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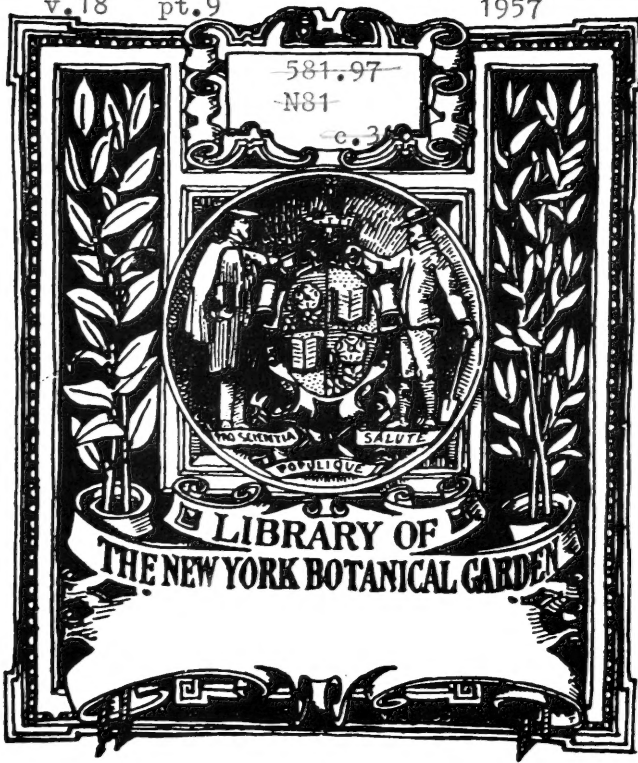
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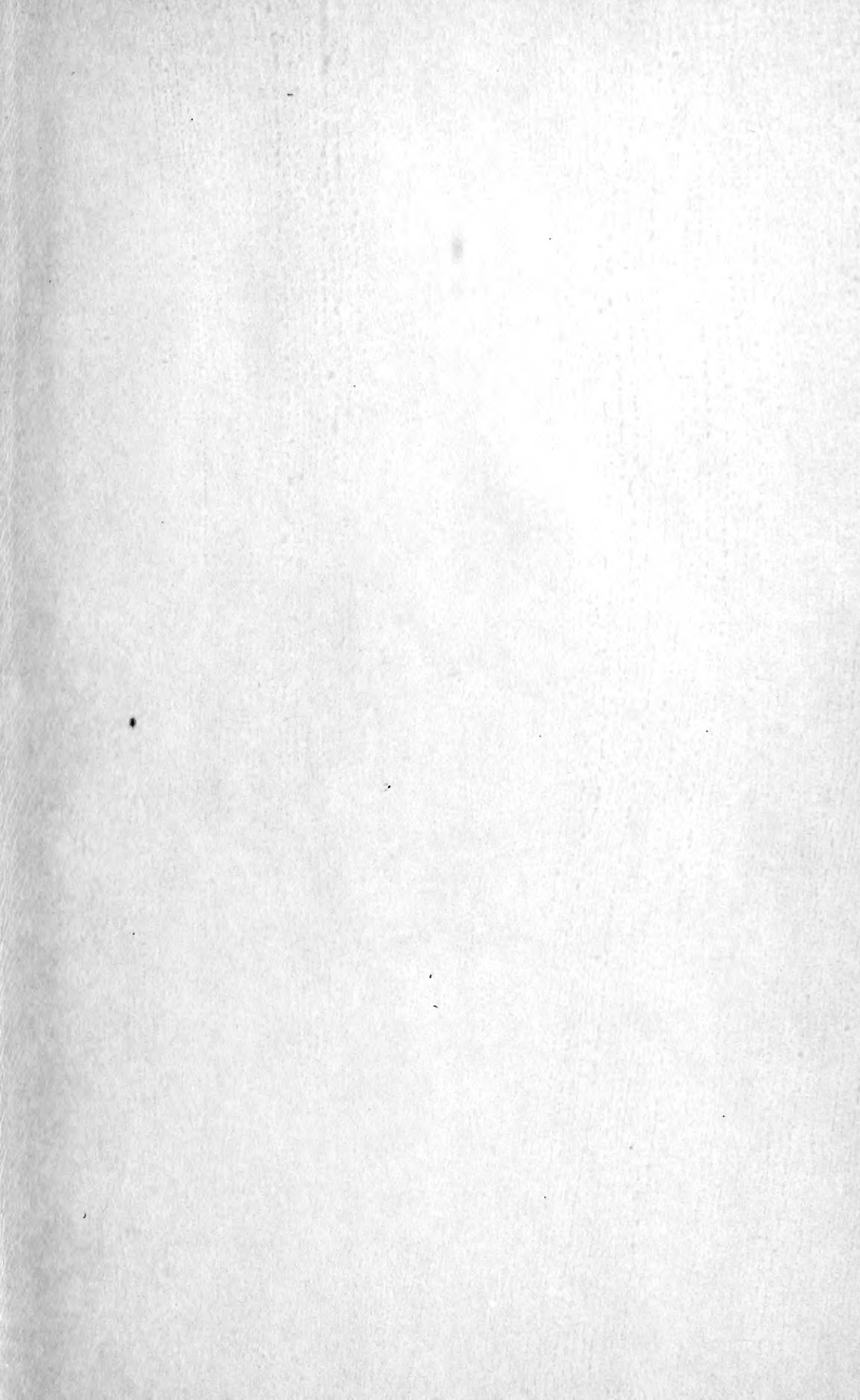
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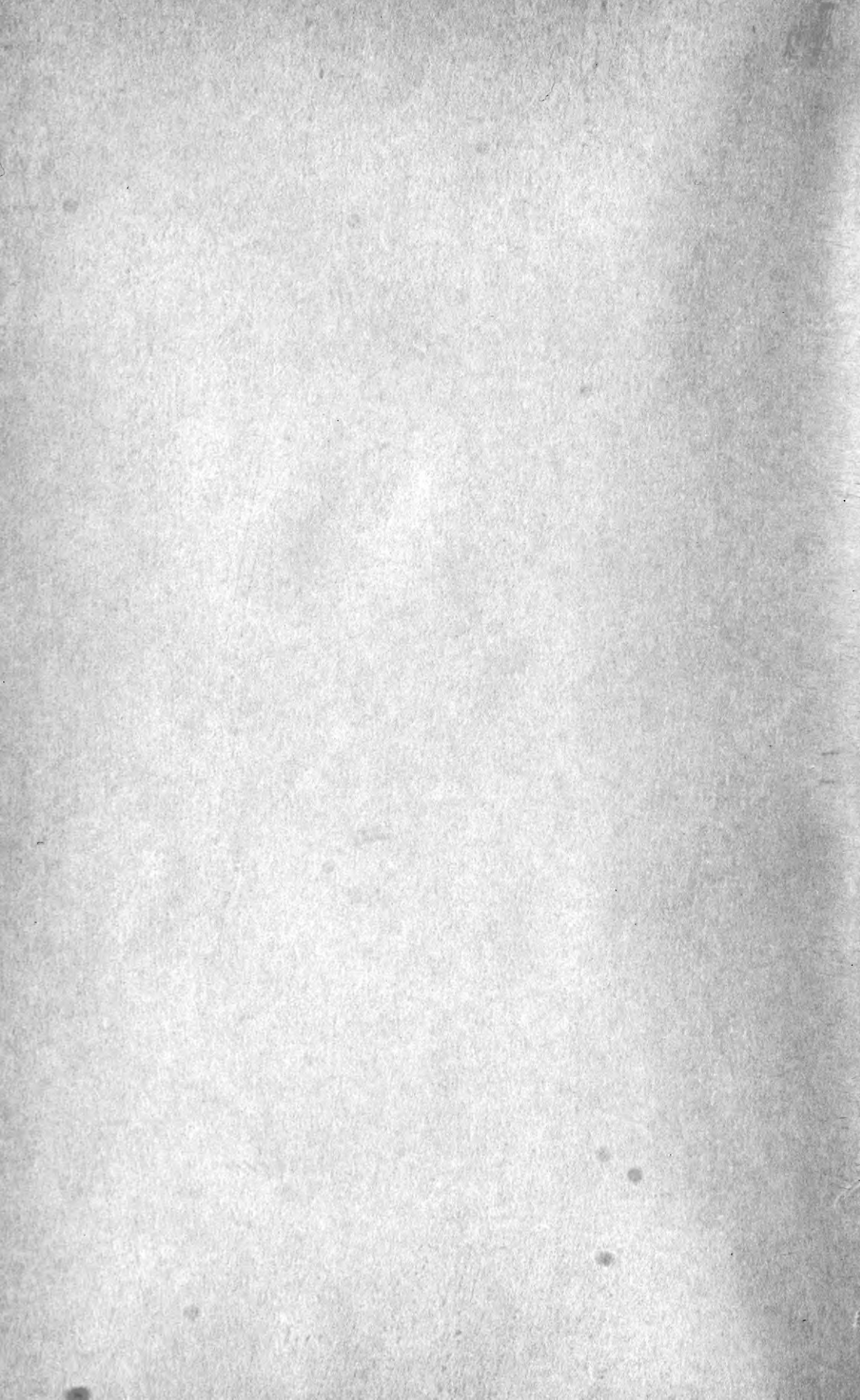
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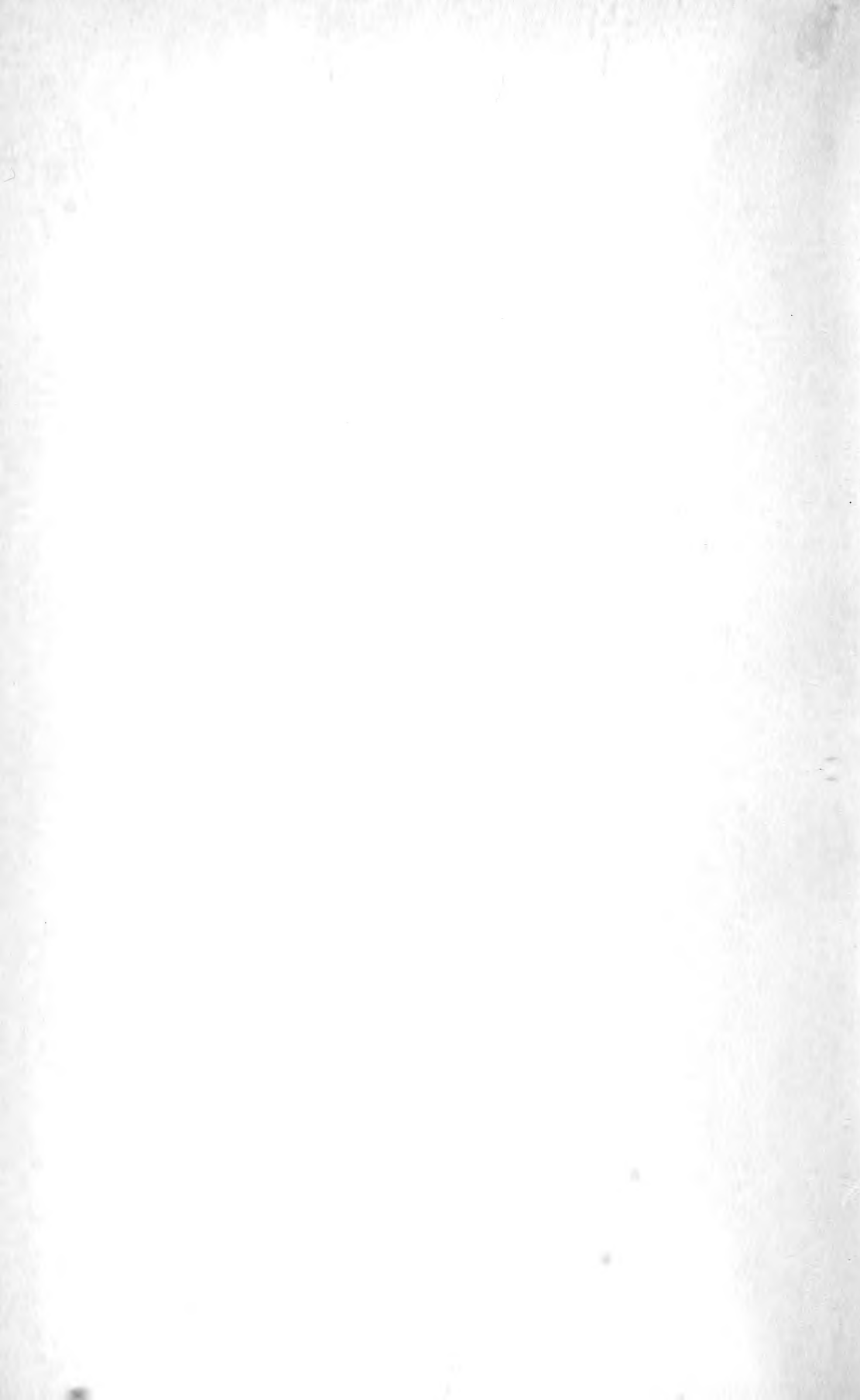
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1957









NORTH AMERICAN FLORA

(POALES)

(CYPERACEAE)

SCIRPEAE (CONTINUATIO)

HENRY KNUT SVENSON



Subscription Price, \$1.50

Separate Copies, \$2.00

PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

Issued November 5, 1957

v. 18
pt. 9

Revised Key to Tribe 2. Scirpeae.*

BY HENRY KNUTE SVENSON

- Scales of the spikelet spirally imbricate.
 Base of the style not enlarged.
 Scales of the spikelet not subtended by inner scales.
 Scales usually not membranous, the bristles, when present, 1-8.
 Bristles simple, sometimes lacking. 1. SCIRPUS.
 Bristles with plate-like thickenings (except in *F. incompleta*). 2. FUIRENA.
 Scales membranous, with spreading or loosely ascending tips, the
 bristles usually numerous and silky-elongate. 3. ERIOPHORUM.
 Each spikelet-scale subtended by an inner, commonly rudimentary,
 hyaline scale. 4. HEMICARPHA.
 Base of the style enlarged.
 Style-base persistent as a tubercle.
 Scales glabrous; spikelet solitary, terminating the leafless culm. 5. ELEOCHARIS.
 Scales pubescent; spikelets rarely solitary. 6. BULBOSTYLIS.
 Style-base deciduous; bristles absent. 7. FIMBRISTYLIS.
 Scales of the spikelet 2-ranked.
 Base of the style not persistent as a tubercle. 8. ABILDGAARDIA.
 Base of the style persistent as a tubercle. 5. ELEOCHARIS.

2. FUIRENA Rottb. Descr. & Ic. 70. 1773.

Vaginaris Pers. Syn. Pl. 1: 70. 1805.

More or less pubescent perennial (rarely annual) plants, occasionally with tuberous-thickened rhizomes. Culms usually leafy, angled and striate, with many-flowered terete spikelets in terminal and axillary clusters. Scales spirally imbricate, awned. Stamens 3. Style 3-cleft, deciduous. Perianth normally of six bristles, the inner three usually scale-like and inflated and ovate at the apex. Achene sharply trigonous, whitened, becoming brown when mature, often prolonged into a slender beak as long as the body of the achene.

Type species, *F. umbellata* Rottb.

- Leaves reduced to sheaths without blades. 1. *F. scirpoidea*.
 Culms leafy. 2. *F. incompleta*.
 Perianth of 6 slender retrorsely-toothed bristles.
 Three inner bristles (scales) of the perianth ovate-thickened at the apex,
 and usually awn-tipped.
 Three outer bristles capillary to filiform (sometimes enlarged in the
 middle in *F. simplex*).
 Scales of the spikelet with short (1 mm. long) erect mucro; spike-
 lets erect. 3. *F. robusta*.
 Scales of the spikelet with a long filiform awn; spikelets spreading
 or reflexed.
 Beak of the achene hispid to pubescent; awn terminal. 4. *F. squarrosa*.
 Beak of the achene glabrous; awn rising from below the apex
 of the scale. 5. *F. simplex*.
 Three outer bristles lacking; perianth-scales nearly sessile.
 Perianth-scales membranous, with a slender recurved apical awn. 6. *F. umbellata*.
 Perianth scales spongy-thickened at the apex; apical bristle usually
 lacking. 7. *F. bulbipes*.

1. *Fuirena scirpoidea* Michx. Fl. Bor.-Am. 1: 38. 1803.

Vaginaris Richardi Pers. Syn. Pl. 1: 70. 1805.

?*Fuirena longa* Chapm. Fl. S. U. S. ed. 3. 541. 1897. (Appalachicola, Florida.)

Perennial with elongate, woody, horizontal rootstocks; culms erect, 2-6 dm. tall, the leaves represented by loose sheaths 2-3 cm. long; spikelets terminal, clustered or sometimes solitary, 5-12 mm. long, the pubescent scales with a short, subulate mucro; perianth-scales with thickened, ovate body (1 mm. long, not awned) with stipe 1 mm. long; achene becoming nearly black when mature, the somewhat hispid beak slightly longer than the scales; bristles equaling the stipe; anthers 1.5 mm. long.

* See p. 479.

TYPE LOCALITY: Florida.

DISTRIBUTION: Swamps and pineland; on the coastal plain, Georgia to Louisiana; Cuba (Pinar del Río).

ILLUSTRATIONS: Michx. Fl. Bor.-Am. 1: pl. 7; Clarke, Ill. Cyp. pl. 58, f. 1-3; Small, Man. SE. Fl. 172.

2. *Fuirena incompleta* Nees in Mart. Fl. Bras. 2¹: 107. 1842.

Fuirena hexachaeta Schlecht. Linnaea 19: 69. 1847. (Toluca, Mexico.)

Perennial with creeping rootstocks; culms slender, 4-6 dm. tall; leaves narrow, stiff, pubescent, 5-12 cm. long, 2-5 mm. wide; inflorescence of dense heads of 6-10 spikelets in a terminal panicle; spikelets 8-12 mm. long, oblong, the aristate, pubescent scales not closely appressed; bristles usually 6, slender, retrorsely barbed, equaling or exceeding the short-beaked achene; anthers 2 mm. long.

TYPE LOCALITY: Goyaz, Brazil.

DISTRIBUTION: Wet places: Mexico; Guatemala; Panama; South America.

ILLUSTRATIONS: Clarke, Ill. Cyp. pl. 58, f. 6, 7.

3. *Fuirena robusta* Kunth, Enum. Pl. 2: 185. 1837.

Fuirena bahiensis Lindl. & Nees; Nees in Mart. Fl. Bras. 2¹: 108. 1842. (Brazil.)

Fuirena latifolia Steud. Syn. Cyp. 126. 1855. (Bahia, Brazil.)

Fuirena schizophylla C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 82. 1871. (Vuelta de Abajo, Cuba.)

Tall, erect perennial; culms thick, spongy, 1-2 m. high, 4-5 angled; leaves numerous, glabrous, with short, thick, slightly scabrous blades 5-10 cm. long, mostly 1-2 cm. wide; spikelets in axillary and terminal compound umbels, grayish-pubescent or brownish, 5-10 mm. long, acute, the appressed scales tipped with a short, stout mucro; perianth-scales stipitate, the body ovate and thickened, aristate at the apex; bristles slender, nearly equaling the scales, usually smooth; achene with a glabrous short beak; anthers 1 mm. long.

TYPE LOCALITY: Southern Brazil.

DISTRIBUTION: Cuba; Panama (Barro Colorado Island, *L. H. Bailey* 256); Suriname; Brazil.

ILLUSTRATION: Clarke, Ill. Cyp. pl. 59, f. 12.

4. *Fuirena squarrosa* Michx. Fl. Bor.-Am. 1: 37. 1803.

Fuirena hispida Ell. Bot. S. C. & Ga. 1: 579. 1821. ("High ridges between the Flint and Chattahoochie Rivers, Georgia.")

Fuirena pumila Torr.; Spreng. Syst. 1: 237. 1825. (Long Island, N. Y.)

Fuirena squarrosa β *pumila* Torr. Comp. 46. 1826.

Fuirena Torreyana Beck, Bot. U. S. 429. 1833.

Fuirena squarrosa var. *hispida* Chapm. Fl. S. U. S. 514. 1860.

Fuirena squarrosa var. *brevisetata* Coville, Bull. Torrey Club 17: 6. 1890.

Fuirena breviseta Coville; Harper, Bull. Torrey Club 28: 466. 1901.

Perennial, to 1 m. tall, with a short, creeping or bulbous rootstock, or becoming dwarfed and annual (var. *pumila*); culms slender, many-angled, glabrous to hispid; leaves and sheaths nearly glabrous to densely hispid, 2-7 mm. wide, the blades to 2 dm. long; spikelets 2-8, 5-15 mm. long, in squarrose, capitate terminal or axillary clusters, the spreading awns of the hispid scales prominent; perianth-scales long-aristate at the apex; bristles from very short to as long as the scales, smooth to retrorsely toothed; mature achene dark brown, with a long prominently hispid beak sometimes nearly glabrous in var. *pumila*; anthers 0.5-0.75 mm. long.

TYPE LOCALITY: Georgia.

DISTRIBUTION: Massachusetts, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia to Texas and Oklahoma (chiefly on the coastal plain), Kentucky, Michigan, Indiana, and Illinois; Cuba (Western Cuba and Isle of Pines); Puerto Rico.

ILLUSTRATIONS: Ell. Bot. S. C. & Ga. pl. 1, f. 3; Bull. Torrey Club 17: pl. 98, f. 3-6; Rep. N. J. Mus. 1910: pl. 19, f. 4; A. Gray, Man. ed 7. 197. f. 306; Britt. & Brown, Ill. Fl. ed. 2. 1: 338. f. 832, 833.

NOTE: Northward the plants become annual (var. *pumila*) with more slender and elongate bristles and scale setae, and a less hispid (sometimes nearly glabrous) style. Transitions to the typical southern plant are numerous.

5. *Fuirena simplex* Vahl, Eclog. 2: 8. 1798.

- Fuirenia obtusiflora* Vahl, Eclog. 2: 8. 1798. (South America.)
Fuirenia squarrosa *e* (*aristulata*) Torr. Ann. Lyc. N. Y. 3: 291. 1836. (Arkansas?)
Fuirenia Schiedeana Kunth, Enum. Pl. 2: 183. 1837. (Vera Cruz, Mexico.)
Fuirenia aristulata Steud. Syn. Cyp. 127. 1855.
Fuirenia squarrosa var. *macrostachya* Britton, Bull. Torrey Club 11: 87. 1884.
Fuirenia repens Böck. Bot. Jahrb. 7: 277. 1886. (San Luis Potosí, Mexico.)
Fuirenia simplex f. *macrostachya* Coville, Bull. Torrey Club 17: 4. 1890.
Fuirenia cylindrica Bush, Missouri Bot. Gard. Rep. 16: 91. 1905. (Dona Ana County, New Mexico; an aberrant, probably pathologic collection.)
Fuirenia ciliata Bush, Missouri Bot. Gard. Rep. 16: 97. 1905. (Smith County, Texas.) Not *F. ciliata* Leprieur ex Steud. 1855.
Fuirenia zacapana Bartlett in Rob. & Bartl. Proc. Am. Acad. 43: 50. 1907. (Gualan, Guatemala.)
Fuirenia primaria M. E. Jones, Contr. W. Bot. 18: 25. 1933, e descr. (Baja California.)

Perennial with a ligneous, creeping, occasionally tuber-bearing rootstock; culms angled, slender, usually elongate, 1–8 dm. tall; leaves 3–25 cm. long, 3–10 mm. wide, nearly glabrous to densely hispid; spikelets 2–8, 6–15 mm. long (20 mm. in “var. *macrostachya*”), in squarrose, capitate terminal or axillary clusters, the long, spreading awns of the hispid scales prominent; perianth-scales long-stipitate, the inflated body with a subapical awn; bristles shorter than or exceeding the scales; mature achene yellowish-brown, the long, somewhat thickened beak glabrous; anthers 1 mm. long.

TYPE LOCALITY: Baia Chica, Venezuela (?).

DISTRIBUTION: Nebraska and Missouri, south to Oklahoma and Texas; Mexico; British Honduras; Guatemala; western Cuba (including the Isle of Pines).

ILLUSTRATIONS: Bull. Torrey Club 17: pl. 98, f. 2; Field Mus. Publ. Bot. 3: 82; Britt. & Brown, Ill. Fl. ed. 2. 1: 338, f. 834; Carn. Inst. Wash. Publ. 522: 297.

NOTE: “Var. *macrostachya*,” a form with large spikelets, occurs in Texas and Oklahoma. *F. ciliata* Bush is a pubescent form with smooth bristles, abundant from Missouri to Texas. *F. zacapana* Bartlett is an elongate form with short scale-mucro and smooth bristles.

6. *Fuirenia umbellata* Rottb. Descr. & Ic. 70. 1773.

- Fuirenia paniculata* L. f. Suppl. 105. 1781.
Fuirenia camptotracha C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 82. 1871.
Fuirenia tereticulmis Presl, Rel. Haenk. 1: 180. 1828, fide Böck. Linnaea 37: 111 (1871). (Acapulco, Mexico.)

Perennial with short, thick rootstocks, occasionally tuber-bearing; culms usually stout (6–15 dm. tall), erect, often 4-angled, with loose sheaths; leaves flat, 7–16 cm. long, 5–25 mm. wide, glabrous or sparingly pilose; panicles pilose, 1–5, terminal and in the upper leaf-axils; spikelets numerous in capitate clusters, acute, oblong to linear-oblong, 6–10 mm. long, the scales greenish-brown, pubescent, aristate, with spreading or recurved awns; perianth-scales nearly sessile, obovate, membranous and translucent, the apex tipped by a falcate to recurved, capillary seta; scales a little longer than the smooth, short-beaked, trigonous achene; anthers 1 mm. long.

TYPE LOCALITY: Suriname.

DISTRIBUTION: Meadows and marshes: Mexico to Panama; Cuba; Jamaica; Hispaniola; Puerto Rico; Guadeloupe to Trinidad; tropical South America; Old World tropics.

7. *Fuirenia bulbipes* Blake, Contr. U. S. Nat. Herb. 24: 2. 1922.

- Fuirenia umbellata* var. *unguiculata* Kükenth. Repert. Sp. Nov. 23: 200. 1926. (Isle of Pines, Cuba: Ekman 11485).

Closely resembling *F. umbellata*, from which it differs in its somewhat inflated, frequently reddish perianth-scales, which are usually not apiculate or awned.

TYPE LOCALITY: Cristina, Dep. Izabal, Guatemala.

DISTRIBUTION: Yucatan; British Honduras; Guatemala; western Cuba (including the Isle of Pines).

ILLUSTRATION: Carn. Inst. Wash. Publ. 522: 297.

NOTE: This species is probably a derivative of *F. umbellata*, with thickened perianth-scales.

4. **HEMICARPHA** Nees & Arnott, Edinb. New
Philos. Jour. 17: 263. 1834.

Isolepis R. Br. Prodr. 221. 1810, in part.

Tufted dwarf annuals with slender culms, leafy only at the base. Leaves similar to the 1-3 filiform involucre bracts. Spikes 1-3, ovate to nearly spherical, composed of numerous spirally imbricated, 2-scaled, reduced spikelets; outer scale mucronate, chartaceous and glutinous, an hyaline inner scale usually persistent on the cylindrical rachis but frequently absent or rudimentary. Flowers with a single stamen and 2-cleft style. Achene cylindrical to compressed, studded with minute papillae.

A genus of about 6 species, perhaps intermediate between *Cyperus* and *Lipocarpha*.

Type species, *H. Isolepis* Nees.

Inner scale equaling and partly enclosing the achene.

Mature achene black, compressed; mucro of the outer scale somewhat shorter than the body of the scale.

Mature achene dark brown, cylindrical; mucro of the outer scale much longer than the body of the scale.

Inner scale much shorter than the achene, bristle-like, bifid, or lacking; achene cylindrical, iridescent-brown when mature.

1. *H. Drummondii*.

2. *H. occidentalis*.

3. *H. micrantha*.

1. **Hemicarpha Drummondii** Nees in Mart. Fl. Bras.
2¹: 62. 1842.

Hemicarpha micrantha var. *aristulata* Coville, Bull. Torrey Club 21: 36. 1894. (Western Texas.)

Hemicarpha aristulata Smyth, Trans. Kans. Acad. 16: 163. 1899.

Hemicarpha intermedia Piper in Piper & Beattie, Fl. Palouse Reg. 36. 1901. (Washington [state].)

Hemicarpha micrantha var. *drummondii* Friedland, Am. Jour. Bot. 28: 860. 1942.

Outer scales of the spikelet with a mucro approaching the length of the body of the scale; inner scale equaling and enfolding the flattened, obovate, black achene (averaging 0.55 by 0.7 mm.).

TYPE LOCALITY: St. Louis, Missouri.

DISTRIBUTION: Wet sandy soil: Ohio (Lucas County, *Bartley & Pontius*) to California, Oregon, and Washington.

ILLUSTRATIONS: A. Gray, Man. ed. 7. 198. f. 310; Britt. & Brown, Ill. Fl. ed. 2. 1: 340. f. 837; Am. Jour. Bot. 28: f. 5, 6.

2. **Hemicarpha occidentalis** A. Gray, Proc. Am. Acad.
7: 391. 1868.

Scirpus occidentalis Clarke, Kew Bull. Add. Ser. 8: 30. 1908.

Plants only 1-5 cm. high; outer scales of the spikelet with a long, recurved mucro; inner scale hyaline, enfolding the brown (*Suksdorf* from Falcon Valley), nearly cylindrical achene.

TYPE LOCALITY: Yosemite Valley, California.

DISTRIBUTION: California and Washington.

ILLUSTRATIONS: A. Gray, Man. ed. 7. 198. f. 311; Abrams, Ill. Fl. Pacif. St. 279. f. 671; Jepson, Man. Fl. Calif. 157. f. 157; Am. Jour. Bot. 28: f. 3.

3. **Hemicarpha micrantha** (Vahl) Pax in E. & P.
Nat. Pfl. 2²: 105. f. 113. 1887.

Scirpus micranthus Vahl, Enum. 2: 254. 1805.

Scirpus subsquarrosus Muhl. Descr. Gram. 39. 1817. (Pennsylvania.)

Isolepis micrantha R. & S. Syst. Veg. 2: 110. 1817.

Isolepis subsquarrosa Schrad.; R. & S. Syst. Veg. Mant. 2: 64. 1824.

Isolepis subsquarrosa β *minor* Schrad.; R. & S. Syst. Veg. Mant. 2: 64. 1824.

Hemicarpha subsquarrosa Nees in Mart. Fl. Bras. 2¹: 61. 1842.

Isolepis caespitula Liebm. Vidensk. Selsk. Skr. V. 2: 237. 1851. (Mexico.)

Hemicarpha micrantha var. *minor* Friedland, Am. Jour. Bot. 28: 860. 1942.

Culms to 20 cm. high, becoming much reduced and usually recurved toward the northern limits of the species; outer scales not strongly mucronate; inner scales usually minute, sub-

late to bifid, more frequently absent; achene cylindric, becoming iridescent-brown when mature.

TYPE LOCALITY: South America.

DISTRIBUTION: Scattered localities from Maine and Southern Ontario to Florida, westward to the Great Plains (Minnesota, Kansas, Nebraska); also in Texas, New Mexico, Arizona, California, and Washington; Mexico; Guatemala; El Salvador; Costa Rica; Guadeloupe and Martinique; South America.

ILLUSTRATIONS: Mart. Fl. Bras. 2¹: pl. 4, f. 1; A. Gray, Man. ed. 7. 198. f. 309; Britt. & Brown, Ill. Fl. ed. 2. 1: 339. f. 836; Abrams, Ill. Fl. Pacif. St. 279. f. 670; Jepson, Man. Fl. Pl. Calif. 157. f. 156; Small, Man. SE. Fl. 141; Am. Jour. Bot. 28: 859. f. 7.

5. ELEOCHARIS R. Br. Prodr. 224. 1810.

Mariscus Moench, Meth. 350. 1794, in part.

Isolepis R. Br. Prodr. 221. 1810, in part, at least of later authors.

Bulbostylis Steven, Mém. Soc. Nat. Mosc. 5: 355. 1817.

Clavula Dumort. Fl. Belg. 143. 1827, in part.

Limnochloa sensu Nees in Wight, Contr. Bot. Ind. 71. 1834; not *Limnochloa* Beauv. ex Lestib. f. 1819.

Chaetocyperus Nees, Linnaea 9: 289. 1834.

Scirpidium Nees, Linnaea 9: 293. 1834.

Eleogenus Nees, Linnaea 9: 294. 1834.

Annual or perennial herbs with leafless scapes (culms) frequently proliferous at the apex, and with sheathing scales at the base, the uppermost tubular and often with a tooth-like projection. Spikelet solitary and terminal, terete or flattened, few- or many-flowered, without a subtending bract. Scales spirally imbricated or distichous, frequently deciduous, with one or more sterile scales at the base of the spikelet except in the *Aciculares*. Flower perfect. Style 2-3-cleft, with an enlarged base (tubercle) frequently constricted and usually persistent on the apex of the achene. Perianth-bristles 6 (sometimes branching into 7-9), more frequently reduced in size and number, or entirely lacking. Achene trigonous to biconvex, smooth or variously reticulate or cancellate. Stamens 1-3. Creeping or matted aquatic to terrestrial plants of world-wide distribution. About 150 species.

Type species: *Scirpus palustris* L. [*Eleocharis palustris* (L.) R. & S.]

- Aquatic, usually coarse plants; spikelets not proliferous; culms often as thick as the spikelets; scales yellowish and cartilaginous, not keeled; achenes normally lenticular (except in the dwarf *E. elongata*), mostly with strong, horizontally elongated sculpture; styles 2-3-branched. Series 1. *Mutatae*.
- Periodically submerged or terrestrial plants; frequently proliferous; achenes trigonous, gray to black, the tubercle not constricted at the base, confluent with the achene; style 3-branched. Series 2. *Pauciflorae*.
- Achenes obscurely trigonous to terete, the longitudinal ridges separated by numerous cross-walls (trabeculae); lowest scale fertile; style 3-branched. Series 3. *Aciculares*.
- Achenes smooth, biconvex, glistening-brown when mature; tubercle compressed, lamelliform; style 2-3 branched; cespitose annuals, rarely perennial. Series 4. *Ovatae*.
- Achenes biconvex, olivaceous to purplish-black when mature; style 2-branched; aquatic or terrestrial. Series 5. *Maculosae*.
- Stoloniferous aquatic perennials; sheaths scarious at the apex; pericarp marcescent. Subseries *Ocreatae*.
- Cespitose annuals, rarely stoloniferous; sheaths acute at the apex. Subseries *Rigidae*.
- Achenes yellow to brown or black when mature; plants usually stoloniferous, with strict, elongated, sometimes spongy culms. Series 6. *Palustriformes*.
- Achenes biconvex, yellow or brown; aquatics; style 2-branched. Subseries *Palustres*.
- Achenes trigonous; aquatic or terrestrial plants; style 3-branched; sheaths truncate. Subseries *Truncatae*.
- Mostly dwarf aquatic to terrestrial plants with capillary, frequently 4-angled culms; achenes trigonous (except in *E. minuta* var. *bicolor*), white to gray and smooth to deeply cancellate; style 3-branched. Series 7. *Tenuissimae*.
- Coarse chiefly South American plants, similar to the *Tenuissimae*; achenes smooth, trigonous, white or gray to black, usually exceeding 1 mm. in length. Series 8. *Sulcatae*.
- Species of the Atlantic coast of unknown affinity (perhaps of *Pauciflorae*); achenes trigonous, gray; bristles red. *E. albid.*

Series 1. *Mutatae* Svenson, Rhodora 31: 127. 1929.

