
Jaltomata bohsiana: A New Species and Key to the *Jaltomata* (Solanaceae) of Mexico

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ABSTRACT. A new species of *Jaltomata* Schltdl. (Solanaceae) from Mexico is described and a key to the *Jaltomata* of Mexico is provided. Known only from the type locality, *J. bohsiana* Mione & D. M. Spooner is distinguished from the similar *J. procumbens* (Cav.) J. L. Gentry by having a purple flowering calyx to 6.8 mm diam., the calyx lobes both recurved and concave in cross section, and a fruiting calyx to 10 mm diam. In contrast, *J. procumbens* has a mostly green flowering calyx that is not recurved, the calyx lobes are not concave in cross section, with a diameter greater than 7 mm, and a fruiting calyx diameter greater than 10 mm.

Key words: IUCN Red List, *Jaltomata*, Mexico, Solanaceae, trichomes.

In Mexico, the berries (1–1.9 cm diam.) of *Jaltomata* Schltdl. species (Solanaceae) are commonly consumed and sold in markets (Davis & Bye, 1982; Williams, 1985; Davis, 1986). The leaves are consumed like spinach (Nee, 1986), and plants are used as fodder (Casas et al., 2001). The labels of a few herbarium specimens list medicinal uses of various parts. Despite widespread use, the taxonomy of this group has not been adequately studied. *Flora Fanerogámica del Valle de México* (Rzedowski & Rzedowski, 1985) and the *Flora de Veracruz* (Nee, 1986) list a single taxon, *J. procumbens* (Cav.) J. L. Gentry. Subsequent studies have led to the recognition of four species in Mexico: *J. chihuahuensis* (Bitter) Mione & Bye of northern Mexico; *J. grandiflora* (B. L. Rob. & Greenm.) D'Arcy, Mione & Davis of Michoacán (hills near Pátzcuaro); *J. procumbens*, a widespread and variable species distributed from Arizona, United States, to Ecuador; and *J. repandidentata* (Dunal) Hunz., distributed from Mexico to Bolivia. A fifth Mexican species is recognized here, based on morphological characters and DNA analysis, as part of ongoing taxonomic study of the genus *Jaltomata*.

Jaltomata bohsiana Mione & D. M. Spooner, sp. nov. TYPE: Mexico. México: on S side of rd. from Rte. 130 (134) to Valle de Bravo, 2 km E of San Ramón, 19°10'N, 100°01'W, 2450 m, pine forest with epiphytic vegetation, growing in soil next to drainage ditch, rare, 15 Oct. 1988, D. M. Spooner & J. Gómez 4253 (holotype, CONN; isotype, MEXU). Figure 1.

Haec species *Jaltomatae procumbenti* (Cav.) J. L. Gentry similis, sed ab ea calyce sub anthesi purpureo usque ad 6.8 mm diam. lobis in sectione transversali recurvis concavis, sub fructu usque ad 10 mm diam. distinguitur.

Erect herb becoming woody only at base, 60–90 cm tall; stems purple proximally, green distally (Fig. 1A) except for purple nodes, the mature stems glabrate but pubescent at nodes; stem of seedling densely pubescent. Leaves alternate, often geminate, the blade membranous, elliptical, to 16 × 7.9 cm, glabrate, margin entire to slightly repand, apex acuminate, base aequilateral and attenuate; petiole to 3.3 cm. Inflorescence axillary, umbellate (Fig. 1), 5- to 7-flowered including buds; peduncles to 25 mm (to 31 mm with ripe fruit), angled, green; pedicels 8–20 mm, angled, green to purple. Flowers with the calyx purple (Fig. 1B, C), darker at tips of the lobes on adaxial face, 5–6.8 mm diam., 2.5–3.25 mm from pedicel to lobe tip (4–5.5 mm with ripe fruit), ca. 1 mm from pedicel to sinus (ca. 2 mm with ripe fruit), the calyx lobes both recurved and concave in cross section (Fig. 1B). Corolla rotate, pale green, 5-lobed (Fig. 1A, B), adaxially pilosulose, 16–19 mm diam. in pistillate phase, 20–24 mm diam. in hermaphroditic phase, measured on living plants, 11–14 mm long (on holotype, pressed with flower oriented sideways), the margin ciliate; stamens ca. 3 mm (pistillate phase, Fig. 1A upper flower) to 7 mm (hermaphroditic phase, Fig. 1A lower flower), slender part of the filament glabrous, villous on the expanded base, the trichomes to 0.5 mm, unbranched; undehiscent anthers yellow



Figure 1. *Jaltomata bohsiana* Mione & D. M. Spooner. —A. Inflorescence, upper flower in earlier pistillate phase with short stamens and undehiscent anthers, lower flower in later hermaphroditic phase with elongated stamens and dehiscent anthers; the arrow points to the stigma. —B. Abaxial view of flower showing small purple calyx having sepals both recurved and concave in cross section. —C. Ripe fruit with calyx on top attached by peduncle and pedicel. Photos (by T.M.) are of cultivated plants grown from seeds of holotype. Scale bars = 5 mm.

