
Three New Species of *Jaltomata* (Solanaceae) from Ancash, Peru

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ABSTRACT. Three new *Jaltomata* species from the department of Ancash, Peru, are described and illustrated. The three species are distinguished from others in the genus by features of the flowers, hairs, and leaves. Fruits of *Jaltomata cajacayensis* S. Leiva & Mione are gathered for consumption. *Jaltomata lomana* Mione & S. Leiva is known only from a single fog-dependent plant community, a lomas formation. *Jaltomata yungayensis* Mione & S. Leiva is widely distributed at high elevations.

Species of *Jaltomata* have simple, often geminate leaves, 5-merous flowers with rotate to campanulate or tubular corollas, and a bicarpellate ovary housing numerous ovules. The inflorescence is umbellate; anthers dehisce longitudinally and the ovary is girdled by a disk at its base. The berry, orange or red on most South American species and dark purple to black on most Central American species, is not enclosed by the calyx and is often edible (Leiva, 1998; Mione, 1992). The genus includes about 50 herbaceous and shrubby species distributed from Arizona, U.S.A., to Bolivia, with one species each on the Galápagos Islands and Greater Antilles (Mione et al., 1993). These descriptions of three new species are a contribution to ongoing systematic studies of this genus (e.g., Mione, 1999; Mione & Leiva, 1997).

MATERIALS AND METHODS

The compound light microscope was used for measurement of stalked glands and stigma papillae; flowers placed in 70% ethanol in Peru were used. The sizes of structures as indicated by the scale bars in the figures may differ somewhat from the sizes given in the descriptions because alcohol-pre-

served flowers were used for drawing, while dried specimens were used for measurements. Seeds of *J. lomana* were not available for study.

Trichomes are not gland-tipped unless indicated as such. Finger hairs are uniseriate, unbranched, and multicellular. Branchlet hairs (Fig. 3B) have multiple termini (Seithe, 1979). A gland-tipped finger hair has a bulbous terminal cell (Fig. 1C) that stains densely with neutral red, as does the multicellular head of a stalked gland (illustrated in Mione & Serazo, 1999).

Jaltomata cajacayensis S. Leiva & Mione, sp. nov. TYPE: Peru. Ancash: Bolognesi, highway from Pativilca to Recuay and Huaraz, km 90, town of Cajacay, 2540 m, open sun, roadside with *Agave andina* and *Carica candicans*, 18 Jan. 1998, T. Mione, S. Leiva G. & L. Yacher 624 (holotype, NY; isotype, CONN). Figure 1.

Planta fruticosa; axes juvenes, folia, faciesque abaxialis calycis obtecta pilis indivisis apice glandiferentibus; folia ovata vel deltata, ad 9 cm longitudine, 10 cm latitudine, petiolo ad 3.2 cm longitudine; inflorescentia floribus 14 ut maximum; calyx 13 mm diametro maturitate fructus; corolla brevissime, tubulosa, limbo reflexo 10.3–19.2 mm diametro, olivacea; filamenta villosa secus proximales $\frac{1}{2}$ partes longitudinis; bacca aurantiaca, ad 9 mm diametro.

Shrub to 1.1 m high. Young axes, peduncles, pedicels, and abaxial faces of calyx villous with erect, gland-tipped finger hairs to 3 mm long. Woody stems glabrous, terete, to at least 1.5 cm diam. Leaves alternate, often geminate, the blade ovate or deltoid, to 9 × 10 cm, pubescence of gland-tipped finger hairs on both faces, the margin repand, sinuate or dentate with up to 5 pairs of broad, rounded teeth; petiole to 3.2 cm long. Inflorescence axillary or less commonly arising from a

