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NORTH AMERICAN FLORA

(POALES)

POACEAE (pars)

ALBERT SPEAR HITCHCOCK



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of the glumes, about twice as thick, strongly nerved; first glume nearly as long as the sterile lemma, acuminate-pointed; second glume exceeding the sterile lemma, both much exceeding the fruit and at maturity spreading and exposing it, acuminate-pointed, the summit of the lemma arcuate, the sterile palea obsolete; fruit 2 mm. long, 1 mm. wide, obovate, stipitate, smooth and shining.

TYPE LOCALITY: Savannah, Georgia.

DISTRIBUTION: Georgia to Florida and eastern Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 354; Contr. U. S. Nat. Herb. 15: f. 368.

EXCLUDED SPECIES

Brachiaria ciliatissima (Buckl.) Chase; Hitchc. Bull. U. S. Dep. Agr. 772: 221. 1920.

Panicum ciliatissimum Buckl. Prel. Rep. Geol. & Agr. Surv. Tex. App. 4. 1866.

Plants perennial, producing long, leafy stolons, with short internodes, rooting at the swollen nodes, the sheaths mostly longer than the internodes but usually not inclosing them, the blades short, firm, and divaricately spreading; flowering stems usually sparingly branching, erect or ascending, 15-40 cm. high, glabrous, the nodes bearded; leaf-sheaths sparsely, or sometimes rather densely, pilose, mostly shorter than the internodes; ligule densely hairy, less than 1 mm. long; blades 3-7 cm. long, 3-5 mm. wide, tapering from near the rounded base to a sharp point, flat, puberulent or glabrous, usually ciliate along the lower portion of the thick, white margin; panicles finally long-exserted, 3-6 cm. long, rarely more than 1 cm. wide, the few, erect branches bearing approximate, short-pedicelled spikelets, placed with the back of the fruit turned from the rachis, that is, the first glume toward the rachis; spikelets 4 mm. long, about 1.8 mm. wide, pointed; first glume three fourths the length of the spikelet or more, cuneate, 5-nerved, glabrous, or with a few silky hairs at the very base; second glume and sterile lemma subequal, exceeding the fruit, 5-nerved, the internerves densely silky-pubescent, or in the lemma sometimes nearly glabrous, the portion from the lateral nerves to the margins densely clothed with white and glistening silky hairs, the sterile palea about two thirds as long as its lemma; fruit 3 mm. long, about 1.6 mm. wide, ellipsoid, apiculate, transversely rugose.

TYPE LOCALITY: Northern Texas.

DISTRIBUTION: Southwestern Arkansas and Texas.

ILLUSTRATION: Contr. U. S. Nat. Herb. 15: f. 365.

NOTE 1: This supposed *Panicum* represents a third species of the genus *Brachiaria*, already treated in this work (see pages 160 and 161). It may readily be distinguished by its densely silky spikelets.

NOTE 2: *Panicum disciferum* Fourn. (Mex. Pl. Gram. 19. 1886) is also a *Brachiaria*, and should be included among the synonyms of *B. plantaginea* (Link) Hitchc. (page 160).

ADDITIONAL SPECIES (NOT IN THE KEY)

12a. **Panicum didistichum** Mez, Notizbl. Bot. Gart. Berlin 7: 63. 1917.

Differing from *P. molle* in the slightly smaller, more densely pubescent spikelets, more closely set on the rachis.

TYPE LOCALITY: Grenada, Nicaragua.

DISTRIBUTION: Known only from the type collection (Levy 1124).

87a. **Panicum cyanescens** Nees, Agrost. Bras. 220. 1829.

Differing from *P. parvifolium* in having less slender, more erect, firm culms, longer blades (3-8 cm. long), and stiffly ascending panicle-branches, naked below.

TYPE LOCALITY: Brazil.

DISTRIBUTION: British Honduras; Trinidad to Brazil.

DOUBTFUL SPECIES

Panicum ambitiosum Fourn. Mex. Pl. Gram. 30. 1886. Type locality: Mexico. Probably a species of *Ichnanthus*.

- Panicum densum* Muhl. Descr. Gram. 122. 1817. Type locality: Eastern United States.
Panicum dichotomum spathaceum Wood, Bot. & Flor. ed. 1871. 393. 1871.
Panicum discolor Spreng. Mant. Fl. Hal. 31. 1807. Type locality: Pennsylvania.
Panicum flexuosum Raf. Jour. Bot. Desv. 4: 273. 1814. Type locality: New Jersey.
Panicum gracilescens Desv.; Poir. in Lam. Encyc. Suppl. 4: 279. 1816. Type locality: Carolina.
Panicum Rafinesquianum Schultes, in R. & S. Syst. Veg. Mant. 2: 257. 1824. Based on *P. flexuosum* Raf.
Panicum sessilicaule Desv.; Hamilt. Prodr. 11. 1825. Type locality: Carolina?
Panicum speciosum Walt. Fl. Car. 73. 1788. Type locality: South Carolina.
Panicum viliforme Wood, Class-Book ed. 1861. 785. 1861. Type locality: Eastern Tennessee.

56. STEINCHISMA Raf.; Steud. Nom. Bot. ed. 2. 2: 635. 1841.

See *Panicum hians*, page 236.

57. ICHNANTHUS Beauv. Agrost. 56. 1812.

Navicularia Bertol. Opusc. Sci. Bologna 3: 408. 1819. Not *Navicularia* Adans. 1763.

Perennial or rarely annual grasses with erect or creeping stems and flat usually broad sometimes petioled leaf-blades. Inflorescence an open or contracted panicle, the panicles terminal and axillary, the spikelets in pairs unequally short-pedicelled along the stiffly spreading or ascending main branches. Spikelets with keeled glumes so as to appear somewhat laterally compressed, similar in structure to those of *Panicum*, the glumes and sterile lemma usually rather strongly nerved, and commonly ending in an apiculation or convolute point. First glume usually more than half as long as the spikelet, 3-nerved, the second glume and sterile lemma about equal, longer than the fruit, 5-nerved, the lemma inclosing a membranaceous palea and rarely a staminate flower; fertile lemma usually acute or acutish, indurate, dorsally compressed, usually raised on a short stipe, the margins usually flat but in our species more or less inrolled, the base bearing on either side membranaceous appendages adnate to the lemma below, free above, the appendages in most of our species obsolete and indicated by minute scars or excavations only; palea entirely inclosed in the margins of the lemma.

Abnormal specimens occur, especially in nos. 3-5, in which the sterile lemmas are greatly multiplied, forming elongate curved spikelets as much as 2 cm. long.

Type species, *Ichnanthus panicoides* Beauv.

Appendages of fertile lemma reduced to scars.

Leaf-blades petiolate, the petiole 1-15 mm. long; first glume acute, about half as long as the spikelet.

Spikelets 3 mm. long; culms delicate, spreading, much-branched.

Spikelets 3.5-4 mm. long; culms erect, simple or sparingly branched.

Leaf-blades sessile, clasping; first glume acuminate or attenuate-pointed, mostly more than half as long as the spikelet.

Second glume hispid with slender hairs along the margin; culms delicate, the leaf-blades mostly not more than 5 cm. long and 1 cm. wide; sterile palea small and narrow.

Second glume glabrous or rarely with a very few hairs; plants comparatively stout, the leaf-blades mostly more than 1 cm. wide; sterile palea well-developed, nearly as long as its lemma.

First glume about as long as the spikelet; fertile lemma nearly as long as the spikelet; leaf-blades ovate-lanceolate to elliptic-lanceolate, thin.

First glume and fertile lemma shorter than the spikelet; leaf-blades lanceolate to oval, firm.

Leaf-blades lanceolate, 1-2 cm. wide, glabrous.

Leaf-blades oval to ovate lanceolate, 1.5-3.5 cm. wide, often pubescent beneath.

Appendages of fertile lemma evident.

Panicle of numerous clustered branches.

Panicle of 2-5 racemes.

1. *I. mayarensis*.

2. *I. lanceolatus*.

3. *I. tenuis*.

4. *I. nemorosus*.

5. *I. pallens*.

6. *I. axillaris*.

7. *I. mexicanus*.

8. *I. Standleyi*.

1. *Ichnanthus mayarensis* (Wright) Hitchc. Contr. U. S. Nat.
Herb. 12: 228. 1909.

Panicum mayarense Wright; Sauv. Anal. Acad. Ci. Habana 8: 206. 1871.

Ichnanthus Wrightii Hitchc. Contr. U. S. Nat. Herb. 12: 229. 1909.

Stems slender, wiry, straggling or spreading, rooting at the lower nodes, 20-40 cm. long, smooth or the lower part minutely pubescent, striate, the nodes several; leaf-sheaths shorter, often much shorter, than the internodes, striate, smooth or sparsely papillose-hispid on the surface, puberulent on the margin, especially toward the apex; blades lanceolate to narrowly elliptic, 2-5 cm. long, 3-6 mm. wide, striate, smooth throughout or scaberulous above, abruptly narrowed at base into a petiole 1-5 mm. long, or on the sterile shoots as much as 15 mm. long; panicles 2-8 cm. long, usually long-exserted, the few main branches as much as 3 cm. long, rather stiffly spreading, the primary and secondary axes glabrous or scaberulous; spikelets about 3 mm. long, lanceolate, nearly terete, acute, glabrous, the unequal pedicels 0.5-2 mm. long; first glume 1.5 mm. long, broad and clasping at base, acute; second glume and sterile lemma equal, 3 mm. long, acuminate, strongly nerved, the sterile palea narrow, about 1 mm. long; fertile lemma 2 mm. long, acute, only slightly compressed dorsally, the margins inrolled, nearly or quite meeting, the scars at base about 0.5 mm. long, the stipe obsolete.

TYPE LOCALITY: Mayarí Abajo, Cuba.

DISTRIBUTION: Eastern Cuba.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 1.

2. *Ichnanthus lanceolatus* Scribn. & Smith, Bull. U. S. Dep. Agr.
Agrost. 4: 36. 1897.

Panicum Lindenii Fourn. Mex. Pl. Gram. 29. 1886. Not *P. Lindenii* Griseb. 1866.

Stems erect or slightly spreading at base, 40-60 cm. high, striate, glabrous or puberulent, the nodes about 4, glabrous, or puberulent below the sheath-margin; leaf-sheaths shorter than the internodes, striate, glabrous on the surface or the lowermost villous, the margin villous; blades lanceolate to ovate-lanceolate, or the lower ovate, 5-7 cm. long, 1-3 cm. wide, the uppermost reduced, rather firm in texture, glabrous or slightly scaberulous beneath, scabrous above, narrowed from a rounded or cordate base into a petiole 1-10 mm. long; panicles terminal and axillary, 5-12 cm. long, the one from the uppermost sheath smaller, the few branches rather stiffly spreading, as much as 6 cm. long, the axes scaberulous; spikelets about 4 mm. long, lanceolate, only slightly compressed laterally, glabrous, the pedicels scabrous, unequal, the shorter of the pair about 1 mm. long, the longer about 3 mm. long; first glume 2 mm. long, broad and clasping at base, acute; second glume and sterile lemma nearly equal, clasping at base, acuminate, the sterile palea small and narrow, about 1 mm. long; fertile lemma nearly 3 mm. long, acute, the margins flat and overlapping toward the apex, inrolled and nearly meeting toward the base, the scar at base very short, extending downward into a minute wing on the very short stipe.

TYPE LOCALITY: Izamal, Yucatán.

DISTRIBUTION: Yucatán.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 4: pl. 5; Field Mus. Publ. Bot. 3: 36; Contr. U. S. Nat. Herb. 22: pl. 6.

3. *Ichnanthus tenuis* (Presl) Hitchc. & Chase, Contr. U. S. Nat.
Herb. 18: 334. 1917.

Oplismenus tenuis Presl, Rel. Haenk. 1: 319. 1830.

Panicum exile Steud. Syn. Gram. 45. 1854.

Panicum alsinoides Griseb. Fl. Brit. W. Ind. 550. 1864.

Ichnanthus alsinoides Munro; Hemsl. Biol. Centr. Am. Bot. 3: 500. 1885.

Apparently annual; stems slender, spreading or creeping, rooting at the nodes, much-branched, the fertile shoots ascending 10-20 cm. high, glabrous or puberulent, mostly in lines, purplish; leaf-sheaths shorter than the internodes, papillose-hispid with weak slender hairs; blades lanceolate, 2-5 cm. long, 4-10 mm. wide, sessile, rounded or slightly cordate at base, acute or acuminate, thin, glabrous or puberulent, often sparsely hispid, the margins scabrous; panicles terminal and axillary, 2-4 cm. long, or the axillary smaller, mostly on long slender

peduncles, the few branches rather weakly spreading, as much as 2 cm. long, the axes slender, angled, scaberulous and sometimes puberulent, often villous or with a few long hairs at the base of the branches; spikelets narrowly lanceolate, 3 mm. long, acuminate, hispid, the pedicels slender, unequal, the shorter of the pair 1 mm. or less, the other twice or thrice as long; first glume broad and clasping at base, attenuate into a slender point nearly as long as the spikelet, glabrous, scaberulous; second glume and sterile lemma nearly equal, acuminate, the former attenuate-pointed, prominently nerved, hispid with slender hairs along the lateral nerves, the sterile palea small and narrow; fertile lemma 1.5-2 mm. long, dorsally compressed, oblong, rounded at the apex, the margins flat, widely separated, the scar about 0.3 mm. long, extending downward into a wing decurrent on the short stipe of the lemma.

TYPE LOCALITY: Panama.

DISTRIBUTION: Costa Rica to Panama and northern South America.

ILLUSTRATIONS: Rep. Mo. Bot. Gard. 10: *pl. 24*; Contr. U. S. Nat. Herb. 22: *pl. 2*.

4. *Ichnanthus nemorosus* (Sw.) Döll, in Mart. Fl. Bras. 2²: 289. 1877.

Panicum nemorosum Sw. Prodr. 22. 1788.

Milium nemorosum Moench, Meth. Suppl. 67. 1802.

Echinolaena nemorosa Kunth, Rév. Gram. 1: 54. 1829.

Stems spreading and creeping, rooting at the nodes, much-branched, pubescent or glabrescent, the nodes pubescent, the fertile shoots decumbent or rising 10-20 cm.; leaf-sheaths shorter than the internodes, pubescent or glabrescent, villous on the margin and collar; blades ovate-lanceolate to elliptic-lanceolate, 3-7 cm. long, 1-2 cm. wide, clasping at the usually unsymmetrical base, somewhat abruptly narrowed toward the apex, thin, sparsely hispid and scaberulous on both surfaces, or glabrescent; panicles terminal and axillary, 1-4 cm. long, ovate or often narrow, the few branches weakly spreading or appressed, usually not more than 2 cm. long, the axes angled and scabrous, villous at the base of the branches; spikelets 2.5-3 mm. long, glabrous, the pedicels short, 1-2 mm. or less; first glume a little shorter than the second and about as long as the sterile lemma, 5-nerved, the lateral nerves contiguous, broad and somewhat clasping at the base, acuminate or attenuate-pointed at the apex, the keel scaberulous above; second glume and sterile lemma 5-nerved, the lateral nerves distant, the glume scaberulous on the keels, acuminate or attenuate-pointed, sometimes with a few hairs near the margin, the lemma smooth on the keel, acute or somewhat rounded at apex; the sterile palea well-developed, nearly as long as the lemma; fertile lemma lanceolate, 2 mm. long, acutish, yellow-brown at maturity, the scar at base about 0.3 mm. long, bearing no wing below, the margins somewhat inrolled, distant.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Southern Mexico to Panama; Cuba to Trinidad.

ILLUSTRATIONS: Trin. Ic. *pl. 210*; Contr. U. S. Nat. Herb. 22: *pl. 3*.

5. *Ichnanthus pallens* (Sw.) Munro; Benth. Fl. Hongk. 414. 1861.

Panicum pallens Sw. Prodr. 23. 1788.

Panicum hemignostum Steud. Syn. Gram. 77. 1854.

Panicum montanum Poit.; Fourm. Mex. Pl. Gram. 30, as synonym. 1886.

Stems much-branched, spreading, creeping at the base, rooting at the nodes, the fertile culms ascending 30-80 cm. or sometimes more, puberulent; leaf-sheaths usually glabrous on the surface, villous on the margin; blades lanceolate, often somewhat falcate, 5-10 cm. long, mostly 1-2 cm. wide, somewhat clasping at the asymmetric narrowed base, somewhat abruptly narrowed to an acuminate point, the lower surface glabrous or slightly scaberulous, roughened with irregular cross-veins, sometimes with a few scattered stiff hairs, the upper surface scaberulous, often with a few stiff hairs at the base and on the basal portion of the margin; panicles terminal and from several of the upper axils, 5-10 cm. long, rather compact, elliptic, the main branches ascending, as much as 6 cm. long, usually bearing secondary branches, the axes angled and scabrous, pubescent at the base of the branches; spikelets 3-3.5 mm. long, glabrous or rarely with a few stiff hairs; first glume 1.5-2 mm. long, somewhat clasping at base, attenuate-pointed, scabrous on the keel; second glume longer than the sterile lemma, acuminate

but scarcely attenuate-pointed, scabrous on the keel and roughened on the lateral nerves; sterile lemma similar to the second glume but shorter and less narrowed at the summit, the palea well-developed, nearly as long as the lemma; fertile lemma oblong, 1.5 mm. long, rounded at apex, the margins inrolled, distant, the scars at base 0.3 mm. long, narrowly winged at the side.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Eastern Mexico and the West Indies to tropical South America.

ILLUSTRATIONS: Trin. Ic. *pl.* 211, 212A; Contr. U. S. Nat. Herb. 22: *pl.* 4.

6. *Ichnanthus axillaris* (Nees) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 334. 1917.

Panicum axillare Nees, Agrost. Bras. 141. 1829.

Stems much-branched, spreading or prostrate, rooting at the nodes, the fertile shoots ascending 10–20 cm. in open ground, or among shrubs clambering to the height of 1–1.5 meters, puberulent or glabrescent; leaf-sheaths villous, at least on the margin; blades oval, ovate, or ovate-lanceolate, 3–12 cm. long, 1.5–3.5 cm. wide, cordate-clasping at base, acute or acuminate, rather thick and firm, pubescent or glabrous beneath, scabrous above; panicles terminal and axillary, similar to those of *I. pallens* but averaging larger, sometimes as much as 20 cm. long; spikelets similar to those of *I. pallens* in arrangement and structure, but usually larger; glumes often sparsely pilose; sterile lemma containing a well-developed palea and a staminate flower; fertile lemma 2 mm. long, with a prominent scar at base.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Hispaniola; Porto Rico; Guatemala to Panama and Brazil.

7. *Ichnanthus mexicanus* Fourn. Mex. Pl. Gram. 34. 1886.

Stems tall, glabrous; leaf-sheaths densely villous or glabrate; ligule a very short, densely ciliate membrane; blades (only the upper seen) gradually narrowed from the cordate base to a slender point, 8–18 cm. long, as much as 2.5 cm. wide near base, pubescent on both surfaces; panicle 30 cm. long, about 8 cm. wide, rather densely flowered, the branches ascending, clustered, the longer ones as much as 10 cm. long, spikelet-bearing from base; spikelets single or in clusters along the scabrous rachis, 4–4.5 mm. long, the pedicels 1–2 mm. long, densely scabrous-hispidulous; first glume about as long as the spikelet, 3-nerved, pointed, scabrous, villous along the margins and at the apex; second glume about as long as the fruit, 5-nerved, scabrous, the long hairs sparse or wanting; sterile lemma similar to the second glume but weakly 5-nerved, the palea well developed, ciliate on the keels; fertile lemma about 3 mm. long, the boat-shaped point distinct, the appendages rather firm, ovate-oblong, distinct from near the base, about 0.5 mm. long.

TYPE LOCALITY: Trapiche de la Concepcion, Oaxaca.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: *pl.* 8.

8. *Ichnanthus Standleyi* Hitchc. Contr. U. S. Nat. Herb. 24: 662. 1930.

Apparently perennial; stems slender, spreading, branching, minutely pubescent; sheaths rather sparingly pubescent, villous on the margin; ligule very short, densely ciliate; blades ovate-lanceolate, somewhat acuminate-pointed, sparingly hispid on both surfaces, scabrous on the margin, 4–6 cm. long, 1–2 cm. wide, often petioled, the petiole slender, as much as 15 mm. long; inflorescence long-exserted, consisting of 2–5 racemes 1–2 cm. apart and 5–10 mm. long, finally more or less reflexed; spikelets dark-purple, about 5 mm. long; glumes about as long as the spikelet, acuminate, sparsely hispidulous, pilose on the margins; sterile lemma similar to the glumes but less acuminate; fertile lemma white, elliptic, about 3.5 mm. long, the wings or appendages evident but minute, about 0.5 mm. long.

TYPE LOCALITY: Siguatepeque, Honduras.

DISTRIBUTION: Known only from the type locality.

DOUBTFUL SPECIES

Panicum Schlechtendalii Fourn. Mex. Pl. Gram. 22, 30. 1886. Probably *Ichnanthus nemorosus*.
Panicum Schlechtendalii monstrosum Fourn. Mex. Pl. Gram. 31. 1886. Based upon a specimen
 (Mirador, Galeotti 5689) with abnormal spikelets; probably *Ichnanthus pallens*.

58. LASIACIS (Griseb.) Hitchc.; Hitchc. & Chase, Contr. U. S.

Nat. Herb. 15: 16. 1910.

Panicum § *Lasiacis* Griseb. Fl. Brit. W. Ind. 551. 1864.

Perennial shrubby often climbing grasses with much-branched stems (herbaceous and simple in *L. procerrima*), flat often slightly petiolate leaf-blades, and open or somewhat contracted panicles terminating the main stem and primary branches, reduced panicles terminating the secondary often fascicled branches. Spikelets subglobose, ovoid or ellipsoid, placed obliquely on their pedicels, the glumes and sterile lemma broad, abruptly apiculate, papery-chartaceous, shining, often black at maturity, many-nerved, glabrous, or lanose at the apex only. First glume rarely more than one third the length of the spikelet, somewhat inflated-ventricose. Second glume and sterile lemma subequal, about as long as the fertile lemma, or the glume slightly shorter, the lemma inclosing a membranaceous palea and sometimes a staminate flower. Fertile lemma white, bony-indurate, obovoid, obtuse, the margins inrolled inclosing the edges of the indurate palea, both lemma and palea bearing at the apex in a slight crateriform excavation a tuft of woolly hairs, the palea concave below, gibbous above, the apex often free at maturity.

Type species, *Panicum divaricatum* L.

Stems erect, simple, annual; leaf-blades as much as 40 cm. long and 5 cm. wide, deeply cordate-clasping.

Stems much-branched, woody; leaf-blades mostly less than 20 cm. long, narrowed at base or somewhat cordate.

Main stem prostrate, the fertile shoots prostrate, ascending or erect.

Leaf-blades lanceolate, mostly less than 5 cm. long; fertile shoots strongly dorsiventral, mostly prostrate.

Leaf-blades linear-lanceolate, about 10-12 cm. long; fertile shoots ascending or erect from a decumbent base, not dorsiventral.

Main stem clambering, or much branched and forming a tangled mass.

Ligule noticeable, brownish, about 2 mm. long.

Spikelets clustered toward the tips of the slender scabrous branches; blades elongate, more than 10 times as long as wide, scabrous on the upper surface.

Spikelets not clustered toward the tips of the branches (somewhat so in *L. Standleyi*); blades less than 10 times as long as wide.

Blades glabrous on the upper surface.

Blades scabrous on the upper surface.

Panicles ovoid, 5-6 cm. long, the branches short, spreading or reflexed.

Panicles 10-15 cm. long, the branches ascending, naked below.

Ligule inconspicuous, hidden within the mouth of the sheath, rarely as much as 1 mm. long.

Stems not high-climbing, decumbent and rooting at base, forming a tangled mass, with no strong central cane; spikelets clustered toward the ends of the branches.

Stems high-climbing, forming a strong central cane; spikelets not clustered toward the ends of the branches.

Leaf-blades glabrous on both surfaces, often more or less scabrous. (See *L. ruscifolia*, rarely with glabrous ovate-lanceolate blades.)

Main stem papillose-hispid; lateral flowering branches glabrous; panicles small and narrow.

Main stem (except sometimes the young shoots) smooth.

Leaf-blades narrow, usually 3-4 mm., sometimes 5 mm. wide, 8-10 cm. long.

Leaf-blades more than 5 mm. wide if as much as 10 cm. long.

Panicles few-flowered, 5-10 cm. long; branches strongly zigzag, the branchlets strongly divaricate or reflexed; blades narrowly lanceolate, firm, mostly less than 1 cm. wide (sometimes wider on vigorous shoots).

Panicles many-flowered, usually 15-25 cm. or more

1. *L. procerrima*.

2. *L. Rugelii*.

3. *L. Grisebachii*.

4. *L. oaxacensis*.

5. *L. ligulata*.

6. *L. scabrior*.

7. *L. Standleyi*.

8. *L. rhizophora*.

9. *L. leptostachya*.

10. *L. Harrisii*.

11. *L. divaricata*.

- long on the primary branches; branches straight or arcuate, not zigzag; blades mostly more than 1.5 cm. wide.
- Spikelets globose, about 3 mm. long. 12. *L. globosa*.
- Spikelets lanceolate-ellipsoid, 3.5-5 mm. long.
- Spikelets 4.5-5 mm. long, on short stiff appressed pedicels; blades oblong-ovate or elliptic-lanceolate. 13. *L. Sloanci*.
- Spikelets 3.5-4 mm. long, on flexuous spreading pedicels; blades lanceolate or narrowly-lanceolate. 14. *L. patentiflora*.
- Leaf-blades pubescent on one or both surfaces (sometimes glabrous in *L. ruscifolia*).
- Blades narrowly lanceolate, averaging 8-10 times as long as wide; panicle large and open; spikelets 4-5 mm. long. 15. *L. sorghoidea*.
- Blades ovate-lanceolate or elliptic, sometimes lanceolate, often more or less cordate-clasping; panicle often compact or at least the branches commonly compactly flowered; spikelets 3-4 mm. long.
- Sterile lemma 1. 16. *L. ruscifolia*.
- Sterile lemmas 2. 17. *L. anomala*.

1. *Lasiacis procerrima* (Hack.) Hitchc.; Chase, Proc. Biol. Soc.

Wash. 24: 145. 1911.

Panicum procerrimum Hack. Oesterr. Bot. Zeits. 51: 431. 1901.

Stems succulent, somewhat woody at base but not perennial, erect from a thick woody rootstock, simple, as much as 4 meters high and 1 cm. thick, glabrous, glaucous; leaf-sheaths usually overlapping, glabrous or rarely pubescent; ligule inconspicuous; blades narrowly lanceolate, 15-40 cm. long, 2-5 cm. wide, deeply cordate-clasping, the lobes overlapping, gradually acuminate at apex, glabrous and glaucous, rarely pubescent, the basal lobes sometimes ciliate; panicles very large, open and much-branched, as much as 1 meter long, the branches naked below, finally widely spreading, the lower in whorls, as much as 40 cm. long, the main axis smooth, the branchlets and pedicels scabrous; spikelets scattered, 3-4 mm. long, ovoid or elliptic.

TYPE LOCALITY: On the river Tiliří near La Verbena and Alajuelita, Costa Rica.

DISTRIBUTION: Central Mexico to Panama and northern South America.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 10.

2. *Lasiacis Rugelii* (Griseb.) Hitchc. Bot. Gaz. 51: 302. 1911.

Panicum Rugelii Griseb. Cat. Pl. Cub. 233. 1866.

Stems much-branched, prostrate, the main ones slender, mostly about 2 mm., sometimes 2.5 mm. thick, appressed-hispidulous, the sterile shoots prostrate, the leaves strongly distichous and dorsiventral, approximate, the fertile shoots sometimes ascending toward the end; leaf-sheaths overlapping, hispidulous, villous on the margin and around the summit; ligule inconspicuous; blades lanceolate or oblong-lanceolate, 2-5 cm. long, 4-12 mm. wide, hispidulous or puberulent on both surfaces; panicles small and few-flowered, usually not more than 5 cm. long, the few branches spreading, the axes pubescent, scabrous on the angles; spikelets 5 mm. long.

TYPE LOCALITY: Matanzas, Cuba.

DISTRIBUTION: Western Cuba; Haíti; Yucatán; San Luis Potosí.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 11.

3. *Lasiacis Grisebachii* (Nash) Hitchc. Bot. Gaz. 51: 302. 1911.

Panicum Grisebachii Nash, Bull. Torrey Club 35: 301. 1908.

Stems much-branched, glabrous, the main ones creeping and rooting at the nodes, as much as 2 mm. in diameter, the fertile shoots erect or ascending, 20-40 cm. high; leaf-sheaths hispidulous especially on the margin, or the surface glabrescent; ligule inconspicuous; blades narrowly lanceolate, 6-12 cm. long, 5-10 mm. wide, puberulent beneath, glabrous above, scabrous on the margin; panicles ovate, mostly 5-6 cm. sometimes 10 cm. long, the few branches rather stiffly ascending, few-flowered; spikelets 4 mm. long, similar to those of *L. divaricata*.

TYPE LOCALITY: Madruga, Cuba.

DISTRIBUTION: Western Cuba; Vera Cruz to Honduras.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 12.

4. *Lasiacis oaxacensis* (Steud.) Hitchc. ; Chase, Proc. Biol. Soc.
Wash. 24: 145. 1911.

Panicum oaxacense Steud. Syn. Gram. 73. 1854.

Plants straggling and branching but not high-climbing nor with a strong central cane; stems decumbent and geniculate at base, rooting at the lower nodes, the ascending branches 1-2 meters long, glabrous; leaf-sheaths glabrous or rarely appressed-pubescent, the margin villous; ligule prominent, 2-5 mm. long, brownish; blades narrowly lanceolate, 10-25 cm. long, 1-2 cm. wide, abruptly narrowed at base, long-tapering at apex, scabrous on both surfaces; panicles open, as much as 30 cm. long and nearly as wide, the slender scabrous branches and branchlets ascending below, drooping above, naked below, the spikelets clustered toward the tips, no smaller secondary panicles present; spikelets 4 mm. long, elliptic, often purple.

TYPE LOCALITY: Oaxaca.

DISTRIBUTION: Western Jamaica; Hispaniola; southern Mexico to Panama and Ecuador.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 13.

5. *Lasiacis ligulata* Hitchc. & Chase, Contr. U. S. Nat. Herb. 18:
337. 1917.

Panicum divaricatum puberulum Griseb. Fl. Brit. W. Ind. 551. 1864.

Clambering to a height of 5-10 meters, the robust glabrous central cane as much as 1 cm. in diameter, the wide-spreading main branches and the arcuate secondary ones not in fascicles, not zigzag; sheaths ciliate on the overlapping margin, otherwise glabrous; ligule membranaceous-ciliate, brown, 1-2 mm. long; blades flat, firm, 6-12 cm. long, 0.8-1.5 cm. wide, lanceolate, acuminate, narrowed to the base, glabrous on the upper surface, puberulent or glabrous beneath, the margins scabrous; panicles terminating the numerous branches, exerted or partly included, oval in outline, rather open, 5-10 cm. long, usually half to three fourths as wide, the branches few, spreading, finally reflexed, branching or flowering from near the base, usually bearing 5-10 short-pedicelled spikelets; spikelets about 4 mm. long, obovoid and purplish-black at maturity, the glumes and sterile lemma as well as the fruit with a lanate tuft at the tip.

TYPE LOCALITY: Port of Spain, Trinidad.

DISTRIBUTION: Porto Rico to Ecuador and Brazil.

ILLUSTRATIONS: Kunth, Rév. Gram. pl. 29; Contr. U. S. Nat. Herb. 22: pl. 14.

6. *Lasiacis scabrior* Hitchc. Proc. Biol. Soc. Wash. 40: 85. 1927.

Stems climbing or straggling, woody, as much as 3 meters tall, pubescent or glabrescent; leaf-sheaths more or less hispidulous, densely villous on the margin; ligule prominent, brown, mostly 3-5 mm. long; blades rather firm, elliptic-lanceolate, mostly 8-12 cm. long and 1-1.5 cm. wide, harshly scabrous on the upper surface, puberulent beneath; panicles not much exerted, ovoid, rather densely flowered, mostly 5-6 cm. long, sometimes as much as 10 cm., the branches spreading, or the lower finally reflexed, the axis and branches pubescent; spikelets ovoid, pale, about 4 mm. long.

TYPE LOCALITY: Cubilquitz, Guatemala.

DISTRIBUTION: Nicaragua to Panama.

7. *Lasiacis Standleyi* Hitchc. Proc. Biol. Soc. Wash. 40: 86. 1927.

Stems branching and straggling, mostly 1-2 meters tall, rooting at the nodes with slender branching stilt-roots; leaf-sheaths glabrous or hispidulous; ligule prominent, brown, 3-5 mm. or even 8 mm. long; blades narrowly elliptic-lanceolate, 10-15 cm. long, 1-2.5 cm. or rarely 3 cm. wide, somewhat falcate, scabrous on the upper surface, minutely pubescent beneath; panicles 10-15 cm. long, the few branches stiffly ascending, the spikelets somewhat clustered toward the ends of the scabrous branches and branchlets; spikelets ovoid-globular, pale or finally dark, about 4 mm. long.

TYPE LOCALITY: La Tejona, Costa Rica.

DISTRIBUTION: Costa Rica.

8. *Lasiacis rhizophora* (Fourn.) Hitchc.; Chase, Proc. Biol. Soc.
Wash. 24: 145. 1911.

Panicum rhizophorum Fourn. Mex. Pl. Gram. 31. 1886.

Stems branching and straggling, not forming a strong central cane, decumbent at base and rooting at the lower nodes, the fertile stems ascending, 30-100 cm. long, glabrous or pubescent; leaf-sheaths appressed-hispidulous or glabrescent, villous on the margin; ligule inconspicuous; blades lanceolate to ovate-lanceolate, 7-14 cm. long, 1.5-3 cm. wide, somewhat cordate at base, rather abruptly narrowed above to an acuminate point, pubescent or scabrous beneath, scabrous above; panicles 8-15 cm. long, the branches stiffly ascending, naked below, the spikelets clustered toward their tips, the axis scabrous; spikelets 3-4 mm. long, ovoid.

TYPE LOCALITY: Orizaba, Mexico.

DISTRIBUTION: Southern Mexico to Costa Rica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 15.

9. *Lasiacis leptostachya* Hitchc. Contr. U. S. Nat. Herb. 22:
19. 1920.

Plants forming a stout central cane, with numerous slender branches at the nodes, clambering to the height of several meters; main stems roughened and somewhat cinereous with papillae and irregularly appressed hairs; floral branchlets slender, conspicuously zigzag, smooth, 20-40 cm. long; leaf-sheaths glabrous or nearly so, densely long-ciliate on the margin, hirsute on the collar; ligule inconspicuous, about 0.5 mm. long; blades narrowly lanceolate, 7-10 cm. long, 5-10 mm. wide, narrowed toward each end, glabrous on both surfaces; panicles small and narrow, rather dense, 2-4 cm. long, few-flowered; spikelets about 5 mm. long, oblong-ovoid, pale; first glume about one third as long as the spikelet; second glume and sterile lemma equal, as long as the spikelet, woolly at tip; fertile lemma as long as the sterile, woolly at the tip.

TYPE LOCALITY: Jinotepe, Nicaragua.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 16.

10. *Lasiacis Harrisii* Nash, Torreya 13: 274. 1913.

Stems clambering among bushes to the height of 5 meters or more, the main canes slender but strong, the very slender branches pendent, the young twigs commonly rosy-purple; leaf-sheaths slender, glabrous except the margin and throat, or rarely the young ones sparsely hispid; ligule inconspicuous; blades linear-lanceolate, 5-10 cm. long, 2-6 mm. wide, gradually narrowed to an acuminate apex, thin and lax, glabrous, the margins scabrous; panicles narrow, mostly less than 5 cm. long, often partially included in the uppermost sheath, the branches short and appressed, the longer usually not more than 1 cm. long, and bearing not more than 4 spikelets; spikelets similar to those of *L. divaricata* but less turgid.

TYPE LOCALITY: Cinchona, Jamaica.

DISTRIBUTION: At 1000-1500 meters, Jamaica and Porto Rico.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 17.

11. *Lasiacis divaricata* (L.) Hitchc.; Hitchc. & Chase, Contr. U. S. Nat.
Herb. 15: 16. 1910.

Panicum divaricatum L. Syst. Nat. ed. 10. 871. 1759.

Panicum bambusoides Desv.; Hamilt. Prodr. 10. 1825.

