2. Spartina gracilis Trin.

Spartina gracilis Trin. Mém. Acad. Imp. Sci. Saint-Petersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 4(1): 110. 1840. (*Hooker*, N. Amer., is cited, but probably collected by *Douglas*.)

Alkali cordgrass.

Strongly rhizomatous perennials, the rhizomes 3–5 mm thick with overlapping scales; culms solitary, 3–7.5 (10) dm tall, erect, glabrous; sheaths smooth to striate, glabrous; ligule a fringe of hairs, 0.5–1.5 mm long; blades flat, becoming involute in drying, 2.5–5 (8) mm broad at the base and 15–20 cm long, scabrous on the upper surface and margins, glabrous beneath; panicles (6) 8–16 (22) cm long of 2–6 (10) racemosely arranged, appressed spikes, the spikes 2–4.5 (7) cm long; spikelets closely crowded, 18–28 per spike, each 1-flowered, appressed; glumes glabrous except for the ciliate keel, the first 3.5–5 (7) mm long, linear, mucronate, the margins hispidulous, the second 7–8.5 (10) mm long, slightly exceeding the lemma, narrow-lanceolate, 3-nerved, the lateral nerves near the midnerve, the lateral nerves and or just the keel nerve scabrous to pectinate, awnless or mucronate; lemma long, 6.2–7.5 (8.5) mm, lanceolate, usually blunt tipped, 1-nerved, the keel ciliate, at least towards the apex, otherwise glabrous; palea large, subequal to the lemma, lanceolate, thin and papery, glabrous, the 2 nerves close together; anthers 2.5–5 mm long; $2n = 40, 42$.

Shores of lakes, streambanks, wet meadows and moist seeps, often alkaline situations; s. B.C. and Sask., s. through e. Wash., Idaho, Mont. and N.D. to e. Calif., Nev., c. Ariz., n. N.M. and Nebr. June–Sept.

77. HILARIA H.B.K. Galleta

Wiry, rhizomatous or stoloniferous perennials; culms stiff, solid; sheaths open; ligule a ciliate membrane or fringe of hairs; blades narrow, flat or involute, non-auriculate; inflorescence a slender, dense spike with clusters of 3 spikelets at each node of a zig-zag rachis; spikelet cluster with 2 lateral, 2- (3)-flowered, staminate spikelets and a central, 1-flowered, perfect spikelet, the combination of 6 glumes forming a false involucre, those of the central spikelet against the axis, disarticulating as a whole cluster from the persistent rachis; glumes firm, usually asymmetrical, some of them bearing 1 or more awns, each of the first glumes of the lateral spikelets with a prominent awn at one side from about the middle; lemmas thin and hyaline, 3-nerved, awned or awnless; palea subequal to the lemma and similar in texture; $x = 9$.

A genus of 7 species, 5 in arid and semiarid regions of the sw. U.S. and n. Mex., 1 species extending s. to Venezuela. (Named for Auguste St. Hilaire, a French naturalist.)

Hilaria was placed in the tribe Zoysieae by A. S. Hitchcock (Manual Grasses U.S., 1951). Species of *Hilaria* are important as range grasses in the Southwest due mostly to their abundance in dry habitats and perseverance under heavy grazing pressure rather than to palatability.

1 Culms and often the leaves lanate pubescent, (3.5) 5–8.5 (10) dm tall ..... 1. *H. rigida*
1 Culms and leaves glabrous to hirsutulous, 1.5–4 (6.5) dm tall ..... 2. *H. jamesii*

1. Hilaria rigida (Thurber) Benth. ex Scribn.

Pleuraphis rigida Thurber in S. Wats. Bot. Calif. 2: 293. 1880. *Hilaria rigida* Benth. ex Scribn. Bull. Torrey Bot. Club 9: 33, 86. 1882. (*Cooper 2230*, "Fort Mojave and Providence Mountains," Calif., 24 Feb. 1860 or 1861.)

