

SYSTEMATICS OF THE GENUS *SIPARUNA* (MONIMIACEAE, SIPARUNOIDEAE) IN MEXICO, WITH DESCRIPTIONS OF TWO NEW SPECIES

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RESUMEN

Cinco especies de *Siparuna* son reconocidas para México en este estudio, de las cuales *S. austromexicana* Lorence y *S. scandens* Lorence son descritas como nuevas. Tres más son reducidas a sinonimia: *S. colimensis* Perk., y *S. nicaraguensis* Hemsl. bajo *S. andina* (Tul.) A.DC. y *S. sumichrastii* (A.DC.) Perk. bajo *S. riparia* (Tul.) A.DC. Se registra *S. tonduziana* Perk. por primera vez para México. Se proporcionan clave y diagnóstico de las especies, datos de distribución, hábitat y relaciones; además de la cita de material representativo consultado para cada uno de los taxa.

ABSTRACT

In this study five species of *Siparuna* are recognized for Mexico, of which two, *S. austromexicana* Lorence and *S. scandens* Lorence, are described as new. Three others are reduced to synonymy: *S. colimensis* Perk. and *S. nicaraguensis* Hemsl. under *S. andina* (Tul.) A.DC., and *S. sumichrastii* (A.DC.) Perk. under *S. riparia* (Tul.) A.DC. *Siparuna tonduziana* Perk. is recorded for the first time in Mexico. A key to the species is provided, and for each taxon descriptions are given, as well as information on distribution, habitat, affinities and citation of representative specimens.

INTRODUCTION

Siparuna Aubl. is the largest genus of Monimiaceae, with over 100 species, all neotropical and most centered in the Andes and Amazon Basin of South America. The genus reaches its northernmost limits in Mexico at 21°50'-22°50' N latitude, where *S. andina* extends into Veracruz and San Luis Potosí in the east and Jalisco and Nayarit in the west. Although *Siparuna* has been treated monographically in the past (DeCandolle, 1868; Perkins & Gilg, 1901; Perkins, 1901, 1911) and some regional floristic treatments also exist (Standley, 1922, 1937; Standley & Steyermark, 1946; Duke, 1962), there are no modern revisions. Past workers often had access to only limited material which failed to show the full range of morphological variation and geographical distribution of certain species (e.g., *S. andina*), whereas large series of collections are essential to delimit many taxa. Consequently, infrageneric concepts were often narrow and many have subsequently proven untenable.

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My field studies in Mexico and a review of material at CHAPA, ENCB, F, MEXU, MICH, MO, MSC, US, and XAL prior to treatments for the floras of Chiapas, Nicaragua and Mesoamerica prompted a revision of the Mexican species. In this study five species are recognized for Mexico, including the first record of *Siparuna toduziana* for Mexico. Two of the species are herein described as new based on recent collections (*S. austromexicana* and *S. scandens*), whereas three others are reduced to synonymy for the first time (*S. colimensis*, *S. nicaraguensis* and *S. sumichrasti*).

Siparunas are aromatic shrubs, small trees or rarely vines of the moist and wet forest zones. Important taxonomic characters are provided by the type and density of trichomes, and features of the leaf margin, inflorescence and flowers. It is unclear what pollinates the small, yellow, orange or red flowers. The fleshy, white or red fruiting receptacle splits open irregularly at maturity to expose a number of carpels bearing fleshy red outgrowths which are apparently dispersed by birds.

SIPARUNA Aublet

Dioecious or monoecious shrubs, small trees or rarely vines, aromatic, often lemon-scented, sparsely to densely pubescent, the trichomes simple, multangulate or stellate. Leaves opposite, rarely ternate, exstipulate, entire or dentate, petiolate. Inflorescence axillary, simple or forked, cymose. Flowers unisexual, pedicellate, the hypanthium urceolate, enclosing the stamens for carpels, crowned, by a fleshy, flat or domed velum, its margin entire or lobed and bearing a few small tepals, the velum with a small central annulus through which the stamens or styles protrude. Staminate flowers with few to many stamens, the filament broad, flat, the anther small, oblong, bilocular, valvate. Pistillate flowers with few to many free, elongate carpels, the styles exserted, papillose. Fruit fleshy, enclosing the carpels, when ripe splitting irregularly from the apex and spreading to reveal the carpels; carpels reticulate-pitted, covered apically by a red, aril-like structure.

Vernacular names: "limoncillo" (referring to the lemony odor which all the Mexican species have), "mata-chinche", "manzanillo" (*Mexia* 1528, 1530).

Although all the species occurring in Mexico are dioecious, some of the South American and Panamanian ones are monoecious.

KEY TO SIPARUNA IN MEXICO

- 1a. Mature leaves and stems subglabrous or sparsely pubescent with scattered trichomes.
 - 2a. Leaf margins entire or sinuate-dentate, the teeth (if present) small, obtuse or depressed apically; leaf and stem trichomes all stellate with usually short, spreading-appressed rays; Veracruz and elsewhere 1. *S. andina*
 - 2b. Leaf margins serrate-dentate, the teeth prominent, acute; leaf and stem trichomes mixed simple and stellate or multangulate with usually long, spreading-erect rays; Veracruz 3. *S. riparia*
- 1b. Mature leaves and stems conspicuously pubescent, often densely villous or velutinous-tomentose.
 - 3a. Mature leaves at most moderately pubescent, the trichome rays never contiguous on abaxial surface of lamina; mature leafy stems pilose, scurfy or sparsely velutinous.
 - 4a. Leaf margins entire or sinuate-dentate, the teeth (if present) small, obtuse or

depressed apically; leaf trichomes all stellate, the rays usually spreading-appressed (simple and multangulate trichomes present on some plants from GRO, JAL & NAY, but the leaf margins always entire or sinuate-dentate; Veracruz and elsewhere 1. *S. andina*

- 4b. Leaf margins prominently serrate-dentate, the teeth acute; leaf trichomes mixed simple, stellate and multangulate, the rays usually spreading-ascendant; Veracruz 3. *S. riparia*

- 3b. Mature leaves \pm densely velutinous-tomentose, the trichome rays mostly contiguous on abaxial surface of lamina; mature leafy stems \pm densely velutinous-tomentose.

