

**INFL:** 5–36 cm; branches appressed to spreading; spikelets 3–30 per branch. **SPIKELET:** 3–7 mm; glumes 2–6 mm, ± equal, persistent; bisexual florets 1–2; lemma 3–7 mm, glabrous or scabrous, tip acute to obtuse, gen glabrous or minutely scabrous; palea ± = lemma; sterile cluster 0.5–4 mm, > axis, acute to obtuse, not resembling bisexual floret. Dry rocky hillsides, chaparral, woodland; < 1500 m. NCoRI, c&s SN, ScV (Sutter Buttes), CW, SW, DMoj; NV, AZ, Baja CA. Apr–May

***M. spectabilis*** Scribn. (p. 1467) PURPLE ONION GRASS Rhizomes short to long. **ST:** 3.5–10 dm; corms short-stalked, scattered. **LF:** ligule 0.1–3 mm; blade 2–5 mm wide. **INFL:** 5–26 cm; branches gen appressed; spikelets 1–4 per branch. **SPIKELET:** 7–19 mm; glumes 3.5–7 mm, ± equal, < 1/2 spikelet, obtuse, persistent; bisexual florets 3–7; lemma 6–9 mm, glabrous or minutely scabrous, gen widest above middle, tip acute to obtuse; palea ± 7/8 lemma; sterile cluster ± 2.5 mm, 1.5–3.5 mm, acute, tapered, gen concealed. Wet sites, meadows, conifer forest; 1200–2600 m. KR, n NCoR, n SNH, Wrn; BC, Rocky Mtns. May–Jul ★

***M. stricta*** Bol. (p. 1467) Densely caespitose. **ST:** 1–9 dm; corms 0. **LF:** ligule 2.5–5 mm; blade 1.5–5 mm wide. **INFL:** 3–30 cm; branches very appressed; spikelets 1–2 per branch, pedicels sharply bent below spikelets. **SPIKELET:** 6–23 mm, open, appearing V-shaped; glumes 6–16 mm, ± equal, spreading, distal 1/2 translucent, deciduous; bisexual florets 2–4; lemma 8–16 mm, glabrous or

minutely scabrous, tip obtuse to acute, awn 0; palea 1/2–3/4 lemma; sterile cluster 2–7 mm, acute to acuminate, resembling lower florets. Open sites, conifer forest, rocky areas in alpine; 1200–3350 m. KR, NCoRH, CaR, SNH, Teh, s SCoR, TR, Wrn, SNE, DMtns; OR, UT. [*M. s. var. albicaulis* Boyle] Jun–Aug

***M. subulata*** (Griseb.) Scribn. Rhizomes short. **ST:** 5–13 dm; corms sessile, clustered. **LF:** ligule 0.4–5 mm; blade 2–10 mm wide. **INFL:** 8–25 cm; branches appressed to spreading; spikelets 1–5 per branch. **SPIKELET:** 10–28 mm; glumes persistent, lower 4–8 mm, upper 6–12 mm, acute; bisexual florets 2–5; lemma 8–15 mm, gen hairy with longer hairs near base, tip strongly tapered, acuminate, awn 0; sterile cluster 4–9 mm, tapered, resembling bisexual florets. Moist sites, streambanks, conifer forest; < 2300 m. KR, NCoR, CaRH, n&c SNH, CCo, SnFrB, Wrn; AK, Rocky Mtns; also in S.Am. Apr–Jul

***M. torreyana*** Scribn. (p. 1467) **ST:** decumbent to erect, 3–10 dm; corms 0. **LF:** ligule 1–5 mm; blade 1–2.5 mm wide. **INFL:** 6–25 cm; branches gen appressed; spikelets 4–38 per branch. **SPIKELET:** 3.5–7 mm; glumes 3–7 mm, ± equal, acute, persistent; bisexual florets 1–2; lemma 3.5–6 mm, back scabrous or occ hairy with longer hairs near tip, tip obtuse to weakly notched, awn 0 or to 2 mm; sterile cluster 0.5–4 mm, < axis, widest at distal end, truncate. Chaparral, conifer forest; < 1600 m. NW (exc NCoRH), CaRF, n&c SN, ScV (Sutter Buttes), CW. Mar–Jun

## MELINIS

Ann, per. **ST:** erect to prostrate; internode solid to hollow. **LF:** gen cauline; ligule hairy. **INFL:** gen panicle-like, open; branches spreading to ascending; spikelets subsessile to stalked. **SPIKELET:** falling as 1 unit; glumes strongly unequal, lower << upper or 0, upper glume silky-hairy; florets 2, lower floret sterile or staminate, lemma ± = upper glume, upper floret fertile, lemma membranous to thick, firm, smooth, ± white in fr, margin flat, tip blunt, palea ± = lemma. 22 spp.: warm temp, subtrop, se Asia, Afr. (Greek: a cereal, probably millet) [Wipff 2007 FNANM 25:490–492; Zizka 1990 Mitt Inst Allg Bot Hamburg 23:563–572]

