

## A Revision of *Symplocos* Jacq. Section *Neosymplocos* Brand (Symplocaceae)

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A taxonomic revision of *Symplocos* Jacq. section *Neosymplocos* Brand is provided to replace the outdated 1901 treatment of Brand. A total of 780 specimens and 17 photographic images from 23 herbaria was examined to evaluate the taxonomic importance of morphological characteristics. Eleven species are recognized (*S. altissima*, *S. angulata*, *S. corymboclados*, *S. falcata*, *S. glandulosomarginata*, *S. glaziovii*, *S. insolita*, *S. microstyla*, *S. nitidiflora*, *S. organensis*, and *S. tenuifolia*), one new name is proposed (*S. insolita*), and several names are lectotypified. Descriptions, illustrations, distribution maps, and an identification key to all taxa are provided. All species except *S. altissima*, *S. angulata*, and *S. glaziovii* were studied in the field. Species of section *Neosymplocos* are distributed mainly in the Serra do Mar (Mata Atlântica rain forest) of southern and southeastern Brazil. Nearly 55% of them are narrow endemics, rare, and probably threatened with extinction through habitat destruction of their montane environments.

### Resumo

Uma revisão taxonômica de *Symplocos* Jacq. seção *Neosymplocos* Brand é aqui fornecida para substituir o desatualizado 1901 tratamento de Brand. Um total de 780 exsicatas e 17 fotografias de 23 herbários foram examinadas para avaliar a importância taxonômica das características morfológicas. Onze espécies são reconhecidas (*S. altissima*, *S. angulata*, *S. corymboclados*, *S. falcata*, *S. glandulosomarginata*, *S. glaziovii*, *S. insolita*, *S. microstyla*, *S. nitidiflora*, *S. organensis*, e *S. tenuifolia*), um nome novo é proposto (*S. insolita*), e vários nomes foram lectotipificados. Descrições, ilustrações, mapas e uma chave de identificação para todos os táxons são aqui fornecidas. Todas as espécies exceto *S. altissima*, *S. angulata* e *S. glaziovii* foram estudadas no campo. Espécies da seção *Neosymplocos* são distribuídas principalmente na Serra do Mar (Mata Atlântica) do sul e sudeste do Brasil. Aproximadamente 55% delas são endêmicas restritas, raras e provavelmente ameaçadas de extinção devido a destruição de seus habitats montanos.

The family Symplocaceae [order Ericales *sensu* Angiosperm Phylogeny Group (1998, 2003)] comprises the single genus *Symplocos* Jacq. with ca. 325 species of woody flowering plants distributed in the tropical and subtropical regions of the Americas, southern and eastern Asia, Australia,

and the East Indies, with several species reaching the temperate zones of North America and Eastern Asia (Brand 1901; Wood and Channel 1960; Wang et al. 2004; Fritsch et al. 2006). *Symplocos* is recognized by alternate, simple, exstipulate leaves, axillary (rarely terminal), usually multi-flowered inflorescences, bisexual or rarely unisexual actinomorphic flowers, a connate calyx and corolla, an androecium with usually numerous epipetalous bi- or multiseriate or fasciculate stamens with globose to ellipsoid anther sacs, a two- to five-carpellate inferior ovary, an undivided style, one to four unitegmic ovules per locule, and a drupaceous fruit crowned by the persistent calyx (Nootboom 1975; Cronquist 1981). Phylogenetic studies based on DNA sequence data strongly support Symplocaceae as monophyletic (Soejima and Nagamasu 2004; Wang et al. 2004; Fritsch et al. 2006).

#### PREVIOUS SYSTEMATIC WORK ON *SYMPLOCOS* SECT. *NEOSYMPLOCOS*

The most recent and comprehensive published taxonomic treatment of *Symplocos* is that of Brand (1901). Brand recognized four subgenera within *Symplocos*: *Epigenia* (Vell.) Brand, *Eusymplocos* Brand ( $\equiv$  subg. *Symplocos*), *Hopea* (L.f.) C.B. Clarke, and *Microsymplocos* Brand. Subgenus *Microsymplocos* comprises two sections disjunct between the Greater Antilles (section *Urbaniocharis* Brand) and southern and southeastern Brazil (section *Neosymplocos* Brand). According to Brand (1901), this subgenus is characterized by small flowers, monadelphous stamens, and claviform filaments. Species of section *Neosymplocos* are readily distinguished from those of section *Urbaniocharis* by their pubescent filaments (versus glabrous), a likely synapomorphy for the section (Aranha Filho et al. 2005). Brand (1901) described 11 species and one variety for section *Neosymplocos* (*S. aegrota*, *S. altissima*, *S. angulata*, *S. ascendens*, *S. corymoclados*, *S. densiflora* var. *densiflora*, *S. densiflora* var. *minor*, *S. falcata*, *S. glaziovii*, *S. nitidiflora*, *S. orgaensis*, and *S. tenuifolia*), all of which were newly described. Brand recognized three species in section *Urbaniocharis* (*S. ciponimoides* Griseb., *S. lanata* Krug et Urb., and *S. micrantha* Krug et Urb.), a section in which currently seven species are recognized (Fritsch and Almeda, in prep.).

Pollen morphology has been considered important in the infrageneric classification and phylogeny of *Symplocos*. Thus Nootboom (1975), in his revision of *Symplocos* of the Old World, placed subgenus *Microsymplocos* under subgenus *Hopea* based largely on the palynological data of Meijden (1970). Meijden, however, did not have sufficient material of *Microsymplocos* for a critical study of subgenus *Microsymplocos*: only *S. lanata* (section *Urbaniocharis*) and *S. tenuifolia* (section *Neosymplocos*) were sampled.

Nagamasu (1989a, 1989b, 1993) concluded that the pollen of species in subgenus *Hopea* is structurally different from that of section *Neosymplocos*. Pollen grains of subgenus *Hopea* have a thin tectum, suprategmatal ornamentation, and a distinct columella layer (versus a massive tectum lacking suprategmatal ornamentation and an indistinct columella layer). Moreover, Barth (1979, 1982) and Nagamasu (1989a, 1989b, 1993) noted that pollen of the species of section *Neosymplocos* is similar to that of subgenus *Symplocos*. Based on these observations, Nagamasu (1989a, 1989b, 1993) recognized *Microsymplocos* at the subgeneric level, and suggested a close relationship between subgenera *Microsymplocos* and *Symplocos*.

Nagamasu, however, did not consider Mai's (1986) evidence that species of *Urbaniocharis* possess pollen similar to species of sections *Pseudosymplocos* Brand and *Barberina* (Vell.) A.DC. (both within subgenus *Epigenia*), which resemble the pollen types of subgenus *Hopea*. Thus, a massive tectum lacking suprategmatal ornamentation and an indistinct columella layer would be confined only to pollen of section *Neosymplocos* and subgenus *Symplocos*.

In their molecular phylogenetic studies of *Symplocos*, Wang et al. (2004) and Fritsch et al.

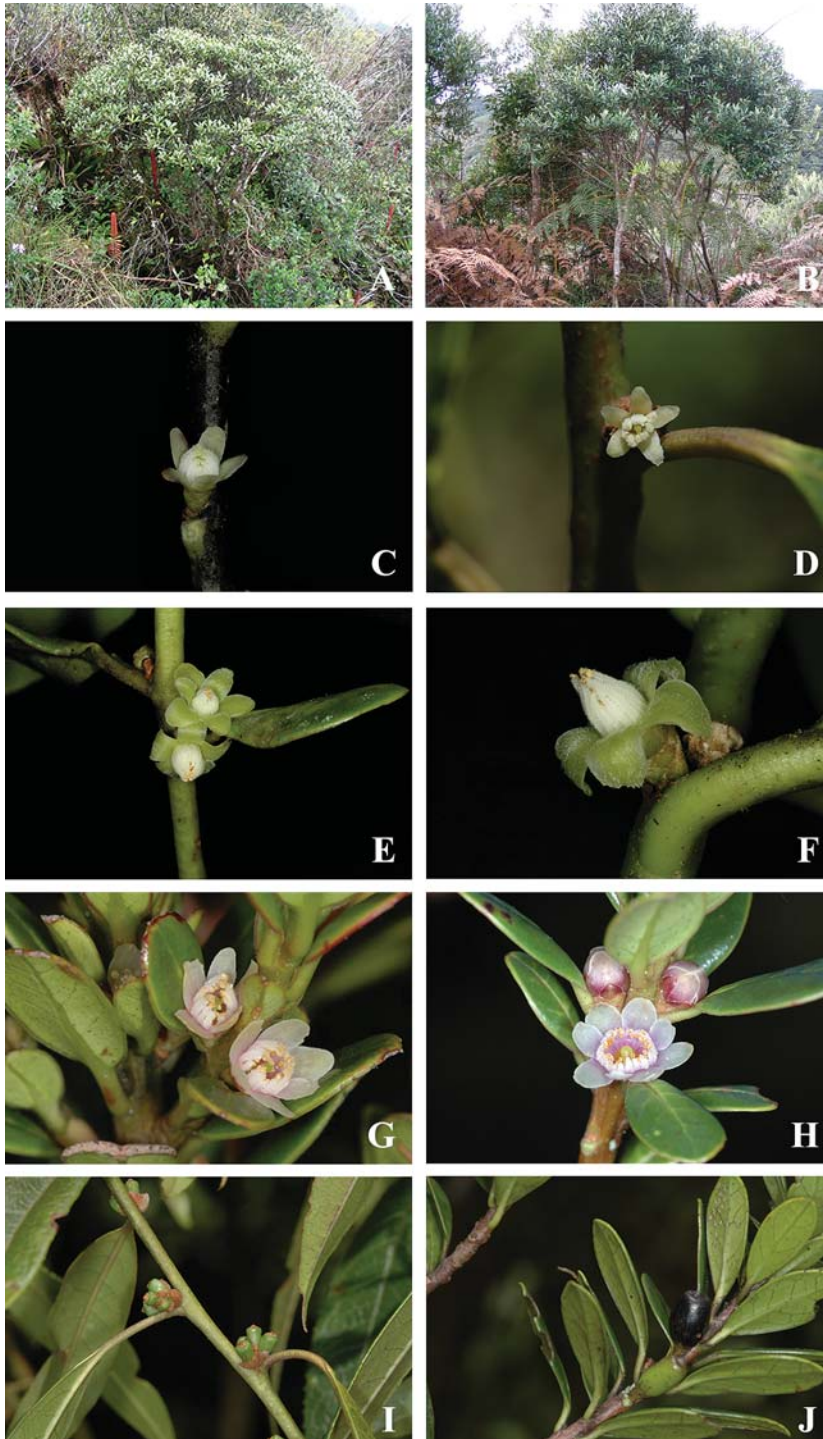


FIGURE 1. Photographs of some *Neosymplocos* Brand species. A. Habit of *S. corymboclados*; B. Habit of *S. glandulosomarginata*; C. Flower of *S. corymboclados*; D. Flower of *S. falcata*; E. Inflorescence of *S. nitidiflora*; F. Flower of *S. nitidiflora*; G. Flower of *S. organensis*; H. Flower of *S. organensis*; I. Immature fruits of *S. falcata*; J. Immature (green) and mature (blackish) fruits of *S. organensis*. (Photo A-B by P.W. Fritsch; D, G-J by F. Almeda; C, E-F by J.L.M. Aranha Filho).

(2006) concluded that although the two sections of subgenus *Microsymplocos* are monophyletic, subgenus *Microsymplocos* is not. Instead, section *Neosymplocos* nests within section *Symplocastrum* Brand of subgenus *Symplocos* and section *Urbaniocharis* is sister to the clade comprising sections *Symplocastrum* and *Neosymplocos*.

Upon closer inspection, the characters used by Brand (1901) to define subgenus *Microsymplocos* (other than the small flowers) appear to be based on erroneous observations. Species of section *Urbaniocharis* have indistinctly pentadelphous rather than strictly monadelphous stamens, and filamentous rather than clavate filaments (Fritsch and Almeda, in prep.). In contrast, species of section *Neosymplocos* possess monadelphous stamens and linear-deltoid filaments. These observations help to reconcile the polyphyly of subgenus *Microsymplocos* based on molecular evidence with Brand's circumscription of the subgenus. The small flower size of both sections is possibly a convergent adaptation for small pollinating insects (Borhidi 1996; Wang et al. 2004). Moreover, sections *Neosymplocos* and *Symplocastrum* share several floral characteristics in addition to the palynological ones already discussed. As observed in *Symplocos organensis* and *S. falcata*, the anthers sacs release pollen prior to anthesis. The same phenomenon has been observed in some species of *Symplocastrum* from Mesoamerica (R. Kriebel, pers. comm.). Also, species of both sections have monadelphous stamens and flattened filaments (versus terete filaments in section *Urbaniocharis*).

According to Kelly and Almeda (2002), Brand's monograph is clearly outdated. Recent phylogenetic studies (Soejima and Nagamasu 2004; Wang et al. 2004; Fritsch et al. 2006) provide a sound basis for a new infrageneric classification. Wang et al. (2004) noted the relative lack of taxonomic and morphological studies on section *Neosymplocos*; most published research involving species of this section has been restricted to new species descriptions and treatments in regional floras (e.g., Sleumer 1937; Hoehne 1938; Occhioni 1974, 1975a, 1975b; Aranha Filho et al. 2005). An unpublished taxonomic revision of the group was presented as part of a Ph.D. dissertation (Bidá 1995). This work, although in many ways an improvement over Brand's treatment, in our view contains questionable species circumscriptions and an inadequate key to species, among other problems. Here we provide a taxonomic revision of *Symplocos* section *Neosymplocos* based on detailed comparative morphological data to update Brand's treatment.

#### GEOGRAPHIC DISTRIBUTION, ENDEMISM, AND HABITAT OF THE SPECIES OF *SYMPLOCOS* SECT. *NEOSYMPLOCOS*

The 11 species recognized in this treatment are nearly endemic to Brazil; only *Symplocos tenuifolia* reaches Paraguay (Bidá 1995). Species of *Neosymplocos* are found primarily in montane habitats of the Serra do Mar (Mata Atlântica rain forest) of southern and southeastern Brazil (although there are no species known from Rio Grande do Sul). Species are to be expected in the Mata Atlântica of northeastern Brazil (especially Bahia) when the Brazilian highland flora becomes better documented. Only three species (*S. insolita*, *S. microstyla*, and reportedly *S. angulata*) occur in "campo rupestre" (rocky field) habitats, all in the southern portions of the Cadeia do Espinhaço.

*Symplocos falcata*, *S. glandulosomarginata*, and *S. tenuifolia* are the most geographically widespread and common (i.e., collections from many localities); *S. corymboclados* and *S. nitidiflora* are also geographically widespread but uncommon. The other species are rare and appear to be narrowly endemic. *Symplocos altissima*, *S. glaziovii* (both restricted to the Serra dos Órgãos in Rio de Janeiro state), and *S. angulata* (restricted to the Serra do Caraça in Minas Gerais) were collected only prior to 1900. *Symplocos organensis* is endemic to Rio de Janeiro and apparently restricted to montane elfin forest in the Serra dos Órgãos. *Symplocos insolita* and *S. microstyla* are endemic to the Serra do Cipó and Serra do Caraça (both in Minas Gerais), respectively. Thus, six out of

11 species (54.5%) are narrow endemics.

Most species of *Symplocos* section *Neosymplocos* occur exclusively from 1000 to 2000 m elevation (*S. corymboclados*, *S. insolita*, *S. microstyla*, *S. organensis*, and reportedly *S. altissima*, *S. angulata*, and *S. glaziovii*). Some species, however, are also found at lower elevations of the Mata Atlântica (*S. falcata*, *S. glandulosomarginata*, *S. nitidiflora*, and *S. tenuifolia*). There are no species occurring exclusively in the lowlands of the Mata Atlântica.

Most *Neosymplocos* species grow in a limited range of habitats within the Mata Atlântica, occurring mainly in elfin forest and montane ombrophilous forest. Only the widespread and fairly common species are found in additional habitats, such as araucaria forest, riparian situations, secondary and semideciduous forests, and even “restinga” (a coastal sand community of eastern Brazil with low nutrient status and high insolation). *Symplocos insolita*, *S. microstyla*, and reportedly *S. angulata* are found in campo rupestre.

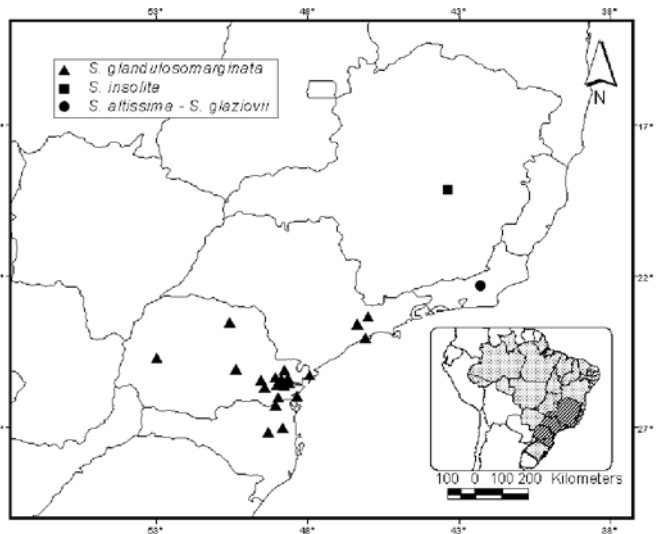


FIGURE 2. Distribution of *Symplocos altissima*, *S. glandulosomarginata*, *S. glaziovii*, and *S. insolita*.

### MATERIALS AND METHODS

Type material and general collections from the following herbaria were studied: BM, BHCN, CAS, ESA, G, GUA, HB, HRCB, IAC, K, M, MBM, NY, R, RB, RFA, S, SP, SPF, SJRP, UEC, and UPCB. The collections from B were examined through the internet as digital photographs. A total of 17 photographic images and nearly 780 specimens, including the types of all names involved in this treatment except *S. corymboclados* var. *micromorpha*, were examined. Field work during November, 2004 (São Paulo, Minas Gerais, and Rio de Janeiro) and October, 2005 (Minas Gerais and Paraná) supplemented the study of herbarium specimens. An index to specimens studied, a comparison of our revision to those of Brand (1901) and Bidá (1995), and a list of scientific names in this work are provided in Appendices 1, 2, and 3, respectively.

Several specimens that could be considered types presented discrepancies concerning collection data (e.g., identical collection numbers but different dates, different localities). This is especially true of collections ascribed to A.F.M. Glaziou, data from which are known to be unreliable or confusing (Wurdack 1970). Brand (1901) mentioned no date in the protologue of the names attached to these types, which would otherwise have helped to guide assessments of typification. In many cases, we assumed that these discrepancies are transcription errors or errors in matching the label information to the specimen. Some specimens nonetheless have been tentatively excluded from the type collection cited here, even when collector and number matched the type collection, because the localities on their labels did not match those cited by Brand (1901) in the protologue. Comments on such specimens are provided in the species discussion sections. When no locality was

provided, we assumed that the specimen is a type. The dates provided in the typification are derived from the labels of designated lectotypes.

All descriptions are based on field observations and herbarium specimens. The habit of *Symplocos altissima*, *S. angulata*, and *S. glaziovii* and corolla lobe color of *S. angulata* and *S. glaziovii* were taken from the original descriptions. Flowering and fruiting periods, vernacular names, elevational ranges, distribution, habit, and habitat were based on label information of herbarium specimens and field observations. Specimens without precise geographic coordinates (nearly all) were estimated from label information as supplemented by data from maps and on-line gazetteers (<http://www.biolink.csiro.au/gazfiles.html>; <http://gnswww.mil/geonames/gns/index.jsp>). Some characters used in the descriptions and keys, such as anther color and corolla lobe posture, are based on field observations.

Some species known to us only from the type collection (*Symplocos altissima*, *S. angulata*, and *S. glaziovii*) had few open flowers that were difficult to measure without damage to the specimen, or only had flower buds. In these cases, flower length was measured from the largest available bud on the specimen. The hypanthium was measured from the floral articulation to the base of the calyx lobes. Corolla lobe and stamen measurements were taken from dissected flowers at anthesis whenever possible. Stamen length was measured from the base of the distinct portions of the filaments to the apex of the anthers. Corolla lobe width was measured at the widest point. *Symplocos altissima*, *S. angulata*, and *S. glaziovii* were poorly sampled due the scarce material available and the lack of flowers at anthesis. In these cases, we measured the corolla lobes, stamens, disc, and style of the largest flowers found on available specimens. Fruit length was measured at maturity and included the height of the calyx lobes or the disc.

#### TAXONOMIC TREATMENT

##### *Symplocos* sect. *Neosymplocos* Brand in Engl.,

Pflanzenr. IV. 242 (6):70. 1901.

TYPE.— *Symplocos tenuifolia*.

Evergreen tree or shrub, occasionally candelabriform, usually densely branched from middle upward. Branches emerging at a 45° angle, mature branches various shades of brown, commonly striate longitudinally. Petiole adaxially concave, flattened, or canaliculate, abaxially ± rounded; leaf blade drying green to brown, rotund to spatulate, coriaceous, venation ± brochidodromous, midvein sulcate adaxially, secondary and tertiary veins branched near both midvein and margin, margin revolute, marginal glands usually present at least distally and frequently caducous, apical gland often present and early caducous or rarely persistent. Inflorescence axillary, fasciculate, 1- to 20-flowered; bracts usually numerous, basal two commonly early caducous, others persistent, margin ciliate, apex acute to rounded. Flower bisexual, actinomorphic, sessile, articulate, 1.5–11 mm long; hypanthium glabrous or rarely strigillose; calyx lobes 5, erect, deltoid to rotund, margin ciliate; corolla lobes 5 to 8, elliptic to rotund, usually glabrous, margin ciliate. Stamens 20 to 40, monadelphous, indistinctly 2- to 5-seriate, arched inwardly, connate, adnate to corolla, frequently exceeding gynoecium; filaments white, linear-deltoid, flattened tangentially, occasionally constricted at apex, subfleshy, pubescent; anthers white, greenish white, or yellow, latrorse, ellipsoid becoming globose upon dehiscence. Ovary inferior, 3(4)-locular; disc flat or prominently elevated, smooth to rugose; style straight, terete, glabrous or rarely sparsely pubescent; stigma 3(4)-lobed; ovules 2 per carpel, ± ovoid. Drupe (1)2(3)-locular, green when immature and black when mature, ellipsoid to globose, disc not reaching or rarely exceeding persistent calyx lobes; calyx lobes erect to tightly appressed to disc. Seed 1(to 3) per fruit. Embryo straight; cotyledons longer than the radicle.

**Key to Species of *Symplocos* sect. *Neosymplocos***

Asterisks (\*) denote species that fall out twice in the key.