stem dichotomy, umbellate, 6- to 14-flowered. Peduncle to 15 mm long, pedicel to 20 mm long. Calyx green at anthesis, 3–4 mm from pedicel to tip of lobe, ciliate with both branchlet hairs to 0.25 mm long and gland-tipped finger hairs to 1 mm long; adaxially pubescent with finger hairs to 0.4 mm long; calyx at fruit maturity (from *Leiva 1739*) stellate and 13 mm diam. Corolla short-tubular with a reflexed limb, dull olive-green, the tube (observed by pressing) $1.5\text{--}2 \times 6.5\text{--}8$ mm, within the tube two dark green maculae flanking the radial vein extending to the tip of each corolla lobe, narrow purple ring surrounding mouth of tube, the limb 10.3–19.2 mm diam., the 5 lobes alternating with lobules, adaxially glabrous within tube and the limb pilosulose, the hairs 0.21–0.5 mm long, abaxially with finger hairs, some gland-tipped, 0.15–1.2 mm long, ciliate with finger hairs to 0.6 mm long. Stalked multicellular glands 75–90 μm long, abundant on both faces of calyx and abaxial corolla, uncommon on adaxial corolla. Stamens 7 mm long; filaments villous on proximal $\frac{1}{2}$ of the length, the finger hairs purple, to 1.5 mm long, decreasing in length distally; anthers cream-colored, 1–2.1 mm long. Style 3.5–10 mm long; stigma capitate, dark green and exerted to 5.5 mm beyond anthers on living plants, 0.5–0.9 mm wide, the papillae 45 μm long. Nectar disk broad, girdling base of the ovary (Fig. 1H). Gynoecium glabrous. Mature berries orange (not seen, from informant at type locality), nearly spherical, 5–9 mm diam. Seeds (*Leiva 1739*) numerous, subtriangular to reniform, alveolate, $1.4\text{--}1.7 \times 1.1\text{--}1.3$ mm, 0.5–0.55 mm thick.

Uses, habitat, local name, phenology. When the type collection was made, two women told us that the fruits are sweet and commonly eaten by everyone, and that the plants are not deliberately cultivated but are common in and along the edge of

agricultural fields. One woman told us that a tea made from leaves and flowers is used to treat stomach ache and children's diarrhea, and to bring regularity to the menstrual cycle. The Quechua name is "musho." Flowering in January, and flowering and fruiting in November.

Jaltomata cajacayensis is similar to *J. propinqua* (Miers) Mione & M. Nee in that both bear gland-tipped hairs and have a short-tubular corolla with a much broader limb. *Jaltomata cajacayensis* has a green corolla and cream-colored anthers, the style is exerted a few millimeters beyond the stamens, and it is known only from the vicinity of one montane town (Cajacay) in the department of Ancash; *J. propinqua* has blue to purple corollas and anthers, the style is twice the length of the stamens, and it is widely distributed in the department of Lima, Peru (Mione et al., 1993).

Paratypes. PERU. **Ancash:** Bolognesi, Cajacay, 2600 m, 18 Nov. 1995, *Leiva 1739* (AAU, CCVS, CORD, F, HAO, HUT, MO, NY, USM), 18 Jan. 1998, *Leiva et al. 2132* (F, HAO).

***Jaltomata lomana* Mione & S. Leiva, sp. nov.**

TYPE: Peru. Ancash: Casma, Lomas de Mongon, $9^{\circ}37'S$, $78^{\circ}43'W$, 450 m, 17 Sep. 1938, *H. E. Stork, O. B. Horton & C. Vargas C. 9183* (holotype, K; isotypes, G, GH). Figure 2.

Planta fruticosa; axes juvenes, folia, calyx fere glaber; folia ovata ad 6 cm longitudine, 3.4 cm latitudine, petiolo ad 7 mm longitudine; inflorescentia floribus 7 ut maximum; calyx 8–11 mm diametro, fructu; corolla breviter tubulosa, limbo patente 11–14 mm diametro, alba; filamenta villosa secus proximale dimidium longitudinis; bacca ad 6 mm diametro.

