

*Muhlenbergia microsperma* (DC.) Kunth, LITTLESEED MUHLY. Annual (in range), fibrous-rooted, cespitose, several–many-stemmed at base, ascending, in range 10–50 cm tall; shoots when young often purplish red, with stem  $\pm$  bent (geniculate) at nodes below midplant, leaves minutely scabrous with short stiff hairs. **Stems (culms):** low-ridged except side flat and smooth where within sheath appressed to axillary shoot, to 0.8 mm diameter with conspicuously swollen nodes, pale green becoming reddish with green ridges, with minute, upward-ascending hairs along ridges (sometimes short-strigose approaching node), nodes aging reddish; internodes hollow. **Leaves:** alternate distichous, simple with sheath, heteromorphic with a distinctive first leaf on each new shoot (prophyll), typical foliage leaves, and on the lower plant  $\pm$  bladeless sheaths enclosing a special inflorescence; prophyll = a membranous open sheath, narrowly lanceolate in outline, 5–15 mm long, strongly 2-keeled and flat between keels, keels green and short-ciliate with upward-angled teethlike hairs; of foliate leaves sheath open, often  $<$  internode, pale green becoming reddish with green veins, membranous on margins, mostly minutely scabrous with inconspicuous hairs along veins but having longer hairs approaching blade, without lobes (auricles) at top; ligule membranous, cut-truncate to cut-obtuse, 1.1–2 mm long, continuous with sheath margins; blade acuminate-linear, 3–60  $\times$  1.3–2.6 mm, flat or aging loosely inrolled, minutely toothed from base to tip, parallel-veined with veins slightly raised on both surfaces but lacking midrib, veins green, upper surface finely pubescent with erect short hairs along veins, lower surface short-scabrous. **Inflorescence:** spikelets, in 2 types of panicles, terminal, open panicles + panicles appearing axillary (terminal on reduced shoot) tightly enclosed within 2–3 bladeless sheaths at lower stem nodes (cleistogamous panicle), spikelet typically with 1 floret, bracteate, awned. Open panicle ovoid to lanceoloid in outline, 50–200 mm long, the lowest lateral branch often enclosed within sheath of flag leaf, with ascending to diverging lateral branches,  $\pm$  feathery with long, soft purple awns; lower branches to 70 mm long (including awns) decreasing upward; peduncle and principal axis ridged, wiry, minutely scabrous along ridges with upward-pointing teeth; stalk of lateral spikelet 0.3–0.7 mm long, stalk of terminal spikelet 1.7–3 mm long. **Spikelet:** purplish, narrowly lanceolate, in range 2.5–3.5 mm long (excluding awn), breaking above glumes; **glumes** 2, ovate, lower glume 0.5–0.9 mm long and upper glume 0.7–1 mm long, lower glume  $\leq$  upper glume, 1-veined, membranous and pale green soon aging purplish but green along vein, obtuse to short-notched and sometimes fringed at tip, minutely scabrous and  $\pm$  angled along vein; callus ca. 0.15 mm long, hairy with soft straight hairs to ca. 0.3 mm long; **lemma** awned, narrowly lanceolate, in range 2.7–3.5 mm long, 3-veined, green aging purplish, acuminate but usually minutely 2-forked with a long, subterminal awn, outer surface minutely scabrous, soft-hairy below midpoint on margins and at base between veins, the hairs straight, 0.2–0.5 mm long, the awns 10–22 mm long, straight to flexuous, purple or sometimes aging light tan; **palea** narrowly lanceolate, 2.4–2.6 mm long, palea  $<$  lemma, acuminate at tip, green aging purplish, 2-veined with veins converging at tip, hairy at base between veins, minutely scabrous along veins. Cleistogamous panicle of 1–3  $\pm$  subsessile spikelets with 1 floret surrounded by 2 or 3 leaf sheaths bearing diminutive blades, if only 1 fertile spikelet sometimes with minute projections on subtending stalk (= aborted spikelets); in fruit dispersed enclosed within sheath. **Spikelet:** **glumes** absent; **lemma** ca. 2 mm long with awn ca. 1.5 mm long; **palea** ca. 2 mm long, slightly  $>$  lemma. **Flower:** bisexual; **perianth**

**(lodicules)** 2, free, ± trapeziform to inversely triangular, 0.25 × 0.15 mm, translucent-white or translucent-pale green, sometimes minutely dentate or crenate on margin approaching tip, (sometimes with a 1–3 hairs at base); **stamens** 3, free; filaments threadlike, as long as palea, whitish; anthers exerted from tip of palea (open panicle only), dorsifixed, dithecal, subequal, lanceoloid to narrowly oblong, 0.5–1.3 mm long, dark purplish red (some greenish in cleistogamous panicle), longitudinally dehiscent; pollen whitish; **pistil** 1; ovary superior, ellipsoid, 0.4 × 0.2 mm, light yellowish green; styles 2, exerted from lemma near midpoint, whitish at base and purplish red on feathery stigma. **Fruit:** achene (caryopsis), enveloped by lemma and palea, lanceoloid to fusiform, 1.7–2.5 mm long, whitish (tinged brown from purple pigment) with green embryo; of cleistogamous panicle = a lanceoloid packet ca. 5 mm long, with tough, inrolled sheaths. Mid-January–early April.

Native. Annual growing on sandy slopes and boulder outcrops in full sun at scattered localities throughout the range, often in small but dense local populations, where fruits drop to the ground year after year. *Muhlenbergia microsperma* is easy to recognize when fertile because it has a feathery inflorescence with slender, purple awns. This is a species of *Muhlenbergia* that additionally has “cleistogamous panicles,” each which consists of one to three spikelets produced in the “axil” at a lower node, where the spikelet becomes enclosed and hidden by several bladeless leaf sheaths. The cleistogamous panicle is a packet that becomes the dispersal unit.

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