

Two new species of *Physalis* (Solanaceae) endemic to Jalisco, Mexico

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Key words: Solanaceae, *Physalis*, new species, Jalisco, Mexico.

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Physalis is primarily an American genus, and estimates of its number of species range from 75 (D'Arcy, 1991) to 120 (Hendrych, 1989). Recently some species have been removed from *Physalis*, such as *P. amphitricha* (Bitter) Standl. & Steyerl. and *P. calidaria* Standl. & Steyerl., both now in *Tzeltalia* (Estrada & Martínez, 1998). Other species have been added, such as *P. solanaceus* (Schltdl.) Axelius, which was transferred from *Margaranthus* (Axiolius, 1995). Studies of the Mexican species have resulted in the description of three new endemic species: *P. queretaroensis* M. Martínez and L. Hernández (1999), *P. waterfallii* O. Vargas, M. Martínez and Dávila (1999) and *P. hunzikeriana* M. Martínez (1999).

If one adds recently described species and subtracts those recently placed in synonymy by Vargas et al. (1998), the genus *Physalis* comprises 85 species, 46 of which are endemic to Mexico. The state of Jalisco, in western Mexico, is especially diverse, with 32 species, 5 of which are endemic. Recent collections in Jalisco have found two new species.

Physalis longiloba Vargas, M. Martínez & Dávila, sp. nov. (Fig. 1).

TYPE: MEXICO. **Jalisco.** Autlán de Navarro, Sierra de Manantlán, passing Rincón de Manantlán along creek, 2100 m, 19°35'55"N, 104°12'35"W, 26 Apr 1997 (fl,