- 1a. Disc prominently elevated (0.7–1 mm).
  - 2a. Candelabriform shrub; young leaf blade abaxially strigose; base of leaf blade cordate or subcordate; fruit 3–5 mm wide . . . . . 7. *S. insolita*
  - 2b. Small tree (reportedly); young leaf blade abaxially tomentose; base of leaf blade cuneate, rounded, or subrounded; fruit 5–7 mm wide. . . . . 2. *S. angulata*
- 1b. Disc flat.
  - 3a. Margin of mature leaf blade with 13 to 25 glands per cm . . . . . 5. *S. glandulosomarginata*
  - 3b. Margin of mature leaf blade with 0 to 8 glands per cm.
    - 4a. Young leaf blade abaxially glabrous.
      - 5a. Leaf blade 8–11 × 4–5.5 cm; the two basal bracts rotund to subrotund, 3–4 × 1.5–2.5 mm; calyx and corolla lobes densely strigillose abaxially . . . 1. *S. altissima*
      - 5b. Leaf blade 2–6.5 × 0.5–2.5 cm; the two basal bracts deltoid or subdeltoid, 0.5–2 × 0.4–1.5 mm; calyx and corolla lobes glabrous or sparsely pubescent abaxial-medially.
        - 6a. The two basal bracts 0.5–1 × 0.4–0.7 mm; flower 2–4 mm long; calyx lobes 1–1.5 × 0.8–1 mm; corolla lobes 1.5–2.5 mm long; anthers white or greenish white; fruit 5–7 × 3–5 mm. . . . . 3. *S. corymboclados\**
        - 6b. The two basal bracts 1.5–2 × 1–1.5 mm; flower 4–11 mm long; calyx lobes 1.5–2 × 1–1.5 mm; corolla lobes 2.7–3.5 mm long; anthers yellow; fruit 7–12 × 5–7 mm . . . . . 10. *S. organensis*
    - 4b. Young leaf blade abaxially pubescent.
      - 7a. Young leaf blade strictly tomentose abaxially; leaf blade 0.5–4 × 0.3–1.6 cm.
        - 8a. Young leaf blade eglandular; leaf blade elliptic, oblong, obovate, ovate, or rotund; hypanthium 0.4–0.5 mm long; calyx lobes 0.5–1 mm long; style ca. 0.1 mm long. . . . . 8. *S. microstyla*
        - 8b. Young leaf blade glandular; leaf blade oblanceolate or spatulate; hypanthium 0.8–1.1 mm long; calyx lobes 1–1.2 mm long; style 0.4–0.6 mm long . . . . . 6. *S. glaziovii*
      - 7b. Young leaf blade strigose, strigillose, sericeous-strigose, or mixed tomentose-pilose-sericeous abaxially, if strictly tomentose then leaf blade 5–16 × 1.8–4 cm.
        - 9a. The two basal bracts 3–4 × 1.3–2.5 mm; hypanthium densely strigillose or rarely glabrous; corolla lobes 2.2–3.5 mm wide, reflexed; anthers yellow; style 1–1.5 mm long; fruit 10–20 mm long . . . . . 9. *S. nitidiflora*
        - 9b. The two basal bracts 0.7–3 × 0.5–1.5 mm; hypanthium glabrous; corolla lobes 1–2 mm wide, ascending or spreading (unknown in *S. tenuifolia*); anthers white to green (unknown in *S. tenuifolia*); style 0.5–1 mm long; fruit 3–10 mm long.
          - 10a. Young leaf blade abaxially mainly tomentose near margin, otherwise sericeous-pilose, adaxially densely sericeous or pilose along midvein; calyx lobes glabrous or rarely sparsely pubescent abaxial-medially; fruit 3–6 mm long, ovoid or globose. . . . . 11. *S. tenuifolia*
          - 10b. Young leaf blade abaxially sericeous-tomentose or strigose throughout, adaxially glabrous or rarely puberulent on basal half of midvein, or if densely sericeous or tomentose along midvein then calyx lobes densely

sericeous-tomentose or strigose abaxially and fruit 8–10 mm long, cylindrical or nearly so.

11a. Young leaf blade glabrous adaxially; leaf blade 2–6.5 × 0.8–2.5 cm; calyx lobes glabrous or sparsely pubescent abaxially, then glabrescent; fruit 5–7 mm long. . . . . 3. *S. corymboclados*\*

11b. Young leaf blade sericeous-tomentose or sericeous-strigose adaxially, rarely glabrous; leaf blade 5–16 × 1.8–4 cm; calyx lobes densely pubescent abaxially, rarely glabrescent; fruit 8–10 mm long . . . . . 4. *S. falcata*

**1. *Symplocos altissima*** Brand in Engl., Pflanzenr. IV. 242 (6):71. 1901. TYPE.— BRAZIL. Rio de Janeiro: “Alto do Macahé bei Nova Friburgo” (protologue), 1892, *A.F.M. Glaziou 19618* (holotype: B destroyed; photo of holotype: NY!, RFA!; lectotype, here designated: K!; isolectotypes: IAN, P).

The B holotype of *Symplocos altissima* was destroyed during World War II. The only type material we have seen is that from K, which we therefore designate as lectotype.

Reportedly a tall tree. Branches distally flattened, smooth, glabrous. Petiole 5–15 mm long, adaxially concave, glabrous; leaf blade broadly elliptic or occasionally ovate or obovate, 8–11 × 4–5.5 cm, glabrous, base attenuate or cuneate, margin conspicuously serrate on distal  $\frac{3}{4}$  or occasionally serrulate or crenate, marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex acuminate or occasionally broadly obtuse, acumen (when present) 1–3 mm long. Inflorescence 4–10 mm long, 1- to 8-flowered; bracts 7 to numerous, densely ferruginous-strigillose abaxially, margin ciliate; the two basal bracts caducous, rotund to subrotund, keeled to concave, 3–4 × 1.5–2.5 mm, apex rounded, apical gland usually lacking; other bracts 1–2 × 1–2 mm, apices of basalmost rounded, gradually more acute distally. Flower 3–6 mm long; hypanthium 1–1.5 mm long, glabrous; calyx lobes deltoid to subdeltoid, 1–1.5 × 0.8–1 mm, densely golden yellow- to ferruginous-strigillose abaxially; corolla lobes 5(6), elliptic to subrotund, 3–5 × 2–3 mm, densely golden yellow- to ferruginous-strigillose abaxially. Stamens 25 to 30(to 35), exceeding and obscuring gynoecium; filaments 0.5–3 mm long. Disc 1–1.5 mm in diameter, flat, rugose, glabrous or sparsely pubescent; style 1–1.5 mm long, glabrous or rarely sparsely pubescent. Fruit unknown.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 3.

**PHENOLOGY.**— Unknown.

**DISTRIBUTION AND HABITAT.**— Endemic to Nova Friburgo (Rio de Janeiro). Reportedly in elfin forest at ca. 2000 m elevation in the Serra dos Órgãos (Bidá 1995) but species of *Neosymplocos* that occur in such forests usually have smaller leaves (e.g., *Symplocos organensis*). It is therefore possible that *S. altissima* occurs in the lower montane ombrophilous forest of Nova Friburgo. Distribution map, Figure 2.

**DISCUSSION.**— *Symplocos altissima* is recognized by its glabrous leaves and calyx and corolla lobes that are densely strigillose abaxially. *Symplocos nitidiflora* and usually *S. falcata* are the only other species of section *Neosymplocos* with densely strigillose calyx and corolla lobes. The leaves of the last two species, however, are pubescent at least when young, whereas those of *S. altissima* are glabrous.

**ADDITIONAL SPECIMEN EXAMINED.**— BRAZIL. No location indicated, *A.F.M. Glaziou* (illegible number) (BM).



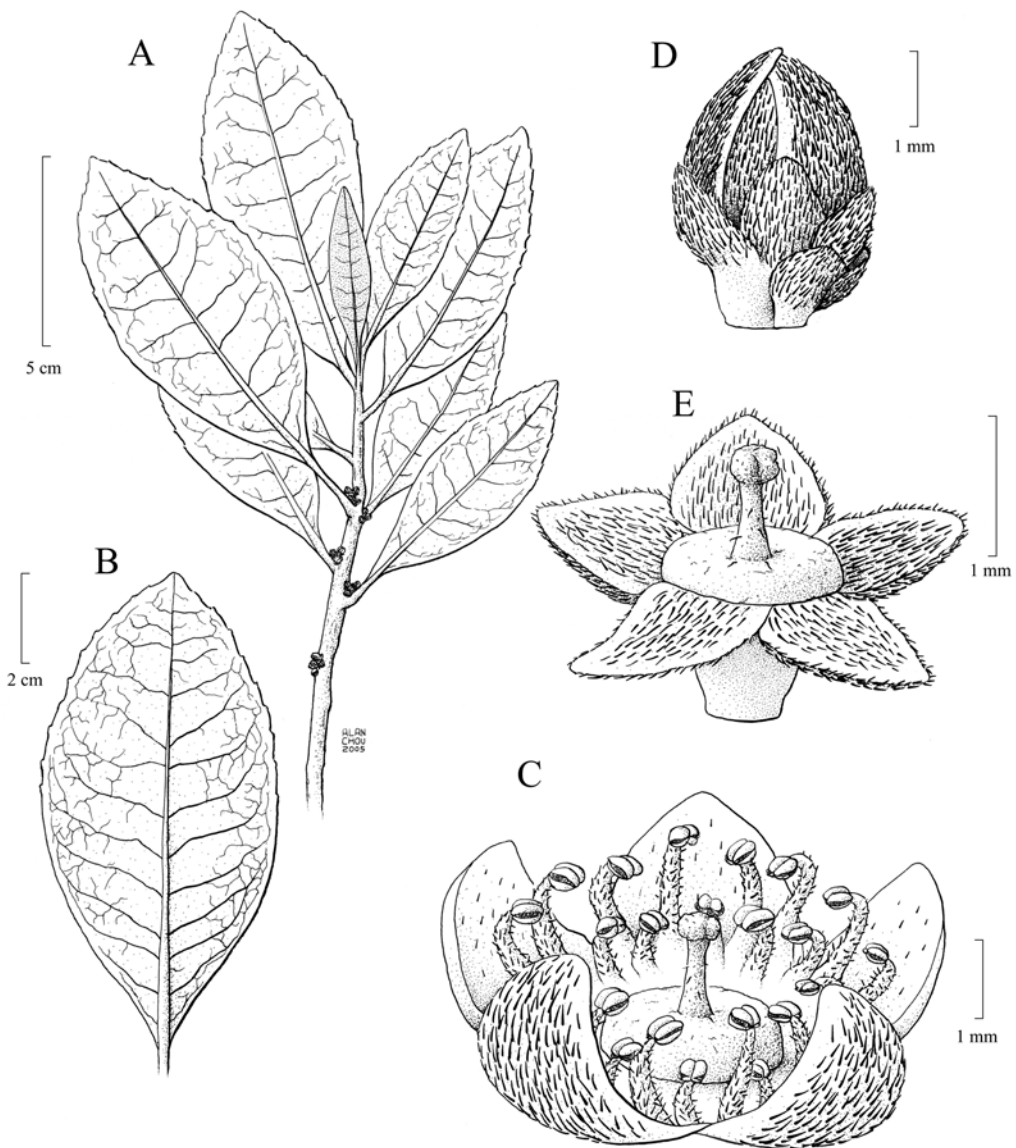


FIGURE 3. *Symplocos altissima* Brand. A. Flowering branch; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bract; E. Flower with corolla and androecium removed. (A–E from Glaziou 19618).

**2. *Symplocos angulata* Brand in Engl., Das Pflanzenreich IV. 242 (6):73. 1901. TYPE.—**BRAZIL. Minas Gerais: Serra do Caraça, Morro do Inficcionado, 1885, *A.F.M. Glaziou 15189* (holotype: B destroyed; photo of holotype: NY!; lectotype, here designated: G!; isoelectotypes: K!, P (3)).

*Symplocos angulata* was described by Brand (1901) from *Claussen 174* and *Glaziou 15189*. *Glaziou 15189* is the only collection seen by the authors. We selected the specimen at G as lectotype because its label has the same locality provided by Brand (1901) in the protologue. In addition, it has fruiting and flowering material.

Reportedly a small tree. Branches strongly angled, striate, fissured, tawny tomentose, glabrescent. Petiole 1–3 mm long, adaxially flat, tawny tomentose, glabrescent; leaf blade obovate or occasionally rotund, broadly oblong or ovate, 2.5–4.7 × 1.5–3 cm, abaxially densely tawny tomentose, rarely glabrescent, adaxially sparsely puberulent on basal half of mid-vein, otherwise glabrous, glabrescent, secondary and tertiary veins sparsely branched near midvein and margin, base cuneate or occasionally rounded to subrounded, margin entire or occasionally inconspicuously serrulate mainly on distal half,

marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex obtuse, retuse, or rarely truncate. Inflorescence 4–8 mm long, 1- to 5-flowered; bracts 7 to 15 (to 20), margin ciliate; the two basal bracts caducous, rotund to subrotund, keeled, 1.5–2 × 1–1.5 mm, densely to sparsely tawny tomentose abaxially, apex rounded or nearly so, apical gland usually lacking; other bracts 1–2 × 1–2 mm, glabrous or rarely sparsely tawny tomentose abaxial-medially, apices of basalmost subobtuse to obtuse, gradually more acute distally. Flower 3–6 mm long; hypanthium 1–1.5 mm long, glabrous; calyx lobes deltoid to occasionally rotund, 1–2 × 1–2 mm, glabrous or rarely sparsely tawny tomentose abaxially and then glabrescent; corolla lobes 5, reportedly pink, obovate to subrotund, 2–5 × 1.5–3 mm, glabrous or rarely sparsely pubescent, margin ciliate. Stamens 25 to 35, exceeding and obscuring gynoecium; filaments 0.5–2 mm long. Disc 0.8–1 mm in diameter, prominently elevated (0.7–1 mm), rugose, glabrous; style 0.5–1 mm long, glabrous. Fruit 2(3)-locular, 7–9 × 5–7 mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes erect to slightly appressed to disc, glabrous. Seed 1, 3–5 × 1.5–2 mm.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 5.

**PHENOLOGY.**— Flowering in June; fruiting in March and June.

**DISTRIBUTION AND HABITAT.**— Endemic to the Serra do Caraça, Pico do Inficcionado, in the southern part of the Cadeia do Espinhaço (Minas Gerais) reportedly in campo rupestre. Our field work on Pico do Inficcionado during October, 2005 failed to relocate this species in its natural habitat. Distribution map, Figure 4.

**DISCUSSION.**— *Symplocos angulata* is distinguished by the combination of its cuneate, subrounded, or rounded leaf base, tomentose young leaves abaxially, and prominently elevated (0.7 to 1 mm) disc. *Symplocos insolita*, the only other species of *Neosymplocos* that has an elevated disc, can be distinguished from *S. angulata* by the characters in the key.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Minas Gerais:** Serra do Caraça, Mar. 1892, *E.H.G. Ule* 2475 (R). No location indicated, 1842, *P. Claussen* 200 (BM).

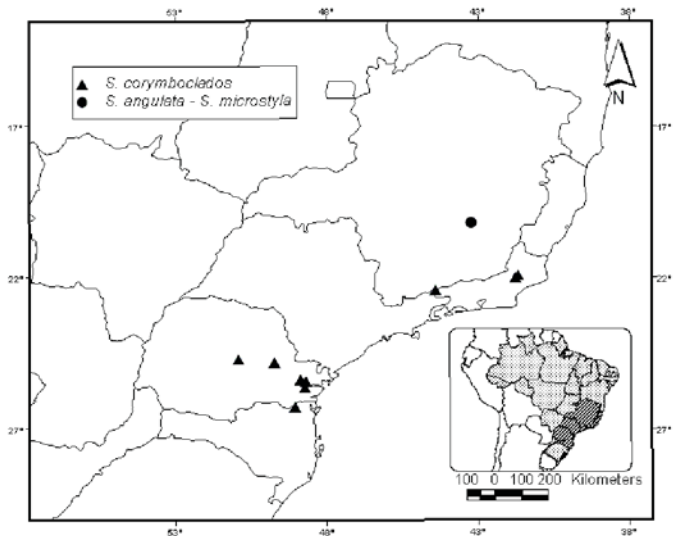


FIGURE 4. Distribution of *Symplocos angulata*, *S. corymbocladus*, and *S. microstyla*.

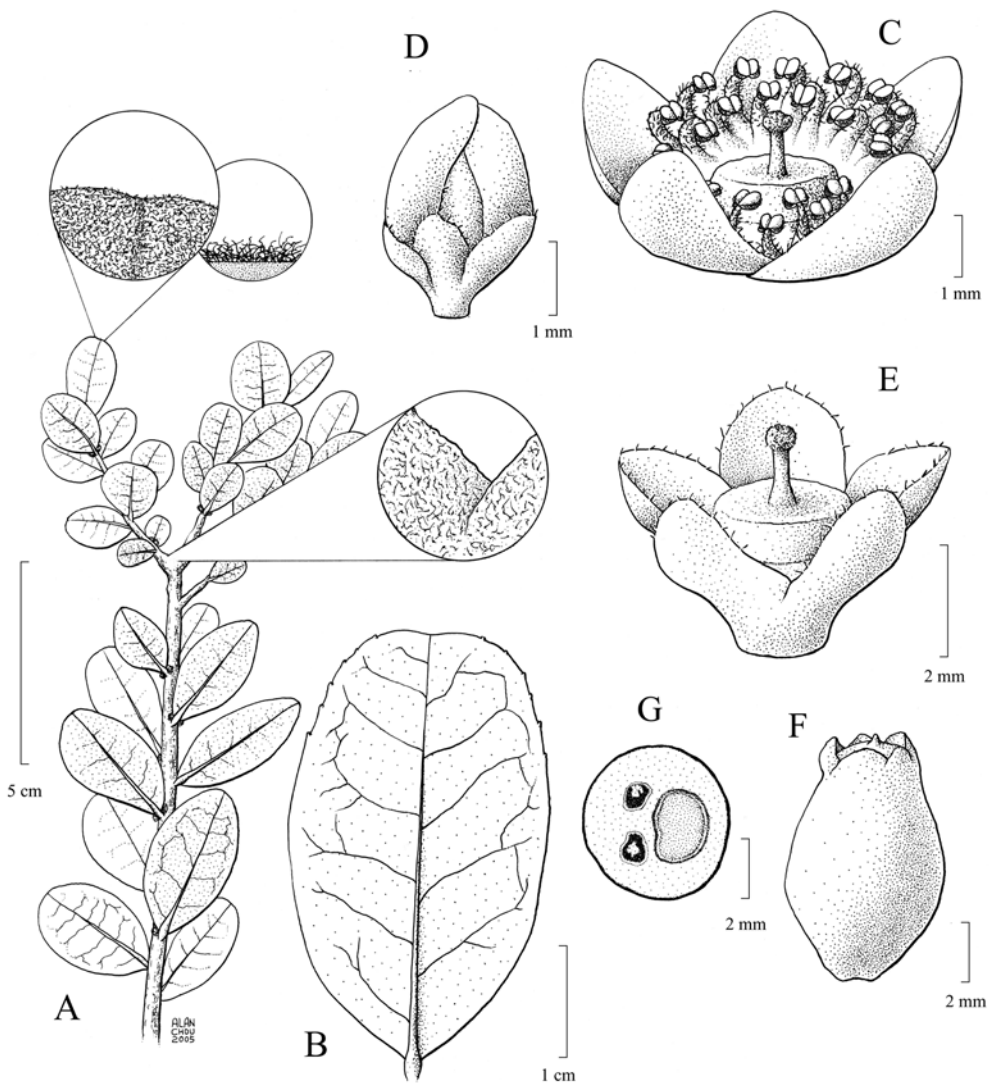


FIGURE 5. *Symplocos angulata* Brand. A. Flowering branch with branch and leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud. E. Flower with corolla and androecium removed; F. Mature fruit; G. Mature fruit in cross-section. (A–B from Claussen 200; C–G from Glaziou 15189).

**3. *Symplocos corymboclados* Brand in Engl., Pflanzenr. IV. 242 (6):72. 1901. TYPE.— BRAZIL. Rio de Janeiro: “Alto do Macahé bei Nova Friburgo” (protologue), 1891, *A.F.M. Glaziou 18359* (holotype: B destroyed; photo of holotype: NY!, RFA!; lectotype, here designated: K!; isolectotypes: BR, P).**

*Symplocos corymboclados* Brand var. *micromorpha* Sleumer, Repert. Spec. Nov. Regni Veg. 42. 264. 1937. TYPE.— BRAZIL. “In regionis silvaticae partibus superioribus montis Itatiaia, 1400–2000 m.s.m.” (protologue), September 1901, *R. Wettstein & V. Schiffner s.n.* (holotype: B destroyed).

We examined *Glaziou 18359* from G and K, and two photographs of the destroyed B holotype from NY and RFA. We excluded the G specimen of *Glaziou 18359* from the type collection because the locality on its

label does not agree with that in the protologue. We therefore have designated the K specimen as lectotype because it is the only type material that we have seen.

No authentic material of *Symplocos corymboclados* var. *micromorpha* has been located. The description indicates that the only differences between the nominate variety and variety *micromorpha* are the leaf dimensions. The leaves of the nominate variety are 2–6.5 × 0.8–2.5 cm and those of variety *micromorpha* are 3–3.5 × 0.8–1 cm. These differences are insignificant and unworthy of formal recognition at the infraspecific level.

Shrub or tree 1–10 m tall. Branches ± terete, striate, fissured, glabrous or white- or golden yellow-strigose, then glabrescent. Petiole 5–8 mm long, adaxially concave to canaliculate, glabrous or white- or golden-yellow-strigose, then glabrescent; leaf blade elliptic to obovate, 2–6.5 × 0.8–2.5 cm, abaxially glabrous to densely white- or golden yellow-strigose, then glabrescent, adaxially glabrous or rarely puberulent on basal half of midvein, then glabrescent, secondary and tertiary veins highly branched near midvein and margin, base attenuate to cuneate, margin inconspicuously serrulate on distal half, rarely conspicuously serrate, marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex acuminate or nearly acute, acumen (when present) 1–7 mm long. Inflorescence 5–8 mm long, 1- to 6-flowered; bracts 7 to 25, glabrous or abaxially sparsely white- or golden yellow-strigillose mainly along medial vein, margin frequently ciliate; the two basal bracts usually early caducous, deltoid, keeled to concave, 0.5–1 × 0.4–0.7 mm, apex acute or nearly so, apical gland usually lacking; other bracts 1–2 × 1–2 mm, apices of basalmost obtuse, gradually more acute distally. Flower 2–4 mm long; hypanthium 0.8–1.3 mm long, glabrous; calyx lobes nearly deltoid to rotund, 1–1.5 × 0.8–1 mm, glabrous or sparsely white- or golden yellow-strigillose abaxial-medially and then glabrescent; corolla lobes 5(6), ascending, white, cream, or green, elliptic to subrotund, 1.5–2.5 × 1–2 mm, glabrous or sparsely white- or golden yellow-strigillose abaxial-medially. Stamens 20 to 35(to 40), exceeding and obscuring gynoecium; filaments 0.5–1.5 mm long; anthers white or greenish white. Disc 0.5–1 mm in diameter, flat, smooth or ± rugose, glabrous or rarely sparsely pubescent; style 0.5–1 mm long, glabrous. Fruit 1(2 or 3)-locular, ellipsoid or cylindrical, 5–7 × 3–5 mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes erect or slightly appressed to disc, glabrous. Seed 1(2 or 3), 4–5 × 2.5–3.3 mm.

**VERNACULAR NAME.**— congonha (*P. Campos Porto 831* (R, RB)).

**ILLUSTRATION.**— Figure 6.

**PHOTOGRAPHIC IMAGES.**— Figures 1A, 1C.

**PHENOLOGY.**— Flowering usually from September to November, occasionally July and August; fruiting usually from November to March, occasionally in June or October.

**DISTRIBUTION AND HABITAT.**— *Symplocos corymboclados* is known from southeastern (Rio de Janeiro and Minas Gerais) and southern (Paraná and Santa Catarina) Brazil. In Rio de Janeiro it is disjunct between the northern and southern regions growing in windy, humid elfin forest between 1400 m to 1800 m elevation as a shrub or small tree although it is to be expected in high montane ombrophilous forest as well. It also occurs in the western part of the Serra do Itatiaia in Minas Gerais. In southern Brazil it grows in elfin forest (1100 m to 2000 m elevation) and high montane ombrophilous forest (1400 to 1850 m elevation) as a mid-canopy tree (ca. 10 m tall), and occasionally in riparian situations. In Paraná the species is widespread but uncommon. It occurs mainly in the Serra do Mar extending to the western region of Paraná in low montane ombrophilous forest. The species rarely occurs in secondary vegetation. Distribution map, Figure 4.