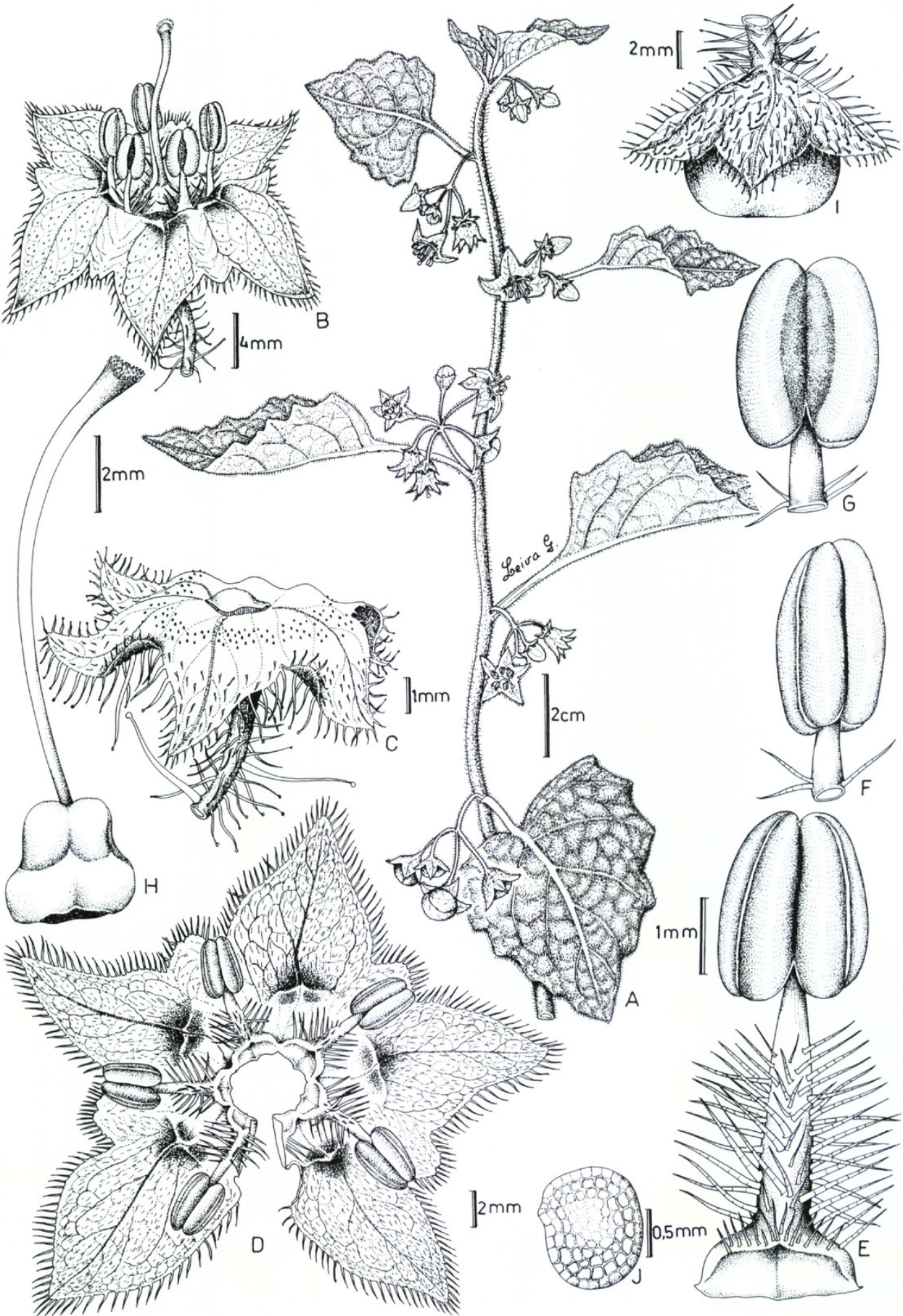
Shrub to 8 dm tall. Young axes, peduncles, pedicels, leaves, and calyx nearly glabrous, the finger hairs to 0.15 mm long where present. Larger