***M. repens*** (Willd.) Zizka subsp. *repens* NATAL GRASS, RUBY GRASS Ann or short-lived per. **ST:** decumbent to erect, (2)4–15 dm; internodes glabrous or with swollen-based hairs; sheath 3–9 cm, glabrous; ligule hairs 0.5–1.5 mm; blade 3–27 cm, gen 2–9 mm wide, upper surface glabrous. **INFL:** (4)6–22 cm; 1° branches 2.5–6(11) cm, glabrous to puberulent; spikelet stalk 0.5–5 mm, ± wiry, hairy. **SPIKELET:** 2–5.5 mm, ± 1–2 mm wide, ovate to elliptic; lower glume < 1.5 mm, 0–1-veined, upper glume 2–5 mm, densely silky-

hairy, hairs ≤ 7 mm, rose to ± purple fading to pink or white in age; lower floret staminate or sterile, lemma ± like upper glume, 5-veined, tip minutely lobed, palea ± = lemma; upper floret ± 2/3 length lower floret, lemma firm, ± white, shiny; anthers 3. 2n=36. Disturbed areas, slopes; < 850 m. NCoRO, SnJV, s CCo, SCoRO, SCo, WTR, PR; to s US; native to S.Afr, w Asia. [*Rhynchelytrum r.* (Willd.) C.E. Hubb.; *R. roseum* (Nees) Stapf & C.E. Hubb.; *Tricholaena r.* Nees] Used for soil stabilization. All yr

## MUHLENBERGIA MUHLY

Paul M. Peterson

Ann, per, occ mat-like, often rhizomed. **ST:** decumbent to erect, ± clumped. **LF:** basal and cauline; sheath open; ligule membranous, entire to irregularly toothed, occ with 1 large tooth on each side; blade flat to rolled. **INFL:** panicle-like, narrow to open; branches spreading to appressed. **SPIKELET:** gen single (bisexual) occ paired (bisexual, staminate or sterile); glumes subequal, gen 1–3-veined, short-pointed to awned, upper glume occ 3-veined; florets 1, occ 2; axis breaking above glumes; lemma short-pointed to awned, glabrous to hairy, 3-veined; palea ≤ lemma. **FR:** ± fusiform, red-brown, gen falling with lemma and palea. 173 spp.: temp Am, s Asia. (G.H.E. Muhlenberg, PA botanist, 1753–1815) Reports of *M. dumosa* Vasey, *M. glauca* (Nees) B.D. Jacks., *M. thurberi* (Scribn.) Rydb. have proved to be erroneous.

1. Ann
2. Lemma awned, awn 1–3 cm, lemma 2.5–6 mm
  3. Lemma gen 4.5–6 mm; infl gen < 1.5 cm wide, branches closely appressed; glumes gen 1–2 mm . . . . . *M. appressa*
  - 3' Lemma gen 2.5–4.5 mm; infl 1–5 cm wide, branches spreading to ascending; glumes gen < 1 mm . . . . . <sup>2</sup>*M. microsperma*
- 2' Lemma short-awned, awn < 1 mm, or awn 0; lemma < 2.5 mm
  4. Infl narrow, < 1 cm wide; branches closely appressed; sts often rooting at lower nodes. . . . . <sup>2</sup>*M. filiformis*
  - 4' Infl open, 1.5–8 cm wide; branches reflexed, ascending to spreading; sts not rooting at lower nodes
    5. Infl branches stiffly spreading to reflexed ± 90° from axis; glumes glabrous; ligule teeth 2, 1 on each side . . . . . *M. fragilis*
    - 5' Infl branches ascending < 80° from axis; glume tip short-hairy; ligule truncate to obtuse, irregularly short-toothed . . . . . *M. minutissima*

