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NORTH AMERICAN FLORA

(POALES)

(CYPERACEAE)

CARICEAE (continuatio)

KENNETH KENT MACKENZIE



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51. *Carex cephaloidea* Dewey, Rep. Pl. Mass. 262. 1840.

Carex muricata var. *cephaloidea* Dewey, Am. Jour. Sci. 11: 308. 1826. (Type from western Massachusetts.)

Carex cephalophora var. β Torr. Ann. Lyc. N. Y. 3: 389. 1836. (Based on *C. muricata* var. *cephaloidea* Dewey.)

Carex sparganioides var. *cephaloidea* Carey, in A. Gray, Man. 542. 1848. (Based on *C. cephaloidea* Dewey.)

Carex sparganioides var. *minor* Boott, Ill. Carex 123, pl. 394, f. 2. 1862. (Based on *C. muricata* var. *cephaloidea* Dewey.)

"*Carex cephalophora* Muhl." Böck. Linnaea 39: 61, in part. 1875.

Rootstocks stout, conspicuously short-creeping, brownish-black, fibrillose; culms erect but rather weak, usually 3-5 dm. high, sharply triangular, the lower portion covered by the overlapping sheaths, the upper half strongly serrulate on the angles, shorter than or exceeding the leaves, light-brownish-tinged at base; lower leaves with short blades, the upper 3-6 with ascending, deep-green, thin, weak, flat blades 2.5-3.5 dm. long and 3-7 mm. wide, glabrous, but roughened on the margins and towards the apex, the sheaths loose, conspicuously green-and-white-mottled dorsally and septate-nodulose, whitened, fragile and easily broken ventrally, the lowest only transversely rugulose, truncate and not thickened nor reddish-brown-tinged at mouth, not exceeding base of blade, the ligule longer than wide, slightly dark-margined; spikes 5-10, densely aggregated in a solitary terminal head 1.5-4 cm. long, 8-10 mm. thick, the lower 3-5 distinguishable, and sometimes slightly separate, the few inconspicuous staminate flowers terminal and the usually numerous spreading or slightly ascending perigynia basal; bracts scale-like or short and bristle-form; scales ovate, small, thin, greenish-hyaline with green midrib, acute or acutish or obtusish, narrower than and half the length of the bodies of the perigynia; perigynia plano-convex, ovate, sharp-edged to base and serrulate to middle, deep-green, 3.5-4 mm. long, 1.75-2.25 mm. wide, membranaceous, flat ventrally, substipitate, rounded at base, nerveless ventrally and obscurely few-nerved dorsally, tapering into a serrulate beak about one third the length of the body, bidentate, the teeth sharp, erect, white-hyaline within, the sutures on both sides conspicuous; achenes lenticular, substipitate, minutely apiculate, suborbicular, 1.75 mm. long; style slender, straight, jointed with achene, slightly thickened at base; stigmas two, reddish-brown, rather short, slender.

TYPE LOCALITY (of *Carex muricata* var. *cephaloidea* Dewey, on which *C. cephaloidea* is based): "Common" (i.e., in western Massachusetts, where the author resided).

DISTRIBUTION: Rich woods, in calcareous districts, New Brunswick to Minnesota, and southward to northwestern New Jersey and Illinois. An early-flowering species, maturing several weeks before its allies. (Specimens examined from New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, southwestern Quebec, New York, northwestern New Jersey, northeastern Pennsylvania, southern Ontario, Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota).

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 840; ed. 2. f. 889; Rob. & Fern. Man. f. 402; Boott, Ill. Carex 123, pl. 394, f. 2.

52. *Carex aggregata* Mackenzie, Bull. Torrey Club 37: 246. 1910.

Carex agglomerata Mackenzie, Bull. Torrey Club 33: 442. 1906. (Type from Missouri.) Not *C. agglomerata* C. B. Clarke, 1903.

Rootstocks lignescens but rather slender, conspicuously short-creeping, brownish or blackish, fibrillose, the culms 4-10 dm. high, erect, ascending, or even decumbent, usually considerably exceeding the leaves, sharply triangular, smooth below, slightly rough immediately beneath the head, light-brownish-tinged at base; leaves regularly and evenly distributed on the lower part of the culm and not chiefly tufted near the base, the blades flat, light-green, not stiff, 1-5 dm. long, 3-6 mm. wide, smooth towards the base, roughened towards the apex and on the margins; sheaths conspicuously green-and-white-mottled and septate-nodulose dorsally, whitened but not easily broken ventrally, usually not transversely rugulose, concave, reddish-brown-tinged and thickened at mouth, the ligule wider than long, not dark-margined; spikes 5-10, densely aggregated in a terminal head 2.5-5 cm. long, 10 mm. thick, the lower more or less separate and the upper closely aggregated, the few inconspicuous staminate flowers terminal and the 8-15 ascending or at length spreading perigynia below; bracts awl-shaped, elongate, those of the lower spikes usually conspicuous, much shorter than the head, but frequently rudimentary; scales ovate, small, thin, greenish-hyaline with a green midrib, acuminate to cuspidate, about the length of the bodies of the perigynia, but somewhat nar-

rower; perigynia plano-convex, ovate, sharp-edged to base and serrulate to the middle, deep-green, 3.25-4.5 mm. long, about 2 mm. wide, membranaceous, flat ventrally, sessile, round-truncate at base, nerveless ventrally, obscurely few-nerved dorsally, tapering into a serrulate beak about half the length of the body, bidentate, the teeth sharp, erect, white-hyaline within, the sutures on both sides conspicuous; achenes lenticular, oblong-orbicular, 2 mm. long, very short-stipitate, minutely apiculate; style slender, straight, jointed with achene, slightly thickened at base; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY (of *C. agglomerata* Mackenzie, on which *C. aggregata* is based): Courtney, Jackson County, Missouri (*B. F. Bush 1718*).

DISTRIBUTION: Rich woods in calcareous districts, western New Jersey to District of Columbia, and westward to Kansas and Oklahoma. (Specimens examined from western New Jersey, New York, Pennsylvania, District of Columbia, Ohio, Indiana, Kentucky, Illinois, Iowa, Missouri, Kansas, Oklahoma.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 890.

NOTE: See "Distribution of *Carex aggregata* in the Philadelphia region." Bayard Long, *Torreyana* 16: 131-136. 1916.

53. *Carex sparganioides* Muhl; Willd. Sp. Pl. 4: 237. 1805.

Carex sparganioides var. *lutea* Farwell, Papers Mich. Acad. 1: 91. 1923. (Type from Michigan.)

Cespitose, the rootstocks lignescens, short-elongate, dark, fibrillose, the culms 3-7.5 dm. high, from ascending and weak to strictly erect, the sheaths much overlapping, the culms sharply triangular, narrowly margined, serrulate above, usually exceeding the leaves, brownish-yellow-tinted at base; leaves with well-developed blades 3-6 to a culm, ascending but rather weak, 5-10 mm. wide, 2-4 dm. long, green, flat, strongly minutely serrulate on the margins and usually noticeably roughened on the veins; sheaths loose, conspicuously green-and-white-mottled and septate-nodulose dorsally, white, fragile and easily broken ventrally (the lower transversely rugulose), concave and scarcely thickened at mouth, not exceeding base of blade, the ligule wider than long, conspicuously dark-margined; spikes 6-12, the upper aggregated, the lower separate, in an elongate linear or linear-oblong terminal head 3-9 cm. long, 12 mm. thick or less, all except the upper distinguishable, the lower often considerably separated; staminate flowers apical, inconspicuous, with the 5-50 ascending or spreading perigynia below; bracts bristle-form, short and inconspicuous, often rudimentary; scales ovate, small, thin, greenish-hyaline, the midrib green, obtusish to short-cuspidate, narrower than the perigynia and usually about the length of their bodies, inconspicuous and largely hidden by the perigynia; perigynia plano-convex, ovate, 3 mm. long, 1.75 mm. wide, deep-green or lighter-green or yellowish-green at full maturity, serrulate to middle, submembranaceous, sharp-edged to the base, the nerves on both sides wanting or inconspicuous, the margins somewhat elevated ventrally, substipitate, round-tapering at base, rather abruptly contracted into a serrulate beak shorter than the body, bidentate, the teeth sharp, erect, white-hyaline within, the sutures on both sides conspicuous; achenes lenticular, substipitate, minutely apiculate, suborbicular, 1.5 mm. long; style slender, straight, jointed with achene, slightly thickened at base; stigmas two, short, reddish-brown, slender.

TYPE LOCALITY: "Habitat in Pennsylvania."

DISTRIBUTION: Dry woods and thickets, especially in calcareous districts, New Hampshire and Quebec to South Dakota, and southward to Virginia, Kentucky, and Kansas. (Specimens examined from Quebec, Ontario, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, Ohio, Indiana, Michigan, Wisconsin, Illinois, Minnesota, Iowa, South Dakota, Missouri, Kansas.)

ILLUSTRATIONS: Schkuhr, Riedgr. pl. *LL*, f. 142; Britt. & Brown, Ill. Fl. f. 839; ed. 2. f. 891; Rob. & Fern. Man. f. 401; Boott, Ill. *Carex* 122. pl. 394, f. 1.

13. *Multiflorae* Kunth, Enum. Pl. 2: 387, in part. 1837; Tuckerm. Enum. Caric. 9. 1843; Carey, in A. Gray, Man. 540. 1848; L. H. Bailey, Proc. Am. Acad. 22: 135, in part. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 142. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 122. 1917; Mackenzie, Erythra 8: 28. 1922. PHLEOIDEAE Meish. Acta Hort. Petrop. 18: 281. 1901. ASTROSTACHYAE Holm, Am. Jour. Sci. IV. 16: 454, in part. 1903. ACANTHOPHORAE Holm, Am. Jour. Sci. IV. 16: 454, in part. 1903. Species are referred to the genus *Vigna* Beauv. by Rafinesque (Good Book 27. 1840).

Densely cespitose; culms more or less sharply triangular; sheaths usually transversely

rugulose, and often red-dotted ventrally; spikes very numerous, forming a spicate head, small, androgynous or pistillate, but never gynaeandrous, the lower more or less compound; bracts frequently conspicuous; perigynia low-convex dorsally, flat ventrally, yellowish or yellowish-brown (or in *C. alma* blackish in age), appressed-ascending or somewhat spreading, not thick-walled, somewhat spongy at base, short-stipitate, sharp-margined, nerved dorsally, nerveless or more or less nerved ventrally, closely enveloping achene in upper part, conspicuously beaked, the beak sutured dorsally, serrulate, bidentate; achenes lenticular, apiculate, jointed with the style, the base of the style little to markedly thickened; stigmas 2.

A group represented by some thirteen species in the temperate and warmer parts of North America; by a number of species in Eastern Asia; and by two in South America. It does not occur naturally in Europe, Africa, or Australasia.

Scales strongly white-hyaline-margined.

Perigynia sharp-margined above, submembranaceous, blackish at maturity, ovate or oblong-ovate, rounded-truncate at base.

54. *C. alma*.

Perigynia sharp-margined to base, membranaceous, straw-colored, narrower, round-tapering at base.

55. *C. agrostoides*.

Scales not at all or but little hyaline-margined; perigynia sharp-margined to base, yellowish, tawny, or brownish at maturity.

Perigynia 3-4.5 mm. long; pistillate scales (except lowest) acute or cuspidate; beak of perigynium much shorter than the body.

Scales and perigynia greenish- or slightly yellowish-brown-tinged. (Oklahoma.)

56. *C. fissa*.

Scales and often perigynia strongly brownish- or reddish-brown-tinged.

Ligule conspicuous, as long as wide; scales brownish-tinged; perigynia strongly nerved ventrally, usually appressed-ascending at maturity.

57. *C. densa*.

Ligule very short.

Scales brown; perigynia greenish-straw-colored, obscurely nerved ventrally, appressed-ascending at maturity.

58. *C. autumnalis*.

Scales reddish-brown; perigynia reddish-brown or yellowish-brown-tinged, spreading at maturity.

Perigynia flat and nerveless or nearly so ventrally, the body sparingly serrulate above, tapering into the beak.

59. *C. vicaria*.

Perigynia low-convex and strongly nerved ventrally, the body strongly serrulate above, abruptly contracted into the beak.

60. *C. breviligulata*.

Perigynia 2.25-3.5 mm. long; pistillate scales strongly awned.

Beak of perigynium much shorter than the body; leaves normally shorter than the culm.

Body of perigynium reniform or orbicular, strongly resinous-dotted; perigynia squarrose, usually exceeding awn of scale.

61. *C. triangularis*.

Body of perigynium narrower, little resinous-dotted; perigynia more ascending, little exceeded by awns of scales.

Upper sheaths strongly prolonged upward at mouth; perigynia sharply bidentate, strongly nerved dorsally, green-margined above, 1.7-2.25 mm. wide.

62. *C. annectens*.

Upper sheaths truncate or low-convex at mouth; perigynia bidentulate, usually nerveless or obscurely few-nerved dorsally, little green-margined above, 1.5-1.8 mm. wide.

63. *C. brachyglossa*.

Beak of perigynium about equalling the body.

Leaf-blades normally exceeding culms, very rough, long-tapering; sheaths greenish-white or olive-tinged ventrally; teeth of perigynia subulate-triangular, sharp.

64. *C. vulpinoidea*.

Leaf-blades much shorter than the culms, little roughened, short-tapering; sheaths white ventrally; teeth of perigynia triangular, short.

65. *C. Dudleyi*.

54. *Carex alma* L. H. Bailey, Mem. Torrey Club 1: 50. 1889.

— "*Carex chrysoleuca* Holm" Parish, Bull. So. Calif. Acad. 5: 22. 1906.