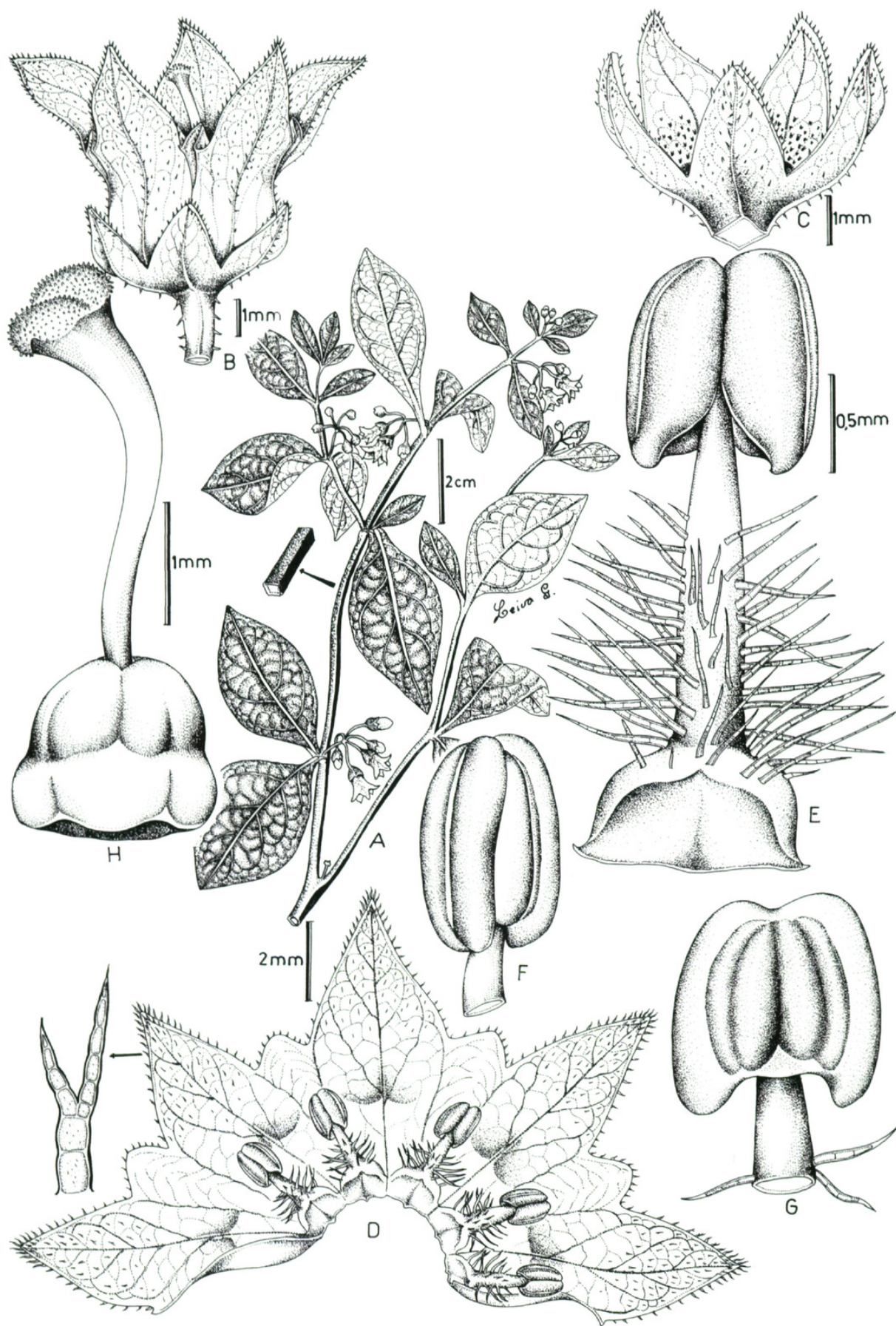
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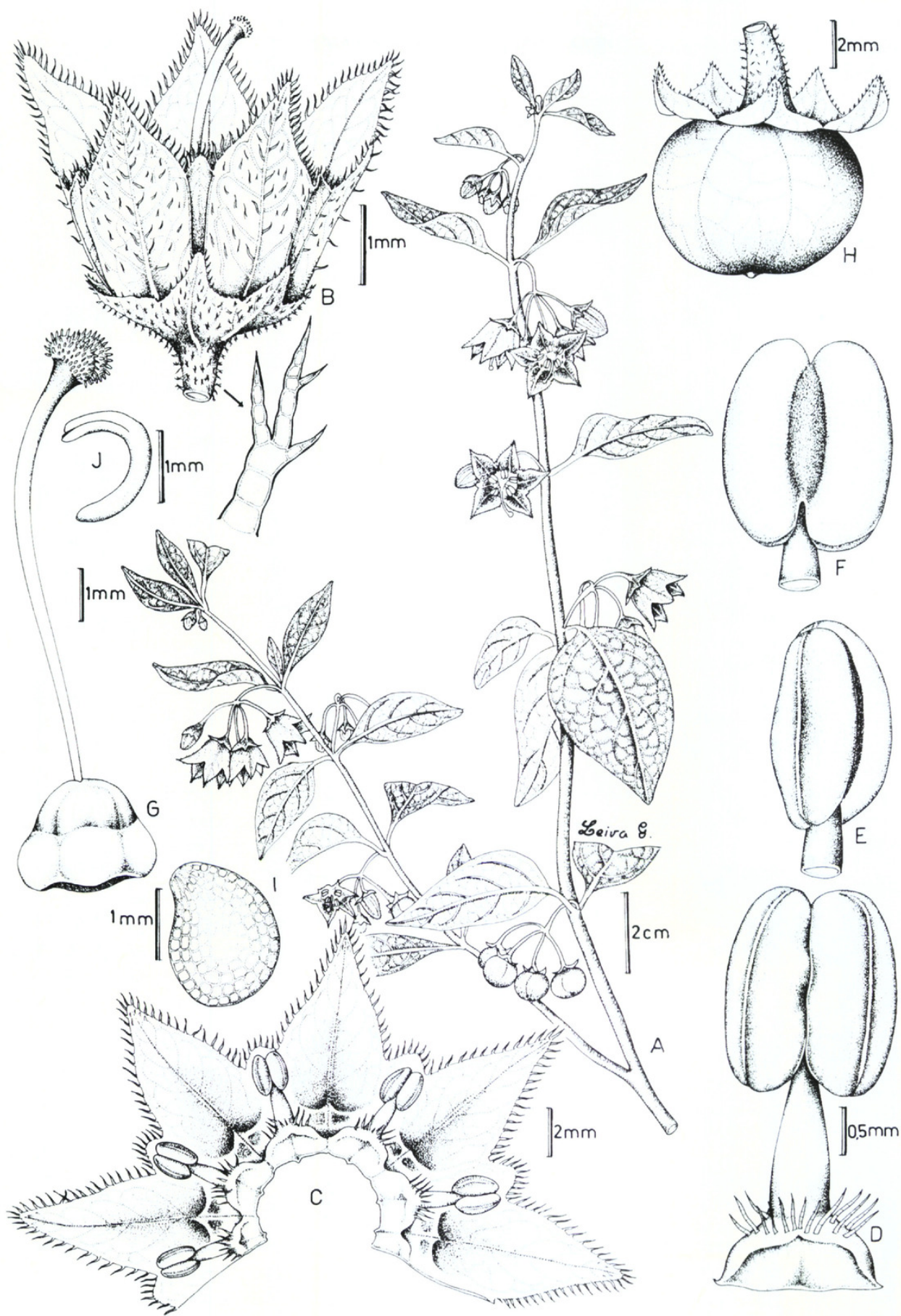
Figure 1. *Jaltomata cajacayensis* S. Leiva & Mione. —A. Branch with inflorescences and leaves. —B. Flower, oblique view. —C. Calyx, lateral view. —D. Corolla, overhead view showing basal adnation of stamens. —E. Stamen, ventral view, with abundant finger trichomes, base flattened by adpression to ovary. —F, G. Anther and distal portion of filament, lateral and dorsal views, respectively. —H. Gynoecium including basal disk. —I. Berry with calyx, lateral view. —J. Seed. (From *S. Leiva et al. 2132*, drawn by S. Leiva.)