- 1' Per
6. Lemma awn 0 or short-awned, awn < 1 mm
7. Infl 5–14 cm wide, open, branches spreading . . . . . *M. asperifolia*
- 7' Infl ≤ 4 cm wide, narrow, branches ascending to appressed, occ loosely spreading
8. Rhizomes creeping, ± scaly; sts ± decumbent to erect
9. Glumes 2.5–4 mm, ± = lemma; lower 1/2 lemma short-soft-hairy . . . . . <sup>2</sup>*M. californica*
- 9' Glumes 0.5–1.8 mm, ± 1/2 lemma; lemma glabrous to ± scabrous
10. Ligule gen 1–2.5 mm; infl axis gen obscured by branches, spikelets . . . . . *M. richardsonis*
- 10' Ligule gen < 1 mm; infl axis gen visible between branches . . . . . *M. utilis*
- 8' Rhizomes 0; sts clumped or decumbent and ± rooting at nodes
11. Blade < 4 cm; lemma gen < 2 mm; st gen < 3 dm . . . . . <sup>2</sup>*M. filiformis*
- 11' Blade ≥ 5 cm; lemma gen > 2.5 mm; st 2–15 dm
12. Infl ≤ 15 cm, 1.5–4 cm wide; branches loosely fld . . . . . *M. jonesii*
- 12' Infl 15–60 cm, ≤ 1.2 cm wide; branches densely fld . . . . . *M. rigens*
- 6' Lemma awn 1–30 mm
13. Infl open, 6–15 cm wide, branches spreading . . . . . *M. porteri*
- 13' Infl gen < 6 cm wide, branches ascending to appressed, occ spreading
14. Glumes 1 or 2, gen < 0.5 mm, vein 0 . . . . . [*M. schreberi*]
- 14' Glumes 2, gen > 0.5 mm, vein(s) evident
15. Rhizome gen scaly, creeping
16. Blade gen rolled, < 2 mm wide; anther purple, 1.5–3 mm
17. Lemma, palea short-soft-hairy on lower 1/2; sts loosely clumped, decumbent . . . . . <sup>2</sup>*M. arsenei*
- 17' Lemma base sparsely short-hairy; palea glabrous to ± scabrous; sts erect, ± rooting at lower nodes . . . . . <sup>2</sup>*M. pauciflora*
- 16' Blade gen flat, ≥ 2 mm wide; anther yellow, gen ≤ 1.5 mm
18. Hairs at lemma base 2–3.5 mm . . . . . *M. andina*
- 18' Hairs at lemma base < 1.5 mm
19. Lemma awn gen < 2.2 mm; anther 1–1.5 mm . . . . . <sup>2</sup>*M. californica*
- 19' Lemma awn 2.5–9 mm; anther < 0.5 mm . . . . . *M. mexicana*
- 15' Rhizomes 0
20. Upper glume 3-veined, 3-toothed . . . . . *M. montana*
- 20' Upper glume gen 1-veined, obtuse, acute, or awned
21. Lower glume 2-veined, 2-awned; infl 5–8 mm wide, spike-like, dense . . . . . *M. alopecuroides*
- 21' Lower glume 1-veined, with 1 awn or awnless; infl 5–30 mm wide, dense to loose
22. Glumes 0.5–1 mm, obtuse; cleistogamous spikelets gen present in lowermost st axils . . . . . <sup>2</sup>*M. microsperma*
- 22' Glumes gen 1.5–3.5 mm, acute, acuminate, or awned; cleistogamous spikelets 0
23. Lemma, palea short-soft-hairy on lower 1/2; sts loosely clumped, decumbent . . . . . <sup>2</sup>*M. arsenei*
- 23' Lemma base sparsely short-hairy; palea glabrous to ± scabrous; sts erect, ± rooting at lower nodes . . . . . <sup>2</sup>*M. pauciflora*

*M. alopecuroides* (Griseb.) P.M. Peterson & Columbus (p. 1467) WOLFTAIL Per. **ST**: 3–6 dm. **LF**: ligule 2–12 mm, acuminate; blade 4–12 cm, 1–2 mm wide, flat; midribs, margins ± white; tip with awn-like extension of midrib, 3–10 mm. **INFL**: 4–10 cm, 5–8 mm wide, spike-like, densely fld. **SPIKELET**: paired, pair with subtending axis segment falling as 1 unit; lower spikelet staminate or sterile, upper spikelet bisexual; glumes 1–2 mm, unequal, awned, lower glume 2-veined, 2-awned, awns 1–3.5 mm, upper glume 1-veined, 1-awned, awns 2.5–5 mm; lemma 3–4 mm, short soft-hairy on lower 2/3, awn 1.5–3 mm; anthers 1.5–2 mm, yellow. *2n*=40. Rocky slopes and mesas; ± 500 m. e DMtns (New York Mtns); sw US, Mex; also nw Argentina, Bolivia. [*Lycurus setosus* (Nutt.) C. Reeder; *L. phleoides* Kunth, misappl.] Jul–Oct ★

*M. andina* (Nutt.) Hitchc. FOXTAIL MUHLY Per; rhizome scaly, creeping. **ST**: 2.5–8.5 dm. **LF**: ligule 0.5–1.5 mm, truncate, ciliate; blade 4–16 cm, 2–4 mm wide, flat. **INFL**: 2–15 cm, 5–15 mm wide, narrow; branches appressed, loosely fld. **SPIKELET**: glumes 2–4 mm, acuminate or short-awned; lemma 2–3.5 mm, hairs at base = lemma, awn 1–7 mm; anthers 0.5–1.5 mm, yellow. *2n*=20. Canyons, streambanks, wet meadows; < 3100 m. KR, NCoRI, SN, SCoRI, SnBr, SNE, DMtns; to Can, CO, w TX. Jul–Sep

*M. appressa* C.O. Goodd. APPRESSED MUHLY Ann. **ST**: 1–4 dm. **LF**: ligule 1.5–3 mm, truncate to obtuse, decurrent to sheath, toothed; blade 1–5 mm, 1–2 mm wide, flat or folded. **INFL**: 4–14 cm, 0.5–1.5 cm wide, narrow; branches appressed, loosely fld. **SPIKELET**: in lower branch axils cleistogamous, enclosed by tightly rolled sheath; glumes 1–2 mm, obtuse to acute; lemma 4.5–6 mm, hairs

at base short-appressed between veins, awn 1–3 cm; anther 0.5–1 mm, purple. Open canyon bottoms, rocky slopes; 20–1600 m. s ChI (San Clemente Island), DMtns (Providence Mtns); s AZ, Baja CA. Apr–May ★

