Moussonia adpressipilosa (Gesneriaceae), a New Solitary-Flowered Species from Mexico and Guatemala

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Abstract. *Mousonnia adpressipilosa* D. L. Denham ex Ramírez-Roa (Gesneriaceae), a new solitary-flowered species from southern Mexico and Guatemala, is described and illustrated. It has been collected principally in Chiapas, Mexico, with only one location in the Sierra de los Cuchumatenes, Guatemala. Although the possession of solitary flowers is considered unusual in *Moussonia* Regel, an increase in the number of species both validly published and undescribed with this condition indicates the opposite. The combination of characteristics that distinguish the new species from other solitary-flowered species are principally the whitish strigose indumentum; the shallowly serrated and revolute leaves; the flat adaxial and abaxial surface of the leaves, adaxial surface green, abaxial surface reddish; and flowers with thick, narrow, slightly ventricose, and gradually widening tubular corollas. A key for the solitary-flowered species of *Moussonia* is included.

Resumen. *Moussonia adpressipilosa* D. L. Denham ex Ramírez-Roa (Gesneriaceae) es una nueva especie de flores solitarias del sur de México y Guatemala, que se describe e ilustra. Ha sido colectada principalmente en Chiapas, México y en una sola localidad en la sierra de los Cuchumatenes, Guatemala. Aunque la presencia de flores solitarias es considerada poco común en *Moussonia* Regel, el aumento en el número de especies tanto validamente publicadas como no descritas aún con esta condición, indica lo contrario. Las características que distinguen a la nueva especies de otras de flores solitarias son principalmente el indumento estrigoso blanquecino, hoja ligeramente aserradas y revoluta, haz y envés planos, haz verde, envés rojizo y flores tubulares gruesa, angosta, ligeramente ventricosa y gradualmente ensanchada hacia el limbo. Se incluye una clave de identificación para las especies de *Moussonia* con flores solitarias.

Key words: Gesneriaceae, Guatemala, Mexico, *Moussonia*.

Moussonia Regel is a Neotropical genus of Gesneriaceae distributed from northern Mexico (Sonora, Durango, Querétaro, and San Luis Potosí) to Panama, with 11 species (Wiehler, 1983). It was previously treated as a section of the closely related *Kohleria* Regel, but Wiehler (1975) recognized the genus and transferred 11 species into *Moussonia* from *Kohleria* sect. *Moussonia* (Regel) Fritsch. Kvist and Skog (1992), in their revision of the genus *Kohleria*, mentioned 12 species of *Moussonia*. Burtt and Wiehler (1995) published the most recent classification of the Gesneriaceae, and they recognized *Moussonia* as a genus with 11 species. The present paper is part of a revision of the genus *Moussonia*, as a doctoral thesis, and I currently estimate that there are about 24 species in the genus, some of them new.

Solitary flowers in *Moussonia* are considered to have arisen through the reduction of cymes (Wiehler, 1983), a hypothesis that is supported by the presence of a pair of bracts on the pedicel. Morton (1967: 73) stated that this condition is aberrant and contradictory in *Moussonia*. However, I have observed this condition in several species, such as *M. ampla* L. E. Skog, *M. fruticosa* (Brandegee) Wiehler, *M. rupicola* (Standley & L. O. Williams) Wiehler, *M. serrulata* (C. V. Morton) Wiehler, *M. viminalis* (Brandegee) Wiehler, and at least three undescribed taxa. Additionally, the condition of solitary flowers or inflorescence pattern, features of the leaves such as the pattern of venation, trichome type, presence of domes on the abaxial leaf surface, as well as other features of the calyx and corolla, are all useful taxonomic characters to distinguish species in *Moussonia* (Ramírez-Roa & Varela, in prep.).

Despite being represented by a limited number of collections, the description of the new species from Mexico, *Moussonia adpressipilosa*, is supported based on the morphological characters previously mentioned.

Moussonia adpressipilosa D. L. Denham ex Ramírez-Roa, sp. nov. TYPE: Mexico. Chiapas: Km 19, Colonia Cuahutemoc, Mpio. La Trinitaria, *A. Shilom Ton 8148* (holotype, MEXU-663939; isotype, MO). Figure 1.

