Ceram [=Seram Island], [3.133°S, 129.5°E], (fl), *H.L.B. 0* (L); Ceram [=Seram Island], [3.133°S, 129.5°E], (fl/fr), *H.L.B. 0* (L); Ceram [=Seram Island], [3.133°S, 129.5°E], (fr), *H.L.B. 0* (L); Ceram [=Seram Island], [3.133°S, 129.5°E], 1859–1860 (fl), *W.H. de Vriese & J.E. Teijsmann s.n.* (L); NW Seram, Wai Hanou[?], [3.133°S, 129.5°E], 15 Oct 1910 (fl/fr), *L.M.R. Rutten 1791* (L); W Seram, Riring, [2.982°S, 128.422°E], 600–700 m, 30 Sep 1918 (fl), *L.M.R. Rutten 1731* (L); W Seram; along a trail between Buria and the foot of Mt. Batu Putih until Wae (River) Mala, Kecamatan (District) Taniwel, 02°54'S, 128°28'E, 350–500 m, 4 Feb 1985 (fl/fr), *M. Kato et al. 5825* (L, TI). **Papua:** Bernhard biv. [=Bernhard Camp], [3.498°S, 139.185°E], 50 m, 20 Jul 1938 (fl), *E. Meijer Drees 256* (L); Bernhard biv. [=Bernhard Camp], [3.498°S, 139.185°E], 50 m, 20 Jul 1938 (fr), *E. Meijer Drees 256* (L); Bernhard Camp, Idenburg River [=Taritatu River], [3.498°S, 139.185°E], 50 m, Apr 1939 (fl), *L.J. Brass 13820* (A, L); Bernhard Camp, Idenburg River [=Taritatu River], [3.498°S, 139.185°E], 50 m, Apr 1939 (fl/fr), *L.J. Brass 13953* (A, L); biv. Sakaj, 15 m, 5 Jul 1941 (fl), *Anta 32* (L); division South New Guinea, subdivision Moejoe, Opka; +-10km. NE from Ninati, [5.634°S, 140.908°E], 50 m, 13 Mar 1959 (fr), *C. Kalkman 6472* (A, L); Jappen [=Yapen] - Biak. Antam near Seroei [=Serui], [1.878°S, 136.237°E], 29 Jul 1939 (fl/fr), *Aet & Idjan 210* (L); Jappen [=Yapen] - Biak. Antam near Seroei [=Serui], [1.878°S, 136.237°E], 29 Jul 1939 (fr), *Aet & Idjan 210* (K); Jappen [=Yapen] - Biak. Semimi near Seroei [=Serui], [1.878°S, 136.237°E], 3 Aug 1939 (fl/fr), *Aet & Idjan 320* (L); N. Guinea bij Prauwen bivak, 18 Aug 1920 (fl), *H.J. Lam 811* (K, L). **Papua Barat:** Sorong, Misool, Blowpo Mountains, [1.895°S, 130.084°E], 100 m, 19 Sep 1948 (fl), *D.R. Pleyte 943* [L.2]; Waren, 60 mi S of Manokwari, [1.547°S, 134.158°E], 400 m, 26 Mar 1940 (fl/fr), *R. Kanehira & S. Hatusima 13095* (A). **Sulawesi Tenggara:** Kolaka area, Gn. Watuwila foothills, above Sanggona, Gn. Sopura, 3°49'S, 121°40'E, 1500 m, 4 Nov 1989 (fl), *M.J.E. Coode 6147* (A, L).

MICRONESIA. Kosrae: Mt. Keies, Mallens [=Malem?], Kusaie [=Kosrae], [5.289°N, 163.024°E], 23 Aug 1938 (fl/fr), *T. Hosokawa 9496* (L). **Province unknown:** locality unknown, (fl), *R. Kanehira 5017* (TI).