*M. arsenei* Hitchc. (p. 1467) TOUGH MUHLY Per; rhizomes occ ± short or appearing 0. **ST**: 1.5–4 dm, decumbent at base. **LF**: ligule 1–2 mm, acuminate, toothed, ± decurrent to sheath, with 1 large tooth on each side; blade 1–5 cm, < 2 mm wide, rolled. **INFL**: 4–12 cm, 1–3 cm wide, narrow; branches ascending to appressed, loosely fld. **SPIKELET**: glumes 2–3 mm, acute, ± short-awned, awn < 1 mm; lemma 3.5–5 mm, short-soft-hairy on lower 1/2, awn 4–12 mm; palea short-soft-hairy on lower 1/2; anther 1.6–3 mm, purple. Limestone rock outcrops, slopes; 1400–1860 m. DMtns (Clark Mtn Range); to se UT, n NM, n Baja CA. Aug–Sep ★

*M. asperifolia* (Trin.) Parodi (p. 1467) SCRATCH GRASS Per; rhizomes shiny, scaly; ± stolonated. **ST**: decumbent to erect, 1–6 dm. **LF**: ligule 0.2–1 mm, truncate, minutely ciliate; blade 2–6 cm, 1–2.8 mm wide, flat or folded. **INFL**: 6–17 cm, 5–14 cm wide, ovoid, open; branches 5–14 cm, spreading. **SPIKELET**: glumes 0.5–1.5 mm, acute; florets 1–2; lemma 1–2 mm, glabrous ± short-awned; anther 1–1.2 mm, purple. *2n*=20,22,28. Moist, often alkaline meadows, seeps, hot springs; 120–2150 m. CA; w N.Am, s S.Am. Jul–Oct

*M. californica* Vasey (p. 1467) CALIFORNIA MUHLY Per; rhizomes short, scaly, creeping. **ST**: 3–7 dm. **LF**: ligule 0.8–2 mm, truncate, irregularly toothed, minutely ciliate; blade 4–16 cm, 2–6 mm wide, flat. **INFL**: 5–13 cm, < 2 cm wide, narrow; branches ascending

to erect, short, densely fld. **SPIKELET**: glumes 2.5–4 mm, acuminate, ± long-tapered to awned, awn < 1.2 mm; lemma 2.8–4 mm, short-soft-hairy on lower 1/2, hairs < 1.5 mm, awn < 2.2 mm; anther 1–1.5 mm, yellow.  $2n=80$ . Streambanks, canyons; 100–2000 m. SCo, SnGb, SnBr, SnJt. Jun–Sep ★

*M. filiformis* (S. Watson) Rydb. PULL-UP MUHLY Ann. **ST**: decumbent, loosely clumped, rooting at lower nodes, 0.2–3 dm. **LF**: ligule 1–2.5 mm, obtuse to acute, margin serrate; blade 1–4 cm, 1–2 mm wide, flat or rolled. **INFL**: 1–6 cm, < 1 cm wide, cylindrical, narrow; branches closely appressed. **SPIKELET**: glumes 0.5–1.2 mm, obtuse, ± toothed at 10×; lemma 1.5–2 mm, short-awned, awn < 1 mm; anther 0.5–1 mm, purple to yellow.  $2n=18$ . Moist meadows, seeps, streambanks; 150–3350 m. NW, SN, WTR, SnBr, SnJt, GB; to BC, c US, NM, Mex. Jun–Aug

*M. fragilis* Swallen (p. 1467) DELICATE MUHLY Ann. **ST**: erect or spreading, 1–3.5 dm. **LF**: ligule 1–3 mm, decurrent to sheath, with 1 large tooth at each side; blade 1–6 cm, 1–2 mm wide, flat, margin, midvein strongly white-thickened. **INFL**: 10–30 cm, 3.5–8 cm wide, ovoid, open; branches thread-like, stiffly spreading to reflexed ± 90° from central axis. **SPIKELET**: glumes 0.5–1 mm, obtuse to acute, glabrous; lemma ± 1 mm, gen glabrous, margin, midvein occ short-hairy; anther < 0.5 mm, purple.  $2n=20$ . Open, ± disturbed, limestone gravelly wash; ± 1600 m. e DMtns (Clark Mtn Range, New York Mtns); to w TX, Mex. Oct ★

*M. jonesii* (Vasey) Hitchc. JONES' MUHLY Per. **ST**: densely clumped, 2–5 dm. **LF**: basal gen tufted; ligule 2–4.5 mm, acute; blade 5–12 cm, 1–2.5 mm wide, flat to ± folded. **INFL**: 4–15 cm, 1.5–4 cm wide; branches ascending to loosely spreading, loosely fld. **SPIKELET**: glumes 0.6–1.8 mm, obtuse, upper irregularly toothed, ± 3-veined; lemma 2.8–3.5 mm, short-soft-hairy on lower 1/3, short-awned, awn < 1 mm; anther 1.4–2.2 mm, purple.  $2n=20$ . Open slopes; 1130–2130 m. KR, CaRH, n SNH. Jun–Aug ★

*M. mexicana* (L.) Trin. Per; rhizomes scaly, creeping. **ST**: 3–7 dm. **LF**: ligule 0.4–1 mm, truncate, irregularly toothed; blade 4–12 cm, 2–5 mm wide, flat. **INFL**: 2–15 cm, 5–15 mm wide, narrow; branches stiffly ascending, densely fld. **SPIKELET**: glumes 1.5–3.5 mm, acuminate to short-awned, awn < 2 mm; lemma 1.8–3.4 mm, hairs at base < 1.5 mm, awn 2.5–9 mm; anther < 0.5 mm, yellow.  $2n=40$ . Uncommon. Riverbanks, canyons; 60–1530 m. KR, NCoRO, n SN; to BC, e US. Jul–Aug