**DISCUSSION.**— *Symplocos corymboclados* is characterized by the combination of its glabrous leaf blade adaxially (rarely puberulent along basal half of midvein), glabrous or (when young) strigose leaf blade abaxially, glabrous or sparsely pubescent calyx lobes, glabrous or medially pubescent corolla lobes abaxially, white to greenish white anthers, and fruit 5–7 mm long. It resem-

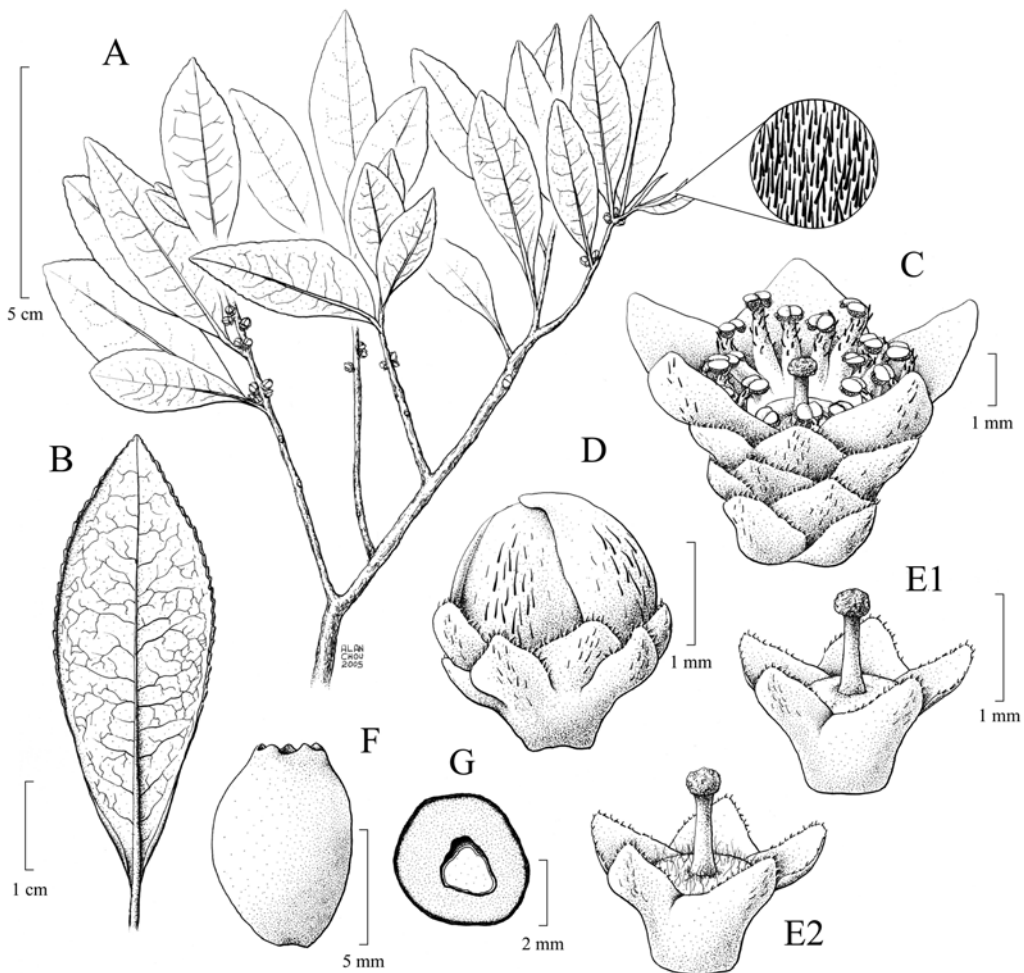


FIGURE 6. *Symplocos corymboclados* Brand. A. Flowering branch with leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E1 and E2. Flower with corolla and androecium removed to show disc surface variation; F. mature fruit; G. Mature fruit in cross-section. (A–E1 from *Glaziou 18359*; E2 from *Hatschbach 17316*; F–G from *Lobão et al. 667*).

bles *S. falcata* in leaf shape, margin, and anther color. *Symplocos falcata*, however, has calyx lobes that are densely sericeous-tomentose or strigillose and fruit that is 8–10 mm long and calyx lobes with indument at least when young.

Individuals from Rio de Janeiro, Paraná, and a few from Santa Catarina generally differ in some morphological features. Specimens from Rio de Janeiro have secondary and tertiary veins impressed adaxially, leaves densely strigose abaxially with margin conspicuously serrate, corolla lobes frequently glabrous, and fruit ± ellipsoid with erect calyx lobes. In contrast, specimens from Paraná have glabrous or sparsely (rarely densely) strigose leaves abaxially, leaves with the secondary and tertiary veins impressed adaxially, a sparsely serrulate leaf blade margin, corolla lobes that are usually pubescent abaxial-medially, and a ± cylindrical fruit with calyx lobes slightly appressed to the disc. Several specimens from Santa Catarina are similar to those from Rio de Janeiro in their

pubescent leaf blade margin and glabrous corolla lobes. The secondary and tertiary veins, however, are strongly sulcate adaxially. We consider these morphological differences to be taxonomically insignificant because of strong overlap among populations from Rio de Janeiro and Paraná.

Based on morphological differences between specimens from Rio de Janeiro and Paraná, Bidá (1995) considered the Paraná collections as *S. hatschbachii* (ined.). We consider the Paraná material to represent variation within *S. corymboclados*, in agreement with Occhioni (1974).

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Minas Gerais:** Itatiaia, 1918, *P. Campos Porto 831* (R, RB). **Paraná:** Antonina, trail to Pico Caratuva, 19 Oct. 2005, *P.W. Fritsch et al. 1831* (CAS, MBM, UEC); Serra Ibitiraquire, Pico Paraná, 20 Dec. 1977, *O.S. Ribas & V.A.O. Dittrich 2185* (MBM, NY); Campina Grande do Sul, Morro Itapiroca, Kielse farm, 18 Sep. 1999, *E. Barbosa et al. 376* (MBM); Serra Ibitiraquire, 30 Nov. 1996, *J. Cordeiro & O.S. Ribas 1388* (B, BHCB, G, HRCB, MBM (2), NY); Serra do Ibitiraquire, Morro Tucum, 24 Oct. 2000, *J. Cordeiro et al. 1777* (MBM, RB); Pico Caratuva, 5 Oct. 1967, *G. Hatschbach s.n.* (B 100158489, HB 58575, MBM 23454); road to Rio Taquari-Rio Divisa, 18 Oct. 1959, *G. Hatschbach 6405* (G, MBM, RFA); Serra do Mar, Pico Caratuva, 5 Oct. 1967, *G. Hatschbach 17316* (BM, MBM, NY, RFA, S, UPCB); Pico Caratuva, 2 Aug. 1967, *G. Hatschbach 16836* (MBM); Serra de Ibitiraquire, 25 Sep. 1969, *G. Hatschbach 22230* (HB, MBM, RFA (2)); Serra Ibitiraquire, Pico Ferraria, 1 Nov. 2001, *A.Y. Mocochinski & M.B. Scheer 86* (MBM); Morro Tucum, 22 Dec. 1999, *O.S. Ribas et al. 2880* (MBM, SPF); Serra dos Órgãos, Pico Caratuva, 4 July 1991, *C.V. Roderjan & A. Vicentini 930* (MBM); Serra do Ibitiraquire, Pico Caratuva, 28 June 2002, *M.B. Scheer & A.Y. Mocochinski 451* (UPCB); Pico Paraná, Abrigo 3, 7 Sep. 1996, *J.M. Silva et al. 1696* (MBM, UPCB); trail to Pico Paraná, Serra Ibitiraquire, 5 Oct. 1997, *J.M. Silva et al. 2055* (MBM); Guaratuba, Serra do Araçatuba, Morro dos Perdidos, 18 Sep. 1997, *H.M. Fernandes & E.P. Santos 35* (MBM); Serra do Araçatuba, 15 Sep. 1982, *R. Kummrow 2033* (MBM); Serra do Araçatuba, Morro dos Perdidos, 18 Sep. 1997, *E.P. Santos & H.M. Fernandes 348* (MBM); Serra do Araçatuba, 23 Nov. 1996, *E.P. Santos et al. 284* (MBM, UPCB); Serra do Araçatuba, 15 Sep. 1995, *J.M. Silva & E.P. Santos 1053* (MBM); Laranjeiras do Sul, Rio Reserva, 18 Mar. 1987, *J.C. Lindeman & J.H. de Haas 5017* (MBM); Morretes, Serra da Prata, near Torre da Prata, 8 Dec. 1998, *E. Barbosa et al. 240* (MBM); Parque Estadual do Pico Marumbi, 17 July 2000, *S. Dala Rosa 106* (UPCB); Piraquara, Serra do Mar, along a trail on W slope of Morro do Canal, 15 Oct. 2005, *P.W. Fritsch et al. 1807* (CAS, MBM, UEC); Rio Taquari, 29 Sep. 1951, *G. Hatschbach s.n.* (MBM 23454); Morro do Canal, 9 Jan. 2004, *O.S. Ribas et al. 5760* (MBM); Morro do Canal, *O.S. Ribas et al. 5848* (MBM, SPF); Morro do Canal, 18 Sep. 2004, *E.J. Stange 6* (UPCB); Quatro Barras, Rio Taquari, 8 Oct. 1968, *G. Hatschbach 19951* (HB, K, MBM, UPCB); Rio Taquari, 20 Oct. 1971, *G. Hatschbach 27669* (MBM); Rio Taquari, 21 Jan. 1975, *G. Hatschbach 35784* (MBM); Morro Anhangava, 23 Sep. 1992, *C.V. Roderjan 1018* (MBM). **Rio de Janeiro:** Itatiaia, Retiro, 18 Oct. 1903, *P.K.H. Dusen 29* (S); Retiro, 18 Oct. 1903, *P.K.H. Dusen 301* (R); 20 Oct. 1903, *P.K.H. Dusen 2023* (S); Santa Maria Madalena, Alto do Desengano, Oct. 1934, *J. Lima dos Santos 277* (B, RB); Parque Estadual do Desengano, Pedra do Desengano, 26 Mar. 2002, *A.Q. Lobão et al. 667* (SPF); Parque Estadual do Desengano, Pedra do Desengano, 5 Oct. 1984, *G. Martinelli et al. 13155* (UPCB). **Santa Catarina:** Campo Alegre, Serra do Iquererim, 18 Oct. 1957, *R. Reitz & R.M. Klein 5249* (B, NY); Morro do Iquererim, 10 Jan. 1958, *R. Reitz & R.M. Klein 6132* (UPCB).

**4. *Symplocos falcata*** Brand in Engl., Pflanz. IV. 242 (6):71. 1901. TYPE.— BRAZIL. Rio de Janeiro: Serra do Alto do Macahé, 1889, *A.F.M. Glaziou 17473* (holotype: B destroyed; lectotype, here designated: G!; isolectotypes, C, K!, P, photo of C in NY!).

*Symplocos aegrota* Brand in Engl., Pflanz. IV. 242 (6):71. 1901. TYPE.— BRAZIL. Rio de Janeiro: “Bei Nova Friburgo” (protologue), 1885, *A.F.M. Glaziou 15203* (holotype: B destroyed; photo of holotype: NY!, RFA!; lectotype, here designated: G!; isolectotypes: K!, P).

*Symplocos ascendens* Brand in Engl., Pflanz. IV. 242 (6):71. 1901. TYPE.— BRAZIL. Rio de Janeiro: “Alto do Macahé bei Nova Friburgo” (protologue), 1892, *A.F.M. Glaziou 20212* (holotype: B destroyed; lectotype, here designated: K!; isolectotypes: C, G!, P, US, photo of C in NY!, RFA!, photo of US in RFA!).

*Symplocos densiflora* Brand in Engl., Pflanz. IV. 242 (6):71. 1901. TYPE.— BRAZIL. Minas Gerais: “Rancho do Morro Cavado” (protologue), 1876, *A.F.M. Glaziou 7769* (holotype: B destroyed; lectotype, here designated: G!; isolectotypes: K!, P).

*Symplocos densiflora* Brand var. *minor* Brand in Engl., Pflanz. IV. 242 (6):71. 1901. TYPE.— BRAZIL. São Paulo: “Campos da Bocaina” (protologue), 1878, *A.F.M. Glaziou 11167* (holotype: B destroyed; lectotype, here designated: K!; isolectotype: P).

We selected the material from G as lectotype of *S. falcata* because it includes a date and the locality cited on the protologue. *Symplocos aegrota* was based on three syntypes: *Glaziou 15203*, *17129*, and *17696*. We chose to lectotypify this name on *Glaziou 15203* because all the specimens within this collection match the protologue and it is fairly well represented in herbaria. We specifically designated the specimen from G as lectotype because of its label information, which matches the protologue. The holotype of *S. ascendens* was destroyed during World War II. We chose the specimen from K as lectotype because its label is more complete when compared with the type from G. *Symplocos densiflora* var. *densiflora* is based on two syntypes: *Glaziou 6695* and *7769*. We selected *Glaziou 7769* from G as lectotype because it has the exact location mentioned by Brand (1901) on its label. The holotype of *S. densiflora* var. *minor* (*Glaziou 11167*) was also destroyed in World War II. We excluded *Glaziou 11167* from G from the type collection because its locality does not agree with the protologue. We designated the material from K as lectotype because it is the only material of the type collection seen with label information that agrees with the protologue.

Tree or rarely shrub 2–25 m tall. Branches flattened to ± terete, striate, fissured or smooth, white-, golden yellow-, or ferruginous-sericeous-tomentose, -strigose, or occasionally -hirsute, glabrescent. Petiole 2–20 mm long, adaxially flat or slightly concave, white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigose, glabrescent; leaf blade elliptic, oblong, or obovate, 5–16 × 1.8–4 cm, abaxially and adaxially densely white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigose, usually glabrescent abaxially and adaxially, secondary and tertiary veins highly branched near midvein and margin, base attenuate or occasionally cuneate to narrowly rounded, margin conspicuously serrate on distal  $\frac{3}{4}$ , less often serrulate or rarely entire, marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex commonly acuminate or occasionally nearly acute, acumen (when present) 2–35 mm long. Inflorescence 4–8 mm long, 1- to 10-flowered; bracts 6 to numerous, abaxially densely white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigillose, margin frequently ciliate; the two basal bracts usually early caducous, deltoid to rotund, keeled, 2–3 × 0.8–1.2 mm, apex acute to rounded, apical gland usually lacking; other bracts 1–5 × 0.5–2.5 mm, apices of basalmost obtuse or rounded proximally, gradually more acute distally. Flower 3–4.5 mm long; hypanthium 0.8–1.2 mm long, glabrous; calyx lobes deltoid or occasionally rotund, 1–1.5 × 1–1.5 mm, densely white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigillose abaxially; corolla lobes 5(6), ascending or spreading, white, cream, or green, broadly elliptic to rotund, 2–3.5 × 1–2 mm, densely white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigillose abaxially, rarely only medially or glabrous. Stamens 25 to 35, exceeding and partly or totally obscuring gynoecium; filaments 0.5–2 mm long; anthers white or greenish white. Disc 0.8–1.3 mm in diameter, flat, slightly rugose, glabrous or rarely sparsely pubescent; style 0.5–1 mm long, glabrous. Fruit 2(3)-locular, cylindrical or nearly so, 8–10 × 4–6 mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes erect to tightly appressed to disc, white-, golden yellow-, or ferruginous-sericeous-tomentose or -strigillose, rarely glabrescent. Seed 1, 5–6 × 0.8–1.5 mm.

**VERNACULAR NAMES.**— canela (*M. Kuhlmann 2048* (MBM)), congonha (*P. Campos Porto 831* (R, RB)), congonha da mata (Bidá 1995).

**ILLUSTRATION.**— Figure 8.

**PHOTOGRAPHIC IMAGES.**— Figure 1D, II.

**PHENOLOGY.**— Flowering usually from September to December, occasionally in February or

June to August; fruiting usually from November to February, occasionally in March or April or June to October.

**DISTRIBUTION AND HABITAT.**— *Symplocos falcata* is one of the most common and widespread species of section *Neosymplocos* in southeastern Brazil (São Paulo, Minas Gerais, Rio de Janeiro, and Espírito Santo, near the border with Minas Gerais). This species occurs mainly in low and high montane ombrophilous forest of the Serra do Mar (200 to 1900 m elevation) as understory (partial shade) or mid-canopy trees. In elfin forest it can be a shrub or small tree (1100 to 2400 m elevation). It also can be found in riparian situations, araucaria forest, “brejo” (marshes partially and permanently inundated by water), disturbed forest formations, and secondary vegetation. Distribution map, Figure 7.

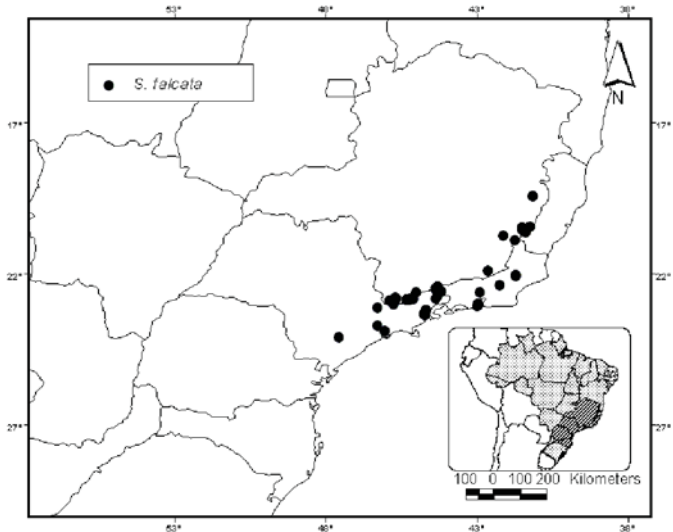


FIGURE 7. Distribution of *Symplocos falcata*.

**DISCUSSION.**— *Symplocos falcata* is readily distinguished by the combination of its pubescent young leaves, densely sericeous-tomentose or strigillose calyx lobes at least when young, ascending or spreading corolla lobes, white to greenish white anthers, and fruit 8–10 mm long. In leaf size and shape *S. falcata* is most similar to *S. altissima* and *S. nitidiflora*. The leaves of *S. altissima*, however, are glabrous, and *S. nitidiflora* has strongly reflexed corolla lobes and yellow anthers. In addition, *S. nitidiflora* has larger pollen, with mesocolpia possessing a thick layer of sexine and a thinner layer of nexine-1, whereas that of *S. falcata* is smaller, with mesocolpia possessing a thinner layer of sexine and a thicker layer of nexine-1 (Occhioni 1975a). In leaf shape, size, and margin, and anther color, *S. falcata* is similar to *S. corymbocladus*. The latter, however, has smaller fruit (5–7 mm long) with glabrous calyx lobes.

*Symplocos falcata* exhibits significant morphological variation correlated with habitat and elevation, and this variation is reflected in the several names published that here are relegated to synonymy. The component of *S. falcata* largely encompassed by *S. aegrota*, *sensu* Brand (1901), occurs in windy and humid areas of elfin forest. The most important characters used by Brand (1901) to distinguish *S. aegrota* from *S. falcata* were an acute leaf apex and an entire leaf margin (versus acuminate and serrate to serrulate). Several specimens collected in low and high montane ombrophilous forest in Rio de Janeiro, however, show considerable overlap in these characters. The characters that separate *S. densiflora* from *S. falcata* are hirsute (versus tomentose-sericeous) branches and obovate (versus elliptic) leaves that are abaxially strigose (versus sericeous-tomentose). Our field observations at Itatiaia and Camanducaia, however, revealed that individuals occurring in the understory (as shrubs or small trees) have characteristics of *S. densiflora* and the upper branches of mid-canopy trees have those of *S. falcata*. Frequently, the lower branches (in partial shade) of the mid-canopy trees have hirsute branches and obovate leaves that are abaxially strigose. Furthermore, several collections (*Glaziou 5888*, *Dusen 14240*, and *Mgf. & App. 10403*) from Rio



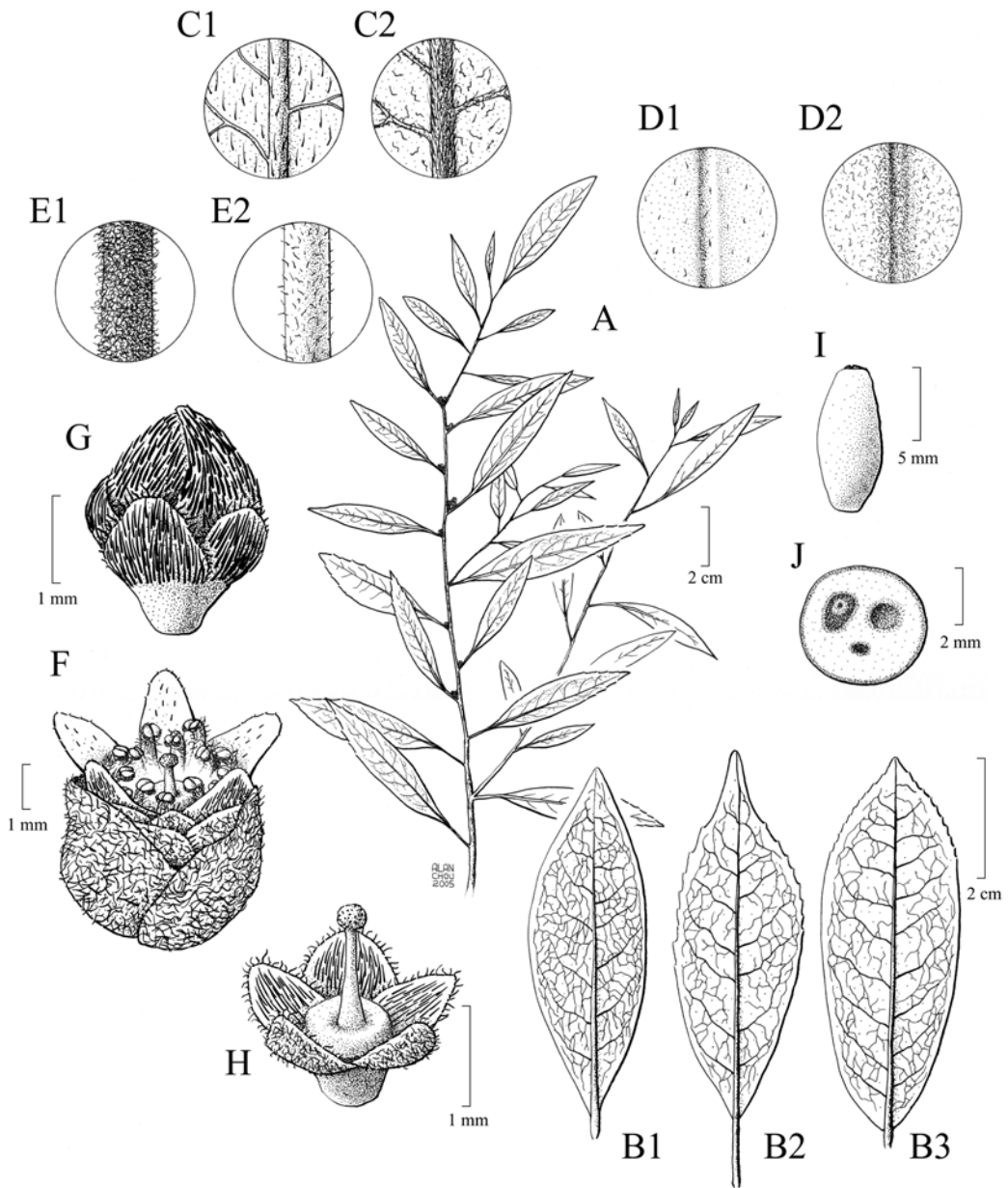


FIGURE 8. *Symplocos falcata* Brand. A. Flowering branch; B1, B2, and B3. Variation in leaf morphology (abaxial surface); C1 and C2. Variation in leaf indument (abaxial surface); D1 and D2. Variation in leaf indument (adaxial surface); E1 and E2. Variation in branch indument; F. Flower at anthesis with subtending bracts and androecium opened outward to show ovary apex, style, and stigma; G. Floral bud; H. Flower with corolla and androecium removed; I. Mature fruit; J. Mature fruit in cross-section. (A, B2, C2, D1, and E2–H from *Glaziou 17473*; B1, D2, and E1 from *Glaziou 15203*; B3 and C1 from *Glaziou 7769*; I–J from *Glaziou 17129*).

