
JOURNAL
OF THE
ARNOLD ARBORETUM

VOL. XXIV

OCTOBER, 1943

NUMBER 4

PLANTS OF COAHUILA, EASTERN CHIHUAHUA, AND
ADJOINING ZACATECAS AND DURANGO, II

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TYPHACEAE

Typha truxillensis H.B.K. Nov. Gen. et Sp. 1: 68 (1815).

CHIHUAHUA: 3 mi. west of Camargo, *White*.

Widely distributed in our area along the rivers and elsewhere about permanent water.

NAIADACEAE

Naias guadalupensis (Spreng.) Morong, Mem. Torr. Bot. Cl. 3: 60 (1893).

COAHUILA: Monclova, in the river, *White* 1768. CHIHUAHUA: 3 mi. west of Camargo, *White* 2279.

A submerged aquatic, widely distributed in America.

POTAMOGETONACEAE

Zannichellia palustris L. Sp. Pl. 969 (1753).

COAHUILA: Monclova, *Marsh* 1688.

An aquatic of saline waters, world-wide in distribution.

Ruppia maritima L. Sp. Pl. 127 (1753).

COAHUILA: Laguna de Jaco, washed up on the beach, *Stewart & Johnston* 1978.

A nearly cosmopolitan species, usually in saline waters.

Potamogeton pectinatus L. Sp. Pl. 127 (1753).

Collected in ponds in the Rio Grande bottoms, near San Elizario (*Wright* 1895).

Widely distributed over the world in brackish waters.

Potamogeton illinoensis Morong, Bot. Gaz. 5: 50 (1880).

COAHUILA: Monclova, *Marsh* 1672, det. by E. C. Ogden.

Widely distributed in the United States and ranging south to Central America.

Potamogeton nodosus Poir. in Lam. Encyc. Suppl. 4: 535 (1816).

CHIHUAHUA: Sierra Hechiceros, Rancho Encampanada, along creek, *Stewart* 196; Ojo Caliente, Oct. 16, 1852, *Thurber* 823.

An aquatic, nearly world-wide in distribution.

ALISMACEAE

Echinodorus cordifolius (L.) Gris. Abh. K. Ges. Wiss. Goettingen **7**: 257 (1857).

COAHUILA: Torreón, periodically flooded land, 1898, *Palmer* 466. CHIHUAHUA: Guadalupe, about pond, Oct. 11, 1852, *Thurber* 805.

Lophotocarpus calycinus (Engelm.) J. G. Smith, Lophot. U. S. 3 (Sept. 1899).

COAHUILA: Hermanas, *Marsh* 2260.

Eastern United States west to South Dakota and New Mexico, and south in Coahuila.

Lophotocarpus fluitans (Engelm.) J. G. Smith, Lophot. U. S. 1 (Sept. 1899).

The type of this species, of southern New Mexico and trans-Pecos Texas, was collected by Wright (nos. 1899 and 679) in ponds in the bottom-land of the Rio Grande near San Elizario, Texas.

Sagittaria longiloba Engelm. ex Torr. Bot. Mex. Bound. 212 (1859).

This species has been repeatedly collected in the wet bottom-lands along the Rio Grande between El Paso and old Fort Quitman, Texas. It ranges from central United States south into Mexico. The type came from near San Elizario, Texas.

GRAMINEAE

Bromus Schaffneri (Fourn.) Scribn. & Merr. U. S. Dept. Agric., Div. Agrost. Bull. **24**: 30 (Jan. 1901); Scribn. Bull. Torr. Bot. Cl. **28**: 246 (April, 1901).

COAHUILA: Saltillo, 1898, *Palmer* 5, 266; Parras, May 15, 1847, *Gregg*. ZACATECAS: Valley 15 km. west of Concepcion del Oro, *Stanford et al.* 556.

A common, chiefly ruderal species of central Mexico. Collections have been generally identified as *B. laciniatus* Beal, but that is a montane plant obviously distinct from the weedy species concerned here.

Bromus sp.

CHIHUAHUA: Sierra Organos, 1937, *LeSueur* 211 in pt.

The collection is similar to the plant of Arizona and New Mexico referred to *B. carinatus*.

Bromus sp.

COAHUILA: Mesa Grande, 40 km. northwest of Hac. Encantada, common in meadows, *Stewart* 1633; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1439.

Similar to the plants of the Chisos and Davis Mountains of Texas passing as *B. marginatus* and *B. polyanthus*.

Bromus anomalus Rupr. ex Fourn. Mex. Pl. **2**: 126 (1886).

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh* 628; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1309; trail between Encantada Mesa and Fresno Mesa, July 20, 1938, *Marsh* 1399; Sierra Gloria, *Marsh* 1945, 1947; Carneros Pass area, July 1880, *Palmer* 1372; Sierra del Pino, La Noria, in shaded arroyo and damp meadow, *Johnston & Muller* 497, *Stewart* 1213; Sierra Madera, Cañon Charretera, rocky arroyo in oak belt, *Johnston* 8926. CHIHUAHUA: Sierra Organos, 1937, *LeSueur* 211 in pt.

Widely distributed in western United States and south to southern Mexico. A very variable species, particularly in the amounts and distribution of indument. The material from the Sierra del Pino and the Sierra

Madera represents a hairy robust form with broad leaves and a large drooping panicle.

Brachypodium mexicanum (R. & S.) Link, Hort. Berol. **1**: 41 (1833).

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh 613*; Sierras Negras, 9 km. south of Parras, *Stanford et al. 230*.

Coahuila and Nuevo Leon south to Central America. A very variable species with forms differing greatly in appearance, apparently even in a single locality. The cited collections have very narrow leaves and short-awned lemmas.

Festuca ligulata Swallen, Am. Jour. Bot. **19**: 436 (1932).

COAHUILA: Mountains 24 km. northwest of Fraile, *Stanford et al. 405*.

A coarser, densely tufted plant, with the spikelets larger than in the type of the species from the Guadalupe Mts., Texas, but apparently better referred to *F. ligulata* than to the more northern *F. Thurberi*.

Poa sp.

COAHUILA: Parras, March 1905, *Purpus 1112*; Sierra de Parras, April 1905, *Purpus 1146*; Sierras Negras, 9 km. south of Parras, *Stanford et al. 167*. ZACATECAS: 15 km. west of Concepcion del Oro, *Stanford et al. 477*.

I am unable to name this species. The collection from the Sierras Negras has been identified as *P. involuta* Hitchc.

Poa sp.

COAHUILA: 6 mi. east of Saltillo, 1880, *Palmer 1366*.

The cited specimen has been identified as *P. Ruprechtii* Peyr.

Poa Bigelovii Vasey & Scribn. Descr. Cat. Grasses U. S. 81 (1885).

COAHUILA: Saltillo, 1905, *Palmer 532*.

Oklahoma and western Texas to southern California and south into northern Mexico. The species has been repeatedly collected about El Paso, Texas, and is to be expected in adjacent northern Chihuahua.

Poa annua L. Sp. Pl. 68 (1753).

COAHUILA: Saltillo, 1905, *Palmer 711*; Saltillo, 1898, *Palmer 6*; Saltillo, *Gregg*. CHIHUAHUA: Chihuahua, 1908, *Palmer 28*.

A European grass, widely established in the United States and Mexico.

Eragrostis obtusiflora Scribn. U. S. Dept. Agric., Div. Agrost. Bull. **8**: 10. *t. 5* (1897).

CHIHUAHUA: Margin of Laguna de Santa Maria, April 20, 1852, *Wright 193* (ISOTYPE); near Laguna Santa Maria, 1899, *Nelson 6413*.

Known only from saline soils in northwestern Chihuahua, southwestern New Mexico, and southeastern Arizona. It much resembles *Distichlis stricta* in general habit.

Eragrostis curtipedicellata Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 97 (1863).

COAHUILA: Don Martin Dam, *Harvey 932*.

Kansas and New Mexico to Texas and northeastern Coahuila.

Eragrostis reptans (Michx.) Nees, Agrost. Bras. 514 (1829).

COAHUILA: Don Martin Dam, mud flats, *Harvey 927, 928*.

Kentucky to South Dakota and Texas, south into northeastern Mexico.

Eragrostis megastachya (Koel.) Link, Hort. Berol. **1**: 187 (1827).

COAHUILA: Near Don Martin Dam, *Harvey* 948; Sabinas, *Nelson* 6823 (US); Saltillo, 1898, *Palmer* 389; valley-floor east of Puerto Caballo, near bushes by ephemeral charco, *Johnston* 8330; Sierra Cruces, 4 mi. west of Santa Elena, black loam on flats, *Stewart* 828; north of Sierra Cruces, west of San Rafael, on sabaneta, *Johnston & Muller* 1038; 7 mi. south of Jaco, about mogote, *Johnston & Muller* 1110. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, slopes, *Stewart* 2399; Pirámide, under oak tree on gravelly flat, *Johnston* 8119; 10 mi. southeast of Organos, under bushes at foot of grassy slope, *Stewart & Johnston* 2036A; Cañon del Coyote, 20 km. northwest of Santa Fe, in mogote, *Stewart* 2607; Chihuahua, *LeSueur* 83, 122; 20 km. south of Camargo, arroyo, *Harvey* 1377. DURANGO: Tlahualilo, barren hills, *Pittier* 475 (US).

A European weed, widely introduced in America. Where I have seen this plant in Coahuila and Chihuahua, however, it behaves like an indigenous species, associating with indutable native species and growing with them in remote undisturbed places where a single introduced species is certainly not to be expected.

Eragrostis diffusa Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 97 (1863).

COAHUILA: Saltillo, 1898, *Palmer* 811, 812; 7 mi. south of Jaco, about a mogote, *Johnston & Muller* 1109; Torreon, low ground along the Rio Nazas, 1898, *Palmer* 510. CHIHUAHUA: Pirámide, moist rocky soil, *Johnston* 8137; Ojo Almagre, Sierra Almagre, wet sand in canyon, *Johnston & Muller* 1214; Chihuahua, *Pringle* 416, *LeSueur* 78; 3 mi. north of Charca Piedra, under bushes on silty plain, *Johnston* 7929; Camargo, banks of the Rio Conchos, *Harvey* 1404; 50 km. west of Camargo, *Harvey* 1414; Jimenez, banks of the Rio Florido, *Harvey* 1313.

Central Texas to Arizona and south into northern Mexico.

Eragrostis sp.

COAHUILA: Saltillo, 1898, *Palmer* 376; Sierra del Pino, La Noria, meadows and open hillsides, *Stewart* 1205. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, slopes, *Stewart* 2400; canyon west of Organos, damp gravelly arroyo, *Stewart & Johnston* 2081.

Closely related to *E. diffusa* and perhaps only a form of it, differing in its dense elongate inflorescence. The branches of the panicle are very short and strict and bear crowded strictly ascending spikelets. In typical *E. diffusa* the panicle is open, with elongate spreading branches. I have seen the plant from Coahuila, Chihuahua, trans-Pecos Texas, and New Mexico.

Eragrostis mexicana (Hornem.) Link, Hort. Berol. **1**: 190 (1827).

COAHUILA: Monclova, 1939, *Marsh* 1834; Saltillo, 1898, *Palmer* 409—412; Saltillo, 1905, *Palmer* 710; San Lorenzo Canyon, 6 mi. southeast of Saltillo, about old goat pen in canyon, 1904, *Palmer* 398; Chojo Grande, 27 mi. southeast of Saltillo, 1904, *Palmer* 334, 335; Parras, 1880, *Palmer* 1367.

Texas to Arizona and south through Mexico to South America.

Eragrostis neomexicana Vasey, Contr. U. S. Nat. Herb. **2**: 542 (1894).

COAHUILA: Sierra del Carmen, El Jardin del Sur, Sept. 3, 1936, *Marsh* 766.

Western Texas to Arizona.

Eragrostis caudata Fourn. Mex. Pl. **2**: 115 (1881).

Eragrostis Palmeri Wats. Proc. Am. Acad. **18**: 182 (1883).

Eragrostis erosa Scribn. ex Beal, Grasses No. Am. **2**: 483 (1896).

COAHUILA: Villa Juarez, 1880, *Palmer* 1368 (type of *E. Palmeri*); Sierra del Pino, La Noria, arroyo banks, *Johnston & Muller* 664; Sierra Cruces, 5 mi. south of Santa

Elena, rocky flat among bushes, *Johnston & Muller* 1378; western base of Picacho del Fuste, brushy rocky slope, *Johnston* 8413; Sierra Madera, Cañon Charretera, edge of thickets on rocky flat, *Johnston* 9062; west end of Sierra Fragua, Aguaje Pajarito, rocky ridge, *Johnston* 8676; high rocky west ridge of Sierra Fragua, north of Puerto Colorado, *Johnston* 8760; Sierras Negras, 9 km. south of Parras, *Stanford et al.* 135. CHIHUAHUA: Sierra Santa Eulalia, Oct. 1885, *Pringle* 415 (isotype of *E. erosa*).

Southern and western Texas south into Chihuahua, Coahuila, and northern Tamaulipas. An isotype of *E. caudata* (from Matamores) at the Gray Herbarium is evidently conspecific with the type of *E. Palmeri*. From isotypic material of *E. erosa* they differ only in their slightly smaller spikelets.

Eragrostis intermedia Hitchc. Jour. Wash. Acad. **23**: 450 (1933).

COAHUILA: Allende, *Marsh* 2237; Sierra del Carmen, Sept. 2, 1936, *Marsh* 800; Santo Domingo, igneous hill, *Wynd & Mueller* 476; Palm Canyon near Muzquiz, *Marsh* 979; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1452; between south end of Hillcoat Mesa and Buena Vista headquarters, July 27, 1938, *Marsh* 1510; Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 200; Saltillo, 1909, *Arsène*; Saltillo, 1898, *Palmer* 408; Sierra del Pino, La Noria, hillsides and along arroyo, *Johnston & Muller* 498, *Stewart* 1203.

Central Texas west to Arizona and south into northern Mexico. A densely tufted perennial with tall erect culms. Habitally very similar to *E. caudata* but differing in having hairy nodes in the panicle, spreading spikelets, and a more open usually proportionately broader inflorescence. Some of the collections from northeastern Coahuila have rather small spikelets and approach *E. lugens* Nees, a widely distributed species in tropical America, which extends northward through Mexico to eastern Texas.

Monanthochloë littoralis Engelm. Trans. Acad. Sci. St. Louis **1**: 437 (1859).

COAHUILA: 4 mi. west of Cuatro Cienegas, common in strongly saline and gypseous soil on flat, *Johnston* 7129.

This species has been known only from salt marshes about the Gulf of Mexico and along the Pacific coast of Mexico and adjacent United States. The material from Cuatro Cienegas is sterile, but in all vegetative details it agrees with material from coastal salt marshes. The plant grows only a few centimeters high, from well-developed scaly rhizomes, and covers small areas of very saline gypsiferous soil.

Distichlis texana (Vasey) Scribn. U. S. Dept. Agric., Div. Agrost. Cir. **16**: 2 (1899).

COAHUILA: Torreon, large masses on sandy banks of Rio Nazas, 18–24 inches high, with runners rooting at the nodes, Oct. 1898, *Palmer* 507.

A coarse grass with long trailing stolons, growing in sandy places. The species has been collected near the Rio Grande at Presidio and Castolon, Texas, and hence it may be expected in northern Coahuila and northeastern Chihuahua.

Distichlis stricta (Torr.) Rydb. Bull. Torr. Bot. Cl. **32**: 602 (1905).

COAHUILA: Cuatro Cienegas, saline soil, *Johnston* 7125, *Harvey* 1234, *Marsh* 2080; Laguna de Jaco, salt flats at south end of lake, *Johnston & Muller* 1089. CHIHUAHUA: Laguna de Santa Maria, 1899, *Nelson* 6416.

A salt grass widely distributed over western United States and Mexico. It has been collected at many stations along the Rio Grande.

Arundo Donax L. Sp. Pl. 81 (1753).

VERNACULAR NAME: Carrizo.

COAHUILA: Palm Canyon, near Muzquiz, *Marsh* 975; Monclova, 1880, *Palmer* 1345; Monclova, *Harvey* 1132.

Texas to California and southward. A plant of the Old World, now widely established in the warmer parts of America. Well established along the Rio Grande and elsewhere about ponds and streams in our area.

Phragmites communis Trin. Fund. Agrost. 134 (1820).

Collected along the Texan bank of the Rio Grande and hence to be expected in northern Coahuila and Chihuahua. Widely distributed in the warmer parts of the world.

Melica montezumae Piper, Proc. Biol. Soc. Wash. **18**: 144 (1905).

Melica alba Hitchc. Contr. U. S. Nat. Herb. **17**: 367 (1913).

COAHUILA: San Lorenzo Canyon, 6 mi. southeast of Saltillo, 1905, *Palmer* 551; Sierra Mojada, April 19, 1892, *Jones* 482 (US). CHIHUAHUA: Sierra Santa Eulalia, shaded places, April 6, 1885, *Pringle* 430 (ISOTYPE); Chihuahua, *Wilkinson* (US).

Edwards Plateau and Big Bend, Texas, south into our area. Piper and Hitchcock independently named this species, basing their names on the same group of specimens and indicating the same collections as the type. The species has been taken to be endemic to our area, but Mr. W. S. Boyle, who is monographing the genus, has properly indicated, through his identification of the Gray Herbarium material, that the species is also present in Texas.

Melica nitens Nutt. ex Piper, Bull. Torr. Bot. Cl. **32**: 387 (1905).

COAHUILA: Along arroyo south and west of Sierra Azul, Buena Vista Ranch, July 8, 1938, *Marsh* 1230, 1260.

Eastern United States west to Kansas and Arizona and south through eastern Coahuila to Nuevo Leon.

Triodia pulchella H.B.K. Nov. Gen. et Sp. **1**: 155 (1816).

VERNACULAR NAMES: Zacate borreguerro; Zacate pelillo; Zacatito.

COAHUILA: Sierra del Carmen, Aug. 29, 1936, *Marsh* 692; between Santo Domingo and Piedra Blanca, open country, *Wynd & Mueller* 496; Cuatro Cienegas, *Marsh* 2050; Puerto del Norte, Cuatro Cienegas, *Harvey* 1204; near Sacramento, gravelly wash, *Johnston* 7085; Saltillo, 1898, *Palmer* 257, 413; 10 mi. east of Fraile, stony bahada, *Johnston* 7307; near Santa Elena, eastern foothills of Sierra Cruces, gravelly flat, *Stewart* 840; Puerto Ventanillas, south of Las Delicias, limestone slope, *Stewart* 2967; Parras, 1880, *Palmer* 1359. CHIHUAHUA: Laguna Santa Maria, *Nelson* 6414; Chihuahua, *LeSueur* 11; 20 mi. south of Camargo, *Harvey* 1399. DURANGO: Torreon, rocky hills, *Hitchcock* 7547 (US); Tlahualilo, barren hills, *Pittier* 480; Cerro San Ignacio, *Purpus* 4616 (US). ZACATECAS: Concepcion del Oro, very common, 1904, *Palmer* 263; valley 15 km. west of Concepcion del Oro, *Stanford et al.* 560; Cedros, footslopes and hills, *Lloyd* 89 (US).

Western Texas to southern Nevada and southern California, south to central Mexico. A common but unobtrusive widely distributed, almost ubiquitous, grass among the desert scrub on dry slopes and in desert valleys. A capable xerophyte that flowers throughout the summer and appears to remain unaffected by long droughts. Although it is frequently locally abundant, horses and cattle ignore it if any other food is available. During

long dry spells the plants appear to become shaggy-white-villous. The shaggy indument disappears after a rain and is apparently composed of myriads of hair-like water-soluble crystals which are products of transpiration.

Triodia pilosa (Buckl.) Merr. U. S. Dept. Agric., Div. Agrost. Cir. **32**: 9 (1901).

COAHUILA: Don Martin Dam, *Harvey* 933; calcareous soil near Piedras Negras, *Pringle* 8306; Puerto Santa Anna, *Marsh* 942; Yerda Spring, *Marsh* 296; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1448; Cañon Espantosa, Sierra San Vicente, *Schroeder* 136.

Kansas and Texas to Nevada and Arizona, south into northeastern Mexico.

Triodia avenacea H.B.K. Nov. Gen. et Sp. **1**: 156 (1816).

COAHUILA: 3 km. southwest of Fraile, in arroyo, *Stanford et al.* 331. ZACATECAS: Concepcion del Oro, stony mesa, 1904, *Palmer* 280; valley 15 km. west of Concepcion del Oro, *Stanford et al.* 561.

Northern Zacatecas and Nuevo Leon southward to central Mexico. A low spreading plant, with stolons.

Triodia grandiflora Vasey, Contr. U. S. Nat. Herb. **1**: 59 (1890).

Triodia Nealleyi Vasey, U. S. Dept. Agric., Div. Bot. Bull. **12**²: t. 36 (1891).

COAHUILA: Saltillo, 1898, stony hillside, *Palmer* 414, 813; Saltillo, 1905, *Palmer* 735; base of mountains 3 mi. southeast of Saltillo, *Johnston* 7252; La Rosa, limestone hills, *Shreve & Tinkham* 9575; hills 20 mi. west of Saltillo, *Shreve & Tinkham* 9824; Sierra Guajes, Cañon Madera, east of Buena Vista, hillside, *Stewart* 1505; Sierra del Pino, rocky crest of ridge west of La Noria, *Johnston & Muller* 602; western base of Picacho del Fuste, rocky slope, *Johnston* 8441; Sierra Madera, Cañon Charretera, ledge on sunny hillside, *Johnston* 9102; San Antonio de los Alamos, top of tuff cliffs, *Johnston* 8253; Sierra Cruces, Cañon Tinaja Blanca, crest of sierras, *Johnston & Muller* 297; eastern foothills of Sierra Cruces, north of Santa Elena, rocky flats, *Johnston & Muller* 1384; west of Santa Elena, sunny hillside, *Stewart* 827. CHIHUAHUA: Sierra Virulento, rocky slope, *Johnston* 8093A; Sierra Santa Eulalia, Aug. 12, 1885, *Pringle* 406. ZACATECAS: Concepcion del Oro, 1904, *Palmer* 265.

