

# Jaltomata I: circumscription, description, and new combinations for five South American species (Solaneae, Solanaceae)

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Mione, Thomas, Gregory J. Anderson (Ecology and Evolutionary Biology, University of Connecticut, Storrs, CT 06269, U.S.A.), and Michael Nee (The New York Botanical Garden, Bronx, New York 10458-5126, U.S.A.). *Jaltomata* I: circumscription, description, and new combinations for five South American species (Solaneae, Solanaceae). *Brittonia* 45: 138–145. 1993.—The genus *Jaltomata* (including *Hebecladus*) is described. Five *Hebecladus* species are transferred to *Jaltomata*. *Jaltomata viridiflora* is widespread, from western Venezuela through Ecuador; *J. bicolor* and *J. propinqua* occur in central Peru; *J. umbellata* of the Loma Formation of the Department Lima, Peru is rare; *J. ventricosa* is known only from the vicinity of La Libertad, Otuzco, Peru. All are montane except for *J. umbellata*. Included are short descriptions and illustrations.

El género *Jaltomata* (incluyendo *Hebecladus*) se describe en este trabajo. Cinco especies de *Hebecladus* son transferidas a *Jaltomata*. *Jaltomata viridiflora* está difundida extensamente en los Andes desde el oeste de Venezuela hasta el Ecuador; *J. bicolor* y *J. propinqua* se encuentran en la región central del Perú; *J. umbellata* de la Formación Loma de Departamento Lima, Perú, es rara; *J. ventricosa* es conocida solamente en la vecindad de La Libertad, Otuzco, Perú. Las especies tratadas son de montaña, exceptuando *J. umbellata*. Se incluyen descripciones cortas e ilustraciones.

**Key words:** Andean flora, *Hebecladus*, *Jaltomata*, Solanaceae, Solaneae, Solanoideae.

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Prior to this study it was virtually impossible to identify species of South American *Jaltomata* because nearly all basionyms are in other genera and species descriptions were widely scattered in the literature. Macbride (1962) treated the Peruvian species of this group but commented that, "The group needs to be studied by a student who can study living plants; . . ." Our revision of the taxonomy of this genus derives from a study of about 400 living plants (greenhouse-grown and in the field) and herbarium specimens. The living plants

were used for taxonomy, comparative morphology, and chloroplast DNA restriction site-based phylogeny construction. Here we treat five species, providing a brief description and an illustration of part of each.

The new combinations presented here result from the current recognition among systematists that *Jaltomata* Schldl. (1838) should include most species previously assigned to *Saracha* (D'Arcy, 1973, 1987; D'Arcy et al., 1992; Davis, 1980; Gentry, 1973, 1974) and all species of *Hebecladus* Miers (1845) (Hunziker, 1979; Mione, 1992). Some of the latter were originally described as *Atropa* by Ruiz and Pavón (1799). This brings the total number of recognized *Jaltomata* species to about 30. These

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species are tropical and subtropical, perennial herbs and small shrubs that are distributed from Arizona, U.S.A., to southern Bolivia (Mione, 1992; Morton, 1944), in the Greater Antilles (1 species, Adams, 1972; Liogier & Martorell, 1982; Mione, 1992) and on the Galápagos Islands (1 species, D'Arcy, 1982).

Traditionally, corolla form and habit were used to distinguish between *Jaltomata* and *Hebecladus* (Davis, 1980; Hunziker, 1979). Miers (1845) described *Hebecladus* species as suffrutescent, bearing tubular or infundibular corollas, and residing in South America, while *Jaltomata* species have been described as herbs with rotate or broadly campanulate corollas, distributed throughout the combined range of the two genera (Davis, 1980). Georg Bitter seems to have been the first to note (1924, p. 374) that these genera grade into each other. This contention was reiterated by Morton (1938) who wrote, "the genus [*Jaltomata*, as *Saracha*] verges on . . . *Hebecladus*." Similarly, Macbride (1962) observed that the two genera together formed a natural group, and thus included *Hebecladus* species in his key to the Peruvian species of *Jaltomata* (the latter as *Saracha*). Furthermore, Hunziker (1979) treated both genera under *Jaltomata* and remarked, "I am unable to draw a line of separation between *Jaltomata* and *Hebecladus* Miers. Both groups share a number of common attributes . . . [and] there are intermediate [corolla] forms." Later, Nee (1986), Hunziker again (1987), Knapp et al. (1991) and Mione (1992) all supported the inclusion of *Hebecladus* within *Jaltomata*.