— *Carex vitrea* Holm, Am. Jour. Sci. IV. 17: 302, f. 5-7. 1904. (Type from Palm Springs, California.)

— *Carex arizonensis* C. B. Clarke, Kew Bull. Add. Ser. 8: 68, except as to Canadian specimen. 1908. (Type from Arizona.)

Cespitose, the rootstocks short-prolonged, stout, black, fibrillose, the culms 3-12 dm. high, aphyllodipod, sharply triangular with flat sides, roughened above, slender but erect, usually noticeably exceeding the leaves, dark-brown at base; leaves with well-developed blades several to a culm, all towards the base, the blades light-green, thickish, flat or canaliculate, 1-5 (usually 2-3) dm. long, 3-6 mm. wide, the margins strongly serrulate and the

apex rough, the sheaths tight, more or less septate-nodulose dorsally, thin and more or less purplish-dotted ventrally, usually not cross-rugulose, slightly thickened at mouth and prolonged beyond base of blade, the ligule about as long as wide; head compound or decompound, 2.5-20 cm. long, 1-2 cm. thick, the clusters from closely aggregated to strongly separated, the individual spikes hardly recognizable, with the staminate flowers uppermost and forming a short cone and the several spreading-ascending perigynia beneath; a few of the lower bracts present, but short, 2 cm. long or less, with broadly dilated hyaline-margined bases and attenuately prolonged tips; upper bracts scale-like; scales ovate, straw-colored or brownish, with sharply defined midvein, soon white-hyaline-margined, awned to obtusish, about the width of and length of the perigynia; perigynia plano-convex, ovate or oblong-ovate, 3.5-4 mm. long, 1.8 mm. wide, blackish at maturity, short-stipitate, rounded-truncate and somewhat spongy at base, submembranaceous, obscurely striate on both sides, narrowly margined above, serrulate above middle, tapering or contracted into a serrulate beak about one third the length of the body, flat, dorsally cleft, bidentate, the teeth triangular, appressed, very short; achenes lenticular, oval, short-stipitate, apiculate, 1.5 mm. long; style short, slender, jointed with achene, enlarged at base; stigmas two, slender, light-reddish.

TYPE LOCALITY: San Bernardino County, California (Parry & Lemmon 396).

DISTRIBUTION: Along streams in southern California, from Monterey and Tulare counties southward, and eastward to southern Nevada and Arizona. (Specimens examined from southern California, southern Nevada and Arizona.)

ILLUSTRATIONS: Am. Jour. Sci. IV. 17: 303. f. 5-7 (as *C. vitrea*); Erythea 8: 28. f. 8; Jepson, Fl. Calif. 1: 213. f. 30, d-f; Jepson, Man. Fl. Pl. Calif. f. 166; Abrams, Ill. Fl. Pacif. St. f. 695.

55. *Carex agrostoides* Mackenzie, Bull. Torrey Club 34: 607. 1908.

Densely caespitose, the rootstocks short, stout, blackish, fibrillose, the culms 4-8 dm. high, exceeding the leaves, slender but strict, sharply triangular, roughened on the angles, brownish-black at base and conspicuously clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 2-4 to a culm, usually 2-4 dm. long, very long-attenuate, 1-2 mm. wide, flat at base, strongly involute above, light-green, stiff, roughened towards the apex, the sheaths tight, conspicuously white-hyaline ventrally and sparingly red-dotted, truncate at mouth, the ligule wider than long; head decompound, 4-7 cm. long, 8-20 mm. thick, the lower one or two clustered, more or less separate, the upper closely aggregated; spikes very numerous, closely sessile, distinguishable with difficulty, oblong-ovoid, usually 2-5 mm. long, 1.5-2.5 mm. wide, androgynous or staminate at both ends, containing 1-10 appressed perigynia; bracts absent, or few and short (1.5 cm. long); scales oblong-ovate or lanceolate, obtusish to short-awned, greenish-straw-colored or light-brownish with 3-nerved green or in age whitish midrib and conspicuous hyaline margins, wider than but slightly exceeded by the mature perigynia; perigynia plano-convex, lanceolate-cuneate, 2.5-3.5 mm. long, scarcely 1 mm. wide, membranaceous, light-greenish, in age straw-colored, scarcely spongy at base, margined to base, serrulate at base of beak, nerveless ventrally, obscurely few-nerved dorsally, minutely short-stipitate, round-tapering at base, tapering at apex into a beak as long as or longer than the body, with serrulate margins and white-tipped bidentate apex; achenes lenticular, narrowly oblong-ovoid, yellowish-brown, 1.5 mm. long, 0.5 mm. wide, truncately substipitate, tapering at apex and short-apiculate; style slender, straight, slightly enlarged at base, jointed with achene; stigmas two, light-reddish-brown, slender, long.

TYPE LOCALITY: Luna, northwest of Mogollon Mountains, Socorro County, New Mexico (Wootton, July 28, 1900, in herb. New Mexico Agricultural College).

DISTRIBUTION: Arid regions, Arizona and New Mexico to Sonora. (Specimens examined from New Mexico, Arizona, Sonora.)

56. *Carex fissa* Mackenzie, sp. nov.

Cespitose, from short-prolonged, thick, stout, black, fibrillose rootstocks, the culms slender above but strict, stoutish (4-7 mm. thick) at base, 2.5-7.5 dm. high, rather bluntly triangular, the sides convex or flat, smooth or slightly roughened beneath head, much exceeding the leaves, light-brown at base; leaves with well-developed blades 4-6 to a culm, on lower

third, but not bunched, the blades light-green, thick, flat or channeled at base, usually 1-2 dm. long, 3-5 mm. wide, the sheaths not septate-nodulose nor conspicuously green-and-white-mottled dorsally, thin and strongly cross-rugulose ventrally, thin at mouth and strongly prolonged and red-dotted beyond base of blade, quickly rupturing, the ligule very short, much wider than long; head 2.5-4 cm. long, 8-18 mm. thick, oblong or ovoid-oblong, the spikes 10-20, androgynous, all closely aggregated or the lower somewhat separate, the individual spikes poorly defined, with 8-20 ascending or at length spreading perigynia below and the inconspicuous staminate flowers above; lower bracts setaceous-prolonged, much shorter than the head, the upper scale-like; scales ovate, acute or cuspidate, hyaline or light yellowish-brown-tinged with green midvein, narrower and somewhat shorter than the perigynia; perigynia plano-convex with flat inner face, or slightly concavo-convex, 3.5 mm. long, 2 mm. wide, the body ovate-orbicular, light-green or slightly yellowish-brown-tinged in age, submembranaceous, sharp-margined nearly to base, serrulate above the middle, nerveless or very nearly so ventrally, slenderly few-nerved dorsally, substipitate, round-truncate at base, abruptly contracted into a serrulate beak half length of the body, dorsally cleft, bidentate, the teeth short, subulate-triangular, appressed, light-reddish-brown-tinged; achenes lenticular, quadrate-orbicular, 2 mm. long, 1.75 mm. wide, short-apiculate, substipitate; style short, straight, enlarged at base, jointed with achene; stigmas two, slender, reddish-brown.

Type collected at Sapulpa, Oklahoma (*Bush 1043*).

DISTRIBUTION: Eastern Oklahoma. (Specimens examined from eastern Oklahoma.)

57. *Carex densa* L. H. Bailey, Mem. Torrey Club 1: 50. 1889.

"*Carex Brongniartii* Kunth" Boott, Ill. *Carex* 124, in part. *pl.* 402. 1862.

"*Carex disticha* Huds." W. Boott, in S. Wats. Bot. Calif. 2: 230. 1880.

"*Carex glomerata* Thunb." W. Boott, in S. Wats. Bot. Calif. 2: 232. 1880.

"*Carex paniculata* L." W. Boott, in S. Wats. Bot. Calif. 2: 232, in part. 1880.

Carex Brongniartii var. *densa* L. H. Bailey, Proc. Am. Acad. 22: 137, as to description. 1886.

(Type from California.)

"*Carex chrysoleuca* Holm, Am. Jour. Sci. IV. 17: 302. f. 3, 4. 1904. (Type from Mariposa, California.)

Cespitose, the rootstocks short-prolonged, stout, black, fibrillose, the culms aphyllopodic, 3-7 dm. high, sharply triangular, with flat sides, strict and rather stout, 4-6 mm. thick at base, smooth or roughened above, usually exceeding the leaves, brownish at base; leaves with well-developed blades several to a culm, all towards the base, the blades flat, usually 1.5-2.5 dm. long, 3-6 mm. wide, roughened on the margins and towards the apex, the sheaths tight, inconspicuously septate-nodulose and green-and-white-mottled dorsally, thin, white-hyaline, and usually cross-rugulose and slightly red-dotted ventrally, convex and prolonged beyond base of blade at mouth, not thickened, the ligule conspicuous, as long as wide; heads oblong or oblong-ovoid, compound, 2-5 cm. long, 1-1.5 cm. thick, the clusters closely aggregated, the individual spikes hardly recognizable, the staminate flowers inconspicuous, apical, the perigynia 6-15, appressed-ascending, or sometimes spreading at maturity; lower bracts setaceous-prolonged, usually much shorter than the head; scales ovate, brownish, with conspicuous 3-nerved green center, cuspidate to acute, about the width of but shorter than the perigynia; perigynia plano-convex, slightly convex ventrally, ovate, 3.5-4.5 mm long, 1.5-2 mm. wide, thin-margined to base, the edges slightly elevated, serrulate to middle, substipitate, round-tapering at base, yellowish-brown-tinged with green margin, strongly several-nerved dorsally and few-nerved ventrally, membranaceous, tapering or contracted into a serrulate beak one half length to nearly as long as the body, dorsally cleft, strongly bidentate, the teeth triangular-subulate, strongly reddish-tinged; achenes lenticular, sub-orbicular, 1.5-1.75 mm. long, short-stipitate, apiculate; style slender, straight, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY: Mark Wests Creek and Napa, California, *Bigelow* (illustrated by Boott; see *Mackenzie, Erythra* 8: 29. 1922).

DISTRIBUTION: Dry soil, west of the higher ranges of the Sierra Nevadas, from Santa Clara and Mariposa counties, California, northward into Oregon. (Specimens examined showing range as given.)

ILLUSTRATIONS: Boott, Ill. *Carex* 124, in part. *pl.* 402 (as *C. Brongniartii*); *Erythra* 8: 29. f. 9;

Jepson, Fl. Calif. 1: 214, f. 30, g-i; Jepson, Man. Fl. Pl. Calif. f. 167; Abrams, Ill. Fl. Pacif. St. f. 697; Am. Jour. Sci. IV. 17: 303, f. 3, 4 (as *C. chrysoleuca*).

Note: Palmer 389 from San Diego County, California, the first collection cited by Bailey under *Carex Brongniartii* var. *densa*, is erroneously referred here. The same number is also cited by him (Mem. Torrey Club 1: 51) under his *Carex festiva* var. *stricta*. It is *Carex subfusca* W. Boott.

58. *Carex autumnalis* Mackenzie, sp. nov.

"*Carex densa* L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4²⁰: 167, as to Mexican specimens. 1909.

Rootstocks woody, short-creeping, blackish, fibrillose, with short internodes; culms 6-9 dm. high, light-brownish and 4-5 mm. thick at base, much exceeding leaves, slender above and 1.5 mm. thick beneath head, sharply triangular with slightly concave sides, smooth or nearly so, phyllopodic, biennial, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades 5-8 to a fertile culm, on lower fourth, the sheaths tight, very sparingly septate-nodulose dorsally, sparingly red-dotted ventrally near mouth, short-prolonged and high-convex at mouth, the ligule very short, the blades flat with slightly revolute margins, firm, dull-green, mostly 1-2 dm. long, 3.5-6 mm. wide, roughened on margins towards apex only; head narrowly oblong to ovoid-oblong, 2-8 cm. long, 8-20 mm. thick, simple or compound towards base, the spikes 8-20, androgynous, aggregated, or the lower more or less separate, scarcely distinguishable, suborbicular, with 5-20 appressed or in age somewhat spreading perigynia, the staminate part small and inconspicuous; lower 1-4 bracts setaceous-prolonged, much shorter than head, the others scale-like; scales ovate, acute or short-cuspidate, narrower than and about length of bodies of perigynia, light-brown with narrow hyaline margins and 1-3 nerved lighter center; perigynia plano-convex, ovate, 3.5-4 mm. long, 1.5-2 mm. wide, greenish-straw-colored, membranaceous, lightly nerved dorsally, obscurely nerved ventrally, sharp-edged, serrulate on upper third or half, rounded and spongy at base, tapering into a serrulate beak half length of body, dorsally cleft, shallowly bidentate, the teeth short, triangular; achenes lenticular, yellowish, ovate, 2 mm. long, 1.5 mm. wide, truncate stipitate, minutely apiculate; style slender, deciduous, straight, scarcely enlarged at base; stigmas two, slender.

Type collected in low meadows, Flor de Maria, State of Mexico, Mexico, October 3, 1892, Pringle 4275 (sheet no. 817295 in U. S. Nat. Herb.).

DISTRIBUTION: Mountains of Mexico. (Specimens examined from Mexico (state), Oaxaca, Hidalgo, Chihuahua.)

59. *Carex vicaria* L. H. Bailey, Mem. Torrey Club 1: 49. 1889.

"*Carex glomerata* Thunb." Böck. Linnaea 39: 59, in part. 1875; W. Boott, in S. Wats. Bot. Calif. 2: 232. 1880.

"*Carex Brongniartii* Kunth" L. H. Bailey, Proc. Am. Acad. 22: 137. 1886.

