

VOLUME 17

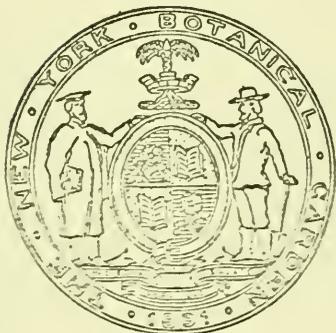
PART 7

NORTH AMERICAN FLORA

(POALES)

POACEAE (pars)

ALBERT SPEAR HITCHCOCK



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- Collar glabrous (throat of sheath more or less pilose); panicle usually exerted, narrow, condensed. 37. *S. domingensis*.
- Collar densely pilose, at least at the sides; panicle usually included at base (sometimes entirely included).
- Culms robust, 1-2 meters tall; spikelets 2.5-3 mm. long. 38. *S. giganteus*.
- Culms more slender, mostly less than 1 meter tall; spikelets 2-2.5 mm. long.
- Panicle open, often large, the branches and branchlets flexuous, the spikelets loosely arranged. 39. *S. flexuosus*.
- Panicle open or compact, if open, the spikelets crowded on the branchlets.
- Panicle compact or spike-like, usually exerted. 40. *S. contractus*.
- Panicle, or the exerted portion, somewhat open, the branches naked below (sometimes entirely enclosed).
- Base of plant a close tuft. 41. *S. cryptandrus*.
- Base of plant a cluster of knotty rhizomes; culms erect, slender, mostly less than 30 cm. tall; blades short, involute, spreading. 42. *S. Nealleyi*.

1. *Sporobolus ciliatus* Presl, Rel. Haenk. 1: 242. 1830.

Vilfa ciliata Trin. Mém. Acad. St.-Petersb. VI. 6²: 63. 1840. (Based on *Sporobolus ciliatus* Presl.)

Vilfa Preslii Steud. Nom. Bot. ed. 2. 2: 768. 1841. (Based on *Sporobolus ciliatus* Presl, the name probably changed because of *Vilfa ciliata* Beauv. 1812.)

Annual, foliage yellow-green when dry; culms erect or geniculate and spreading, branching from the lower nodes, glabrous, glandular-pitted below the nodes, 10-30 cm. tall; sheaths crowded and overlapping toward the base of the plant, glabrous except the densely ciliate margin, more or less glandular-pitted on the nerves, the uppermost elongate with a short blade; ligule less than 0.5 mm. long, ciliate; blades flat, rather stiff, ciliate with long rather distant hairs from a papillose base, pilose on both surfaces with scattering long hairs, mostly 5-10 cm. long, as much as 5 mm. wide; panicles erect, rather stiff, bronze-brown, spike-like, more or less interrupted, mostly 5-10 cm. long, the axis glabrous, somewhat glandular-pitted, the branches and pedicels appressed, glandular; spikelets about 2 mm. long, rather broad, glabrous; first glume less than half as long, the second as long as the spikelet.

TYPE LOCALITY: Panama.

DISTRIBUTION: Savannas and open ground, Honduras to Panama.

2. *Sporobolus vaginiflorus* (Torr.) Wood, Class-book ed. 1861, 775. 1861.

Vilfa vaginiflora Torr.; A. Gray, N. Am. Gram. & Cyp. 3. 1834; Trin. Mém. Acad. St.-Petersb. VI. 6²: 56. 1840.

Cryptostachys vaginata Steud. Syn. Gram. 181. 1854. (Type from North America.)

Sporobolus minor Vasey; A. Gray, Man. ed. 6. 646. 1890. (Type from North Carolina.) Not *S. minor* Kunth, 1830.

Sporobolus filiculmis L. Dewey, Contr. U. S. Nat. Herb. 2: 519. 1894. (Based on *S. minor* Vasey.) Not *S. filiculmis* Vasey. 1885.

Sporobolus ovatus Beal, Grasses N. Am. 2: 300. 1896. (Based on *S. minor* Vasey.)

Sporobolus vaginatus Scribn. Bot. Gaz. 21: 15. 1896. (Based on *Cryptostachys vaginata* Steud.)

? *Sporobolus vaginiflorus* var. *minor* Scribn.; Chapm. Fl. S. U. S. ed. 3. 598. 1897. (Type from North Carolina and Tennessee.)

Sporobolus vaginiflorus var. *inaequalis* Fernald, Rhodora 35: 109. 1933. (Type from Concord, New Hampshire.)

Annual, branching from the base; culms several-noded, erect to spreading, glabrous, mostly 20-40 cm. tall, sometimes as much as 75 cm.; sheaths glabrous, more or less pilose at the throat;

ligule less than 0.5 mm. long, ciliate; blades subinvolute or often flat at least at base, glabrous beneath, scabrous on the upper surface and margins especially toward the tip, often ciliate near base, sometimes sparsely long-pilose on the upper surface near the base, the lower often elongate, the upper short, as much as 2 mm. wide; panicles terminal and axillary, slender, mostly not more than 3 cm. long, the terminal exerted or partly included, the axillary mostly included in the sheaths, late in the season the sheaths swollen and containing cleistogamous spikelets; glumes acute, glabrous, about equal, 3–5 mm. long; lemma as long as the glumes or exceeding them, acute or acuminate, rather sparsely pubescent, sometimes mottled with dark spots; palea acuminate, sometimes longer than the lemma.

TYPE LOCALITY: New Jersey.

DISTRIBUTION: Sandy soil or open waste ground, Maine and Ontario to Minnesota and Nebraska, and southward to Georgia, Texas, and Arizona.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 466; Hitchc. Man. f. 820.

3. *Sporobolus neglectus* Nash, Bull. Torrey Club 22: 464. 1895.

Sporobolus vaginiflorus neglectus Scribn. Bull. U. S. Dep. Agr. Agrost. 17 (ed. 2): 170. f. 466. 1901. (Based on *S. neglectus* Nash.)

Sporobolus ozarkanus Fernald, Rhodora 35: 109. 1933. (Type from Webb City, Missouri, Palmer 3133.)

Annual; differing from *S. vaginiflorus* chiefly in the smaller, paler, plumper spikelets 2–3 mm. long, and in the glabrous lemma; blades often sparsely pilose; panicles usually entirely hidden in the more swollen sheaths; palea usually about as long as the lemma.

TYPE LOCALITY: Woodruff Gap, New Jersey (Britton in 1887).

DISTRIBUTION: Dry open ground and sandy fields, Quebec and Maine to North Dakota, and southward to Maryland, Tennessee, and Texas; Washington, Arizona.

ILLUSTRATION: Hitchc. Man. f. 822.

NOTE: *S. ozarkanus* Fernald is a form from the Ozark Mountains, Missouri, with rather strongly pilose leaves.

4. *Sporobolus tenuissimus* (Schrank) Kuntze, Rev. Gen. 3²: 369. 1898.

Panicum tenuissimum Schrank, Denks. Bot. Ges. Regensb. 2: 26. 1822.

Agrosticula muralis Raddi, Agrost. Bras. 33. 1823. (Type from Brazil.)

Sporobolus muralis Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 368. 1917. (Based on *Agrosticula muralis* Raddi.)

Annual; culms slender, erect, compressed, glabrous, 25–75 cm. tall; sheaths glabrous, compressed-keeled; ligule very short, ciliate; blades flat, thin, long-acuminate, glabrous or nearly so, 5–15 cm. long, the uppermost blades not much reduced, 1–3 mm. wide; panicles about half the length of the entire culm, narrow, open, 3–6 cm. wide, the branches and branchlets glabrous, capillary, spreading; spikelets glabrous, about 1 mm. long, on slender glabrous pedicels; first glume about one fourth, the second about half the length of the spikelet.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Waste ground, Virgin Islands through the Lesser Antilles to Brazil.

ILLUSTRATION: Raddi, Agrost. Bras. pl. 1, f. 2.

5. *Sporobolus macrospermus* Scribn.; Beal, Grasses N. Am. 2: 302. 1896.

Annual; culms erect, branching and geniculate at base, glabrous, 15–30 cm. tall; sheaths crowded toward the base, glabrous, the uppermost elongate with a reduced blade; ligule very short, ciliate; blades flat or loosely involute, ciliate with scattering long weak hairs, glabrous beneath or sometimes sparsely pilose on the upper surface, mostly less than 5 cm. long, 1–3 mm. wide; panicles narrowly pyramidal, open, mostly brownish, mostly 3–8 cm. long, the axis glabrous, the capillary branches in verticils, spreading, flexuous, glabrous, 1–2 cm. long, bearing a few spikelets on the upper half, these longer than the pedicels; spikelets about 2 mm. long, glabrous, the first glume one third to half as long, the second as long as the spikelet.

TYPE LOCALITY: Guadalajara, Mexico (Pringle 2447).

DISTRIBUTION: Rocky or sterile open ground, southern Mexico and Guatemala.

NOTE: See also Bull. U. S. Dep. Agr. Agrost. 4: 15. 1897.

6. *Sporobolus annuus* Vasey, Bull. Torrey Club 14: 9. 1887.

Annual; culms erect or somewhat spreading, branched at base, glabrous, 10–15 cm. tall; sheaths glabrous, keeled; ligule about 2 mm. long; blades flat or folded, glabrous, 1–3 cm. long, 1 mm. wide, the midrib thickened; panicles oblong or ovoid, open, about half the entire height of culm, the axis glabrous, the branches ascending, scaberulous, the axils glabrous, the pedicels capillary, thickened below the spikelet; glumes equal, glabrous, abruptly sharp-pointed, 1.5–1.7 mm. long; lemma a little shorter than the glumes, appressed-pubescent.

TYPE LOCALITY: Noragachi, Chihuahua (*Palmer 4a* in 1885).

DISTRIBUTION: Sandy soil near water; known only from the type locality.

7. *Sporobolus microspermus* (Lag.) Hitchc. Jour. Wash. Acad.

23: 453. 1933.

Milium microspermum Lag. Gen. & Sp. Nov. 2. 1816.

Agrostis minutissima Steud. Syn. Gram. 171. 1854. (Type from New Mexico, *Fendler 986*.)

Vilfa confusa Fourn. Mex. Pl. Gram. 101. 1886. (Type from Mexico; *Hall & Harbour 643* from the United States also cited by Fournier.)

Sporobolus confusus Vasey, Bull. Torrey Club 15: 293. 1888. (Based on *Vilfa confusa* Fourn.)

Sporobolus confusus var. *aberrans* Jones, Contr. W. Bot. 14: 10. 1912. (Specimens cited from Bowie, Arizona, and Juárez, Mexico.)

Sporobolus minutissimus Hitchc. Proc. Biol. Soc. Wash. 41: 161. 1928. (Based on *Agrostis minutissima* Steud.)

Annual; culms erect or spreading, branched below, slender, puberulous or scaberulous, 10–30 cm. tall; sheaths striate, scaberulous; ligule thin, pointed, 1–2 mm. long; blades flat, lax, scaberulous, mostly less than 10 cm. long, 1–2 mm. wide; panicles oblong, open, half or two thirds as long as the entire culm, the axis glabrous below, scaberulous above, the branches spreading, scabrous, glabrous in the axils, the pedicels slender, spreading, thickened below the spikelets; spikelets 1–1.8 mm. long; glumes obtuse, about equal, half to three fourths as long as the spikelet or a little more, distinctly or obscurely pilose; lemmas obtuse, pubescent on mid-nerve and margins.

TYPE LOCALITY: Mexico (grown in Spain from seed sent by Sessé).

DISTRIBUTION: Sandy or rocky open ground, Montana and eastern Washington to Nebraska, Texas, New Mexico, and southern California; Costa Rica.

ILLUSTRATION: Hitchc. Man. f. 814.

8. *Sporobolus ramulosus* (H.B.K.) Kunth, Rév. Gram. 1: 68.

1829.

Vilfa ramulosa H.B.K. Nov. Gen. & Sp. 1: 137. 1815.

Agrostis ramulosa R. & S. Syst. Veg. 2: 361. 1817. (Based on *Vilfa ramulosa* H.B.K.)

Vilfa minima Vasey, Monthly Rep. U. S. Dep. Agr. 1874: 155. 1874. (Type from Twin Lakes, Colorado, *Wolf 1077*.) Not *V. minima* Trin. 1854.

Sporobolus Wolfii Vasey, Bull. Torrey Club 10: 52. 1883. (Type from Twin Lakes, Colorado, *Wolf 1077*.)

Sporobolus racemosus Vasey, Bull. Torrey Club 14: 9. 1887. (Type from Chihuahua, *Palmer* in 1885.)

Muhlenbergia Wolfii Rydb. Bull. Torrey Club 32: 600. 1905. (Based on *Sporobolus Wolfii* Vasey.)

Annual; culms spreading, branching at the lower nodes, glabrous, angled, 10–20 cm. tall; sheaths glabrous, striate, shorter than the internodes; ligule truncate, erose, less than 0.5 mm. long; blades flat, lax, glabrous beneath, scabrous-pubescent on the upper surface, mostly 1–3 cm. long, 1 mm. wide or less; panicles oblong, open, 2–5 cm. long, the axis glabrous, the branches ascending, somewhat scabrous, the pedicels short, stiff, scabrous, appressed along the main branches; spikelets about 1 mm. long; glumes broad, obtuse, about equal, glabrous, half as long as the spikelet; lemma rather turgid, acutish.

TYPE LOCALITY: Jorullo, Mexico.

DISTRIBUTION: Open dry ground, Colorado, New Mexico, Arizona, and southward to Guatemala.

ILLUSTRATION: Hitchc. Man. f. 813.

9. *Sporobolus bahamensis* Hack. Oesterr. Bot. Zeits. 52: 56.
1902.

Annual; culms slender, erect, 15–30 cm. tall; sheaths glabrous; ligule very short, ciliate; blades loosely involute, mostly 4–6 cm. long, about 1 mm. thick, glabrous; panicle oblong, open, about half the length of the entire culm, 3–4 cm. wide, the branches capillary, ascending or spreading, mostly solitary, glabrous, naked on the lower part; spikelets a little more than 1 mm. long, somewhat clustered, short-pedicel, the lateral pedicels shorter than the spikelet, glabrous; glumes shorter than the spikelet, nearly equal, 0.3–0.4 mm. long, the first acutish, the second broader, obtuse; lemma and palea equal, obtuse; fruit a little shorter than the lemma.

TYPE LOCALITY: Acklin Island, Bahamas.

DISTRIBUTION: Among shrubs; known only from the type locality (*Eggers 3905*, the type, and *Brace 4251*).

10. *Sporobolus Shepherdii* Vasey, Bull. Torrey Club 14: 8. 1887.

Annual; culms erect or spreading, branching at the base and lower nodes, scaberulous below the nodes, 20–40 cm. tall; sheaths glabrous or faintly scaberulous, striate; ligule erose, 2–3 mm. long; blades flat or loosely involute, glabrous beneath, pubescent on the upper surface, mostly less than 5 cm. long, 1–2 mm. wide; panicles oblong or ovoid, open, 5–10 cm. long, the axis scaberulous, the delicate branches rather stiffly ascending, glabrous in the axils, scabrous, as much as 7 cm. long, the pedicels (branches of the second or third order) capillary, glabrous or nearly so, more or less flexuous especially near the summit, enlarged below the spikelet (the enlargement roughish); spikelets about 2 mm. long or a little less; glumes as long as the spikelet or a little shorter, glabrous, rather obtuse, the first a little shorter than the second; lemma and palea about equal, appressed-pubescent except at the tip.

TYPE LOCALITY: Southwestern Chihuahua (*Palmer 9* in 1885).

DISTRIBUTION: Rocky pine woods, Chihuahua and Durango.

11. *Sporobolus capillipes* Jones, Contr. West. Bot. 14: 9. 1912.

Sporobolus capillipes var. *delicatulus* Jones, Contr. West. Bot. 14: 10. 1912. (Type from Soldier Canyon, Sierra Madre, Chihuahua.)

Annual; differing from *S. Shepherdii* in the smaller spikelets, about 1.5 mm. long, the shorter glumes, one half to two thirds as long as the lemma, and the glabrous or nearly glabrous lemma.

TYPE LOCALITY: San Diego Canyon, Sierra Madre, Chihuahua.

DISTRIBUTION: "Lower temperate Life Zone"; known only from the two type localities cited.

NOTE: This may be only a form of *S. Shepherdii* as suggested by Jones. The panicles are described as "often a foot long."

12. *Sporobolus virginicus* (L.) Kunth, Rév. Gram. 1: 67. 1829.

Agrostis virginica L. Sp. Pl. 63. 1753.

Vilfa virginica Beauv. Agrost. 16, 182. 1812. (Based on *Agrostis virginica* L.)

Agrostis pungens Muhl. Descr. Gram. 72. 1817. (Type from eastern United States.) Not *A. pungens* Schreb. 1769.

Crypsis virginica Nutt. Gen. 1: 49. 1818. (Based on *Agrostis virginica* "Willd.")

Podosaeum virginicum Link, Hort. Berol. 1: 85. 1827. (Based on *Agrostis virginica* L.)

Perennial, with numerous, branching, widely creeping, slender rhizomes (yellowish in drying); culms erect, 10–40 cm. tall; sheaths overlapping, more or less pilose at the throat; blades flat or becoming involute especially toward the fine point, conspicuously distichous, mostly less than 5 cm. long or on the innovations longer; panicle pale, contracted or spikelike, 2–8 cm. long, 5–10 mm. thick; spikelets 2–2.5 mm. long; glumes and lemma about equal.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Sandy or muddy seashores and saline marshes, forming extensive colonies, with relatively few flowering culms, southeastern Virginia (Gron. Pl. Virg.) to Florida and Texas, and southward through the West Indies to Brazil; also Ecuador to Chile; warmer parts of the Old World.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 470; Hitchc. Man. f. 816.

Sporobolus virginicus var. *littoralis* (Lam.) Hitchc. *Agrostis littoralis* Lam. Tab. Encyc. 1: 161. 1791. (Basis of *Sporobolus virginicus* var. *littoralis*). *Agrostis barbata* Pers. Syn. Pl. 1: 75. 1805. (Based on *Agrostis littoralis* Lam.) *Vilfa littoralis* Beauv. Agrost. 16, 147, 181. 1812.

(Based on *Agrostis littoralis* Lam.) *Sporobolus littoralis* Kunth, Rév. Gram. 1. 68. 1829. (Based on *Agrostis littoralis* Lam.) Similar to *S. virginicus* but larger, the culms as much as 1 m. tall and the panicles as much as 15 cm. long. TYPE LOCALITY: South America. DISTRIBUTION: Southern Florida to Brazil; common in the West Indies.

13. *Sporobolus Poiretii* (R. & S.) Hitchc. *Bartonia* 14: 32. 1932.

Agrostis compressa Poir. in Lam. Encyc. Suppl. 1: 258 (no. 78). 1810. Not *A. compressa* Willd. 1790, nor Poir. op. cit. 1: 259. 1810.
Axonopus Poiretii R. & S. Syst. Veg. 2: 318. 1817. (Based on *Agrostis compressa* Poir. "n. 78.," and the basis of *Sporobolus Poiretii*.)
Agrostis tenuissima Spreng. Syst. 1: 258. 1825. (Described from West Indies and South America.)
Vilfa exilis Trin. Mém. Acad. St.-Petersb. VI. 6^e: 89. 1840. (Type from Jalapa, Mexico.)
Vilfa Berteroana Trin. Mém. Acad. St.-Petersb. VI. 6^e: 100. 1840. (Type from Santo Domingo.)
Sporobolus angustus Buckl. Proc. Acad. Phila. 1862: 88. 1863. (Type from Texas.)
Vilfa tenacissima var. *exilis* Fourn. Mex. Pl. Gram. 99. 1886. (Based on *Vilfa exilis* Trin.)
Vilfa tenacissima var. *intermedia* Fourn. Mex. Pl. Gram. 99. 1886. (Type from Mexico.)
Vilfa tenacissima var. *robusta* Fourn. Mex. Pl. Gram. 100. 1886. (Type from Mexico.)
Sporobolus Berteroanus Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 370. 1917. (Based on *Vilfa Berteroana* Trin.)

Perennial; culms erect, solitary or in small tufts, glabrous, 30-100 cm. tall; sheaths glabrous, more or less pubescent on the margin and around the throat, somewhat keeled; ligule firm, less than 0.5 mm. long, ciliolate; blades flat at base, usually more or less involute above, tapering to a long fine point, glabrous or nearly so except the scabrous point; elongate, 2-5 mm. wide at base; panicle usually spikelike, but more or less interrupted, 10-40 cm. long, the branches appressed or ascending, closely flowered, the middle ones mostly less than 1 cm. long; spikelets about 2 mm. long; glumes obtuse, somewhat unequal, about half as long as the spikelet or less; lemma acutish.

TYPE LOCALITY: Carolina (Bosc).

DISTRIBUTION: Open ground and waste places, Virginia to Tennessee and Arkansas; on ballast in Oregon and New Jersey; also tropical Asia; apparently introduced in America.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 126 (*S. indicus*); Hitchc. Man. f. 818.

NOTE: At maturity the extruded reddish caryopses remain for some time sticking to the panicle by the mucilaginous pericarp. The inflorescence is often attacked by a black fungus.

This species has been included in *Sporobolus indicus* in many manuals.

14. *Sporobolus indicus* (L.) R. Br. Prodr. 170. 1810.

Agrostis indica L. Sp. Pl. 63. 1753.
Agrostis elongata Lam. Tab. Encyc. 1: 162. 1791. (Type from South America; *Agrostis indica* L. cited as synonym.) Not *Sporobolus elongatus* R. Br. 1810.
Vilfa elongata Beauv. Agrost. 16, 147, 181. 1812. (Based on *Agrostis elongata* Lam.)
Sporobolus Lamarckii Desv.; Hamilt. Prodr. 4. 1825. (Based on *Agrostis elongata* Lam.)
Sporobolus Jacquemontii Kunth, Rév. Gram. 427. 1831. (Type from Santo Domingo.)
Sporobolus littoralis var. *elongatus* Dur. & Schinz, Consp. Pl. Afr. 5: 821. 1894. (Based on *Vilfa elongata* Beauv.)

Resembling *S. Poiretii*; blades more slender, especially at base; panicle branches longer, more slender, and less densely flowered, loosely ascending to somewhat spreading, the panicle narrow but not spikelike.

TYPE LOCALITY: Jamaica. The locality given by Linnaeus is "India" but the type specimen was sent from Jamaica by Patrick Browne.

DISTRIBUTION: Punta Gorda, Florida; ballast, Mobile, Alabama; also tropical America and southeastern Asia.

ILLUSTRATIONS: Kunth, Rév. Gram. pl. 127; Hitchc. Man. f. 818B.

15. *Sporobolus Palmeri* Scribn. Bull. U. S. Dep. Agr. Agrost. 11: 48. 1898.

Perennial, glaucous; culms densely cespitose, erect, 1-noded above the base, glabrous, 30-50 cm. tall; sheaths glabrous, striate, crowded below, pilose at the throat; ligule very short, densely ciliate with hairs 0.5-1 mm. long; blades involute, rather stiff, sharp-pointed, glabrous, 5-12 cm. long, 1-2 mm. wide when flattened; panicles open, rather diffuse, 20-30 cm. long, the axis glabrous or nearly so, the branches rather stiff, finally spreading, mostly solitary, glabrous in the axils, smooth, as much as 15 cm. long, the pedicels (branches of about the fourth order) capillary, somewhat flexuous, longer than the spikelets; spikelets 3-3.5 mm. long, plumbeous,

glabrous; first glume obtuse, 1.5 mm. long; second glume 2–2.5 mm. long; lemma obtuse; palea broad, a little longer than the lemma, the keels close together; caryopsis about 2 mm. long.

TYPE LOCALITY: City of Durango, Mexico (*Palmer 180* in 1896).

DISTRIBUTION: Alkali bottoms; known only from the type collection.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. *pl.* 5.

16. *Sporobolus macrus* (Trin.) Hitchc. Amer. Jour. Bot. 2: 303. 1915.

Vilfa macra Trin. Mém. Acad. St.-Pétersb. VI. Sci. Nat. 6²: 79. 1840.

Perennial, with short scaly creeping rhizomes 2–3 cm. long, the scales closely imbricate; culms erect, glabrous, one or two in small colonies, 50–70 cm. tall; sheaths glabrous, pilose about the throat and the upper surface of the blades near base; ligule very short, a mere trace, the base of the blade folded in around it; blades flat or more or less involute, glabrous except at base, 10–20 cm. long, 1–3 mm. wide; panicles narrow, mostly inclosed at base, 5–15 cm. long, the branches erect; spikelets 4–5 mm. long, compressed, glabrous; glumes acutish, the first about two thirds as long as the spikelet, the second a little longer than the first, lemma and palea subequal or the palea a little longer, the tips boat-shaped.

TYPE LOCALITY: Louisiana.

DISTRIBUTION: Wet pine land, Oklahoma, Mississippi, and Louisiana.

ILLUSTRATION: Hitchc. Man. *f.* 826.

NOTE: Except for the rhizomes this species resembles *Sporobolus asper* var. *Hookeri*.

17. *Sporobolus asper* (Michx.) Kunth. Rév. Gram. 1: 68. 1829.

Agrostis aspera Michx. Fl. Bor. Am. 1: 52. 1803.

Agrostis composita Poir. in Lam. Encyc. Suppl. 1: 254. 1810. (Type from Carolina.)

Vilfa aspera Beauv. Agrost. 16, 147, 181. 1812. (Based on *Agrostis aspera* Michx.)

Vilfa composita Beauv. Agrost. 16, 147, 181. 1812. (Based on *Agrostis composita* Poir.)

Agrostis involuta Muhl. Descr. Gram. 72. 1817. (Described from Susquehanna, Pa., and New Jersey.)

Agrostis longifolia Torr. Fl. U. S. 1: 90. 1823. (Specimens cited from New York, New Jersey, Massachusetts, and Pennsylvania.)

Muhlenbergia aspera Trin.; Kunth, Enum. Pl. 1: 210. 1833. (Based on *Agrostis aspera* Michx.)

Muhlenbergia composita Trin.; Kunth, Enum. Pl. 1: 229. 1833. (Based on *Agrostis composita* Poir.)

Vilfa longifolia Torr.; Trin. Mém. Acad. St.-Pétersb. VI. 6²: 107. 1840. (Based on *Agrostis longifolia* Torr.)

Sporobolus longifolius Wood, Class-book ed. 1861. 775. 1861. (Based on *Agrostis longifolia* Torr.)

Sporobolus compositus Merr. Circ. U. S. Dep. Agr. Agrost. 35: 6. 1901. (Based on *Agrostis composita* Poir.)

Perennial; culms erect, rather stout, solitary or in small tufts, several-noded, glabrous, 60–120 cm. tall; sheaths glabrous, strongly overlapping, more or less pubescent or pilose around the throat and on the collar; ligule very short, scarcely measurable; blades elongate, flat, becoming involute, the lower narrow and rolled at base, tapering to a fine scabrous point, more or less pilose near base on the upper surface, sometimes pilose beneath near base, 1–4 or rarely 5 mm. wide; panicles pale or whitish, sometimes purplish, terminal and axillary, contracted, more or less spikeletlike, usually inclosed at base or sometimes entirely inclosed in the inflated upper sheaths, 5–15 cm. long, the branches appressed; spikelets 4–6 mm. long, compressed, glabrous; glumes acutish, rather broad, the first about half as long as the spikelet, the second two thirds to three fourths as long; lemma and palea subequal, the tips boat-shaped.

TYPE LOCALITY: Illinois (*Michaux*).

DISTRIBUTION: Prairies and sandy meadows, Vermont to North Dakota, and southward to Tennessee, Colorado, Texas, Utah, and New Mexico; eastern Washington.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: *f.* 119; Hitchc. Man. *f.* 824.

Sporobolus asper var. *pilosus* (Vasey) Hitchc. Proc. Biol. Soc. Wash. 41: 161. 1928. *S.*

pilosus Vasey, Bot. Gaz. 16: 26. 1891. Blades and sheaths more or less pilose. TYPE LOCALITY: Kansas (*Smythe*). DISTRIBUTION: Prairies and rocky hills, Kansas (Saline County and westward); Texas (Del Rio).

Sporobolus asper var. *Hookeri* (Trin.) Vasey, Descr. Cat. Grasses U. S. 43. 1885. *Vilfa*

Drummondii Trin. Mém. Acad. St.-Pétersb. VI. 6²: 106. 1840. (Type from Texas.) *Vilfa*

Hookeri Trin. Mém. Acad. St.-Pétersb. VI. 6²: 106. 1840. (Type from Texas.) *Glyceria stricta*

Buckl. Proc. Acad. Phila. 1862: 95. 1863. (Type from Texas. Inflorescence abnormal, the

spikelets diseased with 2 or 3 several-nerved lemmas.) *Sporobolus Drummondii* Vasey, Cat. Grasses

U. S. 44. 1885. (Based on *Vilfa Drummondii* Trin.) *Sporobolus asper* var. *Drummondii* Vasey,

Contr. U. S. Nat. Herb. 3: 60. 1892. (Based on *Vilfa Drummondii* Trin.) *Sporobolus attenuatus* Nash, in Small, Fl. SE. U. S. 123. 1903. (Type from Starkville, Miss., Kearney 83.) Less robust, the more slender fewer-flowered panicle looser; spikelets usually smaller, 3–5 mm. long; foliage rarely somewhat villous. TYPE LOCALITY: Texas. DISTRIBUTION: Prairies, Missouri, Mississippi, Texas, and Oklahoma.

18. *Sporobolus clandestinus* (Spreng.) Hitchc. Contr. U. S. Nat. Herb. 12: 150. 1908.

Agrostis clandestina Spreng. Mant. Fl. Ital. 32. 1807.
Muhlenbergia clandestina Trin. Gram. Unifl. 190. 1824. (Based on *Agrostis clandestina* Spreng.)
Vilfa clandestina Nees; Steud. Nom. Bot. ed. 2. 2: 767. 1841. (Based on *Agrostis clandestina* Spreng.)
 ? *Vilfa Riehlii* Steud. Syn. Gram. 154. 1854. (Type from North America.)
Sporobolus canovirens Nash; Britton, Man. 1042. 1901. (Type from St. George, Kansas.)

Perennial; culms relatively stout to slender, erect or spreading, usually cespitose in rather large bunches, glabrous, several-noded, 50–100 cm. tall; sheaths glabrous or the lower pilose, more or less pilose at the throat, except the lower mostly shorter than the internodes; ligule very short; blades flat becoming involute, tapering to a long fine scabrous point, pilose on the upper surface near base, sometimes also beneath, 1–3 mm. wide; panicles narrow, contracted or spike-like, 5–10 cm. long, terminal and axillary, the terminal often exserted, the axillary usually enclosed in the somewhat inflated sheaths; spikelets 5–7 mm. long, compressed; glumes acute or subacute, glabrous, the first more than half as long as the spikelet, the second longer than the first; lemma sparsely appressed-pubescent, acuminate; palea longer than the lemma, sometimes as much as 10 mm. long.

TYPE LOCALITY: Pennsylvania (*Muhlenberg*).

DISTRIBUTION: Sandy fields, pine barrens, hills, and prairies, Connecticut to Illinois and Kansas, and southward to Florida and Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 120; Hitchc. Man. f. 827.

19. *Sporobolus purpurascens* (Sw.) Hamilt. Prodr. 5. 1825.

Agrostis purpurascens Sw. Prodr. 25. 1788.
Vilfa purpurascens Beauv. Agrost. 16, 182. 1812. (Based on *Agrostis purpurascens* Sw.)
Vilfa pilifera var. *latifolia* Rupr. Bull. Acad. Brux. 9: 228. 1842. Name only, for *Galeotti 5706*.
Vilfa Grisebachiana Fourn. Mex. Pl. Gram. 98. 1886. (Type from Cuba.)
Vilfa densiflora Fourn. Mex. Pl. Gram. 98. 1886. (Type from Orizaba, Botteri 139)
Vilfa Liebmanni Fourn. Mex. Pl. Gram. 100. 1886. (Type from Mexico.)

Perennial; culms erect, glabrous, mostly 2–3-noded, 30–60 cm. tall; sheaths glabrous; ligule erose, scarcely 0.5 mm. long; blades flat or loosely involute, glabrous, remotely ciliate with long hairs from papillae or papillose only, 5–15 cm. long, the uppermost shorter, 1–4 mm. wide; panicles contracted, sometimes almost spikelike, dark-brown or purple, more or less interrupted, 7–15 cm. long, the axis glabrous, the branches in verticils, appressed or somewhat ascending, floriferous nearly to base, 1–2 cm. long or the upper shorter; spikelets 3–4 mm. long, glabrous, first glume acuminate, about half as long as the spikelet; second glume, lemma, and palea about the same length.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Sandy prairies, southern Texas, eastern Mexico, Revillagigedo Islands (Socorro, Mason 1663), and West Indies to Brazil.

ILLUSTRATIONS: Trin. Ic. pl. 58B; Hitchc. Man. f. 837.

NOTE: This species is referred to *Vilfa pilifera* Trin. of India by Fournier (Mex. Pl. Gram. 98. 1886).

20. *Sporobolus cubensis* Hitchc. Contr. U. S. Nat. Herb. 12: 237. 1909.

Perennial; culms densely cespitose, erect, glabrous, about 3-noded, 30–50 cm. tall; sheaths glabrous, pilose at the throat, the lower strongly felty-ciliate; ligule very short; blades rather firm or stiff, erect, flat or involute, 10–15 cm. long, the uppermost shorter, 1–3 mm. wide, the lower ones narrowed into a channeled ciliate base; panicle erect, usually brown or bronze-yellow, narrowly pyramidal, 10–15 cm. long, the axis glabrous, the branches in verticils 1–2 cm. apart, finally horizontally spreading or reflexed, as much as 2 or even 3 cm. long, flexuous, some

of them naked at base for as much as 5 mm.; spikelets about 4 mm. long, acute, somewhat secund along the lower side of the branches, the lateral pedicels 0.5 mm. long; first glume gradually acute, a little more than half as long as the spikelet, the second as long as the lemma.

TYPE LOCALITY: Isle of Pines (*Curtiss 392*).

DISTRIBUTION: Sandy barrens, Cuba to Puerto Rico; Chiapas; Costa Rica to Pará and Bolivia.

21. *Sporobolus junceus* Kunth, Rév. Gram. 1: 68. 1829.

Agrostis juncea Michx. Fl. Bor. Am. 1: 52. 1803. (Type from Carolina.) Not *A. juncea* Lam. 1783.

Heleochloa juncea Beauv. Agrost. 24, 147. 1812. (Based on *Agrostis juncea* Michx.)

Colpodium junceum Trin. in Spreng. Neu. Entd. 2: 37. 1821. (Based on *Agrostis juncea* Michx.)

Crypsis juncea Steud. Nom. Bot. 1: 242. 1821. (Based on *Agrostis juncea* Michx.)

Vilfa juncea Trin. Gram. Unifl. 157. 1824. (Based on *Agrostis juncea* Michx.)

Vilfa Schiedeana Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 73. 1840. (Type from Arkansas.)

Vilfa gracilis Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 74. 1840. (Basis of *Sporobolus gracilis*.)

Vilfa fulvescens Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 76. 1840. (Type from North America.)

Vilfa subsetacea Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 133 (in note). 1840. (Based on *V. gracilis* Trin. [op. cit. page 74, not op. cit. page 104].)

Vilfa Vincenti Steud. Syn. Gram. 155. 1854. (Type from Rusk County, Texas.)

Aira triglumis Steud. Syn. Gram. 223. 1854. (Type from Rusk County, Texas.)

Sporobolus ejuncidus Nash, in Britton, Man. 106. 1901. (Based on *Sporobolus junceus* Kunth.)

Sporobolus gracilis (Trin.) Merrill, Rhodora 4: 48. 1902.