In addition to the gradation in corolla morphology and habit that prompted these workers to suggest that *Hebecladus* and *Jaltomata* should be united, Mione et al. (1990) presented chloroplast DNA restriction site data showing that *Jaltomata* is strongly paraphyletic without the inclusion of *Hebecladus*. Sixteen to 17 chloroplast DNA characters firmly place *Hebecladus viridiflorus* (H.B.K.) Miers and *H. ventricosus* Baker within *Jaltomata* (Mione, 1992).

Based on the above evidence, we choose to unify *Jaltomata* and *Hebecladus*. The species treated below with basionyms in

*Atropa* have undisputedly been considered *Hebecladus* since 1845 and therefore do not require separate justification for their inclusion within *Jaltomata*.

Earlier descriptions of the genus *Jaltomata* are either based on species of only part of the geographic distribution or represent the earlier circumscription, i.e., without *Hebecladus* species (e.g., Benítez de Rojas, 1974 [as *Saracha*]; Castillo Pinilla, 1974; D'Arcy, 1973; Davis, 1980; Dodson & Gentry, 1978; Gentry & Standley, 1974; Kearney and Peebles, 1951 [as *Saracha*]; Macbride, 1962 [as *Saracha*]; Nee, 1986; Rzedowski & Rzedowski, 1985; Shreve & Wiggins, 1964 [as *Saracha*]). A generic synonymy and description of *Jaltomata* in the current sense follow. Hair terminology follows Seithe (1979).

#### JALTOMATA Schldl.

*Jaltomata* Schldl., Index sem. hort. hall. 1838. 8. 1838.

TYPE: *Jaltomata edulis* Schldl., which was preceded by a description of the same species, as *Atropa procumbens* Cav. The species that the type belongs to is *Jaltomata procumbens* (Cav.) J. L. Gentry.

*Hebecladus* Miers, London J. Bot. 4: 321. 1845. TYPE: *Hebecladus viridiflorus* (Humb., Bonpl. & Kunth) Miers, based on *Atropa viridiflora* Humb., Bonpl. & Kunth.

*Herbs* to *shrubs* to 2 m high, sometimes scandent (without specialized structures), terrestrial, unarmed. *Branches* erect or spreading, 4- or 5-sided to terete, usually hollow. Vesture of multicellular finger- or branchlet-hairs, gland-tipped or not. *Leaves* alternate or appearing opposite (rarely appearing verticillate), simple, petiolate, estipulate, ovate, ovate-lanceolate or ovate-acuminate, sometimes basally truncate, entire, subentire or toothed, often tapering asymmetrically along distal portion of petiole. *Inflorescence* axillary or from a stem dichotomy (false dichotomy), pedunculate, umbel-like (Fig. 1E). Pedicels basally articulated after fruit ripens, sometimes angled. *Flowers* five-merous; bisexual; regular. Calyx enclosing the bud with valvate aestivation. Flowering calyx with sepals partially connate, lobes triangular, narrowly triangular or obtuse, rotate with a stellate outline (Fig. 1), or the lobes reflexed. Fruiting calyx