*M. microsperma* (DC.) Kunth (p. 1467) LITTLESEED MUHLY Ann, short-lived per. **ST**: 1–6 dm. **LF**: ligule 1–2 mm, decurrent to sheath, truncate to obtuse, toothed; blade 2–6 cm, 1–2.5 mm wide, flat or loosely rolled. **INFL**: 5–20 cm, 1–5 cm wide; branches spreading to ascending, loosely to densely fld. **SPIKELET**: in lower branch axils cleistogamous, enclosed by tightly rolled sheath; glumes 0.5–1 mm, obtuse; lemma gen 2.5–4.5 mm, short-soft-hairy at base, awn 1–3 cm; anther 0.5–1 mm, purple.  $2n=20,40,60$ . Open, ± disturbed sites; < 1650 m. CCo, SCoRO, SW, D; to sw UT, AZ, Mex; also in S.Am. Mar–May

*M. minutissima* (Steud.) Swallen (p. 1467) Ann. **ST**: ascending to erect, 0.2–3 dm. **LF**: ligule 1–2 mm, truncate to obtuse, short-toothed; blade 0.5–4 cm, 1–2 mm wide, flat. **INFL**: 1–20 cm, narrowly ovoid, open; branches 1.5–5 cm, ascending < 80° from central axis. **SPIKELET**: glumes 0.5–1 mm, obtuse, tip short-hairy; lemma 1–1.5 mm, margins, midvein short-hairy; anther 0.5–1 mm, purple.  $2n=60,80$ . Open, ± disturbed, sandy slopes, seeps; 400–2300 m. KR, n&c SNH, SnBr, SnJt, SNE; to WA, MT, w TX, Mex. Jul–Oct

*M. montana* (Nutt.) Hitchc. (p. 1467) MOUNTAIN MUHLY Per. **ST**: 1–4 dm, densely tufted. **LF**: ligule 4–10 mm, acute; blade 5–12 cm, 1–2.5 mm wide, flat, ± rolled. **INFL**: 4–15 cm, 2–6 cm wide, oblong; branches spreading to ascending, loosely fld. **SPIKELET**: glumes 1.5–3 mm, upper 3-toothed, 3-veined; lemma 3–4.2 mm, margin, midvein short-soft-hairy on lower 1/2, awn 6–18 mm; anther 1.5–2.2 mm, purple.  $2n=20,40$ . Open slopes, granitic rock outcrops, dry meadows; 1640–3420 m. KR, SNH; w US to C.Am. Jun–Aug

*M. pauciflora* Buckley (p. 1473) FEW-FLOWERED MUHLY Per; rhizomes ± short, knot-like, or appearing 0. **ST**: erect, 3–5 dm, wiry, ± rooting at lower nodes; lower nodes knot-like. **LF**: ligule 1–2.5 mm, decurrent to sheath, with 1 large tooth on each side; blade 5–8 cm, 0.5–1.5 mm wide, flat to ± folded. **INFL**: 5–12 cm, 0.5–3 cm wide, narrow; branches ascending to appressed, loosely fld. **SPIKELET**: glumes 1.4–3.2 mm, acuminate to ± short-awned, awn < 1 mm; lemma 4–5 mm, base sparsely short-hairy, awn 5–20 mm; palea glabrous to ± scabrous; anther 1.8–2 mm, purple. Rocky slopes, ledges, canyons; 1755 m. e DMtns (New York Mtns); to s CO, w TX, Mex. Sep–Oct ★

*M. porteri* Beal (p. 1473) Per. **ST**: 2.5–8 dm, wiry; lower nodes knot-like. **LF**: ligule 1–2.5 mm, truncate, decurrent to sheath, toothed; blade 2–8 cm, 1–2 mm wide, flat to ± folded. **INFL**: 4–15 cm, 6–15 cm wide, ovoid, open; branches thread-like, spreading. **SPIKELET**: glumes 2–3 mm, acuminate, occ short-awned, awn < 1 mm; lemma 3–4.2 mm, hairy below middle, awn 2–10 mm; anther 1.5–2.3 mm, purple to yellow.  $2n=20,23,24,40$ . Among boulders or shrubs, rocky slopes, cliffs; 610–1680 m. SnBr, PR, SNE, DMoj; to CO, w TX, Mex. Jun–Oct

*M. richardsonis* (Trin.) Rydb. (p. 1473) MAT MUHLY Per, matted; rhizome scaly. **ST**: decumbent to erect, 0.5–4 dm; lower nodes often swollen or knot-like. **LF**: ligule 1–2.5 mm, acute to truncate, decurrent to sheath; blade 1–5 cm, 1–2 mm wide, flat to ± rolled. **INFL**: 1–12 cm, 1–4 mm wide, cylindrical, narrow; axis gen obscured by appressed branches. **SPIKELET**: glumes 0.8–1.8 mm, acute to ± short-awned; lemma 2–3 mm, glabrous, ± scabrous at tip, ± short-awned, awn < 0.5 mm; anther 1.2–1.5, yellow to purple.  $2n=40$ . Open sites, ± moist meadows, talus slopes, along streams; 1220–3670 m. KR, CaRH, SNH, SCoRO, TR, SnJt, GB, DMtns; to Can, ne US, Mex. Jun–Aug