- 5a. Leaf margins coarsely dentate, the teeth unequal, to 4 mm long; trichomes 1-1.5 (—3) mm long, mostly simple mixed with fewer multangulate ones 5. *S. tonduziana*

- 5b. Leaf margins finely dentate, sinuate-dentate or subentire, the teeth subequal, 0.5-2 (—3) mm long; trichomes 0.5-1 mm long, mostly or all stellate or multangulate, mixed with fewer simple hairs.

- 6a. Leaf margins subentire to sinuate-dentate, the teeth broad, rounded or obtuse; few to many simple hairs present on lamina in addition to stellate and multangulate trichomes; mature flowers 3-4 mm diam., the stamens and style tips exerted from the orifice, the annulus small or absent; shrubs or small trees; CHIS, OAX, VER 2. *S. austromexicana*

- 6b. Leaf margins finely dentate, the teeth narrow, acute; leaf trichomes all stellate and multangulate; mature flowers 4-6 mm diam., the stamens and style tips scarcely exerted from the orifice, the annulus prominently raised; true vines, reaching 10 mm in the canopy; OAX .. 4. *S. scandens*

1. *Siparuna andina* (Tul.) A.DC., Prodr. 16(2): 648. 1868; Perk. & Gilg, Pflanz. 4 (101): 88. 1901.

Citrosma andina Tul., Ann. Sci. Nat. 4(3): 36. 1855; Tul., Monogr. Monim.: 338. 1855. Type: MEXICO. Oaxaca, mountains of Oaxaca, 1,000 m alt., 1840, H. Galeotti 7184 (P, holotype; photographs, Field neg. no. 34791: F, MEXU, MO).

Siparuna nicaraguensis Hemsl., Biol. Centr. Amer. Bot. 3: 69. 1882. Type: NICARAGUA. Chontales, Tate 385, 386, 421 (K, syntypes, not seen).

Siparuna davillifolia Perk., Bot. Jahrb. Syst. 26: 681. 1901; Perk. & Gilg, Pflanz. 4(101): 92. 1901; Perk., Pflanz. 4(101), Nachtr.: 50. 1911. Type: NICARAGUA. Segovia Pantasmo, Oersted 1 (B, probably destroyed; photographs, Field neg. no. 13495: F, MEXU, MO).

Siparuna colimensis (Perk., Bot. Jahrb. Syst. 28: 682. 1901; Perk & Gilg, Pflanz. 4(101): 92. 1901. Type: MEXICO. Colima, Kerber s.n. in 27 Oct. 1880 (B, probably destroyed; photographs, Field neg. no. 13490: F, MEXU, MICH, MO).

Shrubs or small trees 2-8(-10) m tall, the new growth glabrate or sparsely to moderately scurfy pubescent, the minute trichomes stellate with (2-)4-10(-12) spreading \pm appressed rays, the mature leafy stems terete, 2-5 mm diam., scurfy or glabrate. Leaves opposite (rarely ternate on vigorous shoots), petiolate the pairs subequal; petioles of a pair unequal, 10-50(-100) \times 1.5-2.0 mm, scurfy or glabrate; lamina chartaceous to subcoriaceous, elliptic, broadly elliptic or obovate-elliptic, \pm falcate, (60-)80-250(-275) \times (25-)40-115-(150) μ m, the base cuneate, obtuse, truncate or shallowly cordate, the sides subequal, the apex rounded, usually abruptly and shortly acuminate, the acumen 3-10 mm long, rarely obtuse, drying dull dark greenish or grayish-brown, \pm discolorous, both surfaces glabrate or

minutely stellate pubescent, the trichomes appressed, not contiguous, stellate with (4-)6-12(-14) spreading rays, denser along the costa and veins abaxially, the secondary veins 6-9(-12) pairs, making a 45-65° angle with the costa, the 3° veins oblique, the venation visible to 3° adaxially and to 4° abaxially, the margin entire to sinuate-dentate, often undulate, the teeth small, obtuse or depressed apically. Cymes axillary or on leafless nodes, usually shorter than the petioles, 5-22 mm long, solitary or in groups of 2-4(-8), the axes and flowers sparsely to moderately stellate pubescent. Staminate cymes 3-25-flowered, the main axes to 10-15 x 0.5 mm, simple or forked; male flower at anthesis 2.5-5.0 mm diam. x 1.5-2.5 mm long, the velum glabrous, when fresh yellow turning orange-red, raised, ± conical, the margin strongly (4-)5-6 lobed, the lobes spreading or reflexed, obtuse, apiculate, the margin revolute; stamens (5-)6-7(-9), ovate to broadly elliptic or ligulate, 1.8-3.0 x 0.8-1.4 mm, the apex acute or apiculate, the thecae comprising 1/3 (1-1/2) total length of stamen, the outer 4 stamens partially exerted at anthesis; pedicel 2-4 mm long. Pistillate cymes smaller than the staminate, the axes 2-7 mm long, usually simple, 1-8-flowered; pistillate flower at anthesis 3-4 mm diam. x 2-3 mm long, the glabrous velum with 5(-6) ultimately reflexed lobes, raised to a central annulus, the orifice tubelike, sheathing the style bases; styles (6-)7-9, curved, papillose, coalescent basally; exerted for ca 1 mm; pedicel 3-5 mm long. Fruiting receptacle obovoid to subglobose, when fresh pinkish-red with white spots (6-)8-11 mm diam., crowned by the persistent velum, the surface sparsely and minutely stellate pubescent; pedicel + peduncle to 15 mm long.

Distribution: Mexico (Nayarit, Colima, Jalisco, probably Michoacan, Guerrero, Oaxaca, Chiapas, San Luis Potosí, Veracruz, Tabasco) south to Panama (unknown from El Salvador).