Although I am following Hitchcock in delimiting this species, I am convinced that it is an aggregate containing several undifferentiated species. Typical *T. grandiflora* is a plant with the habit of *T. pilosa*, having usually pale well-developed spikelets with acute or subulate lemma-lobes. *Triodia Nealleyi* is a species more closely related to *T. avenacea* and has a spicate crowded inflorescence, in which the individual spikelets are less obvious, smaller, usually reddish, and the lemma-lobes elongate-spreading and obtuse. Both of these forms are present in our area. Plants from Chihuahua and Arizona are distinguishable, but are unnamed. Certain plants from the Sierra Guajes, Sierra del Pino, and Sierra Madera are also separable, but without a name. The aggregate of forms here included ranges from western Texas to Arizona and south in eastern Mexico to Hidalgo and Oaxaca.

Triodia texana Wats. Proc. Am. Acad. **18**: 180 (1883).

COAHUILA: Rio Grande Valley near Piedras Negras, *Pringle* 9019; Allende, *Marsh* 1798; 11 mi. south of Allende, tree-lined arroyo, *Johnston* 7017; Yerda Spring, *Marsh* 286; Monclova, 1880, *Palmer* 1371; near Rancho Teresa, south of Castaños, moist place in desert, *Wynd & Mueller* 178.

Central and southern Texas and northeastern Mexico.

Triodia albescens Vasey, U. S. Dept. Agric., Div. Bot. Bull. **12**²: t. 33 (1891).

COAHUILA: Rio Grande Valley near Piedras Negras, *Pringle* 9023; 21 mi. south of Sabinas, *Johnston* 7041.

Texas and Kansas to Colorado and New Mexico, south into northeastern Coahuila.

Triodia mutica (Torr.) Scribn. Bull. Torr. Bot. Cl. **10**: 30 (1883).

COAHUILA: Sierra del Carmen, Sept. 13, 1936, *Marsh* 908; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 2270; 2 mi. northwest of Fronteras, road to Natadores, silty *Larrea* desert, *Johnston* 7174; near Sacramento, silty bajada, *Johnston* 7091; Santa Teresa, south of Castaños, *Wynd & Mueller* 196; 3 mi. east of Cuatro Cienegas, rocky bajada, *Johnston* 7110; between Hac. La Rosa and Hac. Lechuguilla, dry desert, *Wynd & Mueller* 62; 14 mi. east of Paila, *Shreve & Tinkham* 9891; hills 20 mi. west of Saltillo, *Shreve & Tinkham* 9820; mountains west of Saltillo, 1880, *Palmer* 2020; foothills of the Sierra Cruces north of Santa Elena, stony flats among brush, *Johnston & Muller* 1016, 1377; western base of the Picacho del Fuste, bushy rocky flat, *Johnston* 8414. CHIHUAHUA: Sierra Santa Eulalia, dry calcareous soil, *Pringle* 405; arroyo 20 km. south of Camargo, *Harvey* 1376. DURANGO: Tlahualilo, barren hills, *Pittier* 468 (US).

Texas to Arizona and south into northern Mexico.

Blepharidachne Bigelovii (Wats.) Hack. in DC. Monogr. Phan. **6**: 261 (1889).

COAHUILA: Several miles west of Buenavista, on road between San Antonio de los Alamos and Puerto Caballo, banks of gypsiferous shales, small clumps 1–3 inches broad, pale, frequent, leaves very pungent, *Johnston* 8309; south of Laguna de Leche, confined to gypsiferous shales, rigid, erect, local, leaves pungent, *Johnston* 8615; northern foothills of the Sierra Cruces, about 10 mi. north of Santa Elena, gypsiferous shales, local, *Johnston* 9411; east base of Picacho de San José, gypsiferous shales, *Johnston* 9401. TEXAS: Rustler Springs, Culberson Co., 1928, *Cory* 1238; rocky hills near Frontera, north of El Paso, in small compact bunches, May 4, 1852, *Wright* 2028 (TYPE); rocky hills near Frontera, May 4, 1852, *Bigelow*; Frontera, July 1852, *Parry*.

Known only from the collections cited. Where I have seen the plant it was confined to thin gypsum seams in Upper Cretaceous shales. Since gypsum is present in the areas in Texas where it has been collected, the probabilities are that the species is gypsophilous. The plant forms very strict stiff tufts less than a decimeter tall. The pale rigid leaves have a pungent tip. Because of its distinctive appearance it is readily recognizable, even in the sterile state.

Cottea pappophoroides Kunth, Rév. Gram. **1**: 84 (1829).

COAHUILA: Sierra Hechiceros, Cañon Indio Felipe, sides of dry arroyo, *Stewart* 175; gypsum beds in the valley between La Vibora and Matrimonio Viejo, *Johnston* 9340; 16 mi. south of Laguna del Rey, gypsum plain, *Johnston* 7816; Rancho Las Uvas, Valle Acatita, frequent on gypsum flats, *Stewart* 2695. CHIHUAHUA: Chihuahua, rocky hills near Millers Dam, Sept. 12, 1885, *Pringle* 420; 20 km. south of Camargo, *Harvey* 1395. DURANGO: Torreon, rocky hill, *Hitchcock* 7543 (US).

Southern and western Texas to Arizona and south to southern Mexico; also in South America. The type came from Peru. Although obviously not confined to gypsum, the species frequently occurs on gypsum in Coahuila, and where I have seen it, it is locally confined to that substratum. On gypsum the plants form a very dense caudex of stem-bases and cleisto-

genes that becomes 3–7 cm. in diameter, although supporting only a relatively few leafy stems. Plants from other substrata develop very loose caudices or none at all. I can detect no other differences between these plants.

Pappophorum Wrightii Wats. Proc. Am. Acad. **18**: 178 (1883).

COAHUILA: Mt. Carmel Canyon, Rio Grande, *Parry*; Saltillo, in graveyard, 1898, *Palmer* 395; near Rosario, about mogote, *Johnston* 8823; 42 mi. west of Saltillo, *Shreve & Tinkham* 9838; San Antonio de los Alamos, summit of tuff cliffs, gravelly flat, *Johnston* 8256; valley between La Vibora and Matrimonio Viejo, margin of gypsum beds, *Johnston* 9351; Parras, 1880, *Palmer* 1361; Castillon, on gypsum flat, *Johnston & Muller* 1269; north of Sierra Cruces, sabaneta west of San Rafael, *Johnston & Muller* 1039; gypsum ridge east of Laguna de Jaco, *Stewart & Johnston* 1965. CHIHUAHUA: Pirámide, gravelly flat under liveoak, *Johnston* 8116; San José del Progreso, south end of Sierra Seca, gypsum flats, *Stewart* 2324; Charco de Grado, Oct. 1852, *Thurber* 825; Chihuahua, *LeSueur* 45; Jimenez, banks of the Rio Florido, *Harvey* 1329; 6 mi. west of Piloncillo, lava hillside, *Johnston* 7876.

Central Texas to Arizona and south to Oaxaca; western South America. As with *Cottea*, this grass, although not restricted to gypsum, is encountered most frequently about gypsum beds and usually in greater abundance there than on other substrata.

Pappophorum mucronulatum Nees, Agrost. Bras. 412 (1829).

COAHUILA: Cuatro Cienegas, *Marsh* 2048; west of Puerto de las Monjas, mouth of arroyo, *Johnston* 8641; Saltillo, dry ground near irrigated field, *Hitchcock* 450; Saltillo, common in graveyard, 1898, *Palmer* 377; near La Rosa, *Shreve & Tinkham* 9904; Parras, 1880, *Palmer* 1360.

Texas to Arizona and northern Mexico.

Pappophorum bicolor Fourn. Mex. Pl. **2**: 133 (1886).

COAHUILA: Don Martin Dam, *Harvey* 939; 21 mi. south of Sabinas, bank of arroyo, *Johnston* 7047; Hermanas, *Marsh* 1591; Monclova, 1880, *Palmer* 1362; near Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 203; hills 20 mi. west of Saltillo, *Shreve & Tinkham* 9834; on plain 1 mi. south of Ocampo, in mogote, *Johnston* 8885; 7 mi. south of Jaco, near mogote, *Johnston & Muller* 1107.

Texas to Arizona and south into northeastern Mexico.

Scleropogon brevifolius Phil. Ann. Univ. Chile **36**: 206 (1870).

VERNACULAR NAMES: Colo del Zorro; Zacate del Burro.

COAHUILA: Sierra del Carmen, Sept. 13, 1936, *Marsh* 898; Muzquiz, *Marsh* 1118; Saltillo, colonies in depressions on mesas, 1898, *Palmer* 386; Chojo Grande, 27 mi. southeast of Saltillo, level places on mesas, 1904, *Palmer* 340; Parras, Oct. 1910, *Palmer* 5005. CHIHUAHUA: Candelaria, *Stearns* 254 (US); Villa Ahumada, *LeSueur* 72; Santa Eulalia Plains, 1885, *Wilkinson* (US); 15 km. south of Camargo, *Harvey* 1401, 1402. ZACATECAS: Cedros, *Lloyd* 169 (US).

Western Texas to Colorado and Arizona and south to southern Mexico; Argentina. A common and characteristic grass of the silty valley soils in Coahuila, especially of the flat area where some run-off temporarily accumulates during rains. Frequently associated with tobosa (*Hilaria mutica*) and common about the margin of well-developed tobosa flats. The sabanetas of Coahuila, level grassy places of varying size scattered in the desert scrub on the gentle slopes of the major valleys or in the broad open canyons, are usually dominated by this grass. The plant spreads by rhizomes and

large areas may be covered by a pure colony of the plant. The awns are usually stramineous but occasional plants have the awns pink and so permit an observer to determine the extent of an individual plant in the colony. I have noted plants covering three or four square meters and so dominating its particular area that adjoining plants of the species scarcely transgress upon it. The plants are extremely prolific and during the summer the female plants are a mass of fruiting inflorescences; although useless as animal food, they are an attractive element in the desert scene.

Agropyron sp.

COAHUILA: Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1304; Sierra Gloria, *Marsh* 1949.

The cited specimens belong to the group of *A. arizonicum* and *A. spicatum*, but differ from them in their large, elongate, attenuate, awn-tipped glumes.

Elymus canadensis L. Sp. Pl. 83 (1753).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 529; Sierra del Carmen, Aug. 9, 1936, *Marsh* 635; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1440; Saltillo, in orchard, 1898, *Palmer* 260; Saltillo, frequent, July 16, 1848, *Gregg* 263. CHIHUAHUA: 5 km. west of Camargo, *Harvey* 1406.

Widely distributed in the United States, extending south into Chihuahua, Coahuila, and Nuevo Leon.

Sitanion Hystrix (Nutt.) J. G. Smith, U. S. Dept. Agric., Div. Agrost. Bull. **18**: 15 (1899).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 788; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1312; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1436; north end of Carneros Pass, infrequent, tufts among cacti, spikes nodding, *Johnston* 7290. ZACATECAS: 15 km. west of Concepcion del Oro, 18–30 inches tall, *Stanford et al.* 555.

Western United States and adjacent Mexico; south along the eastern Sierra Madre to central Mexico.

Koeleria cristata (L.) Pers. Syn. Pl. **1**: 97 (1905).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 539; Sierra del Carmen, Aug. 26, 1936, *Marsh* 631; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1315; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1445; Sierra Gloria, *Marsh* 1902, 1944.

Widely distributed in the United States; in Mexico extending south in the mountains to Central America.

Sphenopholis obtusata (Michx.) Scribn. *Rhodora* **8**: 144 (1906).

COAHUILA: Rio Grande Valley at Piedras Negras, April 17, 1900, *Pringle* 8285.

Widely distributed in the United States and south to southern Mexico.

Trisetum deyeuxioides (H.B.K.) Kunth, *Rév. Gram.* 102 (1829).

Hitchcock, *Contr. U. S. Nat. Herb.* **17**: 325 (1913), reports a collection of Pringle (no. 1432) from wet banks of a stream in the Mapula Mts. In his published diaries Pringle mentions collecting the species in the Mapula Mts. on Oct. 30, 1886. The species is known from the mountains of Chihuahua and south to southern Mexico.

Avena fatua L. Sp. Pl. 80 (1753).

COAHUILA: Saltillo, old field, April 1898, *Palmer* 8.

A European weed, widely introduced in the United States and Mexico.

Danthonia mexicana Scribn. Proc. Acad. Nat. Sci. Phila. **1891**: 301 (1891).

COAHUILA: West base of Picacho del Fuste, coarse tufts on limestone ledges on north slope, *Johnston* 8382; Carneros Pass, limestone ledges, Sept. 20, 1890, *Pringle* 3279 (ISOTYPE); Sierra de Parras, April 1905, *Purpus* 1125 in pt.

A rare species, known only from the stations cited above, and from Tehuacan, Puebla.

Agrostis semiverticillata (Forsk.) C. Chr. Dansk. Bot. Arkiv **43**: 12 (1922).

COAHUILA: Muzquiz, Sabinas River, 1936, *Marsh* 410; Muzquiz, 1938, *Marsh* 1157, 1169; Hermanas, 1939, *Marsh* 1621; Monclova, 1939, *Marsh* 1697; Saltillo, 1905, *Palmer* 527; Saltillo, 1898, *Palmer* 806; San Juan de la Vaqueria, May 25, 1847, *Gregg* 711; Parras, 1880, *Palmer* 2019; Parras, Feb. 1905, *Purpus* 1111. CHIHUAHUA: Chihuahua, low meadows, 1908, *Palmer* 29; Chihuahua, wet river bank in shade, 1908, *Palmer* 160; 2 km. west of Jimenez, *Harvey* 1315.

A species of the Old World, now widely distributed in wet soils in the warmer parts of America.

Agrostis exarata Trin. Gram. Unifl. 207 (1824).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 547.

From Alaska south through western United States into northern Mexico.

Agrostis hiemalis (Walp.) B.S.P. Prelim. Cat. N. Y. 68 (1888).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 544.

Boreal North America south into the mountains of northern Mexico.

Polypogon monspeliensis (L.) Desf. Fl. Atlant. **1**: 67 (1798).

CHIHUAHUA: 2 km. west of Jimenez, *Harvey* 1317.

A European weed, widely distributed in the United States and northern Mexico.

Polypogon elongatus H.B.K. Nov. Gen. et Sp. **1**: 134 (1815).

COAHUILA: Saltillo, along water in ditch, in garden, 1898, *Palmer* 2. CHIHUAHUA: Presa de Chihuahua, 1936, *LeSueur* 150.

Wet soils from southern Arizona south through Mexico, reaching South America.

Lycurus phleoides H.B.K. Nov. Gen. et Sp. **1**: 142. t. 45 (1815).

Lycurus phleoides var. *glaucifolius* Beal, Grasses No. Am. **2**: 271 (1896).

COAHUILA: Sierra del Carmen, Aug. 14, 1936, *Marsh* 658; limestone hill near Santo Domingo, *Wynd & Mueller* 454; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1274, 1285; Mesa Grande, 40 km. northwest of Hac. Encantada, meadows, *Stewart* 1631; base of mountains 3 mi. southeast of Saltillo, *Johnston* 7250; Chojo Grande, 27 mi. southeast of Saltillo, bunches in sandy gravel in canyon, 1904, *Palmer* 339; Sierra del Pino, La Noria, flats and meadows, *Johnston & Muller* 460, *Stewart* 1210; west base of Picacho del Fuste, banks of cemented gravels, *Johnston* 8444; Sierra Cruces, Cañon Tinaja Blanca, rocky slopes on crest at head of canyon, *Stewart* 1950; San Antonio de los Alamos, gravelly flats above cliffs, *Johnston* 8252a. CHIHUAHUA: rocky hills near Chihuahua, May 28, 1885, *Pringle* 426 (isotype of var. *glaucifolius*); Chihuahua, 1935, *LeSueur* 76. ZACATECAS: Valley 15 km. west of Concepcion del Oro, *Stanford et al.* 476.

Ranging from Oklahoma and western Texas west to Arizona and south

in Mexico to Guanajuato (the type locality), Hidalgo, and Puebla. The species is frequent on rocky soils in our area.

Hitchcock, Contr. U. S. Nat. Herb. **17**: 305 (1913), reports *L. phalaroides* H.B.K. from Cedros, Zac. (Lloyd 179). The report needs verification. Perhaps a slender specimen of *L. phleoides* is involved.

Muhlenbergia biloba Hitchc. Contr. U. S. Nat. Herb. **17**: 294 (1913).

Bealia mexicana Scribn. in Hack. True Grasses 103 (1890).

CHIHUAHUA: Hills northwest of Chihuahua, Oct. 7, 1886, *Pringle 819* (ISOTYPE).

Known from a few stations in Baja California, Chihuahua, and Durango.

Muhlenbergia texana Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 91 (1863).

CHIHUAHUA: Volcanic hills 20 km. north of Chihuahua, open canyon, in gravel of stream-bed, *Stewart & Johnston 2139*; hills northeast of Chihuahua, wet ledges, Oct. 7, 1885, *Pringle 399*; rocky hills northwest of Chihuahua, gravel bars of stream, Oct. 21, 1885, *Pringle 400*.

Trans-Pecos Texas to Arizona and south along the Sierra Madre, in Chihuahua and Sonora, to Durango.

Muhlenbergia crispiseta Hitchc. No. Am. Fl. **17**: 440 (1935).

CHIHUAHUA: Mapula Mts., thin soil of summits, Nov. 11, 1886, *Pringle 824*.

Known from a few collections in San Luis Potosi and the mountains of Chihuahua.

Muhlenbergia implicata (H.B.K.) Kunth, Rév. Gram. **1**: 63 (1829).

CHIHUAHUA: Portrero Peak, east of Mapula station, rocky banks of stream, Oct. 12, 1886, *Pringle 818*.

North through Mexico to Hidalgo, Durango, and Chihuahua.

Muhlenbergia depauperata Scribn. Bot. Gaz. **9**: 187 (1884).

COAHUILA: Along seepage on limestone ledges at top of escarpment at west side of Potrero de la Mula, locally abundant, depressed, *Johnston 9250*. CHIHUAHUA: Pirámide, shaded crevices at base of large rock-masses, *Johnston 8122*; Sierra Santa Eulalia, thin dry soil of ledges, 1885, *Pringle 404*.

Trans-Pecos Texas to Arizona and south to Central Mexico.

Muhlenbergia arenacea (Buckl.) Hitchc. Proc. Biol. Soc. Wash. **41**: 161 (1928).

COAHUILA: Sierra del Carmen, Sept. 13, 1936, *Marsh 907*; northeastern foothills of the Sierra Cruces, 5 mi. south of San Rafael, silty flat in arroyo, *Johnston & Muller 1032*; 3 mi. east of San José, silty flats, *Johnston 8217*. CHIHUAHUA: 50 km. north of Jimenez, in arroyo, *Harvey 1375*. ZACATECAS: Valley 15 km. west of Concepcion del Oro, *Stanford et al. 517*.

Western Texas and adjacent New Mexico south into our area.

Muhlenbergia asperifolia (Nees & Meyen) Parodi, Rev. Fac. Agron. Buenos Aires **6**: 117 (1928).

DURANGO: Mapimi, dense masses in bottom of damp arroyo, 1898, *Palmer 554*.

Western United States south into northern Mexico; also in southern South America. The species has been collected along the Rio Grande near El Paso and is to be expected in northern Chihuahua.

Muhlenbergia glauca (Nees) Mez, Rep. Sp. Nov. **17**: 214 (1921).

COAHUILA: Sierra de la Paila, Oct. 1910, *Purpus 5006*; Sierra Madera, Cañon Charretera, gravelly bed of arroyo, one plant, *Johnston 8906*; Sierra del Pino, La Noria,

shaded arroyo-bank, gravelly soil, *Johnston & Muller* 466. CHIHUAHUA: Rocky hills northeast of Chihuahua, cold wet ledges, Sept. 28, 1885, *Pringle* 395.

Trans-Pecos Texas to Arizona and south to central Mexico.

Muhlenbergia Emersleyi Vasey, Contr. U. S. Nat. Herb. **3**: 66 (1892).

COAHUILA: Sierra del Carmen, Aug. 9-26, 1936, *Marsh* 624, 655; trail from southern extremity of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh* 1511; Sierra Madera, Cañon Charretera, bed of arroyo and on rocky flats, *Johnston* 8950, 9072; Sierra Gloria, *Marsh* 1948; San Lorenzo Canyon, 6 mi. southeast of Saltillo, high on canyon side, 1904, *Palmer* 401; Sierra del Pino, La Noria, *Stewart* 1208, *Johnston & Muller* 462, 587. CHIHUAHUA: Encampanada, Sierra Hechiceros, sunny open slopes, *Stewart* 202; Pirámide, sheltered crevices about base of rock-masses, *Johnston* 8118; Organos, rocky open canyon, *Stewart & Johnston* 2066.

Trans-Pecos Texas to Arizona and south to Durango and Hidalgo. A species of the oak-belt, forming coarse clumps in rocky soil, commonly at the edges of thickets or on sheltered arroyo-banks. The material from eastern Coahuila has a denser stiffer plumbeous, rather than pinkish, panicle, and shorter awns than typical *M. Emersleyi*. This aberrant eastern material, well exemplified by *Palmer* 401, may deserve nomenclatural recognition.

Muhlenbergia lanata (H.B.K.) Hitchc. No. Am. Fl. **17**: 459 (1935).

CHIHUAHUA: Rocky hills northeast of Chihuahua, cool slopes, Oct. 10, 1885, *Pringle* 391.