de Janeiro show these purported species differences on the same specimen. In circumscribing *S. ascendens*, Brand (1901) used only the ascending petioles to separate it from *S. falcata*. This, however, appears to be an artifact of the drying process, and even *S. falcata*, *sensu* Brand (1901), has such petioles. Brand (1901) distinguishes *S. densiflora* vars. *densiflora* and *minor* by leaves 8–12 versus 7–9 cm long, respectively. This difference is not sufficient for the recognition of varieties because it is a single character uncorrelated with geography.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Espírito Santo:** Dores do Rio Preto, Parque Nacional do Caparaó, near Casa Queimada, 19 Oct. 1999, *F.F. Mazine et al.* 202 (ESA); Iúna, Parque Nacional do Caparaó, between Arrozal and Rancho dos Cabritos, 18 Feb. 2000, *V.C. Souza et al.* 23397 (ESA). **Minas Gerais:** Camanducaia, Monte Verde District, Serra da Mantiqueira, 8 km from Monte Verde, on the trail to Pedra Partida and Pedra Redonda, *F. Almeda et al.* 8782 (CAS, UEC); Monte Verde District, Serra da Mantiqueira, 9 Nov. 2004, *F. Almeda et al.* 8788 (CAS, UEC); Monte Verde District, Serra da Mantiqueira, 9 Nov. 2004, *F. Almeda et al.* 8790 (CAS, UEC); Monte Verde District, 29 Sep. 2004, *J.L.M. Aranha Filho et al.* 29 (UEC); Monte Verde District, 30 Sep. 2006, *J.L.M. Aranha Filho et al.* 43 (UEC); Mata do Altair, near the road, 8 Dec. 2000, *G.S. França 211* (BHCB, HRCB); Mata do Altair, near the road, 12 Oct. 2000, *G.S. França & J.R. Stehmann 125* (BHCB, HRCB); near Monte Verde District, 19 Nov. 1979, *H. de F. Leitão Filho & R.R. Rodrigues 10670* (UEC); Gonçalves Road, 23 Oct. 2001, *J.R. Stehmann & I.B. Castro 3001* (BHCB, HRCB); Caparaó, Serra do Caparaó, 13 Sep. 1941, *A.C. Brade 16932* (MBM, RB, UPCB (2)); Parque Nacional do Caparaó, trail to Pico da Bandeira, 15 June 1991, *G. Hatschbach & J.M. Silva 55522* (MBM, SPF); Serra do Brigadeiro, 12 Jan. 1995, *L.S. Leoni 2759* (UPCB); Parque Nacional, 29 Sep. 1993, *L.S. Leoni et al.* 3076 (HB, UPCB); Parque Nacional do Caparaó, trail to Tronqueira-Terrerao, near the river, 29 Sep. 1995, *J.A. Lombardi 939* (BHCB, HRCB); Pico do Luiz Inácio, 21 Oct. 1947, *A.X. Moreira 46* (R); Parque Nacional do Caparaó, trail to Pico da Bandeira, 12 Dec. 1998, *J. Paula-Souza et al.* 2109 (ESA); Parque Nacional do Caparaó, trail between Tronqueira and Pico da Bandeira, 2 Sep. 1996, *V.C. Souza et al.* 12147 (ESA, SPF); Delfim Moreira, between Delfim Moreira and Itajubá, 17 Mar. 1939, *A. Gehrt & M. Kuhlmann s.n.* (SP 40077); Paraíso, between Pedra São Domingos and Pessegueiro, 14 Oct. 2000, *G.S. França & J.R. Stehmann 158* (BHCB, HRCB). **Rio de Janeiro:** Itatiaia, Sep. 1934, *A.C. Brade 14050* (RB); 1918, *P. Campos Porto 831* (R, RB); 18 Oct. 1903, *P.K.H. Dusen s.n.* (K 1978111, S); 18 June 1902, *P.K.H. Dusen 573* (R (2); S, SP); 20 Oct. 1903, *P.K.H. Dusen 2135* (S); 24 June 1873, *A.F.M. Glaziou 6695* (K, NY); Caminho das Macieiras, 18 Oct. 1922, *J.G. Kuhlmann s.n.* (R 111294, RB 22314); road Registro × Planalto, Km 9, 16 Sep. 1974, *P. Occhioni 6240* (RFA); road to Planalto, Km 5, 16 Sep. 1974, *P. Occhioni 6255* (RFA); Macieiras, 15 Mar. 1975, *P. Occhioni 7064* (RFA); road to Registro, Agulhas Negras, 12 Mar. 1975, *P. Occhioni 7100* (RFA); road Registro-Planalto, 11 Dec. 1975, *P. Occhioni 7830* (RFA); Registro, on the road to Planalto do Itatiaia, Km 2, 17 Jan. 1979, *P. Occhioni 8702* (MBM, RFA); 10 Jan. 1896, *E.H.G. Ule 644* (R); Nova Iguaçu, Tinguá REBIO, Pico do Tinguá, Rala Trail, Sapé, 30 Jan. 2002, *H.C. de Lima et al.* 5988 (RB); Tinguá REBIO, Pico do Tinguá, Rala Trail, Sapé, 30 Jan. 2002, *H.C. de Lima et al.* 6019 (RB); Petrópolis, 1889, *A.F.M. Glaziou 17696* (G, K); Rio de Janeiro, Serra da Tijuca, 6 Feb. 1946, *Altamiro et al.* 51 (MBM, RB, UPCB); Serra da Tijuca, 6 Mar. 1946, *A.A. Edmund & Walter 51* (R, UPCB); Paula e Virgínia, Tijuca, Oct. 1964, *A.P. Duarte 8668* (GUA, HB, RB, UPCB (2)); Tijuca, Pedra do Conde, 25 Sep. 1928, *A. Ducke s.n.* (RB 22312); Pico da Tijuca, 30 Sep. 1900, *E. Hemmendorff 3241* (S); Archer, Tijuca, Sep. 1915, *F.C. Hoehne 311* (SP); Pedra do Cônego, Tijuca, 16 Oct. 1928, *J.G. Kuhlmann s.n.* (RB 148776); Santa Maria Madalena, Pedra Dubois, 25 June 1987, *C. Farney et al.* 1439 (RB); Pedra Dubois, 22 Feb. 1983, *T. Plowman & H. C. de Lima 12863* (NY); Teresópolis, Parque Nacional da Serra dos Órgãos, near the upper part of the Rancho Frio Trail, 9 Mar. 2005, *C. Seele 1055* (RB); Parque Nacional da Serra dos Órgãos, trail to Rancho Frio, 11 Mar. 2005, *J. Wesenberg & R. Engelmann 628* (RB); no location indicated, 1883–1884, *A.F.M. Glaziou s.n.* (NY 486948); *A.F.M. Glaziou 5888* (S); *A.F.M. Glaziou 17636* (G). **São Paulo:** Bocaina, Lageado, 7 Dec. 1952, *Mgf. & App.* 10403 (GUA, RB, UPCB); Lageado, Dec. 1972, *J. Reis s.n.* (RFA 15715); Serra da Bocaina, road to São José do Barreiro-Silveiras, Km 16, 2 Jan. 1981, *G.J. Shepherd & S.L.K. Shepherd 12859* (UEC); Campos do Jordão, Pico do Itapeva, 6 Nov. 1987, *S.M. Carmello-Guerreiro et al.* 13 (SPF); Parque Estadual, 16 Oct. 1984, *J.P.M. Carvalho & M. de J. Robin s.n.* (MBM 235530); 26 Sep. 1980, *J.E.R. Collares 48* (RB); 27 Sep. 1980, *J.E.R. Collares 64* (RB); road between Reserva do Instituto Florestal and São José dos Alpes, ca. 6 km, 29 Sep. 1984, *L.S. Kinoshita et*

*al.* 16544 (UEC, UPCB); Umuarama, 28 Jan. 1935, *M. Kuhlmann s.n.* (SP 32527, UPCB 26734); Umuarama, 22 Nov. 1949, *M. Kuhlmann 2048* (SP, SPF, UPCB); Campo das Macieiras, 13 June 1950, *M. Kuhlmann 2531* (SP, UPCB); Guarda Farm, Horto Florestal, 15 Dec. 1966, *J. Mattos & N. Mattos 14362* (ESA, SP, UPCB); Fazenda da Guarda, Horto Florestal, 17 Dec. 1966, *J. Mattos & N. Mattos 14469* (SP); 16 Feb. 1981, *Messias 48* (RB); road to Pico Itapeva, 12 Jan. 1977, *P. Occhioni 8009* (MBM, RFA); road to Pico Itapeva, 12 Jan. 1977, *P. Occhioni 8024* (RFA); Parque Estadual, trail to Rio Sapucaí, 10 Oct. 2001, *J.R. Pirani et al. 4896* (MBM, NY, SP, SPF); Parque Estadual, Pinheiro Seco, 16 Oct. 1984, *M. de J. Robin & J.P.M. Carvalho s.n.* (MBM 235531); Parque Estadual de Campos do Jordão, Instituto Florestal, São José dos Alpes, 22 Feb. 1984, *M. de J. Robin & J.P.M. Carvalho 8398* (UPCB); Parque Estadual de Campos de Jordão, Instituto Florestal, trail to the waterfall, 7 Jan. 1985, *M. de J. Robin & A.D. Pereira 212* (MBM, UPCB); 21 Nov. 1980, *A.A.B. Rubens 198* (RB); Parque Estadual, 27 Apr. 1981, *A.A.B. Rubens 255* (RB); 24 June 1981, *A.A.B. Rubens 264* (RB); Parque Estadual de Campos de Jordão, 17 Aug. 1980, *J.C.C. Uruahy 21* (RB); Cunha, margin of Rio Paraibuna, 28 Jan. 2004, *F.A.R.D.P. Arzolla 425* (UEC); Parque Estadual da Serra do Mar, 30 Mar. 1994; *J.B. Baitello 594* (UPCB); Parque Estadual da Serra do Mar, Núcleo Cunha, 13 Dec. 1996, *D.F. Bertani et al. 1* (ESA, SPF, UEC); Estação Experimental da Serra do Mar, Núcleo Cunha, Morro da Marlene, trail to elfin forest, *A.R. Ferretti 140* (ESA, HRCB, SP, SPF, UEC); Parque Estadual da Serra do Mar, Núcleo Cunha-Indaiá, Rio Bonito Trail, 28 Jan. 2004, *N.M. Ivanauskas et al. 5069* (ESA); Parque Estadual da Serra do Mar, Rio Bonito, 17 Aug. 1994, *M.L. Kawasaki & G.A.D.C. Franco 571* (HRCB, SPF, UEC); Parque Estadual da Serra do Mar, Pedreira, 18 Aug. 1994, *M.L. Kawasaki & G.A.D.C. Franco 1252* (HRCB, SPF, UEC, UPCB); Santo André, Alto da Serra, 3 Oct. 1912, *P.K.H. Dusen 14240* (NY, S); Alto da Serra, Estação Biológica, 2 Oct. 1931, *F.C. Hoehne s.n.* (SP 28310); Reserva Biológica do Alto da Serra de Paranapiacaba, 6 Nov. 1991, *M. Kirizawa et al. 2568* (SP); Estação Biológica, 30 Sep. 1922, *J.G. Kuhlmann s.n.* (RB 162879); São Caetano do Sul, 7 Oct. 1922, *J.G. Kuhlmann s.n.* (RB 21948); São José do Barreiro, Serra da Bocaina, 29 June 1994, *K.D. Barreto 2696* (ESA); 21 Sep. 1997, *L. Freitas 299* (UEC).

**5. *Symplocos glandulosomarginata*** Hoehne [*“S. glanduloso-marginata”*], Arq. Bot. São Paulo 1(1):37–38, tab. 44. 1938. TYPE.— BRAZIL. São Paulo: São Paulo, Jardim Botânico, 10 November 1932, *O. Handro s.n.* (holotype: SP!; isotypes: B!, K!, MBM!, NY (3)!, S!, US, photo of US in RFA!).

Shrub or tree 2–25 m tall. Branches ± terete, striate, fissured, white-, golden yellow-, or ferruginous-tomentose, glabrescent. Petiole 2–5 mm long, adaxially flat, white-, golden yellow-, or ferruginous-tomentose, glabrescent; leaf blade narrowly elliptic or occasionally oblanceolate or obovate, 3.5–5 × 0.5–1.5 cm, abaxially densely white-, golden yellow-, or ferruginous-tomentose, glabrescent, adaxially rarely sparsely strigose on surface and occasionally puberulent on basal half of midvein, otherwise glabrous, glabrescent, secondary and tertiary veins sparsely branched near midvein and margin, base attenuate or nearly so, margin entire, marginal and apical glands persistent or rarely a few caducous, persistent glands 13 to 25 per cm, apex acute or occasionally obtuse-rounded, rarely hooked-retuse. Inflorescence 5–7 mm long, 1- to 7-flowered; bracts 6 to 22; the two basal bracts usually early caducous, deltoid, keeled, 0.8–1 × 0.5–0.7 mm, glabrous, margin not ciliate, apex acute or subacute, apical gland usually lacking; other bracts 1–1.5 × 1–1.5 mm, densely white-, golden yellow-, or ferruginous-tomentose abaxially, margin ciliate, apices of basalmost obtuse or nearly rounded, gradually more rounded distally. Flower 3–4 mm long; hypanthium 0.8–1 mm long, glabrous; calyx lobes deltoid to rotund, 1–1.5 × 1–1.5 mm, glabrous; corolla lobes 5(6), broadly elliptic to obovate, 2–3 × 1–1.5 mm, white to greenish white, glabrous or rarely sparsely pubescent. Stamens 25 to 35, exceeding and obscuring gynoecium; filaments 0.5–2 mm long. Disc 1–1.5 mm in diameter, flat, slightly rugose, glabrous or rarely sparsely pubescent; style 0.5–0.8 mm long, glabrous. Fruit (1 or 2)3-locular, ellipsoid, 6–9 × 3–5 mm, disc enlarged and distended beyond persistent calyx; calyx lobes erect, glabrous. Seed 1, ca. 5 × 2 mm.

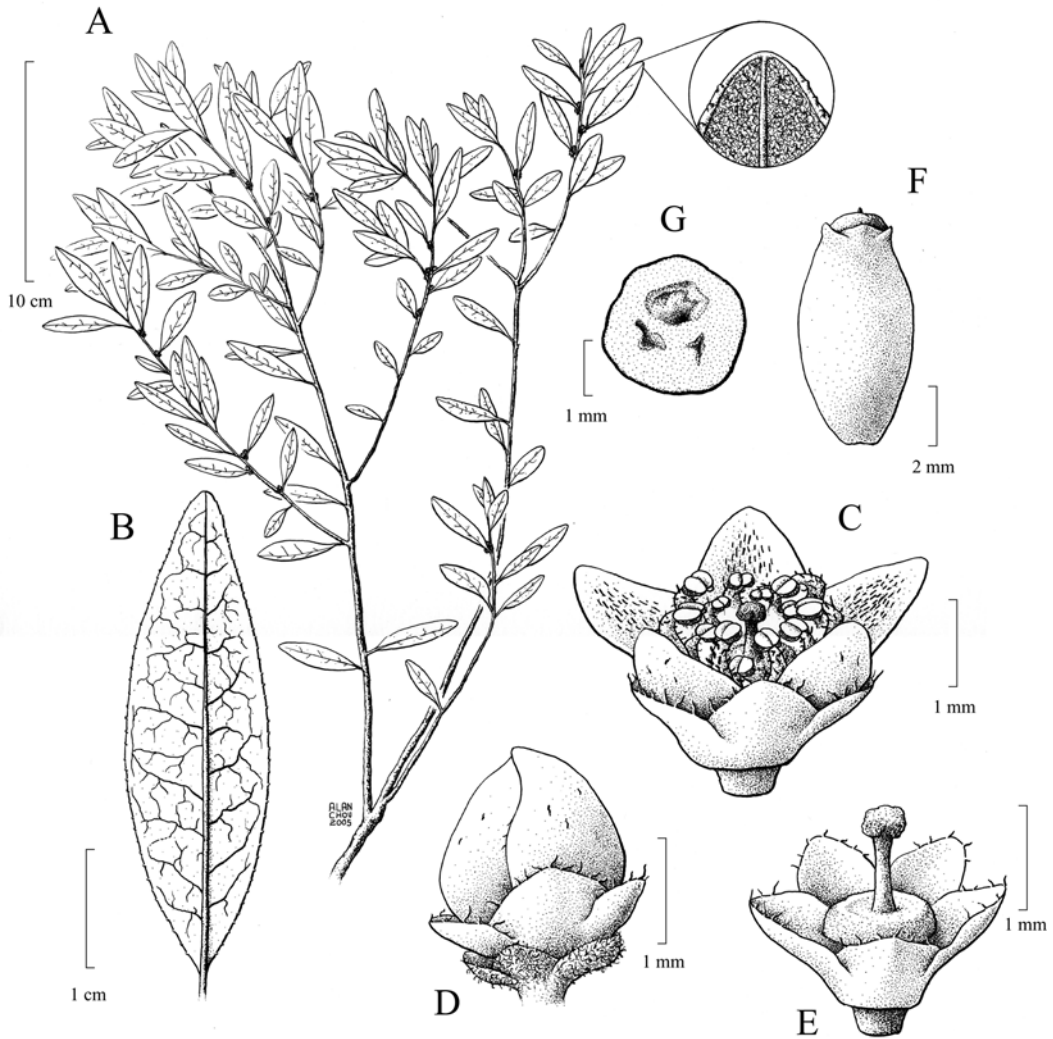


FIGURE 9. *Symplocos glandulosomarginata* Hoehne. A. Flowering branch with leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E. Flower with corolla and androecium removed; F. Mature fruit; G. Mature fruit in cross-section. (A–E from *Handro s.n.*; F–G from *Hatschbach 39767*).

**VERNACULAR NAMES.**— falsa caneta (Bidá 1995), maria mole (*G. Tiepolo 13* (MBM)).

**ILLUSTRATION.**— Figure 9.

**PHOTOGRAPHIC IMAGE.**— Figure 1B.

**PHENOLOGY.**— Flowering from September to November; fruiting from December to February, occasionally May and July.

**DISTRIBUTION AND HABITAT.**— *Symplocos glandulosomarginata* occurs mainly in the Serra do Mar of Paraná, reaching northeastern Santa Catarina and northeastern São Paulo (450 to 1350 m elevation). This species can be found in the western regions of Paraná in riparian situations, brejo, and araucaria, montane ombrophilous, semideciduous, and secondary forests. *Symplocos glandulo-*

*somarginata* is usually a mid-canopy tree but also grows in transitional habitats between montane ombrophilous and elfin forest (1000 to 1500 m elevation). In the latter situation, it is a small tree or even a shrub. Distribution map, Figure 2.

**DISCUSSION.**— *Symplocos glandulosomarginata* is easily recognized by its many persistent glands on the mature leaves (13 to 25 per cm). This species is also characterized by the combination of sparsely puberulent leaves on the basal half of the midvein adaxially, tomentose indument (when young) abaxially, and a fruit with an enlarged disc distended beyond the persistent calyx. The species resembles *S. tenuifolia* in the sapling stage, and *S. glaziovii* in leaf indument, size, and shape, but both of these species have few or no persistent glands on mature leaves (0 to 8 per cm).

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Paraná:** Antonina, trail to Pico Caratuva, 19 Oct. 2005, *P.W. Fritsch et al.* 1832 (CAS, MBM, UEC); Balsa Nova, Serra São Luís, 18 July 1971, *G. Hatschbach* 26859 (MBM, UPCB); Bocaiúva do Sul, Serra de Santana, 30 Jan. 1996, *J.T. Motta et al.* 3017 (BHCB, MBM, NY, SPF); Serra da Bocaina, 11 Nov. 1998, *J.M. Silva & L.M. Abe* 2622 (BHCB, ESA, MBM, SP); Campina da Cascavel, 8 Nov. 1976, *G. Hatschbach* 39177 (MBM, NY, UEC); Campo Grande, Nov. 1902, *G. Edwall s.n.* (SPF 83567); Guaraqueçaba, Serra Gigante, 21 Dec. 2002, *A.Y. Mocochinski* 232 (MBM); Guaratuba, 23 Feb. 2002, *O.S. Ribas et al.* 4421 (BHCB, ESA, MBM); Morretes, Parque Estadual do Pico Marumbi, 3 Nov. 1999, *S. Dala Rosa* 56 (UPCB), Rio Arraial, 11 Nov. 1965, *G. Hatschbach* 13112 (MBM (2), UPCB); Palmeira, Café Highway, Rio Tibagi, 22 Oct. 1965, *G. Hatschbach* 13053 (HB, MBM (2), NY, UPCB); Santa Rita, 26 Oct. 1982, *G. Hatschbach* 45713 (MBM); Piraquara, Carvalho, 13 Sep. 1911, *P.K.H. Dusen* 12195 (S); road to and vicinity of SANEPAR Water Company, 500 m from Represa do Carvalhinho, 17 Oct. 2005, *P.W. Fritsch & J.L.M. Aranha Filho* 1826 (CAS, MBM, UEC); Serra do Mar, along a trail on W slope of Morro do Canal, 15 Oct. 2005, *P.W. Fritsch et al.* 1808 (CAS, MBM, UEC); Serra do Mar, along a trail on W slope of Morro do Canal, 15 Oct. 2005, *P.W. Fritsch et al.* 1809 (CAS, UEC); Serra do Emboque, Vale das Trutas, 3 Feb. 1992, *G. Hatschbach* 50102 (MBM); Represa de Piraquara, 8 Nov. 1984, *R. Kummrow* 1730 (MBM, NY); Mananciais da Serra, 10 Nov. 1976, *Y.S. Kuniyoshi* 4077 (HB); Mananciais da Serra, Morro do Canal, 19 Jan. 1999, *A. Lacerda* 275 (MBM, UPCB); Mananciais da Serra, Jan. 2005, *M. Reginatto* 177 (UPCB); Morro do Canal, 3 Feb. 2004, *O.S. Ribas et al.* 5871 (MBM, SPF); Quatro Barras, Pico do Anhangava, 11 Feb. 1992, *M.V. Capranica s.n.* (UPCB 26175); Serra da Graciosa, Rio Corvo, 2 July 1995, *A.C. Cervi & C. Kozera* 6101 (MBM, UEC, UPCB); Rio Corvo, 7 Nov. 1966, *G. Hatschbach* 15089 (MBM (2), RFA, UPCB); Rio Graciosa, Rio Corvo, 19 Nov. 1998, *G. Hatschbach et al.* 68818 (MBM, UPCB); Pico do Anhangava, 11 Feb. 1992, *T. Plowman s.n.* (NY 486774); Serra da Baitaca, 22 Oct. 1993, *G. Tiepolo* 13 (MBM); Serra da Baitaca, 23 Dec. 1993, *G. Tiepolo* 47 (MBM); Serra da Baitaca, 15 Jan. 1997, *G. Tiepolo et al.* 564 (UPCB); São José dos Pinhais, Zinco, 21 Jan. 1999, *J. Cordeiro et al.* 1512 (B, MBM, SPF); Governador Lupion Highway, Rio Pequeno, 5 Nov. 1961, *G. Hatschbach s.n.* (HB 16506, MBM 23461, UPCB 3413); Rio Pequeno, 5 Nov. 1966, *G. Hatschbach* 22851 (MBM, NY, S, UPCB); Guaricana, 5 Nov. 1975, *G. Hatschbach* 34895 (MBM, UEC); Guaricana, 17 Feb. 1977, *G. Hatschbach* 39767 (HB, MBM, NY, UEC); Córrego Fundo, 26 Jan. 1983, *G. Hatschbach* 46053 (MBM); Colony Santo Andrade, 21 May 1980, *G. Hatschbach* 43002 (MBM); Colony Roseira, 23 Feb. 1968, *C. Kocziaki* 85 (MBM, RFA); Mananciais da Serra, 25 Sep. 1997, *J.H.P. de Macedo s.n.* (MBM 251000); Guaricana, 24 Oct. 1997, *J.M. Silva et al.* 2120 (MBM); Tijucas do Sul, Serra Papanduva, 6 Nov. 1998, *E. Barbosa et al.* 197 (MBM); Ypiranga, 4 Sep. 1911, *P.K.H. Dusen* 12143 (K, NY, S (2)); no location indicated, Joinville-Curitiba Highway, Km 47, 25 Nov. 1972, *P. Occhioni* 5342 (RFA). **Santa Catarina:** Blumenau, Morro Spitzkopf, 21 Oct. 1959, *R. Reitz & R.M. Klein* 1130 (B); Morro Spitzkopf, 23 Oct. 1959, *R. Reitz & R.M. Klein* 4130 (K, NY); Campo Alegre, Serra do Iquererim, 19 Nov. 1992, *J. Cordeiro & C.B. Poliquesi* 921 (MBM, UEC); Morro do Iquererim, 8 Nov. 1956, *L.B. Smith & R.M. Klein* 7392 (B, R, S); Ibirama, Horto Florestal, 12 Nov. 1956, *L.B. Smith & R.M. Klein* 7557 (NY, R, RB). **São Paulo:** Cunha, Parque Estadual da Serra do Mar, Núcleo Cunha-Indaiá, 28 Jan. 2004, *N.M. Ivanauskas et al.* 5068 (ESA); Jundiá, Reserva Biológica Municipal da Serra do Japi, 2 June 1998, *E.C. Leite* 562 (UEC); no location indicated, road to Campo Grande, Nov. 1902, collector's name illegible 5792 (SP).