Culms septate.

Septa approximate below the spikelet; reticulation of the achene coarse; bristles exceeding the achene.

Septa not approximate; achene nearly smooth; bristles poorly developed.

1. *E. interstincta*.

2. *E. equisetoides*.

Culms not septate.

Culms angled; bristles with teeth.

Culms coarse, 2-5 mm. wide.

Culms 4-angled.

Culms 3-angled.

Achene constricted below the summit into a neck about one-half the width of the achene.

Achene not constricted but prolonged gradually into a cellular beak.

Culms slender, not exceeding 2 mm. wide.

Achenes trigonous, 1-1.5 mm. long (including the style-base).

Achenes biconvex, 2-4 mm. long (including the style-base).

Achene constricted into a neck below the style-base.

Style-base acuminate.

Style-base broadly triangular, as wide as the apex of the achene.

Achene not constricted at the apex.

Culms not angled; bristles without teeth.

3. *E. quadrangulata*.

4. *E. fistulosa*.

5. *E. mutata*.

7. *E. elongata*.

8. *E. Robbinsii*.

9. *E. mitrata*.

10. *E. plicarhachis*.

6. *E. cellulosa*.

1. *Eleocharis interstincta* (Vahl) R. & S. Syst. Veg.

2: 149. 1817.

Scirpus plantagineus Sw. Fl. Ind. Occ. 123. 1797; not *S. plantagineus* Retz. 1785.

Scirpus interstinctus Vahl, Enum. 2: 251. 1805.

Limnochloa articulata Lindl. & Nees; in Mart. Fl. Bras. 2¹: 100. 1842. (Brazil.)

Eleocharis septata Miq. Linnaea 17: 58. 1843. (Suriname.)

Culms terete, 4-10 dm. high, about 5 mm. thick, septate, the septations becoming approximate below the spikelet; caudex short; roots coarse, light brown or reddish-brown; sheaths membranous, pointed at the summit, the basal sheaths sometimes free and elongated; style bifid or trifid; stamens 3; spikelets cylindric, 1.5-4 cm. long, many-flowered; scales in several ranks, oblong, often acute, striate, straw-colored or grayish, with a scarios margin; achenes rough, 2 mm. long (excluding the style-base), yellow or gray, with prominent transverse rectangular cells often forming longitudinal ribs, and a pronounced annular thickening at the summit; style-base dark brown; bristles 6, exceeding the achene, stout, flattened, with coarse teeth.

TYPE LOCALITY: "In Caribaeis" (*Martfeld*).

DISTRIBUTION: Florida, Texas; Bermuda Islands and southward through the tropics.

ILLUSTRATIONS: Clarke, Ill. Cyp. pl. 33, f. 6-9; Rhodora 31: pl. 188, f. 2.

2. *Eleocharis equisetoides* (Ell.) Torr. Ann. Lyc. N. Y.

3: 296. 1836.

Scirpus equisetoides Ell. Bot. S. C. & Ga. 1: 79. 1816.

Eleocharis Elliotti A. Dietr. Sp. Pl. 2: 82. 1833.

Eleocharis interstincta of American authors, not *E. interstincta* R. & S.

Culms terete, 5-10 dm. high, about 5 mm. thick, prominently septate at intervals of 1-5 cm., the surface roughened by numerous minute projections; caudex short; roots coarse, reddish-brown; sheaths membranous, pointed at the summit, those at the base often free from the culm and greatly elongated; style bifid or trifid; stamens 3; spikelets cylindric, 2-4 cm. long, many-flowered; scales in several ranks, oblong, striate, straw-colored, with an obscure purplish border beneath the scarios margin; achenes nearly smooth, 2-2.5 cm. long (including the style-base), golden-yellow or light brown, broadly obovate, biconvex, with fine transverse linear-rectangular reticulations; style-base dark brown; bristles narrow and weak, rarely equaling the achene.

TYPE LOCALITY: Fayetteville, North Carolina.

DISTRIBUTION: Deep water of ponds; along the coast, Massachusetts to Louisiana; inland in New York, Indiana, Michigan, Wisconsin, and Missouri.

ILLUSTRATIONS: A. Gray, Man. ed. 7. 181. f. 238; Britt. & Brown, Ill. Fl. ed. 2. 1: 311. f. 758; Rhodora 31: pl. 188, f. 1; Rep. N. J. Mus. 1910: pl. 17, f. 5 (all as *E. interstincta*).

3. *Eleocharis quadrangulata* (Michx.) R. & S.

Syst. Veg. 2: 155. 1817.

Scirpus quadrangulatus Michx. Fl. Bor.-Am. 1: 30. 1803.

Scirpus marginatus Muhl. Descr. Gram. 28. 1817. Not *S. marginatus* Thunb. 1794.

Scirpus albo marginatus Schultes in R. & S. Syst. Veg. Mant. 2: 74. 1824.
Eleocharis quadrangulata var. *crassior* Fernald, Rhodora 37: 393. 1935. (Wellesley, Massachusetts.)

Culms 4-sided, with sharp angles, coarse, 5-10 dm. high, from a short caudex; roots coarse, gray, often tuber-bearing; sheaths red or brown, membranous, with a loose, brown tip, glistening, sometimes prolonged into leaf-like blades; spikelets 2-5 cm. long, cylindrical, acute; scales 4-ranked, elliptic, 5 mm. long, 2 mm. wide, rounded or somewhat acute, straw-colored, striate, not keeled; style bifid or trifid; stamens 3; achene 2.7-4.2 mm. long including the beak (1 mm. long), narrowly obovate, deep shining-brown, almost smooth, with about 24 rows of transverse linear cells, narrowed at the summit to a neck about one-fourth the width of the achene, broadening again to form the base of the elongated triangular style; bristles light brown, equaling the achene, slender and obscurely toothed.

TYPE LOCALITY: Carolina (the slender typical plant).

DISTRIBUTION: Deep to shallow water: Massachusetts, west to Wisconsin, south to Texas; Jalisco.

ILLUSTRATIONS: Ell. Bot. S. C. & Ga. pl. 3, f. 2; Rhodora 27: pl. 149, f. 1-4; 31: pl. 188, f. 4; Rep. N. J. Mus. 1910: pl. 17, f. 6.

4. *Eleocharis fistulosa* (Poir.) Schultes in R. & S. Syst. Veg. Mant. 2: 89. 1824.

Scirpus fistulosus Poir. in Lam. Encyc. 6: 749. 1804.
Scirpus acutangulus Roxb. Fl. Ind. 1: 213. 1820. (India.)
Scirpus medius Roxb. Fl. Ind. 1: 213. 1820. (India.)
Baeothryon fistulosum A. Dietr. Sp. Pl. 2: 94. 1833.
Limnochloa acutangula Nees in Wight, Contr. Bot. Ind. 114. 1834.
Limnochloa media Nees in Wight, Contr. Bot. Ind. 114. 1834.
Limnochloa obtusetrigona Lindl. & Nees; Nees in Mart. Fl. Bras. 2^a: 100. 1842. (Brazil.)
Eleocharis planiculmis Steud. Syn. Cyp. 80. 1855. (Java.)
Eleocharis obtusetrigona Steud. Syn. Cyp. 80. 1855.
Eleocharis mutata var. *obtusetrigona* Clarke, Bull. Herb. Boiss. 6 (Append. 1): 20. 1898.

Culms sharply triangular, coarse, 4-6 dm. high; roots coarse, reddish-brown; sheaths brown, membranous, rather loose, pointed at the summit; spikelets 1.5-3.5 cm. long, cylindrical, acute; scales 4 mm. long, straw-colored or gray, broadly-ovate, obtuse or somewhat acute, firm, striate, the margins erose but not conspicuously membranous; style trifid; stamens 3; achene 2-2.4 mm. long (including the style-base), obovate, turgid, green or light brown, rough, with about 20 rows of deeply pitted quadrangular cells, the apex narrowed to a neck about one-half the width of the achene, broadening again to form the base of the triangular style; bristles coarse, usually exceeding the achene, firmly toothed.

TYPE LOCALITY: Madagascar.

DISTRIBUTION: Fresh to brackish water: Texas (*Runyon*); Cuba; Mexico; Guatemala; Panama; Old and New World tropics.

ILLUSTRATIONS: Clarke, Ill. Cyp. pl. 35, f. 1-4; Rhodora 27: pl. 149, f. 5-10; 31: pl. 188, f. 3, 13; Descole, Gen. & Sp. Plant. Argent. 4: pl. 59.

5. *Eleocharis mutata* (L.) R. & S. Syst. Veg. 2: 155. 1817.

Scirpus mutatus L. Plant. Jam. Pug. 6. 1759.
Limnochloa mutata Nees, Linnaea 9: 294. 1834.

Culms sharply triangular, coarse, 4-10 dm. high, from a short caudex; roots very numerous, fibrous, gray or brown; sheaths straw-colored or light brown, membranous, pointed at the summit, often elongated; spikelets 1.5-5 cm. long, cylindrical, usually obtuse; scales many-ranked, straw-colored, thin, orbicular to obovate, with broad membranous sides and an erose upper margin, often slightly keeled, frequently not appressed to the rachis; style trifid; stamens 3; achene 1.7-2.3 mm. long (including the style-base), elliptic or obovate, shining, rather smooth, yellow to brown, with about 24 rows of shallow, transversely linear cells with their margins often slightly raised, surmounted at the summit by an angular thickening which merges gradually into the short style-base; bristles 6, irregular, equaling the achene, lustrous-brown, with coarse but soft teeth.

TYPE LOCALITY: Jamaica (Browne).

DISTRIBUTION: West Indies; Mexico; British Honduras; Panama; tropical South America; tropical Africa.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 311. f. 759; Rhodora 27: pl. 149, f. 11-14; 31: pl. 188, f. 8.

6. *Eleocharis cellulosa* Torr. Ann. Lyc. N. Y.

3: 298. 1836.

Scirpus dictyospermus C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 79. 1871. (Cuba.)

Culms terete, rarely triangular, 3-7 dm. high, 1-2 mm. wide, straw-colored or greenish; roots coarse, pale to dark brown; stolons elongated; upper sheaths rigid, oblique, with an elongated mucronate tip, often purplish; lowest sheaths membranous and inflated or leaf-like; spikelets cylindric, 1.5-4.5 cm. long, obtuse, thicker than the culm; scales orbicular or obovate, obtuse, 4 mm. long, rigid, striated, straw-colored, with a conspicuous brown border and white, scarious margins, the brown coloration sometimes wanting; style trifid; stamens 3; mature achene shining, brown, elliptic to obovate, lenticular, with about 20 rows of quadrangular cells, overlaid by a glass-like surface, merging at the summit into a stout, spongy beak, tipped by the short, dark style-base; bristles light brown, equaling the achene, involute, without teeth.

TYPE LOCALITY: Bay of St. Louis, Mississippi (*Dr. Ingalls*).

DISTRIBUTION: In brackish to saline coastal waters: Cape Hatteras, North Carolina (*Fosberg*); Georgia (*Eyles*); Florida to Texas and northern Mexico; Bermuda; West Indies; Yucatan.

ILLUSTRATION: Rhodora 31: pl. 188, f. 11.

7. *Eleocharis elongata* Chapm. Fl. S. U. S. 515. 1860.

Culms very slender, usually less than 1 mm. in width, elongated, 5-8 dm. long, often floating on the surface of the water, flattened or obscurely angled; roots fibrous; stolons abundant, brown or straw-colored, elongated, with culms rising from the nodes; spikelets 1-1.5 cm. long, 2 mm. wide, acute; style trifid; stamens 3; scales linear, obtuse, 3.5 mm. long, striate, greenish, conspicuously bordered with brown just within the hyaline margin; achenes 1.5 mm. long, including the style-base, triangular, light green, obovate (the inner face broadest, with about 12 rows of coarse, transversely linear cells), abruptly narrowed at the summit to a short neck one-fourth the width of the achene, from which rises the short, acute, deep brown style-base; bristles 6 or 7, equaling the achene, greenish, prominently toothed.

TYPE LOCALITY: "In still water, Apalachicola, Florida."

DISTRIBUTION: Georgia (*Eyles*); Florida; Brazil.

ILLUSTRATION: Rhodora 31: pl. 188, f. 6.

8. *Eleocharis Robbinsii* Oakes, Mag. Hort. Bot.

7: 178. 1841.

Culms slender, 1-2 mm. wide, 2-7 dm. high, triangular, sometimes producing tufts of capillary stems which float in the water; roots either fibrous or spongy; stolons slender and elongate, the nodes inconspicuous; sheaths dull brown, the summit oblique; spikelet 1-2.5 cm. long, acute, scarcely wider than the culm; scales few (4-9), lanceolate, 7 mm. long, greenish, striate, the margins and tip scarious, with a keel formed by 2 or 3 prominent longitudinal ridges; style trifid; stamens 3; achenes brown, 2-2.5 mm. long (not including the slender, elongate style-base), oblong-obovate, narrowed below the middle, lenticular, rarely triangular, turgid, with 15-18 rows of shallow, transversely linear-rectangular cells, narrowed at the apex to a neck one-half the width of the achene, broadening again to form the base of the flattened style; bristles 7, closely and firmly toothed, twice as long as the achene.

TYPE LOCALITY: Pondicherry Pond, Jefferson, New Hampshire (*Robbins*).

DISTRIBUTION: Shallow water, borders of ponds and in ditches: chiefly along the coast, Nova Scotia and New Brunswick to North Carolina, Georgia, and northern Florida; inland also in Quebec (*Victorin*), New York, Pennsylvania, Indiana, Michigan, Wisconsin, and Ontario.

ILLUSTRATIONS: A. Gray, Man. ed. 7. 181. f. 240; Britt. & Brown, Ill. Fl. ed. 2. 1: 311. f. 760; Rhodora 31: pl. 188, f. 5; Rep. N. J. Mus. 1910: pl. 17, f. 7.

9. *Eleocharis mitrata* (Griseb.) Clarke, Symb. Ant.

2: 62. 1900.

Scirpus mitratus Griseb. Fl. Brit. W. Ind. 570. 1864.

Culms slender, 3-6 dm. high, cylindric, striate, from stoloniferous rootstocks; sheath purplish, the summit blunt to acute; spikelet cylindric, 1.5-2 cm. long; scales ovate-oblong, obtuse, greenish on the convex, substrate back, purple along the whitish margin; style bifid; achene yellowish, biconvex, obovate, subtruncate with an enlarged ring below the style-base, strongly narrowed to the base, with 11-13 rows of transversely elongated cells on each face, 2.0 mm. long, including the 0.5 mm.-long blunt, somewhat tricuspidate, broad, brown style-base; bristles half the length of the achene.

TYPE LOCALITY: Savannas, Trinidad (*Crueger*).

DISTRIBUTION: Trinidad; San Domingo; French Guiana; Brazil.

ILLUSTRATIONS: *Rhodora* 41: *pl.* 537, *f.* 5; Clarke, Ill. Cyp. *pl.* 33, *f.* 10-13.10. *Eleocharis plicarhachis* (Griseb.) Svenson,*Rhodora* 31: 158. 1929.*Scirpus plicarhachis* Griseb. Cat. Pl. Cub. 239. 1866.*Heleocharis elata* Böck. Vidensk. Meddel. 1871: 151. 1872. (Maracaibo, an old colony in Brazil.)

Erect from an ascending spongy rootstock, often with slender, elongate rhizomes; culms wiry, flexuous, striate and sulcate, 2.5-6 dm. high; sheaths usually rigid, 4-8 cm. long, purplish or straw-colored, oblique at the summit; spikelets 1-2 cm. long, about 25-flowered, narrowly cylindric, acute; scales loose, 3.5 mm. long, linear, obtuse, striate, with an obvious midrib; style bifid; stamens 3; achene biconvex, 2 mm. long (including the beak), light brown, orbicular to obovate, with about 12 longitudinal rows of quadrate cells with upraised edges, narrowed at the summit and surmounted by a turgid annulus-elevation from which rises the deep-brown or black, lanceolate style-base; bristles 6, exceeding the achene, coarse, flat, with strong, scattered teeth.

TYPE LOCALITY: Pinar del Rio, Cuba (*C. Wright* 3372).

DISTRIBUTION: Cuba; Mexico; Panama; British Guiana; Colombia; Brazil; Peru; Paraguay; Argentina.

ILLUSTRATIONS: *Rhodora* 31: *pl.* 188, *f.* 7; Clarke, Ill. Cyp. *pl.* 33, *f.* 14-16; Descole, Gen. & Sp. Plant. Argent. 4: *pl.* 51.Series 2. *Pauciflorae* Svenson, *Rhodora* 31: 127. 1929.

Dwarf plants 2-7 cm. high; spikelet with green scales; achenes 1-1.3 mm. long.

11. *E. parvula*.

Plants with culms at least 15 cm. high.

Culms strongly compressed, usually proliferous at the tip; achenes not strongly punctate.

Spikelets stramineous, acute; achenes long-beaked, 2-3 mm. long.

13. *E. rostellata*.

Spikelets brownish, obtuse; achene dark brown to black, 1 mm. long.

14. *E. melanocarpha*.

Culms not strongly flattened and not proliferous; achenes strongly punctate, 2-3 mm. long.

12. *E. pauciflora*.11. *Eleocharis parvula* (R. & S.) Link; Bluff & Fingerh.

Compend. Fl. Germ. ed. 2. 1: 93. 1836.

Scirpus pusillus Vahl, Enum. 2: 246. 1805. (Based partly on *Scirpus capillaceus* Michx. which is *E. acicularis*.) Not *Eleocharis pusilla* R. Br. 1810.*Scirpus nanus* Spreng, Pug. 1: 4. 1813. (Halle, Germany.) Not *S. nanus* Poir. 1804; nor *Eleocharis nana* Kunth, 1837.*Scirpus parvulus* R. & S. Syst. Veg. 2: 124. 1817. (Germany.)*Scirpus humilis* Wallr. Sched. Crit. 27. 1822. (Germany.) Not *S. humilis* Vell. 1825; nor *S. humilis* Willd. 1837.*Eleogiton parvula* Link, Hort. Berol. 1: 285. 1827.*Limnochloa parvula* Reichenb. in Mössler, Handb. ed. 2. 1808. 1829.*Baeothryon nanum* A. Dietr. Sp. Pl. 2: 91. 1833.*Baeothryon pusillum* A. Dietr. Sp. Pl. 2: 92. 1833.*Eleocharis pygmaea* Torr. Ann. Lyc. N. Y. 3: 313. 1836. ("Near New York.")*Eleocharis pygmaea* β. ? *anachaeta* Torr. Ann. Lyc. N. Y. 3: 441. 1836. (New Orleans.)*Scirpus translucens* LeGall; J. Lloyd, Fl. Loire-Inf. 275. 1844. (France.)

- Chaetocyperus pygmaea* Walp. Ann. 3: 683. 1852.
 ? *Isoplepis leptos* Steud. Syn. Cyp. 91. 1855. (Mexico: Parry 130.)
Chaetocyperus membranaceus Buckl. Proc. Acad. Phila. 1862: 10. 1862. (Llano County, Texas.)
Eleocharis pusillus Wood, Bot. & Fl. ed. 1871. 361. 1871. Not *E. pusilla* R. Br. 1810.
Scirpus leptos C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 80. 1871.
Heleocharis triflora Böck. Flora 63: 437. 1880. (Morro de Boquilla, Vera Cruz: Liebmann.)
Scirpus pollicaris Delile, Descr. Egypte 19: 50 (nomen nudum). 1813. pl. 63, f. 10. 1882. (Egypt.)
Scirpus nanus var. *anachaetus* Britton, Trans. N. Y. Acad. 11: 75. 1892.
Cyperus parvulus Missb. & Krause in Sturm, Fl. Deutschl. ed. 2: 26. 1900.
Scirpus coloradoensis Britton, Torreyia 4: 93. 1904. (Larimer County, Colorado.)
Eleocharis leptos Svenson, Rhodora 31: 176. 1929. Not *E. lepta* Clarke, 1900.
Eleocharis leptos var. *coloradoensis* Svenson, Rhodora 31: 177. 1929.
Eleocharis leptos var. *Johnstonii* Svenson, Rhodora 31: 177. 1929. (San Bernadino Mts., California.)
Eleocharis parvula var. *anachaeta* Svenson, Rhodora 36: 386. 1934.
Eleocharis parvula f. *spongiosa* Fassett, Rhodora 39: 273. 1937. (Maine.)
Eleocharis membranacea Gilly, Am. Midl. Nat. 26: 66. 1941.
Eleocharis coloradoensis Gilly, Am. Midl. Nat. 26: 66. 1941.

Forming mats; roots fibrous, often with minute tuberous stolons; culms capillary (2-7 cm. high), greenish or straw-colored, often spongy and translucent, terete, becoming somewhat striate in drying; upper sheath inconspicuous, membranous; spikelets 2-3.5 mm. long, broadly ovate, 2-9-flowered; scales ovate, scarcely keeled, obtuse or acute, striate and chartaceous, green to yellowish, often dull brown on the sides; lowest scale empty, half the length of the spikelet; stamens 3; style trifid; achenes obovate, 1-1.3 mm. long, straw-colored, equilaterally triangular with prominent angles, smooth and shining, under high magnification sometimes lightly striate-reticulate; style-base very small, triangular, greenish; bristles straw-colored, equaling or exceeding the achene (rudimentary in var. *anachaeta*, which sometimes has achene angles blunter and the surface more reticulate).

TYPE LOCALITY: Germany; "in inundatis lacus Koelmensis in Mannsfeldia."

DISTRIBUTION: Saline places in western Europe and along the Mediterranean Sea; Atlantic Coast from Newfoundland to Cuba and Mexico and on the Pacific Coast from Vancouver to California; inland in New York, Michigan, and Missouri. Var. *anachaeta* scattered in saline regions from Missouri and westward in the United States and Mexico; known also from Cuba, and from two collections in South America, at Maracaibo in Venezuela, and Rio de Janeiro.

ILLUSTRATIONS: Rhodora 31: pl. 189, f. 18; 36: pl. 320, f. 5, 6; Britt. & Brown, Ill. Fl. ed. 2: 1: 327. f. 801.

12. *Eleocharis pauciflora* (Lightf.) Link, Hort. Berol. 1: 284. 1827.

- Scirpus pauciflorus* Lightf. Fl. Scot. 1078. 1777. (Scotland.)
Scirpus Boeothryon L. f. Suppl. 103. 1781. (Europe.)*
Heleocharis atacamensis Philippi, Fl. Atacam. 53. 1860. (Chile.)
Scirpus andinus Philippi, Anal. Univ. Chile 43: 554. 1873. (Chile.)
Eleocharis Suksdorfiana Beauverd, Bull. Soc. Bot. Genève II. 13: 267. 1922. (Washington [State].)
Scirpus bernardinus Munz & Johnston, Bull. Torrey Club 52: 221. 1925. (California.)
Eleocharis pauciflora var. *Suksdorfiana* Svenson, Rhodora 31: 174. 1929.
Eleocharis pauciflora var. *bernardina* Svenson, Rhodora 31: 174. 1929.
Heleocharis Vierhapperi Bojko, Verh. Zool.-Bot. Ges. Wien 79: 300. 1930. (Austria.)
Eleocharis pauciflora var. *Fernaldii* Svenson, Rhodora 36: 380. 1934. (Maine.)
Heleocharis meridionalis Tsinz. Fl. URSS 3: 580. 1935. (Turkestan.)

Erect, from creeping rootstocks, the stolons often with conspicuously thickened buds; culms slender, 1.5-4 dm. high, striate; sheath 2-3 cm. long, straw-colored or brownish, truncate; spikelets 4-7 mm. long, ovate, 2-7-flowered; scales all flower-bearing, chocolate-brown with pale, scarious margins and tip, the two lower larger; stamens 3, the filaments often whitened and elongated; style trifid; achenes obovoid or fusiform, 2-3 mm. long, in cross section triangular or plano-convex, prominently reticulate with small rectangular cells; the triangular or lanceolate beak tipped by the dark style; bristles slender, often irregularly toothed, equaling or exceeding the achene, sometimes poorly developed.

TYPE LOCALITY: Scotland.

DISTRIBUTION: In calcareous soil: Greenland to northern Ontario (54° N, Dutilly & Lepage 16775), Saskatchewan, and British Columbia, south to California, New Mexico, Colorado, Iowa, Illinois, Indiana, Pennsylvania, New Jersey, New York, and northern New England; mountains of Eurasia; southern Andes.

* For additional European synonyms see Rhodora 31: 171, 172. 1929.

ILLUSTRATIONS: *Rhodora* 31: *pl.* 189, *f.* 23; 36: *pl.* 320, *f.* 1-4; Britt. & Brown, Ill. Fl. ed. 2. 1: 327. *f.* 802.

13. *Eleocharis rostellata* Torr. Fl. N. Y. 2: 347. 1843.

Scirpus rostellatus Torr. Ann. Lyc. N. Y. 3: 318. 1836.

Eleocharis rostellata var. *occidentalis* S. Wats. Bot. Calif. 2: 222. 1880. (California.)

Eleocharis platypus Clarke in Sodiro, Bot. Jahrb. 34 (Beibl. 78): 3. 1904. (Ecuador.)

Eleocharis rostellata var. *Congdonii* Jepson, Fl. Calif. 1: 196. 1922. (California.)

Erect or arching from a short vertical rootstock; roots thickened, whitish; culms wiry, conspicuously flattened and sulcate, 2.5-15(-22) dm. in length, 1-2 mm. wide, often reclining and rooting from the apex; sheaths rigid, truncate or oblique; spikelet spindle-shaped, acute, 12-20-flowered, 8-20 mm. long; scales light brown, rigid, ovate, the uppermost becoming acute; stamens 3; style trifid; achene obovoid, obtusely triangular or plano-convex, olive, shiny, under magnification lightly reticulate, 2-3 mm. long, narrowed into the obtuse, light green, beaked style-base, which is about one-third the length of the achene; bristles firm, regularly toothed, light brown, equaling the achene.

TYPE LOCALITY: "Penn-Yan, Yates County, New-York, *Dr. Sartwell!*"

DISTRIBUTION: Seacoast of Nova Scotia and Maine, southward to Florida; calcareous and saline places in the interior: Ontario to New Jersey; Michigan, Wisconsin, Illinois, Kansas, Oklahoma, and Texas; British Columbia to Wyoming, Utah, California, and New Mexico; Bermuda; Cuba; Haiti; northern Mexico; Andes of Ecuador and Argentina.

ILLUSTRATIONS: *Rhodora* 31: *pl.* 189, *f.* 17; 36: *pl.* 320, *f.* 9; A. Gray, Man. ed. 7. 185. *f.* 263; Britt. & Brown, Ill. Fl. ed. 2. 319. *f.* 782.

14. *Eleocharis melanocarpa* Torr. Ann. Lyc. N. Y. 3: 311. 1836.

Tufted from a short, ligneous caudex with thickened, spongy roots, the hardened culm-bases of the previous year persistent; culms firm, flattened, sulcate, 2-6 dm. long, often 1 mm. wide, frequently proliferous at the summit; sheaths truncate with a prominent subulate mucro at the apex; spikelets cylindrical-ovoid, obtuse, many-flowered, 6-15 mm. long; scales firm, obtuse, stramineous with brownish sides and broad scarious margins; stamen 3, anthers 1.5 mm. long; style trifid; achene 1.1 mm. long, dark glossy brown to black, trigonous, with rounded costulate angles, truncate at the broadened apex, minutely cellular; style-base pallid, low-pyramidal to nearly flat, often with prominent overhanging margin; bristles dark brown, shorter than the achene, retrorsely toothed, often rudimentary.

TYPE LOCALITY: "Pine barrens, generally not far from streams of water—near Savannah, Georgia, *Dr. Baldwin.*"

DISTRIBUTION: Sandy margins of ponds on the coastal plain: Massachusetts to Texas; inland in Virginia (Augusta County, *Carr*; Rockingham County), Indiana, and Michigan (*Hanes*).

ILLUSTRATIONS: *Rhodora* 39: *pl.* 464, *f.* 6; A. Gray, Man. ed. 7. 184. *f.* 255; Britt. & Brown, Ill. Fl. ed. 2. 1: 317. *f.* 776; Clarke, Ill. Cyp. *pl.* 38, *f.* 16-20.

Series 3. *Aciculares* Svenson, *Rhodora* 31: 128. 1929.

Perennials with creeping rootstocks.

Culms capillary to filiform, not markedly flattened.

Spikelets green or tinged with brown.

Culms and scales deep green (sometimes with a purplish band); anthers 0.7-1.0 mm. long.

Achenes 0.7-1.0 mm. long; scales appressed.

Achenes 1.5 mm. long; scales spreading and prominently striate (mountains of Mexico).

Culms (conspicuously spongy) and scales pale green; anthers 0.3-0.4 mm. long.

Spikelets deep purple; achenes truncate, 0.5-0.7 mm. long (Texas).

Culms coarse, 1.0-1.5 mm. wide, usually flattened.

Culms markedly ancipital, frequently spiral; scales scarious-acuminate; achenes without bristles.

Culms usually flattened, not spiral; scales obtuse; achenes with bristles.

Cespitose annuals, rarely exceeding 4 cm. in height.

Trabeculae about 15 in a longitudinal series.

Anthers 0.2-0.3 mm. long; achene 0.6-0.7 mm. long.

Anthers 0.7 mm. long; achene 0.4-0.5 mm. long; scales conspicuously attenuate.

Trabeculae about 30 in a longitudinal series; anthers 0.4 mm. long; achene 0.7-0.8 mm. long.

15. *E. acicularis*.

16. *E. nervata*.

18. *E. radicans*.

17. *E. Reverchonii*.

20. *E. Wolfii*.

19. *E. bonariensis*.

21. *E. cancellata*.

22. *E. brachycarpa*.

23. *E. bella*.

15. *Eleocharis acicularis* (L.) R. & S. Syst. Veg.
2: 154. 1817.

- Scirpus acicularis* L. Sp. Pl. 48. 1753.
Mariscus acicularis Moench, Meth. 350. 1794.
Cyperus acicularis With. Brit. Pl. ed. 3. 2: 78. 1796.
Scirpus trichodes Muhl. Descr. Gram. 30. 1817. (North America?)
Eleocharis costata Presl. Fl. Cech. 11. 1819. (Europe.)
Isolepis acicularis Schlecht. Fl. Berol. 1: 36. 1823.
Scirpus Chaeta Schultes in R. & S. Syst. Veg. Mant. 2: 72. 1824.
Clavula acicularis Dumort. Fl. Belg. 143. 1827.
Clavula comosa Dumort. Fl. Belg. 143. 1827. (Europe.)
Scirpidium aciculare Nees, Linnaea 9: 293. 1834.
Chaetocyperus acicularis Nees in Mart. Fl. Bras. 2¹: 95. 1842.
 ?*Scirpus yokoscensis** Fr. & Sav. Enum. Pl. Jap. 2: 543. 1879. (Japan.)
Heleocharis acicularis var. *japonica* Baker; Diels, Bot. Jahrb. 29: 228. 1900. Nomen nudum.
 (Japan.)
Eleocharis comosa K. Richt. Pl. Eur. 1: 143. 1890.
Eleocharis acicularis var. *longiseta* Svenson, Rhodora 31: 189. 1929. (Japan.)
Eleocharis acicularis var. *occidentalis* Svenson, Rhodora 31: 190. 1929. (California.)
Heleocharis Svensonii Tsinz. Fl. URSS 3: 580. 1935.

Usually forming close mats; culms 2-20 (rarely -25) cm. high, capillary, deep green, usually angular and sulcate; rootstocks capillary, with abundant stolons; roots firm, white; sheaths loose, reddish-striate at the base, the apex scarious and somewhat inflated; spikelets ovate to linear, 2-7 mm. long, acute, 3-15-flowered (usually 5-8-flowered); scales ovate-lanceolate, acute, green, with reddish-brown sides and scarious margins, usually only a few subtending mature fruit; achene 0.7-1 mm. long, obovate-oblong, yellow to white or brown, obscurely 3-angled, with many longitudinal ribs and close trabeculae (about 40-50 in a longitudinal series); style-base narrow, somewhat compressed, conic-triangular; bristles 3 or 4, brownish, very slender, equaling the achene, often wanting.

TYPE LOCALITY: Europe.

DISTRIBUTION: Greenland to Alaska, south to northern Florida and northern Mexico; Eurasia.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 315. f. 771; A. Gray, Man. ed. 7. 183. f. 250; Rhodora 41: pl. 539, f. 1, 9b.

NOTE: Var. *gracilescens* Svenson (Rhodora 31: 191. 1929. *Isolepis longifolia* Steud. Syn. Cyp. 90. 1855. Both types from St. Louis, Missouri) is a coarse elongate plant from Missouri, Tennessee, and Oklahoma, perhaps distinct from *E. acicularis*. For variations of the European plant, see Rhodora 31: 183 (1929).

16. *Eleocharis nervata* Svenson, Rhodora 31: 204. 1929.

Chaetocyperus radicans Steud. Syn. Cyp. 74. 1855. (Oaxaca, Mexico.)

Heleocharis radicans Hemsl. Biol. Centr. Am. Bot. 3: 456. 1885. Not *Eleocharis radicans* (Poir.) Kunth, 1837.

Plants matted, usually with elongated, whitened rhizomes; culms soft, spreading, 3-9 cm. long, obscurely striate and angled; sheaths membranous and marcescent, greenish, hyaline at the apex; spikelets ovate, 2-3 mm. long, 3-5-flowered; scales ovate, acute to obtuse, keeled, spreading at maturity, prominently striate, green, sometimes rufescent on the sides; style trifid; stamens 3; anthers 0.7 mm. long; achenes 1.5 mm. long, narrowly obovate, with 60-70 trabeculae in each longitudinal series; style-base conic; bristles frequently 3, equaling the achene.

TYPE LOCALITY: Vicinity of Puebla (*Arsène* 217).

DISTRIBUTION: Alpine summits in Mexico and Guatemala.

ILLUSTRATION: Rhodora 31: pl. 190, f. 33.

17. *Eleocharis Reverchonii* Svenson, Rhodora
31: 203. 1929.

Extensively creeping, with long, filiform rootstocks; culms capillary, sulcate, 2-20 cm. long; spikelets 2-4 mm. long, purple, ovate to ovate-lanceolate, acute, many-flowered; scales ovate, obtuse, hyaline at the margin; style trifid; anthers 3, 0.7-1.0 mm. long; achenes 0.5-0.7 mm. long, narrowed at apex and base, with about 20 trabeculae in each longitudinal series; style-base conic; bristles lacking.

* "yokoscensis," corrected in index.

