16 Lemma awnless or with an awn less than 5 mm long, attached near the midlength, the lemma membranous; palea often absent or no more than ⅔ the length of the lemma ..... 21. *Agrostis*

15 Glumes compressed-carinate, abruptly short-awned from an obtuse apex; panicles dense, spike-like ..... 27. *Phleum*

14 Spikelets disarticulating below the glumes, the spikelet falling entire.

17 Glumes awned.

18 Lemmas 0.7–1.5 mm long; anthers small, 0.4–0.7 mm long ..... 22. *Polypogon*

18 Lemmas (1.2) 1.7–2.5 mm long; anthers 1.1–2.3 mm long ..... 27. *Phleum*

17 Glumes awnless, sometimes aristate in *Cinna*.

19 Panicles open, drooping; lemmas short-awned from a notched apex; rachilla prolonged behind the palea ..... 23. *Cinna*

19 Panicles dense, spike-like; lemmas awned from the middle or below; rachilla not prolonged behind the palea ..... 26. *Alopecurus*

11. KOELERIA Pers. Junegrass

Tufted annuals and perennials, mostly cespitose; culms hollow; sheaths open to the base; ligules membranous; blades narrow, flat to involute, non-auriculate; inflorescence usually contracted into a spike-like panicle; spikelets usually 2- to sometimes 4-flowered, flattened, the florets perfect, the rachilla joints short, less than 1 mm long, usually prolonged beyond the upper floret as a slender bristle or bearing a vestigial floret, disarticulating above the glumes and between the florets; glumes relatively large, keeled, thin, acute, unequal, the first glume 1-nerved, the second broader, often slightly longer, obscurely 3- (5)-nerved; lemmas thin, 5-nerved, shiny, glabrous to somewhat scabrous, the first lemma as long to slightly longer than the second glume, awnless or short-awned from a minutely bifid apex; palea 2-keeled, nearly as long as the lemma, scarious and colorless; lodicules entire to bifid; stamens 3; ovary glabrous, the styles terminal; $x = 7$.

About 20 species of temp. and arctic regions of the N. Hemisphere; two species in the U.S., *K. nitida*, a native perennial, and *K. phleoides* (Vill.) Pers., an introduced annual. (Named in honor of the German agrostologist from Mainz, Georg Ludwig Koeler, 1765–1807.)

Koeleria shows close affinities with the Poeae tribe but is a member of the Aveneae with closer affinities to *Sphenopholis* and *Trisetum*.

1. Koeleria nitida Nutt.

Aira cristata L. Sp. Pl. 63. 1753. *Poa cristata* L. Syst. Nat. ed. 12. 2: 94. 1767. *Festuca cristata* Vill. Hist. Pl. Dauphiné 1: 250. 1786; not L. 1753. *Airochloa cristata* Link, Hort. Regius Bot. Berol. 1: 127. 1827. *Rostraria cristata* Tzvelev, Novit. Syst. Pl. Vasc. 7: 47. 1970 [1971]. ("Habitat in Angliae, Galliae, Helvetiae.")

Koeleria cristata Pers. Syn. Pl. 1: 97. 1805, based on "*Poa cristata* auctorum"; not *Poa cristata* (L.) L. *Brachystylus cristatus* Dulac, Fl. Dépt. Hautes-Pyrén. 85. 1867. (Typification recondite.) *K. cristata* is an illegitimate name.

K. gracilis Pers. Syn. Pl. 1: 97. 1805. *Aira gracilis* Trin. Fund. Agrostogr. 144. 1820. *Airochloa gracilis* Link, Hort. Regius Bot. Berol. 2: 276. 1833. *K. cristata* var. *gracilis* A. Gray, Manual Bot. 591. 1848. (Europe.) *K. gracilis* is an illegitimate name also since Persoon included *Poa nitida* Lam. in the synonymy.

K. nitida Nutt. Gen. N. Amer. Pls. 1: 74. 1818. *K. gracilis* subsp. *nitida* Domin, Biblioth. Bot. 65: 229. 1907. (*Nuttall*, "On the plains of Missouri," in 1811.)

K. cristata var. *nuttalii* A. Wood, Cl.-Book Bot. ed. of 1847. 613. 1847. (Mich.)

K. gracilis subsp. *idahensis* Domin, Biblioth. Bot. 65: 175, 237. 1907. (*Heller 309* [error for *3091*], Lewiston, Nez Perce Co., Idaho, 20 May 1896.)

Junegrass.