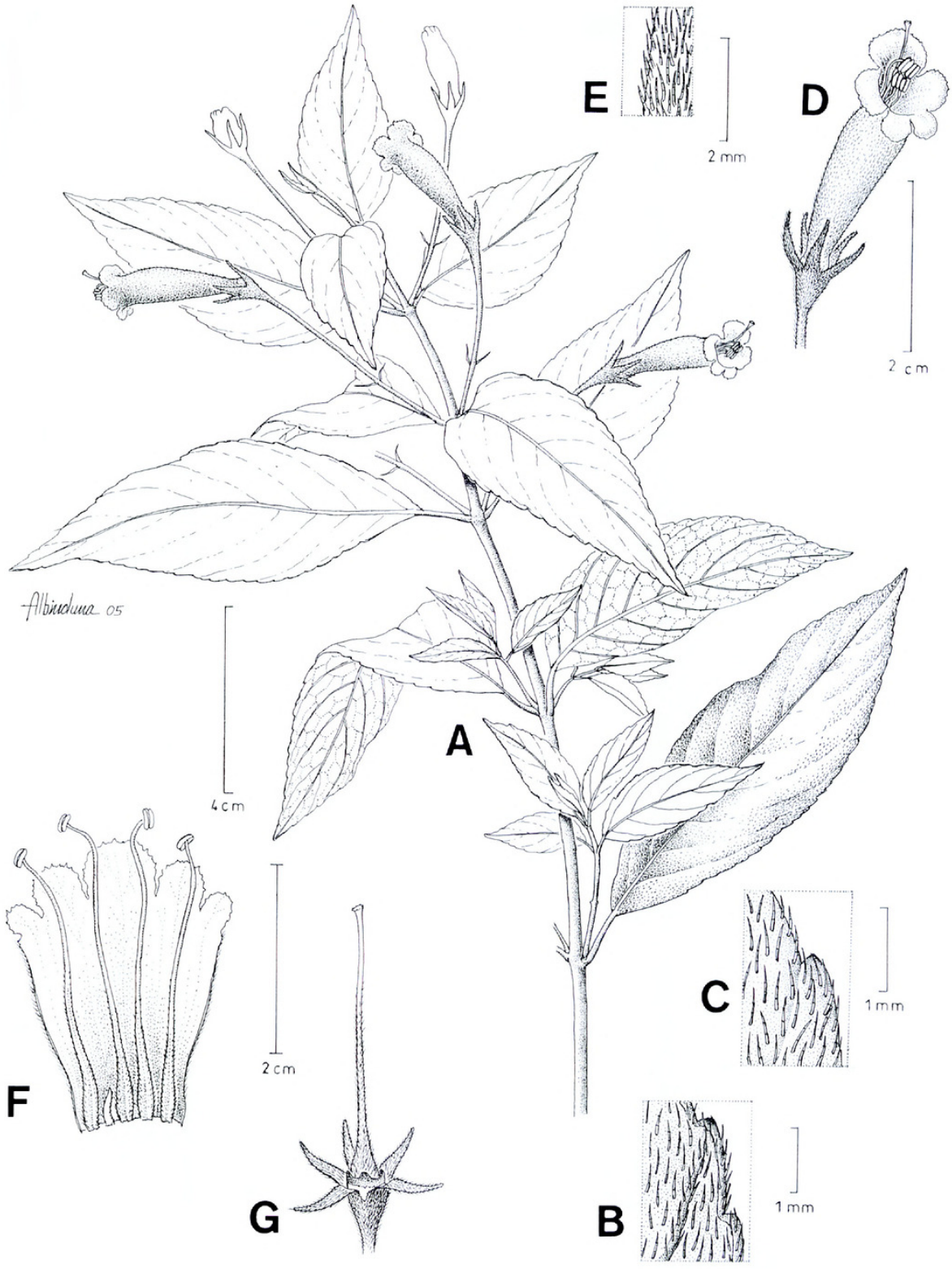

Figure 1. *Moussonia adpressipilosa* D. L. Denham ex Ramírez-Roa. —A. Habit. —B. Abaxial leaf surface. —C. Adaxial leaf surface. —D. Flower. —E. Surface of corolla tube. —F. Stamens and staminode. —G. Pistil and glandular disc. A (leaves)–C drawn from *Miranda 6192*; A (flowers), D–G drawn from *Shilom Tom 8148*.

Moussoniae fruticosae (Brandegee) Wiehler affinis, sed differt indumento strigoso albido plantam totam obtegenti, pedicello calycis basem versus amplificanti, tubo calycino turbinato-triangulari, lobis subulatis, venis indistinctis, sinubus plus minusve rotundatis, corolla tubulari fere recta, angusta, vix ventricosa, gradatim dilatata, non translucenti.