TYPE LOCALITY: Western Texas (*Reverchon*).
 DISTRIBUTION: Prairies, Texas.
 ILLUSTRATION: *Rhodora* 31: *pl.* 190, *f.* 27.

18. *Eleocharis radicans* (Poir.) Kunth, Enum. Pl.
 2: 142. 1837.

Scirpus radicans Poir. in Lam. Encyc. 6: 751. 1804. (Puerto Rico.)
Eleogiton radicans A. Dietr. Sp. Pl. 2: 97. 1833.
Eleocharis costulata Kunth, Enum. Pl. 2: 142. 1837. (Chile.)
Chaetocyperus costulatus Nees, Nova Acta Acad. Leop.-Carol. 19 (Suppl. 1): 96. 1843.
Eleocharis acicularis var. *Lindheimeri* Clarke; Britton, Jour. N. Y. Micr. Soc. 5: 105. 1889, as syn. (Texas.)
Eleocharis acicularis var. *radicans* Britton, Jour. N. Y. Micr. Soc. 5: 105. 1889.
Eleocharis Lindheimeri Svenson, *Rhodora* 31: 199. 1929.

Culms matted, 3-8 cm. high, light green, soft and spongy, striate; rootstocks slender and extensively creeping, white or light brown; roots fibrous, white; sheaths membranous, closely investing the culm, fugacious; spikelets ovate, acute, 3-4 mm. long, 6-12-flowered; scales ovate-lanceolate, the lower blunt, green, striate, the upper often strongly keeled at the tip; style trifid; stamens 3; anthers 0.3-0.4 mm. long; achenes narrowly obovate, yellowish, about 0.7 mm. long (excluding the narrow, conic beak), with elevated longitudinal ridges and about 30-40 close trabeculae in each longitudinal series; bristles usually 4, very slender, white, retrorsely toothed, exceeding the achene or sometimes lacking.

TYPE LOCALITY: "Porto Rico, dans les terrains marécageux, par M. Ledru."
 DISTRIBUTION: Virginia (*Fernald*), Michigan, Texas, Oklahoma, and California; northern Mexico; Puerto Rico; Haiti; Santo Domingo; Hawaii; southern South America.
 ILLUSTRATIONS: *Rhodora* 31: *pl.* 190, *f.* 31 (as *E. Lindheimeri*); 41: *pl.* 539, *f.* 9a; Descole, Gen. & Sp. Plant Argent. 4: *pl.* 72C.

19. *Eleocharis bonariensis* Nees, Jour. Bot. Hook.
 2: 398. 1840.

Chaetocyperus bonariensis Nees in Mart. Fl. Bras. 2¹: 96. 1842.
Chaetocyperus obtusatus Nees in Mart. Fl. Bras. 2¹: 94. 1842. (Brazil.)
Heleocharis striatula Desv. in C. Gay, Hist. Chile Bot. 6: 173. 1853. (Chile.)
Heleocharis oxyneura Durieu, Bull. Soc. Bot. Fr. 2: 609. 1855. (France.)
Eleocharis amphibia Durieu; Cuigneau, Act. Soc. Linn. Bordeaux 21: 487. 1858. (France.)
Eleocharis aciculariformis Greenman, Proc. Am. Acad. 34: 566. 1899. (Mexico.)
Heleocharis acicularis subsp. *B. H. bonariensis* Osten, Anal. Mus. Hist. Nat. Montevideo II. 3: 173. 1931.

Rootstocks creeping, 1-1.5 mm. thick; culms fascicled, usually flattened, somewhat rigid, 1.5-4 dm. high, about 0.5 mm. wide, bright green or yellowish, striate and sulcate; sheaths yellow or brown, often reddish at the base, the firm apex obtuse, elongated and spreading; spikelets lanceolate, 4-8 mm. long, the lowest scale about half the length of the spikelet; scales ovate-lanceolate, obtuse, green with reddish sides; style trifid; stamens 3, anthers 1.5 mm. long; achene elliptic to narrowly obovate, 1-1.3 mm. long, with many longitudinal ribs and about 50-60 trabeculae in each longitudinal series; style-base small, conic, one-third as wide as the achene; bristles 3 or 4, white, sharply toothed, equaling the achene or somewhat shorter.

TYPE LOCALITY: Argentina.
 DISTRIBUTION: Mexico; southern South America; vicinity of Bordeaux, France, where undoubtedly introduced.
 ILLUSTRATIONS: Act. Soc. Linn. Bordeaux 21: *pl.* 2; Bull. Soc. Bot. Fr. 49: *pl.* 4 (as *Heleocharis amphibia*); Husnot, Cyperaceae *pl.* 17; *Rhodora* 31: *pl.* 190, *f.* 37, 38; Anal. Mus. Nac. Buenos Aires 34: 451; Descole, Gen. & Sp. Plant. Argent. 4: *pl.* 69.

20. *Eleocharis Wolfii* A. Gray in H. Patters.
 Cat. Pl. Illinois 46. 1876.

Scirpus Wolfii A. Gray, Proc. Am. Acad. 10: 77. 1874.

Culms sparsely cespitose, from slender creeping rhizomes, 1.5-3 dm. high, about 1 mm. in diameter, two-edged, often concavo-convex or inrolled, frequently spiral, lightly striate; sheath oblique and scarious at the apex; spikelets slender-ovoid, acute, 5-9 mm. long; scales

oblong-ovate, acuminate, purple-striate, with a scarious margin; style trifid; anthers 3, 1 mm. long; achene pyriform, light brown, shining, 1 mm. long, strongly costulate with 9 longitudinal ribs and about 40-45 trabeculae in each longitudinal series; style-base depressed-truncate, with an apiculate center; bristles lacking.

TYPE LOCALITY: Canton, Illinois (*J. Wolf*).

DISTRIBUTION: Wet meadows and prairies: New York (adventive), Indiana, Tennessee, Illinois, Louisiana, Iowa, Missouri, Oklahoma, Kansas, Colorado, Saskatchewan.

ILLUSTRATIONS: Clarke, Ill. Cyp. *pl. 37, f. 1-7*; Britt. & Brown, Ill. Fl. ed. 2. 1: 315. *f. 772*; Rhodora 31: *pl. 190, f. 36*.

21. *Eleocharis cancellata* S. Wats. Proc. Am. Acad.
18: 170. 1883.

Annual? Dwarf, caespitose; culms 1.5-4 cm. high, radiating from a vertically branched rootstock, capillary, striate and sulcate, light green; sheaths closely investing the culm, fugacious; spikelets 2-4 mm. long, ovate to ovate-lanceolate, acute, the flowers numerous; scales obtuse, striate, green, with a narrow brown line on each side, the margin and tip hyaline, at maturity often exposing the achenes; style trifid; anthers 0.2-0.3 mm. long; achenes broadly obovate-pyriform, 0.6-0.7 mm. long (including the small conic style-base), white and shining, with 6 longitudinal ribs and about 15 trabeculae in each longitudinal series, and with conspicuous translucent fenestration between the trabeculae; bristles lacking.

TYPE LOCALITY: San Luis Potosí, Mexico (*Schaffner 575*).

DISTRIBUTION: Central and northern Mexico; perhaps New Mexico.

ILLUSTRATION: Rhodora 31: *pl. 190, f. 30*.

22. *Eleocharis brachycarpa* Svenson, Rhodora 31: 200. 1929.

Slightly caespitose annual with flexuous, capillary culms 1-7 cm. long; spikelets 2-4 mm. long, many-flowered; scales green or streaked with brown, striate, attenuate-lanceolate, with prominently scarious tips; style trifid; anthers 0.7 mm. long; achenes 0.4-0.5 mm. long, obovate, almost terete, with about 15 trabeculae in each longitudinal series; style-base narrowly conic; bristles lacking.

TYPE LOCALITY: "In locis paludosis, Matamoros" (*Berlandier*).

DISTRIBUTION: Lower Río Grande, Mexico.

ILLUSTRATION: Rhodora 31: *pl. 190, f. 34*.

23. *Eleocharis bella* (Piper) Svenson, Rhodora
31: 201. 1929.

Eleocharis acicularis var. *minima* Torr.; Britton, Jour. N. Y. Micr. Soc. 5: 104. 1889. (Oregon.)
Eleocharis acicularis var. *bella* Piper; Piper & Beattie, Fl. Palouse Reg. 35. 1901. (Washington [State].)

Annual? Rootstock very short, the plant forming dense round tufts 5-10 cm. in diameter; culms ascending, 2-6 cm. high, light green, capillary, soft, sometimes angled and sulcate; sheaths loose, inflated at the summit, acute; spikelets 2-3 mm. long, blunt or acute, ovate, many-flowered; scales ovate-lanceolate, keeled at the summit, acute, with a broad green midrib and purple-striated sides; style trifid; anthers 0.4 mm. long; achene yellowish or white, linear-obovate, 0.7-0.8 mm. long, obtusely 3-angled, with 3 primary and many secondary longitudinal ridges and about 30 trabeculae in each longitudinal series; bristles none.

TYPE LOCALITY: Pullman, Washington (*Piper 3055*).

DISTRIBUTION: Chiefly in river alluvium: Washington, Idaho, and Montana, south to northern Mexico (Chihuahua, *Mueller*).

ILLUSTRATIONS: Jepson, Man. Fl. Pl. Calif. 148. *f. 135*; Rhodora 31: *pl. 190, f. 29*.

Series 4. *Ovatae* Svenson, Rhodora 31: 128. 1929.

Tubercle (style-base) nearly or quite as broad as the achene; stamens 3.

Spikelets broadly ovoid to cylindrical, obtuse to subacute; scales obtuse; tubercle depressed or deltoid, rarely half as high as the body of the achene.

- Tubercle deltoid, compressed (lamelliform), the sides usually concave, one-third to nearly one-half as high as the body of the achene; bristles (wanting in var. *Peasei*) much exceeding the achene. 24. *E. obtusa*.
- Tubercle lamelliform, very low, not more than one-fourth as high as the body of the achene; summit of the achene appearing truncate; bristles equaling the achene or rudimentary. 26. *E. Engelmanni*.
- Spikelets lanceolate, acuminate; scales acute; tubercle elongate-deltoid, one-half as high as the body of the achene. 27. *E. lanceolata*.
- Tubercle less than two-thirds as broad as the achene; stamens 2 or 3. 25. *E. ovata*.

24. *Eleocharis obtusa* (Willd.) Schultes in R. & S.

Syst. Veg. Mant. 2: 89. 1824.

- Scirpus obtusus* Willd. Enum. 76. 1809. (Pennsylvania.)
Scirpus elegantulus Steud. Syn. Cyp. 317. 1855. (New Orleans.)
Eleocharis diandra C. Wright, Bull. Torrey Club 10: 101. 1883. (Connecticut.)
Eleocharis obtusa var. *jejuna* Fernald, Proc. Am. Acad. 34: 492. 1899. (Maine.)
Eleocharis ovata var. *gigantea* Clarke; Britton, Jour. N. Y. Micr. Soc. 5: 103. 1889. Nomen nudum. (Oregon.)
Eleocharis obtusa var. *gigantea* Fernald, Proc. Am. Acad. 34: 493. 1899.
Eleocharis Macounii Fernald, Proc. Am. Acad. 34: 497. 1899. (Quebec.)
Eleocharis ovata var. *obtusa* Kükenth.; Skottsbl. Acta Hort. Gothob. 2: 212. 1926.
Eleocharis obtusa var. *Peasei* Svenson, Rhodora 31: 217. 1929. (New Hampshire.)
Eleocharis obtusa var. *ellipsoidalis* Fernald; Svenson, Rhodora 31: 218. 1929. (Massachusetts.)

Annual (rarely perennial, as in var. *ellipsoidalis*), usually erect; culms numerous, 0.3–5 dm. long, yellowish-green, capillary to 1.5 mm. in diameter; sheaths purplish at base, at the apex firm and somewhat oblique; spikelets globose-ovoid to ovoid-cylindric, obtuse, many-flowered, 2–13 mm. long, closely or loosely flowered; scales ovate-oblong to suborbicular, brown, with a narrow scarios margin and usually a greenish midrib; style bifid or trifid; achene 1–1.5 mm. long, turbinate-obovoid, narrowed at the base, pale to deep brown, smooth and shining; style-base strongly flattened, deltoid, acute, nearly as wide as the achene; bristles 6 or 7, dark brown, coarse, exceeding the achene, retrorsely toothed.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Nova Scotia, west to Minnesota, south to northern Florida and Texas; Colorado and New Mexico; British Columbia and Idaho to northern California; Hawaiian Islands.
 ILLUSTRATIONS: A. Gray, Man. ed. 7. 182. f. 247; Britt. & Brown, Ill. Fl. ed. 2. 1: 313. f. 766; Jepson, Man. Fl. Pl. Calif. 148. f. 133; Abrams, Ill. Fl. Pacif. St. 1: 263. f. 627; Proc. Am. Acad. 34¹⁹: pl., f. 1–7; Rhodora 41: pl. 540, f. 1, 6, 7.

NOTE: The complex represented by *E. obtusa*, *E. ovata*, *E. diandra*, *E. Engelmanni*, and *E. lanceolata* is very difficult and, because of the presence of intergrading forms, all could perhaps be treated as a single species. *E. diandra*, found where there are rapid changes of water level, is directly transitional to *E. obtusa*. In the estuary of the Hudson River in New York forms representing *E. obtusa*, *E. ovata*, *E. diandra*, and *E. lanceolata*, as least in respect to style-base and shape of spikelets, occur at the various tide levels. *E. Macounii* represents a variant with elongated style-base somewhere between *E. obtusa* and *E. ovata*, in which some of the achenes are slightly trigonous. Occasional autumnal plants of typical *E. obtusa* are found with well-developed rhizomes; in var. *ellipsoidalis* of the Atlantic coast, rhizomes commonly appear. Var. *jejuna* commonly forms mats of small prostrate plants in swamps that have dried out.

25. *Eleocharis ovata* (Roth) R. & S. Syst. Veg. 2: 152. 1817.*

Trichophyllum ovatum Farwell, Rep. Mich. Acad. 21: 358. 1920.

Eleocharis annua House, Bull. N. Y. State Mus. 243–244: 58. 1923.

In habit similar to *E. obtusa*, but usually less coarse; culms 0.3–5 dm. long; spikelet globose-ovoid to ovoid-cylindric, obtuse or acute, many-flowered, 2–8 mm. long; scales oblong to narrowly ovate, obtuse, purplish-brown, with pale midrib and base and a white, scarios margin; style bifid or trifid; achene obovoid or inverted-pyriform, light brown, shining, 1 mm. long excluding the deltoid-conic style-base, which is half as broad as the summit of the achene; bristles light brown, 6 or 7, exceeding the achene or frequently lacking.

TYPE LOCALITY: Europe.

DISTRIBUTION: Scattered, chiefly northward on lake margins: Newfoundland and Quebec, south to Maine and Vermont; Michigan, Wisconsin, Minnesota, Washington, Oregon; Eurasia.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 313. f. 765; Proc. Am. Acad. 34¹⁹: pl., f. 8–10; A. Gray, Man. ed. 7. 182. f. 246; Abrams, Ill. Fl. Pacif. St. 1: 262. f. 626; Rhodora 41: pl. 540, f. 4.

NOTE: The name *Scirpus soloniensis* Dubois, transferred to *Eleocharis*, has recently been used for this species because of *Scirpus ovatus* Gilib. Exerc. Phyt. 512 (1792). The validity of Gilibert's binomials has been rejected by McVaugh, Gent. Herb. 8: 87–90 (1949).

* For synonymy of European plants see Rhodora 31: 211, 212 (1929).

26. *Eleocharis Engelmanni* Steud. Syn. Cyp. 79. 1855.

- Eleocharis Engelmanni* var. *detonsa* A. Gray in H. Patters. Cat. Pl. Illinois 46. 1876. (Illinois.)
Eleocharis ovata var. *Engelmanni* Britton, Jour. N. Y. Micr. Soc. 5: 103. 1889.
Eleocharis Engelmanni var. *robusta* Fernald, Proc. Am. Acad. 34: 496. 1899. (Missouri.)
Eleocharis monticola Fernald, Proc. Am. Acad. 34: 496. 1899. (California.)
Eleocharis monticola var. *leviseta* Fernald, Proc. Am. Acad. 34: 496. 1899. (Idaho.)
Trichophyllum Engelmanni Farwell, Rep. Mich. Acad. 21: 359. 1920.
Trichophyllum monticolum House, Am. Midl. Nat. 6: 205. 1920.
Eleocharis monticola var. *pallida* St. John; St. John & Jones, Northw. Sci. 2: 81. 1928. (Washington [State].)
Eleocharis Engelmanni var. *monticola* Svenson, Rhodora 31: 209. 1929.
Eleocharis Engelmanni var. *monticola* f. *leviseta* Svenson, Rhodora 31: 210. 1929.
Eleocharis obtusa var. *Engelmanni* Gilly, Iowa St. Coll. Jour. Sci. 21: 92. 1946.

Resembling *E. obtusa* in habit, the culms 1-4 dm. long; spikelets dark to pale brown, obtuse to acute, cylindrical, 5-16 mm. long; scales obtuse to acute, appressed; achenes similar to those of *E. obtusa* but appearing truncate by the depressed tubercle which is not more than one-fourth the height of the body of the achene; bristles about equaling the achene, retrorsely toothed, frequently reduced or lacking.

TYPE LOCALITY: St. Louis (*Engelmann*).

DISTRIBUTION: Southern Maine to Washington [state], south to Georgia and California.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 314. f. 767; Proc. Am. Acad. 34th: pl., f. 37-40; A. Gray, Man. ed. 7. 183. f. 248; Abrams, Ill. Fl. Pacif. St. 1: 263. f. 628; Rhodora 41: pl. 540, f. 2.

27. *Eleocharis lanceolata* Fernald, Proc. Am. Acad. 34: 493. 1899.

- Trichophyllum lanceolatum* House, Am. Midl. Nat. 6: 205. 1920.
Eleocharis obtusa var. *lanceolata* Gilly, Iowa St. Coll. Jour. Sci. 21: 92. 1946.

Culms slender, almost capillary, erect, 2 dm. high; spikelets many-flowered, 5-8 mm. long, narrowly ovate-lanceolate, acuminate; scales scarios, acute, light brown, with a greenish midrib; achene broadly obovate, 1 mm. long, light brown; style-base as broad as the summit of the achene, compressed, elongate-deltoid, half as high as the body of the achene; bristles 6-7, brown, coarse, exceeding the achene.

TYPE LOCALITY: Central Arkansas (*Harvey*).

DISTRIBUTION: Arkansas and Texas.

ILLUSTRATIONS: Proc. Am. Acad. 34th: pl., f. 27-29; Rhodora 41: pl. 540, f. 5.

Series 5. *Maculosae* Svenson, Rhodora 31: 128. 1929.

Sheaths firm, acute at the apex; achenes black or purplish-brown; chiefly caespitose annuals.

Achenes 0.7-1.5 mm. long.

Achenes 0.7-1.0 mm. long; not stoloniferous.

Achenes 0.9-1.5 mm. long; plants stoloniferous.

Achenes 0.5 mm. long.

Spikelets usually elongated, 2-8 mm. long, many-flowered; achene frequently broadest at the summit.

Spikelets ovate, 1-2 mm. long, 3-9-flowered. (Bahama Islands.)

Sheaths membranous-marcescent at the apex; perennials.

Mature achenes olivaceous.

Culms not rigid or conspicuously thickened, rarely exceeding 0.5 mm. in width.

Style-base conic-subulate; achenes lightly punctate.

Style-base low-conic; achenes longitudinally striate.

Culms rigid, frequently recurved, often 1.5-2 mm. wide; style-base low-conic.

Mature achenes black to purplish-brown.

Scales yellow to green; achenes 0.8 mm. long; style-base conic; bristles white.

Scales purplish-brown to black; achenes 1.3-1.5 mm. long, including the subulate style-base; bristles reddish-brown.

Subseries *Rigidae*.

28. *E. caribaea*.

29. *E. Sintenisii*.

30. *E. atropurpurea*.

31. *E. bahamensis*.

Subseries *Ocreatae*.

32. *E. olivacea*.

33. *E. Schaffneri*.

34. *E. Sellowiana*.

35. *E. flavescens*.

36. *E. maculosa*.

28. *Eleocharis caribaea* (Rottb.) Blake, Rhodora 20: 24. 1918.

- Scirpus geniculatus* L. Sp. Pl. 48. 1753, in part. Not *S. geniculatus* L. Sp. Pl. ed. 2. 71. 1762.*
Scirpus caribaeus Rottb. Descr. Pl. Rar. 24. 1772. (West Indies.)

* See note under *E. elegans*.

- Scirpus geniculatus* β *minor* Vahl, Enum. 2: 251. 1805.
Eleocharis capitata R. Br. Prodr. 225. 1810. (Australia.)
Eleocharis setacea R. Br. Prodr. 225. 1810. (Australia.)
Eleocharis geniculata R. & S. Syst. Veg. 2: 150. 1817.
Eleocharis caduca Schultes in R. & S. Syst. Veg. Mant. 2: 88. 1824. (Egypt.)
Scirpus Brownii Spreng. Syst. 1: 204. 1825.
Eleocharis capitatus Nees in Wight, Contr. Bot. Ind. 112. 1834.
Eleocharis microformis Buckl. Proc. Acad. Phila. 1862: 10. 1862. (Northern Texas.)
Eleocharis dispar E. J. Hill, Bot. Gaz. 7: 3. 1882. (Indiana.)
Chlorocharis capitata Rikli, Jahrb. Wiss. Bot. 27: 564. 1895.
Eleocharis capitata var. *dispar*, Fernald, Rhodora 8: 129. 1906.
Eleocharis caribaea var. *dispar* Blake, Rhodora 20: 24. 1918.
Eleocharis caribaea var. *Stokesii* F. B. H. Brown, Bishop Mus. Bull. 84: 106. 1931. (Polynesia.)

Cespitose; culms firm, 0.3–4 dm. high, striate and sulcate; sheaths prominent, stramineous, usually with a brown base and a firm, oblique, often attenuate apex; spikelets globose or ovoid, obtuse, many-flowered; scales ovate-orbicular, almost cartilaginous to membranous, yellow to pale brown; style bifid; stamens 2 or 3; achene obovoid, 0.7–1 mm. long, lustrous-black to purplish, the spongy, whitened style-base variable in shape but usually much depressed; bristles 6–8, coarse, brown, exceeding the achene or occasionally lacking.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: South Carolina, Florida, Texas, California, Indiana, Michigan, Ontario; tropics of the Old and New Worlds. The most widely distributed species of *Eleocharis*.

ILLUSTRATIONS: Rottb. Descr. & Ic. pl. 15, f. 3; Britt. & Brown, Ill. Fl. ed. 2. 1: 313. f. 764; A. Gray, Man. ed. 7. 182. f. 244; Anal. Mus. Nac. Buenos Aires 34: 440; Rhodora 31: pl. 191, f. 45, 48; Descole, Gen. & Sp. Plant. Argent. 4: pl. 58B (as *Heleocharis geniculata*).

NOTE: The development of rootstocks in this species is very rare but occurs sometimes in the Egyptian *E. caduca* and in occasional other African specimens, as well as in one or two specimens from the Florida Keys; see note on *E. Sintenisii*.

29. *Eleocharis Sintenisii* Böck. Beitr. Cyp. 1: 16. 1888.

Eleocharis Shaferi Britton, Mem. Torrey Club 16: 59. 1920. (Oriente, Cuba.)

Eleocharis yunqueensis Britton; Britton & Wilson, Sci. Surv. Porto Rico 5: 92. 1923. (Puerto Rico.)

Heleocharis Ekmanii Kükenth. Repert. Sp. Nov. 23: 192. 1926. (Cuba.)

Heleocharis debilis f. *macra* sensu Kükenth. Repert. Sp. Nov. 23: 192. 1926. (Brazil.)

Rootstocks wide-creeping to matted-lignescens; culms filiform, 0.5–3 dm. long, often short and rigid, irregularly sulcate; sheaths stramineous to purple, the apex acute, not inflated; spikelets usually few-flowered, elliptic-lanceolate to ovate, obtuse to acute; scales obtuse to subacute, stramineous to purple, often with a green midrib; stamens 2 or 3, anthers 0.4–0.7 mm. long; style bifid; achenes lenticular, narrowly obovoid, 0.9–1.5 mm. long, shining-black; style-base conic to subulate; bristles light brown to white, equaling or exceeding the achene.

TYPE LOCALITY: "Prope Bayamon ad Palo Seco in fossis," Puerto Rico.

DISTRIBUTION: Cuba; Puerto Rico.

ILLUSTRATIONS: Rhodora 41: pl. 541, f. 3, 6.

NOTE: *E. Sintenisii* should probably be placed under the Brazilian *E. debilis*. The specimens previously cited by me (Rhodora 41: 49. 1939) from Big Pine Key, Florida, seem to represent *E. caribaea* with a very rare development of rootstocks.

30. *Eleocharis atropurpurea* (Retz.) Kunth, Enum. Pl. 2: 151. 1837.

Scirpus atropurpureus Retz. Obs. 5: 14. 1789.

Isolepis atropurpurea R. & S. Syst. Veg. 2: 106. 1817.

Eleocharis atropurpurea A. Dietr. Sp. Pl. 2: 97. 1833.

Eleocharis atropurpureus Nees in Wight, Contr. Bot. Ind. 113. 1834.

Eleocharis Lereschii Shuttl. Flora 20: 241. 1837. (Switzerland.)

Scirpus erraticus Rota; De-Not. Ann. Sci. Nat. III. 5: 366. 1846. (Italy.)

Isolepis setifolia A. Rich. Tent. Fl. Abyss. 2: 498. 1852. (Abyssinia.)

Eleocharis Zanardinii Parl. Fl. Ital. 2: 67. 1852. (Italy.)

Eleocharis monandra Hochst.; Steud. Syn. Cyp. 75. 1855. (Northern Africa.)

Isolepis allochroa Steud. Syn. Cyp. 91. 1855. (Bahia, Brazil.)

Isolepis dichroa Steud. Syn. Cyp. 91. 1855. (Senegal.)

Eleocharis ? erratica Steud. Syn. Cyp. 79. 1855. (Italy.)

Eleocharis multiflora Chapm. Fl. S. U. S. 517. 1860. (Florida.)

Trichophyllum atropurpureum House, Am. Midl. Nat. 6: 204. 1920.

Dwarf annual, cespitose; culms 3–12 cm. high, capillary, erect or arcuate; sheaths deep brown at the base, the firm apex oblique and often attenuate; spikelet oblong-ovoid, 2–8 mm. long, many-flowered, the lower scales frequently deciduous; scales ovate, membranous, blunt, with broad, green midrib and deep brown sides; style bifid; stamens 1–3; achenes strongly flattened, lenticular, obovoid, frequently widest at the summit, 0.5 mm. long, smooth, lustrous-black to translucent cherry-red; style-base minute, flattened, about one-fourth the width of the achene; bristles slender, translucent, shorter than the achene, often reduced or wanting.

TYPE LOCALITY: Calcutta, India (Koenig).

DISTRIBUTION: Sporadically in damp sand; Georgia, Florida, Nebraska, Iowa, Colorado, Washington (Lake Chelan), Texas; Mexico; tropics of the Old and New Worlds; Lake Leman, Switzerland; northern Italy.

ILLUSTRATIONS: Husnot, *Cyperaceae* pl. 17; Clarke, Ill. Cyp. pl. 36, f. 6–9; A. Gray, Man. ed. 7. 182. f. 243; Rhodora 31: pl. 191, f. 49; Descole, Gen. & Sp. Plant Argent. 4: pl. 57A.

31. *Eleocharis bahamensis* Böck. Beitr. Cyp. 2: 11. 1890.

Eleocharis atropurpurea sensu Clarke, Symb. Ant. 2: 65. 1900. Not *E. atropurpurea* Kunth, 1837. ? *Eleocharis campitricha* var. β *Schweinitzii* Clarke, Symb. Ant. 2: 69. 1900. (Perhaps from British Guiana.)

Dwarf and sprawling, matted; culms of unequal length, 2–5 cm. long, capillary-setaceous, erect or recurved, obscurely quadrangular and lightly sulcate; apex of the upper sheath firm, oblique, elongated; spikelet minute, 1–2 mm. long, in fruit broadly ovate, 3–9-flowered; scales membranous, acutish, purplish-brown, with a green midrib; achene minute, about 0.5 mm. long, black and shining, the surface slightly roughened; style-base pallid, disciform, apiculate in the center, about two-thirds the width of the achene; bristles 6, slender, of unequal length, a little shorter than the achene, white, retrorsely toothed, united to form a prominent base.

TYPE LOCALITY: Bahamas.

DISTRIBUTION: Bahamas.

ILLUSTRATION: Rhodora 31: pl. 191, f. 51.

32. *Eleocharis olivacea* Torr. Ann. Lyc. N. Y. 3: 300. 1836.

Scirpus olivaceus Kuntze, Rev. Gen. 2: 758. 1891.

Trichophyllum olivaceum House, Am. Midl. Nat. 6: 205. 1920.

Eleocharis flaccida var. *olivacea* Fern. & Griseb. Rhodora 37: 155. 1935.

Culms light green, often decumbent, 2–15 cm. long (3 dm. in elongate plants from the southern states), flattened and grooved, diffusely tufted from slender rootstocks; apex of the upper sheath membranous but not conspicuously dilated; spikelets oblong-ovoid, acute, 20–30-flowered, 3–7 mm. long; scales ovate, rather membranous and loosely imbricated, with green keel and brown sides, sometimes green throughout; style bifid; stamens 2 or 3; achene obovoid, narrowed at the base, 1 mm. long, olive to dark brown, the surface punctulate and often marcescent; style-base conic, light green, annular-thickened at the base, one-fourth as wide as the achene, sometimes prolonged into a subulate beak; bristles 6–8 (usually 7), green or whitish, opaque or semi-translucent, exceeding the achene, retrorsely toothed.

TYPE LOCALITY: "Pine barrens of New Jersey!"

DISTRIBUTION: Chiefly near the coast from Nova Scotia and southern New Brunswick to Virginia, inland to the Great Lakes, Wisconsin, and Minnesota; also in South Carolina (Aiken), northern Georgia (Stone Mt.), and western Florida.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 312. f. 762; A. Gray, Man. ed. 7. 182. f. 242; Rhodora 31: pl. 191, f. 43; 41: pl. 541, f. 2.

33. *Eleocharis Schaffneri* Böck. Bot. Jahrb.

7: 274. 1886.

Heleocharis exilis Böck. Beitr. Cyp. 1: 16. 1888. (Mexico.)

Cespiteous; culms light green, capillary, setaceous, spreading, sulcate, 3–5 cm. high; apex of the upper sheath membranous, scarcely inflated, obtuse; spikelet ovate, somewhat acute, 2–3 mm. long, 7–15-flowered; scales membranous, green, sometimes with light reddish or bronze sides, broadly ovate, obtuse or acute; style bifid; stamens 2 or 3; achene 0.7 mm. long, olive-green, the surface with elongate black striations; style-base very small, flattened,

gray, slightly apiculate, one-fourth as wide as the achene; bristles 6 or 7, white, somewhat shorter than the achene.

TYPE LOCALITY: San Luis Potosí (*Schaffner 204*).

DISTRIBUTION: Mexico; Honduras; Guatemala; Costa Rica.

ILLUSTRATION: *Rhodora* 31: *pl. 191, f. 39*.

34. *Eleocharis Sellowiana* Kunth, Enum. Pl. 2: 149. 1837.

Eleogenus Sellowianus Nees in Mart. Fl. Bras. 2¹: 103. 1842.

Eleocharis homonyma Steud. Syn. Cyp. 79. 1855. (Guiana.)

Heleocharis albivaginata δ *macrostachya* Böck. Linnaea 36: 438. 1870. (Puerto Rico?)

Scirpus Sellowianus Griseb. Abh. Ges. Wiss. Gött. 24: 312. 1879.

Eleocharis crispovaginata Böck. Bot. Jahrb. 8: 206. 1887. (Northern Ecuador.)

Eleocharis Pittieri Böck. Allg. Bot. Zeitschr. 2: 35. 1896. (Costa Rica.)

Eleocharis Sellowiana var. *homonyma* H. Pfeiffer, Herb. 56: 54. 1921.

Eleocharis galapagensis Svenson, *Rhodora* 31: 233. 1929. (Galapagos Islands.)

Culms numerous, rigid, somewhat spongy and thickened, 8–15 cm. long, usually 1.5–2 mm. wide when dry, striate, constricted below the spikelet; upper sheath with a divided, hyaline, fugacious apex; spikelets 5–10 mm. long, ellipsoid, acute, many-flowered; scales appressed, oblong, obtuse, scarcely keeled, stramineous, with a narrow brown stripe on each side of the midrib; style bifid; stamens 3; achene 0.8–1 mm. long, broadly obovate, turgid-lenticular, somewhat flattened at the margin, olivaceous, shining, minutely black-striate; style-base yellowish-green, short-conic, acute, marginulate below, about one-fourth as wide as the achene; bristles 7 or 8, glistening-white, shorter than the achene.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Costa Rica; tropical South America.

ILLUSTRATIONS: Anal. Mus. Nac. Buenos Aires 34: 438; *Rhodora* 31: *pl. 191, f. 42*; Anal. Mus. Hist. Nat. Montevideo II. 3: *pl. 37, f. 16*; Descole, Gen. & Sp. Plant. Argent. 4: *pl. 52*.

35. *Eleocharis flavescens* (Poir.) Urban, Symb. Ant. 4: 116. 1903.

Scirpus flavescens Poir. in Lam. Encyc. 6: 756. 1804.

? *Scirpus flaccidus* Reichenb.; Spreng. f. Tent. Suppl. Syst. 3. 1828. (Suriname.)

Baeothyrion flavescens A. Dietr. Sp. Pl. 2: 91. 1833.

Scirpus Gaudichaudianus Kunth, Enum. Pl. 2: 157. 1837. (Brazil.)

Eleogenus ocreatus Nees in Mart. Fl. Bras. 2¹: 102. 1842, in part. (Probably from Brazil.)

Eleocharis ochreatea Steud. Syn. Cyp. 79. 1855.

Scirpus bahiensis Steud. Syn. Cyp. 83. 1855. (Brazil.)

Scirpus ocreatus Griseb. Fl. Brit. W. Ind. 570. 1864.

Heleocharis albivaginata Böck. Linnaea 36: 437. 1870.

Scirpus anisochaetus C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 80. 1871. (Cuba.)

? *Heleocharis Urbani* Böck. Allg. Bot. Zeitschr. 2: 20. 1896. (Brazil.)

Heleocharis Dussiana Böck. Allg. Bot. Zeitschr. 2: 54. 1896. (Martinique.)

Heleocharis flaccida Urban, Symb. Ant. 2: 165. 1900.

? *Eleocharis thermalis* Rydb. Mem. N. Y. Bot. Gard. 1: 69. 1900. (Yellowstone Park, Wyoming.)

Eleocharis praticola Britton; Small, Fl. SE. U. S. 182. 1903. (Florida.)

Trichophyllum ochreatum House, Am. Midl. Nat. 6: 205. 1920.