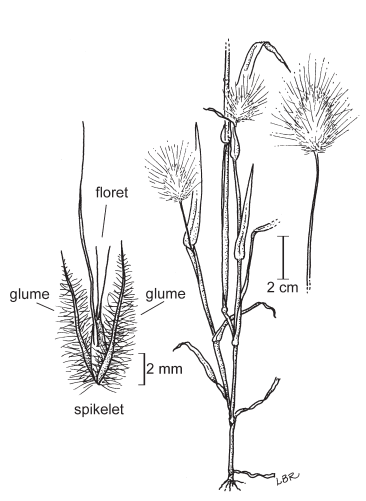
*M. rigens* (Benth.) Hitchc. (p. 1473) DEER GRASS Per. **ST**: densely clumped, 5–15 dm. **LF**: ligule 0.5–2 mm, truncate, ± ciliate; blade 10–50 cm, 1.5–6 mm wide, flat. **INFL**: 15–60 cm, 5–12 mm wide, cylindrical, narrow; branches appressed, densely fld. **SPIKELET**: glumes 1.8–3 mm, acute or obtuse, ± scabrous; lemma 2.5–3.5 mm, base sparsely short-hairy, ± abruptly pointed; anther 1.3–1.7, yellow to purple.  $2n=40$ . Sandy to gravelly places, canyons, stream bottoms; < 2150 m. CaRH, SN, GV, SCoRO, SCo, TR, SnJt, SNE, DMoj; to TX, Mex. Jun–Sep

*M. utilis* (Torr.) Hitchc. APAREJO GRASS Per; rhizome scaly. **ST**: decumbent, often creeping, 0.5–3 dm. **LF**: ligule 0.3–0.8 mm, truncate, decurrent to sheath; blade 1–3.5 cm, 0.6–1.2 mm wide, flat to ± rolled. **INFL**: 1–5 cm, 1–3 mm wide, narrow; branches short, appressed; axis gen visible between branches. **SPIKELET**: glumes 0.5–1.5 mm, acute; lemma 1.5–2.5 mm, acute, glabrous; anther 1–1.2 mm, yellow to purple.  $2n=20$ . Wet sites along streams, ponds; 250–1000 m. SCoRO, SCo, WTR; to TX, C.Am. Oct–Mar

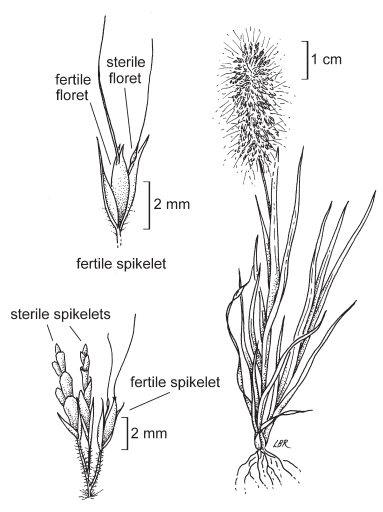
## MUNROA

Jesús Valdés-Reyna

Ann, mat-forming. **ST**: stolon-like, 2–8 cm, terminating in clusters of lvs from which new sts arise; st to 15 cm. **LF**: mostly basal; sheath hairy-tufted at throat; ligule hairy; blade linear, gen inrolled, occ flat or folded, sharply pointed, margins white, thickened. **INFL**: terminal, head-like; spikelets 2–4, subsessile to pedicelled, clustered, subtended by lfy bract; axis breaking above glumes or below bract. **SPIKELET**: laterally compressed; florets 2–10, lower florets bisexual or pistillate; terminal florets sterile; glumes < spikelet, 1-veined, unawned; lower glumes gen present, upper absent or reduced on terminal spikelet;