Carex vulpinoidea var. *vicaria* Kükenth. in Engler, Pflanzenreich 4²⁰: 148. 1909. (Based on *C. vicaria* L. H. Bailey.)

Cespitose, the rootstocks very short-prolonged, stout, black, fibrillose, the culms aphyllopodic, 3-6 dm. high, sharply triangular, with flat sides, slender but strict, strongly roughened on the angles, usually noticeably exceeding the leaves, brownish at base; leaves with well-developed blades several to a culm, all towards the base, the sheaths overlapping, the blades flat, usually 1-2 dm. long, 3-4.5 mm. wide, roughened on the margins and towards the apex, the sheaths tight, inconspicuously septate-nodulose dorsally, white-hyaline, cross-rugulose, and sparingly red-dotted ventrally, not readily breaking, slightly thickened, yellowish-tinged, convex and prolonged beyond base of blade at mouth, the ligule almost obsolete; head oblong, 1.5-3.5 cm. long, 8-12 mm. thick, decompound, the clusters closely aggregated; individual spikes hardly recognizable, the staminate flowers apical, inconspicuous, the perigynia 6-15, appressed-ascending, or at maturity spreading; bracts setaceous, usually only the lower 1 or 2 developed; scales ovate, reddish-brown with green midrib, acute to cuspidate, about the width of but shorter than the perigynia; perigynia plano-convex, flat on inner face, ovate, short-stipitate, the base rounded, narrowly margined, serrulate at base of beak, 3-3.5 mm. long, 1.5 mm. wide, yellowish- or reddish-brown-tinged, with narrow thick green margin, nerveless ventrally, few-nerved dorsally, membranaceous, tapering into a serrulate beak about half the length of the body, dorsally cleft, bidentate, the teeth short, triangular, strongly reddish-tinged; achenes lenticular, ovate-suborbicular, 1.5-1.75 mm. long, short-stipitate,

apiculate; style slender, straight, enlarged at base, jointed with achene; stigmas two, reddish, short, slender.

TYPE LOCALITY: Oregon, *E. Hall* (see Mackenzie, *Erythea* 8: 30. 1922.)

DISTRIBUTION: Marshes and swales, Washington to northern California. (Specimens examined from range as given.)

ILLUSTRATION: Abrams, Ill. Fl. Pacif. St. f. 698.

60. *Carex breviligulata* Mackenzie, *Erythea* 8: 92. 1922.

Carex vicaria var. *costata* L. H. Bailey, Mem. Torrey Club 1: 49. 1889. (Type from Grant's Pass, Oregon.)

Carex vulpinoidea var. *vicaria* f. *costata* "L. H. Bailey" Kükenth. in Engler, *Pflanzenreich* 4²⁰: 148. 1909. (Based on *C. vicaria* var. *costata* L. H. Bailey.)

Cespitose, the rootstocks very short-prolonged, stout, black, fibrillose, the culms aphyllodipodic, 3-6 dm. high, sharply triangular with flat sides, slender but strict, 2.5-4 mm. thick at base, strongly roughened on the angles, usually noticeably exceeding the leaves, brownish at base; leaves with well-developed blades 4-7 to a culm, on lower fourth, the blades flat or canaliculate at base, usually 1-2 dm. long, 3-4.5 mm. wide, light-green, roughened on the margins and towards the apex, the sheaths tight, inconspicuously septate-nodulose and white-and-green-mottled dorsally, white-hyaline, cross-rugulose, and sparingly red-dotted ventrally, not readily breaking, prolonged at mouth beyond base of blade and sometimes yellowish-tinged, the ligule very short; head oblong, decomposed, 1.5-3.5 cm. long, 8-12 mm. thick, the clusters closely aggregated, the individual spikes hardly recognizable, the staminate flowers apical, forming a short cone, the perigynia 6-15, appressed-ascending, or at maturity spreading; lower bracts setaceous-prolonged, usually not conspicuous, the upper scale-like; scales ovate, acute to cuspidate, light-reddish-brown with 3-nerved green center, about the width of but rather shorter than the perigynia; perigynia thick-plano-convex, ovate, slightly convex ventrally and with slightly raised thick edge to base, serrulate from middle, 3.25-3.75 mm. long, 1.5-2 mm. wide, yellowish-brown with green margins, membranaceous, several-nerved dorsally and fewer-nerved ventrally, substipitate, round-tapering at base, abruptly narrowed into a serrulate beak half to two thirds length of the body, dorsally cleft, bidentate, the teeth short, triangular, strongly reddish-tinged; achenes lenticular, ovate-suborbicular, 1.75 mm. long, short-stipitate, apiculate; style slender, straight, enlarged at base, jointed with achene; stigmas two, slender, reddish.

TYPE LOCALITY (of *C. vicaria* var. *costata*, on which *C. breviligulata* is based): Grant's Pass, Oregon (*Henderson* 1477).

DISTRIBUTION: Damp meadows, northern California and southern Oregon. (Specimens examined from northern California and southern Oregon.)

ILLUSTRATION: Abrams, Ill. Fl. Pacif. St. f. 699.

61. *Carex triangularis* Böck. *Flora* 39: 226. 1856.

"*Carex vulpinoidea* Michx." Gay, *Ann. Sci. Nat.* II, 10: 357, in part. 1838. (Rio Brazos, Texas, *Drummond*.)

Carex vulpinoidea var. *platycarpa* Gay; *E. Hall*, *Pl. Tex.* 25. 1873. (Based on reference immediately preceding; Hall's plant to be excluded.)

Carex vulpinoidea var. *Drummondiana* Böck. *Linnaea* 39: 96. 1875. (Based on *C. triangularis* Böck.)

Carex vulpinoidea var. *triangularis* Kükenth. in Engler, *Planzenreich* 4²⁰: 148. 1909. (Based on *C. triangularis* Böck.)

Cespitose, the rootstocks short-prolonged, blackish, stout, tough, fibrillose, the culms 4-9 dm. high, exceeding the leaves, aphyllodipodic, slender but strict, 3-5 mm. thick at base, acutely triangular with flat sides above, obtusely triangular below, roughened on the angles beneath the head, brownish at base; leaves with well-developed blades 4-6 to a culm, on lower third, but not bunched, the blades erect-ascending, flat or slightly canaliculate at base, light-green, thinnish but firm, 1-3 dm. long and 3-4.5 mm. wide, long-tapering, roughened on the margins and towards the apex, the sheaths tight, not readily breaking, cross-rugulose and sparingly red-dotted and olive-green-tinged ventrally, strongly prolonged upward beyond base of blade and convex and slightly thickened and reddish-brown-tinged at mouth, the ligule very short; spikes numerous in a compound oblong head 3-5 cm. long, 1-1.5 cm. thick, the clusters all aggregated, greenish-yellow when young, and light-yellowish-brown at

maturity, the individual spikes poorly defined, the staminate flowers apical, inconspicuous, the perigynia several to many, spreading-ascending, or soon widely spreading; lower bracts setaceous-prolonged, usually shorter than the head, the upper much reduced; scales ovate-triangular, narrower and shorter than the perigynia, greenish-hyaline and more or less strongly reddish-brown-tinged, the center green, 3-nerved, short-awned; perigynia plano-convex, much flattened at maturity, orbicular or reniform, 3-3.5 mm. long, 2.5-3 mm. wide, greenish-yellow or at maturity light-brownish-yellow, the upper margins green, thick-edged to base, serrulate above middle, substipitate and truncate-cordate, flat and nerveless or nearly so ventrally and slenderly few-nerved dorsally, membranaceous, red-dotted and punctate, abruptly contracted into a serrulate beak about one third length of body, sharply bidentate, the teeth triangular-subulate, reddish-brown; achenes lenticular, short-oblong-quadrate, short-stipitate, apiculate, 1.75 mm. long, 1.25 mm. wide; style slender, straight, enlarged at base, jointed with achene; stigmas two, short, reddish-brown.

TYPE LOCALITY: "Ad flumen Rio Brazos terrae texanae leg. Drummond."

DISTRIBUTION: Wet prairies and swampy meadows, southeastern Missouri and Oklahoma to Mississippi and Texas. (Specimens examined from Mississippi, Louisiana, Texas, Arkansas, Oklahoma, southeastern Missouri.)

ILLUSTRATION: Boott, Ill. *Carex* 125. pl. 409, f. 2.

62. *Carex annectens* Bickn. Bull. Torrey Club 35: 492. 1908.

Carex vulpinoidea var. *ambigua* Barratt; Boott, Ill. *Carex* 125. pl. 406. 1862. (Type from Connecticut.)

Carex vulpinoidea var. *platycarpa* Gay; E. Hall, Pl. Tex. 25. 1873. (As to Hall's plant only: "perigynia not spotted.")

Carex xanthocarpa var. *annectens* Bickn. Bull. Torrey Club. 23: 23. 1896. (Type from New York.)

Carex setacea var. *ambigua* Fernald, Rhodora 8: 167. 1906. (Based on *C. vulpinoidea* var. *ambigua* Barratt.)

Carex vulpinoidea var. *annectens* Farwell, Papers Mich. Acad. 1: 91. 1923. (Based on *C. annectens* Bickn.)

Carex vulpinoidea var. *xanthocarpa* f. *annectens* "Bickn." Kükenth. in Engler, Pflanzenreich 4²⁰: 148. 1909. (Based on *C. xanthocarpa* var. *annectens* Bickn.)

Cespitose, the rootstocks very short-prolonged, stout, tough, fibrillose, blackish, the culms 3-10 dm. high, exceeding the leaves, very rarely shorter, stiff but slender, 2.5-4.5 mm. thick at base, acutely triangular above with flat sides, obtusely triangular below, roughened beneath the head, brownish at base, the lower leaves reduced, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades 3-6 to a culm, on the lower third, but not bunched, the blades erect-ascending, flat, or slightly canaliculate, light-green, thinnish but rather firm, 2-4 dm. long, 2-5 mm. wide, long-tapering, roughened on the margins and towards the apex, the sheaths tight, thin, cross-rugulose, red-dotted and greenish-white ventrally, strongly prolonged upward beyond base of blade and high-convex and slightly thickened and yellowish at mouth, the ligule much wider than long; spikes very numerous or numerous, in a more or less compound terminal head 2-7 cm. (usually 3-5 cm.) long, 8-15 mm. thick, the lower clusters often somewhat separated and usually not strongly compound, the upper densely aggregated; heads greenish-stramineous when young, yellowish-brown when mature, the individual spikes distinguished with difficulty; staminate flowers apical, inconspicuous, with the several to many ascending or at maturity spreading perigynia beneath; bracts setaceous-prolonged, very variable in length and size, usually shorter than the head, often rather conspicuous, the upper scale-like; scales ovate, reddish-brown with hyaline margins, the center green, 3-nerved, terminating in a rough awn slightly exceeding the lower perigynia and equaling or exceeded by the upper in each spike; perigynia plano-convex, membranaceous, ovate-orbicular or broader, 2.6-3.2 mm. long, 1.7-2.25 mm. wide, brownish-yellow at maturity, occasionally yellowish-green, short-stipitate, rounded or truncate at base, flat, nerveless or nearly so and sharp-edged to base ventrally, strongly serrulate above middle, low-convex and slenderly but conspicuously few-nerved dorsally, rarely varying to nearly nerveless, green-margined above, abruptly contracted into a rough-serrulate beak much shorter than the body, dorsally cleft, strongly bidentate, the teeth short, somewhat spreading, triangular, reddish-brown; achenes lenticular, orbicular-quadrate, short-stipitate, rounded at base and apex, apiculate, 1.5 mm. long; style slender, straight, jointed with achene, enlarged at base; stigmas two, slender, rather short, reddish-brown.

TYPE LOCALITY (of *C. xanthocarpa* var. *annectens*, on which *C. annectens* is based): "Common at New York. In the Columbia College Herbarium are specimens from Staten Island (*Britton*) and North Carolina (*Curtis*)." The Staten Island specimen is taken as the type.

DISTRIBUTION: Dry fields and pastures, mostly in acid soils; largely a species of the coastal plain, but occasional inland, Texas to Florida, and northward to Maine and Wisconsin. (Specimens examined from Maine, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, Georgia, Florida, Ohio, Indiana, Wisconsin, Oklahoma.)

ILLUSTRATIONS: Boott, Ill. *Carex* 125. pl. 405 (no. 1), 406, 409 (except no. 2); Britt. & Brown, Ill. Fl. f. 331; ed. 2. f. 395; Rob. & Fern. Man. f. 407; Bull. Lab. Nat. Hist. Univ. Iowa 4: pl. 7; Francis, Grasses 321 (as *C. vulpinoidea*).

NOTE: Both *Carex annectens* and *C. brachyglossa* are weedy species, and frequently are introduced outside of their natural ranges.

63. *Carex brachyglossa* Mackenzie, Bull. Torrey Club 50: 355. 1923.

Carex xanthocarpa Bickn. Bull. Torrey Club 23: 22. 1896. (Type from New York.) Not *C. xanthocarpa* Degland, 1807.

Carex vulpinoidea var. *xanthocarpa* Kükenth. in Engler, Pflanzenreich 4²⁰: 148. 1909. (Based on *C. xanthocarpa* Bickn.)

—*Carex Bicknellii* Camus, Not. Syst. Mus. Paris 1: 239. 1910. (Based on *C. xanthocarpa* Bickn.) Not *C. Bicknellii* Britton, 1896.

Carex annectens var. *xanthocarpa* Wiegand, Rhodora 24: 74. 1922. (Based on *C. xanthocarpa* Bickn.)