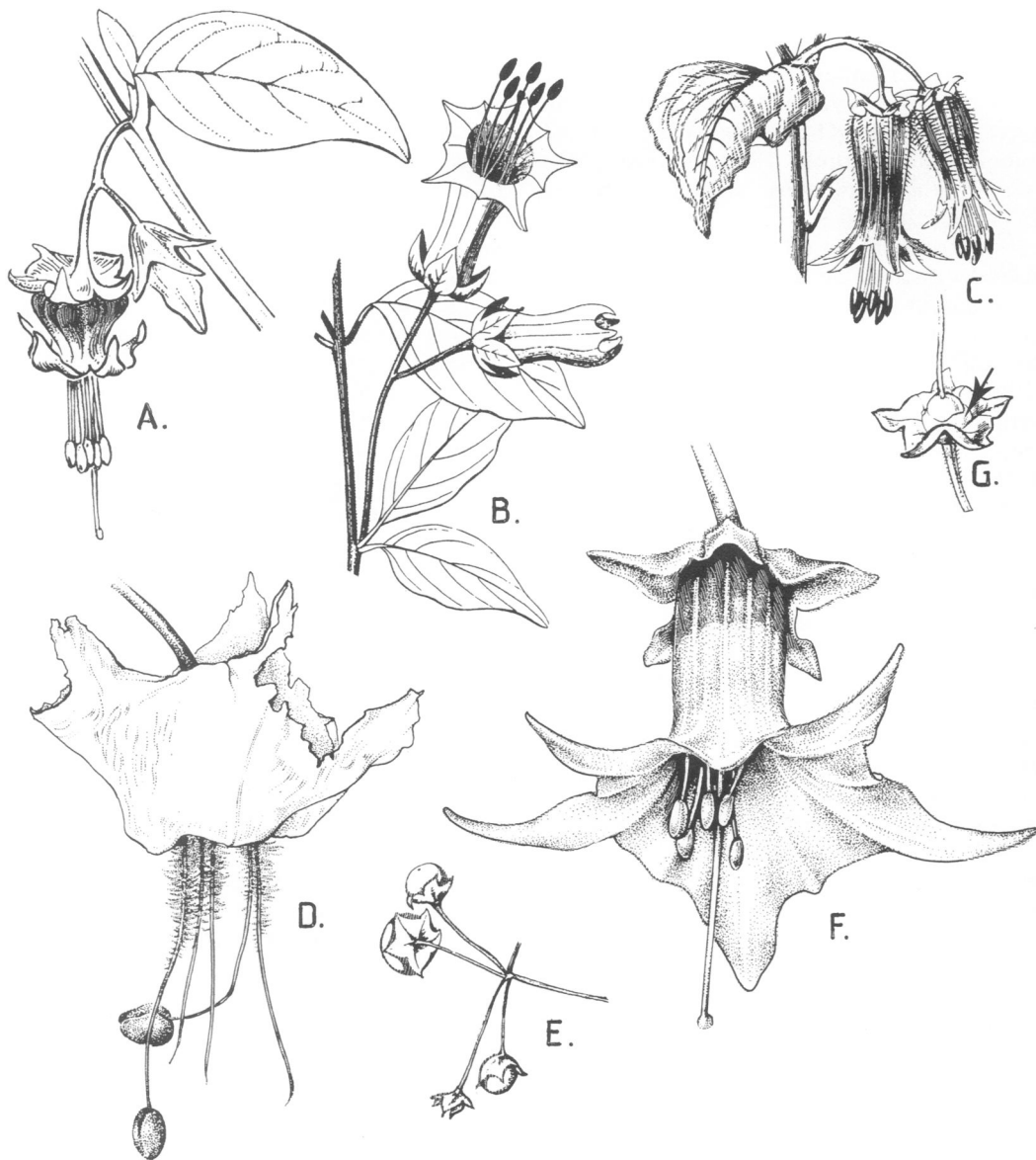


FIG. 1. Some South American *Jaltomata*. A. *J. ventricosa* (redrawn from portion of Baker, 1870, t. 208). B. *J. viridiflora* (portion of Humboldt, Bonpland and Kunth, 1818, t. 196). C. *J. bicolor* (redrawn from Hooker, 1845, t. 4192). D. Pressed flower of *J. propinqua* (from Ochoa & Vilcapoma 279). E. Inflorescence of *J. propinqua* (redrawn from portion of Miers, 1849, t. 38). F. *J. umbellata* (drawn from living material of Chavez s.n.). G. Typical gynoeceium and calyx of *Jaltomata*; arrow points to the annular disk (redrawn from Hooker, l.c.).

conspicuously accrescent, green or purple, spreading behind berry, rotate (Fig. 1E) to reflexed. Most species having 10-lobed corollas, the five larger lobes alternating with 5 smaller lobules, the latter sometimes in-

conspicuous. *Corolla* aestivation with five valvate lobes, each lobe alternating with an inwardly pleated and shorter lobule. *Corolla* 1–5 cm diam., rotate, broadly infundibular, campanulate, tubular, in one species (*J. ven-*