Perennial; culms densely cespitose, erect, slender, glabrous, about 3-noded, 30–60 cm. tall; sheaths glabrous; ligule very short; blades closely folded or involute, glabrous beneath, puberulent on the upper surface near the base, scabrous-pubescent above the base, less than 1 mm. thick as folded; panicles mostly bronze-brown, oblong or narrowly pyramidal, open, 7–15 cm. long, the axis glabrous, the branches in verticils 1–2 cm. (rarely more) apart, flexuous, ascending or usually widely spreading, 2–3 cm. long, naked at base, the short-pedicel spikelets appressed, not overlapping or only slightly so; spikelets about 3 mm. long, glabrous; first glume about half as long as the spikelet, the second as long as the acute lemma or a little longer.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Pine barrens of the Coastal Plain, southeastern Virginia to Florida and Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 455; Hitchc. Man. f. 835.

22. *Sporobolus Mülleri* (Fourn.) Hitchc.

Vilfa Mülleri Fourn. Mex. Pl. Gram. 98. 1886. (Basis of *Sporobolus Mülleri*.)

Sporobolus erectus Hitchc. Contr. U. S. Nat. Herb. 17: 313. 1913. (Type from Jalapa, Mexico, Hitchcock 6616.)

Perennial; culms cespitose, erect, glabrous, slightly compressed, 3–4-noded, 60–70 cm. tall; sheaths glabrous; ligule a ciliate-erose ring 0.5 mm. long, sometimes with a few long hairs at the side; blades flat or becoming involute, somewhat soft and thick, sparsely papillose-hispid with long hairs on the margins, otherwise glabrous, the main culm-blades as much as 15 cm. long and 4 mm. wide, the uppermost narrow and involute, 2–4 cm. long, those of the innovations slender and involute; panicle narrow, dark-brown, 10–15 cm. long, 3–4 cm. wide, the axis glabrous, the branches in verticils, slender, ascending, naked below, the lower 2–3 cm. long; spikelets glabrous, short-pedicel and appressed along the upper half of the branches, about 4 mm. long, the pedicels mostly less than 1 mm. long; first glume acute, 1.5 mm. long; the second as long as the lemma and palea, the latter at maturity splitting down the middle by the enlarged caryopsis, each part acute, about 1 mm. wide; caryopsis elliptic, abruptly pointed at each end, 2 mm. long, 1 mm. wide.

TYPE LOCALITY: Orizaba, Mexico (*Müller 2117*).

DISTRIBUTION: Banks and open ground, State of Veracruz.

23. *Sporobolus Curtissii* (Vasey) Small; Kearney, Bull. U. S. Dep. Agr. Agrost. 1: 24. 1895.

Sporobolus floridanus var. *Curtissii* Vasey; Beal, Grasses N. Am. 2: 290. 1896.

Perennial; culms densely cespitose, slender, erect, glabrous, without nodes above the base, 30–70 cm. tall; sheaths glabrous, somewhat keeled, the uppermost very long; ligule very short;

blades slender, rather stiff, flexuous, flat or involute, glabrous, stiffly pilose on the upper surface near the base, 15–30 cm. long, 0.5–1 mm. wide, the culm-blade short; panicles pyramidal, open, 7–20 cm. long, the axis glabrous or slightly scabrous, the branches rather stiffly ascending, solitary or in twos, pilose in the lower axils with a few long hairs, rather distant, the lower 4–7 cm. long; spikelets appressed along the main branches, usually not overlapping, longer than the pedicels, brownish, glabrous, about 4.5 mm. long; glumes about equal, acuminate, as long as or longer than the lemma and palea.

TYPE LOCALITY: Florida (*Curtiss*).

DISTRIBUTION: Dry pine barrens, North Carolina, Georgia, and Florida.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 124; Hitchc. Man. f. 832.

24. *Sporobolus Tharpii* Hitchc. Proc. Biol. Soc. Wash. 41: 161.
1928.

Perennial; culms densely cespitose, glabrous, 1-noded, 60–100 cm. tall; sheaths glabrous, overlapping on the lower half of the culm, the lower firm, loose, shining; ligule very short, ciliate-erose; blades elongate, involute, slender, flexuous, glabrous, long-ciliate at base, tapering to a long fine point; panicle open, narrow, as much as 30 cm. long, the axis glabrous, the branches stiffly ascending, solitary or in twos, glabrous in the axils, the lower as much as 15 cm. long; spikelets appressed along the branches and branchlets, about 3 mm. long, longer than the pedicels; first glume narrow, acuminate, about half as long as the spikelet, the second glume, lemma, and palea about equal.

TYPE LOCALITY: Padre Island, Texas (*Tharp 4772*).

DISTRIBUTION: Known only from Padre Island, southern Texas.

ILLUSTRATION: Hitchc. Man. f. 853.

25. *Sporobolus teretifolius* Harper, Bull. Torrey Club 33: 229.
1906.

Perennial; culms cespitose, erect, wiry, glabrous, without nodes above the base, 60–80 cm. tall; sheaths pilose at the throat, the lower shining and becoming somewhat flattened, the uppermost very long; ligule erose, about 0.5 mm. long; blades elongate, slender, terete or tightly folded above the channeled base, wiry, flexuous, glabrous, pilose on the upper surface at base, mostly less than 1 mm. thick; panicle pyramidal, open, narrow, 15–20 cm. long, the axis angled, scaberulous, the capillary branches, branchlets, and pedicels ascending or somewhat spreading, scabrous, the pedicels, if branches of the third order, often shorter than the spikelets, if of the second order, longer; spikelets purplish-brown, 4–4.5 mm. long, glabrous; first glume half as long as the spikelet or a little longer, the second equaling the lemma and palea.

TYPE LOCALITY: Near Moultrie, Georgia (*Harper 1642*).

DISTRIBUTION: Moist pine barrens, Georgia (Moultrie, the type, and Irby, *Tracy 1483*) and North Carolina (Southport, *Fults 1816*).

NOTE: In the type the blade is channeled for a short distance at the base but soon becomes terete and glabrous; the summit of the sheath and the base of the blade above are densely long-pilose. In the Irby specimen the blades are partly terete or nearly so and partly compressed and tightly folded. In the Southport specimen the blades are partly channeled and partly tightly folded but the margins are scabrous and the base is not pilose. These forms cannot be properly evaluated until more material is available.

26. *Sporobolus floridanus* Chapm. Fl. S. U. S. 550. 1860.

Perennial, more robust than *S. Curtissii*; culms cespitose, erect, glabrous, with no nodes above the base, 75–100 cm. tall; sheaths compressed, glabrous, sometimes pilose near the summit; ligule very short; blades continuous with the sheath, those of the main culm mostly flat, mostly folded at base, scaberulous on the margin, rather abruptly acute, elongate, 1–5 mm. wide, those of the innovations slender, tightly folded, pilose around the base and summit of the sheath; panicles narrow, open, mostly purple, 15–35 cm. long, the axis angled, scaberulous, the branches and branchlets ascending, scabrous, pilose or pubescent in the axils, solitary or more or less clustered, the lower as much as 15 cm. long; spikelets 4–5 mm. long, mostly shorter than

the pedicels; glumes subequal or the first shorter; lemma and palea mostly a little longer than the second glume.

TYPE LOCALITY: Middle and western Florida.

DISTRIBUTION: Low pine barrens, Georgia and Florida.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 123; Hitchc. Man. f. 837.

27. *Sporobolus heterolepis* (A. Gray) A. Gray, Man. 576. 1848.

Vilfa heterolepis A. Gray, Ann. Lyc. N. Y. 3: 233. 1835.

Agrostis heterolepis Wood, Class-Book ed. 2. 598. 1847. (Based on *Vilfa heterolepis* A. Gray.)

Perennial; culms densely tufted, erect, glabrous, mostly 1-noded, 30–70 cm. tall; sheaths somewhat pilose at the throat, glabrous or the lower sometimes sparsely pilose on the back; ligule very short; blades elongate, flat, becoming involute at the slender attenuate scabrous tip, 2 mm. or less wide; panicles narrowly pyramidal, open, 5–20 cm. long, the axis scaberulous, the branches ascending or spreading, scabrous, naked below, few-flowered above, 3–6 cm. long, the lower often clustered; spikelets grayish, 4–6 mm. long; glumes acuminate, the first 2–4 mm. long, the second 4–6 mm. long; lemma and palea shorter than the second glume, the palea slightly longer than the lemma; caryopsis globose, nutlike, nearly 2 mm. thick, finally splitting the palea.

TYPE LOCALITY: Watertown, New York (*Crawe*).

DISTRIBUTION: Prairies, Quebec to Saskatchewan and Wyoming, and southward to Connecticut, Illinois, Arkansas, and eastern Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 121; Hitchc. Man. f. 830.

28. *Sporobolus interruptus* Vasey, Bull. Torrey Club 15: 8. 1888.

Sporobolus arizonicus Thurb.; Vasey, Bull. Torrey Club 15: 8. 1888. (As synonym of *S. interruptus*.)

Perennial; culms densely tufted, erect, glabrous, without nodes above the base, 30–60 cm. tall; sheaths glabrous or the lower more or less softly pilose, pilose at the throat; ligule very short, ciliate; blades erect, flat or folded, sparsely pilose to glabrous, mostly 10–15 cm. long, the uppermost shorter, 1–2 mm. wide; panicles narrowly pyramidal, open, brownish-plumbeous, 10–20 cm. long, the axis glabrous, the branches distant, ascending or finally somewhat spreading, glabrous, mostly solitary, naked below, the branchlets short, ascending or appressed, the pedicels mostly shorter than the spikelets; spikelets about 6 mm. long; first glume about half as long as the spikelet, the second usually about as long as the lemma and palea.

TYPE LOCALITY: San Francisco Forest, Arizona (*Rusby 885*).

DISTRIBUTION: Grassy plains and hills, northern Arizona.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 122; Hitchc. Man. f. 829.

29. *Sporobolus argutus* (Nees) Kunth, Rév. Gram. Suppl. xvii. 1830.

Vilfa arguta Nees, Agrost. Bras. 395. 1829.

Vilfa arkansana Trin. Mém. Acad. St.-Pétersb. VI. 6^o: 64. 1840. (Type from Arkansas.)

Vilfa subpyramidalata Trin. Mém. Acad. St.-Pétersb. VI. 6^o: 61. 1840. (Type from Texas.)

Vilfa Richardi Steud. Syn. Gram. 153. 1854. (Type from West Indies.)

Vilfa agrostioides Buckl. Proc. Acad. Phila. 1862: 88. 1863. (Type from Llano County, Texas.)

Vilfa sabeana Buckl. Proc. Acad. Phila. 1862: 90. 1863. (Type from San Saba County, Texas.)

Sporobolus noterophila Hemsl. Biol. Centr. Am. Bot. 3: 546. 1885. (Name only.)

Vilfa noterophila Rupr.; Fourn. Mex. Pl. Gram. 99. 1886. (Type from Puebla, Mexico.)

Perennial, in spreading or prostrate tufts; culms slender, glabrous, 2–3-noded, 10–40 cm. tall; sheaths glabrous, pilose at the throat; ligule a ciliate membrane 1 mm. long; blades flat, mostly less than 10 cm. long, 2–4 mm. wide, sparsely long-ciliate toward the base, scabrous on the margin; panicles pale, pyramidal, 3–7 cm. long, rarely longer, the axis glabrous, the branches spreading, somewhat viscid, glabrous, 1–3 cm. long, naked below, closely flowered above, the lowermost in a distinct verticil; spikelets a little more than 1 mm. long; first glume minute, the second as long as the lemma and palea.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Sandy or gravelly soil, especially along streets and along the seashore, and in the interior in alkaline soil, Kansas and Colorado to Louisiana and Texas; Arizona; southern Florida; also tropical America.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 128; Hitchc. Man. f. 838.

30. *Sporobolus Buckleyi* Vasey, Bull. Torrey Club 10: 128. 1883.

Perennial, the base strongly compressed; culms erect, slender, glabrous, 1–3-noded, 40–100 cm. tall; sheaths compressed, strongly overlapping below, densely pilose at the throat, on the margin and on the collar; ligule very short; blades flat, glabrous except the scabrous margins, elongate, 3–7 or as much as 10 mm. wide; panicles open, 10–30 cm. long, the axis glabrous, the branches capillary, widely spreading, solitary, rather distant, glabrous on the axils, naked below, 5–20 cm. long, the branchlets mostly short and more or less appressed, rather closely flowered; spikelets 1.5 mm. long; glumes narrow, the first a little shorter, the second a little longer than the acute lemma; palea about as long as the lemma, splitting as the grain (1 mm. long) ripens.

TYPE LOCALITY: Texas (*Buckley*).

DISTRIBUTION: Thickets, open ground, and along roads and trails, Texas and eastern Mexico; common in Yucatan.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 459; Hitchc. Man. f. 846.

31. *Sporobolus texanus* Vasey; Coult. Contr. U. S. Nat. Herb. 1: 57. 1890.

Perennial, in close spherical tufts; culms erect or spreading, rather slender, wiry, glabrous, about 2-noded, 30–50 cm. tall; sheaths more or less pilose at the throat, glabrous or the lower papillose-pilose; ligule about 0.5 mm. long, ciliate; blades flat, often involute in drying, scabrous on the upper surface and on the margins, glabrous or nearly so beneath, mostly less than 10 cm. long, 1–4 mm. wide; panicles open, diffuse, breaking away at maturity, 15–30 cm. long, about as wide, the axis angled, scabrous, the branches, the capillary branchlets and the long pedicels stiffly spreading; spikelets 2–2.5 mm. long, glabrous; first glume acute, one third to half as long as the spikelet, the second acuminate, slightly exceeding the acute lemma and palea, the latter splitting early.

TYPE LOCALITY: Screw Bean, Presidio County, Texas (*Nealley 755*).

DISTRIBUTION: Mesas, valleys, and salt marshes, Kansas to Colorado, Texas, and New Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 463; Hitchc. Man. f. 851.

32. *Sporobolus brasiliensis* (Raddi) Hack. Bull. Herb. Boiss. II. 4: 278. 1904.

Aira brasiliensis Raddi, Agrost. Bras. 36. 1823.

Eragrostis airoides Nees, Agrost. Bras. 509. 1829. (Based on *Aira brasiliensis* Raddi.)

Perennial; culms in small tufts; erect, glabrous, without nodes above the base, about 1 meter tall; sheaths several, overlapping on the lower part of the culm, glabrous, sparsely pilose or glabrous at the throat; ligule short, ciliate; blades flat or those of the innovations involute, scabrous on the upper surface, glabrous beneath, elongate, 2–3 mm. wide; panicles open, rather more than half the entire length of the plant, 6–15 cm. wide, the axis glabrous, the slender branches, branchlets, and pedicels spreading, 1–3 together on the axis, the clusters distant; spikelets 1–2-flowered, rarely 3-flowered, about 1.3 mm. long, the pedicels 2 or 3 times as long as the spikelet; glumes somewhat unequal, a little shorter than the spikelet, acute; lemma acute, rounded on the back, without lateral nerves.

TYPE LOCALITY: Rio de Janeiro, Brazil.

DISTRIBUTION: Savannas, Cuba; also Brazil.

NOTE: The species is retained in *Sporobolus*, in spite of its often 2-flowered spikelets, because of the absence of lateral nerves in the lemma.

33. *Sporobolus trichodes* Hitchc. Contr. U. S. Nat. Herb. 17: 311. 1913.

Sporobolus capillaris Vasey, Contr. U. S. Nat. Herb. 1: 283. 1893. (Basis of *S. trichodes*.) Not *S. capillaris* Miq. 1851.

Perennial, glabrous throughout; culms cespitose, erect, 30–40 cm. high; ligule ciliate-erose, about 0.5 mm. long; blades flat or usually involute, especially the slender scabrous points, 4–8 cm. long, the lower as much as 2 mm. wide, the uppermost culm-blade 3–4 cm. long; panicle

oblong-elliptic, open, 10–15 cm. long, 2–4 cm. wide, the branches solitary or in pairs, somewhat spreading, naked below, capillary, no short branches at base, the pedicels delicate, all spreading, the ultimate lateral ones about as long as the spikelet or a little longer; spikelets brownish, broad, 1.5 mm. long; glumes nearly equal, oblong, obtuse, 0.5 mm. long; lemma and palea equal, obtuse; fruit flattened, smooth, brown, oblong-circular, nearly 1 mm. long, 0.7 mm. wide.

TYPE LOCALITY: Rio Blanco, near Guadalajara, Mexico (*Palmer 512* in 1882).

DISTRIBUTION: Dry ledges and rocky hills, Chihuahua to Morelos and Jalisco.

NOTE: Liebmann's 707 and 708, from Consoquitla, Veracruz, have slightly smaller spikelets (about 1 mm. long) but agree otherwise.

34. *Sporobolus atrovirens* (H.B.K.) Kunth, Rév. Gram. 1: 68. 1829.

Vilfa atrovirens H.B.K. Nov. Gen. & Sp. 1: 138. 1815.

Agrostis atrovirens R. & S. Syst. Veg. 2: 361. 1817. (Based on *Vilfa atrovirens* H.B.K.)

Vilfa atrovirens H.B.K. Nov. Gen. & Sp. 7: pl. 685. 1825. (Error for *atrovirens*.)

Perennial; culms caespitose in rather small tufts, erect, glabrous, 1–2-noded, 10–30 cm. tall; sheaths glabrous; ligule very short, erose; blades flat or becoming loosely involute, especially at the slender point, glabrous, mostly in a basal tuft about 5 cm. long, 1–2 mm. wide, rarely 3 mm.; panicles oblong, mostly dark-colored, open, 7–15 cm. long, rarely longer, mostly 4–6 cm. wide; the axis glabrous, the capillary branches often horizontal, naked at base, mostly solitary, somewhat distant, the lower with short ascending or spreading branches, the spikelets short-pedicelated, appressed and closely set along the main branches and the lower branchlets; spikelets about 1 mm. long; glumes somewhat unequal, less than half as long as the spikelet, the first obtuse.

TYPE LOCALITY: El Peñon, Valley of Mexico.

DISTRIBUTION: Rocky hills, central and southern Mexico.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. 7: pl. 685.

35. *Sporobolus airoides* (Torr.) Torr. Pacif. R. R. Rep. 7³: 21. 1858.

Agrostis airoides Torr. Ann. Lyc. N. Y. 1: 151. 1824.

Vilfa airoides Trin.; Steud. Nom. Bot. ed. 2. 2: 766. 1841. (Based on *Agrostis airoides* Torr.)

Sporobolus diffusissimus Buckl. Proc. Acad. Phila. 1862: 90. 1863. (Type from western Texas.)

Sporobolus altissimus Vasey; Brand. Proc. Calif. Acad. II. 2: 212. 1889. (Type from San Diego, California.)

Sporobolus altissimus var. *minor* Vasey; Brand. Proc. Calif. Acad. II. 2: 213. 1889. (Type from San Enrique, California.)

Perennial, in large tough bunches; culms erect to spreading, glabrous, 2–3-noded, 50–100 cm. tall; sheaths strongly pilose at the throat; ligule very short; blades elongate, flat, soon becoming involute, often flexuous, scabrous on the upper surface and on the long fine point, pilose just above the base, glabrous beneath, usually less than 4 mm. wide; panicles nearly half the length of the entire height of the plant, at maturity half or two thirds as wide, the axis glabrous, the stiff slender branches and branchlets finally widely spreading, naked at base and in the axils, somewhat distant on the axis; spikelets 2–2.5 mm. long, aggregate along the upper half or two thirds of the branchlets; first glume about half as long as the spikelet, commonly falling towards maturity; second glume, lemma and palea about equal, the palea splitting as the grain ripens.

TYPE LOCALITY: Branches of the Arkansas River near the Rocky Mountains (*James*).

DISTRIBUTION: Meadows and valleys, especially in moderately alkaline soil, South Dakota to eastern Washington, and southward to Texas and northern Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 127; Hitchc. Man. f. 847.

36. *Sporobolus Wrightii* Munro; Scribn. Bull. Torrey Club 9: 103. 1882.

Bauchea Karwinskyi Fourn. Mex. Pl. Gram. 87. 1886. (Type from Mexico, *Karwinsky 1015*, 1015b.)

Sporobolus Schaffneri Mez, Repert. Sp. Nov. 17: 295. 1921. (Type from San Luis Potosí, Mexico.)

Perennial in large dense tufts; culms robust, erect, firm and hard, 1–2 meters tall, or sometimes more slender and somewhat less than a meter tall, but usually erect; sheaths sparsely

pilose at the throat; ligule densely pilose, 1–2 mm. long; blades elongate, flat or more or less involute, in the robust forms 3–6 mm. wide, in smaller forms narrower and rolled; panicles pale, narrow, open, mostly 30–60 cm. long, in small specimens shorter, the axis glabrous, the branches crowded, straight, stiffly ascending, 5–10 cm. long, the short branchlets appressed, closely flowered from the base or nearly so; spikelets 2–2.5 mm. long, the first glume about one third as long, the second two thirds to three fourths as long; lemma and palea about equal

TYPE LOCALITY: Pantano, Arizona (*Pringle*).

DISTRIBUTION: Mesas and valleys, southern and western Texas to southern California and central Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 458; Hitchc. Man. f. 849.

NOTE: This species seems to intergrade with *S. airoides* in southern California and northern Mexico. The tall robust forms with close narrow panicles and appressed branchlets are distinctly different from the more spreading *S. airoides* with narrow or involute blades and somewhat diffuse panicles. The smaller forms of *S. Wrightii* still retain the narrow panicle with stiffly ascending branches.

37. *Sporobolus domingensis* (Trin.) Kunth, Rév. Gram. Suppl. xvii. 1830.

Vilfa domingensis Trin. in Spreng. Neu. Entd. 2: 59. 1821.

Agrostis domingensis Schultes, in R. & S. Syst. Veg. Mant. 3: Addit. 570. 1827. (Based on *Vilfa domingensis* Trin.)

Sporobolus inordinatus Mez, Repert. Sp. Nov. 17: 294. 1921. (Type from Cuba.)

Perennial; culm cespitose, erect, glabrous, 3–5-noded, 50–100 cm. tall; sheaths glabrous, pilose at the throat; ligule densely ciliate, 1–1.5 mm. long; blades flat, attenuate-pointed, scabrous on the upper surface, very scabrous on the margins, glabrous beneath, elongate, 3–6 mm. wide; panicles narrow, mostly 10–15 cm. long, rather dense, the branches ascending or appressed, overlapping, irregularly arranged on the axis or the lower more or less in verticils; spikelets about 2 mm. long, densely clustered on the short appressed branchlets; first glume half as long as the spikelet.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Coral sand and rocks along the coast, southern Florida and the West Indies; Yucatan.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 457; Hitchc. Man. f. 840.

NOTE: Differing from *S. argutus* in the usually larger size, broader blades, stiffer longer panicles, and larger spikelets.

38. *Sporobolus giganteus* Nash, Bull. Torrey Club 25: 88. 1898.

Sporobolus cryptandrus var. *robustus* Vasey, Contr. U. S. Nat. Herb. 1: 56. 1890. (Type from Texas, *Nalley* [746]). Not *S. robustus* Kunth, 1831.

Sporobolus cryptandrus var. *giganteus* Jones, Contr. West. Bot. 14: 11. 1912. (Based on *S. giganteus* Nash.)

Perennial, resembling *S. cryptandrus*; culms erect, robust, 1–2 meters tall; blades as much as 1 cm. wide, usually less pilose on the collar; panicle usually thicker than in *S. contractus*, less spikeletlike; spikelets 2.5–3 mm. long.

TYPE LOCALITY: Dona Ana County, New Mexico (*Woolon* 394).

DISTRIBUTION: Mesas and sandhills, western Texas to Arizona.

ILLUSTRATION: Hitchc. Man. f. 845.

39. *Sporobolus flexuosus* (Thurb.) Rydb. Bull. Torrey Club 32: 601. 1905.

Vilfa cryptandra var. *flexuosa* Thurb.; Vasey, in Rothr. Bot. Wheeler's Surv. 282. 1878.

Sporobolus cryptandrus var. *flexuosus* Thurb. in S. Wats. Bot. Calif. 2: 269. 1880. (Based on *Vilfa cryptandra* var. *flexuosa* Thurb.)

Perennial, resembling *S. cryptandrus*; blades often involute; panicles larger, more open and spreading, often elongate, the spreading branches flexuous, drooping, or reflexed, the branchlets also spreading and loosely flowered.

TYPE LOCALITY: Nevada and Arizona (*Wheeler Exped.*).

DISTRIBUTION: Mesas, western Texas to southern Utah, southeastern California, and northern Mexico.

ILLUSTRATION: Hitchc. Man. f. 841B.

40. *Sporobolus contractus* Hitchc. Am. Jour. Bot. 2: 303. 1915.

Sporobolus cryptandrus var. *strictus* Scribn. Bull. Torrey Club 9: 103. 1882.

Sporobolus strictus Merr. Circ. U. S. Dep. Agr. Agrost. 32: 6. 1901. (Based on *Sporobolus cryptandrus* var. *strictus* Scribn.; also the basis of *S. contractus* Hitchc.) Not *S. strictus* Franch., 1893.

Perennial, resembling *S. cryptandrus*; culms erect; panicle dense and spike-like, as much as 50 cm. long, usually included at the base, rarely entirely included in the sheath.

TYPE LOCALITY: Camp Lowell, Arizona (*Pringle*).

DISTRIBUTION: Mesas, dry bluffs, and sandy fields, Colorado to Nevada, and southward to western Texas, southeastern California, and Sonora.

ILLUSTRATION: Hitchc. Man. f. 841D.

41. *Sporobolus cryptandrus* (Torr.) A. Gray, Man. 576. 1848.

Agrostis cryptandra Torr. Ann. Lyc. N. Y. 1: 151. 1824.

Vilfa tenacissima var. *fuscicola* Hook. Fl. Bor. Am. 2: 239. 1839. (Type from Menzies Island, Columbia River, Washington.)

Vilfa cryptandra Torr.; Trin. Mém. Acad. St.-Petersb. VI. 6^e: 69. 1840. (Based on *Agrostis cryptandra* Torr.)

Vilfa Triniana Steud. Syn. Gram. 156. 1854. (Type from British Columbia.)

Sporobolus cryptandrus vaginatus Lunell, Am. Midl. Nat. 2: 123. 1911. (Type from Benson County, North Dakota.)

Sporobolus cryptandrus var. *involutus* Farwell, Rep. Mich. Acad. 22: 179. 1921. (Type from Rochester, Michigan.)

Perennial; culms usually in small tufts, erect or spreading, sometimes prostrate, glabrous, 30–100 cm. tall; sheaths glabrous, pubescent on the margin, long-pilose at the throat, more or less pilose in a line across the collar; ligule about 0.5 mm. long, densely ciliate; blades flat, more or less involute in drying and usually involute at the attenuate tip, scabrous on the margin, rather short or elongate, 2–5 mm. wide; panicles terminal and axillary, usually included at the base, sometimes entirely included, the well developed terminal ones open, as much as 25 cm. long, the axis glabrous, the branches rather distant, spreading or sometimes reflexed, naked at base, as much as 8 cm. long or even more, the spikelets crowded along the upper part on short appressed branchlets; spikelets pale or plumbeous, 2–2.5 mm. long, glabrous; first glume one third to half as long, the second about as long as the acute lemma and palea.

TYPE LOCALITY: Canadian River [Texas or Oklahoma] (*James*).

DISTRIBUTION: Sandy open ground, Maine and Ontario to Alberta and Washington, and southward to North Carolina, Indiana, Louisiana, Arizona, and northern Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 456; Hitchc. Man. f. 841A.

42. *Sporobolus Nealleyi* Vasey, Contr. U. S. Nat. Herb. 1: 57. 1890.

Perennial, resembling dwarf specimens of *S. cryptandrus* but the base loosely rhizomatous; culms slender, erect, 15–40 cm. tall; blades slender, involute, squarrose-spreading, mostly less than 5 cm. long; panicles delicate, open, 3–8 cm. long, sometimes included in the sheath, the branches and branchlets mostly spreading; spikelets less crowded than in *S. cryptandrus*.

TYPE LOCALITY: Brazos Santiago, Texas (*Nealley*).

DISTRIBUTION: Gypsum sands, western Texas and New Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 462; Hitchc. Man. f. 841C.

107. PHIPPSIA (Trin.) R. Br. Chlor. Melv. 27. 1823.

Colpodium § *Phippsia* Trin. Neue Entdeck. 2: 37. 1821. (Type species, *C. monandrum* Trin., based on *Agrostis algida* Phipps.)

A dwarf, tufted perennial, with narrow, few-flowered panicles of small spikelets. Spikelets 1-flowered, disarticulating above the glumes, the rachilla not prolonged; glumes unequal, minute, the first sometimes wanting; lemma thin, somewhat keeled, 3-nerved, acute; palea a little shorter than the lemma, dentate.

Type species, *Agrostis algida* Phipps.

1. *Phippsia algida* (Phipps) R. Br. Chlor. Melv. 27. 1823.*Agrostis algida* Phipps, Voy. 200. 1774.*Trichodium algidum* R. & S. Syst. Veg. 2: 283. 1817. (Based on *Agrostis algida* Wahl. [the same as *A. algida* Phipps].)*Colpodium monandrum* Trin. Neue Entdeck. 2: 37. 1821. (Based on *Agrostis algida* Phipps.)*Vilfa algida* Trin. Gram. Unifl. 159. 1824. (Based on *Agrostis algida* Phipps.)*Vilfa monandra* Trin. Gram. Unifl. 159. 1824. (Type from "Sin. Laurentii" [probably St. Lawrence Island, Alaska], *Chamisso*.)

Culms densely tufted, glabrous, 2-10 cm. tall; sheaths loose, thin, glabrous; ligule thin, whitish, 1-2 mm. long; blades numerous, flat, lax, abruptly contracted at apex, 1-2 mm. wide; panicles narrow, 1-2 cm. long, the branches short, appressed, glabrous; spikelets 1.5-2 mm. long.

TYPE LOCALITY: Arctic regions.

DISTRIBUTION: Arctic regions of both hemispheres; alpine summits, Colorado.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 70; Hitchc. Man. f. 699.

108. *HELEOCHLOA* Host, Gram. Austr. 1: 23. 1801.*

Low annual spreading grasses, with oblong, dense, spike-like panicles, terminal and on short lateral branches, the subtending leaves with inflated sheaths and reduced blades. Spikelets 1-flowered, the rachilla disarticulating above the glumes; glumes about equal, narrow, acute; lemma broader, thin, a little longer than the glumes; palea nearly as long as the lemma, 2-nerved, readily splitting between the nerves; caryopsis free from the lemma and palea.

Type species, *Heleochloa alopecuroides* Host.

Panicles oblong, nearly sessile in a broad subtending sheath.

Panicles linear, exserted.

1. *H. schoenoides*.2. *H. alopecuroides*.1. *Heleochloa schoenoides* (L.) Host, Gram. Austr. 1: 23. 1801.*Phleum schoenoides* L. Sp. Pl. 60. 1753.*Crypsis schoenoides* Lam. Tab. Encyc. 1: 166. 1791. (Based on *Phleum schoenoides* L.)

Culms tufted, several-noded, branched at the base and more or less at the nodes, erect, spreading, or prostrate, glabrous, 10-30 cm. tall; sheaths glabrous, striate, shorter than the nodes, more or less inflated, especially below the panicles; ligule a ciliate erose membrane about 1 mm. long; blades flat with involute slender tips, mostly glabrous beneath, usually pubescent or villous on the upper surface, glabrous on the collar, rarely more than 10 cm. long, usually less than 5 cm., mostly 1-4 mm. wide; panicles dense, oblong, nearly sessile in the usually inflated subtending sheath, pale, 1-4 cm. long, 8-10 mm. thick; spikelets about 3 mm. long, much compressed; glumes ciliate-scabrous on the keels; lemma a little longer than the glumes; palea nearly as long as the lemma.

TYPE LOCALITY: Southern Europe.

DISTRIBUTION: Waste places, Massachusetts to Delaware, Michigan, and Illinois; introduced from the Mediterranean region.

ILLUSTRATIONS: Host, Gram. Austr. 1: pl. 30; Bull. U. S. Dep. Agr. 772: f. 89; Hitchc. Man. f. 857A.

2. *Heleochloa alopecuroides* (Pill. & Mitterp.) Host, Gram. Austr. 1: 23. 1801.*Phleum alopecuroides* Pill. & Mitterp. Iter Poseg. 147. 1783.*Crypsis alopecuroides* Schrad. Fl. Germ. 1: 167. 1806. (Based on *Heleochloa alopecuroides* Host.)

Culms tufted, about 2-noded, branching at base, mostly unbranched above, erect or stiffly spreading, or prostrate, glabrous, as much as 40 cm. tall; sheaths glabrous, not inflated or only slightly so; ligule ciliate, about 1 mm. long; blades flat, acuminate, scabrous and sometimes sparsely pilose on the upper surface, as much as 10 cm. long, usually shorter, 2-4 mm. wide; panicles dense, cylindrical, pale or olive, exserted from the uppermost sheath, 2-6 cm. long, 4-5 mm. thick; spikelets about 2 mm. long; glumes ciliate on the keel; lemma longer than the glumes.

TYPE LOCALITY: Europe.

DISTRIBUTION: Ballast, near Philadelphia; waste places and ballast, near Portland, Oregon; introduced from southern Europe.

ILLUSTRATIONS: Host, Gram. Austr. 1: pl. 29; Hitchc. Man. f. 857B.

* For remarks on nomenclature see Hitchc. Man. 868. 1935.

109. *ARCTAGROSTIS* Griseb. in Ledeb. Fl. Ross. 4: 434. 1853.

Perennial, erect caespitose grasses with creeping rhizomes, flat blades, and contracted or open panicles. Spikelets 1-flowered, disarticulating above the glumes, the rachilla not (or rarely slightly) prolonged; glumes 2, subequal, acutish, membranaceous; lemma a little longer than the glumes and of about the same texture, 5-nerved (the lateral nerves sometimes obscure), awnless; palea about as long as the lemma, 2-nerved, the nerves approximate.

Types species, *Colpodium latifolium* R. Br.

1. *Arctagrostis latifolia* (R. Br.) Griseb. in Ledeb. Fl. Ross. 4: 434. 1853.

- Colpodium latifolium* R. Br. Chlor. Melv. 28. 1823.
Vilfa arundinacea Trin. Gram. Unifl. 157. 1824. (Type from Kotzebue Sound, Alaska.)
Sporobolus arundinaceus Kunth, Rév. Gram. Suppl. xvii. 1830. (Based on *Vilfa arundinacea* Trin.)
Colpodium arundinaceum Hook. Fl. Bor. Am. 2: 238. 1839. (Based on *Vilfa arundinacea* Trin.)
Vilfa xerampelina Trin. Mém. Acad. St.-Petersb. VI. 6^e: 103. 1840. (Type from British North America.)
Cinna Brownii Rupr. Beitr. Pfl. Russ. Reich. 2: 66. 1845. (Based on *Colpodium latifolium* R. Br.)
Arctagrostis latifolia var. *arundinacea* Griseb. in Ledeb. Fl. Ross. 4: 435. 1853. (Based on *Vilfa arundinacea* Trin.)
Arctagrostis arundinacea Beal, Grasses N. Am. 2: 317. 1896. (Based on *Vilfa arundinacea* Trin.)
Arctagrostis angustifolia Nash, Bull. N. Y. Bot. Gard. 2: 151. 1901. (Type from Dawson, Yukon Territory, Williams in 1899.)
Arctagrostis macrophylla Nash, Bull. N. Y. Bot. Gard. 2: 151. 1901. (Type from Dawson, Yukon Territory, Williams in 1899.)
Arctagrostis poaeoides Nash, Bull. N. Y. Bot. Gard. 2: 152. 1901. (Type from Dawson, Yukon Territory, Williams in 1899.)