Cespitose, the rootstocks very short-prolonged, stout, tough, fibrillose, blackish, the culms 3–12 dm. high, exceeding the leaves, very rarely shorter, stiff but slender, 2.5–4.5 mm. thick at base, acutely triangular above with flat sides, obtusely triangular below, roughened beneath the head, brownish at base, the lower leaves reduced, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades 3–6 to a culm, on the lower third, but not bunched, the blades erect-ascending, flat or slightly canaliculate, light-green, thinnish but rather firm, 2–4 dm. long, 3–6 mm. wide, long-tapering, roughened on the margins and towards the apex, the sheaths tight, thin, cross-rugulose, red-dotted and greenish-white ventrally, short-prolonged upward beyond base of blade and truncate or slightly convex at mouth and slightly thickened and yellowish, the ligule nearly as long as wide; spikes very numerous or numerous in a more or less compound terminal head 2–7 cm. (usually 3–5 cm.) long, 8–15 mm. thick, narrowly oblong-ovoid, the lower clusters not separated and usually not strongly compound, the upper densely aggregated; heads greenish-yellow when young, golden-brown when mature, the individual spikes distinguished with difficulty; staminate flowers apical, inconspicuous, with the several to many ascending or at maturity spreading perigynia beneath; bracts setaceous-prolonged, very variable in length and size, usually shorter than the head, often inconspicuous, the upper scale-like; scales ovate, reddish-brown with hyaline margins, the center green, 3-nerved, terminating in a rough awn mostly shorter than the perigynia; perigynia plano-convex, membranaceous, typically golden-yellow at maturity, ovate to broadly ovate, usually 2.2–2.7 mm. long, 1.5–1.8 mm. wide, short-stipitate, round-tapering at base, flat, nerveless and sharp-edged to base ventrally, serrulate at base of beak, low-convex and nerveless or faintly or occasionally plainly few-nerved dorsally, not green-margined or scarcely so above, abruptly contracted into a serrulate beak much shorter than the body, dorsally cleft, shallowly bidentate, the teeth short, appressed, triangular, dull-reddish-brown; achenes lenticular, oblong-quadrate, 1.5 mm. long, short-stipitate, rounded at base and apex; style slender, straight, jointed with achene, enlarged at base; stigmas two, slender, rather short, reddish-brown.

TYPE LOCALITY: Paoli, Chester County, Pennsylvania, Pennell & Long 7598 (Herb. Acad. Phila.).

DISTRIBUTION: Fields, pastures, and dry banks, especially in calcareous districts, Maine to Iowa, and southward to Virginia and Kansas. (Specimens examined from Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, District of Columbia, Virginia, Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, Missouri, Kansas.)

64. *Carex vulpinoidea* Michx. Fl. Bor. Am. 2: 169. 1803.

—*Carex microsperma* Wahl. Sv. Vet.-Akad. Nya Handl. 24: 144. 1803. (Type from Pennsylvania.)

—*Carex multiflora* Muhl.; Willd. Sp. Pl. 4: 243. 1805. (Type from Pennsylvania.)

—*Carex longibracteata* Hornem. Hort. Hafn. 881. 1815. (Type from North America.)

—*Carex polymorpha* Schw. Ann. Lyc. N. Y. 1: 65. 1824. (Type from New Jersey and Carolina.) Not *C. polymorpha* Muhl. 1817.

- Carex bracteosa* Schw.: Schw. & Torr. Ann. Lyc. N. Y. 1: 306. 1825.* (Type in herb. Torrey from North Carolina.)
Carex setacea Dewey, Am. Jour. Sci. 9: 61. *pl. B, f. 5*. 1825.† (Type from western Massachusetts.)
Carex multiflora var. *microsperma* Dewey, Am. Jour. Sci. 11: 317. 1826. (Based on *C. microsperma* Wahl.)
Vignea setacea Raf. Good Book 27. 1840. (Based on *Carex setacea* Dewey.)
Carex vulpinaeformis Tuckerm. Enum. Caric. 9. 1843. (Based on *C. vulpinoidea* Michx.)
Carex vulpinoidea var. *microsperma* Dewey, in Wood, Class-Book ed. 2. 577. 1847. (Based on *C. microsperma* Wahl.)
Carex scabrior Sartw.; Dewey, Am. Jour. Sci. II. 8: 349. 1849. (Type from Penn Yan, New York.)
Carex vulpinoidea var. *glomerata* Barratt; Boott, Ill. Carex 125. *pl. 404* (in part). 1862. (Type from Connecticut.)
Carex vulpinoidea var. *scabrior* Wood, Bot. & Fl. ed. 1871. 371. 1871. (Based on *C. scabrior* Sartw.)
Carex vulpinoidea var. *setacea* Kükenth. in Engler, Pflanzenreich 4²⁰: 148. 1909. (Based on *C. setacea* Dewey.)
Carex vulpinoidea var. *segregata* Farwell, Rep. Mich. Acad. 22: 180. 1921. (Type from Dundee, Michigan.)

Cespitose, the rootstocks short-prolonged, rather stout, tough, blackish, fibrillose, the culms 2-9 dm. high, normally exceeded by the leaves, usually 3-4 mm. thick at base, slender but stiff, sharply triangular with flat sides above, roughened on the angles above, dark-brownish at base; leaves with well-developed blades usually 4 or 5 to a culm, on lower half, but not bunched, the blades erect-ascending, light- or yellowish-green, flat, or somewhat channeled at base, 1-5 dm. long, 2-4 mm. wide, long-tapering, strongly roughened on the margins and towards the apex, the sheaths tight, ventrally thin, cross-rugulose, and greenish-white or more or less olive-tinged, short-convex, thickened and slightly prolonged at mouth beyond base of blade, the ligule wider than long, dark-margined; spikes numerous, in a compound terminal head 3-10 cm. (usually 5-8 cm.) long, 5-20 mm. thick, the lower branches more or less separate, the upper densely aggregated; heads greenish-yellow when young, brownish-yellow at maturity, the individual spikes distinguished with difficulty; staminate flowers apical, inconspicuous, with the several to many spreading or ascending-spreading perigynia beneath; bracts setaceous-prolonged, very variable in length and size, but almost invariably present and conspicuous; scales ovate, yellowish-brown-hyaline with 3-nerved green center and hyaline margins, narrower than the perigynia, and terminating in a rough awn about the length of the lower and exceeding the upper perigynia in each spike; perigynia plano-convex, membranaceous, 2-2.5 mm. long, 1-1.5 mm. wide, yellowish-green or straw-colored, the body ovate-orbicular or orbicular, thick-edged and corky-margined to the rounded or round-tapering base, flat and nerveless or nearly so ventrally, rounded and slenderly several-nerved dorsally, slightly green-margined above, often serrulate at base of beak, short-stipitate, contracted into a serrulate or entire-margined‡ beak about the length of the body, dorsally cleft, bidentate, the teeth triangular, subulate, sharp; achenes lenticular, orbicular-ovate, stipitate, long-tapering at base, rounded and short-apiculate at apex, about 1 mm. long; style short, slender, enlarged at base, jointed with achene; stigmas two, slender, elongate, light-reddish-brown.

TYPE LOCALITY: "Hab. in Canada et Nova Anglia."

DISTRIBUTION: Swampy places, Newfoundland to Vancouver Island, and southward to Florida, Texas, Arizona, and Oregon. One of our most widely distributed and abundant species. Introduced into Europe. (Specimens examined from Newfoundland, Quebec, Nova Scotia, New Brunswick, Ontario, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Florida, Mississippi, Tennessee, Kentucky, Ohio, Michigan, Wisconsin, Indiana, Illinois, Minnesota, Iowa, Missouri, Arkansas, Louisiana, Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Manitoba, Saskatchewan, Colorado, New Mexico, Arizona, Idaho, Washington, Oregon, British Columbia.)

ILLUSTRATIONS: Am. Jour. Sci. 9: *pl. B, f. 5* (as *C. setacea*, poor); 10: *pl. F, f. 19* (as *C. multiflora microsperma*, very poor); Boott, Ill. Carex 125. *pl. 404, 407, 408* (as *C. setacea*); Britt. & Brown,

* *Carex bracteosa* Schw. is cited as published in Ann. Lyc. N. Y. 1: 65, but it does not so appear in the copies of that publication available to me.

† *Carex setacea* Dewey has been the source of a great deal of trouble to students of botany. I have come to the conclusion that it is based on unfertilized material of *Carex vulpinoidea* in which the undeveloped achenes have not distended the lower part of the perigynia so as to give them their characteristic appearance. For another view see Bicknell, Bull. Torrey Club 23: 24. 1896.

‡ The beak of the perigynium in *Carex vulpinoidea* is either serrulate or smooth, but so far I have not associated this difference with any other.

Ill. Fl. f. 830, 832 (as *C. setacea*); ed. 2. f. 894, 896 (as *C. setacea*); Rob. & Fern. Man. f. 405, 406 (as *C. setacea*); Schkuhr, Riedgr. Nachtr. pl. Lll. f. 144; Engler, Pflanzenreich 4²⁰: 145. f. 24, D-F; Rep. N. J. Mus. 1910: pl. 21, f. 2; Abrams, Ill. Fl. Pacif. St. f. 701; Francis, Grasses 305; Knobel, Grasses pl. 27, f. 90.

NOTE: See Bicknell, Bull. Torrey Club 23: 21. 1896.

65. *Carex Dudleyi* Mackenzie, *Erythea* 8: 30. 1922.

Cespitose, the rootstocks short-prolonged, rather stout, tough, dark-colored, fibrillose, the culms 3-7 dm. high, aphyllopodic, stiff, stoutish, 4-5 mm. thick at base, sharply triangular with flat sides, roughened on the angles above, strongly exceeding the leaves, brownish at base; leaves with well-developed blades 4-6 to a culm, on lower fourth, but not bunched, the blades light-green, thinnish but rather firm, flat, 1-3 dm. (usually 1.5-2.5 dm.) long, 4-7 mm. wide, short-tapering, the margins serrulate, otherwise little roughened, the sheaths tight, somewhat green-and-white-mottled dorsally, white and red-dotted ventrally, more or less cross-rugulose, not fragile, slightly prolonged at mouth beyond base of blade, low-convex and narrowly yellowish-brown-tinged, the ligule wider than long; head compound or decomposed, 2-3.5 cm. long, about 1 cm. thick, the spikes or clusters of spikes all closely aggregated, the individual spikes hardly recognizable, the apical staminate flowers inconspicuous, the several to many perigynia ascending or at maturity spreading; lower bracts setaceous-prolonged, shorter than the head, but conspicuous, the upper scale-like; scales ovate, hyaline and more or less yellowish-brown-tinged, the center 3-nerved, green, nearly width of perigynia, strongly awned, the awns often exceeding the perigynia; perigynia plano-convex or slightly biconvex, 2.5-3 mm. long, 1.2 mm. wide, membranaceous, yellowish-green or straw-colored, sharply margined to base, serrulate above middle, round-tapering, substipitate, slightly spongy at base, several-nerved dorsally, obscurely few-nerved at base ventrally, abruptly contracted into a serrulate flat beak about the length of the body, dorsally cleft, shallowly bidentate, the teeth triangular, appressed, very short; achenes lenticular, oval-orbicular, short-stipitate, apiculate, 1.5 mm. long; style short, slender, jointed with achene, enlarged at base; stigmas two, slender, elongate, reddish-brown.

TYPE LOCALITY: Tassajara Hot Springs, California (*Elmer 3132*).

DISTRIBUTION: In the Coast Ranges of California, from Monterey County to Lake County; apparently local. (Specimens examined from range as given.)

ILLUSTRATION: Abrams, Ill. Fl. Pacif. St. f. 700.

14. *Paniculatae* Kunth, Enum. Pl. 2: 389. 1837; Tuckerm. Enum. Caric. 9. 1843; Carey, in A. Gray, Man. 540. 1848; Kükenth. in Engler, Pflanzenreich 4²⁰: 174. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 123. 1917; Mackenzie, *Erythea* 8: 31. 1922. PHAENOCARPAE Holm, Am. Jour. Sci. IV. 16: 455. 1903. Referred by L. H. Bailey (Proc. Am. Acad. 22: 135. 1886) to the MULTIFLORAE Kunth. Species are referred to the genus *Physiglochis* Neek. by Rafinesque (Good Book 27. 1840). Treated as a genus *Rhynchopera* by Börner (Abh. Nat. Ver. Bremen 21: 272. 1913).

Densely or loosely cespitose, forming large dense stools; culms not weakly cellular and not flattened in drying; sheaths strongly red-dotted ventrally, not transversely rugulose or sparingly so in age; inflorescence paniculate or spicate-paniculate, the spikes very numerous, small, androgynous or pistillate, but never gynaeceandrous, the lower more or less compound or often decomposed; bracts usually not conspicuous; perigynia very thick, high-convex dorsally and often somewhat convex ventrally, brownish or chestnut in age, ascending or spreading, coriaceous, often shining, spongy at base, closely enveloping achene in upper half of body, stipitate (often strongly), narrowly margined, nerved dorsally, nerveless or nerved ventrally, serrulate from the middle, conspicuously beaked, the beak sutured dorsally, serrulate, bidentate; achenes lenticular; style jointed with achene, deciduous, its base more or less thickened; stigmas two.

Species of swampy meadows, best developed in calcareous districts. In North America represented by four species in the cooler temperate parts, one of which also occurs in Eurasia. Three species are widely distributed in Eurasia, one or two of which extend into northern Africa or the Canary Islands. Several species occur in the more temperate parts of Australasia; none in South America.

