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United States Department of Agriculture,

DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

SOME ARIZONA GRASSES.

The material on which the following list of Arizona grasses is based was collected by Prof. David Griffiths and Director R. H. Forbes while pursuing their investigations of the forage conditions in Arizona, in cooperation between the Division of Agrostology and the Arizona Agricultural Experiment Station. Unless otherwise stated, the specimens cited below were collected by Professor Griffiths during the months of September and October, 1900.—F. LAMSON-SCRIBNER.

TRACHYPOGON SECUNDUS (Presl) Scribn. n. comb. (*Heteropogon secundus* Presl, Rel. Haenk. 335. 1830; *Trachypogon montufari* Nees Agrost. Bras. 342. 1829, not H. B. K. 1815; *Trachypogon polymorphus secundus* Hack. in DC. Monog. Phan. 6: 326. 1889.)

Dragoon Mountains, No. 1839; near Pearce, No. 1934.

Elionurus barbiculmis Hack. in DC. Monog. Phan. 6: 339. 1889.

Near Pearce, No. 1956.

ELIONURUS BARBICULMIS PARVIFLORUS Scribn. var. nov. Sessile spikelets about 5 mm. long, broader in proportion to its length and less acuminate-pointed than in the species, in which the sessile spikelet is 8-9 mm. long.

Dragoon Mountains, No. 1849.

Andropogon contortus L. Sp. Pl. 1045. 1753. (*Heteropogon contortus* R. & S. Syst. 2: 836. 1817; *H. hirtus* Pers.)

Dragoon Mountains, No. 1844; Vales, No. 1678; near Pearce, No. 1947.

The first glume of the pedicellate spikelet glabrous or sparingly tuberculate-pilose near the apex.

Andropogon hirtiflorus feensis (Fourn.) Hack. in DC. Monog. Phan. 6: 372. 1889. (*A. feensis* Fourn. Mex. Pl. 2: 62. 1881.)

Dragoon Mountains, No. 1851.

Andropogon torreyanus Steud. Nom. ed. 2, 1: 98. 1840. (*A. glaucus* Torr., not Muhl.; *A. saccharoides torreyanus* Hack. in DC. Monog. Phan. 6: 495. 1889.)

Papayo Reservation, without number.

Sessile spikelet 3-4 mm. long.

Andropogon leucopogon Nees, Linnæa, 19: 694. 1845. (*A. saccharoides leucopogon* Hack. in DC. Monog. Phan. 6: 496. 1889.)

Tombstone, No. 1982; Dragoon Mountains, No. 1854; Sulphur Spring Valley, No. 1639; Rincon Mountains, No. 1784.

Andropogon halepensis (L.) Brot. Fl. Lusit. 1: 89. 1804.

University grounds, Tucson, No. 1533.

Nazia aliena (Spreng.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 17: 28, fig. 324. 1899. (*Lappago aliena* Spreng. Neue Entd. 3: 15. 1822.) Western prickle-grass.

Near Pearce, No. 1952; Benson, No. 1832.

Nazia racemosa (L.) Kuntze, Rev. Gen. Pl. 3: 357. 1898. (*Cenchrus racemosus* L. Sp. Pl. 1049. 1753; *Lappago racemosa* Honck. Syn. 1: 440.) Prickle-grass.

University grounds, Tucson.

Hilaria jamesii (Torr.) Benth. Journ. Linn. Soc. 19: 62. 1881. (*Pleuraphis jamesii* Torr. Ann. Lyc. N. Y. 1: 148, t. 10. 1824.) Black bunch-grass.

Sulphur Spring Valley, No. 1647, R. H. Forbes.

Hilaria mutica (Buckl.) Benth. Journ. Linn. Soc. 19: 62. 1881. (*Pleuraphis mutica* Buckl. Proc. Acad. Nat. Sci. Phil. 1862: 95. 1862.) Black grama.

Benson, No. 1998; Vales, No. 1679. The margins of the outer glumes densely fringed with short silky hairs, prominent nerves of the broad outer glumes three, diverging above as in the type, which, however, has 5-7 nerves in the outer glumes.

Sulphur Spring Valley, No. 1647. In this specimen the outer glumes of the staminate spikelets are about 6 mm. long, oblong, obtuse or subacute; nerves 3-5, running nearly parallel. The shape of the glumes approaches those of *H. jamesii*, but the size of the spikelets and character of the pubescence at the base of the group are those of *H. mutica*.

Hilaria cenchroides H. B. K. Nov. Gen. et Sp. Pl. 1: 117, t. 37. 1815. Curly mesquite.