PALAU. Melekeok: Babeldaob, Gardok [=Lake Ngardok], [7.513°N, 134.604°E], 17 Apr 1938 (fl), *S. Hatusima 5017* (A). **PAPUA NEW GUINEA. Bougainville:** Iru, [6.58°S, 155.47°E], 30 Sep 1931 (fl), *J.H.L. Waterhouse 565* (K); Iru, [6.58°S, 155.47°E], 30 Sep 1931 (st), *J.H.L. Waterhouse 565* (L); NE Bougainville, Namatoa, [5.642°S, 155.072°E], 1500 ft, 7 Mar 1932 (fl/fr), *J.H.L. Waterhouse 692-B* (A); NE Bougainville, Namatoa, [5.642°S, 155.072°E], 1500 ft, 7 Mar 1932 (fl/fr), *J.H.L. Waterhouse 692-B* (L); Pavairi, 6°15'S, 155°30'E, 2700 ft, 23 Jan 1967 (fl/fr), *P. Lavarack & C.E. Ridsdale 31105* (L); Pavairi, 6°15'S, 155°30'E, 2700 ft, 23 Jan 1967 (fr), *P. Lavarack & C.E. Ridsdale 31105* (A). **East New Britain:** S/Dist. Pomio, near helicopter pad on lower slopes of Mt. Lululua, 5°43'S, 151°02'E, 1065 m, 4 May 1973 (fl), *P.F. Stevens & Y. Lelean 58213* (A); S/Dist. Pomio, near helicopter pad on lower slopes of Mt. Lululua, 5°43'S, 151°02'E, 1065 m, 4 May 1973 (fl/fr), *P.F. Stevens & Y. Lelean 58213* (L). **Manus:** Admiralty Islands, Derimbat, [1.986°S, 147.065°E], 100 m, 2 Jul 1973 (fr), *D.B. Foreman 52403* (K, L); Admiralty Islands, lower part of Mt. Dremsel Road, 2°10'S, 149°50'E, 30 m, 24 Oct 1974 (fr), *D.B. Foreman & P. Katik 59121* (A, L, MO); Lorengau Sub-province, Buyang, 2°43'0"S, 147°3'E, 530 m, 7 Mar 1981 (fl), *K. Kerenga & J.R. Croft 77262* (A, L); Lorengau Sub-province, Peleu, Base of Mt. Dremsel, 2°9'40"S, 146°56'E, 25 Mar 1981 (fl/fr), *K. Kerenga 77510* (A, L); Manus Island, Pelikawa, 2°7'S, 146°44'E, 0 m, 25 Jun 1971 (fl), *B.C. Stone & H. Streimann 10489* (L); Manus Island, Wili River above Pelikawa, 2°7'S, 146°44'E, 500 ft, 24 Jun 1971 (fr), *B.C. Stone & H. Streimann 10474* (K, L); Pirikawa, 2°10'S, 146°57'E, 0 ft, 21 Jun 1971 (fl/fr), *G. Argent 1109* (A, L). **Milne Bay:** Goodenough Island, [9.367°S, 150.267°E], 900 m, 25 Oct 1953 (fl), *L.J. Brass 24933* (A); Goodenough Island, [9.367°S, 150.267°E], 800 m, 26 Oct 1953 (fl/fr), *L.J. Brass 24994* (A). **Morobe:** Nordostliches Neu-Guinea, Sattelberg, Yoangen, to Mongi River, [6.485°S, 147.646°E], 3500 ft, 15 Jun 1937 (fr), *Clemens 6613* (A, L). **New Ireland:** Bismarck Archipelago, New Ireland (Neu-Mecklenberg), Ugana District, Abhang des Selet Gebirges, [3.33°S, 152°E], 150 m, 12 May 1938 (fl), *G. Peckel 106* (BO, L). **Southern Highlands:** cleared ground near Waro 'airstrip', along track to Yorokobain Village, 6°32'S, 143°11'E, 425 m, 10 Sep 1993 (fl/fr), *W.N. Takeuchi 9177* (L). **West New Britain:** New Britain, Gasmata Subdistrict, Torlu River, 6°0'S, 151°02'E, 4800 ft, 24 Mar 1965 (fl), *C.D. Sayers 24192* (A, L); New Britain, Kandrian Subdistrict, Pirlong Village, 6°06'S, 150°45'E, 1300 ft, 14 Mar 1965 (fl/fr), *C.D. Sayers 21993* (A, L). **Western:** Agu River branch of the middle Fly River, [7.083°S, 141.117°E], 50 ft, 29 Sep 1967 (fl), *R. Pullen 7405* (A, L); Bensbach Sub-district, near Weam, 8°38'S, 141°7'E, 100 ft, 16 Aug 1967 (fl), *C.E. Ridsdale & M. Galore 33743* (A, L); Kiunga Sub-District, W side of Kiunga Airstrip, 6°10'S, 141°20'E, 70 ft, 24 Aug 1971 (fl), *D.B. Foreman & P. Katik 52010* (E); Kiunga Sub-District, W side of Kiunga Airstrip, 6°10'S, 141°20'E, 70 ft, 24 Aug 1971 (fl/fr), *D.B. Foreman & P. Katik 52010* (L); Lake Daviumbu, Middle Fly River, [7.6°S, 141.283°E], Aug 1936 (fl), *L.J. Brass 7565* (A, L); Subprovince Nomad, Nomad Station, 06°13'S, 142°15'E, 100 m, 17 Apr 1978 (fr), *K. Kerenga & Y. Lelean 73907* (A, E, L).

