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ANDEIMALVA, A NEW GENUS OF MALVACEAE FROM ANDEAN SOUTH AMERICA

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Abstract: A new genus, **Andeimalva,** is described to accommodate four species previously placed in *Tarasa* and *Malacothamnus.* The taxonomic placement of the Chilean species *M. chilensis* in the primarily North American genus has been questioned for nearly 40 years. This species occurs in the Andes of central Chile, unlike the rest of the genus, which is distributed in California, Baja California, and Mexico. Molecular phylogenetic data revealed the strongly supported relationship of *Malacothamnus chilensis* to the Andean species *Tarasa machupicchensis, T. mandonii,* and *T. spiciformis.* The latter species share with *M. chilensis* the unusual base chromosome number of $x = 6$, which is not found in other members of *Tarasa* or other closely related genera ($x = 5$), or the North American *Malacothamnus* ($x = 17$). Considering the phylogenetic and chromosome data, as well as morphology and geography, these four species form a clade that merits generic status and are recognized at generic rank.

Keywords: *Andeimalva,* Andes, *Malacothamnus,* Malvaceae, *Tarasa.*

The dubious systematic position of *Malacothamnus chilensis* (Gay) Krapov. (Malvaceae) has been the subject of some discussion, most notably by Bates (1963) and Bates and Blanchard (1970). Originally described as *Sphaeralcea chilensis* Gay (1846), this species from the Chilean Andes was transferred to *Malacothamnus* E. L. Greene by Krapovickas (1952) after he examined several North American species of the genus, although he did not discuss the basis for the removal of the species from *Sphaeralcea* A. St.-Hil. Several other Chilean species of *Sphaeralcea,* many of them described by Philippi (1892) in a single publication, were placed in synonymy with *Malacothamnus chilensis* by Krapovickas (1952). Since then, *M. chilensis* has remained the sole South American member of an otherwise North American genus.

As most recently defined, *Malacothamnus* contains 11–12 species of shrubs and subshrubs found in arid regions of California, Baja California, and Mexico (Fryxell, 1988), with one species, *M. chilensis,* restricted to the Chilean Andes (Krapovickas, 1952). Most species of *Malacothamnus* were originally described as *Malvastrum* A. Gray or *Sphaeralcea,* but were transferred to *Malacothamnus* because of their light to dark mauve flowers displayed in dense or loose axillary glomerules, and completely dehiscent and uniovulate mericarps (Kearney, 1951). The North American species of *Malacothamnus* have a base chromosome number of $x = 17$ (Webber, 1936; Bates, 1963), but *M. chilensis* was counted as $2n = 12$ by Bates and Blanchard (1970). When the latter authors reported this unusual chromosome number, they stated "there is no justification in retaining the South American species in *Malacothamnus*" (Bates and Blanchard, 1970, pp. 933–934). Likewise, Bates (1963) earlier doubted the placement of *M. chilensis* in the genus and remarked that the smooth-walled, unarmed, and completely dehiscent mericarps of this species resembled those found in some species of the Andean genus *Tarasa* Philippi, in particular *T. geranioides* (Cham. & Schl.) Krapov. and *T. meyeri* Krapov. Although mericarp morphology in *Tarasa* is

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TABLE 1. Distinguishing morphological characters and chromosome numbers for *Andeimalva* and related genera.

Genus	2*n*	Habit	Flower color	Involucral bracts	Mericarp lateral walls	Mericarp dehiscence	Seeds per Mericarp
Andeimalva	12	Shrubs or treelets	Light to dark mauve	2–3	Smooth	Complete	1
Nototriche	10, 20, 30, 40	Acaulescent cushion plants	Purple, red, white, yellow	Absent	Smooth	Complete	1
Sphaeralcea	10, 20, 30	Shrubs or herbs	Salmon-orange, purple	2–3	Smooth-upper portion Reticulate-lower portion	Partial-upper portion only	1–3
Tarasa	10, 20	Shrubs or herbs	Lilac, magenta, white	2–3	Reticulate or smooth	Complete	1

diverse (Table 1), most species have a prominent awn borne at the apex of the mature mericarps. In *T. geranioides* and *T. meyeri,* the mericarps are smooth-walled and the awn is greatly reduced so that it is almost undetectable, thus resembling the mericarps of *M. chilensis.* Bates (1963) proposed that the carpels of *M. chilensis* represented the end point of an evolutionary lineage separate from the other *Malacothamnus* species. However, despite Bates' (1963) previous observations on this species, its atypical chromosome number, and remote geographic location, no further action was taken to realign *M. chilensis.*

