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Four New Species of *Cyphomandra* (Solanaceae) from South America

LYNN BOHS

Pringle Herbarium, Marsh Life Science Building,
University of Vermont, Burlington, Vermont 05405-0086

ABSTRACT. Four new species in the Neotropical genus *Cyphomandra* are described and illustrated. **Cyphomandra pilosa** and **C. foetida** are found on the eastern slopes of the Andes from Colombia to Peru. **Cyphomandra oblongifolia** is a morphologically variable species of Suriname and the Amazon basin. **Cyphomandra sibundoyensis** is known only from a small area in southern Colombia.

Cyphomandra is a Neotropical genus of about 50 species ranging from Mexico to northern Argentina and southeastern Brazil. Most are small, fast-growing trees that occupy secondary sites or colonize gaps in the primary forest. *Cyphomandra* is generally thought to be most closely related to *Solanum*, both genera having anthers that dehisce by terminal pores. It differs from *Solanum* in that the anther connectives are conspicuously swollen on the abaxial and often also on the adaxial side. In addition, *Cyphomandra* can be recognized by its distinctive pattern of growth in which three main plagiotropic branches arise from the top of a single trunk, forming a spreading crown. All the flowers and fruits are borne on the plagiotropic branches in a sympodial arrangement, with a terminal inflorescence ending each sympodial unit. The leaves of the crown are arranged in a characteristic pattern in which at least some of them occur as anisophyllous pairs. The leaves of the trunk may differ considerably from those of the crown in size and shape. Most species have simple and elliptic or ovate leaves with cordate bases, but they may also be imparipinnate, pinnatifid, or variously lobed. Leaf blade measurements are taken from the apex to the petiole. In leaves with cordate bases, the length of the basal lobes is measured parallel to the midrib from the lowest point of the lobe to the distal end of the petiole.

Pubescence is an important taxonomic character in the Solanaceae. Most species of *Cyphomandra* have an indumentum composed predominantly of multicellular glands and gland-tipped and eglandular uniseriate finger hairs (see scheme of Seithe 1979). In addition, epidermal cells containing crystal sand are often present and have the appearance of small pale dots, or punctae, on the surface of the stems and inflorescence axes, and frequently also on the leaves and calyces (see Metcalfe 1983 for a more detailed description). Although the seeds of many species appear to bear trichomes, these apparent hairs represent the remnants of thickenings in the anticlinal walls of the outer epidermal cells of the testa. These structures, termed "pseudohairs" in the following descriptions, have been noted in other genera of the Solanaceae such as *Lycopersicon* and *Solanum* and have been described in detail by Edmonds (1983) for *Solanum* section *Solanum*.

The flowers of *Cyphomandra* are actinomorphic, pentamerous, and generally green, white, or purple. The corollas lack interpetalar tissue and are described as urceolate, campanulate, or stellate, depending on the depth of the division of the corolla. All species develop rather large, fleshy berries, some of which are edible by virtue of their sweet, juicy pulp.

Until recently, the taxonomy of this genus was in a state of complete disarray, having been virtually ignored since Dunal's treatment in DeCandolle's Prodromus (Dunal 1852). Recent monographic studies (Bohs 1986) have identified four new species in the genus, which are described here. A detailed treatment of the entire genus is currently underway.

Cyphomandra pilosa Bohs, sp. nov. (fig. 1).—TYPE: Peru, Dept. San Martín, Prov. Mariscal Cáceres, region of Tocache Nuevo, Cerro de Palo Blanco, near the bridge over the Río Tocache, side of path in virgin forest, 600–800 m, 27 Apr 1983, *Bohs & Schunke 2169* (holotype: GH!; isotypes: COL!, F!, G!, K!, MO!, NY!, S!, US!, USM!).

Ab aliis speciebus Cyphomandrae axibus foliisque pilosis, foliis elliptico-ovatis vel ellip-

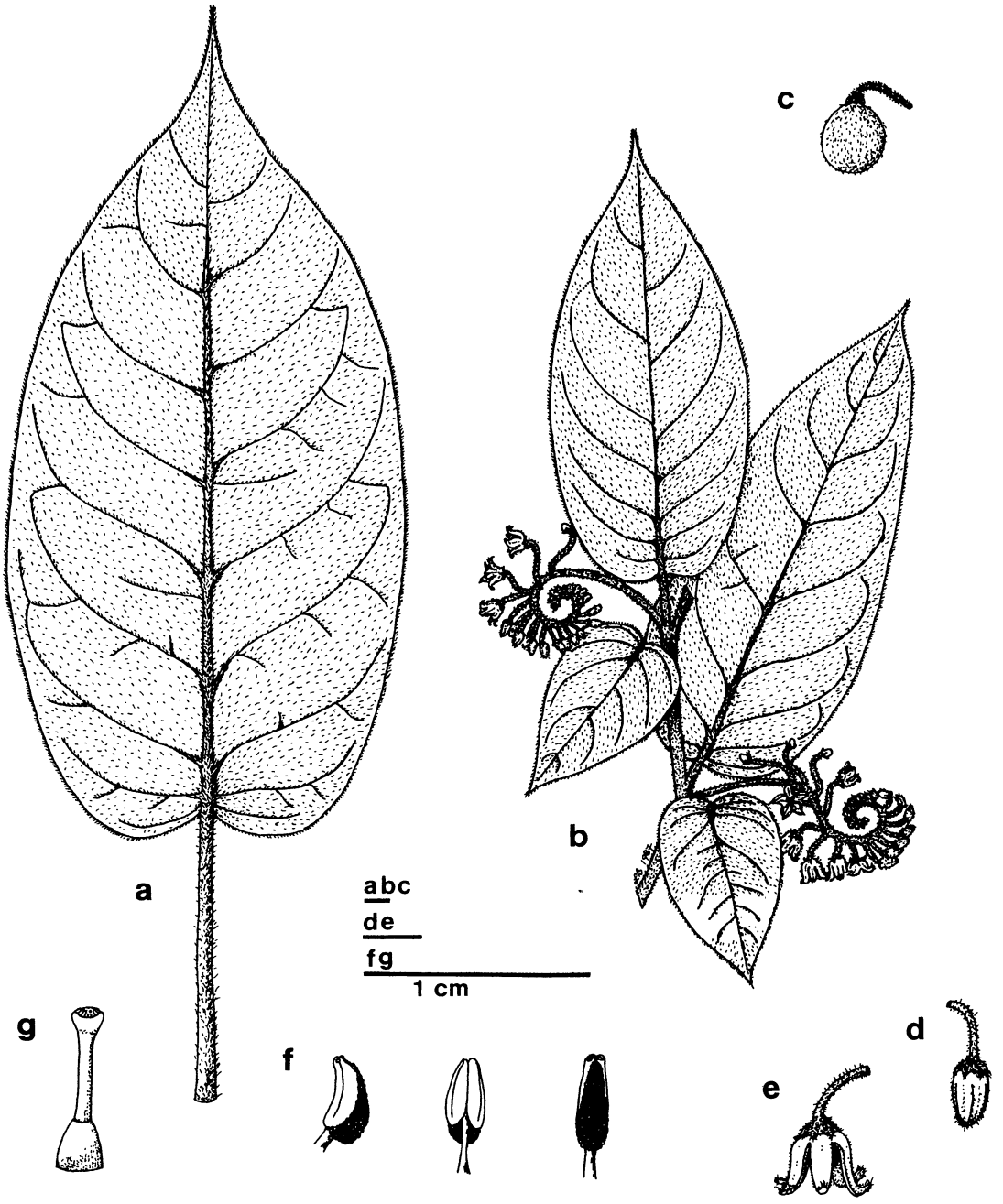

FIG. 1. *Cyphomandra pilosa*. a. Trunk leaf. b. Crown leaves and inflorescences. c. Fruit. d. Bud. e. Opened flower. f. Stamens (left to right: side, adaxial, abaxial view). g. Gynoecium. (Based on: a, b, d–g—*Bohs & Schunke 2169*; c—*Shemluck 319*.)