Panicum Chauvinii Steud. Syn. Gram. 68. 1854.

Panicum divaricatum stenostachyum Griseb. Fl. Brit. W. Ind. 551. 1864.

Plants usually glabrous throughout except the margin of the sheaths; stems woody, much-branched, clambering over shrubs to the height of 3-4 meters, the main cane strong, as much as 6 mm. in diameter, the main branches often fascicled, the vigorous secondary sterile shoots usually strongly divaricate or zigzag, the prophyllum prominent at the base of the branches; leaf-sheaths glabrous except the villous or ciliate margin and the sometimes hispid collar; ligule very short, not noticeable without displacing the blade; blades narrowly lanceolate, 5-12 cm. long, 5-15 mm. wide, or on the vigorous sterile shoots much larger, narrowed at the

base, gradually narrowed above to an acuminate point, scabrous on the margin and sometimes slightly on the surface, the older deciduous from the sheaths, the basal portion of the fertile shoots bearing the old sheaths but otherwise naked; panicles terminating the main culm and the fertile branches, ovate or oblong, 5–20 cm. long, loosely flowered, the branches distant, spreading or often reflexed, the axes angled, scabrous, flexuous, the lower usually 2–4 cm., sometimes as much as 10 cm. long, the main branches ordinarily 5–10-flowered; spikelets ovoid, about 4 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: At low altitudes, southern Florida; West Indies; Mexico to Panama and tropical South America.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 353; Vasey, Agr. Grasses U. S. pl. 13; Proc. Biol. Soc. Wash. 24: 145, f. 11; Field Mus. Publ. Bot. 3: 33; Contr. U. S. Nat. Herb. 22: pl. 18.

12. *Lasiacis globosa* Hitchc. Contr. U. S. Nat. Herb. 17:
251. 1913.

Stems climbing, glabrous; leaf-sheaths glabrous, ciliate on the overlapping margin; ligule a narrow pilose membrane about 0.5 mm. long; blades firm, elliptic-lanceolate, scabrous on the margins and upper surface and more or less so beneath, those of the flowering branches 8 to 12 cm. long, 1 to 2 cm. wide; panicle pyramidal, loosely flowered, 6 to 15 cm. long, the branches very scabrous, widely spreading, the longer as much as 7 cm. long; spikelets on scabrous pedicels 1 to 2 cm. long, globose, 3 mm. long; first glume circular, gibbous, nerved, scabrous on the keel, ciliate on the membranaceous margin, about 1 mm. long; second glume and sterile lemma glabrous and shining, equal, a little shorter than the fertile lemma, reticulate-veined, lanate-ciliate on the rounded apex; fertile lemma umbonate, the point protruding from the second glume and sterile lemma, this and the apex of the palea woolly.

TYPE LOCALITY: Acapulco, Mexico.

DISTRIBUTION: Western Mexico.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 19.

13. *Lasiacis Sloanei* (Griseb.) Hitchc. Bot. Gaz. 51: 302. 1911.

Panicum latifolium Hamilt. Prodr. 10. 1825. Not *P. latifolium* L. 1753.

Panicum Sloanei Griseb. Fl. Brit. W. Ind. 551. 1864.

Climbing to the height of 3 or 4 meters, forming a strong central cane, the stems glabrous, the branches solitary or 2 or 3 together, elongate; leaf-sheaths glabrous except the margin, the collar conspicuously villous; ligule inconspicuous; blades oblong-ovate or elliptic-lanceolate, 10–15 cm. long, 2.5–4 cm. wide, those of the branches smaller, narrowed at the unsymmetrical base, abruptly narrowed above to an acuminate point, somewhat papery in texture when dry, glabrous on both surfaces or scabrous above, scabrous on the margin; panicles open and usually loosely few-flowered, 10–20 cm. long, the branches distant and widely spreading, the lower as much as 10 cm. long, flexuous, scaberulous; spikelets 4–5 mm. long, elliptic.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies to northern South America; central Mexico to Costa Rica.

ILLUSTRATIONS: Sloane, Hist. Jam. pl. 71, f. 3; Contr. U. S. Nat. Herb. 22: pl. 20.

14. *Lasiacis patentiflora* Hitchc. & Chase, Contr. U. S. Nat.
Herb. 18: 338. 1917.

High-climbing with a strong central cane as much as 8 mm. thick, the plant glabrous throughout except at the summit of the sheaths; branches numerous, solitary, widely spreading and finally repeatedly branching, the branches and branchlets straight or arcuate, divergent at a rather narrow angle; sheaths with a ring of hairs at the summit or at least a tuft of hairs on either side, sometimes pubescent on the margins toward the summit; ligule about 0.5 mm. long, thin-membranaceous; blades on vigorous shoots as much as 14 cm. long and 2.5 mm. wide, but mostly about 8–12 cm. long and 1.5–2 cm. wide, acuminate, rounded-tapering to the base, usually somewhat asymmetric, glabrous, scabrous on the margin and somewhat so on both surfaces; panicles numerous, short-exserted, mostly 12–20 cm. long, nearly as wide, the slender axis and distant spreading flexuous branchlets angled, scabrous, the pedicels

flexuous, spreading; spikelets pale, blotched with dark blue or purple at maturity, 3.4–3.8 mm. long, globose-obovoid, the glumes and sterile lemma lanate-ciliate on the margin toward the apex; fruit 3 mm. long, 2 mm. wide.

TYPE LOCALITY: Tobago.

DISTRIBUTION: Dominica; Salvador to Venezuela, Trinidad, and British Guiana.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 21.

15. *Lasiacis sorghoidea* (Desv.) Hitchc. & Chase, Contr. U. S.

Nat. Herb. 18: 338. 1917.

Panicum lanatum Sw. Prodr. 24. 1788. Not *P. lanatum* Rottb. 1776.

Panicum sorghoideum Desv.; Hamilt. Prodr. 10. 1825.

Panicum orinocense Willd.; Spreng. Syst. 1: 316, as synonym. 1825.

Panicum praegnans Steud. Syn. Gram. 74. 1854.

Panicum lanatum sorghoideum Griseb. Fl. Brit. W. Ind. 551. 1864.

Panicum martinicense Griseb. Fl. Brit. W. Ind. 552. 1864.

Panicum Swartzianum Hitchc. Contr. U. S. Nat. Herb. 12: 140. 1908.

Lasiacis Swartzianum Hitchc. Bot. Gaz. 51: 302. 1911.

Stems much-branched, erect or clambering to a height of 5–7 meters, the strong central cane as much as 1 cm. thick, glabrous, or pubescent, the main branches sometimes 1 meter or more long, arcuate, bearing slender branchlets toward the pendent ends or the branchlets fasciated on the main stem, the young shoots usually pubescent; leaf-sheaths pubescent especially on the margin and collar, the surface sometimes glabrate; ligule inconspicuous; blades lanceolate or elliptic-lanceolate, those of the main stem or of vigorous shoots as much as 20 cm. long and 3 cm. wide, those of the fertile branches usually 8–12 cm. long and 1.5 cm. wide, or on the fasciated branchlets smaller, often falcate, velvety on both surfaces or puberulent only, or glabrate above; panicles on the main stem and larger branches usually 10–20 cm. long, at maturity as wide or wider, many and rather compactly flowered, the branches long and again branched, the axes very scabrous; spikelets 4–5 mm. long.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Throughout the West Indies but rare in Cuba; Mexico to tropical South America.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 22.

16. *Lasiacis ruscifolia* (H.B.K.) Hitchc.; Chase, Proc. Biol. Soc. Wash.

24: 145. 1911.

Panicum ruscifolium H.B.K. Nov. Gen. & Sp. 1: 101. 1815.

Panicum compactum Sw. Adnot. Bot. 14. 1829. Not *P. compactum* Kit.; Schultes, Oesterr. Fl. ed. 2. 1: 212, as synonym. 1814.

Panicum megacarpum Steud.; Griseb. Fl. Brit. W. Ind. 551, as synonym. 1864.

Panicum Liebmannianum Fourn. Mex. Pl. Gram. 33. 1886.

Lasiacis compacta Hitchc. Bot. Gaz. 51: 302. 1911.

Lasiacis Liebmanniana Hitchc.; Chase, Proc. Biol. Soc. Wash. 24: 145. 1911.

More robust than any other species, freely branching, the shoots usually strongly dorsal-ventral; stems becoming several meters long, glabrous or rarely puberulent; leaf-sheaths often overlapping, glabrous on the surface or sometimes hispidulous toward the apex (in some Central American specimens papillose-hispid throughout), glabrous or often ciliate or villous on the margin especially near the summit, the collar glabrous or villous; ligule inconspicuous; blades ovate-lanceolate or elliptic, sometimes lanceolate, the primary 10–15 cm. long, 3–6 cm. wide, narrowed or often cordate-clasping at the asymmetric base, rather abruptly narrowed to an acuminate but not attenuate apex, puberulent or glabrous beneath, glabrous or scabrous above, the secondary blades similar or reduced; panicles narrow and compact, 5–20 cm. long, or often with distant lower branches, these compactly flowered, or rarely the panicle somewhat open, with spreading implicate but rather closely flowered branches, the axes hispidulous and scabrous; spikelets 3–4 mm. long, nearly globose at maturity.

TYPE LOCALITY: Volcan de Jorullo, Mexico.

DISTRIBUTION: Mostly near the coast, Cuba and Jamaica; Mexico to northern South America.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 23.

17. *Lasiacis anomala* Hitchc. Jour. Wash. Acad. Sci. 9: 37. 1919.

Stems woody, branching, clambering over bushes, glabrous, the main stem as much as 5.5 mm. thick and 5 meters long; leaf-sheaths glabrous or more or less pilose, striate, ciliate,

densely villous on the collar; ligule a short ciliate membrane; blades ovate-lanceolate or elliptic-lanceolate, as much as 10 cm. long and 3 cm. wide on the main flowering stems, usually 4-6 cm. long and 1-2 cm. wide on the lateral flowering branches, rather thin, narrowed and usually asymmetric at base, sometimes a little cordate-clasping, puberulent, or sometimes glabrate on the upper surface; panicles oblong-ovoid, 7-10 cm. long, 3-5 cm. wide, those on the lateral branches smaller, the lower branches somewhat distant, spreading or somewhat reflexed, all rather compactly flowered, puberulent, the pedicels angled, rather stout, 1-2 mm. long; spikelets ovoid, becoming nearly globose at maturity, 3-4 mm. long; first glume about one third, second glume about two thirds, as long as the spikelet; first and second sterile lemmas about equal and about as long as the fertile lemma, the glumes and lemmas slightly woolly at the tip, the second sterile lemma infolding the fruit more closely than usual for the first lemma in other species; fruit ovoid-globose, obtuse, because of the presence of a second sterile lemma, the palea side facing the second glume.

TYPE LOCALITY: Trinidad.

DISTRIBUTION: Trinidad to eastern Brazil.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 24.

DOUBTFUL SPECIES

Panicum maculatum Aubl. Pl. Guian. 51. 1775. This cannot be identified from the brief description. The species described under this name by Schultes (in R. & S. Syst. Veg. Mant. 2: 238. 1824) appears to be *Lasiacis ligulata*. Urban* states that the name is based on "Miliun arundinaceum scandens et maculatum Plum. Msc. IV. tab. 82" which Aublet cites, and that Plumier's plant came from Martinique. He also states that the plate cited represents either *Lasiacis sorghoidea* or *L. Sloanei*. Since the former species is common in Martinique and the latter has not been found there, he assumes that the name *P. maculatum* applies to what has been called *Lasiacis sorghoidea*.

Panicum glutinosum Lam. Tab. Encyc. 1: 174. 1791. Not *P. glutinosum* Sw. 1788. Probably *Lasiacis sorghoidea*.

Panicum agglutinans Kunth, Enum. Pl. 1: 120. 1833. Based upon *Panicum glutinosum* Lam.

59. SACCIOLEPIS Nash, in Britton, Man. 89. 1901.

Annual or perennial subaquatic grasses with narrow leaf-blades and spike-like panicles. Spikelets oblong or ovate-oblong, prominently nerved. First glume not more than half as long as the spikelet. Second glume and sterile lemma about equal, the former distinctly and the latter slightly gibbous at base, several-nerved, inflated and longer than the indurate slightly stipitate fertile lemma.

Type species, *Panicum gibbum* Ell.

Spikelets 4 mm. long; culms decumbent and rooting at base; at least the lower leaf-sheaths hispid.

Spikelets 2-3 mm. long; culms erect, leaf-sheaths glabrous.

Plants perennial; spikelets 3 mm. long.

Plants annual; spikelets 2 mm. long.

1. *S. striata*.

2. *S. vilvoidea*.

3. *S. myuros*.

1. *Sacciolepis striata* (L.) Nash, Bull. Torrey Club 30: 383. 1903.

Holcus striatus L. Sp. Pl. 1048. 1753.

Panicum striatum Lam. Tab. Encyc. 1: 172. 1791.

Panicum gibbum Ell. Bot. S. C. & Ga. 1: 116. 1816.

Panicum aquaticum Muhl. Descr. Gram. 126. 1817.

Panicum hydrophilum Schultes, in R. & S. Syst. Veg. Mant. 2: 237. 1824.

Panicum Elliottianum Schultes, in R. & S. Syst. Veg. Mant. 2: 256. 1824.

Panicum aquaticum Bosc.; Spreng. Syst. 1: 319. 1825.

Hymenachne bermudianum Steud. Syn. Gram. 99. 1854.

Hymenachne striata Griseb. Fl. Brit. W. Ind. 354. 1861.

Sacciolepis gibba Nash, in Britton, Man. 89. 1901.

Perennial; stems rooting at the decumbent or creeping base, 50-150 cm. high, glabrous, the nodes often villous; leaf-sheaths hispid or the upper glabrous; ligule inconspicuous, a

* Repert. Sp. Nov. 16: 149. 1919.

ciliate fringe; blades linear-lanceolate, 10–20 cm. long, 4–10 mm. wide, abruptly rounded or cordate, gradually narrowed from below the middle to an acuminate apex, appressed-hispidulous on both surfaces, or glabrous, the margin scabrous, ciliate near the base; panicle narrow, almost spike-like, 5–20 cm. long, the branches appressed, the lower sometimes as much as 5 cm. long, the axis and pedicels glabrous, the latter slender, flexuous, 1–3 mm. long; spikelets about 4 mm. long, 1 mm. thick, oblong, prominently nerved, yellowish-green, glabrous; first glume ovate, 1 mm. long, 3-nerved; second glume broad, saccate or gibbous at base, a little shorter than the sterile lemma, abruptly acute, about 11-nerved; sterile lemma flat, somewhat concave on the back, abruptly acute, the few lateral nerves near the margin, the palea thin, nearly as long as its lemma; fertile lemma oblong, 1.5 mm. long, inrolled at the margins, the rounded summit of the palea free.

TYPE LOCALITY: Virginia.

DISTRIBUTION: New Jersey to Florida, and westward to Oklahoma and eastern Texas; Cuba, Porto Rico, and Jamaica.

ILLUSTRATIONS: Proc. Biol. Soc. Wash. 21: 6. f. 2; Vasey, Agr. Grasses U. S. pl. 14; ed. 2. pl. 103; Britt. & Brown, Ill. Fl. f. 279; ed. 2. f. 387.

2. *Sacciolepis vilvoidea* (Trin.) Chase, Proc. Biol. Soc. Wash.

21: 7. 1908.

Panicum vilvoidea Trin. Gram. Pan. 171. 1826.

Hymenachne fluviatilis Nees, Agrost. Bras. 273. 1829.

Plants perennial, erect, glabrous throughout; stems 80–150 cm. high, succulent; leaf-sheaths striate, mostly longer than the nodes; ligule a thin membrane about 1 mm. long; blades linear, the lower 5–10 cm. long, the middle 20–30 cm. long, the uppermost 5–10 cm. long, all 2–6 mm. wide; panicle close and spike-like, 10–40 cm. long, about 5 cm. thick, the pedicels mostly less than 1 cm. long; spikelets 3 mm. long, narrowed upward, prominently nerved, glabrous; first glume oblong-ovate, 1.5 mm. long; second glume and sterile lemma about equal, somewhat gibbous at base, 7-nerved, the sterile palea narrow, about half as long as the lemma; fertile lemma nearly 2 mm. long, little depressed, the margins flat.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Cuba; tropical South America.

ILLUSTRATION: Trin. Ic. pl. 204.

3. *Sacciolepis myuros* (Lam.) Chase, Proc. Biol. Soc. Wash.

21: 7. 1908.

Panicum myuros Lam. Tab. Encyc. 1: 172. 1791.

Panicum myosurus Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Hymenachne myurus Beauv. Agrost. 49, 165. 1812.

Panicum phleiforme Presl, Rel. Haenk. 1: 302. 1830.

Plants annual, glabrous except the upper surface of the leaf-blades; stems erect, 40–120 cm. high, or sometimes depauperate; leaf-sheaths striate; ligule membranaceous, 1–2 mm. long; blades as much as 60 cm. long and 7 mm. wide, in depauperate specimens only 5–10 cm. long, the uppermost reduced, sparsely pilose on the upper surface; panicle dense and spike-like, as much as 40 cm. long, usually 5–10 cm. long, 3–5 mm. wide, the branches short or the lower, in robust specimens, as much as 3 cm. long, appressed, the pedicels less than 1 mm. long; spikelets 2 mm. long, narrowed above, glabrous, prominently nerved; first glume ovate, 1 mm. long; second glume and sterile lemma about equal, about 9-nerved, the former gibbous at base, the sterile palea narrow, about 1 mm. long; fertile lemma 1.5 mm. long, rather narrow, acute, the margins slightly inrolled.

TYPE LOCALITY: Tropical America, the type specimen being from Cayenne.

DISTRIBUTION: Isle of Pines; southern Mexico; Panama; northern South America.

ILLUSTRATION: Proc. Biol. Soc. Wash. 21: 7. f. 3.

60. *HYMENACHNE* Beauv. Agrost. 48. 1812.

Perennial swamp-grasses, with decumbent rooting stems, erect fertile shoots, broad cordate-clasping leaf-blades, and narrow or spike-like panicles. Spikelets lanceolate, acuminate. First glume one third to one half as long as the spikelet, remote, a distinct stipe below the second

glume. Second glume and sterile lemma 5-nerved, acuminate or attenuate-pointed. Fertile lemma membranaceous, acuminate, the margins thin, not inrolled, the palea similar to the lemma in texture, free at the summit.

Type species, *Agrostis monostachya* Poir.

Panicle spike-like, dense, the lower branches sometimes distant, appressed; second glume shorter than the sterile lemma; spikelet 4-5 mm. long.

Panicle narrow but somewhat open, the branches ascending, or only the upper portion spike-like; second glume nearly as long as the sterile lemma; spikelet 3-4 mm. long.

1. *H. amplexicaulis*.

2. *H. donacifolia*.

1. *Hymenachne amplexicaulis* (Rudge) Nees, *Agrost. Bras.*

276. 1829.

Panicum amplexicaule Rudge, *Pl. Guian.* 21. 1805.

Agrostis monostachya Poir. in *Lam. Encyc. Suppl.* 1: 256. 1810.

Panicum Hymenachne Desv. *Opusc.* 82. 1831.

Plants essentially glabrous; stems creeping and rooting at base, the erect fertile portion 1-2 meters high; leaf-sheaths longer or shorter than the internodes; ligule a short membrane; blades 15-30 cm. long, 1-3 cm. wide, cordate-clasping at the scarcely narrowed base, the lobes usually overlapping, ciliate, gradually narrowed to an acuminate apex, the margin smooth below, scabrous above; panicle spike-like, 10-40 cm. long, 1 cm. wide, the lower branches sometimes distant, as much as 2 cm. long, appressed; spikelets 4-5 mm. long; first glume about half as long as the spikelet, 1-nerved, acuminate, scabrous on the keel; second glume on a stipe 0.5 mm. long, shorter than the sterile lemma, acuminate or somewhat attenuate-pointed, scabrous on the nerves; sterile lemma similar to the second glume, distinctly attenuate-pointed; fertile lemma about as long as the second glume, acuminate, membranaceous, the margins thin, not inrolled, the palea free above.

TYPE LOCALITY: British Guiana.

DISTRIBUTION: West Indies and central Mexico to tropical South America.

ILLUSTRATIONS: *Proc. Biol. Soc. Wash.* 21: 1. f. 1; Beauv. *Agrost. pl.* 10, f. 8; Rudge, *Pl. Guian. pl.* 27; Trin. *lc. pl.* 205.

2. *Hymenachne donacifolia* (Raddi) Chase, *Jour. Wash. Acad.*

Sci. 13: 177. 1923.

Panicum donacifolium Raddi, *Agrost. Bras.* 44. 1823.

Panicum auriculatum Willd.; Spreng. *Syst.* 1: 322. 1825.

Panicum polystachyum Presl, *Rel. Haenk.* 1: 312. 1830.

Hymenachne patula Fourn. *Mex. Pl. Gram.* 37. 1886.

Hymenachne auriculata Chase, *Proc. Biol. Soc. Wash.* 21: 5. 1908.

Foliage characters similar to those of *H. amplexicaulis*; panicle narrow, 20-40 cm. long, the upper portion spike-like, the lower portion loose or interrupted, the branches 3-10 cm. long, ascending or appressed; spikelets 3-4 mm. long; first glume about one third the length of the spikelet, 3-nerved; second glume and sterile lemma somewhat unequal, acuminate, or the lemma attenuate-pointed, slightly scabrous on the nerves, the glume short-stiped; fertile lemma nearly as long as the second glume, acuminate.

TYPE LOCALITY: Near Rio Janeiro, Brazil.

DISTRIBUTION: Cuba; Panama and tropical South America.

61. *HOMOLEPIS* Chase, *Proc. Biol. Soc. Wash.* 24: 146. 1911.

Perennial grasses with long leafy runners, rooting at the nodes, more or less decumbent flowering stems, narrowly lanceolate blades, and narrow panicles. Spikelets rather large, subfusiform. First and second glume equal or the first slightly longer, 7-9-nerved, the pair wholly covering the sterile and fertile florets. Sterile lemma nearly as long as the glumes, broad, infolding the fertile lemma, and inclosing a narrow hyaline palea and sometimes a staminate flower. Fruit elliptic, pointed, smooth and shining, the lemma and palea less indurate than in *Panicum*, the margins of the lemma flat.

Type species, *Panicum aturense* H.B.K.

Sterile lemma villous; base of panicle branches glabrous or nearly so.

Sterile lemma glabrous; base of panicle branches pubescent.

1. *H. aturenensis*.

2. *H. isocalycia*.

1. *Homolepis aturensis* (H.B.K.) Chase, Proc. Biol. Soc. Wash.
24: 146. 1911.

- Panicum aturense* H.B.K. Nov. Gen. & Sp. 1: 103. 1815.
Panicum viridiflorum Nees, Agrost. Bras. 135. 1829.
Panicum blepharophorum Presl, Rel. Haenk. 1: 312. 1830.
Panicum tumescens Trin. Mém. Acad. St.-Pétersb. VI. Sci. Nat. 3^e: 316. 1834.
Milium orinoccense Willd.; Steud. Nom. Bot. ed. 2. 2: 146, as synonym. 1841.

Stems 1-5 dm. high from decumbent rooting bases or stolons as much as 2 m. long, glabrous; foliage light- or yellowish-green; leaf-sheaths compressed-keeled, striate, glabrous, the margins villous, the surface near the margins more or less papillose-hispid, usually a hispidulous line at the collar; blades narrowly lanceolate, flat, thin, 5-15 cm. long, or those of the runners only 2 cm. long and the uppermost culm-blade much reduced, 10-15 mm. wide, truncate or cordate at base, acuminate, scabrous and minutely ciliate on the margin, glabrous or sometimes pubescent; panicles exserted from the elongate somewhat inflated upper sheath, narrowly elliptic, rather compact (open at anthesis), 5-10 cm. long, the slender branches ascending, floriferous from near the base, the color olive- or bronze-green; spikelets elliptic, 5-8 mm. long, narrowed at base, acuminate at apex, glabrous, striate-nerved, the pedicels often flexuous, the minimum length about 3 mm.; second glume villous at base on margin where inclosed by first glume; sterile lemma softly appressed-villous.

TYPE LOCALITY: Atures, Venezuela.

DISTRIBUTION: Southern Mexico to Brazil and Bolivia.

ILLUSTRATIONS: H.B.K. Nov. Gen. & Sp. *pl.* 33; Proc. Biol. Soc. Wash. 24: 147, *f.* 12.

2. *Homolepis isocalycia* (G. Meyer) Chase, Proc. Biol. Soc.
Wash. 24: 147. 1911.

- Panicum isocalycium* G. Meyer, Fl. Esseq. 59. 1818.
Panicum Langei Fourn. Mex. Pl. Gram. 23. 1886.

Stems 3-7 dm. tall, from a creeping or stoloniferous rooting base, glabrous; leaf-sheaths glabrous, pubescent on collar and margin; blades narrowly oblong-lanceolate, 8-18 cm. long, 7-15 mm. wide, cordate at base, acuminate at apex, glabrous, ciliate and scabrous on the margin; panicle ovoid, 5-10 cm. long, rather loosely flowered, the slender flexuous main branches ascending, pubescent at base, the spikelets appressed, the pedicels about 2 mm. long; spikelets 5-6 mm. long, more turgid than in *H. aturensis*, acute but scarcely acuminate; sterile lemma glabrous.

TYPE LOCALITY: British Guiana.

DISTRIBUTION: Vera Cruz; British Guiana to Brazil.

62. *SCUTACHNE* Hitchc. & Chase; Chase, Proc. Biol. Soc.
Wash. 24: 148. 1911.

Erect tufted perennial grasses, with linear leaf-blades and narrow panicles. Spikelets fusiform, acuminate, the base attenuate, the internodes of the rachilla elongate, the lowermost forming a stipe, the first glume adnate to it. First glume membranaceous, about half the length of the spikelet, broad, the margins connate below. Second glume and sterile lemma subequal, a manifest internode of the rachilla between them, leathery-indurate, brown or brownish, 5-nerved, the lemma inclosing a palea of similar texture, and sometimes a staminate flower. Fruit but slightly more indurate than the second glume and sterile lemma, elliptic in outline, the lemma abruptly acuminate into a slender, densely pubescent tip, the margins slightly inrolled below, membranaceous, flat and pubescent above, the summit of the palea usually inclosed, densely pubescent on the margin.

Type species, *Panicum durum* Griseb.

- Stems leafy, the blades elongate; panicles terminal only, of several branches. 1. *S. dura*.
 Stems nearly naked, the leaves reduced to the sheaths or nearly so, the basal leaves with blades; panicles terminal and axillary, simple. 2. *S. amphistemon*.

1. *Scutachne dura* (Griseb.) Hitchc. & Chase; Chase, Proc. Biol. Soc. Wash. 24: 149. 1911.

Panicum durum Griseb. Mem. Am. Acad. II. 8: 533. 1862.
Alloteropsis dura Hitchc. Contr. U. S. Nat. Herb. 12: 211. 1909.

Stems 3-5 dm. tall, glabrous or the nodes sometimes puberulent; leaf-sheaths glabrous; ligule very short; blades as much as 35 cm. long, 4-8 mm. wide, the uppermost only 3-4 cm. long, erect, the upper rounded or truncate at base, the lower gradually narrowed below, rather firm, glabrous except the retrorsely scabrous margin; panicles long-exserted, 5-10 cm. long, the branches puberulent, ascending or sometimes spreading, 2-4 cm. long, the spikelets short-pedicelled and appressed; spikelets 5-6 mm. long, narrowed at the base, acuminate; first glume thin, light-colored, contrasting with the remaining darker part of the spikelet, puberulent or nearly glabrous, distinctly 3-nerved, with 1 or 2 pair of indistinct intermediate nerves; second glume and sterile lemma pubescent.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba, Hispaniola, and Jamaica.

ILLUSTRATION: Proc. Biol. Soc. Wash. 24: 149. f. 13.

2. *Scutachne amphistemom* (Wright) Hitchc. & Chase; Chase, Proc. Biol. Soc. Wash. 24: 149. 1911.

Panicum amphistemom Wright; Sauv. Anal. Acad. Ci. Habana 8: 207. 1871.
Alloteropsis amphistemom Hitchc. Contr. U. S. Nat. Herb. 12: 211. 1909.

Stems 25-40 cm. tall, glabrous, the leaves clustered at the base, the flowering stems somewhat branched and geniculate; basal blades 8-12 cm. long, narrowed at base, rounded at apex, firm, striate, the cauline leaves distant, reduced to sheaths; panicles terminating the main stem and the few distant branches, narrow, few-flowered, the few short branches appressed, bearing a pair of spikelets, one nearly sessile, the other with a pedicel about its own length; spikelets narrow, about 7 mm. long; first glume only slightly lighter in color than the minutely puberulent second glume and sterile lemma.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba.

63. ISACHNE R. Br. Prodr. 196. 1810.

Perennial grasses with simple or usually branching stems, flat striate-nerved leaf-blades, and paniculate inflorescence. Spikelets obovoid to subglobose. Glumes membranaceous, about equal and as long as the fruits or at maturity exceeded by these. Lower floret perfect or staminate, its lemma and palea indurate and similar in form and texture to those of the upper floret. Both florets (or fruits) plano-convex, obtuse, equal in size or the upper shorter, the pair usually remaining attached together by the minute rachilla joint below the upper floret.

Isachne polygonoides is exceptional in that the lower floret is unlike the upper. In all the species the lower floret of some of the spikelets may fail to perfect a grain. When sterile the floret is often longer and the lemma less convex than when fertile, the spikelets on the same panicle thus having a somewhat diverse appearance.

Type species, *Isachne australis* R. Br.

Florets appressed-pubescent.

Blades ovate-clasping.

Blades linear.

1. *I. polygonoides*.

2. *I. leersioides*.

Florets glabrous, or the palea minutely hispidulous.

Panicles contracted, spike-like, not more than 3 cm. long, the branches appressed or the lower sometimes ascending; plants low and spreading.

Panicles open, the branches spreading or ascending.

Blades about 3 mm. wide, thick, rigid, pungent, with conspicuously thickened midrib.

Blades mostly 5-20 mm. wide, firm but not pungent nor with thickened midrib.

3. *I. pygmaea*.

4. *I. rigidifolia*.

Stems trailing; blades rarely more than 5 cm. long.

Stems clambering; blades mostly more than 5 cm. long.

Glumes pubescent; blades firm, not more than 12 cm. long and 1 cm. wide.

5. *I. rigens*.

6. *I. angustifolia*.

Glumes glabrous (rarely obscurely pubescent at tips); blades mostly more than 15 cm. long and 1.5 cm. wide.

Spikelets aggregate toward the ends of the branches and branchlets.

Spikelets not aggregate; panicle loosely flowered.

7. *I. arundinacea*.

8. *I. disperma*.

1. *Isachne polygonoides* (Lam.) Döll, in Mart. Fl. Bras. 2²: 273. 1877.

Panicum polygonoides Lam. Encyc. 4: 742. 1797.

Panicum trachyspermum Nees, Agrost. Bras. 212. 1829.

Isachne trachysperma Nees, in Seem. Bot. Voy. Herald 224. 1854.

Stems decumbent, branching and spreading, rooting at the lower nodes, the flowering branches ascending, 1-3 dm. tall, glabrous, the nodes glabrous but the base of the sheath hispid; leaf-sheaths mostly shorter than the internodes, papillose-hispid or glabrate; ligule a ring of stiff hairs about 2 mm. long; blades ovate or ovate-lanceolate, 2-5 cm. long, 7-17 mm. wide, cordate-clasping and ciliate at base, acute or somewhat acuminate at apex, striate-nerved, scabrous on upper surface, puberulent or pubescent beneath; panicles numerous, ovoid, partially inclosed in the sheaths or finally exserted, the branches and branchlets slender, spreading, stiff and more or less implicate, the pedicels 2-4 mm. long, enlarged at the extremity; spikelets about 1.5 mm. long, first glume glabrous; second glume sparsely hispidulous; lower floret lanceolate, only slightly turgid, greenish, glabrous, cartilaginous rather than indurate, exceptional for the genus in resembling the glumes rather than the upper floret; upper floret pubescent, whitish, indurate, hemispherical.

TYPE LOCALITY: Cayenne, French Guiana.

DISTRIBUTION: Guatemala to Brazil.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 25.

2. *Isachne leersioides* Griseb. Mem. Am. Acad. II. 8: 533. 1862.

Stems slender, branched, trailing, glabrous, striate, 1-2 m. long; leaf-sheaths on the main stems much shorter than the elongate internodes, overlapping on the flowering branches, appressed papillose-hispid or nearly glabrous; ligule a very short membrane, ciliate with stiff hairs about 1 mm. long; blades linear, 5-15 cm. long, 0.5-4 mm. wide, long-acuminate, striate-nerved, cartilaginous-margined, scabrous or hispidulous on both surfaces; panicles terminating the branches, ovoid or oblong, 5-15 cm. long, as much as 7 cm. wide, the branches mostly single, rather stiffly ascending or spreading, bearing from near the base stiffly spreading branchlets, the spreading pedicels 2-3 mm. long; spikelets about 1 mm. long; glumes hispidulous; florets appressed-pubescent.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 26.

3. *Isachne pygmaea* Griseb. Fl. Brit. W. Ind. 553. 1864.

Stems low, the slender branches spreading, glabrous, the flowering shoots usually less than 15 cm. tall; leaf-sheaths glabrous, ciliate on the margins; ligule a very short hispidulous ring; blades narrowly oblong-lanceolate, 0.5-2 cm., or rarely 3 cm. long, rarely more than 2 mm. wide, spreading, glabrous or puberulent, the white margin cartilaginous and somewhat scabrous; panicles long-exserted, narrow, compact and spike-like, usually less than 2 cm. long, the lower branches short and somewhat distant, appressed or rarely ascending; spikelets about 1.3 mm. long, nearly sessile; glumes glabrous, about two thirds as long as the spikelet; florets glabrous.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Central Jamaica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 27.

4. *Isachne rigidifolia* (Poir.) Urban, Symb. Ant. 4: 85. 1903.

Agrostis rigidifolia Poir. in Lam. Encyc. Suppl. 1: 257. 1810.
Milium rigidum Poir. in Lam. Encyc. Suppl. 1: 257, as synonym. 1810.
Milium rigidifolium R. & S. Svst. Veg. 2: 319. 1817.
Panicum rigidifolium Kunth, Rév. Gram. 37. 1829.
Panicum arbusculum Sieber; Griseb. Fl. Brit. W. Ind. 553, as synonym. 1864.

Stems spreading and branching, the flowering shoots firm and rigid, 1.5-4 dm. tall; leaf-sheaths glabrous, stiffly ciliate on the margin, overlapping on the flowering shoots; ligule a very short lacerate or ciliate membrane; blades oblong, 2-4 cm. long, 2-4 mm. wide, firm, rigidly spreading, pungently pointed, glabrous, the cartilaginous margin and thick midrib whitish; panicles long-exserted, open, oblong, rather narrow, 2-5 cm. long, branches ascending or spreading, bearing the branchlets mostly on the lower side, the pedicels rigid, 1-2 mm. long; spikelets about 2 mm. long, purplish, borne obliquely upon the pedicels; glumes glabrous or sparsely appressed-hispidulous near apex; florets smooth.

TYPE LOCALITY: Santo Domingo.
 DISTRIBUTION: Hispaniola, Saba, Guadeloupe, and Martinique.
 ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 28.

5. *Isachne rigens* (Sw.) Trin. Gram. Pan. 252. 1826.

Panicum rigens Sw. Prodr. 23. 1788.

Stems tufted, glabrous, slender, wiry, trailing, 1-2 m. long, as much as 1 mm. thick, the numerous flowering shoots curving upward, 1-3 dm. long; leaf-sheaths glabrous or puberulent, ciliate on the margin; ligule a ring of stiff hairs about 0.5 mm. long; blades narrowly oblong-lanceolate, 2-5 cm. long, 2-5 mm. wide, moderately firm but not stiff and rigid, scabrous on both surfaces and on the cartilaginous margin; panicles ovoid or oblong, 2-5 cm. long, the branches and branchlets stiffly ascending or spreading, the pedicels 1-2 mm. long; spikelets 1.8-2 mm. long; glumes minutely hispidulous; rachilla between the two florets minutely villous; palea of upper floret sparsely appressed-hispidulous.

TYPE LOCALITY: Jamaica.
 DISTRIBUTION: Jamaica; also from Venezuela and Colombia.
 ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 29.

6. *Isachne angustifolia* Nash, Bull. Torrey Club 30: 377. 1903.