*triosa*) the tube urceolate and the limb retrorse (Fig. 1A), if the corolla is non-rotate then the lobes flare. *Filaments* 5, filiform, markedly enlarged/swollen at base where adnate to base of corolla, the expanded base pubescent with finger hairs, slender part of filament pubescent with finger hairs (Fig. 1D) or not, filament inserted obliquely into ventral face of anthers in bud. Anthers dehiscing longitudinally. Ovary superior, bicarpellate, ovules 42–412 ( $n = 128$  ovaries) per ovary. Style slender (Fig. 1G), exerted or not. Stigma single, bilobed, slightly bilobed, or grooved. Nectary disk annular around base of ovary (Fig. 1G). Nectar clear to yellowish drops at base of corolla and androecium, or, in several Peruvian and one Bolivian species orange to red, filling base of corolla and visible through corolla. *Fruit* a juicy globose or oblate berry, 4–25 mm diam., many-seeded, black, purple, green, orange, red or yellow (also white *vide* Ruiz & Pavón, 1799).

At this time we make the following transfers and synonymies. Calyx lobe radius is the length from the center of the calyx to the tip of one of the calyx lobes. The calyx sinus radius is the length from the center of the calyx to one of the calyx sinuses. Label data for specimens cited as providing local names or use information are listed under specimens examined.

**Jaltomata ventricosa** (Baker) Mione, comb. nov. (Fig. 1A).

*Hebecladus ventricosus* Baker, Saund. Refug. Bot. 3: t. 208. 1870. TYPE: PERU. Without locality, a cultivated specimen (LECTOTYPE, here designated: t. 208 of J. G. Baker (*l.c.*), curators of K and WELT were unable to find any type specimens).

Erect *shrub* to 1 m high, glabrate. *Leaves* ovate, acute, blade to 6.5 cm long by 4.5 cm wide, entire or less commonly sinuate-dentate or toothed with no more than 3 teeth per margin, the upper surface bright green. *Inflorescence* usually 1–2(–4) flowered (sometimes branched on cultivated plants from seed of *Leiva 138* but not mentioned in the original publication nor shown in the lectotype). *Peduncle* 4–9 mm long, green, terete. *Pedicel* 7–16 mm long, always longer than peduncle to which it is attached, green,

terete. *Flowers* nodding from 45° below horizontal to pendent. Flower buds triangular when viewed perpendicular to bud's length. Flowering calyx shiny green abaxially, 18–22 mm diam., lobe radius 9.5–10 mm, sinus radius 3–5 mm. *Corolla*, tube urceolate, limb completely and outwardly retrorse and 10-lobed, 8–10 mm long, 12–14.5 mm diam., whitish to pale yellow, remaining open at night. Base of the flower filling with orange-red nectar that is visible through the corolla. *Stamens* (not including expanded base) 14–15 mm long, exerted beyond corolla 7–9 mm. *Filaments*, slender part pubescent on basal half, the hairs purple, branched with up to 4 termini, the hairs to 0.7 mm long. *Anthers*, undehisced 2.6–3.0 mm long × 2.0–2.2 mm wide, dehisced 2–2.3 mm long. *Style* 13.8–15.7 mm long. *Stigma* exerted beyond anthers to 5 mm. *Ovules* 118–181 ( $n = 3$  ovaries) per ovary. Mature berries red according to collector, orange in greenhouse. Description based on living plants of *Leiva 138* (provided by S. Leiva, A. Sagástegui A. and M. O. Dillon). Chromosome number  $n = 12$  (this study, meiosis of anthers from plants from seeds of *Leiva 138*). See Macbride (1962) and Baker (*l.c.*) for other English descriptions.

*Distribution*: Known only from the Department of La Libertad, Province Otuzco, Peru, alt. 2500–3200 m. Roadsides, rock walls, and rocky areas.

*Local name*: “sogorome” (*Leiva 138*, *Sagástegui 11574*); “sorogome” (*Leiva & Leiva 118*).

*Uses*: Berries are edible (*Leiva 118 & 138*, *Sagástegui 11574*).

*Specimens examined*: PERU. **La Libertad**: PROV. OTUZCO: San Miguel (Camino Salpo-Samne), flores amarillo-verdoso, 2500 m, *S. Leiva & P. Leiva 118* (F); Salpo-Shitahuara (Al norte de Salpo), flores blancuecinas, 3100 m, *S. Leiva 138* (CONN, F); Cerro Ragache (Salpo), flores blancas y bayas globosas, 3200 m, *A. Sagástegui A. et al. 11574* (NY).