Shrub, 0.8–1.2 m tall; stems slender, branched above the base, terete, the basal woody stems reddish with sparse white strigose pubescence, the new growth greenish, densely white strigose; base of each trichome lacking a multicellular ring of epidermic cells;

stem surfaces with small, elliptic, red spots; nodes with a pair of evident, circular, shiny, reddish, fleshy dots at the base of petioles. Leaves opposite, those of a pair mostly unequal, the smaller 4.3–6 × 1.6–3.2 cm, the larger to 4.9–9.5 × 2.3–3.5 cm; petiole 5–8(19) mm, with pubescence as in the stem; blades elliptic, slightly oblique, crustaceous, light silvery green or reddish green abaxially, darker green adaxially, with pubescence as in the stem; margin lightly revolute, shallowly serrate, with cunonioid tooth, with 15 to 22 hydathode-tipped teeth on each side, sinuses rounded, apex of tooth acuminate; venation pinnate, primary vein slightly curved, not impressed adaxially, conspicuous abaxially, strigose adaxially; secondary veins semi-craspedodromous, proximal portion of the blade more acute than distal portion, 6 to 8 pairs, tertiary venation transverse; abaxial blade surface flat, slightly strigose, stomata evident, apparently without domes. Flowers solitary in the axils of new growth, rarely 2 on the same peduncle, peduncle slender, 0.7–2.5 cm long, with 2 filiform bracts 3–3.5 × 0.16–0.5 mm; pedicel 1.7–2.4(–4) cm, enlarged at the apex below the floral tube, the entire flower stalk with pubescence and spots as on the stems. Calyx tube turbinate-triangular, densely white appressed-villose throughout, 3–4 × 2.5–3 mm, lobes subulate, abruptly tapering, spreading, 4–8(9) × 1.3–2 mm, margin entire, generally slightly concave at the base of one side and slightly convex at the base of the other side, sinus almost rounded, veins obscured by the trichomes; corolla tubular, straight, narrow, lightly ventricose and gradually widening, thick, red to red-orange, densely strigose, except for the glabrous ventral and dorsal portions of the limb that are covered by the lateral lobes in bud, cylindric trichomes with some septa filled with anthocyanins; corolla tube 2.2–2.8 cm, broader at the base (0.45–0.61 cm), throat 7.5–9 mm wide, limb 1–1.3 cm wide, dorsal and lateral lobes ovate, 4.5–5 × 5–6 mm, ventral lobe 3.5–4 × 3.5–4 mm, lateral lobes intermediate in size and shape, red with spots and lines near the throat and lobes; stamens 4, didynamous, inserted; dorsal staminode 3.2 mm; filaments slender, slightly puberulent, widening near the base, free, densely red villous, curved at the apex, not swollen terminally near the connective; anthers rectangular, with longitudinal dehiscence, coherent, 1.5 × 1.2 mm, mid-dorsal side of the anthers bearing small, fleshy, broad prolongations; nectary represented by a low annular ring with 5 triangular glands, to ca. 0.7 mm high at the glands, 0.5 mm high at the ring, densely velutinous with acroscopic trichomes; ovary half-inferior, the free portion densely velutinous like the nectary; style slender, 2 cm, apex slightly curved and thickened, puberulous, with minutely glandular trichomes; stigma narrowly stomatomorphic. Fruit a dry capsule, ovoid, apex conic, dehiscing apically and loculicidally into 2 valves, brownish green, 8–10 × 4.4–5.5 mm, white appressed-villous; seeds numerous, yellow-brown, 0.15–0.2 × less than 0.1 mm.

Distribution, habitat, and phenology. Endemic to Mexico and Guatemala, *Moussonia adpressipilosa* is known from Chiapas, Mexico, and the Sierra de los Cuchumatanes, Guatemala, where it grows in montane rainforest, sometimes mixed with oak–pine forest or in steep rocky wet forest in ravines, at elevations from 550 to 1300 m. Collections with flowers have been made in May and August. Collections with fruits have been made in May and July.

Etymology. The epithet "adpressipilosa" refers to the dense strigose indumentum, which covers virtually the entire above-ground portion of the plant.