Known from scattered stations in Chihuahua, and from San Luis Potosi to Puebla.

Muhlenbergia abata sp. nov.

Planta perennis gracilis humilis e rhizomatibus gracilibus oriens; caulibus numerosissimis gracilibus stricte ramosis saepe 1-3 dm. longis rigidulis laxe decumbentibus vel procumbentibus; vaginis quam internodiis $\frac{1}{4}$ brevioribus vel eis non raro subaequilongis, maturitate solum partem infra medium internodii culmi amplexantibus, margine scabridulis; ligula ad 1 mm. longa apice rotundata basi decurrente; lamina rigidula plus minusve curvata, 3-6 cm. longa, 1-2 mm. lata, saepe arcte involuta, subtus glabra supra minute scabridula; paniculis scabridulis 2-4 cm. longis paucifloris interruptis angustis subspicatis infra medium brevissime stricteque pauciramosis; spiculis ca. 3 mm. longis strictis acutis elongatis 0.3-5 mm. longe pedicellatis; glumis subaequilongis hyalinis pallidis obscure uninervatis acutis 1.8-2 mm. longis; lemmatibus plumbeis obscurissime nervatis elongatis, supra medium sparse minuteque scabridulis, alibi glabris, apice acutis vel breviter sed distincte rostratis.

TEXAS: Big Springs, 1902, *Tracy* 8218; San Elizario, in field, Sept. 26, 1849, *Wright* 746. NEW MEXICO: Cook's Spring, northern Luna Co., Nov. 3, 1887, *Bigelow*; Ft. Bayard Watershed, Grant Co., 1905, *Blumer* 1781; Mangas Springs, 18 mi. northwest of Silver City, Grant Co., *Metcalfe* 774; valley of the Rio Grande 10-100 mi. above El Paso, *Wright* 1982 (TYPE, Gray Herb.). CHIHUAHUA: Chihuahua, Oct. 1935, *LeSueur* 50. SONORA: El Bilito, northeast of El Tigre, Bavispe Area, *Santos* 2134. SAN LUIS POTOSI: 14 mi. northwest of Cedral, dense pure colony in depression near road on desert plain, 1938, *Johnston* 7609; valley of San Luis Potosi, 1876, *Schaffner* 1025 in pt.

This is the species accepted as *M. repens* by Hitchcock, No. Am. Fl. **17**: 451 (1935) and Man. Grasses U. S. 362. fig. 737 (1935). As discussed

under the following species, the name "*M. repens*" properly applies to the plant which Hitchcock called *M. utilis*. From the true *M. repens* (that is, *M. utilis*), the present plant differs in its distinctly larger spikelets, scabrid lemmas and pedicels, looser paler acute glumes more than half as long as the lemma, somewhat larger ligule, and coarser stems and leaves. It ranges in western Texas and southern New Mexico south through Chihuahua to San Luis Potosi.

Muhlenbergia repens (Presl) Hitchc. in Jepson, Fl. Calif. **1**: 111 (1912).

Sporobolus repens Presl, Rel. Haenk. **1**: 241 (1830).

Vilfa utilis Torr. Pac. R. R. Rep. **5**¹: 365 (1857).

Muhlenbergia utilis (Torr.) Hitchc. Jour. Wash. Acad. **23**: 453 (1933).

Vilfa sacatilla Fourn. Mex. Pl. **2**: 101 (1886).

COAHUILA: Parras, May 16, 1847, *Gregg*; Parras, thick masses on alkali bottom, 1898, *Palmer* 452. CHIHUAHUA: Valley of the Sacramento near Chihuahua, by stream, Nov. 6, 1885, *Pringle* 418.

Central Texas, southern California (where probably introduced), Durango, San Luis Potosi, and central Mexico. Hitchcock has treated this plant as *M. utilis*, cf. No. Am. Fl. **17**: 451 (1935) and Man. Grasses U. S. 362. fig. 738 (1935), and applied the name *M. repens* to the plant I have called *M. abata*. The original description of *Sporobolus repens* Presl, and Scribner's illustration, Ann. Mo. Bot. Gard. **10**: 53. t. 30 (1899), of the isotype of Presl's species at St. Louis leave little doubt as to the precise identity of the species. It is obviously one of the forms of *M. utilis* found in central and southern Mexico.

Muhlenbergia montana (Nutt.) Hitchc. Bull. U. S. Dept. Agric. **772**: 145, 147 (1920).

CHIHUAHUA: High summits of the Sierra Santa Eulalia, 1885, *Pringle* 392.

Western United States south into Chihuahua and Sonora.

Muhlenbergia Porteri Scribn. in Beal, Grasses No. Am. **2**: 259 (1896).

COAHUILA: Don Martin Dam, *Harvey* 946; 2 mi. northwest of Frontera, road to Natadores, silty *Larrea* desert, culms numerous, tangled, spreading, *Johnston* 7172; eastern margin of Llano de Guaje, near La Pistola, forming tangled masses supported by bushes in mogote, *Johnston & Muller* 357, 764; San Antonio de los Alamos, one colony at base of tuff cliffs, *Johnston* 8265; 4 mi. west of Lag. de Leche, sprawling or vining in protection of shrubs, scattered on shrubby desert hillside, *Muller* 3285; Torreon, large masses at base of bushes, 1898, *Palmer* 511. CHIHUAHUA: Presidio del Norte [Ojinaga], July 1852, *Parry*; Juarez, dry mesa, Sept. 26, 1902, *Pringle* 11233; Chihuahua, hills and plains, *Pringle* 478 (US); Parral-Chihuahua road, 10 km. north of Rio San Pedro, *Harvey* 1430.

Texas and Colorado to California and south into northern Mexico. A common grass in silty valley soils, usually growing in the shelter of bushes. The globose entangled masses of stems, 3–4 dm. in diameter and supported by the shrubbery a meter or more above the ground, are very characteristic features of the mogotes in Coahuila. The plant, when covered with its very abundant open airy purplish panicles, is conspicuous and attractive.

Muhlenbergia arizonica Scribn. Bull. Torr. Bot. Cl. **15**: 8 (1888).

CHIHUAHUA: Rocky hills northeast of Chihuahua, thin dry soil, Sept. 16, 1885, *Pringle* 402.

Arizona southward in the mountains of Sonora and Chihuahua to Sinaloa and Durango.

Muhlenbergia arenicola Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 91 (1863).

COAHUILA: Western base of Picacho del Fuste, silty places on slopes, tufted, not common, *Johnston* 8422; tableland north of Cañon del Cuervo Chico, common on wide grassy valley, *Johnston* 8538; between Palos Blancos and San Pedro, east of Cuesta Zozaya, common on grassy valley on tableland, *Johnston* 9273, 9275; foot slopes at mouth of Cañon Santa Cruz, 20 km. south of Ocampo, *Johnston* 9174; 10 mi. east of Fraile, silty place at edge of bahada, *Johnston* 7304; north of Sierra Cruces, about mogote 5 mi. west of San Rafael, *Johnston & Muller* 1042; gypsum ridge east of Laguna Jaco, fairly common, *Stewart & Johnston* 1962; eastern foothills of Sierra Cruces, 8 mi. north of Santa Elena, stony flat, *Johnston & Muller* 1024; 3 mi. east of San José, silty flat about mogote, *Johnston* 8219; San Antonio de los Alamos, flat at summit of tuff cliffs, frequent, *Johnston* 8258; 10–15 km. east of San Antonio de los Alamos, sabaneta, in broad valley, *Johnston* 8288. CHIHUAHUA: 1 mi. east of Pozo de Villa on Coahuilan boundary, silty plain, *Johnston* 8180; 2 mi. south of San Fernando, silty plain, *Johnston* 7938; Chihuahua, plains, *Pringle* 479 (US); arroyo 50 km. north of Jimenez, *Harvey* 1370.

Kansas to Texas and Arizona and south into Zacatecas.

Muhlenbergia setifolia Vasey, Bot. Gaz. **7**: 92 (1882).

COAHUILA: Sierra del Pino, La Noria, banks of arroyo, *Johnston & Muller* 662, 665; escarpment on west side of Potrero de la Mula, rocky sunny ridges, *Johnston* 9243; Sierra Madera, Cañon Charretera, openings in oak-chapparral on rocky flat, frequent, *Johnston* 9061; Saltillo, summit of a stony mountain, 1898, *Palmer* 415; San Lorenzo Canyon, 6 mi. southeast of Saltillo, bunch grass of medium size on canyon side, 1904, *Palmer* 400.

Western Texas south into Coahuila. The species is closely related to *M. rigida* and apparently separable from it by no single character. Its range is mostly just beyond the northern limit of *M. rigida*, but it grows with that species, along the northeastern limits of the latter, in eastern Coahuila. It is a smaller more slender plant than *M. rigida*, with looser tufts of stems and leaves, filiform involute leaf-blades, and narrower fewer-flowered green or brownish (not purple) panicles.

Muhlenbergia rigida (H.B.K.) Kunth, Rév. Gram. **1**: 63 (1829).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 719; Mesa Grande, 40 km. northwest of Hac. Encantada, meadows and hillsides, common, *Stewart* 1628, 1630; Sierra del Pino, La Noria, gravelly flats among clumps of scrub oaks, *Johnston & Muller* 659; Puerto San Lazaro, dominant grass on upper slopes, *Muller* 3095; north end of Carneros Pass, among cacti, not common, *Johnston* 7289. CHIHUAHUA: Sierra Organos, south of Organos at base of oak-clad slope, coarse tufts, rocky places, *Stewart & Johnston* 2065; Sierra Santa Eulalia, Sept. 17, 1885, *Pringle* 401.

Trans-Pecos Texas to Arizona and south to Central America. The species appears to be absent in northeastern Mexico and to reach its eastern limit along the western base of the Sierra Madre in Coahuila and Nuevo Leon. It has been collected in Hidalgo. In eastern Coahuila it is connected by intergrades with the closely related and generally more northerly ranging *M. setifolia*.

Muhlenbergia dubia Fourn. ex Hemsl. Biol. Centr. Am. Bot. **3**: 540 (1885).

COAHUILA: Sierra Madera, Cañon Charretera, coarse tufts in rocky arroyo-bottom just below pine-belt, 3–4 ft. tall, *Johnston* 8975, 9069; Saltillo, among large rocks on

outer rim of treeless mountain, 1898, *Palmer 416*; Saltillo, deep ravines, 1898, *Palmer 379*; San Lorenzo Canyon, 6 mi. southeast of Saltillo, high up canyon, large bunch grass, 1904, *Palmer 399*; Chojo Grande, 27 mi. southeast of Saltillo, bunch grass on canyon side, 1904, *Palmer 341*; north end of Carneros Pass, coarse tufts between bushes, *Johnston 7288*. CHIHUAHUA: Rocky hills northeast of Chihuahua, cool slopes, Oct. 20, 1885, *Pringle 403*.

Trans-Pecos Texas to New Mexico and adjoining Mexico, south through Nuevo Leon and eastern Coahuila to eastern San Luis Potosi. The type of *M. dubia* came from the Chinantla, Puebla. I have seen no authentic material and no collections from south of San Luis Potosi. Our plant is the same as the Texan material described as *M. acuminata* Vasey. Perhaps that name is the proper one for our present plant.

Muhlenbergia villiflora Hitchc. No. Am. Fl. **17**: 470 (1935); Johnston, Jour. Arnold Arb. **22**: 155 (1941).

COAHUILA: Locally common on the gypsum ridges east of Laguna de Jaco, *Johnston & Muller 1074*, *Stewart & Johnston 1963*; 10 mi. east of Fraile, abundant on valley floor, local, *Johnston 7305*; 6 mi. north of La Ventura, common on gypsum plain, local, *Johnston 7642*, *Shreve & Tinkham 9607*.

Known only from scattered stations in Coahuila, San Luis Potosi, Nuevo Leon, and southern Tamaulipas, apparently confined to gypsum.

Muhlenbergia parviglumis Vasey, Contr. U. S. Nat. Herb. **3**: 71 (1892).

COAHUILA: Sierra del Carmen, Sept. 9, 1936, *Marsh 717*; Sierra Madera, Cañon Charretera, banks of arroyo in oak-belt, erect, tufted, *Johnston 9076*.

Known from Uvalde, Val Verde, and Jeff Davis Counties, Texas, and from Nuevo Leon and eastern Coahuila.

Muhlenbergia polycaulis Scribn. Bull. Torr. Bot. Cl. **38**: 327 (1911).

CHIHUAHUA: Hills northeast of Chihuahua, cool wet ledges, 1885, *Pringle 394*.

Trans-Pecos Texas to Arizona and south in the mountains of Baja California, Sonora, and Chihuahua to Durango.

Muhlenbergia pauciflora Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 91 (1863).

COAHUILA: Sierra Mojada, Cañon San Salvador, abundant on slopes, *Muller 3312*.

Trans-Pecos Texas to Arizona and south in the mountains of Baja California, Sonora, and Chihuahua. The type of the species (*Wright 732*) was collected "in declivities in the mountains near El Paso, Sept. 12, 1849."

Muhlenbergia monticola Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 91 (1863).

COAHUILA: Camp near Mt. Carmel canyon, Oct. 1852, *Parry*; Sierra del Carmen, Sept. 1, 1936, *Marsh 872*; limestone hill near Santo Domingo, *Wynd & Mueller 453*; Muzquiz, *Marsh 549*; Sierra Madera, Cañon del Agua, among rocks in oak-pinyon belt, in lower canyon, *Muller 3258*, *3259*; Cuatro Cienegas, *Marsh 2053*; Puerto San Lazaro, rock crevices on dry open slope, *Muller 3071*; Picachos Colorados, base of cliffs, *Johnston & Muller 143*; Sierra Cruces, eastern foothills near Santa Elena, among bushes along arroyo, *Johnston & Muller 238*; Sierra Cruces, Cañon Tinaja Blanca, about rock ledges on crest at head of canyon, *Johnston & Muller 298*; Sierra Mojada, Cañon San Salvador, abundant on slopes, *Muller 3312*. CHIHUAHUA: Sierra San Carlos, base of limestone cliffs, *Johnston & Muller 46*; near Rancho Madera, southwestern base of Sierra Rica, confined to small gypsum outcrop on slope, *Stewart 2434*; volcanic neck east of El Coyote, base of cliff, *Johnston & Muller 1411*; Sierra Almagre, among rocks in deep shaded canyon, *Johnston & Muller 1177*; Sierra de los Organos, 1937, *LeSueur*; Sierra Santa Eulalia, 2 km. north of San Antonio, *Harvey 1513*; Sierra Santa Eulalia, dry limestone ledges, Aug. 1885, *Pringle 396*.

Trans-Pecos Texas to Arizona and south into northern Mexico. In its extreme form, typical *M. monticola* is separated from typical *M. tenuifolia*, of central Mexico, by having narrow inflorescences with strict branches, strict spikelets, and green acute lanceolate glumes. *Muhlenbergia tenuifolia* has purple inflorescences, which have spreading or ascending branches on which the spikelets are divaricate or even reflexed. Its glumes are deep purple, smaller than in *M. monticola*, and commonly denticulate and obtusish and abruptly apiculate at the apex. In our area, the ranges of *M. monticola* and *M. tenuifolia* meet and the species intergrade very badly. I have arbitrarily referred to *M. monticola* those plants with narrow green or weakly purplish inflorescences (i.e., those with strict panicle-branches and strict spikelets), and to *M. tenuifolia* those plants having a usually darkly colored panicle with spreading branches and spikelets.

The type of *M. monticola* (Wright 731) was collected in Limpia Canyon in the Davis Mts., Texas. This typical form has been illustrated by Hitchcock, Man. Grasses U. S. fig. 788 (1935). Very similar plants have been collected elsewhere in trans-Pecos Texas. Material from Arizona, however, differs in having a distinctly looser panicle. Vasey, U. S. Dept. Agric., Div. Bot. Bull. 13¹: t. 19 (1892), has an illustration (sub *M. calamagrostidea*) of the Arizonan form. From Arizona this aberrant form extends south into the Sierra Madre of Sonora and Chihuahua, where the inflorescence becomes larger and more open and the spikelets divaricate or even reflexed. These large plants, except for the green, not purple, panicles, are remarkably similar in gross aspect to some forms of *M. tenuifolia* from about Mexico City, the type locality of that species. It is clear that the two species, *M. monticola* and *M. tenuifolia*, intergrade in the northern states of Mexico and that, if they are both to be recognized, this can be justified only for convenience and performed in an arbitrary manner.

Muhlenbergia tenuifolia (H.B.K.) Kunth, R v. Gram. 1: 63 (1829).

VERNACULAR NAME: Zacate espumilla.

COAHUILA: Mouth of Ca n La Cruz, 20 km. south of Ocampo, gravelly bed of large arroyo, Johnston 9187; Ca n Bocatoche, open arroyo, Muller 3119; La Rosita, Shreve & Tinkham 9591; 2 mi. west of Saltillo, Harvey 1097; Saltillo, edge of garden under trees, 1898, Palmer 393; Sierra Cruces, near Santa Elena, hillsides, Stewart 284; San Antonio de los Alamos, gravelly flat above tuff cliffs, Johnston 8255; Parras, 1880, Palmer 1348; Sierra Parras, Oct. 1910, Purpus 5007; Sierra Negras, 9 km. south of Parras, Stanford et al. 165. CHIHUAHUA: Rocky hills near Chihuahua, May 28, 1885, Pringle 428; hills and plains near Chihuahua, Oct. 23, 1885, Pringle 397. ZACATECAS: Valley 15 km. west of Concepcion del Oro, Stanford et al. 506.

Ranging from central and southern Mexico north into our area. Over most of its range a well marked and readily recognized species, but in our area completely intergrading with the more northern *M. monticola*. The species is a weak perennial and, like *M. monticola*, favors sheltered places at bases of cliffs, along rocky arroyo banks, or on slopes in deep canyons.

Muhlenbergia elongata Scribn. in Beal, Grasses No. Am. 2: 251 (1896).

CHIHUAHUA: Rocky hills east of Chihuahua, ledges, 1885, Pringle 398 (ISOTYPE).

Known only from near Chihuahua and from extreme southwestern parts of the state (Palmer 159).

Muhlenbergia Marshii sp. nov.

Planta perennis; culmis ca. 1 m. altis erectis teretibus glabris dense caespitosis simplicibus, basi ad 3 mm. crassis, internodiis 1–1.5 dm. longis; vaginis internodia 3–5 cm. longe superantibus scabridulis; ligulis 1–1.5 mm. longis truncatis glabris; laminis 15–40 cm. longis 2–4 mm. latis involutis rigidulis utrinque scabridulis; panícula spiciformi 2.5–4 dm. longa 3–6 mm. crassa, haud vel vix interrupta, basi e vagina superiore saepe haud exserta, ramis infra medium paniculae 2–4 cm. longis strictis multifloris; spiculis strictis 0–0.5 mm. longe pedicellatis (aristis glumarum exclusis) ca. 4 mm. longis; glumis subaequalibus 3 mm. longis pallidis subhyalinis obscure medio-nervatis (nervis prominentulis scabridis) lanceolatis, paullo supra basim latioribus deinde sursum in aristam rectam 0.3–0.7 mm. longam gradatim contractis, vel non raro summum ad apicem basim aristae minutissime obscurissimeque truncatis vel emarginatis et lacerato-denticulatis; lemmatibus (aristis rectis ad 0.5 mm. longis exclusis) ad 4 mm. longis glumas evidenter superantibus brunnescentibus supra medium 0.4–0.6 mm. latis deinde sursum gradatim attenuatis, sparse minutissime strigosis sublevibus 3-nervatis basi breviter perinconspicueque adpresseque villosis.

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *E. G. Marsh Jr.* 746 (TYPE, Gray Herb.). TEXAS: Davis Mts., H. O. Canyon above Sawtooth, soil in cracks of rocks in stream-bed, tough tightly rooted clumps, July 1936, *Hinckley*.

A member of the species-complex passing as *M. rigens*, among the members of which it is readily distinguished by its short-awned glumes and lemmas and extreme eastern occurrence. The basal portion of the inflorescence bears elongate strict branches and is not exserted from the uppermost leaf-sheaths. In these characters it agrees with true *M. rigens* of central California and closely related forms from southern California and southern Arizona and adjacent Mexico. True *M. rigens* has a somewhat interrupted inflorescence composed of rather elongate strict branchlets, and it appears to be confined to western middle California.

Muhlenbergia mundula sp. nov.

Planta perennis; culmis ca. 1 m. altis erectis teretibus glabris dense caespitosis simplicibus basi ad 3 mm. crassis, internodiis 1–1.5 dm. longis; vaginis saepe scabridulis quam internodiis saepe 1–5 cm. longioribus; ligulis 1–1.5 mm. longis truncatis vel rotundatis; laminis 8–30 cm. longis 2–4 mm. latis involutis rigidulis; panícula spiciformi 15–30 cm. longa densa 4–9 mm. crassa haud interrupta, e vaginis superioribus evidenter exserta, ramulis inferioribus brevibus 5–15 mm. longis strictis multifloris; spiculis strictis 0–5 mm. longe pedicellatis; glumis 2–3 mm. longis pallidis vel plumbeis subhyalinis obscure medio-nervatis, oblongis vel lanceolatis, apice acutis vel obtusis vel erosis raro attenuatis; lemmatibus 3–4 mm. longis 3-nervatis non raro scabridulis, supra basim latioribus deinde apicem versus gradatim attenuatis muticis.