tico-oblongis, basi truncatis vel leviter cordatis et fructibus pilosis, ellipsoideis vel globosis, apicibus obtusis differt.

Small **tree** 1–5 m tall. **Branches** succulent, densely pubescent-pilose with glandular and eglandular hairs up to 3 mm long, sparsely punctate. **Leaf blades** simple, entire, unlobed, chartaceous to rather fleshy, abruptly short-acuminate at apex, moderately glandular- and eglandular-pubescent and eglandular-pilose adaxially with hairs 1–3 mm long, more so on veins, densely pubescent-pilose abaxially with more slender hairs; major veins ca. 7–9 on each side, the midrib and lateral veins prominent adaxially, more so abaxially; petioles densely pilose. **Trunk leaves** with blade elliptic-ovate, 22–40 cm long, 11–20 cm wide, length : width ratio (1.5)2:1, the base truncate to cordate with basal lobes (0.5)1–2(3) cm long; petioles 4–12 cm long. **Crown leaves** 3 per sympodial unit, the blade elliptic-ovate to elliptic-oblong, 4–30 cm long, 2.5–12 cm wide, length : width ratio 1–3(4):1, the base rounded to truncate or shallowly cordate; petioles 1–4 cm long. **Inflorescence** a simple or rarely forked scorpioid cyme, 15–35(50)-flowered, 3–18 cm long; peduncle 1–6 cm long; rachis 1.5–12 cm long; pedicels 10–20(25) mm long, in fruit 20–30 mm long, spaced 1–5 mm apart, articulated near the base, leaving pedicellar remnants less than 1 mm long. Peduncle, rachis, and pedicels densely pubescent-pilose with glandular and eglandular hairs. **Flower buds** ovate, acute at apex. **Calyx** fleshy, moderately pilose, 2–3 mm high, the lobes deltate, apiculate, 1–2 mm long, 1.5-2 mm wide, ciliate at apex and margin. **Corolla** white to yellow-green or purplish abaxially, greenish-brown, violet, or black adaxially, coriaceous or fleshy, campanulate, 20 mm in diameter, 8–16 mm high, the tube 1.5–2.5 mm long, the lobes 7–15 mm long, 2–4 mm wide, narrowly triangular, nearly glabrous to moderately pilose abaxially, papillose to glabrous adaxially, the margin tomentose, the apex acute, reflexed, cucullate. **Stamens** abaxially convex and curving outwards at tips, 4–5 mm long; anther thecae 3 mm long, 1 mm wide, white, lanceolate, the pores directed upward and somewhat laterally; connective 3–4 mm long, 1 mm wide, yellow, narrowly triangular, abaxially equal to thecae at apex, exceeding them by 1 mm at base, adaxially present nearly the whole length of thecae as a linear-triangular structure 3 mm long, 0.3–0.5 mm wide, or occasionally absent. **Ovary** glabrous or finely pubescent; style cylindrical or clavate, 4–5 mm long, 1 mm in diameter, exserted 2 mm beyond stamens, slightly dilated apically; stigma truncate or capitate, 1–1.5 mm in diameter. **Fruit** ellipsoidal or globose, obtuse at apex, 2.5–5 cm long, 1.5–2.5 cm in diameter, moderately to densely pilose with short glandular and eglandular hairs, green when immature with darker green stripes; presence of stone cell aggregates unknown; seeds ca. 3–4 mm long, 3.5–4 mm wide, densely pubescent with pseudohairs.

Distribution. In clearings and along paths in virgin forest, 150–1800 m in elevation, eastern slope of the Andes from southern Colombia to Ecuador and Peru (fig. 5).

Vernacular names and uses. Irvine (on collection no. 149 at F) indicates that this plant is called "manga caspi" ("pot tree") and "asua manga cushnichina yura" ("chicha-pot-smoking tree") by the lowland Quichua on the Río Payamino in the province of Napo, Ecuador. The leaves are used by the people of this region to smoke clay pots used for storing chicha. Shemluck (on collection no. 319 in ECON) states that this species is known as "pungi huanduj" in the village of Canelos on the Bobonaza River in the province of Pastaza, Ecuador and that a leaf poultice of this species is used for muscle cramps. José Schunke has indicated (pers. comm.) that this species is called "chupo sacha macho" by the inhabitants of eastern Peru around Tocache Nuevo in the Department of San Martín.

Additional specimens examined. COLOMBIA. **Caqueta:** Quebrada del Río Hacha, Cajón de Pulido, 26 Mar 1940, *Cuatrecasas 8751* (F); Morelia, 11 Oct 1941, *von Sneidern A1121* (S). **Putumayo:** Río San Miguel, en el afluente izquierda Quebrada de la Hormiga, 15 Dec 1940, *Cuatrecasas 11085* (F, US); Umbría, 0°54'N, 76°10'W, Dec 1930, *Klug 1857* (BM, F, GH, MO, NY, S, US).

ECUADOR. **Morona-Santiago:** Puerto Santana, ca. 5–6 km from Shell-Mera, 16 Sep 1968, *Lugo 454* (GB, MO); Macuma, ca. 50 km NE of Macas, 21 Mar 1973, *Lugo 3613* (GB, MO); Tunantza, ca. 50 km NE of Macas, 25 Mar 1973, *Lugo 3727* (GB, MO); Macuma, path to Tunantza, 18 Dec 1976, *McElroy 94* (BH). **Napo:** Ca. 2 km W of Muyuna, ca. 5.7 km W of Tena, ca. 0°01'S, 77°51'W, 1 May 1984, *Croat 58835* (GH); roadside above Tena, 10 Jan 1981, *D'Arcy 14047* (MO); 43–47 km S of Coca, end of Auca oil field near Río Tiputini, 5 Nov