Stems clambering, as much as 2 m. long and 2 mm. thick, hard and wiry with a long naked base, branching from the upper nodes, the branches long, leafy, nearly parallel, bearing secondary branches toward the ends, the whole forming a wide flabellate or loosely corymbose mass, in its most characteristic development pushing through the jungle of stream-bank or trail-side and hanging over bushes; leaf-sheaths appressed pilose with papillate hairs or roughened with papillae, or glabrous, the margin ciliate; ligule a ring of very short stiff hairs less than 0.5 mm. long; blades narrowly lanceolate, 3-15 cm. long, but mostly more than 5 cm. long, 5-12 mm. wide, rather firm and stiffly spreading, scaberulous or glabrate, papillose-ciliate at base or papillose only; panicles ellipsoid or oblong, as much as 15 cm. long, the branches stiffly ascending or finally spreading, the branchlets and pedicels finally divaricate, these and the main axis scabrous; spikelets about 1.5 mm. long; glumes minutely hispidulous toward the tip; florets and rachilla glabrous.

TYPE LOCALITY: El Yunque, Porto Rico.
 DISTRIBUTION: Porto Rico and Guadeloupe.
 ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 30.

7. *Isachne arundinacea* (Sw.) Griseb. Fl. Brit. W. Ind. 553. 1864.

Panicum arundinaceum Sw. Prodr. 24. 1788.
Panicum glaucescens H.B.K. Nov. Gen. & Sp. 1: 104. 1815.
Isachne panicea Trin. Gram. Pan. 253. 1826.

Stems climbing among shrubs or small trees to a height of as much as 6 m., as much as 5 mm. thick at base, with strong canes and elongate branches; leaf-sheaths glabrous, or rarely slightly scabrous, ciliate on the margin, sometimes a little papillose near the summit, over-

lapping on the flowering shoots; ligule of stiff hairs as much as 5 mm. long; blades narrowly lanceolate, as much as 20 cm. long and 2 cm. wide, long-acuminate, scabrous, sometimes becoming smoothish, often papillose on margin at base; panicles ovoid or ellipsoid, as much as 12 cm. long and 10 cm. wide, rounded at summit, the branches ascending or the lower finally spreading, branched from about the middle, the spikelets somewhat aggregate on the branchlets, the panicle thus rather compactly flowered at the periphery, the pedicels 0.5-2 mm. long; spikelets about 1.5 mm. long; glumes glabrous or with a few short stiff hairs at the summit; florets glabrous.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica; Vera Cruz to Venezuela and Bolivia.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 31.

8. *Isachne disperma* (Lam.) Döll, in Mart. Fl. Bras. 2^o: 274. 1877.

Panicum dispernum Lam. Tab. Encyc. 1: 173. 1791.

Panicum multinerve Desv.; Poir. in Lam. Encyc. Suppl. 4: 279. 1816.

Panicum confertum Desv.; Poir. in Lam. Encyc. Suppl. 4: 279. 1816.

Isachne (?) *dubia* Kunth, Rév. Gram. 42. 1829.

Aspect of plant as in *I. arundinacea*; leaf-sheaths glabrous or rarely papillose-hispidulous; ligule hairs as much as 2 mm. long; blades averaging larger than in *I. arundinacea*, glabrous, scabrous toward apex; panicles as much as 20 cm. long, the branches and branchlets spreading, the spikelets in twos or threes at the ends of the branchlets, the panicle thus more open and more equally flowered than in *I. arundinacea*, the spikelets not strongly aggregate toward the periphery; spikelets slightly more than 1 mm. long; glumes and florets glabrous.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Lesser Antilles, from St. Kitts to Tobago.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: pl. 32.

64. OPLISMENUS Beauv. Fl. Oware 2: 14. pl. 68, f. 1. 1809.

Orthopogon R. Br. Prodr. 194. 1810.

Hippagrostis Kuntze, Rev. Gen. 776. 1891.

Usually weak, freely branching, creeping annuals or perennials with erect or ascending flowering shoots, flat thin ovate or lanceolate leaf-blades and one-sided spike-like racemes along a main axis. Spikelets terete or somewhat compressed laterally, subsessile, in pairs or solitary in two rows on one side of a narrow scabrous or hairy rachis. Glumes subequal, emarginate or entire, the midnerve extending into an awn, that of the first longer. Sterile lemma exceeding the glumes and acute, notched or entire, mucronate or short-awned, inclosing a hyaline palea. Fruit elliptic, acute, the lemma very convex or boat-shaped, the firm margins clasping the palea, inrolled.

Type species, *Oplismenus africanus* Beauv.

Awns antrorsely scabrous; plants annual.

Awns smooth or obscurely roughened; plants perennial.

Rachis of racemes mostly 2-3 mm. long, bearing usually not more than 5 spikelets; leaf-blades 1-3 cm. long, 4-10 mm. long.

Rachis of lower racemes more than 1 cm. long; bearing usually more than 8 spikelets; leaf-blades mostly more than 4 cm. long, 1-2 cm. wide.

Racemes closely flowered, the lower 1-2 cm. long.

Racemes loosely flowered, the lower 2-5 cm. long, the lower pairs of spikelets as much as 1 cm. apart.

1. *O. Burmanni*.

2. *O. setarius*.

3. *O. hirtellus*.

4. *O. variflorus*.

1. *Oplismenus Burmanni* (Retz.) Beauv. Agrost. 54. 1812.

Panicum hirtellum Burm. Fl. Ind. 24. 1768. Not *P. hirtellum* L. 1759.

Panicum Burmanni Retz. Obs. 3: 10. 1783.

Panicum bromoides Lam. Tab. Encyc. 1: 170. 1791.

Oplismenus bromoides Beauv. Agrost. 54. 1812.

Panicum album Poir. in Lam. Encyc. Suppl. 4: 274. 1816.

Oplismenus albus R. & S. Syst. Veg. 2: 890. 1817.

Orthopogon Burmanni Trin. Fund. Agrost. 181. 1820.

Oplismenus affinis Schultes, in R. & S. Syst. Veg. Mant. 2: 273. 1824.

Panicum lappaceum Willd.; Spreng. Syst. 1: 306, as synonym. 1825.

Oplismenus Humboldtianus Nees, Agrost. Bras. 264. 1829.

- Oplismenus cri-tatus* Presl. Rel. Haenk. 1: 523. 1830.
Oplismenus a-fina Presl. Rel. Haenk. 1: 323. 1830.
Orthopogon bromoides Loud. Hort. Brit. 25. 1830.
Panicum Francoi Steud. Syn. Gram. 44. 1854.
Panicum Sanctae-Marthae Steud. Syn. Gram. 45. 1854.
Panicum Schultesii Steud. Syn. Gram. 46. 1854.
Oplismenus Humboldtianus muticus Fourn. Mex. Pl. Gram. 37. 1886.

Plants annual; stems slender, glabrous or pubescent in lines or sometimes pubescent all over, the flowering shoots as much as 4 dm. long, usually 1-2 dm. long, ascending or nearly prostrate; leaf-sheaths glabrous or papillose-hispid, striate, ciliate on the margin, villous on the collar; ligule a very short membrane, ciliate with hairs about 1 mm. long; blades ovate to ovate-lanceolate, mostly 2-5 cm. long, sometimes longer, 1-1.5 cm. wide, thin, more or less pubescent or hispid on both surfaces, especially toward the base, usually undulate on the margin; panicle ovoid to linear, mostly long-exserted, mostly compact, 2-5 cm. long, sometimes as much as 10 cm. long, the spikes more distant, mostly nodding, the main axis villous; racemes 3 to several, appressed or ascending, rather short and thick, white and silky, mostly 8-15 mm. long, the spikelets closely set and nearly sessile on the rachis, this softly villous and also beset, especially at the base of the spikelets, with stiff papillose hairs 2-3 mm. long; spikelets compressed, whitish, several to many on each rachis; first glume 3-nerved, half as long as sterile lemma, rather sparsely appressed villous, notched at apex, the midnerve extending as a slender straight antrorsely scabrous awn 10-15 mm. long; second glume similar to the first, a little longer, 5-nerved, the awn shorter; sterile lemma similar to the glumes, about 3 mm. long, compressed above, nearly terete below, about 7-nerved, the lower half often copiously villous, the awn shorter than those of the glumes, commonly 1-3 mm. long; fruit smooth and shining, about as thick as wide, pale or brownish, about 2 mm. long.

TYPE LOCALITY: India.

DISTRIBUTION: Tropics of both hemispheres, introduced in America; common from southern Mexico to Brazil; Cuba and Hispaniola.

ILLUSTRATIONS: Burm. Fl. Ind. pl. 12, f. 1; Beauv. Fl. Oware pl. 68, f. 1; Trin. Ic. pl. 193; Field Mus. Publ. Bot. 7: 37; Proc. Biol. Soc. Wash. 24: 152, f. 15; Contr. U. S. Nat. Herb. 22: 125, f. 21.

2. *Oplismenus setarius* (Lam.) R. & S. Syst. Veg. 2: 481. 1817.

- Panicum setarium* Lam. Tab. Encyc. 1: 170. 1791.
Orthopogon parvifolium Nutt. Gen. 1: 55, errata. 1818.
Orthopogon setarius Spreng. Syst. 1: 306. 1825.
Oplismenus parvifolius Kunth, Rév. Gram. 1: 45. 1829.
Panicum Nuttallianum Steud. Nom. Bot. ed. 2. 2: 260. 1841.

Stems slender and lax, the flowering branches ascending or nearly prostrate, usually not more than 1-2 dm. long, sometimes as much as 3 dm., glabrous or pubescent in lines; leaf-sheaths glabrous, villous on the margin, pubescent about the collar; ligule a very short ciliate membrane; blades ovate to ovate-lanceolate, thin, mostly 1-3 cm. long, 4-10 mm. wide, sparsely pilose on both surfaces or glabrate; panicle long-exserted, usually not more than 5 cm. long, rarely as much as 8 cm., the axis scabrous or puberulent; racemes usually 3-5, rarely as many as 8, short and globose, distant or the upper approximate, the lower internode sometimes as much as 2 cm. long, the rachis usually 2-3 mm. long, rarely as much as 5 mm. long (or a little longer in some United States specimens), puberulent, pubescent or villous at base; spikelets rarely as many as 8 on a rachis, usually not more than 5, the lowermost sometimes reduced to awns; glumes more than half as long as the sterile lemma, appressed-hispidulous, often more or less pilose along the margin, more or less notched at apex, the first 3-nerved, the awn mostly 4-8 mm. long, smooth, the second 5-nerved, the awn much shorter, usually 2-3 mm. long; sterile lemma 2-3 mm. long, 7-nerved, appressed-pilose above, the awn short or wanting; fruit about 2.5 mm. long.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Along the coast, North Carolina to Florida, Arkansas, and Texas; southern Mexico to Honduras; West Indies; also from Trinidad to Paraguay.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: 104, f. 400 (as *O. hirtellus*); Bull. U. S. Dep. Agr. 772: 239, f. 145; Contr. U. S. Nat. Herb. 22: 128, f. 22.

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

- Panicum hirtellum* L. Syst. Nat. ed. 10. 870. 1759.
Milium undulatifolium Moench, Meth. 202. 1794.
Orthopogon hirtellus Nutt. Gen. 55. 1818.
Panicum velutinum G. Meyer, Fl. Esseq. 51. 1818.
Oplismenus brasiliensis Raddi, Agrost. Bras. 40. 1823.
Oplismenus velutinus Schultes, in R. & S. Syst. Veg. Mant. 2: 271. 1824.
Orthopogon cubensis Spreng. Syst. 1: 307. 1825.
Echinochloa cubensis Schultes, in R. & S. Syst. Veg. Mant. 3: Addit. 596. 1827.
Oplismenus cubensis Kunth, Rév. Gram. 45. 1829.
Panicum cubense Steud. Nom. Bot. ed. 2. 2: 255. 1841.
Panicum Raddianum Steud. Syn. Gram. 45. 1854.
Oplismenus chondrosioides Fourn. Mex. Pl. Gram. 39. 1886.

Plants perennial; stems widely creeping and branching, the flowering ones usually erect from an ascending base, as much as 7 dm. tall but usually about 3 dm., glabrous or somewhat pubescent; leaf-sheaths glabrous or densely papillose-hispid; ligule membranous, about 0.5 mm. long, short-ciliate; blades lanceolate or oblong-lanceolate, mostly 5–10 cm. long, 1–2 cm. wide, rather abruptly narrowed above into an acuminate apex, glabrous or pubescent, papillose-ciliate at base; panicle long-exserted, 5 to 10 cm. long, the main axis pubescent or the lower part nearly glabrous; the lowest internode commonly about 2 cm. long; racemes mostly 3–7, ascending or spreading, rather distant, compact or sometimes rather loose, the lowermost 1–2 cm. long, the rachis pubescent and also papillose-hispid; spikelets in pairs, the pairs alternating on the two sides of the triangular rachis, appressed-villous or hispid or nearly glabrous, green or, especially the awns, purple; glumes nearly equal, a little more than half as long as the sterile lemma, more or less notched at apex or tapering into the rather stout smooth awn, the first 5-nerved with an awn 5–10 mm. long, the second 7-nerved, the awn once or twice as long as the glume, sometimes shorter, sterile lemma 2.5–3 mm. long, 7-nerved, usually notched at apex, the awn mostly 1–2 mm. long, sometimes wanting; fruit 2–2.5 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Southern Mexico and the West Indies to Argentina.

ILLUSTRATIONS: Field Mus. Publ. Bot. 7: 36; Contr. U. S. Nat. Herb. 22: 130. f. 23.

4. *Oplismenus rariflorus* Presl, Rel. Haenk. 1: 320. 1830.

- Oplismenus latifolius* Haenke; Steud. Nom. Bot. ed. 2. 2: 220, as synonym. 1841.
Panicum parviflorum Steud. Syn. Gram. 45. 1854.
Oplismenus Liebmanni Fourn. Mex. Pl. Gram. 38. 1886.
Oplismenus Thiebauti Fourn. Mex. Pl. Gram. 39. 1886.

Stems sparingly branched, ascending from a decumbent base, as much as 5 dm. tall but mostly less, glabrous or sometimes pubescent; leaf-sheaths glabrous or pubescent, densely ciliate on the margin, villous on the collar; ligule a short ciliate membrane; blades lanceolate or elliptic-lanceolate, mostly about 4–7 cm. long, rarely as much as 13 cm., 1–2 cm. wide, thin, glabrous, scabrous, or sparsely pilose; panicle long-exserted, the main axis 5–15 cm. long, scabrous; racemes several, the lower distant, 2–5 cm. long or even 7 cm., ascending, loosely flowered, the rachis scabrous, often villous at base and pilose at the insertion of the spikelets; spikelets scattered, the lower pairs as much as 1 cm. apart; glumes more than half as long as the sterile lemma, glabrous or hispidulous, rarely pilose, tapering into a smooth awn, the first 3-nerved, the awn 3–8 mm. long, rarely longer, the second 5-nerved, the awn very short or wanting; sterile lemma 3 mm. long, mostly awnless; fruit 2.5 mm. long.

TYPE LOCALITY: Acapulco, Mexico.

DISTRIBUTION: Mexico and Guatemala; also in Ecuador and Peru.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 132. f. 24.

65. *ECHINOCHLOA* Beauv. Agrost. 53. 1812.

Annual or perennial, coarse, often succulent grasses with linear flat blades and narrow panicles consisting of several spike-like racemes along a main axis. Spikelets plano-convex, often spiny-hispid, subsessile, in pairs or in irregular clusters crowded on one side of the panicle branches. First glume about half as long as the spikelet, pointed. Second glume and sterile lemma equal, stiffly hispidulous on the nerves, usually scabrous on the internerves, pointed,

mucronate or the glume short-awned, the lemma mucronate or awned, sometimes conspicuously so, inclosing a membranaceous palea and sometimes a staminate flower. Fruit plano-convex, the lemma and palea smooth and shining, acuminate-pointed, the lemma margins inrolled below, flat above, the apex of the palea not inclosed.

Type species, *Panicum Crusgalli* L.

- Ligule a dense line of stiff yellowish hairs; plants perennial.
 Fruit about 2.5 mm. long; awn of sterile lemma less than 2 mm. long. 1. *E. pyramidalis*.
 Fruit about 4 mm. long.
 Awn of sterile lemma generally 5-10 mm. long; sterile floret staminate. 2. *E. polystachya*.
 Awn of sterile lemma generally 4-5 cm. long; sterile floret neuter. 3. *E. holciformis*.
- Ligule wanting, the ligular area sometimes pubescent; plants annual.
 Racemes simple, rather distant, 1-2 cm. long; spikelets crowded in about 4 rows, the awn of the sterile lemma reduced to a short point; blades 3-6 mm. wide. 4. *E. colonum*.
- Racemes more or less branched, usually more than 2 cm. long; spikelets irregularly crowded and fascicled, usually not arranged in rows, the awn of the sterile lemma variable; blades usually more than 5 mm. wide.
 Sterile floret staminate. 5. *E. paludigena*.
 Sterile floret neuter.
 Fruit 2.5-3 mm. long.
 Leaf-sheaths smooth; awns variable, but the panicle not a dense mass of long-awned spikelets.
 Spikelets about 3 mm. long, excluding awns; panicles erect, or, when large and heavy, nodding at tip. 6. *E. Crusgalli*.
 Spikelets about 2.5 mm. long, excluding awn; panicles nodding, soft, pinkish. 7. *E. Crus-pavonis*.
 Leaf-sheaths, at least the lower, hispid or scabrous; panicle dense, the spikelets long-awned. 8. *E. Walteri*.
 Fruit about 4 mm. long. 9. *E. oplismenoides*.

1. *Echinochloa pyramidalis* (Lam.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 345. 1917.

Panicum pyramidale Lam. Tab. Encyc. 1: 171. 1791.

Panicum spectabilis guadeloupense Hack. Notizbl. Bot. Gart. Berlin 1: 328. 1897.

Echinochloa guadeloupensis Wiegand, Rhodora 23: 63. 1921.

Plants perennial; stems erect, rather fleshy, 1.5-2.5 m. tall, glabrous; leaf-sheaths glabrous; ligule a dense row of stiff yellowish bristles 1-2 mm. long; blades 4-6 dm. long, 5-10 mm. wide, glabrous above, scabrous on the margin and on the nerves beneath; panicle 2-4 dm. long, the axis scabrous; racemes numerous, ascending, 2-7 cm. long, single or somewhat fascicled, distant below but overlapping, stiffly pilose at base and sparsely so along the scabrous or hispidulous rachis; spikelets about 3 mm. long, rather loosely arranged along the rachis, scabrous or slightly hispidulous on the nerves, glabrous or nearly so on the internerves; sterile floret staminate, the lemma mucronate or with an awn 1-2 mm. long; fruit about 2.5 mm. long, mucronate.

TYPE LOCALITY: Africa.

DISTRIBUTION: Tropical Africa; introduced in Guadeloupe.

ILLUSTRATIONS: Kunth, Rév. Gram. pl. 23; Contr. U. S. Nat. Herb. 22: 134. f. 25.

2. *Echinochloa polystachya* (H.B.K.) Hitchc. Contr. U. S. Nat. Herb. 22: 135. 1920.

Oplismenus polystachyus H.B.K. Nov. Gen. & Sp. 1: 107. 1816.

Panicum spectabile Nees; Trin. Gram. Pan. 138. 1826.

Echinochloa spectabilis Link, Hort. Berol. 2: 209. 1833.

Orthopogon hirsutus Spreng.; Steud. Nom. Bot. ed. 2. 2: 234, as synonym. 1841.

Panicum Bonplandianum Steud. Syn. Gram. 47. 1854.

Panicum Bonplandianum Steud. Syn. Gram. 48. 1854.

Plants perennial; stems coarse, 1-2 m. tall from a long creeping rooting base, glabrous, the nodes densely hispid with appressed yellowish hairs; leaf-sheaths glabrous or papillose-hispid; ligule a dense line of stiff yellowish hairs as much as 4 mm. long; blades as much as 2.5 cm. wide, scabrous on the margin and upper surface; panicle 1-3 dm. long, rather dense, the axis angled, very scabrous; racemes ascending, the lower mostly 3-6 cm. long, densely hispid

at base, the rachis very scabrous and more or less papillose-hispid; spikelets rather closely set, nearly sessile, about 5 mm. long; sterile floret staminate, the awn 2-10 mm. long; fruit rather soft, about 4 mm. long, extending into a point about 0.5 mm. long.

TYPE LOCALITY: Venezuela.

DISTRIBUTION: Mexico and the West Indies to Argentina.

ILLUSTRATIONS: Trin. Ic. *pl.* 166; Contr. U. S. Nat. Herb. 22: 135. *f.* 20.

3. *Echinochloa holciformis* (H.B.K.) Chase, Proc. Biol. Soc. Wash. 24: 155. 1911.

Oplismenus holciformis H.B.K. Nov. Gen. & Sp. 1: 107. 1815.

Orthopogon holciformis Spreng. Syst. Veg. 1: 307. 1825.

Panicum holciforme Steud. Syn. Gram. 48. 1854.

Berchtoldia holciformis Fourn. Mex. Pl. Gram. 41. 1886.

Plant perennial; stems erect, sometimes with a decumbent rooting base, stout, succulent, as much as 2 m. tall and 1.5 cm. thick at base, glabrous; leaf-sheaths glabrous; ligule a dense line of stiff hairs, long on the lower leaves, short on the upper leaves; blades mostly 8-15 mm. wide, scabrous on margin and upper surface; panicle dense, or interrupted below, nodding, as much as 4 dm. long, the axis scabrous, densely hispid around the base of the branches; racemes appressed, single or fascicled, the lower as much as 10 cm. long, the rachis scabrous and hispid; spikelets rather closely arranged, nearly sessile, about 5 mm. long, fusiform, green or purple, only slightly convex on the rounded side; first glume acute or obtuse; second glume short-awned; sterile lemma empty, the awn as much as 5 cm. long; fruit elliptic, about 5 mm. long including the point about 1 mm. long.

TYPE LOCALITY: Zinapécuaro, Michoacán, Mexico.

DISTRIBUTION: Central Mexico to Guatemala.

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

Panicum colonum L. Syst. Nat. ed. 10. 870. 1759.

Panicum zonale Guss. Fl. Sic. Prodr. 1: 62. 1827.

Oplismenus repens Presl, Rel. Haenk. 1: 321. 1830.

Panicum prorepens Steud. Syn. Gram. 46. 1854.

Panicum colonum zonale L. Dewey, Contr. U. S. Nat. Herb. 2: 502. 1894.

Echinochloa colona zonalis Wootton & Standley, N. Mex. Coll. Agr. Bull. 81: 45. 1912.

Plants annual; stems prostrate-spreading, ascending, or erect, usually 2-4 dm. long, glabrous, compressed; leaf-sheaths glabrous, compressed; ligule wanting; blades rather lax, 5-10 cm. long, rarely longer, 3-6 mm. wide, somewhat scabrous on the margin, occasionally bearing transverse purple bands (zonate); panicle 5-10 or even 15 cm. long, the axis smooth or slightly scabrous; racemes several, 1-2 cm. long, appressed or ascending, single or occasionally two, approximate, the lower usually distant as much as 1 cm., the rachis triangular-flattened, scabrous; spikelets about 3 mm. long, crowded, nearly sessile, in about 4 rows, second glume and sterile lemma short-pointed but not awned; fruit about 2.5 mm. long, short-pointed.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Tropical regions of the Old World; introduced in America; New Jersey to Florida, and westward to Missouri, Texas, and southern California; Oregon; Mexico and the West Indies to South America.

ILLUSTRATIONS: Trin. Ic. *pl.* 160; Duthie, Ill. Grasses Ind. *pl.* 4; Bull. U. S. Dep. Agr. Agrost. 7: *f.* 69; Britt. & Brown, Ill. Fl. ed. 2. *f.* 309; Contr. U. S. Nat. Herb. 22: 151. *f.* 35.

5. *Echinochloa paludigena* Wiegand, Rhodora 23: 64. 1921.

Echinochloa paludigena soluta Wiegand, Rhodora 23: 64. 1921.

Stems mostly solitary, erect, rather stout, usually 1-1.5 meters tall; ligule none; panicles narrow, usually 20-30 cm. long; racemes ascending, usually simple, rather evenly distributed on the axis, not closely crowded, sometimes remote; spikelets about as in *E. Crusgalli* but not tuberculate; sterile floret staminate.

TYPE LOCALITY: Hillsborough County, Florida.

DISTRIBUTION: Ditches, marshes, and wet places, often in shallow water, southern and central Florida.

6. *Echinochloa Crusgalli* (L.) Beauv. Agrost. 53, 161. 1812.

- Panicum Crusgalli* L. Sp. Pl. 56. 1753.
Panicum Cruscorvi L. Syst. Nat. ed. 10. 870. 1759.
Milium Crusgalli Moench, Meth. 202. 1794.
Panicum grossum Salisb. Prodr. 18. 1796.
Panicum muricatum Michx. Fl. Bor. Am. 1: 47. 1803. Not *P. muricatum* Retz. 1786.
Panicum Crusgalli aristatum Pursh, Fl. Am. Sept. 66. 1814.
Panicum Crusgalli mile Pursh, Fl. Am. Sept. 66. 1814.
Panicum Crusgalli purpureum Pursh, Fl. Am. Sept. 66. 1814.
Oplismenus zelayensis H.B.K. Nov. Gen. & Sp. 1: 108. 1815.
Panicum pungens Poir. in Lam. Encyc. Suppl. 4: 273. 1816.
Panicum Crusgalli muticum Ell. Bot. S. C. & Ga. 1: 114. 1816.
Setaria muricata R. & S. Syst. 2: 495. 1817.
Panicum frumentaceum Roxb. Fl. Ind. 1: 307. 1820. Not *P. frumentaceum* Salisb. 1796.
Echinochloa Crusgalli aristata S. F. Gray, Nat. Arr. Brit. Pl. 2: 158. 1821.
Oplismenus Crusgalli Dumort. Obs. Gram. 138. 1823.
Echinochloa zelayensis Schultes, in R. & S. Syst. Veg. Mant. 2: 269. 1824.
Orthopogon Crusgalli Spreng. Syst. 1: 307. 1825.
Echinochloa frumentacea Link, Hort. Berol. 1: 204. 1827.
Oplismenus muricatus Kunth, Rév. Gram. 1: 44. 1829.
Oplismenus frumentaceus Kunth, Rév. Gram. 1: 45. 1829.
Echinochloa Crusgalli mitis Peterm. Fl. Lips. 82. 1838.
Panicum zelayense Steud. Nom. Bot. ed. 2. 2: 265. 1841.
Echinochloa Crusgalli mutica K. Koch, Linnaea 21: 436. 1848.
Panicum scindens Nees; Steud. Syn. Gram. 47. 1854.
Echinochloa Crusgalli frumentacea W. Wight, Cent. Dict. Suppl. 810. 1909.
Echinochloa muricata Fernald, Rhodora 17: 106. 1915.
Echinochloa Crusgalli edulis Hitchc. Bull. U. S. Dep. Agr. 772: 238. 1920.
Echinochloa Crusgalli zelayensis Hitchc. Bull. U. S. Dep. Agr. 772: 238. 1920.

Plants annual; stems erect or sometimes decumbent at base, as much as 1 m. or even 1.5 m. tall, glabrous; leaf-sheaths glabrous; ligule wanting, the ligular area sometimes slightly pubescent; blades 5–15 mm. wide, scabrous on the margin, sometimes on the upper surface; panicles erect or the larger ones nodding, 10–20 cm. long, the axis scabrous; racemes spreading, ascending or appressed, the lower somewhat distant, as much as 10 cm. long, sometimes branched, the upper approximate, shorter, the rachis scabrous, hispid, especially at the base; spikelets crowded, about 3 mm. long, excluding the awns, strongly hispid or papillose-hispid on the nerves, hispidulous on the internerves; sterile lemma with a well-developed palea, neuter, the awn variable in length, mostly 5 to 10 mm. long on at least a part of the spikelets, sometimes as much as 3 cm. long; fruit elliptic, turgid, narrowed into a cusp or point, 2.5–3 mm. long, whitish or brownish.

TYPE LOCALITY: Europe.

DISTRIBUTION: Warm and temperate regions of both hemispheres; throughout North America as far north as Maine and British Columbia, native and introduced.

ILLUSTRATIONS: Trin. Ic. *pl.* 161, 162, 164; Host, Gram. Austr. 2: *pl.* 19; J. M. Wood, Natal Pl. *pl.* 151; Duthie, Ill. Grasses Ind. *pl.* 5; Vasey, Agr. Grasses U. S. *pl.* 11; ed. 2. *pl.* 14; Bull. U. S. Dep. Agr. Agrost. 7: *f.* 70; Britt. & Brown, Ill. Fl. *f.* 243; ed. 2. *f.* 308; Contr. U. S. Nat. Herb. 22: 141. *f.* 30; 145. *f.* 31; 146. *f.* 32; 147. *f.* 33.

NOTE: The common form of *E. Crusgalli*, including *E. muricata*, is common throughout eastern and northern United States. This may be awned or nearly awnless. On the Mexican plateau the common form is *E. zelayensis*, with ascending or appressed racemes of nearly awnless spikelets. This form extends into the southwestern United States and grades into the eastern form. *Echinochloa Crusgalli mitis* is the awnless form of *E. Crusgalli* and is found throughout the range of this species.

Echinochloa Crusgalli edulis Hitchc. (*E. frumentacea* Link), the Japanese barnyard millet, is a cultivated form with thick, appressed, often falcate racemes and nearly awnless spikelets.

7. *Echinochloa Crus-pavonis* (H.B.K.) Schultes, in R. & S. Syst. Veg. Mant. 2: 269. 1824.

- Oplismenus Crus-pavonis* H.B.K. Nov. Gen. & Sp. 1: 108. 1815.
Panicum sabulicola Nees, Agrost. Bras. 258. 1829.
Panicum Crus-pavonis Nees, Agrost. Bras. 259. 1829.
Echinochloa composita Presl; Nees, Agrost. Bras. 259, as synonym. 1830.
Panicum aristatum Macfad. Bot. Misc. 2: 115. 1831.
Oplismenus jamaicensis Kunth, Enum. Pl. 1: 147. 1833.
Panicum jamaicense Steud. Nom. Bot. ed. 2. 2: 257. 1841.
Panicum Crusgalli sabulicola Döll, in Mart. Fl. Bras. 2: 142. 1877.
Oplismenus angustifolius Fourn. Mex. Pl. Gram. 40. 1886.
Echinochloa sabulicola Hitchc. Contr. U. S. Nat. Herb. 17: 257. 1913.

Differs from *E. Crusgalli* in the soft nodding panicles usually tinged with pink or purple; spikelets averaging smaller, usually about 2.5 mm. long, excluding the awn, more or less hispid but not tuberculate; awn usually not more than 1 cm. long.

TYPE LOCALITY: Province of Cumana, Venezuela.

DISTRIBUTION: Southern Texas and West Indies to Bolivia and Argentina; also in tropical Africa.

ILLUSTRATIONS: Trin. Ic. *pl.* 163; Contr. U. S. Nat. Herb. 22: 149. *f.* 34.

8. *Echinochloa Walteri* (Pursh) A. Heller, Cat. N. Am.

Pl. ed. 2. 21. 1900.

Panicum hirtellum Walt. Fl. Car. 72. 1788. Not *P. hirtellum* L. 1759.

Panicum Walteri Pursh, Fl. Am. Sept. 66. 1814.

Panicum Crusgalli hispidum Ell. Bot. S. C. & Ga. 1: 114. 1816.

Panicum hispidum Muhl. Descr. Gram. 107. 1817. Not *P. hispidum* Forst. 1786.

Panicum longisetum Torr. Am. Jour. Sci. 4: 58. 1822. Not *P. longisetum* Poir. 1816.

Orthopogon hispidus Spreng. Syst. 1: 307. 1825.

Oplismenus longisetus Kunth, Rév. Gram. 1: 45. 1829.

Echinochloa longiaristata Nash, in Small, Fl. SE. U. S. 84. 1903.

Plants annual; stems erect, often succulent, often rooting at the lower nodes when growing in mud or water, 1–2 m. high, as much as 2.5 cm. thick at base, glabrous; leaf-sheaths papillose-hispid, or papillose only, or sometimes scabrous only, or rarely glabrous, sometimes only the lower sheaths hispid or the hairs confined to the marginal region, the collar more or less pubescent; ligule wanting, the ligular area often pubescent; blades usually 10–15 mm. wide, sometimes as much as 3 cm. wide; mostly scabrous on both surfaces; panicle large and dense, as much as 3 dm. long, erect or nodding, the axis very scabrous, more or less papillose-hispid on the angles; racemes appressed or ascending, single or, in the larger plants, usually fascicled, approximate or the lower somewhat distant, sometimes branched, as much as 10 cm. long, the rachis hispidulous and more or less papillose-hispid, especially at base; spikelets closely arranged, several on short branches of the raceme, mostly long-awned, often purple, about 3 mm. long; sterile floret with a palea, neuter, the awn usually 1–2 cm. long, sometimes longer, more rarely reduced to a short point; fruit about 3 mm. long, fusiform, about 1 mm. wide, narrower and more fusiform than in *E. crusgalli*.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: Massachusetts to Florida, and westward to Wisconsin and Texas; Cuba.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 138. *f.* 29.

9. *Echinochloa oplismenoides* (Fourn.) Hitchc. Contr. U. S. Nat.

Herb. 22: 136. 1920.

Bercholdia oplismenoides Fourn. Mex. Pl. Gram. 41. 1886.

Plants annual; stems erect, as much as 1 m. tall, glabrous, the nodes glabrous or rarely appressed-hispidulous; leaf-sheaths glabrous; ligule wanting, rarely a line of short hairs; blades mostly less than 1 cm. wide, scaberulous on the margin and upper surface; panicle narrow, usually not more than 15 cm. long, the axis angled, scabrous; racemes appressed, the lower mostly 3–6 cm. long, the rachis angled, scabrous and more or less stiffly pilose, not hispid at base; spikelets rather densely set, 4–5 mm. long; first glume acutish, glabrous; second glume hispidulous on the nerves, acuminate; sterile lemma empty or with palea only, the awn usually about 1 cm. long, rarely as much as 3 cm. long; fruit about 4 mm. long, mucronate.

TYPE LOCALITY: Toluca, Mexico.

DISTRIBUTION: Mexico, Chihuahua and Sonora to Michoacan and Puebla.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 136. *f.* 27.

66. *CHAETIUM* Nees, Agrost. Bras. 269. 1829.

Bercholdia Presl, Rel. Haenk. 1: 323. 1830.

Perennial grasses with long narrow leaf-blades and dense narrow panicles. Spikelets short-pedicelled, dorsally compressed, lanceolate, having a long slender callus-like base made up of the elongated joint of the rachilla between the glumes, the bearded base of the first glume adnate to it. Glumes bearing awns 3 to 4 times the length of the body of the spikelet, the first reduced to the awn or, in *C. bromoides*, the pair broadened and inclosing the rest of the

spikelet. Sterile lemma bearing a shorter awn or awn-tipped only, the sterile palea obsolete. Fruit subindurate, lanceolate, the lemma acuminate into a scabrous awn or point, the thin margins flat, the summit of the palea not inclosed.

Type species, *Chaetium festuoides* Nees.

First glume as broad as spikelet.
First glume setiform.

1. *C. bromoides*.
2. *C. cubanum*.

1. **Chaetium bromoides** (Presl) Benth.; Hemsl. Biol. Centr. Am.

Bot. 3: 503. 1885.

Bertholdia bromoides Presl, Rel. Haenk. 1: 324. 1830.

Panicum Bertholdia Döll, in Mart. Fl. Bras. 2: 150. 1877.

Stems erect, 0.5–1 m. tall, glabrous or the lower pubescent, the nodes appressed-hispidulous, producing stout creeping leafy stolons from the base; leaf-sheaths glabrous or weakly hispid, hispid on the collar, densely velvety-hispid at the base on the stolons; ligule a dense line of stiff hairs 1–2 mm. long; blades narrowed and folded below, flat above, 2–4 dm. long, 3–6 mm. wide, rather sparsely pilose or hispidulous; panicle 1–2 dm. long, erect, the branches appressed, the lower as much as 7 cm. long, the axis and rachises scabrous; spikelets fusiform, nearly 1 cm. long, including the 3 mm. long antrorsely hispid base, narrowed above into the awns of the glumes, the first about 2 cm. long, the second shorter, the pedicels slender, stiff, scabrous, disarticulating obliquely; glumes with about 3 nerves in the center and 1 or 2 nerves at each margin; fruit about 5 mm. long, short-awned.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Chihuahua to Costa Rica.