Representative specimens examined: MEXICO. Chiapas: Mpio. Ocosingo, Laguna Ocoatal Grande, 6 Feb. 1973, *Breedlove 33026* (MEXU); Colima: without locality, *Kerber s.n. in 27 Oct. 1880* (B, presumably destroyed; photographs: F, MEXU, MICH, MO); Guerrero: La Soledad (NE of Atoyac), 28 Mar. 1899, *Langlassé 975* (MEXU, MICH); Jalisco: San Sebastian, Arroyo Seco, 19 Jan. 1927, *Mexia 1528* (MICH, MO); Nayarit: between Tepic and Jalcoctán, 7 Sept. 1960, *McVaugh 18840* (ENCB, MICH); Oaxaca: between Puerto Eligio and Comaltepec, 28 Oct. 1965, *Martínez C. 429* (ENCB, MEXU-2 colls.); San Luis Potosí: 15 km ENE of Ciudad del Maiz, 30 June 1959, *Rzedowski 11153* (ENCB, MSC); Tabasco: towards Oxolotan from road to Tapijulapa, 6 Aug 1979, *Cowan 2094* (ENCB, MEXU); Veracruz: Mpio. Catemaco, hills E of Coyame, 26 Oct. 1971, *Beaman 5177* (F, MEXU, XAL).

Siparuna andina is the oldest available epithet for the widespread and often collected species going under the name of *S. nicaraguensis* in most herbaria. As may be expected for such a widely distributed species, it is extremely variable as to leaf sil and shape, and degree of pubescence. However, it is distinguishable from the other Mexican species by its leaves with subentire to sparsely dentate margins, the teeth obtuse or often depressed, and its sparse to moderate pubescence of minute, stellate trichomes.

Material from lowland wet and lower montane cloud forest in Oaxaca and

adjacent Veracruz is nearly glabrous with scattered trichomes and a shrubby habit. Populations from southern Oaxaca through Guerrero, Jalisco, Nayarit and Colima are frequently more densely pubescent, the stems often being scurfy or velutinous with longer trichomes, and the leaves are more prominently sinuate-dentate and frequently dry a brighter green color. The habit is also larger, with trees of 6-10 meters being reported. Here the species occurs in barranca vegetation with evergreen or semideciduous tropical forest or in drier pine-oak forest. Such material, referable to *S. colimensis*, at first seems distinct but examination of a large series of collections shows complete intergradation between the extreme forms, making recognition of discrete taxa impossible. Certain collections from Nayarit (*McVaugh 18941*, MICH), Guerrero (*Mexia 1528*, MICH) and Jalisco (*McVaugh 20310*, *20409*, *23232*, all MICH) bear few to numerous long, simple hairs and multangulate trichomes with 2-4 long erect-spreading rays in addition to the characteristic appressed stellate type, thus approaching *S. riparia*. However, *McVaugh 18940* from the same population as *McVaugh 18941* (both MICH) bears only minute, appressed stellate trichomes characteristic of *S. andina*, suggesting these differences can be intrapopulational. Leaf dentation in the above collections is typical of *S. andina*. On the other hand, *Cedillo T. 1399* (MEXU) from southern Oaxaca has dentation suggestive of *S. riparia* but otherwise conforms to *S. andina*.

Most Mesoamerican material (from Chiapas and Tabasco south to Panama) has somewhat scurfy stems, although glabrate forms are also common. Most are shrubs or small trees, although *Breedlove 9749* (MEXU) from Chiapas is said to be a tree of 13 meters. Although the types of *S. nicaraguensis* were not seen, examination of numerous collections from Nicaragua leaves no doubt that they are conspecific with *S. andina*, the most widespread of the two Nicaraguan species.

2. *Siparuna austromexicana* Lorence. sp. nov. Type: MEXICO. Oaxaca: Distr. Juchitán, Mpio. Santa María Chimalapa, 15 km NE of turnoff to Cofradia, 26 km NE of Lázaro Cárdenas road to Santa María Chimalapa, 250 m alt., 24 May 1982, R. Cedillo T. & R. Torres 1378 (MEXU, holotype; isotypes to be distributed).

Frutices vel arbusculae and 5 m altae, dioeciae, ramulis hornotinis fulvis usque flavo-viridibus, dense velutino-tomentosis, trichomatibus persistentibus, mixtis simplicibus multangulato-stellatisque, radiis 4-10, erectopatentibus. Folia opposita, paribus ± inaequalibus, petiolata; petiolis 10-50 mm longis velutino-tomentosis; lamina chartacea elliptica obovato-elliptica, late elliptica vel obovato-elliptica, 90-275 x 55-120 mm, basi cuneata usque obtusa, apice breviter acuminata, superciebus ambabus pilosis usque tomentosis, trichomatibus mixtis simplicibus multangulato-stellatoque, radiis 2-6(-10), erecto-patentibus, venis secundariis in paribus 7-10, margine subintegro usque late sinuato-dentato. Cymae axillares vel ramiflorae, solitariae vel binae quaternaeque aggregatae, dense velutino-tomentosae, 10-15 mm longae, floribus 2-20. Flos masculus sub anthesi 3-4 mm diametro x 2 mm longus, velo glabro, tholiforni, margine crenatim 5-6-loba vix revoluta; staminibus 6, liguatis usque ellipticis, 1.2-1.6 x 0.7-0.9 mm, theca ex 1/3-1/2