Heleocharis flaccida var. *fuscescens* Kükenth. Repert. Sp. Nov. 23: 191. 1926. (Cuba.)

Eleocharis flavescens var. *fuscescens* Svenson, *Rhodora* 41: 48. 1939.

Culms slender, light green, 0.5–4 dm. long, usually soft and lax, striate, in small specimens sometimes becoming somewhat rigid; apex of the sheath membranous, white, inflated; spikelets 2–6 mm. long, ovate, acute or blunt; scales elliptic to oblong-lanceolate, membranous, pale green or yellowish (rarely brown); style bifid; stamens 3; mature achene lustrous, purplish-brown, 0.8 mm. long, obovate, the surface minutely punctulate; style-base green, conic, acute; bristles 6 or 7 (rarely none), shining-white, shorter than the achene, retrorsely toothed.

TYPE LOCALITY: Puerto Rico.

DISTRIBUTION: Delaware, Virginia, South Carolina, Florida, Mississippi; Mexico; West Indies; South America.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 312. *f. 761*; Bih. Sv. Vet.-Akad. Handl. 26(3)^o: *pl. 2, f. 1*; A. Gray, Man. ed. 7. 181. *f. 241*; *Rhodora* 31: *pl. 191, f. 47* (as *E. flaccida*); 41: *pl. 541, f. 1*; Descole, Gen. & Sp. Plant. Argent. 4: *pl. 54B*.

NOTE: In *E. thermalis* the brown achenes are larger (0.9–1.1 mm. long) and the bristles slightly exceed the achene: *A. Nelson 6747 h. 42* from Gibbon Canyon, Wyoming; *M. E. Jones* in 1882 from St. Lawrence, California; *Mason & Smith 8376* from Snelling, California; and presumably *Tidestrom 384* from Wasatch Mts., Utah. These collections should perhaps be segregated as a distinct species, *E. thermalis* Rydb.

36. *Eleocharis maculosa* (Vahl) R. & S. Syst. Veg.
2: 154. 1817.

Scirpus maculosus Vahl, Enum. 2: 247. 1805.

Eleocharis ocreatus var. β 2 *albo-ater* Nees in Mart. Fl. Bras. 2¹: 102. 1842, fide Böckeler.
(Brazil.)

Eleocharis ocreatus var. β 3 *binocreatus* Nees in Mart. Fl. Bras. 2¹: 103. 1842, fide Böckeler.
(Brazil.)

Eleocharis Schottianus Nees in Mart. Fl. Bras. 2¹: 102. 1842. (Brazil.)

Eleocharis binocrenata Nees; Steud. Syn. Cyp. 79. 1855, as syn.

Eleocharis Schottiana Steud. Syn. Cyp. 79. 1855.

Heleocharis Glazioviana Böck. Vidensk. Meddel. 1871: 150. 1872. (Brazil.)

Heleocharis Lehmanniana Böck. Bot. Jahrb. 8: 205. 1887. (Ecuador.)

Trichophyllum maculosum House, Am. Midl. Nat. 6: 205. 1920.

Stolons elongate, castaneous; culms 7–35 cm. long, erect, striate, rigid; apex of the upper sheath conspicuously enlarged, scariosus and rugose; spikelets 5–12 mm. long, ovoid to lanceolate, many-flowered, the scales densely imbricated; scales ovate, rather blunt, firm, shining, purplish-brown to black with scariosus margins, the lowest orbicular with a prominent green midrib; style bifid; stamens 3; achene obovoid, narrowed at the base, 1.3–1.5 mm. long (including the style-base), shining-black, the surface roughened; style-base half as wide as the achene, light brown, with a dilated base and a narrow subulate beak; bristles 7 or 8, reddish-brown, of unequal length, some usually equaling the achene, the retrorse teeth small but very numerous.

TYPE LOCALITY: Guadeloupe (Richard).

DISTRIBUTION: Guatemala; Guadeloupe; Martinique; Dominica; Venezuela; Colombia; Ecuador; Bolivia; Brazil.

ILLUSTRATIONS: Anal. Mus. Nac. Buenos Aires 34: 439; Rhodora 31: pl. 191, f. 40; Descole, Gen. & Sp. Plant. Argent. 4: pl. 53.

Series 6. *Palustriformes* Svenson, Rhodora 31: 128. 1929.

Subseries *Palustres* Svenson, Rhodora 31: 128. 1929.

Basal scales of the spikelet solitary and spatheform, completely encircling the base of the spikelet.

Achenes prominently reticulate-pitted.

Tubercle ovoid, nearly equaling or larger than the achene; spikelets castaneous to purplish. Sea coasts, Alaska to northern Quebec.

37. *E. kamtschatica*.

Tubercle pyramidal, much smaller than the achene; spikelets castaneous. Near the coast, Massachusetts to Louisiana; Cuba.

38. *E. fallax*.

Achenes smooth to faintly reticulate.

Culms elongate-filiform; spikelets 30–40-flowered with obtuse scales; tubercle conic, only 0.2–0.45 mm. wide at the base. Quebec to the margin of the Great Plains.

39. *E. erythropoda*.

Culms usually thicker, frequently inflated or rigidly flattened.

Spikelets few-flowered, the 5–30 scales usually lustrous purple; tubercles conic, only 0.2–0.4 mm. wide at the base. Sea coasts, Hudson Bay to Virginia.

40. *E. halophila*.

Spikelets frequently many-flowered, the scales stramineous to purplish; tubercles depressed-deltoid to lanceolate. Western North America.

41. *E. macrostachya*.

Basal scales of the spikelet usually 2 or 3 below the thinner fertile scales, the lowest not encircling the base of the spikelet.

Tubercles depressed-deltoid, the scales acuminate, and the culms wiry in the southern part of the range, the entire plant commonly becoming soft, with elongate tubercles, northward. Newfoundland to Alabama, west to the Great Plains.

42. *E. Smallii*.

Tubercles depressed-deltoid to lanceolate; culms variable. Western North America.

41. *E. macrostachya*.

37. *Eleocharis kamtschatica* (C. Meyer) Kom. Fl. Pen.
Kamtsch. 1: 207. 1927.

Scirpus kamtschaticus C. Meyer, Mém. Acad. St.-Petersb. Sav. Étr. 1: 198. 1831.

Eleocharis piceata A. Gray, Mem. Am. Acad. II. 6: 417. 1859, in part.

Loosely stoloniferous with filiform culms 0.3–3 dm. high, 0.5–1.0 mm. wide; sheaths reddish, close; spikelets castaneous to purplish, oblong-lanceolate, 4–12 mm. long, loosely few-flowered; basal scale amplexicaul; fertile scales 10–20, broadly ovate, rounded at the

tip, castaneous, subcoriaceous; anthers 1.7–2 mm. long; achenes obovoid, 1.3–1.5 mm. long, 1.2 mm. wide, capped by the spongy-cellular, mitriform, blunt tubercle nearly equaling or larger than the achene; bristles variable.

TYPE LOCALITY: Kamchatka.

DISTRIBUTION: Labrador; Quebec; Alaska; eastern Asia. (cf. *Rhodora* 49: 66. 1947.)

ILLUSTRATIONS: *Rhodora* 31: *pl.* 184, *f.* 32, 33.

NOTE: *E. uniglumis* (in part) of American authors.

38. *Eleocharis fallax* Weath. *Rhodora* 24: 23. 1922.

Eleocharis nervosa Kükenth. Repert. Sp. Nov. 23: 192. 1926. (Cuba.)

Eleocharis ambigens Fernald, *Rhodora* 37: 394. 1935. (Virginia.)

Loosely stoloniferous or scespitose with purplish-castaneous stolons 1.5–2 mm. thick; culms subrigid, pale, 2.5–7 dm. high; sheaths castaneous or purplish, coriaceous and subtruncate at the apex; spikelets lanceolate or narrowly ovoid, acute, 4–10 mm. long, loosely few-flowered; lowest scale amplexicaul, much elongated at the base; fertile scales lanceolate-ovate, acute or subacute, pale brown with a hyaline margin; achene ellipsoid-obovoid, convex to obtusely 3-angled, yellow, often becoming castaneous when mature, 1.2–1.7 mm. long (excluding the pyramidal tubercle which is much smaller than the achene), the surface prominently punctate-reticulate; bristles variable in length.

TYPE LOCALITY: Fresh and brackish springy border of Dinah's Pond, Yarmouth, Massachusetts.

DISTRIBUTION: Along the coast, southern Massachusetts to Louisiana; Texas (Matagorda County, *Bechtold*); Cuba.

ILLUSTRATIONS: *Rhodora* 37: *pl.* 387, *f.* 1–8.

NOTE: The achenes of this species vary from lenticular to bluntly 3-angled. Sometimes the majority of the stigmas are 3-parted, more frequently only one or two will be found in a spikelet, or they may be entirely 2-parted. *E. fallax* forms a link between the two subsections, as the names "fallax" and "ambigens" suggest.

39. *Eleocharis erythropoda* Steud. Syn. Cyp. 76. 1855.

Scirpus glaucus Torr. Fl. U. S. 44. 1824. Not *S. glaucus* Lam. 1791, nor *Eleocharis glauca* Böck. 1871.

Eleocharis calva Torr. Fl. N. Y. 2: 346. 1843. A "provisional species."

Eleocharis palustris var. 2 *calva* A. Gray, Man. 522. 1848.

Trichophyllum palustre var. *calvum* House, Am. Midl. Nat. 6: 205. 1920.

Loosely stoloniferous with capillary or slender rhizomes and stolons; culms usually nearly filiform, rarely 0.5–1.5 mm. wide, subterete; sheaths red or castaneous, very close, the apex frequently darkened and almost truncate; spikelets lanceolate, 1.0–1.7 cm. long, 30–40-flowered, with the appressed basal scale completely encircling the culm; fertile scales brown; anthers 1.3–1.7 mm. long; achenes obovate, dark brown when mature, averaging 1.7 mm. long (including the short, conic tubercle) and 1.0 mm. wide; bristles variable.

TYPE LOCALITY: Ohio (*Frank*).

DISTRIBUTION: Margins of lakes and streams, chiefly in calcareous regions: Cape Breton and Quebec to Hudson Bay and Manitoba, south to Virginia, Tennessee, Illinois, Missouri, Oklahoma, and Nebraska.

ILLUSTRATIONS: *Rhodora* 31: *pl.* 182, *f.* 15, 16; 41: *pl.* 547, *f.* 1, 5.

40. *Eleocharis halophila* Fernald & Brackett; Fernald, *Rhodora* 37: 395. 1935.

Eleocharis uniglumis var. *halophila* Fernald & Brackett, *Rhodora* 31: 72. 1929.

Loosely stoloniferous with slender purplish stolons; culms subrigid, 2–5 dm. high; sheaths purplish, acute at the apex; spikelets lanceolate or narrowly ovoid, acute, loosely 5–30-flowered; lowest scale amplexicaul; fertile scales lanceolate-ovate, acute or subacute, usually lustrous-purple; achene usually dark lucid brown, obovate, averaging 1.6 mm. long (excluding the ovoid-deltoid, sometimes bulbiform tubercle) and approximately 1 mm. wide, the surface smooth; bristles brown, variable in length.

TYPE LOCALITY: Brackish marshes at the mouth of Bonaventure River, Quebec.

DISTRIBUTION: Borders of salt marshes, Hudson Bay and Newfoundland to Virginia.

ILLUSTRATION: *Rhodora* 31: *pl.* 183, *f.* 17–26.

41. *Eleocharis macrostachya* Britton; Small. Fl.
SE. U. S. 184. 1903.

Eleocharis mamillata of authors, not *E. mamillata* Lindb. f.

Eleocharis calva of authors (as to plants of western United States and Hawaii), not *E. calva* Torr. 1843.

Eleocharis palustris β *australis* Nees, Nova Acta Acad. Leop.-Carol. 19 (Suppl. 1): 96. 1843. (Hawaii.)

Scirpus nudissimus Steud. & Jardin, Bull. Soc. Linn. Norm. II. 9: 278, 280. 1875. Nomen subnudum. (Hawaii.)

Eleocharis perlonga Fernald & Brackett, Rhodora 31: 70. 1929. (California.)

Eleocharis xyridiformis Fernald & Brackett, Rhodora 31: 76. 1929. (Valley of Mexico.)

Loosely stoloniferous or subcespitose; culms filiform to 3 mm. wide, usually prominently striate, soft to rigid, frequently flattened, or spirally twisted; sheaths orange to dark red, loose, often truncate and mucronate at the apex; spikelets lanceolate (rarely ovate) to acuminate, pale brown to nearly black, few- or many-flowered, the scales usually remaining appressed at maturity; lower scale frequently encircling the culm; fertile scales lanceolate, firm, acute, scarcely hyaline at the apex, usually with a pale midrib and brown to black margins; anthers 1.5–2.0 mm. long; achenes obovate, glistening yellow when immature, becoming dark brown, averaging 1.8 mm. long (not including the depressed-deltoid to lanceolate tubercle), and 1.0 mm. wide; bristles slender, variable in length.

TYPE LOCALITY: "Indian Territory" (Oklahoma).

DISTRIBUTION: Minnesota, Iowa, Missouri, Illinois (Bluff Lake, *Eggert*), and Texas, west to Alberta, British Columbia, and California, northward along the coast to southern Alaska; northward in the interior of Canada to Great Slave Lake; northern and central Mexico; El Valle, Colombia, *Cuatrecasas 20871* Argentina; Uruguay.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 314. f. 768; Abrams, Ill. Fl. Pacif. St. 1: 264. f. 630; Rhodora 31: pl. 184, f. 34, 35; 41: pl. 547, f. 3–20 (in part); Anal. Mus. Nac. Buenos Aires 34: 444; Descole, Gen. & Sp. Plant. Argent. 4: pl. 57B.

42. *Eleocharis Smallii* Britton, Torreya 3: 23. 1903.

Eleocharis palustris var. *vigens* L. H. Bailey; Britton, Jour. N. Y. Micr. Soc. 5: 104. 1889.

Trichophyllum palustre var. *vigens* House, Am. Midl. Nat. 6: 205. 1920.

Loosely stoloniferous to subcespitose; culms usually firm or wiry, to 1 m. high, 0.5–5 mm. wide; sheath firm, usually with a prominently blackened apex and sinus; spikelets narrowly lanceolate, frequently becoming ovate and loosely-flowered in age, usually acute, 0.5–2.0 cm. long; scales lanceolate, pale to dark brown, with rigid, acuminate, sometimes spreading tips, at the northern border of the range frequently of softer texture; anthers 1.5–2.0 mm. long; achenes obovoid, averaging 2.0 mm. long (excluding the depressed-deltoid to elongate tubercle) and 1.1 mm. wide, becoming dark brown in age; bristles variable.

TYPE LOCALITY: Harrisburg, Pennsylvania.

DISTRIBUTION: Labrador and Newfoundland to Manitoba, Minnesota, and eastern North Dakota, south to Delaware, western Virginia, West Virginia, Tennessee, Alabama, Indiana, Illinois, and Missouri.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 315. f. 770; Rhodora 31: pl. 182, f. 8–11; 41: pl. 547, f. 2, 6.

NOTE: This is the common "*E. palustris*" of New England; the European *E. palustris* seems not to be in America.

Subseries *Truncatae* Svenson, Rhodora 31: 128. 1929.

Slender species, the culms rarely exceeding 1 mm. in width and without transverse septa.

Achenes with prominent keel-like angles; spikelets long-cylindric. 50. *E. tricostata*.

Achenes without keel-like angles.

Rootstocks very stout, 4–5 mm. in diameter; scales of the rootstock 2–3 cm. long; culms subterete (northwestern United States).

58. *E. decumbens*.

Rootstocks thinner (except sometimes in *E. compressa*); rootstock scales not exceeding 1 cm. in length; culms usually angled or flattened.

Culms flattened, sometimes becoming 2 mm. wide; scales of the spikelet with conspicuous whitened, often bifid, acuminate tips (except sometimes in var. *atrata*).

48. *E. compressa*.

- Culms 4-8-angled; scales obtuse to acute (in *E. acutisquamata* with acuminate, not whitened tips).
 Scales acuminate, usually somewhat spreading (Texas). 49. *E. acutisquamata*.
 Scales obtuse to acute.
 Style-base depressed or truncate, often with a central apical projection.
 Tip of upper sheath whitened; achenes 0.7-1 mm. long; culms capillary, not exceeding 8 cm. in height. 47. *E. nitida*.
 Tip of upper sheath dark-girdled; achenes 0.9-1.5 mm. long; culms coarser.
 Rootstocks creeping and elongated.
 Mature achenes yellow to orange. 46. *E. elliptica*.
 Mature achenes olivaceous (vars. *verrucosa* and *pseudoptera*). 45. *E. tenuis*.
 Rootstocks greatly thickened, the numerous wiry culm-bases persisting (western United States). 56. *E. Bolanderi*.
 Style-base conic, pyramidal or mucroniform.
 Style-base mucroniform, its sides nearly parallel; the achenes smooth under magnification (Mexico to South America). 54. *E. Dombeyana*.
 Style-base conic or pyramidal.
 Spikelets linear to linear-lanceolate.
 Body of achene 1.0-1.2 mm. long. 52. *E. Parishii*.
 Body of achene 0.5 mm. long. 53. *E. cylindrica*.
 Spikelets ovoid to ellipsoid.
 Surface of achene not reticulate under magnification; style-base pyramidal (Texas). 55. *E. Palmeri*.
 Surface of achene clearly pitted or reticulate under magnification.
 Achenes olivaceous.
 Surface coarsely and deeply roughened-reticulate, the projecting angles of the cells conspicuous. 45. *E. tenuis*.
 Surface minutely punctate; style-base acicular-elongate. 57. *E. intermedia*.
 Achenes yellowish or brown; achenes with punctate pitting. 51. *E. montevidensis*.
 Coarse species (sometimes slender in *E. montana*) with spongy, often transversely septate culms 2-10 mm. wide; styles 3- (or 2-) branched.
 Culms with transverse septa.
 Culms 1-2 mm. wide. 59. *E. montana*.
 Culms 3-10 mm. wide. 60. *E. elegans*.
 Culms without transverse septa, 3-10 mm. wide. 61. *E. densa*.

45. *Eleocharis tenuis* (Willd.) Schultes in R. & S.

Syst. Veg. Mant. 2: 89. 1824.

Scirpus capitatus L. Sp. Pl. 48. 1753. (Virginia.) Not *Eleocharis capitata* R. Br. 1810.*Scirpus filiformis* Lam. Tab. Encyc. 1: 138. 1791. (New York.) Not *S. filiformis* Burm. f. 1768.*Scirpus tenuis* Willd. Enum. 76. 1809. (Pennsylvania.)*Isolepis filiformis* R. & S. Syst. Veg. 2: 106. 1817.*Eleogiton filiformis* A. Dietr. Sp. Pl. 2: 96. 1833.*Eleocharis filiformis* Kunth, Enum. Pl. 2: 146. 1837.*Eleocharis capitata* (L.) sensu Blake, *Rhodora* 20: 24. 1918. Not *Eleocharis capitata* R. Br. 1810.*Trichophyllum tenuis* Farwell, Rep. Mich. Acad. 21: 359. 1920.*Eleocharis capitata* var. *typica* Svenson, *Rhodora* 34: 199. 1932.*Eleocharis capitata* var. *pseudoptera* Weath. in Svenson, *Rhodora* 34: 202. 1932. (New Jersey.)*Eleocharis capitata* var. *verrucosa* Svenson, *Rhodora* 34: 202. 1932. (Arkansas.)*Eleocharis tenuis* var. *pseudoptera* Svenson, *Rhodora* 41: 65. 1939.*Eleocharis tenuis* var. *verrucosa* Svenson, *Rhodora* 41: 66. 1939.

Culms capillary or filiform, 0.5-4 dm. high, usually quadrangular with slightly concave sides or five-angled, erect from a thickened, creeping, ligneous rootstock; stolons thickened, elongate, covered with acute, brown or reddish scales; sheaths truncate at the apex, with a short mucro; spikelets ellipsoid to ovoid, acute or blunt, 3-10 mm. long, 20-30-flowered; scales ovate, obtuse or acute, reddish-brown to black, with a scarious margin and green keel, the lowest scale suborbicular and larger; styles trifid; stamens 3; achene obovoid, 0.8-1 mm. long, trigonous, olivaceous, alveolate, with wavy transverse bands formed by the projecting angles of the vertically elongated cells; style-base brownish, pyramidal or depressed; bristles 2 or 3, rarely persisting, light brown, less than half as long as the achene.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Cape Breton to South Carolina, west to Illinois, Missouri, Oklahoma, and Texas.

ILLUSTRATION: Clarke, Ill. Cyp. *pl.* 39, *f.* 6-9; Britt. & Brown, Ill. Fl. ed. 2. 1: 318. *f.* 779; A. Gray, Man. ed. 7. 184. *f.* 258; Rhodora 34: *pl.* 219, *f.* 56, 57 (as *E. capitata* var. *typica*); *pl.* 221, *f.* 1-3, 14, 16, 17 (as *E. capitata*).

NOTE: Typical *E. tenuis*, with capillary culms and acute tubercles, is characteristic of the Atlantic drainage slope; var. *verrucosa*, with capillary culms and depressed tubercles, is known from the Mississippi Basin and is isolated in eastern Virginia (Fernald) and Pennsylvania; var. *pseudoptera* (*Scirpus quadrangulatus* Muhl. not Michx.), with winged culms and depressed tubercles, is known from New York, New Jersey, eastern Pennsylvania, Delaware, Virginia, and in the mountains of North Carolina and Tennessee. These varieties are generally distinct.

46. *Eleocharis elliptica* Kunth, Enum. Pl. 2: 146. 1837.

Eleocharis capitata var. *borealis* Svenson, Rhodora 34: 200. 1932. (Nova Scotia.)

Culms filiform, 0.5-4 dm. high, 6-8-angled, erect from a thickened, creeping, ligneous rootstock; stolons thickened, elongate, covered with acute brown to reddish scales; sheaths truncate at the apex, with a short mucro; spikelets ellipsoid to ovoid, obtuse, 3-10 mm. long, 20-30-flowered; scales ovate, brown to black, obtuse to subacute, with a prominent hyaline apex, the lowest scale suborbicular and larger; style trifid; stamens 3; mature achenes 1.0 mm. long, yellow to dull orange, trigonous with blunt outer angle, with shallow, undulate reticulation; style-base depressed, sometimes poorly distinguished from the body of the achene, with an apiculate center; bristles much reduced.

TYPE LOCALITY: Pennsylvania?

DISTRIBUTION: Newfoundland, west to Wisconsin and Minnesota, south to Illinois, Indiana, and Pennsylvania; infrequently in Manitoba, Alberta, Montana, and British Columbia.

ILLUSTRATIONS: Clarke, Ill. Cyp. *pl.* 39, *f.* 1-4 (as "*E. tenuis* Schultes"); Rhodora 34: *pl.* 219, *f.* 58, 59; *pl.* 221, *f.* 4, 15 (as *E. capitata* var. *borealis*).

47. *Eleocharis nitida* Fernald, Rhodora 8: 129. 1906.

Perennial from a slender rootstock; culms capillary, 4-angled, striate, 2-8 cm. high; apex of the upper sheath slightly inflated, whitish; spikelet oblong-ovoid, somewhat acute, 2.5-4.5 mm. long, 1.5-2.5 mm. thick, 8-20-flowered; scales elliptic-oblong, with rounded tips, purplish-brown, with greenish ribs and very narrow scarious margins, the lowermost larger; achene golden-yellow when mature, narrowly obovoid, sharply trigonous, 0.7-1 mm. long, the roughened surface and depressed tubercle as in *E. elliptica*.

TYPE LOCALITY: Springy place, Parker's Station, Pontiac County, Quebec (*Macoun*).

DISTRIBUTION: Moist places, chiefly in acid peat: Newfoundland, Quebec, Ontario (Ottawa), Nova Scotia, New Hampshire, Wisconsin, Minnesota, British Columbia (Glacier Lake, herb. Univ. Minnesota); Kodiak Island, Alaska.

ILLUSTRATIONS: A. Gray, Man. ed. 7. 184. *f.* 260; Rhodora 34: *pl.* 219, *f.* 54, 55.

48. *Eleocharis compressa* Sull. Am. Jour. Sci.

42: 50. 1842.

?*Scirpus acuminatus* Muhl. Descr. Gram. 27. 1817. (Pennsylvania.)

Eleocharis acuminata Nees, Linnæa 9: 294. 1834.

Eleocharis compressa var. *atrata* Svenson, Rhodora 34: 218. 1932. (Pennsylvania.)

Culms strongly flattened, 1-2 mm. in width, striate, erect from creeping rootstocks sometimes nearly 1 cm. thick; upper sheaths 2-9 cm. high, reddish-brown to stramineous, truncate, faintly to prominently toothed; spikelets 5-12 mm. long, oblong-ovate to ovate, acute or obtuse; scales ovate-lanceolate, chestnut-brown (or black in var. *atrata*), the whitened tips attenuate and commonly bifid; style trifid; achene 1-1.5 mm. long, obovate-pyriform, golden-yellow to brown, bluntly trigonous to nearly terete, granular-roughened or reticulate under magnification, the raised margins of the cells often forming undulating lines; style-base depressed- to globose-conic, usually acute; bristles 1-5, fugacious, usually shorter than the achene.

TYPE LOCALITY: Wet places in the Darby Plains, 15 miles west of Columbus, Ohio (*Sullivant*).

DISTRIBUTION: Ontario to central New York, western New Jersey, Washington, D. C., west to Michigan and Illinois; Georgia; Saskatchewan; Oklahoma and Texas.

ILLUSTRATIONS: Clarke, Ill. Cyp. *pl.* 39, *f.* 10-16; Britt. & Brown, Ill. Fl. ed. 2. 1: 318. *f.* 780; A. Gray, Man. ed. 7. 184. *f.* 259; Rhodora 34: *pl.* 219, *f.* 62, 63; *pl.* 221, *f.* 5, 6, 18.

NOTE: This species, which reaches its best development in the prairies and limestone glades of Ohio and Tennessee, is probably the most terrestrial of all species of *Eleocharis*. It perhaps grades into *E. elliptica* and *E. acutisquamata* at the limits of its range.

49. *Eleocharis acutisquamata* Buckl. Proc. Acad. Phila.
1862: 10. 1862.

Culms 3-4 dm. high, rigid, slender (about 0.5 mm. in diameter), angled, striate and sulcate, from lignified, thickened rootstocks; sheaths gray to purplish, the apical tooth not conspicuous; spikelets oblong-ovate, acute, 0.7-1 cm. long, 15-20-flowered; scales reddish-brown, ovate-lanceolate, with inconspicuous, whitened, acute to acuminate tip; achene 1-1.5 mm. long (including the style-base), golden-yellow to brownish, obovate-pyriform, almost terete, with a very blunt outer angle and a granular-roughened, obscurely reticulate surface; style-base brown, short-conic; bristles none.

TYPE LOCALITY: San Saba County, Texas (*Buckley*).

DISTRIBUTION: Texas and Oklahoma; southwestern Minnesota.

ILLUSTRATIONS: *Rhodora* 34: pl. 219, f. 60, 61; pl. 221, f. 7.

50. *Eleocharis tricostata* Torr. Ann. Lyc. N. Y. 3: 310. 1836.

Rootstocks stout, creeping, 2-5 mm. thick; culms 2-6 dm. high, usually slender, striate, compressed or subterete; sheaths 2-6 cm. high, loose, reddish to stramineous, with longitudinal striations and a toothed apex; spikelets densely flowered, long-cylindric, 6-18 mm. long, 2-3 mm. thick, obtuse or sometimes acute; scales ovate, obtuse, reddish-brown with a yellowish midrib and a broad hyaline apex, often emarginate or reflexed; style trifid; achene yellow to dark brown, 0.8-1 mm. long, obovoid, with three prominent keel-like angles, the surface roughened-reticulate; style-base brown, short-conic, acute; bristles none.

TYPE LOCALITY: "Georgia" (*LeConte*).

DISTRIBUTION: Pine-barren ponds: southeastern Massachusetts to New Jersey; Virginia; South Carolina to Florida; Michigan.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 317. f. 778; Rep. N. J. Mus. 1910: pl. 17, f. 10; *Rhodora* 34: pl. 220, f. 75, 76.

51. *Eleocharis montevidensis* Kunth, Enum. Pl. 2: 144. 1837.

Eleocharis arenicola Torr.; Engelm. & Gray, Bost. Jour. Nat. Hist. 5: 237. 1845. (Texas.)

Limnochloa montevidensis Nees in Mart. Fl. Bras. 2: 99. 1842.

Eleocharis montana sensu Britton, Jour. N. Y. Micr. Soc. 5: 109. 1889, and of many later authors. Not *E. montana* (H.B.K.) R. & S.

Trichophyllum arenicolum House, Am. Midl. Nat. 6: 204. 1920.

Heleocharis montana subsp. *H. montevidensis* Osten, Anal. Mus. Hist. Nat. Montevideo II. 3: 183. 1931.

Culms erect from extensively creeping reddish rootstocks, 0.5-4.5 dm. high, rigid, striate; upper sheath deep brown at the base, usually becoming stramineous toward the truncate apex; spikelets ovoid to oblong, blunt, 4-13 mm. long, many-flowered; scales ovate, obtuse, brownish or yellowish, with a hyaline margin; style trifid; achene 1 mm. long, obovoid, triangular, with blunt angles, golden-yellow to brown, with a minutely punctulate, glossy surface; style-base conic, short, sessile at the apex of the achene, or sometimes with a slight constriction; bristles 4-6, brown, toothed, equaling or shorter than the achene.

TYPE LOCALITY: Montevideo, Uruguay (*Humboldt*).

DISTRIBUTION: Chiefly in wet sand: South Carolina to Florida, west to California; Mexico; southern Brazil; Uruguay; Argentina.

ILLUSTRATIONS: Abrams, Ill. Fl. Pacif. St. 1: 266. f. 636; Jepson, Man. Fl. Pl. Calif. 149. f. 137; *Rhodora* 34: pl. 220, f. 64, 65; pl. 221, f. 8, 9 (as *E. arenicola*); Anal. Mus. Nac. Buenos Aires 34: 479; Descole, Gen. & Sp. Plant. Argent. 4: pl. 74.

52. *Eleocharis Parishii* Britton, Jour. N. Y. Micr. Soc.
5: 110. 1889.

Eleocharis disciformis Parish, Bull. So. Calif. Acad. 3: 81. 1904. (California.)

Culms slender, striate, 1-3 dm. high, in fascicles from slender, extensively-creeping, reddish rootstocks; upper sheath brown or reddish below, stramineous above, the brownish

apex truncate and toothed; spikelets linear-lanceolate, acute, 1–1.5 cm. long, rather loosely flowered; scales ovate-oblong, somewhat rigid, stramineous with chestnut or dark brown sides, acute to obtuse with a short hyaline tip; style trifid; achene trigonous with a blunt outer angle, often nearly plano-convex, ellipsoid, narrowed at both ends, yellow to light brown, smooth or faintly reticulate under magnification; style-base acute, short-subulate to conic, sessile upon the body (1.0–1.2 mm. long) of the achene or surmounting a constriction at the apex of the achene; bristles white, 6 or 7, exceeding or shorter than the achene, retrorsely toothed.

TYPE LOCALITY: Agua Caliente, San Diego County, California (*Parish*).

DISTRIBUTION: In deserts and mountain meadows, California, Oregon, Nevada (*Hall*), Arizona, New Mexico; northern Mexico.

ILLUSTRATIONS: Bull. So. Calif. Acad. 3: 82 (*pl. 6*); Abrams, III. Fl. Pacif. St. 1: 264, 265. f. 632, 635; Jepson, Man. Fl. Pl. Calif. 149. f. 136; Rhodora 34: *pl. 220*, f. 66, 67; *pl. 221*, f. 12.

53. *Eleocharis cylindrica* Buckl. Proc. Acad. Phila.
1862: 10. 1862.

Culms erect from a slender, ligneous rhizome, filiform, 2–3 dm. high, sulcate and angled; sheaths stramineous to light brown, truncate at the apex and conspicuously subulate-toothed; spikelets linear-cylindric, many-flowered, acute, 8–17 mm. long, not exceeding 2 mm. in width; scales lanceolate, acute, chestnut-brown, not strongly keeled, the scarious margins inrolled at maturity; stamens 3, the anthers 0.7 mm. long; style trifid; body of the achene 0.8 mm. long, dark brown, obovate, smooth to faintly reticulate, trigonous with sharply costate angles, conspicuously narrowed at the apex; style-base light brown, pyramidal, a little wider than the constricted apex of the achene; bristles slender, brown, much shorter than the achene.

TYPE LOCALITY: Northern Texas (*Buckley*).

DISTRIBUTION: Texas and New Mexico.

ILLUSTRATION: Rhodora 39: *pl. 464*, f. 5.

54. *Eleocharis Dombeyana* Kunth, Enum. Pl. 2: 145. 1837.

Chaetocyperus stoloniferus Nees, Linnaea 19: 695. 1847. (Mexico.)

Heleocharis truncata Schlecht. Bot. Zeit. 7: 118. 1849. (Mexico.)

Limnochloa truncata Liebm. Vidensk. Selsk. Skr. V. 2: 244. 1951.

Eleocharis bivaginata Steud. Syn. Cyp. 77. 1855.

Heleocharis stolonifera Böck. Linnaea 36: 424. 1870.

Heleocharis vulcani Böck. Bot. Jahrb. 8: 206. 1887. (Ecuador.)

Eleocharis montana sensu Svenson, Rhodora 34: 222. 1932. Not *E. montana* (H.B.K.) R. & S. 1817.

Culms 0.5–3 dm. long, from elongate, creeping rootstocks; sheaths as in *E. montevidensis*; spikelets ovate to linear-lanceolate, 8–12 mm. long, acute, many-flowered, often with rather loose scales; scales ovate-elliptic, usually acute, brown with a yellowish or green midrib and a hyaline margin; style trifid; achene 1–1.3 mm. long, obovate, shining yellow or brown, trigonous with blunt outer angle, the surface smooth or very obscurely reticulate; style-base mucroniform, acute, usually with nearly parallel sides; bristles brown, 4, exceeding or shorter than the achene.

TYPE LOCALITY: Peru (*Dombey*).

DISTRIBUTION: Central Mexico; Guatemala; in the Andes from Ecuador to Argentina.

ILLUSTRATIONS: Anal. Mus. Nac. Buenos Aires 34: 477; Rhodora 34: *pl. 220*, f. 70–72; *pl. 221*, f. 10 (as *E. montana*); Descole, Gen. & Sp. Plant. Argent. 4: *pl. 67B*.

55. *Eleocharis Palmeri* Svenson, Rhodora 34: 223. 1932.

Culms rather soft, 1.5–2 dm. high, erect from a ligneous rhizome; sheaths truncate at the apex, mucronate; spikelets cylindric-ovoid, obtuse, 3–8 mm. long; scales ovate-oblong, obtuse, pale brown with greenish midrib, hyaline at the margin and frequently emarginate; style trifid; stamens 3; achene 1–1.3 mm. long, shining brown, pyriform, obtusely trigonous, nearly smooth under magnification; style-base pyramidal, acute, one-fourth as long as the achene; bristles white, equaling the achene.

