

*Bromus* L. BROME, CHESS

*Bromus tectorum* L., CHEATGRASS, DOWNY BROME, DOWNY CHESS. Annual, fibrous-rooted, 1–several-stemmed at base, erect to ascending, in range 15–55 cm tall; shoots typically with ca. 3 cauline leaves, lower shoot pilose and short-pilose but also with a set of minute hairs. **Stems (culms):** cylindric, slender, in range to 1 mm diameter, crimson at nodes, often internodes striped where exposed, smooth and mostly glabrous but puberulent to short-pubescent approaching inflorescence; internodes hollow. **Leaves:** alternate distichous, simple with sheath; sheath of cauline leaves closed 30–50 mm, ridged, in range midrib not more conspicuous than other principal veins, narrowly membranous and ciliate on margins, sheath of the uppermost cauline leaf mostly glabrous, without lobes (auricles) at top; ligule translucent-membranous, jagged-obtuse, 0.8–3 mm long (short on basal sheath), glabrous; blade linear, in range mostly to 65 × 2.5–4 mm, the widest near base, flat, parallel-veined with principal veins raised on both surfaces, mostly short-pilose. **Inflorescence:** spikelets in panicle, terminal, panicle loose, in range mostly < 100 mm long, appearing 1-sided with nodding spikelets on slender, flexible stalks oriented mostly in 1 direction, branching nodes alternate distichous, at each node with 2–9 principal and minor branches, spikelets with (4–)7–11(–13) florets, only 1–several at base fertile and terminal florets considerably reduced and sterile, awned; bract subtending the lowest node present and inconspicuous or absent, sheathing and oblique-ledgelike or partially sheathing, < 0.6 mm long, often rose to purplish; branches at principal nodes unequal, the largest to 25 mm long with 4–8 spikelets, most with 2-spikelets but some abortive; axes of branches wiry and lax, often with edges and the edges aging purple-red, short-pilose to short-villous, usually lacking pulvinus at base. **Spikelet:** ± cylindric, florets not spreading at anthesis, in range most 28–34 mm long (including awns), breaking above glumes and often between fertile florets; **glumes** 2, unequal, narrowly lanceolate and strongly keeled, lower glume in range 5–6.5 mm long and 1-veined, upper glume 7–9.5 mm long and 3-veined (lateral veins not converging at tip), green with membranous margins and at tip aging scarious, glabrous and in range not scabrous, tip of upper glume sometimes split at tip to 0.5 mm; **lemma** body narrowly lanceolate to linear-lanceolate, 12–14 mm long on fertile florets >> glume, 5-veined or 7-veined on rounded back (on sterile florets shorter and having fewer veins), membranous and minutely toothed on margins, green portion scabrous with scattered, small, upward-pointing hairs, shallowly 2-toothed on membranous tip with straight awn arising before teeth, ± rounded, the veins nearly converging toward tip, the teeth 0.5–1.2 mm long, the awn attached 2–3 mm from lemma tip, 10–17 mm long (shorter on sterile florets but always present); **palea** on only fertile florets, membranous, elliptic, 2–2.5 mm < lemma, strongly 2-keeled folded flat along keels, keel veins green and ascending-ciliate, membranous surfaces lacking hairs between keels but with minute hairs on margins. **Flower:** bisexual, cleistogamous (concealed within floret); **perianth (lodicules)** 2, acuminate-lanceolate, 0.6–0.7 mm long, translucent, at anthesis bulbous at base and persistent but flat during fruit development; **stamens** 3, included; filaments ± 1.3 mm long, translucent-white; anthers basifixed, dithecal, 0.5–0.7 mm long, light yellow, longitudinally dehiscent; pollen light yellow; **pistil** 1, at anthesis ca 1.5 mm long; ovary superior, compressed narrowly wedge-shaped, 1 mm long, greenish, with erect, straight hairs on upper 1/3, with 2 sterile, colorless flaps extending beyond tip, 1 flap elliptic, the

longer flap notched and 0.5 mm long, flaps persistent in fruit; styles 2, arising separately from top of ovary; stigma  $\pm$  0.8 mm long, with numerous branchlets, the branchlets twisted, wavy, and often intertwined. **Fruit:** achene (caryopsis), dispersed as floret tightly enclosed within adherent palea and awned lemma + a rachilla segment, awned dispersal unit commonly 20–25 mm long; achene narrowly ellipsoid compressed top-to-bottom, mostly 9–10  $\times$  1.3–1.4 mm, purplish red but paler and reddish below midpoint, concave to somewhat flat (ventral face) and convex (dorsal face), with whitish flap 0.5 mm long and tuft of short hairs on tip; lemma sunken along midline with a raised midvein, scabrous with scattered, short, upward-pointing hairs; palea ciliate along keels, membranous tissue between keels glabrous, membranous margins with short hairs; rachilla segment appressed, flattened front-to-back, 2.5–3 mm long. Mid-April–late May.

Naturalized. Annual currently spotted occasionally in SMM in disturbed, grassy sites along roadsides and trails, but has the potential of becoming invasive. *Bromus tectorum* is easily identified when fruits are present, because the spikelets droop and all tend to be oriented in one direction, probably controlled by wind. The leaves are dead during fruit development, when the panicle commonly turns purple-red.

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