COAHUILA: Sierra Hechiceros, Cañon Indio Felipe, side of dry arroyo, common, *Stewart* 174. CHIHUAHUA: Rancho El Pino, 10 km. southeast of Sierra Rica, rocky slope, frequent, *Stewart* 2407; by streams near Chihuahua, Oct. 13, 1885, *Pringle* 417 (TYPE, Gray Herb.); Quicorichi, Rio Mayo, *Gentry* 1931; southwestern Chihuahua, 1885, *Palmer* 21. SONORA: Cañon Bellota, Sierra Cabellera, Bavispe Area, *Santos* 2096. NEW MEXICO: Berendo Creek, Black Range, Sierra Co., *Metcalf* 1391. ARIZONA: Chiricahua Mts., Rigg's Ranch, *Blumer* 1491; Pinal Creek, Miami, *Harrison* &

Kearney 6342; Mule Mts., *Goodding* 907; Rincon Mts., Manning Camp, *Blumer* 3397; White Mts., *Griffiths* 5445.

This species includes most of the plants of Arizona, New Mexico, and northern Mexico which have passed as *M. rigens*. The plant illustrated by Hitchcock, Man. Grasses U. S., as *M. rigens* belongs to *M. mundula*. It is readily distinguished from true *M. rigens* of central California, and from closely related unnamed forms from southern California and southern Arizona, by having the spike well exerted from the upper leaf-sheaths and by having the lower branches of the panicle only 5–15 mm. rather than 20–30 mm. long. In appearance the species much resembles *M. leptoura*, of northwestern Chihuahua, but it differs from that species in having the glumes distinctly shorter than rather than equalling or surpassing the lemma.

Blepharoneuron tricholepis (Torr.) Nash, Bull. Torr. Bot. Cl. **25**: 88 (1898).

CHIHUAHUA: Mapula Mts., thin soil on summits, Oct. 26, 1886, *Pringle* 822.

Colorado and Utah south through Arizona, New Mexico, and trans-Pecos Texas into the mountains of northern Mexico. The species is known from the Davis, Chinati, and Chisos Mountains of Texas and is, accordingly, to be expected in the mountains of northern Coahuila and north-eastern Chihuahua.

Sporobolus microspermus (Lag.) Hitchc. Jour. Wash. Acad. **23**: 453 (1933).

COAHUILA: San Antonio de los Alamos, colony in loose gravelly soil on flats above tuff cliffs, *Johnston* 8244. CHIHUAHUA: Near Rancho El Pino, 10 km. southeast of Sierra Rica, rocky slope, *Stewart* 2411; Los Medanos, 1935, *LeSueur* 74.

As currently accepted, this species ranges in western United States and south to Costa Rica. A critical study will probably show it to be an aggregate of several well-marked species of limited distribution. Hitchcock, Contr. U. S. Nat. Herb. **17**: 308 (1913), sub *S. ramulosus*, reports the plant from the Sierra Santa Eulalia and from near Chihuahua.

Sporobolus pyramidatus (Lam.) Hitchc. U. S. Dept. Agric., Misc. Pub. **243**: 84 (1936).

Sporobolus pulvinatus Swallen, Jour. Wash. Acad. **31**: 351 (1941).

COAHUILA: South of Laguna de Leche, saline and perhaps gypseous silt in mogote, *Johnston* 8626; Saltillo, along ditch, *Hitchcock* 5580 (US). CHIHUAHUA: 5½ mi. south of Ojinaga, outwash from saline and gypseous shales, *Johnston* 8005; sandy plains near Chihuahua, Sept. 22, 1886, *Pringle* 816. DURANGO: Flats on plains 3 mi. northeast of Bermejillo, *Johnston* 7787.

Texas and Oklahoma to Arizona and south into Mexico; South America.

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

COAHUILA: 4 mi. west of Cuatro Cienegas, coarse tufted grass on alkaline flat, *Johnston* 7133; Laguna de Jaco, saline meadow south of the lake, abundant, coarse tufts, *Johnston & Muller* 1102. CHIHUAHUA: Villa Ahumada flat, 1935, *LeSueur* 71.

Widely distributed in saline soils in western United States and extending south into northern Mexico.

Sporobolus regis sp. nov.

Planta robusta ca. 12 dm. alta e rhizomate elongato nodoso (internodiis 10–12 mm. longis) 3–4 mm. crasso oriens; culmis simplicibus erectis con-

fertis foliosis; vaginis quam internodiis saepe subaequilongis vel usque ad 1 cm. brevioribus, extus pilis numerosis gracilibus 1–2 mm. longis adpressis pallide flavescentibus donatis, vetustioribus glabrescentibus; ligula subnulla 0.3 mm. longa vel brevior fimbriata vel dense et minute ciliolata; laminis 1–3 dm. longis 3–4 mm. latis saepe laxe involutis, subtus levibus, supra pallidioribus minute scabridis; paniculis apertis 3–4 dm. longis ad 15 cm. crassis, basi e vagina superiore haud exsertis, ramis alternis 2–12 mm. distantibus ramulosis adscendentibus vel laxe adscendentibus 5–10 cm. longis, axillis villosis, ramulis laxe adscendentibus saepe purpureis; spiculis 2–2.5 mm. longis glaberrimis unifloris, pedicellis strictis 1–5 mm. longis; gluma exterior 1.2–1.5 mm. longa hyalina late lanceolata acuta, supra basim in medio purpurea; gluma interior 1.5–1.8 mm. longa hyalina lanceolata enervata acuta; lemmate hyalino lanceolato-elliptico obscure uninervato, apice late acuto, longitudinem paleae aequante.

COAHUILA: Salt flat 4 km. southeast of Laguna del Rey, abundant, Sept. 18, 1942, *Stewart 2653* (TYPE, Gray Herb.).

A very well marked species, probably most closely related to *S. airoides* Torr. and *S. Wrightii* Munro. From these and most other members of the genus, *S. regis* differs in the very hairy leaf-sheaths, the tufts of hairs in the axils of the panicle-branches, and the very coarse rhizomes. The bases of the culms and the younger nodes of the rhizomes bear shredded remnants of old leaves.

Sporobolus Wrightii Munro ex Scribn. Bull. Torr. Bot. Cl. **9**: 103 (1882).

VERNACULAR NAME: Zacaton.

COAHUILA: 5 mi. north of Allende, oak thicket on plain, coarse tufts, culms 3–6 ft. tall, *Johnston 7010*; open country between Santo Domingo and Piedra Blanca, *Wynd & Mueller 497*; 20 mi. northwest of La Babia, open valley floor, *Wynd & Mueller 449*; Santa Anna Canyon, *Marsh 495*; trail from southern extremity of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh 1512*; vicinity of Encantada Ranch headquarters and eastward, July 28, 1938, *Marsh 1520*; Cuatro Ciénegas, *Marsh 2038, 2081*; Cuatro Ciénegas, Puerto del Norte, *Harvey 1220*; Saltillo, in large bunches, dry alkaline clay soil, scarce, 1898, *Palmer 1*; Llano de Guaje near Tanque La India, the common grass about the bare flats, *Johnston & Muller 778*; Sierra del Pino, La Noria, large clumps in arroyo, *Johnston & Muller 666*; between Palos Blancos and San Pedro, road to Cuesta Zozaya, common in grassy valley on tableland, *Johnston 9272*; Laguna de Leche, the common grass about the margin of the dry lake, *Johnston 8601*; south of Laguna de Leche, saline soils below outcrops of Upper Cretaceous beds, *Johnston 8624*; east of Laguna de Jaco, about gypsum beds, 6–10 dm. tall, *Stewart & Johnston 1959*; Laguna de Jaco, saline soil at south end of lake, *Johnston & Muller 1091*; 11 km. northeast of Jimulco, *Stanford et al. 72*. CHIHUAHUA: Presidio del Norte, 6–8 ft. tall, *Parry*; 11 mi. south of Ojinaga, along small arroyo in low hills, 3–5 ft. tall, *Johnston 8034*; Pirámide, low ground, heavy soil at edge of cornfield, 3–6 ft. tall, *Johnston 8139*; Carrizal, Aug. 18 or 19, 1846, *Wislizenus 103*; Meoqui, 1938, *LeSueur 34*; 20 km. south of Camargo, *Harvey 1396*. ZACATECAS: 15 km. west of Concepcion del Oro, *Stanford et al. 528*; 7 mi. north of San Tiburcio, heavy, probably alkaline soil among mesquites, *Johnston 7362*.

Trans-Pecos Texas to southern California and south to central Mexico. Hitchcock, Contr. U. S. Nat. Herb. **17**: 309 (1913), reports the species from Chihuahua, Torreon, and Saltillo. It appears to be present in most parts of our area. Although I have accepted this species in the broad traditional sense, I suspect that it is an aggregate of several critical species.

The plants I have included in *S. Wrightii* vary greatly in size, appearance, and selection of habitats. The leaves are broad to narrow, dark or pale green, flat to involute. The plants may form large very coarse tussocks over a meter broad, and with culms nearly 2 m. tall, or low clumps 1–2 dm. tall, with the culms much less than a meter in height. The larger plants are mostly from permanently wet soils; the small plants come from the plains where water stands and evaporates after storms. The soils supporting the plant vary from those with no appreciable amount of salt to those with large amounts of alkali and even gypsum.

Sporobolus cryptandrus (Torr.) Gray, Man. 576 (1848).

COAHUILA: Saltillo, sandy field, *Hitchcock* 5625 (US); Tanque Colorado, among bushes on red dunes, *Johnston* 8663; Los Medanos, 1935, *LeSueur* 60, 80; valley near Chihuahua, Oct. 4, 1885, *Pringle* 419.

Widely distributed in sandy places over the United States and south into northern Mexico. The two following species are probably no more than varieties.

Sporobolus flexuosus (Thurb.) Rydb. Bull. Torr. Bot. Cl. **32**: 601 (1905).

Sporobolus cryptandrus var. *flexuosus* Thurb. in Wats. Bot. Calif. **2**: 269 (1880).

CHIHUAHUA: Los Medanos, 1935, *LeSueur* 80a; between Los Medanos and Samalayuca, sand hills, Sept. 1886, *Pringle* 815; Colonia Diaz, 1899, *Nelson* 6458.

Southwestern United States and northern Chihuahua. Differing from *S. cryptandrus* only in having a more open panicle, with the spikelets and ultimate branchlets spreading rather than appressed along the primary branches of the panicle.

Sporobolus giganteus Nash, Bull. Torr. Bot. Cl. **25**: 88 (1898).

Sporobolus cryptandrus var. *strictus* Scribn. Bull. Torr. Bot. Cl. **9**: 103 (1882).

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

COAHUILA: North end of Cañada Oscuro, gravelly slopes among brush, common, *Johnston* 8460; south of Laguna de Leche, shaly bank among brush, frequent, *Johnston* 8625; Sierra Cruces, 8 mi. north of Santa Elena, stony flat among bushes, *Johnston & Muller* 1027. CHIHUAHUA: Los Medanos, 1935, *LeSueur* 13, 58; 20 km. south of Camargo, *Harvey* 1397.

Southwestern United States and northern Mexico. Probably only a phase of *S. cryptandrus*, with the inflorescence bearing short strict crowded branches and branchlets and accordingly spike-like in form. Hitchcock has distinguished the robust plants of this form as *S. giganteus* and the more slender forms as *S. contractus*.

Sporobolus Nealleyi Vasey, Contr. U. S. Nat. Herb. **1**: 57 (1890); Johnston, Jour. Arnold Arb. **22**: 155 (1941).

COAHUILA: Castillon, confined to gypsum flat, infrequent, *Johnston & Muller* 1268; east of Laguna de Jaco, frequent, confined to gypsum, *Johnston & Muller* 1073, *Stewart & Johnston* 1954; Sierra Cruces, gypsum flats near Santa Elena, *Johnston & Muller* 247; gypsum bed west of Buena Vista, along road between San Antonio de los Alamos and Puerto Caballo, rare, *Johnston* 8314.

Western Texas and eastern New Mexico and south into Coahuila. Apparently confined to gypsum. The type-collection of the species was originally given as collected at "Brazos Santiago, Texas," that is, near the mouth of the Rio Grande, where the species is neither known nor to be

expected. This is apparently the result of a clerical error. Nealley's specimens came from Screw Bean, a locality near the Pecos River, in Reeves County, Texas, where a large variety of gypsophiles has been collected.

Sporobolus spiciformis Swallen, Proc. Biol. Soc. Wash. **56**: 78 (1943).

COAHUILA: Puerto del Norte, Cuatro Cienegas, July 1939, *Harvey* 1225 (TYPE, US.); 4 mi. west of Cuatro Cienegas, common and conspicuous on saline and gypseous flats, 1938, *Johnston* 7132; 4 km. southeast of Laguna del Rey, abundant on salt flats, 1942, *Stewart* 2654; Noria de San Juan, southeast of Laguna del Rey, common on saline plain, 1942, *Stewart* 3008.

Endemic to our area, and apparently confined to saline gypseous soils. The species is most closely related to *S. phleoides* Hack., of saline soils in the deserts of western and northern Argentina. It differs from the southern plant in its paler color, involute leaves, more rigid tighter leaf-sheaths, broader erose or dentate glumes, non-rostrate palea, and much larger anthers.

Oryzopsis hymenoides (R. & S.) Ricker ex Piper, Contr. U. S. Nat. Herb. **11**: 109 (1906).

A widely distributed species of sandy soils in western United States. Hitchcock, Contr. U. S. Nat. Herb. **17**: 285 (1913), reports a collection from "sandhills near Paso del Norte, *Pringle* 1053."

Piptochaetium fimbriatum (H.B.K.) Hitchc. var. **confine** var. nov.

A forma typica austro-Mexicana glumis viridibus evidenter nervatis haud purpureis differt.

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 643; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1284; Sierra Madera, Cañon Charretera, in shade in oak thickets, *Johnston* 9077; Sierra del Pino, La Noria, in thickets on arroyo-bank, *Johnston & Muller* 486 (TYPE, Gray Herb.).

Ranging in the mountains along the Mexican Boundary, from trans-Pecos Texas (Chisos and Davis Mts.) west to Arizona, and from Coahuila and northern Nuevo Leon to northeastern Sonora. Typical *P. fimbriatum* comes from central Mexico and differs from our northern plant in having firmer obscurely veined purple glumes and usually less slender and flaccid leaves. Where I have seen the var. *confine* in Coahuila, it has always grown in very sheltered shaded places, usually under bushes in dense oak thickets, and it is seldom common.

Stipa neomexicana (Thurb.) Scribn. U. S. Dept. Agric., Div. Agrost. Bull. **17**: 132 (1899).

COAHUILA: Along trail from southern extremity of Hillcoat Mesa to Buena Vista Ranch headquarters, July 27, 1938, *Marsh* 1492; tableland north of Cañon del Cuervo Chico, basal slopes of low rounded limestone hills, *Johnston* 8564; north end of Carneros Pass, conspicuous grass among low shrubbery, *Johnston* 7297.

Western Texas and Colorado to Utah and Arizona and south through Coahuila to the mountains of Nuevo Leon.

Stipa leucotricha Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. **51**: 54 (1842).

COAHUILA: Rio Grande Valley near Piedras Negras, April 17, 1900, *Pringle* 8292; Muzquiz, Dec. 5, 1936, *Marsh* 1077; Monclova, *Marsh* 1691, 1718.

Oklahoma south through central Texas into northeastern Coahuila. The

species appears to differ from *S. mucronata* H.B.K., of central and eastern Mexico, only in the large size of the spikelet and fruit and in the usually green rather than purpurescent glumes. The material from Coahuila and adjacent Texas is distinctly smaller than the typical form of *S. leucotricha*, and some of the specimens have colored glumes.

Stipa eminens Cav. Icon. Pl. 5: 42. t. 467 (1799).

COAHUILA: Limestone hill near Santo Domingo, Wynd & Mueller 460; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, Marsh 1460; Sierra Madera, lower part of Cañon Charretera, open flat, Johnston 9161; near Santa Rosa, limestone hills, Shreve & Tinkham 9576; north end of Carneros Pass, Johnston 7298; Sierra del Pino, La Noria, common grass on flats and meadows, Johnston & Muller 454, 663, Stewart 1207; tableland north of Cañon del Cuervo Chico, gravelly places on low limestone hills, Johnston 8562; Sierra Parras, April 1905, Purpus 1125 in pt.; Sierra Cruces, limestone foothills 8 mi. north of Santa Elena, Johnston & Muller 1026; Sierra Cruces, about volcanic ledges on ridge at head of Cañon Tinaja Blanca, Johnston & Muller 305. CHIHUAHUA: Sierra Santa Eulalia, Aug. 12, 1885, Pringle 384.

Trans-Pecos Texas to Arizona and south to central Mexico. Hitchcock, Contr. U. S. Nat. Herb. 24: 238 (1925), reports the species from Cedros, Zacatecas.

Stipa angustifolia Hitchc. Contr. U. S. Nat. Herb. 24: 246 (1925).

COAHUILA: Saltillo, July 25, 1905, Palmer 626.

This species was based upon a specimen collected by Palmer July 25, 1905, "among rocks on summit of Sierra de la Puebla, near Saltillo." The collection number is given as "Palmer 726." The specimen in the Gray Herbarium, agreeing with the original description, and collected near Saltillo on the same date as the type, bears the number Palmer 626. This species has very slender involute leaves. It has been collected in Nuevo Leon (near Pablillo, Mueller 522) and in southern Tamaulipas (Miquihuana, Stanford et al. 645a).

Stipa clandestina Hackel, Rep. Sp. Nov. 8: 516 (1910).

COAHUILA: Saltillo, alt. 1650 m., March 1908, Arsène 3441 (ISOTYPE); Saltillo, alt. 1600 m., March 1908, Arsène 3467; Saltillo, in large bunches, banks of irrigation ditches, 1898, Palmer 3; Saltillo, dry ground, 1910, Hitchcock 815. ZACATECAS: Valley 15 km. west of Concepcion del Oro, valley floor, 18 in. tall, Stanford et al. 553.

Known only from our area.

Stipa editorum Fourn. Mex. Pl. 2: 75 (1886).

COAHUILA: 10 mi. east of Fraile, abundant and most conspicuous species on silty floor of valley, local, Johnston 7303. ZACATECAS: 7 mi. north of San Tiburcio, heavy soil among mesquites, Johnston 7361.

Known from Coahuila, Zacatecas, Nuevo Leon, southern Tamaulipas, and Puebla. The species may possibly be gypsophilous.

Stipa multinodis Scribn. ex Beal, Grasses No. Am. 2: 222 (1896).

CHIHUAHUA: Sierra Santa Eulalia, Aug. 1885, Pringle 385 (ISOTYPE).

Closely related to *S. editorum*, with which it agrees in the many-noded strict culms 7–12 dm. tall and somewhat fruticulose at the base. It differs in a slightly smaller lemma and nearly absent ligule. The species is known only from the type collection.

Stipa robusta (Vasey) Scribn. U. S. Dept. Agric., Div. Agron. Bull. **5**: 23 (1897).

COAHUILA: Sierra Madera, Cañon Charretera, common in rocky bed of arroyo in oak belt, becoming 4 ft. tall, *Johnston* 9073; Saltillo, 1902, *Palmer* 317; Lirios, 1880, *Palmer* 1249; San Antonio de las Alanzanas, near mountain border, 3 ft. tall, Aug. 31, 1848, *Gregg* 349.

Colorado to Arizona and trans-Pecos Texas, and south through Coahuila to the mountains of Nuevo Leon. A large coarse grass apparently restricted to the oak and lower pine belts. The type came from the Chinati Mts., Texas, and accordingly the species is to be expected in the mountains of northeastern Chihuahua. In the United States this species has been reported to have narcotic effects on animals eating it. In the notes accompanying his collections from the mountains of southeastern Coahuila, cited above, Gregg states that the grass is "very injurious to animals, intoxicating and often killing them. Animals acquainted with it will not eat it."

Stipa tenuissima Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. **21**: 36 (1836).

COAHUILA: Sierra del Carmen, Sept. 1, 1936, *Marsh* 878; Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 538; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1314; Saltillo, bunches on shady slope of hill, 1904, *Palmer* 455; Saltillo, 1909, rare, *Arsène* 3469; Chojo Grande, 27 mi. southeast of Saltillo, 1904, *Palmer* 341; north end of Carneros Pass, among low bushes, *Johnston* 7296; Carneros Pass, limestone hills, Sept. 20, 1890, *Pringle* 3274.

New Mexico and trans-Pecos Texas south through Coahuila and Nuevo Leon to Puebla; Argentina.

Aristida adscensionis L. Sp. Pl. 82 (1753).

COAHUILA: Sierra del Carmen, July 29, 1936, *Marsh* 675; 21 mi. south of Sabinas, heavy soil, *Johnston* 7043; Santa Anna Canyon, *Marsh* 433; Cuatro Cienegas, *Marsh* 2059 in pt.; Saltillo, 1898, *Palmer* 388; Chojo Grande, 27 mi. southeast of Saltillo, in ravine, 1904, *Palmer* 333; 42 mi. west of Saltillo, *Shreve & Tinkham* 9839; west base of Picacho del Fuste, cemented gravels, *Johnston* 8415; San Antonio de los Alamos, on canyon-wall and on gravelly flats at top of cliffs, *Johnston & Muller* 874, *Johnston* 8252; Las Uvas, east side of Valle Acatita, gypsum in arroyo, *Stewart* 2696; Parras, 1880, *Palmer* 1352; Torreon, 1898, *Palmer* 512. CHIHUAHUA: Los Medanos, 1935, *LeSueur* 36; Chihuahua, 1935, *LeSueur* 3; rocky hills near Chihuahua, Aug. 1885, *Pringle* 390; Sierra Organos, 1937, *LeSueur* 191; 60 km. north of Escalon, *Harvey* 1306.

A variable annual species widely distributed in the warmer parts of America and the Old World. This species has been consistently described as always having the lemma with three awns. Three of the collections cited above (*Pringle* 390, *Johnston* 8252 and 8415) have the lateral awns minute or nearly wanting, but otherwise they agree closely with the specimens associated with them.

Aristida ternipes Cav. Icon. Pl. **5**: 46 (1799).