Culms glabrous, 50–150 cm. tall, or sometimes dwarf; sheaths glabrous, mostly shorter than the internodes, the uppermost elongate; ligule thin, 5–10 mm. long, or shorter on the innovations; blades scabrous, elongate, as much as 1 cm. wide; panicle from narrow and open to contracted and interruptedly spikelike, 10–30 cm. long, the axis scabrous, the branches appressed to spreading, sometimes as much as 10 cm. long, but with some short ones intermixed; glumes glabrous, mostly 3–4 mm. long; lemma glabrous or scaberulous.

TYPE LOCALITY: Arctic British America.

DISTRIBUTION: Marshes and tundras, circumpolar, in North America from Greenland to Alaska, and southward to Labrador and the upper Yukon basin.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 474, 475.

110. *LAGURUS* L. Sp. Pl. 81. 1753.

An annual grass, with pale, dense, ovoid or oblong woolly heads. Spikelets 1-flowered, the rachilla disarticulating above the glumes, pilose under the floret, produced beyond the palea as a bristle; glumes equal, thin, 1-nerved, villous, gradually tapering into a plumose aristiform point; lemma shorter than the glumes, thin, glabrous, bearing on the back above the middle a slender, exserted, somewhat geniculate, dorsal awn, the summit bifid, the divisions delicately awn-tipped; palea narrow, thin, the two keels ending in minute awns.

Type species, *Lagurus ovatus* L.

1. *Lagurus ovatus* L. Sp. Pl. 81. 1753.

Culms slender, branching at base, pubescent, or sometimes nearly glabrous above, 10–30 cm. tall; sheaths pubescent, somewhat inflated; ligule thin, rounded, pubescent, erose, 2–3 mm. long; blades flat, lax, pubescent, mostly less than 10 cm. long, as much as 1 cm. wide, usually less; panicle pale, downy, bristling with dark awns, 2–3 cm. long, nearly as thick; glumes very narrow, 1 cm. long; lemma 3 mm. long, pilose below, the awn much exceeding the glumes.

TYPE LOCALITY: Southern Europe.

DISTRIBUTION: Cultivated for ornament and sparingly escaped, California (Pacific Grove, San Francisco, Berkeley); ballast, Beaufort, North Carolina; Mediterranean region.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 79; Hitchc. Man. f. 731.

111. *PHLEUM* L. Sp. Pl. 59. 1753.

Stelephuros Adans. Fam. Pl. 2: 31, 607. 1763. (Based on *Phleum* L.)

Plantinia Bubani, Fl. Pyren. 4: 268. 1901. (Based on *Phleum* L.)

Annuals or perennials, with erect culms, flat blades, and dense, cylindric panicles. Spikelets 1-flowered, laterally compressed, disarticulating above the glumes; glumes equal, membranaceous, keeled, abruptly mucronate or awned; lemma shorter than the glumes, hyaline, broadly truncate, 3-5-nerved; palea narrow, nearly as long as the lemma.

Type species, *Phleum pratense* L.

Plants perennial.

Panicles cylindric, several times as long as wide.

1. *P. pratense*.

Panicles ovoid or oblong, not more than twice as long as wide.

2. *P. alpinum*.

Plants annual.

Glumes strongly ciliate on the keels.

3. *P. arenarium*.

Glumes glabrous or scaberulous.

4. *P. paniculatum*.

Glumes widening upward to a swollen summit.

5. *P. subulatum*.

Glumes compressed, the acutish tips approaching.

1. *Phleum pratense* L. Sp. Pl. 59. 1753.

Phleum nodosum var. *pratense* St.-Amans, Fl. Agen. 23. 1821. (Based on *Phleum pratense* L.)

Plantinia pratensis Bubani, Fl. Pyren. 4: 270. 1901. (Based on *Phleum pratense* Huds. [error for L.])

Stelephuros pratensis Lunell, Am. Midl. Nat. 4: 216. 1915. (Based on *Phleum pratense* L.)

Culms tufted, erect from a swollen or bulblike base, glabrous or slightly roughened, 50-100 cm. tall; sheaths glabrous or nearly so; ligule 2-4 mm. long; blades flat, acuminate, scabrous, elongate, mostly 5-8 mm. wide; panicles spikelike, cylindric, erect, dense, abruptly rounded at both ends, commonly 5-10 cm. long, sometimes longer, the spikelets crowded, spreading; glumes about 3.5 mm. long, truncate, with a stout awn 1 mm. long, pectinate-ciliate on the keels; lemma delicate, about 2 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Commonly escaped from cultivation along roadsides and in fields and waste places throughout the United States; Eurasia. Commonly cultivated as a meadow grass, Timothy.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: pl. 14; f. 77; Hitchc. Man. f. 728; Silveus, Tex. Grasses 231.

2. *Phleum alpinum* L. Sp. Pl. 59. 1753.

Phleum Haenkeanum Presl, Rel. Haenk. 1: 245. 1830. (Type from Nootka Sound, Vancouver Island, Haenke.)

Phleum pratense var. *alpinum* Celak. Prodr. Fl. Böhm. 38. 1867. (Based on *P. alpinum* L.)

Phleum alpinum var. *americanum* Fourn. Mex. Pl. Gram. 90. 1886. (Type from Nootka Sound, Vancouver Island, Haenke.)

Phleum alpinum var. *Scribnerianum* Pammel, Proc. Davenport Acad. Sci. 7: 238. 1899. (Type from Geranium Park, Wyoming, Pammel 6.)

Plantinia alpina Bubani, Fl. Pyren. 4: 272. 1901. (Based on *Phleum alpinum* L.)

Culms 20-50 cm. tall, erect from a decumbent somewhat creeping densely tufted base; sheaths glabrous; ligule 2-3 mm. long; blades flat, scabrous, mostly less than 10 cm. long, 4-6 mm. wide; panicles ovoid or oblong, bristly, 1-3 cm. long; glumes about 5 mm. long, hispid-ciliate on the keel, the awns 2 mm. long; lemma about 2 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Common in mountain meadows, in bogs, and wet places, Greenland to Alaska, and southward in the mountains of Maine and New Hampshire; northern Michigan; in the mountains of the Western States to New Mexico and California; also on the seacoast at Fort Bragg, California, and northward; Eurasia and arctic and alpine regions of the southern hemisphere.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 451; Hitchc. Man. f. 728 B.

3. *Phleum arenarium* L. Sp. Pl. 60. 1753.

Annual; culms branched and erect or geniculate at base, glabrous, slender, often purplish above, 3-30 cm. tall; sheaths glabrous, the upper more or less inflated; ligule acutish, as much as 3 mm. long; blades 1.5-3 cm. long, as much as 4 mm. wide, acuminate, scabrous on the upper surface, the uppermost small or wanting; panicles 1.5-3 cm. long, 8 mm. wide, narrowed toward

the tip; glumes about 3 mm. long, pointed, the keels strongly ciliate; lemma about one third as long as the glumes, appressed-pubescent.

TYPE LOCALITY: Europe.

DISTRIBUTION: Ballast near Portland, Oregon; coast of Europe and North Africa.

4. *Phleum paniculatum* Huds. Fl. Angl. 23. 1762.

Phalaris aspera Retz. Obs. 4: 14. 1786. (Type from Europe.)

Phleum asperum Jacq. Coll. Bot. 1: 110. 1786. (Type from Europe.)

Plantinia aspera Bubani, (Nuov. Giorn. Bot. Ital. 5: 317, hyponym. 1873) Fl. Pyren. 4: 269. 1901.
(Based on *Phleum asperum* Jacq.)

Annual; culms erect, bushy-branched, glabrous, 10–40 cm. tall; sheaths glabrous or somewhat roughened, the upper more or less inflated; ligule truncate, as much as 3 mm. long; blades scabrous, flat, 2–10 cm. long, 4–10 mm. wide; panicles stiff, cylindric, somewhat narrowed at tip, 2–8 cm. long, 3–6 mm. wide; spikelets wedge-shaped or obcordate, about 2 mm. long; glumes glabrous or finely granulate-roughened, narrowed below, rounded above with a sharp hard tip; lemma acutish, about 1.3 mm. long.

TYPE LOCALITY: England.

DISTRIBUTION: Ballast, near Portland, Oregon; Mediterranean region.

5. *Phleum subulatum* (Savi) Asch. & Graebn. Syn. Mitteleur. Fl. 2¹: 154. 1899.

Phalaris bulbosa L. Cent. Pl. 1: 4. 1755. (Type from "Oriente.")

Phalaris subulata Savi, Fl. Pis. 1: 57. 1798.

Phalaris Bellardi Willd. Ges. Nat. Freunde Berlin Neue Schr. 3: 415. 1801. (Type from Europe.)

Phalaris tenuis Host, Gram. Austr. 2: 27. 1802. (Type from Europe.)

Phleum tenue Schrad. Fl. Germ. 1: 191. 1806. (Based on *Phalaris tenuis* Host.)

Phleum Bellardi ["*Bellardii*"] Willd. Enum. 1: 85. 1809. (Based on *Phalaris Bellardi* Willd.)

Phleum bulbosum K. Richt. Pl. Eur. 1: 37. 1890. (Based on *Phalaris bulbosa* L.) Not *Phleum bulbosum* Gouan, 1765.

Annual; culms usually numerous, bushy-branched, erect to prostrate, 10–20 cm. tall; sheaths glabrous or scaberulous, the upper often inflated; ligule pointed, as much as 5 mm. long; blades glabrous or nearly so, narrow, gradually sharp-pointed, 3–6 cm. long; panicles narrowly cylindric, 3–8 cm. long, 4–5 mm. wide; spikelets compressed, 2 mm. long; glumes strongly 3-nerved, glabrous, acute; lemma scarcely half as long as the glumes.

TYPE LOCALITY: Italy.

DISTRIBUTION: Ballast, near Philadelphia, and near Portland, Oregon; Mediterranean region.

112. *GASTRIDIDIUM* Beauv. Agrost. 21. 1812.

Annual grasses, with flat blades and pale, shining, spikelets' e panicles. Spikelets 1-flowered, the rachilla disarticulating above the glumes, prolonged behind the palea as a minute bristle; glumes unequal, somewhat enlarged or swollen at the base; lemma much shorter than the glumes, hyaline, broad, truncate, awned or awnless; palea about as long as the lemma.

Type species, *Milium lendigerum* L.

1. *Gastridium ventricosum* (Gouan) Schinz & Thell. Viert. Nat. Ges. Zürich 58: 39. 1913.

Agrostis ventricosa Gouan, Hort. Monsp. 39. 1762. Published earlier than the next.

Milium lendigerum L. Sp. Pl. ed. 2. 91. S 1762. (Type from Europe.)

Agrostis australis L. Mant. 30. 1767. (Type from Portugal.)

Alopecurus ventricosus Huds. Fl. Angl. ed. 2. 1: 28. 1778. (Based on *Agrostis ventricosa* Gouan.)

Agrostis lendigera Neck. Elem. 3: 219. 1790. (Based on *Milium lendigerum* L.)

Avena lendigera Salisb. Prodr. 23. 1796. (Based on *Milium lendigerum* L.)

Gastridium australe Beauv. Agrost. 21, 164. 1812. (Type from Europe.)

Gastridium lendigerum Desv. Obs. Angers 48. 1818. (Based on *Milium lendigerum* L.)

Lachnagrostis phleoides Nees & Meyen; Nees, Nova Acta Acad. Leop.-Carol. 19: Suppl. 146. 1843.
(Type from Valparaiso, Chile.)

Culms erect, ascending, or more or less geniculate at base, often branched, glabrous, 20–40 cm. tall; foliage scant, the sheaths roughish, somewhat inflated; ligule obtuse, lacerate, as much

as 3 mm. long; blades scabrous, as much as 10 cm. long and 4 mm. wide; panicle narrowed above, 5-8 cm. long, about 1 cm. thick; spikelets slender, about 5 mm. long; glumes tapering into a long point, the first about 3 mm. long, the second about one fourth shorter than the first; floret minute, plump, pubescent, the delicate awn 5 mm. long, somewhat geniculate.

TYPE LOCALITY: France.

DISTRIBUTION: Open ground and waste places, common in Oregon and California; Texas; Boston, Mass.; also Chile; introduced; Europe and North Africa.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 78; Hitchc. Man. f. 730.

113. CALAMAGROSTIS Adans. Fam. Pl. 2: 31, 530. 1763.

Deyeuxia Clarion; Beauv. Agrost. 43. 1812. (Type, *Arundo montana* Gaud.)

Amagris Raf. Préc. Déc. 27. 1814. (Based on *Calamagrostis* Adans.)

Athernotus Dulac, Fl. Hautes-Pyr. 74. 1867. (Based on *Calamagrostis* Adans.)

Perennial, usually moderately tall or robust grasses, with small spikelets in open or usually narrow, sometimes spikelike panicles. Spikelets 1-flowered, the rachilla disarticulating above the glumes, usually prolonged behind the palea as a short, commonly hairy bristle; glumes about equal, acute or acuminate; lemma shorter and usually more delicate than the glumes, the callus bearing a tuft of hairs, these often copious and as long as the lemma, awned from the back, usually below the middle, the awn being delicate and straight, or stouter and exerted, bent and sometimes twisted; palea shorter than the lemma.

Type species, *Arundo Calamagrostis* L.

Awn longer than the glumes, geniculate.

Panicle open, the branches spreading, naked below.

Lemma rather densely pubescent.

Lemma glabrous or scabrous.

Blades scattered, 5-9 mm. wide; plant mostly more than 1 m. tall.

Blades mostly basal, mostly not more than 2 mm. wide, often involute.

Awn about 7 mm. long above the bend.

Awn 5 mm. long or less above the bend.

Blades flat, rather lax.

Blades involute.

Blades capillary, sulcate, 5-10 cm. long.

Blades firm, 20-30 cm. long, 1-1.5 mm. thick.

Panicle narrow or compact, the branches appressed or ascending, floriferous from base or with short branches intermixed.

Blades flat, scattered, 6-10 mm. wide.

Blades not more than 4 mm. wide, flat or involute.

Glumes 1 cm. long, gradually long-acuminate; awn nearly 1 cm. long above the bend.

Glumes not more than 8 mm. long, acute or acuminate; awn usually less than 5 mm. long above the bend.

Blades involute.

Panicle dense, almost spikelike.

Panicle narrow but not spikelike.

Blades flat, sometimes involute toward tip.

Panicle dense, more or less spikelike.

Panicle narrow but not spikelike, rather lax.

Blades mostly basal.

Blades scattered along the culm.

Callus-hairs 1 mm. long; blades 1-2 mm. wide.

Callus-hairs 2 mm. long; blades 2-5 mm. wide.

Awn included or scarcely longer than the glumes, straight or geniculate, sometimes wanting.

Awn wanting or very short; panicle open; blades involute, erect.

Blades very slender, more or less flexuous; culm glabrous; callus-hairs very short.

Blades rigid, 1 mm. thick; culm scabrous; callus-hairs 1 mm. long.

Awn present.

Awn geniculate, protruding sidewise from the glumes; callus-hairs rather sparse, shorter than the lemma.

Blades narrow, soon involute; plants low, usually less than 30 cm. tall, not tufted, rhizomatous; panicle compact, spikelike.

Blades flat, drying involute at tip; plants usually tall.

Sheaths pubescent on the collar.

Callus-hairs about one third as long as lemma; western species.

Callus-hairs half to three fourths as long as lemma; eastern species.

1. *C. eriantha*.

2. *C. Bolanderi*.

3. *C. Howellii*.

4. *C. deschampsoides*.

5. *C. Breweri*.

6. *C. lolucensis*.

7. *C. Tweedyi*.

8. *C. foliosa*.

9. *C. guatemalensis*.

10. *C. intermedia*.

11. *C. purpurascens*.

12. *C. Pittieri*.

13. *C. Pringlei*.

14. *C. Leonardi*.

15. *C. orizabae*.

16. *C. erectifolia*.

17. *C. montanensis*.

18. *C. rubescens*.

- Palea about as long as the lemma. 19. *C. Porteri*.
 Palea three fourths as long as the lemma. 20. *C. perplexa*.
 Sheaths glabrous on the collar.
 Panicle loose, the branches spreading or ascending.
 Plants slender, 30–40 cm. tall; blades 1–2 mm. wide. 21. *C. Cainii*.
 Plants 1–1.5 m. tall; blades as much as 1 cm. wide. 22. *C. nutkaensis*.
 Panicle compact. 23. *C. densa*.
 Culms stout, mostly more than 1 m. tall.
 Culms more slender, mostly less than 1 m. tall.
 Spikelets 5–5.5 mm. long.
 Lemma as long as the glumes; panicle spikelike. 24. *C. koelerioides*.
 Lemma shorter than the glumes; panicles narrow but not spikelike. 25. *C. insperata*.
 Spikelets 4–4.5 mm. long. 26. *C. Pickeringii*.
 Awn straight (somewhat bent in *C. epigeios* and *C. lactea*), included; callus-hairs usually not much shorter than the lemma.
 Sheaths pubescent on the collar (see also *C. inexpansa* var. *barbulata*). 27. *C. Scribneri*.
 Sheaths glabrous on the collar.
 Panicle rather loose and open.
 Callus-hairs copious, about as long as the lemma; awn delicate, straight. 28. *C. canadensis*.
 Callus-hairs rather scant, about half as long as the lemma; awn stronger, weakly geniculate. 29. *C. lactea*.
 Panicle more or less contracted.
 Awn attached about the middle of the lemma.
 Blades flat, rather lax.
 Glumes scabrous; plant green. 30. *C. cinnoides*.
 Glumes nearly smooth; plant pale. 31. *C. scopulorum*.
 Blades involute or, if flat, rigid and becoming involute.
 Blades elongate, smooth or scabrous.
 Blades firm, scabrous, rather rigid; ligule 4–6 mm. long; panicle firm. 32. *C. inexpansa*.
 Blades rather lax, narrow; ligule 1–3 mm. long; panicle rather soft. 33. *C. neglecta*.
 Blades broad and short, as much as 5 mm. wide, nearly smooth. 34. *C. crassiglumis*.
 Awn attached near the base, the rachilla not prolonged. 35. *C. epigeios*.

1. *Calamagrostis eriantha* (H.B.K.) Steud. Syn. Gram. 190. 1854.

Deyeuxia eriantha H.B.K. Nov. Gen. & Sp. 1: 145. 1815.

Deyeuxia Schiedeana Steud.; Fourn. Mex. Pl. Gram. 105. 1886. (Type from Mount Orizaba.)

Culms in large dense tufts, erect, slender, scaberulous below the panicle, 30–60 cm. tall; sheaths glabrous, pale; ligule narrow, partly clasped by the base of the blade, about 4 mm. long; blades slender, involute, scabrous, erect, often nearly as long as the culms; panicle open, pyramidal, nodding, purple, fading to brown, 8–12 cm. long, the axis scaberulous, the branches capillary, scabrous, flexuous, spreading, in groups of 2 or 3, 2–3 cm. apart, naked below, few-flowered above; glumes narrow, attenuate or cuspidate, pilose-ciliate on the keel, more or less scaberulous on the lateral nerves and internerves, 6–7 mm. long; lemma a little shorter than the glumes, rather densely appressed-pilose, 4-toothed, 5–6 mm. long, the awn attached just below the middle, geniculate, short-pilose except near the summit, 2–4 mm. long above the bend; callus-hairs short; rachilla about half as long as the lemma, short-pilose.

TYPE LOCALITY: Mountains between Mexico City and Texcoco.

DISTRIBUTION: Southern Mexico, mostly in the vicinity of Mount Orizaba.

2. *Calamagrostis Bolanderi* Thurber, in S. Wats. Bot. Calif. 2:

280. 1880.

Deyeuxia Bolanderi Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Bolanderi* Thurber.)

Culms erect, glabrous or slightly rough below the nodes, 1–1.5 m. tall, with slender rhizomes; sheaths slightly scabrous; ligule scabrous, 4–5 mm. long; blades flat, those of the culm scattered, nearly smooth, 5–20 cm. long, 5–9 mm. wide; panicle open, pyramidal, 10–20 cm. long, the axis glabrous or nearly so below, the branches verticillate, spreading, scabrous, naked below, the longer 5–10 cm. long, the verticils mostly 2–5 cm. apart; glumes 3–4 mm. long, purple, scabrous, acute; lemma very scabrous, about as long as the glumes, the awn from near the base, geniculate, exserted, about 2 mm. long above the bend, the callus-hairs short; rachilla pilose, 1–2 mm. long.

TYPE LOCALITY: Mendocino County, California (*Bolander 6471*, in part).

DISTRIBUTION: Bogs and moist ground, prairies or open woods, near the coast, Mendocino and Humboldt counties, California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 147; Hitchc. Man. f. 609.

3. *Calamagrostis Howellii* Vasey, Bot. Gaz. 6: 271. 1881.

Deyeuxia Howellii Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Howellii* Vasey.)

Culms densely tufted, rather slender, ascending, glabrous, 30–60 cm. tall; sheaths smooth or slightly scabrous; ligule scabrous, 2–8 mm. long; blades slender, scabrous on the upper surface, flat or soon involute, especially toward the tip, about as long as the culms, about 1 mm. wide, the two cauline shorter; panicle pyramidal, rather open, 5–15 cm. long, the lower branches in whorls, ascending, naked below, 3–5 cm. long; spikelets pale or tinged with purple; glumes acuminate, 6–7 mm. long; lemma acuminate, a little shorter than the glumes, the awn attached about 2 mm. above the base, geniculate, exerted about 1 cm.; callus-hairs and hairs of the rachilla about half as long as the lemma.

TYPE LOCALITY: Oregon (*Howell*).

DISTRIBUTION: On perpendicular cliffs, vicinity of the Gap of the Columbia River.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 148; Hitchc. Man. f. 610.

4. *Calamagrostis deschampsoides* Trin. Ic. pl. 354. 1836.

Deyeuxia deschampsoides Scribn. Bull. Torrey Club 10: 8. 1883. (Based on *Calamagrostis deschampsoides* Trin.)

Calamagrostis deschampsoides var. *macrantha* Piper; Scribn. & Merr. Contr. U. S. Nat. Herb. 13: 59. 1910. (Type from Kodiak Island, Alaska.)

Culms erect from an ascending base, loosely tufted or solitary, glabrous, 15–40 cm. tall, with slender creeping rhizomes; sheaths glabrous; ligule 2–3 mm. long; blades flat, rather lax, not numerous at base, smooth except the scaberulous margins, 3–7 cm. long, 1–4 mm. wide; panicle pyramidal, open, 4–8 cm. long, the axis glabrous, the branches verticillate, the lower spreading, capillary, glabrous, naked below, somewhat flexuous, few-flowered; glumes acuminate, glabrous, purplish, mostly 4–6 mm. long; lemma about as long as the glumes, the awn attached about the middle, usually exceeding the lemma 1–2 mm., the callus-hairs about half as long as the lemma; rachilla slender, rather sparsely pilose, 1 mm. long.

TYPE LOCALITY: Kamchatka.

DISTRIBUTION: Bogs and marshy places, Alaska, near the coast, from Prince William Sound to Port Clarence and the Bering Sea islands; also Kamchatka.

ILLUSTRATION: Trin. Ic. pl. 354.

NOTE: The variety *macrantha* differs only in having glumes as much as 7 mm. long.

5. *Calamagrostis Breweri* Thurber, in S. Wats. Bot. Calif. 2: 280. 1880.

Deyeuxia Breweri Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Breweri* Thurber.)

Calamagrostis Lemmoni Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 16. 1898. (Type from California.)

Culms densely tufted, slender or almost filiform, erect, glabrous, 15–30 cm. tall, one node below the middle, another near the base; sheaths glabrous or the lower faintly scabrous; ligule of culm-leaf 3–5 mm. long, of basal leaves shorter; blades at base numerous, erect, usually involute-filiform, often somewhat flexuous, more or less scabrous, 5–10 cm. long, the culm-blade shorter; panicle ovate, purple, open, 3–8 cm. long, the axis glabrous, the lower branches capillary, spreading, naked below, glabrous, few-flowered, 1–2 cm. long; glumes smooth, acute, 3–4 mm. long; lemma cuspidate-toothed, nearly as long as the glumes, the awn from near the base, geniculate, exerted, twisted below, about 2 mm. long above the bend, the callus-hairs short, scant; rachilla long-pilose, about half as long as the lemma.

TYPE LOCALITY: Carson Pass, California (*Brewer 2128*).

DISTRIBUTION: Mountain meadows of the high Sierra Nevada, California.

ILLUSTRATIONS: Bull. U. S. Dept. Agr. Agrost. 17: f. 486; Hitchc. Man. f. 611.

6. *Calamagrostis tolucensis* (H.B.K.) Trin.; Steud. Nom. Bot.
ed. 2. 1: 251. 1840.

Deyeuxia tolucensis H.B.K. Nov. Gen. & Sp. 1: 143. 1815.

Deyeuxia junciformis H.B.K. Nov. Gen. & Sp. 1: 143. 1815. (Type from Toluca, Mexico.)

Calamagrostis cuspidata Spreng. Syst. 1: 253. 1825. (Type from Mexico.)

Calamagrostis junciformis Steud. Nom. Bot. ed. 2. 1: 250. 1840. (Based on *Deyeuxia junciformis* H.B.K.)

Calamagrostis sesquitriflora Steud. Syn. Gram. 190. 1854. (Type from Toluca, Mexico. Steudel's description of the spikelet is erroneous; the type has been examined and found to have a single floret with awned lemma; the large spreading palea is obviously the "awnless floret" referred to by Steudel.)

Culms densely caespitose, erect, glabrous, 20–40 cm. tall; sheaths smooth, shiny; ligule truncate, about 1 mm. long; blades firm, erect, involute, sharp-pointed, glabrous or scabrous on the outer surface, villous on the inner surface, 20–30 cm. long, 1–1.5 mm. thick; panicle pyramidal, loose, open, pale, 10–15 cm. long, the slender branches spreading, glabrous, naked below, few-flowered above, as much as 6 cm. long; glumes lanceolate-attenuate, rather wide, glabrous except the keel, slightly scabrous toward the tip, about 6 mm. long; lemma about as long as the glumes, puberulent toward the tip, the awn attached about the middle, geniculate, twisted and hispidulous below, the terminal segment horizontal, about 5 mm. long; callus-hairs about one third as long as the lemma; rachilla 1.5 mm. long, the hairs 1–2 mm. long.

TYPE LOCALITY: Near Toluca, Mexico.

DISTRIBUTION: Páramos, Mexico and Guatemala.

7. *Calamagrostis Tweedyi* (Scribn.) Scribn.; Vasey, Contr.
U. S. Nat. Herb. 3: 83. 1892.

Deyeuxia Tweedyi Scribn. Bull. Torrey Club 10: 64. 1883.

Culms erect, rather stout, about 3-noded, glabrous, 1–1.5 m. tall, with short rhizomes; sheaths glabrous or roughish toward the summit, the lower becoming fibrous; ligule thin, 4–7 mm. long; blades flat, somewhat scabrous, the cauline 5–15 cm. long, as much as 1 cm. wide, those of the innovations narrower and longer; panicle oblong, erect, purplish, more or less spikelike, often interrupted below, about 10 cm. long, the axis glabrous, the branches short and crowded, scaberulous; glumes abruptly acuminate, glabrous, 6–7 mm. long; lemma scaberulous, about as long as the glumes, the awn from below the middle, twisted, geniculate, exerted about 5 mm., the callus-hairs scant, scarcely 1 mm. long; rachilla pilose, 2 mm. long.

TYPE LOCALITY: Cascade Mountains, Washington (*Tweedy*).

DISTRIBUTION: Known only from the Cascade Mountains, Washington.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 146; Hitchc. Man. f. 612.

8. *Calamagrostis foliosa* Kearney, Bull. U. S. Dep. Agr. Agrost.
11: 17. 1898.

Calamagrostis sylvatica var. *longifolia* Vasey, Contr. U. S. Nat. Herb. 3: 83. 1892. Not *C. longifolia* Hook. 1840.

Culms in large tufts, erect or ascending, scaberulous, especially below the panicle, 30–60 cm. tall; sheaths glabrous; ligule 2–4 mm. long; blades sometimes flat, usually involute, numerous and crowded toward the base, firm, smooth, nearly as long as the culm, 1–2 mm. wide; panicle pale, dense, more or less spikelike, sometimes interrupted below, 5–12 cm. long, the axis scaberulous, the branches scabrous, short and crowded; glumes acuminate, glabrous, about 1 cm. long; lemma acuminate, 5–7 mm. long, the apex with 4 setaceous teeth, the awn from near the base, geniculate, about 8 mm. long above the bend, the callus-hairs numerous, 3 mm. long; rachilla pilose, nearly as long as the lemma.

TYPE LOCALITY (of *C. sylvatica longifolia* Vasey, on which *C. foliosa* is based): Humboldt County, California (*Bolander 6470*).

DISTRIBUTION: Humboldt and Mendocino counties, California.

ILLUSTRATION: Hitchc. Man. f. 613.

9. *Calamagrostis guatemalensis* Hitchc. Proc. Biol. Soc. Wash.
40: 82. 1927.

Culms erect from a creeping base, 30–60 cm. tall; sheaths glabrous or slightly scaberulous; ligule 3–5 mm. long; blades numerous on lower part of plant, firm, flat becoming involute, scabrous on both surfaces, 1–3 mm. wide; panicles narrow, condensed, sometimes interruptedly spikelike, purplish or brownish, 7–12 cm. long, the branches ascending or appressed, floriferous nearly to the base, as much as 3 cm. long; glumes equal, acute, scaberulous, 4–5 mm. long; lemma minutely scaberulous, 4 mm. long, the narrow apex with 4 fine teeth, the callus-hairs about half as long as the lemma; awn attached less than 1 mm. above base, the twisted straight part nearly as long as the lemma, the terminal part bent sharply to one side, 3–6 mm. long; rachilla a little more than 1 mm. long, clothed with hairs about 2 mm. long.

TYPE LOCALITY: Volcán de Agua, Guatemala (*Hitchcock 9120*).

DISTRIBUTION: Mountains of Guatemala.

10. *Calamagrostis intermedia* (Presl) Steud. Nom. Bot. ed. 2.
1: 250. 1840.

Deyeuxia stricta H.B.K. Nov. Gen. & Sp. 1: 146. 1815. (Type from Colombia.) Not *Calamagrostis stricta* Koeler, 1802.

Deyeuxia intermedia Presl, Rel. Haenk. 1: 249. 1830.

Calamagrostis Humboldtiana Steud. Nom. Bot. ed. 2. 1: 250. 1840. (Based on *Deyeuxia stricta* H.B.K.)

Culms in large tufts, erect, pale, scabrous below the panicle, 30–100 cm. tall; sheaths slightly rough, longer than the internodes; ligule truncate, 1–2 mm. long; blades erect, scabrous, involute, elongate, rather rigid, sharp-pointed, 1–2 mm. wide when flat; panicle narrow, rather loose, purple, 15–35 cm. long, the axis scabrous, partially exposed, the branches appressed or ascending, as much as 15 cm. long, scabrous, naked below, with branches floriferous from base intermixed; glumes lanceolate-attenuate, glabrous except the scabrous keel, about 6 mm. long; lemma scaberulous, toothed, 5 mm. long, the callus-hairs less than 1 mm. long; awn attached below the middle, strongly geniculate, exerted, about 5 mm. long above the bend; rachilla 2.5–3 mm. long, pilose with rather short hairs.

TYPE LOCALITY: Colombia (*Haenke*).

DISTRIBUTION: Moist páramos, Costa Rica (Cerro de Bueno Vista) to Argentina.

11. *Calamagrostis purpurascens* R. Br.; Richards. in
Frankl. Journey 731. 1823.

Arundo purpurascens Schultes, in R. & S. Syst. Veg. Mant. 3: Addit. 603. 1827. (Based on *Calamagrostis purpurascens* R. Br.)

Deyeuxia purpurascens Kunth, Rév. Gram. 77. 1829. (Based on *Calamagrostis purpurascens* R. Br.)
Trisetum sesquiflorum Trin. Mémoires Acad. St.-Petersb. VI. 4: 14. 1836. (Type from Kamchatka, Unalaska.)

Calamagrostis sylvatica var. *purpurascens* Thurber; Vasey, Contr. U. S. Nat. Herb. 3: 83. 1892. (Type from Mount Dana, California.)

Calamagrostis sylvatica var. *americana* Vasey, Contr. U. S. Nat. Herb. 3: 83. 1892. (Type from Pen Gulch, Colorado.)

Calamagrostis arctica Vasey, Bull. U. S. Dep. Agr. Bot. 13: pl. 55. 1893. (Type from St. Paul Island, Bering Sea.)

Calamagrostis Vaseyi Beal, Grasses N. Am. 2: 344. 1896. (Type from Cascade Mountains, Washington.)

Calamagrostis purpurascens arctica Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 19. 1898. (Based on *C. arctica* Vasey.)

Calamagrostis yukonensis Nash, Bull. N. Y. Bot. Gard. 2: 154. 1901. (Type from Dawson, Yukon Territory.)

Calamagrostis purpurascens var. *Vaseyi* Jones, Contr. West. Bot. 14: 9. 1912. (Based on *C. Vaseyi* Beal.)

Trisetum Bongardii Louis-Marie, Rhodora 30: 220. 1928. (Type from Unalaska, *Bongard*.)

Trisetum Williamsii Louis-Marie, Rhodora 30: 221. 1928. (Type from Five-finger Rapids, Yukon, *Williams* in 1899, the specimen infested with nematodes.)

Culms tufted, erect, glabrous or scabrous just below the panicle, sometimes with short rhizomes, 40–60 cm. or even 100 cm. tall; sheaths usually scabrous, the old ones persistent, fibrous; ligule 3–5 mm. long; blades flat or more or less involute, rather thick, scabrous; panicle

dense, more or less spikelike, often interrupted below, pinkish or purplish, 5–12 cm. long, rarely longer, the branches short and crowded, rarely as much as 5 cm. long; glumes acute, scaberulous, 6–8 mm. long; lemma nearly as long as the glumes, the apex with 4 setaceous teeth, the awn from near the base, finally geniculate, exserted about 2 mm.; hairs of callus and rachilla about one third as long as the lemma.

TYPE LOCALITY: Northern British America.

DISTRIBUTION: Rocks and cliffs, Greenland to Alaska, and southward to Quebec, South Dakota (Black Hills), Colorado, and California; also in Siberia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 490, 491; Hitchc. Man. f. 614.

NOTE: This species has been referred by some American authors to *Calamagrostis sylvatica* (DC.) Kunth.

12. *Calamagrostis Pittieri* Hack. Oesterr. Bot. Zeits. 52:
108. 1902.

Culms erect from a decumbent base, rather loosely cespitose, glabrous, 30–50 cm. tall; sheaths, at least the lower, puberulent; ligule about 1 mm. long; blades rather short and clustered at the base of the plant, flat or loosely involute, pilose on the upper surface, 10–20 cm. long, 1–2 mm. wide; panicle soft, narrow, rather loose, 10–20 cm. long, the axis nearly smooth, the branches ascending, some of the lower naked at base, as much as 9 cm. long; glumes narrow, acuminate, glabrous, about 5 mm. long; lemma a little shorter than the glumes, the awn attached just above the middle, geniculate, twisted below, the terminal segment horizontal, 5 mm. long; callus sharp, the hairs less than 1 mm. long; rachilla 2 mm. long, strongly pilose with hairs 3 mm. long.

TYPE LOCALITY: Cerro de Buena Vista, 3100 m. alt., Costa Rica (*Pittier 3359*).

DISTRIBUTION: Mountains of Costa Rica.

13. *Calamagrostis Pringlei* Beal, Grasses N. Am. 2: 345. 1896.