**6. *Symplocos glaziovii*** Brand in Engl., Pflanzenr. IV. 242 (6):73. 1901. TYPE.— BRAZIL. Rio de Janeiro: Alto do Macahé, 3 November 1881, *A.F.M. Glaziou* 13469 (holotype: B destroyed; lec-

totype, here designated: NY 297019!; isolectotypes: BM!, C, G!, IAC!, IAN, K!, NY 297020!, P, photo of C in RFA!).

Several isotypes of *S. glaziovii* have been found during our revision. We selected one of the isotypes from NY (297019) as the lectotype because its label has the same date and locality as that in the protologue. Moreover, it has good flowering material.

Reportedly a small tree. Branches  $\pm$  terete, striate, fissured, white-, golden yellow-, or ferruginous-tomentose, glabrescent. Petiole 3–5 mm long, adaxially flat, white-, golden yellow-, or ferruginous-tomentose, glabrescent; leaf blade oblanceolate or spatulate,  $2\text{--}4 \times 0.6\text{--}1.5$  cm, abaxially densely white-, golden yellow-, or ferruginous-tomentose, rarely glabrescent, adaxially sparsely puberulent on basal half of midvein and otherwise glabrous, secondary and tertiary veins sparsely branched near midvein and margin, glabrescent, base attenuate or nearly so, margin entire, marginal and apical glands usually caducous, persistent glands 0 to 8 per cm, apex hooked-retuse or occasionally obtuse, rarely acute. Inflorescence 3–8 mm long, 1- to 10-flowered; bracts 6 to numerous, white-, golden yellow-, or ferruginous-tomentose abaxially; the two basal bracts usually early caducous, deltoid, keeled,  $0.8\text{--}1.2 \times 0.5\text{--}1.5$  mm, margin not ciliate, apex acute or nearly so, apical gland usually lacking; other bracts  $0.8\text{--}1.5 \times 0.5\text{--}0.8$  mm, margin ciliate, apices of basalmost rounded proximally, gradually more obtuse distally. Flower 1.5–3.5 mm long; hypanthium 0.8–1.1 mm long, glabrous; calyx lobes  $\pm$  deltoid to rotund,  $1\text{--}1.2 \times 0.8\text{--}1.2$  mm, sparsely white-, golden yellow-, or ferruginous-tomentose mainly abaxial-medially, glabrescent; corolla lobes 5(6), reportedly pink, broadly elliptic to obovate,  $1.7\text{--}2.3 \times 0.8\text{--}1.2$  mm, glabrous or sparsely pubescent. Stamens 25 to 30, exceeding and obscuring gynoecium; filaments 0.5–1.5 mm long. Disc 0.7–1.2 mm in diameter, flat, rugose, glabrous; style 0.4–0.6 mm long, glabrous. Fruit unknown.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 10.

**PHENOLOGY.**— Flowering in November.

**DISTRIBUTION AND HABITAT.**— Like *Symplocos altissima*, *S. glaziovii* is reportedly endemic to Nova Friburgo (Rio de Janeiro) in elfin forest at ca. 2000 m elevation in the Serra dos Órgãos. Distribution map, Figure 2.

**DISCUSSION.**— The combination of leaves  $2\text{--}4 \times 0.6\text{--}1.5$  cm that are tomentose abaxially (rarely glabrescent), margin with 0 to 8 per cm, style 0.4 to 0.6 mm long, and the disc flat distinguishes *Symplocos glaziovii* from all other species of *Neosymplocos*. The leaf morphology (size, shape, and indument) of *S. glaziovii* suggests that it is related to *S. glandulosomarginata*. The latter can be distinguished from *S. glaziovii* by its persistent glands along the margin (13 to 25 per cm).

**7. *Symplocos insolita* Aranha, P.W. Fritsch, and Almeda, nom. nov.** Replaced name: *Symplocos candelabra* Aranha, P.W. Fritsch, and Almeda, Proc. Calif. Acad. Sci. 56:296–299. 2005, non *S. candelabrum* Brand in Engl., Pflanzenr. IV. 242 (6):39. 1901. TYPE.— BRAZIL. Minas Gerais: Serra do Cipó, Santana do Riacho, 6 km S of the turnoff to Morro do Pilar on the road to Conceição do Mato Dentro, 1350 m,  $19^{\circ}15'40.7''\text{S}$ ,  $43^{\circ}31'59.0''\text{W}$ , 22 November 2004, *F. Almeda, P.W. Fritsch, J.L.M. Aranha Filho & R. Belinello 8910* (holotype: UEC!; photo of holotype: MBM!; isotype: CAS!).

Brand (1901) described *Symplocos candelabrum* (section *Bobua* (DC.) Brand, subgenus *Hopea*) based on one collection from Australia (*Maiden s.n.*). Aranha Filho et al. (2005) described *S. candelabra* (from Brazil) based on *Almeda et al. 8910*. Both epithets are extremely similar, and therefore likely to be confused [Article 53.3 in the International Code of Botanical Nomenclature (McNeill et al. 2006)]. We here provide a replacement name for *S. candelabra*.

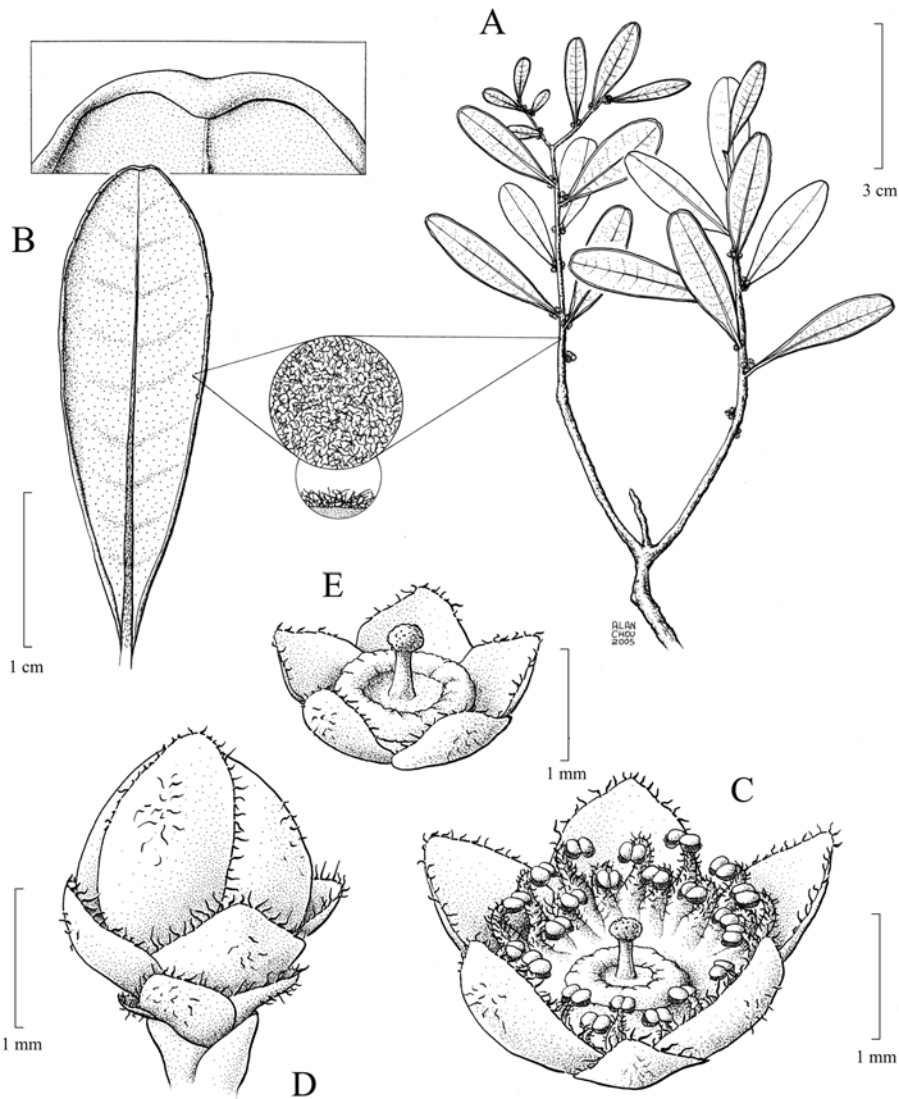


FIGURE 10. *Symplocos glaziovii* Brand. A. Flowering branch with branch indument detail; B. Representative leaf (abaxial surface), leaf indument detail, and close-up of leaf apex; C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E. Flower with corolla and androecium removed. (A–E from *Glaziou 13469*).

Openly branched rigid candelabriform shrub ca. 1 m tall. Branches terete, striate, fissured, densely ferrugineous-hirsute, glabrescent. Petiole 1–3 mm long, adaxially flat, white- to ferrugineous-strigose, glabrescent; leaf blade rotund or subrotund, 1.1–5 × 0.9–3.5 cm, abaxially densely white- to ferrugineous-strigose, glabrescent, adaxially sparsely puberulent on basal half of midvein, otherwise glabrous, glabrescent, secondary and tertiary veins highly branched near midvein and margin, base cordate or subcordate, margin entire or occasionally inconspicuously serrulate mainly on distal half, apex obtuse-truncate marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm. Inflorescence 6–10 mm long, 1- to 5-flowered; bracts 6 to 20; the two basal

bracts usually persistent, nearly deltoid to rotund, keeled,  $1-2 \times 0.75-1$  mm, sparsely ferruginous-strigillose mainly abaxial-medially, margin not ciliate, apex acute, obtuse to rounded, apical gland usually lacking; other bracts  $0.5-1.5 \times 1.5-4$  mm, sparsely to densely ferruginous-strigillose abaxially, apices of basalmost rounded, gradually more acute distally. Flower 5–8.5 mm long; hypanthium 1–1.5 mm long, glabrous; calyx lobes deltoid to occasionally subrotund,  $1.5-2 \times 1-2$  mm, glabrous or sparsely pubescent, then glabrescent; corolla lobes 5(6 or 7), ascending, white, obovate to subrotund,  $3-5 \times 1.5-3$  mm, glabrous or rarely sparsely pubescent. Stamens 25 to 35, exceeding and obscuring gynoecium; filaments 0.5–5 mm long; anthers yellow. Disc 1–1.2 mm in diameter, prominently elevated (0.7–1 mm), rugose, glabrous; style 0.5–0.7 mm long, glabrous. Fruit (2)3-locular, ovoid or ellipsoid,  $7-9 \times 3-5$  mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes tightly appressed to disc, glabrous. Seed 1,  $4-5 \times 1.5-2.5$  mm.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 11.

**PHOTOGRAPHIC IMAGE.**— Aranha Filho et al. 2005.

**PHENOLOGY.**— Flowering in November; fruiting in February.

**DISTRIBUTION AND HABITAT.**— *Symplocos insolita* is known to us only from a single locality in the Serra do Cipó (old Km 132) at 1350 m elevation growing in an open and windy rocky site in campo rupestre. After extensive searching, we found only four plants of this species near what is probably the area where past collections were made. One collection has been made outside this area at the margin of a gallery forest among rocks. Distribution map, Figure 2.

**DISCUSSION.**— *Symplocos insolita* is readily distinguished by its candelabriform habit (rare among *Symplocos* species), and the combination of a strigose leaf blade (when young) abaxially with the base cordate or subcordate, and prominently elevated (0.7 to 1 mm) disc. The only other species with a prominently elevated disc is *S. angulata*, which can be distinguished from *S. insolita* by the characters in the key.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Minas Gerais:** Conceição do Mato Dentro, Parque Natural Municipal do Ribeirão do Campo, 8 Nov. 2002, *R.C. Mota & P.L. Viana 1898* (BHCB, SPF); Jaboticatubas, Lagoa Santa-Conceição do Mato Dentro-Diamantina Highway, 4 Nov. 1972, *A.B. Joly CFSC 3687* (SP); Santana do Riacho, Belo Horizonte-Conceição do Mato Dentro Highway, 4 Nov. 1972, *A.B. Joly & J. Semir CFSC 3685* (K, MBM, SP, UEC).

**8. *Symplocos microstyla*** Aranha, P.W. Fritsch, and Almeda, Proc. Calif. Acad. Sci. 56:299–301. 2005. **TYPE.**— BRAZIL. Minas Gerais: Serra do Caraça, Parque do Caraça on the trail to Pico do Inficcionado, 1941 m, 20°08'S, 43°27'W, 18 November 2004, *F. Almeda, P.W. Fritsch, J.L.M. Aranha Filho & R. Belinello 8878* (holotype: UEC!; photo of holotype: MBM!; isotypes: BHCB!, CAS!, ESA!, K!, MO!, NY!, SP!, SPF!, US!).

Tree ca. 3 m tall. Branches subquadrangular, striate, fissured, golden yellow-tomentose, glabrescent. Petiole 1–4 mm long, adaxially concave, sparsely golden yellow-tomentose, glabrescent; leaf blade elliptic, oblong, obovate, ovate, or rarely rotund,  $0.5-3.5 \times 0.3-1.6$  cm, abaxially golden yellow-tomentose, glabrescent, adaxially sparsely puberulent on basal half of midvein, otherwise glabrous, glabrescent, secondary and tertiary veins highly branched near midvein and margin, base cuneate or subrounded, margin entire, marginal glands lacking, apex obtuse, retuse, or rarely subacute, apical gland usually present, early caducous. Inflorescence 3.5–5 mm long, 1-flowered; bracts 7 to 15, sparsely to densely golden yellow-tomentose mainly abaxial-medially; the two basal bracts usually caducous, deltoid or subdeltoid, keeled,  $1-1.5 \times 0.5-0.75$  mm, margin not ciliate, apex acute or nearly so, apical gland usually lacking; other bracts  $0.8-1.5 \times 1-2$  mm, margin



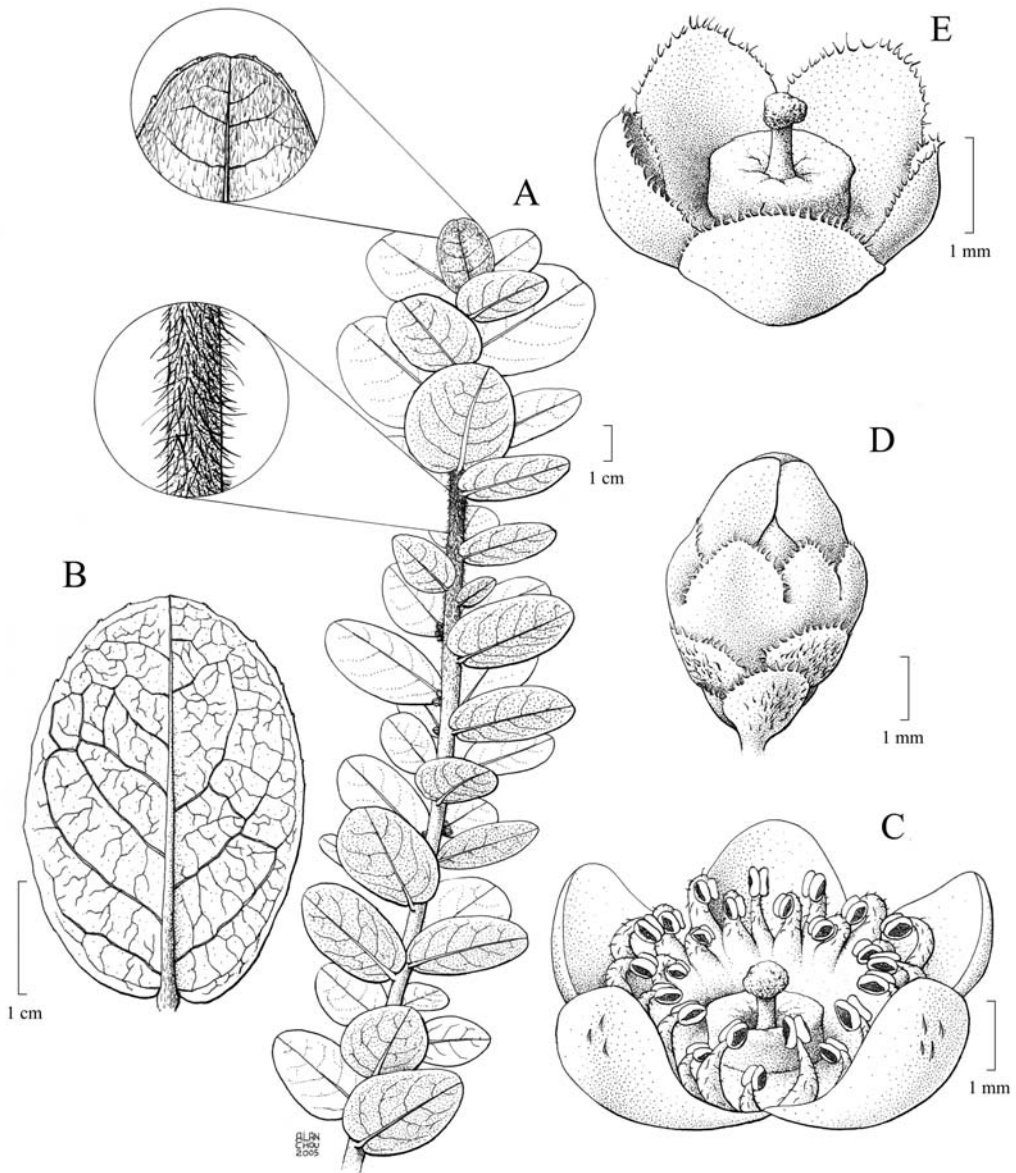


FIGURE 11. *Symplocos insolita* Aranha, P.W. Fritsch, and Almeda. A. Flowering branch with cauline and leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E. Flower with corolla and androecium removed. (A–B from *Joly & Semir CFSC 3685*; C–E from *Almeda et al. 8910*).

ciliate, apices of basalmost obtuse, gradually more rounded distally. Flower 3–4 mm long; hypanthium 0.4–0.5 mm long, glabrous; calyx lobes subdeltoid or less often subrotund, 0.5–1 × 0.6–0.8 mm, golden yellow-tomentose mainly abaxial-medially; corolla lobes 5, ascending, pale green, broadly elliptic to ovate, 1.5–2 × 0.8–1 mm, glabrous. Stamens 25 to 30 (to 35), exceeding and obscuring gynoecium; filaments 0.5–1.1 mm long; anthers yellow. Disc 0.5–0.7 mm in diameter, flat, rugose, glabrous; style ca. 0.1 mm long, glabrous. Fruit (2)3-locular, globose or occasionally

ellipsoid or ovoid,  $2-4 \times 1-3$  mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes slightly appressed to disc, sparsely golden yellow-tomentose. Seed 1(2), ca.  $2-3 \times 0.5-1$  mm.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 12.

**PHENOLOGY.**— Flowering and fruiting in November.

**DISTRIBUTION AND HABITAT.**— *Symplocos microstyla* is known only from Pico do Inficcionado in the Serra do Caraça and represented by two individuals. It grows among *Ilex* in campo rupestre at ca. 1950 m elevation. Distribution map, Figure 4.

**DISCUSSION.**— *Symplocos microstyla* is recognized by the combination of its eglandular, tomentose (when young) leaves abaxially, ascending corolla lobes, pale green stamens exceeding and obscuring the gynoecium, 0.1 mm-long style, and  $2-4 \times 1-3$ -mm fruit with tomentose calyx lobes. It is similar to *S. organensis* in habit and leaf size and shape. *Symplocos organensis* differs from *S. microstyla* by its glabrous leaves, basally lavender and distally white corolla lobes that are

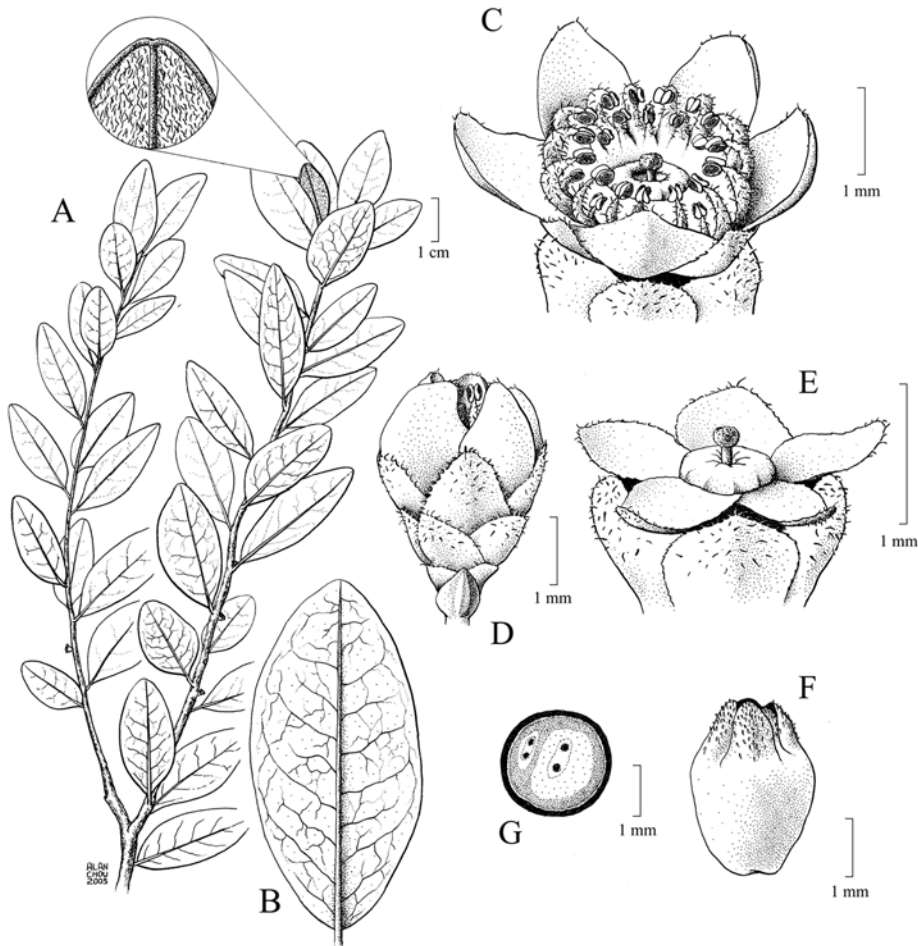


FIGURE 12. *Symplocos microstyla* Aranha, P.W. Fritsch, and Almeda. A. Flowering branch with leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E. Flower with corolla and androecium removed; F. Mature fruit; G. Mature fruit in cross-section. (A–G from Almeda *et al.* 8878).

arched and spreading outwardly, stamens exceeding but not obscuring the gynoecium, style greater than 0.5 mm, and 7–12 × 5–7-mm fruit.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Minas Gerais:** Catas Altas, Serra do Caraça, Pico do Inficionado, 25 Nov. 1999, *M.F. de Vasconcellos s.n.* (BHC 52572); no location indicated, Serra do Caraça, Morro do Inficionado, 1883, *A.F.M. Glaziou 15202* (K).