CHIHUAHUA: Rocky hills northeast of Chihuahua, Aug. 13, 1885, *Pringle* 387; Meoqui, 1936, *LeSueur* 120 in pt.; Meoqui, 1935, *LeSueur* 38.

Ranging from trans-Pecos Texas to Arizona and south through Sonora and Chihuahua; reaching northern South America.

Aristida Schiedeana Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. **51**: 120 (1842).

Aristida Orcuttiana Vasey, Bull. Torr. Bot. Cl. **13**: 27 (1886).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 607. CHIHUAHUA: Sierra Santa Eulalia, Sept. 10, 1885, *Pringle* 386.

Trans-Pecos Texas to southern California and south to Guatemala. Very closely related to *A. ternipes* and differing from that species chiefly in having the neck of the fruit twisted and bent. Our plants represent the northern phase of the species (*A. Orcuttiana*), which is weakly distinguished from the typical southern phase by usually having glabrous and somewhat firmer, paler glumes.

Aristida divaricata H. & B. ex Willd. Enum. Pl. 1: 99 (1809).

CHIHUAHUA: On the Coahuila boundary 1 mi. east of Poza de Villa, silty plain, *Johnston* 8177; Rancho El Pino, 10 km. southeast of Sierra Rica, rocky slope, *Stewart* 2394; 7 mi. south of Pirámide, silty flat, *Johnston* 8108; 4 mi. southeast of Organos, flats at base of grassy slope, *Stewart & Johnston* 2041.

Western Kansas and western Texas to California and south through Chihuahua and Sonora, reaching Guatemala. Much resembling the two previous species and having a similar very lax panicle with long slender abruptly and widely spreading branches, but differing in having three well-developed awns on the lemma. The collection from near Pirámide has the fruiting lemma with a stout untwisted neck and accordingly belongs to the form distinguished as *A. hamulosa* Henr.

Aristida longiseta Steud. Syn. Pl. Glum. 1: 420 (1855).

COAHUILA: Dry mesas near Piedras Negras, Apr. 23, 1900, *Pringle* 9037; Sierra del Carmen, Aug. 14, 1936, *Marsh* 665; 20 mi. northwest of Hac. La Babia, open valley floor, *Wynd & Mueller* 445. CHIHUAHUA: Los Medanos, 1935, *LeSueur* 57.

Widely distributed in the western United States and extending south into our area. The Coahuilan collections, representing the var. *rariflora* Hitchc., have smooth lemmas with a stout neck. LeSueur's collection has more attenuate minutely tuberculate lemmas. Hitchcock, Contr. U. S. Nat. Herb. 22: 563 (1924), reports a collection of the species (*Pringle* 473) from near Chihuahua.

Aristida Roemeriana Scheele, Linnaea 32: 343 (1849).

Aristida purpurea var. *micrantha* Vasey, Contr. U. S. Nat. Herb. 3: 47 (1892).

COAHUILA: Allende, *Marsh* 1799; igneous hill near Santo Domingo, *Wynd & Mueller* 468; Zacate, July 14, 1936, *Marsh* 501; Yerda Spring, July 6, 1936, *Marsh* 293; Hermanas, *Marsh* 1586, 1617; Monclova, *Marsh* 1694; Cañon Bocatoche, grassy valley floor, *Muller* 3111; near Rancho Santa Teresa, *Wynd & Mueller* 173, 202, 206; La Rosita, *Shreve & Tinkham* 9593; east of Hac. La Rosa, mountain slope, *Wynd & Mueller* 44; mountains west of Saltillo, 1880, *Palmer* 1351; Saltillo, stony hills, 1898, *Palmer* 392; Sierra Madera, Cañon Charretera, lower canyon, open flat, *Johnston* 9160; mouth of Cañon La Cruz, 20 km. south of Ocampo, base of mountains, *Johnston* 9176, 9178; Cuatro Cienegas, 1939, *Marsh* 2059 in pt.; Sierra Cruces, 8 km. north of Santa Elena, stony flat, *Johnston & Muller* 1015.

A variable and ill-defined species ranging from Texas south through northeastern Mexico to Hidalgo. It is a plant with small spikelets with strongly unequal, usually purpurescent, glumes in a rather loose panicle with more or less nodding branches. It intergrades completely with *A. purpurea*, *A. longiseta*, *A. Reverchoni*, *A. curvifolia*, *A. dissita*, and *A. glauca*, all intergrading and variable species, and like them incapable of precise definition. The condition is probably the result of free and much repeated interspecific hybridization and subsequent segregation and re-

combination of characters. Since technical characters of the spikelet are as variable and erratic as those found in the form of inflorescence and the gross aspect of the plant, I have preferred to use these latter in defining the "species" in this most difficult genus of grasses.

Aristida Reverchoni Vasey, Bull. Torr. Bot. Cl. **13**: 52 (1886).

Aristida Nealleyi Vasey, Contr. U. S. Nat. Herb. **3**: 45 (1892).

CHIHUAHUA: Sierra Santa Eulalia, dry ledges, Sept. 8, 1885, *Pringle* 389.

Texas to southern California and south into Chihuahua. A plant with very strict subsessile clusters of spikelets forming a spike about 15 cm. long. The awns are rather slender and usually pinkish. The plant intergrades with *A. Roemeriana*, *A. curvifolia*, *A. longiseta*, *A. dissita*, and *A. glauca*. Hitchcock and Henrard treated this plant as a synonym of *A. glauca*, but that is a plant of eastern Mexico with looser spikelet-clusters and a more interrupted spike, more suggestive of a slender form of *A. curvifolia* than of the present species.

Aristida curvifolia Fourn. Mex. Pl. **2**: 78 (1886).

Aristida Wrightii Nash in Small, Fl. S. E. U. S. 116, 1327 (1903).

COAHUILA: Sierra del Carmen, Sept. 12, 1936, *Marsh* 841; Rancho Agua Dulce, lower slopes of Sierra San Manuel, *Wynd & Mueller* 328; limestone hill near Santo Domingo, *Wynd & Mueller* 452; Santa Anna Canyon, *Marsh* 498; Palm Canyon, near Muzquiz, *Marsh* 322; Flores Pasture, near Muzquiz, *Marsh* 315; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1330; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1437; Sierra del Pino, La Noria, flats, *Johnston & Muller* 452, 695, 696; Sierra Madera, Cañon Charretera, bed of arroyo in oak belt, *Johnston* 9068; south of Laguna Leche, slightly saline and gypseous soil near mogote, *Johnston* 8621.

Ranging from Texas to Arizona and south to southern Mexico. A rather coarse and stiff plant with strict subsessile clusters of spikelets forming a stiff interrupted spike 15–30 cm. long. Differing from *A. Reverchoni*, with which it intergrades, in the stiffer brownish awns, firmer non-purpurecent glumes, somewhat interrupted longer spike, and frequently loosely appressed spikelet-clusters. It intergrades with *A. pansa*, *A. arizonica*, *A. Reverchoni*, and *A. Roemeriana*.

To this species I have referred most of the larger plants of Texas and northeastern Mexico which Hitchcock placed in *A. Wrightii* and in *A. glauca*. Hitchcock attempted to distinguish *A. glauca* and *A. Wrightii* by attributing to the former a more slender and elongate, usually somewhat twisted, beak to the lemma, but I find these characters too indefinite and variable to be of any use, if not actually illusory. Henrard placed great emphasis on the obtuse somewhat dentate tips of the glumes found in the type of *A. curvifolia*, but this character is variable and, furthermore, appears sporadically in various species of northern Mexico and the western United States. Otherwise the species seems nearly the same as the Texan plant described as *A. Wrightii*.

Aristida pansa Woot. & Standl. Contr. U. S. Nat. Herb. **16**: 112 (1913).

COAHUILA: Along trail between southern end of Hillcoat Mesa and Buena Vista headquarters, July 27, 1938, *Marsh* 1493; western base of Picacho del Fuste, gypsum beds on north-facing mountain side, *Johnston* 8399; western base of Picacho del

Fuste, rocky flats, *Johnston 8419*; tableland north of Cañon del Cuervo Chico, base of low limestone hill, *Johnston 8563*; Aguaje Pajarito, west end of Sierra Fragua, rocky flats, *Johnston 8714*; north of La Ventura, on gypsum beds, *Shreve & Tinkham 9608*; Picacho de San José, about ledges on high northwestern slope, *Johnston 8209*.

Western Texas and New Mexico south into our area. A plant with branched inflorescence, the branches short, stiffly ascending, and bearing crowded appressed spikelets in dense spicate clusters. The species intergrades with *A. divaricata*, *A. dissita*, and *A. curvifolia*. Typically it has three subequal awns. Among the collections above cited, however, *Johnston 8209*, *8399*, and *8414* are plants otherwise agreeing with *A. pansa* but having only a well-developed middle awn, the lateral ones being reduced and nearly wanting. Another collection, *Johnston 8419*, consists of plants with three subequal awns and was mixed with plants, otherwise similar, having the lateral awns reduced and nearly wanting. The plants with single awns suggest *A. Schiedeana*, but they are obviously variations of *A. pansa*. Curiously they come from the same area in Coahuila where I found a homologous form of *A. adscensionis*.

***Aristida dissita* sp. nov.**

Planta perennis caespitosa 3–7 dm. alta perinconspicue minuteque pubescens et scabridula; culmis numerosis confertis simplicibus teretibus inconspicue striatis; vaginis striatis quam internodiis longioribus, margine ad apicem villosis; ligula subnulla dense breviterque villosa-ciliata; laminis 1–2 dm. longis rigidulis rectis vel saepe plus minusve curvatis glauco-viridibus, saepe involutis et 0.5–1 mm. crassis, raro subplanis et ad 1.5 mm. latis, supra minute hispidulis et scabridulis, subtus sublevibus; panícula exserta elongata 1–3 dm. longa saepe 6–8 cm. crassa aperta dissitiflora adscendente ramosa; rhachi tereti superne subangulata, ramis in nodis solitariis vel binis vel raro trinis gracilibus angulo ca. 45° ab rhachi divergentibus, infra medium paniculae 3–5 cm. distantibus, supra medium 1–3 cm. distantibus; spiculis 0–5 (raro ad 10) mm. longe pedicellatis angulo ca 45° a ramis divergentibus, supra medium ramis 2–8 laxè dispositis; glumis violaceis vel purpureo-viridibus angustis acuminatis, non raro in arista inconspicua gracili terminatis, glabris uninervatis carinatis, gluma exteriori (7–)8–9 mm. longa; gluma interiori (8–)9–10 mm. longa, quam exteriori 1–2 mm. longiore; fructibus angustissimis graciliter attenuatis nigrescentibus non tortis praesertim supra medium non raro minutissime scabridis; aristis subaequalibus 12–18 mm. longis rectis tenuibus; callo ca. 0.9 mm. longo acuto barbato.

COAHUILA: Several miles west of Buena Vista, along road from San Antonio de los Alamos, banks of gypsiferous shales, *Johnston 8302*; 3 mi. east of San José, silty flat, openings in mogote, *Johnston 8218*. CHIHUAHUA: 4 mi. southeast of Mesteñas, grassy rocky slope, *Stewart & Johnston 2016*; Chihuahua, 1935, *LeSueur 19*; near Chihuahua, hills and plains, Oct. 13, 1885, *Pringle 388* (TYPE, Gray Herb.); 13 km. south of Jimenez, *Harvey 1344*. TEXAS: El Paso, mesa, base of hill, 1915, *Hitchcock 774*; Sierra Prieta, Hudspeth Co., 1928, *Cory 1049*; Eagle Mt. mine, Hudspeth Co., 1928, *Cory 1048*; 9 mi. east of Van Horne, Culberson Co., probably gypsiferous soil, *Waterfall 4161*; Nichols Ranch, Glass Mts., Brewster Co., *Warnock T532*. NEW MEXICO: 15 mi. west of Las Lunas, Valencio Co., sandy alluvium, *Bacigalupe 572*.

This species keys to *A. pansa* in Hitchcock's treatment of the genus in the Manual of the Grasses of the United States, 440 (1935), and in North

American Flora, **17**: 376 (1935), and is probably closely related to that species. It agrees with *A. pansa* in having an inflorescence with moderately elongate ascending branches, but it differs in having the spikelets spreading from the branch and hence very loosely disposed, rather than closely appressed to the branch and forming a spicate cluster. The proposed species frequently suggests *A. barbata*, but that plant has a proportionately broader panicle with longer and more widely spreading branches, as well as larger and more widely spreading spikelets on more elongate pedicels. Some of the cited material of *A. dissita* has been identified as *A. hamulosa*, but that species is readily distinguished by its elongate widely spreading or even reflexed panicle-branches and its larger very strict spikelets in spicate clusters. The same characters readily separate it from *A. divaricata*, the species to which the type collection was referred by Hitchcock, Contr. U. S. Nat. Herb. **22**: 549 (1924). In trans-Pecos Texas the panicle-branches of *A. dissita* shorten and become more strict and it passes into *A. Reverchoni*, *A. pansa*, *A. Roemeriana*, and even *A. curvifolia*. The loose inflorescence of *A. dissita*, with its ascending panicle-branches, up to 7 cm. long, and loosely disposed ascending spikelets, gives the species a distinctive aspect and permits its ready recognition. It is difficult to understand why the plant should have remained so long without a name.

Tragus Berteronianus Schult. Mant. **2**: 205 (1824).

COAHUILA: Palm Canyon, near Muzquiz, *Marsh* 1000; Saltillo, 1898, *Palmer* 396; north end of Sierra Cruces, sabaneta west of San Rafael, *Johnston & Muller* 1035. CHIHUAHUA: Presidio del Norte, *Bigelow*; Rancho El Pino, 10 km. southeast of Sierra Rica, *Stewart* 2403; 10 mi. southeast of Organos, under bushes at foot of grassy slope, local, *Stewart & Johnston* 2036; hills and plains near Chihuahua, Aug. 1885, *Pringle* 421; Meoqui, 1935, *LeSueur* 33. ZACATECAS: Near Concepcion del Oro, many plants together among bushes and rocks on stony mesas, 1904, *Palmer* 279.

Texas to Arizona and south to South America and in the warmer parts of the Old World. Although stated by some authors to be introduced into our area, it behaves like an indigenous species. It associates with indubitably native species in scattered localities far from human habitations, and it was collected in Texas, New Mexico, and Arizona far from settlements by the early botanists exploring that then frontier area a hundred years ago. Hitchcock, Contr. U. S. Nat. Herb. **17**: 216 (1913), reports collections of the species from Tlahualilo, Durango, and from Sabinas and Soledad, Coahuila.

Hilaria mutica (Buckl.) Benth. Jour. Linn. Soc. Bot. **19**: 62 (1881).

VERNACULAR NAME: Tobosa.

COAHUILA: Sierra del Carmen, Sept. 6, 1936, *Marsh* 853; Rancho Agua Dulce, eastern slope of Sierra San Manuel, *Wynd & Mueller* 481; Hillcoat Mesa, west of Encantada Ranch, July 25, 1938, *Marsh* 1434; El Berrendo, *Harvey* 1175; near La Rosa, *Shreve & Tinkham* 9905; between Hac. La Rosa and Hac. Lechuguilla, dry desert, *Wynd & Mueller* 61; 6 mi. north of Castillon, dominant on large flat, *Johnston & Muller* 191; northeastern foothills of Sierra Cruces, 5 mi. south of San Rafael, silty flat in arroyo, *Johnston & Muller* 1031; 7 mi. south of Jaco, small flat among mesquites, *Johnston & Muller* 1115. CHIHUAHUA: Chihuahua, plains, *Pringle* 485; Meoqui, 1935, *LeSueur* 40; 10 km. east of Jimenez, *Harvey* 1348; 5 mi. east of Carrillo, extensive clumps on lower slopes of dunes, *Muller* 3321. DURANGO: 3 mi. northeast

of Bermejillo, flats among mesquites, *Johnston* 7788; Torreon, 3-4 ft. tall, protection of mesquites, 1898, *Palmer* 506.

Ranging from western Oklahoma and central Texas west to Arizona and south into our area. A common and widespread grass characteristic of flats where water collects after storms and stands for some time before evaporating. The tobosa flats are most common on the clay soils of the calcareous areas, where they vary from a few square meters in extent up to considerable size. In the igneous areas in eastern Chihuahua, tobosa flats are found chiefly on the bottoms of the larger basins. In Coahuila, in calcareous clays, tobosa flats may be encountered in varying abundance from the bottom of the broad valleys up the long slopes to the bases of the mountains and even on flat places in open canyons in the foothills. The soils of tobosa flats may be moderately gypsiferous, but they seldom if ever are saline. Tobosa growing in favorable situations with continually renewed soil-moisture is considered a good feed for stock. The tobosa developing on flats where it is subjected to irregular wettings and long periods of drought is said to become excessively siliceous and rapidly wears down the teeth of stock subsisting on it. Because of this fact, stock-men distinguish the ecological forms of tobosa and have various names for them. As a botanist I have even been severely criticized for insisting they were all one species.

Hilaria Belangeri (Steud.) Nash, No. Am. Fl. **17**: 135 (1912).

COAHUILA: Base of the mountains 3 mi. southeast of Saltillo, *Johnston* 7251.

CHIHUAHUA: Chihuahua, *LeSueur* 18; Chihuahua, hills and plains, *Pringle* 493; Parral-Chihuahua road, 19 mi. north of Rio San Pedro, *Harvey* 1432.

Texas to Arizona and south into northern Mexico. The present northern plant is very closely related to *H. cenchroides* H.B.K., of central Mexico, and is perhaps not specifically distinct.

Aegopogon cenchroides H. & B. ex Willd. Sp. Pl. **4**: 899 (1806).

CHIHUAHUA: Mapula Mts., thin soil on ledges, Oct. 25, 1886, *Pringle* 823.

Ranging along the western Sierra Madre, from northwestern Chihuahua and adjacent Sonora south to South America.

Microchloa Kunthii Desv. Opusc. 75 (1831).

CHIHUAHUA: Pirámide, sheltered places about the bases of large rock masses, *Johnston* 8120; dry gravelly soil on mesa west of Chihuahua, Aug. 6, 1885, *Pringle* 425.

Baja California and northern Chihuahua south to Argentina.

Leptochloa dubia (H.B.K.) Nees, Syll. Pl. Ratisb. **1**: 4 (1824).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 723; Jardin del Sur, Sept. 3, 1936, *Marsh* 767; Hillcoat Mesa, west of Encantada Ranch, July 24, 1938, *Marsh* 1449; Sierra Guajes, Cañon Madera, hillsides, *Stewart* 1506; Sierra Madera, Cañon Charretera, ledges among bushes on sunny hillside in oak belt, *Johnston* 9103; Saltillo, sandy bottomland, *Hitchcock* 677; Saltillo, 1898, *Palmer* 381, 382; 2 mi. west of Saltillo, *Harvey* 1092A; Sierra del Pino, La Noria, arroyo banks in oak belt, *Johnston & Muller* 493, *Stewart* 1201; Sierra Cruces, 8 mi. north of Santa Elena, thickets along arroyo, *Johnston & Muller* 1029; Sierra Negras, 9 km. south of Parras, *Stanford et al.* 189. CHIHUAHUA: Ojo Almagre, Sierra Almagre, wet sand, *Johnston & Muller* 1212; hills and plains near Chihuahua, *Pringle* 422. ZACATECAS: Concepcion del Oro, 1904, *Palmer* 268.

Texas and Oklahoma to Arizona and southward through Mexico; Argentina. Hitchcock, Contr. U. S. Nat. Herb. **17**: 350 (1913), reports the species from Cedros and Pico de Tiera, Zacatecas. A perennial species usually growing among brush on rocky hillsides and flats.

Leptochloa filiformis (Lam.) Beauv. Ess. Agrost. 71, 166 (1812).

COAHUILA: Monclova, 1880, *Palmer 1364*; Monclova, 1939, *Marsh 1843*.

A weedy plant, widely distributed in the warmer parts of America. Hitchcock, Contr. U. S. Nat. Herb. **17**: 349 (1913), reports a collection by Pringle (no. 1161) from "Paso del Norte," Chihuahua.

Leptochloa viscida (Scribn.) Beal, Grasses No. Am. **2**: 434 (1896).

CHIHUAHUA: Plains near Chihuahua, wet places, 1886, *Pringle 814*.

Wet places, Texas to California and northern Mexico.

Leptochloa fascicularis (Lam.) Gray, Man. 588 (1848).

COAHUILA: Road to Don Martin Dam, *Harvey 947*. CHIHUAHUA: Plains near Chihuahua, shallow water, 1886, *Pringle 813*; Camargo, along the Rio Conchos, *Harvey 1403*. DURANGO: Torreon, in soft mud in overflowed land, 1898, *Palmer 503*.

Wet, frequently brackish soils. Widely distributed in the warmer parts of America.

Leptochloa uninervia (Presl) Hitchc. & Chase, Contr. U. S. Nat. Herb. **18**: 383 (1917).

Collected on the Texas bank of the river (Boquillas, Mariscal Canyon, and mouth of Tornillo Creek) in the Big Bend of the Rio Grande and presumably on the Coahuilan bank of the river also. Widely distributed in wet places in the warmer parts of America.

Eleusine indica (L.) Gaertn. Fruct. et Sem. **1**: 8 (1788).

COAHUILA: Monclova, 1939, *Marsh 1840*. CHIHUAHUA: Presa de Chihuahua, 1936, *LeSueur 129*.

Widely distributed weedy plant, introduced from the Old World.

Cynodon Dactylon (L.) Pers. Syn. **1**: 85 (1805).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh 740*; Yerda Spring, *Marsh 265*; Hermanas, *Marsh 1611*; Monclova, *Marsh 1697*, *Harvey 1131*; Saltillo, 1898, *Palmer 254*; Parras, Nov. 1910, *Purpus 5087*; 11 km. northeast of Jimulco, *Stanford et al. 3*. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, sandy arroyo, *Stewart 2404*; 5 km. west of Camargo, *Harvey 1410*. DURANGO: Torreon, low places, 1898, *Palmer 814*.