TYPE LOCALITY: West margins of the Pecos River, in deep limestone canyon, near the Rio Grande, Valverde County, Texas (*E. J. Palmer 33464*).
 DISTRIBUTION: Known only from the type collection.
 ILLUSTRATION: *Rhodora* 34: *pl. 221, f. 11*.

56. *Eleocharis Bolanderi* A. Gray, Proc. Am. Acad.
 7: 392. 1868.

Culms very numerous, 1–3 dm. high, about 0.5 mm. in diameter, glaucous-green, erect and wiry, from a black, ascending, thick, woody rootstock; sheaths usually stramineous, sometimes purplish at the base, 2–3 cm. high, slightly swollen at the indurated, purplish summit, rarely with a mucro; spikelets 3–8 mm. long, elliptic to ovate, blunt or acute, about 10–20-flowered; scales dark brown to black, ovate, acute, with a short, whitened, scarious tip, the lowest orbicular; stamens 3; style trifid; achene obovoid, 1.5 mm. long, golden-yellow to black, trigonous with a blunt outer angle, with a cellular surface under magnification, the truncate apex forming a depressed style-base with a short apiculate central projection; bristles 3 or 4, retrorsely toothed, reddish-brown, one-half to three-fourths the length of the achene.

TYPE LOCALITY: Bank of creek at Clark's, Mariposa County, California.

DISTRIBUTION: Mountain meadows: California, Oregon, Idaho (herb. U. S. Forest Service), Utah, Nevada (herb. U. S. Forest Service), Colorado, Arizona.

ILLUSTRATIONS: Abrams, Ill. Fl. Pacif. St. 1: 265. *f. 633*; Jepson, Man. Fl. Pl. Calif. 148. *f. 134*; *Rhodora* 34: *pl. 220, f. 68, 69*.

57. *Eleocharis intermedia* Schultes in R. & S.
 Syst. Veg. Mant. 2: 91. 1824.

Scirpus intermedius Muhl. Descr. Gram. 31. 1817. Not *S. intermedius* Thuill. 1799.
Eleocharis reclinata Kunth, Enum. Pl. 2: 143. 1837. (Virginia.)
Eleocharis intermedia var. *Habereri* Fernald, *Rhodora* 8: 130. 1906. (New York.)
Eleocharis reclinata var. *Habereri* House, Bull. N. Y. State Mus. 243–244: 43. 1923.
Eleocharis reclinata f. *Habereri* Svenson, *Rhodora* 39: 265. 1937.

Annual? Diffusely spreading from fibrous roots or from a thin descending rhizome; culms numerous, of unequal length, 0.2–4 dm. long, usually reclining, grayish-green, irregularly sulcate; sheath-apex soft and spreading, a short, hardened, apiculate projection frequently present; spikelets cylindrical-ovoid, acute, 2–7 mm. long, loosely 5–20-flowered; scales obtuse, with broad, green keel and brownish sides, the lowest scale rounded and completely encircling the culm; stamens 2, the anthers 0.4 mm. long; style trifid; achene obovoid to pyriform, 1.5 mm. long including the narrow elongate style-base, obtusely trigonous, light glistening olive, with a minute punctulate reticulation, the brownish style-base conic-subulate; bristles pale brown, equaling or slightly exceeding the style-base.

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: In calcareous regions: eastern Quebec, west to Minnesota, south to Pennsylvania, western Virginia, Tennessee, Indiana, Illinois, and Iowa.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 318. *f. 781*; A. Gray, Man. ed. 7. 185. *f. 261*; *Rhodora* 39: *pl. 465, f. 3* (as *E. reclinata*).

58. *Eleocharis decumbens* Clarke, Kew Bull. Add. Ser.
 8: 23. 1908.

Culms elongated, 5–6 dm. long, striate, subterete, from a stout rootstock 4–5 mm. thick with fibrillose roots, the culm-bases covered by conspicuous, lanceolate, light brown scales 2–3 cm. long; spikelet ellipsoid, obtuse, 5–7 mm. long, 3.5–4 mm. thick; scales brown, ovate, obtuse; style trifid; achene about 1 mm. long, trigonous, yellow, minutely reticulate, with a roughened ovoid-triangular style-base one-third as long as the achene; bristles brown, 2 or 3, some equaling the achene.

TYPE LOCALITY: Mt. Shasta, California, alt. 2500 m. (*H. E. Brown*).

DISTRIBUTION: California (Echo Summit, Eldorado County, *J. T. Howell*).

ILLUSTRATIONS: Abrams, Ill. Fl. Pacif. St. 1: 265. *f. 634*; *Rhodora* 34: *pl. 219, f. 52, 53*.

59. *Eleocharis montana* (H.B.K.) R. & S. Syst. Veg.
2: 153. 1817.

- Scirpus montanus* H.B.K. Nov. Gen. & Sp. 1: 226. 1816.
Scirpus nodulosus Roth, Nov. Pl. Sp. 29. 1821. (Brazil.)
Eleocharis nodulosa Schultes in R. & S. Syst. Veg. Mant. 2: 87. 1824.
Eleocharis consanguinea Kunth, Enum. Pl. 2: 148. 1837. (Brazil.)
Eleocharis nodulosus Nees in Mart. Fl. Bras. 2¹: 104. 1842.
Eleocharis haematolepis Steud. Syn. Cyp. 79. 1855. (Quito, Ecuador.)
Eleocharis subnodulosa Steud. Syn. Cyp. 81. 1855. (Guatemala.)
Heleocharis chrysocarpa Böck. in Warm. Vidensk. Meddel. 1869: 134. 1870. (Brazil.)
Heleocharis nodulosa var. *tenuis* Böck. Flora 62: 160. 1879. (Paraguay.)
Eleocharis andesica Clarke, Kew Bull. Add. Ser. 8: 23. 1908. (Bogotá, Colombia.)
Eleocharis Ravenelii Britton; Small, Flora SE. U. S. 184. 1903. (Texas.)
Heleocharis nodulosa var. *subnodulosa* Kükenth. Repert. Sp. Nov. 23: 192. 1926.
Eleocharis nodulosa var. *angulata* Svenson, Rhodora 39: 258. 1937. (Guasca, Colombia.)
Eleocharis montana var. *nodulosa* Svenson; I. M. Johnston, Jour. Arnold Arb. 25: 47. 1944.

Erect from a coarse, creeping rootstock; culms green, 1–2 mm. thick, 3–8 dm. high, terete, with numerous, usually conspicuous (sometimes nearly obsolete) transverse septa; sheaths elongate, stramineous (often with a purplish-red base), the truncate, darkened apex with a distinct mucro; spikelets many-flowered, oblong-lanceolate, acuminate, rarely obtuse, 8–15 mm. long; scales appressed to slightly spreading, 2 mm. long, obtuse to acute, scarious throughout, light to dark brown, with a broad hyaline margin, the lowest suborbicular, firmer, and broadly scarious-margined; anthers 0.8–1 mm. long; style-branches 2 (not infrequently 3); achenes 1 mm. long, broadly obovate, biconvex, yellow to brown or olivaceous, distinctly pitted-reticulate; style-base usually flattened, brown, half as wide as the achene, deltoid, acute, the surface elevated at the junction with the achene-body; bristles ferruginous, equaling or slightly exceeding the achene, the common base prolonged into a short stipe.

TYPE LOCALITY: Quindiu Pass, near Bogotá, in the Middle Cordillera of Colombia.

DISTRIBUTION: Florida, Louisiana, Texas, Arizona; Mexico to Panama; West Indies; tropical and temperate South America.

ILLUSTRATIONS: Anal. Mus. Nac. Buenos Aires 34: 446; Rhodora 39: pl. 463, f. 2; Descole, Gen. & Sp. Pl. Argent. 4: pl. 56A (as *Heleocharis nodulosa*).

NOTE: The type of *E. montana* is the mountain extreme of the species, with swollen culms which have no visible septation.

60. *Eleocharis elegans* (H.B.K.) R. & S. Syst. Veg.
2: 150. 1817.

- Scirpus geniculatus* L. Sp. Pl. 42. 1753, in part; ed. 2. 71. 1762.
Scirpus elegans H.B.K. Nov. Gen. & Sp. 1: 226. 1816.
Eleocharis geniculata R. & S. Syst. Veg. 2: 150. 1817.
Eleocharis constricta Schultes in R. & S. Syst. Veg. Mant. 2: 87. 1824. (Brazil.)
Scirpus depressus Vell. Fl. Flum. 35. 1825. (Brazil.)
Limnochloa crassiculmis Nees in Mart. Fl. Bras. 2¹: 99. 1842. (Brazil.)
Limnochloa constricta Nees in Mart. Fl. Bras. 2¹: 99. 1842.
Eleocharis crassicaulis Steud. Syn. Cyp. 81. 1855. (Brazil.)
Eleocharis singularis Steud. Syn. Cyp. 81. 1855. (Suriname.)
Eleocharis mexicana Peyr. Linnaea 30: 14. 1859, acc. to Index Kewensis. (Mexico.)

Coarse aquatic plants, erect from a ligneous, creeping rootstock; culms terete, firm, green, 1–15 dm. high, 3–10 mm. wide, with close, usually prominent septa; sheaths reddish, truncate at the summit, usually with an inconspicuous subulate mucro; spikelets many-flowered, lanceolate to cylindrical, usually acute; scales 2 mm. long, not keeled, obtuse, thin, with an opaque, brown central area and broad, scarious, light brown margin; style bifid or trifid; achene 1.5 mm. long, obovate, biconvex to slightly trigonous, yellow to brown, shining, lightly punctate-reticulate; style-base dark brown, flattened, lanceolate, half as long as the achene-body; bristles deep brown, nearly equaling the tubercle, their common base forming a short stipe.

TYPE LOCALITY: Peru.

DISTRIBUTION: Central Mexico; Guatemala; Honduras; El Salvador; Costa Rica; Panama; Cuba, and southward in the West Indies; tropical South America.

ILLUSTRATIONS: Vell. Fl. Flum. 1: pl. 83; Clarke, Ill. Cyp. pl. 39, f. 22–26; Rhodora 39: pl. 463, f. 1 (as *E. geniculata*); Anal. Mus. Nac. Buenos Aires 34: 459; Descole, Gen. & Sp. Plant. Argent. 4: pl. 64.

NOTE: The name *Scirpus geniculatus* included *E. caribaea* and the plant known as *Juncus aquaticus geniculatus*, *capitulis equiseti*, *major* Sloane. In the second edition of *Species plantarum* (1762) Linnaeus restricted the name *Scirpus geniculatus* to the latter. In view of the modern confusion of names, it seems best to take up the unequivocal name *Eleocharis elegans*.

61. *Eleocharis densa* Benth. Pl. Hartw. 27. 1840.

Similar to *E. elegans*, but the culms without outward sign of septation; achenes not so strongly punctate-reticulate as in *E. elegans*.

TYPE LOCALITY: Aguas Calientes, Mexico.

DISTRIBUTION: Central Mexico.

ILLUSTRATION: Rhodora 39: pl. 463, f. 3.

Series 7. *Tenuissimae* Svenson, Rhodora 31: 129. 1929.

Achenes cancellate, i.e. with coarse, deep-pitted reticulation.

Achenes large, 2-3 mm. long.*

Style-base mitriform, as wide as or wider than the achene.

76. *E. tuberculosa*.

Style-base conic-subulate, much narrower than the achene.

77. *E. tortilis*.

Achenes small to medium-sized, not exceeding 1.3 mm. long (species chiefly tropical).*

Achenes 1-1.3 mm. long.

Spikelets narrowly linear, the scales only 3 or 4 (Cuba).

69. *E. alveolata*.

Spikelets lanceolate to ovate, many-flowered.

70. *E. retroflexa*.

Achenes obovate-urceolate, coarsely cancellate; style-base with angles decurrent on the achene.

Achenes obovate, finely cancellate; style-base pyramidal, without decurrent angles.

Culms 1-3 dm. high, firm; spikelets linear-cylindric, usually proliferous (se. United States).

71. *E. vivipara*.

Culms 8-10 cm. high, flaccid; spikelets ovate-oblong (Cuba).

72. *E. grisea*.

Achenes 0.5-0.8 mm. long, whitish-iridescent when mature.

Achenes 0.5 mm. long; pitting horizontally elongate (Cuba).

73. *E. minutissima*.

Achenes 0.6-0.8 mm. long; pitting circular (Mexico).

74. *E. subcancellata*.

Achenes smooth to reticulate, not cancellate.

Achenes biconvex (scattered trigonous achenes usually present).

62. *E. minima* var. *bicolor*.

Achenes trigonous.

Achenes medium-sized (0.8-1.3 mm. long).

Spikelets few (2-6)-flowered, ovate; scales dark purplish-brown (Cuba).

75. *E. oligantha*.

Spikelets many-flowered (if 2-6-flowered the spikelets linear).

Style-base flat (with an apiculate center), as wide as the achene (Mexico).

63. *E. urceolata*.

Style-base conic or pyramidal (if depressed, much narrower than the achene).

Mature achenes glistening white.

64. *E. nana*.

Mature achenes pale gray to deep brown.

Spikelets obviously distichous.

Style-base subulate-tipped (se. United States).

65. *E. Baldwinii*.

Style-base pyramidal, obtuse.

62. *E. minima*.

Spikelets not distichous.

67. *E. microcarpa* var. *fliculmis*.

Achenes small (0.5-0.7 mm. long).

Achenes 0.5-0.6 mm. long, white to faint buff, usually costulate; style-base pyramidal to depressed-conic, narrower than the achene.

66. *E. nigrescens*.

Achenes 0.6-0.7 (rarely 0.8) mm. long, pale gray to greenish.

Achenes pale gray; style-base short-pyramidal.

67. *E. microcarpa*.

Achenes greenish-gray, obovate; style-base depressed; scales whitened.

68. *E. Brittonii*.

* Achene measurements include the style-base.

62. *Eleocharis minima* Kunth, Enum. Pl. 2: 139. 1837.

- Chaetocyperus viviparus* Nees in Mart. Fl. Bras. 2¹: 93. 1842. (Brazil.) Not *Eleocharis vivipara* Link, 1827.
Chaetocyperus polymorphus Lindl. & Nees; Nees in Mart. Fl. Bras. 2¹: 94. 1842, in large part. (Brazil?)
Chaetocyperus Jamesoni Steud. Syn. Cyp. 74. 1855. (Ecuador.)
Isolepis ambigua Steud. Syn. Cyp. 91. 1855. (Brazil.)
Eleocharis bicolor Chapm. Fl. S. U. S. 517. 1860. (Florida.)
Eleocharis tenuissima Böck. Linnaea 36: 419. 1870.
Eleocharis subtilis Böck. Linnaea 36: 426. 1870. (Brazil.)
Eleocharis Wrightiana Böck. Beitr. Cyp. 1: 12. 1888. (Cuba.)
Eleocharis villaricensis Maury; M. Micheli, Mém. Soc. Phys. Hist. Nat. Genève 31(1)¹: 138. 1889. (Paraguay.)
Eleocharis Durandii Böck. Allg. Bot. Zeitschr. 2: 34. 1896. (Costa Rica.)
Eleocharis Jamesonii N. E. Brown, Kew Bull. 1921: 356. 1921.
Eleocharis savannarum Britton, Bull. Torrey Club 48: 327. 1922. (Trinidad.)
Eleocharis oropuchensis Britton, Bull. Torrey Club 48: 327. 1922. (Trinidad.)
Eleocharis minima var. β *ambigua* Kükenth. Repert. Sp. Nov. 23: 194. 1926.
Eleocharis uncialis Chapm.; Small, Man. SE. Fl. 163. 1933. (Florida.)
Eleocharis minima var. *bicolor* Svenson, Rhodora 39: 219. 1937.

Dwarf, 3-7 cm. tall, cespitose, with numerous whitish, elongated fibrous roots; culms capillary, often recurving, quadrangular-sulcate, light green, punctate; sheaths conspicuous, light or dark brown, the apex inflated, blunt, hyaline; spikelets 2-4 mm. long, ovate, few- to many-flowered; scales ovate-lanceolate, mostly acute, dark brown with greenish midrib and hyaline margin; style trifid; achene ovate, 0.75-1.0 mm. long, sharply triangular (biconvex in var. *bicolor*) with convex faces, whitish to pale or olivaceous-brown, lightly reticulate to minutely striate, narrowed at the apex and base, capped by a brownish or gray, short-pyramidal, obtuse style-base; bristles inconspicuous, transparent-white, obscurely toothed, shorter than the achene, often greatly reduced.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Florida, Georgia, Texas, California; Mexico; Costa Rica; San Salvador; Cuba; Jamaica; tropical South America.

ILLUSTRATIONS: Clarke, Ill. Cyp. pl. 37, f. 22-25; Rhodora 39: pl. 460, f. 1-4, 7; pl. 462, f. 1-3; Mém. Soc. Phys. Hist. Nat. Genève 31(1)¹: pl. 40, f. 7-10; Descole, Gen. & Sp. Plant. Argent. 4: pl. 63B.

63. *Eleocharis urceolata* (Liebm.) Svenson, Rhodora 39: 219. 1937.

- Chaetocyperus urceolatus* Liebm. Vidensk. Selsk. Skr. V. 2: 243. 1851. (Mexico.)
Eleocharis Liebmanniana Böck. Linnaea 36: 439. 1870. (Mexico.)

Densely cespitose; culms finely capillary, 3-7 cm. high, dull green, punctate and obscurely quadrangular-sulcate; sheaths purplish, a little inflated at the summit; spikelets 2-3 mm. long, ovate (occasionally narrowly oblong and fewer-flowered), 6-11-flowered; scales spreading in fruit, keeled, green with purplish sides and hyaline margins; style trifid; achenes triangular, costulate, 0.8 mm. long, urceolate-obovate, truncate at the apex, pale gray to brownish-yellow, faintly striate-reticulate to smooth; style-base flat, as wide as the achene, apiculate in the center; bristles none.

TYPE LOCALITY: "Mirador, Potrero de Consoquitla, Mexico."

DISTRIBUTION: Mexico.

ILLUSTRATION: Rhodora 39: pl. 460, f. 5.

64. *Eleocharis nana* Kunth, Enum. Pl. 2: 140. 1837.

- Chaetocyperus punctatus* Nees in Mart. Fl. Bras. 2¹: 93. 1842.
Eleocharis punctata Böck. Linnaea 36: 420. 1870. Not *E. punctata* Hochst. 1855.
Scirpus campotrichus C. Wright in Sauv. Anal. Acad. Ci. Habana 82: 78. 1871. (Cuba.)
Eleocharis campotricha Clarke, Symb. Ant. 2: 69. 1900.

Erect cespitose annual (?) with coarse whitened roots; culms 4-12 cm. long, glaucous-green, punctate, irregularly sulcate; sheaths stramineous, often marcescent, the apex appressed-acute to somewhat inflated; spikelets ovate to elliptic, 3-4 mm. long, 5-8-flowered; scales greenish to stramineous, keeled, the apex and margin hyaline; style trifid; achene sharply trigonous to costate, 1-1.3 mm. long, greenish, becoming pearly-white when mature,

obscurely reticulate; style-base deep olive to brown, short-pyramidal with an acuminate tip; bristles colorless to light brown, exceeding the achene.

TYPE LOCALITY: Rio de Janeiro, Brazil.
DISTRIBUTION: Florida; Cuba; British Guiana; Brazil.
ILLUSTRATION: Rhodora 39: *pl. 462, f. 12.*

65. *Eleocharis Baldwinii* (Torr.) Chapm. Fl. S. U. S.
519. 1860.

Chaetocyperus Baldwinii Torr. Ann. Lyc. N. Y. 3: 295. 1836. (Georgia.)
Eleocharis prolifera Torr. Ann. Lyc. N. Y. 3: 316. 1836, in part. (Southern United States.)

Perennial, forming loose tufts; rootstocks (rarely present) loosely branched-ascending, the fibrous white roots numerous; culms usually wiry, capillary, 3–20 cm. long, often proliferous, dull green, flattened-sulcate, punctate; sheaths prominent, red to yellow, the apex acute; spikelets flattened, linear to ovate, 3–6 mm. long, 3–8-flowered; scales linear, acute, strongly keeled, red to faded brown, the lowest scale much shorter; style trifid; achene 1 mm. long, sharply triangular, dark olive-brown, frequently obscurely striolate; style-base short to long-pyramidal, sharply angled, subulate-tipped, brownish; bristles shorter than the achene, brownish-tinged, obscurely toothed.

TYPE LOCALITY: St. Mary's, Georgia.
DISTRIBUTION: Moist pine barrens: North Carolina, Georgia, Florida, Louisiana.
ILLUSTRATIONS: Rhodora 39: *pl. 460, f. 12, 13.*

66. *Eleocharis nigrescens* (Nees) Steud. Syn. Cyp. 77. 1855.

Scirpidium nigrescens Nees, Linnaea 9: 293. 1834 (nomen nudum); in Mart. Fl. Bras. 2¹: 97 [“*nigrescens*”]. 1842. (Brazil.)
Eleocharis nigrescens Kunth, Enum. Pl. 2: 157. 1837.
Scirpus microlepis Griseb. Cat. Pl. Cub. 239. 1866. (Cuba.)
Heleocharis atropurpurea Böck. Linnaea 36: 459. 1870. (Brazil.)
Heleocharis Hildebrandtii Böck. Flora 61: 34. 1878. (Africa.)
Heleocharis minutiflora Böck. Bot. Jahrb. 7: 274. 1886. (St. Thomas.)
? *Heleocharis Perrieri* Cherm. Bull. Soc. Bot. Fr. 73: 554. 1927. (Madagascar.)
Eleocharis carolina Small, Man. SE. Fl. 165. 1933. (South Carolina.)
Eleocharis nigrescens var. *minutiflora* Svenson, Rhodora 39: 226. 1937.

Cespitose annual with fibrous roots, or perennial with lignescent (usually whitened), vertical, much-branched rootstocks; culms filiform, erect, 3–7 cm. high, obscurely quadrangular-sulcate, punctate; sheath red (sometimes greenish), the apex marcescent or sometimes projecting into an attenuate, appressed appendage 1–2 mm. long; spikelets many-flowered, ovoid, 2–3 mm. long; scales chestnut-brown with a greenish midrib, obtuse to emarginate, scarcely keeled, spreading at maturity; style trifid; achenes trigonous, 0.5–0.6 mm. long, the mature achenes (i.e. those at the base of the spikelet) smooth, semitranslucent, light yellowish-brown with prominent, costulate, whitened, opaque angles; immature achenes (or at least those at the middle part of the spikelets) opaque, white, with obscure striolate reticulation and a pearly lustre and with less costulate angles; style-base brown to light gray, pyramidal (or occasionally depressed-conic), one-third as wide as the achene; bristles none.

TYPE LOCALITY: In maritimis, Bahia, Brazil.
DISTRIBUTION: South Carolina; Mexico; Yucatan; West Indies; Trinidad; Brazil; tropical Africa; Madagascar; Australia.
ILLUSTRATIONS: Clarke, Ill. Cyp. *pl. 38, f. 1–4*; Rhodora 39: *pl. 462, f. 5–9.*

67. *Eleocharis microcarpa* Torr. Ann. Lyc. N. Y. 3: 312. 1836.

Eleocharis microcarpa β? *fliculmis* Torr. Ann. Lyc. N. Y. 3: 312. 1836. (New Jersey.)
Heleocharis Torreyana Böck. Linnaea 36: 440. 1870.
Heleocharis cubensis Böck. Beitr. Cyp. 2: 10. 1890. (Cuba.)

Annual; culms 1–3 dm. high, finely capillary, flexuous, often quadrangular-sulcate; roots fibrous, white; sheaths inconspicuous, closely investing the culm, purple-striate at the base, somewhat acuminate at the apex; spikelets many-flowered, oblong to ovate, 2–7 mm. long; stamens 2 or 3; style trifid; scales loose, strongly keeled, especially toward the acuminate

apex, ovate, with a whitish margin and green, red-bordered midrib, all deciduous except the enlarged lowest scale, which persists as a bract; achene minute, 0.6–0.7 mm. long (nearly 0.7 mm. in the type), obovate, triangular, pale gray or yellowish, smooth; style-base short-pyramidal, gray, often reddish when young; bristles whitish to light brown, appressed, less than half the length of the achene.

TYPE LOCALITY: New Orleans (*Ingalls*).

DISTRIBUTION: Connecticut; New Jersey to Florida and Texas, mostly near the coast; Tennessee and Indiana.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 316. f. 775; A. Gray, Man. ed. 7. 184. f. 254; Rhodora 39: pl. 460, f. 9, 10; pl. 462, f. 14.

NOTE: The northern var. *filiculmis* differs in somewhat coarser, rigid culms, higher style-base, and longer bristles.

68. *Eleocharis Brittonii* Svenson; Small, Man. SE.

Fl. 164. 1933.

Eleocharis tenuis β Torr. Ann. Lyc. N. Y. 3: 310. 1836. (New Orleans.)

Eleocharis microcarpa var. *Brittonii* Svenson, Rhodora 39: 230. 1937.

Annual, similar to *E. microcarpa* in habit but much coarser; culms 1.5–10 dm. high; spikelets ellipsoid to ovoid-ellipsoid, 2.5–5 mm. long; scales appressed, obtuse, scarcely keeled, white or lightly tinged with brown; achene obovate, 0.6–0.8 mm. long, much contracted at the base, obscurely trigonous, grayish-green, obscurely reticulate and often black-spotted; style-base depressed, apiculate; bristles short or lacking.

TYPE LOCALITY: New Orleans (*Ingalls*; type of *E. tenuis* var. β).

DISTRIBUTION: Pine barrens: southern New Jersey, Georgia and Florida to Texas.

ILLUSTRATION: Rhodora 39: pl. 460, f. 11.

69. *Eleocharis alveolata* Svenson, Rhodora 31: 241. 1929.

Scirpus capillaceus Griseb. Cat. Fl. Cub. 239. 1866; not *S. capillaceus* Michx. 1803, nor *Eleocharis capillacea* Kunth, 1837.

Forming dense mats; culms 2–5 cm. long, frequently recurved, capillary, triangular to sulcate-quadrangular, punctate; sheaths reddish-brown, firm, scarious, and a little inflated at the apex; spikelets linear, acute, 2–3 mm. long, usually sterile; scales 3–4, linear, strongly keeled, brown with a hyaline margin; style trifid; achenes most frequently situated at the culm-bases, acutely trigonous, 1–1.3 mm. long (including the prominent style-base), obovate, narrowed at base and apex, stipitate, shining, olivaceous to whitish, prominently cancellate; style-base trigonous, elongate, conic, acuminate, from a broad base; bristles lacking.

TYPE LOCALITY: Herradura, western Cuba (*Ekman 17788*).

DISTRIBUTION: Western Cuba and the Isle of Pines.

ILLUSTRATION: Rhodora 39: pl. 460, f. 8.

70. *Eleocharis retroflexa* (Poir.) Urban, Symb. Ant.

2: 165. 1900.

Scirpus retroflexus Poir. in Lam. Encyc. 6: 753. 1804. (Puerto Rico.)

Cyperus depauperatus Vahl, Enum. 2: 305. 1805. (West Indies.)

Baeothryon retroflexum A. Dietr. Sp. Pl. 2: 93. 1833.

Eleocharis depauperata Kunth, Enum. Pl. 2: 140. 1837.

Chaetocyperus polymorphus var. α *depauperatus* Nees in Mart. Fl. Bras. 2¹: 94. 1842.

Chaetocyperus niveus Liebm. Vidensk. Selsk. Skr. V. 2: 242. 1851. (Probably from Costa Rica.)

Chaetocyperus viviparus Liebm. Vidensk. Selsk. Skr. V. 2: 242. 1851. (Nicaragua.)

Chaetocyperus rugulosus Nees, Bonplandia 3: 86. 1855. (Panama.)

Eleocharis Chaetaria sensu Britton, Jour. N. Y. Micr. Soc. 5: 105. 1889. Not *E. Chaetaria*

R. & S. 1817.

Cespitose, often proliferous annual (?) with fibrous roots; culms green, filiform, usually recurved, 2–2.5 cm. long, flattened to deeply quadrangular-sulcate, obscurely punctate; sheath stramineous to reddish, obtuse, scarious and inflated at the summit; spikelets few- to many-flowered, the scales usually spreading in fruit; scales green, keeled, obtuse to acute, often with chestnut to reddish-brown sides; style trifid; achene 1.0–1.2 mm. long, trigonous, cancellate, costate, obovoid to urceolate, white or stramineous; style-base light brown, as wide

and one-third as long as the body of the achene, pyramidal-acuminate, the angles decurrent on the costae of the achene; bristles white, shorter than the achene. ♀

TYPE LOCALITY: Puerto Rico.

DISTRIBUTION: Alabama; West Indies; Central America from British Honduras southward; Colombia; Venezuela; Dutch Guiana; Brazil.

ILLUSTRATION: Rhodora 39: *pl. 461, f. 11.*

71. *Eleocharis vivipara* Link, Hort. Berol. 1: 283. 1827.

Chlorocharis vivipara Rikli, Jahrb. Wiss. Bot. 27: 564. 1895.

Eleocharis Curtisii Small, Man. SE. Fl. 165. 1933. (North Carolina.)

Erect from a stout often vertical rootstock covered by the culm-bases of the previous year; roots coarse, deep brown; culms 1-3 dm. high, filiform to 0.5 mm. wide, light green, faintly punctate, deeply striate to sulcate; sheaths yellowish, often purple at the base, firm, acute and frequently lightly purple-tipped at the apex; spikelets linear-cylindric, acute, many-flowered, 3-8 mm. long, usually wholly proliferous and seldom perfecting fruit; scales appressed, obtuse, 2 mm. long, usually without a keel, dark chestnut on the sides, with whitish hyaline margin, the lowest somewhat larger, erect and appressed to the base of the spikelet; style trifid; achene triangular, obovate, 1 mm. long, dark gray, coarsely reticulate to cancellate; style-base pyramidal, narrower than the achene, light gray to nearly black with a whitened elevated ridge at the base; bristles reddish-brown, closely retrorse-toothed, nearly equaling the achene.

TYPE LOCALITY: Grown at the Berlin Botanic Garden.

DISTRIBUTION: Swamps on the coastal plain: Virginia to Florida.

ILLUSTRATION: Rhodora 39: *pl. 461, f. 12.*

72. *Eleocharis grisea* Kükenth. Repert. Sp. Nov.

23: 194. 1926.

Culms few from a slender creeping rhizome, 8-10 cm. high (0.5-1 mm. wide in dried material), flaccid, compressed, obscurely sulcate and lightly punctate; sheaths light brownish-purple, the apex marcescent; spikelets ovate-oblong, 3-4 mm. long, 3-6-flowered; scales ovate-oblong, obtuse, stramineous, brownish on the sides, with a hyaline margin; style trifid; achene trigonous, 1 mm. long, greenish-gray, obovate-elliptic, prominently angled, cancellate with small circular pittings; style-base depressed-pyramidal, gray; bristles white, rudimentary, from a cup-like base.

TYPE LOCALITY: Sandy pine lands, Westport, Isle of Pines, Cuba (*Ekman 12077*).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Rhodora 39: *pl. 465, f. 5.*

73. *Eleocharis minutissima* Britton, Mem. Torrey Club

16: 60. 1920.

Densely cespitose; culms capillary, punctulate, 1-3 cm. high, somewhat thickened at the base; roots whitish, rather coarse; spikelets ovoid, 1-2 mm. long, loosely 3-7-flowered; scales spreading, ovate, strongly keeled, green to castaneous with hyaline margins; achenes 0.5 mm. long, oblong, obovoid, iridescent, white to gray, obtusely trigonous, cancellate, the depressions tending to be horizontal; bristles none; style-base gray, low triangular-apiculate, half as wide as the achene.

TYPE LOCALITY: Border of a lagoon near Pinar del Rio, Cuba (*Britton & Gager 6965*).

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Rhodora 39: *pl. 462, f. 13.*

74. *Eleocharis subcancellata* Clarke, Kew Bull. Add. Ser.

8: 21. 1908.

Cespitose, the rhizome when present white, branched-ascending; culms filiform, green, spongy, lightly punctate, sometimes quadrangular-sulcate, 2-7 cm. long; sheaths green to whitish, usually marcescent, the apex sometimes becoming filiform and divergent; spikelets

many-flowered, 2-5 mm. long; scales greenish, keeled, with purplish to chestnut sides; style trifid; achene triangular, elliptic to obovate, 0.6-0.8 mm. long, strongly costate with a truncate apex, whitish with a pearly lustre, lightly cancellate, with circular pitting; style-base narrow, depressed-apiculate; bristles rudimentary, united to form a cup-like base.

TYPE LOCALITY: Muddy places near Guadalajara, Mexico (*Pringle 3430*).

DISTRIBUTION: Mexico.

ILLUSTRATION: *Rhodora* 39: *pl. 461, f. 3*.

75. *Eleocharis oligantha* Clarke, *Symb. Ant.* 2: 69. 1900.

Dwarf, densely matted, often proliferous annual; culms finely capillary, 2-5 cm. long, often recurved or prostrate, punctate, quadrangular-sulcate; sheath stramineous to reddish, scarious and slightly inflated at the apex; spikelets 1-3 mm. long, ovate, 2-6-flowered; scales dark purplish-brown, keeled, spreading in fruit; style trifid; achene 1 mm. long, trigonous, sharply-angled, whitish, becoming gray to dark olive-brown when ripe, faintly punctate-reticulate; style-base usually lighter, pyramidal, acute, somewhat 3-crested at the base with overhanging projections; bristles hyaline, obscurely retrorse-toothed, rudimentary to nearly as long as the achene.

TYPE LOCALITY: Probably western Cuba (*C. Wright 3367, 3368*).

DISTRIBUTION: Western and central Cuba.

ILLUSTRATION: *Rhodora* 39: *pl. 460, f. 6*.

76. *Eleocharis tuberculosa* (Michx.) R. & S. *Syst. Veg.*
2: 152. 1817.

Scirpus tuberculosus Michx. *Fl. Bor.-Am.* 1: 30. 1803.

Rhynchospora monostachya Steud. *Syn. Cyp.* 140. 1855. (New Orleans.)

Chlorocharis tuberculosa Rikli, *Jahrb. Wiss. Bot.* 27: 564. 1895.

Eleocharis tuberculosa var. *pubnicoensis* Fernald, *Rhodora* 23: 233. 1922. (Nova Scotia.)

Eleocharis tuberculosa f. *retrorsa* Svenson, *Rhodora* 39: 250. 1937. (Massachusetts.)

Eleocharis tuberculosa f. *pubnicoensis* Svenson, *Rhodora* 39: 250. 1937.