ILLUSTRATIONS: Presl, Rel. Haenk. pl. 43; Rep. Mo. Bot. Gard. 10: pl. 25.

2. **Chaetium cubanum** (Wright) Hitchc. Contr. U. S. Nat.

Herb. 12: 232. 1909.

Perotis ? cubana C. Wright; Sauv. Anal. Acad. Ci. Habana 8: 288. 1871.

Stems erect, striate, about 4 dm. tall; leaf-blades linear, acuminate, convolute, sparsely ciliate at base; panicle narrow, racemiform; spikelets about 6 mm. long, including the 2 mm. long stipe, this hispid at the oblique base; first glume awn-like, about 2 cm. long; second glume 5-nerved, narrowed into an awn a little longer than that of the first glume; sterile lemma about 4 mm. long, acute; fruit about 4 mm. long, narrowly elliptic, acute.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Known only from the type collection.

67. **TRICHOLAENA** Schrad.; Schultes, in R. & S. Syst. Veg.

Mant. 2: 163. 1824.

Rhynchelytrum Nees; Lindl. Nat. Syst. ed. 2. 446. 1836.

Monachyron Parl. in Hook. Niger Fl. 190. 1849.

Annual or perennial grasses with rather open panicles of silky spikelets on short capillary pedicels. First glume small, much shorter than the spikelets, silky. Second glume and sterile lemma equal, raised on a stipe above the first glume, acute, emarginate or slightly lobed, short-awned, covered except toward the apex with long silky hairs, the palea of the sterile lemma well developed. Fertile lemma shorter than the spikelets, cartilaginous, smooth, boat-shaped, obtuse, the margins thin, not inrolled, inclosing the margins of the palea.

Type species, *Tricholaena micrantha* Schrad.

1. **Tricholaena rosea** Nees, Cat. Sem. Hort. Vratisl. 1836;

Fl. Afr. Austr. 17. 1841.

Rhynchelytrum roseum Stapf & Hubbard (Bews, World's Grasses 223; hyponym. 1929); Prain, Fl. Trop. Afr. 9: 680. 1930. (Stapf & Hubbard restrict *Tricholaena* to *T. teneriffae* and its allies.)

Plants annual or perennial; stems erect, or decumbent and often rooting at the base, glabrous or pubescent, or papillose-pubescent, the nodes often pubescent; leaf-sheaths sparsely

papillose-pubescent, striate; ligule a dense row of stiff hairs about 1 mm. long or a little less; blades flat, mostly less than 15 cm. long, 3-7 mm. wide, slightly scabrous on the margin and upper surface; panicle 1-2 dm. long, the axis scaberulous or smooth, the branches slender, ascending, branched at base; pedicels capillary, flexuous or S-shaped, bearing near the summit several hairs 2-4 mm. long; spikelets tawny or often a beautiful claret, very silky, the hairs 4-6 mm. long, appressed, often forming two groups to correspond to the second glume and sterile lemma; first glume narrow, about 1 mm. long, silky; second glume and sterile lemma equal, about 4 mm. long, somewhat abruptly narrowed above the middle into a narrow emarginate tip, the lower part silky, the tip free of hairs but ciliate, the awn 1-2 mm. long; fruit smooth, about 2 mm. long, obtuse.

TYPE LOCALITY: South Africa.

DISTRIBUTION: Tropical Africa; introduced in America; cultivated in Florida as a forage grass (Natal grass); Florida; Guatemala; Cuba; also in South America and the Hawaiian Islands.

ILLUSTRATIONS: J. M. Wood, *Natal Pl. pl. 180*; Bull. U. S. Dep. Agr. **772**: f. 147.

68. SETARIOPSIS Scribn.; Millsp. Field Mus. Publ. Bot. 1: 288. 1896.

Annual grasses with erect stems, flat leaf-blades, and narrow panicles. Spikelets elliptic, plano-convex, similar in structure to those of *Panicum*, arranged in clusters on the short branches of a narrow or spike-like panicle, each pedicel bearing a slender bristle (modified branchlet) longer than the spikelet. First glume much shorter than the spikelet, broadly ovate, several-nerved. Second glume and sterile lemma about equal, several-nerved, the glume broad, cordate or auriculate at base, the lemma narrower, somewhat lyre-shaped, including a palea but no stamens. Fertile lemma apiculate, somewhat coriaceous but scarcely indurate, transversely rugose or nearly smooth. Palea inclosed by the inrolled margins of the lemma to the tip or nearly to the tip, of the same texture and markings as the lemma.

Type species, *Setaria latiglumis* Vasey.

Sheaths hispid; second glume conspicuously widened; fertile lemma nearly smooth.

1. *S. latiglumis*.

Sheaths glabrous; second glume not conspicuously widened; fertile lemma transversely rugose.

2. *S. auriculata*.

1. *Setariopsis latiglumis* (Vasey) Scribn.; Millsp. Field Mus. Publ. Bot. 1: 289. 1896.

Setaria latiglumis Vasey, Bull. Torrey Club **13**: 229. 1886.

Annual; stems erect or rarely somewhat geniculate at base, slender, scabrous, hispid at the nodes, as much as 1 meter tall; leaf-sheaths papillose-hispid; ligule a densely ciliate short membrane, the hairs 1-2 mm. long; blades flat, scabrous, hispid around the narrowed base, acuminate, as much as 30 cm. long and 15 mm. wide, panicles as much as 25 cm. long, narrow, rather loose in large specimens, spike-like and interrupted in the small ones, the axis scabrous, often sparsely or densely villous, the branches appressed or ascending, the lower in the large panicles being as much as 5 cm. long and compound; spikelets glabrous, ovate, gibbous on the convex side, about 4 mm. long, closely arranged along the branches or branchlets, the pedicels 1-3 mm. long, the subtending bristles slender, somewhat flexuous, 1-2 cm. long; first glume 1.5 mm. long, 2 mm. wide, about 7-nerved; second glume cordate (when spread out), 3.5 mm. long, 4 mm. wide, many-nerved, the nerves somewhat anastomosing, the margins serrate, especially toward the base; sterile lemma narrower than the second glume, about 3.5 mm. long, the lower part circular, about 1.5 mm. long, the upper part narrower, oblong, about 1 mm. long, truncate or somewhat notched at apex, the several nerves parallel, the main nerves reaching the apex without converging; fertile lemma somewhat coriaceous but not indurate, ovate, apiculate, about 2.5 mm. long, obscurely transversely wrinkled.

TYPE LOCALITY: Southwest Chihuahua, Mexico.

DISTRIBUTION: Pacific coast of Mexico from Chihuahua to Chiapas.

ILLUSTRATION: Field Mus. Publ. Bot. 1: pl. 11.

2. *Setariopsis auriculata* (Fourn.) Scribn.; Millsp. Field Mus.

Publ. Bot. 1: 289. 1896.

Setaria auriculata Fourn. Mex. Pl. Gram. 43. 1886.*Setariopsis Scribneri* Mez, Notizbl. Bot. Gart. Berlin 7: 58. 1917.

Annual; stems slender, glabrous except in the vicinity of the nodes, as much as 1 meter tall; leaf-sheaths compressed, glabrous or nearly so, hispid on the collar; ligule a densely ciliate membrane about 1 mm. long; blades flat, narrowed at the base, acuminate, scabrous, as much as 15 cm. long and 1 cm. wide; panicles narrow, as much as 15 cm. long, the axis scabrous, more or less villous, the branches ascending, the lower in large specimens as much as 2 cm. long, in small specimens short, forming an interrupted spike-like panicle; spikelets glabrous, ovate, about 3 mm. long, gibbous on the convex side, the pedicels very short, the subtending bristles 5-10 mm. long, somewhat flexuous; first glume broad-triangular, 1.5 mm. long, nearly 2 mm. wide (when spread out), about 7-nerved; second glume 3 mm. long, ovate, auriculate near the base, that is, with a small sinus on each side of the base, several-nerved; sterile lemma a little longer than the second glume, oblong, concave on the back, the lower third hardened and bulged-out on each side, the upper part inrolled around the fruit, about 7-nerved, the palea narrow, about one third as long as the lemma; fertile lemma ovate, strongly convex, about 2 mm. long, 3-nerved, somewhat indurate, transversely rugose and roughened, the lemma similar in texture, free at the apex.

TYPE LOCALITY: Campechy, Mexico.

DISTRIBUTION: Western and southern Mexico, Sonora to Oaxaca and Yucatán; also in Colombia.

ILLUSTRATION: Field Mus. Publ. Bot. 3: 39.

69. *SETARIA* Beauv. Agrost. 51. 1812. Not *Setaria* Achar.1798; nor *Setaria* Michx. 1803.*Panicum* § *Ptychophyllum* A. Br. Ind. Sem. Hort. Berol. 1855: App. 18. 1855.*Chaetochloa* Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 38. 1897.

Annual or perennial grasses with flat or rarely involute leaf-blades, and narrow, usually spike-like, or rarely open panicles. Spikelets lanceolate or elliptic, rarely globose, sessile or short-pedicelled, single or in clusters, some or all subtended by one to several bristles (sterile branchlets), deciduous, falling free from the bristles, awnless, the main branches usually short, rarely elongate. First glume broad, usually less than half the length of the spikelet, 3- to 5-nerved. Second glume and sterile lemma equal or the former shorter, several-nerved. Fertile lemma coriaceous or indurate, smooth or usually rugose or cross-wrinkled.

Type species, *Panicum viride* L.Blades narrowly elliptic, plaited; bristles below only a part of the spikelets, rarely below all. (Subgenus *PTYCHOPHYLLUM*.)

Plants annual; blades usually less than 2 cm. wide.

Plants perennial; blades usually more than 3 cm. wide.

Panicle of numerous approximate more or less 1-sided racemes, spikelet-bearing to the base, 2-5 cm. long, rarely the lower much longer.

Panicle of more or less fascicled branches, not or scarcely 1-sided, some of them elongate and naked at base.

Branches of panicle as much as 10 cm. long; bristles usually not more than twice as long as the spikelets, inconspicuous; blades as much as 6 cm. wide.

Branches of panicle slender, finally spreading, as much as 20 cm. long; bristles as much as 15 mm. long; blades as much as 10 cm. wide.

Blades linear-lanceolate to linear, narrow; bristles below all the spikelets. (*SETARIA* proper.)

Bristles below each spikelet numerous, at least more than 5; panicle dense, cylindric, spike-like.

Plants annual; spikelets 3 mm. long.

Plants perennial; spikelets mostly 2-2.5 mm. long.

Bristles below each spikelet 1, or by the abortion of the spikelets, 2 or 3.

Bristles more or less retrorsely scabrous.

Plants perennial; spikelets globose or nearly so.

Plants annual; spikelets not globose.

Spikelets about 2 mm. long.

Spikelets about 1.5 mm. long.

Panicle usually green, rarely as much as 8 cm. long, less than 5 mm. thick, the bristles 2-3 mm. long.

1. *S. barbata*.2. *S. Poirietiana*.3. *S. palmifolia*4. *S. paniculifera*.5. *S. lutescens*.6. *S. geniculata*.7. *S. tenax*.8. *S. verticillata*.9. *S. scandens*.

- Panicle usually purple, as much as 15 cm. long and 1 cm. thick, the bristles about 1 cm. long. 10. *S. tenacissima*.
 Bristles antrorsely scabrous only.
 Plants annual.
 Fertile lemma at maturity finely cross-lined or nearly smooth.
 Panicle loosely flowered, tapering above. 11. *S. Grisebachii*.
 Panicle compactly flowered, sometimes interrupted at base.
 Plants as much as 3 meters tall; bristles 1-2 cm. long; fertile lemma smooth or nearly so. 12. *S. magna*.
 Plants mostly less than 1 meter tall.
 Axis of panicle scabrous but not villous. 13. *S. ambigua*.
 Axis of panicle villous.
 Panicle cylindrical, tapering above, green; spikelet falling entire. 14. *S. viridis*.
 Panicle lobed or interrupted, often large and heavy, purple or yellow; fruit deciduous from glumes and sterile lemma. 15. *S. italica*.
 Fertile lemma coarsely transversely rugose.
 Axis of panicle thickly clothed with white stiff hairs 2 mm. long. 16. *S. longipila*.
 Axis of panicle villous, the hairs about 1 mm. long.
 Panicle densely flowered, cylindrical; sheaths scabrous. 17. *S. corrugata*.
 Panicle loosely flowered.
 Blades scabrous but not hispid. 18. *S. Liebmannii*.
 Blades sparsely hispid. 19. *S. latifolia*.
 Plants perennial.
 Spikelets 3 mm. long.
 Blades scabrous. 20. *S. macrosperma*.
 Blades villous. 21. *S. villosissima*.
 Spikelets 2-2.5 mm. long.
 Panicle attenuate at apex.
 Blades linear-lanceolate, more than 5 mm. broad; panicle interrupted or branched, the branches 1 to 3 cm. long. 22. *S. setosa*.
 Blades slender, mostly less than 5 mm. broad; panicle slender, very narrow. 23. *S. rariflora*.
 Panicle often narrowed toward the summit but not attenuate.
 Branches of primary panicle stiffly ascending, of about equal length except toward the summit; panicle yellowish or brownish, the bristles 1-2 cm. long. 24. *S. vulpisetia*.
 Branches of panicle short or only the lower as much as 2-3 cm. long; panicle pale or greenish, the bristles irregular in length, the longer sometimes 1-1.5 cm. long.
 Blades mostly less than 1 cm. wide, often folded; panicle usually loosely or interruptedly spike-like, the branches usually not more than 1 cm. long. 25. *S. macrostachya*.
 Blades flat, as much as 1.5 cm. wide; panicle tapering from near the base, the lower branches as much as 3 cm. long. 26. *S. Scheelei*.

1. *Setaria barbata* (Lam.) Kunth, Rév. Gram. 47. 1829.

Panicum barbatum Lam. Tabl. Encyc. 1: 171. 1791.

Panicum costatum Roxb. Fl. Ind. 1: 314. 1820.

Panicum viaticum Salzm.; Döll, in Mart. Fl. Bras. 2: 155. 1877.

Chamaeraphis viatica Kuntze, Rev. Gen. 770. 1891.

Chamaeraphis costata Kuntze, Rev. Gen. 771. 1891.

Chaetochloa barbata Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 348. 1917.

Annual; stems decumbent, spreading, often rooting at the lower nodes, branching, glabrous, scabrous or villous near the pubescent nodes, as much as 2 meters long, but often much less; leaf-sheaths compressed, ciliate, glabrous or papillose-hispid; ligule about 1 mm. long, densely ciliate, blades narrowly elliptic, flat and rather thin, narrowed to a somewhat truncate base in the upper leaves, to a petiole-like base in the lower, as much as 30 cm. long and 2.5 cm. wide, distinctly plicate in large specimens, obscurely so in dwarf ones; panicles long-exserted, green, as much as 20 cm. long, the rachis scabrous and villous, the branches ascending or spreading, as much as 4 cm. long; spikelets oblong-elliptic, glabrous, about 2.5 mm. long, tending to be in two rows along the branches, at least along the upper part, often clustered on branchlets on the lower part of the branches, the pedicels very short, the bristles flexuous, 5-10 mm. long, subtending a part of the spikelets but usually rather numerous; first glume circular, 3-nerved, 1 mm. long; second glume about two-thirds as long as the fertile lemma, ovate, acute, 7-nerved; sterile lemma as long as the fertile, acute, 7-nerved, the palea about as long and wide as the

lemma; fertile lemma elliptic, acute, a little over 2 mm. long, strongly transverse-rugose, the palea inclosed to the tip.

TYPE LOCALITY: Mauritius.

DISTRIBUTION: Tropics of Asia; introduced from Florida and the West Indies to Brazil.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 159, f. 36.

NOTE: *Setaria barbata* is described by Grisebach (Fl. Brit. W. Ind. 547. 1864) and J. D. Hooker (Fl. Brit. Ind. 7: 56. 1896) under *Panicum flavescens* Sw.

2. *Setaria Poiretiana* (Schultes) Kunth, Rév. Gram. 47. 1829.

Panicum elongatum Poir. in Lam. Encyc. Suppl. 4: 278. 1816. Not *P. elongatum* Salisb. 1796; nor *P. elongatum* Pursh, 1814.

Panicum sulcatum Bertol. Excerpta 14. 1820. Not *P. sulcatum* Aubl. 1775.

Setaria sulcata Raddi, Agrost. Bras. 50. 1823.

Setaria Poiretiana Schultes, in R. & S. Syst. Veg. Mant. 2: 229. 1824.

Panicum speciosum Nees; Trin. Gram. Pan. 169. 1826.

Panicum Crus-ardeae Willd.; Nees, Agrost. Bras. 253. 1829.

Setaria Crus-ardeae Kunth, Rév. Gram. Suppl. xii. 1830.

Panicum flabellatum Steud. Syn. Gram. 53. 1854.

Agrostis flabellata Salzm.; Steud. Syn. Gram. 53, as synonym. 1854.

Setaria Jurgensii Fourn. Mex. Pl. Gram. 42. 1886.

Chamaeraphis Crus-ardeae Kuntze, Rev. Gen. 770. 1891.

Chamaeraphis speciosa Kuntze, Rev. Gen. 770. 1891.

Chamaeraphis "Jurgensii" [Jurgensii] Kuntze, Rev. Gen. 770. 1891.

Panicum Jurgensii Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 40. 1900.

Chaetochloa sulcata Hitchc. Contr. U. S. Nat. Herb. 17: 260. 1913.

Cespitose perennial; stems erect, 1-1.5 meters tall, glabrous, or villous in the vicinity of the nodes; leaf-sheaths papillose-hispid, mostly longer than the internodes, the uppermost elongate, scabrous; ligule ciliate, about 2 mm. long; blades strongly plicate, scaberulous, sometimes sparsely hispid, flat, as much as 1 meter long and 10 cm. wide, narrowed toward each end, the base resembling a petiole; panicles erect, rather compact, commonly purple, long-exserted, as much as 60 cm. long, and 10 cm. wide, the axis puberulent, the branches ascending, irregularly clustered, approximate, usually somewhat falcate, the lower usually 3-5 cm. but sometimes as much as 10 cm. or the distant lowermost even longer; spikelets secund on the branches, narrowed, ellipsoidal, about 3 mm. long, the pedicels puberulent, usually very short, some or all on each branch subtended by somewhat flexuous bristles 5-10 mm. long; first glume 1.5 mm. long, oval, obtuse, 5-nerved; second glume similar to the first, 2 mm. long, 5-nerved; sterile lemma oblong-ovate, acutish, 3 mm. long, obscurely 5-nerved, the palea wanting; fertile lemma somewhat coriaceous, ellipsoidal, apiculate, 3 mm. long, very obscurely cross-wrinkled; palea similar to the lemma in texture and marking, the apex free.

TYPE LOCALITY: Brazil.

DISTRIBUTION: San Luis Potosi to Brazil and Paraguay.

ILLUSTRATIONS: Mart. Fl. Bras. 2: pl. 26; Contr. U. S. Nat. Herb. 22: 160, f. 37.

3. *Setaria palmifolia* (Willd.) Stapf, Jour. Linn. Soc. 42: 186. 1914.

Panicum plicatum Willd. Enum. 1033. 1809. Not *P. plicatum* Lam. 1791.

Panicum palmifolium Willd.; Poir. in Lam. Encyc. Suppl. 4: 282. 1816.

Panicum plicatum haitiense Kunth; Griseb. Fl. Brit. W. Ind. 547, as synonym. 1864.

Chamaeraphis palmifolia Kuntze, Rev. Gen. 771. 1891.

Chaetochloa palmifolia Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 348. 1917.

Perennial; stems 1-1.5 meters tall, glabrous or sparsely villous, the nodes puberulent; leaf-sheaths papillose-hispid or glabrate, hispid on the collar; ligule densely ciliate, about 2 mm. long; blades strongly plicate, flat, pubescent or glabrate, elliptic, narrowed to a petiole-like base, as much as 50 cm. long and 6 cm. wide; panicles rather loose and open, green, long-exserted, as much as 40 cm. long, the rachis scabrous, the branches ascending or spreading, scattered, somewhat distant, especially below, 5-10 cm. long, compound; spikelets lanceolate, acute, about 3 mm. long, closely arranged on short branchlets appressed along the main branches, forming interrupted compound racemes, the pedicels very short, the bristles inconspicuous, at the ends of the branchlets and subtending a part of the spikelets, usually not more than twice as long as the spikelets, often short and imperfectly developed; first glume 1 mm. long, obtuse, 5-nerved; second glume 7-nerved, the outer pair obscure, acutish, 1.5 mm. long;

sterile lemma 5-nerved, acute, 3 mm. long, the palea narrow, about half as long as the lemma; fertile lemma lanceolate, acute, somewhat apiculate, 2.5 mm. long, obscurely cross-wrinkled, the palea entirely included in the margins of the lemma.

TYPE LOCALITY: India.

DISTRIBUTION: Tropics of the Eastern Hemisphere; introduced in Jamaica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 162. f. 38.

4. *Setaria paniculifera* (Steud.) Fourn.; Hemsl. Biol. Centr. Am. Bot. 3: 505. 1885.

Panicum sulcatum Aubl. Pl. Guian. 50. 1775.

Panicum paniculiferum Steud. Syn. Gram. 54. 1854.

Setaria effusa Fourn. Mex. Pl. Gram. 42. 1886.

Chamaeraphis effusa Kuntze, Rev. Gen. 770. 1891.

Chamaeraphis paniculifera Kuntze, Rev. Gen. 770. 1891.

Chamaeraphis sulcata Kuntze, Rev. Gen. 770. 1891.

Panicum mexicanum Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 40. 1900.

Chaetochloa sulcata Hitchc. Contr. U. S. Nat. Herb. 17: 260. 1913.

Setaria sulcata A. Camus, Bull. Mus. Paris 30: 108. 1924. Not *S. sulcata* Raddi, 1823.

Perennial; stems robust, as much as 4 meters tall, glabrous, the nodes glabrous; leaf-sheaths papillose-hispid all over or only at the margin, hispid on the collar; ligule a ciliate membrane 1-2 mm. long; blades flat, strongly plicate, somewhat scabrous, as much as 1 meter long and 10 cm. wide at the middle, tapering toward each end, the lower into a long petiole-like base; panicles green or purplish, often very large, as much as 70 cm. long, the branches ascending, finally spreading, as much as 20 cm. long, these branching and rebranching, the whole panicle becoming loose and open, the axis somewhat scabrous; the branches very scabrous-pubescent; spikelets usually loosely arranged, elliptic-lanceolate, about 3 mm. long, obscurely nerved, glabrous, the pedicels 0.5-2 mm. long, scabrous-pubescent, the flexuous bristles as much as 15 mm. long, subtending a part of the spikelets; first glume nearly half as long as the spikelet, obtuse, 3-5-nerved; second glume about two thirds as long as spikelet, acutish, 5-7-nerved; sterile lemma about as long as the fertile, acute, 5-nerved, the palea narrow, shorter than the lemma; fertile lemma acute, slightly apiculate, closely but distinctly transverse-rugose, the palea inclosed to the tip.

TYPE LOCALITY: Oaxaca, Mexico.

DISTRIBUTION: Southern Mexico and Guadeloupe to Venezuela and Ecuador.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 164. f. 39.

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

Panicum lutescens Weigel, Obs. Bot. 20. 1772.

Panicum glaucum flavescens Ell. Bot. S. C. & Ga. 1: 113. 1816.

Panicum compressum Balb.; Steud. Nom. Bot. ed. 2. 2: 254, as synonym. 1841.

Chaetochloa lutescens Stuntz, Inv. U. S. Dep. Agr. 31: 36, 86. 1914.

Plants annual, erect, often much-branched at base, the stems becoming geniculate below, or in open ground spreading or even prostrate-spreading; stems rather succulent below, as much as 1 meter tall or in rich soil even taller, compressed below, smooth, scabrous just below panicle; leaf-sheaths smooth, compressed-keeled; ligule a ciliate membrane about 1 mm. long; blades as much as 25 cm. long and 1 cm. wide, flat, twisted in a loose spiral, the upper surface along the upper half facing downward, acuminate-pointed, often glaucous, scabrous on the upper surface, toward the base beset with long lax hairs, glabrous beneath; panicle dense, evenly cylindrical, spike-like, yellow at maturity, mostly 5-10 cm. long, sometimes longer, about 1 cm. thick, rounded at the summit, sometimes slightly interrupted at the base, the axis densely pubescent; branches very short, mostly less than 1 mm. long, pubescent like the axis, each branch bearing one developed spikelet and below this a cluster of short branchlets ending in bristles, sometimes a second small and undeveloped spikelet borne in one of these secondary clusters; branchlets irregular in length, mostly less than 1 mm. long, bearing 1 to several bristles, the whole cluster on each branch being usually more than 5 and sometimes more than 20; bristles antrorsely scabrous, yellow, irregular in length, the longer ones 2-3 times as long as the spikelet; spikelets about 3 mm. long, flat on one side, strongly convex on the other, oval in outline but slightly narrowed toward the apex; first glume ovate, about half as long as spikelet, pale, with 3 strong green nerves and an outer inconspicuous pair; second glume about

two thirds as long as the spikelet, with 5 strong nerves and 1 or 2 additional weaker pairs; sterile lemma about as long as the spikelet, 5-nerved, the base embracing the edges of the fertile lemma for about half way, containing a well-developed palea but no stamens; fertile floret strongly marked with numerous transverse ridges.

TYPE LOCALITY: Pomerania, Germany.

DISTRIBUTION: Maine to Florida, and westward to South Dakota and New Mexico; Oregon and California; Jamaica. Introduced from Europe; temperate regions, rare in the Tropics.

ILLUSTRATIONS: Vasey, Agr. Grasses U. S. 18; ed. 2, 20; Trin. Ic. *pl.* 195; Reichenb. Ic. Fl. Germ. 1: *pl.* 47, no. 1466; Schreb. Besch. Gräs. *pl.* 25; Host, Gram. Austr. 2: *pl.* 16; Bull. U. S. Dep. Agr. Agrost. 17: *f.* 401; Hitchc. Text-book Grasses *f.* 23; Britt. & Brown, Ill. Fl. *f.* 281; ed. 2, *f.* 391; Contr. U. S. Nat. Herb. 22: 167. *f.* 40; Bull. U. S. Dep. Agr. 772: *f.* 148.

NOTE: The name formerly applied to this species is *Setaria glauca* Beauv., based on *Panicum glaucum* L., which name should be applied to the species known as *Pennisetum typhoides* Rich. (*P. americanum* (L.) K. Schumann; *Penicillaria spicata* Willd.). The following synonyms are based on *Panicum glaucum* L. as to name but refer to *Setaria lutescens* as to plant:

Pennisetum glaucum R. Br. Prodr. 195. 1810.

Setaria glauca Beauv. Agrost. 51, 178. 1812.

Chamaeraphis glauca Kuntze, Rev. Gen. 767. 1891.

Xiphorus glaucus Nash, Bull. Torrey Club 22: 423. 1895.

Chaetochloa glauca Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

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

Panicum geniculatum Lam. Encyc. 4: 727 (err. typ. 737). 1798.

Cenchrus parviflorus Poir. in Lam. Encyc. 6: 52. 1804.

Pennisetum geniculatum Jacq. f. Ecol. Gram. *pl.* 26. 1815.

Setaria gracilis H.B.K. Nov. Gen. & Sp. 1: 109. 1815.

Setaria purpurascens H.B.K. Nov. Gen. & Sp. 1: 110. 1815.

Panicum imberbe Poir. in Lam. Encyc. Suppl. 4: 272. 1816.

?*Panicum pumilum* Poir. in Lam. Encyc. Suppl. 4: 273. 1816.

Panicum laevigatum Muhl.; Ell. Bot. S. C. & Ga. 1: 112. 1816.

Panicum glaucum purpurascens Ell. Bot. S. C. & Ga. 1: 113. 1816.

Setaria imberbis R. & S. Syst. Veg. 2: 891. 1817.

Pennisetum laevigatum Nutt. Gen. 1: 55. 1818.

Setaria laevigata Schultes, in R. & S. Syst. Veg. Mant. 2: 275. 1824.

Setaria affinis Schultes, in R. & S. Syst. Veg. Mant. 2: 276. 1824.

Setaria berteroniana Schultes, in R. & S. Syst. Veg. Mant. 2: 276. 1824.

Panicum flavum Nees, Agrost. Bras. 238. 1829.

Panicum imberbe pumilum Nees, Agrost. Bras. 240. 1829.

Panicum fuscescens Willd.; Nees, Agrost. Bras. 241, as synonym. 1829.

Panicum dasyurum Nees, Agrost. Bras. 241. 1829.

Panicum penicillatum Willd.; Nees, Agrost. Bras. 242. 1829. Not *P. penicillatum* Nees, Agrost. Bras. 145. 1829.

Panicum tejucense Nees, Agrost. Bras. 243. 1829.

Setaria flava Kunth, Rév. Gram. 46. 1829.

Setaria Ventenatii Kunth, Rév. Gram. 251. 1830.

Setaria tejucensis Kunth, Rév. Gram. Suppl. xi. 1830.

Setaria penicillata Presl, Rel. Haenk. 1: 314. 1830.

Panicum Ventenatii Steud. Nom. Bot. ed. 2: 265. 1841.

Panicum berteronianum Steud. Syn. Gram. 50. 1854.

Panicum psilocaulum Steud. Syn. Gram. 50. 1854.

Setaria glauca laevigata Chapm. Fl. S. U. S. 578. 1860.

Setaria glauca imberbis Griseb. Fl. Brit. W. Ind. 554. 1864.

Setaria glauca penicillata Griseb. Fl. Brit. W. Ind. 554. 1864.

Panicum imberbe purpurascens Döll, in Mart. Fl. Bras. 2: 157. 1877.

Panicum imberbe latifolium Döll, in Mart. Fl. Bras. 2: 157. 1877.

Panicum virescens Salzm.; Döll, in Mart. Fl. Bras. 2: 157, as synonym. 1877.

Panicum glaucescens Salzm.; Döll, in Mart. Fl. Bras. 2: 157, as synonym. 1877.

Panicum imberbe dasyurum Döll, in Mart. Fl. Bras. 2: 157. 1877.

Setaria streptobotrys Fourn. Mex. Pl. Gram. 47. 1886.

Chamaeraphis glauca penicillata Kuntze, Rev. Gen. 767. 1891.

Chamaeraphis glauca imberbis Kuntze, Rev. Gen. 767. 1891.

Setaria perennis Hall; Smyth, Check-list Pl. Kans. 26. 1892; Trans. Kansas Acad. 13: 102. 1893.

Setaria gracilis purpurascens Arech. Anal. Mus. Nac. Montevideo 1: 164. 1894.

Setaria gracilis latifolia Arech. Anal. Mus. Nac. Montevideo 1: 165. 1894.

Setaria gracilis dasyura Arech. Anal. Mus. Nac. Montevideo 1: 165. 1894.

Chamaeraphis Ventenatii Beal, Grasses N. Am. 2: 153. 1896.

Chamaeraphis glauca laevigata Beal, Grasses N. Am. 2: 155. 1896.

Chamaeraphis glauca perennis Beal, Grasses N. Am. 2: 156. 1896.

Chamaeraphis glauca geniculata Beal, Grasses N. Am. 2: 156. 1896.

Chaetochloa imberbis Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa penicillata Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa flava Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa versicolor Bickn. Bull. Torrey Club 25: 105. 1898.

Chaetochloa perennis Bickn. Bull. Torrey Club 25: 107. 1898.

Chaetochloa laevigata Scribn.; Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 10, as synonym. 1900.

- Chaetochloa imberbis perennis* Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 12. 1900.
Chaetochloa imberbis geniculata Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 12. 1900.
Chaetochloa imberbis staepheboides Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 13. 1900.
Chaetochloa purpurascens Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 13. 1900.
Chaetochloa gracilis Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 15. 1900.
Chaetochloa variegata parviflora Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 24. 1900.
Panicum glaberrimum Ell.; Scribn. & Merr. Circ. U. S. Dep. Agr. Agrost. 29: 3, as synonym. 1901.
Chaetochloa Ventenatii Nash; Kearney, Contr. U. S. Nat. Herb. 5: 515. 1901.
Chaetochloa occidentalis Nash, in Britton, Man. 90. 1901.
Chaetochloa geniculata Millsp. & Chase, Field Mus. Publ. Bot. 3: 37. 1903.
Setaria glauca geniculata Urban, Symb. Ant. 4: 96. 1903.
Setaria glauca purpurascens Urban, Symb. Ant. 4: 96. 1903.
Chamaeraphis imberbis Kuntze; Stuck. Anal. Mus. Nac. Buenos Aires III. 4: 76. 1904.
Chamaeraphis gracilis Kuntze; Stuck. Anal. Mus. Nac. Buenos Aires III. 4: 76. 1904.
Chamaeraphis penicillata Presl; Stuck. Anal. Mus. Nac. Buenos Aires III. 4: 76. 1904.
Panicum versicolor Nieuwl. Am. Midl. Nat. 2: 64. 1911. Not *P. versicolor* Doell, 1877.
Panicum occidentale Nieuwl. Am. Midl. Nat. 2: 64. 1911. Not *P. occidentale* Scribn. 1899.

Plants perennial, producing short knotty branching rhizomes as much as 4 cm. long; stems erect, spreading, or prostrate, tufted or solitary, as much as 1 meter tall, sometimes dwarfed, glabrous, usually scabrous below the panicle, the base usually hard and wiry, often more slender than the upper part; leaf-sheaths compressed-keeled, glabrous, sometimes scabrous toward the summit; ligule very short, densely ciliate; blades flat, scabrous, often glaucous, and often more or less villous toward the base on the upper surface, glabrous or somewhat scabrous beneath, mainly straight (not twisted as in *S. lulescens*), as much as 20 cm. long and 8 mm. wide, usually narrower and shorter than this; panicle long-exserted, erect, evenly cylindric, densely flowered, rounded or truncate (not narrowed) at summit, 1-10 cm. long or in robust specimens longer, 4-8 mm. thick (excluding the bristles), yellow, purple, tawny, or greenish, the axis densely and softly pubescent; branches pubescent like the axis, very short, about 1 mm. long to the single spikelet, bearing about the middle a fascicle of irregular branchlets, almost immediately dividing into bristles; bristles several, mostly 8-12, yellow or purple, 1-3 times or even as much as 6 times as long as the spikelets, antrorsely scabrous; spikelets 2-2.5 or even 3 mm. long, ovoid, plano-convex; first glume about one third as long as spikelet, 3-nerved; second glume half to two thirds as long as spikelet, 5-nerved; sterile lemma staminate or neuter, as long as the spikelet, 5- to 7-nerved, the palea well developed; fertile lemma transversely rugose with close narrow ridges.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Along the coast, Massachusetts to Florida and Texas, and northward to Kansas and Illinois; California and New Mexico, and southward through tropical America to Argentina and Chile.

ILLUSTRATIONS: Trin. Ic. pl. 196 (as *P. glaucum* var.); Kunth, Rév. Gram. pl. 37 (as *S. Ventenatii*); Bull. U. S. Dep. Agr. Agrost. 21: f. 2 (as *C. imberbis penicillata*), f. 3 (as *C. purpurascens*), f. 4 (as *C. gracilis*); Britt. & Brown, Ill. Fl. ed. 2. f. 392 (as *C. imberbis*); Contr. U. S. Nat. Herb. 22: 172. f. 41.

NOTE: This species is exceedingly variable, but after a study of a great amount of material and much field work it is impossible to segregate coherent groups. The culms are sometimes single, slender and weak, sometimes caespitose, sometimes stout, much-branched at base, spreading or prostrate; the blades vary in width and the panicles in length. Much of the difference in general appearance is due to the color and length of the bristles; the bristles are long early in the season and in cultivated soil. The differences appear not to be coordinated. In occasional specimens the sterile lemma is indurate and rugose like the fertile lemma. Sometimes the blades are very narrow, only 2-3 mm. wide, but otherwise not distinct; this has been called *Chaetochloa gracilis* (Bull. U. S. Dep. Agr. Agrost. 21: 15. 1900; Contr. U. S. Nat. Herb. 17: 263. 1913).

7. *Setaria tenax* (Rich.) Desv. Opusc. 78. 1831.

Panicum tenax Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Panicum impressum Nees, Agrost. Bras. 247. 1829.

Setaria impressa Kunth, Rév. Gram. Suppl. xii. 1830.

Panicum sphaerocarpum Salzm.; Steud. Syn. Gram. 51. 1854. Not *P. sphaerocarpum* Ell. 1816

Panicum amphibolum Steud. Syn. Gram. 51. 1854.