**Jaltomata viridiflora** (Humb., Bonpl. & Kunth) M. Nee & Mione, comb. nov. (Fig. 1B).

*Atropa viridiflora* Humb., Bonpl. & Kunth, nov. gen. sp. 3: 11, t. 196. 1818. *Hebecladus viridiflorus* (H.B.K.) Miers, London J. Bot. 4: 321. 1845. TYPE: COLOMBIA. Crescit in convalli Guaitarensi, inter urbem

Pasto et Chilanquer, *Humboldt & Bonpland* 2175 (HOLOTYPE: P!; ISOTYPE: B destroyed, photo of B specimen, F neg. 2531 at GH! and NY!).

*Hebecladus lanceolatus* Miers, London J. Bot. 4: 323. 1845. TYPE: ECUADOR. Hacienda de Pinantura, prope Quito, *Hartweg 1301* (HOLOTYPE: K!; ISOTYPE: LD!).

*Hebecladus mollis* Miers, London J. Bot. 7: 352, t. 33. 1848. TYPE: COLOMBIA. Plages de Combayma, *Goudot s.n.* (HOLOTYPE: K!). The seemingly distinctive toothed leaf margin of this holotype was seen on plants also having entire leaves, which are characteristic of the isotype of *A. viridiflora*.

*Herb to shrub, to 2 m high, sometimes scandent. Leaves and young axes velutinous to less commonly puberulent with multicellular, uniseriate, unbranched finger hairs, sometimes to mostly gland-tipped. Leaves entire to toothed, ovate to ovate-lanceolate, the apex acuminate. Inflorescence (1–)2(–4) flowered. Corolla tubular, the tube (1–)2 cm long, pale green, less commonly white or pale yellow, the five larger lobes alternate with five smaller lobules, all flaring. Anthers 1.7–2.2 mm long. Stigma and anthers sometimes differing in height by up to 5 mm, either may be exserted. Mature berries orange (“reddish” on *Fosberg 20426*), broader than high (oblate spheroid) and transversely oblate, 13–19 mm diam., 10–12 mm high (*Mione 458–460*). Chromosome number  $n = 12$  (Heiser, 1963). Description based on numerous herbarium and field-collected specimens from throughout the range of the species.*

Distribution: Andes of western Venezuela through Ecuador, alt. 2500–3400 m. Subparamo and disturbed habitats.

Local names: “uchuva blanca” (*Hawkes 422*); “chantilly” (*Køie 5258*); “uvilla comun” (*Mione 458*); “yerba-mora” (*Luteyn 6476 & 6497*); “uvilla de conejo,” “la vieja” (*Mexia 7586*).

Uses: Fruits not eaten (*Hawkes 422, Mione 458*).

Representative specimens: VENEZUELA. Mérida: Rangel, Parte baja de la cañada de La Mucuchache, la quebrada homónima, afluente del río Chama, 3400–3300 m, *L. Ruíz-Terán & M. Lopez-Figueiras 287* (MERF); trail leading from La Negrita to the Boquerón of the Quebrada de las Cañas, 2990–3300 m, *J. L. Luteyn et al. 6122* (NY). COLOMBIA. Antioquia: Municipio Jardín, Alto de Ventanas, 2400–2800 m, *R. Callejas et al. 3917* (NY); Boyaca: hacienda Retacuba, 3600 m, *P. J. Grubb et al. 244* (K, US); Caldas: above

Salento, path to Romerales, Amarguras, Finca Sta. Inés, 3200 m, *J. G. Hawkes 422* (K); Nariño: N end of Laguna de la Cocha, weed on cultivated slopes, 2850 m, *F. R. Fosberg 20426* (NY); Santander: quebrada de Pais, N of La Baja, ca. 3200 m, *E. P. Killip & A. C. Smith 18764* (GH, NY); without locality, 2300 m, *M. Køie 5258* (C). ECUADOR. Azuay: Nudo de Portete, pass between headwaters of the ríos Tarqui and Giron, 2744 m, *W. H. Camp E-2181* (NY); Carchi: common along Tulcán–El Carmelo road, 3290 m, *T. Mione & C. McQueen 458 and 459* (CONN), and direct (dirt) road between Tulcán and El Angel, 3300 m, *460* (CONN); Tulcán–Pun road bank, 3260 m, *Y. Mexia 7586* (K); Cotopaxi: 12.7 km from gasoline station at N end of Pilalo, on rd. to La Mana, 3180 m, *D. Spooner et al. 5091* (herbarium of T. Mione); Pichincha: declive oriental del Volcán Pichincha, near summit of Cruz Loma, 3400 m, *J. A. Steyermark 52383* (NY); Napo: 10 km E of Papallacta on road to Baeza, 2850 m, *L. Holm-Nielsen et al. 6814* (NY); Chiborazo–Cañar border: Between Sta. Rosa and Joyagshi, 2637 m, *W. H. Camp E-4014* (NY).