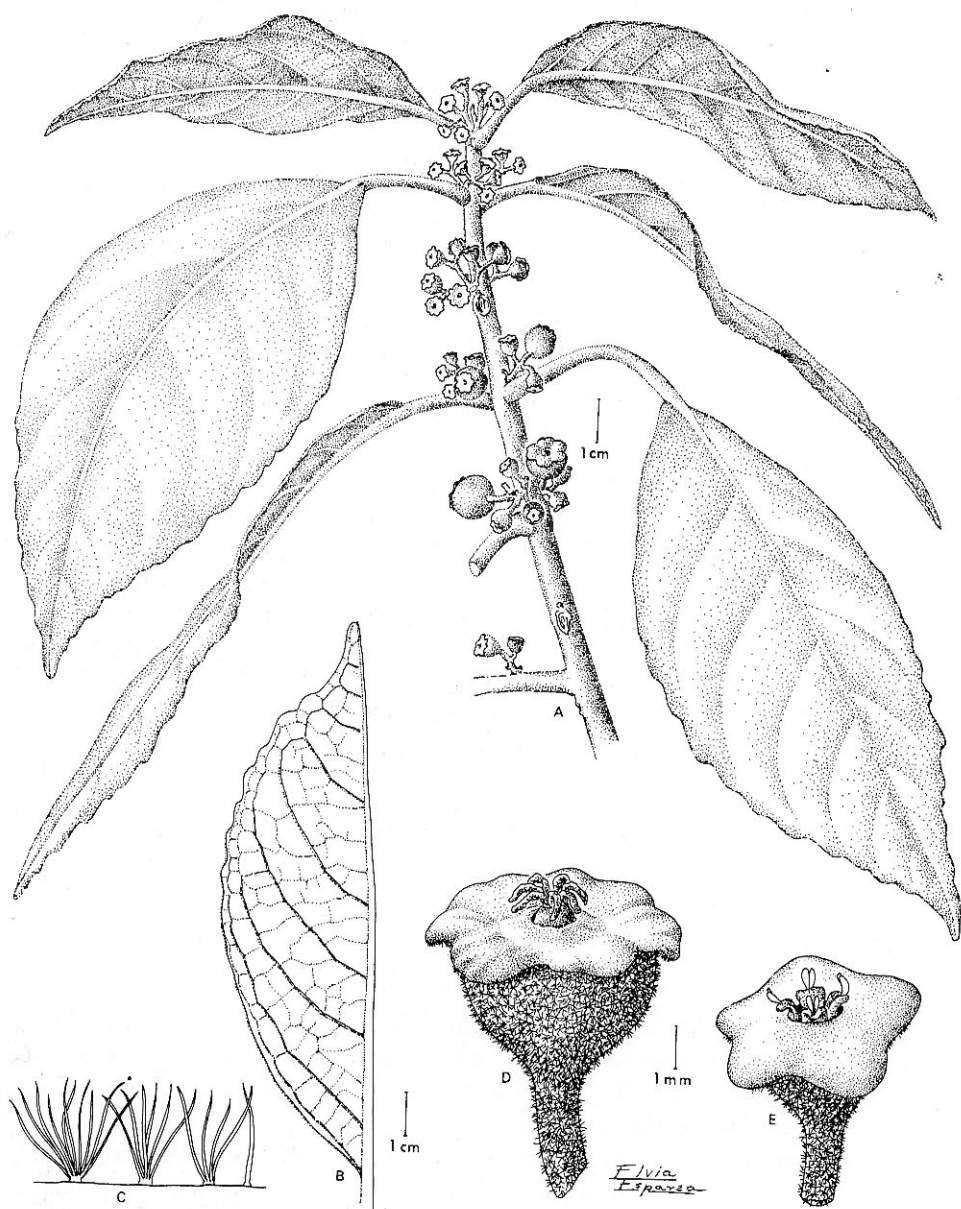


Figure 1. Habit and details of *Siparuna austromexicana* Lorence. A, habit, female individual; B, leaf, detail of venation; C, leaf trichomes, detail to show variation (ca. x 50), D, female flower at anthesis; E, male flower at anthesis. A-D from *Cedillo T. 1378*; E from *Torres 102*.

longitudinis staminis composita, externis 4 exsertis. Flos femineus sub anthesi atque masculus, velo creantim 5-7-loba, stylis 6-12, papillois, ex annulo prominenti exsertis. Fructus ruber, subglobosus, 10 mm diametro, stellato-pubescent. (Fig. 1).

Dioecious shrubs or small trees reaching 5 m tall, the stems often decumbent, the new growth densely fulvous to greenish-yellow, velutinous-tomentose, the mature leafy stems 2.5-4.0 mm diam., persistently tomentose, the trichomes simple, multangulate and stellate, 0.4-0.8 mm diam., the rays 4-10 erect-spreading, to 1 mm long the internodes spaced 10-60 mm. Leaves opposite to subopposite, the pairs \pm unequal, petiolate; petioles velutinous-tomentose, 10-50 x 1.5-2.0 mm; lamina thinly chartaceous, dark olive green, slightly discolorous, elliptic to obovate-elliptic, broadly elliptic or broadly obovate-elliptic (70-)90-250(-275) x (45-)55-120 mm, the base narrowly to broadly cuneate or obtuse, the sides \pm unequal, the apex shortly acuminate, the acumen to 20 mm long, rarely acute, the surfaces persistently pilose-tomentose with few to numerous simple hairs mixed with multangulate and stellate trichomes 0.4-0.8 mm diam., the rays 2-6(-10), erect-spreading, the trichomes contiguous, denser along the costa and veins, the 2° veins (5-)7-10 pairs, festooned brochidodromous, making a 45°-70° angle with the costa, the ultimate venation visible to 3° adaxially and to 4° abaxially, the margin subentire to sinuate-dentate, the teeth usually broad, rounded or obtuse, to 1-3 mm long, 1-3 per cm. Cymes axillary or on leafless nodes, solitary or in groups of 2-4, short, 10-15 mm long, the primary axes simple or forked, 5-10 mm long, the axes and flowers densely velutinous-tomentose. Staminate cymes (2-)5-20-flowered; staminate flower at anthesis 3-4 mm diam. x 2 mm long, the velum glabrous, dome-shaped, pale yellow or whitish when fresh, crenately 5-7-lobed, the lobes obtuse to acute, apiculate, the margin pubescent, scarcely revolute; stamens 6; ligulate to elliptic, 1.2-1.6 x 0.7-0.9 mm, acute, the thecae comprising ca. 1/3-1/2 total length of stamen, the apices of outer 4 stamens exserted and reflexed at anthesis; pedicel 3-5 x 0.5 mm. Pistillate cymes 2-4 flowered. Pistillate flower at anthesis 3.5-4.0 mm diam. x 2.5-3.0 mm long, the vellum pale orange to whitish-yellow when fresh, concave, crenately 5-7 lobed, the lobes obtuse, apiculate, the margin undulate, pubescent, scarcely revolute; styles 6-12, papillose, exserted for 1 mm from the raised annulus; pedicel 2-3 x 1 mm. Fruit red when fresh, subglobose, drying to ca. 10 mm diam., crowned by the persistent velum, the surface moderately stellate-pubescent.