SOLOMON ISLANDS. Choiseul: NW Choiseul, Ghaghara area, [7.048°S, 157.114°E], 25 ft, 14 Nov 1969 (fr), *I.H. Gafui 17564* (K, L). **Guadalcanal:** E Guadalcanal, Makina area, [9.842°S, 160.809°E], 70 ft, 19 Sep 1968 (fr), *R. Mauriasi 11226* (K, L); E Guadalcanal, Makina area, Marau, [9.842°S, 160.809°E], 1020 ft, 20 May 1968 (fl/fr), *I.H. Gafui 9490* (K, L); Gold Ridge, [9.583°S, 160.133°E], 2000 ft, 16 Oct 1962 (fl/fr), *T.C. Whitmore 652* (L); NE Guadalcanal, Rere River, c. three miles inland, [9.571°S, 160.587°E], 20 Nov 1963 (fr), *Z. Lipaqeto 3347* (K, L); SE Guadalcanal, Aligavata [=Aliuaghato] River (Avu Avu), [9.844°S, 160.387°E], 200 ft, 31 May 1968 (fl/fr), *B. Sirute'e 9885* (L); SW Guadalcanal, Duidui [=Nduindui] area, [9.779°S, 159.885°E], 400 ft, 7 Oct 1968 (fl/fr), *H. Farodo 12016* (L); SW Guadalcanal, Lambi Bay area, [9.4°S, 159.6°E], 160 ft, 1 Nov 1968 (fr), *H. Farodo 12368* (L); SW Guadalcanal, Wanderer Bay area, [9.69°S, 159.712°E], 25 Oct 1968 (fl), *R. Mauriasi 12305* (K); SW Guadalcanal, Wanderer Bay area, [9.69°S, 159.712°E], 25 Oct 1968 (fl/fr), *R. Mauriasi 12305* (L); Tambalusu, [9.667°S, 160.117°E], 2500 ft, 20 Oct 1965 (fr), *E.J.H. Corner 78* (A, L); Tambalusu, [9.667°S, 160.117°E], 2000 ft, 20 Oct 1965 (fr), *E.J.H. Corner 83* (A, L); Vulolo, Tutuve Mountain, [9.65°S, 160.183°E], 1200 m, 14 Apr 1931 (fr), *S.F. Kajewski 2499* (A, L); W Guadalcanal, Vuragoba area, Wanderer Bay, [9.69°S, 159.712°E], 90 m, 1 Apr 1968 (fr), *I.H. Gafui 9060* (K, L). **Isabel:** Isabel Island, Mt. Marescott [=Marescot], [8.2°S, 159.55°E], 1000 m, 2 Dec 1932 (fl/fr), *L.J. Brass 3261* (A, L); Santa Ysabel, Maringe Lagoon, near Tiratona Village, [8.11°S, 159.544°E], 22 Oct 1963 (fl), *T.C. Whitmore 2306* (K, L); Santa Ysabel, Maringe Lagoon, near Tiratona Village, [8.11°S, 159.544°E], 1600 ft, 23 Oct 1963 (fl), *T.C. Whitmore 2339* (L). **Western:** E of Kolombangara, Bambari [=Mbambare] Harbour area, [8.058°S, 157.188°E], 120 ft, 20 Dec 1967 (fr), *R. Mauriasi 8551* (L); Kolombangara, [7.967°S, 157.067°E], 5500 ft, 2 Sep 1965 (fl), *E.J.H. Corner 1194* (A); Kolombangara, [7.967°S, 157.067°E], 5500 ft, 2 Sep 1965 (fl/fr), *E.J.H. Corner 1194* (L); N Kolombangara, Shoulder Hill area, [7.914°S, 157.125°E], 1000 ft, 23 Jan 1968 (fl), *R. Mauriasi 8761* (L); N Kolombangara, Shoulder Hill area, [7.914°S, 157.125°E], 1300 ft, 17 Jun 1968 (fr), *R. Mauriasi 11480* (L); NE Kolombangara, Kokove area, [7.95°S, 157.183°E], 200 ft, 10 Jan 1968 (fr), *R. Mauriasi 7605* (K, L); New Georgia Group, Kolombangara Island, west coast, inland from Iri Iri [=Iririri] Village (Merusu Cove), [8.039°S, 156.958°E], 4000 ft, 27 Sep 1963 (fr), *T.C. Whitmore 2069* (L); New Georgia Group, north coast of Kolombangara Island, Rei Cove, [7.853°S, 157.033°E], 500 ft, 23 Feb 1963 (fl), *T.C. Whitmore 1546* (L); New Georgia Group, Roviana Lagoon, Baharo River near Nusahope Village, [8.277°S, 157.469°E], 19 Sep 1963 (fl/fr), *T.C. Whitmore 1953* (K, L); New Georgia Group, Vangunu Island, ridge rising from Gevala [=Nggevala] River at its upper navigable point, [8.683°S, 158.083°E], 12 Dec 1962 (fr), *T.C. Whitmore 1243* (K, L); NW Kolombangara, Rei area, [7.853°S, 157.033°E], 40 ft, 1 Jul 1968 (fl), *R. Mauriasi 11606* (L); NW New Georgia, Hovoro, [8.087°S, 157.596°E], 445 ft, 3 Sep 1964 (fl), *Cowmeadow 3798* (L); NW New Georgia, Kimbukimbu River, [8.233°S, 157.617°E], 250 ft, 30 Oct 1964 (fl/fr), *Cowmeadow 3234* (L); NW New Georgia, Kimbukimbu River, [8.233°S, 157.617°E], 250 ft, 30 Oct 1964 (fr), *Cowmeadow 3234* (K); SE New Georgia, Chochole (Vangunu), [8.6°S, 157.95°E], 5 ft, 26 Jul 1965 (fl/fr), *L. Maenu'u 6462* (K); SE New Georgia, Chochole (Vangunu), [8.6°S, 157.95°E], 5 ft, 26 Jul 1965 (fr), *L. Maenu'u 6462* (L); SE New Georgia, Tita River, [8.25°S, 157.5°E], 15 ft, 15 Jun 1965 (fl/fr), *L. Maenu'u 6015* (L); W Kolombangara, Rei area, [7.853°S, 157.033°E], 155 ft, 8 Feb 1968 (fr), *I.H. Gafui 8951* (K, L).

COUNTRY UNKNOWN. [Possibly from Borneo], 1843–1860 (fl), *T. Lobbs s.n.* (BM).

11. *Styrax wuyuanensis* S.M. Hwang, *Acta Phytotax. Sin.* 18:160. 1980. TYPE: CHINA. HUNAN: Wuyuan Xian, Chetian Cun, [29.452° N, 117.735° E], 6 Apr 1959, *Q.H. Li & C. Chen 183* (HOLOTYPE: LBG not seen—digital image [barcode 00011688!]; ISOTYPES: IBSC not seen, PE not seen—digital image [barcode 00974954!]).

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Shrubs to 3 m tall. Young branchlets brown, with appressed yellow stellate trichomes; older branchlets brown, glabrous. Petiole 2–6 mm long, sparse with yellow stellate trichomes, trichome arms to 0.07–0.17 mm long. Two most proximal leaves on each shoot subopposite. Lamina of fertile shoots 3.4–6.6 × 1.4–2.9 cm, those of sterile shoots to 7.2 × 2.9 cm, 2–2.6 × as long as wide, chartaceous, rhombic, occasionally elliptic-rhombic; abaxial surface grayish brown when dry, with yellow stellate trichomes, trichome arms to 0.07–0.12 mm long, sparse on whole surface; adaxial surface dark brown to brownish green when dry, with yellowish brown stellate trichomes, trichome arms to about 0.08 mm long, pubescence sparse along midvein; base acute to cuneate; margin dentate-serrate; apex acute to short-acuminate; secondary veins 5 to 7 on each side of midvein, abaxially prominent, adaxially plane, tertiary veins reticulate, abaxially and adaxially plane. Fertile shoots 3.5–6.6 cm long, 3- or 4-leaved. Lateral inflorescences solitary, 1.4–1.9 cm long; pseudoterminal inflorescences racemose, 2.6–2.8 cm long, 1- to 3-flowered, rachis dark brown, sparse with short-armed stellate trichomes. Pedicel 12–17 mm long, dark brown, sparsely pubescent with short-armed stellate trichomes; bracteoles about 1 mm long, linear-lanceolate. Flowers 1–1.7 cm long. Calyx about 3 × 4–5 mm, cupuliform; abaxially dark brown becoming lighter near margins, subglabrous, arms of trichomes to 0.13–0.14 mm long; adaxially subglabrous; margin glandular with 5 or 6 unevenly distributed teeth 0.3–0.5 mm long; marginal teeth deltoid, not contiguous, glabrous on both surfaces. Corolla white, tube about 3 mm long, lobes 5, 10–12 × 1.8–4.5 mm, lanceolate or ovate-lanceolate, apex acute, abaxially densely yellow stellate tomentose, adaxially glabrous. Stamens 10; filaments proximally dense with stellate trichomes, distally glabrous; anthers 4–6 mm long. Style about 1.4 cm long, glabrous; stigma capitate. Fruiting calyx 4–5 × 5–7 mm, funnellform. Fruit 0.6–1.1 × 0.5–1 cm, dehiscent, dehiscing from apex to base, ovoid, apex pointed; pericarp dry, outside smooth, completely covered with yellow stellate trichomes.