### *Jaltomata bicolor* (Ruiz López & Pavón) Mione, comb. nov. (Fig. 1C).

*Atropa bicolor* Ruiz López & Pavón, Fl. peruv. 2: 45. 1799. *Kukolis bicolor* (Ruiz López & Pavón) Raf., Sylva tellur. 55. 1838. *Hebecladus bicolor* (Ruiz López & Pavón) Miers, London J. Bot. 4: 322. 1845. TYPE: PERU. Haurocheri versus S. Matthaei, Surco et S. Joannis de Matucana vicos, *Ruiz López & Pavón s.n.* (HOLOTYPE: perhaps MA, not seen). No type specimens (or photographs) were present in a loan of specimens from MA. We postpone lectotypification until any specimens at MA that may not have been loaned are seen. We are confident about this new combination without having seen a type specimen because there are no *Atropa* species in the New World, the tubular, bicolored corolla described in the original publication of *A. bicolor* Ruiz López & Pavón is unique, and the *Jaltomata* specimens having this feature were collected in the region specified in the original publication of *A. bicolor*.

*Atropa biflora* Ruiz López & Pavón, Fl. peruv. 2: 44. t. 181b. 1799. *Ulticonia biflora* (Ruiz López & Pavón) Raf., Sylva tellur. 55. 1838. *Hebecladus biflorus* (Ruiz López & Pavón) Miers, London J. Bot. 4: 322. 1845. TYPE: PERU. Tarmae, Cantae et Huarocheri versus Huassahuassi, Culluay et Div. Joannis de Matucana vicos, *Ruiz López & Pavón s.n.* (HOLOTYPE: likely MA; ISOTYPE: B destroyed, photo of B specimen, F neg. 2530 at GH!) [Note: t. 181b is misleading because it does not show the corolla vesture that is shown on the lower part of the corolla on the photo of the isotype].

*Hebecladus intermedius* Miers, London J. Bot. 4: 323. 1845. TYPE: PERU. Puruchuca, *Mathews 524* (HOLOTYPE: K!).

*Hebecladus weberbaueri* Dammer, Bot. Jahrb. Syst. 37: 638. 1906. TYPE: PERU. Department of Ancash, Province Cajatambo, 3200–3400 m, *Weberbauer 2652* (HOLOTYPE: B destroyed, photo of B specimen, F neg. 2533 at GH!).

Woody *shrub* to 1 m. Young axes with dendritic hairs (sparse to dense); branches glabrate. *Leaves* single, paired or verticillate; usually ovate but variable in size, shape and margin. *Inflorescence* 2–4(–5) flowered. *Corolla* straight-tubular; bicolored, purple (rarely pink or yellow-green) proximal  $\frac{2}{3}$  and pale-green or cream distal  $\frac{1}{3}$ ; 2–3 cm long; with 5 narrowly triangular flaring lobes 3–5 mm long, vestiture of tube externally variable, dense to sparse, trichomes to 1.1 mm long uniseriate or dendritic (all conditions seen on *Saunders 1383*). *Anthers* blue or black. Style and stamens usually exerted, both up to 1 cm beyond corolla tube. According to Macbride (1962) berry white or rarely blue. Description based on numerous herbarium specimens from throughout the range of the species. For other English descriptions see Hooker (1845, *H. biflorus* with plate) and Macbride (1962, *H. bicolor*, *H. intermedius* and *H. weberbaueri*).

Distribution: Central Peru, alt. 3000–5000 m. Open and shrub-covered hillsides, grazed rocky slopes, moist ravines and crevices in stone walls.

Local name: “shuplac” (*López et al. 7601*).