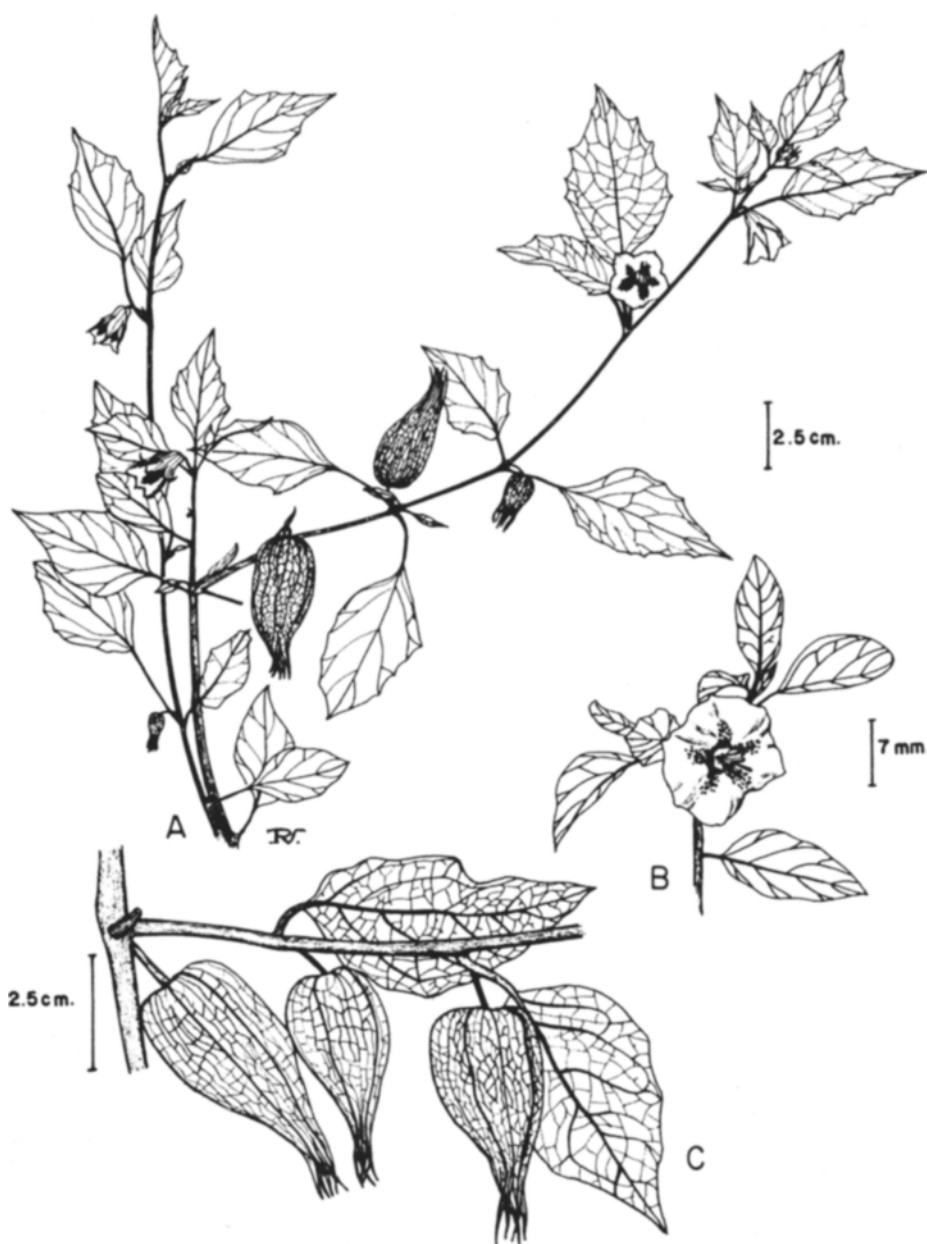


FIG. 1. *Physalis longiloba* (Vargas 873, IBUG). A. Habit. B. Details of the flower. C. Calyx of fruit.

fr), Vargas 873 (HOLOTYPE: IBUG; ISOTYPES: ENCB, IEB, MEXU, NY, ZEA).

Suffrutex rhizomatosus, prostratus, ad nodos caulinos basales radicans, glabrescens. Folia ovata vel late ovata, apice acuminata, margine integra vel dentata, textura aliquantum coriacea. Alabastrum ovatum, apiculatum. Corolla rotato-campanulata, maculis compositis. Antherae purpureae. Calyx in fructu 5-angulatus,

duplo longior quam lator, lobis peranguste triangularibus, acuminatis vel filiformibus.

Suffrutescent with a slender and horizontal rhizome to 1 m long. Stem smooth with lenticels, ca. 90 cm long, repent, rooting at the lower nodes, young parts puberulent with simple, unbranched, eglandular hairs,

but soon glabrate. Leaves alternate at the base and soon geminate with the smaller leaves 1/3 the size of the larger; petiole 1.5–3.6 cm long; lamina 3.6–7.9(–10.2) $\times$ 2.1–6.1 cm, ovate to broadly ovate, apex acuminate, base oblique, cuneate to subcordate, margin entire, undulate or dentate with coarse teeth ca. 5 mm long. Flowers solitary, the buds ovate-apiculate 0.6–1 cm long, strigose; flowering pedicels 0.6–1.5 cm long; flowering calyx 0.9–1.5 cm long, 5–6.5 mm wide at the base of the lobes, lobes lanceolate-acuminate to narrowly acuminate, 5.5–9 mm long, glabrescent. Corolla yellow, 1–1.7 cm long and 1.5–2.2 cm diam., campanulate-rotate, reflexed, with 5 separated brown maculae to 7 mm long, each macula composed of several aggregated smaller dots (rarely single solid blotch), pubescent at the insertion of filaments. Stamens with purple filaments, anthers purple drying blue 3–4 mm long, connective yellow. Style to 9 mm long, stigma clavate. Fruiting pedicels 0.8–1.4 cm long, calyx 5-angled, 3–4.2 $\times$ 1.3–2 cm, with narrowly triangular to acuminate lobes 0.8–1.2 cm long, lobes sometimes almost filiform and then entangling among themselves. Fruit a berry 1.1 cm wide, green. Seeds numerous, kidney-shaped, foveolate, light yellow, ca. 2.1 $\times$ 1.6 mm.

Distribution and ecology.—*Physalis longiloba* is known only from the Sierra de Manantlán, at elevations around 2100 m. It grows abundantly on slopes, open areas and paths in the cloud forest, pine-oak forest, and near reservoirs. It flowers and fruits from September to May.

Etymology.—The epithet refers to the long lobes of the flowering calyx.