Deyeuxia Pringlei Scribn.; Beal, Grasses N. Am. 2: 345, as synonym. 1896.

Culms solitary or few in a tuft, erect, glabrous, 50–60 cm. tall, with creeping rhizomes; sheaths glabrous or slightly rough; ligule 1–2 mm. long; blades flat, scabrous, 10–15 cm. long, 1–2 mm. wide; panicle narrow, rather soft, somewhat nodding, pinkish, 6–10 cm. long, the axis scaberulous, the branches capillary, scabrous, clustered, overlapping, some naked below with short ones intermixed, few-flowered; glumes narrow, acuminate, soft, scaberulous, about 5 mm. long; lemma soft, scaberulous, acuminate, 4 mm. long, the awn attached just below the middle, rather weakly geniculate, somewhat twisted below, the terminal segment exserted, about 4 mm. long; callus-hairs about 1 mm. long; rachilla 1.5 mm. long, strongly pilose with hairs as much as 2 mm. long.

TYPE LOCALITY: Sierra Madre, Chihuahua (*Pringle 1422*).

DISTRIBUTION: Chihuahua.

14. *Calamagrostis Leonardi* Chase; Leonard, Jour. Wash. Acad. 17:
72. 1927.

Culms slender, ascending, solitary or few together, compressed, glabrous, 60–100 cm. tall, the nodes dark, the lower geniculate; sheaths mostly shorter than the internodes, strongly nerved, the lower minutely retrorsely pubescent, shredded in age, the upper glabrous; ligule 3–4 mm. long, crose; blades lax, flat, scabrous, mostly minutely ciliate and in some leaves sparsely pilose on the upper surface, 6–20 cm. long, 2–5 mm. wide; panicle finally long-exserted, pale, nodding, loosely flowered, 12–20 cm. long, 2–4 cm. wide, the slender ascending scabrous branches mostly in small fascicles, evenly distributed, 2–5 cm. long; glumes equal or the first very slightly shorter, abruptly acute, scabrous on the back and keel, 4.5 mm. long, the margins thin, both commonly purple-tinged toward the apex; floret nearly equaling the glumes; lemma nearly equaling the glumes, scabrous on the back, 4–4.2 mm. long, the margins and apex thin, the awn attached a little above the middle, slender, scabrous, flexuous and divergent at maturity; callus-hairs copious, white, about half as long as the lemma; rachilla about one third as

long as the lemma, long-pilose with white hairs on the outer side and with a few hairs at the summit.

TYPE LOCALITY: Fircy, Haïti (*Leonard 4325*).

DISTRIBUTION: Mountain meadows, Hispaniola.

ILLUSTRATIONS: Jour. Wash. Acad. 17: 72. *f. 1*; Hitchc. Man. W. I. *f. 40*.

15. *Calamagrostis orizabae* (Rupr.) Steud.; Beal, Grasses N. Am.
2: 340. 1896.

Deyeuxia orizabae Rupr.; Fourn. Mex. Pl. Gram. 105. 1886.

Achaeta plumosa Fourn. Mex. Pl. Gram. 109. 1886. (Type from Mount Orizaba, Mexico.)

Calamagrostis erecta Beal, Grasses N. Am. 2: 340. 1896. (Based on *Achaeta plumosa* Fourn.)

Calamagrostis plumosa Scribn.; Beal, Grasses N. Am. 2: 340, as synonym of *C. erecta*. 1896. (Based on *Achaeta plumosa* Fourn.) Not *Calamagrostis plumosa* Spreng. 1825.

Culms in large tufts, erect, glabrous, or scaberulous below the panicle, 60–100 cm. tall; sheaths glabrous or scabrous; ligule narrow, about 3 mm. long; blades erect, slender, closely involute, scabrous or nearly glabrous, about half as long as the culm; panicle open, pyramidal, purple, 10–15 cm. long, the axis scaberulous, the branches slender, ascending or spreading, scaberulous, naked below, 4–8 cm. long, usually with a few short few-flowered branches intermixed; glumes acute, glabrous, about 4–5 mm. long; lemma minutely pubescent, 4–4.5 mm. long, awnless or with a short straight awn below the apex; callus-hairs very short; rachilla rather sparsely short-pilose, 1–2 mm. long.

TYPE LOCALITY: Mount Orizaba, Mexico (*Galeotti 5780*).

DISTRIBUTION: Mountains of southern Mexico.

16. *Calamagrostis erectifolia* Hitchcock, sp. nov.

Culms in large dense tufts, erect, scabrous on the upper part, 1–1.5 m. tall; sheaths pale, glabrous or the upper scabrous; ligule 2–3 mm. long; blades erect, closely involute, scabrous, rigid, half as long as the culm, about 1 mm. thick; panicle open, pyramidal, mostly 15–20 cm. long, the axis scabrous, the branches capillary, flexuous, spreading or drooping, scabrous, naked below, as much as 10 cm. long, verticillate, the verticils 3–5 cm. apart; glumes narrow, acute, glabrous except the scabrous keel, 4–5 mm. long, the first 1-nerved, the second 3-nerved; lemma lanceolate, glabrous or minutely scaberulous, about 4 mm. long, the awn wanting or reduced to a short often divergent point not extending beyond the tip of the lemma; callus-hairs rather abundant, about 1 mm. long; rachilla rather stout, short-pilose, 2–3 mm. long.

Culmi dense caespitiosi erecti 1.5 m. alti; vaginae glabrae vel superiores scabrae; ligula 2–3 mm. longa; laminae erectae involutae scabrae rigidae elongatae 1 mm. crassae; panicula pyramidalis patens 15–20 cm. longa, ramis capillaribus flexuosis patulis scabris, inferne nudis, usque ad 10 cm. longis, verticillatis; glumae angustae 4–5 mm. longae; lemma lanceolatum glabrum vel minute scaberulum circa 4 mm. longum; arista nulla vel brevissima; pili calli 1 mm. longi; processus rachillae breviter pilosus 2–3 mm. longus.

Type collected on partially open ground, Mount Nevada, Jalisco, altitude about 3000 meters, September 23, 1910, *A. S. Hitchcock 7162* (U. S. Nat. Herb. no. 844948).

DISTRIBUTION: Mount Nevada and Mount Colima, Mexico.

17. *Calamagrostis montanensis* (Scribn.) Scribn.; Vasey, Contr.
U. S. Nat. Herb. 3: 82. 1892.

Deyeuxia montanensis Scribn. Proc. Soc. Prom. Agt. Sci. 4–5: 52. 1885.

Calamagrostis neglecta var. *candidula* Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 35. 1898. (Type from Cypress Hills, Assiniboia.)

Culms stiffly erect, scabrous below the panicle, usually 20–40 cm. tall, sometimes taller, with slender creeping rhizomes; upper sheaths more or less scaberulous, the lower glabrous, rather papery; ligule 1–3 mm. long; blades erect, scabrous, more or less involute, tapering into a fine sharp point, the culm-blades mostly 5–15 cm. long, mostly less than 2 mm. wide when flat; panicle dense, erect, more or less interrupted, usually pale, 5–10 cm. long, the axis scabrous, the branches scabrous, short and crowded; glumes acuminate, scabrous, 4–5 mm. long; lemma

nearly as long as the glumes, finely 4-toothed, scaberulous, the awn attached about 1 mm. above the base, about equaling the lemma, slightly geniculate and protruding from the sides of the glumes; palea nearly as long as the lemma; hairs of callus and rachilla rather abundant, about half as long as the lemma.

TYPE LOCALITY: Helena, Montana (*Scribner*).

DISTRIBUTION: Plains and dry open ground, Manitoba and Alberta to South Dakota, Wyoming, and Idaho.

ILLUSTRATION: Hitchc. Man. f. 616.

18. *Calamagrostis rubescens* Buckl. Proc. Acad. Phila.

1862: 92. 1862.

- Deyeuxia rubescens* Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis rubescens* Buckl.)
Deyeuxia Cusickii Vasey, Bot. Gaz. 10: 224. 1885. (Type from Eagle Mountains, Oregon, *Cusick* 1159.)
Deyeuxia Suksdorfii Scribn. Bull. Torrey Club 15: 9. 1888. (Type from State of Washington, *Suksdorf* 26.)
Calamagrostis aleutica var. *angusta* Vasey, Contr. U. S. Nat. Herb. 3: 80. 1892. (Type from Santa Cruz, California, *Anderson*.)
Calamagrostis Suksdorfii Scribn.; Vasey, Contr. U. S. Nat. Herb. 3: 82. 1892. (Based on *Deyeuxia Suksdorfii* Scribn.)
Calamagrostis angusta Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 21. 1898. (Based on *C. aleutica* var. *angusta* Vasey.)
Calamagrostis fasciculata Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 23. 1898. (Type from Mendocino County, California, *Pringle* in 1882.)
Calamagrostis subflexuosa Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 22. 1898. (Type from Oakland, California, *Bolander* 2274.)
Calamagrostis Suksdorfii luxurians Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 24. 1898. (Type from Coeur d'Alene Lake, Idaho. *Sandberg, Heller, & McDougal* 630.)

Culms slender, tufted, glabrous, 60–100 cm. tall, with slender creeping rhizomes; sheaths glabrous but pubescent on the collar, sometimes obscurely so; ligule 1–3 mm. long; blades erect, flat or somewhat involute, scabrous, 2–4 mm. wide, those of the culm 10–20 cm. long, those of the innovations 20–40 cm. long; panicle narrow, spikelike or somewhat loose or interrupted, pale or purple, 7–15 cm. long, the axis scaberulous, the branches scabrous, short and crowded, or in loose panicles (*C. Cusickii*) sometimes as much as 5 cm. long, appressed; glumes narrow, acuminate, glabrous, 4–5 mm. long; lemma pale, thin, about as long as the glumes, smooth, the nerves obscure, the awn from near the base, geniculate, exserted from the sides of the glumes, 1–2 mm. long above the bend, the callus-hairs scant, about one third as long as the lemma; rachilla 1 mm. long, the sparse hairs extending to 2 mm.

TYPE LOCALITY: Oregon (*Nuttall*).

DISTRIBUTION: Open pine woods, prairies, and banks, Manitoba to British Columbia, and southward to northern Colorado and central California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 493; Hitchc. Man. f. 618.

NOTE: This species has been referred by some American authors to *Calamagrostis sylvatica* DC., and by others to *Deyeuxia varia* Kunth.

19. *Calamagrostis Porteri* A. Gray, Proc. Am. Acad. 6: 79. 1862.

Deyeuxia Porteri Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Porteri* A. Gray.)

Culms slender, glabrous, erect, 2–4-noded, 60–120 cm. tall, with slender rhizomes; sheaths glabrous except the pubescent collar; ligule 2–4 mm. long; blades flat, spreading, lax, scaberulous, 4–8 mm. wide; panicle narrow but rather loose, pale or purplish, erect or somewhat nodding, 10–15 cm. long, the axis scabrous, the branches scabrous, ascending or appressed, overlapping, as much as 5 cm. long; glumes acuminate, scaberulous, 4–6 mm. long; lemma slightly shorter than the glumes, toothed at the apex, the awn from near the base, about as long as the lemma, bent and protruding from the side of the glumes; palea about as long as the lemma; callus-hairs rather scant, nearly half as long as the lemma; rachilla-hairs scant, extending to about 3 mm.

TYPE LOCALITY: Huntingdon County, Pennsylvania (*Porter* in 1862).

DISTRIBUTION: Dry rocky soil, rare, New York, Pennsylvania, Virginia (*Luray*), and West Virginia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 488; Hitchc. Man. f. 620.

20. *Calamagrostis perplexa* Scribn. Circ. U. S. Dep. Agr. Agrost. 30: 7. 1901.

- Calamagrostis breviseta lacustris* Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 25. 1898. (Type from Fond du Lac, Minnesota.)
Calamagrostis nemoralis Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 26. 1898. Not *C. nemoralis* Philippi, 1896.
Calamagrostis Pickeringii var. *lacustris* Hitchc. Rhodora 8: 210. 1906. (Based on *C. breviseta lacustris* Kearney.)
Calamagrostis lacustris Nash, in Britt. & Brown, Ill. Fl. ed. 2. 1: 208. 1913. (Based on *C. breviseta lacustris* Kearney.)

Resembling *C. Porteri*; differing in the somewhat larger denser panicle, in the more copious callus-hairs about three fourths as long as the lemma, and in the more delicate awn.

TYPE LOCALITY (of *C. nemoralis*): Thacher's Pinnacle, near Ithaca, New York (*Dudley* in 1884).

DISTRIBUTION: Wet rocks and sandy shores, infrequent, Maine (Elliotville), New Hampshire (White Mountains), New York (Ithaca), Ontario (Lake Nipigon), and Minnesota (Fond du Lac).

ILLUSTRATION: Hitchc. Man. f. 622.

21. *Calamagrostis Cainii* Hitchc. Jour. Wash. Acad. 24: 480. 1934.

Culms slender, erect, scabrous below the panicle, 30–40 cm. tall; sheaths glabrous; ligule of culm-leaves thin, rounded or obtuse, finely dentate, becoming lacerate, 1–2 mm. long; blades erect, flat, more or less involute toward the finely attenuate tip, glabrous beneath, scaberulous on the upper surface, narrowed toward base, the basal ones as much as 35 cm. long, 1–2 mm. wide, the uppermost culm-blade 5–10 cm. long, about 1 mm. wide; panicle pale or whitish, loose, 6–10 cm. long, the axis scabrous, the branches ascending or somewhat spreading, verticillate, scabrous, 1–2 cm. long, bearing 1–few spikelets, the whorls 7–15 mm. apart, the pedicels scabrous-pubescent; glumes narrow, nearly equal, acuminate or slightly aristate, glabrous except the scabrous upper half of the keels, 5–6 mm. long, the first 1-nerved, the second 3-nerved; lemma narrow, acuminate, 5-nerved, glabrous below, minutely scaberulous near the finely toothed summit, the callus-hairs about 1 mm. long, the awn about 1 mm. from base, somewhat geniculate, twisted below, the tip bent to one side and somewhat exceeding the glumes; palea a little shorter than the lemma; prolongation of the rachilla very short but the hairs 1–2 mm. long.

TYPE LOCALITY: Summit of Mount LeCoute, Tennessee, alt. about 2000 m. (*Cain* 48).

DISTRIBUTION: Known only from the type locality.

22. *Calamagrostis nutkaensis* (Presl) Steud. Syn. Gram. 190. 1854.

- Deyeuxia nutkaensis* Presl, Rel. Haenk. 1: 250. 1830.
Calamagrostis aleutica Trin.; Bong. Mém. Acad. St.-Petersb. VI. 2: 171. 1832. (Type from Unalaska Island, Alaska.)
Deyeuxia aleutica Munro; Hook. f. Trans. Linn. Soc. 23: 345. 1861. (Based on *Calamagrostis aleutica* Trin.)
Calamagrostis albicans Buckl. Proc. Acad. Phila. 1862: 92. 1862. (Type from Columbia Plains, Oregon, *Nuttall*.)
Deyeuxia breviaristata Vasey, Bull. Torrey Club 15: 48. 1888. (Type from Vancouver Island, *Macoun* in 1887.)
Calamagrostis aleutica patens Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 20. 1898. (Type from Mendocino County, California.)

Culms stout, erect, glabrous or often scabrous, especially below the nodes, 1–1.5 m. tall, with short rhizomes; sheaths glabrous or roughish; ligule 6–8 mm. long; blades elongate, flat becoming involute, gradually narrowed to a long point, scabrous, 8–12 mm. wide; panicle usually purplish, narrow, rather loose, 15–30 cm. long, the axis scabrous, the branches rather stiffly ascending, overlapping, the longer ones 3–6 cm. long, or rarely as much as 15 cm. long; glumes acuminate, scaberulous, 5–7 mm. long; lemma indistinctly nerved, about 4 mm. long, the awn rather stout, from near the base, slightly geniculate, about equaling the lemma or shorter; hairs of callus and rachilla about half as long.

TYPE LOCALITY: Nootka Sound, Vancouver Island (*Haenke*).

DISTRIBUTION: Moist soil or wet wooded hills along the coast from Aleutian Islands, Alaska, to central California; also Kamchatka.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 145; Hitchc. Man. f. 623.

23. *Calamagrostis densa* Vasey, Bot. Gaz. 16: 147. 1891.

Calamagrostis koelerioides var. *densa* Beal, Grasses N. Am. 2: 345. 1896. (Based on *C. densa* Vasey.)
Calamagrostis vilfaeformis Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 20. 1898. (Based on *C. densa* Vasey.)

Culms rather stout, densely tufted, erect, glabrous, or scabrous just below the panicle, mostly more than 1 m. tall, with rather stout rhizomes; sheaths slightly scabrous; ligule 3–5 mm. long; blades flat or subinvolute, scabrous, 15–25 cm. long, the uppermost shorter, 3–8 mm. wide; panicle spikelike, dense, more or less lobed, pale, 10–15 cm. long, the axis scabrous, the branches crowded, overlapping, mostly 1–3 cm. long; glumes acuminate, scaberulous, 4.5–5 mm. long; lemma shorter than the glumes, minutely toothed at apex, the awn bent, twisted below, about as long as the lemma, more or less exerted at the side, the callus-hairs scant or wanting except near the rachilla; palea narrow, as long as, or longer than the lemma; rachilla 1–1.5 mm. long, sparingly pilose.

TYPE LOCALITY: Julian, San Diego County, California (*Orcutt*).

DISTRIBUTION: Dry hills, among shrubs, mountains east of San Diego, California.

ILLUSTRATION: Hitchc. Man. f. 624.

24. *Calamagrostis koelerioides* Vasey, Bot. Gaz. 16: 147. 1891.

Differs from *C. densa* in the more slender glabrous culms and (often purplish) panicles, thinner glabrous glumes, and more prominent callus-hairs. Possibly a form of *C. densa*.

TYPE LOCALITY: Julian, San Diego County, California (*Orcutt*).

DISTRIBUTION: Dry hills, banks, and meadows, Wyoming to Washington, and southward to southern California.

ILLUSTRATION: Hitchc. Man. f. 625.

25. *Calamagrostis insperata* Swallen, Jour. Wash. Acad.

25: 413. 1935.

Culms 85–95 cm. tall, erect, with slender creeping rhizomes; sheaths much shorter than the internodes, smooth or scaberulous; ligule about 5 mm. long; blades flat, glabrous with scabrous margins, 10–22 cm. long, 3–8 mm. wide, acuminate; panicle 12–14 cm. long, the branches narrowly ascending, at least some of them naked toward the base, the lower as much as 5 cm. long; spikelets appressed to the branches, 5–5.5 mm. long; glumes unequal, the first 1-nerved, the second 3-nerved; lemma 4 mm. long, scabrous, the tip narrow, crose, the awn attached about one fourth above the base, equaling the lemma, geniculate, protruding from the sides of the glumes; callus-hairs rather dense, those of the side about half as long as the lemma, those at the back shorter; rachilla 0.5 mm. long, the hairs 2 mm. long.

TYPE LOCALITY: Jackson County, Ohio (*Bartley & Pontius*).

DISTRIBUTION: Known only from the type locality.

26. *Calamagrostis Pickeringii* A. Gray, Man. ed. 2. 547. 1856.

Calamagrostis sylvatica var. *brevisetata* A. Gray, Man. 582. 1848. (Type from White Mountains, New Hampshire.)

Deyeuxia Pickeringii Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Pickeringii* A. Gray.)

Calamagrostis breviseta Scribn. Mem. Torrey Club 5: 41. 1894. (Based on *C. sylvatica* var. *brevisetata* A. Gray.)

Calamagrostis breviseta debilis Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 25. 1898. (Type from Newfoundland, *Robinson & Schrenk 205*.)

Calamagrostis Pickeringii var. *debilis* Fernald & Wiegand, Rhodora 15: 135. 1913. (Based on *C. breviseta debilis* Kearney.)

Culms solitary or few in a tuft, rather rigid, scabrous below the panicle, 30–60 cm. tall, with creeping rhizomes; sheaths glabrous or slightly rough; ligule 2–4 mm. long or shorter on the innovations; blades erect, flat, scabrous, 10–15 cm. long, the basal longer, 4–5 mm. wide; panicle purplish, erect, contracted and rather dense, 7–12 cm. long, the axis scaberulous, the branches short and crowded, 1–2 cm. long, or sometimes in looser panicles, 3–4 cm. long; glumes acute, 4–4.5 mm. long; lemma a little shorter than the glumes, scaberulous, narrowed to an obtuse point, the awn attached about 1 mm. above the base, about as long as the lemma, slightly

bent and protruding somewhat from the side of the glumes; callus-hairs scant, about 0.5 mm. long; rachilla about 1 mm. long, the hairs short, rather scant.

TYPE LOCALITY: White Mountains, New Hampshire (*Pickering*).

DISTRIBUTION: Bogs, wet meadows, and sandy beaches, Newfoundland and Labrador to the mountains of Massachusetts and New York; Isle Royale, Michigan.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 143; Hitchc. Man. f. 627.

NOTE: Smaller plants with slightly smaller spikelets have been called *C. Pickeringii* var. *debilis*.

27. *Calamagrostis Scribneri* Beal, Grasses N. Am. 2: 343. 1896.

Deyeuxia dubia Scribn. & Tweedy, Bot. Gaz. 11: 174. 1886. (The basis of *Calamagrostis Scribneri*.)
Calamagrostis dubia Scribn.; Vasey, Contr. U. S. Nat. Herb. 3: 80. 1892. (Based on *Deyeuxia dubia* Scribn. & Tweedy.) Not *C. dubia* Bunge, 1854.

Calamagrostis canadensis var. *dubia* Vasey, Contr. U. S. Nat. Herb. 3: 80. 1892. (Based on *C. dubia* Scribn.)

Calamagrostis Langsdorfi var. *Scribneri* M. E. Jones, Contr. Bot. 14: 9. 1912. (Based on *C. Scribneri* Beal.)

Culms tufted, slender, glabrous, 60–100 cm. tall, with numerous creeping rhizomes; sheaths scabrous, pubescent on the collar, the lower loose, thin; ligule about 5 mm. long; blades thin, elongate, scabrous, 4–7 mm. wide; panicle pale or purplish, narrow but rather lax, 10–15 cm. long (rarely longer), the axis scaberulous, the branches scaberulous, ascending or appressed, usually 2–3 cm. long, rarely as much as 7 cm. long; glumes acuminate, glabrous, about 4 mm. long; lemma a little shorter than the glumes, sharply toothed, the awn about as long as the glumes or a little longer, feebly bent, the callus-hairs about half as long as the lemma; rachilla minute, its hairs nearly as long as the lemma.

TYPE LOCALITY: Yellowstone Park (*Tweedy*).

DISTRIBUTION: Moist meadows, infrequent, Montana and Washington to Colorado and Oregon.

ILLUSTRATION: Hitchc. Man. f. 629.

28. *Calamagrostis canadensis* (Michx.) Beauv. Agrost. 15, 152, 157. 1812.

Arundo canadensis Michx. Fl. Bor. Am. 1: 73. 1803.

Arundo agrostoides Pursh, Fl. Am. Sept. 86. 1814. (Type from New Jersey or Pennsylvania.)

Calamagrostis mexicana Nutt. Gen. 1: 46. 1818. (Type from North America.)

Calamagrostis agrostoides Pursh; Spreng. Syst. 1: 252. 1825. (Presumably based on *Arundo agrostoides* Pursh.)

Cinna Purshii Kunth, Rév. Gram. 1: 67. 1829. (Based on *Arundo agrostoides* Pursh.)

Calamagrostis Michauxii Trin.; Steud. Nom. Bot. ed. 2. 1: 250. 1840. (Based on *Arundo canadensis* Michx.)

Calamagrostis hirtigluma Steud. Syn. Gram. 188. 1854. (Type from Labrador.)

Deyeuxia canadensis Munro; Hook. f. Trans. Linn. Soc. 23: 345. 1861. (Based on *Arundo canadensis* Michx.)

Calamagrostis oregonensis Buckl. Proc. Acad. Phila. 1862: 92. 1862. (Type from Columbia River, Nuttall.)

Calamagrostis canadensis var. *robusta* Vasey, in Rothr. Bot. Wheeler's Surv. 285. 1878. (Type from Twin Lakes, Colorado, Wolf 1093.)

Calamagrostis pallida Vasey & Scribn.; Vasey, Contr. U. S. Nat. Herb. 3: 79. 1892. (Type from State of Washington, Suksdorf in 1883.) Not *C. pallida* C. Muell. 1861.

Calamagrostis blanda Beal, Grasses N. Am. 2: 349. 1896. (Based on *C. pallida* Vasey & Scribn.)

Calamagrostis canadensis acuminata Vasey; Shear & Rydb. Bull. U. S. Dep. Agr. Agrost. 5: 26. 1897. (Type from Georgetown, Colorado, Shear 615.)

Calamagrostis canadensis campestris Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 31. 1898. (Type from Assinibola, Macoun 56.)

Calamagrostis alaskana Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 32. 1898. (Type from Yukon River, Alaska, Funston 157.)

Calamagrostis atropurpurea Nash, Bull. N. Y. Bot. Gard. 2: 153. 1901. (Type from Dawson, Yukon Territory, Williams in 1899.)

Calamagrostis anomala Suksd. Allg. Bot. Zeits. 12: 43. 1906. (Type from Mount Adams, Washington, Suksdorf 2824.)

Calamagrostis Langsdorfi var. *acuminata* Litw.; Kuseneva, Trav. Mus. Bot. Acad. Russie 18: 52. 1920. (Based on *C. canadensis* var. *acuminata* Vasey.)

Calamagrostis canadensis var. *pallida* Stebbins, Rhodora 32: 45. 1930. (Based on *C. pallida* Vasey & Scribn.)

Calamagrostis Scribneri var. *imberbis* Stebbins, Rhodora 32: 46. 1930. (Based on *C. anomala* Suksd. "not Steud. in Lechl. Berb. Am. Aust. 56. (1857)," the latter a name only.)

Culms suberect, tufted, glabrous, several-noded, 60–150 cm. tall, with numerous creeping rhizomes; sheaths glabrous or rarely obscurely pubescent; ligule 4–7 mm. long, shorter on the

innovations; blades numerous, elongate, flat, rather lax, scabrous, 4–8 mm. wide; panicle nodding, from narrow and rather dense to loose and relatively open, especially at base, pale or purple, 10–25 cm. long, the axis scaberulous, the branches verticillate, scabrous, rather flexuous, overlapping, appressed, ascending or sometimes the lower more or less spreading (especially in anthesis), the longer ones naked below with short ones intermixed; glumes usually 3–4 mm. long, smooth or more commonly scabrous, acute to acuminate; lemma nearly as long as the glumes, smooth, thin, the awn delicate, straight, attached below the middle and extending to or slightly beyond its tip, the callus-hairs abundant, about as long as lemma; rachilla delicate, sparsely long-pilose.

TYPE LOCALITY: Canada (*Michaux*).

DISTRIBUTION: Marshes and wet places, open woods, and meadows, Greenland to Alaska, and southward to Maryland, North Carolina (Roan Mountain), Missouri, and California.

ILLUSTRATION: Hitchc. Man. f. 631.

Calamagrostis canadensis var. *scabra* (Presl) Hitchc. Am. Jour. Bot. 21: 135. 1934. *C. scabra* Presl, Rel. Haenk. 1: 234. 1830. *Deyeuxia Preslii* Kunth, Rév. Gram. Suppl. xx. 1830. (Based on *C. scabra* Presl.) Differing in having on the average wider blades, spikelets 4.5–6 mm. long, the glumes rather firm, hispidly short-ciliate on the keel, strongly scabrous otherwise, but the greater scabridity not constant. TYPE LOCALITY; Nootka Sound, Vancouver Island. DISTRIBUTION: Mountains of New England, New York, and northward, and along the Pacific Coast from Washington to Alaska. ILLUSTRATION: Hitchc. Man. f. 631 B. NOTE: This form has been referred by many American authors to *C. Langsdorfi* (Link) Trin., a distinct Old World species, with minute or obsolete rachilla and smaller spikelets.

Calamagrostis canadensis var. *Macouniana* (Vasey) Stebbins, Rhodora 32: 41. 1930. *Deyeuxia Macouniana* Vasey, Bot. Gaz. 10: 297. 1885. *C. Macouniana* Vasey Contr. U. S. Nat. Herb. 3: 81. 1892. (Based on *Deyeuxia Macouniana* Vasey). Differing from *C. canadensis* in the smaller spikelets, about 2 mm. long. TYPE LOCALITY: Northwest Territory. DISTRIBUTION: Minnesota to Saskatchewan and Washington, and southward to Missouri and Oregon; rare.

29. *Calamagrostis lactea* Beal, Grasses N. Am. 2: 346. 1896.

Calamagrostis Langsdorfi lactea Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 28. 1898. (Based on *C. lactea* Beal.)

Deyeuxia lactea Suksd. Deuts. Bot. Monats. 19: 92. 1901. (Based on *Calamagrostis lactea* Beal.)

Culms ascending, weak, scabrous below the subgeniculate nodes and below the panicle, 80–150 cm. tall, with short knotty rhizomes; sheaths scaberulous; ligule rather firm, 3–5 mm. long; blades elongate, flat, lax, scabrous, 6–12 mm. wide; panicle pale, narrowly pyramidal, rather open and loosely flowered; glumes acuminate, scabrous, 5–6 mm. long; lemma shorter than the glumes, scabrous, the apex setaceous-toothed, the awn attached near the base, about equaling the lemma, weakly geniculate; palea slightly exceeding the lemma, the callus-hairs about half as long; rachilla minute, sparsely pilose.

TYPE LOCALITY: State of Washington (*Suksdorf 1022*).

DISTRIBUTION: Mountain slopes, Washington and Oregon, apparently rare.

ILLUSTRATION: Hitchc. Man. f. 633.

30. *Calamagrostis cinnoides* (Muhl.) W. Barton, Comp. Fl.

Phila. 1: 45. 1818.

Agrostis glauca Muhl. Descr. Gram. 76. 1817. (Type from Pennsylvania.) Not *Calamagrostis glauca* Reichenb. 1830.

Arundo cinnoides Muhl. Descr. Gram. 187. 1817.

Arundo coarctata Torr. Fl. U. S. 1: 94. 1823. (Type from New Jersey.)

Calamagrostis Langsdorfi var. *marylandica* Trin. Gram. Unifl. 225. 1824. (Based on *Arundo cinnoides* Muhl.)

Calamagrostis coarctata Torr.; Hook. Fl. Bor. Am. 2: 240. 1839. (Based on *Arundo coarctata* Torr.)

Calamagrostis Nuttalliana Steud. Nom. Bot. ed. 2. 1: 251. 1840. (Based on *C. canadensis* as described by Nuttall (Gen. 1: 46. 1818).)

Deyeuxia Nuttalliana Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis Nuttalliana* Steud.)

Plant glaucous; culms rather stout, erect, scabrous below the panicle and below the nodes, 80–150 cm. tall, with slender rhizomes readily broken off; sheaths scabrous, sometimes nearly smooth, sometimes sparsely hirsute; ligule rather firm, truncate, 2–4 mm. long; blades flat, scabrous or sometimes sparsely hirsute, 5–10 mm. wide; panicle erect, dense, more or less lobed (somewhat open in anthesis), brownish or purplish, 8–20 cm. long, 1–2 cm. wide, the axis scabrous, the branches scabrous, compactly flowered, 1–3 cm. long; glumes long-acuminate or awn-pointed, scabrous, 6–7 mm. long; lemma firm, acuminate, scabrous, shorter than the

glumes, the awn attached about one fourth below the tip, not much exceeding the lemma, the callus-hairs copious, about two thirds as long; rachilla about 1 mm. long, glabrous below, with a brush of long white hairs at the tip about equaling the lemma.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Bogs and moist ground, Maine to New York, and southward to Alabama.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 485; Hitchc. Man. f. 634.

31. *Calamagrostis scopulorum* M. E. Jones, Proc. Calif. Acad. II. 5:
722. 1895.

Calamagrostis scopulorum lucidula Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 33. 1898. (Type from Wasatch Mountains, Utah, Jones 1145.)

Plant pale, glaucous; culms erect, glabrous, 50–80 cm. tall, with short rhizomes; sheaths glabrous; ligule 3–5 mm. long; blades elongate, flat, scabrous, 3–7 mm. wide; panicle pale to purplish, contracted, sometimes spikelike, 8–15 cm. long, the axis scaberulous, the branches scabrous, crowded, appressed, 1–2 cm. long, rarely more; glumes acute to acuminate, somewhat scabrous, 4–6 mm. long; lemma about as long as the glumes, minutely pilose, the awn attached above the middle, straight, about as long as the lemma, the callus-hairs about two thirds as long; rachilla rather sparsely long-pilose, especially on the upper part.

TYPE LOCALITY: Springdale, Utah (Jones 6075).

DISTRIBUTION: Moist soil in gulches, Wyoming (Wild Cat Peak), Colorado (Pagosa Peak), and Utah.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 489; Hitchc. Man. f. 636.

32. *Calamagrostis inexpansa* A. Gray, N. Am. Gram. & Cyp. 1:
20. 1834.

Calamagrostis stricta var. *brevior* Vasey, in Rothr. Bot. Wheeler's Surv. 285. 1878. (Type from Mosquito, Colorado, Wolf 1098.)

Calamagrostis stricta var. *robusta* Vasey, in Rothr. Bot. Wheeler's Surv. 285. 1878. (Type from Twin Lakes, Colorado, Wolf 1099.)

Calamagrostis hyperborea Lange, Fl. Dan. 50: pl. 2942, f. 1. 1880. (Type from Greenland.)

Deyeuxia neglecta var. *americana* Vasey; Macoun, Cat. Can. Pl. 4: 206. 1888. (Type from Donald, British Columbia, Macoun in 1885.)

Deyeuxia neglecta var. *robusta* Vasey; Macoun, Cat. Can. Pl. 4: 206. 1888. (Type from Alberta, Macoun.)

Calamagrostis robusta Vasey, Contr. U. S. Nat. Herb. 3: 82. 1892. (Presumably based on *C. stricta* var. *robusta* Vasey.) Not *C. robusta* Muell. 1861.

Calamagrostis americana Scribn.; Shear & Rydb. Bull. U. S. Dep. Agr. Agrost. 5: 27. 1897. (Based on *Deyeuxia neglecta* var. *americana* Vasey.)

Calamagrostis inexpansa cuprea Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 37. 1898. (Type from Falcon Valley, Washington, Suksdorf 910.)

Calamagrostis labradorica Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 38. 1898. (Type from Bonne Esperance, Labrador, Allen in 1882.)

Calamagrostis hyperborea stenodes Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 39. 1898. (Type from Marshall Pass, Colorado, Clements 206.)

Calamagrostis hyperborea elongata Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 40. 1898. (Type from Plummer County, Nebraska, Rydberg 1494.)

Calamagrostis hyperborea americana Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 41. 1898. (Based on *Deyeuxia neglecta* var. *americana* Vasey.)

Calamagrostis micrantha var. *sierrae* M. E. Jones, Contr. West. Bot. 14: 9. 1912. (Type from Prattville and Susanville, California, Jones.)

Calamagrostis neglecta var. *inexpansa* M. E. Jones, Contr. West. Bot. 14: 9. 1912. (Based on *C. inexpansa* A. Gray.)

Deyeuxia hyperborea elongata Lunell, Am. Midl. Nat. 4: 218. 1915. (Based on *Calamagrostis hyperborea elongata* Kearney.)

Deyeuxia hyperborea stenodes Lunell, Am. Midl. Nat. 4: 218. 1915. (Based on *Calamagrostis hyperborea stenodes* Kearney.)

Calamagrostis elongata Rydb. Fl. Rocky Mts. 58. 1917. (Based on *C. hyperborea elongata* Kearney.)