In a recent molecular phylogenetic analysis (based on ITS sequence data) of the tribe Malveae, to which *Malacothamnus, Sphaeralcea, Malvastrum,* and *Tarasa* belong, *M. chilensis* was placed sister to several shrubby species of *Tarasa,* while the North American species of *Malacothamnus* were more closely related to other North American genera such as *Eremalche* E. L. Greene, *Iliamna* E. L. Greene, *Malvastrum,* and *Sidalcea* A. Gray (Tate, 2002; Tate et al., in prep.). Figure 1 shows the phylogenetic relationship of *M. chilensis* to *Tarasa* and selected outgroups based on ITS sequence data (Tate and Simpson, in press). Chloroplast sequence data for a subset of Malveae taxa also reconstructed a strongly-supported clade of *M. chilensis* plus the three *Tarasa* species (*T. machupicchensis* Krapov., *T. mandonii* (Baker f.) Kearney, and *T. spiciformis* Krapov.), which was basal to and separate from the remaining species of *Tarasa* (Tate and Simpson, in press). Although the placement of *M. chilensis* with the shrubby *Tarasa* species in the molecular phylogenies was unexpected, the relationship is supported by chromosome number, geographic distribution, and morphology. As traditionally circumscribed, *Tarasa* comprises 30 annual and perennial species with axillary scorpioid cymes bearing lilac or magenta flowers, completely dehiscent and apically aristate mericarps, and a base chromosome number of $x = 5$ (Krapovickas, 1954, 1960, 1979; Bates, 1965). Species of *Tarasa* are found at high elevations (2000–4000 m) in the Andes from central Peru to southern Chile and Argentina, with two species disjunct in the central Mexican highlands. *Tarasa machupicchensis, T. mandonii,* and *T. spiciformis* are unique in the genus because of their lanceolate leaves and relatively large stature (shrubs or treelets up to 3 m). Chromosome counts made for *T. machupicchensis* and *T. mandonii* revealed