Coarse, cespitose plants with short, vertical rootstocks, or often with only soft, fibrous bases; culms flattened, glaucous-green, 1.5-8 dm. high; sheaths stramineous to green, closely appressed, acute at the apex; spikelets many-flowered, broadly ovoid to ovoid-lanceolate, 5-15 mm. long; scales cartilaginous, stramineous with narrow green midrib and faint to dark brown coloration on the sides; achene body 1.5 mm. long, stramineous to olivaceous, trigonous, deeply cancellate; style-base pallid, mitriform, 1.0-1.5 mm. long, obtuse to acute, often 3-lobed at the base, usually equaling (occasionally exceeding) the achene-body in size; bristles nearly equaling the style-base, light brown to ferruginous.

TYPE LOCALITY: "Carolina inferiore."

DISTRIBUTION: Sandy shores, chiefly on the coastal plain: Nova Scotia; New Hampshire, south and west to Texas; inland in Alabama, Tennessee, and Arkansas.

ILLUSTRATIONS: Britt. & Brown, *Ill. Fl. ed. 2*: 1: 316. *f. 774*; A. Gray, *Man. ed. 7*. 183. *f. 253*; *Rhodora* 39: *pl. 464, f. 1-3*.

77. *Eleocharis tortilis* (Link) Schultes in R. & S.
Syst. Veg. Mant. 2: 92. 1824.

Scirpus tortilis Link, *Jahrb. Gewächsk.* 1³: 78. 1820.

Eleocharis simplex Torr. *Ann. Lyc. N. Y.* 3: 306. 1836. Not *Scirpus simplex* Ell. 1816. (North Carolina.)

Eleocharis camptotricha sensu C. Mohr, *Contr. U. S. Nat. Herb.* 6: 399. 1901. Not *E. camptotricha* Clarke, 1900.

Perennial, forming compact clumps; rootstocks (when present) vertical, branched, sub-ligneous, the roots firm, white, thickened; culms light green, twisted, 2-5 dm. high, sharply triangular; sheaths stramineous, acute at the apex; spikelets ellipsoid to ovoid, 4-8 mm. long, few- to many-flowered; scales 2-3 mm. long, obtuse, cartilaginous, yellow, prominently marked with dark chestnut on the sides, the margin hyaline; style trifid; achene 2 mm. long, bluntly to sharply trigonous, deeply cancellate, olivaceous to gray, one-third of its length

occupied by the narrow pyramidal-subulate style-base; bristles equaling or exceeding the achene, reddish-brown, retrorsely toothed.

TYPE LOCALITY: Probably South Carolina (*Bosc.*).

DISTRIBUTION: Swamps and bogs, chiefly on the coastal plain: Long Island, N. Y., to Texas.

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. 1: 316. f. 773; A. Gray, Man. ed. 7. 183. f. 252; Rhodora 39: pl. 464, f. 4.

Series 8. *Sulcatae* Svenson, Rhodora 31: 129. 1929.

Spikelets obovoid, 5–7 mm. long; achenes 1.5 mm. long, including the elongate style-base.

78. *E. pachystyla*.

Spikelets cylindrical to ovate.

Achenes 1.0 mm. long, including the pyramidal style-base.

79. *E. filiculmis*.

Achenes 1.2–1.5 mm. long, including the low style-base, with angles strongly decurrent on the achene.

80. *E. pachycarpa*.

78. *Eleocharis pachystyla* (C. Wright) Clarke,
Symb. Ant. 2: 72. 1900.

Scirpus pachystylus C. Wright in Sauv. Anal. Acad. Ci. Habana 82: 79. 1871.

Culms numerous from a short horizontal or branched-ascending rootstock, 3–5 dm. high, 1–2 mm. wide, rather soft, terete to flattened-sulcate when dry; sheaths dark reddish-brown, not loose, oblique at the herbaceous but firm apex; spikelets obovoid, obtuse, 5–7 mm. long, often clavate at the base; scales obtuse, thin, scarcely keeled, stramineous with brown-flecked margins, the lowest inclined to be cartilaginous; stamens 3; anthers 0.7 mm. long; style trifid; achene narrowly obovoid, trigonous, 1.5 mm. long (including the elongated style-base), yellowish-brown, faintly striate-reticulate; style-base one third as long as the achene body, elongated, triangular-conic, or sometimes almost falcate; bristles dark brown, retrorsely toothed, equaling the body of the achene.

TYPE LOCALITY: Edge of ponds in pine woods, Pinar del Rio (*C. Wright 3373*).

DISTRIBUTION: Cuba; Puerto Rico; San Domingo; Costa Rica; northern South America.

ILLUSTRATIONS: Rhodora 39: pl. 465, f. 4; Clarke, Ill. Cyp. pl. 38, f. 5–9.

79. *Eleocharis filiculmis* Kunth, Enum. Pl. 2: 144. 1837.

Scirpus sulcatus Roth, Nov. Pl. Sp. 30. 1821. Not *S. sulcatus* Petit-Thouars, 1811.

? *Scirpus tenuiculus* Schrad.; Schultes in R. & S. Syst. Veg. Mant. 2: 74. 1824. (Brazil.)

? *Chaetocyperus tenuiculus* Nees in Mart. Fl. Bras. 2¹: 96. 1842.

? *Chaetocyperus emarginatus* Nees in Mart. Fl. Bras. 2¹: 96. 1842. (Brazil.)

Scirpidium sulcatum Nees in Mart. Fl. Bras. 2¹: 98. 1842. (Bahia, Brazil.)

Limnochloa calyprata Liebm. Vidensk. Selsk. Skr. V. 2: 244. 1851. (Mexico.)

Eleocharis calyprata Steud. Syn. Cyp. 81. 1855.

Eleocharis Rothiana Böck. Flora 43: 3. 1860.

Eleocharis sulcata Nees, Linnaea 9: 294. 1834 (nomen nudum); Böck. Linnaea 36: 445. 1870. (Brazil.)

Scirpus filiculmis Schrad.—Griseb. Abh. Ges. Wiss. Gött. 24: 311. 1879.

Heleocharis Balansaiana Böck. Flora 62: 159. 1879. (Pernambuco.)

Heleocharis costaricensis Böck. Allg. Bot. Zeitschr. 2: 34. 1896. (Costa Rica.)

Heleocharis purpureo-vaginata Böck. Allg. Bot. Zeitschr. 2: 34. 1896. (Buenos Aires.)

Erect from an ascending caudex; culms 1.5–4 dm. high, flattened and sulcate, lightly punctate, rarely as much as 1 mm. wide; sheath purplish-brown to stramineous, acute, sometimes slightly inflated at the apex; spikelets ovoid-cylindric, 4–10 mm. long, many-flowered; scales obtuse to emarginate, stramineous to reddish-brown, with a lighter keel and a prominently scarious margin; anthers 0.7 mm. long; style trifid; achene 1.0 mm. long (including the style-base), trigonous with sulcate angles, glistening white, often obscurely reticulate or brown-striolate; style-base nearly as wide as the apex of the achene, irregularly pyramidal, often somewhat flattened, white to light brown, frequently with overhanging margins; bristles white, usually equaling the achene.

TYPE LOCALITY: Brazil.

DISTRIBUTION: Mexico to Panama; Cuba; Dominica; tropical South America.

ILLUSTRATIONS: Anal. Mus. Nac. Buenos Aires 34: 460; Rhodora 39: pl. 465, f. 1, 2; Descole, Gen. & Sp. Plant. Argent. 4: pl. 70A.

80. *Eleocharis pachycarpa* Desv. in C. Gay, Hist. Chile Bot.
6: 174. 1853.

Eleocharis leptocaulis Steud. Syn. Cyp. 77. 1855. (Chile.)

Heleocharis hocarpa Philippi, Anal. Univ. Chile 43: 553. 1873. (Chile.)

Heleocharis lepida Philippi, Anal. Univ. Chile 93: 349. 1896. (Chile.)

Perennial, with a thickened, descending rootstock; culms fascicled, rigid, filiform, 10-40 cm. high, erect to recurved, frequently proliferous; sheath purple to stramineous, the apex rigid, acute, appressed; spikelets ovate, compressed, 5-10 mm. long, about 8-16-flowered; scales loosely subdistichous, ovate-lanceolate, obtuse to acute, purplish-brown to nearly black, usually with a green midrib, not conspicuously hyaline at the margin; stamens 3, anthers 2.0 mm. long; style trifid; achene trigonous with obtuse angles, orbicular-ovate, 1.2-1.5 mm. long (including the style-base), smooth, yellowish-white; style-base pyramidal, subacute to acuminate, the trilobed lower part decurrent on the angles of the achene; bristles slender, equaling the achene or frequently absent.

TYPE LOCALITY: Chile.

DISTRIBUTION: Chile; Argentina; introduced in Nevada (Lake Tahoe, *Beetle*), California (Humboldt and Eldorado Counties, *H. G. Smith*); and in Australia.

ILLUSTRATIONS: *Rhodora* 41: pl. 544, f. 4; *Descole*, Gen. & Sp. Plant Argent. 4: pl. 60.

NOTE: Introduction of the species to Australia and Nevada is probably dependent on the sheep industry.

SPECIES OF UNCERTAIN CLASSIFICATION

81. *Eleocharis albida* Torr. Ann. Lyc. N. Y. 3: 304. 1836.

Eleocharis simplex Kunth, Enum. Pl. 2: 143. 1837. (South Carolina.)

Eleocharis albida var. *Berlandieri* Britton, Jour. N. Y. Micr. Soc. 5: 108. 1889. (Texas.)

Eleocharis Berlandieri Clarke, Symb. Ant. 2: 162. 1900.

Eleocharis bermudiana Britton, Jour. N. Y. Bot. Gard. 13: 191. 1913. (Bermuda.)

Tufted, from a slender, creeping rootstock; culms 0.5-3 dm. long, usually wiry, slender, 1 mm. wide in large specimens, lightly striate; sheaths stramineous, often with a brownish base, the apex strongly oblique, acute, somewhat cartilaginous; spikelets cylindrical-ovoid, 2-10 mm. long, obtuse; scales white to light brown, appressed, obtuse, cartilaginous, scarcely keeled, the scarious margin almost lacking; stamens 3, the anthers 0.8 mm. long; style trifid; achenes 1 mm. long, broadly obovate-trigonous, often contracted at the apex, smooth, dull to shining brown when mature; style-base conic-deltoid, pale brown, one-fourth as wide as the achene; bristles dark reddish-brown, exceeding the achene, with close-set retrorse teeth.

TYPE LOCALITY: Talbot Island, South Carolina (*Baldwin*.)

DISTRIBUTION: Saline shores: Maryland to Mexico; Bermuda.

ILLUSTRATIONS: *Britt. & Brown*, Ill. Fl. ed. 2. 1: 317. f. 777; *A. Gray*, Man. ed. 7. 184. f. 256; *Clarke*, Ill. Cyp. pl. 39, f. 17-21; *Britton*, Fl. Bermuda 52. f. 79; *Rhodora* 39: pl. 464, f. 7.

6. *BULBOSTYLIS* Kunth, Enum. Pl. 2: 205. 1837.

[sub *Isolepis*; nomen conservandum.]

Not *Bulbostylis* Steven, 1817, nor DC. 1836, nom. rejic.

Stenophyllus Raf. Neog. 4. 1825.

Oncostylis Mart.; Nees in Mart. Fl. Bras. 2¹: 80. 1842.

Pubescent annual or perennial herbs with slender erect culms, leafy below, the leaves narrowly linear or filiform with ciliate or pubescent sheaths. Spikelets umbellate, capitate, or solitary, sometimes appearing lateral on the culm, with one or more subtending bracts or sterile scales. Scales pubescent, spirally imbricated, usually deciduous. Flower perfect. Style 3-cleft, with an enlarged base (tubercle) sometimes constricted below and usually persistent on the apex of the achene. Perianth lacking. Achene trigonous, rarely lenticular, with longitudinally elongate cells and frequently with a papillose-roughened surface. Stamens 1-3.

About 70 species, chiefly of dry sandy places in the tropics.

Type species, *Scirpus stenophyllus* Ell. [*Bulbostylis stenophylla* (Ell.) Clarke].

- Inflorescence composed of a single spikelet.
 Spikelet terminal, not distinctly flattened.
 Spikelet ovoid, obtuse.
 Plant with a thickened woody base.
 Base of plant not woody-thickened; achenes strongly 3-lobed.
- Spikelet acuminate.
 Spikelet lateral, distinctly flattened.
 Achenes strongly 3-lobed.
 Achenes not 3-lobed.
- Perennial plants with linear spikelets.
 Dwarf annuals with ovate spikelets.
 Achenes rugose-undulate.
 Achenes not rugose-undulate.
- Inflorescence of two or more spikelets.
 Slender annuals.
 Achenes prominently spinescent-papillose, only 0.6–0.8 mm. long; inflorescence umbellate.
- Achenes not prominently spinescent-papillose.
 Achenes smooth, 0.6 mm. long; inflorescence congested.
 Achenes with transversely rugose to low-papillose surface, 0.8–1.3 mm. long; inflorescence normally umbellate.
 Mature achenes bright bluish-gray with a waxy, low-papillose surface (Atlantic United States).
 Mature achenes distinctly transversely rugulose.
 Mature achenes stramineous.
 Achenes 0.75–0.9 mm. long.
 Achenes 1.0–1.3 mm. long; plant strongly hispid.
 Mature achenes gray to dark brown or black.
 Inflorescence umbellate.
 Inflorescence capitate.
- Perennials.
 Inflorescence capitate; scales with a pectinate-ciliate margin.
 Inflorescence congested to umbellate; scale margins not pectinate.
 Spikelets conspicuously flattened, borne at the apex of the culm (laterally in *B. pauciflora* and *B. setacea*).
 Culms capillary to filiform.
 Slender plants 1–2 dm. high, with capillary leaves similar to the culms.
 Achenes obovate.
 Achenes strongly trilobed.
 Coarse plants 2–6 dm. high with recurved basal leaves (Revillagigedo Islands).
 Culms flat and thickened (0.5–1.0 mm. wide); robust West Indian species.
 Sheath opening densely woolly.
 Inflorescence of 1–3 aggregated spikelets, strongly flattened, 0.5–2 cm. long.
 Inflorescence umbellate.
 Sheath opening not floccose; inflorescence capitate.
 Spikelets ovoid (not conspicuously flattened) in an umbellate to congested inflorescence.
 Achenes not transversely rugose, deep brown.
 Achenes densely papillose.
 Achenes elongate; inflorescence usually crowded; tall, nearly glabrous plants with glistening cinnamon-colored lower sheaths.
 Achenes obovoid; plant dwarf.
 Achenes smooth to slightly papillose, brown, becoming bluish-gray when mature.
 Culms essentially glabrous.
 Culms hispid.
 Achenes transversely rugose, becoming dark gray when mature.
1. *B. paradoxa*.
 2. *B. pubescens*.
 3. *B. Funckii*.
 4. *B. setacea*.
 5. *B. pauciflora*.
 6. *B. Schaffneri*.
 7. *B. curassavica*.
 8. *B. tenuifolia*.
 9. *B. barbata*.
 10. *B. ciliatifolia*.
 11. *B. capillaris*.
 12. *B. hirta*.
 13. *B. arenaria*.
 14. *B. stenophylla*.
 15. *B. Warei*.
 5. *B. pauciflora*.
 4. *B. setacea*.
 16. *B. nesiotica*.
 17. *B. floccosa*.
 18. *B. hispaniolica*.
 19. *B. subaphylla*.
 20. *B. papillosa*.
 21. *B. antiillana*.
 22. *B. junciformis*.
 23. *B. vestita*.
 24. *B. juncoides*.

1. *Bulbostylis paradoxa* (Spreng.) Lindm. Bih. Sv. Vet.-Akad.
 Handl. 26(3)⁹: 17. 1900.

- Schoenus spadiceus* H.B.K. Nov. Gen. & Sp. 1: 227. 1816. (Venezuela.) Not *Eriocaulon spadiceum* Lam. 1789; nor *Schoenus spadiceus* Vahl, 1805.
Schoenus paradoxus Spreng. Syst. 1: 190. 1825.
 ? *Nemum spadiceum* Desv.; Hamilt. Prodr. 13. 1825.
Isolepis paradoxa Kunth, Enum. Pl. 2: 206. 1837.
Rhynchospora perrigida Böck. Allg. Bot. Zeitschr. 2: 93. 1896. (Central America.)
Stenophyllus paradoxus Standley, Contr. U. S. Nat. Herb. 18: 88. 1916.
Bulbostylis spadicea Kükenth. Repert. Sp. Nov. 23: 197. 1926.

Perennial with a thickened, vertical base clothed by persistent leaf-bases, the resulting fire-resistant structure often 6 cm. long and 3 cm. thick; culms 4-12, borne at the apex of the caudex; leaves capillary to filiform, flattened, often recurved, shorter than or equaling the culms, the sheaths densely lanate, 4-10 cm. high, thickened, striate; inflorescence a single terminal, obovate spikelet 7-10 mm. long, 5 mm. wide, becoming broader at maturity by expansion of the perianth-like outer involucre bracts; scales lanceolate, rigid, long-cuspidate, lanate-fimbriate; mature achenes obovate to pyriform, obtusely trigonous, 1.5 mm. long, 1.0 mm. wide, dark brown with the low surface undulations frequently marked by transverse gray lines; tubercle dark brown, depressed-conic; style slender, elongate (2-3 mm. long below the style-branches); stamens 3, the anthers 3.0 mm. long.

TYPE LOCALITY: Caracas, Venezuela.

DISTRIBUTION: Pinelands and dry prairies, Cuba; Panama; northern South America.

NOTE: Vahl (Enum. Pl. 2: 210) described the specimen which he received from herb. Lamarck, from San Domingo, as having "squamis margine nudis," quite evidently not *Schoenus spadiceus* H.B.K.; nor does Lamarck's description of the African plant as having glabrous leaves and glabrous scales conform with the American species under discussion.

2. *Bulbostylis pubescens* (Presl) Svenson, comb. nov.

Abildgaardia pubescens Presl, Rel. Haenk. 1: 180. 1828.

Fimbristylis Preslii Kunth, Enum. Pl. 2: 228. 1837.

Bulbostylis clavinx Clarke, Ill. Cyp. pl. 41, f. 1-3. 1909. (Mexico.)

Annual? Culms filiform, glabrous to slightly hispid, 1-3 dm. high, deeply sulcate; leaves setaceous, glabrous to hispid, much shorter than the culms, the sheaths stramineous, long-pilose at the apex; spikelet single and terminal (sometimes with a single acicular bract half the length of the spikelet), ovate, 5-13 mm. long, 3-6 mm. wide; scales nearly glabrous to hirtellous, stramineous to black, with greenish midrib, acute and sometimes prominently mucronate, little or not at all keeled, becoming loose and spreading at maturity; mature achenes broadly obovate, truncate to depressed at the apex and deeply 3-lobed, abruptly narrowed below the middle, prominently transversely rugose; tubercle conic, trigonous, light brown, frequently deciduous; style elongated and thickened (1.5 mm. long below the branches); stamens 3, the anthers 1.0 mm. long.

TYPE LOCALITY: "Mexico and Luzon" (excluded from Philippines by Merrill, Enum. Philip. Pl. 1: 127. 1922).

DISTRIBUTION: Mexico (Morelos, Chiapas, México [state]); Colombia.

ILLUSTRATION: Clarke, Ill. Cyp. pl. 41, f. 1-3.

3. *Bulbostylis Funckii* (Steud.) Clarke, Kew Bull. Add. Ser.

8: 26. 1908.

Isolepis Funckii Steud. Syn. Cyp. 91. 1855. (Venezuela.)

† *Scirpus tenuispicatus* Böck. Linnaea 36: 740. 1870. (Valle de México.)

Scirpus heterocarpus S. Wats. Proc. Am. Acad. 18: 171. 1883. (San Luis Potosí, Mexico.)

Stenophyllus Funckii Britton, Bull. Torrey Club 21: 30. 1894.

Bulbostylis tenuispicata Barros, Anal. Mus. Argent. Ci. Nat. 41: 338. 1945.

Cespitose annual, the filiform culms 3-12 cm. high, glabrous; leaves similar, smooth to hispidulous, often equaling or exceeding the culms; leaf-sheaths slightly fimbriate at the apex, usually obscured by the numerous, reduced basal spikelets; inflorescence a single terminal, linear, acuminate spikelet 4-10 mm. long; scales dark brown with green keel, loosely attached to the axis, acute to mucronate, the lowermost often with an attenuate mucro; achene broadly obovate, 1 mm. long, stramineous to gray, deeply transverse-rugulose, the basal achenes larger (1.5 mm. long) with coarser, elongated vertical cells; tubercle narrowly to broadly conic; style slender, 1.5 mm. long; stamens 2, the anthers 0.4 mm. long.

TYPE LOCALITY: Venezuela.

DISTRIBUTION: Venezuela; Santa Marta, Colombia; El Salvador; Mexico (Jalisco, México [state], Orizaba, Chihuahua, San Luis Potosí); Arizona and New Mexico; Bolivia (*Mandon 1410*; fide Britton, Bull. Torrey Club 15: 103. 1888).

ILLUSTRATIONS: Bull. Torrey Club 15: pl. 80, f. 5-10; Descole, Gen. & Sp. Plant. Argent. 4: pl. 111A (as *B. tenuispicata*); Anal. Mus. Argent. Ci. Nat. 41: 341.

NOTE: A collection from San Salvador (*Calderón 1141*) has non-rugulose achenes.

4. *Bulbostylis setacea* (Griseb.) Svenson, Contr. Oc. Mus. Hist.
Nat. Col. de la Salle 4: 10. 1946.

Abildgaardia setacea Griseb. Cat. Pl. Cub. 238. 1866.
Fimbristylis Grisebachii Greenman; Combs, Trans. Acad. St. Louis 7: 474. 1897.
Fimbristylis cubensis Clarke, Ill. Cyp. pl. 43, f. 15-17. 1909. (Cuba.)
Bulbostylis Grisebachii Kükenth. Repert. Sp. Nov. 23: 197. 1926.

Tufted perennial; culms capillary to coarsely filiform, 0.5-2 dm. long, sulcate, glabrous to lightly hispid; leaves similar to and often equaling the culms, the sheaths stramineous, fimbriate at the apex; inflorescence capitate, of 2-3 terminal, ovate to lanceolate, compressed spikelets 4-5 mm. long, frequently appearing lateral when the involucre bract is developed, or often reduced to a single spikelet; scales strongly flattened, acute, shining yellowish-brown; mature achenes pale brown, 0.9-1.0 mm. long, 0.8 mm. wide, deeply 3-lobed, with retuse apex, the surface transversely rugulose; tubercle conic, dark brown, normally deciduous; style slender, 1.0 mm. long below the branches; stamens 3, the anthers subulate, 1 mm. long.

TYPE LOCALITY: Cuba (*C. Wright 1531, 3366*).

DISTRIBUTION: Limestone rocks, pinelands, Havana, Santa Clara, and Pinar del Rio provinces in Cuba; Isle of Pines.

ILLUSTRATIONS: *pl. 1, f. 13*; Clarke, Ill. Cyp. *pl. 43, f. 15-17*.

5. *Bulbostylis pauciflora* (Liebm.) Clarke, Kew Bull.
Add. Ser. 8: 26. 1908.

Oncostylis pauciflora Liebm. Vidensk. Selsk. Skr. V. 2: 241. 1851.
Stenophyllis portoricensis Britton, Torrey 13: 216. 1913. (Guanica, Puerto Rico.)
Bulbostylis Ekmanii Kükenth. Repert. Sp. Nov. 23: 197. 1926. (Oriente, Cuba.)
Bulbostylis portoricensis Fernald, Rhodora 40: 392. 1938.

Perennial; culms 1-2 dm. high from a tufted base, glabrous, filiform, flexuous, often spreading or recurved, deeply sulcate, quadrangular to compressed; leaves numerous, setaceous, scabrous, resembling the culms and frequently of the same height; sheaths stramineous to brown, the apex long-fimbriate; spikelet lateral (exceeded by the prominent filiform bract), linear, 5-8 mm. long; scales acute (the two lowermost mucronate), lanceolate, stramineous with prominent, dark brown, keeled midrib, narrow and partially exposing the achenes at maturity; achenes obtusely trigonous, obovate, 1.5 mm. long, 1.0 mm. wide, brownish-stramineous when mature, the surface transversely rugose; tubercle brown, conic, trigonous, frequently deciduous; style 1.0 mm. long below the elongate style-branches; stamens 3, the anthers 1.25 mm. long.

TYPE LOCALITY: St. Croix, West Indies.

DISTRIBUTION: Dry limestone rocks: Cuba; Puerto Rico; Haiti; St. Croix.

ILLUSTRATION: *pl. 1, f. 15*.

6. *Bulbostylis Schaffneri* (Böck.) Clarke, Kew Bull. Add. Ser.
8: 26. 1908.

Scirpus Schaffneri Böck. Bot. Jahrb. 7: 275. 1886.
Scirpus Pringlei Britton, Bull. Torrey Club 15: 103. 1888. (Chihuahua, Mexico.)

Cespitose dwarf annual; culms 2-4 cm. high (or more frequently reduced to basal spikelets), filiform, hispid, sulcate; leaves hispid, setaceous, 2-3 cm. long; inflorescence a single ovate, compressed, acute, loosely-flowered spikelet 5 mm. long (much exceeded by the lowest bract); scales stramineous to chestnut-brown, mucronate and strongly keeled, becoming saccate at the base in maturity; achene broadly obovate, sharply trigonous, truncate to depressed at the apex, rugose-undulate, stramineous at maturity; style-base light brown, depressed-conic; style slender, 1.0 mm. long below the branches; stamens 3, the anthers 0.25 mm. long.

TYPE LOCALITY: San Luis Potosí.

DISTRIBUTION: Chihuahua and San Luis Potosí.

ILLUSTRATIONS: *pl. 1, f. 17*; Bull. Torrey Club 15: *pl. 80, f. 1-4*.

NOTE: Exceedingly close to *B. curassavica*, from which it is distinguished only by the acute-angled, undulate achenes.

7. *Bulbostylis curassavica* (Britton) Kükenth. & Ekman;
Urban, Ark. Bot. 22A¹⁷: 6. 1929.*

Bulbostylis floccosa var. β (?) *pumilio* Clarke in Urban, Symb. Ant. 5: 290. 1907. (Curaçao.)
Stenophyllus curassavicus Britton, Bull. Torrey Club 43: 445. 1916.
Bulbostylis curassavica var. *pallescens* Kükenth. & Ekman; Urban, Ark. Bot. 22A¹⁷: 6. 1929. (Haiti.)

Dwarf caespitose annual, frequently only with a basal spikelet; culms setulose, sometimes reaching 1 dm. in height; leaves filiform, setulose, frequently longer than the culms; inflorescence lateral, usually a single flattened spikelet 3–10 mm. long, 2–3 mm. wide; scales acute, stramineous to brown, with prominent green keel; basal spikelets less flattened, acuminate, dark brown; achenes obovate, 0.6–0.7 mm. long, with obtuse angles, iridescent brown and punctate-reticulate when mature; tubercle brown, flattened, half as broad as the achene; style slender, elongate, 1.5 mm. long below the branches; stamens 2, the anthers slender, 1 mm. long.

TYPE LOCALITY: Curaçao.

DISTRIBUTION: Dry limestone rocks: Curaçao and Haiti.

ILLUSTRATION: *pl. 1, f. 12.*

8. *Bulbostylis tenuifolia* (Rudge) F. Macbr. Field Mus.
Publ. Bot. 11: 5. 1931.

Scirpus tenuifolius Rudge, Pl. Guian. 18. 1805.
Isolepis bufonia H.B.K. Nov. Gen. & Sp. 1: 222. 1816. (Type from Venezuela.)
Scirpus bufonis Poir. in Lam. Encyc. Suppl. 5: 105. 1817.
Oncostylis tenuifolia Nees in Mart. Fl. Bras. 2¹: 83. 1842.
Bulbostylis capillaris var. *tenuifolia* Clarke, Symb. Ant. 2: 89. 1900.

Chiefly annual; culms capillary, 0.5–2.0 dm. high, sulcate, glabrous, rarely hirtellous; leaves capillary, shorter than the culms, the stramineous sheaths lightly fimbriate at the apex; inflorescence a simple or compound umbel, the spikelets mostly long-pedicellate and solitary at the ends of the frequently arcuate branches; spikelets narrowly ovate, 3–6 mm. long, frequently acute; scales dark brown with a lighter keel, glabrous to hirtellous, usually obtuse to acute, rarely mucronate; achenes trigonous, obovate, 0.6–0.8 mm. long, finely spinescent-papillose (occasionally reticulate to nearly smooth), stramineous to grayish-brown, often with concave faces; tubercle reddish-brown, minute; style slender, 0.75 mm. long below the branches; stamen 1, the anther 1.0 mm. long.

TYPE LOCALITY: French Guiana.

DISTRIBUTION: Chiefly northern South America; also scattered in Cuba (*C. Wright 3382*); El Salvador (*Calderón 1413*); Guatemala (*Heyde & Lux 3888*); Consoquitla, Mexico (*Liebmann*); Panama (*Standley 26353*).

ILLUSTRATIONS: *pl. 1, f. 10*; Rudge, Pl. Guian. *pl. 22.*

NOTE: Wright's Cuban specimens and some similar collections, all with distichous, elongate spikelets and nearly smooth achenes, perhaps represent a distinct localized species.

9. *Bulbostylis barbata* (Rottb.) Clarke in Hook. f. Fl.
Brit. Ind. 6: 651. 1893.

Scirpus barbatus Rottb. Descr. Pl. Rar. 27. 1772.
Isolepis barbata R. Br. Prodr. 222. 1810.
Scirpus Dussii Böck. Beitr. Cyp. 2: 38. 1890. [Martinique; type incorrectly cited (*Duss 478* in part) as *Bulbostylis fimbriata* Clarke, Symb. Ant. 2: 87 (1900). Not *B. fimbriata* (Nees) Clarke.]
Stenophyllus floridanus Britton; Nash, Bull. Torrey Club 22: 161. 1895. (Florida.)
Bulbostylis floridanus Fernald, Rhodora 40: 392. 1938.

Densely tufted annual with long fibrous roots; culms erect, filiform, 0.5–2 dm. high, glabrous; leaves setaceous, much shorter than the culms; inflorescence a many-flowered compact umbel 1–1.5 cm. in diameter, often becoming capitate or even reduced to 3 or 4 spikelets, sometimes accompanied by capillary bracts exceeding the inflorescence; spikelets linear, 3–10 mm. long, acute; scales ovate-lanceolate, strongly keeled with green midrib and brown sides and a short excurrent mucro, glabrous to sparsely strigose-hispid; achenes sharply

* The combination made inadvertently in describing var. *pallescens*.

trigonus, obovate, 0.6 mm. long, dull brown, smooth, obscurely reticulate with nearly isodiametric cells; style-base brown, minute, truncate to acicular; stipe nearly lacking; style filiform, 0.5 mm. long, not fimbriate; style-branches 3; stamen 1, the anther 1.0 mm. long.

TYPE LOCALITY: Malabar (*Koenig*).

DISTRIBUTION: Tropics of the Old World; Georgia, Florida, Alabama; Martinique; South America?

ILLUSTRATION: Rottb. Descr. & Ic. *pl.* 17, *f.* 4.

10. *Bulbostylis ciliatifolia* (Ell.) Fernald, *Rhodora* 40: 391. 1938.

Scirpus ciliatifolius Ell. Bot. S. C. & Ga. 1: 82. 1816.

Scirpus coarctatus Ell. Bot. S. C. & Ga. 1: 83. 1816. (Beaufort, South Carolina.)

Isolepis ciliatifolius Torr. Ann. Lyc. N. Y. 3: 352. 1836.

Isolepis coarctata Torr. Ann. Lyc. N. Y. 3: 352. 1836.

Fimbristylis capillaris var. *coarctata* Britton, Bull. Torrey Club 15: 102. 1888.

Stenophyllus capillaris coarctatus Britton, Bull. Torrey Club 21: 30. 1894.

Stenophyllus ciliatifolius C. Mohr, Bull. Torrey Club 24: 22. 1897.

Stenophyllus coarctatus Britton; Small, Fl. SE. U. S. 189. 1903.

Stenophyllus Carteri Britton; Small, Bull. N. Y. Bot. Gard. 3: 420. 1905. (Dade County, Florida.)

Stenophyllus capillaris A. *eu-capillaris* b. *coarctata* H. Pfeiffer, Bot. Arch. 6: 187. 1924.

Bulbostylis capillaris var. *coarctata* F. Macbr. Field Mus. Publ. Bot. 11: 5. 1931.

Bulbostylis coarctatus Fernald, *Rhodora* 40: 392. 1938.

Cespitose annual with glabrous culms 1.0–3.0 dm. tall; sheaths glistening brown-stramineous, lightly asperulous, the apex prominently fimbriate; leaves capillary, setulose! on the margins; inflorescence usually a loose compound umbel, but sometimes with the branches aggregated (*B. coarctata*) or even capitate (*S. Carteri*); spikelets 2–6 mm. long, subacute, dark brown, prominently keeled, frequently subglutinous and usually covered with short strigose pubescence; achenes obtusely trigonus, narrowly obovate (0.6–1.0 mm. long), often slightly 3-lobed at the apex, the convex sides minutely papillate to smooth, with a bluish-gray waxy covering when mature; style filiform, very short (ca. 0.3 mm. below the style-branches), not fimbriate; stamens 2 or 3, the anthers apiculate, 0.5–0.8 mm. long.

TYPE LOCALITY: "Grows in damp soils. Two miles from Beaufort [S. Carolina]."

DISTRIBUTION: Wet sandy pinelands, southeastern Virginia to Louisiana; reported by Britton (Bull. Torrey Club 43: 447. 1916) from Santiago, Cuba (*Britton 1879*), but the collection is perhaps better treated as *B. arenaria*.

ILLUSTRATION: *pl.* 1, *f.* 16.

11. *Bulbostylis capillaris* (L.) Clarke in Hook. f. Fl. Brit. Ind. 6: 652. 1893.

Scirpus capillaris L. Sp. Pl. 49. 1753.

Isolepis ? capillaris R. & S. Syst. Veg. 2: 118. 1817.

Scirpus brachyphyllus Link. Jahrb. Gewächsk. 1^o: 78. 1820. (*Willd. 1201* from Pennsylvania.)

Isolepis brachyphylla Schultes in R. & S. Syst. Veg. Mant. 2: 64. 1824.

Scirpus Mühlenbergii Spreng. Syst. 1: 207. 1825.

Fimbristylis capillaris A. Gray, Man. 530. 1848.

Isolepis radiceiflora Steud. Syn. Cyp. 318. 1855. (Louisiana.)

Stenophyllus capillaris Britton, Bull. Torrey Club 21: 30. 1894.

Bulbostylis capillaris var. *crebra* Fernald, *Rhodora* 40: 395. 1938. (Massachusetts.)

Bulbostylis capillaris var. *isopoda* Fernald, *Rhodora* 40: 395. 1938. (Virginia.)

Annual with fibrous roots; culms glabrous, densely cespitose, filiform, 0.5–3.0 dm. high; leaves capillary, scabrous on the margins, much shorter than the culms; involucre bract very slender, usually exceeding the inflorescence; inflorescence umbellate, often much reduced, sometimes becoming capitate; spikelets ovoid-oblong, 2–7 mm. long, subacute; scales dark brown, obtuse, fimbriate, with a strongly keeled, green midrib; stamens 2, the anthers 0.3 mm. long; achenes obovate, 0.75–0.9 mm. long, sharply angled, truncate, stramineous to pale brown, the surface undulate-rugose; tubercle minute, conic.