Calamagrostis wyomingensis Gandog. Bull. Soc. Bot. France 66: 299. 1920. (Type from Granger, Wyoming, A. Nelson 3884.)

Calamagrostis scopulorum var. *Bakeri* Stebbins, Rhodora 32: 47. 1930. (Type from Pagosa Peak, Colorado, Baker 162.)

Calamagrostis inexpansa var. *robusta* Stebbins, Rhodora 32: 48. 1930. (Based on *C. stricta* var. *robusta* Vasey.)

Calamagrostis inexpansa var. *brevior* Stebbins, Rhodora 32: 50. 1930. (Based on *C. stricta* var. *brevior* Vasey.)

Culms tufted, erect, scabrous below the panicle, 50–80 cm. tall, with rather slender rhizomes; sheaths glabrous or somewhat scabrous, the basal ones numerous, withering but per-

sistent; ligule 4–6 mm. long; blades firm, rather rigid, flat or loosely involute, very scabrous, 2–4 mm. wide; panicle narrow, dense, more or less lobed, 5–15 cm. long, the axis scabrous, the branches mostly erect, crowded and overlapping, very scabrous, 1–2 cm. long or sometimes 3–4 cm. long; glumes abruptly acuminate, scaberulous, 3–4 mm. long; lemma as long as the glumes, scabrous, the awn attached about the middle, straight or nearly so, about as long as the glumes, the callus-hairs half to three fourths as long; rachilla 0.5 mm. long, some of the hairs reaching the tip of the lemma.

TYPE LOCALITY: Penn Yan, New York (*Sartwell*).

DISTRIBUTION: Meadows, marshes, and wet places, Greenland to Alaska, and southward to Maine, New York, Illinois, Missouri, Nebraska, New Mexico, and California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 487; Hitchc. Man. f. 637.

Calamagrostis inexpansa var. *barbulata* Kearney, Bull. U. S. Dept. Agr. Agrost. 11: 37. 1898. Culms robust, puberulent below the nodes; collar of sheaths puberulent; awn minute or obsolete; callus-hairs nearly as long as the lemma. TYPE LOCALITY: Mason County, Washington (*Piper 947*). DISTRIBUTION: Known only from the type locality.

Calamagrostis inexpansa var. *novae-angliae* Stebbins, *Rhodora* 32: 51. 1930. Panicle more loosely flowered, the longer branches naked below. TYPE LOCALITY: Mount Desert, Maine (*Williams & Rand* in 1899). DISTRIBUTION: Wet granite ledges, Maine and Vermont.

NOTE: *Calamagrostis californica* Kearney (Bull. U. S. Dep. Agr. Agrost. 11: 37. 1898) resembles *C. inexpansa*, differing in having longer and somewhat looser panicles and shorter callus-hairs. TYPE LOCALITY: Sierra Nevada, California. Known only from the type specimen (*Lemmon 444* in 1895). ILLUSTRATION: Hitchc. Man. f. 639. It may be a distinct species.

33. *Calamagrostis neglecta* (Ehrh.) Gärtn., Meyer & Scherb. Fl. Wett. 1: 94. 1799.

Arundo neglecta Ehrh. Beitr. 6: 137. 1791.

Deyeuxia neglecta Kunth, Rév. Gram. 1: 76. 1829. (Based on *Arundo neglecta* Ehrh.)

Deyeuxia neglecta var. *gracilis* Scribn. & Tweedy, Bot. Gaz. 11: 175. 1886. (Type from Yellowstone Park, *Tweedy 582*.)

Deyeuxia vancouverensis Vasey, Bull. Torrey Club 15: 48. 1888. (Type from Fort George, James Bay, Quebec, *Macoun* in 1887.)

Deyeuxia neglecta var. *brevifolia* Vasey; Macoun, Cat. Can. Pl. 2^d: 206. 1888. (Type from Pelly Banks, Northwest Territory, *Dawson*.)

Deyeuxia borealis Macoun, Cat. Can. Pl. 2^d: 207. 1888. (Based on *D. vancouverensis* Vasey.)

Calamagrostis laxiflora Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 34. 1898. (Based on *Deyeuxia neglecta gracilis* Scribn.) Not *C. laxiflora* Philippi, 1896.

Calamagrostis micrantha Kearney, Bull. U. S. Dep. Agr. Agrost. 11: 36. 1898. (Type from Prince Albert, Saskatchewan, *Macoun 13111*.)

Calamagrostis neglecta var. *micrantha* Stebbins, *Rhodora* 32: 55. 1930. (Based on *C. micrantha* Kearney.)

Calamagrostis lapponica var. *brevipilis* Stebbins, *Rhodora* 32: 56. 1930. (Type from Straits of Belle Isle, Quebec, *Fernald & Wiegand 2547*.)

Resembling *C. inexpansa*, on the average smaller; ligule 1–3 mm. long; blades smooth or nearly so, lax and soft, narrow, often filiform; panicle on the average smaller; glumes rather thinner in texture, often smooth.

TYPE LOCALITY: Europe.

DISTRIBUTION: Marshes, sandy shores, and wet places, Greenland to Alaska, and southward to Maine, Vermont, New York, Michigan, Wisconsin, Colorado, Utah, and Oregon; also northern Eurasia.

ILLUSTRATION: Hitchc. Man. f. 640.

34. *Calamagrostis crassiglumis* Thurber, in S. Wats. Bot. Calif. 2: 281. 1880.

Deyeuxia crassiglumis Vasey, Grasses U. S. 28. 1883. (Based on *Calamagrostis crassiglumis* Thurber.)

Calamagrostis neglecta var. *crassiglumis* Beal, Grasses N. Am. 2: 353. 1896. (Based on *C. crassiglumis* Thurber.)

Culms erect, glabrous, rather rigid, 15–40 cm. tall, with creeping rhizomes; sheaths glabrous, the lower overlapping, somewhat papery; ligule 1–2 mm. long; blades flat or somewhat involute, smooth, except the scabrous margins, firm, about 4–5 mm. wide; panicle narrow, dense, spikelike, dull-purple, 2–5 cm. long; glumes ovate, rather abruptly acuminate, scaberulous, firm or almost indurate, 3–4 mm. long; lemma about as long as the glumes, broad, obtuse to abruptly pointed, the awn attached about the middle, straight, about as long as the

lemma, the callus-hairs abundant, about 3 mm. long; rachilla 1 mm. long, the hairs reaching to the apex of the lemma.

TYPE LOCALITY: Mendocino County, California (*Bolander 4766, 4787*).

DISTRIBUTION: Swampy soil, rare, Vancouver Island, Washington, and California (Mendocino County).

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 142; Hitchc. Man. f. 642.

35. *Calamagrostis epigeios* (L.) Roth, Fl. Germ. 1: 34. 1788.

Arundo epigeios L. Sp. Pl. 81. 1753.

Calamagrostis georgica K. Koch, Linnaea 21: 387. 1848. (Type from Georgia [Russia], near Tiflis.)

Calamagrostis epigeios var. *georgica* Ledeb. Fl. Ross. 4: 433. 1853. (Based on *C. georgica* C. Koch. Fide Fernald, Rhodora 35: 65. 1933.)

Calamagrostis arenicola Fernald, Rhodora 30: 203. 1928. (Type from Barnstable County, Massachusetts, Fernald 757.)

Culms slender, erect, 1-1.5 m. tall, with creeping rhizomes; sheaths glabrous; ligule about 4 mm. long, rather firm; blades elongate, scabrous, flat, 4-5 mm. wide; panicle pale, erect or somewhat nodding, narrow, rather dense, more or less lobed, narrowed at the summit, 20-30 cm. long; glumes subequal, narrowly lanceolate-attenuate, 4-5 mm. long; lemma strongly 2-toothed at the opaque apex, 2-2.3 mm. long, the awn from a little below the middle, about as long as the glumes, somewhat bent at the middle; callus-hairs rather copious, about as long as the glumes; rachilla obsolete.

TYPE LOCALITY: Europe.

DISTRIBUTION: Sandy woods in dense colonies, Harwich, Massachusetts; Long Island; said to be established also at Gloucester, Massachusetts and in Montgomery County, Pennsylvania; native of Eurasia.

ILLUSTRATION: Hitchc. Man. f. 643.

114. AGROSTIS L. Sp. Pl. 61. 1753.

Vilfa Adans. Fam. Pl. 2: 495. 1763. (Selected type, *A. stolonifera* L.)

Apera Adans. Fam. Pl. 2: 495. 1763. (Type, *Agrostis Spica-venti* L.)

Trichodium Michx. Fl. Bor. Am. 1: 41. 1803. (Type, *T. decumbens*.)

Decandolia Bastard, Fl. Maine-et-Loire 28. 1809. (Selected type, *Agrostis stolonifera* L.)

Agraulis Beauv. Agrost. 5. 1812. (Type, *Agrostis canina* L.)

Anemagrostis Trin. Fund. Agrost. 128. 1820. (Selected type, *Agrostis Spica-venti* L.)

Notonema Raf. Neog. 4. 1825. (Type, *Agrostis arachnoides* Ell.)

Agrestis Bubani, Fl. Pyren. 4: 281. 1901. (Type, *Agrostis verticillata* Vill.)

Podagrostis (Griseb.) Scribn. & Merr. Contr. U. S. Nat. Herb. 13: 58. 1910. (Type, *Agrostis aequivalvis* Trin.)

Annual or usually perennial, delicate or moderately tall grasses, with glabrous culms, flat or sometimes involute scabrous blades and open or contracted panicles of small spikelets. Spikelets 1-flowered, disarticulating above the glumes, the rachilla usually not prolonged; glumes equal or nearly so, acute, acuminate, or sometimes awn-pointed, carinate, usually scabrous on the keel and sometimes on the back; lemma obtuse, usually shorter and thinner in texture than the glumes, awnless or dorsally awned, often hairy on the callus; palea usually shorter than the lemma, 2-nerved in only a few species, usually small and nerveless or obsolete.

Type species, *Agrostis stolonifera* L. (Linnaeus described 12 species, of which *A. stolonifera* is selected as type.)

Palea evident, 2-nerved, at least half as long as the lemma.

Rachilla prolonged behind the palea.

Lemma pubescent.

Lemma glabrous.

Lemma awned; plants annual.

Panicle open, the branches naked below.

Panicle narrow, contracted, interrupted, the branches or some of them floriferous from base.

Lemma awnless; plants perennial.

Prolongation of the rachilla nearly as long as the lemma.

Prolongation of the rachilla not more than half as long as the lemma.

Spikelets 1.5 mm. long.

Spikelets 2 mm. long.

Spikelets 3 mm. long.

Rachilla not prolonged.

1. *A. retrofracta*.

2. *A. Spica-venti*.

3. *A. interrupta*.

4. *A. bacillata*.

5. *A. Liebmanni*.

6. *A. Thurberiana*.

7. *A. aequivalvis*.

- Glumes scabrous on the keel and on the back; panicle contracted, lobed, the short branches densely verticillate. 8. *A. verticillata*.
- Glumes scabrous on the keel only, or glabrous; panicles open or, if contracted, not lobed nor with densely verticillate branches. 9. *A. Rosei*.
- Panicle open, rather diffuse, the branchlets divaricately spreading. Panicle contracted or rather open, but not diffuse, the branchlets not divaricately spreading. 10. *A. humilis*.
- Plants tufted; a dwarf alpine species.
- Plants with rhizomes, stolons, or decumbent bases; taller species of low and medium altitudes. 11. *A. tenuis*.
- Branches of panicle naked at base, the panicle open and delicate; ligule as much as 2 mm. long on culm-leaves, less than 1 mm. on the innovations.
- Branches of panicle or some of them floriferous from near base; ligule as much as 6 mm. long.
- Panicle open, the branches ascending; no long stolons developed.
- Culms decumbent at base; rhizomes wanting. 12. *A. stolonifera*.
- Culms erect; rhizomes present. 13. *A. alba*.
- Culms producing rather stout creeping leafy stolons. 14. *A. nigra*.
- Panicle contracted, the branches appressed; long stolons developed in isolated plants; culms decumbent at base. 15. *A. palustris*.
- Palea obsolete or a minute nerveless scale, rarely as much as one third as long as the lemma.
- Plants annual; lemma with a slender awn 5–10 mm. long.
- Awn flexuous; southeastern states. 16. *A. Elliottiana*.
- Awn straight; Pacific coast.
- Spikelets 5–6 mm. long; lemma awned from the middle. 17. *A. Hendersonii*.
- Spikelets about 1.5 mm. long; lemma awned below the tip. 18. *A. exigua*.
- Plants perennial; lemmas awned or awnless, the awn when present not much exerted.
- Plants spreading by creeping rhizomes (those of *A. lepida* short).
- Hairs at base of lemma 1–2 mm. long. 19. *A. Hallii*.
- Hairs at base of lemma minute or wanting.
- Rhizomes short; alpine tufted plants. 20. *A. lepida*.
- Rhizomes long and slender. 21. *A. pallens*.
- Panicle spikelike.
- Panicle open.
- Panicle 10–15 cm. long, not diffuse, leafy, the blades 2–6 mm. wide. 22. *A. diegoensis*.
- Panicle mostly more than 15 cm. long, rather diffuse; leaves inconspicuous, the blades usually not more than 1 mm. wide. 23. *A. subrepens*.
- Plants caespitose, without rhizomes, but stolons sometimes developed.
- Panicle narrow, contracted, at least some of the lower branches spikelet-bearing from near the base.
- Panicle strict, 2–4 cm. long; blades involute. 24. *A. Blasdalei*.
- Panicle narrow but not strict and spikelike, usually more than 4 cm. long.
- Palea one fourth to one third as long as lemma.
- Leaves mostly basal, filiform-involute, the blades of the culm, if flat, not more than 1 mm. wide. 25. *A. Pittieri*.
- Leaves mostly from the culm, the blades flat, 1–10 mm. wide.
- Panicle from loose to dense, if dense in glomerules or interrupted; glumes, except the keel, smooth to scaberulous.
- Panicle dense and spikelike; glumes very scabrous. 26. *A. exarata*.
- Palea wanting or minute. 27. *A. californica*.
- Lemma awnless. 28. *A. Rossae*.
- Lemma awned. 29. *A. virescens*.
- Spikelets 2 mm. long.
- Spikelets 3 mm. long.
- Panicle condensed or spikelike, or somewhat interrupted, mostly 3–7 cm. long; callus glabrous. 30. *A. toluensis*.
- Panicle narrow but rather loose, 6–15 cm. long; callus short-pilose. 31. *A. subpatens*.
- Panicle open, if narrow the branches naked at base.
- Panicle diffuse; awn of lemma arising near base. 32. *A. Howellii*.
- Panicle open, if diffuse the lemmas awnless.
- Panicle very diffuse, the scabrous capillary branches branching about the middle or above, the branchlets bearing spikelets toward the ends (branches shorter and more divaricate in var. *geminata*). 33. *A. hiemalis*.
- Panicle not diffuse, the branches branching below the middle.
- Lemma awned (awnless individuals occur).
- Spikelets about 2 mm. long. 34. *A. canina*.
- Spikelets 2.5–3 mm. long.
- Ligule 5–8 mm. long. 35. *A. longiligula*.
- Ligule 1–2 mm. long.

- Awn arising about 0.5 mm. above the base of the lemma; blades elongate, usually filiform. 36. *A. Ghiesbreghtii*.
 Awn arising from about the middle of the back; blades mostly flat. 37. *A. borealis*.
 Lemmas awnless (awned individuals occur). 38. *A. Berlandieri*.
 Lemma as long as the glumes.
 Lemma shorter than the glumes.
 Spikelets about 1.5 mm. long (sometimes as much as 2 mm.). 39. *A. idahoensis*.
 Spikelets 2-3 mm. long.
 Palea one fourth to one third as long as the lemma.
 Culm scabrous below panicle. 40. *A. Bourgaei*.
 Culm glabrous below panicle.
 Glumes 2 mm. long, scabrous on the keel only. 41. *A. thyrigera*.
 Glumes 2.5 mm. long, scabrous on keel and back. 42. *A. durangensis*.
 Palea minute or wanting.
 Leaves mostly basal, the blades flat, thin, erect; culms erect; panicles elliptic, 5-10 cm. long, finally divaricately branched; ligule short, truncate. 43. *A. turrialbae*.
 Leaves distributed along the culm.
 Panicles rather lax, sometimes delicate and divaricately spreading; eastern United States. 44. *A. perennans*.
 Panicles rather stiff, the branches whorled and rather stiffly ascending.
 Glumes scaberulous on keel and back; northwestern United States. 45. *A. oregonensis*.
 Glumes scaberulous on keel only; Mexico. 46. *A. Schaffneri*.
 Blades 2-4 mm. wide. 47. *A. tacubayensis*.
 Blades about 1 mm. wide, those of the innovations setaceous.

1. *Agrostis retrofracta* Willd. Enum. 94. 1809.

Vilfa retrofracta Beauv. Agrost. 16, 148, 182. 1812. (Based on *Agrostis retrofracta* Willd.)
Lachnagrostis retrofracta Trin. Fund. Agrost. 128. 1820. (Based on *Agrostis retrofracta* Willd.)
Lachnagrostis Willdenowii Trin. Gram. Unifl. 217. 1824. (Based on *Agrostis retrofracta* Willd.)
Deyeuxia retrofracta Kunth, Rév. Gram. 77. 1829. (Based on *Agrostis retrofracta* Willd.)
Calamagrostis retrofracta Link, Hort. Berol. 2: 247. 1833. (Based on *Deyeuxia retrofracta* Kunth.)
Calamagrostis Willdenowii Steud. Syn. Gram. 192. 1854. (Based on *Lachnagrostis Willdenowii* Trin.)

Perennial; culms cespitose, erect or decumbent at base, retrorsely scabrous below panicle, 3- or 4-noded, 20-60 cm. tall; sheaths glabrous; ligule acute, lacerate, 3-7 mm. long; blades mostly erect or ascending, scabrous, acuminate, 5-15 cm. long, 1-2 mm. wide; panicle finally diffuse, 10-20 cm. long, about the same width, the axis slender, scabrous, the capillary branches at maturity widely, abruptly, and stiffly spreading, in distant fascicles, scabrous, naked, branching about the middle, the branchlets bearing a few spikelets toward the ends; glumes acuminate, scabrous on the keel, 3-4 mm. long; lemma thin, pubescent, about half as long as the glumes, short-bearded on the callus, the awn from about the middle of the back, scabrous, delicate, geniculate, twisted below, exerted about the length of the glumes; palea narrow, nearly as long as the lemma; prolongation of the rachilla slender, pilose, from half to as long as the lemma.

TYPE LOCALITY: Australia.

DISTRIBUTION: Introduced in Ohio (Painesville), Texas (Kent), and central California (15 miles south of Stockton); common in the Hawaiian Islands, Australia, and New Zealand.

ILLUSTRATIONS: Abrams, Ill. Fl. Pacif. St. f. 328; Hitchc. Man. f. 652.

2. *Agrostis Spica-venti* L. Sp. Pl. 61. 1753.

Agrostis gracilis Salisb. Prodr. 25. 1796. (Based on *A. Spica-venti* L.)
Apera Spica-venti Beauv. Agrost. 31, 151. 1812. (Based on *Agrostis Spica-venti* L.)
Anemagrostis Spica-venti Trin. Fund. Agrost. 129. 1820. (Based on *Agrostis Spica-venti* L.)
Festuca Spica-venti Raspail, Ann. Sci. Nat. 5: 445. 1825. (Based on *Agrostis Spica-venti* L.)
Muhlenbergia Spica-venti Trin. Mém. Acad. St.-Pétersb. VI. 6: 285. 1841. (Based on *Agrostis Spica-venti* L.)

Agrostis ventosa Dulac, Fl. Hautes-Pyren. 74. 1867. (Based on *Apera Spica-venti* Beauv.)
Agrostis Anemagrostis Syme, Engl. Bot. ed. 3. 11: 43. 1873. (Based on *Anemagrostis Spica-venti* Trin.)
Agrostis Anemagrostis subsp. *Spica-venti* Syme, Engl. Bot. ed. 3. 11: 43. 1873. (Based on *A. Spica-venti* L.)

Annual; culms branched at base, erect or ascending, glabrous, about 3-noded, 40–60 cm. tall; sheaths glabrous or sometimes slightly rough; ligule as much as 6 mm. long, lacerate; blades scabrous, acuminate, 5–15 cm. long, 1–3 mm. wide; panicle oblong, loose, erect or somewhat nodding; 10–20 cm. long, usually about half as wide, the branches capillary, whorled, ascending or somewhat spreading, naked at base, or with a few short branches intermixed; glumes acuminate, somewhat unequal, 2–2.5 mm. long, the first shorter and narrower; lemma about as long as the second glume, scaberulous, the slender straight awn from below the apex, about twice as long as the glumes; palea about as long as the lemma; prolongation of the rachilla less than 0.5 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Introduced at a few points from Maine to Maryland; Ohio; Portland, Oregon; native of Europe and Siberia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 20: f. 63; Bull. U. S. Dep. Agr. 772: f. 69; Britt. & Brown, Ill. Fl. ed. 2. f. 516.

3. *Agrostis interrupta* L. Syst. Nat. ed. 10. 872. 1759.

Apera interrupta Beauv. Agrost. 31, 151. 1812. (Based on *Agrostis interrupta* L.)
Anemagrostis interrupta Trin. Fund. Agrost. 129. 1820. (Based on *Agrostis interrupta* L.)
Muhlenbergia interrupta Steud. Syn. Gram. 177. 1854. (Based on *Agrostis interrupta* L.)
Agrostis Spica-venti subsp. *interrupta* Hook. f. Stud. Fl. 432. 1870. (Based on *A. interrupta* L.)
Agrostis Anemagrostis subsp. *interrupta* Syme, Engl. Bot. ed. 3. 11: 44. 1873. (Based on *A. interrupta* L.)
Apera Spica-venti var. *interrupta* Beal, Grasses N. Am. 2: 357. 1896. (Based on *Agrostis interrupta* L.)
Agrostis interrupta Bubani, Fl. Pyren. 4: 289. 1901. (Based on *Agrostis interrupta* L.)

Annual; culms usually much branched at base, erect or geniculate at base, glabrous, 2- or 3-noded, 20–60 cm. tall; sheaths glabrous; ligule thin, acute, 2–4 mm. long; blades scabrous, mostly less than 5 cm. long, about 1 mm. wide; panicle narrow, rather dense, erect or somewhat nodding, interrupted, 5–15 cm. long, about 1 cm. wide, the branches whorled, ascending or appressed, 1–4 cm. long, some of them floriferous to base; spikelets green, the lateral pedicels about 1 mm. long; glumes acuminate, scabrous on the keel, somewhat unequal, the second somewhat longer, 2.5–3 mm. long; lemma scaberulous above, about 2 mm. long, the callus minutely pilose, the awn from below the apex, straight, about 1 cm. long; prolongation of the rachilla about 0.3 mm. long.

TYPE LOCALITY: Europe.

DISTRIBUTION: Introduced in Missouri (St. Louis), Idaho (Nezperce Forest), and British Columbia (Okanogan); native of western Europe.

ILLUSTRATIONS: Host, Gram. Austr. 3: pl. 48; Hitchc. Man. f. 653 B.

4. *Agrostis bacillata* Hack. Oesterr. Bot. Zeits. 52: 59. 1902.

Perennial; culms slender, cespitose, erect, glabrous, 1- or 2-noded near base, 15–30 cm. tall; leaves mostly in a short basal cluster, the sheaths glabrous; ligule acute, 2–3 mm. long; blades convolute, setaceous, glabrous except the margins, or scaberulous, mostly not more than 6 cm. long, the upper culm-blade shorter, at or below the middle; panicle ovate, open, 5–8 cm. long, the axis and branches glabrous, the branches 3–5 in a fascicle, spreading, somewhat flexuous, branched about the middle; spikelets on pedicels (branches of the second order) longer than themselves; glumes lanceolate-oblong, acute, glabrous including the somewhat thickened keel, 1.5–2 mm. long; lemma glabrous, a little shorter than the glumes; palea as long as the lemma; prolongation of the rachilla slender, nearly as long as the lemma, tapering to a fine point.

TYPE LOCALITY: Cerro de la Muerte, 3100 meters, Costa Rica (*Pittier 10477*).

DISTRIBUTION: Páramos, Costa Rica.

5. *Agrostis Liebmanni* (Fourn.) Hitchcock.

Apera Liebmanni Fourn. Mex. Pl. Gram. 97. 1886.

Perennial, culms cespitose, glabrous, with fine-leaved innovations at base, ascending 30 to 40 cm. tall; sheaths scaberulous; ligule truncate, dentate, 2 mm. long; basal blades subsetaceous, those of the culm scabrous, 2-3 mm. wide, 2-8 cm. long; panicle rather narrow, open, 10-16 cm. long, the branches slender, scabrous, naked at base, ascending; glumes acutish, rather broad, slightly scabrous on the keel, about 1.5 mm. long; lemma acute, as long as the glumes, awnless; palea narrow, a little shorter than the lemma; prolongation of the rachilla very short, naked.

TYPE LOCALITY: Chiuintla, Mexico (*Liebmann 710*).

DISTRIBUTION: State of Vera Cruz.

6. *Agrostis Thurberiana* Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 23. 1905.

Agrostis Hillebrandii Thurber; Bolander, Trans. Calif. Agr. Soc. 1864-1865: 136, *nomen nudum*. 1866. (Sierras, California, *Hillebrand*.)
Agrostis atrata Rydb. Bull. Torrey Club 36: 531. 1909. (Type from Yoho Valley, British Columbia, *Macoun 64787*.)

Perennial; culms slender, in small tufts, erect or sometimes decumbent at base, glabrous, 2- or 3-noded, 20-40 cm. tall; sheaths glabrous; ligule about 6 mm. long; leaves mostly at the base of the plant, the blades scaberulous, usually not more than 10 cm. long and 2 mm. wide, the uppermost about the middle of the culm; panicle narrow, lax, more or less drooping, 5-8 cm. long, the branches few, slightly scabrous, 2-4 in each whorl, spikelet-bearing from about the middle; spikelets green, pale or purple, 2 mm. long; glumes acute, glabrous except for the minutely scaberulous tip of keels; lemma nearly as long as the glumes, obtuse, faintly 5-nerved, the callus very minutely pilose; palea about 1.3 mm. long; prolongation of the rachilla about 0.3 mm. long, minutely pubescent.

TYPE LOCALITY: Skamania County, Washington (*Suksdorf 1021*).

DISTRIBUTION: Bogs and moist places, at medium and upper altitudes, Colorado to British Columbia, and southward in the Sierras to central California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 1, f. 1*; Hitchc. *Man. f. 655*; Abrams, Ill. Fl. Pacif. St. *f. 330*.

7. *Agrostis aequalvis* (Trin.) Trin. Mém. Acad. St. Pétersb. VI. 6²: 362. 1841.

Agrostis canina var. *aequalvis* Trin.; Bong. Mém. Acad. St.-Pétersb. VI. 2: 171. 1832.
Deyeuxia aequalvis Benth.; (Vasey, Contr. U. S. Nat. Herb. 3: 77, as synonym of *Agrostis aequalvis* Trin. 1892) B. D. Jackson, Ind. Kew. 1: 740. 1893. (Based on *Agrostis aequalvis* Trin., as indicated by Benth. Jour. Linn. Soc. 19: 91. 1881; the combination not made there.)
Podagrostis aequalvis Scribn. & Merr. Contr. U. S. Nat. Herb. 13: 58. 1910. (Based on *Agrostis canina* var. *aequalvis* Trin.)

Perennial; culms cespitose, glabrous, 2- or 3-noded, 30-60 cm. tall; sheaths glabrous; ligule about 2 mm. long; blades erect, slightly scabrous, usually 4-6 cm. long, 1-2 mm. wide; panicle narrow, somewhat loose, usually purple, 5-15 cm. long, the branches slender, those of a fascicle unequal in length, ascending, slightly scabrous, mostly 1-2 cm. long, branched about the middle, the few branches of the second order being the pedicels of the spikelets; spikelets about 3-4.5 mm. long; glumes glabrous, or slightly scabrous on keel near tip, acute; lemma about as long as the glumes, the callus minutely pilose; palea about 1.3 mm. long; prolongation of the rachilla minutely pubescent, one fifth to half as long as the lemma.

TYPE LOCALITY: Sitka, Alaska.

DISTRIBUTION: Bogs and wet meadows, Alaska southward (rare) in the Cascade Mountains to Oregon.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 1, f. 2*; Hitchc. *Man. f. 657*; Abrams, Ill. Fl. Pacif. St. *f. 329*.

8. *Agrostis verticillata* Vill. Prosp. Pl. Dauph. 16. 1779.

- Agrostis alba* var. *verticillata* Pers. Syn. Pl. 1: 76. 1805. (Based on *A. verticillata* Vill.)
Agrostis Willarsii Poir. in Lam. Encyc. Suppl. 1: 251. 1810. (Based on *A. verticillata* Vill.)
Vilfa verticillata Beauv. Agrost. 16, 148, 182. 1812. (Based on *Agrostis verticillata* Vill.)
Agrostis decumbens Muhl.; Ell. Bot. S. C. & Ga. 1: 136. 1816. (Type from Charleston, South Carolina.) Not *A. decumbens* Host, 1809.
Agrostis stolonifera var. *verticillata* St. Amans, Fl. Agen. 28. 1821. (Based on *A. verticillata* Vill.)
Agrostis aquatica Buckl. Proc. Acad. Phila. 1862: 90. 1863. (Type from San Saba County, Texas.)
Agrostis verticillata Bubani, Fl. Pyren. 4: 282. 1901. (Based on *Agrostis verticillata* Vill.)

Perennial, light-green or glaucous-green; culms usually decumbent at base, sometimes with long creeping and rooting stolons, several-noded, the flowering culms 20–80 cm. tall; sheaths glabrous or slightly roughened, sometimes somewhat inflated; ligule truncate, dentate, sometimes scaberulous, 2–6 mm. long; blades scabrous, relatively short, 5–10 cm. long or in luxuriant specimens elongate, 3–4 mm. wide, or sometimes as much as 7 mm. wide; panicle contracted, lobed or verticillate especially at base, light-green or purplish, 3–10 cm. long, the branches densely flowered from the base; spikelets usually falling entire, 2 mm. long; glumes obtuse or barely acute, scabrous on back and keel; lemma 1 mm. long, awnless, truncate and toothed at apex; palea nearly as long as the lemma.

TYPE LOCALITY: France.

DISTRIBUTION: Moist ground at low altitudes, especially along irrigation ditches, Texas to California, and northward to southern Utah and Washington; on ballast at a few Atlantic ports; introduced in America southward through the drier parts to Argentina; native of the warmer parts of the Eastern Hemisphere.

ILLUSTRATIONS: Trin. Ic. pl. 36; Bull. U. S. Dep. Agr. Agrost. 17: f. 484; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 5. f. 2; Abrams, Ill. Fl. Pacif. St. f. 331; Hitchc. Man. f. 658.

9. *Agrostis Rosei* Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 24: 21. 1901.

Perennial; culms glabrous, erect from a geniculate base, about 3-noded; leaves mostly basal, the sheaths glabrous; ligule obtuse, 2 mm. long; blades acuminate, scabrous, 5–8 cm. long, 2–3 mm. wide; panicle open, somewhat diffuse, 10–15 cm. long, 6–12 cm. wide, the capillary branches spreading, somewhat scabrous, the lower verticillate, branched about the middle, 5–6 cm. long, the branchlets divaricate, few-flowered, the pedicels (branches of the third or fourth order) flexuous, mostly longer than the spikelets; glumes ovate-lanceolate, acute, minutely scabrous on the keel near tip, 2 mm. long; lemma a little shorter than the glumes, obtuse, the awn attached near the base, equaling or slightly exceeding the lemma, finely scabrous, straight or slightly bent about the middle; palea about three fourths as long as the lemma.

TYPE LOCALITY: Sierra Madre, State of Zacatecas, Mexico (*Rose 2373*).

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Bull. U. S. Dep. Agr. Agrost. 24: f. 5.

10. *Agrostis humilis* Vasey, Bull. Torrey Club 10: 21. 1883.

Perennial; culms cespitose, slender, erect, 1-noded near the base, usually not more than 15 cm. tall; leaves mostly basal, the sheaths glabrous; ligule obtuse, about 1 mm. long; blades flat or folded, glabrous beneath, minutely pubescent on the upper surface, mostly less than 10 cm. long, about 1 mm. wide or often less; panicle narrow, purple, 1–3 cm. long, rarely longer, the branches appressed or somewhat spreading; glumes 1.5–2 mm. long, glabrous except the slightly scabrous tip of keels; lemma nearly as long as the glumes, awnless; palea about two thirds as long as the lemma.

TYPE LOCALITY: Mt. Adams, Washington (*Howell 85*).

DISTRIBUTION: Bogs and alpine meadows at high altitudes, Wyoming to Washington and Oregon.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13: pl. 33; Bull. U. S. Dep. Agr. Agrost. 7: f. 135; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 8. f. 1; Abrams, Ill. Fl. Pacif. St. f. 332; Hitchc. Man. f. 668.

11. *Agrostis tenuis* Sibth. Fl. Oxon. 36. 1794.

- Agrostis sylvatica* Huds. Fl. Angl. 28. 1762. (Type from England. A teratological form, the florets abnormally elongated; the name rejected, being based on a monstrosity.)
Agrostis vulgaris With. Brit. Pl. ed. 3. 2: 132. 1796. (Type from Europe.)
Vilfa vulgaris Beauv. Agrost. 16. 1812. (Based on *Agrostis vulgaris* With.)
Agrostis alba var. *sylvatica* Smith. Engl. Fl. 1: 93. 1824. (Based on *A. sylvatica* Huds.) Published as new by Scribner (Mem. Torrey Club 5: 40. 1894), the basis given as *A. sylvatica* "L." (error for Huds.).
Agrostis alba var. *vulgaris* Coss. & Germ. Fl. Paris ed. 2. 797. 1861. (Based on *A. vulgaris* With.)
Agrostis stolonifera var. *vulgaris* Celak. Prodr. Fl. Böhm. 710. 1881. (Based on *A. vulgaris* With.)
 Not *A. stolonifera* var. *vulgaris* Heuffel.
Agrostis alba var. *minor* Vasey, Contr. U. S. Nat. Herb. 3: 78. 1892. (Type from Washington, D. C.)

Perennial, with short or, under cultivation, rather long stolons, but no creeping rhizomes; culms slender, glabrous, erect, cespitose, 2- or 3-noded, usually 20–40 cm. tall; sheaths glabrous; ligule truncate, on the innovations less than 1 mm. long, on the culms as much as 2 mm. long; blades more or less scabrous, mostly 5–10 cm. long, 1–3 mm. wide; panicle open, delicate, mostly 5–10 cm. long, the slender branches naked below, the branchlets spreading, the spikelets not crowded; glumes acute, glabrous, the first scabrous on the keel, 2–3 mm. long; lemma a little shorter than the glumes, awnless, the apex minutely toothed; palea about half as long as the lemma.

TYPE LOCALITY: England.

DISTRIBUTION: Escaped from cultivation and established from Newfoundland to Maryland, West Virginia, and Michigan; British Columbia to California; native of Eurasia.

ILLUSTRATION: Hitchc. Man. f. 666.

NOTE. This species has been referred to *Agrostis capillaris* L., a European species not known from America. It is cultivated for lawns and putting greens under the name Colonial Bent (formerly called Rhode Island Bent).