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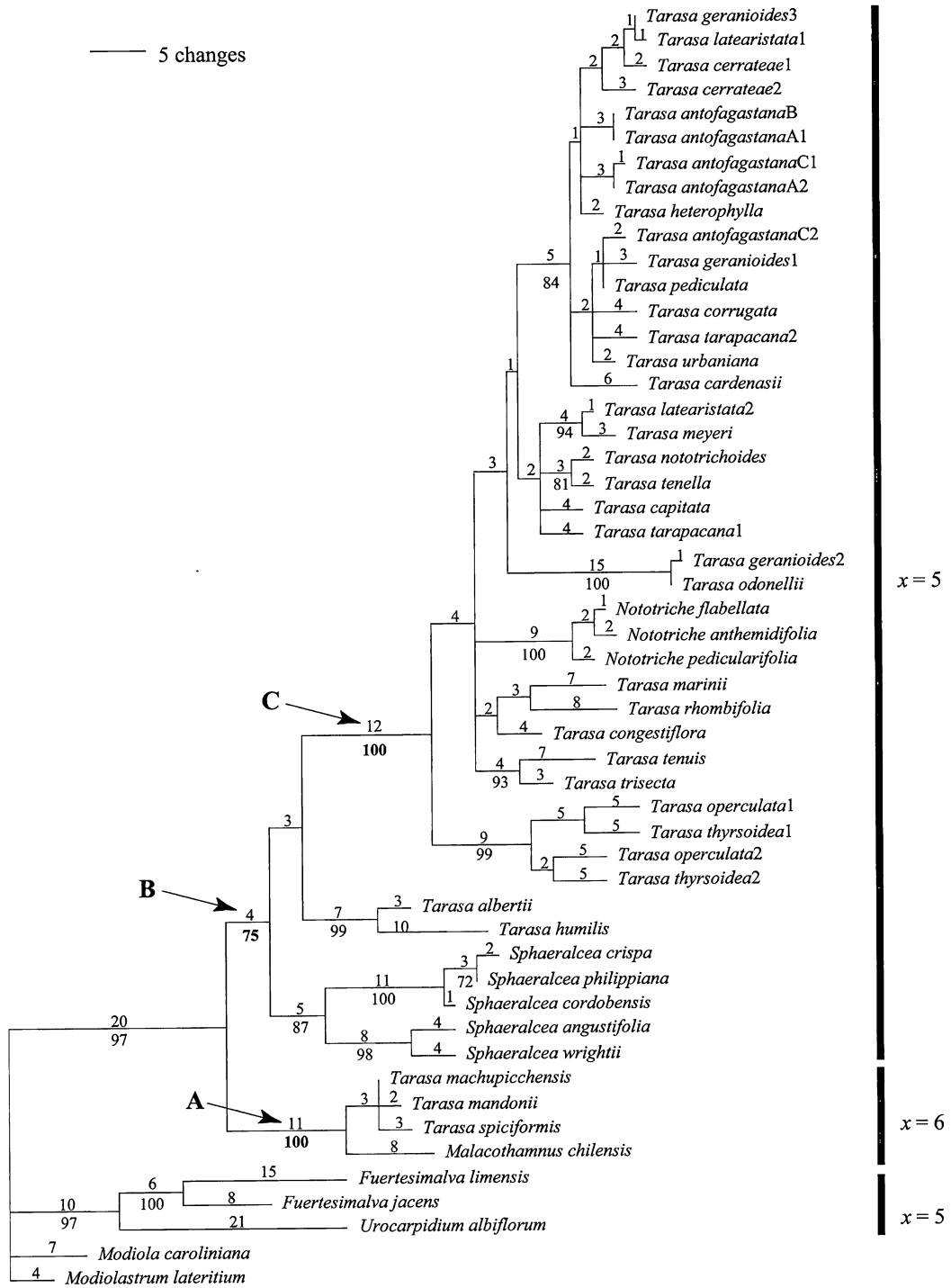
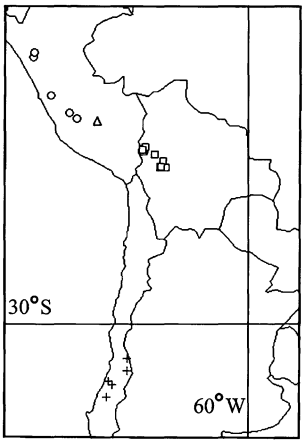


FIG. 1. One of seven most parsimonious trees based on ITS sequence data for *Tarasa* and selected outgroups. Branch lengths are shown above the branches; bootstrap support for 1000 replicates is indicated below. Letters following taxon names indicate a separate population sampled, numbers indicate individual clone number. A. Strongly supported $x = 6$ clade of *Malacothamnus chilensis, Tarasa machupicchensis, T. mandonii,* and *T. spiciformis.* B. The $x = 5$ clade includes the remaining *Tarasa* species, *Sphaeralcea,* and *Nototriche.* C. Well-supported *Tarasa* (including *Nototriche*) clade (redrawn from Tate and Simpson, in press).

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that both species are $2n = 12$ (Tate, 2002), while all other *Tarasa* species are $2n = 10$ or 20 (Krapovickas, 1954, 1960; Fernandez, 1974; Tate, 2002). A base chromosome number of $x = 6$ is uncommon in the genera of tribe Malveae and is encountered only in the more distantly related *Cristaria* Cav., *Gaya* H.B.K., *Lecanophora* Speg., and *Malvastrum* (Fryxell, 1997). Of these, *Malvastrum* is most closely related to *T. machupicchensis, T. mandonii, T. spiciformis,* and *M. chilensis,* but these species most certainly do not belong in *Malvastrum.* In light of the chromosomal and phylogenetic data (Fig. 1), which unite *T. machupicchensis, T. mandonii,* and *T. spiciformis* with *M. chilensis,* and considering their distinctive morphological characteristics and proximal geographic distributions (Fig. 2), these four species form a cohesive group that is here recognized at generic rank. Table 1 outlines the most closely related genera to this new genus, *Andeimalva,* and provides chromosome numbers and distinguishing morphological characters for the genera.