Uses: “. . . fruit . . . eaten by natives” (*Metcalf 30270*).

Representative specimens: PERU. **Ancash**: Bolognesi, 9.7 km SW of highest point on road between Palivilca and Huaraz, 4000–5000 m, *W. D. Stevens 21952* (NY); Recuay, Km 107 between Recuay and Pativilca, 3300 m, *M. Dillon et al. 3178* (BH, F); Aija, en la bajada de Tranca hacia Huayan, 3200–3000 m, *C. Ochoa & A. Salas 15168* (NY); Recuay, Culgumarca (Pativilca-Conococha), 3600 m, *A. López M. et al. 7601* (NY); **Huancavelicia**: Castrovirreina, near Córdova, along rock wall at side of stream in shade, 3175 m, *R. D. Metcalf 30270* (GH); **Lima**: Huaros, Canta, hills about 1 km above Huaros, 3700 m, *S. G. Saunders 1383* (K); Huarochirí, San Mateo, 200 yds up valley of Río Atacra, from junction with Río Rimac, Km 110 Central Hwy, 3476 m, *S. G. E. Saunders 821* (K); Río Blanco, 3000–3500 m, *E. P. Killip & A. C. Smith 21558* (NY).

**Jaltomata propinqua** (Miers) Mione & M. Nee, comb. nov. (Fig. 1D, E).

*Saracha propinqua* Miers, Ann. Mag. Nat. Hist. ser. 2, 3: 446. Miers, Illustr. S. Amer. Pl. t. 38 1849. *Hebecladus propinquus* (Miers) Bitter, Feddes Repert. Spec. Nov. Regni Veg. 17: 246. 1921. TYPE: PERU. Lima. Cuesto de Puruchuco, *Mathews 774* (HOLOTYPE: K!; ISOTYPE: W, photo of W sheet, F neg. 33136 at GH! and WIS!).

Suffrutescent to small *shrub*, to 1.2 m. Young branches, leaves and the abaxial face of the corolla and calyx covered with multicellular, erect finger hairs (sometimes gland-tipped, uniseriate but sometimes branched on calyx). *Leaves* single or paired, lanceolate with the apex acuminate, to ovate with the apex obtuse, entire to sinuate-crenate, to 9.5 cm long by 5.5 cm wide but usually somewhat smaller. *Inflorescence* 4–7(–10) flowered, rarely branched. *Corolla* with a short tube (5 mm, evident only on some herbarium specimens) and reflexed limb (Fig. 1D) 2 cm diam., center dark violet to blue, paler peripherally. Filaments densely villous proximally with uniseriate finger hairs, glabrous distally (Fig. 1D). *Anthers* 1.3–2 mm long, dark. Style twice as long as stamens. Description based on the herbarium specimens cited below. See Bitter (1921) and Macbride (1962) for other descriptions, in Latin and English, respectively.

Distribution: Peru, Department of Lima, mostly prov. Huarochirí, alt. usually 2000–3000 m (extremes 1800 and 3800 m). Rocky and gravelly places, dry open hillsides, and river and stream banks.

Local name and uses: none mentioned on herbarium specimens.

Representative specimens: PERU. **Lima**: Province Canta, Arahua, ladera rocosa, 2600 m, *C. Ochoa & G. Vilcapoma 279* (MO); Arahua, a orillas del río, 3000 m, *G. Vilcapoma S. 55* (US); Province Huarochirí, Km 82 carretera Lima–Huancayo pasando de Matucana hacia Ticlio, 2600 m, *C. Ochoa & A. Salas 15207* (F, NY); Encima de Langa, 2000 m, *C. Ochoa 14610* (NY); Cerca de Pachacosa, 3800 m, *C. Ochoa 7425* (F, US); Matucana, Km 83 Carretera Central, 8500–9500 ft, *S. G. E. Saunders 303* (GH); Santa Eulalia valley, Río Chira, at Pariagancha, 2600 m, *P. C. Hutchison & C. Saravia 7107* (K, MO, NY); distrito Santiago de Tuna, frente al Monte Zárate, al norte de Lucmani, 3200 m, *C. Ochoa & A. Salas 15103* (US); Huquicha arriba de Surco, pradera con arbustos, 3000 m, *E. Cerrate 5852* (MO); Huaquicha, arriba de Surco, 1800 m, *C. Ochoa 1159* (NY); quebrada San Juan, entre Surco y Matucana, pedregoso, falda cerro, 2300 m, *R. Ferreyra 5422* (US); Surco, 2034 m, *J. Soukup 3731* (F, US); Surco, shore of rivulet, c. 2000 m, *E. Asplund 11061* (US); quebrada Ayas ó San Juan, entre Surco y Matucana, 2300 m, *R. Ferreyra 5417* (US); quebrada San Juan, entre Surco y Matucana, 2200–2300 m, *R. Ferreyra 5429* (MO, US); valley Río Rimac, near Lima–Oroya highway at Km 81 east of Lima, 2250 m, *T. H. Goodspeed & R. D. Metcalf 30242* (US).