Illustrations.—Hwang 1980:160, pl. 3; Hwang 1987b:103, pl. 35 (7–13); Zheng 1989:92, fig. 5-121; Liu 1991:67, fig. 1770; Wu & Raven 2000:204, fig. 204 (8–14); He 2006:891, fig. 1269.

Phenology.—Flowering: April. Fruiting: May, July.

Distribution.—China (Anhui, Jiangxi, and Zhejiang); Fig. 4.

Habitat.—In forests and thickets, occasionally in open rocky areas, on sunny hillside slopes and valleys, along streams and roadsides, on damp soil; 450–540 m.

Vernacular names.—Gou luan zi (China, Zhejiang; *S.Y. Zhang 26071*); wan-gan-an-xi-xiang (China, Anhui; Liu 1991); wu-yuan-an-xi-xiang (China; Hwang & Grimes 1996).

Conservation assessment.—*Styrax wuyuanensis* is a narrowly distributed endemic known to us from only eight localities in China: five in Jiangxi, two in Zhejiang, and one in Anhui. The EOO is 1,556 km² and AOO is 28 km², and none of the collections appear to be from protected areas. The last known collections of this species were made in 1959. From satellite imagery in Google Maps, two of the localities, both in Jiangxi, are under threat of possible deforestation from encroaching agriculture or increasing urbanization in the area; we thus propose one location for this area under the threat of possible deforestation. This species tends to occur in valleys and by riversides, where the most deforestation in the area has occurred. We treat the other six localities that are not under an immediate plausible threat as four separate subpopulations, for a total of five locations. We therefore propose to categorize this species as Endangered (EN): B2ab(iii).

Discussion.—*Styrax wuyuanensis* is only known from the border region of Zhejiang, Jiangxi, and Anhui. It can easily be distinguished from all the other members of *S. series Cyrta* with valvate corolla aestivation by its subglabrous calyx and pedicel. Because we were only able to examine a single physical fruiting specimen, the description was supplemented with measurements from the protologue.

Additional specimen examined. **CHINA. Zhejiang:** Kaihua Xian, locality unknown [29.144°N, 118.411°E], 27 May 1959 (fr), *Zhejiang Bot. Resource Team 26071* (MO).

Excluded Name

Styrax faberi var. *acutiserratus* Perkins in Engl., *Pflanzenr.* IV. 241 (Heft 30):34. 1907. TYPE: CHINA. SICHUAN OR HUBEI: *E.F.L. Faber* s.n. (HOLOTYPE: B destroyed).

We have located no material referable to this name, and the holotype has likely been destroyed, because much of the material Perkins examined was located at B and destroyed during World War II. This variety was previously synonymized with *S. faberi* by Hwang (1980). In the protologue, however, it is described as having imbricate corolla lobes. We thus remove this name from synonymy and exclude this name from our treatment.

APPENDIX 1

List of species.

- | | |
|---|--|
| 1. <i>Styrax agrestis</i> (Lour.) G. Don | 6b. <i>Styrax formosanus</i> var. <i>hirtus</i> S.M. Hwang |
| 2. <i>Styrax bracteolatus</i> Guillaumin | 7. <i>Styrax fortunei</i> Hance |
| 3. <i>Styrax confusus</i> Hemsl. | 8. <i>Styrax rubifolius</i> Guillaumin |
| 4. <i>Styrax faberi</i> Perkins | 9. <i>Styrax serrulatus</i> Roxb. |
| 5. <i>Styrax finlaysonianus</i> Wall. ex G. Don | 10. <i>Styrax warburgii</i> Perkins |
| 6a. <i>Styrax formosanus</i> Matsum. var. <i>formosanus</i> | 11. <i>Styrax wuyuanensis</i> S.M. Hwang |

APPENDIX 2

Index to exsiccatae.

All specimens examined by the authors are listed alphabetically by collector followed by collection number and, if collectors or collection numbers are unknown, by the herbarium or herbaria in which the specimen is deposited. Numbers in parentheses correspond to those in the numerical list of species. Numbers in brackets correspond to the number of specimens deposited in the herbarium they follow. If more than two persons participated in the collection, only the first collector listed on the label is cited. Collections with only a date indicated do not have a collection number; for these, herbarium acronyms are indicated to help distinguish them from other collections by the same collector that are also lacking a collection number.