+ *Andeimalva chilensis* Δ *Andeimalva machupicchensis*

□ *Andeimalva mandonii* O *Andeimalva spiciformis*

FIG. 2. Known distribution of *Andeimalva* in South America.

TAXONOMIC TREATMENT

ANDEIMALVA J. A. Tate nov. gen.

Frutex, incano pubescens. Lamina aovato-lanceolata aut suborbiculata. Flores solitarii vel densos glomerulos axillares formantes. Corolla malvina. Mericarpia omnino dehiscentia, monospermis.

TYPE: *Andeimalva mandonii* (Baker f.) J. A. Tate.

SHRUBS OR TREELETS to 3 m tall, stems densely covered with white or yellowish stellate, sometimes stipitate, trichomes. LEAVES simple, ovate-lanceolate or suborbicular, margin crenulate, base rounded or slightly truncate, apex acute. PETIOLES 3–25 mm long. STIPULES paired, linear to lanceolate, up to 12 mm long, 1.0–2.0 mm wide. FLOWERS solitary, in few-flowered axillary cymes, or clustered in dense axillary glomerules. INVOLUCRAL BRACTS 2–3, linear to lanceolate, (3)5–10 mm long, 0.5–1.0(1.5) mm wide. CALYX gamosepalous with 5 triangular lobes, exterior densely stellate-pubescent, interior of lobes densely stellate-pubescent in upper third. COROLLA exceeding calyx in length, petals obovate with a small apical notch, 1.0–3.0 cm long, 0.5–2.0 cm wide, light to dark mauve, united at base to form a 1.0–2.0 mm long corolla tube. STAMENS many (50–75), filaments united into a column 2–8 mm long, staminal column glabrous to densely stellate-pubescent, anthers dorsifixed. CARPELS 7–12, dorsally stellate-pubescent, uniovulate. STIGMAS equal in number to the carpels, capitate, surpassing anther mass by 2–3 mm in length or included. MERICARPS reniform, lateral walls smooth, dorsal surface with stellate trichomes, completely dehiscent, apical awn absent or when present to 4 mm long and persistent on each half of separated mericarp, awn often with stellate hairs, some hairs stipitate. SEEDS reniform, brown at maturity. $2n = 12$.

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KEY TO THE SPECIES OF *ANDEIMALVA*

1. Leaves suborbicular, slightly 3–5-lobed, mericarps without an apical awn; central and southern Chile . . . . . 1. *A. chilensis*
1. Leaves lanceolate, not lobed, mericarps with prominent apical awn; Bolivia, Peru
   2. Flowers clustered in dense glomerules in axils of leaves, mericarp awn 1–1.5 mm long; Peru . . . . . 2. *A. spiciformis*
   2. Flowers solitary or arranged in few-flowered axillary cymes, mericarp awn 1.5–4 mm long; Peru, Bolivia
      3. Staminal column 1.0–1.5 mm long, calyx lobes 4.0–5.0 mm long, petal length less than 2.0 cm; Peru . . 3. *A. machupicchensis*
      3. Staminal column 3.0–8.0 mm long, calyx lobes 5.0–10.0 mm long, petal length 1.5–3.0 cm; Bolivia . . . . . 4. *A. mandonii*

1. Andeimalva chilensis (Gay) J. A. Tate, comb. nov.

Sphaeralcea chilensis Gay. Fl. chil. 1: 293. 1846. TYPE: CHILE. [Se cría en los lugares áridos del pie de las cordilleras en las provincias centrales y del norte], *C. Gay 136* (TYPES: K, NY, P). *Sphaeroma chilense* (Gay) Kuntze. Revis. Gen. Pl. 1: 74. 1891. *Malacothamnus chilensis* (Gay) Krapov. Bol. Soc. Argent. Bot. 4: 189. 1952.