Additional specimens examined: MEXICO. **Jalisco:** Autlán de Navarro, Las Joyas, near sign of ecological path, 1900 m, 19°35'30"N, 104°17'00"W, 11 Sep 1996, *Vargas 862* (ENCB, IBUG, MEXU); Autlán de Navarro, rd. to Arroyo Las Playas, 2100 m, 19°35'37"N, 103°17'02"W, 26 Apr 1997, *Vargas 872* (CHDIR-DGO, ENCB, IBUG, IEB, MEXU, NY, ZEA); Cuautitlán, La Cumbre, 1900 m, 19°37'13"N, 104°16'58"W, 11 Sep 1996, *Vargas 856* (ENCB, IBUG, IEB, MEXU, NY, ZEA); Cuautitlán, at jct. of rds. to La Cumbre & Rincón de Manantlán, toward La Cumbre mtn., 2160 m, 19°33'55"N, 104°13'20"W, 24 Apr 1997, *Vargas 871* (CHDIR-DGO, ENCB, IBUG, IEB, MEXU, NY, ZEA); Cuautitlán, 500 m before Tierras Blancas, on rd. to San Miguel, 2160 m, 19°35'54"N, 104°17'37"W,

24 Apr 1997, *Vargas 870* (ENCB, IBUG, IEB, MEXU, ZEA).

Physalis longiloba is superficially similar to *P. lignescens* Waterf. in its suffrutescent habit, prostrate stems, geminate leaves slightly dentate, and 5-angled fruiting calyxes. However, *P. longiloba* has a flowering calyx to 1.5 cm long with long acuminate lobes to 9 mm long. The flowering calyx of *P. lignescens* is short, less than 9 mm long, with short triangular lobes not exceeding 4 mm in length.

Both species are endemic to Jalisco (Vargas et al., 1998) and restricted to different areas of the Trans-Mexican Volcanic Belt. *Physalis lignescens* is known only from the Nevado de Colima region, whereas *P. longiloba* is restricted to the Sierra de Manantlán Biosphere Reserve. Further, they are phenologically different: *P. lignescens* flowers and fruits from July to August, whereas *P. longiloba* flowers and fruits from September to May.

Physalis longiloba could also be confused with *P. gracilis* Miers because they share a prostrate habit, rooting at the lower nodes and geminate leaves. However, *P. gracilis* has a 10-angled fruiting calyx, whereas that of *P. longiloba* is 5-angled. In addition, *P. gracilis* in fruit has pedicels to 2.4 cm long while those in *P. longiloba* are to 1.4 cm long.

Physalis tamayoi Vargas, M. Martínez & Dávila, sp. nov. (Fig. 2).

TYPE: MEXICO. **Jalisco.** Tapalpa, dirt rd. from Tapalpa to Chiquistlán, 2200 m, 20°02'02"N, 103°50'23"W, 13 Jul 1997 (fl, fr), *O. Vargas 876* (HOLOTYPE: IBUG; ISO-TYPES: MEXU, NY).

Frutex vel suffrutex, erectus, ramosus, trichomatibus simplicibus glandularibusque brunneis obtectus. Folia ovata, apice acuminata, margine serrata. Alabastrum ovatum. Corolla rotato-campanulata, maculis simplicibus vel compositis. Antherae purpureae vel azureae. Calyx pubescens, in fructu 10-angulatus, 5-angulis magis conspicuis, reticulatus, brevilibatus, ovatis, acutis.

Shrub or suffrutescent, erect to 1.5 m high, pubescent throughout with short, simple, unbranched, multicellular, glandless hairs and frequently with brown, simple, unbranched, multicellular, gland-tipped hairs.