This species is recognized by the white strigose pubescence of the plant and flowers; the shallowly serrate and revolute leaf margin; the flat abaxial surface of the leaves with visible stomata, apparently without domes; the leaf blade light silvery green or reddish green abaxially, dark green adaxially; the flowers with thick, narrow, slightly ventricose, and gradually widening tubular corollas; and the calyx with a turbinate-triangular tube, white appressed-villous surface, and subulate lobes abruptly tapering, with almost rounded sinus.

Some of the specimens included here were previously identified either as the closely related *Moussonia fruticosa* or as *M. elegans* Decaisne. The type specimen itself was included in *M. elegans*. This species was first recognized as distinct by Dale L. Denham, from the University of Colorado Museum. He labeled the type specimen in 1971 as *Moussonia adpressipilosa*, but unfortunately he never formally published the species. His notes and a preliminary description were kindly provided to me by his wife, Miriam Denham, and this information was very useful in the preparation of this paper. *Moussonia fruticosa* differs from *M. adpressipilosa* by the narrow, elliptic leaves with the adaxial surface glabrous but ciliate, the pedicel not enlarged at the apex below the floral tube, the evidently thin and lightly pubescent corolla with spreading corolla lobes, the narrowly turbinate calyx tube, linear-triangular calyx lobes that are straight at the base, and acute sinuses. *Moussonia elegans* differs in many aspects, but principally it is distinguished by having villous pubescence and an umbellate inflorescence with four flowers.

Although the character is present in other species of the genus, this is the first published report of the circular, shiny, reddish, and fleshy dots at the base of

the petioles. An anatomical study of this character is underway by Ramírez-Roa and Terrazas (in prep.). This is also the first report of the type of veins and teeth of the margin of the leaves, which are described according to Dilcher (1974) and Hickey and Wolfe (1975).

The following key includes the solitary-flowered species of *Moussonia*.

Key to the Species of *Moussonia* with Solitary Flowers

1a. Calyx lobes dentate; corolla thin . . . . . *M. ampla*
1b. Calyx lobes entire; corolla thin or thick.
  2a. Adaxial surface of the leaves papillose; base of each trichome with a multicellular ring of epidermal cells.
    3a. Corolla estrigose; calyx lobes linear-subulate . . . . . *M. rupicola*
    3b. Corolla pilose; calyx lobes lanceolate-triangular . . . . . *M. serrulata*
  2b. Adaxial surface of the leaves flat; base of each trichome (if present) lacking a multicellular ring of epidermal cells.
    4a. Calyx tube narrowly turbinate; corolla slightly pubescent; leaves glabrous, ciliated.
      5a. Calyx lobes with 3 visible veins; leaf margin setose . . . . . *M. fruticosa*
      5b. Calyx lobes without visible veins; leaf margin pilose . . . . . *M. viminalis*
    4b. Calyx tube turbinate-triangular; corolla densely strigose; leaves white strigose throughout . . . . . *M. adpressipilosa*

The extent of morphological variation in *Moussonia adpressipilosa* is not evident because there is very little material available for study. However, the size of the marginal teeth of the leaves and the size of the calyx lobes vary. Also, one specimen from pine–oak forest (*Cabrera et al., 1856*) has in one node two flowers on one common peduncle.

Conservation status. It should be noted that all the collections of *Moussonia adpressipilosa* in Mexico were made in the 1970s or 1980s from vegetation that had been severely affected by human activity and thus with conservation problems (the specimen from Guatemala was collected in 1942). Field studies are required to ascertain if this species still exists in the wild or if it has become extinct. Among this Mexican Gesneriaceae, one species of *Achimenes* Persoon may already be extinct; this is *A. brevifolia* C. V. Morton, a taxon known only from the type collection made by Hinton in 1937 (Ramirez-Roa, 1987). It is hoped that *M. adpressipilosa* will not follow.

Paratypes. GUATEMALA. **Dept. Huehuetenango:** Vic. Maxbal, ca. 17 mi. N of Barillas, Sierra de los Cuchumatanes, *J. A. Steyermark 48862* (US). MEXICO. **Chiapas:** E of Laguna Tzikaw, Montebello Park, Mpio. La Trinitaria, *D. E. Breedlove 35245* (DS, MEXU, MO); 70 km SW of Palenque to Ocosingo along Jol Uk'um, Mpio. Ocosingo, *D. E. Breedlove 52509* (CAS, LL, MEXU, MO); 15 km al E de las Lagunas de Monte Bello, *E. Cabrera, E. Martínez y H. de Cabrera 1856* (MEXU, US); Montebello-Tziscao, 5 abril 1950, *F. Miranda 6192*.

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