Figure 2. *Jaltomata lomana* Mione & S. Leiva. —A. Branch with inflorescences and leaves, with segment of stem 2 mm wide to left. —B. Flower, lateral view. —C. Calyx, lateral view. —D. Corolla, dissected, overhead view showing basal adnation of stamens, with marginal hair 0.12 mm long to left. —E. Stamen, ventral view, with abundant finger hairs, base flattened by adpression to ovary. —F, G. Anther and distal portion of filament, lateral and dorsal views, respectively. —H. Gynoecium including basal disk. (From *S. Leiva et al. 2140*, drawn by S. Leiva.)

Figure 3. *Jaltomata yungayensis* Mione & S. Leiva. —A. Branch with inflorescences and leaves. —B. Flower, lateral view, with branchlet hair 0.15 mm long at lower right. —C. Corolla, dissected, overhead view showing basal adnation of stamens. —D. Stamen, ventral view, with finger trichomes, base flattened by adpression to ovary. —E, F. Anther and distal portion of filament, lateral and dorsal views, respectively. —G. Gynoecium including basal disk. —H. Berry with calyx, lateral view. —I. Seed. —J. Embryo from seed. (From *S. Leiva et al. 2138*, drawn by S. Leiva.)







branches glabrous, terete. Leaves alternate, often geminate, blade elliptical to ovate, to 6×3.4 cm, the margin entire, ciliolate with finger hairs to 0.15 mm long, the apex acute, the base symmetrical to somewhat oblique; petiole to 7 mm long. Inflorescence axillary or less commonly arising from a stem dichotomy, umbellate, 5- to 7-flowered. Peduncle 3–8 mm long; pedicel 5–14 mm long. Calyx at anthesis green, 3–4.8 mm from pedicel to tip of lobe, ciliolate with finger hairs to 0.1 mm; 8–11 mm diam. on mature (?) fruit. Corolla short-tubular with a spreading limb, white, the tube 1.6×4.0 – 4.3 mm at base (obscured by pressing), the limb 11–14 mm diam., 5-lobed, adaxially with finger hairs 0.12 mm long, erect and abundant on limb, absent in tube, abaxially with finger hairs 0.09 mm long, erect and concentrated on veins, margins ciliate with both finger and branchlet hairs 0.12 mm long. Stalked multicellular glands 55–75 μ m long, abundant on both faces of the young leaves and calyx, and the abaxial face of the corolla (Mione *et al.* 631). Stamens 5.5–6.5 mm long; filaments villous on proximal $\frac{1}{2}$, finger hairs to 0.75 mm long; anthers 0.6–1.5 mm long. Style 4.7–5.4 mm long, slender and straight; stigma capitate, shallowly bilobed, 0.36–0.51 mm wide, the papillae (Mione *et al.* 631) 20–25 μ m long. Nectar disk at base of ovary. Berries (mature?) 4–6 mm diam.

Distribution and habitat. Known only from a single small mountain on the coast, the plant community of which is fog-dependent and therefore known as a lomas formation (Rundel *et al.*, 1991). Flowering in January and September, and fruiting in September.

Jaltomata lomana is an erect, nearly glabrous shrub with petioles to 7 mm long and a white, short-tubular corolla having a spreading limb 11–14 mm in diameter. The type specimen of *J. lomana* (Stork *et al.* 9183) was considered to represent *Saracha dentata* Ruiz & Pavón (Macbride, 1962), but the latter species, now *J. dentata* (Ruiz & Pavón) Benítez, is procumbent, has rotate-campanulate purple corollas, and does not occur in lomas formations.

Paratypes. PERU. **Ancash:** Prov. Casma, km 350 of PanAmerican highway, walk ca. 4 km NW across desert to and up Lomas de Mongon, 630 m, growing in the protection of boulders, not on the open hillside, 20 Jan. 1998, Leiva *et al.* 2140 (F, HAO), Mione *et al.* 631 (MOL, NY).

Jaltomata yungayensis Mione & S. Leiva, sp. nov.

TYPE: Peru. Ancash: Yungay, Cordillera Blanca, about 200–500 m into Huascarán National Park along road from city of Yungay to lake Chinan Cocha and lake Llanganuco, sunny, rocky roadside with shrubs, 3525 m, 19 Jan. 1998, T. Mione, S. Leiva G. & L. Yacher 628 (holotype, NY; isotypes, CONN, MOL). Figure 3.

Planta fruticosa; axes juvenes, folia, faciesque abaxialis calycis puberula, pilis ramosis vel simplicibus; folia lanceolata vel elliptica, ad 6 cm longitudine, 2.1 cm latitudine, petiolo ad 2 cm longitudine; inflorescentia floribus 11 ut maximum; calyx 10 mm diametro maturitate fructus; corolla campanulata vel rotata, 11.5–15.5 mm diametro, purpurea, fauce viride; filamenta villosa secus proximalem $\frac{1}{2}$ partem longitudinis; bacca aurantiaca, ad 8 mm diametro.

