

**MUHLENBERGIA PILOSA (POACEAE: ERAGROSTIDEAE),
A NEW SPECIES FROM MEXICO**

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ABSTRACT

Muhlenbergia pilosa from Mexico is described and illustrated. The new species is distinguished by its densely pilose florets; hirsute internodes; hairy sheath summits; membranous, deeply lacerate to short ciliate ligules, 0.5–2.5(5.0) mm long; and awned, pilose, second glumes. A tabular comparison with *M. lucida* Swallen and *M. versicolor* Swallen is given.

RESUMEN

Muhlenbergia pilosa de México, se describe e ilustra. La nueva especie se distingue por sus flósculos densamente pilosos; entrenudos hirsutos; ápice de las vainas pubescentes; lígulas membranáceas, profundamente laceradas a cortamente ciliadas, 0.5–2.5(5.0) mm de longitud; y segunda gluma aristada, pilosa. Se presenta una tabla comparativa con *M. lucida* Swallen y *M. versicolor* Swallen.

The genus *Muhlenbergia* is represented in Mexico by about 115 species, of which 47% are endemic (Beetle 1987). Morphological characters that delimit the genus are spikelets with single perfect florets and lemmas with three, usually prominent, nerves.

There has been considerable floristic work in the state of México (Reiche 1926; Sánchez 1969) and more recently, 22 additions have been reported to the grass flora from the valley of Mexico, including the following four species of *Muhlenbergia*: *M. hintonii* Swallen, *M. orophila* Swallen, *M. polycaulis* Scribn., and *M. seatonii* Scribn. (Herrera 1988). While making routine determinations at TAES the junior authors noted the unusual morphological features of a new species and sent it to the senior author for clarification. The new species is presented prior to completion of the revision of the entire genus in Mexico (Peterson in preparation) so others working in that country may become aware of its existence and perhaps search for additional locations. The specific epithet of the new species refers to the dense covering of epidermal hairs on the dorsal surface of the lemma and the palea.

Muhlenbergia pilosa P. Peterson, Wipff, & S. D. Jones, sp. nov. (Fig. 1). — TYPE: MEXICO, Mexico, Municipio Tejupilco, 17 km NE of Tejupilco on road to Temascaltepec, 18°59'N, 10°04'W, 30 Oct 1982, *S. D. Koch and P. A. Fryxell* 82256 (holotype, CHAPA; isotypes, CHAPA, IEB, MEXU, MICH, TAES!, US, XAL).

A *Muhlenbergia lucida* culmis (50)90–130 cm altis, internodiis hirsutis, vaginis pilis ad apicem, ligulis membranis laciniis ad apicem 0.5–2.5(5.0) mm longis, antheris 1.3–1.9 mm longis recedit.

Caespitose perennial without rhizomes. Culms (50–)90–130 cm tall, erect, rounded and purplish near base, hirsute just below and above the mostly basal nodes, the hairs appressed; internodes glabrous to antrorsely scaberulous. Sheaths (5–)20–50(–70) cm long, many times longer than the mostly basal internodes, antrorsely scaberulous, in age becoming somewhat fibrillate and shredded below, often brown; sheath margins with a few, hyaline hairs, the hairs up to 2.5 mm long and more numerous near the summit. Ligules 0.5–2.5(–5.0) mm long, delicate, hyaline, deeply lacerate the entire length or reduced to a short ciliate membrane in age; apex obtuse to truncate. Blades 15–35 cm long, 1–3.1 mm wide, flat to tightly involute, antrorsely scaberulous below to scabrous and sparsely hirsute above; margins with intermittent hairs. Panicles 20–45 cm long, 3–8 cm wide, somewhat loosely flowered, the ascending branches 0.8–4.7 cm long, purplish, spreading 20–60° from the culm axis with a tuft of hairs in the axils; pedicels 1–7 mm long, delicate, purplish, short hispidulous to glabrous. Spikelets 2.4–3.7 mm long, erect, 1-flowered. Glumes (1.8)2.1–3.2 mm long, shorter to longer than the lemma, usually equal in length, 1-nerved, pilose on the back, sometimes sparingly near the apex; first glume narrowly lanceolate, unawned, the second more broadly lanceolate, awned; apex acuminate, the awn up to 0.6 mm long, delicate, hyaline. Lemma 2.1–3.7 mm long, lanceolate to oblong-elliptic, 3-nerved, awned, densely pilose on the dorsal surface, the hairs up to 1.6 mm long, whitish; apex acute to acuminate, sometimes minutely bifid with acute teeth, the teeth up to 0.2 mm long; lemma awn 18–31 mm long, flexuous, delicate, often purplish. Palea 2.0–3.5 mm long, oblong-elliptic, 2-nerved, densely pilose on the dorsal surface, the whitish hairs up to 1.5 mm long; apex acute to acuminate. Stamens three; anthers 1.3–1.9 mm long, purplish yellow. Caryopsis 1.1–1.4 mm long, fusiform, light brownish. Chromosome number unknown.