Big galleta.

Coarse perennials, forming large clumps with short, woody rhizomes; culms tall, (3.5) 5–8.5 (10) dm long, spreading, much-branched, leafy, lanate; leaves lanate to glabrate, often scaberulous beneath the longer hairs; ligules 1–2 mm long, densely ciliate, usually hidden in the lanate pubescence around the collar; blades more or less involute, especially towards the tip, 2–5 mm broad and 2–5 cm long; spikes 4–8 (11) cm long; spikelet clusters densely long-villous at the base; glumes of the lateral spikelets subequal, 5–7 mm long, 4- to 5-nerved, ciliate, the first glume asymmetrical, awned from a displaced midnerve at one side, the awn 3–7 mm long, curved or geniculate, this glume often bearing another, shorter, straight awn also, the second glume with a short, straight awn 0.7–2 mm long; glumes of the central spikelet subequal, (4) 5–6.5 mm long, ciliate, flabellate, 5- to 7-nerved, each nerve extended into an irregular awn 2.5–7 mm long; lemmas of the lateral spikelets 5.7–6.5 mm long, glabrous below and ciliate on the scarious, rounded apex, 3-nerved, short-awned, the awn 0.7–1.8 mm long, the lemma of the central spikelet 6–7.2 mm long, also scarious and ciliate apically and glabrous basally, its awn longer, 2–5.5 mm; palea almost as long as the lemma; anthers 2.4–3.2 mm long; $2n = 18$.

Dry deserts to the juniper foothills; se. Utah, w. Ariz., s. Nev., se. Calif., Sonora and Baja Calif. March–June.

2. Hilaria jamesii (Torr.) Benth.

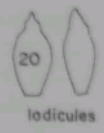
Pleuraphis jamesii Torr. Ann. Lyceum Nat. Hist. New York 1: 148, pl. 10. 1824. *Hilaria jamesii* Benth. J. Linn. Soc., Bot. 19: 62. 1881. (*James*, "at the sources of the Canadian River," [Texas or N.M.], late July or early Aug. 1820.)

H. sericea Benth. J. Linn. Soc., Bot. 19: 62. 1881, nomen nudum. *Pleuraphis sericea* Nutt. ex Benth. ibid., in synonymy. (*Nuttall*, Harris Fork of the Colorado; probably Ham's Fork of the Green River, Wyo., June 1834.)

Galleta.

Strongly rhizomatous or stoloniferous perennials; culms 1.5–4 (6.5) dm tall, erect, sometimes decumbent at the much-branched base, the nodes often puberulent; leaves mostly basal; sheaths glabrous to scaberulous, with a few villous hairs at the throat; ligules 1–2.5 mm long, long-ciliate, lacerate, decurrent; blades flat to folded, 1.5–3 mm broad and 2–5 cm long, becoming involute towards the tip, rigid

HILARIA



ladicules

Hilaria rigida

Hilaria jamesii

often glaucous, glabrous to scaberulous, sometimes hispidulous above; spikes (2) 3–5 (7) cm long; spikelet clusters long-villous at the base; glumes of the lateral spikelets subequal, 5–7 (8.5) mm long, the apex erose, sometimes lacerate, scaberulous to hispidulous, the first glume asymmetrical, awned from a displaced midnerve at one side, the awn 3–5.5 mm long, the second glume awnless or very shortly awned; glumes of the central spikelet subequal, 4–5.5 (6.6) mm long, hispidulous, ciliate, flabellate, each of the 5 nerves extending into an irregular awn 1.5–5 (7) mm long; lemmas of the lateral and central spikelets (4.5) 6–7 (9) mm long, lanceolate, blunt-tipped, glabrous basally and scaberulous apically, 3-nerved, the single lemma of the central spikelet narrow-lanceolate, bearing a dorsal awn from below the bifid apex, the awn 1–2.5 mm long; palea shorter than the lemma, narrow; anthers 2.3–2.8 (3.5) mm long; stigmas long, reddish-brown; $2n = 36$.