Sphaeralcea glabrata Phil. Linnaea 33: 22. 1864–5. TYPE: CHILE. [In Cordillera de Linares dicta habitat], *Germain 01.1856* (HOLOTYPE: SGO 52177). *Sphaeralcea chilensis* Gay var. *glabrata* (Phil.) Reiche. Anales Univ. Chile 91: 370. 1895. *Sphaeroma glabratum* (Phil.) Kuntze. Revis. Gen. Pl. 1: 74. 1891.

Sphaeralcea grandifolia Phil. Anales Univ. Chile 82: 5. 1892. TYPE: CHILE. [Prope San Felipe in valle Aconcagua], Dec 1882, *R.A. Philippi s.n.* (HOLOTYPE: SGO 52193; ISOTYPE: SGO 41091).

Sphaeralcea capitata Phil. Anales Univ. Chile 82: 8. 1892. TYPE: CHILE. "En Chile," *C. Fernández s.n.* (HOLOTYPE: SGO 52190; ISOTYPE: SGO 52191).

Sphaeralcea viridis Phil. Anales Univ. Chile 82: 8. 1892. TYPE: CHILE. COLCHAGUA: [Habitat in andibus prov. Colchagua, (Cord. San Fernando)], *A. Hirth s.n.* (HOLOTYPE: SGO 52182).

Sphaeralcea peteroana Phil. Anales Univ. Chile 82: 9. 1892. TYPE: CHILE. CURICO: [Habitat in andibus provinciae Curicó, loco dicto Pichuanti], *M. Vidal s.n.* (HOLOTYPE: SGO 52188).

SHRUBS to 1.5 m tall. LEAVES simple, suborbicular, slightly 3–5 lobed, bases slightly truncate; fifth leaf below apex 2.0 cm long, 2.5 cm wide. PETIOLES 1.0–2.5 cm long. STIPULES linear, 4.5 mm long, 0.5 mm wide. FLOWERS 3–5, clustered in dense axillary glomerules, shortly pedicellate, pedicels to 3.0 mm long. INVOLUCRAL BRACTS 2–3, filiform, 4.0 mm long, 0.5 mm wide. CALYX lobes 6.0 mm long, 2.0 mm wide. PETALS 1.0 cm long, 0.8 cm wide, light mauve, corolla tube 2.0 mm long. STAMINAL COLUMN 2.0 mm long, densely stellate-pubescent. CARPELS 8–10. STIGMAS included. MERICARPS 3.0 mm long, 2.5 mm wide, apical awn absent. SEEDS 2.0 mm long, 2.0 mm wide. $2n = 12$.

PHENOLOGY: Flowering December to February (fide Bates 1963: 87).

DISTRIBUTION: Andes of central Chile, primarily in the Metropolitana de Santiago, Maule, and Valparaíso Regions (Fig. 2).

REPRESENTATIVE SPECIMEN EXAMINED: CHILE. REGIÓN METROPOLITANA DE SANTIAGO: Provincia de Cordillera, Refugio Alemán Lo Valdés, 1950 m, 5 Jan 2000, *H. M. Meudt & M. A. López Langenbach HM028* (TEX).

This species is readily distinguished from the remainder of the genus by its suborbicular leaves, congested inflorescences, and non-aristate mericarps. DNA sequence data (nuclear and chloroplast) place this species most basal in the genus and sister to the other species of *Andeimalva* (Tate and Simpson, in press; Fig. 1). The type for the species was not designated by previous

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authors, and since I have not seen the material by Gay, lectotypification is still needed for this species. Bates (1963) apparently intended to designate a lectotype after he saw Gay's collections at P, but no further information was published. There is some question as to whether *Malva obtusifolia* Walpers should by synonymous with *A. chilensis*. Krapovickas (1952) thought the two species were distinct because *M. obtusifolia* has scabrous mericarps, while the mericarps in *A. chilensis* are completely smooth. Bates (1963) noted that the interior surfaces of *A. chilensis* mericarps can be faintly reticulated. However, since Walpers' (1843) original description was lacking critical information, and since the type at Berlin was destroyed, insufficient evidence existed for Bates (1963) to rule on the issue. As the same situation remains, I have not included *M. obtusifolia* here.