TYPE LOCALITY: Virginia (*Clayton*).

DISTRIBUTION: Sandy places: southern Maine to Minnesota, south to Texas and Florida; also in Oregon, California, New Mexico, and Arizona; northern Mexico (*Johnston 8145*); very rare in Cuba.

ILLUSTRATIONS: *pl.* 1, *f.* 14; A. Gray, Man. ed. 7. 186. *f.* 268; Rep. N. J. Mus. 1910: *pl.* 17, *f.* 3 (as *Stenophyllus capillacea*); Jepson, Man. Fl. Pl. Calif. 150. *f.* 139; Britt. & Brown, Ill. Fl. ed. 2. 1: 319. *f.* 783; Abrams, Ill. Fl. Pacif. St. 1: 267. *f.* 639; *Rhodora* 40: *pl.* 510.

12. *Bulbostylis hirta* (Thunb.) Svenson, Contr. Oc. Mus. Hist.
Nat. Col. de la Salle 4: 11. 1946.

Cyperus hirtus Thunb. Phytogr. Bl. 6. 1803. (South Africa.)

Scirpus hispidulus Vahl, Enum. 2: 276. 1805. (Guinea.)

Isolepis exilis H.B.K. Nov. Gen. & Sp. 1: 224. 1816. (Venezuela.)

Fimbristylis exilis R. & S. Syst. Veg. 2: 98. 1817.

Fimbristylis hispidula Kunth, Enum. Pl. 2: 227. 1837.

Scirpus chirigota C. Wright in Sauv. Anal. Acad. Ci. Habana 8: 81. 1871. (Cuba.)

Fimbristylis hirta Kükenth. Repert. Sp. Nov. 23: 196. 1926. Not *F. hirta* R. & S. 1817.

Annual, strigose-pubescent throughout; culms thicker and less wiry than in other annual species, 1.5–3 dm. high; leaves half the length of the culms; inflorescence umbellate, the spikelets single, 5–9 mm. long, on long, erect or horizontal rays; scales acute, hispid; achenes trigonous, obovate, 1.0–1.3 mm. long, 1 mm. wide, truncate at the apex and with an obtuse outer angle, dull yellowish-gray, the surface prominently undulate; tubercle conic, borne on a slight elevation and usually deciduous; style very short, 0.75 mm. below the branches; stamens 3, the anthers 0.75–1.0 mm. long.

TYPE LOCALITY: South Africa.

DISTRIBUTION: Africa and Madagascar; occasional in Cuba and Venezuela.

ILLUSTRATIONS: *pl. 1, f. 8*; Clarke, Ill. Cyp. *pl. 43, f. 1–3*.

NOTE: Clarke in Thistleton-Dyer, Fl. Cap. 7: 202 (1898) wrote, "This species is the connecting link between *Fimbristylis* and *Bulbostylis*; its hairy stem is common in *Bulbostylis*, very rare in *Fimbristylis*." The tubercle is usually dehiscent in the same manner as in *B. setacea*.

13. *Bulbostylis arenaria* (Nees) Lindm. Bih. Sv. Vet.-Akad.
Handl. 26(3)⁹: 19. 1900.

Isolepis arenaria Nees, Linnaea 9: 291. 1834. Nomen nudum.

Oncostylis arenaria Nees in Mart. Fl. Bras. 2^o: 87. 1842. (Brazil.)

Tufted annual; culms 0.5–2.5 dm. high, filiform, glabrous or rarely minutely strigulose; leaves half as long as the culms or shorter; inflorescence usually a simple, frequently spreading umbel; spikelets 2–6 mm. long, acute; scales brown, keeled, acute to cuspidate; achenes obovate, 0.8–1.1 mm. long, transversely rugose, becoming dark gray when mature.

TYPE LOCALITY: Eastern Brazil.

DISTRIBUTION: Sandy pinelands: northeastern South America; West Indies; sporadically in Central America; British Honduras (*Schipp 919*).

NOTE: This species has undulate achenes similar to those of *B. juncooides* but of somewhat smaller size. In habit it resembles *B. capillaris*, from which it differs in the dark gray to nearly black achenes. The taxonomic limits of this species with respect to *B. capillaris*, *B. juncooides*, and *B. ciliatifolia* are not clear.

14. *Bulbostylis stenophylla* (Ell.) Clarke, Kew Bull.
Add. Ser. 8: 26. 1908.

Scirpus stenophyllus Ell. Bot. S. C. & Ga. 1: 83. 1816.

Dichroma cespitosum Muhl. Descr. Gram. 14. 1817. (Georgia.)

Dichromena caespitosa Spreng. Syst. 1: 202. 1825.

Stenophyllus cespitosus Raf. Neog. 4. 1825.

Isolepis stenophylla Torr. Ann. Lyc. N. Y. 3: 353. 1836.

Stenophyllus stenophyllus Britton, Bull. Torrey Club 21: 30. 1894.

Densely tufted annual; culms capillary to coarsely filiform, 0.5–2 dm. high, sulcate, glabrous to hirtellous; leaves capillary, channeled, usually shorter than the culms, the sheath stramineous to lucid pale brown; inflorescence terminal, capitate, the 4–8 linear spikelets much exceeded by 3 or 4 elongate, capillary bracts; scales broadly ovate, dull brown, strongly keeled, aristate, hirtellous; achenes sharply trigonous with concave faces, 1 mm. long, 0.7 mm. wide, dark brown, the transverse undulate lines often heightened at maturity by grayish wax-like deposits; tubercle reddish-brown, conic; style slender, 1.0 mm. long below the branches; stamen 1, the anther 1.0–1.5 mm. long.

TYPE LOCALITY: "Around Beaufort [S. C.], common. James Island."

DISTRIBUTION: Sandy pinelands: North Carolina to Florida; Pinar del Rio, Cuba (*Ekman 16765*).

ILLUSTRATION: *pl. 1, f. 11*.

15. *Bulbostylis Warei* (Torr.) Clarke, Kew Bull. Add. Ser.
8: 26. 1908.

Isolepis Warei Torr. Ann. Lyc. N. Y. 3: 354. 1836.
Stenophyllus Warei Britton, Bull. Torrey Club 21: 30. 1894.

Perennial (?); culms relatively stout, often 1 mm. wide, 1-5 dm. high, glabrous, striate; leaves capillary or filiform, often flattened, usually much shorter than the culms, the sheaths stramineous to pale brown, lightly fimbriate at the apex; inflorescence terminal, the densely capitate spikelets surrounded by pectinate-fimbriate bracts equaling or much exceeding the spikelets; spikelets congested, flattened, 6-10 mm. long; scales ovate, brown, appressed, strongly nerved, acute to short-mucronate, long-ciliate at the apex; achenes (rarely maturing) obtusely trigonous, broadly obovate with narrowed base, 1.0 mm. long, 0.8 mm. wide, retusely 3-lobed at the apex, glistening white, the transverse undulations obscure; tubercle minute, conic; style filiform (2.5 mm. long below the branches); stamens 3, the anthers 1.5 mm. long.

TYPE LOCALITY: Tampa Bay, West Florida (*N. A. Ware*).

DISTRIBUTION: Dry sand: Florida and Georgia.

ILLUSTRATION: Clarke, Ill. Cyp. pl. 45, f. 4-7.

16. *Bulbostylis nesiotica* (I. M. Johnston) Fernald,
Rhodora 40: 392. 1938.

Stenophyllus nesioticus I. M. Johnston, Univ. Calif. Publ. Bot. 7: 438. 1922.

Perennial (?) with thickened culm-bases; culms 2-6 dm. high, rather coarse for the genus, glabrous, striate-sulcate; leaves 0.5-1.0 mm. wide, flattened, one-third to half as long as the culms, the recurved blades usually deciduous in mature specimens, the sheaths fibrillose at the apex and frequently over the entire surface of the sheath; inflorescence capitate, terminal (or lateral if the involucre bract is well developed), of 3-6 compressed, sessile, ovate-lanceolate, 8-12-flowered spikelets; scales dull brown, subacute, somewhat glutinous; achenes (apparently rarely maturing) broadly obovate (1.0 mm. long, 0.7-0.9 mm. wide), sharply trigonous, deep gray, transversely rugose; tubercle hemispheric, on a slightly raised projection; style 1 mm. long below the branches; stamens 3, the anthers acuminate, 1.7 mm. long.

TYPE LOCALITY: San Benedicto Island, Revillagigedo Islands, Mexico (*A. W. Anthony 317*).

DISTRIBUTION: Revillagigedo Islands.

NOTE: Probably related to *B. nesiotis* (Hemsl.) Clarke, known only from immature specimens from isolated South Trinidad Island [off the Brazilian coast], and to *B. subaphylla* of eastern Cuba and Hispaniola.

17. *Bulbostylis floccosa* (Griseb.) Clarke, Symb. Ant.
2: 86. 1900.

Scirpus floccosus Griseb. Cat. Pl. Cub. 241. 1866.
Stenophyllus Wilsoni Britton, Torrey 13: 215. 1913. (Bahama Islands.)
Bulbostylis haitiensis Kükenth. Repert. Sp. Nov. 23: 199. 1926. (Haiti.)
Bulbostylis Wilsoni Kükenth.; Urban, Ark. Bot. 22A¹⁷: 7. 1929.

Robust perennial with enlarged culm-bases; culms glabrous, rigid, erect or recurved, 0.5-1.0 mm. in diameter, 1-3 dm. high; leaves few or none, similar to the culms in texture, the sheaths castaneous, the apices and often the young spikelets flocculent-pubescent; inflorescence lateral, or terminal in well-developed plants, of 1-3 aggregated, flattened, brown, linear spikelets 0.5-2 cm. long, 2-3 mm. wide; scales 3-4 mm. long, castaneous, keeled, lightly hispid, often ciliate-floccose at the margin; mature achenes obovate, obscurely trigonous, dark brown to black, 0.7-0.8 mm. long, smooth (the minute, vertically elongated cells scarcely distinguishable); tubercle black, flattened; style slender, obscurely compressed, 2.0 mm. long; stamens 3, the anthers 3 mm. long.

TYPE LOCALITY: Eastern Cuba (*Wright 3381*).

DISTRIBUTION: Sandy beaches: eastern Cuba; Bahama Islands (Castle Island, Little Inagua); Santo Domingo; Haiti.

NOTE: Probably close to *B. curassavica* in its flattened spikelets and somewhat similar achenes.

ILLUSTRATION: pl. 1, f. 18.

18. *Bulbostylis hispaniolica* Kükenth. & Ekman; Urban,
Ark. Bot. 22A¹⁷: 6. 1929.

Perennial with bulbous-thickened culm-bases; culms rigid, filiform, 3–3.5 dm. high; leaves flattened (1.0 mm. wide) and rigid, nearly equaling the culms; sheath apices lightly floccose; inflorescence umbellate, of 3–6 strongly flattened, acute, brown spikelets 1.0–1.5 cm. long, borne singly or 2 or 3 at the ends of short, arcuate rays; scales dull chestnut-brown, obscurely hirtellous, acute to mucronate; achenes broadly obovate, 1.4 mm. long, 1.0 mm. wide, stramineous (immature), the angles blunt, the inner face somewhat concave, faintly transverse-undulate; tubercle small, light brown, short-conic; style slender, obscurely compressed, 2 mm. long below the style-branches; stamens 3, the anthers 2.5 mm. long.

TYPE LOCALITY: Haiti, "Massif du Nord prope Hinche . . . ad colles steriles" (*Ekman H6174*).

DISTRIBUTION: Haiti.

NOTE: Very close to *B. subaphylla* and perhaps only a radiate extreme of that species.

19. *Bulbostylis subaphylla* Clarke, Symb. Ant. 2: 86. 1900.

Stenophyllus subaphyllus Britton, Bull. Dep. Agr. Jamaica 5 (Suppl. 1): 12. 1907.

Bulbostylis alpestris Urban, Symb. Ant. 7: 168. 1912. (Santo Domingo.)

Bulbostylis Tuerckheimii Urban, Symb. Ant. 7: 169. 1912. (Santo Domingo.)

Stenophyllus Harrisii Britton, Torrey 20: 83. 1920. (Jamaica.)

Bulbostylis subaphylla var. *longighumis* Kükenth. Repert. Sp. Nov. 23: 198. 1926. (Sierra de Nipe, Cuba.)

Bulbostylis subaphylla var. *rigida* Kükenth. Repert. Sp. Nov. 23: 199. 1926. (Sierra de Nipe, Cuba.)

Bulbostylis subefimbriata Kükenth.; Urban, Ark. Bot. 22A¹⁷: 7. 1929. (Haiti.)

Coarse perennial, frequently with bulbous-thickened culm-bases; culms glabrous, 2–10 dm. long, rigid, cylindrical to flattened, frequently 1 mm. wide; leaves similar to the culms, the sheaths smooth to hirtellous with a fimbriate to nearly glabrous apex; inflorescence terminal and capitate, of 2–6 shining, dark brown, flattened spikelets, sometimes appearing lateral in plants with elongate involucre bracts, and often proliferous; scales dark brown, glabrous to lightly hirtellous, not strongly keeled, obtuse to acute-short-mucronate, fimbriate to nearly smooth at the margins; mature achenes obovate, bluntly trigonous, shining grayish-brown, 1.3–1.5 mm. long, 0.7 mm. wide, with light transverse undulation; tubercle prominent, hemispheric, dark brown; style flattened, 2.0 mm. long below the branches; stamens 3, the anthers 2.5 mm. long.

TYPE LOCALITY: "Prope villam Monte Verde dictam, Cuba Oriental." (*C. Wright 1533* in part, herb. Gray.)

DISTRIBUTION: Eastern Cuba, Santo Domingo, Jamaica.

NOTE: *B. subaphylla* (= *B. alpestris*) is the smallest extreme of the species (culms ca. 2 dm. long), which appears in its most elongated phase as *B. Harrisii* (= *B. subefimbriata*) (culms 8–10 dm. long, with larger, often proliferous spikelets). Intermediate is *B. Tuerckheimii* (= *B. subaphylla* var. *longighumis* and *B. subefimbriata*), also frequently proliferous.

ILLUSTRATION: *pl. 1, f. 20*.

20. *Bulbostylis papillosa* Kükenth. Repert. Sp. Nov.
23: 198. 1926.

Perennial with bulbous culm-bases; culms 5–10 dm. long, glabrous, lightly striate, generally inflated (2 mm. wide), less frequently filiform; leaves a third to half as long as the culms, deeply channeled, the sheaths light brown, long-fimbriate at the apex; inflorescence a densely contracted, compressed umbel, rarely becoming loosely radiate; spikelets 7–12 mm. long, lucid reddish-brown, subacute; scales ovate, short-mucronate, strongly keeled, glabrous to slightly hirtellous; achene oblong, 1.0–1.1 mm. long, 0.5 mm. wide, stramineous to dull reddish-brown, with obtuse, yellow outer angle and a densely papillose surface; tubercle light brown, depressed; style 0.75 mm. long below the branches; stamens 3, the anthers acuminate, 1.0 mm. long.

TYPE LOCALITY: Sierra de Nipe, Oriente, Cuba.

DISTRIBUTION: Cuba; Haiti; Santo Domingo; Jamaica; Mexico; Panama; northern South America, south to Bolivia and Brazil.

ILLUSTRATIONS: *pl. 1, f. 21*; Anal. Mus. Argent. Ci. Nat. 41: 349.

NOTE: Distinguished from *B. junciformis* by the elongate, papillose achenes, thickened culms, and dense inflorescence.

21. *Bulbostylis antillana* (Britton) Fernald, Rhodora
40: 392. 1938.

Stenophyllus antillanus Britton, Bull. Torrey Club 43: 447. 1916.

Densely tufted perennial; the filiform culms firm and flexuous, 1.5–4 dm. long, glabrous; leaves filiform, similar to the culms and one-half to two-thirds as long; sheaths light cinnamon-brown, flocculent at the apex; inflorescence umbellate, rather compact, the rays (sometimes compound) not exceeding 1.5 cm.; spikelets sessile, fascicled, oblong, 5–6 mm. long; scales lanceolate, brown, keeled, acute; achene trigonous, obovoid, 0.9 mm. long, brown, the surface covered with minute, almost echinate papillae; tubercle small, brown, short-conic.

TYPE LOCALITY: Grand Savanna, Dominica (*F. E. Lloyd 822*).

DISTRIBUTION: Dry sandy savannas locally in Martinique and Dominica.

22. *Bulbostylis junciformis* (H.B.K.) Lindm. Bih. Sv.
Vet.-Akad. Handl. 26(3)⁹: 19. 1900.

Isolepis junciformis H.B.K. Nov. Gen. & Sp. 1: 222. 1816.

Scirpus junciformis Poir. in Lam. Encyc. Suppl. 5: 105. 1817. Not *S. junciformis* Retz. 1791.

Scirpus Humboldtii Spreng. Syst. 1: 213. 1825.

Oncostylis junciformis var. γ *Humboldtiana* Nees in Mart. Fl. Bras. 2¹: 86. 1842.

Bulbostylis junciformis var. *laxiuscula* Kükenth. Repert. Sp. Nov. 23: 198. 1926. (Pinar del Rio, Cuba.)

Perennial with bulbous-thickened culm bases; culms rigid, nearly glabrous, filiform, 2–4 dm. high; leaves glabrous, rigid, filiform, deeply channeled, frequently glaucous, usually half as long as the culms, the sheaths dull castaneous to dark brown, the apices long-fibrillose; inflorescence narrowly umbellate, of capitate glomerules on rays 1–3 cm. long, rarely decomposed, not infrequently reduced to a single capitate inflorescence; spikelets lanceolate, acute, flattened, 4–6 mm. long, numerous in each glomerule; scales lanceolate, acute to short-mucronate, castaneous to dull reddish-brown; achene bluntly trigonous, obovate, 0.7–0.9 mm. long, 0.5–0.7 mm. wide, somewhat truncate at the apex, most frequently with a translucent, shining, golden-brown, subpapillose surface, sometimes opaque-stramineous, often coated at maturity with a bluish-gray waxy covering through which the papillae protrude; stamens 3, the anthers acuminate (1.0 mm. long).

TYPE LOCALITY: Northeastern Venezuela: "in temperatis montanis prope Guachari et villam Cocoller" (*Humboldt*).

DISTRIBUTION: Cuba; British Honduras (*Lundell 6696*); Panama; northern South America.

ILLUSTRATION: *pl. 1, f. 19*.

23. *Bulbostylis vestita* (Kunth) Clarke, Symb. Ant.
2: 87. 1900.

Isolepis vestita Kunth, Enum. Pl. 2: 210. 1837.

Oncostylis vestita Nees in Mart. Fl. Bras. 2¹: 88. 1842.

Oncostylis hispida Liebm. Vidensk. Selsk. Skr. V. 2: 240. 1851. (Mexico.)

Scirpus hirtus Griseb. Cat. Pl. Cub. 241. 1866. (*C. Wright 3383* from Pinales, Cajolbana, Cuba.)

Scirpus vestitus Reichenb.; Böck. Linnaea 36: 753. 1870.

Fimbristylis vestita Hemsl. Biol. Centr. Am. Bot. 3: 460. 1885.

Stenophyllus vestitus Britton, Bull. Torrey Club 43: 446. 1916.

Bulbostylis Langsdorffiana Clarke, Symb. Ant. 2: 89. 1900. (Only as to Antillean citation, *Sintenis 1208*.)

Perennial, sometimes with bulbously-enlarged culm-bases; culms filiform, rigid, 1–3.5 dm. high, strigose-pubescent; leaves capillary, channeled, strigose-pubescent, the sheaths stramineous to light brown, long-fimbriate at the apex; inflorescence capitate or frequently umbellate with spikelets (3–6 mm. long) in glomerules; scales brown, frequently glutinous, hirtellous, with a yellowish keel, prominently mucronate; achenes obovate, trigonous, 0.9 mm. long, frequently truncate, dark-semitranslucent-brown, with a prominent yellow stripe

beneath the blunt angles, often at maturity with minute papillae projecting through a bluish-gray waxy covering; tubercle light brown, flattened; style short, 0.5 mm. long below the branches; stamens 3, the anthers acuminate, 1.0 mm. long.

TYPE LOCALITY: Suriname.

DISTRIBUTION: Dry rocks and sandy pinelands: Cuba; Puerto Rico; Haiti; Mexico; British Honduras; South America.

ILLUSTRATIONS: Clarke, Ill. Cyp. *pl.* 45, *f.* 8-10.

24. *Bulbostylis juncoides* (Vahl) Kükenth.; Osten, Anal. Mus.
Hist. Nat. Montevideo II. 3: 187. 1931.

Schoenus juncoides Vahl, Enum. 2: 211. 1805.

? *Isolepis consanguinea* Kunth, Enum. Pl. 2: 211. 1837. (Brazil.)

? *Oncostylis Kunthiana* Nees in Mart. Fl. Bras. 2: 87. 1842.

Oncostylis tenuifolia var. *hirta* Liebm. Vidensk. Selsk. Skr. V. 2: 240. 1851. (Mexico.)

Oncostylis tenuifolia var. *nana* Liebm. Vidensk. Selsk. Skr. V. 2: 240. 1851. (Mexico.)

? *Scirpus consanguineus* Böck. Linnaea 36: 754. 1870.

Scirpus Lorentzii Böck. Linnaea 38: 378. 1874. (Argentina.)

Bulbostylis argentina Palla, Oesterr. Bot. Zeitschr. 57: 258. 1907. (Argentina.)

Fimbristylis ciliatifolia Britton; S. Wats. Proc. Am. Acad. 22: 459. 1887. Nomen nudum.

Fimbristylis capillaris var. *pilosa* Britton, Bull. Torrey Club 15: 102. 1888. (Guatemala.)

Bulbostylis Fendleri Clarke, Kew Bull. Add. Ser. 8: 27. 1908. (As to Mexican citations, not as to type from Venezuela.)

Bulbostylis Langsdorffiana Clarke, Symb. Ant. 2: 89. 1900. (As to Mexican specimens so determined by Clarke in herb. Kew.)

Bulbostylis hirtella sensu Clarke; Urban, Symb. Ant. 2: 166. 1900. Not *Isolepis hirtella* Schrad.; Schultes, 1824.

? *Bulbostylis consanguinea* Clarke, Kew Bull. Add. Ser. 8: 110. 1908.

Bulbostylis juncoides var. β *Lorentzii* Kükenth.; Osten, Anal. Mus. Hist. Nat. Montevideo II. 3: 187. 1931. (Argentina.)

Bulbostylis juncoides var. γ *ampleiceps* Kükenth.; Osten, Anal. Mus. Hist. Nat. Montevideo II. 3: 188. 1931. (Argentina.)

Perennial (rarely annual at the northern limit of the range) with hard, thickened, frequently semi-bulbous base and coarse roots; culms dull green, 1-3 dm. high, filiform, sulcate, glabrous to pilose; leaves capillary, frequently glaucous, glabrous to pilose, usually one-third the length of the culms; sheaths cinnamon to dark brown, fimbriate at the apex; inflorescence in the typical plant congested and not radiate, but more frequently (var. *ampleiceps*) an umbel with rays 0.5-2 cm. long, bearing single spikelets; spikelets lance-ovate, 3-6 mm. long, subacute; scales brown with a paler midrib, obtuse to acute, frequently glutinous, glabrous to hirtellous; achenes trigonous, broadly obovate, 0.8-1.2 mm. long, with a truncate apex, dark gray when mature, with minute, blunt surface projections in transverse wavy lines; tubercle sessile, rounded-conic, dark brown; style short, 0.5-0.75 mm. long below the branches; stamens 3, the anthers 1.0 mm. long.

TYPE LOCALITY: Montevideo, Uruguay.

DISTRIBUTION: Chisos Mts. Texas (*Ferris & Duncan 2956*); Chiricahua and Huachuca Mts., Arizona, south through the uplands of Mexico; Guatemala (*Türckheim 1293*); Santo Domingo (*Jiménez 81, 83*); Bolivia to Uruguay and Argentina, especially in the lower Andes.

ILLUSTRATIONS: *pl.* 1, *f.* 9; Anal. Mus. Hist. Nat. Montevideo II. 3: *pl.* 34, 35; Descole, Gen. & Sp. Plant. Argent. 4: *pl.* 111B, C, 113; Anal. Mus. Argent. Ci. Nat. 41: 344.

NOTE: The only typical North American collection seen is *Purpus 4234* from Puebla, Mexico, the specimens otherwise belonging to var. *ampleiceps*.

7. *FIMBRISTYLIS* Vahl, Enum. 2: 285. 1805.

Annual or perennial, with culms leafy below. Spikelets umbellate or capitate, terete, several to many-flowered, subtended by a more or less leafy involucre; scales concave, spirally imbricated, gradually deciduous, all fertile. Perianth none. Stamens 1-3. Style 2-3-cleft, frequently compressed, pubescent or glabrous, usually having an enlarged base deciduous with the style. Achene lenticular or 3-angled, reticulate with quadrangular to horizontally (never vertically) elongate cells. A genus chiefly of widespread tropical species.

Type species, *Fimbristylis dichotoma* (L.) Vahl.

Sect. 1: *Dichelostylis* Benth. in Benth. & Hook. Gen. Pl. 3: 1049. 1883. Style-branches 2; achenes lenticular; style commonly fringed below the branches.

Spikelets mostly on elongate rays.

Scales mucronate with long recurving tips; style with pendent basal hairs, nearly as long as the achene.

Scales not mucronate with long recurving tips; style not long-fringed at the base.

Culms with many spikelets; spikelet, if solitary, with prominent bracts.

Achenes not longitudinally ribbed.

Mature achenes gray to black, deeply reticulate with usually horizontally elongated cells; scales brown to black, smooth, or puberulent from the base upward.

Mature achenes dull yellow, obscurely striolate-reticulate with minute isodiametric cells; scales brown, appressed-pubescent above.

Achenes longitudinally ribbed.

Culms with 1-3 spikelets, usually bractless.

Spikelets glomerulate.

Bracts slender, much exceeding the inflorescence; achenes transversely reticulate.

Bracts not exceeding the inflorescence; achenes nearly black, with superficial isodiametric reticulation.

5. *F. squarrosa*.

1. *F. spadicea*.

2. *F. ferruginea*.

3. *F. dichotoma*.

4. *F. schoenoides*.

6. *F. VahlII*.

7. *F. spathacea*.

1. *Fimbristylis spadicea* (L.) Vahl, Enum. 2: 294. 1805.

Scirpus spadiceus L. Sp. Pl. 51. 1753.

Scirpus carolinianus Lam. Tab. Encyc. 1: 142. 1791. (Carolina.)

Scirpus castaneus Michx. Fl. Bor.-Am. 1: 31. 1803. (Florida.)

Scirpus puberulus Michx. Fl. Bor.-Am. 1: 31. 1803. (Carolina.)

Scirpus fimbriatus Poir. in Lam. Encyc. 6: 778. 1804.

Fimbristylis puberulum Vahl, Enum. 2: 289. 1805.

Fimbristylis castaneum Vahl, Enum. 2: 292. 1805.

Fimbristylis cylindricum Vahl, Enum. 2: 293. 1805. (North America.)

Scirpus domingensis Pers. Syn. Pl. 1: 67. 1805. (Santo Domingo.)

Scirpus pubescens Pers. Syn. Pl. 1: 68. 1805.

Fimbristylis speciosa Rohde; Spreng. Pug. 1: 5. 1813. (San Domingo.)

Isolepis Drummondii Torr. & Hook.; Torr. Ann. Lyc. N. Y. 3: 350. 1836. (Texas.)

Fimbristylis Riehleana Steud. Syn. Cyp. 114. 1855, fide Böck. (North America.)

Fimbristylis pentastachya Böck. Flora 40: 36. 1857. (Vera Cruz, Mexico.)

Fimbristylis Drummondii Böck. Flora 41: 603. 1858. (New Orleans, Drummond 416.)

Fimbristylis anomala Böck. Flora 43: 242. 1860. (Texas, Drummond 445.)

Fimbristylis multistriata Böck. Flora 43: 243. 1860. (Rio Brazos, Texas, Drummond.)

Fimbristylis spadicea var. *puberula* Chapm. Fl. S. U. S. 522. 1860.

Fimbristylis spadicea var. *castanea* A. Gray, Man. ed. 5. 566. 1867.

Fimbristylis thermalis S. Wats. Bot. King's Expl. 360. 1871. (Nevada.)

Fimbristylis interior Britton in Britt. & Brown, Ill. Fl. ed. 2. 1: 320. 1913. (Colorado.)

Fimbristylis inaguensis Britton, Torreya 13: 216. 1913. (Bahama Islands.)

Fimbristylis spadicea f. *domingensis* Kükenth. Repert. Sp. Nov. 23: 196. 1926.

Fimbristylis Harperi Britton; Small, Fl. Miami 29. 1913. (Tybee Island, Georgia.)

Fimbristylis puberula f. *pyncostachya* Fernald, Rhodora 37: 396. 1933. (Virginia.)

Fimbristylis puberula f. *euycyla* Fernald, Rhodora 37: 396. 1933. (Virginia.)

Perennial, often with elongated stolons; culms 0.3-1 m. high, often wiry, with pale brown to black sheaths; leaves usually elongate, half as long as the culm or longer, involute to flattened, filiform to 3 mm. wide; rays of the umbel unequal, simple or forked, 1-12 cm. long; spikelets ovoid to long-cylindric, 5-15 mm. long; scales ovate, apiculate, brown to nearly black, most frequently dark lucid brown with paler veins imbedded in the tissue, glabrous to puberulent; achenes pale gray to black, obovate to pyriform, 1.5-1.8 mm. long, plano-convex to lenticular, slightly apiculate at the apex, often narrowed at the base to a minute purplish annulus, the surface marked by horizontal deeply-pitted quadrangular cells; style bifid, flat, densely fimbriate above, the branches long (1.5-2 mm.); stamens 2 or 3, the anthers dark brown, subulate, 1.5-2 mm. long.

TYPE LOCALITY: "In Jamaicae fluviiis."

DISTRIBUTION: Salt marshes along the coast: New York to Florida and Texas; in the interior northward to Ontario, Michigan, Illinois, Nebraska, and the hot springs of California and Nevada; tropical America.

ILLUSTRATIONS: *pl. 1, f. 3*; Sloane, Hist. Jam. *pl. 76* ("Gramen cyperoides majus . . ."); Britt. & Brown, Ill. Fl. ed. 2. 1: 320. *f. 784, 785*; A. Gray, Man. ed. 7. 186. *f. 269, 270*; Clarke, Ill. Cyp. *pl. 49, f. 7, 8*; Abrams, Ill. Fl. Pacif. St. 1: 268. *f. 641*; Field Mus. Publ. Bot. 2: 115; 3: 81; Rep. N. J. Mus. 1910: *pl. 17, f. 1*; Britton, Fl. Bermuda 49. *f. 73*; Jepson, Man. Fl. Pl. Calif. 151. *f. 141*; Rhodora 37: *pl. 388*; Anal. Mus. Nac. Buenos Aires 34: 436.

NOTE: The spikelets were described by Linnaeus as "*oblongis*" and by Sloane as "*oblongo-rotundis spadiceis*" (i.e. clear brown). There are some who will see many species in the variants cited above in synonymy, but in all the achenes appear to be identical. Such variants, based upon vegetative characteristics, are as follows:

Scales shiny	Scales dull	Scales pubescent
	Spikelets elongate	
<i>Scirpus spadicus</i>	<i>F. multistriata</i>	<i>Scirpus carolinianus</i>
<i>F. cylindrica</i>	<i>F. interior</i>	<i>F. puberula</i>
<i>Scirpus domingensis</i>	<i>F. anomala</i>	
<i>F. speciosa</i>		
	Spikelets short	
<i>F. castanea</i>		<i>F. puberula</i> f. <i>eucycla</i>
	Leaves broad and flat	
<i>F. inaguensis</i>	<i>F. Harperi</i>	

2. *Fimbristylis ferruginea* (L.) Vahl, Enum. 2: 291. 1805.

Scirpus ferrugineus L. Sp. Pl. 50. 1753.

Scirpus debilis Lam. Tab. Encyc. 1: 141. 1791, fide Vahl, Enum. 2: 292 (1805). Not *S. debilis* Pursh, 1814.

Scirpus bonariensis Poir. in Lam. Encyc. 6: 763. 1804. (Argentina.)

Scirpus ferrugineus β Poir. in Lam. Encyc. 6: 780. 1804. (Jamaica.)

Isolepis ferruginea Schlecht. & Cham. Linnaea 6: 27. 1831.

Fimbristylis sublateralis Steud. Syn. Cyp. 114. 1855. (Guatemala.)

Fimbristylis ferruginea var. *compacta* Kükenth. Repert. Sp. Nov. 23: 196. 1926. (Cuba.)

Perennial; culms clustered, filiform to 2 mm. wide with thickened bases; leaves much shorter than the culm, frequently lacking, the sheaths pale brown to ferrugineous; rays of the umbel usually short (0.5–2 cm. long), forming a compact cluster; spikelets commonly 5–10, rarely solitary, ovoid-oblong, 8–20 mm. long; scales ovate, acute or slightly mucronulate, chestnut-brown, dull, puberulent toward the apex; achenes obovate, lenticular, 1.5 mm. long, slightly apiculate, dull yellow, opaque, narrowed at the base, the surface lightly reticulate with minute isodiametric cells, the base with a brown stipe jointed above the insertion of the filaments; style bifid, flattened and prominently fimbriate, scarcely enlarged at the base, the branches very short; stamens 3, the anthers 1.0–1.5 mm. long.

TYPE LOCALITY: "In Jamaicae paludibus maritimis."

DISTRIBUTION: Cuba, Bahama Islands, and southward in the West Indies; Yucatan; tropical South America; tropics of the Old World.

ILLUSTRATIONS: *pl. 1, f. 4*; Sloane, Hist. Jam. *pl. 77, f. 2*; Field Mus. Publ. Bot. 2: 115; 3: 80; Clarke, Ill. Cyp. *pl. 42, f. 9, 10*.

NOTE: For Old World illustrations see *Index londinensis*.

3. *Fimbristylis dichotoma* (L.) Vahl, Enum. 2: 287. 1805.

Scirpus dichotomus L. Sp. Pl. 50. 1753.

Scirpus annuus All. Fl. Ped. 2: 277. 1785. (Italy.)

Scirpus diphyllus Retz. Obs. 5: 15. 1789. (India.)

Fimbristylis serratulum Vahl, Enum. 2: 285. 1805. (South America.)

Fimbristylis hirtellum Vahl, Enum. 2: 286. 1805. (South America.)

Fimbristylis glaucum Vahl, Enum. 2: 288. 1805. (India.)

Fimbristylis tomentosum Vahl, Enum. 2: 290. 1805. (India.)

Fimbristylis laxum Vahl, Enum. 2: 292. 1805. (South America.)