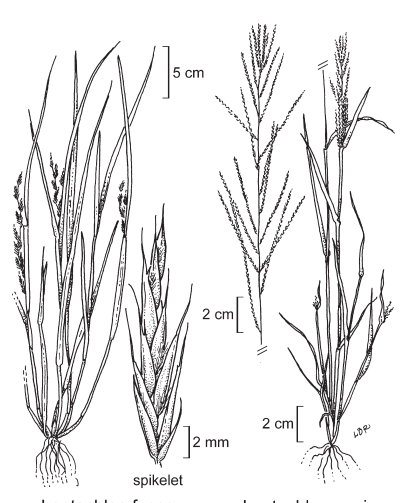
Lagurus ovatus



Lamarckia aurea

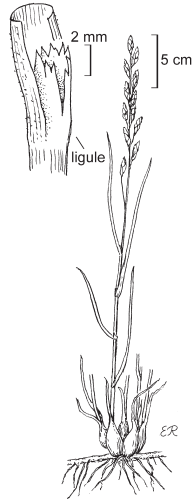


Leersia oryzoides

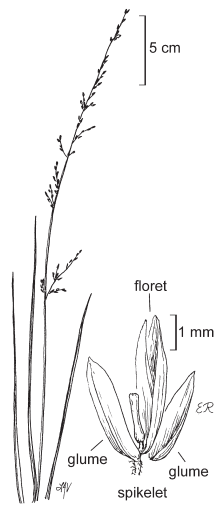


Leptochloa fusca subsp. fascicularis

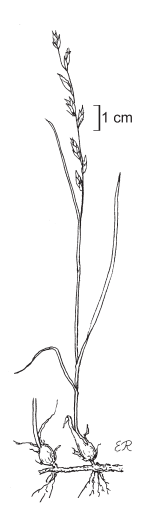
Leptochloa panicea subsp. brachiata



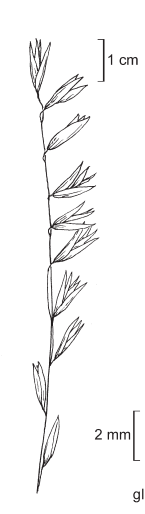
Melica bulbosa



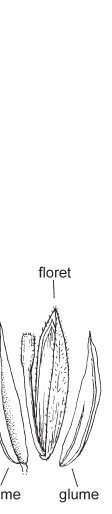
Melica imperfecta



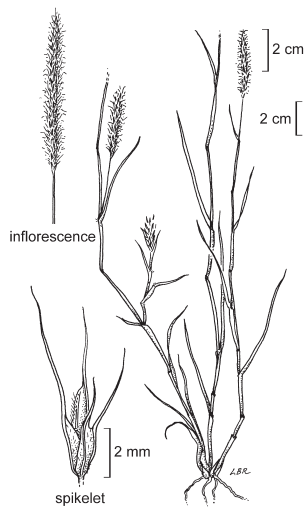
Melica spectabilis



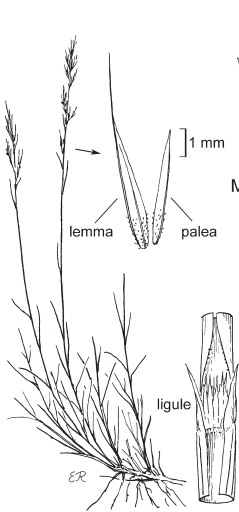
Melica stricta



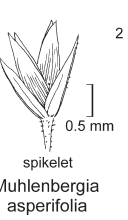
Melica torreyana



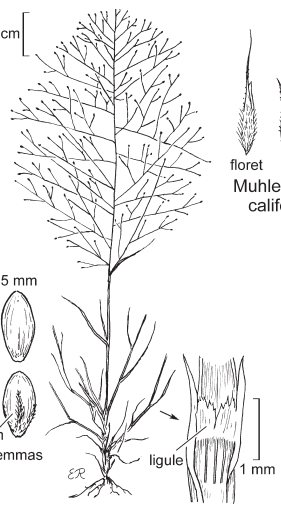
Muhlenbergia alopecuroides



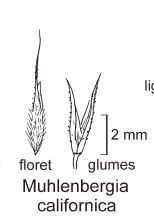
Muhlenbergia arsenei



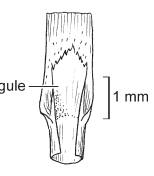
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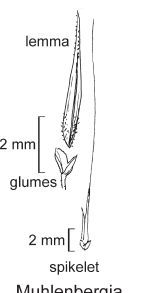
Muhlenbergia fragilis