Panicum intermedium Salzm.; Steud. Syn. Gram. 51, as synonym. 1854. Not *P. intermedium*

Vahl, 1813.

Setaria biconvexa Griseb. Fl. Brit. W. Ind. 555. 1864.

Chaetochloa Salzmänniana Hitchc. Contr. U. S. Nat. Herb. 17: 265. 1913.

Chaetochloa impressa Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 350. 1917.

Setaria sphaerocarpa Hubbard, Contr. Gray Herb. 52: 60. 1917.

Chaetochloa tenax Hitchc. Contr. U. S. Nat. Herb. 22: 176. 1920.

Plants perennial; stems glabrous, scabrous below the panicle, 1-1.5 meters tall, often geniculate at base; leaf-sheaths glabrous or usually scabrous toward the summit, villous on

the margin, densely hispid on the collar; ligule densely pilose, 2-3 mm. long; blades flat, more or less scabrous, narrowed at base, acuminate at apex, as much as 35 cm. long and 2 cm. wide; panicles rather densely flowered, narrowed toward summit but not attenuate, somewhat interrupted or lobed below, 15-30 cm. long, 2-3 cm. wide, the branches ascending, the lower about 2 cm. long, the axis villous with hairs 1-2 mm. long; bristles 1 or 2 below each spikelet, 1-2 cm. long, flexuous, retrorsely scabrous and often antrorsely toward the base, sometimes barblets directed different ways intermixed, pale or tawny, becoming implicate and somewhat one-sided with age; spikelets subspheric, about 2 mm. long, very turgid on one side and somewhat convex on the other; first glume about 1 mm. long or a little less, 5-nerved; second glume about two thirds as long as the spikelet but at maturity pushed aside, exposing nearly half the fertile lemma, 7- to 9-nerved; sterile lemma as long as the fertile, 5- to 7-nerved, the nerves less distinct than those of the glumes, the palea well developed; fertile lemma very turgid, yellowish-brown at maturity, rather indistinctly cross-wrinkled, the palea convex.

TYPE LOCALITY: Cayenne, French Guiana.

DISTRIBUTION: Southern Mexico; Cuba; Jamaica; Barbados; Panama to Brazil and Bolivia.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 177. f. 42.

NOTE: This species resembles *S. vulpiseta*, but is less robust and has retrorsely scabrous bristles and subspheric spikelets. It was described by Grisebach (Fl. Brit. W. Ind. 555. 1864) as *Setaria Onurus*, but the original *Panicum Onurus* Willd., from Montevideo, as described by Trinius (Mém. Acad. St.-Petersb. VI. 3²: 226. 1834) is a different species, later described as *Setaria caespitosa* Hack. & Arech.

9. *Setaria verticillata* (L.) Beauv. Agrost. 51, 178. 1812.

Panicum verticillatum L. Sp. Pl. ed. 2. 82. 1762.

Pennisetum verticillatum R. Br.; R. & S. Syst. Veg. 2: 488, as synonym. 1817.

Chamaeraphis italica verticillata Kuntze, Rev. Gen. 768. 1891.

Chamaeraphis verticillata Porter, Bull. Torrey Club 20: 196. 1893.

Ixophorus verticillatus Nash, Bull. Torrey Club 22: 422. 1895.

Chaetochloa verticillata Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Plants annual, often much branched at base and geniculate-spreading; stems smooth, scabrous below the panicle, as much as 1 meter tall, usually less; leaf-sheaths glabrous, or rarely scabrous toward the summit, ciliate, keeled; ligule very short, densely ciliate; blades flat, rather thin, scabrous on both surfaces, often more or less pilose on one or both surfaces with short scattered hairs, usually 10-20 cm. long and 5-10 mm. wide; panicles erect but not stiff, cylindrical or somewhat tapering upward, more or less lobate or interrupted, especially toward base, mostly 5-15 cm. long, 7-15 mm. wide, or in robust specimens as much as 2 cm., the axis scabrous, or scabrous-hispid on the angles, more or less retrorsely so; branches closely many-flowered, scabrous-hispid on the angles like the axis, the cluster oblong, 3-10 mm. long, the branchlets very short, bearing 1-4 spikelets, a bristle below each spikelet; bristles 1-3 times as long as the spikelets, somewhat flexuous, retrorsely scabrous to base, this often flattened; spikelets about 2 mm. long, oblong-elliptic, not very turgid on the convex side; first glume about one third as long as the spikelet, 3-nerved; second glume and sterile lemma as long as the spikelet, 5-nerved, the sterile palea usually partially developed; fertile lemma finely cross-wrinkled.

TYPE LOCALITY: Southern Europe.

DISTRIBUTION: Widely distributed in the warmer parts of the Eastern Hemisphere; introduced in the United States from Massachusetts to North Dakota, and southward to Virginia and Missouri; Alabama; New Mexico; Utah; California; Coahuila to Guatemala; Cuba; Bermuda; occasional elsewhere.

ILLUSTRATIONS: Trin. Ic. pl. 202; Reichenb. Ic. Fl. Germ. 1: pl. 47, no. 1465; Host, Gram. Austr. 2: pl. 13; Bull. U. S. Dep. Agr. Agrost. 17: f. 403; 21: f. 5 (as *C. brevispica*), f. 6; Britt. & Brown, Ill. Fl. f. 280; ed. 2. f. 390; Contr. U. S. Nat. Herb. 22: 179. f. 43.

9. *Setaria scandens* Schrad.; Schultes, in R. & S. Syst. Veg.

Mant. 2: 279. 1824.

Panicum scandens Trin. Gram. Pan. 166. 1826.

Panicum Trinii Kunth, Enum. Pl. 1: 151. 1833.

Panicum scandens vulgare Döll, in Mart. Fl. Bras. 2²: 171. 1877.

Panicum scandens longiseta Döll, in Mart. Fl. Bras. 2²: 171. 1877.

Chaetochloa scandens Scribn.; Donn. Smith, Pl. Guat. 5: 91. 1899.

Plants annual, much branched below, erect or soon geniculate-spreading; stems slender, sometimes rooting at the lower nodes, as much as 80 cm. long, glabrous, sometimes appressed-

pilose at the nodes, especially below the margin of the sheath; leaf-sheaths glabrous or sparsely appressed-pilose, or the lowermost densely pilose, the margin and collar densely pilose; ligule densely ciliate, less than 1 mm. long; blades flat, linear-lanceolate, as much as 10 cm. long and 1 cm. wide, scabrous especially on upper surface, usually sparsely, sometimes densely pilose on both surfaces; panicles slender, erect, cylindrical, densely flowered, sometimes slightly lobate or interrupted especially at base, often purplish, as much as 8 cm. long, mostly less than 5 mm. thick, the axis softly pubescent and also long-villous, the scattered hairs often longer than the spikelets; branches very short, pubescent and sparsely villous like the axis; clusters of bristles nearly sessile, divided into 3-5 short branchlets, each supporting a spikelet and 1-3 bristles; bristles somewhat flexuous but not becoming implicate, as long as the spikelets to twice as long, antrorsely scabrous except near the tip, there more or less retrorsely scabrous; spikelets about 1.5 mm. long, ovoid, turgid on the convex side; first glume about as long as the spikelet, very broad, enveloping the base of the spikelet, 3-nerved; second glume nearly as long as the spikelet, 5-nerved; sterile lemma as long as the spikelet or slightly exceeding the fertile lemma, 5-nerved, partly enveloping the fertile lemma, the first pair of nerves at the edges of the spikelet, the outer pair on the convex side of the spikelet; fertile lemma transversely striate or weakly rugose.

TYPE LOCALITY: Described from a garden specimen.

DISTRIBUTION: Guatemala to Paraguay and Bolivia; Jamaica; Cuba; Hispaniola.

ILLUSTRATIONS: Trin. Ic. *pl.* 201; Contr. U. S. Nat. Herb. 22: 181. *f.* 44.

10. *Setaria tenacissima* Schrad.; Schultes, in R. & S. Syst. Veg. Mant. 2: 279. 1824.

Panicum tenacissimum Nees, Agrost. Bras. 238. 1829.

Chaetochloa tenacissima Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 352. 1917.

Plants annual, mostly simple or little-branched; stems erect, slender, glabrous, scabrous below the panicle, 1-2 meters tall, leaning on or clambering over other vegetation; leaf-sheaths glabrous, antrorsely scabrous toward the summit, short-hispid on the margin and sparsely so on the surface above, more or less hispid on the collar; ligule very short, densely ciliate; blades flat, very scabrous on both surfaces and more or less pubescent especially beneath, mostly 10-15 cm., sometimes as much as 20 cm. long, mostly not more than 8 mm. wide, gradually tapering from about the middle to the long-acuminate apex, rather abruptly narrowed at base; panicles somewhat nodding or flexuous, rather densely flowered above, somewhat interrupted toward the base, a little tapering toward the summit, as much as 15 cm. long and 1 cm. thick (excluding bristles), the axis densely pubescent and sparsely villous with long weak hairs; clusters of branchlets rather loose, 3-5 mm. long, dividing 2 or 3 times, each ultimate branchlet or pedicel bearing a bristle, the corresponding spikelet sometimes suppressed, the cluster bearing, therefore, usually not more than 8 spikelets and 8 bristles, the branchlet pubescent but not villous; bristles flexuous, becoming implicate, about 1 cm. long, scabrous, antrorsely below, retrorsely above; spikelets about 1.5 mm. long, often dark-purple; first glume about half as long as the spikelet, 3-nerved; second glume and sterile lemma about as long as the fertile lemma, 5-nerved, the sterile palea wanting; fertile lemma transversely rugose with numerous fine ridges.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Guatemala to Brazil and Bolivia; Porto Rico; Hispaniola.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 182. *f.* 45.

11. *Setaria Grisebachii* Fourn. Mex. Pl. Gram. 45. 1886.

Setaria pseudo-verticillata Fourn. Mex. Pl. Gram. 43. 1886.

Setaria laevis Fourn. Mex. Pl. Gram. 45. 1886.

Chaetochloa Grisebachii Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa Grisebachii ampla Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 36. 1900.

Chaetochloa Grisebachii mexicana Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 37. 1900.

Setaria mexicana Schaffn.; Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 37, as synonym. 1900.

Setaria yucatanana W. Herrm. Beitr. Biol. Pfl. 10: 51. 1910.

Plants annual, branched at base, erect or spreading; stems as much as 1 meter tall but usually less, smooth, or scaberulous below the pubescent nodes and below the panicle; leaf-sheaths

smooth, scabrous, or sparingly hispidulous, often papillose, densely ciliate, pubescent or hispid on the collar; ligule a short densely ciliate membrane, scarcely 1 mm. long; blades flat, mostly rather lax, erect or ascending, straight, puberulent and scabrous, as much as 25 cm. long and 1.5 cm. wide, usually less than 15 cm. long and 1 cm. wide; panicle loosely flowered, narrow, tapering toward apex, mostly less than 15 cm. long, the axis scabrous and, except the lower part, also villous; branches rather densely flowered, the lower somewhat distant, sometimes as much as 2.5 cm. long, spreading, usually 5–10 mm. long, and, except the lower, approximate; ultimate branchlets about 0.5 mm. long, bearing a single spikelet and a single bristle below, the spikelet sometimes rudimentary, thus bringing the bristles in pairs; bristles 5–15 mm. long, sometimes shorter, flexuous, antrorsely scabrous, green or purplish; spikelets about 2 mm. long, moderately turgid on the convex side; first glume one fourth to one third the length of the spikelet, 3-nerved; second glume a little shorter than the spikelet, 5-nerved; sterile lemma as long as the fertile lemma, 5-nerved, the palea small; fertile lemma acute, finely cross-wrinkled.

TYPE LOCALITY: Orizaba, Mexico.

DISTRIBUTION: Texas to Arizona, and southward to Oaxaca.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 21: f. 20, 21; Contr. U. S. Nat. Herb. 22: 184, f. 46.

12. *Setaria magna* Griseb. Fl. Brit. W. Ind. 554. 1864.

Chamaeraphis magna Beal, Grasses N. Am. 2: 152. 1896.

Chaetochloa magna Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Plants annual, robust, erect, usually not branched at base, sparingly branched above, the branches erect; stems as much as 4 meters tall, rarely taller, and 2 cm. thick at base, smooth, scabrous below the panicle; leaf-sheaths smooth or scabrous at summit, hispid-ciliate on margins; ligule a densely and stiffly hispid membrane, 1–2 mm. long; blades flat, scabrous, as much as 0.5 meter long and 3.5 cm. wide; panicles densely flowered, nodding, often interrupted at base, tapering at each end, as much as 40 cm. long and 3 cm. thick, those of the branches much smaller, the axis densely pubescent and also villous with ascending hairs about 1 mm. long; branches as much as 1.5 cm. long, many-flowered; bristles somewhat flexuous, 1 or 2 below each spikelet, 1–2 cm. long; spikelets about 2 mm. long, not very turgid on the convex side; first glume about one third as long as the spikelet, 3-nerved; second glume about as long as the spikelet, 5-nerved; sterile lemma as long as the spikelet, 7-nerved, the sterile palea well developed; fertile lemma smooth.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Along the coast, New Jersey to Florida and Texas; Jamaica; Porto Rico; Guadeloupe; Costa Rica.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 402; Britt. & Brown, Ill. Fl. ed. 2. f. 395; Contr. U. S. Nat. Herb. 22: 185, f. 47.

13. *Setaria ambigua* Guss. Fl. Sic. Syn. 1: 114. 1843.

Panicum verticillatum ambiguum Guss. Prodr. Fl. Sic. 80. 1827.

Setaria verticillata ambigua Parl. Fl. Palerm. 1: 36. 1845.

Panicum ambiguum Hausskn. Oesterr. Bot. Zeitschr. 25: 345. 1875.

Chamaeraphis italica ambigua Kuntze, Rev. Gen. 2: 768. 1891.

Chaetochloa ambigua Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 18. 1900.

Plants with the aspect of *Setaria verticillata*; differing in the longer ligule, scabrous but not pilose leaf-blades, and the antrorsely scabrous bristles. The bristles are mostly 2–3 times as long as the spikelets and at maturity are spreading and more or less implicate. This may be only a variety of *Setaria verticillata* or of *S. viridis*, between which it seems to be intermediate. It is retained as a species because it cannot be definitely referred to either of the two species mentioned.

TYPE LOCALITY: Sicily.

DISTRIBUTION: Central and southern Europe; sparingly introduced at Philadelphia, Washington and Mobile.

ILLUSTRATION: Bull. U. S. Dep. Agr. Agrost. 21: f. 7.

14. *Setaria viridis* (L.) Beauv. Agrost. 51, 178. 1812.

- Panicum viride* L. Syst. Nat. ed. 10. 870. 1759.
Pennisetum viride R. Br.; R. & S. Syst. Veg. 2: 489, as synonym. 1817.
Setaria Weinmanni R. & S. Syst. Veg. 2: 490. 1817.
Panicum viride brevisetum Döll. Rhein. Fl. 128. 1843.
Setaria viridis Weinmanni Borhás, Math. Term. Közlem. 15: 310. 1878.
Panicum italicum viride Körn. in Körn. & Wern. Handb. Getreid. 1: 277. 1855.
Chamaeraphis italica viridis Kuntze, Rev. Gen. 767. 1891.
Chamaeraphis viridis Millsp. Bull. W. Va. Agr. Exp. Sta. 2: 466. 1892.
Ixophorus viridis Nash, Bull. Torrey Club 22: 423. 1895.
Chaetochloa viridis Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.
Setaria viridis breviseta Hitchc. Rhodora 8: 210. 1906.

Plants annual, usually branched at base, sometimes geniculate-spreading; stems smooth, scabrous below panicle, usually 20–40 cm. tall, sometimes as much as 1 meter; leaf-sheaths smooth, or scabrous toward the summit, ciliate on the margin and sometimes a little on the collar; ligule very short, densely ciliate; blades flat, linear-lanceolate, straight (not twisted), scabrous especially on the upper surface, usually less than 15 cm. long, commonly less than 1 cm. wide, sometimes as much as 15 mm. wide; panicle erect or somewhat nodding, densely flowered, green or purple, tawny, cylindric but tapering a little at the summit (the smaller ones ovate), rarely as much as 10 cm. long, usually less than 7 cm., commonly 5–8 mm. thick (excluding bristles), the axis densely pubescent and also villous with numerous hairs about 1 mm. long; branches very short, bearing several (mostly 5 or 6) spikelets, the rachis pubescent; bristles 1–3 below each spikelet, mostly 3–4 times as long as the spikelet, antrorsely scabrous, greenish or rarely purplish; spikelets 2–2.5 mm. long, elliptic, not very turgid on the convex side; first glume one third to one fourth as long as the spikelet, 3-nerved; second glume and sterile lemma about as long as the spikelet or the former a little shorter, 5-nerved, the sterile palea not fully developed; fertile lemma finely transversely wrinkled or ridged.

TYPE LOCALITY: Europe.

DISTRIBUTION: Eurasia; introduced in North America from Newfoundland to British Columbia, and southward to Mexico; Costa Rica; Bermuda.

ILLUSTRATIONS: Trin. Ic. pl. 203; Reichenb. Ic. Fl. Germ. 1: pl. 47, no. 1467; Host, Gram. Austr. 2: pl. 14; Bull. U. S. Dep. Agr. Agrost. 7: f. 65; Britt. & Brown, Ill. Fl. f. 282; ed. 2. f. 393; Contr. U. S. Nat. Herb. 22: 187. f. 48.

15. *Setaria italica* (L.) Beauv. Agrost. 51, 170, 178. 1812.

- Panicum italicum* L. Sp. Pl. 56. 1753.
Panicum germanicum Mill. Gard. Dict. ed. 8. Panicum no. 1. 1768.
Panicum italicum germanicum Koeler, Descr. Gram. 17. 1802.
Pennisetum italicum R. Br. Prodr. 195. 1810.
Setaria californica Kellogg, Proc. Calif. Acad. 1: 27. 1855.
Chamaeraphis italica Kuntze, Rev. Gen. 767. 1891.
Ixophorus italicus Nash, Bull. Torrey Club 22: 423. 1895.
Chaetochloa italica Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

A cultivated form of *S. viridis*, differing in being more robust, with broader leaf-blades, and larger lobate panicles. The stem may be as much as 1 cm. thick, the blades as much as 3 cm. wide, and the heads as much as 30 cm. long. At maturity the fruit becomes very turgid and spreads apart the glumes and sterile lemma, and is distinctly longer than these. The head, in some forms, becomes heavy and nodding, and distinctly lobate. The color of the fruit varies from tawny to red, brown, and black. The bristles are 1–3 times as long as the spikelet, green, purple, or brown. The fruit is smooth or obscurely cross-wrinkled and may be as much as 3 mm. long. In the cultivated forms the rachilla disarticulates above the sterile lemma so that the fruit at maturity readily falls from the spikelet, and hence shells out when the heads are threshed. The plants propagate themselves in fields and waste places and then tend to revert to a more primitive form. These uncultivated plants are often difficult to distinguish from forms of *Setaria viridis*. This is especially true in immature specimens, as the disarticulation of the fruit is evident only at maturity, and, even then, in the uncultivated plants, is often less marked.

TYPE LOCALITY: India.

DISTRIBUTION: Cultivated throughout the temperate regions of the world; escaped from cultivation, and appearing more or less as a weed in waste places throughout the United States.

ILLUSTRATIONS: Vasey, Agr. Grasses U. S. 16; ed. 2. 19; Trin. Ic. *pl.* 198; Host, Gram. Austr. 4: *pl.* 14; Bull. U. S. Dep. Agr. Agrost. 7: *f.* 68; 21: *f.* 9; Hitchc. Text-book Grasses *f.* 24, 25; Britt. & Brown, Ill. Fl. *f.* 283; ed. 2. *f.* 354; Contr. U. S. Nat. Herb. 22: 190. *f.* 49.

NOTE: There are many varieties in cultivation differing in the length and color of the bristles, the color of the fruit, and the size and degree of lobing of the panicle or head. The varieties are discussed by Körnicke (Körn. & Wern. Handb. Getreid. 1: 270-279. 1885) and by Hubbard (Am. Jour. Bot. 2: 169. 1915).

16. *Setaria longipila* Fourn. Mex. Pl. Gram. 47. 1886.

Chaetochloa longipila Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 22. 1900.

Plants annual; stems erect, branching at base, glabrous, scabrous just below the panicle, 30-40 cm. tall, the nodes hispidulous; leaf-sheaths mostly glabrous, sometimes scaberulous at summit or sparsely hispid, densely ciliate on the margin, hispid on the collar; ligule a dense line of stiff white hairs 2-3 mm. long; blades flat, 7-10 cm. long, as much as 1 cm. wide, scabrous and sometimes sparsely hispidulous, narrowed toward each end; panicles spike-like, cylindric, somewhat interrupted, rather densely flowered, narrowed toward the summit, 4-7 cm. long, about 5 mm. wide, the axis thickly beset with white, ascending, rather stiff, flexuous hairs about 2 mm. long; branches short and ascending, the rachis somewhat villous like the main axis; bristles mostly one below each spikelet, mostly 3-5 cm. long, antrorsely scabrous; spikelets about 1.7 mm. long, turgid on the convex side; first glume about half as long as the spikelet, 3-nerved; second glume about as long as the fertile lemma or very slightly shorter, 5-nerved, somewhat pointed; sterile lemma as long as the fertile, 5-nerved, slightly pointed; fertile lemma sharply transversely rugose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico, Guatemala, and Salvador.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 191. *f.* 50.

17. *Setaria corrugata* (Ell.) Schultes, in R. & S. Syst. Veg.

Mant. 2: 276. 1824.

Panicum corrugatum Ell. Bot. S. C. & Ga. 1: 113. 1816.

Pennisetum corrugatum Nutt.; Schultes, in R. & S. Syst. Veg. Mant. 2: 276, as synonym. 1824.

Chamaeraphis corrugata Kuntze, Rev. Gen. 770. 1891.

Chaetochloa corrugata Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa hispida Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 25. 1900.

Setaria hispida K. Schumann, Bot. Jahresb. 28: 417. 1902.

Plants annual, branched at base, erect or geniculate-spreading; stems scabrous or the lower part smooth, more or less appressed-hispid at the nodes, as much as 1 meter tall; leaf-sheaths compressed-keeled, scabrous at least toward the summit, villous on the margin or sometimes appressed-pilose all over; ligule a densely ciliate membrane about 1 mm. long; blades flat, gradually narrowed to the base and to the acuminate apex, scabrous on both surfaces, as much as 30 cm. long and 1 cm. wide, the middle culm blades commonly 15-25 cm. long and less than 5 mm. wide, rarely sparsely pilose; panicles densely flowered, cylindric, in larger specimens sometimes interrupted at base, as much as 15 cm. long, or usually less than 10 cm., the axis densely hispid-scabrous, and also rather densely villous with ascending hairs about 1 mm. long; branches 1-3 mm. long, hairy, bearing several spikelets (mostly 5 or 6), and 1-3 bristles below each spikelet; bristles somewhat flexuous, antrorsely scabrous, mostly about 3 times as long as the spikelets, or as much as 2 cm. long, green, tawny, or purple; spikelets about 2 mm. long, turgid on the convex side; first glume about half as long as the spikelet, 3-nerved; second glume a little shorter than the spikelet, 5-nerved; sterile lemma as long as the spikelet, 5-nerved; fertile lemma coarsely transversely rugose.

TYPE LOCALITY: Savannah, Georgia.

DISTRIBUTION: Along the coast, North Carolina to Florida and Louisiana; Cuba.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: *f.* 66; 21: *f.* 11, 13; Contr. U. S. Nat. Herb. 22: 192. *f.* 51.

18. *Setaria Liebmanni* Fourn. Mex. Pl. Gram. 44. 1886.

Setaria rariflora Presl, Rel. Haenk. 1: 313. 1830. Not *S. rariflora* Mikan, 1821.

Panicum rariflorum Presl; Steud. Syn. Gram. 51. 1854.

Panicum dissitiflorum Steud. Syn. Gram. 51, as synonym. 1854.

Chamaeraphis caudata pauciflora Vasey; Beal, Grasses N. Am. 2: 158. 1896.

Chaetochloa Liebmanni Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 31. 1900.

Chaetochloa Liebmanni pauciflora Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 33. 1900.

Plants annual, often branched at base; stems as much as 1 meter tall, or usually less than 50 cm., glabrous, scabrous just below the panicle, the nodes glabrous or puberulent; leaf-sheaths glabrous, the margin ciliate, the collar a more or less hispidulous ridge; ligule a short, densely ciliate membrane; blades flat, rather thin, as much as 20 cm. long and 2 cm. wide, usually about 1 cm. wide, narrowed toward both ends, scabrous, especially beneath; panicles loosely flowered, cylindrical, tapering at each end, often nodding or flexuous, as much as 30 cm. long, or usually 10–20 cm., the axis angled or channeled, scabrous or scabrous-hispidulous; branches ascending, loosely arranged, scabrous like the axis, as much as 2.5 cm. long; branchlets less than 1 mm. long, bearing one bristle below each spikelet; bristles slender, flexuous, antorsely scabrous, 7 to 15 mm. long; spikelets ovate, about 2 mm. long, rather turgid on the convex side, rather prominently nerved; first glume one third or one fourth as long as the spikelet, 3-nerved; second glume about four fifths as long as the fertile lemma, 5-nerved, with an additional accessory pair on the outside; sterile lemma as long as the fertile, 5-nerved, with an accessory pair like the second glume, the palea wanting; fertile lemma somewhat pointed, gibbous, coarsely and strongly transversely rugose.

TYPE LOCALITY: Manantial, Mexico.

DISTRIBUTION: Arizona to Oaxaca; Nicaragua.

ILLUSTRATIONS: Trin. Ic. pl. 96C; Bull. U. S. Dep. Agr. Agrost. 21: f. 23 (as *Chaetochloa caudata*); Contr. U. S. Nat. Herb. 22: 193, f. 52.

19. *Setaria latifolia* (Scribn.) W. Herrm. Beitr. Biol. Pfl. 10:
55. 1910.

Chaetochloa latifolia Scribn. Bull. U. S. Dep. Agr. Agrost. 11: 44. 1898.

Chaetochloa latifolia breviseta Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 31. 1900.

Plants annual, branching at the base; stems erect or geniculate-spreading, 20–40 cm. tall, more or less scabrous, especially below the hispidulous or pubescent nodes and below the panicle; leaf-sheaths papillose-hispid, papillose, or glabrate, densely ciliate; ligule a densely ciliate membrane less than 1 mm. long; blades flat, mostly less than 10 cm. long, as much as 1.5 mm. wide, rounded or somewhat cordate at base, rather abruptly narrowed at the apex, scabrous and also sparsely papillose-hispid; panicles loosely cylindrical, tapering above, more or less interrupted or lobed, mostly 5–8 cm. long, the axis scabrous or pubescent and also villous, the hairs weak and spreading, 1 mm. long; branches short, ascending, the longer as much as 5 mm. long; branchlets about 1 mm. long, bearing a single bristle below the spikelets; bristles flexuous, angled, antorsely scabrous, 5–10 mm. long; spikelets about 2 mm. long or a little longer, moderately turgid on the convex side; first glume one third the length of the spikelet, 3-nerved; second glume a little shorter than the fertile lemma, 5-nerved; sterile lemma as long as the fertile, 5-nerved, the palea well developed; fertile lemma strongly and coarsely transversely rugose.

TYPE LOCALITY: Durango, Mexico.

DISTRIBUTION: Durango to Oaxaca; Brazil.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 21: f. 17; Contr. U. S. Nat. Herb. 22: 195, f. 53.

20. *Setaria macrosperma* K. Schumann, Bot. Jahresb. 28:
417. 1902.

Chaetochloa macrosperma Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 33. 1900.

Plants perennial, often in large tufts; stems usually more or less geniculate at base, and often rooting at the lower nodes, smooth, scabrous below the panicle, rather stout, mostly 1–1.5 meters tall, the nodes glabrous; leaf-sheaths keeled, glabrous, the margin villous, usually hispidulous on the collar; ligule a ciliate membrane, 1–3 mm. long; blades flat, very scabrous

on the upper surface, smooth or scaberulous beneath, narrowed at the base, as much as 50 cm. long and 2 cm. wide; panicles rather loose, tapering above, as much as 25 cm. long, the secondary panicles often much smaller and more compact, the branches ascending, as much as 2 cm. long, about equally distributed, the panicle thus not being interrupted or lobed, the axis scabrous-pubescent and also loosely or sparsely villous with hairs 1-2 mm. long, the hairs rarely wanting; bristles single below each spikelet but often seemingly in pairs because of the abortion of spikelets, straight or obscurely flexuous, antrorsely scabrous, 1.5-3 cm. long, greenish or yellowish; spikelets about 3 mm. long, lanceolate-ovate, not strongly turgid on the convex side, pale or greenish; first glume about one third the length of the spikelet, 3-nerved; second glume two thirds to three fourths as long as the fertile lemma, mostly 5-nerved, sometimes 6- or 7-nerved; sterile lemma as long as the fertile, 5-nerved, concave or sulcate, the palea narrow, about half as long as its lemma; fertile lemma pale, acute or somewhat pointed, finely and not very distinctly cross-wrinkled, the surface appearing cellular.

TYPE LOCALITY: Florida.

DISTRIBUTION: Florida and Bahama Islands.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 7: f. 67 (as *C. composita*); 21: f. 18; Contr. U. S. Nat. Herb. 22: 196. f. 54.

21. *Setaria villosissima* (Scribn. & Merr.) K. Schumann, Bot. Jahresb. 28¹: 417. 1902.

Chaetochloa villosissima Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 34. 1900.

Plants perennial; stems erect or decumbent at base, glabrous, as much as 1 meter tall, nodes more or less pubescent; leaf-sheaths glabrous or somewhat hispidulous, often scabrous toward the summit, compressed-keeled, especially the lower, hispid on the collar, villous on the margin; ligule densely pilose, 2-3 mm. long; blades flat, scabrous and villous, or scabrous only, 15-30 cm. long, 5-8 mm. wide; panicles rather loose, more or less interrupted, tapering at the summit, as much as 23 cm. long, the branches ascending, the lower as much as 2 cm. long, the axis angled, scabrous, villous; bristles single below each spikelet, flexuous, antrorsely scabrous, 1.5-2.5 cm. long; spikelets lanceolate-ovate, acutish, not strongly turgid on the convex side, about 3 mm. long, pale or greenish; first glume one third as long as the spikelet, 3-nerved; second glume nearly as long as the fertile lemma, 5-nerved (rarely 7-nerved); sterile lemma as long as the fertile, 5-nerved, concave or sulcate, the palea narrow, less than 1 mm. long; fertile lemma lanceolate, the tip rather pointed, incurved, the surface finely but sharply cross-wrinkled.

TYPE LOCALITY: San Diego, Texas.

DISTRIBUTION: Texas and Arizona.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 21: f. 19; Contr. U. S. Nat. Herb. 22: 197. f. 55.

22. *Setaria setosa* (Sw.) Beauv. Agrost. 51, 178. 1812.

Panicum setosum Sw. Prodr. 22. 1788.

Panicum caudatum Lam. Tab. Encycl. 1: 171. 1791.

Panicum brachiatum Poir. in Lam. Encyc. Suppl. 4: 282. 1816.

Setaria caudata R. & S. Syst. Veg. 2: 495. 1817.

Setaria elongata Spreng.; Schultes, in R. & S. Syst. Veg. Mant. 2: 280. 1824.

Setaria brachiata Kunth, Rév. Gram. 47. 1829.

Panicum paraetiaenoides Trin. Mém. Acad. St.-Petersb. VI. 3: 219. 1834.

Panicum dumetorum A. Rich.; Steud. Syn. Gram. 49. 1854.

Panicum restitutum Steud. Syn. Gram. 53. 1854.

Setaria setosa caudata Griseb. Fl. Brit. W. Ind. 555. 1864.

Pennisetum Swartzii F. Müll. Fragm. 8: 110. 1873.

Chamaeraphis setosa Kuntze, Rev. Gen. 768. 1891.

Chamaeraphis setosa caudata Kuntze, Rev. Gen. 769. 1891.

Chamaeraphis caudata Britton, Ann. N. Y. Acad. 7: 264. 1893.

Chaetochloa setosa Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa caudata Scribn. Rep. Mo. Bot. Gard. 10: 52. 1899.

Setaria paraetiaenoides Urban, Repert. Sp. Nov. 15: 98. 1917.

Plants perennial; stems erect, spreading, or decumbent at base, often wiry, sometimes prostrate and woody at base with upright branches, glabrous, scabrous below the panicle, sometimes hispidulous about the nodes, mostly not more than 1 meter tall; leaf-sheaths glabrous or rarely pubescent, the lower often keeled, often overlapping, ciliate, hispidulous or rarely

glabrous on the collar; ligule densely ciliate, about 1 mm. long; blades flat or folded, usually rather firm and stiffly spreading, glabrous beneath, scabrous on upper surface, or often pubescent on both surfaces, usually 15-20 cm. long, sometimes as much as 30 cm. long, mostly 5-10 mm. wide, sometimes wider; panicles mostly narrow, sometimes loosely spike-like, sometimes rather open, attenuate at summit, usually 10-20 cm. long, rarely as much as 40 cm., the branches short and crowded or ascending and 1-2 cm. long, approximate or, especially the lower, 1-3 cm. distant, these rarely spreading or somewhat reflexed, the axis villous with hairs as much as 1 mm. long; bristles mostly one below each spikelet, flexuous, antrorsely scabrous, mostly 5-10 mm. long, sometimes scarcely exceeding the spikelets; spikelets about 2 mm. long, rather strongly turgid on the convex side; first glume nearly half as long as the spikelet, 3-nerved; second glume about two thirds as long as the fertile lemma, 5-nerved; sterile lemma about as long as the fertile, 5-nerved, the palea well developed; fertile lemma acutish, finely but strongly cross-ridged.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies; Chacachacare, Trinidad; Colombia.

ILLUSTRATIONS: Trin. Ic. *pl.* 95; Contr. U. S. Nat. Herb. 22: 199, *f.* 56, 57.

NOTE: In habit this species is rather variable, the differences being due chiefly to the length of the bristles, the length and distance of the branches of the panicle, and the relative amount of foliage. The usual form has rather densely flowered panicles with short ascending approximate branches and bristles 5-10 mm. long. An extreme form (*Panicum brachiatum* Poir.), growing on dry brushy hillsides, has wiry, often woody, sometimes decumbent and rooting stems, rather few and distant leaves and loose panicles with distant spreading sometimes reflexed branches as much as 5 cm. long, and short bristles. However, there are all gradations connecting this with the usual form.

23. *Setaria rariflora* Mikan; Trin. Neue Entdeck. 2: 78. 1821.

Setaria vaginata Spreng. Syst. 4: (Cur. Post.) 33. 1827.

Panicum triquetrum Willd.; Döll, in Mart. Fl. Bras. 2: 161, as synonym. 1877.

Chaetochloa rariflora Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 349. 1917.

Plants perennial, tufted; stems erect, or decumbent at base, glabrous, mostly 30-60 cm. tall; leaf-sheaths pubescent with short ascending hairs, or glabrate, keeled, mostly overlapping; ligule densely ciliate, less than 1 mm. long; blades elongate and narrow, pubescent on both surfaces, narrowed at base, usually 2-3 mm. wide, rarely more than 5 mm.; panicles narrow, tapering above, 10-15 cm. long, often less, the axis loosely villous, the hairs mostly less than 1 mm. long; branches ascending, the lower 5-10 mm. long, or often shorter, the panicle then being loosely or interruptedly spike-like; bristles usually one below each spikelet, flexuous, antrorsely scabrous, 4-7 mm. long, or often scarcely exceeding the spikelets; spikelets about 2 mm. long, turgid on the convex side; first glume a little less than half the length of the spikelet, 3-nerved; second glume about two thirds as long as the spikelet, 7-nerved; sterile lemma as long as the fertile, 5- to 7-nerved, the palea well developed; fertile lemma acutish, finely and sharply cross-ridged.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Porto Rico and Cuba to Brazil; on ballast at Mobile, Alabama.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: 201, *f.* 58.

NOTE: This species differs from *S. setosa* chiefly in the long narrow blades and the usually narrower and less bristly panicle. The second glume is shorter and usually 7-nerved. The two forms are given specific rank because the specimens from Brazil agree in having slender rather lax blades and narrow few-flowered interruptedly spike-like panicles like the type of *S. rariflora*. *Setaria setosa* is confined to the West Indies and adjacent parts of South America; there are no specimens known from Brazil. In Trinidad it is found only on the outlying islet Chacachacare. Because of the slightly different aspect and the different geographical range it seems better to recognize the two forms as species rather than varieties, though they are closely related.