**9. *Symplocos nitidiflora*** Brand in Engl., Pflanzenr. IV. 242 (6):71. 1901. TYPE.— BRAZIL. “São Paulo” (protologue), no date indicated, *F. Sellow 221* (holotype: B destroyed; lectotype, here designated: K!).

Brand (1901) proposed the name *Symplocos nitidiflora* based on *Sellow 221* and 770. Only *Sellow 221* from K has been seen by us and therefore we selected this material as lectotype.

Tree 2–9 m tall. Branches distally flattened, smooth, sparsely white- or golden yellow-strigillose, glabrescent. Petiole 13–20 mm long, adaxially concave to canaliculate, sparsely white- or golden yellow-strigillose, glabrescent; leaf blade obovate or less often oblanceolate or elliptic, 5–16 × 2–5 cm, abaxially white- or golden yellow-strigillose, glabrescent, adaxially sparsely puberulent on basal half of midvein, otherwise glabrous, secondary and tertiary veins sparsely branched near midvein and highly branched near margin, base attenuate or nearly so, margin entire or inconspicuously serrulate-crenate on distal half, marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex acuminate or occasionally obtuse, acumen (when present) 2–7 mm long. Inflorescence 5–20 mm long, 1- to 20-flowered; bracts 7 to numerous, densely white- or golden yellow-strigillose abaxially; the two basal bracts usually early caducous, rotund, keeled to concave, 3–4 × 1.3–2.5 mm, margin not ciliate, apex rounded or nearly so, apical gland usually lacking; other bracts 1–2 × 1–2 mm, apices acute to obtuse. Flower 3–7 mm long; hypanthium 1–1.5 mm long, densely white- or golden yellow-strigillose, rarely glabrous; calyx lobes 5, subdeltoid, 1–1.8 × 1–1.3 mm, densely white- or golden yellow-strigillose abaxially, margin ciliate; corolla lobes 5(6), reflexed, green or rarely white to greenish white, elliptic to subrotund, 3–5 × 2.2–3.5 mm, densely white- or golden yellow-strigillose abaxially. Stamens (20 to) 30 to 35, exceeding and obscuring gynoecium; filaments 0.5–5 mm long; anthers yellow. Disc 1–1.5 mm in diameter, flat, rugose, pilose, rarely glabrous; style 1–1.5 mm long, usually glabrous. Fruit (2–)3-locular, ellipsoid, 10–20 × 5–10 mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes tightly appressed to disc, densely white- or golden yellow-strigillose. Seed 1 or 2(3), 6–7 × 0.9–1.3 mm.

**VERNACULAR NAME.**— capororoca falsa (Bidá 1995).

**ILLUSTRATION.**— Figure 14.

**PHOTOGRAPHIC IMAGES.**— Figures 1E, 1F.

**PHENOLOGY.**— Flowering mostly from September to November, occasionally June to August; fruiting mostly from January to March, occasionally May or October to November.

**DISTRIBUTION AND HABITAT.**— *Symplocos nitidiflora* occurs mainly in the Serra do Mar (Mata Atlântica) of Paraná, reaching northern Rio de Janeiro. It grows mainly in low montane ombrophilous forest (890 to 1000 m elevation) as a mid-canopy tree. It is also found in high montane ombrophilous forest, transitional habitats between montane ombrophilous and araucaria forest, or less often in riparian situations (ca. 1050 to 1200 m elevation) where it can be a small tree. In São Paulo, this species reaches the western regions of the Serra do Mar, where it occurs in low montane ombrophilous forest. Distribution map, Figure 13.

**DISCUSSION.**— *Symplocos nitidiflora* is characterized by the combination of its strigillose leaves (when young) abaxially, strigillose calyx lobes, strongly reflexed and densely strigillose corolla lobes abaxially, yellow anthers, and fruit 10–20 mm long. Based on leaf size and shape, we hypothesize that *S. nitidiflora* is related to *S. altissima* and *S. falcata*. *Symplocos altissima* is distin-

guished from *S. nitidiflora* by its glabrous leaves. *Symplocos falcata* can be distinguished from *S. nitidiflora* by its ascending or spreading corolla lobes and white to greenish white anthers, and pollen (see discussion under *S. falcata*).

**ADDITIONAL SPECIMENS EX-**

**AMINED.— BRAZIL. Paraná:**

Morretes, Serra do Mar, Graciosa Road, near Caminho dos Jesuítas, 28 Oct. 1990, *A. Bidá 636* (MBM, NY, UPCB); Serra do Mar, Graciosa-Caminho dos Jesuítas, 23 Mar. 1990, *A. Bidá 650* (UPCB); Piraquara, Serra do Mar, Carvalho, 13 Sep. 1911, *P.K.H. Dusen 13001* (NY, S (3)); road to and vicinity of SANEPAR Water Company, 500 m

from Represa Carvalhinho, 17 Oct. 2005, *P.W. Fritsch & J.L.M. Aranha Filho 1823* (CAS, MBM, UEC); 5 Nov. 2001, *R. Goldenberg 521* (UPCB); Mananciais da Serra, 1 Oct. 2004, *R. Goldenberg & M. Reginatto 669* (UPCB); Mananciais da Serra, Feb. 2004, *R. Goldenberg & I.G. Varassin 617* (UPCB); Banhado, Rio Taquari, 29 Nov. 1951, *G. Hatschbach s.n.* (MBM 23462); 2 Nov. 1948, *G. Hatschbach 1085* (MBM, RFA, S, SP); Quatro Barras, Serra do Mar, Graciosa Road, 23 May 1990, *A.C. Cervi 3117* (UPCB); São José dos Pinhais, Purgatório, 10 Sep. 1982, *G. Hatschbach 45289* (MBM, NY); Santo Andrade Colony, 10 Aug. 1984, *G. Hatschbach 48990* (G, MBM, NY, UEC). **Rio de Janeiro:** Nova Friburgo, Mury, Macaé de Cima, 25 Oct. 1986, *G. Martinelli & M. Leitman 11819* (UPCB); Macaé de Cima, Sophronites Farm, Rio Flores, 20 Aug. 1987, *S.V.A. Pessoa et al. 281* (UPCB); Parque Nacional da Serra dos Órgãos, 16 Oct. 1942, *D. de Barros 1051* (RB); Visconde de Mauá, Serra do Itatiaia, Ribeirão Bonito, 23 June 1936, *P. Campos Porto & L. Lanstyak 2936* (RB); Serra do Itatiaia, Ribeirão Bonito, 20 June 1936, *L. Raristyak 105* (B); no location indicated, 1891, *A.F.M. Glaziou 18347* (K); 1863, *L. Neto 290* (R). **São Paulo:** Salesópolis, Casa Grande, Estação Biológica da Boracéia, 17 Dec. 1986, *A. Custódio Filho 2801* (UEC); Boracéia, 30 Jan. 1949, *M. Kuhlmann 1777* (SP); Santo André, Alto da Serra, *N. de Andrade s.n.* (R 1554); São Paulo, Jabaquara, 12 Oct. 1933, *O. Handro s.n.* (ESA 87706, SP 58585); Jardim Botânico, 21 Sep. 1931, *F.C. Hoehne s.n.* (G 16272); Jardim Botânico (Parque do Estado), 23 Sep. 1931, *F.C. Hoehne s.n.* (GUA 20290, MBM 69154, NY 486873, SP 28275, UEC 23244); Ubatuba, Estação Experimental do Instituto Agrônomo, 12 Aug. 1977, *P.E. Gibbs & H. de F. Leitão Filho 5635* (BM, MBM, NY, R, UEC); no location indicated, *F.C. Hoehne 28275* (NY (2), S (2)). No location indicated, 1840, *H.F. Talbot s.n.* (K 1978113).

**10. *Symplocos organensis*** Brand in Engl., Pflanzenr. IV. 242 (6):72. 1901. TYPE.— BRAZIL. Rio de Janeiro: Serra dos Órgãos, 8 October 1869, *A.F.M. Glaziou 3641* (holotype: B destroyed; lectotype, here designated: NY!; isolectotypes: K!, P).

*Symplocos organensis* was proposed by Brand (1901) from *Glaziou 3641, 6023, 15202, and 17130*. Aranha Filho et al. (2005) excluded *Glaziou 15202* from the syntypes of *S. organensis* and cited it as a paratype of *S. microstyla*. We selected *Glaziou 3641* from NY because it comprises a single sheet, has a precise date and locality, and has good flowering material.

Shrub or occasionally small tree 1–3 m tall. Branches subquadrangular, striate, fissured, glabrous. Petiole 1–6 mm long, adaxially concave, glabrous; leaf blade obovate, less often oblong,

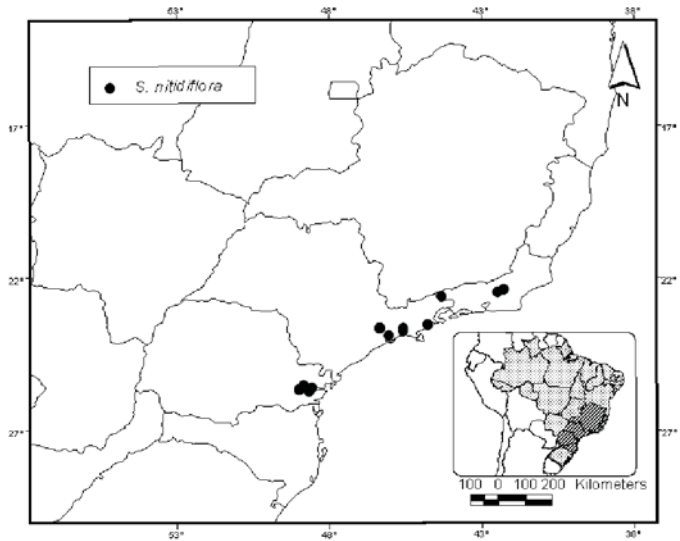


FIGURE 13. Distribution of *Symplocos nitidiflora*.

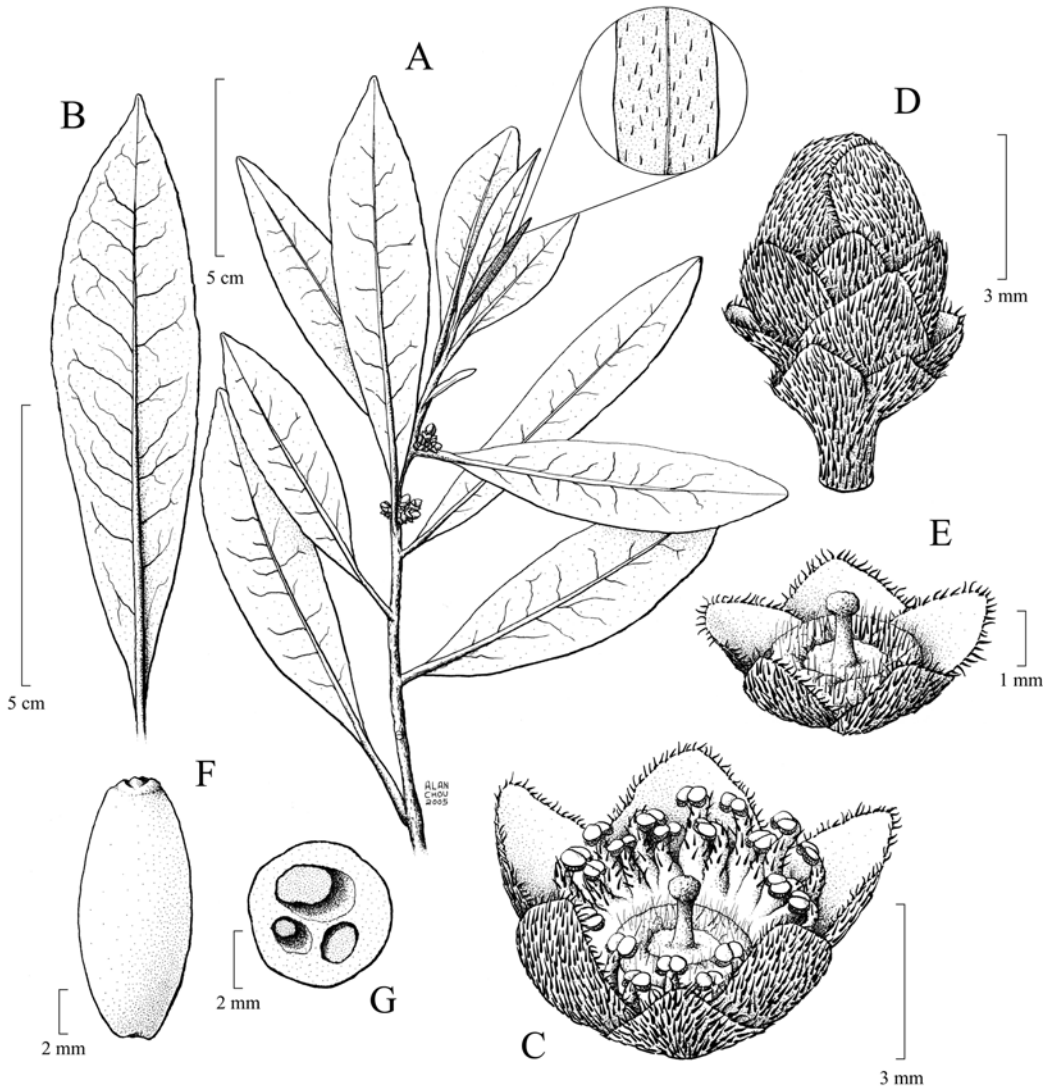


FIGURE 14. *Symplocos nitidiflora* Brand. A. Flowering branch with leaf indument detail; B. Representative leaf (abaxial surface); C. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; D. Flower bud and subtending bracts; E. Flower with corolla and androecium removed; F. Mature fruit; G. Mature fruit in cross-section. (A–B from *Sellow* 221; C–E from *Hoehne* 28275; F–G from *Kuhlmann* 1777).

ovate or elliptic, 2–4.5 × 0.5–1.5 cm, glabrous except at base and around apical gland when young abaxially, then glabrescent, secondary and tertiary veins sparsely branched near midvein and margin, base attenuate or occasionally cuneate to rounded, margin entire or less often inconspicuously serrulate on distal half, marginal and apical glands usually early caducous, persistent glands 0 to 8 per cm, apex obtuse, retuse, or rarely subacute. Inflorescence 5–10 mm long, 1- to 4-flowered; bracts 7 to 20, glabrous; the two basal bracts usually early caducous, deltoid or subdeltoid, keeled, 1.5–2 × 1–1.5 mm, margin not ciliate, apex acute or subacute, apical gland usually present; other bracts 1–2 × 1–2.5 mm, apices of basalmost obtuse, gradually more rounded distally, margin cili-

ate. Flower 4–11 mm long; hypanthium 0.5–1 mm long, glabrous; calyx lobes rotund or subrotund,  $1.5\text{--}2 \times 1\text{--}1.5$  mm, glabrous; corolla lobes 5 to 8, arched-spreading, basally lavender and distally white, elliptic to obovate,  $2.7\text{--}3.5 \times 1.7\text{--}2$  mm, glabrous. Stamens 20 to 25 (to 30), exceeding but not obscuring gynoecium; filaments 0.5–2 mm long; anthers yellow. Disc 1–1.5 mm in diameter, flat, smooth, glabrous; style 0.8–1 mm long, glabrous. Fruit (1)2(3)-locular, ellipsoid or rarely subovoid,  $7\text{--}12 \times 5\text{--}7$  mm, disc not enlarged and not distended beyond persistent calyx; calyx lobes tightly appressed to disc, glabrous. Seed 1(2),  $5\text{--}8 \times 1\text{--}2$  mm.

**VERNACULAR NAME.**— None.

**ILLUSTRATION.**— Figure 16.

**PHOTOGRAPHIC IMAGES.**— Figures 1G, 1H.

**PHENOLOGY.**— Flowering in October to November; fruiting in November.

**DISTRIBUTION AND HABITAT.**— Endemic to the Serra dos Órgãos at ca. 2000 m elevation, where it occurs in elfin forest as a shrub or small tree. Distribution map, Figure 15.

**DISCUSSION.**— *Symplocos organensis* is recognized by the combination of its glabrous leaves, arched and spreading corolla lobes that are distally white and basally lavender, stamens that exceed but do not obscure the gynoecium, 0.8–1 mm-long style, and  $7\text{--}12 \times 5\text{--}7$  mm-long fruit. *Symplocos organensis* is similar to *S. microstyla* in leaf shape and size, and habit. *Symplocos microstyla* has tomentose leaves when young abaxially, tomentose calyx lobes, corolla lobes pale green, ascending, stamens obscuring the gynoecium, stigma nearly sessile (style ca. 1 mm long), and fruit  $2\text{--}4 \times 1\text{--}3$  mm.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Rio de Janeiro:** Nova Friburgo, Serra do Mar, Pico Caledônia, 11 Nov. 2004, *F. Almeda et al.* 8792 (CAS, UEC); Serra do Mar, Pico Caledônia, 11 Nov. 2004, *F. Almeda et al.* 8798 (CAS, UEC); Serra dos Órgãos, 19 Oct. 1958, *A.G. Andrade* 152 (R, UPCB); Abrigo 4, 19 Oct. 1958, *M. Emmerich* 138 (R); Pedra Açu, 21 Oct. 1872, *A.F.M. Glaziou* 6023 (BM, G, K, NY, RFA); *A.F.M. Glaziou* 17130 (K).

**11. *Symplocos tenuifolia*** Brand in Engl., *Pflanzenr.* IV. 242 (6):71–72. 1901. TYPE.— BRAZIL. Paraná: “Carambei” (protologue), no date indicated, *F. Sellow* 4806 (holotype: B destroyed; lectotype, here designated: K!).

Brand (1901) designated several syntypes when describing *S. tenuifolia*: *Lindberg* 506, *Regnell* II40, *Sellow* B 2262, c 2303, 417, 4806, *Ule* 1093, and *Widgren* 1157½. We choose *Sellow* 4806 at K as lectotype even though it does not indicate locality and date because it has a label indicating that it is a duplicate from B. Thus it is likely to have been seen by Brand.

Tree or occasionally shrub 1.5–15 m tall. Branches ± terete, striate, fissured, densely white-,

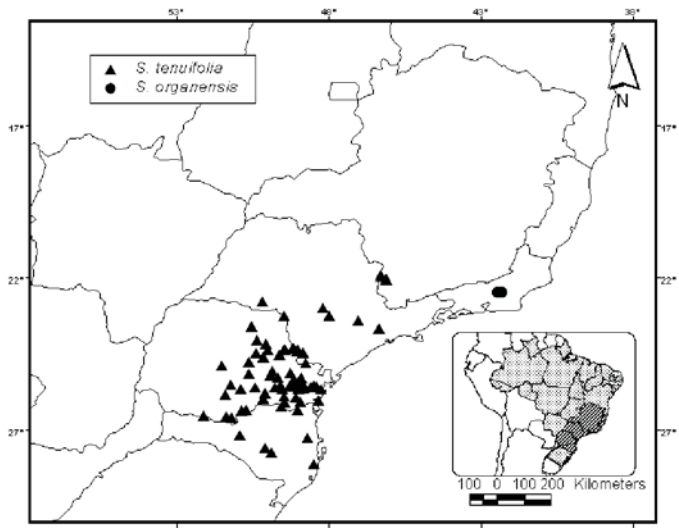


FIGURE 15. Distribution of *Symplocos organensis* and *S. tenuifolia*.