Tucson, No. 1534; Rincon Mountains, No. 1583; Cochise, No. 1883.

Paspalum distichum Linn. Amœn. Acad. 5: 391. 1759. Knot-grass.

Tucson, No. 610.

Eriochloa aristata Vasey, Bul. Torr. Bot. Club, 13: 229. 1886.

University grounds, Tucson, Nos. 1612, 1546. Not previously reported from the United States. Introduced from Mexico.

Eriochloa annulata (Flügge) Kunth, Rev. Gram. 1: 30. 1835. (*Paspalis annulatus* Flügge, Monog. 135. 1810; *Helopus annulatus* Nees, Agrost. Bras. 17. 1829—Doell in Mart. Fl. Bras. 2: 124, t. 19. 1871-1877.)

University grounds, Tucson, September 5, 1900, No. 1516.

This distinct and widely distributed species has not previously been reported from the United States, probably introduced. It is represented in the U. S. National Herbarium by specimens from Cuba, Australia, and India.

Eriochloa punctata (L.) W. Hamilt. Prodr. Pl. Ind. Occ. 5. 1825.

University grounds, Tucson, No. 1537; Benson, No. 2002.

Eriochloa punctata minor Vasey, Contr. U. S. Nat. Herb. 3: 21. 1892.

Sulphur Spring Valley, R. H. Forbes, October, 1900, No. 1641.

PANICUM ARIZONICUM Scribn. & Merrill sp. nov. (*Panicum* (sine nomine) Scribn. Bul. Torr. Bot. Club, 9: 76. 1882; *P. fasciculatum dissitiflorum* Vasey, in herb. Not *P. dissitiflorum* Steud. 1841.)

A tufted, nearly glabrous perennial (?) 3 to 6 dm. high, with narrowly lanceolate leaves, open panicles, and pubescent spikelets. Culms prostrate below and rooting at the lower nodes, glabrous except just below the panicle, as are the numerous branches; nodes glabrous. Sheaths shorter than the internodes, smooth, rather loose; ligule about 1 mm. long, ciliate; leaf-blades 8 to 15 cm. long, 5 to 8 mm. wide, cordate and clasping at the base, gradually tapering to the acuminate apex, thin, but firm, minutely serrulate-scabrous on the prominent, carti-

lacinous margins and with few scattered, stiff, papillate hairs on the margins and often on the midnerve beneath. Panicle at length exserted, 18 to 20 cm. long, the axis and the erect or ascending simple branches pilose with rather stiff, spreading hairs, the lower ones 5 to 8 cm. long, bearing the approximate but not crowded racemose spikelets in pairs (the upper ones solitary), one nearly sessile and often imperfectly developed, the other on a pedicel nearly its own length; pedicels pilose. Spikelets oblong or obovate, somewhat pointed, 3-3.5 mm. long, the three outer glumes pubescent with short, spreading hairs; first glume deltoid, obtuse, enclosing the base of, and about one-third as long as the spikelet, 5-nerved; second and third glumes prominently nerved, subequal, as long as the flowering glume, the second 7-nerved, the third 5-nerved, slightly reticulate-veined above; flowering glume about 3 mm. long, pointed and finely transversely rugose.

Type specimen collected on mesas near Camp Lowell, Santa Cruz Valley, Arizona, 465 C. G. Pringle, 1881.

Other specimens examined: *Arizona*: Tucson, 1596 D. Griffiths, September, 1900; Bowie, 29 J. W. Toumey, October 1, 1896; no locality, 353 J. G. Lemmon, 1882; sandy plains near the Mexican boundary, C. G. Pringle, August 29, 1884; along streams, Santa Catalina Mountain, 3062 J. G. Lemmon and wife, August, 1883. *New Mexico*: Mangos, O. Metcalfe, September 14, 1897. *Texas*: near Madeira Creek, Presidio Co., G. C. Nealley, September, 1892. *Mexico*: Guaymas, 159, 208 E. Palmer, 1887; no locality, 250 E. Palmer, 1897. *Lower California*: San Jose del Cabo, 18 T. S. Brandegee, September 4, 1890.

This species was described by Scribner,¹ without name, as "*Panicum (Virgaria)* allied to *P. fuscum* Sw.," but is certainly distinct from that, and from related species. In some respects it resembles *Panicum velutinosum* of Trin. Icon. 2: t. 180, but is distinct from the plant there described and also very distinct from *P. velutinosum* Nees, Agrost. Bras. 121. 1829, which is certainly different from the plant so considered by Trinius.

Panicum arizonicum is at once distinguished from related species by its panicle characters and especially by its pointed pubescent spikelets.