86 Expedition Team 1208 (9).

Aet & Idjan 210 (10); 320 (10). A.C. d'Alleizette in Jun 1908 (2) (L); in Jul 1908 (1?) (L); in Jun 1909 (9?) (P[2]). A. Allison 55 (3). Ambri & Arifin 442 (10). Ambri et al. 1400 (10). J. Anderson in 24 Apr 1868 (9) (K). Y. Ando et al. 341 (6a). Anhui Team 1355 (7); 1613 (7); 2714 (11). Anonymous in 2 Jul 1830 (9) (K); in 15 Jun 1850 (9) (K); in 13 May 1974 (7) (KUN); s.n. (6a) (A); 196 (3) (A); 517 (4) (A); 1431 (3) (KUN); 1667 (3) (KUN); 1720 (3) (KUN); 1744 (3) (KUN); 1964 (4) (KUN); 2245 (3) (KUN); 2384 (3) (KUN); 2646 (3) (KUN); 2732 (3) (KUN); 2845 (6a) (KUN); 3202 (3) (KUN); 3205 (3) (KUN); 3450 (3) (KUN); 3656 (3) (KUN); 3822 (4) (KUN); 3907 (3) (KUN); 4119 (3) (KUN); 4163 (3) (KUN); 4194 (3) (KUN); 4507 (3) (KUN); 4693 (3) (KUN); 5003 (3) (KUN); 91104 (7) (KUN). Anta 32 (10). G. Argent 1109 (10).

H.L.B. 000 (10). L.H. Bailey in 13 Jun 1917 (7) (A). B. Balansa 4357 (1). S.Y. Bao 885 (9). S.P. Barchet s.n. (3) (MO). B. Bartholomew & D.E. Boufford 3951 (9); 6219 (6a). B. Bartholomew et al. 8755 (9). H.H. Bartlett 6036 (6a). Bauche 34 (1). R.H. Beddome 4968 (9); 4969 (9). K.P. Biswas 4976 (9); 6704 (9). E.M. Bodinier 2222 (4). H.F. Bon 4303 (1). N.L. Bor 4426 (9). Botanical Resource Investigation Team 226 (3); 57584 (3); 84627 (3). D.E. Boufford et al. 25076 (4). L.J. Brass 3261 (10); 7565 (10); 13820 (10); 13953 (10); 24933 (10); 24994 (10). F. Buchanan-Hamilton 1081-1 (9); 1081-2 (9). A.A. Bullock in Sep 1945-Apr 1946 (9) (L). T.L. Bullock 21229 (7).

G.L. Cai 254 (3); 501 (3). X.T. Cai 59-11023 (9). J.M.M. Callery 236 (4). W.R. Carles in 1880 (3) (E); in 15 May 1892 (7) (E); s.n. (4) (E); 4 of 51 (3); 193 (3); 439 (7); 541 (7). W.R. Carles & F.B. Forbes in 17 Apr 1881 (3) (A). J. Cavalerie 2841 (4). G.H. Cave in 1 Apr 1912 (9) (A); in 16 Apr 1912 (9) (A); in 14 Apr 1913 (9) (E); in 1 Jul 1913 (9) (E); in 29 Mar 1919 (9) (E); in 2 Jun 1919 (9) (E); in 1 Sep 1920 (9) (A). T.R. Chand 1368 (9); 1539 (9); 1626 (9); 1689 (9); 2522 (9); 2768 (9); 4301 (9); 4567 (9); 4710 (9); 5092 (9); 5693 (9); 5956 (9). S.Y. Chang 392 (3); 456 (3); 1011 (3); 1027 (3); 1337 (3); 5076 (6a); 5386 (3); 5537 (3); 6027 (7); 6395 (6b); 7841 (3); 8066 (7); 29506 (3); 29710 (3); 30251 (4). T.S. Chang 68 (3). A.C. Chatterjee in Apr 1902 (9) (A, BM, P). G.R. Chen 2338 (4); 2362 (3). G.Z. Chen 23646 (3); 70954 (3). H.Y. Chen 7225 (4). L.Q. Chen 10230 (4). L. Chen 153 (4). S.C. Chen 2 (6a); 65 (6a). S.C. Chen & E.L. Kuo 75 (6a). S.H. Chen 367 (4). S.Q. Chen 347 (7); 367 (4); 410 (7); 3508 (7); 7184 (4); 8789 (3); 9920 (4); 9973 (4); 14537 (7); 14692 (7); 15065 (7); 16774 (7); 50682 (4). T. Chen & P.W. Fritsch 9704082 (3); 9704083 (3); 9704109 (1?); 9704110 (4). Y.F. Chen 2244 (6a). Z.K. Chen 30616 (3). Z.L. Chen 30579 (3). Z.Y. Chen 149 (4). Cheng 101 (7). W.C. Cheng 259 (3); 4419 (7); 5312 (7). W.C. Cheng et al. 4825 (4). C.Y. Chiao 14232 (3); 14545 (3). R.C. Ching 1273 (4); 1618 (7); 2010 (3); 2670 (4); 2866 (7); 3053 (3); 3997 (7); 4825 (4); 4828 (3); 4861 (4); 4910 (3); 4931 (3); 5110 (7); 5191 (4); 5963 (7); 6079 (7). R.C. Ching & C.L. Tso 369 (4); 485 (3); 695 (7); 1316 (3). K.S. Chow 147 (3); 147 (3); 78441 (5); 78463 (5). J.Y. Chuan 71 (7); 307 (7); 381 (7); 1206 (7). C.C. Chuang et al. 4785 (6a). N.K. Chun 40805 (3). N.K. Chun & C.L. Tso 43805 (5). W.Y. Chun 5571 (4); 6283 (4); 7226 (4). H.H. Chung 14 (4); 1111 (3); 1186 (3); 2067 (4); 2622 (4); 2827 (3); 3170 (4); 4032 (4); 6416 (3); 7696 (4); 7976 (4); 8423 (3); 9021 (7); 9108 (7). H.H. Chung & S.C. Sun 210 (7); 288 (4); 394 (7); 486 (4). C.B. Clarke 9253A (9); 15198A (9); 26636A (9); 27913B (9); 41495C (9); 44455A (9). Clemens 6613 (10). J. Clemens & M.S. Clemens 3835 (5). B.J. Conn & W.H. Hu 4066 (6a). M.J.E. Coode 6147 (10). R.E. Cooper 1049 (9); 3777 (9). W.M. Cooper s.n. (3) (GH). E.J.H. Corner 78 (10); 83 (10); 1194 (10). F. Courtois 25360 (11); 26111 (11); 27743 (11); 28848 (11). J.M. Cowan in 16 Jun 1923 (9) (E); s.n. (9) (E); 1058 (9); 2239 (9); 2363 (9). Cowmeadow 3234 (10); 3798 (10). N.T. Cuong et al. HN-NY 401 (5).