Agrostis tenuis var. *aristata* (Parn.) Druce, List Brit. Pl. 79. 1908. *Agrostis stricta* Willd. Sp. Pl. 1: 366. 1797. Not *A. stricta* J. F. Gmel. 1791. (North America.) *Agrostis stricta* Muhl. Descr. Gram. 65. 1817. Not *A. stricta* J. F. Gmel. 1791. (New England and Carolina.) *Trichodium strictum* R. & S. Syst. Veg. 2: 281. 1817. (Based on *Agrostis stricta* Willd.) *Agrostis diffusa* Muhl.; Spreng. Syst. 1: 260, as synonym of *A. stricta* Muhl. 1825. Not *A. diffusa* Host, 1809, nor Muhl. 1817. *Agrostis vulgaris aristata* Parn. Grasses Scotl. 34. 1842. *Agrostis alba* var. *aristata* A. Gray, Man. 578. 1848. Not *A. alba* var. *aristata* Spenner, 1825. (Based on *A. stricta* Willd.) *Agrostis stricta* Büse in Miquel, Pl. Jungh. 341. 1854. Not *A. stricta* J. F. Gmel. 1791. (Based on *Trichodium strictum* R. & S.) *Agrostis alba* var. *stricta* Wood, Class-Book ed. 1861. 774. 1861. (Based on *A. stricta* Willd.) *Agrostis tenuis* f. *aristata* Wiegand, Rhodora 26: 2. 1924. (Based on *A. vulgaris* var. *aristata* Parn.) *Agrostis palustris* var. *stricta* House, Bull. N. Y. State Mus. 254: 98. 1924. (Based on *A. stricta* Willd.) *Agrostis capillaris* var. *aristata* Druce, Fl. Oxf. ed. 2. 474. 1927. (Presumably based on *A. vulgaris* var. *aristata* Parn.) *Agrostis capillaris aristulata* Hitchc. Proc. Biol. Soc. Wash. 41: 160. 1928. (Type from Alexandria, Virginia, Amer. Gr. Nat. Herb. 344.) Lemmas awned from near the base, the awn usually geniculate and exceeding the glumes. TYPE LOCALITY (of *A. vulgaris* var. *aristata* Parn.): Scotland. DISTRIBUTION: Fields and open woods, Nova Scotia and Quebec to North Carolina; Alaska to Vancouver Island; northern California; also in Europe. This form appears to be native, at least in the more northerly part of its range.

12. *Agrostis stolonifera* L. Sp. Pl. 62. 1753.

- Decandolia stolonifera* Bastard, Fl. Maine-et-Loire 29. 1809. (Based on *Agrostis stolonifera* L.)
Vilfa stolonifera Beauv. Agrost. 16, 148, 182. 1812. (Based on *Agrostis stolonifera* L.)
Agrostis alba var. *stolonifera* Smith, Engl. Fl. 1: 93. 1824. (Based on *A. stolonifera* L.)
Agrostis vulgaris var. *stolonifera* Koch, Syn. Fl. Germ. 782. 1837. (Based on *A. stolonifera* L.)

Perennial; culms ascending from a spreading base, the decumbent portion rooting in wet soil, mostly 2- or 3-noded, 20–50 cm. tall; sheaths glabrous; ligule as much as 6 mm. long on the culm-leaves, on the innovations 2–3 mm. long; blades scabrous, usually rather numerous, 5–15 cm. long, 1–3 mm. wide; panicle oblong, pale or purple, somewhat open, 5–15 cm. long, the branches, or some of them, spikelet-bearing from near the base, ascending or spreading, the longer 3–5 cm. long, scabrous, naked below; spikelets 2–3 mm. long; glumes acute, glabrous, the first scabrous on the keel; lemma shorter than the glumes, awnless or rarely awned from the back; palea half to two thirds as long as the lemma.

TYPE LOCALITY: Europe.

DISTRIBUTION: Moist grassy places, Newfoundland to Alaska, and southward to New Jersey in the East and Oregon in the West; also in northern Eurasia.

ILLUSTRATION: Hitchc. Man. f. 660.

13. *Agrostis alba* L. Sp. Pl. 63. 1753.

Agrostis dispar Michx. Fl. Bor. Am. 1: 52. 1803. (Type from South Carolina.)
Decandolia alba Bastard, Fl. Maine-et-Loire 29. 1809. (Based on *Agrostis alba* L.)
Vilfa alba Beauv. Agrost. 16, 146, 181. 1812. (Based on *Agrostis alba* L.)
Vilfa dispar Beauv. Agrost. 16, 147, 181. 1812. (Based on *Agrostis dispar* Michx.)
Agrostis alba var. *major* Gaudin, Fl. Helv. 1: 189. 1828. (Type from Switzerland.)
Agrostis alba var. *dispar* Wood, Class-Book ed. 1861. 774. 1861. (Based on *A. dispar* Michx.)
Agrostis Virletii Fourn. Mex. Pl. Gram. 96. 1886. (Type from San Luis Potosí, Mexico, *Virlet 1345*.)
Agrostis alba Luell, Am. Midl. Nat. 4: 216. 1915. (Based on *Agrostis alba* L.)
Agrostis stolonifera var. *major* Farwell, Rep. Mich. Acad. 21: 351. 1920. (Based on *A. alba* var. *major* Gaudin.)

Differing from *A. stolonifera* in its usually erect more robust culms, sometimes as much as 1–1.5 meters tall, the base erect or decumbent, with strong creeping rhizomes; blades 5–10 mm. wide; panicle pyramidal-oblong, usually reddish, as much as 20 cm. long, the branches spreading in anthesis, sometimes contracting later; lemma rarely awned.

TYPE LOCALITY: Europe.

DISTRIBUTION: Escaped from cultivation in all the cooler parts of the United States, common in the northern states, occasional in the southern states; native of Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 67, pl. 13.

NOTE 1: This species is commonly cultivated for meadows, pastures, and lawns; known in the United States as redtop; appears not to be native in America. Plants growing without cultivation tend to take on the aspect of *A. stolonifera*. *A. stolonifera*, *A. alba*, *A. nigra*, and *A. palustris* are closely allied and appear to intergrade. The name *A. palustris* has been erroneously applied to the species in recent works.

NOTE 2: Linnaeus' diagnosis (Sp. Pl. ed. 1) is inadequate and his original application of the name (*A. alba*) is uncertain, but the specimen in his herbarium bearing the name in his own script belongs to the species for which the name has been generally used by European and American authors ever since. In the second edition of the Species Plantarum (page 96) an undoubted reference to this species is added to the original uncertain one.

14. *Agrostis nigra* With. Brit. Pl. ed. 3. 2: 131. 1796.

Culms long-decumbent at base, also with rather stout leafy stolons, the fertile branches ascending or erect, 20–30 cm. tall; panicle brown or dark-brown, open as in *A. alba* but on the average more condensed along the branches, the base usually partly included; otherwise as in *A. alba*.

TYPE LOCALITY: Germany.

DISTRIBUTION: Sometimes found mixed with "South German" bent (creeping bent), hence may be a constituent of lawns grown from imported seed.

ILLUSTRATION: Hitchc. Man. f. 664.

15. *Agrostis palustris* Huds. Fl. Angl. 27. 1762.

Agrostis polymorpha var. *palustris* Huds. Fl. Angl. ed. 2. 32. 1778. (Based on *A. palustris* Huds.)
Agrostis maritima Lam. Encyc. 1: 61. 1783. (Type from France.)
Agrostis alba var. *palustris* Pers. Syn. Pl. 1: 76. 1805. (Based on *A. palustris* Huds.)
Milium maritimum Clem. Ensayo Var. Vid 285. 1807. (Based on *Agrostis maritima* Lam.)
Agrostis decumbens Gaudin; Muhl. Descr. Gram. 68. 1817. Not *A. decumbens* Host, 1809. (Type from Pennsylvania.)
Vilfa stolonifera var. *maritima* S. F. Gray, Nat. Arr. Brit. Pl. 2: 146. 1821. (Based on *Agrostis maritima* "With." [error for Lam.]
Apera palustris S. F. Gray, Nat. Arr. Brit. Pl. 2: 148. 1821. (Based on *Agrostis palustris* "With." [error for Huds.]
Agrostis alba var. *maritima* G. Meyer, Hannov. Mag. 1823: 138. 1824. (Based on *A. maritima* Lam.)
Agrostis stolonifera var. *maritima* Koch, Syn. Fl. Germ. 781. 1837. (Based on *A. maritima* Lam.)
? *Agrostis alba* var. *decumbens* Eaton & Wright, N. Am. Bot. 117. 1840. (Not definitely based on *A. decumbens* Gaudin.)
Agrostis depressa Vasey, Bull. Torrey Club 13: 54. 1886. (Type from Clear Creek Canyon, Colorado, *Patterson* in 1885.)
Agrostis exarata var. *stolonifera* Vasey, Bull. Torrey Club 13: 54. 1886. (Type from Columbia River, *Suksdorf*.)
Agrostis reptans Rydb. Fl. Rocky Mts. 54. 1917. (Based on *A. exarata* var. *stolonifera* Vasey.)
Agrostis stolonifera var. *palustris* Farwell, Rep. Mich. Acad. 21: 351. 1920. (Based on *A. polymorpha* var. *palustris* Huds.)

Perennial, with long stolons; culms usually decumbent and rooting at base; blades narrower, more appressed, and stiffer than in *A. stolonifera*; panicle narrow, condensed or sometimes somewhat open; otherwise as in *A. stolonifera*.

TYPE LOCALITY: England.

DISTRIBUTION: Marshes along the coast from Newfoundland to Maryland; British Columbia to northern California; introduced at various places in interior of southern Canada and northern United States, and occasional as far south as Texas and New Mexico, especially along ditches; native of Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 5; Britt. & Brown, Ill. Fl. ed. 2. f. 488; Hitchc. Man. f. 662.

NOTE: When the plants grow in crowded masses the stolons cannot develop. In open ground or along ditches the stolons may be as much as a meter long. In western Oregon and Washington it is sometimes a troublesome weed because of the stolons. Cultivated under the name Creeping Bent. New England specimens of this species have been referred to *A. alba* var. *coarctata* Scribn., based on *A. coarctata* Ehrh. of Germany, which appears to be a narrow-panicked form of *A. stolonifera* L.

16. *Agrostis Elliottiana* Schultes, in R. & S. Syst. Veg. Mant. 2:
202. 1824.

Agrostis arachnoides Ell. Bot. S. C. & Ga. 1: 134. 1816. (The basis of *A. Elliottiana*.) Not *A. arachnoides* Poir. 1810.

Annual; culms slender, delicate, erect, glabrous, about 3-noded, 10–40 cm. tall; sheaths glabrous, striate; ligule thin, acute, lacerate, 3–4 mm. long; blades flat, lax, slightly scabrous, mostly less than 5 cm. long and 1 mm. wide; panicle open, finally rather diffuse, about half the entire height of the plant, the axis glabrous below, scabrous above, the branches capillary, in rather distant verticils, spreading, scabrous, the spikelets somewhat crowded toward the ends of the branchlets, the lateral pedicels (branches of the third or fourth order) about as long as the spikelets, thickened upward, the whole panicle breaking away at maturity and rolling before the wind; glumes acute, scabrous on the keel, 1.5–2 mm. long; lemma minutely toothed, very thin, 1–1.5 mm. long, the callus minutely pilose, the awn early deciduous or sometimes wanting, attached below the apex, very slender, flexuous, delicately short-pilose, 5–10 mm. long; palea wanting.

TYPE LOCALITY: Orangeburg, South Carolina.

DISTRIBUTION: Fields, waste places, and open ground, Maryland to Illinois, Missouri, and Kansas, and southward to Georgia, Alabama, and eastern Texas; introduced in Maine and Massachusetts; Yucatan.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 140; Hitchc. Man. f. 672.

17. *Agrostis Hendersonii* Hitchc. Jour. Wash. Acad. 20: 381. 1930.

Plant apparently annual; culms slender, erect, 2-noded, glabrous, about 11 cm. tall; sheaths glabrous; ligule membranaceous, acute, 2–3 mm. long; blades flat or loosely involute, glabrous, 1–3 cm. long, 1 mm. wide; panicle condensed, about 2.5 cm. long, purplish-tinged; spikelets short-pedicelled, 5–6 mm. long; glumes subequal, with a setaceous slightly spreading tip 1–2 mm. long; lemma about 3 mm. long, with 2 setaceous teeth about 0.5 mm. long at the summit, the base or callus pubescent; awn from the middle of the back of the lemma, about 1 cm. long, twice-geniculate, the first bend often somewhat obscure; palea obsolete.

TYPE LOCALITY: Sams Valley, a few miles from Gold Hill, Jackson County, Oregon (*Henderson 12387*).

DISTRIBUTION: Wet ground, Oregon and California.

ILLUSTRATION: Hitchc. Man. f. 670.

18. *Agrostis exigua* Thurber, in S. Wats. Bot. Calif. 2: 275. 1880.

Annual; culms delicate, erect, sometimes branching from near the base, minutely scabrous just below the nodes, about 3-noded, 3–15 cm. tall; sheaths scaberulous; ligule 1–2 mm. long; blades flat, folded, or subinvolute, scabrous, 1–5 cm. long; panicle half the length of the plant, finally open, the axis and branches somewhat scabrous, the lowermost branches in a fascicle of about 5, about 2 cm. long, the branches bearing above the middle 1–few spikelets; glumes acute, scaberulous on and near the keel, 1.5 mm. long; lemma about as long as the glumes, scaberulous toward the 2-toothed apex, bearing below the tip a delicate straight or flexuous awn about 5–8 mm. long; palea wanting.

TYPE LOCALITY: Foothills of the Sierras, California (*Bolander*).

DISTRIBUTION: Known only from California (the type and "muddy borders of pond," Howell Mountain, Napa County, California, *Tracy 1552*).

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 8. f. 2; Hitchc. Man. f. 671.

19. *Agrostis Hallii* Vasey, Contr. U. S. Nat. Herb. 3: 74. 1892.

Agrostis Danyi Scribn. Circ. U. S. Dep. Agr. Agrost. 30: 3. 1901. (Type from Point Arena, California, *Davy & Blasdale 6062.*)

Agrostis occidentalis Scribn. & Merr. Bull. Torrey Club 29: 466. 1902. (Type from McMinnville, Oregon, *Shear 1644.*)

Perennial, with creeping rhizomes; culms erect or decumbent at base, glabrous, mostly 3- or 4-noded, 60–100 cm. tall; sheaths slightly roughened; ligule usually conspicuous, 2–7 mm. long; blades flat, or sometimes somewhat involute, scabrous, 5–15 cm. long, 2–5 mm. wide; panicle narrow, rather loose, often brownish, somewhat nodding, 10–15 cm. long, the axis scabrous, the branches slender, ascending or somewhat spreading, verticillate, usually not more than 5 cm. long, some or all naked at base; glumes acuminate, somewhat unequal, scabrous on the keel and on the back near the keel, about 4 mm. long; lemma awnless, 3 mm. long, the callus with a tuft of hairs 1–2 mm. long; palea wanting.

TYPE LOCALITY: Oregon.

DISTRIBUTION: Mostly in woods near the coast, Oregon to Santa Barbara, California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 10. f. 2*; Hitchc. Man. *f. 674.*

Agrostis Hallii var. *Pringlei* (Scribn.) Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 33. 1905. *Agrostis Pringlei* Scribn. Bull. U. S. Dep. Agr. Agrost. 7: 156. 1897. Branching, foliage stramineous; blades narrow, usually involute; panicle narrow, compact. TYPE LOCALITY: Mendocino County, California. DISTRIBUTION: In sand near the coast, Mendocino County, California, *Pringle.* ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: *f. 133*; Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 12.*

20. *Agrostis lepida* Hitchc. in Jepson, Fl. Calif. 1: 121. 1912.

Perennial, with numerous short rhizomes; culms tufted, slender, erect, glabrous, 1- or 2-noded near base, 30–40 cm. tall; sheaths glabrous, the lower becoming fibrous; ligule as much as 4 mm. long; leaves mostly basal, the blades slender, firm, erect, flat or folded, slightly scabrous, 5–15 cm. long, 1 mm. wide or less, the upper blade below the middle of the culm, 3 cm. long or less; panicle purple, open, 10–15 cm. long, the axis glabrous below, the branches verticillate, becoming divaricately spreading, glabrous, naked below, the lowermost 2–5 cm. long; glumes glabrous or nearly so, acute, 3 mm. long; lemma 2 mm. long, awnless; palea very minute or wanting.

TYPE LOCALITY: Siberian Pass, Sequoia National Park, California (*Hitchcock 3455*).

DISTRIBUTION: Meadows and open woods, southern Sierras.

ILLUSTRATION: Hitchc. Man. *f. 675.*

21. *Agrostis pallens* Trin. Mém. Acad. St.-Pétersb. VI. 6²: 328.

1841.

Agrostis exarata var. *littoralis* Vasey, Bull. Torrey Club 13: 54. 1886. (Type from Oregon, *Howell 64.*)

Agrostis densiflora var. *littoralis* Vasey, Contr. U. S. Nat. Herb. 3: 72. 1892. (Based on *A. exarata* var. *littoralis* Vasey.)

Perennial, with creeping rhizomes; culms erect, glabrous, rather stout, 2–4-noded, 20–40 cm. tall; sheaths glabrous or nearly so; ligule rather firm, 2–3 mm. long; blades flat or somewhat involute, 1–4 mm. wide; panicle contracted, almost spikelike, usually pale, 5–10 cm. long; glumes acuminate, scabrous on the keel, 2.5–3 mm. long; lemma a little shorter than the glumes, awnless; palea wanting.

TYPE LOCALITY: North America.

DISTRIBUTION: Sand dunes along the coast, Washington to central California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 13. f. 1*; Hitchc. Man. *f. 676.*

NOTE: This species may be only a sea-coast form of *A. diegoensis* Vasey.

22. *Agrostis diegoensis* Vasey, Bull. Torrey Club 13: 55. 1886.

Agrostis foliosa Vasey, Bull. Torrey Club 13: 55. 1886. (Type from Oregon.) Not *A. foliosa* R. & S. 1817.

Agrostis diegoensis var. *foliosa* Vasey, Contr. U. S. Nat. Herb. 3: 74. 1892. (Based on *A. foliosa* Vasey.)

Agrostis canina var. *stolonifera* Vasey, Contr. U. S. Nat. Herb. 3: 75. 1892. (Type from Oregon.) Not *A. canina* var. *stolonifera* Blytt, 1847.

Agrostis pallens foliosa Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 34. 1905. (Based on *A. foliosa* Vasey.)

Perennial, with creeping rhizomes; culms erect, often decumbent at base, glabrous, several-noded, 50–120 cm. tall; sheaths glabrous or usually more or less scabrous; ligule thin, dentate or lacerate, 2–5 mm. long; blades flat, lax or sometimes rather stiffly appressed, scabrous, narrow or as much as 6 mm. wide, the lower often pale or brownish; panicle narrow, open, green or tawny, rarely purplish, 10–15 cm. long, the branches ascending, rather stiff, some of them naked below; glumes scabrous on the keel, about 3 mm. long; lemma a little shorter than the glumes, narrow, awnless or with a short straight awn, the callus glabrous or nearly so; palea wanting.

TYPE LOCALITY: San Diego, California.

DISTRIBUTION: Meadows and open woods at low and medium altitudes, Montana and British Columbia to southern California and Nevada.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 15; pl. 16, f. 1*; Abrams, Ill. Fl. Pacif. St. *f. 338*; Hitchc. Man. *f. 677*.

23. *Agrostis subrepens* (Hitchc.) Hitchcock

Agrostis hiemalis subrepens Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 44. 1905.

Perennial, with creeping rhizomes; culms erect, glabrous, 60–100 cm. tall, 3- or 4-noded, the uppermost node about the middle of the culm; sheaths glabrous; ligule 3–5 mm. long; blades loosely involute, scaberulous, slender, not more than 1.3 mm. wide, the tip rather stiff and sharp, the uppermost above the middle of the culm; panicle open, pyramidal, 12–18 cm. long, 10–15 cm. wide, the axis glabrous, the branches slightly scabrous, slender, widely spreading, verticillate or only one or two at a node, the verticils distant 2–4 cm., the lowermost branches mostly 6–8 cm. long; spikelets brownish or purplish, somewhat crowded along the upper part of the branchlets; glumes acuminate, slightly scabrous along the keel, about 2.5 mm. long; lemma shorter than the glumes (about 2 mm. long), awnless, the callus minutely pilose; palea minute (about 0.3 mm. long).

TYPE LOCALITY: Base of Sierra Madre, State of Chihuahua (*Pringle 1420*).

DISTRIBUTION: Wet places, Sierra Madre, Chihuahua (*Hitchcock 7721, Nelson 6195, Townsend & Barber 276*); also in Venezuela (*Fendler 2541*).

24. *Agrostis Blasdalei* Hitchc. Proc. Biol. Soc. Washington 41: 160. 1928.

Perennial; culms closely cespitose, erect or spreading, glabrous, 2- or 3-noded below the middle, 10–15 cm. tall; sheaths glabrous; ligule firm, 1–1.5 mm. long; blades narrow, closely folded or involute, glabrous on the outer surface, rather firm, 2–4 cm. long; panicle strict, narrow, almost spikelike, 2–3 cm. long, the axis very scabrous, the short scabrous branches closely appressed, few-flowered; glumes acuminate, scabrous on keel and back, 2.5–3 mm. long; lemma awnless or with a very short awn just above the middle, about 1.8 mm. long; palea nerveless, about 0.3 mm. long.

TYPE LOCALITY: Cliffs, near Fort Bragg, California (*Davy & Blasdale 6159*).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: *pl. 18*; Abrams, Ill. Fl. Pacif. St. *f. 339*; Hitchc. Man. *f. 679*.

NOTE: This species has been referred to *Agrostis breviculmis* Hitchc. (*A. nana* (Presl) Kunth) of Peru.

25. *Agrostis Pittieri* Hack. Oesterr. Bot. Zeits. 52: 60. 1902.

Perennial; culms cespitose, ascending, slender, glabrous, 2-noded, 30–50 cm. tall; sheaths glabrous; ligule 2–4 mm. long; blades of innovations slender, involute, flaccid, scabrous, 6–10 cm. long, those of the culm sometimes flat, 1 mm. wide; panicle purple, narrow, rather lax, 10–15 cm. long, the axis glabrous, the branches suberect, scabrous, unequal, the longer naked below, 5 cm. long, with short ones intermixed; glumes subequal, acute, scabrous on the keel, 3–3.5 mm. long; lemma about 2 mm. long, the callus short-pilose, awned from about the middle, the awn straight, mostly included in the glumes; palea about one fourth as long as the lemma.

TYPE LOCALITY: Volcano Poás, Costa Rica (*Pittier 334, 790, 2985*).

DISTRIBUTION: Known only from Volcano Poás.

NOTE: This species differs from *A. subrepens* chiefly in the distinct palea.

26. *Agrostis exarata* Trin. Gram. Unifl. 207. 1824.

- Agrostis exarata* var. *minor* Hook. Fl. Bor. Am. 2: 239. 1839. (Type from Rocky Mountains.)
Agrostis grandis Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 316. 1841. (Type from "Columbia (Hooker)" [Columbia River, received from Hooker].)
Agrostis asperifolia Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 317. 1841. (Type from North America.)
Agrostis Scouleri Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 329. 1841. (Type from Nootka Sound, Vancouver Island.)
Agrostis albicans Buckl. Proc. Acad. Phila. 1862: 91. 1863. (Type from Columbia woods, Oregon.)
Agrostis exarata f. *asperifolia* Vasey, Bull. U. S. Dep. Agr. Bot. 13: pl. 31. 1892. (Presumably based on *A. asperifolia* Trin.)
Agrostis filiculmis M. E. Jones, Contr. West. Bot. 14: 13. 1912. (Type from Little DeMotte Park on the Kaibab, northern Arizona, Jones 6056 bb.)

Short-lived perennial; culms in small tufts, erect or somewhat geniculate at base, glabrous, rather leafy, 20–120 cm. tall; sheaths glabrous or somewhat scabrous; ligule prominent; blades flat, 1–8 mm. wide, scabrous; panicle narrow, from somewhat open to close and interruptedly spike-like, 5–25 cm. long; glumes acuminate or awn-pointed, nearly equal, scabrous on the keel and often scaberulous on the back, 2.5–4 mm. long; lemma about 2 mm. long, awnless or bearing from about the middle of the back a straight or bent exerted awn, the callus glabrous; palea less than 0.5 mm. long.

TYPE LOCALITY: Unalaska, Alaska.

DISTRIBUTION: Moist or rather dry open ground, at low and medium altitudes, western Nebraska to Alberta and Alaska, and southward to New Mexico, California, and Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13: pl. 31; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 16, f. 2; pl. 21, f. 1, 2; pl. 22; pl. 23; Hitchc. Man. f. 682 A.

Agrostis exarata var. *monolepis* (Torr.) Hitchc. Am. Jour. Bot. 21: 136. 1934. *A. microphylla* Steud. Syn. Gram. 164. 1854. (Type from North America.) *Polygogon monspeliensis* var. *monolepis* Torr. U. S. Rep. Expl. Miss. Pacif. 5: 366. 1857. (Basis of *A. exarata* var. *monolepis*.) *Polygogon alopecuroides* Buckl. Proc. Acad. Phila. 1862: 88. 1863. (Type from Columbia Plains, Oregon.) *Agrostis alopecuroides* A. Gray, Proc. Acad. Phila. 1862: 333. 1863. (Based on *Polygogon alopecuroides* Buckl.) Not *A. alopecuroides* Lam. 1791. *Agrostis microphylla* var. *major* Vasey, Contr. U. S. Nat. Herb. 3: 58, 72. 1892. (Type from Truckee Valley, Nevada, Watson 1284.) *A. inflata* Scribn.; J. M. Macoun, Canad. Rec. Sci. 6: 152. 1894. (Type from Vancouver Island, Macoun 258.) *A. virescens microphylla* Scribn. Circ. U. S. Dep. Agr. Agrost. 30: 2. 1901. (Based on *A. microphylla* Steud.) *A. exarata microphylla* Hitchc. Am. Jour. Bot. 2: 303. 1915. (Based on *A. microphylla* Steud.) Panicle narrow, often interrupted; lemmas awned. TYPE LOCALITY: Posé Creek, Walkers Pass, California. DISTRIBUTION: Washington to Baja California. ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 7, f. 1; pl. 19, f. 1, 2; Hitchc. Man. f. 682 B.

Agrostis exarata var. *ampla* (Hitchc.) Hitchc. Am. Jour. Bot. 2: 303. 1915. *A. ampla* Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 38. 1905. Robust, panicle large, rather loose; lemmas awned. TYPE LOCALITY: Rooster Rock, Oregon (Suksdorf 135). DISTRIBUTION: British Columbia to Arizona. ILLUSTRATION: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 20.

NOTE: A plate (106) in Vasey, Agr. Grasses ed. 2. 1889, may represent *A. exarata* var. *ampla*. The plate is entitled *Agrostis exarata* var. *pacifica*. There is no description and the type has not been found.

27. *Agrostis californica* Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 359. 1841.

- Agrostis densiflora* Vasey, Contr. U. S. Nat. Herb. 3: 72. 1892. (Type from Santa Cruz, California, Anderson.)
Agrostis densiflora var. *arenaria* Vasey, Contr. U. S. Nat. Herb. 3: 72. 1892. (Type from Mendocino, California, Pringle.)

Perennial; culms cespitose, usually rather stout, erect or somewhat spreading at base, glabrous, 15–60 cm. tall; sheaths glabrous or sometimes slightly scabrous; ligule truncate, usually shorter than in *A. exarata*, puberulent; blades flat, firm, strongly nerved on the upper surface, scabrous, usually not more than 10 cm. long, those of the culm comparatively broad and short, often 3–5 cm. long and 3–5 mm. wide, rarely as much as 10 mm. wide; panicle dense, spike-like, sometimes slightly interrupted, 2–8 cm. long, 5–10 mm. wide; glumes acute or acuminate, about 3 mm. long, prominently scabrous on the keel and strongly scabrous on the sides; lemma a little shorter than the glumes, awnless or with a straight awn from minute to somewhat exceeding the glumes; palea one fourth to one third as long as the lemma.

TYPE LOCALITY: California.

DISTRIBUTION: Sandy soil and cliffs near the sea, Mendocino County to Santa Cruz, California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 7, f. 2; Hitchc. Man. f. 684.

NOTE: This species has been confused with *A. exarata* and with *A. glomerata* (Presl) Kunth of Peru.

28. *Agrostis Rossae* Vasey, Contr. U. S. Nat. Herb. 3: 76. 1892.

Agrostis varians Trin. Mém. Acad. St.-Pétersb. VI. 6^o: 314. 1841. (Type from Rocky Mountains.)
Not *A. varians* Thuill. 1799.
Agrostis variabilis Rydb. Mem. N. Y. Bot. Gard. 1: 32. 1900. (Based on *A. varians* Trin.)

Perennial; culms densely caespitose, erect, glabrous, 1- or 2-noded near base, 10-20 cm. tall; sheaths glabrous; ligule about 0.5 mm. long or the upper 1 mm. long; blades flat or more or less involute, glabrous or nearly so, mostly less than 10 cm. long and not more than 1 mm. wide; panicle contracted, usually purple, 2-6 cm. long, the branches appressed or the lower ascending, somewhat scabrous; glumes acuminate, glabrous except the keel, 2 mm. long; lemma awnless, 1.5 mm. long; palea minute.

TYPE LOCALITY: Yellowstone Park, Wyoming (*Edith Ross* in 1890).

DISTRIBUTION: Rocky creeks and mountain slopes at high altitudes, Colorado and Utah to Alberta, Washington, and California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 481; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 24, f. 1, 2; Abrams, Ill. Fl. Pacif. St. f. 340; Hitchc. Man. f. 680.

NOTE: Differs from *A. exarata* in the hard tufted base, the smaller size and the narrower fewer-flowered panicle with appressed branches. What appears to be an awned form occurs in Colorado (Breckenridge and Mt. Massive) and British Columbia (Revelstoke).

29. *Agrostis virescens* H.B.K. Nov. Gen. & Sp. 1: 135. 1815.

Agraulus mexicanus Presl, Rel. Haenk. 1: 236. 1830. (Type from Mexico.)
Agrostis mexicana Kunth, Rév. Gram. Suppl. xvii. 1830. (Based on *Agraulus mexicanus* Presl.)
Not *A. mexicana* L. 1767.

Differing from *A. toluensis* H.B.K. in having a looser inflorescence; spikelets 2 mm. long; lemma 1.5 mm. long, the awn attached about the middle or a little above.

TYPE LOCALITY: Toluca, State of Mexico.

DISTRIBUTION: Known only from the type collections of the two names cited.

ILLUSTRATION: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 37 B.

30. *Agrostis toluensis* H.B.K. Nov. Gen. & Sp. 1: 135. 1815.

Agrostis Hoffmanni Mez, Repert. Sp. Nov. 18: 3. 1922. (Type from Irazú, Costa Rica, *Hoffmann*.)

Perennial; culms caespitose, erect, glabrous, 2- or 3-noded near the base, mostly 10-30 cm. tall; sheaths glabrous; ligule 2-4 mm. long; blades mostly basal, slender, involute or sometimes some of them flat, glabrous, usually not more than 10 cm. long; panicle narrow, condensed or spikelike, or somewhat loose or interrupted, 3-7 cm. long or sometimes longer, the axis glabrous, the branches short, appressed, glabrous or nearly so, the pedicels more or less scabrous; glumes slightly unequal, brown or purple, acuminate, scabrous on the keel, the second about 3 mm. long; lemma minutely dentate, about 2 mm. long, awned from near the base, the awn somewhat bent, about as long as the glumes, the callus glabrous; palea wanting.

TYPE LOCALITY: Toluca, Mexico.

DISTRIBUTION: Mountains of southern Mexico, and southward to Chile.

ILLUSTRATIONS: Rep. Mo. Bot. Gard. 10: pl. 33; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 37.

31. *Agrostis subpatens* Hitchcock, sp. nov.

Perennial; culms erect or somewhat geniculate at base, slender, caespitose, glabrous, about 2-noded below the middle, 20-40 cm. tall; sheaths glabrous; ligule 3 mm. long; blades mostly basal, those of the innovations slender, involute, rather lax or flexuous, scabrous, 5-10 cm. long, those of the culm flat, 1 mm. wide, or involute; panicle narrow, somewhat loose, brownish, erect, 6-15 cm. long, the axis scabrous, the branches ascending or appressed, scabrous, verticillate, some naked at base, with short ones intermixed, floriferous from base, the lower as much as 5 cm. long, the lateral pedicels mostly shorter than the spikelets; glumes somewhat unequal, acuminate, scabrous on the keel above, about 3 mm. long; lemma about 2 mm. long, the callus short-bearded, the hairs 0.3 mm. long.

Perennis; culmi erecti caespitosi 20-40 cm. alti; ligula 3 mm. longa; laminae involutae graciles scabrae 5-10 cm. longae; panicula angusta subpatens erecta 6-10 cm. longa, ramis

apressis vel ascendentibus; glumae acuminatae paulum inaequales 3 mm. longae; lemma 2 mm. longum, aristo dorsali inframediali praeditum, callo breviter piloso, pilis 0.3 mm. longis, arista geniculata, 2 mm. exserta.

Type collected on Cerro de la Muerte, altitude 3100 meters, January, 1897, (H. Pittier Herb. Inst. Phys.-geogr. Costar. no. 10470; U. S. Nat. Herb. no. 365912).

DISTRIBUTION: Known only from the type collection.

NOTE: A specimen from Volcano Agua, Guatemala (*Hitchcock 9116*), "in shade at medium altitudes," may be this species. It differs in being more leafy, the culms 60 cm. tall, with flat culm-blades 1-2 mm. wide, the ligule as much as 5 mm. long, the panicle more open with no short branches. The spikelets are as in the type.

32. *Agrostis Howellii* Scribn. Contr. U. S. Nat. Herb. 3: 76. 1892.

Perennial; culms ascending from a geniculate base, glabrous, 3- or 4-noded, leafy, 40-60 cm. tall; sheaths glabrous or minutely roughened; ligule 3-4 mm. long; blades flat, lax, scabrous, as much as 30 cm. long, 3-5 mm. wide; panicle loose and open, 10-30 cm. long, the branches flexuous, scabrous, verticillate, those of the second and third order few-flowered toward the ends; glumes somewhat unequal, acuminate, rather narrow and firm, somewhat scabrous on the keel, about 3.5 mm. long; lemma acute, 4-toothed, 2.5 mm. long, awned from near the base, the awn bent, exserted about 6 mm.; palea wanting.

TYPE LOCALITY: Hood River, Oregon (*Howell 198*).

DISTRIBUTION: Multnomah and Hood River counties, Oregon.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 25; Abrams, Ill. Fl. Pacif. St. f. 342; Hitchc. Man. f. 685.

33. *Agrostis hiemalis* (Walt.) B. S. P. Prel. Cat. N. Y. 68. 1888.

Cornucopiae hyemalis Walt. Fl. Carol. 73. 1788.

Agrostis scabra Willd. Sp. Pl. 1: 370. 1797. (Type from North America.)

Trichodium laxiflorum Michx. Fl. Bor. Am. 1: 42. 1803. (Type from Hudson Bay to Florida, Michaux.)

Agrostis laxiflora Poir. in Lam. Encyc. Suppl. 1: 255. 1810. (Type from Carolina, Bosc.)

Vilfa scabra Beauv. Agrost. 16. 182. 1812. (Based on *Agrostis scabra* Willd.)

Trichodium scabrum Muhl. Cat. Pl. 10. 1813. (Based on *Agrostis scabra* Willd.)

Agrostis clavata Trin. Neue Entdeck. 2: 55. 1821. (Type from Kamtchatka.)

Agrostis laxiflora Richards. Bot. App. Frankl. Jour. 731. 1823. (Based on *Trichodium laxiflorum* Michx.)

Trichodium montanum Torr. Fl. U. S. 84. 1823. (Type from Fishkill Mountains, New York.)