- Perigynia very abruptly short-beaked, tapering at base; leaf-blades 2.5-8 mm. wide. 66. *C. decomposita*.
- Perigynia tapering or contracted into the beak, rounded or truncate at base; leaf-blades 1-6 mm. wide.
- Sheaths not copper-tinged at the mouth; head little interrupted; perigynia 2-2.75 mm. long, shining, not concealed by the scales. 67. *C. diandra*.
- Sheaths copper-tinged at the mouth; head interrupted; perigynia 2.5-4 mm. long, nearly concealed by the scales.
- Leaf-blades 2-3 mm. wide, the ligule very short, the sheath convex and conspicuously prolonged beyond base of blade; perigynia 2.5-3 mm. long, dull, the beak serrulate; scales reddish-brown-tinged. 68. *C. prairea*.
- Leaf-blades 2.5-6 mm. wide, the ligule conspicuous, longer than wide, the sheath concave at mouth and only moderately prolonged beyond base of blade; perigynia 3-4 mm. long, shining, the beak setulose-serrulate; scales chestnut-brown-tinged. 69. *C. Cusickii*.

66. *Carex decomposita* Muhl. Descr. Gram. 264. 1817.

Carex Nuttallii Schw. Ann. Lyc. N. Y. 1: 65. 1824. (Type from Arkansas; an obscure species, doubtfully referred here.)

Carex paniculata var. *decomposita* Dewey, Am. Jour. Sci. 10: 276. 1826. (Based on *C. decomposita* Muhl.)

Densely cespitose, the rootstocks very short, lignescent, blackish, fibrillose, the culms stout at base (4-8 mm. thick), slender above but stiff, more or less roughened on the angles above, 4-10 dm. high, obtusely triangular with convex sides, from shorter than to much exceeding the leaves, dark- or blackish-brown at base and clothed with the dried-up leaves of the previous year, the lowest bladeless; leaves of the year with well-developed blades several to a culm, on lower third, strongly separate, the blades erect, very long, 2-7 dm. long, 2.5-8 mm. wide, flat or somewhat canaliculate, thickish, light-green, stiff, the margins and main nerves (especially in the larger leaves) very serrulate, the sheaths tight, septate-nodulose dorsally, hyaline and strongly purplish-red-dotted ventrally, concave and slightly reddish-brown-tinged at mouth, the ligule wider than long; spikes androgynous, very numerous, in a decomposed panicle 4-15 cm. long, 1-4.5 cm. wide, the panicle-branches widely separated but the spikes closely aggregated on the branches, the spikes with several to many spreading perigynia and inconspicuous terminal staminate flowers; bracts absent or occasionally one or two short ones present, 2 cm. long or less, awl-shaped, long-attenuate; scales ovate-triangular, mucronate, hyaline, with 3-nerved green center, narrower and rather shorter than the perigynia; perigynia unequally biconvex, high-convex dorsally, low-convex ventrally, thick, very coriaceous, olive or brownish-green, 2-2.5 mm. long, 1.75 mm. wide, the body broadly obpyramidal, few-nerved dorsally, several-nerved at the base ventrally, sharp-edged ventrally to base and serrulate on upper part, tapering at base into a short stipe, very spongy at base, very abruptly beaked, the beak slender but flat, shallowly bidentate, serrulate, one third length of body; achenes very closely enveloped, lenticular, oblong-elliptic, slightly more than 1 mm. long and less than 1 mm. wide, apiculate, substipitate; style very short, slender, slightly enlarged at base, jointed with achene; stigmas two, light-reddish-brown, slender, short.

TYPE LOCALITY: "Habitat in Cherokee."

DISTRIBUTION: Swamps, Florida to Louisiana, and northward to Maryland and west of the mountains to Michigan and western New York; very local northward. (Specimens examined from western New York, Maryland, Ohio, Michigan, Indiana, Missouri, Arkansas, Louisiana, Alabama, Florida.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 825; ed. 2. f. 899; Rob. & Fern. Man. f. 408; Engler, Pflanzenreich 4²⁹: 176. f. 28, E, F; Boott, Ill. Carex 20. pl. 55; Torr. Fl. N. Y. pl. 142; Am. Jour. Sci. 25: pl. S, f. 28.

67. *Carex diandra* Schrank, Cent. Bot. Anmerk. 57. 1781.

Carex paniculata var. β Leers, Fl. Herborn. 198. 1775. (Type from Germany.)

Carex teretiuscula Gooden. Trans. Linn. Soc. 2: 163. pl. 19, f. 3. 1794. (Type from Norwich, England.)

Carex paniculata var. *minor* Retz. Fl. Scand. Prodr. ed. 2. 219. 1795. (Based on *C. diandra* Schrank.)

Carex Ehrhartiana Hoppe, Coll. Caric. Germ. 207; hyponym. 1829. (Type from central Europe.)

Vigna teretiuscula Reichenb. in Mössler, Handb. ed. 2. 1621. 1829. (Based on *Carex teretiuscula* Gooden.)

Carex teretiuscula var. *cylindrica* Hartm. Skand. Fl. ed. 2. 248. 1832. (Type from Sweden.)

Carex teretiuscula var. *major* Koch, Syn. Fl. Germ. 751. 1837. (Type from Germany.)

- Physiglochis teretiuscula* Raf. Good Book 27. 1840. (Based on *Carex teretiuscula* Gooden.)
Carex teretiuscula var. *crassior* Hartm. Skand. Fl. ed. 4. 297. 1843. (Type from Sweden.)
Carex pseudoparadoxa S. Gibson. Phytol. 1: 778. 1843. (Type from Manchester, England.)
 "Carex mitis Boott" Bock. Linnaea 39: 94. 1875. (From Kashmir.)
Carex teretiuscula var. *Ehrhartiana* Sanio, Bot. Centr. 6: 429. 1881. (Based on *C. Ehrhartiana* Hoppe.)
Carex teretiuscula var. *Ehrhartiana* f. *simplicior* Sanio, Bot. Centr. 6: 430. 1881. (Type from East Prussia.)
Carex teretiuscula St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 875. 1889. (Based on *Carex teretiuscula* Gooden.)
Carex teretiuscula var. *tenella* C. Beckm. Abh. Nat. Ver. Bremen 10: 508. 1889. (Type from central Europe.)
Carex bernardina Parish, Bull. So. Calif. Acad. 5: 24. pl. 21. 1906. (Type from San Bernardino, California.)
Carex diandra f. *tenella* "Beckm." Kükenth. in Engler, Pflanzenreich 4²⁰: 177. 1909. (Based on *C. teretiuscula* var. *tenella* Beckm.)
Carex diandra f. *major* "Koch" Kükenth. in Engler, Pflanzenreich 4²⁰: 177. 1909. (Based on *C. teretiuscula* var. *major* Koch.)

In large dense clumps, the rootstocks very short-elongate, rather slender, tough, blackish, fibrillose, the culms slender, but stiff and erect, 3-7 dm. high, exceeding the leaves, sharply triangular with slightly convex sides, and strongly roughened on the angles, brown or dark-brown at base; leaves with well-developed blades usually 4 or 5 to a culm, on lower fourth, the blades erect-ascending, flat or canaliculate, light-green, 3 dm. long or usually considerably shorter, 1-2.5 mm. wide, roughened on the margins and towards the apex, the sheaths conspicuously striate, tight, thin ventrally and strongly dotted with reddish-brown, prolonged beyond base of blade, truncate or low-convex and not copper-tinged at mouth, the ligule very short; spikes numerous, in a somewhat compound, slender, terminal head 2.5-5 cm. long, 10 mm. thick or less, the lower more or less separated; whole head brownish, the individual spikes hardly distinguishable, the staminate flowers apical, inconspicuous, with the several ascending or at length spreading perigynia beneath; bracts awl-shaped and long-cuspidate, 1 cm. long or less, often rudimentary or absent; scales brownish with a lighter midrib and a hyaline margin, acute, or slightly cuspidate, as wide as the perigynia at base, but usually narrower above, and from slightly shorter to slightly longer; perigynia unequally biconvex, high-convex, rounded, and strongly few-nerved dorsally, low-convex and little nerved at base ventrally, ovate, 2-2.75 mm. long, 1 mm. wide, brown, shining, the body very plump, sharp-edged nearly to base, serrulate above the middle, short-stipitate, round-truncate at base, tapering or abruptly contracted into the beak, slightly margined above, the beak green or whitish in age, strongly serrulate, shallowly bidentate, obliquely cut dorsally, shorter than the body; achenes lenticular, broadly ovate, plump, stipitate, round-tapering at base, long-tapering and apiculate above, 1 mm. long; style short, slender, jointed with achene, slightly enlarged at base; stigmas two, slender, short, reddish-brown.

TYPE LOCALITY: Southern Bavaria, Germany.

DISTRIBUTION: Wet meadows in calcareous regions, Newfoundland and Labrador to Yukon, and southward to New Jersey, Indiana, and Colorado and very locally to southern California; widely distributed in Eurasia and recorded from New Zealand. (Specimens examined from Labrador, Newfoundland, Prince Edward Island, New Brunswick, Nova Scotia, Quebec, Ontario, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Nebraska, Keewatin, Alberta, Manitoba, Saskatchewan, Montana, Wyoming, Colorado, British Columbia, California, Washington, Yukon.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 827; ed. 2. f. 897; Rob. & Fern. Man. f. 409; Engler, Pflanzenreich 4²⁰: 176. f. 28, A-D; Schkuhr, Riedgr. pl. D. f. 19; pl. T. f. 69; Fl. Dan. pl. 1886; Bull. So. Calif. Acad. 5: 25. pl. 21; Abrams, Ill. Fl. Pacif. St. f. 702; Jour. Russe Bot. 1911: 57. f. 38; Hoppe, in Sturm, Deuts. Fl. 50: pl. 3; Reichenb. Ic. Fl. Germ. 8: pl. 222, f. 572; Trans. Linn. Soc. 2: pl. 19, f. 3; Anders. Cyp. Scand. pl. 3, f. 22; Engl. Bot. pl. 1065; ed. 3. pl. 1619, 1620 (*C. Ehrhartiana*); Coste, Fl. Fr. f. 3821; Hegi, Ill. Fl. Mittel-Eur. pl. 46, f. 5; Karst. Deuts. Fl. f. 167(1); Hallier, Deuts. Fl. pl. 426.

NOTE: See A. Bennett (Jour. Bot. 35: 244. 1897) for synonymy.

68. *Carex prairea* Dewey, in Wood, Class-Book 414 (as *C. prarisa*).
 1845; ed. 2. 578 (as *C. prairea*). 1847.

"*Carex paniculata* L." Muhl. Descr. Gram. 224. 1817.

"*Carex paradoxa* Willd." Boott, in Hook. Fl. Bor. Am. 2: 213. 1839.

Carex paniculata var. *minor* Carey, in A. Gray, Man. 540. 1848. (Based on *C. prairea* Dewey.)
 Not *C. paniculata* var. *minor* Retz, 1779.

- "*Carex teretiuscula* var. *major* Koch" Carey, in A. Gray, *Man.* ed. 2. 511. 1856.
Carex teretiuscula var. *ramosa* Boott, Ill. *Carex* 145. 1867. (Based on *C. prairea* Dewey.)
Carex teretiuscula var. *prairea* Britton; Britt. & Brown, Ill. Fl. 1:344. 1896. (Based on *C. prairea* Dewey.)
Carex diandra var. *prairea* "Britton" Kükenth. in Engler, *Pflanzenreich* 4²⁰: 177. 1909. (Based on *C. prairea* Dewey.)

In large dense clumps, the rootstocks very short-elongate, rather slender, tough, blackish, fibrillose, the culms slender, 5-10 dm. high, 3 mm. thick at base, aphyllopodic, sharply triangular with flat sides, very rough on angles, much exceeding leaves, brown or dark-brown at base; leaves with well-developed blades usually 3 or 4 to a fertile culm, on lower fourth, somewhat bunched, the blades light-green, flat with revolute margins, usually 1-3 dm. long, 2-3 mm. wide, much roughened, the sheaths tight, thin and conspicuously red-dotted ventrally, conspicuously prolonged at mouth beyond base of blade, convex and strongly copper-tinged at mouth, the ligule very short; head somewhat decompound, 4-8 cm. long, 1-2 cm. thick, the lower 3-5 branches separated, the upper aggregated, the individual spikes closely aggregated, androgynous, ovoid, 3-6 mm. long, 2.5-4 mm. wide, the staminate flowers inconspicuous, the perigynia 5-10, appressed or ascending, in several rows; lowest bract setaceous, short, the others scale-like; scales narrowly ovate-triangular, acute or short-acuminate or cuspidate, light-reddish-brown, with light-colored 1-3-nerved center, and conspicuous hyaline margins, about as wide as or wider than and nearly as long as and concealing perigynia, often falling with it; perigynia plano-convex or slightly unequally biconvex, 2.5-3 mm. long, 1.25 mm. wide, dark-straw-colored or brownish, dull, the body ovate, thick, sharp-edged to base and serrulate above middle, few-nerved dorsally, obscurely few-nerved towards base ventrally, thick-walled, short-stipitate, truncate at base, tapering into a strongly serrulate beak of somewhat less than its own length, green or in age whitish, obliquely cut dorsally, shallowly bidentate, reddish-tipped with suture hyaline-margined; achenes lenticular, stipitate, apiculate, filling perigynia, suborbicular, scarcely 1 mm. wide; style very short, straight, slender, slightly enlarged at base, jointed with achene; stigmas two, slender, reddish-brown, shorter than to about equaling perigynium.

TYPE LOCALITY: "Abundant in the prairies of Michigan and sparingly found in N. England and N. Y."