except for green connective between pollen sacs in dorsal view, 1.43–1.65 mm (dehiscid, pressed), 1.7–2 mm (undehisced, fresh); pollen grains 83,000 to 116,000 per androecium, 27.5–32.5 µm diam.; style straight, 4.2–6 mm; stigma capitate (Fig. 1A), light green, ca. 0.5 mm across, a very shallow medial groove evident at 32×; gynoecium glabrous except for stigma papillae to 0.02 mm; ovules 112 to 123 per ovary; disk (presumably the source of unpigmented nectar) girdling the base of the ovary. Mature berries shiny black, subspherical (Fig. 1C), ca. 6 × 8–9 × 11 mm when fresh, 8–10 mm across if pressed; seeds brown, numerous, 1.23–1.36 × 0.9–1.06 × 0.32–0.44 mm, ovate to subtriangular, alveolate.

Three types of trichomes were observed, all unpigmented: (1) trichomes of the young leaves, axes, and corolla margin are uniseriate, multicellular, almost always unbranched, gradually taper to a point, appear to lack nuclei, and vary in length; (2) trichomes of the adaxial face of the corolla are living, ca. 0.3 mm long, only the distal cells contain dense cytoplasm, and the distal end of the terminal cell is rounded, not pointed; (3) trichomes of the abaxial face of the corolla are 0.075 mm long, living, and have a multicellular head borne on a unicellular stalk (as illustrated in Mione & Serazo, 1999). The multicellular head stains densely with neutral red, but the stalk cell does not absorb this stain.

Distribution, ecology, and IUCN Red List category. *Jaltomata bohsiana* is known only from the type locality, a pine forest with epiphytic vegetation. Seeds germinated at room temperature in Connecticut without chemical or mechanical treatment. The IUCN

Red List category (IUCN, 2001) is uncertain and is assessed here as Data Deficient (DD).

Etymology. The species epithet honors Lynn Allison Bohs, noted solanologist.

Discussion. *Jaltomata bohsiana* is similar to the widespread and variable species *J. procumbens*. The former is distinguished by having a smaller purple flowering calyx to 6.8 mm diam., calyx lobes both recurved and concave in cross section (Fig. 1B, C), and a fruiting calyx to 10 mm diam. In contrast, *J. procumbens* has a green (sometimes with purple lobe tips) flowering calyx that is not recurved, lobes that are not concave in cross section, with a diameter larger than 7 mm, and a fruiting calyx diameter greater than 10 mm. The seeds and pollen of *J. bohsiana* are noticeably smaller than those of most, but not all, collections of *J. procumbens*. Attempts to hybridize *J. bohsiana* with other similar *Jaltomata* species produced either no fruit-set, hybrid seeds that did not germinate, or hybrids with low pollen stainability (Mione, 1992). The DNA sequence for the gene *waxy* (GBSSI) shows in *J. bohsiana* a unique 27 base insertion, a duplication of the 27 bases immediately upstream of the duplication (Miller et al., in press). The type collection of *J. bohsiana* grouped with the other *Jaltomata* of the Mesoamerican clade in the plastid DNA phylogeny by Mione et al. (1994).

Although *Jaltomata* specimens have been borrowed from numerous herbaria, other specimens of this species have not been seen.

Paratypes. U.S.A. Specimens made from cultivated plants grown at the University of Connecticut and CCSU greenhouses and outdoor gardens, from seed of the type *Spooner & Gómez 4253, Mione 365* (CONN, MO).

KEY TO THE *JALTOMATA* SPECIES OF MEXICO

- 1a. Anthers unequal in size, most noticeable during the pistillate phase while anthers are undehisced; filaments sigmoid or curved during hermaphroditic phase; style curved; strongly but not exclusively associated with coffee plantations. *J. repandidentata*
- 1b. Anthers equal in size; filaments straight during hermaphroditic phase; style straight; habitat variable, including agricultural fields and other disturbed areas.
 - 2a. Calyx lobes concave in cross section; calyx purple at time of flowering, < 6.8 mm diam. *J. bohsiana*
 - 2b. Calyx lobes not concave in cross section; calyx mostly green at time of flowering, > 7 mm diam.
 - 3a. Anthers longer than 2.8 mm; leaves and branches densely velutinous; pollen > 42 µm diam. *J. grandiflora*
 - 3b. Anthers shorter than 2.8 mm; leaves and branches glabrate to pubescent or hirsute; pollen diam. < 39 µm.
 - 4a. Vestiture of stems and leaves variable (including glabrate) but never hirsute; filaments angling away from style at 45° during hermaphroditic phase; corolla 5-lobed or with alternating lobes and lobules totaling 10; flowers per inflorescence variable; peduncle length variable; Arizona, United States, to Ecuador *J. procumbens*
 - 4b. Stems and leaves hirsute; filaments angling away from style at no more than 15° during hermaphroditic state; corolla 5-lobed; inflorescence up to 4-flowered; peduncles not longer than 15 mm; northern Mexico. *J. chihuahuensis*

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