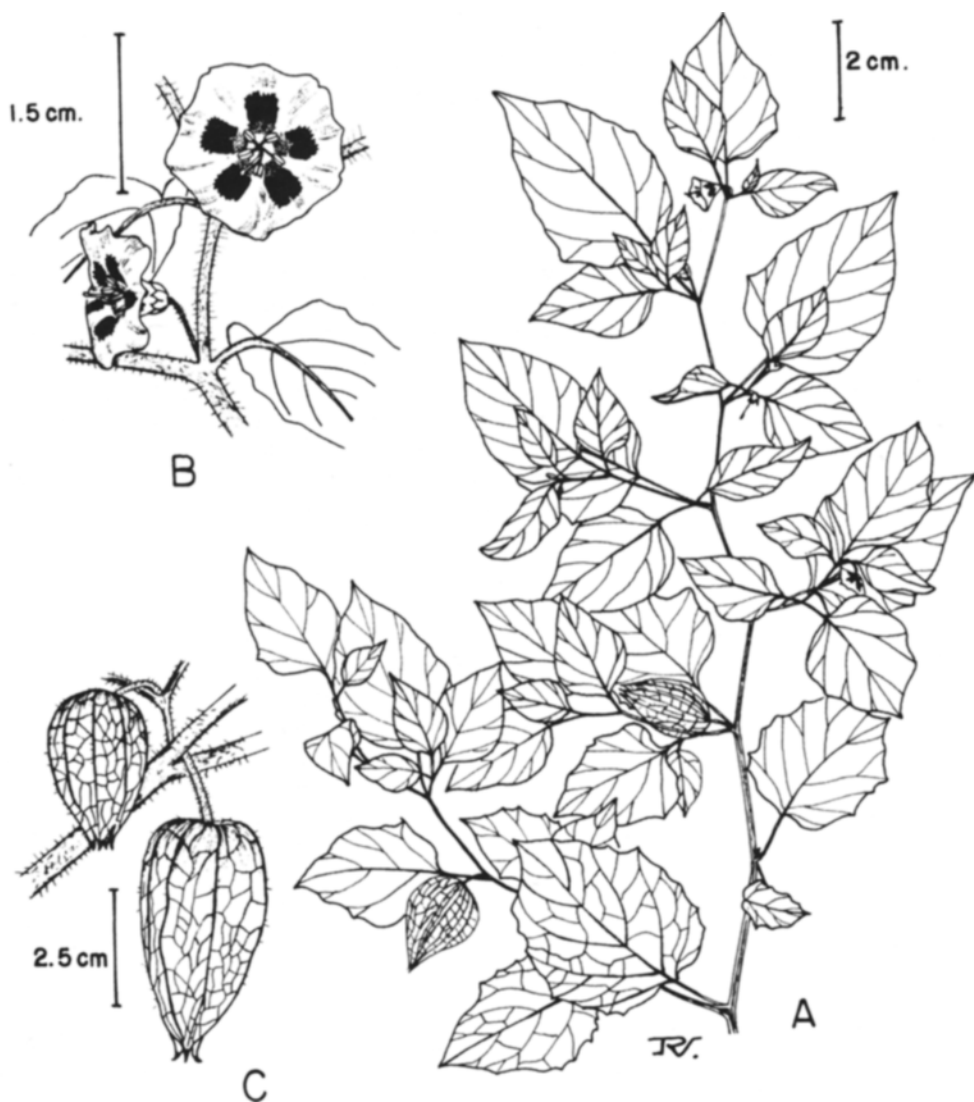


FIG. 2. *Physalis tamayoi* (Villa C. 284, IBUG; Vargas 876, IBUG). A. Habit. B. Details of the flower. C. Calyx of fruit.

Stem terete to lightly angular. Leaves alternate at the base, soon geminate, with the smaller leaves 1/3 the size of the larger; petiole 1–3.8 cm long; lamina 3.4–9.1 × 2.3–6.7 cm, ovate, apex acuminate, base oblique to truncate, margin serrate with short acute teeth ca. 2 mm long. Flowers solitary, the buds ovate, 3–4 mm long; flowering pedicels 0.5–1 cm long; flowering calyx 3.5–6 mm long, 3–3.5 mm wide at the base of the lobes, lobes ovate, acute, 1.5–2.5 mm long, somewhat reflexed, glabrescent to densely

pubescent, with whitish multicellular hairs. Corolla yellow, 0.8–1.1 cm long and 1–1.8 cm diam., campanulate, with 5 separated brown dark maculae 3–4 mm long, each macula consisting of a single solid blotch or composed of several aggregated smaller dots. Stamens with purple filaments, anthers purple to blue, 2.5–3 mm long, connective yellow. Style 7 mm long, stigma clavate. Fruiting pedicels 0.9–1.4 cm long, calyx 10-angled with 5 angles more prominent, 2.4–3.5 × 1.6–2.5 cm, reticulate with pur-