Introduced from the Old World, now widely distributed in the warmer parts of America. A common plant in moist soils, along river bottoms, about fenced tanques, along irrigation ditches, and frequently a tenacious weed in cultivated soils.

Spartina Spartinae (Trin.) Merrill ex Hitchc. Contr. U. S. Nat. Herb. **17**: 329 (1913).

COAHUILA: Cuatro Cienegas, 1939, *Marsh 2037, 2039*; Viesca, 1938, *Shreve 8772*.

Wet saline soils from Florida to Texas and south to Central America; Argentina. In eastern Mexico it has been collected inland in Coahuila and about Hacienda Angostura, east of San Luis Potosi.

Chloris virgata Sw. Fl. Ind. Occ. 203 (1797).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 749; 20 mi. northwest of La Babia, open valley floor, *Wynd & Mueller* 443; Santa Anna Canyon, *Marsh* 429; Monclova, *Marsh* 1848; west of Puerto de las Monjas, 1-4 ft. tall, low ground, *Johnston* 8640; Parras, along arroyo in thickets, 1898, *Palmer* 448; Parras, 1880, *Palmer*; 7 mi. south of Jaco, about mogote, *Johnston & Muller* 1105; meadow about charco southeast of Almagre, *Johnston & Muller* 1226. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, *Stewart* 2397; Los Medanos, 1935, *LeSueur* 63; Meoqui, 1935, *LeSueur* 31; Jimenez, banks of the Rio Florido, *Harvey* 1318.

Texas to southern California, and south to Argentina. Hitchcock, Contr. U. S. Nat. Herb. **17**: 332-333 (1913), reports specimens from Chihuahua City, Torreon, Tlahualilo, and Saltillo. This annual grass is most commonly found in and about mogotes, growing through low bushes on bajillos, in fenced areas about tanques, or in other areas where silty soil is frequently well moistened. In well watered situations it may grow over a meter high. In some unfavored places depauperate plants less than a decimeter high may be found.

Chloris submutica H.B.K. Nov. Gen. et Sp. **1**: 167 (1816).

COAHUILA: Saltillo, along ditch at edge of corn field, 1898, *Palmer* 390. CHIHUAHUA: Northeast of Chihuahua, valley near Nombre de Dios, Aug. 20, 1885, *Pringle* 424. ZACATECAS: 15 km. west of Concepcion del Oro, valley floor, *Stanford et al.* 558.

From our area south to central Mexico.

Chloris latisquamea Nash, Bull. Torr. Bot. Cl. **25**: 439 (1898).

COAHUILA: 11 mi. south of Allende, along tree-lined arroyo, *Johnston* 7018; Sabinas River, Muzquiz, *Marsh* 399.

Texas and northeastern Coahuila.

Chloris aristata (Cav.) Swallen, No. Am. Fl. **17**: 596 (1939).

COAHUILA: Parras, among weeds on bank of ditch, 1898, *Palmer* 450.

From our area south to Costa Rica.

Chloris andropogonoides Fourn. Pl. Mex. **2**: 143 (1886).

COAHUILA: Palm Canyon, near Muzquiz, *Marsh* 984.

Texas and northeastern Mexico.

Trichloris mendocina (Phil.) Kurtz, Mem. Fac. Cien. Univ. Córdoba **1896**: 37 (1897).

COAHUILA: Perros Bravos, Sept. 20, 1848, *Gregg* 473; near Horizonte, 1937, *Wynd* 774; valley of the Nazas, May 10, 1847, *Gregg* 611. CHIHUAHUA: Near El Carmen, 1935, *LeSueur* 70; valley near Chihuahua, 1885, *Pringle* 475. DURANGO: Torreon, along dry ditch among shrubs and cacti, *Hitchcock* 658.

Arizona to trans-Pecos Texas, along the Rio Grande Valley to Laredo, and south into our area; southern South America.

Trichloris pluriflora Fourn. Mex. Pl. **2**: 142 (1886).

Hitchcock, Contr. U. S. Nat. Herb. **17**: 335 (1913), reports a collection (*Nelson* 6827) from Sabinas, Coahuila. Southern Texas, west to Val Verde County, and south in eastern Mexico; also in Andean South America.

Bouteloua simplex Lag. Var. Cien. **4**: 141 (1805).

COAHUILA: Saltillo, corn field, 1898, *Palmer* 397, 398; Chojo Grande, 27 mi. south-

east of Saltillo, appearing after rains in level places near water-course, 1904, *Palmer* 332.

Western Texas and Colorado to Arizona, south to central Mexico.

Bouteloua Parryi (Fourn.) Griffiths, Contr. U. S. Nat. Herb. **14**: 381 (1912).

Bouteloua polystachya var. *vestita* Wats. Proc. Am. Acad. **18**: 177 (1883).

COAHUILA: Carneros Pass area, 1880, *Palmer* 1357 (type of var. *vestita*). CHIHUAHUA: Pirámide, gravelly plain near rock masses, *Johnston* 8132; center of large grassy plain 7 mi. northeast of La Morita, common, *Johnston* 7971; base of Sierra Santa Eulalia, sandy alluvium of streams in rocky hills, *Pringle* 413.

New Mexico to Arizona and south to San Luis Potosi.

Bouteloua barbata Lag. Var. Cien. **4**: 141 (1805).

VERNACULAR NAME: Pata del Cuervo.

COAHUILA: Sacramento, gravelly arroyo, *Johnston* 7086; Cuatro Cienegas, *Marsh* 2065; 4 mi. east of Cuatro Cienegas, ditch by road, *Johnston* 7117; near Rosario, about edge of mogote, stems spreading, *Johnston* 8824; 20 km. north of junction of Monclova and Torreon roads, *Harvey* 1109; 42 mi. east of Saltillo, *Shreve & Tinkham* 9837; Saltillo, near ditch, prostrate, 1898, *Palmer* 400, 401; south base of Picacho San José, gravelly flat, erect, *Johnston & Muller* 804; 3 mi. east of San José, silty plain, ascending, *Johnston* 8216; 7 mi. south of Jaco, about mogote, decumbent, *Johnston & Muller* 1106; Torreon, bank of Rio Nazas in railroad cut, 1898, *Palmer* 514; plains near Jimulco, 1902-1905, *Pringle* 11216, 13626. CHIHUAHUA: Presidio del Norte, *Bigelow, Parry*; 5½ mi. south of Ojinaga, outwash from saline shales, *Johnston* 8006; 4½ mi. northwest of San Francisco, grassy flat, ascending, *Stewart & Johnston* 2010; Los Medanos, *LeSueur* 59; Villa Ahumada, flats, *LeSueur* 65; Chihuahua, hills and plains, *Pringle* 490.

Texas to southern California and south to southern Mexico. This small rapidly growing annual grass is widely distributed in our area, especially about mogotes, ditches, and similar sites where run-off collects after storms and the soil is moistened at frequent intervals during the summer.

Bouteloua hirsuta Lag. Var. Cien. **4**: 141 (1805).

VERNACULAR NAMES: Grama; Navajitas.

COAHUILA: Sierra del Carmen, Aug. 14, 1936 and Sept. 1, 1936, *Marsh* 657, 887; trail from Encantada Mesa to Fresno Mesa, July 14, 1938, *Marsh* 1397; 3 mi. southeast of Saltillo, common on slopes at base of mountains, *Johnston* 7249; Sierra del Pino, La Noria, common on gravelly flats, *Johnston & Muller* 451, *Stewart* 1204; west base of Picacho del Fuste, rocky flats, *Johnston* 8425; Sierra Madera, Cañon Charretera, openings in brush on rocky flats, *Johnston* 9058; eastern foothills of Sierra Cruces near Santa Elena, rocky flats and slopes, *Johnston & Muller* 217, 1385, *Stewart* 831. CHIHUAHUA: Sierra Virulento, east of Rancho Virulento, rocky terrace, *Johnston* 9084; Sierra Organos, 1937, *LeSueur* 165; hills and plains near Chihuahua, *Pringle* 409.

Widely distributed in the western United States and south to Guatemala. Well-drained soils on plains and hillsides. Usually growing with the more common *B. gracilis*.

Bouteloua scorpioides Lag. Gen. et Sp. Nov. 5 (1816).

Reported by Griffiths and Hitchcock from Cedros, Zacatecas (*Lloyd* 105), where it is said to make turf on the plains. Otherwise the species is known only from central Mexico, from San Luis Potosi to Puebla.

Bouteloua ramosa Scribn. ex Vasey, U. S. Dept. Agric., Div. Bot. Bull. **12**¹: t. 44 (1890).

VERNACULAR NAMES: Chino; Zacate Chino.

COAHUILA: 20 km. south of Ocampo, gravelly flats at base of mountains, *Johnston*

9177; Monclova, 1880, *Palmer* 1358; Cuatro Ciénegas, Puerto del Norte, *Harvey* 1207; Cuatro Ciénegas, *Marsh* 2054; near Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 172; 25 mi. south of Monclova, limy hillside, *Johnston* 7200; hills 20 mi. west of Saltillo, *Shreve & Tinkham* 9826; Saltillo, rough stony mountain-side, 1898, *Palmer* 404; west base of Picacho del Fuste, rocky flats, *Johnston* 8418; west end of Sierra Fragua, near Aguaje Pajarito, rocky flat, *Johnston* 8793; desert 55 mi. west of Saltillo, rocky sandstone slope, *Johnston* 7697; Picachos Colorados, rocky slope at base of cliffs, *Johnston & Muller* 117; Sierra Cruces near Santa Elena, rocky flats among brush, *Johnston & Muller* 1022, 1383; San Antonio de los Alamos, gravelly flat at head of cliffs, *Johnston* 8249; near Bufido, limestone hillside, *Johnston & Muller* 850. CHIHUAHUA: Sierra Santa Eulalia, dry calcareous banks, Aug. 14, 1885, *Pringle* 414; 13 mi. south of Jimenez, *Harvey* 1339; 31 mi. southeast of Jimenez, *Muller* 3329. ZACATECAS: Mountains back of Apizalaya, Hac. Cedros, *Lloyd* 254 (US).

Southern trans-Pecos Texas south into our area. A common and characteristic grass on stony slopes and flats along the base and in the foothills of the limestone mountains of Coahuila, particularly in the Palma Belt, where it is usually abundant and a major forage grass.

In recent treatments of *Bouteloua*, the present species, *B. ramosa*, has been treated as a synonym of *B. breviseta* Vasey. These two species, however, although obviously closely related, differ in distribution, soil preference, habit of growth, and in some minor morphological characters. *Bouteloua breviseta* is a plant of highly gypsiferous soils in the northern half of trans-Pecos Texas and in southeastern New Mexico. Its leaves are strongly involute and its spikes are pale and erect or stiffly ascending. *Bouteloua ramosa*, ranging south of *B. breviseta*, is a plant of stony, prevailing limestone, flats and slopes. Its leaf-blades are usually nearly flat, with the upper surface much less hairy than in *B. breviseta*. The dark-colored spikes are stouter and much more spreading. The stems become more fruticulose, are strictly erect, and form denser tufts.

Bouteloua gracilis (H.B.K.) Lag. ex Steud. Nom. Bot. ed. 2, 1: 219 (1840).

VERNACULAR NAMES: Grama; Navajitas.

COAHUILA: Sierra del Carmen, Aug. 21 and 29, 1936, *Marsh* 570, 693; 20 mi. northwest of Hac. La Babia, open valley floor, *Wynd & Mueller* 435; trail from southern end of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh* 1506; Mesa Grande, 40 km. northwest of Hac. Encantada, meadows, abundant, *Stewart* 1632; Saltillo, stony mountain-side, 1898, *Palmer* 399, 406; Saltillo, along ditches, 1898, *Palmer* 403; 3 km. southwest of Fraile, *Stanford et al.* 332; San Antonio de las Alanzanas, frequent, Aug. 3, 1848, *Gregg* 370; Sierra del Pino, La Noria, meadows, *Johnston & Muller* 701, *Stewart* 1209; west base of Picacho del Fuste, gravelly soil, 2-3½ ft. tall, *Johnston* 8424; Sierra Madera, Cañon Charretera, open rocky canyon floor, 2-3 ft. tall, *Johnston* 9159; tableland north of Cañon del Cuervo Chico, rocky slopes of low limestone hills, *Johnston* 8560; between Palos Blancos and San Pedro, east of Cuesta Zozaya, high grassy valley, *Johnston* 9274; Sierra Cruces, near Santa Elena, stony flats among bushes, *Johnston & Muller* 1028; gypsum ridge east of Laguna Jaco, common, *Stewart & Johnston* 1964, 1966. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, rocky slopes, *Stewart* 2408; Sierra Virulento, rocky terrace, *Johnston* 9082; 2 mi. west of Pozo de Villa, sabaneta under low bushes, *Johnston* 8165; 4½ mi. northwest of San Francisco, grassy flat, *Stewart & Johnston* 2011; Sierra Organos, 1937, *LeSueur* 166; White Water, 1893, *Mearns* 2301; Villa Ahumada, flats, *LeSueur* 66; near Chihuahua, *Pringle* 407; 6 mi. west of Piloncillo, with tobosa in grassland, *Johnston* 7878. ZACATECAS: Valley 15 km. west of Concepcion del Oro, *Stanford et al.* 522; Pico de Teira, *Lloyd* 242 (US).

Widely distributed in the western United States and south to central Mexico. A generally distributed grass in our area. It is abundant in some of the larger valleys and on the igneous oak-clad hills of eastern Chihuahua, where it may become the dominant plant over large areas. In the limestone areas of Coahuila it is rather common on the tablelands and larger valleys in the oak and lower pine belts. On the lower slopes of the limestone mountains it is frequent with other grasses among the bushes on rocky flats and slopes in the Palma Belt. It avoids clay, and along the foot of limestone mountains it is found only where the soil is stony.

Bouteloua eriopoda Torr. Pac. R. R. Rep. 4: 155 (1857).

COAHUILA: Sierra del Carmen, Sept. 13, 1936, *Marsh* 896; west base of Picacho del Fuste, cemented gravels on flats, not common, stems pallid, sprawling, *Johnston* 8420; San Antonio de los Alamos, summit of high tuff cliffs, gravelly flat, *Johnston* 8251, 8257; west end of Sierra Fragua, Aguaje Pajarito, frequent on rocky flats, stems grayish, erect or ascending, *Johnston* 8718; eastern foothills of Sierra Cruces near Santa Elena, gypsum flat, *Johnston & Muller* 245; Sierra Cruces, 8 mi. north of Santa Elena, stony flat among bushes, stems laxly ascending, *Johnston & Muller* 1021, 1025; south base of Picacho San José, rocky slope, stems wiry, ascending, *Johnston & Muller* 802. CHIHUAHUA: 1 mi. east of Pozo de Villa, silty plain, among bushes, *Johnston* 8176; Presidio del Norte, Sept. 1, 1852, *Bigelow*; east base of Sierra Virulento, rocky bench, *Johnston* 8085; 4½ mi. northwest of San Francisco, fairly abundant on grassy flat, *Stewart & Johnston* 2012; Sierra Organos, 1937, *LeSueur* 162; Sierra Santa Eulalia, Aug. 31, 1885, *Pringle* 411; south of San Fernando, silty soil on plain, common, *Johnston* 7937; 6 mi. west of Piloncillo, lava slope, *Johnston* 7875.

Western Texas to Arizona and northern Mexico. A generally distributed but not abundant grass in northern Coahuila and eastern Chihuahua. Its pallid lax loosely ascending frequently somewhat sprawling stems and woolly leaf-sheaths give the plant a very distinctive appearance.

Bouteloua Karwinskii (Fourn.) Griffiths, Contr. U. S. Nat. Herb. 14: 394 (1912).

COAHUILA: Valley floor 3–4 km. east of Puerto Caballo, with tobosa, common, *Johnston* 8319; south of Laguna de Leche, flats formed by planed-off Upper Cretaceous beds, slightly saline and gypsiferous soil, *Johnston* 8618; 1–2 mi. west of Matrimonio Viejo, about mogote at base of slightly saline and gypsiferous slope, *Johnston* 9370. ZACATECAS: Cedros, *Lloyd* 170, 183 (US); 7 mi. north of San Tiburcio, heavy slightly saline soil on flats with mesquites, abundant, *Johnston* 7358.

Ranging from our area south and east to southern Tamaulipas (Cañon de las Minas et Victoria, *Karwinski* 1479, type) and San Luis Potosi. Griffiths, l.c., collected the species at Alonzo, east of San Luis Potosi, and gives an illustration, *pl.* 76, of the habitat. The species appears to be confined to slightly saline and gypsiferous clays. In habit it suggests small slender plants of *B. gracilis*, but it has smaller pale spikes.

Bouteloua trifida Thurb. in Wats. Proc. Am. Acad. 18: 177 (1883).

COAHUILA: Road to Don Martin Dam, 9 km. from Nuevo Leon border, *Harvey* 925; Allende, *Marsh* 1788; Palm Canyon, near Muzquiz, *Marsh* 977; Yerda Spring, *Marsh* 290; Santa Anna Canyon, *Marsh* 467; Zacate, *Marsh* 503; Hermanas, *Marsh* 1620; 2 mi. northwest of Fronteras, road to Natadores, silty desert plain, *Johnston* 7171; Monclova, 1880, *Palmer* 1355 (TYPE); Cañon Bocatoche, dominant grass of drier valley-floor, clumps 3 in. in diameter, *Muller* 3110; on desert near Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 205; dry desert between Hac. La Rosa and Hac. Lechuguilla, *Wynd & Mueller* 65; Saltillo, summit of stony treeless mountain, 1898, *Palmer* 402; Saltillo, 1905, *Palmer* 522; base of mountains 20 km. south of

Ocampo, one plant in mogote, *Johnston* 9179; south of Laguna de Leche, slightly saline and gypseous silty flat, *Johnston* 8619; Sierra Cruces, north of Santa Elena, rocky flat among bushes, *Johnston & Muller* 1020, 1379. CHIHUAHUA: Base of Sierra Santa Eulalia, dry gravelly soil, *Pringle* 412.

Western Texas to southern Nevada and Arizona, south to San Luis Potosi.

Bouteloua aristidoides (H.B.K.) Griseb. Fl. Brit. W. Ind. 537 (1864).

COAHUILA: Soledad, 1880, *Palmer* 1354; Monclova, 1880, *Palmer* 1353; Torreon, abundant in deep cut along railroad, 1898, *Palmer* 513. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, rocky slope, *Stewart* 2393; Pirámide, gravelly flats under large oaks, *Johnston* 8117; low ridge southwest of Mesteñas, rocky slope, ascending, *Stewart & Johnston* 2022; Sierra Organos, 1937, *LeSueur* 39; 11 mi. northeast of Camargo, gravelly benches, common, *Johnston* 7904; Jimenez, banks of Rio Florido, *Harvey* 1323; Cañon La Renga, 15 km. northwest of Santa Fe, dry arroyos, ascending, *Stewart* 2620.

Western Texas to southern California and south to central Mexico; South America.

Bouteloua chondrosioides (H.B.K.) Benth. ex Wats. Proc. Am. Acad. **18**: 179 (1883).

CHIHUAHUA: Volcanic hills 20 km. north of Chihuahua, locally common along base of rocky slope, *Stewart & Johnston* 2129; rocky hills northeast of Chihuahua, forming close sod on small patches, *Pringle* 410.

Trans-Pecos Texas to Arizona and south to southern Mexico. Apparently favoring igneous rocks.

Bouteloua rigidisetia (Steud.) Hitchc. Jour. Wash. Acad. **23**: 453 (1933).

COAHUILA: Calcareous mesa near Piedras Negras, April 20, 1900, *Pringle* 8018.

Oklahoma south through central and eastern Texas into adjacent Mexico.

Bouteloua radicata (Fourn.) Griffiths, Contr. U. S. Nat. Herb. **14**: 411 (1912).

COAHUILA: Don Martin Dam, *Harvey* 934; Caracol Mts., 1880, *Palmer* 1354; Puerto San Lazaro, common on rocky arroyo banks, *Muller* 3051.

Coahuila to Arizona and south to southern Mexico.

Bouteloua Johnstoni Swallen, Proc. Biol. Soc. Wash. **56**: 79 (1943).

COAHUILA: South end of Cañada Oscuro, confined to gypsum beds on the escarpment near Tanque La Luz, locally very common, *Johnston* 8491 (ISOTYPE); high west end of the Sierra Fragua, north of Puerto Colorado, one large colony on east slope just below high crest, *Johnston* 8751; 1 km. northeast of Parritas, east side of Valle Acatita, common on gypsum mesas, *Stewart* 2763.

A very distinct species, of which only the three collections cited above are known. Near Tanque La Luz in Cañada Oscuro, and a mile or so to the southeast, on the steep north-facing slopes at the mouth of Cañon del Cuervo Chico, the grass was common on all the gypsum beds exposed on the escarpment. Its behavior was that of a marked gypsophile. On the steep west-facing slope up which I climbed from near Aguaje Pajarito to the high western crest of the Sierra Fragua, I found the grass again common. Here it was confined to a sharply delimited belt over a hundred feet wide. It was associated with some gypsum indicators, but the soil on which it grew was not pure gypsum, only very moderately gypseous at most. My collection no. 8751 came from a small colony near the ridge crest, and the only

one observed away from the belt of the plant just mentioned. The soil gave no indications of being gypsiferous and no recognized gypsophiles were growing with it. Mr. Stewart's collection from near Rancho Parritas came from gypsum.

The plant has a very distinctive habit of growth. The stems, 15–45 cm. long, are ascending or decumbent. The clump appears to die in the middle and soon forms loose spongy rings of growth 5–10 dm. in diameter.