1974, *Gentry 12517* (GH); road Coca-Auca oilfields, 3 km along the road to Yucca, 76°55'W, 0°28'S, 20 Aug 1979, *Holm-Nielsen et al. 19625* (AAU); San José de Payamino, 40 km W of Coca, 0°30'S, 77°20'W, 29 Sep 1982, *Irvine 149* (F); 16 Dec 1983, *Irvine 435* (F, GH); Río Hollín, ca. 10 km E of Archidona, 16 May 1972, *Lugo 2313* (GB, MO); Cotundo, ca. 15 km N of Tena, 18 May 1972, *Lugo 2327* (GB, MO); Lago Agrio, 4 Feb 1973, *Lugo 3104* (GB, MO). **Pastaza:** Curaray (Jesús Pitishka), 18 Mar 1980, *Harling & Andersson 17372* (GB, MO); Canelos, 7 Mar 1971, *Lugo 1548* (GB, MO); Río Pacayacú, vicinity of Canelos, 10 Mar 1971, *Lugo 1577* (GB, MO); Montalvo, Río Bobonaza, 26 Dec 1976, *McElroy 197* (BH); Canelos, 24 Jul 1980, *Shemluck 319* (ECON); vicinity of Puyo, Aug 1939, *Skutch 4401* (A, F, NY, US). **Zamora-Chinchipe:** Road Zamora-Zumba (along Río Jamboe), ca. km 30, S of Finca Cruz-Kaya, 22 Apr 1974, *Harling & Andersson 13858* (GB, MO).

PERU. **San Martín:** Prov. Mariscal Cáceres, region of Tocache Nuevo, Palo Blanco, 29 Jun 1978, *Plowman & Schunke 7458* (F); Dist. Tocache Nuevo, Quebrada de Cañuto, cerca a la Chacra de Lizardo Aliaga, 7 May 1979, *Schunke 10940* (MO).

Within the genus, *Cyphomandra pilosa* most closely resembles *C. foetida* Bohs. These two species differ from all other taxa of *Cyphomandra* by being copiously pubescent with numerous long hairs (up to 3–4 mm long) on the axes, leaves, flowers, and fruits and by having unlobed trunk leaves. *Cyphomandra pilosa* can be distinguished from *C. foetida* by its longer and narrower leaves, very short pedicel remnants, campanulate corollas, shorter anthers, and ellipsoidal or globose fruits with obtuse apices.

Cyphomandra pilosa is most frequently found in eastern Ecuador, but a more southern population is known from the region of Tocache Nuevo in eastern Peru. This apparent disjunction is probably the result of insufficient collecting in the intervening rain forest areas. The Peruvian collections lack the adaxial staminal connective typical of the populations from Ecuador.

The epithet *pilosa* calls attention to the abundant long hairs so obvious in this species.

Cyphomandra foetida Bohs, sp. nov. (fig. 2).—TYPE: Peru, Dept. Huánuco, Prov. Pachitea, Dist. Honoria, Bosque Nacional de Iparia, región de "bosque seco tropical" a lo largo del Río Pachitea cerca del campamento Miel de Abeja (1 km arriba del pueblo de Tournevista o unos 20 km arriba de la confluencia con el Río Ucayali), en sitios abiertos, 300–400 m, 18 Oct 1966, *Schunke 1159* (holotype: F!; isotypes: G!, MO!, NY!, US!).

Ab aliis speciebus Cyphomandrae axibus foliisque pilosis, foliis ovatis vel elliptico-ovatis, basi truncatis vel cordatis, lobis saepe superpositis et fructibus pilosis, ellipsoideis vel fusiformibus, apicibus acutis differt.

Small **tree** 2–7 m tall. **Branches** succulent, moderately to densely pubescent with glandular and eglandular hairs and moderately pilose-hirsute with shining hairs up to 4 mm long, finely punctate. **Leaf blades** simple, entire, unlobed, chartaceous, acuminate at apex, moderately to densely pilose-villous adaxially with white curled hairs, some gland-tipped, more densely so on veins, more densely pubescent-pilose abaxially with glandular and eglandular hairs; major veins 7–8 on each side, the midrib and lateral veins prominent adaxially, more so abaxially; petioles densely pubescent-pilose. **Trunk leaves** with blade ovate-elliptic, 20–23 cm long, 12–15 cm wide, length : width ratio ca. 1.5:1, the base cordate with basal lobes 0.5–1.5 cm long; petioles 8–12 cm long. **Crown leaves** 3–4 per sympodial unit, the blade ovate to elliptic-ovate, 4–22 cm long, 3–12 cm wide, length : width ratio 1–2:1, the base truncate to cordate, sometimes oblique, with basal lobes 0.3–2 cm long; petioles 1.5–9 cm long. **Inflorescence** a simple or forked scorpioid cyme, 20–50-flowered, 3–7(13) cm long; peduncle 0.5–1.5 cm long; rachises 3–6(11) cm long; pedicels 10–20 mm long, in fruit 25–40 mm long, spaced 0.5–4 mm apart, articulated near the base, leaving pedicellar remnants up to 1(2) mm long. Peduncle, rachises, and pedicels pubescent-pilose with glandular and eglandular hairs. **Flower buds** ovate, acute-acuminate at apex. **Calyx** chartaceous, densely pilose and glandular, 2–3 mm high, the lobes deltate, acuminate, 1.5–2 mm long, 1.5–2.5 mm wide, ciliate at apex and margin. **Corolla** green to yellow-green, chartaceous to membranaceous, stellate, 20 mm in diameter, 8–12 mm high, the tube 1–2 mm long, the lobes 7–10 mm long, 2–3 mm wide, narrowly triangular, moderately glandular-tomentose and eglandular-villous abaxially, glabrate to sparsely pubescent adaxially especially on midrib and toward apex, the margin tomentose, the apex acute-acuminate, reflexed. **Stamens** abaxially convex, 4.5–5 mm long; anther thecae 4–5 mm