TABLE 1
COMPARISON OF *Physalis longiloba*, *P. tamayoi*, AND *P. lignescens*

Character	<i>P. longiloba</i>	<i>P. tamayoi</i>	<i>P. lignescens</i>
Habit	Prostrate	Erect	Prostrate or erect
Life form	Suffrutescent	Shrub or suffrutescent	Suffrutescent
Vestiture	Glabrous or glabrescent, simple eglandular hairs 1 mm long	Pubescent, simple eglandular and glandular hairs 0.5 mm long	Glabrous or glabrescent, simple eglandular hairs 1 mm long
Leaf apex	Acuminate	Acuminate	Acute to shortly acuminate
Leaf margin	Entire, undulate or dentate with coarse teeth ca. 5 mm long	Serrate with short acute teeth ca. 2 mm long	Entire, repand or with several acute teeth long
Buds	Ovate, apiculate, 6–10 mm long	Ovate, 3–4 mm long	Globose, apiculate, 4 mm long
Flowering calyx	0.9–1.5 cm long	3.5–6 mm long	4–5(–7) mm long
Flowering calyx lobes	Lanceolate, acuminate to narrowly triangular, 5.5–9 mm long	Ovate, acute, reflexed, 1.5–2.5 mm long	Narrowly triangular, reflexed, (2–)3.5–4 mm long
Maculae	7 mm long	3–4 mm long	3–5 mm long
Anthers	3–4 mm	2.5–3 mm	2.5–3.5 mm
Fruiting calyx	5-angled, glabrous	10-angled with 5 angles more prominent, pubescent	5-angled, glabrous

ple veins, velutinous, with unbranched, multicellular, glandless hairs and brown, simple, unbranched, multicellular, gland-tipped hairs in veins and lobes, lobes ovate, acute, 3–5 mm long. Fruit a berry 1.1 cm diam., green. Seeds numerous, kidney- to disc-shaped, foveolate, dull yellow, ca. 2 × 1.5 mm.

Distribution and ecology.—The species grows in disturbed areas of pine-oak forest, under the cover of *Crataegus mexicana* or along creeks in the forest, at 1910–2150 m. It flowers and fruits from July to November.

Etymology.—The species honors Roberto González Tamayo, a Mexican orchidologist.

Additional specimens examined. MEXICO. **Jalisco.** Tecalitlán, in Los Llanitos, town of Alotitlán, 35 km along dirt rd. to Jilotitlán de Dolores, off hwy. Tecalitlán–Pihuamo, Sierra del Halo, 1910 m, 19°18'20"N, 103°16'35"W, 6 Oct 1988, *Rodríguez 1350a* (IBUG, MEXU); Tecalitlán, 3 km E of San Isidro, on dirt rd. to Plan de Lego, 2150 m, 19°17'23"N, 103°15'35"W, 14 Nov 1989, *Villa C. 284* (IBUG).

Physalis tamayoi is characterized by its shrubby or suffrutescent habit, glandular pubescence, small flowering calyx, 10-angled fruiting calyx with 5 angles more prominent, and short acute calyx lobes. *Physalis tamayoi* is similar to *P. lignescens* in that both have small flowering calyces

with reflexed lobes and ovate, acuminate, and oblique leaves of the same size. Yet, both species are easily distinguished by their vestiture. *Physalis tamayoi* is pubescent with simple, unbranched, multicellular, glandless, and gland-tipped hairs 0.5 mm long, whereas *P. lignescens* is glabrous or glabrescent with simple, unbranched, multicellular, glandless hairs 1 mm long. Flower buds are also different, being ovate in *P. tamayoi* and apiculate in *P. lignescens*. Lastly, the fruiting calyx in *P. tamayoi* is 10-angled with 5 angles more prominent and pubescent, whereas *P. lignescens* has a 5-angled, glabrous fruiting calyx.

Physalis tamayoi and *P. lignescens* are endemic to Jalisco (Vargas et al., 1998) but they are not sympatric. *Physalis lignescens* is restricted to the Trans-Mexican Volcanic Belt at the Nevado de Colima and *P. tamayoi* has been collected in the Sierra de Tapalpa, which belongs to the Trans-Mexican Volcanic Belt and Sierra de Tecalitlán, the northern limit of the Sierra Madre del Sur. *Physalis lignescens* blooms in July and sets fruit through August. Similarly, *P. tamayoi* flowers in July, but the fruiting period extends until November. Table I summarizes the differences among *P. longiloba*, *P. tamayoi*, and *P. lignescens*.

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