2. Andeimalva spiciformis (Krapov.) J. A. Tate, comb. nov.

Tarasa spiciformis Krapov., Kurtziana 2: 113, figs. 1, 3c. 1965. TYPE: PERU. HUANCAVELICA: Izcuchaca, Valle del Mantaro, 2700 m, 6 Aug 1960, *G. Kunkel 495* (HOLOTYPE: LIL!).

SHRUBS to 3.0 m tall. LEAVES ovate-lanceolate, bases rounded; fifth leaf below apex 6.0–10.5 cm long, 1.5–2.0 cm wide. PETIOLES 4.0–8.0 mm long, with stipitate hairs, stipe purple. STIPULES lanceolate, scarious, (3.0)7.0–8.0 mm long, 1.0–2.0 mm wide, densely stellate-pubescent, margins with stipitate hairs. FLOWERS few (2–3) in congested axillary glomerules, mostly sessile. INVOLUCRAL BRACTS 3, linear, 3.0–5.0 mm long, 0.3–0.5 mm wide. CALYX lobes 2.5–5.0 mm long, 2.0–2.5 mm wide. PETALS 0.9–1.6 cm long, 0.4–0.9 cm wide, mauve with darker purple nectar guides, corolla tube 1.0 mm long. STAMINAL COLUMN 5.0–7.0 mm long, stellate-pubescent. CARPELS 9–12. STIGMAS included. MERICARPS 2.5–3.0 mm long, 2.0–2.5 mm wide, apical and dorsal surface stellate-pubescent, long pilose in upper third, apical awn short, linear, slightly recurved, 1.0–1.5 mm long, awn with stellate hairs. SEEDS 2.5 mm long, 2.0 mm wide. Chromosome number unknown.

PHENOLOGY: Flowering and fruiting from February to June.

DISTRIBUTION: Known from only a few localities in the river valleys of central and northwestern Peru (Ayacucho, Huancavelica, and La Libertad) at elevations up to 3200 m (Fig. 2).

REPRESENTATIVE SPECIMENS EXAMINED: PERU. AYACUCHO: North of Huanta, near Huaillay, 3100 m, 14 Feb 1926, *A. Weberbauer 7512* (US); Huanta Mountains, northeast of Huanta, 3100–3200 m, 1–10 Feb 1926, *A. Weberbauer 7512* (F, G, GH). HUANCAVELICA. 8 km east of Mejorada, 2400 m, 13 Mar 1939, *H. E. Stork & O. B. Horton 10899* (F, K, UC). LA LIBERTAD: Río Chusgón, Hda. Cochabamba, 2600 m, 26 Jun 1958, *A. López M. 1439* (US, USM).

This species is distinguished from *A. machupicchensis* and *A. mandonii* by the congested inflorescences clustered in the axils of the leaves. DNA sequence data place this species sister to the *A. machupicchensis*/*A. mandonii* clade (Fig. 1; Tate and Simpson, in press).

3. Andeimalva machupicchensis (Krapov.) J. A. Tate, comb. nov.

Tarasa machupicchensis Krapov., Kurtziana 2: 115, figs. 2, 3b. 1965. TYPE: PERU. CUZCO: Urubamba, Machupicchu, 2300 m, Feb 1938, *C. Vargas C. 791* (HOLOTYPE: LIL!; ISOTYPES: CAS!, F!, GH!).