PANICUM ARIZONICUM TENUE Scribn. & Merrill var. nov.

A small, caespitose form 1.5 dm. high or less, with smaller leaves and panicles than in the species, the panicle branches 1 to 3 cm. long. Spikelets as in the species. Type specimen collected at Fort Huachuca, Arizona, by T. E. Wilcox in 1894. Other specimens examined: Mexican boundary line, south of Bisbee, Arizona, 1072 E. A. Mearns, October 9, 1892. *Texas*: El Paso, M. E. Jones, September 10, 1884.

PANICUM ARIZONICUM LÆVIGLUME Scribn. & Merrill var. nov.

A low, caespitose, much branched form, which differs from *Panicum arizonicum tenue* only in having glabrous spikelets, but which is clearly related to *Panicum arizonicum* rather than to *P. fuscum*.

Type specimen collected at Mescal, Arizona, 1810 David Griffiths, October, 1900. Other specimens examined: Cochise, 1810 Griffiths, October, 1900; Fort Huachuca, T. E. Wilcox, 1894; Johnson's Ranch, 11 miles east of San Pedro River, Mexican boundary, 1694 E. C. Merton, August 7, 1893.

PANICUM ARIZONICUM MAJOR (Vasey) Scribn. & Merrill n. comb. (*Panicum fuscum major* Vasey, U. S. Dept. Agr. Div. Bot. Bul. 8: 26. 1889).

A stout, erect form 6-9 dm. high, with larger leaves, which are scabrous-punctulate or nearly smooth, scabrous-punctulate sheaths, and larger, more branched panicles. Southwestern Chihuahua, Mexico, Dr. E. Palmer, August to November, 1885.

¹ Bul. Torr. Bot. Club, 9: 76. 1882.

The species in this group are much confused and no two botanists have interpreted them alike. The following notes on the several species may be of interest. *Panicum fuscum* Swartz is apparently the most common and widely distributed species in the group and is represented in the U. S. National Herbarium by specimens from Florida, Texas, New Mexico, Mexico, St. Croix, Porto Rico, Martinique, Honduras, and Costa Rica. It is distinguished by its ascending panicle branches, dark-brown, somewhat obtuse, glabrous spikelets, the outer glumes of which are prominently reticulate-veined. See Trin. Icon. **2**: t. 206. 1829. The plant figured by Trinius is doubtless *P. fasciculatum* Sw. which evidently is only a large form of *P. fuscum*.

PANICUM FUSCUM RETICULATUM (Torr.) Scribn. & Merrill n. comb. (*P. reticulatum* Torr. in Marcy's Explor. Red R. La. 299. 1853; *P. fasciculatum reticulatum* Beal, Grasses N. A. **2**: 117. 1896.)

Tucson, Nos. 1545, 1616; Papayo Reservation, No. 1754.

This variety is distinguished from the species only by its contracted panicles and should perhaps be considered only as a form of *Panicum fuscum* Sw. It is represented in the U. S. National Herbarium by specimens from Texas, Arizona, and Mexico.

Panicum grossarium Linn. Amœn. Acad. **5**: 392. 1759. (*Panicum adpersum* Trin. Gram. Panic. 146. 1826; Icon. **2**: t. 169, 1829.) This species is very distinct from *Panicum fuscum* Swartz, and is at once recognized by its larger, lanceolate leaves, 15-20 cm. long, 1.5-2 cm. wide, ciliate sheath margins, scabrous, not papillate rachis, and larger spikelets, which are 4 mm. long, prominently pointed, the outer glumes sparingly tuberculate-hispid, not reticulate-veined. It is well represented by the following specimens from Florida: St. Augustine, 176 T. H. Kearney, jr., July 24, 1895; 6705 A. H. Curtiss, August 3, 1900; Sanibel Island, 292 J. H. Simpson, March, 1891; Key West, 5431 Curtiss, June 22, 1895; Sand Key, Cape Sable, 3606 Curtiss, July 1880; no locality, A. W. Chapman. A small form of this species was also collected on ballast at Philadelphia, Pennsylvania, by F. Lamson-Scribner, September, 1881.

This is apparently a distinct species and is so considered by Grisebach, Fl. Brit. W. Ind. 546, although some of the Florida specimens referred to here are much larger than the plant he described.

Panicum carthaginense Swartz, Prodr. Veg. Ind. Occ. 22. 1788, is apparently represented by a specimen collected on ballast at Mobile, Alabama, by Dr. C. Mohr, September 16, 1891. This species is of doubtful value and should perhaps be considered as a synonym of *Panicum fuscum* Swartz or as a variety of that species.