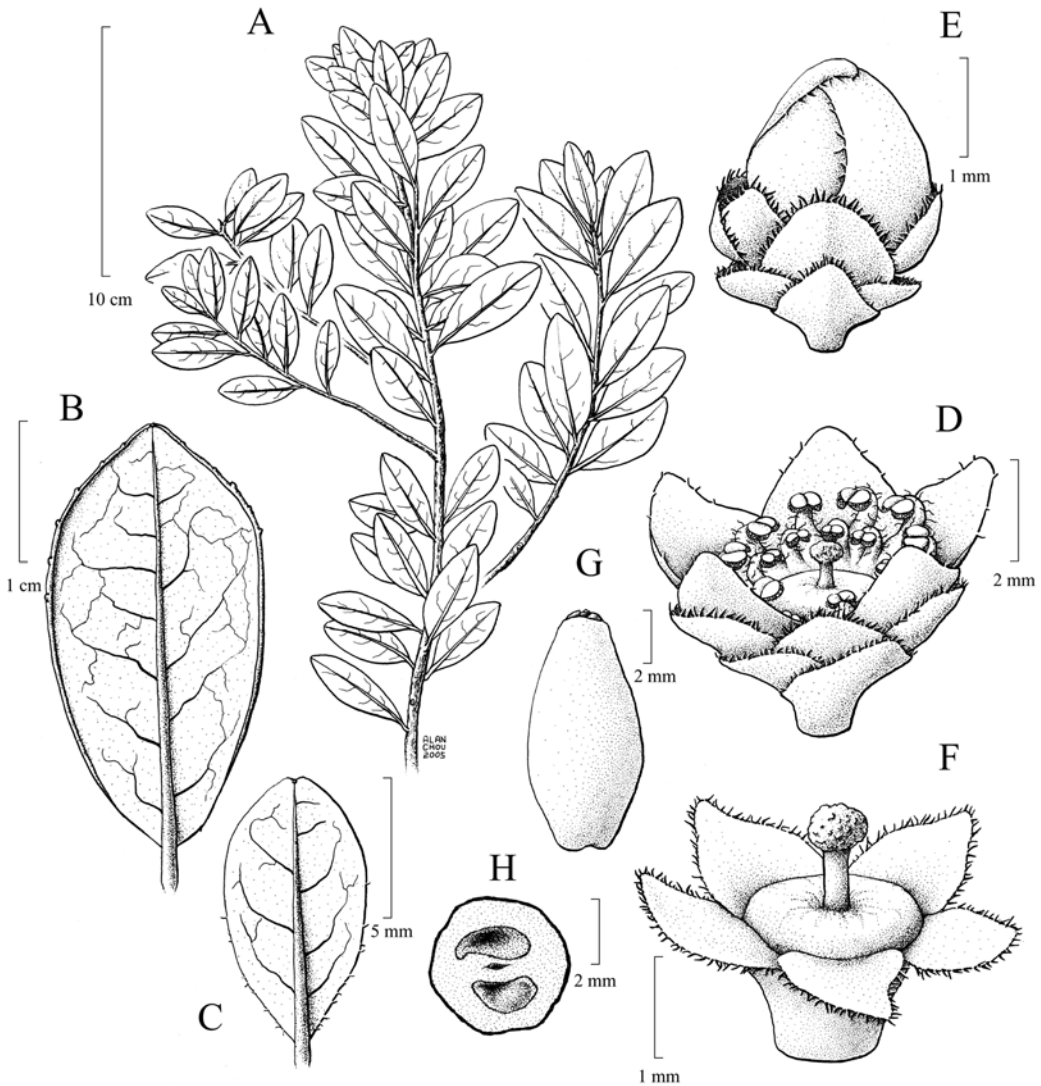


FIGURE 16. *Symplocos organensis* Brand. A. Flowering branch; B. Representative mature leaf (abaxial surface); C. Representative young leaf (abaxial surface); D. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; E. Flower bud and subtending bracts; F. Flower with corolla and androecium removed; G. Mature fruit; H. Mature fruit in cross-section (A–C from *Glaziou 3641*; D–H from *Almeda et al. 8798*).

golden yellow-, or ferruginous-tomentose-strigillose, glabrescent. Petiole 2–5 mm long, adaxially flattened or slightly concave, sparsely white- or golden yellow-tomentose-pilose, glabrescent; leaf blade elliptic to narrowly elliptic, 2–9 × 0.6–2.5 cm, abaxially mixed white-, golden yellow-, or ferruginous-tomentose (mainly near margin) and sericeous-pilose otherwise, glabrescent, adaxially occasionally sparsely white-, golden yellow-, or ferruginous-sericeous-strigose on surface, densely sericeous or pilose along midvein, glabrescent, secondary and tertiary veins highly branched near midvein and margin, base attenuate or cuneate, margin entire or occasionally inconspicuously serrulate on distal half, marginal and apical glands usually caducous, persistent glands 0 to 8 per cm,

apex acuminate or occasionally acute, acumen (when present) 2–15 mm long. Inflorescence 2.5–5 mm long, 1- to 10-flowered; bracts 6–22; the two basal bracts usually early caducous, deltoid to subrotund, keeled, 0.7–1.1 × 0.5–0.8 mm, glabrous, occasionally white-, golden yellow-, or ferrugineous-tomentose abaxially, margin not ciliate, apex acute or nearly so, apical gland usually lacking; other bracts 1–1.5 × 1–1.5 mm, white-, golden yellow-, or ferrugineous-tomentose abaxially, margin ciliate, apices of basalmost obtuse to rounded, gradually more rounded distally. Flower 2–3.5 mm long; hypanthium 0.8–1 mm long, glabrous; calyx lobes deltoid to rotund, 1–1.5 × 1–1.5 mm, glabrous or rarely golden yellow- or ferrugineous-tomentose abaxial-medially, then glabrescent; corolla lobes 5(6), green, white, or greenish white, broadly elliptic to obovate, 2–3 × 1–1.8 mm, glabrous or rarely sparsely pubescent abaxially. Stamens 25 to 35, exceeding and obscuring gynoecium; filaments 0.5–1.8 mm long. Disc 0.8–1.2 mm in diameter, flat, ± rugose, glabrous; style 0.5–0.8 mm long, glabrous. Fruit 2(3)-locular, ovoid or less often globose, 3–6 × 4–5 mm, disc rarely slightly enlarged and slightly distended beyond persistent calyx; calyx lobes glabrous or rarely sparsely tomentose, slightly appressed to disc or occasionally erect. Seed 1 or 2, 2–5.5 × 1.5–3 mm.

**VERNACULAR NAMES.**— capororoca (*A.E. Biank 24* (MBM)), capororoquinha (*R.R.B. Negrelle et al. 610* (UPCB)), carne de vaca (*Beatriz 3* (MBM)), congonha (*P. Occhioni 5338* (RFA)), maria mole (*R. Reitz 3216* (MBM)), maria mole miúda (*Y.S. Kuniyoshi & Ponciano 4717* (MBM)), oreiha de gato (*R. Reitz s.n.* (MBM)), pessegueiro-bravo (*A.L. Cavalheiro et al. s.n.* (SP)), and vauvú (*S.R. Ziller & Y.S. Kuniyoshi 713* (MBM)).

**ILLUSTRATION.**— Figure 17.

**PHENOLOGY.**— Flowering mostly from October to December, rarely September to May; fruiting mostly from December to March, rarely November, April, or May.

**DISTRIBUTION AND HABITAT.**— *Symplocos tenuifolia* is the most common and widespread species of section *Neosymplocos*. It is fairly common in Paraná, ranging to northern, central, and eastern Santa Catarina and southern Minas Gerais through southwestern and central São Paulo and rarely in the western regions of the Serra do Mar in São Paulo. *Symplocos tenuifolia* is commonly collected in araucaria forest (ca. 800 to 1100 m elevation). It is also fairly common in secondary vegetation, riparian situations, semideciduous forest and brejo, especially in transitional habitats between araucaria and montane ombrophilous forest (ca. 1300 m elevation). This species can also be encountered less commonly in restinga (sea level) from Santa Catarina to Paraná. One collection of *S. tenuifolia* was collected in a gallery forest surrounded by cerrado. Distribution map, Figure 15.

**DISCUSSION.**— *Symplocos tenuifolia* can be recognized by its vegetative characters. The mid-vein is densely sericeous or pilose (mostly in young leaves) and the leaf blade is mixed tomentose and sericeous-pilose, mainly tomentose near the margin and mainly sericeous-pilose otherwise. The margin of the young leaves is sparsely glandular (0 to 8 glands per cm). The dimensions of the mature fruit (3–6 × 4–5 mm) are also important diagnostic characters. Saplings of *S. tenuifolia* resemble those of *S. glandulosomarginata* in leaf size, shape, and indument. In *S. glandulosomarginata* the leaf margin is densely glandular (13 to 25 per cm). The only other species among *Neosymplocos* species that exhibits comparable foliar indument variation is *S. falcata*; the latter has larger fruits (8–10 mm long).

Bidá (1995) proposed *S. reitzii* in his Ph.D. thesis, but this name was never published. According to Bidá, *S. reitzii* would be endemic to eastern Santa Catarina state growing in montane ombrophilous forest (ca. 1000 m elevation) and would be morphologically similar to *S. tenuifolia*. Bidá (1995) differentiated *S. reitzii* from *S. tenuifolia* mostly based on branch indument, fruit shape, and calyx lobe size. Examining specimens of both entities, we could not determine if *S. reitzii* is



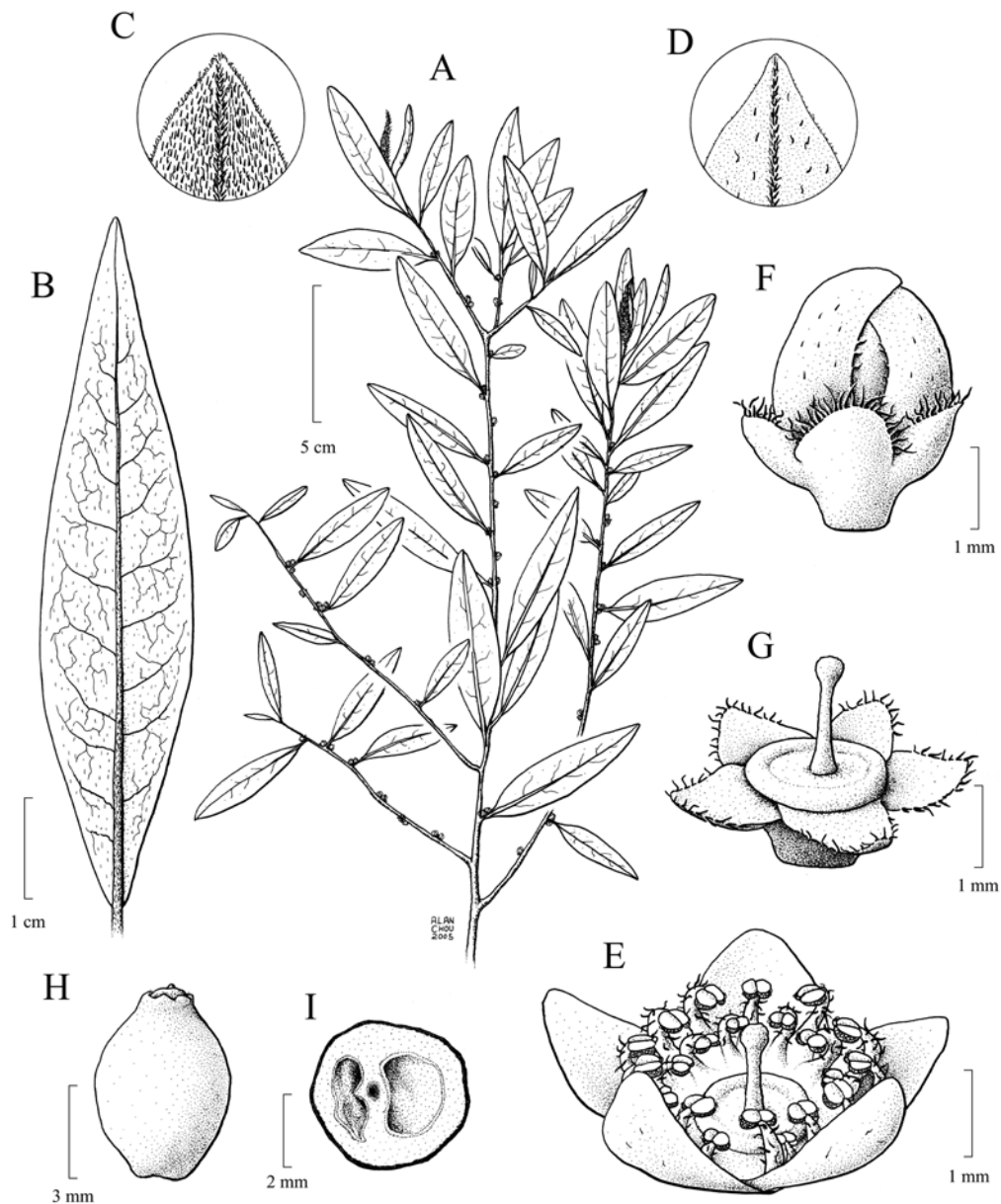


FIGURE 17. *Symplocos tenuifolia* Brand. A. Flowering branch; B. Representative leaf (abaxial surface); C. Leaf indument detail (abaxial surface); D. Leaf indument detail (adaxial surface); E. Flower at anthesis with androecium opened outward to show ovary apex, style, and stigma; F. Flower bud; G. Flower with corolla and androecium removed; H. Mature fruit; I. Mature fruit in cross-section (A–D from *Sellow 4806*; E–G from *Hatschbach 27614*; H–I from *Krapovickas & Cristóbal 40910*).

taxonomically distinct. Therefore, we tentatively consider *S. reitzii* to be the same as *S. tenuifolia*. Further field work will be needed to determine the status of *S. reitzii*.

**ADDITIONAL SPECIMENS EXAMINED.**— **BRAZIL. Minas Gerais:** Caldas, Nov. 1854, *G.A. Lindberg 506* (S); 5 Nov. 1873, *C.W.H. Mosen 619* (S (4)); 1 Mar. 1876, *C.W.H. Mosen 4533* (S (2)); *A.F. Regnell II40* (K,

M, NY (2), S (5)); *A.F. Regnell II40c* (S); Poços de Caldas, Chiqueirão Farm, *H. de F. Leitão Filho et al. 1586* (UEC); Dec. 1882, *C.B. Rolian 7472* (R); no location indicated, 1845, *J.F. Widgren 370* (S); 1845, *J.F. Widgren 1157½* (K, M, NY, S (2)). **Paraná:** Açungui, 1 Mar. 1948, *A. Mattos & L.G. Labouriau 2011* (RB); Adrianópolis, Mato Preto, 18 Jan. 2000, *O.S. Ribas & L.M. Abe 3024* (ESA, G, HRCB, MBM); Antonina, Rio do Meio, 26 Nov. 1982, *G. Hatschbach 45741* (BHCB, MBM, NY, UPCB); Monte Alegre, 23 Mar. 1954, *J.G. Kuhlmann s.n.* (RB 150802); Balsa Nova, Tamanduá, 12 Nov. 1980, *G. Hatschbach 43348* (MBM, NY); Biturana, Fomeado Grande Farm, 2 Feb. 2005, *D. Liebsch s.n.* (UPCB 50525); Bocaiúva do Sul, Sesmaria, Rio Capivari, 14 Jan. 1969, *G. Hatschbach 20737* (MBM, RFA); 5 Dec. 1978, *G. Hatschbach 41840* (MBM, NY, UPCB); Colony São João XXIII, 26 Nov. 1986, *G. Hatschbach & J. Cordeiro 50814* (HRCB, MBM, S, UPCB); road to Parque das Lauráceas, near Colony São João, 13 Nov. 1993, *C.B. Poliquesi & J. Cordeiro 163* (ESA, MBM, UEC, UPCB); Campo Largo, Retiro Grande, 3 Jan. 1978, *G. Hatschbach 40722* (MBM, UEC); Campo Magro, Caverna Sumidouro, 18 Nov. 1996, *G. Tiepolo & A.C. Svolenski 600* (MBM); Campo do Tenente, Campo de Fora Farm, 10 Feb. 1982, *R. Kummrow & J.G. Stutts 1730* (MBM); Carambei, Rio São João, Castro, 17 Dec. 1975, *R. Reitz & R.M. Klein 17849* (B, NY); Clevelândia, 3 Capões, 22 Oct. 1972, *G. Hatschbach 30808* (MBM, RFA); Brandalize Farm, 29 Apr. 1966, *J.C. Lindeman & J.H. de Haas 1096* (MBM); Colombo, EMBRAPA, 15 Dec. 1978, *P. Carvalho 96* (MBM); Campestre, 15 Dec. 1989, *V. Nicolack & O.S. Ribas 110* (MBM, UEC); 24 Sep. 2004, *R.F.S. Possette & M. Dias 265* (MBM); EMBRAPA, Rio Ribeira, 15 Dec. 1978, *E. Rotta s.n.* (MBM 65724); Contenda, near Contenda, 7 Nov. 1977, *L.R. Landrum 2430* (MBM); Curitiba, UFPR, Centro Politécnico, trail to Educação Física, 29 Nov. 1992, *A. Bidá 677* (UPCB); UFPR, Centro Politécnico, 12 Dec. 1992, *A. Bidá 678* (UPCB); ca. 300 m from the Centro de Ciências Florestais e da Madeira, UFPR, 20 m off the road to the Centro, 14 Oct. 2005, *P.W. Fritsch & J.L.M. Aranha Filho 1803* (CAS, UEC); 4 Apr. 1914, *I.G. Jönsson 4* (S); 4 Apr. 1914, *I.G. Jönsson 132* (NY); Rio Taquari, 12 Nov. 1961, *E. Pereira 6886* (RB); General Carneiro, Passo da Galinha, 19 Nov. 1972, *G. Hatschbach 30714* (MBM, NY, RFA, SP, UEC); Guapira, 16 Feb. 1913, *A.C. Brade 5802* (S (2), SP); Guaratuba, Rio da Praia, 22 Nov. 1967, *G. Hatschbach 17941* (MBM (2), NY, RFA, UPCB); Inácio Martins, Monte Alto, 21 Jan. 1998, *G. Hatschbach & et al. 67499* (ESA, MBM); Irati, Aleixo Farm, 31 Oct. 1972, *P. Carvalho 84* (MBM, UEC); Colégio Estadual Florestal de Irati, 14 Mar. 1973, *P. Carvalho 171* (MBM); Itaiacoca, 18 Mar. 1904, *P.K.H. Dusen s.n.* (S); Itaperussu, 18 Nov. 1908, *P.K.H. Dusen 7152* (NY, S); Itapoá, Reserva Volta Velha, Jan. 1992, *R.R.B. Negrelle s.n.* (UPCB 21359); Reserva Volta Velha, 17 Feb. 1993, *R.R.B. Negrelle & C. Londero A762* (MBM, UPCB); Reserva Volta Velha, 11 Jan. 1992, *R.R.B. Negrelle et al. 28* (UPCB); Reserva Volta Velha, 20 Jan. 1993, *R.R.B. Negrelle et al. 610* (UPCB); Reserva Volta Velha, 22 Nov. 1996, *C.I. Salimon s.n.* (UPCB 28971); Ivaí, 10 Mar. 1977, *G. Hatschbach 39788* (MBM, UEC); Jaguariaíva, Rio das Mortes, 2 Nov. 1989, *A.C. Cervi 2990* (MBM (2), UPCB); Rio das Mortes, 23 Oct. 1990, *A.C. Cervi & A. Dunaiski 3279* (NY, SJRP, UPCB); Parque Estadual do Cerrado, 28 Oct. 1993, *A.C. Cervi & A. Uhlmann 4149* (UPCB); PR-151, near the bridge over Rio das Mortes, 16 Dec. 1991, *A.C. Cervi et al. 3587* (MBM, UPCB); 28 May 1997, *A.C. Cervi et al. 6272* (UPCB); 12 Apr. 1910, *P.K.H. Dusen 9691* (S); Jaguariaíva State Park, 16 Oct. 2005, *P.W. Fritsch et al. 1822* (CAS, UEC); Água Clara, 12 Nov. 1981, *G. Hatschbach 44366* (MBM, RB); Recanto Prainha, 10 Feb. 1997, *O.S. Ribas & L.B.S. Pereira 1716* (BHCB, SJRP, UPCB); Parque Estadual do Cerrado, 19 July 1994, *A. Uhlmann s.n.* (UPCB 25784); Lapa, Volta Grande, 20 Dec. 1979, *P.I. Oliveira 180* (B, MBM); PR-427, 1 km from the bridge over Rio Iguaçú, 29 Nov. 2001, *O.S. Ribas et al. 3961* (BHCB); Mandirituba, Passo Amarelo, 21 Sep. 1992, *A. Dunaiski 303* (MBM); Morretes, Barro Branco, 29 Jan. 1987, *J. Cordeiro & A. Souza 411* (MBM, S); Rio Sapintanduva, 25 Jan. 1977, *G. Hatschbach 39726* (MBM); Otacilio Costa, Cardoso Farm, 10 Feb. 1996, *O.S. Ribas et al. 1205* (MBM); Palmeira, Colony Quero-Quero, 10 Nov. 1951, *G. Hatschbach 2690* (MBM, UPCB); Santa Amélia Farm, 5 Nov. 1967, *G. Hatschbach & J.P. Fontella 17691* (GUA, MBM RB); Santa Rita Farm, ca. 65 km W of Curitiba on road to Ponta Grossa, 2 Dec. 1981, *L.R. Landrum 3928* (CAS, MBM); Paranaguá, Areal Imbocuí, 18 Apr. 1995, *S.R. Ziller & Y.S. Kuniyoshi 713* (MBM); Banestado, near Praia Leste, 25 Nov. 1994, *S.R. Ziller & G. Wanke 615* (MBM); Paula Freitas, 17 Nov. 1972, *G. Hatschbach & C. Kocziicki 30699* (MBM, RFA); Pinhais, 1 Oct. 1910, *P.K.H. Dusen 10331* (K, NY, S); 12 Feb. 1914, *P.K.H. Dusen 14512* (S); 3 Nov. 1914, *P.K.H. Dusen 15801* (K, NY, S); Pinhão, Rio Touros, 10 Mar. 1967, *J.C. Lindeman & J.H. de Haas 4748* (MBM, NY); Barbaquá, *J.C. Lindeman & J.H. de Haas 4917* (MBM, RB); Piraí do Sul, Joaquim Murtinho, 18 Dec. 1976, *G. Hatschbach 39198* (MBM, NY, UEC); Piraquara, Condomínio Cantareira, 31 May 2001, *O.V. Doria 39* (ESA); 1908, *P.K.H. Dusen 6897* (S); Serra