C. d'Argy in 1846-1866 (4) (A). J.M. Dalziel in Apr 1901 (3) (E); s.n. (3) (E). R.H. Dan 5637 (3); 5730 (3). J.P.A. David in 1873 (3) (P). J.M. Delavay in 1893-1895 (2) (P); in Jul 1894 (2) (P[2]); in Jul 1894 (8) (P[3]). C.Y. Deng 86012 (7). L. Deng 1158 (3); 2718 (5); 3601 (5); 4239 (3); 4430 (4); 6157 (4); 6290 (3); 6889 (4); 7326 (3); 8141 (4); 8151 (4). M.B. Deng et al. 3447 (3); 3811 (7). Z.Y. Deng et al. 2773 (7). F.G. Dickson 3049 (9); 5035 (9); 9218 (9); 9763 (9). G.Q. Ding 2394 (3). G.Q. Ding & G.L. Shi 121 (4); 527 (4); 623 (3). X.Y. Dong 93510 (3). Dr. King's Collector in Apr 1893 (9) (A); 71 (9); 324 (9); 434 (9); 449 (9). Dr. Prain's Collector in Jun 1898 (9) (A); 284 (9). L.D. Duan 20020587 (4). F. Ducloux 2137 (2); 2138 (8); 2213 (8). S.T. Dunn 2899 (4).

East China Workstation Team 6629 (7). P.A. Eberhardt 3296 (1); 3952 (1); 4715 (1). F.H. Endert 1543 (10); 1741 (10).

H. Fa'arodo 12368 (10). C.S. Fan & Y.Y. Li 38 (4); 78 (4); 219 (3); 445 (4). W.Z. Fang 181 (4); 7983 (7). H. Farodo 12016 (10). U.J. Faurie 51 (6a); 184 (6a); 187 (6a); 188 (6a); 189 (6a); 1745 (6a); 8371 (6a); 8397 (6a). K.M. Feng 20498 (9); 20543 (9). Z.J. Feng 83632 (3); 84119 (3). G. Fenzel 210 (5); 262a (5). G. Finlayson s.n. (5) (BM, G, K). F. Fleury 37821 (5). F.B. Forbes 274 (3); 968 (3). C. Ford in Aug 1883 (4) (BM); 28 (3);