Scirpus sulcatus Ell. Bot. S. C. & Ga. 1: 86. 1816. [Savannah, Georgia (*Baldwin*).] Not *S. sulcatus* Petit-Thouars, 1811.

Fimbristylis annua R. & S. Syst. 2: 95. 1817.

Scirpus pubescens Link, Jahrb. Gewächsk. 1³: 80. 1820. [*Willdenow 1269*; lapsus calami for *Scirpus pallescens*.]

Scirpus nitidulus Link, Jahrb. Gewächsk. 1³: 81. 1820. [*Willdenow 1273*, South America (*Humboldt*).]

Scirpus fuscescens Link, Jahrb. Gewächsk. 1³: 81. 1820. [*Willdenow 1270* from the Orinoco (*Humboldt*).]

Scirpus Baldwinianus Schultes in R. & S. Syst. Veg. Mant. 2: 85. 1824.

Scirpus Elliottii Spreng. Syst. 4²: 28. 1827.

Fimbristylis Humboldtii Presl, Rel. Haenk. 1: 190. 1828.

Fimbristylis verrucosa Presl, Rel. Haenk. 1: 190. 1828.

Fimbristylis Baldwiniana Torr. Ann. Lyc. N. Y. 3: 344. 1836.

Scirpus depauperatus Muhl.; Kunth, Enum. Pl. 2: 233, as syn. 1837. (*Willdenow 1222* from Pennsylvania.)

Fimbristylis brizoides Nees & Meyen; Nees in Mart. Fl. Bras. 2¹: 74. 1842.

? *Fimbristylis sublateralis* Steud. Syn. Cyp. 114. 1855, e descr. (Guatemala.)

Fimbristylis polymorpha Böck. Linnaea 37: 14. 1871.

Fimbristylis diphylla var. *pluristriata* Clarke in Hook. f. Fl. Brit. Ind. 6: 637. 1893. (India.)

Fimbristylis alamosana Fernald, Proc. Am. Acad. 36: 491. 1901. (Mexico.)

Fimbristylis Holwayana Fernald, Proc. Am. Acad. 36: 492. 1901. (Mexico.)

Fimbristylis ophiticola Britton, Mem. Torrey Club 16: 60. 1920. (Camaguary, Cuba.)

- Fimbristylis annua* var. *diphylla* Kükenth. Repert. Sp. Nov. 23: 196. 1926.
Fimbristylis annua f. *brizoides* Kükenth. Repert. Sp. Nov. 23: 196. 1926.
Fimbristylis annua f. *tomentosa* Kükenth. Repert. Sp. Nov. 23: 196. 1926.
Fimbristylis annua f. *oblonga* Kükenth. Repert. Sp. Nov. 23: 196. 1926. (Cuba.)
Fimbristylis darlingtoniana Pennell, Bartonian 15: 30. 1933. (Pennsylvania.)
Fimbristylis dichotoma f. *annua* Ohwi, Jour. Jap. Bot. 14: 577. 1938.
Fimbristylis dichotoma f. *tomentosa* Ohwi, Jour. Jap. Bot. 14: 578. 1938.
Fimbristylis diphylla var. *tomentosa* Barros, Anal. Mus. Argent. Ci. Nat. 41: 328. 1945.

Annual or perennial; culms glabrous to pubescent, slender, 0.5–7 dm. high; leaves linear, flat, 1–3 mm. wide, frequently denticulate at the apex, often glaucous or pubescent, shorter than the culms, the involucre leaves 2–4, not elongate; umbel simple or compound, loose, with slender rays; spikelets oblong to ovoid, acute, 5–10 mm. long; scales ovate, acute; achene obovate, lenticular, 1.0 mm. long, white to pale buff (rarely brown), with about ten rows of horizontally elongated cells on each face and about ten longitudinal ribs formed by the cell margins, the surface also frequently verrucose; style prominently flattened with slightly enlarged base, bifid, fimbriate below the bifurcation and sometimes to the base; stamens 2, or frequently 1.

TYPE LOCALITY: India.

DISTRIBUTION: Pennsylvania to Florida and Texas; north in the flat country to Illinois and Missouri; tropical and warm regions of the Old and New Worlds.

ILLUSTRATIONS: *pl. 1, f. 1*; All. Fl. Ped. *pl. 88, f. 5*; Field Mus. Publ. Bot. 3: 81 (as *F. lava*); Clarke, Ill. Cyp. *pl. 42, f. 1–4*; Britt. & Brown, Ill. Fl. ed. 2: 1: 321. *f. 787*; A. Gray, Man. ed. 7. 187. *f. 271*; Rhodora 37: *pl. 389* (as *F. Baldwiniana*); Anal. Mus. Argent. Ci. Nat. 41: 327.

NOTE: This is one of the most widely distributed plants in the world; Clarke estimates at least 400 synonyms. The synonymy given above relates primarily to New World plants; for those of the Old World, see Clarke in Hook. f. Fl. Brit. Ind. 6: 636 (1893). For further varieties see Cherm. Arch. Bot. [Caen] 47: 31 (1931). The species is frequently perennial in the tropics.

4. *Fimbristylis schoenoides* Vahl, Enum. 2: 286. 1805.

- Scirpus schoenoides* Retz. Obs. 5: 14. 1789.
Fimbristylis inconstans Steud. Syn. Cyp. 107. 1855, fide Clarke. (America.)

Perennial; culms glabrous, to 4 dm. high; leaf-blades involute, attenuate from the slightly dilated bases; bracts of the involucre inconspicuous; spikelets solitary and sessile, or with 1 or 2 additional peduncled spikelets, ovoid, 5–12 mm. long; scales broadly ovate-orbicular, 3 mm. long, stramineous to dark brown, mucronate, many-nerved, glabrous; achenes obovate, lenticular, 1.5 mm. long, 1 mm. wide, stramineous to brown, punctulate-reticulate with small isodiametric cells, prominently stipitate at the base; style moderately bulbiform at the base, flattened, fimbriate at and below the 2 style-branches; stamens 3.

TYPE LOCALITY: India.

DISTRIBUTION: Florida; southeastern Asia; Australia.

ILLUSTRATIONS: *pl. 1, f. 7*; Small, Man. SE. Fl. 156.

NOTE: An Old World species sparingly introduced in America. For synonymy see Clarke in Hook. f. Fl. Brit. Ind. 6: 634 (1893).

5. *Fimbristylis squarrosa* Vahl, Enum. 2: 289. 1805.

- Isolepis hirta* H.B.K. Nov. Gen. & Sp. 1: 224. 1816. (Aragua, Venezuela.)
Fimbristylis hirta R. & S. Syst. Veg. 2: 99. 1817.
Pogonostylis squarrosus Bertol. Fl. Ital. 1: 313. 1834.
Fimbristylis comata Nees in Wight, Contr. Bot. India 102. 1834.

Annual; culms striate, 2–4 dm. high, pubescent or glabrous; leaves basal, very narrow, flat, usually pubescent, shorter than the culms; bracts of the inflorescence shorter than or equaling the rays; inflorescence umbellate, with 1–6 unequal, slender rays 2–3 cm. long; spikelets oblong, many-flowered, usually solitary on the divaricate rays, the central spikelet sessile; scales ovate, brown, strongly mucronate with recurved tips, hispid, especially on the greenish midrib; achene lenticular, glistening brown when mature, obovate, 0.7 mm. long, 0.5 mm. wide, often with coarse horizontal reticulation; style somewhat flattened, 0.7 mm. long, fimbriate at the junction of the 2 short style-branches, the bulbous base fringed by long, recurved hairs nearly the length of the achene; stamen 1, the anther 0.3 mm. long.

TYPE LOCALITY: South America (?), "e collect. Amer. Loefling ded. Dr. Ortega."

DISTRIBUTION: Cuba (*C. Wright s. n.*); South America; India.

ILLUSTRATIONS: Clarke, Ill. Cyp. *pl. 41, f. 8–10*; Anal. Mus. Argent. Ci. Nat. 41: 325.

6. *Fimbristylis VahlII* (Lam.) Link, Hort. Berol. 1: 287. 1827.

- Scirpus VahlII* ("Vhalii") Lam. Tab. Encyc. 1: 139. 1791.
Isolepis VahlII H.B.K. Nov. Gen. & Sp. 1: 221. 1816.
Fimbristylis congesta Torr. Ann. Lyc. N. Y. 3: 345. 1836. (New Orleans, Drummond.)
Fimbristylis Vincentii Steud. Syn. Cyp. 109. 1855. (Texas.)
Scirpus apus A. Gray, Proc. Am. Acad. 10: 78. 1874. (California, Bolander.)
Fimbristylis apus S. Wats. Bot. Calif. 2: 224. 1880.
Fimbristylis perpusilla Harper; Small, Fl. SE. U. S. 188. 1903. (Georgia.)

Cespitose annual with capillary culms 1-15 cm. high, or with spikelets frequently sessile at the base; leaves filiform, rough, channeled or somewhat flattened, nearly equaling the culms; involucre bracts filiform, much exceeding the capitate clusters of 3-8 spikelets; spikelets oblong-cylindric, obtuse, 4-8 mm. long, many-flowered; scales oblong-lanceolate, acuminate, green to dull brown, with prominent midrib; achene obovate, 0.4 mm. long, stramineous, translucent, prominently reticulate with horizontally elongated cells; style very slender, 0.8 mm. long, not fimbriate below the short bifurcation, bulbous at the base; stamen 1, the anther 0.2 mm. long.

TYPE LOCALITY: "*Habitat in America meridionali, nec in Hispania*" (Vahl, Enum. 2: 263).

DISTRIBUTION: In moist soil, chiefly river banks: North Carolina to Florida, west to Texas and Missouri; California; Nicaragua (*C. Wright*); South America.

ILLUSTRATIONS: *pl. 1, f. 6*; Britt. & Brown, Ill. Fl. ed. 2. 1: 321. *f. 788*; Clarke, Ill. Cyp. *pl. 42, f. 11-13*; Abrams, Ill. Fl. Pacif. St. 1: 267. *f. 640*; Jepson, Man. Fl. Pl. Calif. 150. *f. 140*; Anal. Mus. Argent. Ci. Nat. 41: 333.

NOTE: *F. perpusilla* was based on very dwarf, immature material, with aberrantly elongate achenes close to those of *Harper 118* from Eutaw, Alabama. I believe these specimens to be *F. VahlII*.

7. *Fimbristylis spathacea* Roth, Nov. Pl. Sp. 24. 1821.

- Scirpus glomeratus* Retz. Obs. 4: 11. 1786. (India.) Not *S. glomeratus* L. 1753.
 ? *Scirpus obtusifolius* Lam. Tab. Encyc. 1: 141. 1791. (India.)
Scirpus obtusifolius Vahl, Enum. 2: 275. 1805.
 ? *Isolepis obtusifolia* Beauv. Fl. Oware 2: 38. 1812.
Fimbristylis obtusifolia Kunth, Enum. Pl. 2: 240. 1837.
Scirpus obtusifolius Griseb. Fl. Brit. W. Ind. 571. 1864. Probably not *S. obtusifolius* Lam. 1791.
Fimbristylis Sintenisii Böck. Bot. Jahrb. 7: 276. 1886. (Puerto Rico.)
Fimbristylis glomerata Urban, Symb. Ant. 2: 166. 1900. (Brazil.) Not *F. glomerata* Nees, 1834.
Fimbristylis melanospora Fernald, Proc. Am. Acad. 36: 491. 1901. (Mexico.)

Perennial; culms tufted, stiff, erect, subterete, 1-1.5 mm. wide, 1-4 dm. high; leaves flat, much shorter than the culm, concave, 1-3 mm. wide, green to dull brown, the apex blunt to mucronate; involucre usually shorter than the small, dense, compound umbel; spikelets ellipsoid to short-cylindric, 3-6 mm. long; scales ovate, light to dark brown, 1.5 mm. long, broadly keeled with a flattened hyaline margin; achenes lenticular, obovate, 0.8 mm. long, yellow, becoming purplish-black at maturity, the rugose surface minutely reticulate; style 0.5 mm. long below the bifurcation, scarcely flattened and not at all fimbriate; stamens 1 or 2, the anthers 0.6 mm. long.

TYPE LOCALITY: India.

DISTRIBUTION: Moist or wet soil at low elevations: West Indies; Mexico; Central America; South America; Old World tropics.

ILLUSTRATIONS: *pl. 1, f. 5*; Beauv. Pl. Oware *pl. 81*.

NOTE: For further synonymy of the Old World plants, see Clarke in Hook. f. Fl. Brit. Ind. 6: 640 (1893).

Sect. 2: *Trichelostylis* Benth. in Benth. & Hook. Gen. Pl. 3: 1049. 1883. Style-branches 3; achenes trigonous; style not fringed below the branches.

Spikelets linear to linear-oblong.

Culms not conspicuously flattened; achenes 0.5 mm. long, translucent.

Culms conspicuously flattened; achenes 0.8-0.9 mm. long, opaque.

Spikelets globose or subglobose.

8. *F. autumnalis*.

9. *F. complanata*.

10. *F. miliacea*.

8. *Fimbristylis autumnalis* (L.) R. & S. Syst. 2: 97. 1817.

- Scirpus autumnalis* L. Mant. 180. 1771. (Virginia.)
Scirpus mucronulatus Michx. Fl. Bor.-Am. 1: 31. 1803. (Carolina mountains.)
Scirpus Michauxii Pers. Syn. Pl. 1: 68. 1805. (Renaming of *Scirpus mucronulatus* Michx.)

Trichelostylis geminata Nees, *Linnaea* 9: 290. 1834 (nomen nudum); Lindl. & Nees; Nees in Mart. Fl. Bras. 2¹: 79. 1842.

Trichelostylis mucronulatus Torr. Ann. Lyc. N. Y. 3: 355. 1836.

Fimbristylis Frankii Steud. Syn. Cyp. 111. 1855. (Ohio.)

? *Fimbristylis microstachya* Steud. Syn. Cyp. 113. 1855. (Brazil, Pohl.)

Fimbristylis autumnalis β *gracilis* Böck. *Linnaea* 37: 39. 1871.

Trichelostylis borealis Wood, Bot. & Fl. ed. 1871. 364. 1871. (Illinois, J. Wolf.)

Fimbristylis Frankii var. *brachyactis* Fernald, *Rhodora* 11: 180. 1909. (Maine.)

Fimbristylis autumnalis f. *brachyactis* Blake, *Rhodora* 20: 25. 1918.

? *Fimbristylis autumnalis* var. *gracilis* Kükenth. Repert. Sp. Nov. 23: 196. 1926. (*Willdenowia* 1226, from the Orinoco.)

Fimbristylis autumnalis var. *mucronulata* Fernald, *Rhodora* 37: 398. 1935.

Cespitose glabrous annual; culms 1-4 dm. high, narrow, 0.5-1.0 mm. wide, diffuse or erect; leaves flat, 0.5-2.5 mm. wide; the bracts usually shorter than the decomposed to nearly simple umbel; spikelets ovoid to narrowly cylindrical, sessile or peduncled; scales ovate-lanceolate, appressed, dull brown with a greenish keel, mucronate; achenes obovate, 0.5 mm. long, the angles often costulate, translucent buff, smooth to faintly reticulate with horizontal cells (frequently verrucose at the base, sometimes throughout); style terete, not fimbriate, bulbous at the base, 1.0 mm. long below the 3 branches; stamens 1 or 2, the anthers 0.3 mm. long.

TYPE LOCALITY: Virginia (*Clayton*).

DISTRIBUTION: Maine, west to Ontario and Minnesota, south to Florida, Oklahoma, and Texas; British Honduras (*Schipp* 903, *Gentle* 1961); Cuba.

ILLUSTRATIONS: *pl. 1, f. 2*; A. Gray, Man. ed. 5. *pl. 3, Fimbristylis f. 6-9*; ed. 7. 187. *f. 273, 274*; Britt. & Brown, Ill. Fl. ed. 2. 1: 322. *f. 789, 790*; Rep. N. J. Mus. 1910: *pl. 17, f. 2*; Anal. Mus. Argent. Ci. Nat. 41: 335.

NOTE: Vahl, depending on Rottböll's figure (which is *Cyperus Haspan*), confused the identity of *Scirpus autumnalis*, leading to misinterpretation by Torrey and others.

9. *Fimbristylis complanata* (Retz.) Link, Hort. Berol.

1: 292. 1827.

Scirpus complanatus Retz. Obs. 5: 14. 1789.

Cyperus complanatus Willd. Sp. Pl. 1: 270. 1797.

Cyperus amentaceus Rudge, Pl. Guian. 16. 1805, fide Kükenthal, Pflanzenreich 4⁹⁰: 629. 1936. (French Guiana.)

Scirpus anceps Willd. Ges. Nat. Freunde Berlin Mag. 2: 288. 1808. (Java.) Not *S. anceps* Poir. 1804.

Isolepis Willdenowii R. & S. Syst. 2: 120. 1817.

Trichelostylis complanata Nees in Wight, Contr. Bot. India 103. 1834.

Trichelostylis Rudgeana Nees in Mart. Fl. Bras. 2¹: 79. 1842.

Fimbristylis obscura Fernald, Proc. Am. Acad. 36: 492. 1901.

Fimbristylis autumnalis var. *complanata* Barros, Anal. Mus. Argent. Ci. Nat. 41: 334. 1945.

Glabrous cespitose annual; culms flattened, 1-3 mm. wide, 2-6 dm. high; leaves 2-6 mm. wide, shorter than the culms, the involucre bracts usually 2 and shorter than the inflorescence; umbel compound or decomposed, the linear or linear-oblong spikelets 5-10 mm. long, sessile or on capillary peduncles; scales brown, ovate to lanceolate, with a short mucro; achenes trigonous, white to buff, opaque, 0.8-0.9 mm. long, usually with horizontally elongated reticulation, frequently verrucose; style terete, not fimbriate, bulbous at the base, 1.0 mm. long below the 3 branches; stamens 2.

TYPE LOCALITY: India.

DISTRIBUTION: Mexico; British Honduras (*Schipp* 904); abundant from Cuba southward in the West Indies; tropical South America; Old World tropics.

ILLUSTRATIONS: Ges. Nat. Freunde Berlin Mag. 2: *pl. 8, f. 2*; Rudge, Pl. Guian. *pl. 19*; Koorders, Excursionsfl. Java 4: 106. *f. 260*.

NOTE: For further synonymy and varieties of Old World plants see Clarke in Hook. f. Fl. Brit. Ind. 6: 646 (1893). Perhaps best treated as a broad-culmed tropical variant of *F. autumnalis*.

10. *Fimbristylis miliacea* (L.) Vahl, Enum. 2: 287. 1805.

Scirpus miliaceus L. Syst. Nat. ed. 10. 868. 1759.

Isolepis miliacea Presl, Rel. Haenk. 1: 188. 1828.

Trichelostylis miliacea Nees in Wight, Contr. Bot. Ind. 104. 1845.

Annual with fibrous roots; culms weak, 2-7 dm. long, angled above; leaves soft, 1-3 mm. wide, with loose sheaths; involucre bracts filiform, shorter than the decomposed umbellate

inflorescence; spikelets globose or subglobose, 2-4 mm. long, many-flowered; scales brown, ovate, obtuse, convex, tipped by a short mucro; achenes obscurely trigonous, narrowly obovate, 0.5-0.6 mm. long, pale buff, opaque, often pearly, with about 4 longitudinal rows of trabeculae on each face, slightly stipitate and frequently verrucose; style bulbous at the base, fimbriate at the base of the 3 branches but smooth below; stamens 1 or 2, the anthers 0.2-0.3 mm. long.

TYPE LOCALITY: India.

DISTRIBUTION: Pennsylvania (on ballast), Florida, Arkansas, California; Mexico; Central America; West Indies, from Cuba southward; South America; tropics of the Old World.

ILLUSTRATIONS: Rotth. Descr. & Ic. *pl.* 5, *f.* 2; Abrams, Ill. Fl. Pacif. St. 1: 268. *f.* 642.

NOTE: For further synonymy see Clarke in Hook. f. Fl. Brit. Ind. 6: 644 (1893).

8. ABILDGAARDIA Vahl, Enum. 2: 296. 1805.

Fimbristylis of authors.

Glabrous perennials, with slender culms, narrow setaceous basal leaves, flattened, usually solitary spikelets, and an involucre of 1 bract. Scales imbricated in two rows, keeled and deciduous. Bristles none. Stamens 1-3. Style pubescent, deciduous, with a somewhat swollen base. Achenes trigonous.

About 15 species, chiefly in the Old World tropics. Differs from *Bulbostylis* in the glabrous, distichous scales, and the stalked, tuberculate achenes with isodiametric cells.

Type species, *Cyperus monostachyos* L.

1. *Abildaardia monostachya* (L.) Vahl, Enum. 2: 296: 1805.

Cyperus monostachyos L. Mant. 180. 1771.

Fimbristylis monostachya Hassk. Pl. Jav. Rar. 61. 1848.

Culms slender, tufted, 2-4 dm. high; leaves setaceous, 0.5 mm. wide, half as high as the culms; involucre shorter than the spikelet; spikelet ovate-lanceolate, 1-1.5 cm. long, many-flowered, the lower scales readily deciduous; scales greenish-white, strongly keeled; style with 3 short branches; achenes 2-2.5 mm. long, yellowish-white, verrucose, prominently stalked.

TYPE LOCALITY: India.

DISTRIBUTION: Wet grassy places: Florida and Mexico to Argentina; Old World tropics.

ILLUSTRATIONS: Rotth. Descr. & Ic. *pl.* 13, *f.* 3; Anal. Mus. Argent. Ci. Nat. 41: 337; Ann. Missouri Bot. Gard. 30: 300.

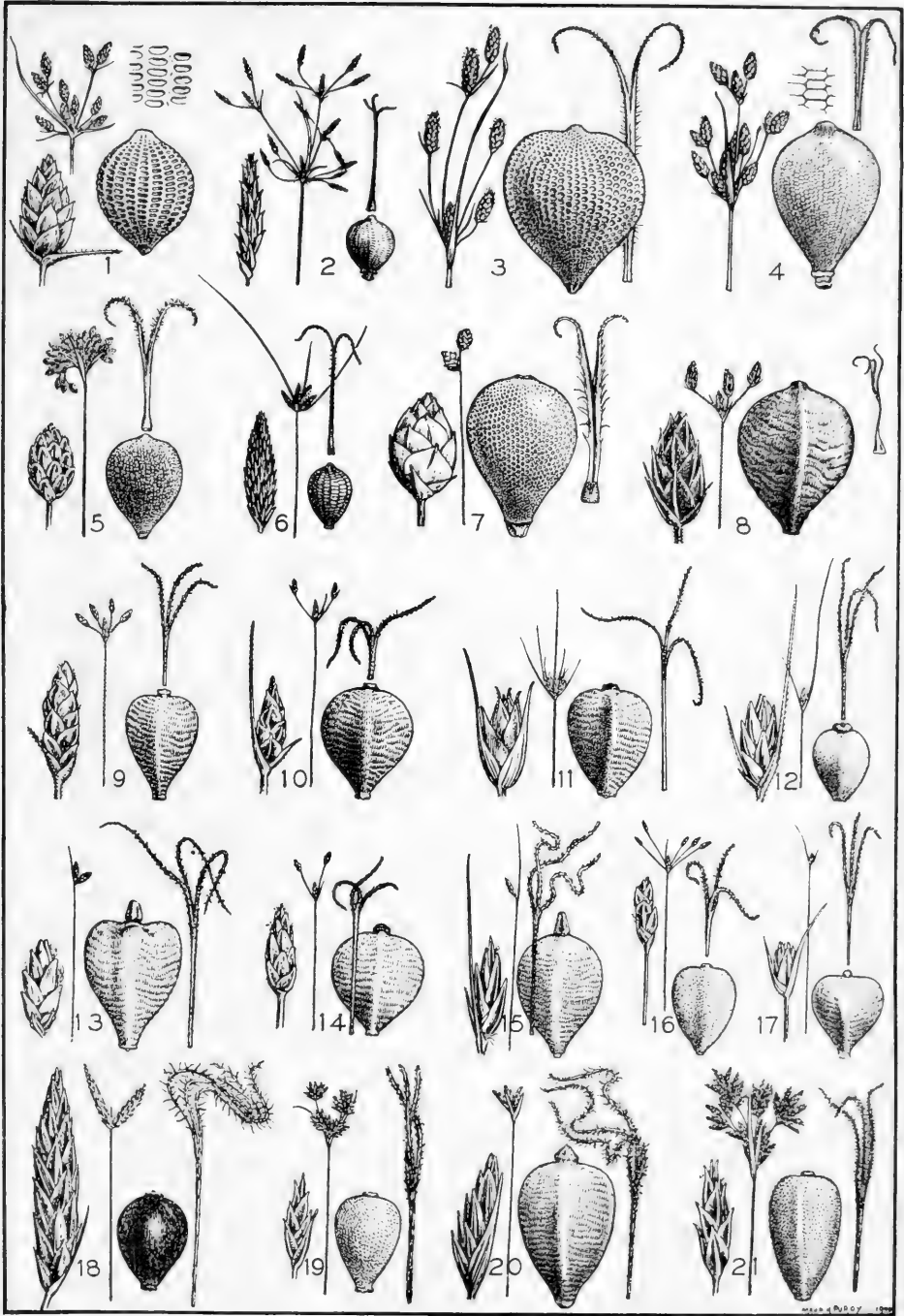
PLATE 1

Figs. 1-7. *Fimbristylis*. Figs. 8-21. *Bulbostylis*.

Fig. 1. *Fimbristylis dichotoma*; Britton, Britton & Gager 7311, Cuba. Fig. 2. *F. autumnalis*; Morong, Aug. 2, 1873. Fig. 3. *F. spadicea*; Curtiss 4093, Jacksonville, Florida. Fig. 4. *F. ferruginea*; Curtiss 322, Isle of Pines. Fig. 5. *F. spathacea*; Shafer 136, Batabano, Cuba. Fig. 6. *F. Vahlü*; Ferris & Duncan 3119, Texas. Fig. 7. *F. schoenoides*; Curtiss 6912, Florida. Fig. 8. *Bulbostylis hirta*; Britton & Wilson 15441, Cuba. Fig. 9. *B. juncoidea* var. *amplexans*; Mueller 1966, Orizaba, Mexico. Fig. 10. *B. tenuifolia*; Britton, Britton, Earl & Gager 6379, Pinar del Río, Cuba. Fig. 11. *B. stenophylla*; R. M. Harper 1489, Charlton County, Georgia. Fig. 12. *B. curassavica*; Eyerdam 92, Haiti. Fig. 13. *B. setacea*; Regnell III, 2822 (coll. Ekman), Cuba. Fig. 14. *B. capillaris*; Biltmore herb. 446b, Biltmore, North Carolina. Fig. 15. *B. pauciflora*; Raunkiaer, 1906, St. Croix. Fig. 16. *B. ciliatifolia*; Curtiss 5711, Florida. Fig. 17. *B. Schaffneri*; Schaffner 202, Mexico. Fig. 18. *B. floccosa*; Ekman 4006, Haiti. Fig. 19. *B. junciformis*; Calderón 1053, El Salvador. Fig. 20. *B. subaphylla*; Ekman 13606, Santo Domingo. Fig. 21. *B. papillosa*; Harris 12423, St. Andrew, Jamaica.

Spikelets $\times 2.5$; achenes and styles $\times 15$ except *Fimbristylis spadicea*, *F. ferruginea*, *F. schoenoides*, and *Bulbostylis hirta*, in which, because of their large size, the styles are $\times 6$.

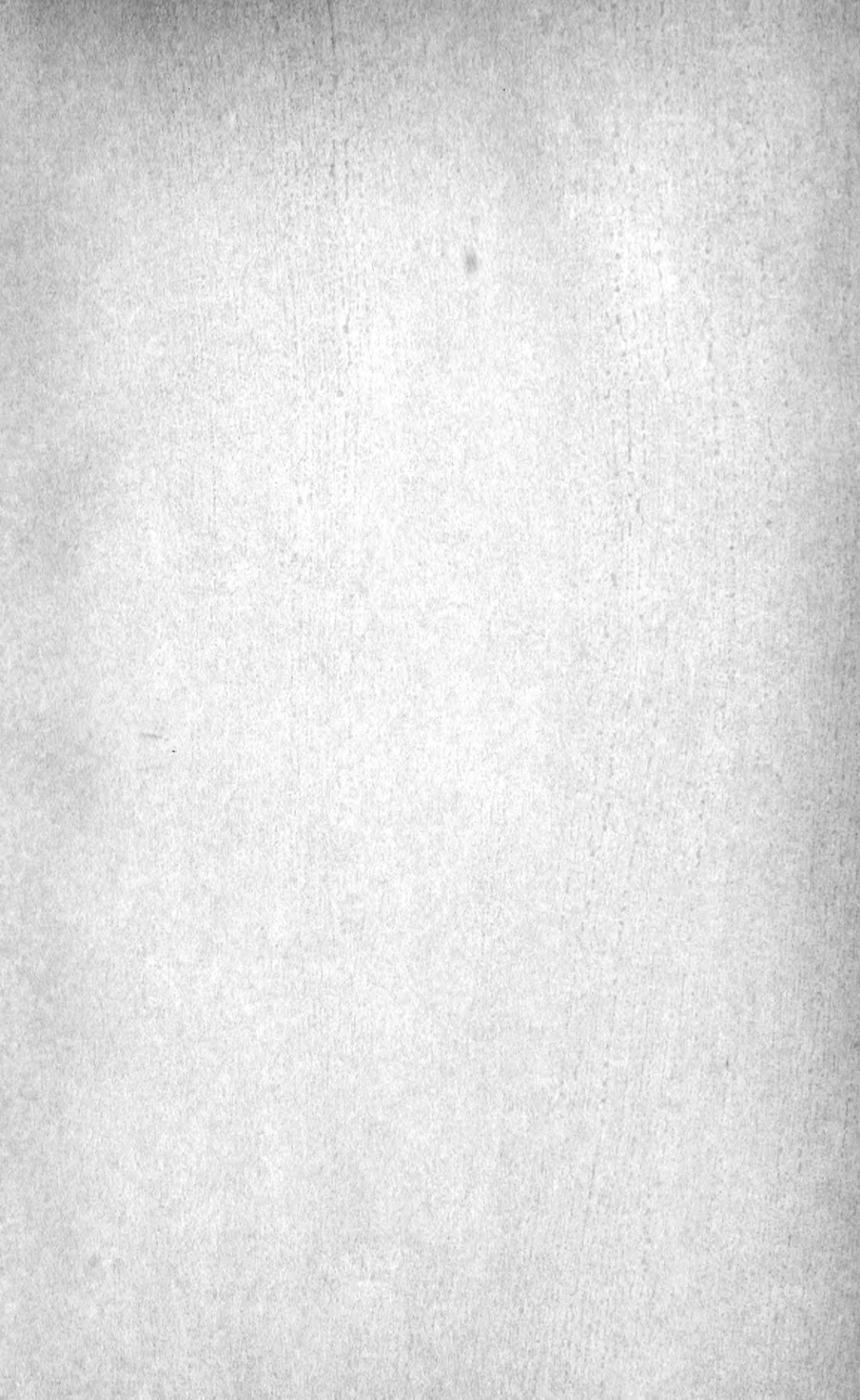
Note: the achene of Fig. 10 is larger than in typical specimens.

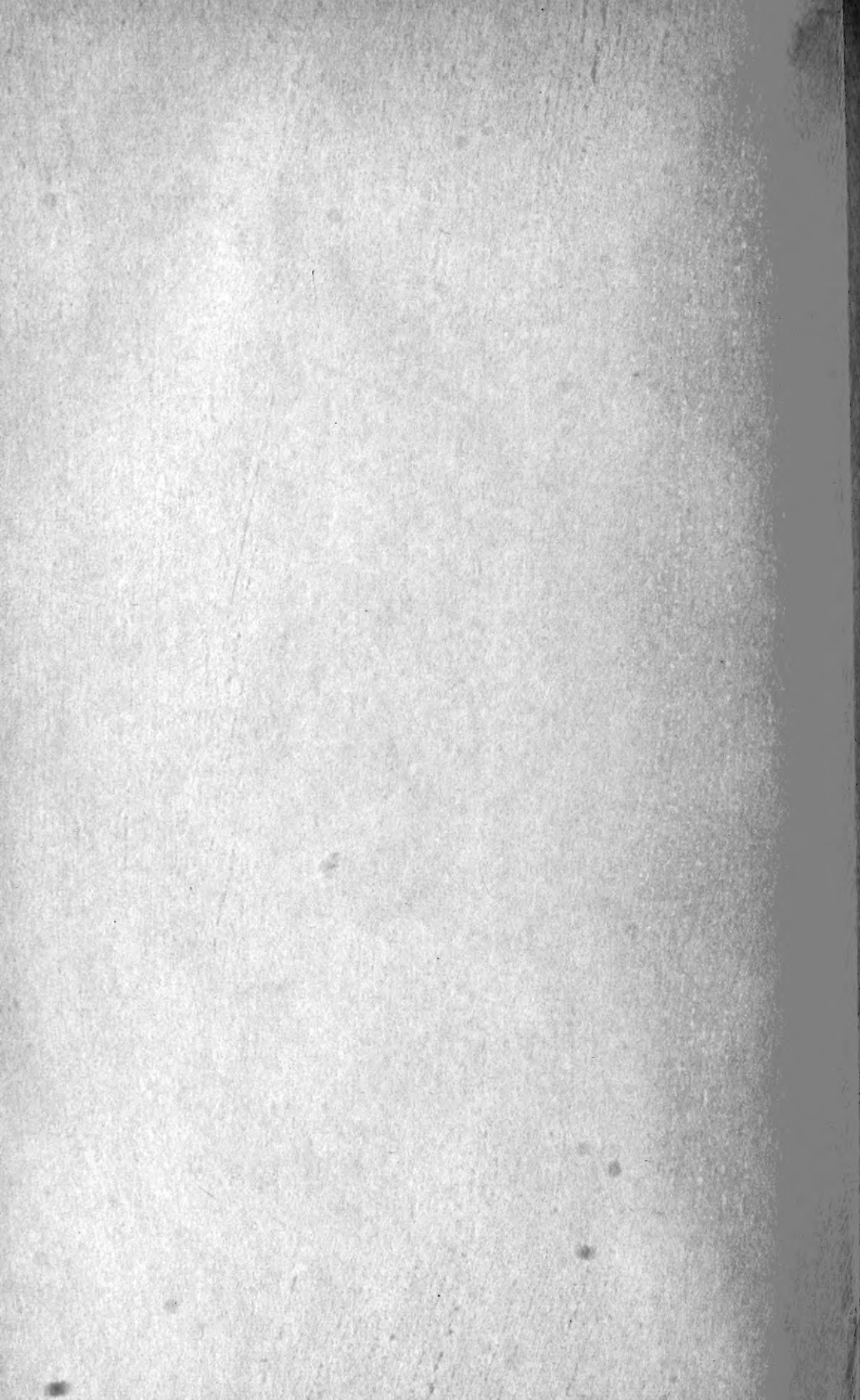


FIMBRISTYLIS AND BULBOSTYLIS









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