Trichodium laxum Schultes, in R. & S. Syst. Veg. Mant. 2: 157. 1824. (Based on *T. laxiflorum* Muhl., on the supposition that it was different from *T. laxiflorum* Michx., but Muhlenberg's species is the same as Michaux's.)

Trichodium album Presl, Rel. Haenk. 1: 244. 1830. (Type from Nootka Sound, Vancouver Island, Haenke.)

Agrostis nutkaensis Kunth, Rév. Gram. Suppl. xvii. 1830. (Based on *Trichodium album* Presl.)

Agrostis nootkaensis Trin. Mém. Acad. St.-Petersb. VI. 6: 326. 1841. (Based on *Trichodium album* Presl.)

Agrostis laxiflora var. *montana* Tuckerm. Am. Jour. Sci. 45: 43. 1843. (Based on *Trichodium montanum* Torr.)

Agrostis scabra var. *tenuis* Tuckerm. Am. Jour. Sci. 45: 45. 1843. (Type from Lincoln, New Hampshire.)

Agrostis laxiflora var. *caespitosa* Torr. Fl. N. Y. 2: 442. 1843. (Type from New York.)

Agrostis laxiflora var. *scabra* Torr. Fl. N. Y. 2: 442. 1843. (Based on *A. scabra* Willd.)

Agrostis laxiflora var. *tenuis* Torr. Fl. N. Y. 2: 442. 1843. (Based on *A. scabra* var. *tenuis* Tuckerm.)

Agrostis Torreyi Tuckerm. Mag. Hort. Hovey 9: 143. 1843. (Based on *Trichodium montanum* Torr.) Not *A. Torreyi* Kunth, 1830.

Agrostis leptos Steud. Syn. Gram. 169. 1854. (Type from Louisiana.)

Agrostis scabra var. *oreophila* Wood, Class-Book ed. 1861. 774. 1861. (Based on *A. [laxiflora* var.] *montana* Tuckerm. There is no reference to *A. oreophila* Trin.)

Agrostis scabriuscula Buckl. Proc. Acad. Phila. 1862: 90. 1863. (Type from Columbia Plains, Oregon, Nuttall.)

Agrostis scabra var. *montana* Fernald, Proc. Portland Soc. Nat. Hist. 2: 91. 1895. (Based on *Trichodium montanum* Torr. This combination was made by Vasey, giving Tuckerm. as author (Contr. U. S. Nat. Herb. 3: 76. 1892), the basis not given, and erroneously cited as synonym of *A. novaeangliae* Vasey.)

Agrostis canina var. *hiemalis* Kuntze, Rev. Gen. Pl. 3: 338. 1898. (Based on *Cornucopiae hiemalis* Walt.)

Agrostis antedecens Bickn. Bull. Torrey Club 35: 473. 1908. (Type from Nantucket, Bicknell in 1908.)

Agrostis hiemalis nutkaensis Scribn. & Merr. Contr. U. S. Nat. Herb. 13: 56. 1910. (Based on *A. nutkaensis* Kunth.)

Agrostis hyemalis Lunell, Am. Midl. Nat. 4: 216. 1915. (Based on *Cornucopiae hiemalis* Walt.)

Agrostis scabra f. *Tuckermani* Fernald, *Rhodora* 35: 207. 1933. (Type from Braintree, Massachusetts.)

Agrostis scabra var. *septentrionalis* Fernald, *Rhodora* 35: 209. 1933. (Type from Bonne Bay, Newfoundland, Fernald, Long, & Fogg 1310.) *Forma setigera* Fernald, *op cit.* 210. (Type from Burgeo, Newfoundland, Fernald, Long, & Fogg 79, the lemmas awned.)

Perennial; culms usually tufted, slender, erect, glabrous, 20–80 cm. tall; sheaths glabrous or scaberulous; ligule 1–3 mm. long; blades mostly basal, flat or loosely involute, scabrous, narrow, often setaceous, sometimes as much as 2 mm. wide, rarely wider; panicle diffuse, usually purple, as much as 30 cm. long or rarely more, the branches rather few, long, very scabrous, capillary, finally stiffly spreading, verticillate, especially the lower, the verticils distant, bearing spikelets near the ends; glumes 1.5–2 mm. long, acute or acuminate, scabrous on the keels; lemma two thirds to three fourths as long as the glumes, awnless or rarely awned; palea wanting.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Meadows and moist open ground at low and medium altitudes, in reduced forms ascending into alpine regions, Newfoundland to Alaska, and southward to Florida, California, and central Mexico.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 26, 27; Bull. U. S. Dep. Agr. 772: f. 68; Abrams, Ill. Fl. Pacif. St. f. 343; Hitchc. Man. f. 686.

NOTE: At maturity the whole panicle breaks away and rolls before the wind.

Agrostis hiemalis var. *geminata* (Trin.) Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 44. 1905. (Published as *A. hiemalis* *geminata*.) *Agrostis geminata* Trin. *Gram. Unifl.* 207. 1824. *Agrostis geminata* f. *exaristata* Fernald, *Rhodora* 35: 211. 1933. (Type from Gaspé County, Quebec, Fernald, Dodge, & Smith 25485.) Branches of panicle short and divaricate; lemma awned or awnless. (The type is awned.) TYPE LOCALITY: Unalaska. DISTRIBUTION: At high altitudes and latitudes, Newfoundland to Alaska, and southward to New Hampshire, North Dakota, Colorado, and California. ILLUSTRATION: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 28, f. 1.

34. *Agrostis canina* L. Sp. Pl. 62. 1753.

Trichodium caninum Schrad. *Fl. Germ.* 1: 198. 1806. (Based on *Agrostis canina* L.)

Agraulis caninus Beauv. *Agrost.* 5, 146, 147. 1812. (Based on *Agrostis canina* L.)

Agrostis canina var. *alpina* Wood, *Bot. & Fl.* 384. 1870. (Type from mountains of the Eastern States.) Not *A. canina* var. *alpina* DuRoi. 1869.

Agrostis alba var. *vulgaris* f. *aristata* Millsp. *Fl. W. Va.* 469. 1892. (Type from Monongalia, West Virginia.)

Perennial; culms cespitose, glabrous or slightly scaberulous, slender, erect or decumbent at base, 30–50 cm. tall, often producing stolons with fasciated leaves; sheaths glabrous or slightly scaberulous; ligule acute, 2 mm. long; blades flat or loosely involute, mostly less than 1 mm. wide, those of the innovations usually very slender; panicle narrow, loose, 5–10 cm. long, the slender scabrous branches ascending or spreading, as much as 4 cm. long, naked below; glumes equal, acute, 2 mm. long, the lower minutely scabrous on the keel; lemma a little shorter than the glumes, awned about the middle, the awn exerted, bent, the callus minutely pilose; palea minute.

TYPE LOCALITY: Europe.

DISTRIBUTION: Meadows and open ground, Newfoundland to Quebec, and southward to Delaware and Michigan; possibly native northward but introduced in the United States; native in Europe and Siberia.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 402; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 9, f. 2; Hitchc. Man. f. 694.

35. *Agrostis longiligula* Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68:

54. 1905.

Perennial, usually rather leafy; culms erect, cespitose, glabrous, 50–70 cm. tall; leaves of the culm about 4, the sheaths glabrous; ligule 5–8 mm. long; blades flat, scabrous, 10–15 cm. long, usually 3–4 mm. wide, sometimes narrower; panicle bronze-purple, oblong, loosely flowered, 10–15 cm. long, the branches very scabrous, the spikelets somewhat crowded toward the ends, the lower verticillate, as much as 5 cm. long; glumes acute, scabrous on the keel, slightly unequal, the lower longer, 3–4 mm. long; lemma about 2.5 mm. long, bearing at the middle an exerted bent awn; palea minute.

TYPE LOCALITY: Fort Bragg, California (*Davy & Blasdale 6110*).

DISTRIBUTION: Bogs and marshes at low altitudes, Tillamook County, Oregon, to Mendocino County, California.

ILLUSTRATIONS: Abrams, Ill. Fl. Pacif. St. f. 344; Hitchc. Man. f. 698.

36. *Agrostis Ghiesbreghtii* Fourn. Mex. Pl. Gram. 97. 1886.

Agrostis setifolia Fourn. Mex. Pl. Gram. 97. 1886. (Type from Mount Orizaba, Mexico, Liebmann 712.) Not *A. setifolia* Brot. 1804.

Perennial; culms slender, erect, glabrous, 50–90 cm. tall; sheaths glabrous; ligule 2–4 mm. long; blades erect, slender or filiform, mostly elongate, usually more or less involute, glabrous or somewhat scabrous; panicle purplish, oblong, open, 15–30 cm. long, the axis glabrous, the branches in distant verticils, glabrous or nearly so, capillary, naked on the lower half, divaricately branched, as much as 10 cm. long, the branchlets few-flowered; glumes acute, about 3 mm. long; lemma about 2 mm. long, awned from about 0.5 mm. above the base, the awn bent, exserted; palea wanting.

TYPE LOCALITY: Oaxaca, Mexico (*Ghiesbreght*).

DISTRIBUTION: Southern Mexico.

NOTE: A fragment of the type specimen of *Agrostis Ghiesbreghtii* Fourn. was kindly sent from the Paris Herbarium by Dr. Humbert.

37. *Agrostis borealis* Hartm. Handb. Skand. Fl. ed. 3. 17. 1838.

- ? *Agrostis rubra* L. Sp. Pl. 62. 1753. (Identity uncertain.)
Agrostis canina var. *aenea* Trin.; Bong. Mém. Acad. St.-Pétersb. VI. 2: 170. 1832. (Type from Sitka, Alaska.)
Agrostis canina var. *melaleuca* Trin.; Bong. Mém. Acad. St.-Pétersb. VI. 2: 170. 1832. (Type from Sitka, Alaska.)
Agrostis aenea Trin. Mém. Acad. St.-Pétersb. VI. 6^e: 332. 1841. (Based on *A. canina* var. *aenea* Trin.) Not *A. aenea* Spreng. 1827.
Agrostis canina var. *tenella* Torr. Fl. N. Y. 2: 443. 1843. (Type from northern New York.)
Agrostis Pickeringii Tuckerm. Mag. Hort. Hovey 9: 143. 1843. (Type from White Mountains, New Hampshire.)
Agrostis concinna Tuckerm. Mag. Hort. Hovey 9: 143. 1843. (Type from Mount Monroe, White Mountains, New Hampshire.)
Agrostis Pickeringii var. *rupicola* Tuckerm. Am. Jour. Sci. 45: 42. 1843. (Type from White Mountains, New Hampshire.)
Trichodium concinnum Wood, Class-Book ed. 2. 600. 1847. (Based on *Agrostis concinna* Tuckerm.)
Agrostis exarata var. *aenea* Griseb. in Ledeb. Fl. Ross. 4: 441. 1853. (Based on *A. canina* var. *aenea* Trin.)
Aira labradorica Steud. Syn. Gram. 220. 1854. (Type from Labrador. Steudel describes the spikelet as 2-flowered, but the type specimen in Paris has but one floret; the description otherwise agrees with the specimen.)
Agrostis rubra var. *breviaristata* Lange, Consp. Fl. Groenl. 158. 1880. (Type from Julianehaab, Greenland.)
Agrostis rubra var. *americana* Scribn. in Macoun, Cat. Can. Pl. 2^s: 391. 1890. (Based on “*A. rupestris* Chapm. (non All.),” the type from Roan Mountain, North Carolina.)
Agrostis novae-angliae Vasey, Contr. U. S. Nat. Herb. 3: 76. 1892. (Type from Mount Washington, New Hampshire, Pringle.) Not *A. novaeangliae* Tuckerm.
Agrostis rubra var. *alpina* MacM. Metasp. Minn. Valley 65. 1892. (Based on *A. canina* var. *alpina* Oakes, a name only, but other synonyms cited show that the name belongs here.)
Agrostis paludosa Scribn. Bull. U. S. Dep. Agr. Agrost. 11: 49. 1898. (Type from Blanc Sablon, Labrador.)
Agrostis borealis var. *macrantha* Eames, Rhodora 11: 88. 1909. (Type from Blow-me-down Mountains, Newfoundland, the spikelets abnormal.)
Agrostis Bakeri Rydb. Bull. Torrey Club 36: 532. 1909. (Type from Pagosa Peak, Colorado, Baker 150.)
Agrostis borealis var. *paludosa* Fernald, Rhodora 35: 207. 1933. (Based on *A. paludosa* Scribn.)

Perennial; culms erect or sometimes geniculate at base, caespitose, glabrous, 20–60 cm. tall or, in alpine or high northern plants, dwarf; sheaths glabrous; ligule 1–2 mm. long; blades flat or more or less involute, glabrous or somewhat scabrous, 5–10 cm. long, mostly less than 1 mm. wide, in large lax plants as much as 3 mm. wide; panicle pyramidal, 5–15 cm. long, the axis and branches glabrous or more or less scabrous, the lower whorled, spreading, naked below, mostly 1–4 cm. long; glumes 2.5–3 mm. long, acute, somewhat scabrous on the keels; lemma a little shorter than the glumes, awned from about the middle, the awn usually bent and exserted, sometimes straight and included, rarely wanting; palea minute or obsolete.

TYPE LOCALITY: Sweden.

DISTRIBUTION: Rocky slopes and moist banks at high altitudes and latitudes, Newfoundland and Greenland to Alaska, and southward to the high mountains of New England and New York; West Virginia; summit of Roan Mountain, North Carolina; and in the Rocky Mountains to Colorado; also in northern Europe.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 493; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 34, 35; Hitchc. Man. f. 696.

NOTE 1: Trinius describes *Agrostis Mertensii* from the southern Andes of Chile (Linnæa 10: 302. 1836). He states that the same species was collected in Unalaska by Mertens. The Mertens specimen is *A. borealis* Hartm.

NOTE 2: *Agrostis Bakeri* is a form with straight included awns. Rocky Mountain specimens from Alberta to Colorado may be awned or awnless, the awn straight or geniculate.

NOTE 3: This species was referred to *A. rupestris* All. by A. Gray in a list of plants from Roan Mountain, North Carolina, and by Chapman (Fl. S. U. S. 551. 1860).

38. *Agrostis Berlandieri* Fourn. Mex. Pl. Gram. 96. 1886.

Culms ascending, 20–30 cm. tall; blades flat, about 2 mm. wide; ligule 3 mm. long; panicle more or less included in the uppermost sheath, contracted, 7–10 cm. long, the branches subverticillate, some floriferous from the base, the longer from the middle; glumes rather broad, nearly equal, acute, scabrous on the keel, about 1.7 mm. long; lemma as long as the glumes, awnless; palea wanting.

TYPE LOCALITY: Totonihó, Mexico (*Berlandier 531*).

DISTRIBUTION: Known only from the type collection.

NOTE: The description of the plant is taken from a sketch of the type, and that of the spikelets from a fragment of the type, both sent from the Paris Herbarium by Dr. Humbert.

39. *Agrostis idahoensis* Nash, Bull. Torrey Club 24: 42. 1897.

Agrostis tenuis Vasey, Bull. Torrey Club 10: 21. 1883. (Type from San Bernardino Mountains, California, *Parish Brothers 1085*.) Not *A. tenuis* Sibth. 1794.

Agrostis tenuiculmis Nash; Rydb. Mem. N. Y. Bot. Gard. 1: 32. 1900. (Based on *A. tenuis* Vasey.)

Agrostis tenuiculmis recta Nash; Rydb. Mem. N. Y. Bot. Gard. 1: 32. 1900. (Type from Belt Pass, Montana, *Rydberg 3327½*.)

Perennial; culms slender, cespitose, erect, glabrous, 10–30 cm. tall; leaves mostly basal, the sheaths glabrous; ligule 1–2 mm. long; blades flat or more or less involute, glabrous beneath, scaberulous on the upper surface, mostly less than 1 mm. wide; panicle loosely spreading, 5–10 cm. long, the branches capillary, flexuous, naked below, scabrous; glumes about 1.5 mm. long, sometimes as much as 2 mm., acute; lemma about 1.3 mm. long, awnless; palea minute.

TYPE LOCALITY: Forest, Idaho (*Heller 3431*).

DISTRIBUTION: Mountain meadows, at medium and high altitudes, western Montana to Washington, and southward to New Mexico and the high mountains of southern California; Fairbanks, Alaska.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13¹: pl. 34; Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 29; Abrams, Ill. Fl. Pacif. St. f. 346; Hitchc. Man. f. 687.

40. *Agrostis Bourgaei* Fourn. Mex. Pl. Gram. 95. 1886.

Perennial, without creeping rhizomes; culms erect, usually retrorsely scaberulous below the nodes, antrorsely scabrous below the panicle, several-noded below the middle, 60–120 cm. tall; sheaths usually more or less scabrous; ligule 3–4 mm. long; blades flat, scabrous, 2–5 mm. wide; panicle open, purplish, rather narrow, mostly 15–25 cm. long, the axis scabrous, the branches ascending or spreading, slender, scabrous, naked on the lower half, the lower in verticils, the verticils about 5 cm. apart; spikelets somewhat crowded on the branchlets; glumes slightly unequal, acute, rather conspicuously scabrous on the keels, about 2 mm. long; lemma glabrous, obtusish, awnless, or rarely with a short straight awn, 1.5–1.8 mm. long, the callus glabrous; palea about 0.5 mm. long.

TYPE LOCALITY: Near Mexico City (*Bourgeau 682*).

DISTRIBUTION: Along ditches, Federal District, Mexico.

ILLUSTRATION: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 37, f. D.

41. *Agrostis thyrsgera* Mez, Repert. Sp. Nov. 17: 301. 1921.

Perennial; culms erect from an ascending base, loosely cespitose, glabrous, 20–60 cm. tall; sheaths glabrous or nearly so; ligule 2–5 mm. long; blades flat, scabrous, those of the culm mostly less than 7 cm. long, 1–3 mm. wide; panicle narrow, open, 5–25 cm. long, the axis glabrous below, the branches in rather distant verticils, unequal, capillary, ascending or appressed, scabrous, naked below, several-flowered, the lateral pedicels shorter than the spikelets;

glumes acute, scabrous on the keels, about 2 mm. long; lemma 1.5 mm. long, awnless; palea about one fourth to one third as long as the lemma.

TYPE LOCALITY: State of Mexico (*Pringle 4251, 4485, 11209*).
DISTRIBUTION: State of Mexico.

42. *Agrostis durangensis* Mez, *Repert. Sp. Nov.* 17: 301. 1921.

Perennial; culms cespitose, erect, glabrous, about 3-noded to or above the middle, 60–80 cm. tall; sheaths glabrous or slightly roughened; ligule 2–4 mm. long; blades scabrous, those of the culm flat, about 1 mm. wide, of the innovations more or less involute; panicle narrow, rather loose, pale or purplish, 10–15 cm. long, the axis glabrous or nearly so, the branches verticillate, ascending or somewhat appressed, naked below, scabrous, the spikelets crowded on the upper part, the lateral pedicels less than 1 mm. long; glumes acuminate, scabrous on keel and back, about 2.5 mm. long; lemma slightly scabrous, a little shorter than the glumes, awnless, the callus glabrous; palea about one third as long as the lemma.

TYPE LOCALITY: Durango (*Palmer*, presumably 190).
DISTRIBUTION: Wet places, Durango and Federal District, Mexico.

43. *Agrostis turrialbae* Mez, *Repert. Sp. Nov.* 18: 4. 1922.

Perennial; culms erect, cespitose, glabrous, about 2-noded near base, 20–30 cm. tall; sheaths glabrous; ligule dentate, 1–2 mm. long; blades flat, usually rather lax, mostly basal, erect, scaberulous, 5–10 cm. long, sometimes more, 1–2 mm. wide; panicle elliptic, open, rather few-flowered, 5–10 cm. long, the axis glabrous, the branches in rather distant verticils, glabrous or nearly so, spreading, finally divaricately branched about the middle, few-flowered, the pedicels mostly much longer than the spikelets; glumes acute, glabrous on the keel, minutely scabrous near the tip, 1.5–2 mm. long; lemma 1.3 mm. long, awnless; palea wanting.

TYPE LOCALITY: Volcán Turrialba, Costa Rica.
DISTRIBUTION: Pastures and wet páramos, high mountains of Costa Rica and Colombia.

44. *Agrostis perennans* (Walt.) Tuckerm. *Am. Jour. Sci.* 45: 44.
1843.

- Cornucopiae perennans* Walt. *Fl. Carol.* 74. 1788.
Agrostis Cornucopiae Smith; J. Nichols ["S. Urban"], *Gentleman's Mag.* 59: 873. 1789. (Based on *Cornucopiae perennans* Walt.)
Agrostis elegans Salisb. *Prodr. Stirp.* 25. 1796. (Based on *Cornucopiae perennans* Walt.)
Agrostis anomala Willd. *Sp. Pl.* 1: 370. 1797. (Based on *Cornucopiae perennans* Walt.)
Alopecurus carolinianus Spreng. *Nachtr. Bot. Gart. Halle* 10. 1801. (Type from Kentucky.)
Not *A. carolinianus* Walt. 1788.
Trichodium decumbens Michx. *Fl. Bor. Am.* 1: 42. 1803. (Type from Virginia to Florida, *Michaux.*)
Trichodium perennans Ell. *Bot. S. C. & Ga.* 1: 99. 1816. (Based on *Cornucopiae perennans* Walt.)
Trichodium Muhlenbergianum Schultes; in R. & S. *Syst. Veg. Mant.* 2: 159. 1824. (Based on Muhlenberg's *Trichodium* no. 4, from Pennsylvania [Muhl. *Descr. Gram.* 62. 1817].)
Agrostis Michauxii Trin. *Gram. Unifl.* 206. 1824. (Based on *Trichodium decumbens* Michx.)
Not *A. Michauxii* Zucc. 1809.
Agrostis noveboracensis Spreng. *Syst.* 1: 260. 1825. (Type from New York, *Torrey.*)
Agrostis decumbens Link. *Hort. Berol.* 1: 80. 1827. (Based on *Trichodium decumbens* Michx.)
Not *A. decumbens* Host, 1809.
Trichodium noveboracense Schultes, in R. & S. *Syst. Veg. Mant.* 3: Addit. 555. 1827. (Based on *Agrostis noveboracensis* Spreng.)
Trichodium scabrum [Muhl. misapplied by] *Darl. Fl. Cestr.* 1: 54. 1837. (Type from Pennsylvania.)
Agrostis Schweinitzii Trin. *Mém. Acad. St.-Pétersb.* VI. 6^e: 311. 1841. (Type from Pennsylvania, *Schweinitz.*)
Agrostis oreophila Trin. *Mém. Acad. St.-Pétersb.* VI. 6^e: 323. 1841. (Type from Bethlehem, Pennsylvania.)
Agrostis Schiedeana Trin. *Mém. Acad. St.-Pétersb.* VI. 6^e: 327. 1841. (Type from Mexico.)
Agrostis noxae-angliae Tuckerm. *Mag. Hort. Hovey* 9: 143. 1843. (Type from White Mountains, New Hampshire.)
Agrostis campyla Tuckerm. *Am. Jour. Sci.* II. 6: 231. 1848. (Type from New England.)
Agrostis scabra var. *perennans* Wood, *Class-Book* ed. 1861. 774. 1861. (Presumably based on *A. perennans* Tuckerm.)
Agrostis chinanilla Fourn. *Mex. Pl. Gram.* 96. 1886. (Type from Chinantla, Mexico.)
Agrostis perennans var. *aestivalis* Vasey, *Contr. U. S. Nat. Herb.* 3: 76. 1892. (Type from Athens, Illinois; the slender lax form.)

Agrostis intermedia Scribn. Bull. Torrey Club 20: 476. 1893. (Type from Pine Mountain, Harlan County, Tennessee, *Kearney 39*.) Not *A. intermedia* Balb. 1801.

Agrostis pseudointermedia Farwell, Ann. Rep. Comm. Parks & Boul. Detroit 11: 46. 1900. (Based on *A. intermedia* Scribn.)

Agrostis Scribneriana Nash, in Small, Fl. SE. U. S. 126. 1903. (Based on *A. intermedia* Scribn.)
Agrostis perennans var. *humilis* Farwell, Papers Mich. Acad. 1: 87. 1921. (Type from Detroit, Michigan. *Farwell 5672* $\frac{1}{2}$.)

Perennial; culms erect or decumbent at base, varying from weak and lax to relatively stout and tall, glabrous, 30–100 cm. tall; sheaths glabrous or slightly rough; ligule 2–5 mm. long; blades flat, lax to stiffly upright, scabrous, 10–20 cm. long, 1–6 mm. wide, those of the culm several; panicle pale-green or tawny, oblong, open, 10–20 or even 30 cm. long, the branches ascending, scabrous, capillary, naked on the lower half, verticillate, the branchlets appressed or divaricately spreading; glumes acute or acuminate, scabrous on the keel, 2–3 mm. long; lemma awnless, rarely awned, 1.5–2 mm. long; palea minute or wanting.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Open ground, old fields and open woods, in rather dry soil from sea level to the tops of mountains, Quebec to Minnesota, and southward to Florida and Guatemala.

ILLUSTRATIONS: Gentleman's Mag. 59: pl. opp. 872; Fraser, *Agrostis Cornuc. pl.*; Bull. U. S. Dep. Agr. Agrost. 17: f. 478; Hitchc. Man. f. 690.

NOTE: In dry open ground the culms are erect and rather stout; in shady places the plants are lax and the panicles are lax with divaricate branches.

Agrostis perennans var. *elata* (Pursh) Hitchc. Bull. U. S. Dep. Agr. Pl. Ind. 68: 50. 1905. ? *Cornucopiae altissima* Walt. Fl. Carol. 74. 1788. (Type from South Carolina. Possibly *Agrostis alba* L.) *Trichodium elatum* Pursh, Fl. Am. Sept. 1: 61. 1814. (The basis of *Agrostis perennans* var. *elata*.) *Agrostis elata* Trin. Mém. Acad. St.-Pétersb. VI. 6: 317. 1841. (Based on *Trichodium elatum* Pursh.) ? *Agrostis altissima* Tuckerm. Am. Jour. Sci. 45: 44. 1843. (Based on *Cornucopiae altissima* Walt.; Tuckerman's plant is *A. perennans* var. *elata*.) ? *Trichodium altissimum* Michx.; Wood, Class-Book ed. 2. 599. 1847. (Based on *Cornucopiae altissima* Walt.) *Agrostis hiemalis* var. *elata* Fernald, Rhodora 23: 229. 1921. (Based on *Trichodium elatum* Pursh.) *Agrostis perennans* f. *chaetophora* Fernald, Rhodora 35: 317. 1933. (Type from Huntingdon County, Pennsylvania.) *Agrostis perennans* var. *aestivalis* f. *atherophora* Fernald, Rhodora 35: 317. 1933. (Type from Terrebonne, Quebec.) Differing in the more slender and elongate culms, often decumbent at base, but particularly in the crowding of the spikelets toward the ends of the branchlets, causing them to droop somewhat. TYPE LOCALITY: New Jersey, Carolina. DISTRIBUTION: Marshes and bogs, mostly near the coast, New Jersey to Mississippi.

45. *Agrostis oregonensis* Vasey, Bull. Torrey Club 13: 55. 1886.

Agrostis attenuata Vasey, Bot. Gaz. 11: 337. 1886. (Mount Hood, Oregon, *Howell 210*.)

Agrostis Hallii var. *californica* Vasey, Contr. U. S. Nat. Herb. 3: 74. 1892. (Type from California, *Bolander 6103*.)

Agrostis Schiedeana var. *armata* Suksdorf, Werdenda 1: 1. 1923. (Type from Klickitat County, Washington, *Suksdorf 6310*.)

Perennial; culms erect, cespitose, glabrous, 60–90 cm. tall; sheaths glabrous or scaberulous; ligule acute, 2–4 mm. long; blades flat, scabrous, 2–4 mm. wide; panicle oblong, open, 10–30 cm. long, rather narrow, the branches verticillate, capillary, scabrous, usually rather stiffly ascending, unequal, naked on the lower half; glumes acuminate, scabrous on the keel and scaberulous on the back, 2.5–3 mm. long; lemma 1.5 mm. long, awnless; palea about 0.5 mm. long.

TYPE LOCALITY: Oregon (*Howell 49*).

DISTRIBUTION: Marshes, bogs, and wet meadows, Montana to British Columbia, and southward to Wyoming and California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Pl. Ind. 68: pl. 13, f. 2; pl. 14, f. 2; pl. 30; Abrams, Ill. Fl. Pacif. St. f. 347; Hitchc. Man. f. 692.

46. *Agrostis Schaffneri* Fourn. Mex. Pl. Gram. 94. 1886.

Agrostis Schaffneri var. *mutica* Fourn. Mex. Pl. Gram. 94. 1886. (Type from Mexico.)

Perennial; culms erect, glabrous, solitary or few in a tuft, 60–80 cm. tall; sheaths glabrous; ligule 3–5 mm. long; blades flat, lax, scabrous, 12–18 cm. long, 2–4 mm. wide; panicle large, oblong, at first inclosed at base in the uppermost sheath, mostly purple, 15–30 cm. long, the axis scabrous, the branches verticillate, naked below, scabrous, the lowest verticil usually with numerous branches, ascending or somewhat spreading, as much as 12 cm. long; glumes acute, scabrous on the keels, 2.5–3 mm. long; lemma 1.5 mm. long; palea wanting.

TYPE LOCALITY: Tacubaya, Federal District, Mexico.

DISTRIBUTION: Southern Mexico.

NOTE: This species is described by Fournier as awned; the specimens cited are *Schaffner 86* and *308*. A variety *mutica* is described as awnless, one specimen being cited, *Schaffner 1*, also from Tacubaya. The specimens in the U. S. National Herbarium are all awnless. Dr. Humbert has kindly sent fragments and a sketch of Schaffner's no. *86* in the Paris Herbarium. The spikelets are partly awned and partly awnless.

47. *Agrostis tacubayensis* Fourn. Mex. Pl. Gram. 95. 1886.

Perennial, culms tufted about 30 cm. tall, the innovations numerous; sheaths glabrous; ligule of culm-leaves 3 mm. long, of the innovations 1.5 mm. long; blades of culm-leaves flat, slightly scabrous, erect, 3-5 cm. long, about 1 mm. wide or less, those of the innovations setaceous; panicle narrow, open, purple, about 10 cm. long, the branches ascending, naked below or with some short branches intermixed, the pedicels strongly scabrous; glumes somewhat unequal, acuminate, scabrous on the keel, the first longer, about 2.5 mm. long; lemma about 1.5 mm. long, awnless; palea wanting.

TYPE LOCALITY: Tacubaya, Federal District, Mexico (*Schaffner 91*).
DISTRIBUTION: Southern Mexico.

115. *PEREILEMA* Presl, Rel. Haenk. 1: 233. 1830.

Annuals with narrow flat blades and narrow condensed, more or less interrupted, panicles, silky with numerous awns. Spikelets 1-flowered, in dense fascicles or globose clusters along the axis of a panicle, the rachilla articulate above the glumes, not produced beyond the floret, the spikelet surrounded at base by numerous sterile spikelets in the form of bristles or delicate bracts; glumes thin, equal, the midnerve extending into a slender awn; lemma terete, pilose below, the summit minutely bifid, the midnerve extending into a slender flexuous awn longer than the bristles.

Type species, *Pereilema crinitum* Presl.

Bristles pilose; globose clusters of spikelets deciduous from the main axis.

1. *P. ciliatum*.

Bristles scabrous; branches of panicle not deciduous from the main axis.

2. *P. crinitum*.

Lemma about 1.5 mm. long.

3. *P. Beyrichianum*.

Lemma 2-3 mm. long.

1. *Pereilema ciliatum* Fourn. Mex. Pl. Gram. 93. 1886.

Pereilema setarioides Fourn. Mex. Pl. Gram. 93. 1886. (Type from Orizaba.)

Culms slender, branching, spreading, rooting at the lower nodes, glabrous, as much as 50 cm. tall; sheaths glabrous; ligule 0.5 mm. long; blades flat, thin, scabrous, mostly less than 10 cm. long, 1-3 mm. wide, auricled at base, the auricles ciliate; panicles slender, 3-7 cm. long, the axis angled, flexuous, pubescent, the more or less globular clusters of spikelets contiguous, finally deciduous from the axis, 3-5 mm. long, the lower scarcely longer; bristles numerous, plumose, 2-4 mm. long; glumes gradually narrowed into a plumose awn about as long as the body, totaling about 2 mm.; lemma about 2.5 mm. long, pubescent, the awn 5-15 mm. long.

TYPE LOCALITY: Mexico (specimens cited from Orizaba and Córdoba.)

DISTRIBUTION: Dry shaded ledges, at medium altitudes, Vera Cruz to Jalisco.

2. *Pereilema crinitum* Presl, Rel. Haenk. 1: 233. 1830.

Pereilema crinitum var. *cirratum* Fourn. Mex. Pl. Gram. 93. 1886. (Several specimens cited from Orizaba and Córdoba.)

Culms erect or more or less branching and spreading at base, slender, glabrous, mostly 2- or 3-noded, 20-40 cm. tall; sheaths glabrous or scaberulous at least toward the summit; ligule thin, erose, about 0.5 mm. long; blades flat, thin, scabrous 5-20 cm. long, 1-4 mm. wide, usually narrowed at the auricled base, the auricles ciliate or pilose; panicles more or less nodding or flexuous, 5-20 cm. long, pale or purplish, the axis angled, scabrous, the branches not deciduous, short, densely flowered, the lower often distant and as much as 3 cm. long; bristles about as long as the awns of the glumes; glumes thin, hyaline, oblong, glabrous, about 1 mm. long, abruptly narrowed into a straight scabrous awn 2-3 mm. long; lemma terete, gradually

narrowed from near the base, densely short-pilose at base, faintly scaberulous above, about 1.5 mm. long, the awn slender, flexuous, 1.5–2.5 cm. long; palea about as long as the lemma.

TYPE LOCALITY: Panama.

DISTRIBUTION: Open ground, brushy slopes, and moist banks, at low and medium altitudes, Mexico to Ecuador.

ILLUSTRATIONS: Presl, Rel. Haenk. 1: 233, pl. 37, f. a; Trin. Ic. pl. 358.

3. *Pereilema Beyrichianum* (Kunth) Hitchc. Contr. U. S. Nat. Herb. 24: 385. 1927.

Muhlenbergia Beyrichiana Kunth, Rév. Gram. 63, nomen nudum. 1829; Enum. Pl. 1: 200. 1833.
Pereilema brasiliannum Trin. Mém. Acad. St.-Petersb. VI. 6: 382. 1841. (Type from Brazil.)

Culms often rather stout, erect or usually branching and spreading at base and often rooting at the lower nodes, often several-noded, as much as 1 meter tall; sheaths scaberulous; ligule rather firm, 0.5 mm. long; blades flat, thin, scabrous, 5–15 cm. long, mostly 2–5 mm. wide, auricled at base, the auricles strongly ciliate; panicles 5–15 cm. long, the branches not deciduous, spreading or sometimes reflexed, all except the upper distant, the lower as much as 4 cm. long, the axis angled, scabrous; bristles about as long as the awns of the glumes or shorter; glumes thin, hyaline, glabrous, about 1 mm. long, the awns 3–4 mm. long; lemma rather strongly nerved, scabrous, short-pilose at base, 2–3 mm. long, the awn 1.5–2 cm. long; palea about as long as the lemma.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Open ground, stone walls, and shady banks, Costa Rica to Brazil and Ecuador.

ILLUSTRATION: Mart. Fl. Bras. 2³: pl. 10.

116. *ALOPECURUS* L. Sp. Pl. 60. 1753.

Tozzellia Bubani, Fl. Pyren. 4: 274. 1901. (Type, *Alopecurus agrestis* L.)