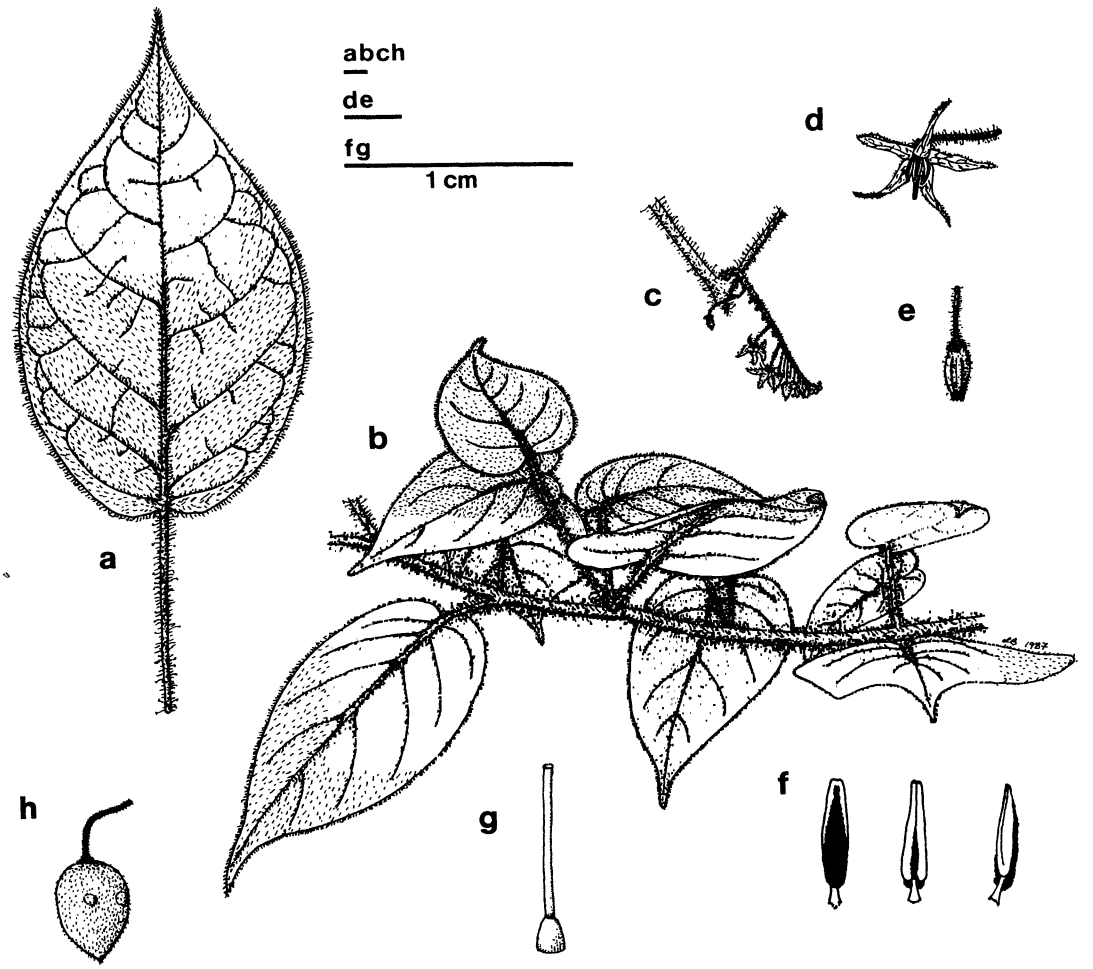

FIG. 2. *Cyphomandra foetida.* a. Trunk leaf. b. Crown leaves. c. Inflorescence. d. Opened flower. e. Bud. f. Stamens (left to right: abaxial, adaxial, side view). g. Gynoecium. h. Fruit. (Based on: a—*Schunke 4235*; b—*Bohs & Schunke 2164*; c–g—*Schunke 1159*; h—*Albuquerque et al. 1384.*)

long, 1–1.5 mm wide, white or light yellow, lanceolate, the pores introrse and directed upward; connective 4.5–5 long, 0.5–1 mm wide, narrowly triangular, abaxially equal to or slightly shorter than thecae at apex, exceeding them by 0.5 mm at base, adaxially present at base as a linear-triangular structure 1.5–3 mm long and 0.5 mm wide. **Ovary** glabrous to densely glandular; style filiform, 5–8 mm long, 0.3–0.5 mm in diameter, exserted 2–4 mm beyond stamens, not dilated apically; stigma truncate or capitate, 0.3–0.5 mm in diameter. **Fruit** ellipsoidal or fusiform, acute at apex, 2.5–7.5 cm long, 1–3 cm in diameter, densely glandular- and eglandular-pilose, green when immature with green or greyish longitudinal stripes; mesocarp with smooth round or oval stone cell aggregates; seeds 4–5 mm long, 3–3.5 mm wide, puberulent with pseudohairs around margin.

Distribution. Open or disturbed places in rain forest, 200–700 m in elevation, eastern slope of Andes in Peru and adjacent Amazonian Brazil (fig. 5).

Vernacular names. This species is known as "pepinillo chuposacha" (*Schunke 14032*), "asnapanga" (*Schunke 4235*), and "millua chuposacha" (*Schunke 7957*) in the Department of San

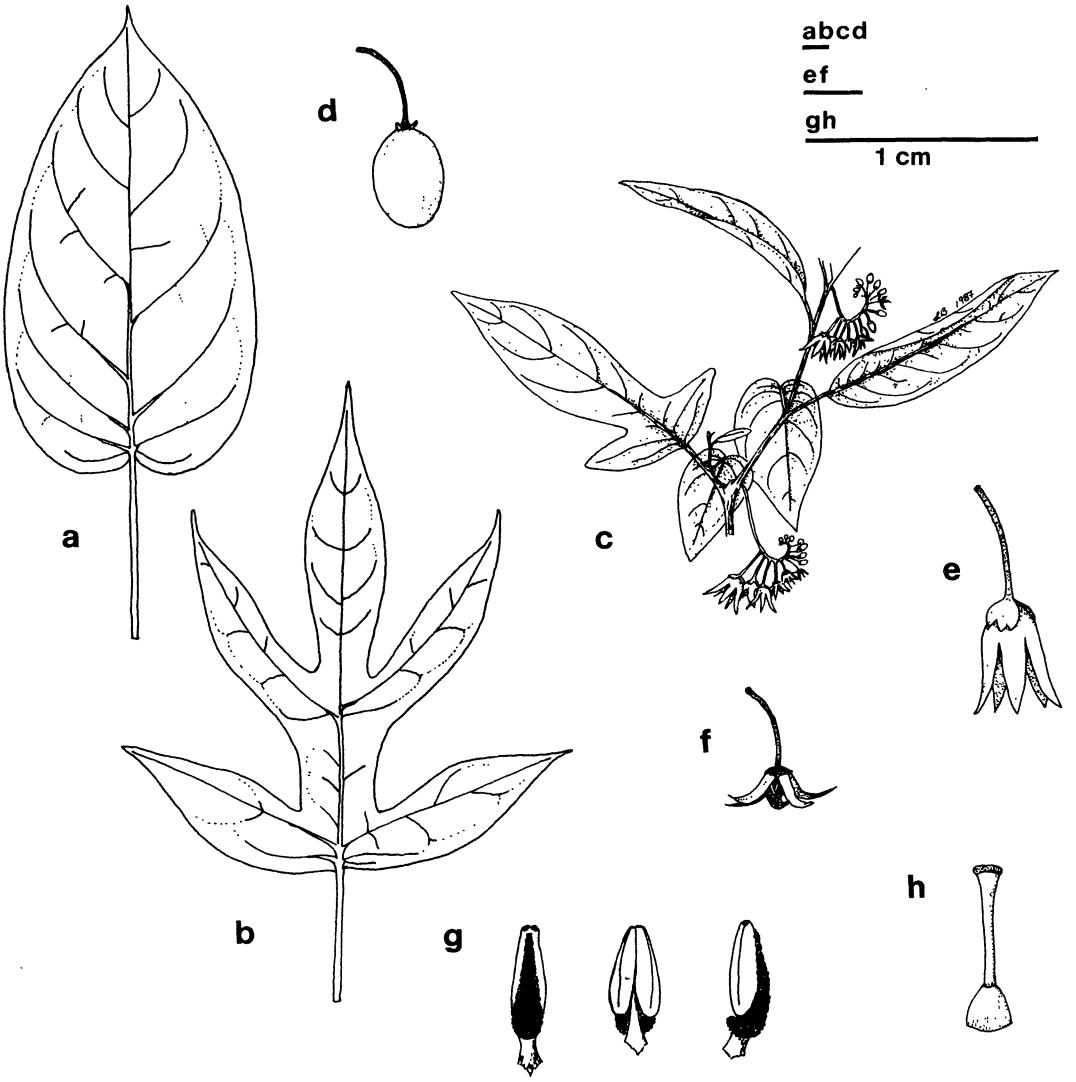

FIG. 3. *Cyphomandra oblongifolia.* a, b. Trunk leaves. c. Crown leaves and inflorescences. d. Fruit. e. Opened flower (campanulate form). f. Opened flower (small-flowered form). g. Stamens (left to right: abaxial, adaxial, side view). h. Gynoecium. (Based on: a—*Krukoff 5461*; b—*Schmidt 18*; c, e, g, h—*Maas 416*; d—*Silva 116*; f—*Prance et al. 2352.*)