DISTRIBUTION: Wet meadows in calcareous districts, Quebec to Saskatchewan, and southward to New Jersey, Indiana, Iowa, and Nebraska. (Specimens examined from Quebec, Ontario, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania; Ohio, Indiana, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Manitoba, North Dakota, Nebraska, Saskatchewan.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 398; Rob. & Fern. *Man.* f. 410.

NOTE: The name of this species was first given as "*prarisa*," but it was corrected to "*prairea*" in the second edition of Wood's Class-Book.

69. *Carex Cusickii* Mackenzie; Piper & Beattie, Fl. N. W. Coast 72. 1915.

- "*Carex paniculata* L." W. Boott, in S. Wats. *Bot. Calif.* 2: 232, in part. 1880.
Carex teretiuscula var. *ampla* L. H. Bailey, *Mem. Torrey Club* 1: 53. 1889. (Type from eastern Oregon.)
Carex arizonensis C. B. Clarke, *Kew Bull. Add. Ser.* 8: 68, as to Canadian specimen only. 1908.
Carex diandra var. *ampla* "L. H. Bailey" Kükenth. in Engler, *Pflanzenreich* 4²⁰: 177. 1909. (Based on *C. teretiuscula* var. *ampla* L. H. Bailey.)

In large clumps, rather densely caespitose, the culms 7-12 dm. high, stout, 4-6 mm. thick at base, aphyllopodic, sharply triangular, the sides flat, roughened above, much exceeding the leaves, brown at base; leaves with well-developed blades usually 3 or 4 to a fertile culm, on lower fourth, somewhat bunched, the blades flat with revolute margins, usually 1-3 dm. long, 2.5-6 mm. wide, much roughened towards apex, the sheaths somewhat septate-nodulose dorsally, conspicuously red-dotted and not cross-rugulose ventrally or more or less so, concave and copper-colored at mouth, and only moderately prolonged beyond base of blade, the ligule longer than wide; lower bladeless sheaths numerous and conspicuous; head decompound, 4-8 cm. long, 1-2 cm. thick, the lower 1-3 branches more or less separate, the upper aggregated, the individual spikes closely aggregated, androgynous, ovoid, 3-6 mm. long, 2.5-4 mm. wide, the staminate flowers inconspicuous, the perigynia 5-10, in several ranks, spreading at maturity; lowest bract setaceous, short and inconspicuous, the others scale-like; scales ovate-

triangular, acute or short-acuminate, chestnut-brown with hyaline margins and lighter midrib, about as wide as and from slightly shorter to slightly longer than and nearly concealing perigynia, often falling with them; perigynia very thick, more or less strongly biconvex, 3-4 mm. long, 1.5 mm. wide, brownish-black at maturity, coriaceous, shining, the body ovoid-orbicular, few-nerved dorsally, obscurely nerved towards base ventrally, short-stipitate, strongly truncate at base, sharp-edged to base, serrate above, abruptly narrowed into a setulose-serrulate beak of less than its own length, green or whitish in age, shallowly bidentate, obliquely cleft dorsally; achenes lenticular, stipitate, apiculate, filling perigynia, suborbicular, 1.25 mm. wide; style short, slender, slightly enlarged at base, jointed with achene; stigmas 2, slender, light-reddish-brown, short.

TYPE LOCALITY (of *C. teretiuscula* var. *ampla*, on which *C. cusickii* is based): "Quaking bogs, head of Burnt River, E. Oregon, *Cusick 1331*; near Salem, *Howell*."

DISTRIBUTION: Wet meadows, Montana to Vancouver, and southward to Utah and San Francisco Bay, California; rare in California and there confined to the Coast Ranges. (Specimens examined from Montana, Idaho, Utah, California, Oregon, Washington, British Columbia.)

ILLUSTRATIONS: *Erythea* 8: 31. f. 10; Jepson, Fl. Calif. 1: f. 30, j-l; Jepson, Man. Fl. Pl. Calif. f. 168; Abrams, Ill. Fl. Pacif. St. f. 703.

15. *Vulpinae* Kunth, Enum. Pl. 2: 383, in part, especially as to type species. 1837; Tuckerm. Enum. Caric. 9. 1843; Carey, in A. Gray, Man. 540. 1848; L. H. Bailey, Proc. Am. Acad. 22: 134. 1886. VULPINOIDEAE Kunth, Enum. Pl. 2: 381, in part. 1837. MURICATAE Fries, Summa Veg. Scand. 73, in part. 1845. STENORHYNCHAE Holm, Am. Jour. Sci. IV. 16: 454. 1903; Kükenth. in Engler, Pflanzenreich 4²⁰: 165. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 123. 1917; Mackenzie, *Erythea* 8: 32. 1922. ACANTHOPHORAE Holm, Am. Jour. Sci. IV. 16: 454, in part. 1903. Species are referred to the genus *Loncooperis* Raf. (Good Book 27. 1840).

Densely caespitose, or the rootstocks more or less elongate; culms triangular or concave-triangular, frequently weakly cellular and flattened in drying; sheaths usually either transversely rugulose or red-dotted ventrally; spikes few to many, androgynous or pistillate, but never gynaeandrous, forming a spicate or capitate head, the lower from simple to compound; bracts not strongly developed; perigynia plano-convex, yellowish or yellowish-brown, appressed-ascending to spreading, not very thick-walled, but strongly spongy at base, closely enveloping the achene in the upper part of the body, stipitate, usually strongly many-nerved dorsally, strongly ribbed to nerveless ventrally, the margins nearly obsolete or very narrow on lower half, conspicuously beaked, the beak sutured dorsally, usually serrulate, bidentate; achenes lenticular, apiculate, jointed with the style, the latter more or less thickened at base; stigmas two.

Species of swampy places, of which eleven are widely distributed in North America, especially in the temperate portions. Four species are recorded from southern Africa and the highlands of eastern Africa. One species is widely distributed in Europe and western Asia, and extends into northern Africa. One species occurs in southern Australia. No South American species are known.

Perigynium tapering into the beak, the body strongly nerved ventrally or perigynium very long-beaked.

Perigynium 3-4 mm. long, the beak much shorter than the body; scales dark-tinged.

Head capitate, simple, 8-30 mm. long; scales brownish-black or reddish-brown.

Leaves all clustered near base; sheaths not green-and-white-mottled dorsally; culms slender; perigynia little spongy at base.

70. *C. Jonesii*.

Leaves not all clustered near base; sheaths green-and-white-mottled dorsally; culms thickish at base, strongly aphyll-podic.

Sheaths cross-rugulose ventrally, usually convex and prolonged at mouth; perigynia little spongy at base, very shallowly bidentate; stigmas short; culms not weak.

71. *C. neurophora*.

Sheaths not cross-rugulose ventrally, concave or truncate and not prolonged at mouth; perigynia strongly spongy at base, sharply bidentate; stigmas long; culms weak.

72. *C. nervina*.

Head not capitate, often compound, 2-7 cm. long; scales light-brownish or chestnut-brown; culms sharply triangular.

- Leaf-sheaths not green-and-white-mottled dorsally; culms 2-4 dm. high; leaf-blades 2-3 mm. wide. 73. *C. chihuahuensis*.
- Leaf-sheaths conspicuously green-and-white-mottled dorsally; culms 3.5-8 dm. high; leaf-blades 2.5-5 mm. wide. 74. *C. oklahomensis*.
- Perigynium 4-7 mm. long, the beak as long as or longer than the body.
- Perigynium 4-6 mm. long, strongly nerved ventrally, rounded at base, membranaceous, the beak 1-2 times the length of the body; sheaths not purplish-dotted ventrally; achenes ovate-orbicular.
- Sheaths cross-rugulose ventrally, easily broken, prolonged upward at mouth beyond base of blade, not thickened at mouth.
- Leaf-blades 4-8 mm. wide; perigynia 4-5 mm. long, the beak about the length of the body. 75. *C. stipata*.
- Leaf-blades 8-15 mm. wide; perigynia 5-6 mm. long, the beak longer than the body. 76. *C. uberior*.
- Sheaths not cross-rugulose ventrally or only obscurely so, not easily broken, not prolonged upward at mouth beyond base of blade, thickened at mouth. 77. *C. laevicarinata*.
- Perigynium 6-7 mm. long, obscurely nerved ventrally, with a disk-like subcoriaceous base, the beak 2-3 times the length of the body; sheaths conspicuously purplish-dotted ventrally; achenes strongly ovate, tapering above. 78. *C. Crus-corvi*.
- Perigynium contracted into a beak not longer than the body, the body nerveless ventrally, except sometimes at base.
- Perigynium faintly nerved dorsally, with beak about length of body; sheaths not cross-rugulose ventrally. 79. *C. alopecoidea*.
- Perigynium strongly nerved dorsally, with beak about half length of body; sheaths cross-rugulose ventrally. 80. *C. conjuncta*.

70. *Carex Jonesii* L. H. Bailey, Mem. Torrey Club 1: 16. 1889.

"*Carex Bonplandii* var. *angustifolia* Boott" W. Boott, in S. Wats. Bot. Calif. 2: 233, in part. 1880.
 "*Carex illota* L. H. Bailey" Parish, Bull. So. Calif. Acad. 5: 52. 1906.
Carex nervina var. *Jonesii* Kükenth. in Engler, Pflanzenreich 4²⁰: 167. 1909. (Based on *C. Jonesii* L. H. Bailey.)

Cespitose, the rootstocks slender, elongate, dark-brown, more or less fibrillose, the culms slender but strict, 2 mm. thick at base, 2-6 dm. high, exceeding the leaves, sharply triangular above with flat sides, roughened on the angles beneath the head, inconspicuously aphyllopodic, light-brownish-tinged at base; leaves with well-developed blades about 3 to a culm, bunched above the base, the blades flat, light-green, rather stiff, ascending, usually 5-15 cm. long, 1.5-2.5 mm. wide, slightly roughened towards the apex, the sheaths tight, not green-and-white-mottled dorsally, very thin ventrally and truncate at mouth, not cross-rugulose and not thickened at mouth, the ligule much wider than long; spikes 4-8, closely capitate in an orbicular or short-oblong, dense, erect head 8-18 mm. long and 8-10 mm. thick, none of the spikes separate and bracts not present; staminate flowers apical, inconspicuous, the 5-10 ascending or at length spreading perigynia below; scales ovate-triangular, brownish or blackish with inconspicuous green midrib and hyaline margins, acute, about the width of but somewhat shorter than the mature perigynia, which at maturity are conspicuous in the spikes; perigynia plano-convex, ovate-lanceolate, 3-4 mm. long, 1.25-1.5 mm. wide, somewhat spongy at base, membranaceous, straw-colored or brownish-tinged, flat ventrally and rounded dorsally, substipitate, truncate at base, widest immediately above the base, sharp-edged to base, and slightly margined above, strongly striate on both sides, tapering into a nearly smooth or slightly serrulate beak about one third the length of the body, hyaline at orifice, bidentate, the teeth very short, appressed, triangular, dark-chestnut-tinged; achenes lenticular, minute, 1.25 mm. long, 0.75 mm. wide, strongly apiculate, substipitate, broadly oval; style slender, straight, jointed with achene, scarcely enlarged at base; stigmas two, light-colored, short, slender, quickly breaking off.

TYPE LOCALITY: Soda Springs, Nevada County, California (*M. E. Jones*.)

DISTRIBUTION: High mountains, Montana to Wyoming, and westward to Washington and California, where confined to the Sierra Nevada and San Bernardino mountains. (Specimens examined from Wyoming, Washington, Oregon, California.)

ILLUSTRATIONS: *Erythra* 8: 32. f. 11; Jepson, Man. Fl. Pl. Calif. f. 169; Abrams, Ill. Fl. Pacif. St. f. 704.

71. *Carex neurophora* Mackenzie, in Abrams, Ill. Fl. Pacif. St.
1: 298, f. 706. 1923.

"*Carex nervina* L. H. Bailey" Mackenzie, in Rydb. Fl. Rocky Mts. 123, in part. 1917.

Cespitose, the rootstocks slightly elongate, black, fibrillose, rather slender but tough, the culms 3-7 dm. high, strongly aphyllodid, stout (3.5 mm. thick) and brownish-tinged at base, slender above, strictly erect, sharply triangular with concave sides, smooth or roughened above, exceeding leaves; leaves with well-developed blades about 4 to a culm, clustered on the lower fourth, the lower 4 or 5 with much reduced blades but with conspicuous sheaths, the sheaths tight, conspicuously green-and-white-mottled dorsally, cross-rugulose, thickish and convex and short-prolonged at mouth, the blades flat, light-green, not stiff, up to 4 dm. long, about 3.5 mm. wide, the ligule almost obsolete; spikes 5-10, androgynous, very closely aggregated into a dense ovoid or oblong head 1.5-2.5 cm. long, 8-12 mm. thick, the individual spikes scarcely distinguishable, consisting of a few very inconspicuous apical staminate flowers and several to many at length widely spreading perigynia; bracts not developed; scales ovate, obtuse or acute, thin, brown with slender green midvein and without hyaline margins, nearly width but only about half length of perigynia; perigynia plano-convex, lanceolate, 3.5-4 mm. long, 1.5 mm. wide, light-brown, or deep-chestnut-tinged above, membranaceous, finely several- to many-nerved on both sides, not margined below, but sharp-edged above, short-stipitate, little spongy and rounded at base, tapering into a sparingly minutely serrulate beak half length of body, dark-tipped, shallowly bidentate, the teeth very short, triangular; achenes lenticular, ovoid-quadrate, 1.5 mm. long, 1 mm. wide, apiculate, short-stipitate; style short, slender, thickened at very base, jointed with achene; stigmas two, light-colored, short, slender, quickly breaking off.