24. *Setaria vulpiseta* (Lam.) R. & S. Syst. Veg. 2: 495. 1817.

Panicum vulpisetum Lam. Encyc. 4: 735 (err. typ. 745). 1798.

Setaria composita H.B.K. Nov. Gen. & Sp. 1: 111. 1815.

Setaria polystachya Schrad.; Schultes, in R. & S. Syst. Veg. Mant. 2: 277. 1824.

Panicum compositum Nees, Agrost. Bras. 244. 1829. Not *P. compositum* L., 1753.

Panicum macrourum Trin. Mém. Acad. St.-Petersb. VI. 3: 227. 1834.

Setaria Alopecurus "hort. Gor."; Trin. Mém. Acad. St.-Petersb. VI. 3: 227, as synonym. 1834.

Panicum amplifolium Steud. Syn. Gram. 53. 1854.

Panicum subsphaerocarpum Salzmann; Schlecht. Linnaea 31: 483. 1862.

Chamaeraphis setosa vulpiseta Kuntze, Rev. Gen. 769. 1891.

Chamaeraphis composita Kuntze; Beal, Grasses N. Am. 2: 154. 1896.

Chaetochloa composita Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa vulpiseta Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 350. 1917.

Plants perennial, branching at base, often in large tufts; stems glabrous, stout, often decumbent at base, as much as 2 meters tall; leaf-sheaths keeled, glabrous, or scaberulous or hispidulous toward the summit or rarely all over, hispid on the margin and densely hispid on the well-marked ridge of the collar, the hairs yellowish, as much as 4 mm. long; ligule densely hispid like the collar, 2 mm. long; blades flat, gradually narrowed from the middle toward both ends, the larger somewhat plaited, scabrous, especially beneath, as much as 50 cm. long and 3 cm. wide; panicles rather densely and evenly flowered, tapering toward the apex and often somewhat tapering at base, as much as 30 cm. long and 4-5 cm. wide (secondary panicles much smaller, sometimes only 5 cm. long), the branches stiffly ascending or spreading, as much as 2-3 cm. long and of about equal length except toward the summit, the axis densely villous; bristles 1 or 2 at the base of each spikelet, slightly flexuous, brownish, antrorsely scabrous, mostly 1-2 cm. long, appearing second on the branches after the fall of the spikelets; spikelets ovoid, 2-2.5 mm. long, pale, moderately turgid on the convex side; first glume about half as long as the spikelet, 3-nerved; second glume two thirds to three fourths as long as the fertile lemma, 7-nerved; sterile lemma as long as the fertile, 5-nerved, the palea well developed; fertile lemma lanceolate, acutish, strongly and rather coarsely cross-wrinkled.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Southern Mexico and the West Indies (Porto Rico, Santo Domingo) to Argentina.

NOTE: The panicles sometimes resemble those of *S. magna* but are less densely flowered; the fertile lemma is cross-wrinkled instead of nearly smooth. From *S. macrosperma* it is distinguished by the smaller spikelets.

25. *Setaria macrostachya* H.B.K. Nov. Gen. & Sp. 1: 110. 1815.

Panicum macrostachyum Nees, Agrost. Bras. 245. 1829.

Panicum Onurus Willd.; Nees, Agrost. Bras. 251, as synonym. 1829.

Chamaeraphis setosa macrostachya Kuntze, Rev. Gen. 769. 1891.

Chaetochloa gibbosa Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 24. 1900.

Chaetochloa leucopila Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 26. 1900.

Chaetochloa macrostachya Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 29. 1900.

Chaetochloa rigida Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 30. 1900.

Setaria leucopila K. Schumann, Bot. Jahresb. 28: 417. 1902.

Chamaeraphis macrostachya Kuntze; Stuck. Anal. Mus. Nac. Buenos Aires III. 4: 76. 1904.

Setaria Berlandieri W. Herrm. Beitr. Biol. Pfl. 10: 56. 1910.

Plants perennial, tufted, usually pale or glaucous, more or less hirsute around the base; stems erect or geniculate at base, scabrous below the panicle and usually below the glabrous or hispidulous nodes, 40-120 cm. tall; leaf-sheaths more or less compressed-keeled, glabrous or usually scaberulous toward the summit, rarely pubescent, ciliate on the margin, the collar hispidulous or glabrous; ligule densely ciliate, 1-3 mm. long; blades flat or folded, scabrous on the upper surface, smooth or scabrous beneath, rarely pubescent on both surfaces, 15-40 cm. long, 3-5 mm. wide; panicles spike-like, 10-25 cm. long, or sometimes shorter, somewhat tapering above but not attenuate, more or less interrupted or lobed, sometimes rather open below, the branches usually short, the axis pubescent and often also villous with hairs 1-2 mm. long; bristles mostly single below each spikelet, 10-15 mm. long with shorter ones intermixed, flexuous, antrorsely scabrous; spikelets pale (the nerves usually pale), 2-2.5 mm. long, turgid on the convex side, sometimes strongly so at maturity; first glume about half as long as the spikelet, 3-nerved; second glume two thirds to three fourths as long as the spikelet, 5- to 7-nerved; sterile lemma as long as the fertile, 5-nerved, the palea narrow, a little shorter than the lemma; fertile lemma rather sharply but finely marked with cross-wrinkles.

TYPE LOCALITY: Guanajuato, Mexico.

DISTRIBUTION: Texas and Colorado to Arizona, and southward to Oaxaca; Haiti.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 12¹: pl. 5 (as *S. caudata*); Vasey, Agr. Grasses U. S. 17. 1884 (as *S. setosa*); Bull. U. S. Dep. Agr. Agrost. 21: f. 14 (as *C. leucopila*); f. 15 (as *C. composita*); 21: f. 16; f. 24 (as *C. setosa*); Contr. U. S. Nat. Herb. 22: 204, f. 60; 205, f. 61.

NOTE: The species is somewhat variable in habit and includes what Scribner and Merrill (Bull. U. S. Dep. Agr. Agrost. 21: 27, f. 15. 1900) and Hitchcock (Contr. U. S. Nat. Herb. 17: 263. 1913) referred to *Chaetochloa composita*. The typical form is rather robust with flat blades 5-10 mm. wide, and large panicles 15-25 cm. long, the branches ascending, about 1 cm. long, or even as much as 2 cm. The commoner form of Texas and northern Mexico is less robust, the blades narrower, 3-4 mm. wide, often folded, the panicles more compactly flowered and spike-like. There are so many intermediate specimens that it seems impracticable to draw specific lines between the forms.

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

Setaria polystachya Scheele, Linnaea 22: 339. 1849. Not *S. polystachya* Schrad. 1824.
Panicum Scheelei Steud. Syn. Gram. 51. 1854.
Chaetochloa polystachya Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 37. 1900.
Chaetochloa Scheelei Hitchc. Contr. U. S. Nat. Herb. 22: 207. 1920.

Plants perennial; stems 60–120 cm. tall, erect or geniculate at base, compressed below, glabrous, the nodes often appressed-pilose; leaf-sheaths compressed-keeled, glabrous, or scabrous near summit or on the keel, or sometimes more or less hispid on the surface, the collar hispid; ligule densely hispid, 1–2 mm. long; blades flat, scabrous or more or less pubescent, 15–25 cm. long, as much as 1.5 cm. wide; panicle rather loose, 15–20 cm. long, tapering from near the base, the lower branches as much as 3 cm. long, ascending, the axis scabrous-pubescent and rather sparsely villous; bristles mostly 1–1.5 cm. long, rather numerous, flexuous, antrorsely scabrous; spikelets a little more than 2 mm. long, pale; first glume about one third as long as the spikelet, 3-nerved; second glume a little shorter than the fertile lemma, 5-nerved; sterile lemma as long as the fertile, 5-nerved, the palea small and narrow; fertile lemma finely cross-wrinkled.

TYPE LOCALITY: New Braunfels, Texas.

DISTRIBUTION: Texas; Vera Cruz.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 21: f. 22; Contr. U. S. Nat. Herb. 22: 208. f. 62.

NOTE: This species is allied to *S. macrostachya*, from which it differs in the looser panicle with longer ascending lower branches. The broad flat blades distinguish it from the common form of *S. macrostachya* in Texas.

DOUBTFUL SPECIES

Setaria falcifolia Fourn. Mex. Pl. Gram. 44. 1886. "Absque loco (Jurg. n. 622)."

70. *IXOPHORUS* Schlecht. Linnaea 31: 420. 1862.

A perennial grass with flat leaf-blades and an inflorescence composed of numerous secund spikes racemose along a main axis. Spikelets oblong-lanceolate, nearly terete, nearly sessile, each subtended by a slender flexuous bristle (sterile branchlet) longer than the spikelet. Glumes membranaceous, the first short, the second about as long as the spikelet. Sterile lemma similar to the second glume, staminate, the palea well-developed, as long as the lemma, finally becoming broad and papery. Fertile floret chartaceous, flattened dorsally, shorter than the lemma and palea, apiculate.

Type species, *Urochloa unisetata* Presl.

1. *Ixophorus unisetus* (Presl) Schlecht. Linnaea 31: 421,
747. 1862.

Urochloa unisetata Presl, Rel. Haenk. 1: 319. 1830.
Panicum unisetum Trin. Mém. Acad. St.-Petersb. VI. 3: 217. 1834.
Ixophorus Schiedeana Schlecht. Linnaea 31: 421. 1862.
Setaria unisetata Fourn.; Hemsl. Biol. Centr. Am. Bot. 3: 506. 1885.
Setaria Schiedeana Fourn.; Hemsl. Biol. Centr. Am. Bot. 3: 505. 1885.
Setaria cirrhosa Fourn. Mex. Pl. Gram. 43. 1886.
Panicum Palmeri Vasey, Contr. U. S. Nat. Herb. 1: 281. 1893.
Panicum Pringlei Vasey, Contr. U. S. Nat. Herb. 1: 363. 1895.
Ixophorus Pringlei Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 6. 1897.
Ixophorus Pringlei minor Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 7. 1897.
Panicum cirrhosum Scribn. & Merr. Bull. U. S. Dep. Agr. Agrost. 21: 40. 1900.
Setaria polyneura W. Herrm. Beitr. Biol. Pfl. 10: 42. 1910.

Plants smooth, rather succulent, branching below, often pale or glaucous; stems erect or geniculate at base, as much as 1 meter tall, often low or depauperate; leaf-sheaths more or less compressed-keeled, the margin glabrous; ligule a thin lacinate membrane 1–2 mm. long; blades linear or linear-elliptic, acuminate, as much as 60 cm. long and 4 cm. wide, usually about 2 cm. wide, in depauperate specimens only 3 cm. long and 4 mm. wide, the margins scabrous; panicle oblong, as much as 20 cm. long, the axis angled, scabrous; racemes or spikes few to many, ascending or sometimes spreading, irregularly arranged, approximate above,

distant below, often falcate, as much as 10 cm. long, usually about 5 cm., as many as 50 or in depauperate specimens only 2 or 3, the rachis angled, scabrous, floriferous nearly to base; spikelets secund in about 2 rows, 4-5 mm. long, about 1 mm. wide, nearly terete, acuminate, pectinate, closely approximate, or somewhat distant below, ascending, nearly sessile, the single bristle flexuous, smooth or nearly so, usually purplish, viscid, 1-2 times as long as the spikelet; first glume broad and short, truncate or acutish, 0.5-1 mm. long, 3-nerved, rarely scaberulous; second glume about as long as the spikelet or a little shorter, obtuse, weakly several-nerved; sterile lemma appearing acute from the inrolling of the margin above, 5-nerved, often scaberulous on the nerves, the palea as long as the lemma, the margins thin and wide, overlapping and inclosing the 3 large anthers, at maturity widening and more or less clasping the lemma, becoming prominent and papery; fertile lemma dorsally compressed, oblong-elliptic, pale, about 2.5 mm. long, 1 mm. wide, apiculate, minutely scaberulous-punctate, 5-nerved, the outer pair of nerves on the edge, the margin inrolled over the palea below, the palea free above.

TYPE LOCALITY: Mexico.

DISTRIBUTION: San Luis Potosí to Costa Rica.

ILLUSTRATION: Bull. U. S. Dep. Agr. Agrost. 4: pl. I, 11.

71. PENNISETUM Rich. in Pers. Syn. Pl. 1: 72. 1805.

Penicillaria Willd. Enum. 1036. 1809.

Gymnothrix Beauv. Agrost. 59. pl. 13, f. 6. 1812.

Annual or perennial, often branched grasses, with usually flat blades and dense spike-like panicles. Spikelets solitary or in groups of two or three, surrounded by an involucre of bristles, these not united or only at the very base, often plumose, falling attached to the spikelets; first glume shorter than the spikelet, sometimes minute or wanting; second glume shorter than or equaling the sterile lemma; fertile lemma chartaceous, smooth, the margin thin, inclosing the palea.

Type species, *Pennisetum typhoideum* Rich.

Bristles of the fascicle about 4 cm. long; panicles oval, feathery.

Bristles of the fascicle not more than 2 cm. long, most of them much shorter; panicles cylindrical.

Grain at maturity subglobose, bursting through the lemma and palea; panicles solidly dense, 2 cm. or more thick.

Grain permanently inclosed in the lemma and palea; panicles not solid, less than 2 cm. thick.

Fascicles, or most of them, with 2 or more spikelets (often but 1 in depauperate specimens of no. 2).

Bristles free throughout.

Fascicles sessile.

Fascicles pedunculate.

Bristles united at the base into a minute disk.

Stems slender, rarely more than 50 cm. tall; inner bristles conspicuously plumose.

Stems stout, mostly 1-1.5 meters tall; innermost bristles only ciliate or plumose.

Innermost bristles not more than 2.5 cm. long, sparsely ciliate.

Innermost bristles, or some of them, 4-5 cm. long, plumose at base.

Fascicles with but one spikelet.

Bristles conspicuously plumose.

Bristles not plumose.

Panicles terminal on the primary stem and leafy branches only.

Blades flat or involute-pointed only, 10 cm. or more long.

Spikelets 2-2.5 mm. long; axis about 0.5 mm. thick.

Spikelets 4.5 mm. or more long; axis 1-3 mm. thick.

Panicles dense, the spikelets obscured in the bristles.

Bristles scant, most of them scarcely exceeding the spikelets or shorter, one conspicuously longer than the rest.

1. *P. villosum*.

2. *P. glaucum*.

3. *P. purpureum*.

4. *P. orientale triflorum*.

5. *P. ciliare*.

6. *P. Karwinskyi*.

7. *P. vulcanicum*.

8. *P. setosum*.

9. *P. Antillarum*.

10. *P. crinitum*.

- Bristles numerous, most of them much longer than the spikelet, one not conspicuously longer than the rest.
- Panicles relatively loose, the spikelets not obscured in the bristles.
- Blades involute, not more than 5 cm. long.
- Panicles terminal and axillary, the latter on slender naked peduncles, 1 to several from a sheath.
- Blades elongate, rarely more than 12 mm. wide, tapering into a long setaceous-involute tip; spikelets 6-7 mm. long, the bristles mostly shorter.
- Blades 15-40 mm. wide, if narrower not elongate, not setaceous-tipped; spikelets 4.5-6 mm. long, some of the bristles always longer.
- Sterile lemma empty; panicles rather densely flowered; most of the bristles not more than once and a half the length of the spikelets.
- Panicles dull-green; bristles scant, most of them not exceeding the spikelet, the innermost about twice as long.
- Panicles tawny; bristles numerous, most of them exceeding the spikelet, the innermost not conspicuously longer than the others.
- Sterile lemma inclosing a well-developed palea and usually a staminate flower; panicles loosely flowered; most of the bristles about twice the length of the spikelet.
11. *P. nervosum*.
12. *P. complanatum*.
13. *P. domingense*.
14. *P. durum*.
15. *P. distachyum*.
16. *P. prolificum*.
17. *P. bambusiforme*.

1. *Pennisetum villosum* R. Br.; Fresen. Mus. Senckenb. 2: 134. 1837.

Pennisetum villosum humile Hochst.; A. Rich. Tent. Fl. Abyss. 2: 387. 1852.
Cenchrus villosus Kuntze, Rev. Gen. 3: 347. 1898.

Plants rather pale, perennial, at length forming dense clumps from a knotty crown; stems ascending, 15-50 cm. tall, rarely 1 meter or more tall, commonly branching from the lower nodes, mostly flattened or angled in drying, the uppermost joint villous at least below the inflorescence, otherwise glabrous; leaf-sheaths loose, mostly overlapping, pilose along the scarious margin and at the summit or glabrous; ligule a ring of fine hairs 1.5-2 mm. long; blades ascending or spreading, 3-6 mm. wide, mostly elongate, the upper often exceeding the inflorescence but in dwarf plants sometimes only 8-10 cm. long, flat or folded, sparsely pilose on the upper surface or glabrous, the margins and sometimes the under surface scabrous; panicle grayish-tawny, very dense, oval, 3-15 cm. long, 3-5 cm. wide including the bristles; fascicles short-pedicelled, with a tuft of white hairs at the base of the pedicel; spikelets 8-10 mm. long; first glume about 1 mm. long, truncate, denticulate, scarcely nerved; second glume ovate-lanceolate, acuminate, half as long as the spikelet; sterile floret staminate, lemma about as long as the fertile, acuminate, several-nerved, scaberulous, the palea nearly as long as the lemma; fertile floret similar to the sterile, somewhat firmer.

TYPE LOCALITY: Abyssinia.

DISTRIBUTION: North Africa and Arabia; cultivated for ornament in North America, and occasionally escaped.

ILLUSTRATIONS: Stand. Cycl. Hort. f. 2857; Contr. U. S. Nat. Herb. 22: f. 63.

2. *Pennisetum glaucum* (L.) R. Br. Prodr. 195. 1810.

Panicum glaucum L. Sp. Pl. 56. 1753.
Holcus spicatus L. Syst. Nat. ed. 10. 1305. 1759.
Pennisetum typhoideum Rich. in Pers. Syn. Pl. 1: 72. 1805.
Penicillaria spicata Willd. Enum. 1037. 1809.
Pennisetum spicatum R. & S. Syst. Veg. 2: 499, as synonym. 1817.
Penicillaria Plukenetii Link, Hort. Berol. 1: 221. 1827.
Cenchrus spicatus Kuntze, Rev. Gen. 3: 346. 1898.

Plants annual, branching at the base, robust, as much as 2 meters tall; stems simple, or rarely branching, densely villous below the panicle, often minutely so below the nodes, otherwise glabrous, the nodes usually appressed-pubescent; leaf-sheaths loose, mostly overlapping, commonly scabrous and usually densely hairy on the margins toward the summit and on the collar; ligule densely hairy, about 3 mm. long; blades flat, rather thin, cordate at base, sometimes as much as 5 cm. wide and 1 meter long, scabrous on both surfaces, the midnerve

prominent; panicles cylindrical, stiff, very dense, as much as 50 cm. long and 2-2.5 cm. thick, pale tawny tinged with purple, the stout axis densely villous; fascicles on densely villous peduncles about 3 mm. long; bristles numerous, as long as the spikelets or longer, scabrous, the inner one ciliate; spikelets 1-2, short-pedicelled, oval, about 3 mm. long; first glume short or sometimes wanting, obtuse, ciliate, nerveless; second glume similar to the first but usually longer; sterile lemma similar to the glumes but a little longer; fertile floret firm, oval, longer than the sterile, the lemma nerveless below, 5-nerved above, densely ciliate, the palea about as large and broad as the lemma, ciliate, villous on the back; caryopsis spreading apart the lemma and palea, finally often becoming much larger than these.

TYPE LOCALITY: Ceylon.

DISTRIBUTION: The warmer parts of the Eastern Hemisphere; occasionally cultivated in the United States and sometimes found as an escape. Known in the United States as pearl millet.

ILLUSTRATIONS: E. & P. Nat. Pl. 2: f. 32; Hitchc. Text-book Grasses f. 26; Zeits. Naturw. 79: pl. 3; Bull. U. S. Dept. Agr. 772: f. 149; Contr. U. S. Nat. Herb. 22: f. 66.

NOTE: *Pennisetum americanum* K. Schumann, based on *Panicum americanum* L., has been used for this species, but the Linnaean name is based on two unidentifiable figures.

3. *Pennisetum purpureum* Schum.; Schum. & Thonn. Beskr. Guin. Pl. 64. 1827.

Plants perennial in very large clumps; stems suberect, often decumbent at base, 2-2.5 meters tall, robust, glaucous, sparingly branching, densely pubescent below the panicle and sometimes below the nodes, the nodes glabrous or those of the branches appressed-hirsute; leaves numerous; leaf-sheaths often pubescent on the collar, otherwise glabrous; ligule stiffly ciliate, 2-2.5 mm. long; blades flat, with a thick midrib, 10-15 mm. wide, elongate, tuberculate-pilose on the upper surface toward the base, scabrous to smooth beneath, the margin scabrous; panicles on the main stems 15-25 cm. long, those of the branches smaller, 12-15 mm. thick, bronze to purplish, rather dense, the axis terete, densely pubescent; fascicles sessile, ascending to spreading; bristles several, scabrous, or the inner ciliate, 5-10 mm. long, one commonly 12-15 mm. long; spikelets 2-5 (rarely 1), one sessile, the others pedicellate, lanceolate-acuminate, 4-5 mm. long; first glume wanting; second glume from minute to one third as long as the spikelet; sterile lemma half to two thirds as long as the fertile lemma, its palea sometimes developed; fertile lemma subindurate at base, with an attenuate-nerved tip.

TYPE LOCALITY: Guinea.

DISTRIBUTION: Equatorial Africa; cultivated for forage in Central America, the West Indies, and Brazil; occasionally escaped.

4. *Pennisetum orientale triflorum* (Nees) Stapf; Hook. f. Fl. Brit. Ind. 7: 86. 1896.

Pennisetum triflorum Nees; Steud. Syn. Gram. 107. 1854.

Plants perennial, forming tough clumps from knotty crowns; stems erect from an ascending base, usually 1 meter or more tall, rather robust, simple or sparingly branching, pubescent or scabrous below the panicle, otherwise glabrous, the nodes appressed-pubescent; leaves numerous; leaf-sheaths loose, mostly overlapping, ciliate on the margin, otherwise glabrous; ligule lacerate-ciliate, scarcely 1 mm. long; blades flat, lax, 5-10 mm. wide, elongate, sparsely hispid on the upper surface, scabrous beneath and sometimes with a few scattered hairs; panicles 12-20 cm. long, about 15-20 mm. thick, loose, at least toward the base, the axis angled, densely pubescent; fascicles pedicellate, spreading or reflexed; bristles several, plumose except the upper third, 10-15 mm. long, one as much as 2 cm. long; spikelets 3-5, lanceolate-acuminate, about 6 mm. long, scaberulous; glumes acuminate, weakly nerved, the first less than half as long, the second nearly as long as the spikelet; sterile floret staminate, the lemma acuminate, 3-nerved, as long as the fertile, the palea about as long; fertile lemma 5-nerved, scarcely firmer than the sterile lemma.

TYPE LOCALITY: Nepal.

DISTRIBUTION: India; introduced in Jamaica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 64.

5. *Pennisetum ciliare* (L.) Link, Hort. Berol. 1: 213. 1827.*Cenchrus ciliaris* L. Mant. 302. 1771.*Pennisetum cenchroides* Rich. in Pers. Syn. Pl. 1: 72. 1805.*Panicum vulpinum* Willd. Enum. Hort. Berol. 1031. 1809. Not *P. vulpinum* L. 1759.

Plants perennial, tufted from a knotty crown; stems geniculate, slender, 1-50 cm. tall, sometimes taller, sparingly branching, scabrous at least on the uppermost joint; leaf-sheaths minutely scabrous and usually pilose along the margin; ligule ciliate, about 1 mm. long, sometimes minute; blades flat, 3-5 mm. wide, 2-10 cm. long (longer in plants in moist situations), scabrous on the upper surface and long-pilose toward the base, glabrous or nearly so beneath; panicle 2-10 cm. long, the axis angled; fascicles nearly sessile, the outer bristles slender, scabrous, 1-3 mm. long, the inner plumose and flattened below, 5-8 mm. long; spikelets 1-3, lanceolate, glabrous, about 5 mm. long, the nerves green; first glume ovate-lanceolate, 1-nerved, 2 mm. long; second glume 3-nerved, 3 mm. long; sterile lemma 5-nerved, as long as the fertile floret, the palea about as long; fertile floret only a little firmer than the sterile, the lemma 5-nerved.

TYPE LOCALITY: Cape of Good Hope.

DISTRIBUTION: India to Africa; introduced in Porto Rico and Guatemala.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 65.

6. *Pennisetum Karwinskyi* Schrad. Linnaea 12: 431. 1838.*Cenchrus multiflorus* Presl, Rel. Haenk. 1: 318. 1830.*Pennisetum multiflorum* Fourn. Mex. Pl. Gram. 49. 1886. (This name is not based on *Cenchrus multiflorus* Presl.)

Plants perennial, in loose clumps from hard knotted crowns, the stems produced from hard scaly bulb-like buds which burst through the basal and underground sheaths; stems erect, simple or with leafy shoots from the lower nodes, mostly 1-1.5 meters, rarely only about 0.5 meter tall, very scabrous below the panicle, otherwise glabrous, the lower internodes compressed; leaf-sheaths keeled, mostly overlapping, pilose along the margin at least toward the summit, sometimes sparsely papillose-pilose, or rarely the lower densely pilose, throughout; ligule 1.5-2 mm. long, membranaceous-ciliate; blades usually rather firm, ascending or spreading, flat, 10-40 cm. long, 5-15 mm. wide, broadest at the base, tapering to a long-attenuate very scabrous, usually involute tip, the upper surface scabrous and usually sparsely papillose-pilose, rarely densely so, sometimes scabrous only, the lower surface usually scabrous, sometimes smooth, the margins very scabrous; panicle 5-17 cm. long, mostly 10-12 mm. wide, excluding the elongate bristles, tawny or purplish or sometimes greenish, mostly dense except at the base, but sometimes the fascicles rather loosely arranged, the axis strongly angled, pubescent; fascicles on a short thick densely pubescent pedicel; outer bristles slender, 1-3 mm. long, scabrous, the inner firm, thickened at base, 5-7 mm. long, often one of them 2 or 3 times as long as the others, some of the inner plumose; spikelets about 3, lanceolate, 5-6 mm. long, scaberulous; first glume about half as long as the spikelet, 1-nerved; second glume about two thirds as long as the spikelet; 5-nerved; sterile and fertile florets similar, 5-nerved, the sterile floret staminate, the palea nearly as long as the lemma, the fertile floret firmer and more faintly nerved.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico to Costa Rica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 67.

7. *Pennisetum vulcanicum* Chase, Jour. Wash. Acad. 13:

363. 1923.

Plants perennial, about 1 meter tall; stems suberect, terete and scabrous below the panicle, otherwise compressed and glabrous, branching from the lower nodes; nodes glabrous; leaves numerous, the sheaths overlapping, keeled, villous along the margin and on the sides of the collar, otherwise glabrous or very sparsely pilose; ligule densely ciliate, about 1 mm. long; blades flat or drying folded, with a prominent midnerve, 20-45 cm. long, 5-8 mm. wide, with a long scabrous tip, scabrous and papillose-pubescent or papillose only on the upper surface, glabrous beneath; panicle slightly flexuous, 10-17 cm. long, 18-20 mm. wide, excluding the

longest bristles, tawny or purplish tinged, rather dense except at the base, the axis pilose on the angles; fascicles on hairy peduncles 1-1.5 mm. long, finally spreading or reflexed; bristles numerous, scabrous, united at the very base, very unequal, the outermost short, slender, scabrous only, the inner 1-1.5 cm. long, flattened, flexuous, plumose about half their length, the innermost one stouter, 2-5 cm. long, plumose at base, unequal in fascicles of the same panicle, the longer in the middle fascicles; spikelets 3-5 in each fascicle (only 1 or 2 well developed), sessile, 6-9 mm. long, about 1.4 mm. wide, attenuate, scaberulous; glumes attenuate, 3-5-nerved, the first one fourth to one third, the second two thirds to three fourths as long as the spikelet; sterile lemma nearly as long as the fertile, finely many-nerved, inclosing a palea of nearly equal length and a staminate flower; fertile lemma subindurate, 5-nerved, the apex attenuate and spreading.

TYPE LOCALITY: Salvador.

DISTRIBUTION: Salvador and Costa Rica.

8. *Pennisetum setosum* (Sw.) Rich. in Pers. Syn. Pl. 1: 72. 1805.

Cenchrus setosus Sw. Prodr. 26. 1788.

Panicum cenchrroides Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Panicum erubescens Willd. Enum. Hort. Berol. 1031. 1809.

Pennisetum purpurascens H.B.K. Nov. Gen. & Sp. 1: 113. 1815.

Pennisetum uniflorum H.B.K. Nov. Gen. & Sp. 1: 114. 1815.

Panicum densispica Poir. in Lam. Encyc. Suppl. 4: 273. 1816.

Panicum triticoides Poir. in Lam. Encyc. Suppl. 4: 274. 1816.

Setaria cenchrroides R. & S. Syst. Veg. 2: 495. 1817.

Pennisetum triticoides R. & S. Syst. Veg. 2: 877. 1817.

Gymnothrix geniculata Schultes, in R. & S. Syst. Veg. Mant. 2: 284. 1824.

Setaria geniculata Sieber; Schultes, in R. & S. Syst. Veg. Mant. 2: 284, as synonym. 1824.

Pennisetum alopecuroides Desv.; Hamilt. Prodr. 11. 1825.

Pennisetum erubescens Desv.; Hamilt. Prodr. 11. 1825.

Pennisetum Richardi Kunth, Rév. Gram. 49. 1829.

Pennisetum hirsutum Nees, Agrost. Bras. 284. 1829.

Pennisetum pallidum Nees, Agrost. Bras. 285. 1829.

Pennisetum flavescens Presl, Rel. Haenk. 1: 316. 1830.

Pennisetum dasistachyum Desv. Opusc. 76. 1831.

Pennisetum Hamiltonii Steud. Nom. Bot. ed. 2. 2: 297. 1841.

Pennisetum Sieberi Kunth; Steud. Syn. Gram. 109. 1854.

Pennisetum nicaraguense Fourn. Bull. Soc. Bot. Fr. 27: 293. 1881.

Pennisetum indicum var. *purpurascens* Kuntze, Rev. Gen. 787. 1891.

Plants perennial, in loose clumps, sometimes 30 or more stems in a clump; stems usually 1-2 meters tall, slender to robust, subcompressed, ascending or suberect from the more or less geniculate, sometimes rooting lower nodes, bearing 1 to several flowering branches from the lower and middle nodes, scabrous below the panicle, otherwise glabrous; leaf-sheaths loose, from glabrous to rather densely papillose-hirsute, usually sparsely hirsute along the margin toward the summit, otherwise glabrous; ligule membranaceous-ciliate, 2-3 mm. long; blades mostly rather firm, ascending or spreading, 10-40 cm. long, 4-18 mm. wide, tapering toward the base (or the reduced upper blades widest at base), acuminate into a long slender very scabrous tip, from scabrous on both surfaces (or rarely glabrous beneath) to rather densely papillose-hirsute on both surfaces, more commonly scabrous beneath and sparsely papillose-hirsute above, always stiffly hairy back of the ligule; panicles terminating the primary stem and branches, occasionally one or two axillary panicles borne in the upper sheaths, 10-25 cm. long, 8-10 mm. in diameter, excluding the elongate bristles, usually somewhat nodding, rather dense, from pale-yellow to dusky-purple, the common axis slender and scabrous; fascicles on a very short pubescent base, spreading or reflexed in age; bristles numerous, the outer slender and scabrous, the inner stouter, densely silky-plumose below, irregular in length, 3-6 mm. long, one longer, sometimes as much as 2 cm. long; spikelets solitary, sessile, about 3 mm. long, scaberulous; first glume oblong, obtuse or acute, nerveless or 1-nerved, less than half as long as the spikelet; second glume nearly as long as the spikelet, obtuse or acute, 5-7-nerved; sterile floret staminate, the lemma acute, 5-nerved, the palea nearly as long; fertile floret firm, smooth, minutely ciliate-fringed at the tip.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Tropical America.

ILLUSTRATIONS: Kunth, Rév. Gram. *pl.* 39; Trin. Ic. *pl.* 20; Bull. U. S. Dep. Agr. Agrost. 20: *f.* 27; Bull. U. S. Dep. Agr. 772: *f.* 150; Contr. U. S. Nat. Herb. 22: *f.* 68.

9. *Pennisetum Antillarum* (Poir.) Desv. *Opusc.* 76. 1831.

Panicum Antillarum Poir. in Lam. *Encyc. Suppl.* 4: 275. 1816.

Saccharum ? *Antillarum* R. & S. *Syst. Veg.* 2: 877. 1817.

Setaria Antillarum Kunth, *Rév. Gram.* 46. 1829.

Plants probably perennial; stems erect, slender, terete, branching, scabrous below the panicle, otherwise glabrous; leaf-sheaths pilose, ciliate at the throat; blades narrowly linear, acuminate, pilose on the upper surface at least toward the base, glabrous beneath; panicle 8-15 cm. long, very slender, acuminate; rather dense, the slender axis minutely scabrous; fascicles approximate, spreading or somewhat reflexed; bristles few, scabrous, the longer about as long as the spikelet, one about twice as long; spikelets 2-2.5 mm. long; first glume small or wanting; second glume broad, thin, as long as the spikelet, broad and more or less 3-toothed at summit, 5-nerved; sterile lemma a little shorter than the second glume, somewhat erose or 3-toothed at summit, 5-nerved; fertile floret glabrous, terete or fusiform, a little shorter than the second glume and sterile lemma, the apex minutely ciliate-fimbriate.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Only known from the type specimen.

ILLUSTRATION: *Contr. U. S. Nat. Herb.* 22: f. 69.

10. *Pennisetum crinitum* (H.B.K.) Spreng. *Syst. Veg.* 1: 302. 1825.

Gymnothrix crinita H.B.K. *Nov. Gen. & Sp.* 1: 112. 1815.

Pennisetum Humboldtianum Hemsl. *Biol. Centr. Am. Bot.* 3: 508. 1885.

Plants perennial, glabrous as a whole; stems solitary or few together, erect from a curved or slightly geniculate base, robust, usually 2 meters or more tall, commonly bearing leafy flowering branches from all but the lower nodes, these often bearing sterile branches, the internodes conspicuously channeled on the side toward the sheath, the lower mostly compressed, relatively short, the upper elongate; leaf-sheaths much shorter than the internodes, rather loose; ligule stiffly ciliate, about 0.5 mm. long; blades erect or ascending, rather thick, flat, those of the main culm 20-40 cm. long, 8-18 mm. wide, broadest at the base, those of the branches smaller; primary panicles usually rather short-exserted, mostly stiffly erect, 12-25 cm. long, about 10 mm. thick, excluding the longer bristles, dense or sometimes loose at the base, stramineous or tawny or sometimes with pale bristles and greenish-purple spikelets, the axis ridged, scabrous, toward the base often 2 mm. thick, the panicles of the branches commonly partly included, shorter, more slender, less densely flowered; fascicles nearly sessile; bristles few, scabrous, not plumose, irregular in length, 3-10 mm. long, the innermost stouter, 1.2-20 mm. long; spikelet solitary, sessile, 5-6 mm. long, scaberulous toward tip; first glume obtuse, half as long as spikelet, 1-nerved; second glume nearly as long as spikelet, 5-nerved; sterile lemma acuminate, about as long as the fertile, 5-nerved, fertile lemma acuminate, firm, obscurely 5-nerved, minutely scaberulous.

TYPE LOCALITY: Michoacán, Mexico.

DISTRIBUTION: Southern Mexico.

ILLUSTRATION: *Contr. U. S. Nat. Herb.* 22: f. 70.

11. *Pennisetum nervosum* Trin. *Mém. Acad. St.-Pétersb.* VI. 3^e: 177. 1834.

Gymnothrix nervosa Nees, *Agrost. Bras.* 277. 1829.

Plants perennial, in large clumps; stems erect from a branching geniculate base, robust, 1.5-3 meters tall, compressed, glabrous, sparingly branching; leaves numerous, the leaf-sheaths commonly purplish, loose, glabrous; ligule stiffly ciliate, less than 1 mm. long; blades firm, flat or folded, those of the main culm 15-40 cm. long, 8-15 mm. wide, the upper sometimes reflexed, the upper surface and margin scabrous; panicles mostly short-exserted, 15-30 cm. long, 12-15 mm. thick, dense, tawny to purplish-tinged, flexuous or with an S-shaped bend in the middle, the slender scabrous axis readily breaking; fascicles sessile; bristles numerous, slender, scabrous, 4-12 mm. long, one not conspicuously longer than the rest; spikelet solitary, sessile, 5-6 mm. long, acuminate, strongly nerved; first glume about one fourth the

length of the spikelet; second glume and sterile lemma subequal, attenuate, strongly nerved, scaberulous; fertile lemma slightly shorter, subindurate, attenuate.