SHRUBS OR TREELETS to 3 m tall. LEAVES lanceolate, bases rounded; fifth leaf below apex 5.5–7.5 cm long, 1.5–2.3 cm wide. PETIOLES 3–6 mm long, with stipitate hairs, stipe purple. STIPULES linear to lan-

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ceolate, scarious, 5.0–9.0 mm long, 1.0 mm wide, margins with stellate-stipitate hairs. FLOWERS solitary or in very few-flowered (1–2) axillary cymes, pedicellate, pedicels to 1.8 cm long at maturity. INVOLUCRAL BRACTS 2–3, linear, 4.0–7.0 mm long, 0.5 mm wide. CALYX lobes 4.0–5.0 mm long, 3.0–4.0 mm wide. PETALS 1.0–1.9 cm long, 0.8–1.0 cm wide, mauve, corolla tube 1.0–1.5 mm long. STAMINAL COLUMN 1.0–1.5 mm long, stellate-pubescent. CARPELS 10–12. STIGMAS surpassing anther mass by 2–3 mm in length. MERICARPS 3.0–3.5 mm long, 2.0–3.0 mm wide, apical and dorsal surface stellate-pubescent, apical awn prominent, linear, 2.0–4.0 mm long, awn pubescence also dense stellate-stipitate. SEEDS 2.0 mm long, 1.0 mm wide. $2n = 12$.

PHENOLOGY: Flowering and fruiting from December to June.

DISTRIBUTION: Endemic to the Urubamba Valley in Peru, primarily collected on the dry slopes surrounding the ruins at Machu Picchu, 2000–2800 m elevation (Fig. 2).

REPRESENTATIVE SPECIMENS EXAMINED: PERU. CUZCO: Urubamba. [Not legible], 2100 m, 30 Mar 1942, *C. Vargas 2793* (US); Machupicchu, Urubamba Valley, 6000 ft, 9 May 1939, *E. K. Balls B6807* (BM, CAS, F, K, UC, US); Ruins of Machu Picchu, 2400 m, 21 Jun 1936, *J. West 6425* (MO, UC); Machu Picchu, 29 Dec 1998, *M. E. Timaná & J. A. Tate 3771* (TEX); Machu-Picchu, 2500 m, 20 Apr 195?, *Rauh & Hirsch P837* (CAS); Camino a Huinayhuayna, 2800 m, 8 May 1976, *R. Chavez Alfaro 3453* (MO); Machu Picchu, 8750 ft., 27 Mar 1959, *S. G. E. Saunders 434* (BM); Punto Real, Urubamba Valley, 2500 m, [date unknown], *T. G. Tutin 1343* (BM); Machu Picchu, 2800 m, 2 May 1960, *W. Hoffmann 265* (B); Cerro Machu-picchu, trail up mountain, 2200 m, 16 May 1936, *Y. Mexia 8080a* (UC, US).

This species is morphologically most similar to *A. mandonii,* but can be distinguished from the latter by its smaller flowers, shorter staminal column and mostly solitary flowers. DNA sequence data (nuclear and chloroplast) also support the sister relationship of *A. machupicchensis* and *A. mandonii* (Fig. 1, Tate and Simpson, in press).

4. Andeimalva mandonii (Baker f.) J. A. Tate, comb. nov.

Sphaeralcea mandonii Baker f., J. Bot. 31: 364. 1893 ("*mandoni*"). TYPE: BOLIVIA. LARECAJA: vicinitiis Sorata in nemoribus, 2800–3000 m, Apr–Oct 1859, *G. Mandon 808* (LECTOTYPE, here designated: K!; ISOLECTOTYPES: BM!, G!, GH!, NY!, P, S!, US!). *Malvastrum mandonii* (Baker f.) J. F. MacBride, Publ. Field Mus. Nat. Hist., Bot. Ser. 13, 3a: 520. 1956. *Tarasa mandonii* (Baker f.) Kearney, Leafl. W. Bot. 5(12): 190. 1949.

SHRUBS OR TREELETS to 3 m tall. LEAVES ovate-lanceolate, base rounded; fifth leaf below apex 4.5–12.0 cm long, 1.1–3.0(4.5) cm wide. PETIOLES 3.0–10.0(12.0) mm long, with stipitate hairs, stipe purple. STIPULES linear to lanceolate, scarious, 5.0–12.0 mm long, 1.0–2.0 mm wide, margins with stipitate hairs. FLOWERS few (1–4) in axillary cymes, sessile in bud to pedicellate at maturity, pedicels to 2.0 cm long. INVOLUCRAL BRACTS 2–3, lanceolate, 5.0–10.0(12.0) mm long, 0.5–1.5 mm wide. CALYX lobes 5.0–10.0 mm long, 3.0–5.0 mm wide. PETALS 1.5–3.0 cm long, 1.5–2.0 cm wide, light to dark mauve, corolla tube 1.0–2.0 mm long. STAMINAL COLUMN 3.0–8.0 mm long, stellate-pubescent to glabrous. CARPELS 10–12. STIGMAS surpassing anther mass by 2.0–3.0 mm in length or included. MERICARPS 3.3–4.5 mm long, 3.3–4.0 mm wide, apical and dorsal surface stellate-pubescent, apical awn prominent, linear, 1.0–3.5 mm long, awn pubescence also dense