Distribution: The species is known only from Mexico, where it occurs in SE Oaxaca and adjacent Veracruz and Chiapas, in and adjacent to the Isthmus of Tehuantepec.

Specimens examined: MEXICO. Chiapas: Mpio. Cintalapa, Oaxaca-Chiapas border, 4 km W of La Cienega, 10 May 1972, *Breedlove 25101* (MEXU); *ibid.*, 3 km E of Francisco Madero, NE of Cintalapa 4 Oct. 1974, *Breedlove 38049* (MEXU); La Ceiba, Río Venta, 6 km E of Raudales, 5 Apr. 1966; *González Q. 3440* (ENCB, MSC). Oaxaca: Distr. Juchitán, Mpio. Santa María Chimalapa, 12 km SW of Santa María Chimalapa, 12 March 1982, *Torres C. & Cedillo T. 102* (MEXU); Veracruz: Mpio. Hidalgotitlán, W tributary of Río Las Cuevas, S of

La Laguna, 18 Apr. 1982, *Wendt, Vázquez T., Méndez, Navarrete & García M. 3875* (CHAPA, MEXU).

Habitat: *Siparuna austromexicana* occurs in lowland evergreen rain forest with *Dialium*, *Lonchocarpus*, *Poulsenia*, *Pouteria*, *Pterocarpus*, etc., and lower montane wet forest with *Liquidambar*, *Pinus*, *Quercus*, *Inga*, etc. from ca. 130 to 1,400 m altitude, often along streams or rivers.

Among the Mexican species *Siparuna austromexicana* is most closely allied to *S. scandens* from Oaxaca (described below). The latter differs in being a true canopy vine with uniquely stellate-multangulate trichomes, leaves with finely denticulate margins bearing narrow, acute teeth, and somewhat larger flowers with a distinct central annulus and scarcely exerted stamens and styles. Some simple hairs are always present in *S. austromexicana*, although the proportion varies from few (e.g. *Cedillo 1378*, *Torres 102*), to many (e.g., *Wendt et al. 3875*). *Siparuna tonduziana* differs in having much longer, mostly simple trichomes and coarsely dentate leaves with unequal teeth.

3. *Siparuna riparia* (Tul.) A.DC., Prodr. 16(2): 647. 1868; Perk., Bot. Jahrb. Syst. 28: 689. 1901; Perk. & Gilg, Pflanzenr. 4(101): 99. 1901.

Citriosma riparia Tul., Ann. Sci. Nat. 4(3): 36. 1855; Tul., Monogr. Monim.: 336. 1855. Type: MEXICO. Veracruz ("Prov. Oaxaca"): Huatusco, 1843, *Ghiesbreght 8* (P, lectotype, here designated; photograph, MEXU; isotypes, P, 2 collections; photographs, MEXU).

Siparuna riparia var. *sumichrastii* A.DC., Prodr. 16(2), 648. 1868. Type: MEXICO. Veracruz: Orizaba, *Sumichrast 974* (G-DC, holotype, not seen; microfiche, Herb. DC 16(2): 648: MEXU).

Siparuna sumichrastii (A.DC.) Perk., Bot. Jahrb. Syst. 28: 682. 1901; Perk. & Gilg, Pflanzenr. 4(101): 92. 1901; Perk., Pflanzenr. 4(101) Nachtr.: 50. 1911.

Siparuna riparia var. *macrophylla* Perk., Bot. Jahrb. Syst. 28: 690. 1901; Type: MEXICO. Veracruz: Fortin, *Kerber 370* (B. presumably destroyed).

Siparuna riparia var. *grandiflora* Perk. & Gilg, Pflanzenr. 4(101): 99. 1901. *nomen superfl.*, based on *S. riparia* var. *macrophylla* Perk.

Shrubs 2-6 m tall, the new growth sparsely pilose to densely velutinous-tomentose, the hairs brownish, to greenish-yellow, \pm undulate, mixed simple, stellate and multangulate with 2-4(-8) spreading-erect rays, the mature leafy stems dark, 3-5 mm diam, glabrate to persistently pilose or villous. Leaves opposite to subopposite, often ternate, petiolate, the pairs subequal; petioles of a pair subequal (6-)10-30 x 1-2 mm, glabrate or pilose-velutinous; lamina chartaceous, elliptic to obovate-elliptic or obovate (70-)80-170 x (30-)40-70 mm, broadest above the middle, the base cuneate to obtuse or rarely subcordate, the sides subequal, the apex shortly acuminate, the acumen 5-10 mm, concolorous drying olive to dark brownish-green, both surfaces glabrate or with scattered mixed simple stellate and multangulate trichomes with 2-5(-8) long, erect-spreading rays, denser abaxially along costa and veins, the 2° veins 8-11 pairs, making a