Martín and as "siuca sacha" (*McDaniel et al. 2568*) in the Department of Loreto, Peru.

Additional specimens examined. PERU. **Loreto:** Prov. Ucayali, Contamana, road to Oriente, 28 Jul 1970, *McDaniel et al. 2568* (US). **San Martín:** Prov. Mariscal Cáceres, Dist. Tocache Nuevo, Pueblo Mantención, property of Hernán Ortíz, about 10 km S of Tocache Nuevo, 26 Apr 1983, *Bohs & Schunke 2164* (GH, USM); Dist. Tocache Nuevo, Fundo Porvenir, 3 Sep 1970, *Schunke 4325* (F, G, GH, MO, NY, US); Dist. Tocache Nuevo, Cañutillo, NW de la carretera marginal, a 28 km de Tocache, 6 Jul 1974, *Schunke 7175* (GH); Dist. Uchiza, Caserío Nueva Unión abajo de Puerto Huicte, 1 Aug 1974, *Schunke 7957* (GH); Dist. Tocache Nuevo, Quebrada de Mantención, cerca al Fundo del Sr. Hernán Ortíz Gonzáles, 29 Aug 1983, *Schunke 14032* (F, GH, MO, USM).

BRAZIL. **Acre:** Rio Branco-Porto Velho Highway, km 22, 14 Feb 1979, *Albuquerque et al. 1384* (MO); es-

trada Rio Branco-Porto Acre, km 39, 13 Oct 1980, *Cid 2894* (GH).

Like *C. pilosa*, this species is densely pubescent on all vegetative parts. The fruits are also covered with long hairs. *Cyphomandra foetida* may be distinguished from *C. pilosa* by the shorter and broader leaves, the longer pedicellar remnants, the longer anthers, and the more elongated and pointed fruits.

This species has been found only in the tropical forests of eastern Peru and Amazonian Brazil. Additional localities are to be expected along the eastern slope of the Andes to the north into Ecuador and possibly Colombia and perhaps down into the Amazon basin.

An unusual feature of sterile plants observed in the field near Tocache, Peru, was the pairing of large cordate leaves on the plagiotropic branches with smaller leaves whose petioles were erect and perpendicular to the branch. All leaf blades were displayed horizontally (parallel with the ground). Young shoots of this species are colored a striking chocolate-brown.

The epithet *foetida* connotes the foul odor of the plant, as observed by collectors. A similar odor characterizes many species of *Cyphomandra* and is probably due to aromatic compounds secreted by the abundant glandular hairs present on the vegetative parts of the plants.

Cyphomandra oblongifolia Bohs, sp. nov. (fig. 3).—TYPE: Brazil, Rondônia, Rondônia, secondary vegetation, 20 Aug 1971, *Maas 416* (holotype: NY!; isotypes: F!, K!, MO!, P!, U!, WIS!).

Ab aliis speciebus Cyphomandrae caulibus foliisque fere glabris, foliis oblongis vel elliptico-oblongis, inflorescentiis brevibus, simplicibus, pedicellis delapsis vestigiis manifestis relinquens, corollis campanulatis, antheris stylisque brevibus, differt.

Small **tree** 2–8 m tall. **Branches** slender, glabrous or glandular-puberulent, sometimes sparsely eglandular-pilose with hairs 1–3 mm long, abundantly punctate. **Leaf blades** simple, entire, lobed or unlobed, subcoriaceous, acute to acuminate at apex, glabrous or occasionally sparsely pilose adaxially, glandular-puberulent on veins, glabrous abaxially; major veins 5–7 on each side, the midrib and lateral veins prominent abaxially, less so adaxially; petioles glabrous or sparsely pilose. **Trunk leaves** unlobed or 3–7 lobed; if unlobed, the blade elliptic or oblong, 15–25 cm long, 8–10 cm wide, length: width ratio 2–2.5:1, the base truncate to shallowly cordate; if lobed, the blade 14–20 cm long, 12–22 cm wide, the terminal lobe elliptic, the upper lateral lobes ascending, the lower lobes spreading, the sinuses acute, reaching ½ to ⅘ to midrib, the base truncate; petioles 3–8 cm long. **Crown leaves** 4 per sympodial unit, unlobed or 2–3-lobed; if unlobed, the blade elliptic-oblong or ovate, 4–20 cm long, 2.5–8 cm wide, length: width ratio 1.5–2.5:1, the base rounded to truncate or cordate with basal lobes 1–1.5 cm long; if lobed, the blade 12–16 cm long, 5.5–13 cm wide, the terminal lobe elliptic, the lateral lobes spreading, the sinuses acute, reaching ½ to ¾ to midrib, the base rounded to truncate; petioles 1–5 cm long. **Inflorescence** a simple or rarely forked scorpioid cyme, 15–35-flowered, 3–10 cm long; peduncle 1–4 cm long; rachis 2–7 cm long; pedicels 10–25 mm long, in fruit 20–30 mm long, spaced 1–5 mm apart, articulated near the base and leaving pedicellar remnants 1–2 mm long. Peduncle, rachis, and pedicels glabrous or glandular-puberulent, occasionally sparsely pilose. **Flower buds** ovate, acute at apex. **Calyx** somewhat fleshy, punctate and glandular-puberulent or glabrate, (1)3–6 mm high, the lobes rounded to truncate, apiculate, often unequal, (0.5)2–3 mm long, (1)2–2.5 mm wide. **Corolla** white, green, or purplish, fleshy, campanulate (to stellate), ca. (15)30 mm in diameter, (8)15–20 mm high, the tube (1)3–6 mm long, the lobes (5)10–17 mm long, 2–4 mm wide, triangular, glabrous abaxially and adaxially, the margin tomentose, the apex acute, reflexed, slightly cucullate. **Stamens** abaxially convex, curved outwards at tip, 5–6 mm long; anther thecae 3.5–5 mm long, 1–1.5 mm wide, yellow or white, lanceolate, the pores directed upward; connective 3.5–5 mm long, 1 mm wide, purple, narrowly triangular, abaxially slightly shorter than thecae at apex, exceeding them by 0.5–1 mm at base, adaxially not present. **Ovary** glabrous; style filiform, 4–5 mm long, 0.3–0.5 mm in diameter, exserted (0)1–3 mm beyond stamens, not or slightly dilated apically; stigma truncate, 0.3–0.5(1) mm in diameter. **Fruit** ellipsoidal to globose, obtuse at apex, 3–5 cm long, 2–5 cm in diameter, glabrous, the color when ripe unknown; mesocarp with stone cell aggregates;

seeds 4–7 mm long, 3–5 mm wide, glabrous and rugose or pubescent with submarginal pseudohairs.