Panicum capillare Linn. Sp. Pl. 86. 1753.

University grounds, Tucson, No. 1520; near Pearce, No. 1938; Cochise, No. 1918, a small form related to *Panicum barbipulvinatum* Nash.

Panicum cognatum Schultes, Mant. **2**: 235. 1824. (*P. divergens* Muhl. 1817, not H. B. K. 1815; *P. autumnale* Bosc. 1825.)

Benson, No. 1833; Dragoon Mountains, No. 1862.

Panicum colonum Linn. Syst. Nat. ed. 10, 870. 1759.

Papayo Reservation, No. 1655; University grounds, Tucson, Nos. 1518 and 1534, forms approaching *Panicum crus-galli* Linn.

Panicum crus-galli Linn. Sp. Pl. 56. 1753.

Benson, No. 1993; Papayo Reservation, No. 1671; Fairbank, No. 1970; Tucson, No. 1616. All these numbers represent the awnless form, which has been called var. *muticum* by various authors, although all are somewhat different from the European specimens and those of the eastern United States so referred.

Panicum hallii Vasey & Scribn. Bul. Torr. Bot. Club, **11**: 61. 1884. Mescal, No. 1813.

- Panicum obtusum** H. B. K. Nov. Gen. et Sp. Pl. 1:98. 1815.
Tucson, Nos. 1514, 1546; Benson, No. 2006; near Pearce, No. 1935; Sulphur Spring Valley, No. 1645 R. H. Forbes, October, 1900.
- Panicum sanguinale** Linn. Sp. Pl. 57. 1753. (*Syntherisma sanguinalis* Nash.)
University grounds, Tucson, No. 1517.
- Panicum saccharatum** Buckl. Prel. Rept. Geol. and Agrl. Surv. Tex. App. 2. 1866. (*P. lachnanthum* Torr. 1857, not Hochst. 1855.)
Near Pearce, No. 1942; Benson, No. 1997; Fort Lowell, No. 1572; Dragoon Mountains, No. 1871; Rincon Mountains, No. 1782.
- Chaetochloa composita** (H. B. K.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 4:39. 1897—Scribn. & Merrill, *ibid.* Bul. 21:27. 1900. (*Setaria composita* H. B. K.)
Benson, No. 2003; Tucson, No. 1511, small form.
- Chaetochloa grisebachii** (Fourn.) Scribn. l. c.—Scribn. & Merrill, l. c. 35. (*Setaria grisebachii* Fourn.)
Common in sandy soil, Sulphur Spring Valley, Wilcox to Cochise, No. 1901.
- Chaetochloa macrostachya** (H. B. K.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21:29. 1900. (*Setaria macrostachya* H. B. K.)
Near Pearce, No. 1944.
- Chaetochloa viridis** (Linn.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 4:39. 1897. (*Panicum viride* Linn.; *Setaria viridis* Beauv.)
University grounds, Tucson, No. 1526.
- Cenchrus montanus** Nees in Royle, Ill. Bot. Himal. 416. 1839.
University grounds, Tucson, No. 1530. Introduced from Asia.
- Cenchrus tribuloides** Linn. Sp. Pl. 1050. 1753.
Fort Lowell, No. 1560.
- Aristida æquiramea** Scheele, Linnæa, 22:343. 1849.
Cochise, No. 1880.
- Aristida æquiramea* Scheele has been variously referred to *A. purpurea* Nutt., *A. fendleriana* Steud., *A. longiseta* Steud., and *A. fasciculata* Torr., but is a very distinct species. It is most closely related to *Aristida purpurea* Nutt., but is readily distinguished by its usually larger size, larger spikelets, shorter empty glumes, and especially by its very strongly tuberculate-hispid flowering glumes. No. 1880 Griffiths, cited above, differs from typical *A. æquiramea* in having nearly awnless empty glumes.
- Aristida americana** Linn. Amœn. Acad. 5:393. 1760. (*Aristida fasciculata* Torr. Ann. Lyc. N. Y. 1:154. 1824; *Aristida dispersa* Trin. & Rupr. Agrost. 3:129. 1842.)
University grounds, Tucson, No. 1528.
From a careful study of the synonymy of this species, it is evident that *Aristida americana* Linn. is the correct name for this species.
- ARISTIDA AMERICANA BROMOIDES** (H. B. K.) Scribn. & Merrill, n. comb. (*Aristida bromoides* H. B. K. Nov. Gen. et Sp. Pl. 1:122. 1815.)
Benson, No. 1835; Rincon Mountains, No. 1808; Pearce, No. 1926; Sulphur Spring Valley, 1632 R. H. Forbes, October, 1900.
This is the common, low, cæspitose form of the species, and scarcely worthy of specific rank.
- Aristida divaricata** Humb. & Bonpl. in Willd. Enum. 99. 1809.
Mescal, No. 1816.
- Aristida divergens** Vasey, Contr. U. S. Nat. Herb. 3:48. 1892. (*A. schiediana minor* Vasey.)
Dragoon Mountains, No. 1872; near Pearce, No. 1838.