45-55° angle with the costa, the 3° veins slightly oblique, the venation visible to 4° adaxially and to 4-5° abaxially, the margin serrate-dentate, the teeth acute, indurated. Cymes axillary or on leafless nodes, shorter than or occasionally exceeding the petioles 10-33 mm long, solitary or in groups of 2-4, the axes and flowers sparsely to densely pilose to velutinous. Staminate cymes 4-20-flowered, the main axes 3-30 mm long, simple or forked; staminate flower at anthesis 3-4 mm diam. x 2.5-3.5 mm long, the velum glabrous, bright yellow when fresh, raised and conical, the margin strongly 5-6-lobed, the lobes obtuse, apiculate, ultimately reflexed, the margin revolute; stamens 6-8(-10) subcircular to ovate or ligulate, 1.5-2.5 x 1-2 mm, obtuse or acute, the thecae comprising 1/5-1/3 total length of stamen; pedicel 2-8 mm long. Pistillate cymes smaller, solitary or paired, the axes 2-5 mm long, usually simple, with 1-5 flowers; pistillate flower at anthesis 2.5-5.0 mm diam. x 1.5-2.5 mm long, the glabrous velum yellow when fresh, with 5-6(-7) ultimately reflexed lobes, raised to a central annulus, the orifice tubelike and sheathing the styles basally, the margin revolute; styles 7-10, slightly papillose, exerted for 0.6-0.8 mm; pedicel 3-6 mm long. Fruiting receptacle obovoid-globose, when fresh red with white spots, drying to 7-12 mm diam., the surface glabrate or with scattered trichomes.

Distribution: Known only from Veracruz, Mexico.

Representative specimens: MEXICO. Veracruz: Mpio. Huatusco, Dos Puentes, 5 Apr. 1978, *Ventura A. 15161* (ENCB, XAL); Orizaba, hills above, 5 Feb. 1895, *Pringle 6128* (MEXU, MSC); Mpio. Tequila, Tlazolalpan, 29 Mar. 1976, *Vázquez T. 371* (MEXU, XAL); Mpio. Totutla, Totutla, 14 Apr. 1976, *Ventura A. 12762* (ENCB, MEXU); Mpio. Zongolica, between Zongolica and Nacaxtla, 10 Nov. 1976, *Vázquez T. 572* (XAL).

Habitat: *Siparuna riparia* occurs between 800 and 1,600 m in the cloud forest zone of central Veracruz. *Quercus* is often dominant here, mixed with temperate deciduous elements such as *Liquidambar*.

DeCandolle (1868) based his variety *sumichrastii* on a nearly glabrous plant with sparsely pilose flowers having less reflexed lobes than in *S. riparia*. Perkins (1901) later raised it to the rank of species. However, examination of a wide range of material reveals a complete intergradation in density of pubescence. Furthermore, the degree to which the tepals are reflexed depends on the age of the flower. It is thus impossible to recognize this taxon even at the varietal level.

Among Mexican species, *Siparuna riparia* is most closely allied to *S. andina* in floral morphology, but differs in having longer trichomes including simple hairs, and serrate-dentate leaf margins with acute teeth. As these differences do not intergrade, and since the species are generally segregated geographically as well as altitudinally in Veracruz, both are best recognized as discrete entities.

Duke (1962) reports the species from Panama with some reservation. All authentic material I have seen of *Siparuna riparia* is from Veracruz.

4. *Siparuna scandens* Lorence, sp. nov. Type: MEXICO. Oaxaca: Distr. Ixtlán, Sierra de Juárez; Route 175 Tuxtepec to Oaxaca, ca. 4 km N of Vista Hermosa, cloud forest, 1,300 m, 17 Apr. 1982, D. Lorence & R. Cedillo T. 4063 (MEXU, holotype; isotypes to be distributed).

Frutices dioeciae usque ad 10 m altae caulibus alte scandentibus, ramulis hornotinis fulve usue viridi-flave dense velutino-tomentosis, trichomatibus persistentibus, omnibus multangulato-stellatis, radiis 6-16, erecto-patentibus. Folia opposita, paribus \pm inaequalibus, petiolatis; petiolis 12-25 mm longis, velutino-tomentosis; lamina chartacea, elliptica, late ovato-elliptica vel late obovato-elliptica, 100-180 x 60-100 mm, basi cuneata, obtusa, truncata vel non profunde cordata, apice breviter acuminata, superficiebus ambabus confertim tomentosis, trichomatibus omnibus multangulato-stellatis, radiis (2-)3-10(-16), erecto-patentibus, venis secundariis in pareibus 7-10, margine subtiliter dentata. Cymae axillares vel ramiflorae, solitariae vel binae quaternaeque aggregatae, dense stellato-tomentosae, 8-15 mm longae, floribus 2-12. Flos masculus sub anthesi 4-8 mm diametro x 2-3 mm longus, velo glabro, annulo centrali prominenti, margine non profunde 4-5 lobo vel undulato, revoluta staminibus 8-9, ovato-deltoides usque ligulatis, 1.5-1.8 x 0.6-1.6 mm, theca grandi, ex usque ad 1/2 longitudinis staminis composita, parum exserta. Flos femineus sub anthesi atque masculus, autem 3-5 mm diametro velo 5-7 lobo; stylis 5-8, papillosis, vix exsertis ex annulo centrali prominenti. Fructus ruber, subglobosus, 7-8 mm diametro, stellato-pubescent (Fig. 2).