Distribution. In clearings or along streams in tropical rain forest, on varzea or terra firme, 0–200 m in elevation, tributaries of Amazon in Peru, Bolivia, and Brazil; also in Suriname and probably the other Guianas (fig. 5).

Vernacular names and uses. Boom (on collection no. 4054 in GH) indicates that this species is called "shía" by the Chácabo Indians of Bolivia and that a decoction of the leaves is drunk by them to cure liver problems.

Additional specimens examined. **Campanulate form:** PERU. **Loreto:** Prov. Maynas, Padre Isla, Río Amazonas, frente de Iquitos, 27 Feb 1978, *Díaz & Jaramillo 1* (MO); Moena Caño between Iquitos and Río Itaya, 7 Jan 1976, *A. Gentry et al. 15689* (GH). **Madre de Dios:** Parque Nacional de Manu, in forest near Cocha Cashu station, 11 Aug 1973, *Foster 2535* (MO); same locality, between Panagua and Tayakome, 17–24 Aug 1974, *Foster et al. 3455* (USM); vicinity of Cocha Cashu Station, 28 Oct 1976, *Foster & Terborgh 5167* (USM).

BRAZIL. **Acre:** Foz do Macauhan, 9°20'S, 69°W, 12 Aug 1933, *Krukoff 5461* (K, NY); 2–4 km W of Cruzeiro do Sul, 24 Oct 1966, *Prance et al. 2761* (F, K, NY, S, U, US, WIS); same locality, 3 Nov 1966, *Prance et al. 2984* (F, K, NY, S, U, US, WIS). **Amazonas:** Municipality Humayta, near Tres Casas, 14 Sep–11 Oct 1934, *Krukoff 6319* (A, B, BM, BR, F, G, K, MO, NY, S, U, US); Juruá, Marary, Sep 1900, *Ule 5204* (G, HBG, K, L). **Mato Grosso:** Ca. 2.5 km N of Xavantina, 14°38'S, 52°14'W, 13 Sep 1967, *Argent et al. 6378* (E, K, NY, U); vicinity of Chavantina, margin of Rio Mortes, 25 Sep 1964, *Prance et al. 59094* (C, F, G, K, MO, NY, S, U, US, WIS); Vale de Sonhos, ca. 80 km S of Xavantina (14°44'S, 52°20'W), 5 Sep 1967, *Ratter et al. 626* (NY); 8 km NE of the Base Camp (12°54'S, 51°52'W, ca. 270 km N of Xavantina), 25 Jun 1968, *Ratter et al. 1977* (E, K, NY, U); Rio Amolar, near source of Rio Paraguay, May 1927, *D. Smith 183* (K). **Mato Grosso do Sul:** Municipio de Camapuã, fazenda Pontal (Lagoão) M.S., 4 Nov 1979, *Silva 116* (US). **Rondônia:** Island in Rio Madeira opposite Jaciparaná, 27 Jun 1968, *Prance et al. 5277* (F, MO, NY, S, U, US, WIS).

BOLIVIA. **Beni:** Prov. Vaca Diez, vicinity of the Chácabo village Alto Ivon, 11°45'S, 66°02'W, 1 Dec 1983, *Boom 4054* (GH); same locality, 7 Apr 1984, *Boom 4978* (GH); Río Beni, Cachuela Esperanza, Oct 1924, *Meyer 237* (U). **Without Department:** Unter der Serrania Ricardo Franco, km 31, 4 Sep 1951, *Schmidt 18* (M).

Stellate form: SURINAME. Nickerie River, forest on levee 1 km W of post Utrecht at mouth of Cupido River, 14 May 1949, *Lanjouw & Lindemann 3239* (U); W of Coppename mouth, concession Haenen, 1 Mar 1954, *Lindemann 5535* (U); region Tumuc-Humac (frontier Brazil–French Guiana–Suriname), l'embocuchure de la crique Ouarémapan, 22 Jul 1972, *Sastre 1430* (MO); Lower Suriname River, 23 Aug 1913, *Soeprato 301* (U); Cupido rits, dist. Nickerie, 15 Nov 1975, *Teunissen (LBB) 15327* (U); Nanni kreek nabij Tomofo kreek, dist. Nickerie, 11 Nov 1975, *Teunissen (LBB) 15465* (U); in sylvis prope Abontjoeman, Sara kreek, fluv. Suriname, May 1910, *Coll. indigen 267* (U).

Small-flowered form: BRAZIL. **Amazonas:** Behind Santa Maria, W. bank of Rio Acre opposite Boca do Acre, 17 Sep 1966, *Prance et al. 2352* (F, K, NY, S, U, US, WIS); Rio Purus between Aiapuá and Moibanda, 22 Nov 1971, *Prance et al. 16289* (F, K, NY, S, U, US, WIS); Bom Fin, Rio Juruá, Oct 1900, *Ule 5205* (G, HBG, K, L).

Cyphomandra oblongifolia has many morphological features in common with the species of the *Cyphomandra hartwegii* alliance, which includes *C. hartwegii* (Miers) Walp., *C. endopogon* Bitter, *C. tobagensis* Sandw., and *C. sibundoyensis* Bohs. All these species have slender anthers and obvious stone cell aggregates in the fruits; all except *C. endopogon* have truncate stigmas that are not dilated at the apex of the style. The trunk leaves are often pinnately lobed in *C. oblongifolia*, *C. endopogon*, and *C. hartwegii*. Typical collections of *C. oblongifolia* can be distinguished from the other species in this alliance by the nearly glabrous, oblong or ellipitic-oblong leaves, the short simple inflorescences with obvious pedicellar remnants, the campanulate corollas, and short anthers and styles.

The collections from Suriname exhibit morphological features intermediate between *C. oblongifolia* and *C. hartwegii*. As in *C. hartwegii*, corollas are stellate with long lobes and a very short tube (2–3 mm). The calyx is also short, only 2–4 mm high. The slightly expanded stigma is about 1 mm in diameter, and the style is equal to the stamens; this type of gynoecium is not typical of either *C. oblongifolia* or *C. hartwegii*. Besides these floral features, the plants resemble *C. oblongifolia* in their narrow leaves and sparse indumentum, the short style, and the short anthers without an adaxial connective. These populations may be the result of hybridization between *C. oblongifolia* and *C. hartwegii*, which also occurs in Suriname.