TYPE LOCALITY: Bahia, Brazil.

DISTRIBUTION: Southern Texas (Brownsville); Brazil and Ecuador to Argentina.

12. *Pennisetum complanatum* (Nees) Hemsl. Biol. Centr. Am.

Bot. 3: 507. 1885.

Gymnolthrix complanata Nees, Bonplandia 3: 83. 1855.

Gymnolthrix mexicana Fourn. Mex. Pl. Gram. 48. 1886.

Gymnolthrix Grisebachiana Fourn. Mex. Pl. Gram. 48. 1886.

Pennisetum mexicanum Hemsl.; B. D. Jackson, Ind. Kew. 2: 458. 1894.

Plants perennial; stems solitary or few together, erect or ascending from a strong rhizome, scabrous below the panicle, otherwise glabrous; simple or, more commonly, with one or two, rarely with several, flowering branches, the lower nodes sometimes geniculate, the internodes terete (or the lower slightly compressed) slightly or not at all channeled, not elongate and naked; leaf-sheaths loose, commonly as long as the internodes or longer, pilose on the margin at the summit, sometimes pubescent on the collar; ligule ciliate, about 2 mm. long; blades thinner than in *P. crinitum*, mostly somewhat spreading, flat, or folded at base, 20–55 cm. long, 5–8, rarely 10 mm. wide, glabrous beneath, very scabrous on the upper surface, often papillose-pilose toward the base, and with stiff hairs just back of the ligule, attenuate into an elongate involute-setaceous tip; panicles nodding or somewhat flexuous, 7–16 cm. long, about 10–12 mm. thick, excluding the longest bristles, with tawny or purplish bristles and pale spikelets, the slender axis ridged and scabrous; fascicles on a very short pubescent base; bristles several, scabrous but not plumose, mostly 10–15 mm. long, one as much as 2 cm. long; spikelets solitary, sessile, ovate-lanceolate, 5–6 mm. long, minutely pubescent above; first glume triangular, 1-nerved, about one fourth as long as the spikelet; second glume a little shorter than the spikelet, acuminate or subulate-pointed, 5-nerved; sterile lemma as long as the fertile, 7-nerved, acuminate, the stamens wanting, the palea 2-toothed, nearly as long as the lemma; fertile lemma acuminate, scaberulous, weakly 5-nerved, the palea free at the tip.

TYPE LOCALITY: Panama.

DISTRIBUTION: Southern Mexico to Panama.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 71.

13. *Pennisetum domingense* Spreng. Syst. 1: 302. 1825.

Gymnolthrix domingensis Spreng.; Schultes, in R. & S. Syst. Veg. Mant. 2: 284. 1824.

Plants perennial; stems tall, wiry, glabrous, branched, the branches solitary or fasciated, the internodes elongate, rigid; leaf-sheaths glabrous, striate, more or less inflated; ligule very short, ciliate; blades rigid, involute, spreading, glabrous, subulate-pointed, 1–5 cm. long, readily falling from the sheath; panicles 3–6 cm. long, erect, the rachis angled, scabrous; fascicles rather few, subsessile; bristles numerous, flexuous, scabrous, 5–10 mm. long, one about twice as long; spikelets 4–4.5 mm. long; first glume ovate, acute, about one third as long as the spikelet; second glume oblong-ovate, acute, about twice as long as the first, 5-nerved; sterile lemma as long as the spikelet, weakly 5-nerved, concave on the back, somewhat mucronate, the palea about as long as the lemma, inclosing stamens; fertile lemma firm, brownish, mucronate, somewhat scaberulous.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Cuba and Santo Domingo.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 72.

14. *Pennisetum durum* Beal, Grasses N. Am. 2: 163. 1896.

Pennisetum crinitum Scribn.; Beal, Grasses N. Am. 2: 163. 1896. Not *P. crinitum* Spreng. 1825.

Pennisetum Pringlei Leeke, Zeits. Naturw. 79: 33. 1907.

Plants perennial; stems erect, glabrous, sometimes glaucous, 1–2 meters tall, branched above, the few branches appressed, the nodes glabrous or puberulent; leaf-sheaths glabrous or scaberulous; ligule densely ciliate, about 1.5–2 mm. long; blades flat, linear, gradually narrowed

into a slender point, as much as 60 cm. long, 5-15 mm. wide, scabrous or pubescent; panicles terminal and 1-4 from the upper sheaths, on rather slender scabrous peduncles, nodding, 3-10 cm. long, 1 cm. wide, densely flowered, pale-greenish, the axis angled, scabrous; bristles several, most of them shorter than the spikelets, the innermost sometimes twice as long as the spikelet; spikelets 6-7 mm. long, acuminate; first glume obtusish, about one fourth as long as spikelet, nerveless, ciliolate; second glume about half as long as spikelet, obtusish, ciliolate, sometimes scaberulous, 3-5-nerved; sterile lemma acuminate, as long as spikelet, scaberulous, 5-nerved, concave on the back; fertile lemma acuminate, firm, scaberulous, especially at tip.

TYPE LOCALITY: State of Chihuahua, Mexico.

DISTRIBUTION: Chihuahua to Oaxaca.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 73.

15. *Pennisetum distachyum* (Fourn.) Rupr.; Fourn. Mex. Pl.
Gram. 48. 1886.

Gymnothrix distachya Fourn. Mex. Pl. Gram. 48. 1886.

Plants perennial; stems 1-4 meters tall, robust, glabrous or scabrous below the nodes, branching from the middle and upper nodes, the primary branches ascending, the secondary and ultimate branchlets slender and spreading or nodding with 1-4 slender-peduncled drooping panicles from each sheath, the whole forming a top-heavy, leafy compound inflorescence; nodes appressed-hirsute; leaf-sheaths loose, hirsute along the margin and at the summit or glabrate; ligule 2-3 mm. long; blades flat, mostly spreading, appressed-hirsute on both surfaces or glabrate beneath and sometimes nearly so above, those of the main culm 25-45 cm. long, 1.5-3.5 cm. wide, narrowed or attenuate at base, the apex acuminate; panicles numerous, dull green, the slender, flexuous, scabrous peduncles unequal, the longest often as much as 15-20 cm. long, one of the cluster of panicles usually partly included, the panicles rather densely flowered, 3-8 cm., rarely 10 cm. long, about 1 cm. wide, excluding the longest bristles, usually tapering to the apex, the axis slender, angled, scabrous; bristles slender, scant (mostly less than 20) unequal, most of them shorter than the spikelet, or but little exceeding it, the innermost about twice as long as the spikelet; spikelets 4.5-5.5 mm. long, 1-1.2 mm. wide, acuminate; glumes unequal, obscurely ciliolate, the first minute, 1-nerved, acute or obtuse, the second about one third to nearly half the length of the spikelet, 3-nerved, acute or subacute; sterile lemma slightly exceeding the fertile lemma, 5-nerved, depressed down the middle, scabrous especially toward the summit, acuminate, the palea wanting; fertile lemma acuminate, but little indurate, 5-nerved and scabrous toward the summit.

TYPE LOCALITY: State of Vera Cruz, Mexico.

DISTRIBUTION: Southern Mexico to Costa Rica.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 74.

16. *Pennisetum prolificum* Chase, Contr. U. S. Nat. Herb. 22:
231. 1921.

Plants perennial; resembling *P. distachyum*, branching from the upper nodes, the branches often in fascicles of 2 to several, relatively slender, repeatedly fasciculately branching, the ultimate branchlets very slender, nodding, their nodes often strongly geniculate, the very numerous panicles 2-5 together on very slender flexuous usually glabrous peduncles, mostly 2-10 cm. long, the terminal panicle often solitary, the whole system of branches forming a great drooping, leafy compound inflorescence often 1 meter or more long and probably nearly as wide; nodes glabrous or strigose; leaf-sheaths loose, glabrous or ciliate on the margin above, sometimes with a few long soft hairs at the summit; ligule about 2 mm. long; blades on the average a little shorter and broader than those of *P. distachyum*, narrowed but not long-attenuate at base, glabrous on both surfaces or slightly scabrous above; panicles tawny, 3-5 cm. long, about 1 cm. wide, denser than in *P. distachyum*, slightly tapering or obtuse at the apex; bristles slender, numerous, more spreading than in *P. distachyum*, most of them exceeding the spikelet, the innermost not conspicuously longer than the rest; spikelet similar to that of *P. distachyum*, but minutely scabrous only or glabrous, the glumes thinner, more obtuse, the

first usually nerveless, often erose; sterile palea wanting; fertile lemma thinner than in *P. distachyum*.

TYPE LOCALITY: State of Vera Cruz, Mexico.

DISTRIBUTION: Southern Mexico.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 75.

17. *Pennisetum bambusiforme* (Fourn.) Hemsl.; B. D. Jackson,
Ind. Kew. 2: 458. 1894.

Gymnothrix bambusiformis Fourn. Mex. Pl. Gram. 48. 1886.

Pennisetum tristachyum bambusiforme Leeke, Zeits. Naturw. 79: 33. 1907.

Pennisetum tristachyum Galeottiana Leeke, Zeits. Naturw. 79: 33. 1907.

Plants perennial, resembling *P. distachyum*, glabrous, branching from the upper nodes, the branches often in fascicles of 2 or 3 (on the average less numerous than in *P. prolificum*), slender, repeatedly branching, the whole forming a drooping compound leafy inflorescence, looser and less massive than in *P. prolificum*; nodes glabrous, rarely appressed-pubescent; leaf-sheaths loose, ciliate on the margin and with an erect tuft of white hairs at the summit (old sheaths commonly glabrescent); ligule about 2 mm. long; blades flat, rather firmer than in the two preceding species, ascending or spreading, those of the main culm 20–35 cm. long, 2–3.5 cm. wide, narrowed, sometimes somewhat attenuate at base, scabrous or appressed-pubescent on the upper surface, softly appressed-pubescent beneath, sometimes glabrescent; panicles purplish-tawny, 5–12 cm. long (rarely longer), about 1 cm. wide, excluding the longest bristles, loose, flexuous, tapering at the apex, the slender angled axis scabrous or hispidulous; fascicles not crowded, ascending; bristles slender, flexuous, numerous, very unequal, most of them about twice the length of the spikelet, the innermost sometimes as much as 2 cm. long; spikelet 5–6 mm. long, 1–1.2 mm. wide, scabrous; glumes unequal, the first minute, usually nerveless, obtuse or erose, the second one fourth to one third the length of the spikelet, 1–3-nerved, acute or erose; sterile lemma exceeding the fertile lemma, 5–7-nerved, attenuate into a slender flexuous tip, inclosing a well-developed palea and usually a staminate flower; fertile lemma 4.5–5 mm. long, scabrous toward the acuminate apex, but little indurate.

TYPE LOCALITY: Mirador, Vera Cruz.

DISTRIBUTION: Southern Mexico to Peru.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 76. *

72. CENCHROPSIS. See 74. *Cenchrus* (page 341).

73. PARATHERIA Griseb. Cat. Pl. Cub. 236. 1866.

Perennial spreading grasses with short flat blades and spike-like racemes. Spikelets appressed to slender erect branches, the ends of the branches produced beyond the spikelets as slender awns, the articulation at the base of spikelet and also of branch, this forming a sharp callus below the attached acuminate spikelet. Glumes minute or obsolete. Sterile lemma equaling the cartilaginous fruit.

Type species, *Paratheria prostrata* Griseb.

1. *Paratheria prostrata* Griseb. Cat. Pl. Cub. 236. 1866.

Chamaeraphis parvigluma Munro; Sauv. Anal. Acad. Ci. Habana 8: 208, name only. 1871.

Panicum leptochyrium Döll, in Mart. Fl. Bras. 2: 150. 1877.

Stems prostrate or decumbent, branching, 50 cm. long, glabrous, the nodes appressed-hispid; leaf-sheaths hirsute or the upper glabrate; ligule densely ciliate, about 1 mm. long, with a few longer hairs at the sides; blades rather stiff, spreading or ascending, flat, more or less villous, scabrous on the margin, acuminate, scarcely narrowed at base, as much as 8 cm. long, mostly 3–5 cm., 3–4 mm. wide; raceme partly inclosed in the base of the upper sheath, erect, 5–10 cm. long, the axis scabrous, the branches appressed, slender and stiff, angled, scabrous, the basal part adnate to the axis and tapering to a point, separating at maturity and forming a scabrous sharp point to the fruit, the upper part tapering into a slender awn 2–3 cm. long; spikelets narrow, flattened, lanceolate-acuminate, 7–9 mm. long, the pedicel about 1 mm.

long; glumes thin, less than 1 mm. long, sometimes obsolete, a few slender hairs at base, the second glume next to the axis; sterile lemma as long as the spikelet, acuminate, weakly several-nerved or striate, neuter, the palea wanting; fertile lemma acuminate, cartilaginous, the wide thin flat margins inclosing the margins of the palea to the tip; palea acuminate and as long as the lemma, rounded on the back, the two keels appearing as faint nerves.

TYPE LOCALITY: Hanábana, Cuba.

DISTRIBUTION: Western Cuba; also in Brazil and tropical Africa.

ILLUSTRATION: Mart. Fl. Bras. 2: pl. 25.

74. *CENCHRUS* L. Sp. Pl. 1049. 1753.

Rarum Adans. Fam. Pl. 2: 35. 597. 1763.

Cenchropsis Nash, in Small, Fl. SE. U. S. 109, 1327. 1903.

Annual or perennial low or moderately tall, often spreading grasses, with mostly flat leaf-blades and spicate inflorescence. Spikelets sessile, one to several together, permanently inclosed in a bristly or spiny involucre or bur, composed of more or less coalesced sterile branchlets; burs sessile or nearly so on a slender, compressed or angled axis, its apex produced into a short point beyond the uppermost bur, the burs falling entire, the grains germinating within them; involucre (especially in our species) somewhat oblique, its body irregularly cleft, the lobes rigid, in most species resembling the spines, the cleft on the side of the bur next to the axis reaching to the tapering, abruptly narrowed or truncate base, the bristles or spines barbed, at least toward the summit; spikelets mostly glabrous or nearly so; first glume 1-nerved, usually narrow, sometimes wanting; second glume and sterile lemma 3- to 5-nerved, the lemma inclosing a well-developed palea and usually a staminate flower; fruit usually turgid, indurate, the lemma acuminate, the nerves visible toward the summit, the margins thin, flat, a prominent U-shaped ridge on the back just above the base, the radicle at germination breaking through its outer margin; stamens 3; styles 2, the stigmas plumose; grain dorsally compressed, with a punctiform hilum, free within the lemma and palea.

Type species, *Cenchrus echinatus* L.

Involucral lobes united at the base only; spikes dense.

Plants perennial; involucral lobes terete, scabrous.

Plants annual; inner involucral lobes sulcate down the outside, densely villous-ciliate within.

Involucral lobes united above the base.

Blades involute, squarrose, numerous, conspicuously distichous, not more than 2.5 cm. long, about 1 cm. apart.

Blades not involute and squarrose, nor conspicuously distichous, much longer and farther apart.

Involucre with a ring of slender bristles at base. Plants annual.

Bristles antrorsely scabrous, much exceeding the involucral lobes.

Bristles retrorsely barbed, not much exceeding the involucral lobes.

Burs, excluding the bristles, not more than 4 mm. wide, numerous, crowded in a long spike; lobes of the involucre interlocking, not spine-like.

Burs, excluding the bristles, 5-7 mm. wide, not densely crowded; lobes of the involucre erect or nearly so or rarely one or two lobes loosely interlocking, the tips spine-like.

Spikelets about 5.5 mm. long; involucral lobes villous at base within.

Spikelets 6.5 mm. long; involucral lobes long-ciliate except at summit.

Involucre with flattened spreading spines, no ring of slender bristles at base.

Body of the bur ovate, not more than 3.5 mm. wide, tapering at base; plants perennial.

Burs glabrous; spines 4-6 mm. long.

Burs pubescent; spines rarely more than 4 mm. long, usually shorter.

Body of bur 3-3.5 mm. wide; spines 3-4 mm. long.

Body of bur less than 3 mm. wide; spines 2-3 mm. long.

Body of the bur globose, 5 mm. wide or more, not tapering at base; plants annual.

Burs, including spines, 7-8 mm. wide, finely pubescent.

Burs, including spines, 10-40 mm. wide, densely woolly.

Burs several to many; spines not more than 8 mm. long.

Burs 1 to 4; spines 1 cm. long or more.

1. *C. myosuroides*.

2. *C. catharticus*.

3. *C. distichophyllus*.

4. *C. pilosus*.

5. *C. viridis*.

6. *C. echinatus*.

7. *C. insularis*.

8. *C. gracillimus*.

9. *C. incertus*.

10. *C. microcephalus*.

11. *C. pauciflorus*.

12. *C. tribuloides*.

13. *C. Palmeri*.

1. *Cenchrus myosuroides* H.B.K. Nov. Gen. & Sp. 1: 115. 1815.

Panicum cenchroides Ell. Bot. S. C. & Ga. 1: 111. 1816. Not *P. cenchroides* Rich. 1792.
Pennisetum pungens Nutt. Gen. 1: 54. 1818.
Pennisetum myosuroides Spreng. Syst. 1: 303. 1825.
Cenchrus Elliottii Kunth, Rév. Gram. 51. 1829.
Cenchrus alopecuroides Presl. Rel. Haenk. 1: 317. 1830.
Cenchrus setoides Buckl. Prel. Rep. Geol. & Agr. Surv. Tex. App. 3. 1866.
Cenchropsis myosuroides Nash, in Small, Fl. SE. U. S. 109, 1327. 1903.

Plants perennial, solitary or in small clumps, usually 1-2 meters tall, glabrous as a whole; stems rather robust and woody, terete, commonly glaucous, erect or geniculate below (rarely decumbent with ascending flowering branches), commonly branching from the lower 2-5 nodes, most of the branches sterile, sometimes fascicled, forming conspicuous knobs at the node; leaf-sheaths loose, usually not clasping the internodes, firm, strongly nerved; ligule 2-3 mm. long, firm-membranaceous, with a densely ciliate margin; blades ascending or spreading, firm, 15-40 cm. long, 5-12 mm. wide, tapering from the rounded flat base to an attenuate, often involute tip, scabrous on the upper surface, rarely sparsely pilose at the base; inflorescence usually short-exserted, 10-25 cm. long, 5-9 mm. wide, strict, erect, dense, the common axis slender, angled, puberulent; burs 1-flowered, at first appressed, spreading in age, 5-7 mm. (mostly about 5 mm.) long, at maturity about as wide, the bristles retrorsely scabrous, united at the base only, the lowest row shorter, slender and spreading, the inner bristles slender, not flattened nor nerved, about equaling the spikelet, erect or nearly so; spikelet 4.5-5.5 mm. long, 1.5-1.8 mm. wide, acuminate; first glume about one third the length of the spikelet; second glume and sterile lemma 3- to 5-nerved, the glume slightly shorter than the equal sterile lemma and fruit.

TYPE LOCALITY: Batavanó, Cuba.

DISTRIBUTION: Georgia to Florida, Texas, and Sonora, south to Oaxaca; Cuba, Porto Rico; Peru to Argentina.

ILLUSTRATIONS: H.B.K. Nov. Gen. & Sp. *pl. 35*; Bull. U. S. Dep. Agr. Bot. 12: *pl. 6*; Bull. U. S. Dep. Agr. Agrost. 7: *f. 70*; Contr. U. S. Nat. Herb. 22: *f. 7*.

2. *Cenchrus catharticus* Delile, Ind. Sem. Hort. Monsp. 1838: 4.
1839; Linnæa 13: Lit.-Ber. 103. 1839.

Cenchrus niloticus Fig. & De-Not. Mem. Accad. Torino II. 14: 380. 1855.
Cenchrus annularis Anderss. in Peters, Reise Mossamb. Bot. 553. 1864.

Plants annual, glabrous as a whole, decumbent and rooting at the lower nodes, the ends and the branches ascending; stems 30-100 cm. long, not much compressed, scabrous below the inflorescence; leaf-sheaths loose, keeled, scabrous at the summit; ligule stiffly ciliate, about 1 mm. long; blades narrowly ascending, 10-20 cm. long, 5-6 mm. wide at the base, tapering thence to an attenuate involute tip, scabrous on the upper surface, smooth or nearly so beneath; spikes included at base or short-exserted, 8-10 cm. long, about 7-9 mm. wide, the axis slender, angled, scabrous; burs usually 2-flowered, nearly erect, 4-6 mm. long, scarcely as wide, the pedicel almost obsolete; bristles united at the base only, the outer row short, terete, spreading, unequal, the inner (7-10) flattened, subequal, rigid, erect, the scabrous tips slightly spreading, the outer surface sulcate down the middle, with 1-3 green nerves in the sulcus, densely villous along the margin on the inner surface except at the summit; spikelets slightly shorter than the inner involucre lobes; first glume developed or obsolete; second glume and sterile lemma thin, faintly 3- to 7-nerved, two thirds to three fourths as long as the fruit, the sterile palea usually well developed; fruit 4-4.5 mm. long, about 1.5 mm. wide, acuminate.

TYPE LOCALITY: Nubia.

DISTRIBUTION: On ballast about Mobile, Alabama; native from Egypt to Abyssinia.

ILLUSTRATIONS: Mem. Accad. Torino II. 14: *pl. 33*; Contr. U. S. Nat. Herb. 22: *f. 8*.

3. *Cenchrus distichophyllus* Griseb. Cat. Pl. Cub. 234. 1866.

Plants perennial; stems tufted, rigid, erect, or ascending from a curved, not geniculate base, simple or with a few appressed branches, the numerous internodes very short, the long leafless upper part of the stem appressed-pubescent; leaf-sheaths overlapping, appressed-pubescent, often becoming glabrate in age; ligule ciliate, scarcely 1 mm. long; blades 1.5-2.5

cm. long, about 1.5 mm. wide, conspicuously distichous, stiffly spreading at a uniform angle and usually about 1 cm. apart, involute, sharp-pointed, glabrous on the outer surface, scabrous on the inner, sometimes with a few long hairs at the base; spike long-exserted, 2-3 cm. long, bearing usually 5-7 spreading yellow burs, the slender axis glabrous, its summit prolonged beyond the uppermost bur as a sharp point 2-4 mm. long; burs, including the spines, 5-6 mm. long, nearly as broad, the body of the bur about 3 mm. long and 2 mm. wide, puberulent, the outer spines subterete, swollen at the base, the lobes of the involucre about 10, prolonged into sharp, slender spines, pilose on the inner surface toward the base, retrorsely barbed toward the tip; spikelet solitary, terete or thicker than wide, about 3.3 mm. long and 1.3 mm. wide; first glume very narrow, often obsolete; second glume obtuse, shorter than the subequal pointed sterile and fertile lemmas; fruit turgid, the palea puberulent on the upper half.

TYPE LOCALITY: Guanés, Cuba.

DISTRIBUTION: Western Cuba.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 9.

4. *Cenchrus pilosus* H.B.K. Nov. Gen. & Sp. 1: 116. 1815.

Cenchrus pallidus Fourn. Mex. Pl. Gram. 50. 1886.

Plants annual; stems often rather stout, compressed, usually decumbent at base and rooting at the lower nodes, 20-100 cm. long, simple or sparingly branching below, scabrous below the inflorescence, otherwise glabrous; leaf-sheaths keeled, loose, glabrous or toward the summit scabrous, or rarely ciliate; ligule ciliate, about 0.8 mm. long; blades 10-40 cm. long, or rarely longer, 6-12 mm. wide, rather thin and lax, flat or folded at the rounded base, scabrous on the upper surface and usually pilose, glabrous on the lower surface or scabrous toward the summit; spikes finally rather long-exserted, 5-14 cm. long, dense or loose at the base, the axis strongly angled, scabrous, a tuft of white hairs usually borne just below the burs, the summit prolonged beyond the uppermost bur into a slender point 2-3 mm. long; burs globose, the body about 5 mm. high, as broad or broader, densely villous, tawny, the numerous slender bristles antrorsely scabrous, commonly purplish, the inner more than twice as long as the body, the lobes of the body about 8, interlocking at maturity; spikelets usually 3, exceeding the body of the involucre, 4-4.5 mm. long, about 1.8 mm. wide, acuminate; first glume obsolete; second glume and sterile lemma shorter than the fruit, thin, very minutely puberulent; fruit turgid, the palea minutely puberulent between the nerves except toward the base.

TYPE LOCALITY: Near Villa del Pao, Venezuela.

DISTRIBUTION: Southern Mexico to Venezuela and Ecuador.

ILLUSTRATIONS: H.B.K. Nov. Gen. & Sp. pl. 36; Contr. U. S. Nat. Herb. 22: f. 10; Field Mus. Publ. Bot. 7: 40.

5. *Cenchrus viridis* Spreng. Syst. 1: 301. 1825.

Cenchrus echinatus viridis Spreng.; Griseb. Fl. Brit. W. Ind. 556. 1864.

?*Cenchrus viridis macrocephalus* Döll, in Mart. Fl. Bras. 2: 310. 1877.

?*Cenchrus rigidus* Willd.; Döll, in Mart. Fl. Bras. 2: 310. 1877.

Plants annual; stems often rather robust, 30-100 cm. tall or more, usually terete, erect from a more or less geniculate base, the lower internodes commonly short, sparingly branching from the base or lower nodes, glabrous, or scabrous below the spike only; leaf-sheaths mostly overlapping, loose, keeled, glabrous; ligule ciliate, scarcely 1 mm. long; blades thin, flat, lax, mostly 10-30 cm. long, 6-12 mm. wide, rounded at the base, scabrous on the upper surface, on the margins, and on the midnerve beneath; spike usually short-exserted, 4-10 cm. long, rarely longer, dense, the slender axis minutely pubescent, the naked tip 2-4 mm. long; burs depressed-globose, the body about 4 mm. high, as broad or broader, villous, tawny, the outer bristles numerous, very slender, crowded toward the base, the inner usually exceeding the body and the spikelets, erect or spreading, the lobes of the body usually 6-8, interlocking at maturity; spikelets usually 3, exceeding the body of the involucre, mostly 4-4.5 mm. long, about 1.4 mm. wide; first glume obsolete; second glume two thirds to three fourths as long as the subequal sterile lemma and fruit.

TYPE LOCALITY: Guadeloupe, West Indies.

DISTRIBUTION: South Florida, Mexico, and the West Indies to Brazil; also in the Philippine Islands, Guam, Siam, and northern Australia.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 22: f. 11; Field Mus. Publ. Bot. 7: 40.

6. *Cenchrus echinatus* L. Sp. Pl. 1050. 1753.

Cenchrus pungens H.B.K. Nov. Gen. & Sp. 1: 115. 1815.

Cenchrus macrocarpus Ledeb.; Steud. Nom. Bot. ed. 2: 1: 317. 1840.

Cenchrus brevisetus Fourn. Mex. Pl. Gram. 50. 1886.

Cenchrus echinatus brevisetus Scribn. in Millsp. Field Mus. Publ. Bot. 2: 26. 1900.

Plants annual; stems ascending from a geniculate or decumbent base, often rooting at the lower nodes, branching from the base and usually from the lower nodes, commonly 25–60 cm. long, sometimes as much as 1 meter long, compressed, scabrous below the spike, otherwise glabrous; leaf-sheaths loose, mostly compressed, glabrous or hairy on the margin toward the summit, rarely sparsely pilose; ligule ciliate, about 1 mm. long; blades commonly 6–20 cm. long and 3–8 mm. wide (extremes larger or smaller), usually rather stiff, but sometimes lax, flat, tapering from the rounded base to a more or less involute or folded summit, glabrous beneath, scabrous and sparsely pilose on the upper surface, at least toward the base; spikes finally rather long-exserted, 3–10 cm. long (commonly not more than 7 cm. long), not very dense, the axis strongly flexuous, scabrous; burs truncate at base, the body 4–7 mm. high, as broad or broader, pubescent, tawny or plumbeous, the outer slender bristles on the average less numerous and relatively shorter than in *C. viridis*, the inner stout, broadened at base, the longest of them usually about equaling the lobes of the body but sometimes longer or sometimes much reduced, ascending or spreading, the lobes of the body commonly 10, erect or bent inward or sometimes one or two lobes inflexed, often with one or two green lines down the back, the tips hard and spine-like, retrorsely barbed; spikelets 3–6, usually 4, about equaling the lobes or shorter, 4.5–6 mm. long, about one third as wide; first glume narrow, 1-nerved; second glume two thirds to three fourths as long as the subequal sterile lemma and fruit, the summit of the fertile lemma submembranaceous, the 3 nerves usually obvious.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: South Carolina to New Mexico, and southward to Uruguay; introduced in the Hawaiian Islands, Philippine Islands, and Samoa.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 407; Mart. Fl. Bras. 2: pl. 43; Contr. U. S. Nat. Herb. 22: f. 12; Field Mus. Publ. Bot. 7: 41 (2 f., 1 as *C. brevisetus*).

7. *Cenchrus insularis* Scribn. in Millsp. Field Mus. Publ. Bot. 2: 26. 1900.

Plants annual, resembling robust specimens of *C. echinatus*, the rather firm blades scabrous on the upper surface, not pilose; spikes 5–10 cm. long, not very dense, the axis as in *C. echinatus*; burs globose, the body 9–11 cm. high, minutely pubescent, the obconical base villous; bristles very numerous, ascending, the outermost very slender, short, the inner successively broader at base and longer, two rather well-defined series equaling or exceeding the lobes of the body, conspicuously long-ciliate at the broad base; lobes of the body 8–10, suberect, exceeding the spikelets, conspicuously long-ciliate except at the sharp spine-like summits; spikelets 2 or 3, 6–7 mm. long, 2–2.2 mm. wide; first glume narrow, usually obsolete; second glume very minutely puberulent down the center or glabrous, two thirds to three fourths as long as the equal sterile lemma and fruit, the base of the sterile lemma and upper part of the palea minutely puberulent, the summit of the fertile lemma submembranaceous, strongly nerved.

TYPE LOCALITY: Alacran Shoals near Yucatán.

DISTRIBUTION: Yucatán; also in Colombia.

ILLUSTRATIONS: Contr. U. S. Nat. Herb. 22: f. 13; Field Mus. Publ. Bot. 7: 42, 43.

8. *Cenchrus gracillimus* Nash, Bull. Torrey Club 22: 299. 1895.

Plants perennial, at length forming dense clumps, glabrous as a whole; stems 20–80 cm. tall, commonly branching from the lower nodes, but sometimes remaining simple, often scabrous toward the summit, compressed, slender, wiry, erect or ascending, the outer culms of large clumps geniculate at base; leaf-sheaths loose, keeled, the lower overlapping, sometimes sparsely pilose; ligule ciliate, about 0.5 mm. long; blades usually folded and stiffly flexuous, 5–20 cm. long, 2–5 mm. (usually 2–3 mm.) wide, scabrous on the upper surface and sometimes pilose at the base; spikes usually long-exserted, 2–6 cm. long, the burs not crowded, sometimes distant more than their own length, the slender axis flexuous, scabrous; burs 3.5–5 mm. wide

(excluding the spines), somewhat tapering to the base, glabrous; spines spreading or reflexed, all glabrous and flat, broadened at base, the lowest ones slender, shorter, some of the upper ones commonly 5-6 mm. long; body of the bur usually with 1 or 2 deep clefts, the lobes about 8, erect or spreading, 6-8 mm. long, ciliate at the base, rigid and spine-like; spikelets 2 or 3, 5.5-7 mm. long, about 1.5 mm. wide; first glume narrow, usually present; second glume and sterile lemma attenuate-pointed, the tips often spreading, the glume about three fourths the length of the attenuate-pointed fruit.

TYPE LOCALITY: Eustis, Florida.

DISTRIBUTION: Southern Alabama to Florida, Cuba, Jamaica.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 404; Contr. U. S. Nat. Herb. 22: f. 14.

9. *Cenchrus incertus* M. A. Curt. Bost. Jour. Nat. Hist. 1:

135. 1835.

Cenchrus strictus Chapm. Bot. Gaz. 3: 20. 1878.

Plants perennial but apparently fruiting the first year, at length forming dense clumps, glabrous as a whole; stems 25 to 100 cm. tall, compressed, on the average stouter than those of *C. gracillimus*, scabrous (or rarely pubescent) at the summit, ascending or erect from a decumbent base, freely branching; leaf-sheaths loose and open, overlapping on the short lower internodes, often pilose near the margin toward the summit; ligule ciliate, about 0.5 mm. long; blades commonly folded, but sometimes flat, rarely stiffly flexuous as in *C. gracillimus*, 7-25 cm. long, 2-5 mm. (rarely 7 mm.) wide, scabrous on the upper surface and sparsely long-pilose, at least toward the base; spikes long-exserted or those of the branches short-exserted, 4-10 cm. long, the burs not crowded but on the average closer than in *C. gracillimus*, the slender axis flexuous, scabrous, sometimes pilose; burs 3-5 mm. wide, excluding the spines, the body finely and densely pubescent, the base glabrous; spines spreading, flat, broadened at base, the lower often obsolete on the outer face of the bur and represented by low knobs or ridges, the upper few, rarely more than 5 mm. long; body of the bur usually not deeply cleft on the outer face, the lobes commonly 5-7, erect to spreading, 4-6 mm. long, rigid and spine-like, long-ciliate at the broad base; spikelets 1-3, 5-6 mm. long, about 2 mm. wide; first glume usually present, narrow, pointed; second glume about three fourths the length of the subequal sterile and fertile lemmas; fruit attenuate, the palea minutely puberulent toward the summit.

TYPE LOCALITY: Near Wilmington, North Carolina.

DISTRIBUTION: North Carolina to Florida and Texas.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 405; Contr. U. S. Nat. Herb. 22: f. 15.

10. *Cenchrus microcephalus* Nash; Hitchc. & Chase, Contr. U. S.

Nat. Herb. 18: 356. 1917.

Plants probably perennial, tufted, with numerous leafy sterile shoots at the base, glabrous as a whole; stems 30-70 cm. tall, compressed, slender, scabrous below the spike, ascending from a decumbent base, branching from the middle and upper nodes; leaf-sheaths, especially those of the sterile shoots, strongly keeled, pilose on the margin toward the summit and on the shoots, with a tuft of white hairs on each side at the apex, this inconspicuous on the old leaf-sheaths; ligule ciliate, about 0.5 mm. long; blades folded at base, often flat above, rather thin, mostly 10-20 cm. long, 2-3 mm. wide, pilose on the upper surface; spikes mostly short-exserted, 3-5 cm. long, the slender axis flexuous, scabrous; burs (including the bristles) about 6 mm. long and 5 mm. wide, the body scarcely wider than the thick base, minutely pubescent; spines flat, broadened at base, the lowermost short and spreading, the upper stout, ciliate at the base, shorter than the 5 or 6 lobes of the involucre, these erect or ascending, ciliate nearly to the summit, rigid but relatively blunt; spikelets usually 2, 4-4.5 mm. long, about 1 mm. wide; first glume nearly half the length of the equal sterile lemma and fruit.

TYPE LOCALITY: Berry Islands, Bahamas.

DISTRIBUTION: Berry Islands.

ILLUSTRATION: Contr. U. S. Nat. Herb. 22: f. 16.

11. *Cenchrus pauciflorus* Benth. Bot. Voy. Sulph. 56. 1844.

Cenchrus roseus Fourn. Mex. Pl. Gram. 50. 1886.

Cenchrus echinatus f. *longispina* Hack.; Kneucker, Allg. Bot. Zeits. 9: 169. 1903.

Plants annual, sometimes forming large mats; stems 20–90 cm. long, compressed, rather stout, scabrous or rarely pubescent at the summit, spreading, ascending or rarely suberect, from a decumbent base, usually freely branching; leaf-sheaths pubescent along the margin, rarely throughout, sometimes with a tuft of white hairs at the summit, loose, those below the spikes commonly inflated; ligule ciliate, nearly 1 mm. long; blades usually flat but sometimes subinvolute or folded, spreading, 3–15 cm. long, 2–7 mm. wide, tapering from base to apex, scabrous on the upper surface and sometimes on the lower, often pilose near the base above; spikes numerous, short-exserted or partly included, 1–10 cm. long (commonly 3–8 cm. long), the burs rather crowded, the slender axis flexuous, scabrous, sometimes pilose; burs (excluding the spines) 3–7 mm. wide (commonly 4–6 mm.), pubescent, often densely so, rarely nearly glabrous; spines numerous, spreading or reflexed, flat, broadened at base, the lowermost shorter and relatively slender, some of the upper ones commonly 4–5 mm. long, usually villous at the base; body of the bur often with one deep cleft on the outer face, the lobes commonly about eight, erect or spreading or one or two inflexed, usually villous at the base, rigid and spine-like; spikelets commonly two, 5–7 mm. long, about 2 mm. wide; first glume usually not more than one third the length of the spikelet; second glume and sterile lemma subequal or the lemma nearly as long as the turgid acuminate-pointed fruit.