Dioecious lianas reaching 10 m in trees, the stems 4-5 cm diam., the new growth pale fulvous to greenish-yellow, velutinous-tomentose, the mature leafy stems 2.5-5.0 mm diam., persistently tomentose, the trichomes multangulate and stellate, 0.3-0.7 mm diam., the rays 6-16, erect-spreading, the internodes spaced 45-100 mm. Leaves opposite to subopposite, the pairs \pm unequal, petiolate; petioles 12-25 x 1.5-2.0 mm, velutinous-tomentose; lamina chartaceous, drying dark olive green, slightly discolorous, elliptic, ovate-elliptic, broadly elliptic or broadly ovate-elliptic to broadly obovate-elliptic (90-)100-180 x (50-)60-100 mm, the base cuneate to obtuse, truncate or shallowly cordate, often slightly unequal, the apex shortly acuminate, rarely acute or even obtuse, both surfaces densely tomentose, the trichomes contiguous, denser along costa and veins, multangulate and stellate, 0.4-0.8 mm diam., the rays (2-)3-10(-16), erect-spreading, to 0.7 mm long, the 2° veins 7-10 pairs, making a 55-65° angle with the costa, brochidodromous, the ultimate venation visible to 2°(-3°) adaxially and to 3°(-4°) abaxially, the margins finely dentate, the teeth narrow, mostly acute, to 0.5 mm long, spaced (3-)5-7 per cm. Cymes axillary or on leafless nodes, solitary or in groups of 2-4, short, 8-15 mm long, the axes and flowers densely stellate-tomentose, the main axes to 10 mm, simple or forked. Staminate cymes 2-7-flowered; staminate flower at anthesis (3-)4-6 mm diam. x 2-3 mm long, the velum glabrous, when fresh yellow with a raised orange central annulus, shallowly 4-5-lobed or undulate, the lobes apiculate, the margin revolute, pubescent; stamens 8-9, ovate-deltoid to ligulate, 1.5-1.8 x 0.6-1.6 mm, the apex acute, the thecae large, comprising ca 1/2 length of stamen, scarcely exserted at anthesis; pedicel 3-6 x 1 mm. Pistillate inflorescence

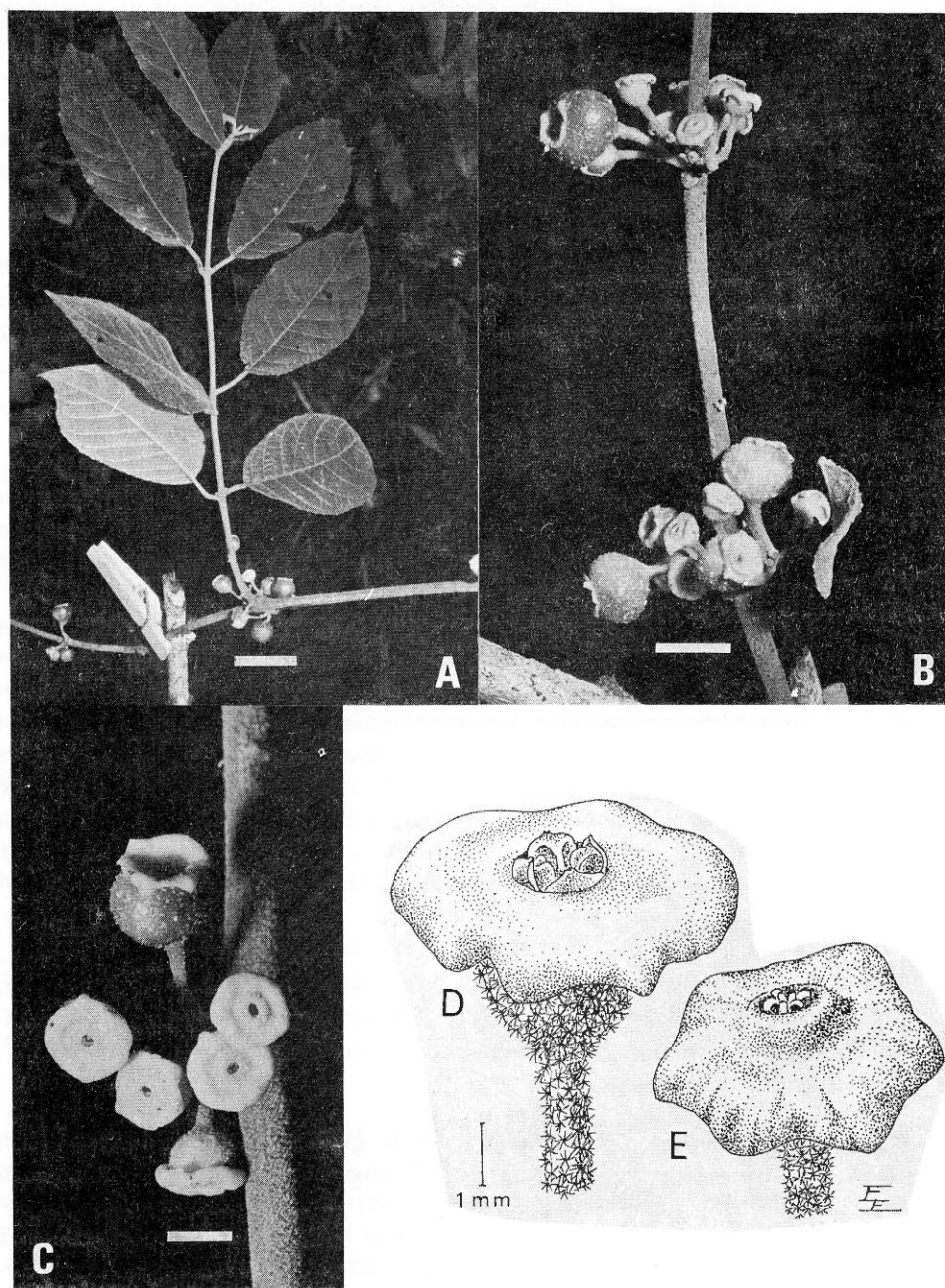


Figure 2. Habit and details of *Siparuna scandens* Lorence. A, habit, female individual; B-C, female flowering and fruiting stems; D, male flower at anthesis; E, female, flower at anthesis. A-C from Lorence 4185; D from Lorence 4065; E from Lorence 4063. Bar equals 4 cm in A, 1 cm in B, and 5 mm in C.

similar to male, 3-12-flowered; pistillate flower at anthesis like male but smaller, 3-5 mm diam., the velum with (4-)5-7 lobes, the styles 5-8, strongly papillose, scarcely exerted from the raised annulus; pedicel 1.5-3.0 mm long. Fruit subglobose, red when fresh, drying ca. 8-10 mm diam., the surface pubescent.

Distribution: *Siparuna scandens* is known only from Oaxaca, Mexico, where it occurs on the lower northern slopes of the Sierra de Juárez near Vista Hermosa and La Esperanza, and from SW Oaxaca near the Chiapas border.