Muhlenbergia californica



Muhlenbergia minutissima

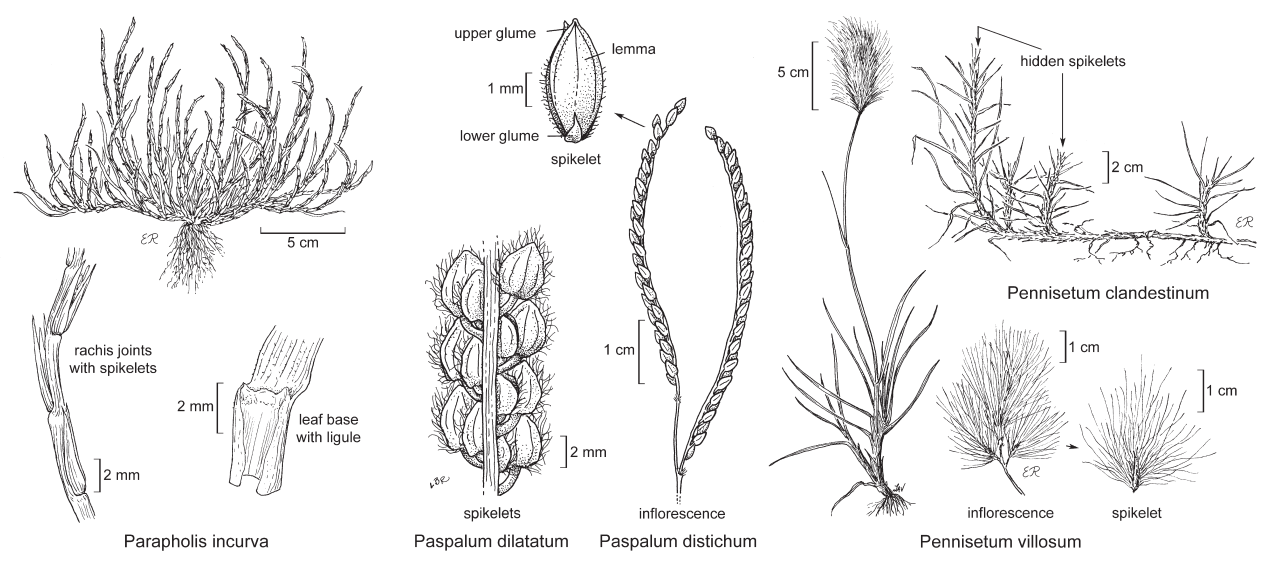
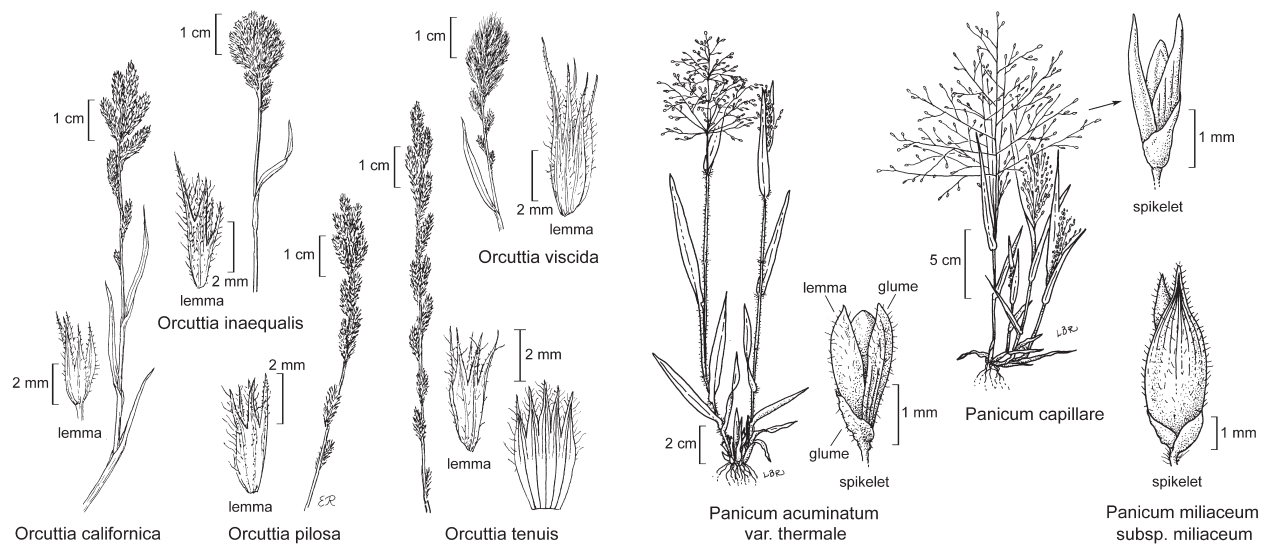
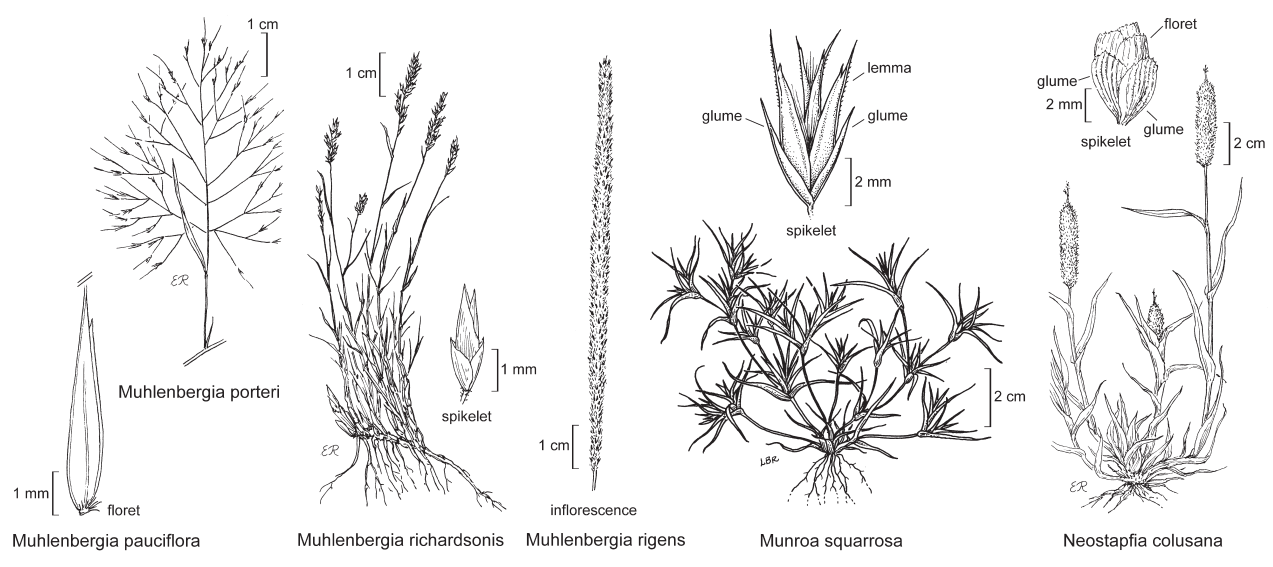


Muhlenbergia microsperma



Muhlenbergia montana





# The Jepson Manual

## Vascular Plants of California

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