Bouteloua curtispindula (Michx.) Torr. in Emory, Notes Mil. Recon. 154 (1848).

COAHUILA: Desert 25 mi. southwest of Sabinas, *Wynd & Mueller* 217; Sierra del Carmen, Aug. 12, 1936, *Marsh* 642; Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 642; Yerda Spring, *Marsh* 252, 264; Palm Canyon, *Marsh* 980; Santa Anna Canyon, *Marsh* 546; trail from south end of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh* 1507; Monclova, *Harvey* 1151; Sierra Gloria, *Marsh* 1946; La Rosita, *Shreve & Tinkham* 9592; Saltillo, 1898, *Palmer* 407; Buena Vista, frequent, July 24, 1848, *Gregg* 301; Chojo Grande, 27 mi. southeast of Saltillo, 1904, *Palmer* 371; 3 km. southwest of Fraile, *Stanford et al.* 327; Sierra Cruces, near Santa Elena, abundant on open hillsides, up to 10 dm. tall, *Stewart* 832; San Antonio de los Alamos, gravelly flat on top of cliffs, *Johnston* 8254; west end of Sierra Fragua near Aguaje Pajarito, rocky flats, *Johnston* 8792; Sierra Negras, 9 km. south of Parras, *Stanford et al.* 195; 11 km. northeast of Jimulco, *Stanford et al.* 51. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, rocky slopes, *Stewart* 2406; Chihuahua, rocky hillsides, 1908, *Palmer* 114; Chihuahua, hills and plains near Chihuahua, Aug. 27, 1885, *Pringle* 408. ZACATECAS: Concepcion del Oro, 1904, *Palmer* 264; Cedros, foot-slopes, 1908, *Lloyd* 201.

Widely distributed in central and eastern United States and south to Central America; South America. A common and widely distributed grass in our area, frequent in the grasslands of eastern Chihuahua. In the limestone mountains of Coahuila, with *B. ramosa*, forming the best pasturage for horses and cattle on the rocky slopes and flats in the foothills, and with *B. gracilis* the good pasturage on the tablelands and mountain valleys. In the eastern parts of our area the plants tend to have few spikelets in each spike and to intergrade with *B. uniflora*.

Bouteloua uniflora Vasey, Bot. Gaz. 16: 26 (1891).

COAHUILA: Trail from Encantada Mesa to Fresno Mesa, July 20, 1938, *Marsh* 1376; Sierra del Pino, La Noria, meadow at lower edge of pine belt, *Johnston & Muller* 450, *Stewart* 1217; Sierra Madera, Cañon Charretera, openings in oak thickets on rocky flat, *Johnston* 9060; Saltillo, 1906, *Griffiths* 8408; Carneros Pass, tufts among bushes, *Johnston* 7299. ZACATECAS: Valley 15 km. west of Concepcion del Oro, plant 18 inches tall, *Stanford et al.* 536.

Known from Crockett and Val Verde Counties, Texas, south through eastern Coahuila to southwestern Nuevo Leon. This species is very closely related to *B. curtispindula* and is perhaps no more than an extreme form of that species. The material cited above agrees closely with the type collection. In all the specimens, only a single spikelet is borne at the base of the spike-rachis, which is prolonged above and distinctly overtops the lower glume of the spikelet. Material of *B. curtispindula* from eastern Coahuila and Nuevo Leon frequently has reduced spikes and some specimens have occasional spikes bearing only a single spikelet. In these spikes the rachis is slightly shorter than or about equal to the first glume, and it does not distinctly surpass it, as in typical *B. uniflora*. Since the eastern

material of *B. curtispendula* tends to have the dark-colored spikelets usually present in *B. uniflora* and to simulate that species in habit, the differences seem more technical than important.

Cathestecum erectum Vasey & Hack. Bull. Torr. Bot. Cl. **11**: 37. t. 45 (1884).

CHIHUAHUA: Presidio del Norte, *Bigelow, Parry*; 10 mi. south of Ojinaga, one colony in ravine in low hills, *Johnston 8018*.

In Texas known from the Big Bend area, near Presidio, and near Porvenir. The plant in Texas and adjoining Mexico seems confined to areas of gypseous, frequently saline, Upper Cretaceous clays and shales. The type came from Presidio, Texas. The species is also reported from the Pacific slope of Mexico, from Sonora to El Salvador, cf. Swallen, Jour. Wash. Acad. **27**: 500 (1937).

Munroa squarrosa (Nutt.) Torr. Pac. R. R. Rep. **4**: 158 (1857).

CHIHUAHUA: Sandy soil near Juarez, Sept. 26, 1902, *Pringle*; near Colonia Diaz, *Nelson 6457*.

Central United States south into Chihuahua.

Buchloë dactyloides (Nutt.) Engelm. Trans. Acad. Sci. St. Louis **1**: 432 (1859).

COAHUILA: Saltillo, banks of ravine in compact mat, 1898, *Palmer 7*; 2 mi. west of Saltillo on road to Torreon, *Harvey 1087*; valley near Fraile, *Stanford et al. 271, 288*.

CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, wet sandy arroyo, common, *Stewart 2405*; 10 km. east of Jimenez, *Harvey 1346*. ZACATECAS: Concepcion del Oro, cemetery, 1904, *Palmer 267*; valley 15 km. west of Concepcion del Oro, *Stanford et al. 552*; Cedros, sinks and flats, *Lloyd 211*.

Central United States and south in eastern Mexico to Puebla.

Phalaris canariensis L. Sp. Pl. 54 (1753).

COAHUILA: Monclova, 1939, *Marsh 1693*.

A Mediterranean species, introduced in various parts of America.

Phalaris caroliniana Walt. Fl. Carol. 74 (1788).

COAHUILA: Muzquiz, 1936, *Marsh 1078*. CHIHUAHUA: Common, forming large pure stands in low meadows and along ditches, 1908, *Palmer 32*.

Widely distributed in the southern half of the United States and in adjoining Mexico.

Trichachne insularis (L.) Nees, Agrost. Bras. 86 (1829).

COAHUILA: Santa Anna Canyon, *Marsh 430*; hills 20 mi. west of Saltillo, *Shreve & Tinkham 9829*. CHIHUAHUA: Rocky hills near Chihuahua, Aug. 1885, *Pringle 378*.

Florida to New Mexico and south to Argentina. A coarse plant in the tropics but becoming small in stature in our area and frequently rather similar in aspect to *T. californica*, but readily distinguished from it by its proportionately narrower, lanceolate spikelets, bearing sordid or tawny, rather than pure white or purplish, hairs.

Trichachne Hitchcockii Chase, Jour. Wash. Acad. **23**: 454 (1933).

COAHUILA: Sierra Cruces, limestone hillside just west of Santa Elena, rare, *Johnston 8195*.

Known from a few collections from Texas (San Antonio west to Sander-son) and south to San Luis Potosi.

Trichachne californica (Benth.) Chase, Jour. Wash. Acad. **23**: 455 (1933).

COAHUILA: Don Martin Dam, *Harvey* 935; Hermanas, *Marsh* 1626; Monclova, 1880, *Palmer* 1341; mouth of Cañon Cuervo Chico, under bushes on rocky flat, *Johnston* 8570; Rosario, among bushes in mogote, *Johnston* 8825; 14 mi. east of Paila, *Shreve & Tinkham* 9899; north of Sierra Cruces, about mogote west of San Rafael, *Johnston & Muller* 1040. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, rocky slope, *Stewart* 2409; Coahuilan boundary 1 mi. east of Poza de Villa, among bushes on silty plain, *Johnston* 8173; Chihuahua, 1935, *LeSueur* 77.

Texas to Colorado and Arizona, and south to central Mexico.

Digitaria sanguinalis (L.) Scop. Fl. Carn. ed. 2, **1**: 52 (1772).

COAHUILA: Muzquiz-La Mariposa, 1936, *Marsh* 1049; Monclova, 1939, *Harvey* 1165; Saltillo, 1898, *Palmer* 387. CHIHUAHUA: Presa de Chihuahua, 1936, *LeSueur* 142; 5 km. west of Camargo, 1939, *Harvey* 1415.

Widely introduced European garden weed.

Leptoloma cognatum (Schult.) Chase, Proc. Biol. Soc. Wash. **19**: 192 (1906).

COAHUILA: Sabinas, *Nelson* 6822 (US); Santo Domingo, open slopes of igneous hill, *Wynd & Mueller* 482; Sierra Cruces, edge of gypsum bed in arroyo south of Santa Elena, only one plant seen, *Johnston* 9405. CHIHUAHUA: 4 mi. southeast of Organos, in low bushes on grassy slope, fairly common, *Stewart & Johnston* 2047; Chihuahua, hills and plains, *Pringle* 489 (US).

Eastern United States to Minnesota and Texas and west along the boundary to Arizona; south through eastern Mexico to San Luis Potosi.

Eriochloa gracilis (Fourn.) Hitchc. Jour. Wash. Acad. **23**: 455 (1933).

COAHUILA: Torreon, under bushes on banks of Rio Nazas, 1898, *Palmer* 509. CHIHUAHUA: Cieneguita, wet arroyo bottom, *Johnston & Muller* 1417; Los Medanos, 1935, *LeSueur* 64; near the Sacramento, Chihuahua, Sept. 16, 1886, *Pringle* 812; 20 km. south of Camargo, *Harvey* 1385.

Texas to Arizona and south to Central America.

Eriochloa punctata (L.) Desv. ex Hamilt. Prodr. Ind. Occ. 5 (1825).

COAHUILA: Monclova, *Harvey* 1147.

Louisiana and eastern Texas south in eastern Mexico to Vera Cruz; South America.

Brachiaria Meziana Hitchc. Contr. U. S. Nat. Herb. **12**: 140 (1908).

COAHUILA: Saltillo, along irrigation ditch, 1910, *Hitchcock* 402. CHIHUAHUA: Valley near Chihuahua, Sept. 20, 1885, *Pringle* 375.

Coahuila and Chihuahua south to Oaxaca.

Paspalum distichum L. Syst. Nat. ed. 10, **2**: 855 (1759).

COAHUILA: Saltillo, 1898, *Palmer* 259, 391. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, wet sandy arroyo, *Stewart* 2401; 5 km. west of Camargo, *Harvey* 1407. DURANGO: Mapimi, 1898, *Palmer* 553.

Along streams and ditches and other wet places, widely distributed in America.

Paspalum pubiflorum Rupr. ex Fourn. Mex. Pl. **2**: 11 (1886).

COAHUILA: Yerda Spring, *Marsh* 292; Santa Anna Canyon, *Marsh* 435; Palm Canyon, *Marsh* 324; Muzquiz, *Marsh* 1156; Mesa Grande, northwest of Hac. Encantada, wet arroyo, fairly common, *Stewart* 1619; Hermanas, *Marsh* 2259; Monclova, *Marsh* 1721; 50 km. south of Monclova, *Harvey* 1126; Sierra Hechiceros, Cañon Indio Felipe, creek bank, *Stewart* 91; Sierra Cruces, Cañon Tinaja Blanca, arroyo bank,

erect, *Stewart 1133*; Torreon, 1898, *Palmer 515*; Jimulco Springs, May 13, 1885, *Pringle 427*. CHIHUAHUA: Sierra Almagre, Ojo Almagre, about spring, becoming 6 ft. tall, *Johnston & Muller 1201*; near Chihuahua, by streams, Sept. 1885, *Pringle 374*; 5 km. west of Camargo, *Harvey 1405a*.

Louisiana and Texas south to southern Mexico.

Paspalum crinitum Chase in Hitchc. Contr. U. S. Nat. Herb. **17**: 237 (1913).

COAHUILA: Chojo Grande, 27 mi. southeast of Saltillo, about summit of waterfall in moist place, 1904, *Palmer 338*.

Reported by Chase, Contr. U. S. Nat. Herb. **28**: 61 (1929) from Coahuila, San Luis Potosi, Jalisco, and Puebla.

Paspalum Hartwegianum Fourn. Mex. Pl. **2**: 12 (1886).

COAHUILA: 24 km. east of Don Martin Dam, *Harvey 949*.

Texas south to southern Mexico.

Paspalum mutabile Chase, Contr. U. S. Nat. Herb. **28**: 61 (1929).

COAHUILA: Palm Canyon, Muzquiz area, *Marsh 978*.

Northeastern Mexico south to Hidalgo.

Paspalum ciliatifolium Michx. Fl. Bor. Am. **1**: 44 (1803).

CHIHUAHUA: Los Medanos, 1935, *LeSueur 62*.

A very variable species of sandy soils, widely distributed in the eastern half of the United States; reported from the West Indies and Central America. The cited collection is an unusually glabrous plant and keys to *P. propinquum* in Chase's monograph. I am, however, perfectly content to refer it to typical *P. ciliatifolium*; cf. *Rhodora 36*: 21 (1934). Chase cites a collection of *P. stramineum* Nash from near Juarez, Chihuahua ("Paso del Norte, *Pringle 1123*"). This is presumably a form of the present species with puberulent foliage and somewhat hairy fruit, i.e. the var. *stramineum* (Nash) Fernald.

Panicum ramisetum Scribn. U. S. Dept. Agric., Div. Agrost. Cir. **27**: 9 (1910).

COAHUILA: Rio Grande Valley near Piedras Negras, April 23, 1900, *Pringle 8323*.

Texas south into adjoining Coahuila. The present species probably should be united with *P. Reverchoni* Vasey (1889), an older species having practically the same geographical distribution.

Panicum lanuginosum Ell. var. ***Lindheimeri*** (Nash) Fernald, *Rhodora 36*: 77 (1934).

COAHUILA: Muzquiz, *Marsh 1171*; Cañon Agua Grande, west of Las Delicias, by water, erect, *Stewart 2800*.

A phase of a variable species widely distributed in the eastern United States. Although ranging with the other variants of the species farther northward and eastward, the present glabrous form is the most common, if not the only, phase of the species in south central and trans-Pecos Texas.

Panicum oligosanthos Schultes, var. ***Scribnerianum*** (Nash) Fernald, *Rhodora 36*: 80 (1934).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 519*; Sierra Hechiceros, Cañon Indio Felipe, common on creek bank, *Stewart 74*.

Widely distributed in the United States; in Mexico known only from Coahuila.

Panicum pedicellatum Vasey, U. S. Dept. Agric., Div. Bot. Bull. **8**: 28 (1889).

COAHUILA: Sierra Madera, Cañon Charretera, common in gravelly bed of arroyo in oak belt, *Johnston* 8919.

Central Texas and eastern Coahuila.

Panicum fasciculatum Sw. Prodr. Veg. Ind. Occ. 22 (1788).

Panicum fasciculatum var. *reticulatum* Beal, Grasses No. Am. **2**: 117 (1896).

CHIHUAHUA: Plains near Chihuahua, Sept. 2, 1885, *Pringle* 379, 380; 6 mi. west of Piloncillo, low place in grassland, *Johnston* 7863.

Florida; Texas to Arizona and south into South America.

Panicum arizonicum Scribn. & Merr. U. S. Dept. Agric., Div. Agrost. Cir. **32**: 2 (1901).

COAHUILA: San Antonio de los Alamos, summit of tuff cliffs, gravelly flat, two plants only, *Johnston* 8250. CHIHUAHUA: 7½ mi. south of Pirámide, silty flat, flooded by storm-water, rare, *Johnston* 8100; 10 mi. southeast of Organos, fairly abundant on gentle grassy slope, *Stewart & Johnston* 2034; north of El Carmen, 1935, *LeSueur* 69; Chihuahua, *Pringle* 487 (US); Meoqui, 1935, *LeSueur* 37; 20 km. south of Camargo, *Harvey* 1391.

Trans-Pecos Texas to southern California and south in western Mexico to Oaxaca.

Panicum hirticaule Presl, Rel. Haenk. **1**: 308 (1830).

COAHUILA: Rancho Las Uvas, east side Valle Acatita, shale on slope, *Stewart* 2701. CHIHUAHUA: Llano Chilicote, 7 mi. east of Chilicote Station, grassy flat, *Johnston* 7992; Chihuahua, 1935, *LeSueur* 12; Meoqui, 1935, *LeSueur* 32; 20 km. south of Camargo, *Harvey* 1378; 6 mi. west of Piloncillo, lava hillside, *Johnston* 7866.

Texas to southern California and south to South America. An annual species, becoming large and coarse in the tropics. Our reduced northern form is 1–3 dm. tall.

Panicum filipes Scribn. ex Heller, Contr. Herb. Frankl. Marsh. College **1**: 13 (1895).

COAHUILA: El Berrendo, *Harvey* 1186.

Texas and eastern Coahuila.

Panicum Hallii Vasey, Bull. Torr. Bot. Cl. **11**: 64 (1884).

COAHUILA: Yerda Spring, *Marsh* 288; Santa Anna Canyon, *Marsh* 427; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1278; 2 mi. northwest of Fronteras, road to Natadores, silty desert plain, *Johnston* 7170; near Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 174; mountains west of Saltillo, 1880, *Palmer* 1338; hills 20 mi. west of Saltillo, *Shreve & Tinkham* 9821; Sierra del Pino, La Noria, meadows and arroyo-bank, *Johnston & Muller* 467, 694, *Stewart* 1211; Sierra Madera, Cañon Charretera, ledges on sunny slope in oak belt, *Johnston* 9104; 14 mi. east of Paila, *Shreve & Tinkham* 9897; San Antonio de los Alamos, gravelly flat on top of tuff cliffs, *Johnston* 8250; Sierra Cruces, 8 mi. north of Santa Elena, stony flat, *Johnston & Muller* 1017; 7 mi. south of Jaco, about mogote, *Johnston & Muller* 1111. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, rocky slope, *Stewart* 2395; Coahuilan boundary a mile east of Pozo de Villa, silty plain, *Johnston* 8175; Sierra Santa Eulalia, Aug. 1885, *Pringle* 376.

Texas to Arizona and south to Hidalgo and Durango.

Panicum lepidulum Hitchc. & Chase, Contr. U. S. Nat. Herb. **15**: 75 (1910).

Based upon *Pringle* 487, collected Sept. 22, 1885, by stream in rocky hills near (west of) Chihuahua, the type, and on material from Durango and the Federal District. I have not seen the type collection. The other

specimens originally cited, however, suggest that it may possibly be only a form of *P. Ghiesbreghtii* Fourn.

Panicum bulbosum H.B.K. Nov. Gen. et Sp. **1**: 99 (1815).

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh* 630; Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 514; Sierra Gloria, *Marsh* 1875. CHIHUAHUA: River canyon west of Chihuahua, moist places, Aug. 7, 1885, *Pringle* 377.

Trans-Pecos Texas to Arizona and south to Oaxaca.

Panicum virgatum L. Sp. Pl. 59 (1753).

Panicum plenum Hitchc. & Chase, Contr. U. S. Nat. Herb. **15**: 80 (1910).

COAHUILA: Sierra del Pino, head of Cañon Ybarra, dry hillside, *Stewart* 1248; Sierra del Pino, La Noria, arroyo banks, *Johnston & Muller* 465. CHIHUAHUA: Pirámide, low ground, coarse clumps 2-4 ft. tall, *Johnston* 8140.

United States, except the Pacific States, south to Central America.

Panicum Havardii Vasey, Bull. Torr. Bot. Cl. **14**: 95 (1887).

CHIHUAHUA: Los Medanos, 1935, *LeSueur* 82.

Extreme western Texas, eastern New Mexico, and northern Chihuahua, in sandy places. Hitchcock & Chase, Contr. U. S. Nat. Herb. **15**: 94 (1910), report a collection from "Paso del Norte, *Pringle* 1124."

Panicum agrostoides Spreng. Pl. Pugil. **2**: 4 (1815).

Panicum condensum Nash in Small. Fl. S. E. U. S. 93 (1903).

COAHUILA: Muzquiz Swamp, 1936, *Marsh* 928.

Eastern United States and northeastern Mexico.

Panicum obtusum H.B.K. Nov. Gen. et Sp. **1**: 98 (1816).

VERNACULAR NAME: Zacate Gramilla.

COAHUILA: Open country between Rancho Santo Domingo and Hac. Piedra Blanca, *Wynd & Mueller* 486; Santa Anna Canyon, *Marsh* 463; Yerda Spring, *Marsh* 964; vicinity of Encantada Ranch headquarters and eastward, July 27 or 28, 1938, *Marsh* 1514, 1535; desert near Rancho Santa Teresa, south of Castaños, *Wynd & Mueller* 204; Saltillo, in graveyard, 1898, *Palmer* 394; 24 km. northwest of Fraile, south slope of mountain, *Stanford et al.* 397a; La Ventura, *Nelson* 3908 (US); Torreon, overflowed land, 1898, *Palmer* 504; 5 km. northeast of Jimulco, dry canyon, *Stanford et al.* 125; Sierra del Pino, 10 km. southwest of La Noria, dry hillside, *Stewart* 1266a; Sierra del Pino, La Noria, meadow on flat, *Johnston & Muller* 698; Sierra Cruces, 3 km. west of Santa Elena, black loamy flat, *Stewart* 834; charco on plain southeast of Almagre, wet meadow, *Johnston & Muller* 1225. CHIHUAHUA: Rancho El Pino, southeast of Sierra Rica, wet sandy arroyo, *Stewart* 2398; 2 mi. west of Pozo de Villa, sabaneta, *Johnston* 8164; Llano de Chilicote, flats 7 mi. east of Chilicote Station, *Johnston* 7990; Chihuahua, *Pringle* 476 (US); south of Chihuahua, 1936, *LeSueur* 131; 10 km. east of Jimenez, *Harvey* 1349. ZACATECAS: Concepcion del Oro, cemetery, 1904, *Palmer* 266; mountain 18 km. west of Concepcion del Oro, *Stanford et al.* 582.

Missouri and Texas to Colorado and Arizona, and south to central Mexico. Growing in wet soil or low places where storm water frequently collects.