- Aristida havardii** Vasey, Bul. Torr. Bot. Club, **13** : 27. 1886.
Cochise, No. 1885.
- Aristida schiediana** Trin. & Rupr. Agrost. **3** : 120. 1842.
Dragoon Mountains, No. 1866.
- Muhlenbergia gracillima** Torr. Pac. R. R. Rept. **4**⁵ : 155. 1857.
Rincon Mountains, No. 1805; Mescal, No. 1811; Dragoon Mountains, No. 1857.
- Muhlenbergia porteri** Scribn. in Beal, Grasses N. A. **2** : 259. 1896. (*M. texana*
Thurb. in Coult. Man. Bot. Rocky Mt. Reg. 410. 1885. Not Buckley. 1862.)
Vales, No. 1872; Tucson, No. 1602. A form with unusually large panicles.
- Muhlenbergia vaseyana** Scribn. Rept. Mo. Bot. Gard. **10** : 52. 1899. (*M. distichophylla* of American authors. Not Kunth.)
Dragoon Mountains, No. 1876; near Pearce, No. 1857 (small form).
- Lycurus phleoides** H. B. K. Nov. Gen. et Sp. Pl. **1** : 142. 1815.
Pearce, No. 1959; Dragoon Mountains, No. 1838.
- Sporobolus airoides** Torr. Pac. R. R. Rept. **7**³ : 21. 1856.
Sulphur Spring Valley, No. 1638 R. H. Forbes, October, 1900; Benson, No. 2005;
Tucson, No. 1502; Wilcox, No. 1904, abundant about an alkali lake bottom, a
valuable grass, called "fine saccaton."
- Sporobolus argutus** (Nees) Kunth, Enum. **1** : 215. 1833. (*Vilfa arguta* Nees
Agrost. Bras. 395. 1829.)
Benson, No. 1490; Wilcox, sandy ground, No. 1896.
- Sporobolus auriculatus** Vasey, Contr. U. S. Nat. Herb. **3** : 64. 1892. (*S. asperifolius brevifolius* Vasey, *ibid.* **1** : 56. 1890. Not *S. brevifolius* Nees.)
Dragoon Mountains, No. 1864. A peculiar form with nearly all the spikelets
2-flowered.
- Sporobolus confusus** (Fourn.) Vasey, Bul. Torr. Bot. Club, **15** : 293. 1888. (*Vilfa confusa* Fourn. Mex. Pl. **2** : 101. 1881.)
Dragoon Mountains, No. 1846.
- Sporobolus cryptandrus** (Torr.) A. Gray, Man. Bot. 576. 1848. (*Agrostis cryptandra* Torr. Ann. Lyc. N. Y. **1** : 151. 1824.)
Fairbank, No. 1981; Fort Lowell, No. 1581; Sulphur Spring Valley, No. 1636 R. H.
Forbes, September, 1900.
- SPOROBOLUS STRICTUS** (Scribn.) n. comb. (*Sporobolus cryptandrus stricta*
Scribn. Bul. Torr. Bot. Club, **9** : 103. 1882.)
Benson, No. 2004; University grounds, Tucson, No. 1532; Rincon Mountains, No.
1796; Wilcox, No. 1893.
This form is readily distinguished from *Sporobolus cryptandrus* A. Gray, by its strict,
erect, densely flowered, wand-like panicles, the lower portion of which is
enclosed in the inflated leaf-sheath.
- Sporobolus wrightii** Munro in Scribn. Bul. Torr. Bot. Club, **9** : 103. 1882.
Sulphur Spring Valley, No. 1637 R. H. Forbes, October, 1900.
- Sporobolus utilis** Torr. Pac. R. R. Rept. **5**² : 365. 1857. (*Vilfa saccatilla* Fourn.
Mex. Pl. **2** : 101. 1881; *Sporobolus saccatilla* Griseb. l. c.)
Sulphur Spring Valley, R. H. Forbes, No. 1635.
- Epicampes rigens** Benth. Journ. Linn. Soc. **19** : 88. 1881. (*Cinna macroura* Thurb.
1880. Not Kunth. 1835.)
Dragoon Mountains, No. 1848. Forms large tussocks and is invariably closely
cropped by stock.
- Polypogon monspeliensis** (Linn.) Desf. Fl. Atl. **1** : 67. 1798. (*Alopecurus monspeliensis* Linn. Sp. Pl. 89. 1753.)
Tucson, No. 1619.