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stellate-stipitate. SEEDS 2.0–2.5 mm long, 1.5–2.0 mm wide. $2n = 12$.

PHENOLOGY: Apparently flowering and fruiting year round.

DISTRIBUTION: Cloud forests of the Bolivian Andes at 2000–3500 m elevation (Fig. 2).

REPRESENTATIVE SPECIMENS EXAMINED: BOLIVIA. COCHABAMBA: Ayopaya. Sailapata, 2700 m, Mar–Apr 1935, *M. Cárdenas 3112* (CAS, US); Independencia, arriba del pueblo, 3000 m, 29 Nov 1981, *S. G. Beck 7438* (LPB, US); ±10 km al NW de Independencia, 3000 m, 10 May 1988 *S. G. Beck & R. Seidel 14510* (TEX). LA PAZ: Larecaja. Sorata, 43 kms hacia Quiabaya, 2970 m, 13 Apr 1979, *S. G. Beck 1355* (US); Salida de Sorata hacia Consata, 3250 m, 7 Mar 1982, *J. F. Casas & J. Molero 6556* (F, G, MO, NY); Iminapi-Larecaja, 3000 m, Apr 1951, *M. Cárdenas 4862* (CAS, US); 7 km de Sorata hacia Laripata, 3160 m, 27 May 1991, *R. Fortunato et al. 1893* (C, F, G, MO, NY, TEX); along road to Consata, ca. 4–15 km above (N of) Sorata, 2896–3500 m, 24 May 1990, *J. L. Luteyn & L. J. Dorr 13790* (CAS, NY, TEX); 11 km from Sorata on road to Tacacoma, 3500 m, 31 Mar 1971, *J. G. Hawkes et al. 5013* (C, MO); Inquisivi. Quime, small town about 100 mi from Oruro via Eucalyptus, crossing the Quimcruz Mountains by the Tres Cruces Pass, 8000 ft, 31 Mar 1949, *W. M. A. Brooke 5383* (BM, F); Huanahawira, 3 km NW of Quime, 3300 m, 21 Dec 1989, *L. J. Dorr et al. 6747* (NY, TEX); trail to Chichipata, 3100 m, 15 May 1988, *M. Lewis 88613* (G, LPB, MO, TEX); Pongo, following the Quime-Caxata Road between Pongo Chico and Huanahawira between ca. 2–4 km SW from Quime, 3500 m, 19 May 1988, *M. Lewis 88662* (G, LPB, TEX); lower slopes of Cruz Pata, 3100–3200 m, 12 Jun 1988, *M. Lewis 88821* (NY); ca. 2 km SW of Quime, climbing the forested slope of the Lower Cerro Chamaquiri N of the Rio Khatu, 3300–3500 m, 29 Jun 1988, *M. Lewis 88969* (MO, NY); ca. 1–4 km NW of Quime, along trail between Cerro Cruz Pata and the mouth of the Rio Serenani, collections from slopes and along the Rio Chichipata, 3350 m, 13 Dec 1988, *M. Lewis 882068* (MO, NY); just after Pongo on the road to Quime, 3440 m, 9 Jan 1968, *B. B. Vuilleumier 480* (GH, MO, NY, TEX, US).

Because no holotype was chosen in Baker's original description, a lectotype (K) is here designated based on the probable specimen that Baker saw at that time. Both morphological and DNA sequence data support *A. mandonii* and *A. machupicchensis* as sister taxa (Fig. 1).

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