Oplismenus hirtellus (L.) Beauv. Ess. Agrost. 54, 168 (1812).

COAHUILA: Palm Canyon near Muzquiz, Sept. 19, 1936, *Marsh* 985.

Northern Mexico to Argentina.

Echinochloa colonum (L.) Link, Hort. Berol. **2**: 209 (1833).

COAHUILA: Sierra del Carmen, Aug. 29, 1936, *Marsh* 699; Santa Anna Canyon,

Marsh 428, 431; Sabinas River, Muzquiz, *Marsh* 405; El Berrendo, *Harvey* 1179; Monclova, *Marsh* 1844; 12 km. north of Agritos, damp arroyo, *Stewart* 1282; Llano de Guaje, 5 km. west of mouth of Cañon Ybarra, about tanque, *Stewart* 1920; Tanque Jerico, north of Rancho El Fuste, under bushes near tank, *Johnston* 8342; Parras, bottom-land, 1898, *Palmer* 454; Torreon, under bushes along Rio Nazas, 1898, *Palmer* 508. CHIHUAHUA: Presidio del Norte, *Bigelow*; Presa de Chihuahua, *LeSueur* 134; Sierra Organos, *LeSueur* 176; Jimenez, banks of Rio Florido, *Harvey* 1330.

A European weed, widely distributed in gardens and bottom-lands.

Echinochloa Walteri (Pursh) Heller, Cat. No. Am. Pl. ed. 2, 21 (1900).

COAHUILA: Muzquiz Swamp, *Marsh* 891.

Eastern United States south to Texas and northern Coahuila.

Echinochloa crus-galli (L.) Beauv. Ess. Agrost. 53 (1812).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 751; Hermanas, *Marsh* 1576; Cuatro Cienegas, 1939, *Marsh* 2023; Saltillo, 1898, *Palmer* 380, 418. CHIHUAHUA: Presa de Chihuahua, *LeSueur* 135.

Widely distributed weedy plant in gardens and wet soils.

Chaetium bromoides (Presl) Benth. ex Hemsl. Biol. Centr. Am. Bot. **3**: 503 (1885).

Hitchcock, Contr. U. S. Nat. Herb. **17**: 259 (1913), reports this species from "CHIHUAHUA: Chihuahua, *Palmer* in 1886." The data on the specimen is possibly erroneous. Except for this specimen, the species is known only from central Mexico south into Central America.

Setaria lutescens (Weigel) Hubbard, Rhodora **18**: 232 (1916).

CHIHUAHUA: 5 km. west of Camargo, 1939, *Harvey* 1413.

A European weed, widely distributed in temperate North America.

Setaria geniculata (Lam.) Beauv. Ess. Agrost. 51, 178 (1812).

COAHUILA: 20 mi. northwest of La Babia, open valley floor, *Wynd & Mueller* 431; Santa Anna Canyon, *Marsh* 434; Sabinas River, Muzquiz, *Marsh* 396; Muzquiz Swamp, *Marsh* 936; valley below Saltillo, frequent, 2 ft. tall, Sept. 23, 1848, *Gregg* 536; Saltillo, 1898, *Palmer* 383; Parras, 1898, *Palmer* 451; Jimulco Springs, May 13, 1885, *Pringle* 431. CHIHUAHUA: Chihuahua, *LeSueur* 138.

Southeastern United States west to Texas and south to Argentina. The type of *Chaetochloa gibbosa* Scribn. & Merr., referred to *C. macrostachya* by Hitchcock, Contr. U. S. Nat. Herb. **22**: 204 (1920), properly belongs in the synonymy of the present species.

Setaria verticillata (L.) Beauv. Ess. Agrost. 51, 178 (1810).

COAHUILA: Monclova, 1939, *Marsh* 1841; Parras, shaded garden, 1898, *Palmer* 453. CHIHUAHUA: Presa de Chihuahua, 1936, *LeSueur* 137.

A European weed.

Setaria Grisebachii Fourn. Mex. Pl. **2**: 45 (1886).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 762; Jardin del Sur, Sept. 3, 1936, *Marsh* 776; Sierra Guajes, Cañon Madera, east of Buena Vista, hillside, *Stewart* 1503; Palm Canyon, *Marsh* 983; Saltillo, in garden, 1898, *Palmer* 385; San Lorenzo Canyon, 6 mi. southeast of Saltillo, mouth of canyon, 1904, *Palmer* 397; Chojo Grande, shade of rocky ledges, 1904, *Palmer* 336, 337; Sierra del Pino, La Noria, hillsides and meadows, *Stewart* 1206; San Antonio de los Alamos, talus at base of cliffs, *Johnston* 8275. CHIHUAHUA: 7 mi. northwest of Temporales de Honorato, abundant in mogote, *Stewart & Johnston* 1989; Chihuahua, *LeSueur* 25; rocky hills northeast of Chihuahua, shaded places, Sept. 16, 1885, *Pringle* 381.

Texas to Arizona and south to southern Mexico. A native annual, very suggestive of *S. verticillata* in general habit.

Setaria macrostachya H.B.K. Nov. Gen. et Sp. **1**: 110 (1816).

Chaetochloa leucopila Scribn. & Merr. U. S. Dept. Agric., Div. Agrost. Bull. **21**: 26 (1900).

Setaria leucopila Schum. in Just's Bot. Jahresb. **28**¹: 417 (1902).

COAHUILA: Allende, *Marsh* 1791; Sierra del Carmen, Aug. 8, Sept. 6 and 13, 1936, *Marsh* 687, 852, 903; northwest of Hac. La Babia, open valley floor, *Wynd & Mueller* 441; Cañon Milagro, Sierra Guajes, shaded places, *Stewart* 1707; trail from south end of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh* 1504; Cuatro Cienegas, *Marsh* 2027, *Harvey* 1209a; Monclova, *Marsh* 1696; Saltillo, 1898, *Palmer* 378; east base of Picacho del Fuste, about bushes on flat, *Johnston* 8433; north of Sierra Cruces, about mogote west of San Rafael, *Johnston & Muller* 1041; Sierra Cruces, sunny hillside 5 km. west of Santa Elena, *Stewart* 833; Parras, 1880, *Palmer* 1363 (isotype of *S. leucopila*); Parras, 1898, *Palmer* 449. CHIHUAHUA: Silty plain on Coahuilan boundary 1 mi. east of Pozo de Villa, *Johnston* 8174; Rancho El Pino, south-east of Sierra Rica, rocky slope, *Stewart* 2396; Los Medanos, 1935, *LeSueur* 55; 20 km. south of Camargo, *Harvey* 1383. ZACATECAS: Concepcion del Oro, 1904, *Palmer* 261.

Central and southern Texas to Arizona and south to Central America. A very variable species in height, leaf-width, and size and form of the spike, apparently in response to varying ecological conditions. Our common form has the leaves less than 8 mm. broad, the spike cylindrical, and the plant usually 4–8 dm. tall. It has been described as *S. leucopila*. More vigorous plants have leaves 10–15 mm. wide, the plant over a meter tall, and the spike cylindrical or broadest below the middle and more or less attenuate above. Typical *S. macrostachya* is this large form with cylindrical spike. From the large forms with attenuate inflorescence there are numerous transitions to *S. Scheelei*, a more robust plant with more or less branched open inflorescence.

Setaria Scheelei (Steud.) Hitchc. Proc. Biol. Soc. Wash. **41**: 163 (1928).

COAHUILA: Torreon, 1898, *Palmer* 505. CHIHUAHUA: Ojo Almagre, Sierra Almagre, about spring, 6 ft. tall, *Johnston & Muller* 1202.

Texas and northeastern Mexico. *Setaria villosissima* (Scribn. & Merr.) Schum. is probably a synonym of this species.

Cenchrus myosuroides H.B.K. Nov. Gen. et Sp. **1**: 115 (1816).

COAHUILA: Santa Anna Canyon, *Marsh* 437; Saltillo, *Hitchcock* 5647 (US); Cienega Grande, May 18, 1847, *Gregg* 702; Tinaja del Norte, Sierra Cruces, 25 km. northwest of Santa Elena, among rocks in shaded canyon, not common, *Stewart* 2151. CHIHUAHUA: Wet places near Chihuahua, May 25, 1885, *Pringle* 429; Meoqui, 1936, *LeSueur* 140; 60 km. north of Escalon, *Harvey* 1302.

Texas (Uvalde to Brewster Counties) south through Mexico to South America.

Cenchrus echinatus L. Sp. Pl. 1050 (1753).

COAHUILA: Monclova, 1880, *Palmer* 1343; Monclova, 1939, *Marsh* 1831.

Chase, Contr. U. S. Nat. Herb. **22**: 61 (1920), reports the species from Torreon (*Hitchcock* 7558). Texas to Arizona and south into tropical America.

Cenchrus pauciflorus Benth. Bot. Voy. Sulphur 56 (1840).

VERNACULAR NAME: Chancaquilla.

COAHUILA: On desert 25 mi. southwest of Sabinas, *Wynd & Mueller* 218; Rancho Agua Dulce, valley floor, *Wynd & Mueller* 404; 20 mi. northwest of Hac. La Babia, valley floor, *Wynd & Mueller* 444; Yerda Spring, 1936, *Marsh* 287; Hac. Encantada, abundant on flats, 1941, *Stewart* 1733; Monclova, 1939, *Marsh* 1823; near Esmeralda, fairly common along arroyo, *Stewart* 2179; Cañon Agua Grande, west of Las Delicias, on flats, common, *Stewart* 2825. CHIHUAHUA: 1935, *LeSueur* 7; 20 km. south of Camargo, 1939, *Harvey* 1393.

Chase, Contr. U. S. Nat. Herb. **22**: 71 (1920), reports the species from Saltillo. This species is probably indigenous to Mexico and Texas and was formerly much less generally distributed than at present. It has become a widely distributed and obnoxious weed along roads and about towns in waste ground. Chase refers the common, apparently indigenous *Cenchrus* of central United States to *C. pauciflorus*, but that seems doubtfully correct, for the broader darker green leaves and the shape and armature of the burs of that plant are more suggestive of *C. echinatus*.

Imperata brevifolia Vasey, Bull. Torr. Bot. Cl. **13**: 26 (1886).

Imperata Hookeri (Anderss.) Hack. in DC. Monogr. Phan. **6**: 97 (1889).

Collected in the bottoms of the Rio Grande on the Texan side of the river between El Paso and old Fort Quitman, and almost certainly to be found on the Chihuahuan side also.

Andropogon hirtiflorus (Nees) Kunth, Rév. Gram. **1**: Suppl. xxxix (1830).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 548. CHIHUAHUA: Sierra Organos, common on oak-clad slopes south of Organos, *Stewart & Johnston* 2069; rocky hills northeast of Chihuahua, Aug. 29, 1885, *Pringle* 383.

Trans-Pecos Texas to Arizona and south into tropical America. Our plants represent the Mexican var. *jeensis* (Fourn.) Hitchc. The plant closely resembles *A. scoparius* and *A. cirratus*, from which it differs chiefly in the scabrid strigose hairy glumes.

Andropogon cirratus Hack. Flora **68**: 119 (1885).

CHIHUAHUA: Rocky hills northeast of Chihuahua, Oct. 17, 1885, *Pringle* 382.

Southeastern Arizona to trans-Pecos Texas (east to the Davis Mts.) and south into Chihuahua and eastern Sonora. Closely related to *A. scoparius* and probably only a well-marked geographical variety, differing in having the hairs on the spikelet and pedicels scanty or nearly absent.

Andropogon scoparius Michx. Fl. Bor. Am. **1**: 57 (1803).

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh* 607; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh* 1272; Hillcoat Mesa, lying west of Encantada Ranch, July 25, 1938, *Marsh* 1433; Sierra del Pino, La Noria, along arroyo bottom and on rocky flats among scrub-oaks, *Johnston & Muller* 449, 661; tableland north of Cañon Cuervo Chico, rocky slopes of low rounded limestone hills, *Johnston* 8558.

Eastern United States west to Idaho and northern Arizona, apparently entering Mexico only in northern Coahuila. Our material falls into the var. *neomexicana* (Nash) Hitchcock, cf. *Rhodora* **37**: 143 (1935).

Andropogon virginicus L. var. *tenuispatheus* (Nash) Fern. & Griseb. *Rhodora* **37**: 142 (1935).

COAHUILA: Cañon Agua Grande, west of Las Delicias, near water, erect, 3 m. tall, scarce, *Stewart* 2818.

Wet ground from southeastern United States to California and south into tropical America.

Andropogon ternarius Michx. Fl. Bor. Am. **1**: 57 (1803).

COAHUILA: Sierra de los Guajes, Cañon Madera, fairly abundant on hillsides, *Stewart 1504*; Sierra Madera, Cañon Charretera, rocky bed of open arroyo in oak belt, common, becoming 4 ft. tall, *Johnston 9074*.

Delaware to Missouri and south to Florida and central Texas, entering Mexico only in northern Coahuila.

Andropogon Hallii Hack. Sitzungsab. Akad. Wiss. Wien **89**¹: 127 (1884).

CHIHUAHUA: Los Medanos, 1935, *LeSueur 61*.

Sandy places from North Dakota to Utah, and south to Arizona and trans-Pecos Texas and northern Chihuahua.

Andropogon Gerardi Vitman, Summa Pl. **6**: 16 (1792).

Andropogon furcatus Muhl. ex Willd. Sp. Pl. **4**: 919 (1806).

COAHUILA: Sierra del Pino, meadows in the pine forests north of La Noria, common and conspicuous, *Johnston & Muller 542*, *Stewart 1226*.

Widely distributed in eastern and central United States. Known in Mexico only in Coahuila.

Andropogon saccharoides Sw. Prodr. 26 (1788).

Andropogon barbinodis Lag. Gen. et Sp. Nov. 3 (1816).

Andropogon perforatus Trin. ex Fourn. Mex. Pl. **2**: 59 (1886).

VERNACULAR NAME: Zacate aceite.

COAHUILA: Sierra del Carmen, July 29, 1936, *Marsh 638*; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh 1313*; Hillcoat Mesa, lying west of Encantada Ranch, July 25, 1938, *Marsh 1435*; Hermanas, *Marsh 1628* and *2254*; Monclova, 1880, *Palmer 1347*; Monclova, *Marsh 1692*; desert near Rancho Santa Teresa, *Wynd & Mueller 207*; 2 mi. west of Saltillo, *Harvey 1096*; Saltillo, 1898, *Palmer 4*, 261, 810; Sierra del Pino, La Noria, *Stewart 1212*, *Johnston & Muller 667*; Sierra Madera, Cañon Charretera, bed of arroyo, *Johnston 9075*; 10 km. southwest of El Oro, on bajillo, *Stewart 3028*; Sierra Jimulco, 5 km. northeast of Jimulco, *Stanford et al. 132*. CHIHUAHUA: Vicinity of Rancho El Pino, 10 km. southeast of Sierra Rica, rocky slopes, *Stewart 2410*; near Juarez, May 30, 1888, *Pringle 1994*; Agua Caliente, 1935, *LeSueur 51*; Chihuahua, 1935, *LeSueur 2*; arroyo 20 km. south of Camargo, *Harvey 1382*, 1389; 6 mi. west of Piloncillo, grassland, *Johnston 7879*. ZACATECAS: Concepcion del Oro, 1904, *Palmer 262*.

Alabama and Missouri west to southern California and south to Argentina. A variable widely spread species which I am here accepting in the broad sense used by Hackel in his monumental treatment of the genus. Attempts to segregate out certain forms, such as *A. barbinodis*, by stressing length of peduncle, hairiness of the nodes, shape of panicle, size of spikelets, etc., have been singularly unsuccessful but persistent. The characters used show little tendency to vary together and some of them are probably associated with the vigor and rapidity of growth. Significantly, these segregates and the restricted species have practically the same geographical distribution in Mexico and the United States and commonly may be detected in the same locality. Some plants of *A. saccharoides* have a conspicuous pore developed on the glumes and have been distinguished as *A. perforatus*. The distribution of the form is sporadic and may occur in

plants referred either to *A. saccharoides* or to *A. barbinodis*. Pitted glumes are known in other species of *Andropogon*. I see no reason why the development should be given specific recognition in the present case.

***Sorghum halepense* (L.) Pers.** Syn. Pl. **1**: 101 (1805).

COAHUILA: Sierra del Carmen, Sept. 8, 1936, *Marsh* 760; trail from the southern end of Hillcoat Mesa to Buena Vista headquarters, July 27, 1938, *Marsh* 1508; Santa Anna Canyon, *Marsh* 436; Monclova, *Marsh* 1663; Saltillo, weed in field, *Hitchcock* 5649 (US). CHIHUAHUA: Arroyo 20 km. south of Camargo, *Harvey* 1398.

A Mediterranean grass, now widely introduced into the warmer parts of America. A serious weed in irrigated lands, particularly in the Laguna District.

***Sorghastrum nutans* (L.) Nash** in Small, Fl. S. E. U. S. 66 (1903).

COAHUILA: Palm Canyon near Muzquiz, *Marsh* 986.

Eastern United States and south into Mexico.

***Heteropogon contortus* (L.) Beauv. ex R. & S.** Syst. Veg. **2**: 836 (1817).

COAHUILA: Sierra del Carmen, Aug. 22, 1936, *Marsh* 583; igneous hill near Santo Domingo, *Wynd & Mueller* 470; Palm Canyon, near Muzquiz, *Marsh* 993; Puerto del Norte, Cuatro Cienegas, *Harvey* 1206; Monclova, 1880, *Palmer* 1346; Puerto Santo Lazaro, Sierra Gavia, *Muller* 3070; limestone hills near Santa Rosa, *Shreve & Tinkham* 9582; 14 mi. east of La Paila, *Shreve & Tinkham* 9893; Sierra Cruces, stony flats between bushes 8 mi. north of Santa Elena, *Johnston & Muller* 1018. CHIHUAHUA: Sierra Organos, 1937, *LeSueur* 161; Sierra Santa Eulalia, *Pringle* 480; Meoqui, 1936, *LeSueur* 141; 13 km. southwest of Jimenez, *Harvey* 1340.

Florida to Arizona and southward; widely distributed in the warmer parts of the world. Although growing on limestone, this species is more abundant on igneous rocks, particularly basalt. Usually growing on rocky slopes and at times dominating large areas.

***Heteropogon melanocarpus* (Ell.) Benth.** Jour. Linn. Soc. Bot. **14**: 71 (1882).

Hitchcock, Contr. U. S. Nat. Herb. **17**: 212 (1913), cites a collection from the Mapula Mts., Chihuahua, *Pringle* 820. The species is widely distributed in the warmer parts of the world and extends north through western Mexico to Arizona.

***Trachypogon Montufari* (H.B.K.) Nees**, Agrost. Bras. 342 (1829).

CHIHUAHUA: Rocky flat just east of Organos, locally common on ledges, *Stewart & Johnston* 2059; Chihuahua, *LeSueur* 15.

Southern and eastern Texas; Arizona; Mexico to Argentina.

***Elyonurus barbiculmis* Hack.** in DC. Monogr. Phan. **6**: 339 (1889).

CHIHUAHUA: Rocky flats just east of Organos, locally common about ledges, leaf-tufts bright green, *Stewart & Johnston* 2058; west of Chihuahua, 1935, *LeSueur* 14; Cerro Coronel, Chihuahua, rocky hills, Aug. 5, 1885, *Pringle* 423.

Trans-Pecos Texas to Arizona and south to Durango.

***Manisuris altissimus* (Poir.) Hitchc.** Jour. Wash. Acad. **24**: 292 (1934).

COAHUILA: Sabinas River, near Muzquiz, 1936, *Marsh* 404.

Wet places in the warmer parts of the world; introduced into America. The species has been collected repeatedly on the Texan bank of the river in the Big Bend of the Rio Grande.

Hackelochloa granularis (L.) Kuntze, Rev. Gen. **2**: 776 (1891).

CHIHUAHUA: Open canyon in igneous hills 20 km. north of Chihuahua, sprawling in moist gravel, rare, *Stewart & Johnston* 2128; hills near Chihuahua, *Pringle* 1057 (US).

Arizona south through Chihuahua to Central America. A weedy grass widely distributed in the warmer parts of the world. Said to be introduced in our area, but, if so, introduced at a very early date, for it was collected at unfrequented places in southeastern Arizona by Charles Wright as early as 1851.

Coix lacryma-jobi L. Sp. Pl. 972 (1853).

COAHUILA: Saltillo, July 1880, *Palmer* 1337.

A species of the Old World tropics, widely cultivated in America for its bead-like fruits and frequently spontaneous.

Tripsacum dactyloides L. Syst. Nat. ed. 10, 1261 (1759).

Tripsacum dactyloides var. *occidentale* Cutler & Anderson, Ann. Mo. Bot. Gard. **28**: 258 (1941).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 536; Sierra Encantada, 7 km. west of Buena Vista, fairly common in wet canyon, *Stewart* 1450; Santa Anna Canyon, *Marsh* 438; Palm Canyon, near Muzquiz, *Marsh* 982.

Connecticut to Iowa and south to Florida and through Texas and northeastern Mexico to San Luis Potosi. Hitchcock, and recently Cutler & Anderson, have placed the *Tripsacum* of northeastern Mexico in *T. lanceolatum* Rupr. I am, however, unable to separate Texan specimens from those collected in Coahuila, Nuevo Leon, Tamaulipas, and eastern San Luis Potosi. Characters in the size, shape, and surface of the segments of the female inflorescence readily separate these specimens from the more southerly and westerly *T. lanceolatum*.

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Johnston, I. M. 1943. "Plants of Coahuila, Eastern Chihuahua, and Adjoining Zacatecas and Durango, II." *Journal of the Arnold Arboretum* 24(4), 375–421.
<https://doi.org/10.5962/p.185483>.

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