TYPE LOCALITY: Stevens Pass, Cascade Mountains, Washington (*Sandberg & Leiberger* 773).

DISTRIBUTION: High mountains, from Wyoming and Montana to Washington and Oregon. (Specimens examined from Wyoming, Montana, Idaho, Washington, Oregon.)

ILLUSTRATION: Abrams, Ill. Fl. Pacif. St. f. 706.

72. *Carex nervina* L. H. Bailey, Bot. Gaz. 10: 203.
pl. 3, f. 6-8. 1885.

Cespitose, the rootstocks short-elongate, black, fibrillose, rather slender but tough, the culms stout at base, 3.5 mm. thick, strongly aphyllodid, 3-9 dm. high, flattened and striate, weak, sharply triangular, concave on the sides, slightly flattened in drying, about equaling or exceeding the leaves, roughened on the angles above, brownish-tinged at base; leaves with well-developed blades about 6 to a fertile culm, on lower fourth, but not bunched, the blades very flat, flaccid, light-green, 1-3 dm. long, 3.5-5 mm. wide, not long-attenuate, roughened towards apex, somewhat nodulose at base, the sheaths conspicuously green-and-white-mottled dorsally, tight and not cross-rugulose ventrally, thickened and truncate or concave at mouth, not prolonged upward, the ligule nearly as long as wide, brown-margined; inflorescence consisting of 5-10 scarcely distinguishable androgynous spikes, densely aggregated into an ovoid or oblong head 1.5-3 cm. long, 8-10 mm. thick, the individual spikes suborbicular or ovoid, the larger 8 mm. long, 6 mm. wide, and containing some 6-12 ascending or at length spreading perigynia below and a few rather inconspicuous staminate flowers above; lower bract more or less developed, 5-20 mm. long, cuspidate, the center green, the margins brownish-hyaline; scales ovate, acute, brown with green center and narrow hyaline margins, about width of but shorter than perigynia; perigynia plano-convex, lanceolate or ovate-lanceolate, 3.5-4 mm. long, 1.5 mm. wide, light-brown or deep-chestnut-tinged above, membranaceous, strongly many-nerved on both faces, sharp-margined above but not wing-margined, the lower one fourth strongly spongy, substipitate, rounded at base, tapering into a smooth or subserrulate beak half length of body, sharply bidentate, the teeth slender, erect, short but conspicuous; achenes lenticular, narrowly quadrate-orbicular, 1.75 mm. long, 1.25 mm. wide, short-apiculate, substipitate; style slender, short, enlarged at base, jointed with achene; stigmas two, slender, light-colored, elongate.

TYPE LOCALITY: Summit Camp, California (Kellogg, July 10, 1870).

DISTRIBUTION: Mountains of southern Oregon and California, where found in the Sierra Nevada as far south as Tulare County. (Specimens examined showing range as given.)

ILLUSTRATIONS: Bot. Gaz. 10: pl. 3, f. 6, 7, 8; Erythraea 8: f. 12; Jepson, Fl. Calif. 1: f. 31 a-c; Jepson, Man. Fl. Pl. Calif. f. 170; Abrams, Ill. Fl. Pacif. St. f. 705.

NOTE: The more extended easterly range given this species by me in Rydberg's Rocky Mountain flora is based on specimens of *Carex neurophora* Mackenzie.

73. *Carex chihuahuensis* Mackenzie, Bull. Torrey Club

35: 265. 1908.

Loosely caespitose, from rather slender, long-creeping, tough, black, fibrillose rootstocks, the culms 2-4 dm. high, slender but strict, sharply triangular with flat sides, slightly roughened above, exceeding the leaves, dark-brown or blackish at base, aphyllopodic, the dried-up leaves usually inconspicuous; leaves with well-developed blades 4-8 to a culm, clustered on the lower fourth, the sheaths much overlapping, the blades flat or channeled, thick, ascending or more or less spreading, 5-15 cm. long, 2-3 mm. wide, very rough towards the apex, the sheaths tight, not green-and-white-mottled nor septate-nodulose dorsally nor cross-rugulose ventrally, sparingly red-dotted towards mouth, thin and truncate and scarcely thickened at mouth, the ligule very short, much wider than long; inflorescence consisting of numerous scarcely distinguishable spikes, densely aggregated (or the lower clusters separate) into a simple or somewhat compound ovoid or oblong head 2-7 cm. long, 7-15 mm. thick, the individual spikes with 4-10 ascending or more or less spreading perigynia below and the inconspicuous staminate flowers above; bracts scale-like, the lower prolonged into cusps, shorter than the head; scales oblong-ovate, obtuse (or lower acute), brown or light-brownish with lighter 3-nerved center and white-hyaline margins, about the width of but shorter than the perigynia; perigynia plano-convex, narrowly ovate, straw-colored or yellowish-brown-tinged, membranaceous but thicker and rather corky at base, 3.5 mm. long, 1.5 mm. wide, sharp-margined nearly to base, serrulate above middle, conspicuously several- to many-nerved dorsally, less conspicuously several- to many-nerved on lower half ventrally, short-stipitate, round-truncate at base (the young perigynia rounded), tapering at apex into a serrulate beak one fourth to one third the length of the whole (or longer in the young perigynia), obliquely cleft dorsally, deeply bidentate, the teeth subulate-triangular, appressed, chestnut-tinged, the dorsal suture and false ventral suture conspicuous; achenes lenticular, truncate short-apiculate, substipitate, oval, 1.5 mm. long, 1 mm. wide, filling upper part of perigynium-body; style slender, short, jointed with achene, enlarged at base; stigmas two, light-reddish-brown, slender, elongate.

TYPE LOCALITY: Puerta de St. Diego, Chihuahua (Hartman 620).

DISTRIBUTION: Mountains of Chihuahua, Mexico. (Specimens examined from Chihuahua.)

74. *Carex oklahomensis* Mackenzie, Torrey 14: 126. 1914.

Cespitose, from short-prolonged, stout, tough, dark-colored, fibrillose rootstocks, the culms 3.5-8 dm. high, 4-6 mm. thick at base, 1.5 mm. thick beneath head, slender but stiff, sharply triangular with flat sides, rough above, not wing-angled nor strongly flattened in drying, exceeding leaves, aphyllopodic, brownish at base; leaves with well-developed blades 3 or 4 to a culm, the blades flat, thickish, up to 4 dm. long, 2.5-5 mm. wide, serrulate on margins towards apex as well as roughened on veins, the sheaths tight, strongly green-and-white-mottled dorsally, but not conspicuously septate-nodulose, ventrally white-hyaline, not red-dotted nor cross-rugulose, thin, and soon ruptured, exceeding base of blade, the ligule wider than long, dark-margined; head 4-7 cm. long, about 15 mm. thick, oblong-cylindric, with numerous spikes, continuous or somewhat interrupted below, the basal branches compound, appressed, sessile or short-peduncled, the upper simple, closely aggregated and scarcely distinguishable; spikes androgynous, subglobose, 5-8 mm. long, nearly as wide, with about 6-12 appressed-ascending perigynia and inconspicuous staminate flowers; lower one or two bracts prolonged, setaceous, the others scale-like; scales ovate or lance-ovate, as wide as but shorter than perigynia, chestnut-brown-tinged with hyaline margins and 3-nerved center, the prominent midvein excurrent as a cusp; perigynia plano-convex, lance-ovate, 4-5 mm. long, 1.75 mm. wide, thick, the walls thin, spongy and subtergite at base, green or in age green-

ish-straw-colored but not brownish, dorsally conspicuously 7-10-nerved, ventrally less conspicuously fewer-nerved, sharp-margined nearly to the truncate subcordate base, serrulate to the middle, stipitate, tapering into a serrulate beak much shorter than body, at apex reddish-brown-tinged, and with a dorsal suture, deeply bidentate, the teeth subulate, appressed; achenes lenticular, yellow, ovate-orbicular, 1.75 mm. long, 1.5 wide, apiculate, substipitate; style, short, slender, thickened at base, jointed with achene; stigmas two, reddish-brown, slender, short.

TYPE LOCALITY: Catale, Oklahoma (*Bush 993*).

DISTRIBUTION: Wet places in calcareous districts, southwestern Missouri, northwestern Arkansas, eastern Oklahoma, and eastern Texas. (Specimens examined showing range as given.)

75. *Carex stipata* Muhl.; Willd. Sp. Pl. 4: 233. 1805.

—*Carex Boscii* Willd.; Spreng, Syst. 3: 812. 1826. (Type from North Carolina.)

—“*Carex vulpinoidea* Michx.” Torr. Ann. Lyc. N. Y. 3: 390. 1836.

—*Lonicoperis stipata* Raf. Good Book 27. 1840. (Based on *Carex stipata* Muhl.)

Carex stipata var. *crassicutra* Peck; Howe, Ann. Rep. N. Y. State Mus. 48: 128. 1897. (Type from New York.)

Carex stipata var. *subsecuta* Peck; Howe, Ann. Rep. N. Y. State Mus. 48: 128. 1897. (Type from New York.)

Densely caespitose, the rootstocks short-prolonged, stout, tough, dark, fibrillose, the culms stout, 4-6 mm. thick at base, erect but weak and flattened in drying, 3-12 dm. high, from shorter than to exceeding the leaves, triangular with concave sides, the angles slightly winged and strongly serrulate especially above, light-brown at base; leaves with well-developed blades 3-6 to a culm, the blades erect-ascending, green, flaccid, flat, 1.5-5 dm. long, 4-8 mm. wide, the upper part serrulate on the margins and roughened below, the sheaths septate-nodulose dorsally, and thin, cross-rugulose, not thickened at mouth and easily breaking ventrally, prolonged above base of blade, the ligule very conspicuous, longer than wide, colored on the margin; spikes numerous, yellowish-brown, in a compound, terminal, oblong-linear to ovoid head 3-10 cm. long, 1-2.5 cm. thick, the lower branches often somewhat separate; separate spikes hardly distinguishable, the staminate apical flowers inconspicuous, with the usually 4-10 ascending or spreading perigynia beneath; lowest bract bristle-form, 5 cm. long or less, often wanting, the others, if present, short; scales ovate-triangular, brownish-hyaline with 3-nerved green center, acuminate or cuspidate, narrower than and about the length of the bodies of the perigynia; perigynia plano-convex, lanceolate, thick, 4-5 mm. long, 1.5 mm. wide, yellow at maturity, membranaceous, sharp-edged to base, strongly several-nerved dorsally, strongly few-nerved ventrally, substipitate, spongy and truncate-rounded at base, tapering into a serrulate beak about the length of the body, dorsally cleft, bidentate, the teeth triangular, appressed, reddish-brown-tinged; achenes lenticular, short-apiculate, substipitate, plump, ovate-orbicular, 1.5-2 mm. long, 1.25-1.75 mm. wide; style slender, straight, strongly enlarged at base, jointed with achene; stigmas two, 1.5-2 mm. long, slender, light-reddish-brown.

TYPE LOCALITY: “Habitat in Pennsylvania.”

DISTRIBUTION: Swamps and wet meadows, Newfoundland to southern Alaska, and southward to North Carolina, Tennessee, Kansas, New Mexico, and central California; one of the most widely distributed of the American species of *Carex*; also in Japan. (Specimens examined from Newfoundland, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, Tennessee, Ontario, Ohio, Indiana, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota, Manitoba, Alberta, Saskatchewan, Wyoming, Colorado, New Mexico, Montana, Idaho, Utah, California, Oregon, Washington, British Columbia, southern Alaska.)

ILLUSTRATIONS: Schkuhr, Riedgr. *pl. Ithh.* f. 132; Engler, Pflanzenreich 4th: 169. f. 27. II-L; Britt. & Brown, Ill. Fl. f. 823; ed. 2. f. 900; Rob. & Fern. Man. f. 412; Rep. N. J. Mus. 1910: *pl. 21*, f. 1; *Erythra* 8: f. 13; Jepson, Fl. Calif. 1: f. 31, *d-f*; Jepson, Man. Fl. Pl. Calif. f. 171; Abrams, Ill. Fl. Pacif. St. f. 707; Am. Jour. Sci. IV. 8: 106. f. 1; 107. f. 2-5; 109. f. 6, 7.

76. *Carex uberior* (C. Mohr) Mackenzie.

“*Carex stipata* Muhl.” Chapm. Fl. S. U. S. 533. 1860.

Carex stipata var. *maxima* Chapm.; Boott, Ill. Carex 122. *pl. 391*. 1862. (Type from Florida.) Not *C. maxima* Scop. 1772.

Carex stipata var. *uberior* C. Mohr, Contr. U. S. Nat. Herb. 6: 419. 1901. (Type from Mobile County, Alabama.)

Cespitose, the rootstocks very short, dark-colored, fibrillose, the culms 4-9 dm. high, stout (6-12 mm. thick at base) but weak, sharply triangular with concave sides, much flattened in drying, very rough above, exceeding or shorter than the leaves, light-brown at base and clothed with the few short-bladed leaves of the previous year; leaves of the year 4-6 to a culm, on lower third, not bunched, the blades yellowish-green, thin, flat, usually 1-3.5 dm. long, 8-15 mm. wide, roughened towards apex, the sheaths loose, conspicuously septate-nodulose dorsally, thin and easily broken and conspicuously cross-rugulose ventrally, convex and short-prolonged beyond base of blade at mouth, the ligule conspicuous, longer than wide; head decompound, 4-10 cm. long, 2-4 cm. thick, the clusters all densely aggregated or the lower approximate, the spikes numerous, androgynous, scarcely distinguishable, the staminate flowers very inconspicuous, the perigynia several to many, ascending or at maturity spreading, the beaks conspicuous; lower bracts setaceous, usually not conspicuous, the upper scale-like; scales lanceolate, light-yellowish-brown with hyaline margins and 3-nerved green center, cuspidate or awned, narrower and much shorter than perigynia; perigynia plano-convex, lanceolate, 5-6 mm. long, 2 mm. wide, membranaceous but spongiose at base, yellowish-green or at maturity dull-brownish-green or straw-colored, slenderly many-nerved on both sides, sharp-edged to base, serrulate at base of beak, stipitate, truncate-cordate at base, tapering into a flat beak more than length of body, serrulate, reddish-brown-tipped, obliquely cleft dorsally, bidentate; achenes lenticular, broadly ovate, yellowish-brown, shining, substipitate, apiculate, 2 mm. long, 1.5 mm. wide; style slender, straight, enlarged at base, jointed with achene; stigmas two, light-reddish-brown, very short.