Low or moderately tall perennial grasses with flat blades and soft, dense, spike-like panicles. Spikelets 1-flowered, disarticulating below the glumes, strongly compressed laterally; glumes equal, awnless, usually united at base, ciliate on the keel; lemma about as long as the glumes, 5-nerved, obtuse, the margins united at base, bearing from below the middle a slender dorsal awn, this included or exerted two or three times the length of the spikelet; palea wanting.

Type species (selected), *Alopecurus pratensis* L.

Spikelets 5–6 mm. long; introduced perennials.

Panicle slender, tapering at each end; glumes scabrous on the keel.

Panicle cylindric, dense; glumes conspicuously ciliate on the keel.

Spikelets 2–4 mm. long (rarely 5 mm. in *A. saccatus*, annual); native species.

Plants perennial.

Spikelets densely woolly all over; panicle oblong, 1–5 cm. long, about 1 cm. thick.

Spikelets not woolly; panicle linear or oblong-linear, less than 1 cm. thick.

Awns exerted 2 mm. or more.

Awns exerted 3–5 mm.; panicle 4–6 mm. thick; spikelets about 3 mm. long.

Awns exerted 2–3 mm.; panicle 3–4 mm. thick; spikelets 2.5 mm. long.

Awns scarcely exceeding the glumes.

Plants annual.

Spikelets 2–3.5 mm. long; panicle dense.

Spikelets 2–2.5 mm. long; anthers 0.5 mm. long.

Spikelets 3–3.5 mm. long; anthers about 1 mm. long.

Spikelets 4–5 mm. long; panicle relatively loose.

1. *A. myosuroides*.

2. *A. pratensis*.

3. *A. alpinus*.

4. *A. pallescens*.

5. *A. geniculatus*.

6. *A. aequalis*.

7. *A. carolinianus*.

8. *A. Howellii*.

9. *A. saccatus*.

1. *Alopecurus myosuroides* Huds. Fl. Angl. 23. 1762.

Alopecurus agrestis L. Sp. Pl. ed. 2. 1: 89. 1762. (Type from Europe.)

Tozzellia agrestis Bubani, Fl. Pyren. 4: 274. 1901. (Based on *Alopecurus agrestis* L.)

Perennial; culms tufted, erect or decumbent at base, slightly scabrous, 10–50 cm. tall; sheaths glabrous; ligule crose-truncate, 2–3 mm. long; blades flat, glabrous, gradually acuminate, 5–15 cm. long, 2–3 mm. wide; panicles slender, somewhat tapering at each end, 4–10

cm. long, 3–5 mm. wide; glumes 6 mm. long, pointed, whitish with 3 green nerves, glabrous, scabrous on the keel, short-ciliate at base, lemma about as long as the glumes, the awn bent, exserted 5–8 mm.

TYPE LOCALITY: England.

DISTRIBUTION: Fields, waste places, and ballast ground, Maine to North Carolina; Washington and Oregon; introduced, rare; native of Eurasia.

ILLUSTRATION: Hitchc. Man. f. 706 B.

2. *Alopecurus pratensis* L. Sp. Pl. 60. 1753.

Perennial; culms erect, glabrous, about 2-noded, 30–80 cm. tall; sheaths glabrous, shorter than the internodes, the upper somewhat inflated; ligule truncate, 1–2 mm. long; blades flat, scabrous, 5–15 cm. long, 2–6 mm. wide, the uppermost reduced; panicles long-exserted, oblong, usually scarcely narrowed at summit, 3–7 cm. long, 7–10 mm. thick; glumes 5 mm. long, villous on the keel and pubescent on the sides; lemma glabrous, about as long as the glumes, the awn attached near the base, geniculate, exserted 2–5 mm.

TYPE LOCALITY: Europe.

DISTRIBUTION: Fields and waste places, Newfoundland and Labrador to Alaska, and southward to Delaware, Iowa, Idaho, and Oregon; introduced; native of Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 74; Bull. U. S. Dep. Agr. Agrost. 7: f. 116.

3. *Alopecurus alpinus* Smith, Engl.

Bot. pl. 1126. 1803.

? *Alopecurus borealis* Trin. Fund. Agrost. 58. 1820. (Type from Asia and North America.)

Alopecurus occidentalis Scribn. & Tweedy, Bot. Gaz. 11: 170. 1886. (Type from Yellowstone National Park, Tweedy.)

Alopecurus behringianus Gand. Bull. Soc. Bot. Fr. 667: 298. 1920. (Type from St. Paul Island, Alaska.)

Perennial; culms erect or often decumbent at base, with slender creeping rhizomes, rather stiff and rushlike, glabrous, 2-noded, the lower near the base, 10–80 cm. tall; sheaths glabrous, shorter than the internodes, the uppermost often somewhat inflated; ligule truncate, 2–3 mm. long; blades flat, scabrous, those of the culm mostly less than 10 cm. long, 3–5 mm. wide; panicles long-exserted, ovoid or oblong, woolly, 1–3 cm. long, about 1 cm. wide; glumes 3–4 mm. long, woolly; lemma about as long as the glumes, glabrous below, pubescent above, the awn attached near the base, exserted slightly or as much as 5 mm.

TYPE LOCALITY: Scotland.

DISTRIBUTION: Mountain meadows and along brooks, Greenland to Alaska, and southward in the Rocky Mountains to Colorado; also in arctic and northern Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 131: pl. 24, 1; Bull. U. S. Dep. Agr. Agrost. 7: f. 117; 17: f. 452; Hitchc. Man. f. 709.

NOTE: Vasey misapplied the name *Alopecurus pratensis* var. *alpestris* Wahl. to this species (Contr. U. S. Nat. Herb. 3: 86. 1892).

4. *Alopecurus pallescens* Piper; Piper & Beattie,

Fl. Palouse Reg. 18. 1901.

Perennial, tufted, pale-green; culms erect or the lower nodes geniculate, glabrous, 30–50 cm. tall; sheaths glabrous, the upper somewhat inflated; ligule thin, acuminate, as much as 7 mm. long; blades flat, scabrous on the upper surface, 1–5 mm. wide; panicles finally long-exserted, pale, 2–7 cm. long, 4–6 mm. wide; glumes about 3 mm. long, ciliate on the keel, appressed-pubescent on the sides; lemma about as long as the glumes, glabrous, the awn attached near the base, geniculate, exserted 3–5 mm.; anthers orange, 2 mm. long.

TYPE LOCALITY: Pullman, Washington (*Piper* 1743).

DISTRIBUTION: Edges of ponds and wet places, Idaho to Washington and northern California.

ILLUSTRATION: Hitchc. Man. f. 711.

5. *Alopecurus geniculatus* L. Sp. Pl. 60. 1753.

Tozzettia geniculata Bubani, Fl. Pyren. 4: 275. 1901. (Based on *Alopecurus geniculatus* L.)

Perennial; culms several-noded, decumbent or long-decumbent at base, rooting at the lower nodes, glabrous, 10–50 cm. long above the rooting base; sheaths glabrous, usually not

inflated; ligule 2-3 mm. long; blades scaberulous, 1-4 mm. wide; panicles about as in *A. aequalis*; spikelets about 2.5 mm. long, the tip dark-purple; awn of lemma about as long again as the spikelet; anthers about 1.5 mm. long. Differing from *A. aequalis* in the longer rooting base, the purple-tipped spikelets, and the more conspicuous awn, giving the panicle a softly bristly appearance.

TYPE LOCALITY: Europe.

DISTRIBUTION: In water and wet places, Newfoundland to Saskatchewan and British Columbia, and southward through New England to New York, New Jersey, and Virginia, and through Washington to California; Montana; Colorado; Arizona; also in Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 115; Hitchc. Man. f. 715.

6. *Alopecurus aequalis* Sobol. Fl. Petrop. 16. 1799.

Alopecurus aristulatus Michx. Fl. Bor. Am. 1: 43. 1803. (Type from Canada, Michaux.)

Alopecurus fulvus Smith, Engl. Bot. pl. 1467. 1805. (Type from England.)

Alopecurus subaristatus Pers. Syn. Pl. 1: 80. 1805. (Type from Canada.)

Alopecurus geniculatus var. *natans* Wahl. Fl. Lapp. 22. 1812. (Type from Lapland.)

Alopecurus geniculatus var. *aristulatus* Torr. Fl. U. S. 1: 97. 1823. (Based on *A. aristulatus* Michx.)

Alopecurus caespitosus Trin. Ic. pl. 241. 1830. (Type from Northwest America, Douglas.)

Alopecurus geniculatus var. *fulvus* Schrad. Linnaea 12: 424. 1838. (Based on *A. fulvus* Smith.)

Alopecurus geniculatus var. *robustus* Vasey, Bull. Torrey Club 15: 13. 1888. (Type from Vancouver Island, Macoun.)

Alopecurus Howellii var. *Merrimani* Beal, Grasses N. Am. 2: 278. 1896. (Type from Pribilof Islands, Alaska, "C. H. Merriman" [error for Merriam].)

Alopecurus Howellii var. *Merriami* Beal; J. M. Macoun, in D. S. Jordan, Fur Seals N. Pacif. 3: 573. 1899. (Correction of var. *Merrimani* Beal.)

Alopecurus aristulatus var. *natans* Simmons, Ark. Bot. 6¹⁷: 4. 1907. (Based on *A. geniculatus* var. *natans* Wahl.)

Tozzettia fulva Lunell, Am. Midl. Nat. 4: 216. 1915. (Based on *A. fulvus* Smith.)

Alopecurus aristulatus var. *Merriami* St. John, Mem. Can. Dep. Mines 126: 42. 1922. (Based on *A. Howellii* var. *Merriami* Beal.)

Alopecurus aequalis var. *natans* Fernald, Rhodora 27: 198. 1925. (Based on *A. geniculatus* var. *natans* Wahl.)

Perennial; culms erect or spreading, usually rooting at the nodes, 2- or 3-noded, glabrous, 15-60 cm. tall; sheaths glabrous, usually not inflated; ligule truncate, about 3 mm. long; blades slightly scabrous, 1-4 mm. wide, the upper not much reduced; panicles more or less exerted, slender, 2-7 cm. long, about 4 mm. wide; glumes about 2 mm. long, ciliate on the keels, appressed-pubescent on the sides; lemma glabrous, about as long as the glumes, the awn attached below the middle, straight or slightly geniculate, included or exerted about 1 mm.; anthers about 1 mm. long.

TYPE LOCALITY: Greece.

DISTRIBUTION: In water and wet places, Greenland to Alaska, and southward to Pennsylvania, Illinois, Kansas, New Mexico, and California; also in Eurasia.

ILLUSTRATIONS: Trin. Ic. pl. 241; Hitchc. Man. f. 713.

7. *Alopecurus carolinianus* Walt. Fl. Carol. 74. 1788.

Alopecurus ramosus Poir. in Lam. Encycl. 8: 776. 1808. (Type from Carolina.)

Alopecurus gracilis Willd.; Trin. Mém. Acad. St.-Pétersb. VI. 6¹: 38. 1840. (Type from Carolina.)

Alopecurus Macounii Vasey, Bull. Torrey Club 15: 12. 1888. (Type from Oak Bay, Vancouver Island, Macoun.)

Alopecurus geniculatus var. *caespitosus* Scribn. in Macoun, Cat. Can. Pl. 2⁵: 389. 1890. (Type from Yale, British Columbia, Macoun.)

Alopecurus geniculatus var. *ramosus* St. John, Rhodora 19: 167. 1917. (Based on *A. ramosus* Poir.)

Annual; culms tufted, much branched at base, erect or more or less spreading, glabrous, 10-50 cm. tall; sheaths glabrous, the upper sometimes a little inflated; ligule mostly 3-4 mm. long; blades flat, scabrous, mostly 2-4 mm. wide; panicles usually more slender than those of *A. geniculatus*; glumes 2-2.5 mm. long, pale, not purple-tipped; awn of lemma about as in *A. geniculatus*; anthers 0.5 mm. long.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Moist open ground, old fields, and wet places, New Jersey to British Columbia, and southward to Florida, Texas, Arizona, and California.

ILLUSTRATION: Hitchc. Man. f. 717.

8. *Alopecurus Howellii* Vasey, Bull. Torrey Club 15: 12. 1888.

Alopecurus californicus Vasey, Bull. Torrey Club 15: 13. 1888. (Type from Santa Cruz, California, Anderson.)

Annual; culms erect, or geniculate below, glabrous, 15–30 cm. tall, often dwarf; sheaths glabrous, the upper more or less inflated; ligule thin, 3–5 mm. long; blades flat, scabrous, 1–2 mm. wide, sometimes as much as 4 mm.; panicles oblong to linear, exerted or, especially in dwarf specimens, included at base, 2–6 cm. long, 4–7 mm. wide; glumes 3–3.5 mm. long, ciliate on the keel, appressed-pilose on the lateral nerves; lemma glabrous, a little shorter than the glumes, the awn attached about 1 mm. from the base, geniculate, exerted 3–5 mm.; anthers orange, about 1 mm. long.

TYPE LOCALITY: Medford, Oregon (*Howell 215*).

DISTRIBUTION: Wet places, Oregon and California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13¹: pl. 27; Hitchc. Man. f. 719.

9. *Alopecurus saccatus* Vasey, Bot. Gaz. 6: 290. 1881.

Similar to *A. Howellii*, from which it may not be distinct; culms averaging lower; panicles 2–4 cm. long, less dense, short-exserted or partly included; spikelets 4–5 mm. long, the awn exerted 5–8 mm.; anthers 1 mm. long.

TYPE LOCALITY: Eastern Oregon.

DISTRIBUTION: Wet places along the Columbia river, Washington, Oregon, and California (Colusa County).

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13¹: pl. 28; Hitchc. Man. f. 720.

ALOPECURUS CRETICUS Trin. Neue Entdeck. 2: 45. 1821. Annual; culms 10–40 cm. tall; panicle dense, narrowed at each end; spikelets wedge-shaped, 4 mm. long; glumes firm, the keels broadly winged toward the summit, ciliate; lemma truncate, the awn from near the base. TYPE LOCALITY: Crete. DISTRIBUTION: Ballast, Philadelphia; native of Europe.

117. *LIMNODEA* L. Dewey, Contr. U. S. Nat. Herb. 2: 518. 1894.

Greenia Nutt. Trans. Am. Phil. Soc. II. 5: 142. 1837. (Type, *G. arkansana* Nutt.) Not *Greenia* Wight & Arn. 1834; *Greenia* and *Greenia* were both named for Benjamin Daniel Greene, a botanist of Boston.

Sclerachne Torr.; Trin. Mém. Acad. St.-Pétersb. VI. 6²: 273. 1841. (Selected type, *Greenia arkansana*.) Not *Sclerachne* R. Br. 1838.

Thurberia Benth. Jour. Linn. Soc. 19: 58. 1881. (Type, *Greenia arkansana* Nutt.) Not *Thurberia* A. Gray, 1854.

A slender annual with flat blades and narrow panicles. Spikelets 1-flowered, disarticulating below the glumes, the rachilla prolonged behind the palea as a short, slender bristle; glumes equal, firm; lemma membranaceous, smooth, nerveless, 2-toothed at the apex, bearing from between the teeth a slender bent awn, twisted at base; palea a little shorter than the lemma.

Type species, *Greenia arkansana* Nutt.

1. *Limnodea arkansana* (Nutt.) L. Dewey, Contr. U. S. Nat. Herb. 2: 518. 1894.

Greenia arkansana Nutt. Trans. Am. Phil. Soc. II. 5: 142. 1837.

Sclerachne arkansana Torr.; Trin. Mém. Acad. St.-Pétersb. VI. 6²: 274. 1841. (Based on *Greenia arkansana* Nutt.)

Sclerachne pilosa Trin. Mém. Acad. St.-Pétersb. VI. 6²: 275. 1841. (Type from Texas.)

Limnusa arkansana Trin.; Steud. Nom. Bot. ed. 2, 2: 45. 1841. (Based on *Greenia arkansana* Nutt.)

Stipa demissa Steud. Syn. Gram. 131. 1854. (Type from New Orleans, Drummond 465.)

Mühlenbergia hirtula Steud. Syn. Gram. 180. 1854. (Type from Texas.)

Limnusa pilosa Steud. Syn. Gram. 421. 1855. (Based on *Sclerachne pilosa* Trin.)

Thurberia arkansana Benth.; Vasey, Grasses U. S. 16. 1883. (Based on *Greenia arkansana* Nutt.)

Thurberia pilosa Vasey, Grasses U. S. 16. 1883. (Based on *Sclerachne pilosa* Trin.)

Limnodia arkansana pilosa Scribn. Bull. U. S. Dep. Agr. Agrost. 7: ed. 3. 139. 1900. (Based on *Sclerachne pilosa* Trin.)

Culms branching at base, glabrous, mostly 3- or 4-noded, 20–40 cm. tall; sheaths glabrous or slightly roughened, sometimes sparsely pilose; ligule thin, dentate or lacerate, 1–2 mm. long; blades more or less pubescent or pilose on both surfaces, mostly 5–10 cm. long and 2–4 mm.

wide; panicles narrow but loose, 5–15 cm. long; spikelets 3.5–4 mm. long; glumes scabrous, hispidulous or pilose; lemma about as long as the glumes, the awn 8–10 mm. long.

TYPE LOCALITY: Red River, Arkansas.

DISTRIBUTION: Dry soil, prairies and river banks, Coastal Plain, Florida to Texas, Arkansas, and Oklahoma.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 12: pl. 9; Bull. U. S. Dep. Agr. Agrost. 7: f. 133; 20: f. 55 (C, a spikelet of var. *pilosa*); Bull. U. S. Dep. Agr. 772: f. 73; Hitchc. Man. f. 704.

NOTE: The variety *pilosa* differs only in having pilose rather than hispidulous or scabrous glumes; the two forms grade into each other.

118. CINNA L. Sp. Pl. 5. 1753.

Abola Adans. Fam. Pl. 2: 31, 511. 1763. (Based on *Cinna* L.)

Cinnastrum Fourn. Mex. Pl. Gram. 90. 1886. (Selected type, *Deyeuxia poaeformis* H.B.K.)

Tall perennial grasses, with flat blades and paniculate inflorescence. Spikelets 1-flowered, disarticulating below the glumes, the rachilla forming a stipe below the floret and produced behind the palea as a short or minute bristle; glumes equal or subequal, 1- or 3-nerved; lemma similar to the glumes, nearly as long, 3-nerved, bearing a minute short, straight awn just below the apex (awnless in *C. poaeformis*, rarely awnless in the other species); palea apparently 1-keeled, the two nerves very close together, or 1-nerved.

Type species, *Cinna arundinacea* L.

Spikelets obtusish, 2–2.5 mm. long; prolongation of the rachilla slender, nearly half as long as the lemma.

Spikelets acute, 3.5–5 mm. long; prolongation of the rachilla minute.

Spikelets 3.5–4 mm. long; panicle loose, the branches spreading or drooping.

Spikelets 5 mm. long; panicle rather dense, the branches ascending.

1. *C. poaeformis*.

2. *C. latifolia*.

3. *C. arundinacea*.

1. *Cinna poaeformis* (H.B.K.) Scribn. & Merr. Bull. U. S. Dep.

Agr. Agrost. 24: 21. 1901.

Deyeuxia poaeformis H.B.K. Nov. Gen. & Sp. 1: 146. 1815.

Poa subuniflora Kunth, Rév. Gram. 115. 1829. (Based on *Deyeuxia poaeformis* H.B.K.)

Cinnastrum miliaceum Fourn. Mex. Pl. Gram. 91. 1886. (Type from Mexico.)

Cinnastrum poaeforme Fourn. Mex. Pl. Gram. 91. 1886. (Based on *Deyeuxia poaeformis* H.B.K.)

Culms erect or ascending at base, glabrous or sometimes slightly rough, 3- or 4-noded, usually 1–1.5 meters tall; sheaths scabrous; ligule firm, scabrous, acute, more or less nerved, as much as 1 cm. long; blades scabrous, somewhat narrowed at base, rather lax, 10–25 cm. long, as much as 1 cm. wide; panicle narrow, open, as much as 40 cm. long, the slender branches naked on the lower half, fascicled, scabrous, flexuous, spreading or drooping, the lower as much as 10 cm. long, the axis glabrous below, scabrous above; spikelets obtusish, 2–2.5 (rarely 3) mm. long, rather crowded on the upper half of the branches; glumes scabrous, 3-nerved; lemma 5-nerved, awnless, scaberulous near tip; palea a little shorter than the lemma, 2-keeled, the keels close together; caryopsis dark-brown, narrowed at each end, 1.5 mm. long; prolongation of the rachilla slender, glabrous, about half as long as the lemma.

TYPE LOCALITY: Mount Jorullo, Mexico.

DISTRIBUTION: Wet thickets and moist banks, 2000–3000 meters altitude, Mexico to Peru.

2. *Cinna latifolia* (Trev.) Griseb. in Ledeb. Fl. Ross. 4: 435. 1853.

Agrostis latifolia Trev.; Göpp. Beschr. Bot. Gart. Breslau 82. 1830.

Cinna expansa Link, Hort. Berol. 2: 236. 1833. (Type from Western North America.)

Cinna pendula Trin. Mém. Acad. St.-Petersb. VI. 6: 280. 1841. (Localities cited, Norway, Sitka, Baikal.)

Cinna arundinacea var. *pendula* A. Gray, Man. ed. 2. 545. 1856. (Based on *Cinna pendula* Trin.)

Cinna pendula var. *glomerula* Scribn. Proc. Acad. Phila. 1884: 290. 1884. (Type from Washington, Tweedy.)

Cinna Bolanderi Scribn. Proc. Acad. Phila. 1884: 290. 1884. (Type from California, *Bolander 6090*.)

Cinna pendula var. *Bolanderi* Vasey, Contr. U. S. Nat. Herb. 3: 57. 1892. (Based on *C. Bolanderi* Scribn.)

Cinna pendula var. *mutica* Vasey, Contr. U. S. Nat. Herb. 3: 57. 1892. (Type from Oregon, *Cusick*.)

Culms erect or decumbent at base, scaberulous below the nodes, 3- or 5-noded, 1–1.5 meters tall; sheaths scaberulous; ligule nerved, scaberulous, acutish, lacerate, about 1 cm. long;

blades scabrous, 10–20 cm. long, as much as 1 cm. or even 1.5 cm. wide; panicle usually green, oblong, loose, 15–40 cm. long, the axis glabrous below, scabrous above, the branches slender, rather distant, flexuous, fascicled, scabrous, naked below, spreading or drooping, the lower as much as 20 cm. long; spikelets 3.5–4 mm. long, acute; glumes scaberulous, the first 1-nerved, the second rather faintly 3-nerved; lemma faintly 3-nerved, a little shorter than the glumes, the awn as much as 1 mm. long, sometimes wanting; palea 2-nerved, the nerves very close together; prolongation of the rachilla minute.

TYPE LOCALITY: Europe.

DISTRIBUTION: Moist woods, Newfoundland and Labrador to Alaska, and southward to Connecticut, in the mountains to North Carolina, to Michigan, Illinois, South Dakota, in the mountains to northern New Mexico, to Utah and central California; also in northern Eurasia.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 477; Bull. Tenn. Exp. Sta. 7: pl. 24. f. 95; Hitchc. Man. f. 701 B.

3. *Cinna arundinacea* L. Sp. Pl. 5. 1753.

Agrostis Cinna Retz. Obs. 5: 18. 1789. (Based on *Cinna arundinacea* L.)

Agrostis Cinna Lam. Tab. Encyc. 1: 162. 1791. (Based on *Cinna arundinacea* L.)

Agrostis Cinna Pursh, Fl. Am. Sept. 1: 64. 1814. (Based on *Cinna arundinacea* Willd., error for L.)

Muhlenbergia Cinna Trin. Gram. Unifl. 191. 1824. (Based on *Agrostis Cinna* Lam.)

Cinna arundinacea var. *inexpansa* Fernald & Griscom, Rhodora 37: 135. 1935. (Type from Virginia, Fernald & Long 3648.)

Culms erect, glabrous, several-noded (nodes as many as 10), usually 1–1.5 meters tall; sheaths glabrous or scaberulous, mostly overlapping; ligule thin, nerved, somewhat scaberulous, soon deeply lacerate, about 1 cm. long; blades narrowed toward base, scaberulous or nearly smooth on the surfaces, scabrous on the margins, mostly more than 15 cm. long, and mostly less than 1 cm. wide; panicle narrow, many-flowered, rather dense, grayish, nodding, 15–30 cm. long, the branches ascending, some in each fascicle floriferous nearly to the base; spikelets acute, 5 mm. long; glumes somewhat unequal, acute, scabrous on the keel, somewhat scaberulous on the sides, the first 1-nerved, the second 3-nerved; lemma usually about as long as the second glume, glabrous, bearing below the tip a minute straight awn; palea apparently 1-nerved; prolongation of the rachilla minute.

TYPE LOCALITY: Canada.

DISTRIBUTION: Moist woods, Maine to South Dakota, and southward to Georgia and eastern Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 134; Bull. U. S. Dep. Agr. 772: f. 72; Hitchc. Man. f. 701.

119. *POLYPOGON* Desf. Fl. Atlant. 1: 66. 1798.

Santia Savi, Mem. Soc. Ital. Modena 8: 479. 1799. (Type, *S. plumosa* Savi.)

Raspailia Presl, Rel. Haenk. 1: 238. pl. 40. 1830. (Type, *R. agrostoides* Presl.) Not *Raspailia* Brongn. 1826.

Nowodworskya Presl, Rel. Haenk. 1: 351. 1830. (Based on *Raspailia* Presl.)

Annual or perennial usually decumbent grasses, with flat blades and dense, bristly, spike-like panicles. Spikelets 1-flowered, the pedicel disarticulating a short distance below the glumes, leaving a short-pointed callus attached; glumes equal, entire or 2-lobed, awned from the tip or from between the lobes, the awn slender, straight; lemma much shorter than the glumes, hyaline, usually bearing a slender straight awn shorter than the awns of the glumes.

Type species, *Alopecurus monspeliensis* L.

Plants annual.

Glumes slightly lobed.

Glumes prominently lobed, the lobes ciliate-fringed.

Plants perennial.

Plants stout, mostly erect, 50–150 cm. tall; panicles 15–30 cm. long.

Plants lower, often geniculate; panicles 5–15 cm. long.

Awns rather stiff and straight; glumes 2.5–3 mm. long.

Awns delicate, flexuous; glumes 1.5–2 mm. long.

1. *P. monspeliensis*.

2. *P. maritimus*.

3. *P. elongatus*.

4. *P. littoralis*.

5. *P. australis*.

1. *Polygogon monspeliensis* (L.) Desf. Fl. Atlant. 1: 67. 1798.

Alopecurus monspeliensis L. Sp. Pl. 61. 1753.

Phleum crinitum Schreb. Besch. Gräs. 1: 151. 1769. (Based on *Alopecurus monspeliensis* L.)

Alopecurus aristatus var. *monspeliensis* Huds. Fl. Angl. 28. 1778. (Based on *A. monspeliensis* L.)

Agrostis alopecuroides Lam. Tab. Encyc. 1: 160. 1791. (Based on *A. monspeliensis* L.)

Phleum monspeliense Koeler, Descr. Gram. 57. 1802. (Based on *Alopecurus monspeliensis* L.)

Polygogon crinitus Nutt. Gen. Pl. 1: 50. 1818. (Based on *Phleum crinitum* Smith [error for Schreb.].)

Polygogon flavescens Presl, Rel. Haenk. 1: 234. 1830. (Type from Peru, Haenke.)

Santia monspeliensis Parl. Giorn. Bot. Ital. 1: 151. 1845. (Based on *Alopecurus monspeliensis* L.)

Annual; culms erect or decumbent at base, glabrous or minutely roughened, mostly 3- or 4-noded, 15–50 cm. tall (sometimes depauperate or as much as 1 m. tall); sheaths glabrous or minutely roughened, sometimes somewhat inflated; ligule 5–6 mm. long, nerved, scabrous, acute, more or less lacrate; blades scabrous, in average plants 5–15 cm. long, 4–6 mm. wide; panicle dense, spikelike, oblong, bristly, 2–15 cm. long, 1–2 cm. wide, tawny-yellow when mature; glumes hispidulous, about 2 mm. long, the awn 6–8 mm. long, rarely longer; lemma smooth and shining, about half as long as the glumes, the delicate awn slightly exceeding them.

TYPE LOCALITY: France.

DISTRIBUTION: Ballast and waste places, New Brunswick to Georgia, and westward to Alaska and California, infrequent in the East, mostly confined to the coastal states, a common weed at low altitudes in the western states; also in Bermuda, and Mexico to Argentina; native of the Eastern Hemisphere.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 75; Hitchc. Man. f. 721 A.

2. *Polygogon maritimus* Willd. Ges. Nat. Freunde Berlin
Neue Schr. 3: 443. 1801.

Alopecurus maritimus Poir. in Lam. Encyc. 8: 779. 1808. (Based on *Polygogon maritimus* Willd.)

Polygogon monspeliensis var. *maritimus* Coss. & Dur. in Durieu, Expl. Sci. Algér. Bot. 2: 70. 1855.
(Based on *P. maritimus* Willd.)

Annual; culms erect or ascending, sometimes decumbent at base, glabrous; sheaths glabrous; ligule as much as 6 mm. long, scaberulous, weakly nerved, narrowed to a usually lacrate tip; blades scabrous, usually not more than 5 cm. long, 2–4 mm. wide; panicle less dense than in *P. monspeliensis*, often interrupted, usually not more than 5 cm. long; glumes 2.5–3 mm. long, hispidulous below, the deep lobes ciliate-fringed, the awns 7–10 mm. long.

TYPE LOCALITY: France.

DISTRIBUTION: Georgia (Tybee Island) and California (Napa, New York Falls); rare; native of the Mediterranean Region.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 473; Hitchc. Man. f. 721 B.

3. *Polygogon elongatus* H.B.K. Nov. Gen. & Sp. 1: 134. 1815.

Alopecurus elongatus Poir. in Lam. Encyc. Suppl. 5: 495. 1817. (Based on *Polygogon elongatus* H.B.K.)

Raspailia agrostoides Presl, Rel. Haenk. 1: 239. 1830. (Type from Peru.)

Nowodworskya agrostoides Presl, Rel. Haenk. 1: 351. 1830. (Based on *Raspailia agrostoides* Presl.)

Perennial; culms erect or often decumbent at base, glabrous, rather stout, as much as 1 meter tall; sheaths glabrous; ligule nearly glabrous, somewhat nerved, lacrate at the rather broad summit, as much as 8 mm. long; blades scabrous on the margins, glabrous or somewhat scabrous on the surfaces, as much as 20 cm. long and 1 cm. wide; panicle erect or nodding at summit, somewhat loose and interrupted, especially below, mostly 15–30 cm. long, the slender branches closely flowered to base, or with some naked at base intermixed, in close clusters or verticils; glumes hispidulous, about 3 mm. long, gradually narrowed to an awn 2–3 mm. long; lemma 1.5 mm. long, the awn from below the tip, 1–2 mm. long.

TYPE LOCALITY: Chillo, Ecuador.

DISTRIBUTION: Marshes, borders of streams, ditches, and wet places, Mexico to Argentina.

ILLUSTRATION: Mart. Fl. Bras. 2³: pl. 11.

4. *Polygogon littoralis* Smith, Comp. Fl. Brit. ed. 2. 13. 1816.

Agrostis littoralis With. Brit. Pl. ed. 3. 2: 129. 1796. (Not *A. littoralis* Lam. 1791.)
Agrostis lutosus Poir. in Lam. Encyc. Suppl. 1: 249. 1810. (Based on *A. littoralis* With.)
Vilfa lutosus Beauv. Agrost. 16, 148, 181. 1812. (Based on *Agrostis lutosus* Poir.)
Polygogon interruptus H.B.K. Nov. Gen. & Sp. 1: 134. 1815. (Type from Venezuela.)
Alopecurus interruptus Poir. in Lam. Encyc. Suppl. 5: 495. 1817. (Based on *Polygogon interruptus* H.B.K.)
Polygogon lutosus Hitchc. Bull. U. S. Dep. Agr. 772: 138. 1920. (Based on *Agrostis lutosus* Poir.)

Perennial; culms tufted, geniculate at base, glabrous, 30–80 cm. tall, 2- or 3-noded, or, in tall geniculate plants, several-noded; sheaths glabrous, the upper sometimes inflated; ligule 2–5 mm. long or the uppermost longer, scaberulous, nerved, laciniate; blades more or less scabrous, 5–15 cm. long, commonly 4–6 mm. wide; panicle oblong, more or less interrupted or lobed, 5–15 cm. long, often purplish; glumes 2.5–3 mm. long, scabrous, the awns 3–5 mm. long; lemma smooth and shining, 1 mm. long, minutely toothed at the truncate apex, the awn exceeding the glumes.

TYPE LOCALITY: England.

DISTRIBUTION: Ditches and wet places at low altitudes, British Columbia to New Mexico and California, and eastward to Louisiana, and, in a few localities, to Alabama; Bermuda; also Mexico to Argentina; native of the Eastern Hemisphere.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 472; Hitchc. Man. f. 723.

NOTE: *Polygogon littoralis* was thought by Duval-Jouve to be a hybrid between *P. monspeliensis* and *Agrostis alba* (Bull. Soc. Bot. Fr. 2: 288. 1875).

5. *Polygogon australis* Brongn. in Duperrey, Voy. Coq. Bot. Phan. 21. 1829.

Polygogon crinitus Trin. Gram. Unifl. 171. 1824. (Type from Chile.) Not *P. crinitus* Nutt. 1818.
Polygogon interruptus var. *crinitus* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires III. 6: 473. 1906. (Based on *P. crinitus* Trin.)

Perennial; culms as much as 1 meter tall, glabrous or minutely roughened, several-noded; sheaths glabrous or minutely roughened; ligule 1–3 mm. long (shorter than in the other species), weakly nerved; blades 5–15 cm. long, 5–7 mm. wide, scabrous; panicle soft, lobed or interrupted, mostly 8–15 cm. long, the numerous awns purplish; glumes 1.5–2 mm. long, hispidulous, the awns flexuous, delicate, 4–6 mm. long.

TYPE LOCALITY: Concepción, Chile.

DISTRIBUTION: Introduced at Bingen, Washington; native of Chile and Argentina.

120. *LYCURUS* H.B.K. Nov. Gen. & Sp. 1: 141. 1815.

Pleopogon Nutt. Jour. Acad. Phila. II. 1: 189. 1848. (Type species, *P. setosum*, which is *Lycurus phleoides*.)

Low perennial grasses, with dense spikelike panicles, the spikelets borne in pairs, the lower of the pair sterile, the short branchlets deciduous. Spikelets 1-flowered, the rachilla articulate above the glumes; glumes awned, the first usually 2-awned; lemma narrow, firm, longer than the glumes, terminating in a slender awn.

Type species, *L. phleoides* H.B.K.

Culms erect or decumbent at base; ligule 2–3 mm. long, distinctly visible from side view.

Culms decumbent-spreading; ligule short, not visible from side view.

1. *L. phleoides*.

2. *L. phalaroides*.

1. *Lycurus phleoides* H.B.K. Nov. Gen. & Sp. 1: 142. 1815.

Pleopogon setosum Nutt. Jour. Acad. Phila. II. 1: 189. 1848. (Type from Santa Fé, New Mexico, Gambel.)

Lycurus phleoides var. *glaucofolius* Beal, Grasses N. Am. 2: 271. 1896. (Specimens cited from Mexico and Texas.)

Plant more or less glaucous; culms densely tufted, compressed, erect or decumbent at base, several-noded, striate, scaberulous, especially about the nodes, 20–50 cm. tall; sheaths glabrous, keeled, shorter than the internodes; ligule acute, 2–3 mm. long; blades flat or folded, rather thick, scabrous on the upper surface and on the whitish margins, glabrous beneath, those of the