Cynodon dactylon (L.) Pers. Syn. 1 : 85. 1805. (*Panicum dactylon* Linn. Sp. Pl. 85. 1753; *Capriola dactylon* O. Kuntze, Rev. Gen. Pl. 2 : 764. 1891.)
University grounds, Tucson, No. 1520.

Chloris elegans H. B. K. Nov. Gen. et Sp. Pl. 1 : 166, t. 49. 1815. (*Chloris alba* Presl, Rel. Haenk. 1 : 289. 1830.)

Cochise, No. 1923; near Pearce, No. 1929; University grounds, Tucson, No. 1521; Mescal, No. 1826; Dragoon Mountains, No. 1852; Sulphur Spring Valley, No. 1643 R. H. Forbes, October, 1900.

Chloropsis mendozina (Phil.) Kuntze, Rev. Gen. Pl. 3² : 348. 1898. (*Chloris? mendozina* Phil. Anal. Univ. Chile, 36 : 208. 1870; *Chloropsis blanchardiana* J. Gay in herb. Paris; *Trichloris blanchardiana* Scribn. Bul. Torr. Bot. Club, 9 : 146. 1882; *Trichloris fasciculata* Fourn. Mex. Pl. 2 : 142. 1881; *Trichloris verticillata* Vasey, U. S. Dept. Agr. Div. Bot. Bul. 12² : 25, pl. 25. 1891; *Chloropsis fasciculata* O. Kuntze, Rev. Gen. Pl. 2 : 771. 1891; *Chloropsis blanchardiana* O. Kuntze, l. c.; *Trichloris mendocina* Kurtz, Mem. Facult. Ci. Univ. Cordoba, 1896 : 37. 1897; *Leptochloris greggii* Munro in herb.)

Benson, No. 1969.

NOTE—Kuntze¹ has the following note regarding this genus: “*Trichlora* und *-is* sind nicht nebeneinander zulässig, sodass das synonym von Hackel giltig wird. Hackel schrieb: bei den “Gärtnern” als *Chloropsis* oder *Chloridopsis* (ein unpublicirten name) bekannt. Durand ind. schreibt, *Chloridopsis* “Gaertn.” sodass man den botaniker namens Gaertner damit verstehen müsste.”

Chloropsis Hack. 1887. “Hort.” in Engler & Prantl, Nat. Pfl. 2² : 59. 1887, as synonym; *Chloridopsis* Hack. l. c., as synonym; *Trichloris* Fourn. Mex. Pl. 2 : 142. 1881. Not *Trichlora* Baker. 1877.

Kuntze is, however, evidently wrong in his conception of species in this genus, as he recognizes six, holding *Chloropsis fasciculata*, *C. blanchardiana*, and *C. mendozina* as distinct species, although they are identical. There are apparently two well-marked species in this genus, *Chloropsis mendozina* (Phil.) O. Kuntze and *C. pluriflora* (Fourn.) O. Kuntze (*Trichloris pluriflora* Fourn.), both of which grow in North and South America. For an admirable discussion of the species in this genus see F. Kurtz, Col. Fl. Arg. 46–50. 1900 (reprint from Bol. Acad. Nac. Cordoba 16. 1900).

Bouteloua aristidoides (H. B. K.) Griseb. Fl. Brit. W. Ind. 537. 1864. (*Dinebra aristidoides* H. B. K. Nov. Gen. et Sp. Pl. 1 : 171. 1815.)

Mescal, No. 1818; University grounds, Tucson, No. 1527; near Pearce, No. 1928; Cochise, No. 1922.

Bouteloua bromoides (H. B. K.) Lag. Gen. et Sp. Nov. 5. 1816. (*Dinebra bromoides* H. B. K. Nov. Gen. et Sp. Pl. 1 : 172, t. 51. 1815.)

Rincon Mountains, No. 1670; near Pearce, No. 1949.

Bouteloua curtispindula (Michx.) Torr. in Emory, Notes Mil. Recon. 153. 1848. (*Chloris curtispindula* Michx. 1803; *Bouteloua racemosa* Lag. 1805.)

Benson, No. 1834; Dragoon Mountains, No. 1837; Cochise, No. 1907.

Bouteloua eriopoda Torr. Pac. R. R. Rept. 4⁵ : 155. 1857.