From dry desert scrub of the lower valleys to the pinyon-juniper woodlands of the foothills, Utah (all but the Wasatch and Uinta divisions), s. Wyo. and w. Kansas, s. to se. Calif., s. half of Nev., Ariz., N.M. and possibly Trans-Pecos Texas. May–Aug.

Galleta often grows in association with blue grama in sagebrush areas where it may even become the dominant species over large areas. The production of an abundance of nutritious forage and ability to withstand heavy grazing and prolonged periods of drought make galleta an important range species.

Tribe 10. AELUROPODEAE

Stoloniferous or rhizomatous, dioecious (rarely monoecious) perennials of saline or alkaline places; culms solid; sheath margins free; ligule a short fringed membrane; blades usually short and stiff, non-auriculate; inflorescence a contracted panicle or sometimes a raceme; spikelets few- to many-flowered, mostly unisexual; disarticulation of the pistillate florets above the glumes and between the florets; lemmas 7- to several-nerved; lodicules 2, truncate, membranous; embryo eragrostoid; $x = 10$.

This small tribe of 4 mostly dioecious genera in the U.S. is represented only by *Distichlis* in our area. Superficially *Distichlis* resembles some members of the Poeae, and it was commonly referred to that tribe in older treatments. Members of the Aeluropodeae tribe usually inhabit alkaline or saline habitats.

78. DISTICHLIS Raf. Saltgrass

Low, dioecious (rarely monoecious), strongly rhizomatous or sometimes stoloniferous perennials; culms rigid, erect, solid, glabrous, usually completely clothed to the inflorescence by the distichous, closely overlapping leaves; leaves firm, glabrous; sheaths open; ligule a short membrane, more or less erose-ciliolate and sometimes tipped with long, stiff hairs; blades stiff and pungent, non-auriculate; inflorescence relatively few-flowered and of compact panicles or racemes; spikelets large, few- to many-flowered, laterally flattened, the pistillate spikelets disarticulating above the glumes and between the florets; glumes unequal, broad, acute, keeled, the first glume 3- to 5-nerved, the second 5- to 7- (9)-nerved, the lateral nerves sometimes indistinct; lemmas broad, faintly 7- to 13-nerved, awnless, laterally compressed, the lemma of the pistillate spikelets thicker than those of the staminate spikelets; palea more or less as long as the lemma, strongly 2-keeled, the keels more or less winged, the paleas of the pistillate florets enclosing the caryopsis; lodicules flabellate, membranous, erose-lobulate, 0.5–1 mm long; stamens 3; caryopsis brown, glabrous, the styles terminal; $x = 10$.

A genus of 4 species distributed in saline and alkaline marshes, moist flats and tidelands in N. and S. Amer. (From the Greek *distichos*, 2-ranked, in reference to the leaves.)

Desert saltgrass is not very palatable, but in some extensive alkaline flats it is the only forage available to livestock.

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1. Distichlis spicata (L.) Greene

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D. dentata Rydb. Bull. Torrey Bot. Club 36: 536. 1909. *D. stricta* var. *dentata* C. L. Hitchc. Univ. Wash. Publ. Biol. 17(1): 553. 1969. (*Sandberg & Leiberg 463*, Wash., 14 July 1893.) A pistillate plant.

Desert saltgrass, interior saltgrass.

Strongly rhizomatous, dioecious perennials; culms 1–4.5 (5) dm tall, usually decumbent at the base and becoming somewhat stolon-like; leaves sometimes pilose in the vicinity of the collar, especially at the upper margins of the sheath, the hairs 0.5–3 mm long; sheaths glabrous, the membranous margins sometimes extending apically as lateral auricles of the ligule; ligules 0.2–0.6 mm long, ciliate; blades