**Jaltomata umbellata** (Ruiz López & Pavón)  
Mione & M. Nee, comb. nov. (Fig. 1F).

*Atropa umbellata* Ruiz López & Pavón, Fl. Peruv. 2: 44, t. 181, fig. a. 1799. *Hebecladus umbellatus* (Ruiz López & Pavón) Miers, London J. Bot. 4: 322. 1845. TYPE: PERU. Chancay, Limae et Lurin, *Dombey s.n.* (LECTOTYPE, here designated: P!).

*Hebecladus turneri* Miers, London J. Bot. 4: 323. 1845. TYPE: Without locality, evidently from a cultivated specimen *vide* Miers, *D. Turner s.n.* (HOLOTYPE: K!).

*Shrub* to 1 m. Axes and abaxial face of calyx bearing both gland-tipped finger hairs and shorter, non-glandular dendritic hairs interspersed among each other. Leaf blades typically entire, ovate, the apex acute, less than 11 cm long and 8 cm wide. *Inflorescence* 4–9 flowered. Peduncle 4.5–11 mm long. Pedicel 6–9 mm long, with dense gland-tipped finger hairs. Lobes of calyx and corolla triangular to narrowly triangular. Flowering calyx 8–9 mm diam., lobe radius 4–5 mm long, sinus radius 2 mm long. *Corolla* tubular with a broad limb. *Corolla* tube 6.5–8 mm long, partially to nearly completely filled with red nectar on living material. Corolla limb rotate to campanulate, cream or pale-green, 14–23 mm diam., remaining open at night. *Stamens* (including expanded base) 9.2–10.9 mm long, exerted from corolla up to 7 mm. Filaments, slender part with a few to several finger trichomes to 0.5 mm long on basal  $\frac{1}{4}$ – $\frac{1}{3}$  of the length. *Anthers* undehisced 1.9–2.1 mm long  $\times$  1.4–1.5 mm wide, dehisced 1.2–1.3 mm long. Style 8–13.3 mm long. Stigma exerted beyond anthers up to 8 mm but sometimes not exerted, overhead dimensions 0.46–0.56 mm by 0.4–0.46 mm, often protruding through the otherwise closed corolla prior to anthesis. Ovules 70–78 per ovary. Fruiting calyx-lobe radius 6–8 mm. Mature berry orange in greenhouse. Seed (field collected) 1.36–1.48 mm long. Chromosome number  $2n = 24$  (Diers, 1961),  $n = 12$  (this study, meiosis of anthers from plants from seeds of *Chavez s.n.*). Description based on living plants of *Chavez s.n.*, provided by R. Chavez and T. Davis IV. See Bitter (1924) and Macbride (1962) for other descriptions, in Latin and English, respectively.

Distribution: Peru, Department of Lima, coastal desert (Loma formation), alt. 300–500 m, apparently rare.

Local name and uses: none mentioned on herbarium specimens.

Specimens examined: PERU. Lima: Chancay, Lomas of Lachay, ca. 105 km N of Lima on Pan Am Hwy, 300–500 m, *M. O. Dillon et al. 3626* (BH, NY); Atacongo Lomas, in the sheltered loam pockets, 32 km S of Lima, 8 km east of Pachacamac Ruins, not common here, 400 m, *H. E. Stork et al. 9294* (GH, K); hills of San Agustin (Loma-Formation), 350 m, *A. Weberbauer 5223* (GH); and same locality *A. Weberbauer 5228* (GH); sandy hills of Lachay-Lima, dry and hot desert, *R. Chavez s.n.* (plants grown from seeds, field voucher not seen).

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