Shrub to 2.3 m high. Young axes, peduncles, pedicels, leaves, and abaxial faces of calyx puberulent, with both branchlet and finger hairs to 0.15 mm long. Woody stems brown, terete and hollow, glabrous with age. Leaves alternate, often geminate, the blade lanceolate to elliptical, to 4.9 (– 6) $\times$ 2.1 (– 4.8) cm, margins entire to repand, apex usually acute, the base of some leaves somewhat oblique; petiole to 2 cm long. Inflorescence axillary or less commonly arising from a stem dichotomy, umbellate, sometimes branched, 4- to 11-flowered. Peduncle to 10 mm long; pedicel to 9 mm long. Calyx green at anthesis, 2.5–3 mm from pedicel to tip of lobe, adaxially glabrous, margins ciliate with finger hairs to 0.25 mm long; at fruit maturity to 10 mm diam. Corolla campanulate to rotate, 11.5–15.5 mm diam., 5 lobes alternating with inconspicuous lobules (obscured by pressing); dark purple with a pale green throat having 5 pairs of dark-green maculae in a ring, each pair of maculae straddling the main vein that extends radially to the tip of the corolla lobe, abaxial face pubescent with finger hairs, and a few branchlet hairs, to 0.9 mm but commonly 0.3 mm long, adaxial face glabrous, margins off-white, ciliate with finger hairs to 0.75 mm long. Stalked multicellular glands 75–90 μ m long abundant on abaxial and adaxial faces of calyx and abaxial face of corolla. Stamens 2.8–3.9 mm long; filaments villous on proximal $\frac{1}{2}$, finger hairs unpigmented, 0.3 mm long; anthers cream-colored, 1.25–1.55 mm long. Style 6.4–7.6 mm long, straight. Stigma capitate, shallowly bilobed (obscured by pressing), 0.54–0.72 mm wide. Nectar disk at base of ovary, orange on living plants but red/orange nectar not observed. Gynoecium glabrous. Berries subspherical, to 8 mm across, orange at maturity. Seeds numerous, subreniform, alveolate, 1.6 – 1.8×1.3 – 1.5 mm, 0.45–0.54 mm thick. Infructescence up to 8-fruited.

Habitat, phenology, and local name. *Jaltomata yungayensis* has been collected from 3000 to 4150 m on steep south-facing scree slopes, in shrublands, and on roadsides among shrubs. Flowering and fruiting in January, October, and December, and flowering in April and May. A local name is

“lampuxso,” and fruits are not eaten (*Leiva et al.* 2139).

Jaltomata yungayensis is similar to *J. diversa* (Macbride) Mione: both are shrubs of high altitude, and have branchlet hairs on young axes and leaves, and rotate to campanulate corollas. *Jaltomata yungayensis*, from Ancash, has pedunculate inflorescences, and the corolla is purple with a green throat. In contrast, *J. diversa* from the departments of Apurímac, Arequipa, Ayacucho, and Cuzco, Peru, lacks peduncles (umbels are sessile) and has a white corolla (Mione, 1999).

Paratypes. PERU. **Ancash:** Prov. Yungay, Huascarán National Park, regione Huaraz, 13 Oct. 1976, *Bernardi et al.* 16680 (G, NY); Huascarán National Park, Llanganuco Sector, near park entrance, alt. 3330–3525 m, 30 Dec. 1984, *Smith & Goodwin* 8875 (NY), 19 Jan. 1998, *Leiva et al.* 2138 (CONN, HAO); along road from Yungay to lake Llanganuco, pueblo de Huashau, 3000 m, 19 Jan. 1998, *Leiva et al.* 2139 (HAO), *Mione et al.* 629, 630 (CONN); Prov. Huaylas, Huascarán National Park, Quebrada Santa Cruz between Lago Santa Cruz Chico and Cashapampa exit, 3870–3350 m, 17 Jan. 1985, *Smith et al.* 9333 (MO); Huascarán National Park, Auquispuquio area of ruins, 3800–3900 m, 7 Apr. 1986, *Smith et al.* 11992 (MO, NY); Pucapampa (Lampanín-Huaylas), 4150 m, ladera, 3 May 1987, *Mostacero & Leiva* 1897 (HUT, NY); Prov. Corongo, Cerro Clarinirka (arriba de Corongo), 3500–3600 m, 7 Aug. 1993, *Leiva & Lezama* 865 (HAO), 28 June 1998, *Leiva et al.* 2200 (HAO).

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