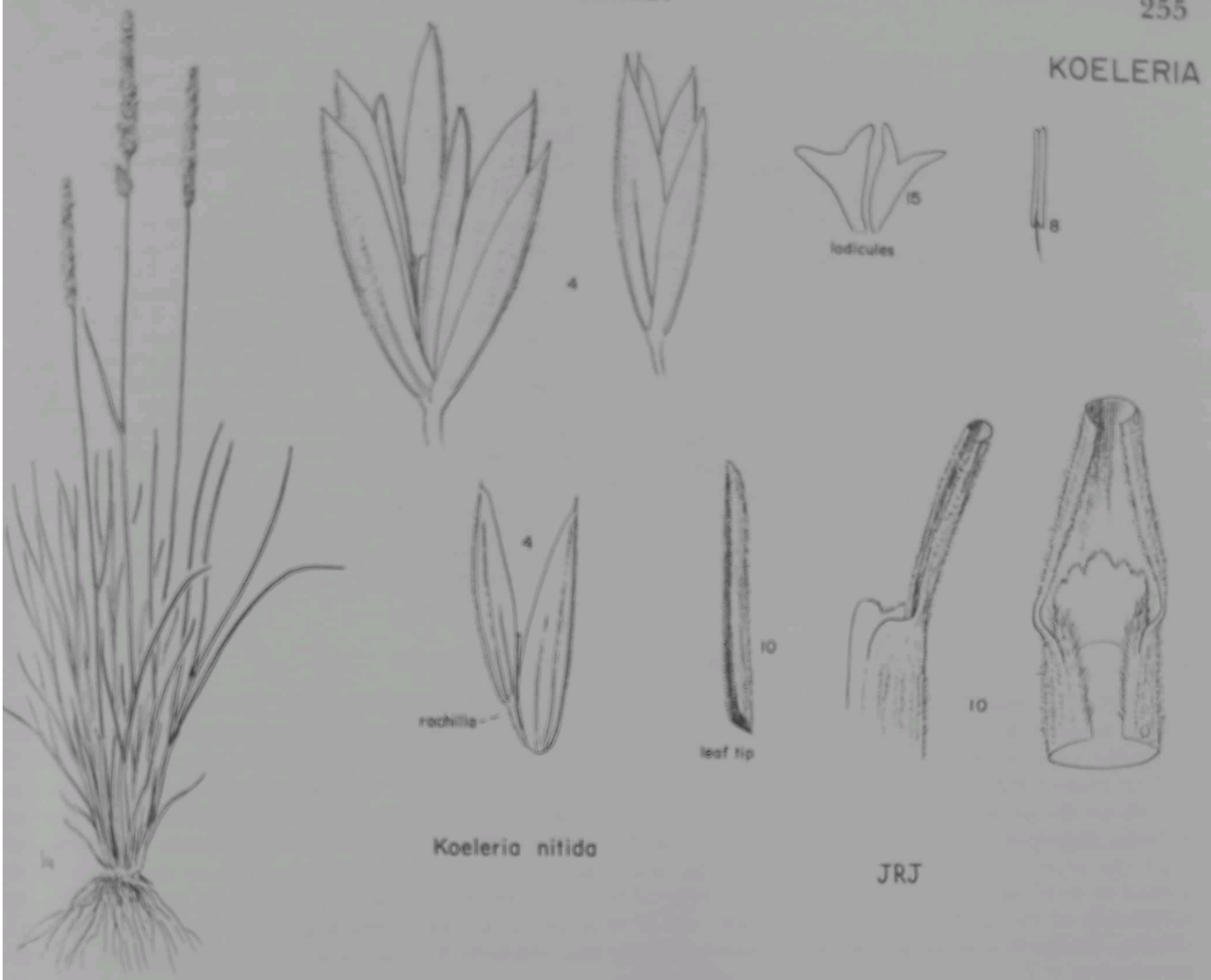
Cespitose perennials; culms (2) 2.5–6.5 dm tall; leaves mostly basal, the culm leaves few and small; sheaths hispid, sometimes densely so, rarely glabrous; ligules 0.5–1.5 (2) mm long, erose to subentire, ciliolate, sometimes puberulent; blades usually folded or involute, if flat 1–2 (2.5) mm broad, hispid to glabrous, with prow-shaped tips; panicle (2.5) 4–11 (15) cm long, contracted, spike-like, branches short, appressed, the rachis densely puberulent; spikelets 4–5 mm long, 2- (3- to 4)-flowered, the rachilla pilose; glumes subequal, scabrous on the keel and sometimes scaberulous all over, the first glume 2.8–4.5 (5) mm long, narrow-lanceolate to lanceolate, 1-nerved, the second 3.2–5 (5.5) mm long, lanceolate, 1- to 3-nerved, the lateral nerves obscure; lemmas about as long as the second glume, 3.2–5 (5.2) mm long, lanceolate, 5-nerved, the lateral nerves obscure, scaberulous, sometimes with a short awn near the tip; palea often as long as the lemma, membranous; lodicules about 0.8 mm long; anthers 1.2–2.5 mm long; $2n = 14, 15, 16, 28$.

Sagebrush foothills to dry open forests and ridges at subalpine elevs.; B.C., N.W.T., and Ont., s. throughout the w. states and n. Mex. and e. through Texas, Mo. and Ill. to Del. Late June–Aug.