Specimens examined: MEXICO. Oaxaca: District of Ixtlán, Sierra de Juárez, Route 175, ca. 5 km N of Vista Hermosa, 14 Apr. 1982, *Lorence & Torres 4008* (MEXU); *ibid.*, ca. 4 km N of Vista Hermosa, 17 Apr. 1982, *Lorence & Cedillo T. 4065* (MEXU); *ibid.*, ca. 4 km NE of La Esperanza, 28 May 1983, *Lorence & Cedillo T. 4185* (MEXU); Mpio. of Sta. María Chimalapa 10 km SE of Las Juntas, near Chiapas border, 1,000 m, *Wendt, Villalobos & Navarre 4150* (CHAPA, MEXU).

Habitat: In the Sierra de Juárez it occurs in montane cloud forest with Lauraceae, *Hedyosmum*, *Brunellia*, *Liquidambar*, *Rheedia*, etc., at 1,200-1,450 m elevation, altitudes above which *S. andina* grows in this region. In SW Oaxaca it was collected at 1,000 m in montane forest with *Pinus*, *Carpinus*, *Ficus*, *Inga* and *Liquidambar*.

Among the Mexican species, *Siparuna scandens* is closest to *S. austromexicana* which differs in being a shrub or small tree with leaves having subentire to sinuate-dentate margins with rounded or obtuse teeth and some simple hairs in addition to the stellate and multangulate trichomes. *Wendt et al. 4150* is atypical in having a few simple leaf trichomes and somewhat more exerted styles, but otherwise corresponds with *S. scandens*. Both *S. andina* and *S. riparia* may be distinguished by their much sparser, non-contiguous leaf trichomes and glabrate to scurfy or villous stems, whereas *S. tonduziana* differs in having much more coarsely and irregularly dentate leaves and much longer trichomes comprised mainly of simple hairs.

5. *Siparuna tonduziana* Perk., Bot. Jahrb. Syst. 31: 746. 1902; Perk., Pflanzenr. 4(101), Nachtr.: 51. 1911. Type: COSTA RICA, San José, Las Vueltas Tucurrique, 635 m, *A. Tonduz 12766* (holotype, B, probably destroyed; isotypes, P, 2 collections; photographs BEXU).

Shrubs or small trees 2-3 m tall, the new growth yellowish-brown pilose-velutinous with spreading simple or rarely multangulate trichomes 1-1.5(-3) mm long, the mature leafy stems terete, 4-5 mm diam., spreading-pilose. Leaves opposite, petiolate, those of a pair subequal; petioles of a pair subequal, 12-32 x 1.5-2 mm, spreading pilose; lamina chartaceous, broadly elliptic to broadly obovate-elliptic, occasionally \pm falcate, 140-270 x 85-110 mm, the base obtuse, rounded or shallowly cordate, the sides often unequal, the apex acute or shortly acuminate, the acumen 10-20 mm long, rarely obtuse, drying brownish-green, discolorous, both surfaces persistently spreading pilose, the trichomes mostly contiguous, denser along the costa and margins, simple, rarely multangulate with 2-4 erect rays, 1-1.5(-2) mm long, the secondary veins 10-11 pairs, making a 50-65° angle with

the costa, the venation visible to 3° adaxially and to 4° abaxially, the margin prominently dentate, the teeth acute, unequal, 1-4 mm long, the margin ciliate. Cymes axillary or on leafless nodes, usually shorter than the petioles, 10-15 mm long, solitary or in groups of 2-4, the axes and flowers yellowish-brown pilose-velutinous. Staminate cymes 3-15-flowered, the main axes 4-10 mm long, simple or forked; staminate flower at anthesis 1.5-2 mm long x 2.5-4 mm diam., the glabrous velum yellowish or pinkish when fresh, raised to the annulus, the margin 6-7-lobed or undulate, the lobes obtuse or rounded, \pm apiculate; stamens 4-6, flattened, the anther ellipsoid, exerted for ca. 0.5 mm; pedicels slender, 3-5 mm long. Pistillate cymes shorter, solitary or paired, 3-5-flowered, the main axes 2-5 mm long, usually simple; pistillate flower at anthesis 2.5-4 mm long and 2.5-4 mm diam., the glabrous velum pinkish or yellowish when fresh, with 6-7 obtuse or rounded, \pm apiculate lobes, raised to the central annulus; styles 7-10, scarcely papillose, exerted for 0.6-0.8 mm; pedicels 2-4 mm long. Fruiting receptacle subglobose, when fresh pinkish-red, drying to 10-15 mm diam., the surface sparsely pilose.

Distribution: Mexico (Veracruz), Guatemala, Costa Rica and Panama.

Specimens examined: MEXICO. Veracruz; Mpio. of Jesús Carranza, S of Poblado 2, alt. 250 m, 17°12' N Lat., 94°39' W Long., 30 May 1983, *Wendt, Villalobos C. & Navarrete 4173* (CHAPA, MEXU).

Habitat: In Mexico, *Siparuna tonduziana* is known only from lowland rain forest with *Byrsonima*, *Clethra*, *Dialium*, *Elaeagia*, *Eschweilera*, *Licania*, *Ormosia*, *Pouteria*, etc., at 250 m altitud. Elsewhere in Mesoamerica it occurs along the Atlantic slopes from near sea level to ca. 1,900 m altitude.

Wendt et al. 4173 represents the first record of the species from Mexico known to me. The Uxpanapa River zone lies at the northernmost limits of Mesoamerica and Dr. Tom Wendt's collections from there are yielding a number of range extensions for taxa previously known from Central America or Chiapas, in addition to various new taxa.

Its coarsely dentate leaf margins with alternately large (to 4 mm) and small teeth, and dense golden brown pubescence of predominantly simple hairs 1-1.5(-3) mm long readily set *Siparuna tonduziana* apart from the other four species in Mexico.

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