Several collections from Amazonian Brazil differ in having stellate corollas with very short lobes (5–6 mm long) and tube (ca. 1 mm long)

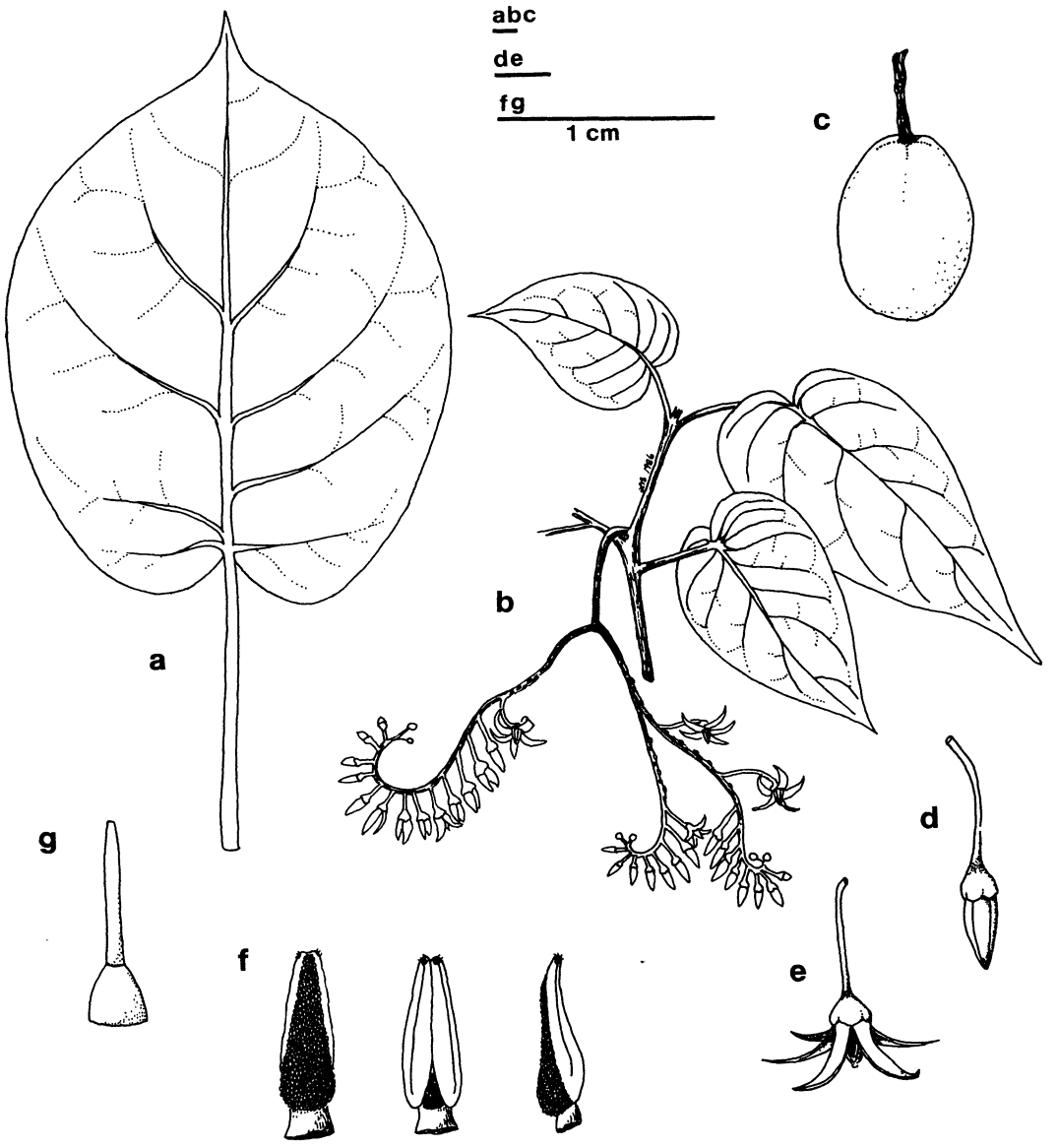

FIG. 4. *Cyphomandra sibundoyensis.* a. Trunk leaf. b. Crown leaves and inflorescence. c. Fruit. d. Bud. e. Opened flower. f. Stamens (left to right: abaxial, adaxial, side view). g. Gynoecium. (Based on: a, c–g—*Bohs & Juajibioy 2222*; b—*Bristol 1316.*)

and often nearly truncate calyces 1–2 mm high. They conform to typical members of this species in all other features.

The epithet *oblongifolia* refers to the characteristic oblong shape of the leaves that is one of the distinctive features of this species.

Cyphomandra sibundoyensis Bohs, sp. nov. (fig. 4).—TYPE: Colombia, Putumayo, Valley of Sibundoy, 2 km E of Sibundoy, finca of Gomercindo Rodríguez, planted here among agricultural crops, but said to grow wild in the surrounding mountains, "tree

4.5 m, corolla light purple mottled with dark violet, fruits large, yellowish, 9 × 7 cm, pulp and placenta cream-colored, bright pink around seeds; used formerly to dye black, blue, and yellow; fruits edible, more acid than *C. betacea*," 2200 m, 20 Aug 1983, *Bohs & Juajibioy 2222* (holotype: COL!; isotypes: CAUP!, F!, GH!, MO!).

Ab aliis speciebus Cyphomandrae caulibus glabris, foliis non lobatis, fere glabris, corollis stellatis violaceis, inflorescentiis ramosis, vestigiis pedicellorum rhachi fere complanis, fructibus luteis magnis, seminibus magnis differt.

Small **tree** 4–8 m tall. **Branches** succulent, glabrous or sparsely puberulent with glandular and eglandular hairs less than 0.5 mm long, punctate. **Leaf blades** simple, entire, unlobed, subcoriaceous, acuminate at apex, glabrous to sparsely eglandular-pilose and glandular-puberulent adaxially, glabrous to sparsely glandular-puberulent abaxially; major veins 5–7 on each side, the midrib and lateral veins prominent adaxially, more so abaxially; petioles glabrous or minutely papillose. **Trunk leaves** with blade ovate-elliptic, 20–37 cm long, 15–28 cm wide, length : width ratio ca. 1.5:1, the base cordate with basal lobes 3–4 cm long; petioles 10–22 cm long. **Crown leaves** 4 per sympodial unit, the blade ovate, 5–18 cm long, 4–13 cm wide, length : width ratio 1–2:1, the base cordate, sometimes oblique, with basal lobes 1–3.5 cm long; petioles 2–7.5 cm long. **Inflorescence** a branched scorpioid cyme, 40–100+-flowered, 8–20 cm long; peduncle 3–5 cm long; rachises 3–14 cm long; pedicels 15–25 mm long, in fruit 40 mm long, spaced 1–2(5) mm apart, articulated at the base and leaving pedicellar remnants 0.5–1 mm long. Peduncle, rachises, and pedicels glabrous or sparsely glandular-puberulent. **Flower buds** ovate-elliptic, acuminate at apex. **Calyx** fleshy, glabrous, 4–5 mm high, the lobes obtuse, minutely apiculate, 1–3 mm long, 3 mm wide, glabrous or sparsely ciliolate at apex. **Corolla** lavender or greenish-purple mottled with dark violet, coriaceous, stellate, 25–30 mm in diameter, 10–15 mm high, the tube 1–2 mm long, the lobes 8–14 mm long, 2.5–3 mm wide, narrowly triangular, glabrous abaxially, sparsely to moderately tomentose adaxially especially toward apex, the margin tomentose, the apex acute, reflexed. **Stamens** abaxially convex, 7–8 mm long; anther thecae 6–7 mm long, 2 mm wide, purple, lanceolate, the pores introrse and directed upward; connective 5–5.5 mm long, 1–1.5 mm wide, dark purple, narrowly triangular, abaxially slightly shorter than thecae at apex, equal to or slightly exceeding them at base, adaxially present. **Ovary** glabrous; style cylindrical, 6–7 mm long, 0.5–1 mm in diameter, slightly shorter than to exserted 1–2 mm beyond stamens, not dilated apically; stigma truncate, 0.5–1 mm in diameter. **Fruit** ellipsoidal, ovoid, or globose, obtuse at apex, 6–10 cm long, 5.5–7 cm in diameter, glabrous, yellow or orange when ripe; mesocarp with stone cell aggregates; seeds 6–9 mm long, 4–7 mm wide, densely pubescent with pseudohairs.