PARATYPES: MEXICO, Mexico, 5 km NE of Tejupilco on Mex 134 to Temascaltepec, 18°57'N, 100°8'W, 6 Oct 1991, *Peterson and Annable* 11061 (ANSM, CHAPA, ENCB, IEB, K, MEXU, MO, RSA, TAES, UC, US, UTC, WIS); 26 km NE of Tejupilco on Mex 134 and 2.4 km S of Temascaltepec, 19°01'N, 100°3'W, 6 Oct 1991,



FIG. 1. *Muhlenbergia pilosa*, Mexico, Mexico (Koch and Fryxell 82256). A. Habit. B. Ligule. C. Inflorescence. D. Inflorescence branch. E. Spikelet. F. Glumes. G. Lower glume, ventral view. H. Upper glume, ventral view. I. Floret. J. Lemma, ventral view. K. Palea, dorsal view. L. Palea enclosing the stamens, pistil, and lodicules. M. Caryopsis.

TABLE 1. SALIENT CHARACTERS DISTINGUISHING *MUHLENBERGIA PILOSA*, *M. LUCIDA*, AND *M. VERSICOLOR*.

Characters	<i>M. pilosa</i>	<i>M. lucida</i>	<i>M. versicolor</i>
Culm height (m)	(0.5-)0.9-1.3	0.25-0.6	(0.8-)1-1.5(-2)
Internode	hirsute	glabrous to puberulent	glabrous to puberulent
Sheath auricles	absent	absent	well-developed
Sheath summit	hairy	puberulent	puberulent
Blade	flat to involute	involute	folded
Ligule	delicate below, lacerate above	firm below, entire above	firm below, entire above
Ligule length (mm)	0.5-2.5(-5.0)	3-6	(5-)10-22
Inflorescence branches	spreading 20-60° from culm axis	spreading 20-80° from culm axis	ascending and appressed
Second glume	awned, pilose	unawned, pilose	awned, scaberulous
Anther length (mm)	1.3-1.9	2.1-2.4	1.6-2.0

Peterson and Annable 11072 (ANSM, CHAPA, ENCB, IEB, MEXU, MO, US).

DISTRIBUTION, HABITAT, AND RELATIONSHIPS

Muhlenbergia pilosa is known only from the state of México northeast of Tejupilco along the road to Temascaltepec. It occurs in open, oak and pine-grass savannahs on steep rocky slopes and roadcuts in clayish soils between 1530 and 1810 m. It is found associated with species of *Stevia* Cav., *Bouteloua* Lagasez, *Heteropogon* Pers., *Stipa* L., *Trachypogon* Nees, *Pennisetum* Rich. in Pers., and *Aegopogon tenellus* (DC.) Trin., *Rhynchelytrum repens* (Willd.) C. E. Hubb., *Pereilema crinitum* Presl, and *Muhlenbergia ciliata* (Kunth) Kunth. The morphological characters that can consistently be used to distinguish among *M. pilosa*, *M. lucida* Swallen, and *M. versicolor* Swallen are listed in Table 1. *Muhlenbergia pilosa* differs from the latter two species by possessing hirsute internodes, hairy sheath summits, and membranous, deeply lacerate to short-ciliate ligules, 0.5-2.5(5) mm long.

Muhlenbergia pilosa superficially resembles *M. lucida*, a species known only from the Sierra Madre Occidental of western Chihuahua (Swallen 1936). *Muhlenbergia lucida* occurs in a very different habitat from *M. pilosa*. The former is found on gray to reddish or white volcanic pumice, lapilli tuff, and altered rhyolite lava flows in dry rocky sites among boulders at elevations between 2000 and 2600 m (Peterson et al. in review). Characteristics shared by both species are flat to involute leaf blades; whitish, densely pilose florets that are borne on delicate pedicels; and pilose glumes.

The new species seems most closely related to *M. versicolor*, a member of section *Epicampes*, which ranges in Mexico from Guanajuato, Michoacán, Morelos, Guerrero, México, Distrito Federal, Veracruz, Oaxaca, and Chiapas to Guatemala and Honduras (Swallen 1950; Soderstrom 1967; Breedlove 1986). *Muhlenbergia versicolor* occurs sympatrically with *M. pilosa* and is found in slightly more mesic sites, in pine-needle or oak-leaf litter. Besides the gross morphological differences observed between the leaf blades, i.e., folded in *M. versicolor* versus flat to involute in *M. pilosa*, the adaxial ribs are angled with a pointed apex in the former and flat-topped with a flattened apex in the latter.

ACKNOWLEDGMENTS

We thank Alice Tangerini for providing the illustration, Socorro González E. for preparing the Spanish abstract, and Dan Nicolson for correcting the Latin diagnosis.

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(Received 2 Sept 1991; revision accepted 14 Nov 1991.)



Peterson, Paul M., Wipff, J. K., and Jones, Stanley D. 1992. "MUHLENBERGIA PILOSA (POACEAE: ERAGROSTIDEAE), A NEW SPECIES FROM MEXICO." *Madroño; a West American journal of botany* 39, 150–154.

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