Mescal, No. 1825; Rincon Mountains, No. 1669.

Bouteloua havardi Vasey, Proc. Am. Acad. 18 : 179. 1883.

Mescal, No. 1829.

Bouteloua hirsuta Lag. Varied. Cienc. Lit. Art. 2 : 141. 1805.

Dragoon Mountains, No. 1865; near Pearce, No. 1948; Rincon Mountains, No. 1809.

¹ Rev. Gen. Pl. 2 : 771. 1891.

BOUTELLOUA MICRANTHA Scribn. & Merrill sp. nov.

A very slender, erect, caespitose, glabrous perennial 7-9 dm. high, with sparingly branched culms, which are geniculate below, 6-10 very slender, erect or ascending, densely flowered spikes 2-2.5 cm. long, and very small spikelets. Sheaths shorter than the internodes, glabrous; ligule a ciliate fringe about 2 mm. long; leaf-blades 5-8 cm. long, about 3 mm. wide, with few long papillate hairs on the margins and often on the upper surface. Panicle 1.5-2 dm. long, the spikes about equaling or the upper ones exceeding the internodes, common rachis smooth. Pedicel of the spikes about 2 mm. long, minutely short-pubescent; the rachis flattened, scabrous on the margins. Spikelets crowded in two rows, secund, purplish, 2-2.5 mm. long; empty glumes unequal, the first hyaline, lacerate at the apex, about 1 mm. long, the second firm, purplish, ovate, pubescent, with few short, stiff hairs, cleft at the apex, the midnerve prominent, excurrent as a stout awn 0.5 mm. in length; flowering glume about 2 mm. long, pilose with rather long, ascending hairs below and on the margins, smooth above, three-cleft, three-awned, the awns from the cleft less than 1 mm. long, scarcely exceeding the lobes of the glume, the two middle lobes broad, obtuse, the lateral ones very narrow, acute. Palea equaling the glume, 4-toothed, the teeth ciliate. Awns 2, very short. Sterile rudiment on a pedicel about 0.5 mm. long, with a tuft of few short hairs at the apex, consisting of three glumes and three awns which are somewhat longer than those of the flowering glume.

Type specimen collected at Fort Lowell, Arizona. David Griffiths, September 1900, No. 1556. No. 244 of E. Palmer's Mexican collection for 1897 is the same.

This species has been confused with *Bouteloua polystachya* and *B. microstachya*, but is strikingly different from those species in habit of growth. It is perhaps most closely related to *Bouteloua rothrockii*, but is distinguished by its very slender habit, smaller, narrower spikes, much smaller spikelets, and shorter awns.

Bouteloua oligostachya (Nutt.) Torr. in A. Gray, Man. Bot. ed. 2, 553. 1856. (*Atheropogon oligostachyus* Nutt. Gen. 1 : 78. 1818.)

Wilcox, No. 1905; near Pearce, No. 1980; University grounds, Tucson, No. 1552; Dragoon Mountains, No. 1863; Sulphur Spring Valley, R. H. Forbes, No. 1640.

Bouteloua polystachya (Benth.) Torr. Pac. R. R. Rept. 4⁵ : 366, t. 10. 1847. (*Chondrosium polystachyum* Benth. Bot. Voy. Sulph. 56. 1841.)

Wilcox, No. 1897, abundant on sandy ground; Benson, No. 2009; University grounds, Tucson, No. 1524; Sulphur Spring Valley, R. H. Forbes, No. 1646; Rincon Mountains, No. 1785.

Bouteloua vestita (S. Wats.) Scribn. Contr. U. S. Nat. Herb. 2 : 531. 1894. (*B. polystachya vestita* S. Wats. Proc. Am. Acad. 18 : 177. 1883.)

Mescal, No. 1819; Pearce, No. 1927.

Dactyloctenium ægyptium (Linn.) Willd. Enum. 1029. 1809.

University grounds, Tucson, No. 1515.

Leptochloa dubia (H. B. K.) Nees, Syllog. Ratisb. 1 : 4. 1824. (*Chloris dubia* H. B. K. Nov. Gen. et Sp. Pl. 1 : 169. 1815; *Diplachne dubia* Scribn. Bul. Torr. Bot. Club, 10 : 30. 1883.)

Cochise, No. 181; near Pearce, No. 1943; University grounds, Tucson, No. 1539, a young plant.

Leptochloa fascicularis (Lam.) A. Gray, Man. Bot. 588. 1848. (*Festuca fascicularis* Lam. Tabl. Encycl. 1 : 189. 1791; *Diplachne fascicularis* Beauv. Agrost. 160. 1812.)