- 105 (3); 143 (3); 355 (4). D.B. Foreman 52403 (10). D.B. Foreman & P. Katik 52010 (10); 59121 (10). G. Forrest 9827 (9). R. Fortune A32 (3). A.R. Franchet in May (4) (P). H. Fung 2264 (5); 20064 (5); 20180 (5).
- I.H. Gafui 8951 (10); 9060 (10); 9490 (10); 17564 (10). A.T. Gage 238 (9). J.S. Gamble 3146A (9); 3147A (9); 7561 (9); 7950 (9); 9631 (9). G.A. Gammie 10 (9). X.M. Gao 1535 (4); 1554 (7); 1593 (4). X.P. Gao 50245 (3); 50316 (4); 50472 (3); 50631 (4); 50675 (3); 54268 (3); 54550 (3). M. Gaudichaud 270 (5). J.L. Gressitt 1593 (3). A.J.C. Grierson & D.G. Long 3723 (9). W. Griffith 286 (9); 928 (9); 933 (9); 2268 (9); 3672 (9). V.M. Grubb 140 (7). Guilin Expedition 70038 (4); 70284 (4). Guizhou Team 3012 (7), 3034 (7).
- D.V. Hai et al. HN-NY 942 (5). Hainan Botanical Expedition Team 83 (4); 307 (4); 887 (17). H.H. Haines 357 (9); 5705 (9). H.F. Hance 39 (4); 13738 (4). H.F. Hance & G.T. Sampson 13738 (4). W. Hancock in 13 May 1877 (3) (BM); 28 (3). H.F. Handel-Mazzetti 130 (4); 2474 (7); 10457 (4); 11697 (4). Hangzhou Botanical Garden Herbarium 28902 (7). S. Hatusima 5017 (10). B. Hayata in 27 Mar 1928 (6a) (TAI). G.S. He 4427 (3); 4446 (4); 5040 (4); 5115 (3); 5247 (3); 6427 (3); 9437 (3); 9580 (3). J. He 2699 (3). A. Henry 394 (6a); 554 (6a); 721 (7); 913 (6a); 1155 (4); 2063 (6a); 2064 (6a); 3450 (4); 3450 (7); 3450a (4); 3928 (7); 3943 (7); 4524 (4); 4524 (4); 5977 (7); 11551 (4). B.C. Henry 13738 (4). HGIB 70284 (4). Y.Y. Ho 22153 (7); 23287 (3); 24375 (7); 27970 (7). M.A. Hock 804 (9); 920 (9). K. Honda 31 (4). Hongshui River Expedition 1085 (7); 89-1426 (7). J.D. Hooker in Apr 1850 (9) (K); s.n. (9) (A, BM, E, GH, K[2], L[2], P [2]); 58 (9). J.D. Hooker & T. Thomson in Oct 1850 (9) (K); s.n. (9) (A, C, L[2], P [2]). T. Hosokawa 9044 (10); 9496 (10). F.C. How 70504 (5); 71118 (5); 71606 (5); 71614 (5); 71841 (5). C.F. Hsieh & W.S. Tang 20 (6a). Y.K. Hsiung 5411 (7); 5479 (4); 6448 (4). C. Hsu & C.S. Kuoh 6936 (6a). C.M. Hu 1245 (3); 1431 (3); 1667 (3); 1744 (3); 1825 (3); 1857 (4); 1964 (4); 2023 (3); 2089 (3); 2301 (3); 2384 (3); 2518 (3); 2646 (3); 2708 (6a); 2732 (3); 2759 (6a); 2901 (3); 3197 (4); 3202 (3); 3450 (3); 3800 (4); 3918 (3); 4694 (3); 5139 (3). H. H. Hu 305 (3); 306 (7); 652 (4); 861 (4); 861 (4); 879 (4); 879 (4); 1089 (4); 1480 (4); 1495 (3); 1577 (7); 2588 (7). Y.Y. Hu & K.Y. Luo HR630143 (9). C. Huang 162710 (4); 163508 (4); 164129 (4); 164222 (3); 164222 (3). C.I. Huang & G.F. Zhong 3267 (4). F.J. Huang 0010 (7). S.F. Huang 581 (6a); 4781 (6a). T.C. Huang 9713 (6a). T.C. Huang & S.F. Huang 14108 (6a). Y.L. Huang 1 (4). Y.Y. Huang & Y.Z. Qi 279 (6a). Z. Huang 36313 (5). N.K. Ip 7664 (7).
- F. Jenkins in 1841 (9) (K); in 1845 (9) (K); s.n. (9) (E, L[4], P[5]); 3288 (9).
- K'tung 78 5888 (4); 6047 (4). S.F. Kajewski 2499 (10). C. Kalkman 6472 (10). R. Kanehira 5017 (10); 19376 (6a); 21197 (6a). R. Kanehira & S. Hatusima 13095 (10). M.T. Kao 7956 (6a); 10075 (6a). Y.C. Kao & Q.D. Huang 621 (6a). Y.C. Kao & S.H. Lai 292 (6a); 337 (6a). M. Kato et al. 5825 (10). R. Kaulback 157 (9). J. Keenan et al. 3128 (9); 3694 (9). R.L. Keenan in Sep 1873 (9) (K). H. Keng 1056 (6a). H. Keng & M.T. Kao 1255 (6a); 2552 (6a); 2604 (6a). Y.L. Xeng 213 (3); 432 (3); 661 (3); 1477 (3); 1911 (7); 2381 (7). K. Kerenga 77510 (10). K. Kerenga & J.R. Croft 77262 (10). K. Kerenga & Y. Lelean 73907 (10). W.D. Kermode 16640 (9). A.F.G. Kerr in 4 Mar 1921 (9) (BM); 2432 (9); 4986 (9); 4986A (9); 20830 (1); 20907 (9); 20917 (9). M.S. Khan 4338 (9). F. Kingdon Ward 474 (9); 6609 (9); 18397 (9); 18495 (9); 22072 (9). G.K. Kjellberg 690 (10). S.P. Ko 51615 (3); 52545 (4). W.N. Koelz 22464 (9); 22527 (9); 22895 (9); 27423 (9); 28110 (9); 29595 (9); 30804 (9); 33566 (9). T. Koyama & M.T. Kao 14243 (6a). C.M. Kuo 8320 (6a); 51202 (6a). U. Kurosu 5 (6a); 7 (6a). M. Kurz 28 (9).
- J. de La Touche s.n. (4) (E); 149 (3). C.C. Lacaita H.III.588 (9). S.S. Lai 1333 (3); 1611 (3); 1686 (4); 1687 (3); 1755 (3); 2039 (3); 2266 (3); 2268 (4); 2374 (4); 2457 (7); 3245 (4); 3427 (7); 3736 (3); 4158 (3); 4191 (7). S.S. Lai et al. 4434 (6a); 4696 (4); 4861 (4). H.J. Lam 811 (10). J. Lamont s.n. (4) (L); 1071 (4). C.R. Lancaster in 20 May 1979 (3) (BM). K. Larsen et al. 43489 (9). S.Y. Lau 20132 (4). S.K. Lau 3789 (5); 3994 (4); 5241 (5); 28244 (5). P. Lavarack & C.E. Ridsdale 31105 (10). K.L. Le 414 (9). H. Lecomte & A.E. Finet 1317 (5). W.P. Leu 927 (6a). W.P. Leu et al. 487 (6a); 629 (6a); 1432 (6a). C.O. Levine 467 (4); 1461 (3); 3154 (4). G.Z. Li 13128 (4); 13155 (4). G.F. Li 63260 (7). H.J. Li 322 (4). P.Y. Li 10824 (7). Q.H. Li & C. Chen 183 (11); 346 (11). Y.H. Li 1224 (9); 3627 (9); 11437 (9); 11969 (9); 12429 (9). Y.K. Li 400153 (3). Z.T. Li 1168 (4); 2673 (4). Z.Y. Li 468 (4); 1085 (3); 1621 (4). B.H. Liang 89243 (4). C.F. Liang 31682 (4). H.Y. Liang 61784 (5); 62161 (5); 63077 (5); 63613 (5); 63618 (5); 64652 (5); 65184 (5); 65185 (5); 69937 (4). K. Liang 70653 (3). Q.F. Liang 14 (57). X.R. Liang 63097 (5); 63466 (5); 64652 (5); 65185 (5). C.C. Liao & Y.Y. Lien 1824 (6a). C.C. Liao & et al. 391 (6a); 418 (6a); 561 (6a). C.J. Liao 15179 (4). F.M. Liebmann s.n. (9) (C). J.Q. Lin 28413 (4). P.J. Lin et al. 35 (6a). Y.C. Lin 204 (4). Z.W. Lin 205 (9). K. Ling 2454 (4); 2557 (3); 7941 (7). P.P. Ling 105 (7). T.N. Liou & P.C. Tsoong 2277 (3). Z. Lipaquito 3347 (10). E.D. Liu 5678 (9); 6244 (9). E.D. Liu et al. 4726 (7). J.H. Liu 356 (6a). J.K. Liu 470 (4). K.M. Liu & L.X. Xiao SCSB-HN-0328 (4). K.M. Liu et al. SCSB-HN-0831 (4). L.H. Liu 10489 (3); 10579 (3). M.D. Liu & H.M. Lin A60133 (3). S.L. Liu et al. 1025 (3). S.M. Liu et al. 6 (6a). T.S. Liu in 22 Oct 1957 (6a) (A). T.Y. Liu et al. 447 (6a). X.Q. Liu 24626 (3). Y. Liu 194 (3). Y.G. Liu 104 (3); 497 (3). Z.B. Liu 339 (4). T. Lobb in 1843–1860 (10) (BM); s.n. (9) (K). Longxi Mt. Exped. 1301 (6a); 1435 (3); 1648 (3); 2046 (3). J. de Loureiro s.n. (1) (BM). Q.H. Lu 104 (4); 121 (3); 4103 (6b); 5003 (3); 5015 (3); 5031 (3). S.Y. Lu 15388 (4); 15502 (6a). F. Ludlow & G. Sherriff 2994 (9); 15843 (9). L.B. Luo 17 (4); 998 (3). Lushan Botanical Garden 2245 (3).
- D. Macgregor in 1908 (3) (A[3]); in 1908 (4) (A); 5 (3); 34 (3). F. Maekawa 2010 (7). L. Maenu'u 6015 (10); 6462 (10). E.E. Maire in May (8) (P). P.Y. Mao 1278 (9). S.H. Mao 51 (3); 90 (4); 90 (4); 261 (3); 291 (4). C. Maries in Dec 1878 (4) (K). M.T. Masters s.n. (9) (E, L, P); 409 (9); 3288 (9). R. Mauriasi 7605 (10); 7605 (10); 8551 (10); 8761 (10); 11226 (10); 11226 (10); 11480 (10); 11606 (10); 12305 (10); 12305 (10). F.A. McClure 78 (3); 133 (3). E. Meijer Drees 256 (10). R. E. Mell 673 (3). Menglian Expedition 9495 (9); 9729 (9). E.D. Merrill 10733 (3); 11258 (7); 11293 (3); 11296 (4); 11030 (3). W. Mesny 13738 (4). F.N. Meyer 1487 (3); 440 (3). H. Migo in 5 May 1935 (3) (A). F.J.H. von Mueller s.n. (9) (C). G. Murata & N. Hisao 39077 (6a). S.K. Murti 12986 (9).
- T. Namba et al. 1238 (6a). Nanling Expedition 1536 (3). Native Collector 3288 (9). Native Collectors of Bot. Garden, Calcutta s.n. (9) (E, L, P [2]). D.H. Nicolson 3068 (9). M.X. Nie 4499 (7); 6941 (7). M. X. Nie & S. S. Lai 2090 (4); 2159 (3); 2366 (3); 2449 (6a); 2544 (4); 3153 (4); 3564 (4); 3721 (3); 4499 (7); 4870 (4); 5228 (3). M. X. Nie et al. 6782 (4); 7397 (4); 8003 (4); 8061 (4); 8487 (4); 8573 (4); 8790 (3); 9125 (4); 9372 (3); 9797 (4).
- R. Oldham 294 (6a).
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APPENDIX 3