Distribution. Cloud forest, 1400–2300 m in elevation, endemic to Sibundoy, Colombia and surrounding areas (fig. 5).

Vernacular names and uses. The fruits are edible and have a sweet and pleasantly acidulous taste (*Bristol 1316; Bohs & Juajibioy 2222*). Pedro Juajibioy (pers. comm.) states that this species is known as "tomate salvaje" and "tomate silvestre" in the Valley of Sibundoy, Colombia, and that it was the source of a black, blue, or yellow dye. He also reports that the placenta of the fruit may be used as a cure for intestinal worms.

Additional specimens examined. COLOMBIA. **Huila:** Confluence of Ríos Villalobos and Cauchos, Jan 1943, *Schultes & Villarreal 5271* (ECON). **Putumayo:** Valle de Sibundoy, 5 km S of Sibundoy, 12 Jun 1963, *Bristol 1119* (ECON); 1 km S Balsayaco, 20 Aug 1963, *Bristol 1316* (ECON); Sibundoy, 29 May 1946, *Schultes & Villarreal 7650* (ECON, F, GH, K, US).

Cyphomandra sibundoyensis belongs to the C. *hartwegii* complex because of its slender anthers, truncate stigma, and fruits with stone cell aggregates. This species bears a close resemblance to *C. hartwegii* but the flowers are purplish instead of green and it does not have the lobed trunk leaves so often found in the latter species.

Cyphomandra sibundoyensis produces some of the largest fruits known in the genus. The fruit pulp is sweet, juicy, and pleasant-tasting, and the seeds are surrounded by an attractive purplish layer. Despite the stone cell aggregates and large seeds, this species may be an excellent candidate for development as a fruit crop.

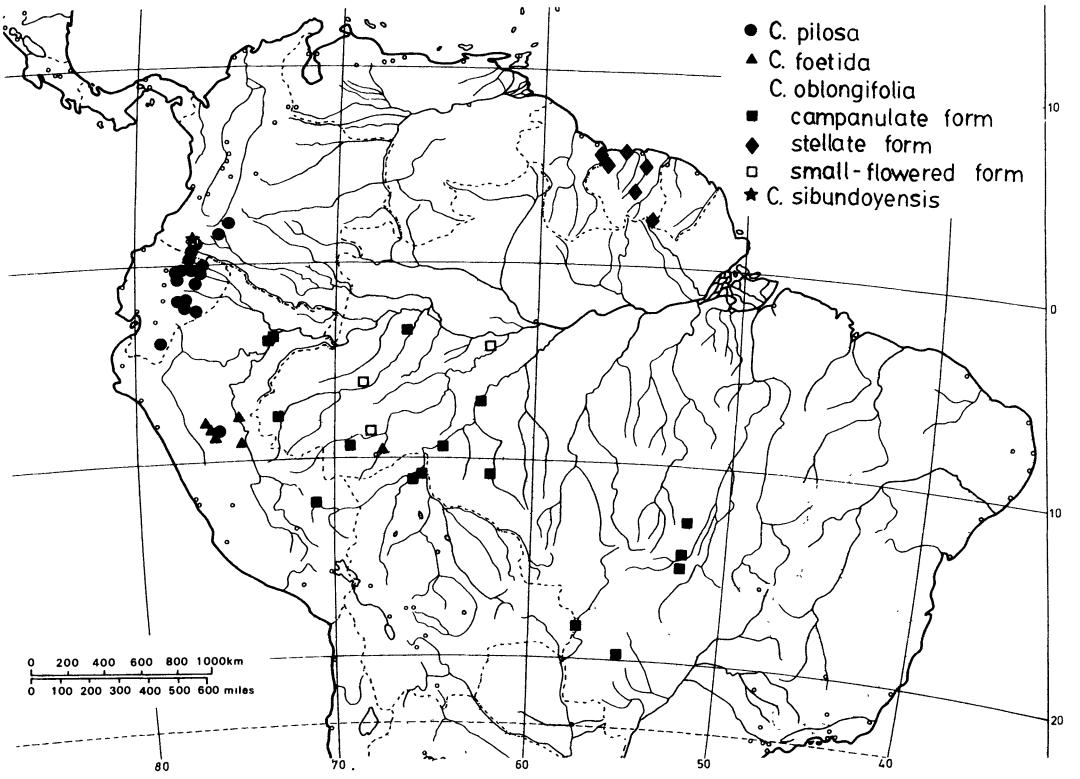

FIG. 5. Distribution of *Cyphomandra pilosa*, *C. foetida*, *C. oblongifolia*, and *C. sibundoyensis*. Base map copyright 1979 by the University of Utrecht.

The epithet *sibundoyensis* reflects the narrow distribution of this species, which has been collected only in and around the Valley of Sibundoy, Colombia.

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LITERATURE CITED

BOHS, L. 1986. The biology and taxonomy of *Cyphomandra* (Solanaceae). Ph.D. dissertation, Harvard University.

DUNAL, M. F. 1852. Solanaceae. In A. P. DeCandolle, *Prodromus systematis naturalis regni vegetabilis* 13(1): 1–690. Paris: Victoris Masson.

EDMONDS, J. M. 1983. Seed coat structure and development in *Solanum* L. section *Solanum* (Solanaceae). J. Linn. Soc., Bot. 87:229–246.

METCALFE, C. R. 1983. Secreted mineral substances. Pp. 82–97 in *Anatomy of the Dicotyledons*, 2nd ed., vol. 2, eds. C. R. Metcalfe and L. Chalk. Oxford: Clarendon Press.

SEITHE, A. 1979. Hair types as taxonomic characters in *Solanum*. Pp. 307–319 in *The biology and taxonomy of the Solanaceae*, eds. J. G. Hawkes, R. N. Lester, and A. D. Skelding. London: Academic Press.