do Mar, along road to Morro do Canal, ca. 8 km from BR-277, 15 Oct. 2005, *P.W. Fritsch & J.L.M. Aranha Filho* 1813 (CAS, MBM, UEC); Florestal, 26 Dec. 1947, *G. Hatschbach s.n.* (MBM 23497); road between Rio Taquari and Rio Divisa, 13 Nov. 1949, *G. Hatschbach* 1611 (MBM, RFA, S); Colony Santa Maria, Serra do Mar, 3 Oct. 1971, *G. Hatschbach* 27614 (HB, MBM, RFA, S); Fazenda Experimental de Agronomia, 31 Mar. 1971, *N. Imaguire* 2775 (MBM); Mananciais da Serra, 14 Nov. 1983, *Y.S. Kuniyoshi & Ponciano* 4717 (HB, MBM (3), SJRP); Mananciais da Serra Morro do Canal, 13 Nov. 1998, *A. Lacerda* 100 (MBM, UPCB); Mananciais da Serra, Morro do Canal, 17 Dec. 1998, *A. Lacerda* 192 (MBM, UPCB); Mananciais da Serra, 31 Oct. 1977, *L.R. Landrum* 2244 (MBM); Colony Santa Luzia, 22 Nov. 1983, *P.I. Oliveira* 780 (MBM, UPCB); Santa Bárbara Ranch, 14 Feb. 2004, *O.S. Ribas et al.* 5888 (MBM, RB); 10 Mar. 1993, *A. Vicentini & S.R. Ziller* 168 (MBM); Pitanga, 5 Mar. 2003, *A.E. Biank* 24 (MBM); Ponta Grossa, 14 Nov. 1914, *P.K.H. Dusen* 15858 (NY, S); Vale do Pitangui, 9 Nov. 1989, *A.C. Cervi & G. Hatschbach* 3008 (CAS, MBM, UPCB); Parque Vila Velha, Lagoa Dourada, 23 Nov. 1963, *G. Hatschbach & E. Pereira* 10719 (B); 2 Nov. 1928, *F.C. Hoehne s.n.* (SP 23301); Vila Velha, 16 Jan. 1987, *A. Krapovickas & C.L. Cristóbal* 40910 (K, MBM); 24 Dec. 1971, *P.L. Krieger* 11387 (RB); Café Highway, Lagoa Dourada, 26 Nov. 1972, *P. Occhioni* 5371 (RFA); Vila Velha, Lagoa Dourada, 23 Nov. 1963, *E. Pereira & G. Hatschbach* 8121 (HB, MBM, RB); Rio São Jorge, 6 Nov. 1992, *Takeda & Schiesinsky* 904 (HRCB); Rio Tibagi, 20 Oct. 1999, *S.R. Ziller & W. Maschio* 1942 (MBM); Porto Dom Pedro II, 22 Apr. 1911, *P.K.H. Dusen* 11463 (NY, S); Quatro Barras, Pinhal, 25 Dec. 1943, *G. Hatschbach* 82 (MBM, RB); Reserva, 13 Dec. 1996, *V.F. Kinupp et al.* 257 (UEC, UPCB); Canguiri Farm, 9 Jan. 1984, *C.V. Roderjan & Y.S. Kuniyoshi* 273 (MBM (2), UPCB); Serra da Baitaca, Morro Anhangava, 23 Jan. 1994, *G. Tiepolo* 48 (MBM); 6 June 1995, *S.R. Ziller & W. Maschio* 810 (MBM); São João do Triunfo, 7 Nov. 1967, *G. Hatschbach* 17760 (B, MBM, UPCB); Fiat Lux Farm, W of São João do Triunfo, 21 July 1966, *J.C. Lindeman & J.H. de Haas* 1874 (RB); São João Farm, 22 July 1966, *J.C. Lindeman & J.H. de Haas* 1910 (MBM); 13 Oct. 1979, *G. Loughan s.n.* (MBM 65590, UPCB 11384); São José dos Pinhais, Contenda, 7 Nov. 1977, *G. Hatschbach* 40298 (HB, MBM, NY, UEC); Colony Roseira, 23 Feb. 1968, *C. Kocziński* 77 (MBM, NY (2)); road to Santa Catarina, 10 Feb. 1980, *Y.S. Kuniyoshi s.n.* (MBM 293196); BR-277, 21 Nov. 1984, *J.R.S. Muniz* 3 (MBM); Barro Preto, 12 Jan. 1979, *P.I. Oliveira* 154 (B, MBM, SPF); São Mateus do Sul, 9 Mar. 1929, *Gurgel s.n.* (R 111289, UPCB 3125); 6 Mar. 1929, *Gurgel & P. Occhioni* 14648 (RB); *P.Nunes s.n.* (RFA 20547, 20620); Sapopema, Vila Rural, 15 Oct. 1998, *A.L. Cavalheiro et al. s.n.* (BHCB 50611, G); Telêmaco Borba, Parque Estadual Samuel Klabin, Recinto das Marrecas, Monte Alegre Farm, 1 Nov. 1994, *S.A. Filipaki s.n.* (UPCB 33131); Tibagi, Canyon Guartelá, 4 Nov. 1994, *C.M.V. Cardoso et al. s.n.* (ESA 49238, K 1978110, UEC 103733); Estrela Ranch, Rios Iapó-Saltinho, 12 Dec. 1989, *S. Colli et al. s.n.* (K 197863); Canyon Guartelá, Rio Iapó, near Cachoeira Ponte de Pedra, 10 Nov. 1992, *G. Hatschbach & E. Barbosa* 58185 (BHCB, MBM); Canyon Guartelá, 10 Feb. 1997, *V.F. Kinupp* 104 (G, SJRP); Parque Estadual do Guartelá, 29 Oct. 2004, *D.C. Maia & R. Morokawa s.n.* (UPCB 50231); Estiva, 11 Feb. 2004, *C.G. Mielke s.n.* (BHCB 60267); Parque Estadual do Guartelá, Rio Iapó, 20 Sep. 1996, *S.R. Ziller* 1526 (MBM); Tijucas do Sul, Ambrósios, 27 Nov. 1990, *C.B. Poliquesi & J.M. Silva* 31 (MBM); Ambrósios, 10 Jan. 1992, *O.S. Ribas & D. Guimarães* 412 (MBM, UPCB); Ventania, Rancho dos Pinheiros, 9 Feb. 1999, *A.L. Cavalheiro et al. s.n.* (MBM 239764, SP 338664); Rancho do Pinheiro, 11 Dec. 1998, *E.M. Francisco & A.L. Cavalheiro s.n.* (SJRP 21688); no location indicated, Serrinha, 14 Jan. 1904, *P.K.H. Dusen* 3436 (S); Capão Grande, 3 Feb. 1909, *P.K.H. Dusen* 7745 (NY, S); near Brandalize Sawmill, ca. 20 km N of Clevelândia, 10 Apr. 1966, *J.C. Lindeman & J.C. de Haas* 1090 (RB, MBM); BR-2, near Taquari, 50 km from Curitiba, Oct. 1971, *P. Occhioni s.n.* (RFA 13309); Rio Negro, 22 Nov. 1972, *P. Occhioni* 5266 (RFA); Joinville-Curitiba Road, Km 47, 25 Nov. 1972, *P. Occhioni* 5338 (RFA); BR-2, near Taquari, 50 km from Curitiba, 12 Nov. 1961, *G.J.F. Pabst & E. Pereira* 6712 (HB, R, RFA); road between Ponta Grossa and Itararé, Km 203, 5 Nov. 1977, *G.J. Shepherd & J.B. de Andrade* 6137 (MBM, RB, UEC). **Santa Catarina:** Bom Retiro, 25 Oct. 1957, *R. Reitz & R.M. Klein* 5444 (NY); Brusque, Mata do Hoffmann, 25 Nov. 1949, *R. Reitz s.n.* (RFA 21845); Mata do Hoffmann, 25 Nov. 1949, *R. Reitz* 3216 (B, G, HB, MBM, NY, S, UPCB); Azambuja, 9 Mar. 1954, *R. Reitz* 5830 (NY, S (2)); Campo Alegre, lower slopes of Morro Iquererim, Sep. 1956, *L.B. Smith & R.M. Klein* 8495 (NY, R); Lajes, ca. 15 km E of Otacílio Costa, 2 km W of the crest of Serra Geral, 21 Nov. 1977, *L.R. Landrum* 2654 (MBM); between Palmeiras and Lajes, 2 Dec. 1956, *L.B. Smith & R.M. Klein* 8111 (R, NY); 17 km NW from Bocaina do Sul, 11 Feb. 1957, *L.B. Smith & R.M. Klein* 11262 (R, UPCB); Ponte Alta, 24 Oct. 1962, *R. Reitz & R.M. Klein* 13329 (UPCB); Porto União, Antônio Cândido, 3 Nov. 2001, *Beatriz* 3 (MBM); 14 Nov.

1931, *Gurgel s.n.* (R 94131); 14 Nov. 1931, *Gurgel 16235* (RB); São José, Serra da Boa Vista, 24 Oct. 1957, *R. Reitz & R.M. Klein 5391* (K); Videira, Parque da Uva, 26 Oct. 1964, *L.B. Smith & R.M. Klein 12969* (NY, R); no location indicated, Reserva Floresta dos Pilões, 1 Dec. 1950, *A.P. Duarte & J. Falcão 3201* (GUA, RB); W of Serra do Itajaí, Nov. 1876, *F. Muller 195* (R). **São Paulo:** Apiaí, Pinhalzinho-Apiaí, 11 km from Bom Sucesso do Itararé, 13 Dec. 1997, *J.M. Torezan et al. 600* (ESA (2), IAC, UEC); Assis, Estação Ecológica de Assis, 13 Jan. 1993, *G. Durigan 30611* (UEC); Bofete, between Bofete and Guarei, Cachoeira Farm, 25 Jan. 1945, *M. Kuhlmann 1298* (SP, UPGB); Santa Terezinha (Eucatex) Farm, 12 July 2004, *R.A.G. Viani et al. 486* (ESA); Bom Sucesso do Itararé, road from Bom Sucesso do Itararé, 2 km before Mineração São Judas, 15 Dec. 1997, *S.I. Elias et al. 162* (ESA, IAC, UEC); Botucatu, EUCATEX Florestal S.A., Morrinhos Farm, *J.E. Albuquerque et al. 1854* (ESA); Capão Bonito, Barra Mansa Farm, Oct. 1996, *K.D. Barreto et al. s.n.* (ESA 87070); Itararé, Ibiti Farm, Road Itararé-Bom Sucesso do Itararé, 12 Feb. 1995, *P.H. Miyagi et al. 353* (IAC, SPF); 17 km from Itararé to Bom Sucesso do Itararé, 13 Nov. 2003, *J. Paula-Souza et al. 3702* (ESA); Ibiti Farm, Itararé-Bom Sucesso Road, 30 Oct. 1993, *V.C. Souza 4534* (ESA, RB, SPF); Ibiti Farm, 18 Feb. 1993, *V.C. Souza et al. 2358* (ESA, MBM, SPF); Ibiti Farm, 6 Sep. 1993, *V.C. Souza et al. 4322* (ESA, SPF); Itu, Dec. 1825, *L. Riedel s.n.* (NY); near Porto Feliz, Nov. 1825, *L. Riedel 120* (NY (2)); São Paulo, Santo Amaro, 23 Nov. 1913, *A.C. Brade 7482* (SP); 22 Nov. 1934, *A.C. Erns 5* (SP); Sengés, PISA-Papel e Celulose Farm, 18 Dec. 1997, *F. Chung et al. 218* (ESA (2), IAC, UEC); PISA-Papel e Celulose Farm, Poço do Encanto, 18 Dec. 1997, *S.I. Elias et al. 303* (ESA, IAC, UEC); no location indicated, near São Paulo, *K.F.P. von Martius s.n.* (M 90854). No location indicated, Chácara da Associação dos Professores, June 2000, *G.C.T. Ceccantini* (SPF); Fea, Pomar, 22 Nov. 1972, *N. Imaguirre 3138* (RFA); Rio Pardo, 1824, *L. Riedel s.n.* (NY); *F. Sellow s.n.* (G 16302); *F. Sellow 14970* (K); between Paraná and Santa Catarina, *SP 185* (RB); *E.H.G. Ule 1093* (M); collection without indication of collector *120* (NY). **PARAGUAY. Cannandiyú:** 46 km S from Katuaté, 3 km N from Río Itambery, route Pto. Stroessner, Saltos del Guairá, 18 Dec. 1982, *A. Schinini 23206* (G) (according to Bidá 1995).

#### ACKNOWLEDGMENTS

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**List of accepted species of *Symplocos* Jacq. section *Neosymplocos* Brand**

1. *Symplocos altissima* Brand
2. *Symplocos angulata* Brand
3. *Symplocos corymboclados* Brand
4. *Symplocos falcata* Brand
5. *Symplocos glandulosomarginata* Hoehne
6. *Symplocos glaziovii* Brand
7. *Symplocos insolita* Aranha, P.W. Fritsch, and Almeda
8. *Symplocos microstyla* Aranha, P.W. Fritsch, and Almeda
9. *Symplocos nitidiflora* Brand
10. *Symplocos organensis* Brand
11. *Symplocos tenuifolia* Brand

**Appendix 1**

Index to specimens examined. Numbers in parentheses correspond to those of each species in the taxonomic treatment. Collectors whose names were illegible are marked with (\*), collections without indication of collector with (\*\*), and collections taken from Bidá (1995) with (\*\*\*)

Albuquerque, J.E. 1854 (11); Almeda, F. 8782 (4); 8788 (4); 8790 (4); 8792 (10); 8798 (10); 8878 (8); 8910 (7); Altamiro et al. 51 (4); Andrade, A.G., 152 (10); Andrade, N. de s.n. (9); Aranha Filho, J.L.M. 29 (4); 43 (4); Arzolla, F.A.R.D.P. 425 (4).

Baitello, J.B. 594 (4); Barbosa, E. 197 (5); 240 (3); 376 (3); Barreto, K.D. s.n. (11); 2696 (11); Barros, D. de 1051 (9); Beatriz 3 (11); Bertani, D.F. 1 (4); Biank, A.E. 24 (11); Bidá, A. 636 (9); 650 (9); 677 (11); 678 (11); Brade, A.C. 5802 (11); 7482 (11); 14050 (4); 16932 (4).

Campos Porto, P. 831 (3), (4); 2936 (9); Capranica, M.V. s.n. (5); Cardoso, C.M.V. s.n. (11); Carmello-Guerreiro, S.M. 13 (4); Carvalho, P. 84 (11); 96 (11); 171 (11); Carvalho, J.P.M. s.n. (4); Cavalheiro, A.L. s.n. (11); s.n. (11); Ceccantini, G.C.T. 1494 (11); Cervi, A.C. 2990 (11); 3008 (11); 3117 (9); 3279 (11); 3587 (11); 4149 (11); 6101 (5); 6272 (11); Chung, F. 218 (11); Claussen, P. 200 (2); Colli, S. s.n. (11); Collares, J.E.R. 48 (4); 64 (4); Cordeiro, J. 411(11); 921 (5); 1388 (3); 1777 (3); 1512 (5); Custódio Filho, A. 2801 (9).

Dala Rosa, S. 56 (5); 106 (3); Doria, O.V. 39 (11); Duarte, A.P. 3201 (11); 8668 (4); Ducke, A. s.n. (4); Dunaiski, A. 303 (11); Durigan, G. 30611 (11); Dusen, P.K.H. s.n. (4); s.n. (11); 29 (3); 301 (3); 573 (4); 2023 (3); 2135 (4); 3436 (11); 6897 (11); 7152 (11); 7745 (11); 9691 (11); 10331 (11); 11463 (11); 12143 (5); 12195 (5); 13001 (9); 14240 (4); 14512 (11); 15801 (11); 15858 (11).

Edmund., A.A. 51 (4); Edwall, G. s.n. (5); Elias, S.I. 162 (11); 303 (11); Emmerich, M. 138 (10); Erns, A.C. 5 (11).

Farney, C. 1439 (4); Fernandes, H.M. 35 (3); Ferretti, A.R. 140 (4); Filipaki, S.A. s.n. (11); França, G.S. 125 (4); 158 (4); 211 (4); Francisco, E.M. s.n. (11); Freitas, L. 299 (4); Fritsch, P.W. 1803 (11); 1807 (3); 1808 (5); 1809 (5); 1813 (11); 1822 (11); 1823 (9); 1826 (5); 1831 (3); 1832 (5).

Gerht, A. s.n. (4); Gibbs, P.E., 5635 (9); Glaziou, A.F.M. illegible number (1); s.n. (4); 3641 (10); 5888 (4); 6023 (10); 6695 (4); 7769 (4); 11167 (4); 13469 (6); 15189 (2); 15202 (8); 15203 (4); 17130 (10); 17473 (4); 17636 (4); 17696 (4); 18347 (9); 18359 (3); 19618 (1); 20212 (4); Goldenberg, R. 521 (9); 617 (9); 669 (9); Gurgel s.n. (11); s.n. (11); 14648 (11); 16235 (11).

Handro, O. s.n. (5); s.n. (9); Hatschbach, G. s.n. (3); s.n. (3); s.n. (5); s.n. (9); s.n. (11); 82 (11); 1085 (9); 1611 (11); 2690 (11); 6405 (3); 10719 (11); 13053 (5); 13112 (5); 15089 (5); 16838 (3); 17316 (3); 17691 (11); 17760 (11); 17941 (11); 19951 (3); 20737 (11); 22230 (3); 22851 (5); 26859 (5); 27614 (11); 27669 (3); 30669 (11); 30714 (11); 30808 (11); 34895 (5); 35784 (3); 39177 (5); 39198 (11); 39726 (11); 39767 (5); 39788 (11); 40298 (11); 40722 (11); 41840 (11); 43002 (5); 43348 (11); 44366 (11); 45713 (5); 45289 (9); 45741 (11); 46053 (5); 48990 (9); 50102 (5); 50814 (11); 55522 (4); 58185 (11); 67499 (11); 68818 (5); Hemmendorff, E. 3241 (4); Hoehne, F.C.; s.n. (4); s.n. (9); s.n. (9); s.n. (11); 311 (4); 28275 (9).

- Imaguire, N. 2775 (11); 3138 (11); Ivanauskas, N.M. 5068 (5); 5069 (4).  
 Joly, A.B. CFSC 3685 (7); CFSC 3687 (7); Jönsson, I.G. 4 (11); 132 (11).  
 Kawasaki, M.L. 571 (4); 1252 (4); Kinoshita, L.S. 16544 (4); Kinupp, V.F. 104 (11); 257 (11); Kirizawa, M. 2568 (4); Koczicki, C. 77 (11); 85 (5); Krapovickas, A. 40910 (11); Krieger, P.L. 11387 (11); Kuhlmann, J.G. s.n. (4); s.n. (4); s.n. (4); s.n. (4); s.n. (11); Kuhlmann, M. s.n. (4); 1298 (11); 1777 (9); 2048 (4); 2531 (4); Kummrow, R. 1730 (11); 2033 (3); 2507 (5); Kuniyoshi, Y.S. s.n. (11); 4077 (5); 4717 (11).  
 Lacerda, A. 100 (11); 192 (11); 275 (5); Landrum, L.R. 2244 (11); 2430 (11); 2654 (11); 3928 (11); Leitão Filho, H. de F. 1586 (11); 10670 (4); Leite, E.C. 562 (5); Leoni, L.S. 2759 (4); 3076 (4); Liebsch, D. s.n. (11); Lima, H.C. de 5988 (4); 6019 (4); Lima dos Santos, J. 277 (3); Lindberg, G.A. 506 (11); Lindeman, J.C. 1090 (11); 1096 (11); 1874 (11); 1910 (11); 4748 (11); 4917 (11); 5017 (3); Lobão, A.Q. 667 (3); Lombardi, J.A. 939 (4); Loughn, G. s.n. (11).  
 Macedo, J.H.P. de s.n. (5); Maia, D.C. s.n. (11); Martinelli, G. 11819 (9); 13155 (3); Martius, K.F.P. s.n. (11); Mattos, A. 2011 (11); 14362 (4); 14469 (4); Mazine, F.F. 202 (4); Messias 48 (4); Mgf. 10403 (4); Mielke, C.G. s.n. (11); Miyagi, P.H. 353 (11); Mocoichinski, A.Y. 86 (3); 232 (5); Moreira, A.X. 46 (4); Mosen, C.W.H. 619 (11); 4533 (11); Mota, R.C. 1898 (7); Motta, J.T. 3017 (5); Muller, F. 195 (11); Muniz, J.R.S. 3 (11).  
 Negrelle, R.R.B. s.n. (11); 28 (11); 610 (11); A762 (11); Neto, L. 290 (9); Nicolak, V. 110 (11); Nunes, P. s.n. (11).  
 Occhioni, P. s.n. (11); 5266 (11); 5338 (11); 5342 (5); 5371 (11); 6240 (4); 6255 (4); 7094 (4); 7100 (4); 7830 (4); 8009 (4); 8024 (4); 8702 (4); Oliveira, P.I. 154 (11); 180 (11); 780 (11).  
 Pabst, G.J.F. 6712 (11); Paula-Souza, J. 2109 (4); 3702 (11); Pereira, E. 6886 (11); 8121 (11); Pessoa, S.V.A., 281 (9); Pirani, J.R. 4896 (4); Plowman, T. s.n. (5); 12823 (4); Poliquesi, C.B. 31 (11); 163 (11); Possette, R.F.S. 265 (11).  
 Raristyak, L. 105 (9); Reginatto, M. 177 (5); Regnell, A.F. II40 (11); II40ç (11); Reis, J. s.n. (4); Reitz, R. s.n. (11); 1130 (5); 3216 (11); 4130 (5); 5391 (11); 5444 (11); 5830 (11); 6132 (3); 13329 (11); 17849 (11); Ribas, O.S. 412 (11); 1205 (11); 1716 (11); 2185 (3); 2880 (3); 3024 (11); 3961 (11); 4421 (5); 5249 (3); 5760 (3); 5848 (3); 5871 (5); 5888 (11); Riedel, L. s.n. (11); s.n. (11); 120 (11); Robin, M. de J. s.n. (4); 212 (4); 8398 (4); Roderjan, C.V. 273 (11); 1018 (3); 930 (3); Rolian, C.B. 7472 (11); Rotta, E. s.n. (11); Rubens, A.A.B. 198 (4); 255 (4); 264 (4).  
 Salimon, C.I. s.n. (11); Santos, E.P. 284 (3); 348 (3); Scheer, M. 451 (3); Seele, C. 1055 (4); Sellow, F. s.n. (11); 221 (9); 4806 (11); 14970 (11); Shepherd, G.J. 6137 (11); 12859 (4); Silva, J.M. 1053 (3); 1696 (3); 2055 (3); 2120 (5); 2622 (5); Smith, L.B. 7392 (5); 7557 (5); 8111 (11); 8495 (11); 11262 (11); 12969 (11); Souza, V.C. 2358 (11); 4322 (11); 4534 (11); 12147 (4); 23397 (4); SP 185; (11); Stange, E.J. 6 (3); Stehmann, J.R. 3001 (4).  
 Takeda 904 (11); Talbot, H.F. s.n. (9); Tiepolo, G. 13 (5); 47 (5); 48 (11); 564 (5); 600 (11); Torezan, J.M. 600 (11).  
 Uhlmann, A. s.n. (11); Ule, E.H.G. 644 (4); 2475 (2); 1093 (11); Ururahy, J.C.C. 21 (4).  
 Vasconcellos, M.F. de s.n. (8); Viani, R.A.G. 486 (11); Vicentini, A. 168 (11).  
 Wesenberg, J. 628 (4); Widgren, J.F. 370 (11); 1157½ (11).  
 Ziller, S.R. 615 (11); 713 (11); 810 (11); 1526 (11); 1942 (11).  
 \* 5792 (5).  
 \*\* 120 (11).  
 \*\*\* Schinini, A. 23206 (11).

## Appendix 2

Comparison of Brand (1901) and Bidá's (1995) treatment of *Symplocos* section *Neosymplocos* to that in the present work. Synonyms are indented. Specimens of taxa marked with an asterisk were not available at the time of Brand's revision.

Brand 1901	Bidá 1995	Present treatment
<i>S. aegrota</i>	<i>S. aegrota</i>	<i>S. falcata</i>
<i>S. altissima</i>	<i>S. altissima</i>	<i>S. altissima</i>
<i>S. angulata</i>	<i>S. angulata</i>	<i>S. angulata</i>
		<i>S. insolita</i> *
<i>S. ascendens</i>	<i>S. falcata</i>	<i>S. falcata</i>
<i>S. corymboclados</i>	<i>S. corymboclados</i>	<i>S. corymboclados</i>
	<i>S. hatschbachii</i> *, <i>nom. ined.</i>	<i>S. hatschbachii</i> *, <i>nom. ined.</i>
<i>S. densiflora</i> var. <i>densiflora</i>	<i>S. densiflora</i>	<i>S. falcata</i>
<i>S. densiflora</i> var. <i>minor</i>	<i>S. densiflora</i> var. <i>minor</i>	<i>S. falcata</i>
<i>S. falcata</i>	<i>S. falcata</i>	<i>S. falcata</i>
	<i>S. ascendens</i>	<i>S. ascendens</i>
		<i>S. aegrota</i>
		<i>S. densiflora</i> var. <i>densiflora</i>
		<i>S. densiflora</i> var. <i>minor</i>
<i>S. glaziovii</i>	<i>S. glaziovii</i>	<i>S. glaziovii</i>
<i>S. nitidiflora</i>	<i>S. nitidiflora</i>	<i>S. nitidiflora</i>
<i>S. organensis</i>	<i>S. organensis</i>	<i>S. organensis</i>
		<i>S. microstyla</i>
<i>S. tenuifolia</i>	<i>S. tenuifolia</i>	<i>S. tenuifolia</i>
	<i>S. reitzii</i> , <i>nom. ined.</i>	<i>S. reitzii</i> , <i>nom. ined.</i>
	<i>S. glandulosomarginata</i>	<i>S. glandulosomarginata</i>
<b>Totals:</b>		
11 species, 12 taxa	13 species	11 species

## Appendix 3

Index to scientific names. Synonyms are italicized.

Barberina, section	408	<i>S. cipunimoides</i>	408
Bobua, section	428	<i>S. corymboclados</i>	409, 416, 417, 419
Epigenia, subgenus	408	<i>S. corymboclados</i> var. <i>micromorpha</i>	417
Eusymplocos, subgenus	408	<i>S. densiflora</i>	421
Ericales, order	407	<i>S. densiflora</i> var. <i>minor</i>	421
Hopea, subgenus	408, 428	<i>S. falcata</i>	409, 420, 422, 423
Microsymplocos, subgenus	408, 410	<i>S. glandulosomarginata</i>	409, 411, 425, 426
Neosymplocos, section	408–413	<i>S. glaziovii</i>	411, 427, 429
Pseudosymplocos, section	408	<i>S. insolita</i>	411, 428, 431
Symplocaceae, family	407, 408	<i>S. lanata</i>	408
Symplocastrum, section	410	<i>S. micrantha</i>	408
Symplocos		<i>S. microstyla</i>	416, 430, 432
<i>S. aegrota</i>	420	<i>S. nitidiflora</i>	409, 433–435
<i>S. altissima</i>	411, 414, 415	<i>S. organensis</i>	409, 434, 436, 437
<i>S. angulata</i>	415–417	<i>S. tenuifolia</i>	436, 439
<i>S. ascendens</i>	420	Symplocos, subgenus	408
<i>S. candelabrum</i>	428	Urbaniocharis, section	408, 410