Fairbank, No. 1971.

Leptochloa mucronata (Michx.) Kunth, Rev. Gram. 1 : 91. 1835. (*Eleusine mucronata* Michx. Fl. Bor. Am. 1 : 65. 1803.)

University grounds, Tucson, No. 1513.

Leptochloa mucronata pulchella Scribn. Bul. Torr. Bot. Club, **9** : 147. 1882. Benson, No. 1989. This variety is the small tufted form and extends from Mississippi to Arizona and Mexico. From the specimens in the U. S. National Herbarium it is evident that its small size is due to habitat.

LEPTOCHLOA PILOSA Scribn. sp. nov.

A caespitose, rigid, somewhat purplish perennial about 3.5 dm. high, with papillate-bispid sheaths and terminal panicles of many slender, spreading spikes 3-6 cm. long. Culms glabrous, somewhat branched below; sheaths usually exceeding the internodes, rather loose, pilose with long, weak, spreading hairs, each from a dark-colored glandular papilla; ligule a lacerate fringe about 2 mm. long; leaf-blades 5-12 cm. long, 4-6 mm. wide, rigid, ascending, acute, subauriculate at the base, often somewhat involute, and with few scattered papillate hairs on the upper surface, glabrous beneath. Spikelets about 2 mm. long, 2- to 3-flowered; empty glumes subequal, acute; flowering glumes obscurely emarginate, not mucronate, about 1.5 mm. long.

Type specimen collected in sandy soil, Dappan, Travis Co., Texas, 294 J. E. Bodin, September, 1891.

No. 1603 Griffiths, Tucson, Arizona, September, 1900, is apparently the same, differing only in its shorter leaves and panicle branches.

This species is closely related to *Leptochloa mucronata*, but is at once distinguished by its rigid leaves and papillate-pilose sheaths.

Leptochloa pringlei Beal, Grasses N. A. **2** : 426. 1896. (*Diplachne pringlei* Vasey, l. c.) Dragoon Mountains, No. 1850; Rincon Mountains, No. 1801.

Leptochloa viscida (Scribn.) Beal, Grasses N. A. **2** : 434. 1896. (*Diplachne viscida* Scribn. Bul. Torr. Bot. Club, **10** : 30. 1883.)

Benson, No. 1988; No. 1968, from the same locality, is a lax form of this species.

Pappophorum wrightii S. Wats. Proc. Am. Acad. **18** : 128. 1883. (*P. boreale* Torr. Pac. R. R. Rept. **4**⁵ : 155. 1857. Not Griseb. 1853.)

Mescal, No. 1827; Rincon Mountains, No. 1673; Vales, No. 1668; University grounds, Tucson, No. 1525; Cochise; No. 1908; Pearce, No. 1925.

Pappophorum vaginatum Buckl. Prel. Rept. Geol. and Agr. Surv. Texas, App. 1. 1866. (*P. apertum* Munro in Scribn. Bul. Torr. Bot. Club, **9** : 148. 1882.)

Fairbank, No. 1969; University grounds, Tucson, No. 1538.

As Buckley's name is the earliest one published for this species it is here taken up, as both Buckley's and Munro's species were based on the same plant, No. 803 C. Wright, Texas, 1849.¹ At the time the description of *P. apertum* was published it was supposed that *P. vaginatum* was only an herbarium name, although it had been published many years before. On account of its very obscure publication it was not listed in Index Kewensis.

Cottea pappophoroides Kunth, Rev. Gram. **1** : 281, t. 52. 1835.

Near Pearce, No. 1939.

Arundo donax Linn. Sp. Pl. 81. 1753.

No label; probably University grounds, Tucson.

Triodia mutica (Torr.) Scribn. Bul. Torr. Bot. Club, **10** : 30. 1883. (*Tricuspis mutica* Torr. Pac. R. R. Rept. **4** : 156. 1857.)

Tombstone, No. 1976; Mescal, No. 1812, frequent on gravelly banks.

TRIODIA PILOSA (Buckl.) n. comb. (*Uratepis (Tricuspis) pilosa* Buckl. Proc. Acad. Nat. Sci. Phil. **1862** : 94. 1862; *Tricuspis acuminata* Munro in A. Gray, l. c., 335; *Sieglingia acuminata* O. Kuntze, Rev. Gen. Pl. **2** : 789. 1891; *Sieglingia pilosa* Nash in Britt. & Br. Illus. Fl. **3** : 504. 1898.)

Tombstone, No. 1975.

¹ Scribn. Bul. Torr. Bot. Club, **9** : 148. 1882.