TYPE LOCALITY: Bay of Magdalena, Lower California.

DISTRIBUTION: Maine to Oregon, and southward to Florida, California, and tropical America.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 12: pl. 7; Bull. U. S. Dep. Agr. Agrost. 7: f. 69 (as *C. tribuloides*); Tenn. Agr. Exp. Sta. Bull. 7: pl. 17, f. 65 (as *C. tribuloides*); Hitchc. Text-book Grasses f. 27 (as *C. carolinianus*); Britt. & Brown, Ill. Fl. f. 284 (as *C. tribuloides*); ed. 2. f. 397 (as *C. carolinianus*); Contr. U. S. Nat. Herb. 22: f. 17, 18; Field Mus. Publ. Bot. 7: 45 (as *C. tribuloides*).

NOTE: This species was commonly known as *C. tribuloides* until 1908, and more recently as *C. carolinianus*.

12. *Cenchrus tribuloides* L. Sp. Pl. 1050. 1753.

Cenchrus echinatus tribuloides Torr. Fl. U. S. 69. 1823.

Cenchrus vaginatus Steud. Syn. Gram. 110. 1854.

Cenchrus tribuloides macrocarpus Steud. Syn. Gram. 110. 1854.

Cenchrus tribuloides macrocephalus Döll, in Mart. Fl. Bras. 2: 312. 1877.

Cenchrus macrocephalus Scribn. Bull. U. S. Dep. Agr. Agrost. 17: 110. 1899.

Plants annual, very leafy; stems stout, at first erect, soon branching and becoming radiate-decumbent, 15–60 cm. long, the ends ascending, rooting at the nodes and with numerous ascending branches 10–30 cm. tall, scabrous or pilose at the summit; leaf-sheaths usually much overlapping, sharply keeled, broad, those below the spikes inflated, pubescent at least along the margin and with a dense tuft of hairs on each side at the summit; ligule ciliate, 1 mm. long; blades flat or folded, the margins usually more or less involute, firm, spreading, 3–18 cm. long (seldom more than 12 cm. long), 4–7 mm. wide, tapering from base to apex, scabrous on the upper surface; spikes numerous, usually exceeded by the subtending leaf, 3–9 cm. long, the burs crowded, the axis flexuous, scabrous or pilose; burs more oblique than in any other of our species, 5–6 mm. wide and 8–9 mm. high (excluding the spines), usually conspicuously villous, but sometimes short-pubescent only, the base puberulent, usually with a few long hairs at the very base; spines finally spreading, flat, the lowermost relatively short and slender, the upper ones broadened at the base, sometimes as much as 3 mm. broad, some of them 5–8 cm. long, long-villous on the inner face and margins of the broad base, the hairs of the margin rather stiffly spreading, the ends needle-like and retrorsely barbed; body of the bur with no deep cleft on the outer face, the tips of the spikelets usually not showing above the base of the clefts, the lobes six to eight, mostly about equal and simulating the larger spines, erect to spreading, villous on the inner face and on the margins at the base like the spines, the outer surface glabrous or nearly so above the base; spikelets usually two, 7–8 mm. long, about 3 mm. wide; first glume about one third the length of the spikelet; second glume sometimes minutely puberulent on the lower part of the middle internerves, slightly shorter than the sterile lemma, this slightly shorter than the acuminate-pointed fruit.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Along the coast, New York to Florida and Louisiana; Costa Rica; West Indies; also in Brazil.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Agrost. 17: f. 406; A. Gray, Man. ed. 6. pl. 14; Britt. & Brown, Ill. Fl. ed. 2. f. 396; Contr. U. S. Nat. Herb. 22: f. 19; Bull. U. S. Dep. Agr. 772: f. 151.

13. *Cenchrus Palmeri* Vasey; Brand. Proc. Calif. Acad. II. 2:
211. 1889.

Plants annual, leafy; stems rather slender, compressed, scabrous below the nodes, pubescent at the summit, at first erect, soon branching and spreading, 12-42 cm. tall; leaf-sheaths mostly overlapping, loose, retrorsely velvety-pubescent, the hairs longer and denser at the summit; ligule ciliate, 2-2.5 mm. long; blades mostly flat, rather firm, ascending or spreading, 3-18 cm. long, 3-7 mm. wide, tapering from the base to an attenuate apex, very scabrous on both surfaces; spikes reduced to 1-4 burs, commonly 1 or 2, the terminal spikes mostly long-exserted, those of the branches overtopped by the subtending leaf; burs (including the spines) 2-2.5 cm. high and 2.5-4 cm. broad, the body scarcely oblique, depressed-globose, truncate at base, about 10 mm. high and 12 mm. wide, pale-tawny-canescens; spines numerous, spreading or reflexed, usually blackish purple above the villous-canescens, greatly thickened base, but sometimes yellow, the lowermost short, stout, and thorn-like, the others long-attenuate, retrorsely barbed and sometimes flexuous at the needle-like tips, commonly some of them divided in two part way or to the base, and some 12-15 mm. long; body of the bur thick-walled, the lobes mostly 12-15, erect or spreading, similar to the spines; spikelets 4-7, more or less distorted by the pressure of the rigid involucre, 7-9 mm. long, 2-3 mm. wide; first glume very narrow, usually wanting; second glume and sterile lemma slightly shorter than the acuminate fruit, obscurely puberulent on the middle internerves.

TYPE LOCALITY: Guaymas, Mexico.

DISTRIBUTION: Sonora and Lower California.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. Bot. 13: pl. 3; Contr. U. S. Nat. Herb. 22: f. 20.

DOUBTFUL SPECIES

Cenchrus carolinianus Walt. Fl. Carol. 79. 1788.

Cenchrus gracilis Beauv. Agrost. 57, 157. 1812.

Cenchrus hirsutus Spreng. Neue Entd. 3: 15. 1822.

75. *STENOTAPHRUM* Trin. Fund. Agrost. 175. 1820.

Creeping stoloniferous perennials, with short flowering stems, rather broad and short obtuse blades, and terminal and axillary spikes. Spikelets imbedded in one side of an enlarged and flattened corky rachis disarticulating at maturity, the spikelets remaining attached; first glume small; second glume and sterile lemma about equal, the latter with a palea or staminate flower; fertile lemma chartaceous.

Type species, *Panicum dimidiatum* L.

1. *Stenotaphrum secundatum* (Walt.) Kuntze, Rev. Gen.

794. 1891.

Ischaemum secundatum Walt. Fl. Car. 249. 1788.

Rottboellia stolonifera Poir. in Lam. Encyc. 6: 310. 1804.

Stenotaphrum americanum Schrank, Fl. Monac. pl. 98. 1812.

Stenotaphrum sarmentosum Nees, Agrost. Bras. 93. 1829.

Stenotaphrum glabrum americanum Döll, in Mart. Fl. Bras. 2: 300. 1877.

Stenotaphrum dimidiatum americanum Hack.; Stuck. Anal. Mus. Nac. Buenos Aires III. 14: 57. 1911.

An extensively creeping glabrous perennial, the stolons with long internodes and short leafy branches, the sheaths equitant, the blades short, obtuse; flowering stems 10-30 cm. tall, compressed; leaf-sheaths compressed-keeled, glabrous on the margin; ligule densely pubescent, scarcely 0.5 mm. long, a few longer hairs at the sides; blades oblong or linear, abruptly rounded at base and apex, flat or often folded, 2-15 cm. long, usually less than 10 cm., 4-8 mm. wide;

spikes flat, often falcate, 5-10 cm. long, the rachis 4-5 mm. wide; spikelets partially imbedded in 2 rows on one side of the rachis, lanceolate, 4-5 mm. long, glabrous or minutely puberulous, sometimes a few short hairs at the base of the cavity in the rachis and at the base of the first glume; first glume orbicular, thin, nerveless, sometimes puberulent under a lens, 1 mm. long; second glume as long as the spikelet, about 7-nerved, rather firm; sterile lemma as long as the second glume, nearly as firm as the fertile floret, nerveless; fertile lemma cartilaginous, nearly as long as the second glume.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina to Louisiana, and southward to Panama and Brazil.

ILLUSTRATIONS: Bull. U. S. Dep. Agr. 772: f. 132; Field Mus. Publ. Bot. 3: 45; Bull. U. S. Dep. Agr. Bot. 12: pl. 8; Bull. U. S. Dep. Agr. Agrost. 20: f. 28; Mart. Fl. Bras. 2: pl. 39.

76. AMPHICARPON Raf. Am. Mo. Mag. 2: 175. 1818.

Annual or perennial erect grasses with flat blades and narrow terminal panicles. Spikelets of two kinds on the same plant, one in a terminal panicle, perfect but usually not fruitful, the other cleistogamous on slender leafless subterranean branches from the base of the stem or sometimes also from the lower nodes; first glume of the aerial spikelets variable in size, sometimes obsolete; second glume and sterile lemma about equal; lemma and palea indurate, the margins of the lemma thin and flat; fruiting spikelets much larger, the first glume wanting; second glume and sterile lemma strongly nerved, subrigid, exceeded at maturity by the turgid, elliptic, acuminate fruit with strongly indurate lemma and palea, the margins of the lemma thin and flat; stamens with small anthers on short filaments.

Type species, *Milium ampicarpon* Pursh.

Blades conspicuously hispid.
Blades glabrous or nearly so.

1. *A. Purshii*.
2. *A. floridanum*.

1. *Amphicarpon Purshii* Kunth, Rév. Gram. 1: 28. 1829.

Milium ampicarpon Pursh, Fl. Am. Sept. 1: 62. 1814.

Milium ciliatum Muhl. Descr. Gram. 77. 1817. Not *M. ciliatum* Moench, 1802.

Amphicarpon ampicarpon Nash, Mem. Torrey Club 5: 352. 1894.

Erect annual; stems glabrous, 30-60 cm. tall; leaf-sheaths overlapping on the lower half of the culm, papillose-hispid, the uppermost longer; ligule densely ciliate, 1-2 mm. long; blades stiffly ascending, gradually narrowed from near the base to a stiff somewhat involute point, densely papillose-hispid, ciliate, 5-15 cm. long, as much as 15 mm. wide, the uppermost reduced and somewhat distant; terminal panicle 5-15 cm. long, the few branches appressed, or somewhat spreading in anthesis, the lowermost as much as 5 cm. long, the axis and angled branches very scabrous; spikelets elliptic-lanceolate, glabrous, about 4 mm. long and 1 mm. wide, pale or yellowish, appressed to the branches, the pedicels hispid-scabrous; first glume small or wanting; second glume and sterile lemma similar, as long as the spikelet or the sterile lemma a little longer, 5-nerved, the sterile floret neuter, the palea wanting; fertile floret about as long as the second glume, cartilaginous, brownish, elliptic-lanceolate, acute, the flat margins of the lemma with a few appressed hairs, inclosing the palea to the tip; subterranean spikelets on slender branches reflexed or descending from the base of the culms, the branches bearing papery scales near the base and usually a single spikelet on a leafless terminal peduncle, the branches as much as 15 cm. long, usually 5-10 cm.; spikelets fusiform, turgid at maturity, about 7 mm. long, acute, more or less appressed-hispidulous; first glume wanting; second glume and sterile lemma about equal, striately several-nerved; fertile lemma indurate, as long as the sterile lemma, rounded on the back, appressed-hispidulous toward the summit, the apex acuminate, awl-shaped, hard and sharp.

TYPE LOCALITY: Egg Harbor, New Jersey.

DISTRIBUTION: New Jersey to Georgia.

ILLUSTRATIONS: Pursh, Fl. Am. Sept. pl. 2; Bull. U. S. Dep. Agr. Agrost. 7: f. 32; Britt. & Brown, Ill. Fl. f. 238; ed. 2. f. 389; Bull. U. S. Dep. Agr. 772: f. 152.

2. *Amphicarpum floridanum* Chapm. Fl. S. U. S. 572. 1860.

An erect perennial with extensively creeping and branching scaly rhizomes; stems glabrous, 30-60 cm. tall, the nodes glabrous or hispidulous; leaf-sheaths papillose-pubescent, especially near summit, the lower overlapping, the upper shorter than the internodes; ligule densely ciliate, about 1 mm. long; blades appressed or ascending, sometimes spreading, oblong-lanceolate, rounded or partly clasping at the base, acute at apex, rather firm and stiff, glabrous or sometimes sparingly appressed-hispidulous, the margin thick and cartilaginous, sharply hispidulous-scabrous; 5-10 cm. long, 4-10 mm. wide, the uppermost somewhat reduced; panicle 5-15 cm. long, the few distant branches appressed, or in anthesis spreading, the lowermost as much as 6 cm. long, the axis scabrous; spikelets narrowly elliptic, about 6 mm. long, acute, glabrous, the angular pedicels hispid-scabrous; first glume small and nerveless or wanting; second glume and sterile lemma similar, as long as the spikelet, 7-nerved, one or two nerves sometimes faint, the sterile floret neuter, the palea wanting; fertile floret glabrous, as long as the second glume, acute; subterranean spikelets borne on branches from the base of the culms or from the rhizomes, the branches scaly at base with a naked peduncle bearing a single spikelet; spikelet glabrous, 8-10 mm. long, fusiform, at maturity turgid, the fruit spreading apart the glume and sterile lemma; first glume wanting; second glume and sterile lemma firm, equal, as long as the spikelet, several-nerved; fertile floret brownish, turgid-fusiform, subulate-pointed, the palea rounded and turgid from the inclosed caryopsis; caryopsis subspheric, 5 mm. long, 4.5 mm. wide, with a pubescent apiculate apex.

TYPE LOCALITY: Apalachicola River, Florida.

DISTRIBUTION: South Carolina to Florida.

ILLUSTRATION: Bull. U. S. Dep. Agr. Agrost. 7: f. 33.

77. *OLYRA* L. Syst. Nat. ed. 10. 1261. 1759.

Mapira Adans. Fam. Pl. 2: 39. 1763.

Woody climbing or straggling perennials with ample blades abruptly narrowed into a petiole, convolute in the bud before expanding, the consequent creases permanent and conspicuous in the mature blades. Spikelets unisexual, unlike in appearance, the staminate and pistillate together in panicles terminating the culm or leafy branches, the pistillate spikelets on clavate pedicels on the upper panicle branches or at the ends of the branches, the staminate spikelets on slender pedicels or sessile on the lower branches or on the lower part of the pistillate branches; pistillate spikelets ovate-lanceolate, usually setaceous-pointed; first glume wanting; second glume and sterile lemma membranaceous, nerved, acuminate-setaceous or long-acuminate, the glume longer-pointed than the lemma; fruit elliptic, lemma and palea thick, bony-indurated at maturity, the margins of the lemma scarcely inrolled; grain dorsally subcompressed, inclosed in the lemma and palea; staminate spikelets readily deciduous, much smaller than the pistillate, narrowly lanceolate, glumes and sterile lemma wanting, lemma and palea thin-membranaceous, the lemma 3-nerved, the palea 2-nerved.

Type species, *Olyra latifolia* L.

Fruit pitted.

Fruit not pitted.

Fruit silky-pubescent at base and margins.

Fruit smooth and glabrous.

Panicles, at least the primary, much more than 10 cm. long, many-flowered; pistillate spikelets more than 3 mm. long.

Fruit about 10 mm. long.

Fruit 5-6 mm. long.

Blades rounded or subcordate at the asymmetric base.

Blades cordate at the symmetric base.

Panicles ovoid, few-flowered, less than 3 cm. long; pistillate spikelets less than 3 mm. long.

1. *O. Standleyi*.

2. *O. yucatanana*.

3. *O. caudata*.

4. *O. latifolia*.

5. *O. cordifolia*.

6. *O. lateralis*.

1. *Olyra Standleyi* Hitchc. Proc. Biol. Soc. Wash. 40: 86. 1927.

Erect caespitose perennial; stems slender, 1-3 meters tall, the nodes in dry specimens presenting one or two raised dark sharp edges, sometimes hirsutulous on these ridges; ligule shorter than the somewhat flaring border at top of leaf-sheath; blades oblong-elliptic, as

much as 17 cm. long and 4 cm. wide (the lower not seen), somewhat cordate at base, puberulent on the upper surface at base and on the short petiole; panicle of several fastigate branches spreading at maturity, the axis extending above the whorl and bearing one or two ascending branches, the main branches 8-12 cm. long, bearing appressed spikelets, 1-4 pistillate spikelets on the upper part, staminate spikelets below, the peduncle and base of the branches more or less puberulent, smaller axillary panicles from the upper sheaths; staminate spikelets about 1 cm. long, the lemma narrow, acuminate-pointed, the palea a little shorter, acute; pistillate spikelets glabrous, the glume and sterile lemma 5-nerved, rather thin, somewhat reticulate with cross veins, gradually acuminate, pointed, the glume (including the point) about 2 cm. long, the sterile lemma a little shorter; fruit narrow, about 8 mm. long, narrowed to an obtuse apex, glabrous, minutely pitted, the pits oblong; palea nearly as long as the lemma, almost inclosed by the margins of the lemma.

TYPE LOCALITY: El Muñeco, Costa Rica.

DISTRIBUTION: Known only from the type collection.

2. *Olyra yucatana* Chase, Proc. Biol. Soc. Wash. 21: 178. 1908.

Stems tall, slender; leaf-sheaths mostly longer than the internodes, crisp-puberulent; blades oblong-lanceolate, 13-16 cm. long, one third as wide, abruptly acuminate, trapezoid-truncate at base; panicles contracted, often a second one from the upper sheath, 8-15 cm. long, 2 cm. wide, axis and rachis scabrous; staminate spikelets on the lower branches and lower part of upper pistillate branches, 8 mm. long including the setaceous tip of the lemma, palea about 2 mm. shorter; pistillate spikelets 15-17 mm. long, the glume and sterile lemma scabrous, 7-nerved, 8 mm. long, and acuminate into flexuous setaceous tips as long again in the glume, half as long in the sterile lemma; fruit elliptic, obscurely pointed, 7 mm. long, 4 mm. wide, white and shining or old ivory toward maturity, the lemma silky-pubescent at base and on the margins.

TYPE LOCALITY: Pocoboch, Yucatán.

DISTRIBUTION: Yucatán.

ILLUSTRATION: Field Mus. Publ. Bot. 3: 46.

3. *Olyra caudata* Trin. Linnaea 10: 292. 1836.

Olyra Pittieri Hack. Oesterr. Bot. Zeits. 51: 461. 1901.

Stems simple, 60 cm. or more tall, glabrous; leaf-sheaths longer than the internodes, glabrous; ligule firm, rounded, puberulent, 3-5 mm. long; blades oblong-lanceolate, 20-26 cm. long, 6-7 cm. wide, abruptly narrowed at the somewhat unequal base into a hispidulous petiole about 3 mm. long, acuminate, scabrous on the margin, especially at apex, glabrous, somewhat glaucous and weakly reticulate beneath, scaberulous beneath at apex; panicle corymbiform, simple, spreading, the axis short, the branches racemes 6-8, simple, fastigate, as much as 10 cm. long, the rachis compressed-triangular, the angles scabrous; staminate spikelets in twos or threes along the raceme, shortly pedicelled, the pistillate single at the apex of each raceme; staminate spikelets 7 mm. long, linear-lanceolate, acute, awnless, glabrous, the glume and sterile lemma 3-nerved; glume and sterile lemma of pistillate spikelets ovate, scaberulous, 7- to 9-nerved, about 1 cm. long, extending into a slender scabrous point 3-4 cm. long (total length 4-5 cm.); fertile lemma oblong-ovate, smooth, 9-10 mm. long, 5 mm. wide, slightly umbonate, gray or plumbeous.

TYPE LOCALITY: Peru.

DISTRIBUTION: Costa Rica to Brazil and Peru.

4. *Olyra latifolia* L. Syst. Nat. ed. 10. 1261. 1759.

Olyra paniculata Sw. Prodr. 21. 1788.

Olyra arundinacea H.B.K. Nov. Gen. & Sp. 1: 197. 1816.

Olyra latifolia arundinacea Griseb. Fl. Brit. W. Ind. 535. 1864.

Glabrous perennial, bamboo-like in aspect, commonly 5 meters tall, the strong hollow stems sometimes 1 cm. thick, erect and unsupported, the summit only arching (or weaker stems leaning among brush, the lower half to two thirds simple and naked, the short sheaths

bladeless or nearly so, the elongate internodes blotched with dull purple, branching from the upper nodes, the branches commonly fascicled, divaricate, often 1 meter long, sometimes again branching; leaf-sheaths glabrous, puberulent, scaberulous or hispidulous; ligule membranaceous or chartaceous, 1-5 mm. long, puberulent or glabrous; blades oblong-lanceolate, glabrous or puberulent or scaberulous, rounded or subcordate at the unequal base, contracted into a glabrous or hispidulous petiole 1-2 mm. long, acuminate, as much as 25 cm. long and 10 cm. wide on the primary culms, often much smaller on the branches, the lowermost on both primary culm and branches rudimentary; panicles 10-15 cm. long, about two thirds as wide, those of the secondary branches reduced, the branches stiffly ascending or spreading, each bearing a single large long-acuminate pistillate spikelet at the thickened summit and several small slender-pedicelled staminate spikelets along the rachis; staminate spikelets 3-5 mm. long, narrow, the lemma extending into an awn about 5 mm. long, the palea similar, acuminate; second glume and sterile lemma of pistillate spikelets membranaceous, ovate-lanceolate, glabrous or scabrous, 7- to 9-nerved, acuminate or extending into a scabrous point as much as 2 cm. long; fruit oval, rounded at both ends, flattened, 4-5 mm. long, 3 mm. wide, smooth and shining, pearly white, gray, or plumbeous.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Mexico and the West Indies to Brazil; reported from Florida.

ILLUSTRATIONS: Trin. Ic. *pl.* 346; Bull. U. S. Dep. Agr. 772: *f.* 153; Proc. Biol. Soc. Wash. 21: 177. *f.* 1.

5. *Olyra cordifolia* H.B.K. Nov. Gen. & Sp. 1: 198. 1816.

Resembling *O. latifolia*; leaf-blades on the average larger, glabrous, oblong, abruptly rounded to the cordate symmetric base, rather abruptly narrowed toward apex to a slender twisted point, 15-25 cm. long, 7-10 cm. wide, the pubescent petiole mostly less than 5 mm. long.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Southern Mexico; also from Venezuela to Paraguay.

ILLUSTRATION: Trin. Ic. *pl.* 342.

6. *Olyra lateralis* (Presl) Chase, Proc. Biol. Soc. Wash. 21:

179. 1908.

Panicum laterale Presl, Rel. Haenk. 1: 305. 1830.

Plants much-branched, straggling or climbing; stems slender, rather wiry, glabrous, the nodes swollen, more or less pubescent; leaf-sheaths pubescent, striate, villous on the margin, mostly 1-2 cm. long, the truncate summit bearing a few long cilia; ligule a membrane less than 0.5 mm. long, bearing short cilia; blades oblong-lanceolate, 1.5-4.5 cm. long, 7-12 mm. wide, slightly ciliate and more or less puberulous at the truncate or subcordate base, the width about the same in the lower third or half, gradually narrowed above to a rounded tip, this acute or slightly apiculate, the surface glabrous or slightly scabrous above, glabrous and sometimes glaucous beneath, several-nerved, striate between the nerves, the petiole pubescent, about 1 mm. long; panicles on slender peduncles, ovoid, 2-3 cm. long, rarely longer, few-flowered, the branches terete, glabrous, or the lower puberulent, the pulvini slightly puberulent; staminate spikelets appressed on the lower branches; pistillate spikelets elliptic or ovoid, flattish on one side, convex on the other, 2.5 mm. long, 1.4 mm. wide, apiculate, pubescent, brown at maturity; second glume and sterile lemma about equal, the latter inclosed within the margins of the former, the sterile palea wanting; fruit smooth, brownish, inclosed within the margins of the sterile lemma, about 1.5 mm. long, 1 mm. wide.

TYPE LOCALITY: Peru.

DISTRIBUTION: Costa Rica to Bolivia.

78. LITHACHNE Beauv. Agrost. 135. 1812.

Cespitose herbaceous perennials with simple stems, the blades contracted at base and convolute in the bud as in *Olyra*. Spikelets unisexual, unlike in appearance; inflorescence consisting of few to several small panicles or racemes, solitary or borne in fascicles of two to five, short-erect from the sheaths, each bearing one pistillate spikelet on a clavate pedicel

at the summit, and one to several staminate spikelets on slender pedicels below; a narrow, short-exserted, terminal, wholly staminate panicle often present, rarely a fascicle of 2 or 3 such panicles; pistillate spikelets V-shaped owing to the greatly swollen fertile lemma; first glume wanting; second glume and sterile lemma membranaceous, nerved, unequal, long-acuminate; fruit laterally subcompressed (forming an exception to the tribe character of dorsally compressed fruit in *Paniccae*); lemma and palea thick bony-indurate, the lemma greatly swollen or gibbous on the back, so as to appear in side view half obcordate-truncate, the margins inrolled over a narrow palea; grain laterally subcompressed, inclosed in the lemma and palea. Staminate spikelets narrowly lanceolate, reduced to the thin-membranaceous lemma and palea and 3 stamens.

Type species, *Olyra pauciflora* "L." [Sw.].

Leaf-blades 1.5-3 cm. wide.
Leaf-blades less than 5 mm. wide.

1. *L. pauciflora*.
2. *L. Pineti*.

1. *Lithachne pauciflora* (Sw.) Beauv.; Poir. Dict. Sci. Nat. 27:
60. 1823.

Olyra pauciflora Sw. Prodr. 21. 1788.
Olyra axillaris Lam. Encyc. 4: 547. 1797.
Lithachne axillaris Beauv. Agrost. 166. 1812.

Stems tufted, slender, hard, glabrous, geniculate and naked below, ascending and leafy above, 30-50 cm. tall; leaf-sheaths mostly shorter than the internodes, striate, glabrous or puberulous between the nerves, ciliate; ligule a short membrane less than 0.5 mm. long; blades flat, asymmetrically rhombic-lanceolate, 5-8 cm. long, 1-2.5 cm. wide, acuminate, spreading, glabrous, sometimes puberulous around the base or sparsely hispidulous, scabrous on the margin and toward apex, contracted into a petiole about 1 mm. long, this puberulous and also hispid; panicles narrow and few-flowered, from the upper sheaths, more or less included, the branches ascending or appressed; staminate spikelets narrow, 3-4 mm. long, the lemma 3-nerved, scabrous on the keel, acuminate into a short awn, the palea similar, 2-nerved, acuminate, a little shorter than the lemma; pistillate spikelets usually only 1-3 in each panicle, the second glume and sterile lemma similar, oblong, abruptly narrowed above the fruit into a slender point, in all 8-10 mm. long, 7- to 9-nerved, glabrous; fruit pearly-white, triangular-truncate, 4-5 mm. long, 3 mm. wide at summit.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies and southern Mexico to northern Argentina.

ILLUSTRATIONS: Proc. Biol. Soc. Wash. 21: 181, f. 2; Beauv. Agrost. pl. 24, f. 11.

2. *Lithachne Pineti* (Wright) Chase, Proc. Biol. Soc. Wash. 21:
182. 1908.

Olyra Pineti Wright; Griseb. Mem. Am. Acad. II. 8: 532. 1862.

Stems tufted, spreading, capillary, glabrous, about 20 cm. long, naked below; leaf-sheaths about 1 cm. long, sulcate, glabrous; ligule a short membrane less than 0.5 mm. long; blades flat, spreading or reflexed, rather remote below, somewhat crowded at summit, oblong-elliptic, 10-15 mm. long, 2-3 mm. wide, rounded at base, rather abruptly acute at apex, many-nerved, glabrous or slightly scabrous, the petiole less than 1 mm. long, hispidulous; panicles 1 to few-flowered from the upper sheaths; staminate spikelets lanceolate-acuminate; pistillate spikelets about as in *L. pauciflora*, the second glume and sterile lemma about 5 mm. long; fruit about 3 mm. long, apiculate.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba and Haïti.

79. *RADDIA* Bertol. Opusc. Sci. Bologna 3: 410. 1819.

Strepthium Schrad.; Nees, Agrost. Bras. 298. 1829.

Low caespitose herbaceous perennials with simple stems, the blades narrowed at the base, the creases (folds in the bud) indistinct, usually conspicuously distichous and turned with

the surfaces on a single plane. Spikelets unisexual, unlike in appearance; the staminate and pistillate in distinct small panicles, the staminate terminal or from the upper nodes, the pistillate axillary, short-exserted, few-flowered, usually from the lower nodes (a few staminate spikelets sometimes borne below the pistillate spikelets); pistillate spikelets lanceolate; first glume wanting, second glume and sterile lemma membranaceous, strongly nerved, subequal, acuminate; fruit dorsally subcompressed, lanceolate, acute; lemma and palea bony-indurate but less so than in *Olyra* and *Lithachne*, the margins flat, nearly meeting over the palea. Staminate spikelets linear-lanceolate.

Type species, *R. brasiliensis* Bertol.

Sheaths glabrous or nearly so.

Blades 4-7 cm. long.

Blades 1.5-3 cm. long.

Sheaths densely hirsute.

1. *R. strictiflora*.

2. *R. concinna*.

3. *R. costaricensis*.

1. *Raddia strictiflora* (Fourn.) Chase, Proc. Biol. Soc. Wash. 21: 185. 1908.

Strepium strictiflorum Fourn. Bull. Soc. Bot. Belg. 15: 465. 1876.

Olyra strictiflora Hemsl. Biol. Centr. Am. Bot. 3: 510. 1885.

Stems caespitose, ascending from a geniculate base, striate, puberulent between the nerves, 30-50 cm. tall, naked below, the leaves crowded toward the summit; leaf-sheaths striate, glabrous, or puberulent between the nerves, ciliate, produced upward on each side 1-3 mm.; ligule firm, rounded, extending between the projections of the sheath, puberulent, 1-3 mm. long; blades oblong-elliptic, 3-6 cm. long, 1.5-2 cm. wide, rounded below into a pubescent petiole about 1 mm. long, abruptly contracted at apex into an acuminate subulate point, glabrous, or slightly scaberulous above; panicles narrow, the branches appressed, more or less included in the upper sheaths, 2-4 cm. long; staminate spikelets narrow, about 5 mm. long, acuminate, the lemma membranaceous, 3-nerved, the palea similar, 2-nerved, a little shorter than the lemma; pistillate spikelets narrow, 10-12 mm. long, 2 mm. wide, the second glume and sterile lemma similar, rather firm, oblong, acuminate, 7-9-nerved, the 2 or 3 pairs of nerves near the margin, leaving a wide internerve on each side the midnerve, glabrous or minutely scaberulous; fruit about 7 mm. long and 1.5 mm. wide, brownish.

TYPE LOCALITY: Arroyo Sello, Mexico.

DISTRIBUTION: Southern Mexico to Honduras.

2. *Raddia concinna* (Hook. f.) Chase, Proc. Biol. Soc. Wash. 21: 185. 1908.

Olyra concinna Hook. f. Bot. Mag. pl. 7469. 1896.

Stems caespitose, slender, erect, 15-30 cm. tall, the conspicuously distinct leafy shoots resembling the pinnately compound leaves of a leguminous plant, the leaf-sheaths overlapping, slightly compressed; blades oblong, 1.5-3 cm. long, 5-10 mm. wide, somewhat abruptly pointed, glaucous beneath; staminate spikelets about 1 cm. long, on slender pedicels; pistillate spikelets 7-10 mm. long, on thickened pedicels; fruit a little shorter than the glume and sterile lemma, narrow, nearly terete, smooth and glabrous.

TYPE LOCALITY: San José, Costa Rica.

DISTRIBUTION: Nicaragua and Costa Rica.

ILLUSTRATION: Bot. Mag. pl. 7469.

3. *Raddia costaricensis* Hitchc. Proc. Biol. Soc. Wash. 40: 87. 1927.

Erect caespitose perennial; stems stiff, sometimes bent at the nodes, glabrous, 20-30 cm. tall; leaf-sheaths overlapping, densely hirsute; blades crowded, rather firm and stiffly spreading, oblong-lanceolate, rounded at base, acute, 3-4 cm. long, 4-6 mm. wide, villous beneath, glabrous or sparsely hirsute on the upper surface, revolute in drying; staminate panicles narrow, pale, the spikelets 3-4 mm. long; pistillate panicles consisting of a few (apparently 1 or 2) pistillate

spikelets and several staminate ones below, the pistillate spikelets glabrous, 7 mm. long, with an apiculation 1.5 mm. long; staminate spikelet glabrous, pale, 3 mm. long.

TYPE LOCALITY: Río Hondo, Costa Rica.

DISTRIBUTION: Known only from the type collection.

80. MNIOCHLOA Chase, Proc. Biol. Soc. Wash. 21: 185. 1908.

Low tufted perennials, the flowering stems with 1-3 nodes, the short sheaths destitute of blades, distinct from the sterile stems, which bear several to many more or less distichous, flat, ovate-lanceolate blades less than 2 cm. long, narrowed into a short petiole. Inflorescence monoecious, consisting of two slender spike-like racemes, one pistillate, the other staminate, at the summit of a slender naked culm; pistillate spikelets dorsally compressed, 1-flowered, lanceolate-oblong, solitary on very short clavate pedicels along one side of a slender triangular rachis; first glume wanting, second glume and sterile lemma subequal, not setaceous; fertile lemma white-cartilaginous, subindurated, the margins flat, infolding a palea of like texture and equal length; grain dorsally compressed; staminate spikelets smaller than the pistillate, glumes and sterile lemma wanting, lemma and palea membranaceous, equal, the lemma 1-nerved, palea 2-nerved; stamens 3.

Type species, *Digitaria pulchella* Griseb.

Flowering stems much exceeding the sterile ones; fruit glabrous.

1. *M. pulchella*.

Flowering stems about equal in height; fruit pubescent.

2. *M. strephioides*.

1. *Mniochloa pulchella* (Griseb.) Chase, Proc. Biol. Soc. Wash. 21: 186. 1908.

Digitaria pulchella Griseb. Cat. Pl. Cub. 231. 1866.

Strephium? pulchellum Wright; Sauv. Anal. Acad. Ci. Habana 8: 202. 1871.

Flowering stems filiform, 15-25 cm. tall, the nodes 2 or 3, at least the lower geniculate, the upper internode and peduncle elongate; sterile stems spreading or prostrate, the distichous leaves approximate; leaf-sheaths of fertile stem slightly inflated, 1-3 cm. long, those of the sterile shoots ciliate on the margin and at the summit, at least the upper overlapping; blades firm, oblong-ovate, 8-18 mm. long, 3-5 mm. wide, subacute, sparsely hairy along the mid-nerve, pale green above, dark purplish beneath, undulate on the margins; racemes erect or ascending, 2-3.5 cm. long, the staminate slightly shorter than the pistillate; spikelets glabrous, 2.5 mm. long; staminate spikelets 1.5 mm. long, glabrous, the glume and sterile lemma of the pistillate spikelets about one fourth shorter than the glabrous fruit.

TYPE LOCALITY: El Yunque de Baracoa, Cuba.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Proc. Biol. Soc. Wash. 21: pl. 4.

2. *Mniochloa strephioides* (Griseb.) Chase, Proc. Biol. Soc. Wash. 21: 186. 1908.

Olyra strephioides Griseb. Cat. Pl. Cub. 229. 1866.

Flowering stems slender, 4-7 cm. tall, equaling or shorter than the sterile stems; sterile stems less delicate than in the preceding, puberulent in lines, naked below, the nodes pubescent; leaf-sheaths striate, puberulent, ciliate on margin and at summit, the upper overlapping; blades triangular-ovate, rather firm, 10-15 mm. long, 4-8 mm. wide, truncate and somewhat unequal at base, striate with many nerves, scaberulous, or puberulent beneath; racemes erect, 1-3 cm. long, about equal; staminate spikelets scarcely half as long as the pistillate, glabrous; pistillate spikelets 3.5 mm. long, the glume and sterile lemma glabrous, exceeding the fruit; fruit clothed with white silky hairs.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Western Cuba.

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