Index to the taxonomic treatment of scientific names.

Numbers in parentheses correspond to taxon numbers in the text. Synonyms and excluded names are italicized.

- | | | |
|--|--|--|
| Cyrta Lour. | var. <i>hypoleucus</i> Pamp. (7)—616 | <i>jucundus</i> Diels (3)—592 |
| <i>agrestis</i> Lour. (1)—586 | <i>faberi</i> Perkins (4)—599 | <i>ledermannii</i> Perkins (10)—630 |
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| <i>luculenta</i> Miers (9)—624 | S.M. Hwang (4)—599 | <i>philadelphoides</i> Perkins (3)—592 |
| <i>serrulata</i> (Roxb.) Miers (9)—624 | var. <i>formosanus</i> (Matsum.) S.M. | var. <i>superbus</i> Chun (3)—592 |
| <i>virgata</i> (Wall. ex G. Don) Miers (9)—624 | Hwang (4)—601 | <i>rostratus</i> Hosok. (10)—630 |
| Styrax L. | var. <i>matsumuraei</i> (Perkins) S.M. | <i>rubifolius</i> Guillaumin (8)—622 |
| <i>agrestis</i> (Lour.) G. Don (1)—586 | Hwang (4)—601 | <i>rugosus</i> Kurz |
| <i>annamensis</i> Guillaumin (1)—586 | <i>finlaysonianus</i> Wall. ex G. Don (5)—606 | var. <i>formosanus</i> Matsum. (4)—599 |
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| var. <i>microphyllus</i> Perkins (4)—599 | <i>fukiensis</i> W.W. Sm. & Jeffrey (3)—592 | <i>suzukii</i> K. Mori (6)—610 |
| var. <i>superbus</i> (Chun) S.M. Hwang (3) | <i>funkikensis</i> K. Mori (6)—610 | <i>virgatus</i> Wall. ex G. Don (9)—624 |
| —592 | <i>henryi</i> Perkins (6)—610 | <i>warburgii</i> Perkins (10)—630 |
| <i>dasyanthus</i> Perkins (7)—616 | var. <i>microcalyx</i> Perkins (6)—610 | <i>wuyuanensis</i> S.M. Hwang (11)—634 |
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