Koeleria nitida bears close resemblance to *Poa fendleriana* of tribe Poeae from which it can be distinguished by its fewer florets per spikelet, densely puberulent rachis and shining white hyaline palea.

Shinners (Rhodora 58: 93–96. 1956) pointed out the illegitimacy of the name *K. cristata* (L.) Pers. *Koeleria cristata* is to be regarded as a new name by Persoon, based on "*Poa cristata* auctorum" (typification recondite), rather than a transfer from *Poa cristata* (L.) L. which he referred to *K. phleoides*. Shinners believed the oldest valid name for the taxon to be *K. macrantha* (Ledeb.) J. A. Schultes, based on the Asian *Aira macrantha* Ledeb. (1812). Johnston (in Correll & Johnston, Manual of the Vascular Plants of Texas. 139. 1970) and Gould (Grasses of Texas. 126. 1975) used the name *K. pyramidata* (Lam.) Beauv., based on the European *Poa pyramidata* Lam. (1791). To avoid confusion and to encourage a careful comparison with the European material, we have chosen the oldest New World name, *K. nitida* Nutt.

Junegrass is a good native forage grass but is seldom in enough abundance to be important.



12. SPHENOPHOLIS Scribn. Wedgegrass

Tufted annuals or short-lived perennials; culms hollow; sheaths open to the base, glabrous to pubescent; ligules membranous; blades flat, soft, non-auriculate, the collar often oblique; inflorescence a dense or loose, erect or nodding panicle; spikelets (1-) 2- (3)-flowered, the florets perfect, the rachilla produced beyond the upper floret, often with a vestigial lemma or as a slender bristle, disarticulating below the glumes and falling as a unit; glumes slightly keeled and compressed, very unlike in size and shape, the first glume narrow-lanceolate, acute, 1-nerved, the second broadly obovate to oblanceolate, 3- (5)-nerved, obtuse or broadly acute at the apex, scarious margined, usually slightly shorter than the lowermost lemma; lemmas firm, obscurely, if at all, 5-nerved, rounded on the back, smooth to scabrous, awnless; palea shorter than the lemma, thin, membranous, colorless, 2-nerved; lodicules membranous, obovate, often lobed; stamens 3; ovary glabrous, the styles terminal; $x = 7$.

A genus of 4 species, 3 in the c. and e. U.S. and *S. obtusata*, widespread nearly throughout N. Amer. and in the Caribbean. (From the Greek *sphen*, a wedge, and *pholis*, scale, in reference to the broadly obovate second glume.)

The fact that *S. obtusata* and its synonyms have been variously placed in *Koeleria*, *Trisetum*, *Poa*, *Festuca* and *Agrostis* points up the fact that it shares with *Koeleria* a somewhat transitional position between tribes Poeae and Aveneae.

Reference: Erdman, K. S. Taxonomy of the genus *Sphenopholis*. Iowa State Coll. J. Sci. 39: 289–336. 1965.

1. Sphenopholis obtusata (Michx.) Scribn.

Aira obtusata Michx. Fl. Boreali-Amer. 1: 62. 1803. *Airopsis obtusata* Desvaux, J. Bot. (Desvaux) 1: 200. 1808. *Festuca obtusata* Michx. ex Beauv. Essai Nouv. Agrostogr. 163. 1812. *Poa obtusata* Link, Hort. Regius Bot. Berol. 1: 176. 1827. *Agrostis obtusata* Steudel, Nomencl. Bot. Hort. ed. 2. 1: 41. 1840. *Koeleria obtusata* Trin. ex Steudel, ibid. 849, in synonymy. *Reboulea obtusata* A. Gray, Manual Bot. 591. 1848. *Eatonia obtusata* A. Gray, Manual Bot. ed. 2. 558. 1856. *Sphenopholis obtusata* Scribn. Rhodora 8: 144. 1906. (*Michaux*, "Hab. in sabulosis Carolinae, Georgiae, Floridae.")

Koeleria truncata var. *major* Torr. Fl. N. & Middle Sect. U. S. 1: 117. 1823. *Koeleria pennsylvanica* var. *major* Torr. Fl. State New York 2: 469. 1843. *Reboulea pennsylvanica* var. *major* A. Gray, Manual Bot. 591. 1848. *Eatonia pennsylvanica* var. *major* A. Gray, Manual Bot. ed. 2. 558. 1856. *S. pallens* subsp. *major* Scribn. Rhodora 8: 145. 1906. *S. pallens* var. *major* Scribn. ex B. L. Robinson, Rhodora 10: 65. 1908. *Reboulea pallens* var. *major* Farw. Rep. Michigan Acad. Sci. 17: 182. 1916. *S. obtusata* var. *major* K. S. Erdm. Iowa State Coll. J. Sci. 39: 310. 1965. (*Cooley*, "Near Deerfield, Mass.")

Trisetum lobatum Trin. Mem. Acad. Imp. Sci. St.-Pétersbourg,