TYPE LOCALITY (of *C. stipata* var. *uberior* Mohr, on which *C. uberior* is based): Mobile County, Alabama (Mohr).

DISTRIBUTION: Deep swamps on the coastal plain and the southern Mississippi valley, Florida to Texas, and northward to southern New Jersey and Pennsylvania and in the Mississippi valley to Missouri and Kentucky. (Specimens examined from New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Alabama, Florida, Missouri, Kentucky.)

ILLUSTRATIONS: Boott, Ill. *Carex* 122. pl. 390 (as *C. stipata*), pl. 391.

77. *Carex laevivaginata* (Kükenth.) Mackenzie, in Britt. & Brown, Ill. Fl. ed. 2. 1: 371. 1913.

Carex stipata var. *laevivaginata* Kükenth. in Engler, Pflanzenreich 4²⁰: 172. 1909. (Type from Biltmore, North Carolina.)

Densely cespitose, the rootstocks short-prolonged, stout, tough, dark, fibrillose, the culms aphyllopodic, stoutish, 3-5 mm. thick at base, 3-8 dm. high, shorter than to somewhat exceeding the leaves, sharply triangular with concave sides, and slightly wing-angled, weak and flattened in drying, very rough above, light-brown at base; leaves with well-developed blades 3-6 to a culm, not bunched, the blades erect-ascending, light-green, flaccid, flat, usually 1-3 dm. long, 3-6 mm. wide, roughened on margins and towards tip, the sheaths stipitate-nodulose dorsally and not at all or only obscurely transversely rugulose ventrally, strongly thickened at mouth, not prolonged beyond base of blade and not breaking, the ligule conspicuous, longer than wide, colored on the margin; spikes numerous, yellowish-green, in a somewhat compound linear-oblong or oblong head 2.5-6 cm. long, 1-1.5 cm. thick, the lower branches little separate; individual spikes poorly defined, androgynous, the perigynia 4-10, ascending or spreading; bracts bristle-form and inconspicuous or the upper scale-like; scales triangular-lanceolate, hyaline with 3-nerved green center, awned, narrower than and about length of bodies of perigynia; perigynia plano-convex, lanceolate, thick, 4.5-5 mm. long, 1.5-2 mm. wide, greenish or yellowish at maturity, membranaceous, strongly nerved on both sides, sharp-edged to base, abruptly slender-stipitate, spongy and truncate-rounded at base, tapering into a serrulate beak 1-2 times length of the body, dorsally cleft, bidentate, the teeth subulate-triangular, dark-tinged, appressed; achenes lenticular, small, strongly apiculate and substipitate, the body ovate-orbicular, 1.5-1.75 mm. long, 1.25 mm. wide; style slender, straight, jointed with achene, slightly enlarged at base; stigmas two, slender, reddish-brown, 1.5-2 mm. long.

TYPE LOCALITY (of *C. stipata* var. *laevivaginata* Kükenth. on which *C. laevivaginata* is based): Biltmore, North Carolina (Biltmore no. 262a).

DISTRIBUTION: Swampy woods, Massachusetts to Minnesota, and southward to Florida and Missouri. (Specimens examined from Massachusetts, Rhode Island, Connecticut, New York, New

Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee, Kentucky, Ohio, Indiana, Illinois, Minnesota, Missouri.)

NOTE: First fully described and contrasted with *C. stipata* in Small & Carter's Flora of Lancaster County, Pennsylvania (54. 1913); see also Fernald (Rhodora 17: 231. 1915).

78. *Carex Crus-corvi* Shuttlw.; Kunze, Suppl. Riedgr.

128. 1842; *pl.* 32. 1844.

Carex Crus-corvi f. *orthoclados* Kunze, Suppl. Riedgr. 166, *pl.* 42. 1844. (Type from Louisiana.)

Carex Crus-corvi f. *orthostachys* Kunze, Suppl. Riedgr. 167. 1844. (Type from Illinois.)

Carex ornithorhyncha Engelm.; Kunze, Suppl. Riedgr. 167, as synonym. 1844.

Carex Hystrix A. Gray; Kunze, Suppl. Riedgr. 167, as synonym. 1844.

Carex sicatiformis Boott, Bost. Jour. Nat. Hist. 5: 113. 1845. (Type from New Orleans, Louisiana.)

Carex Halei Dewey, Am. Jour. Sci. II. 2: 248. 1846. (Type from Louisiana.)

Cespitose, the rootstocks short-prolonged, tough, stout, black, fibrillose, the culms very stout, 8-12 mm. thick at base, erect, 5-9 dm. high, light-brown at base, shorter than the leaves, sharply triangular with concave sides, the angles strongly serrulate and slightly winged; leaves with well-developed blades 5-8 to a culm, the blades erect-ascending, flat, light-green, very elongate, 3-7 dm. long, 5-10 mm. wide, serrulate on margins and roughened towards the apex, the sheaths septate-nodulose dorsally, and ventrally thin, strongly purplish-dotted, not cross-rugulose and not thickened nor prolonged beyond base of blade at mouth, the ligule conspicuous, dark-margined, wider than long; spikes very numerous, in a compound terminal head 7-17 cm. long, 1.5-5 cm. thick, the lower branches often somewhat separate; separate spikes hardly distinguishable, the staminate flowers apical, inconspicuous, with the several to many ascending or spreading perigynia beneath; lower bract usually present, bristleform, 8 cm. long or less, sometimes wanting, the others, if present, short; scales lanceolate-triangular, thin, greenish or light-brownish-tinged, or soon hyaline, with 3-nerved green center, acuminate to aristate, 3-5 mm. long and narrower than the perigynia; perigynia plano-convex, 6-7 mm. long, yellowish or brownish in age, the body narrowly ovoid, the lower third turgid, disk-like, very spongy and subcoriaceous, 2.5-3 mm. long, 1-1.25 mm. wide, strongly nerved dorsally, obscurely nerved and sharp-margined ventrally, short-stipitate, truncate-cordate at base, and tapering into a serrulate slender beak 2-3 times length of body, dorsally cleft, deeply bidentate, the teeth subulate, slightly spreading; achenes lenticular, strongly ovate, rounded at the short-stipitate base, tapering above, slightly apiculate, 1.75 mm. long, 1 mm. wide; style slender, straight, somewhat enlarged at base, jointed with achene; stigmas two, light-reddish-brown, slender, short.

TYPE LOCALITY: New Orleans, Louisiana (*Drummond 432*).

DISTRIBUTION: Swamps, Florida to Texas, and northward in the Mississippi Valley to southern Michigan, southern Minnesota, and eastern Nebraska. (Specimens examined from Michigan, Wisconsin, Indiana, Illinois, Minnesota, Iowa, Kentucky, Tennessee, Missouri, Kansas, Oklahoma, Arkansas, Texas, Louisiana, Mississippi, Georgia, Florida.)

ILLUSTRATIONS: Kunze, Suppl. Riedgr. *f.* 32, 42; Britt. & Brown, *Ill. Fl. f.* 824; ed. 2. *f.* 901; Rob. & Fern. *Man. f.* 413; Engler, *Pflanzenreich* 4th: 169. *f.* 27, M-Q; Boott, *Ill. Carex* 25. *pl.* 65.

79. *Carex alopecoidea* Tuckerm. Enum. Caric. 18. 1843.

Carex cephalophora var. *maxima* Dewey, Am. Jour. Sci. 43: 92. 1842. (Type from Penn Yan, New York.) Not *C. maxima* Scop. 1772.

Carex alopecoidea var. *sparsispicata* Dewey, Am. Jour. Sci. II. 8: 350. 1849. (Type from Washington, Michigan.)

Carex alopecoidea f. *sparsispicata* "Dewey" Kükenth. in Engler, *Pflanzenreich* 4th: 167. 1909. (Based on *C. alopecoidea* var. *sparsispicata* Dewey.)

Densely cespitose, the rootstocks very short-prolonged, stout, conspicuously black-fibrillose, the culms rather slender, 4-8 dm. high, 3-4 mm. thick at base, usually exceeded by the leaves, weak, sharply triangular with concave sides, rather strongly winged and serrulate on the angles above, flattened in drying, dark-brownish at base; lower leaves with short blades, the upper 3 or 4 with ascending, thin, flaccid, flat blades 3-4 dm. long and 2.5-5 mm. wide, roughened on the margins and towards the apex, the sheaths tight, septate-nodulose dorsally, thin ventrally and very readily breaking, purplish-dotted, not cross-rugulose, not thickened at mouth, but prolonged upward beyond base of blade, the ligule conspicuous, dark-margined, longer than wide; spikes 8-12, densely aggregated in a solitary, terminal head

2-3 cm. long, 8-10 mm. thick, the lower 3 to 5 distinguishable, bearing the few inconspicuous staminate flowers above and the 8-15 ascending or in age somewhat spreading perigynia below; bracts bristle-form, slightly enlarged at base, about 1 cm. long, not conspicuous; scales ovate, copper-colored with hyaline margins and 3-nerved green center, acuminate or cuspidate, narrower and rather shorter than the perigynia; perigynia plano-convex, ovate, 3-4 mm. long, 1.75 mm. wide, the body dull-brownish-yellow, the margins and beak greenish, membranaceous, sharp-edged to base, narrowly winged and serrulate above, stipitate, somewhat spongy and rounded-truncate at base, nerveless ventrally, rather faintly many-nerved dorsally, rather abruptly narrowed into a serrulate beak about the length of the body, bidentate, the teeth triangular, very short and reddish-brown-tinged, both sutures conspicuous; achenes lenticular, apiculate, substipitate, suborbicular, 1.5 mm. long; style slender, short, scarcely enlarged at base, jointed with achene; stigmas two, slender, reddish-brown, short.

TYPE LOCALITY: "Hab. Penn-Yan, Nov. Ebor. D. Sartwell."

DISTRIBUTION: Swampy meadows in calcareous districts, Quebec and Maine to Minnesota, and southward to northwestern New Jersey and Iowa. (Specimens examined from Quebec, Ontario, Maine, Vermont, Massachusetts, Connecticut, New York, New Jersey, Michigan, Wisconsin, Indiana, Minnesota, Illinois, Iowa.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 828; ed. 2. f. 892; Rob. & Fern. Man. f. 403; Boott, Ill. Carex 26. pl. 68.

80. *Carex conjuncta* Boott, Ill. Carex 122. pl. 392. 1862.

"*Carex vulpina* L." Carey, in A. Gray, Man. 541. 1848.

Cespitose, the rootstock lignescens, short, blackish, fibrillose, the culms stout but weak and spongy, erect or ascending, 4-8 dm. high; exceeding or shorter than the leaves, sharply triangular and narrowly winged, roughened on the margins, drying very flat and 2-3 mm. wide, light-brownish-tinged at base; leaves with well-developed blades about 3-6 to a culm, the blades erect-ascending, flat, flaccid, 1.5-3.5 dm. long, 3-10 mm. wide, serrulate on the margins and roughened below towards the apex, the sheaths more or less septate-nodulose dorsally, very fragile, quickly breaking, cross-rugulose and red-dotted ventrally, convex at the mouth and exceeding base of blade; spikes 7-15, in a more or less compound slender terminal head 1.5-6 cm. long, 8-15 mm. thick, the lower branches often somewhat separate, the upper spikes hardly distinguishable, the staminate flowers apical, inconspicuous, the several to many ascending or somewhat spreading perigynia basal; lower bract bristle-form, 4 cm. long or less, usually short, the others, if present, short; scales ovate-triangular, hyaline with a green midrib, acuminate to cuspidate, narrower than and about the length of the bodies of the perigynia; perigynia plano-convex, ovate, 3.5-5 mm. long, 1.6-2 mm. wide, greenish or yellowish-green, membranaceous, sharp-edged to base, 4-5-nerved dorsally, several-nerved at base and somewhat spongy ventrally, short-stipitate, round-truncate at base, tapering or somewhat abruptly contracted into a serrulate beak about half length of the body, shallowly bidentate, the sutures conspicuous and teeth short; achenes lenticular, suborbicular, 1.5 mm. long, short-stipitate, apiculate; style slender, straight, jointed with achene, slightly thickened at base; stigmas two, slender, reddish-brown, rather short.

TYPE LOCALITY: "Hab. In America septentrionali. New York, Torrey. Kentucky, Short ("*C. stipata*"). Ohio, Sullivan. Illinois, Mead." Sullivan's specimens from Columbus, Ohio, are figured by Boott, and are taken as the type.

DISTRIBUTION: Borders of alluvial thickets, usually in calcareous districts, New York and New Jersey to the District of Columbia, and westward to South Dakota and eastern Kansas. (Specimens examined from New York, New Jersey, Pennsylvania, District of Columbia, Michigan, Ohio, Kentucky, Indiana, Illinois, Iowa, Missouri, eastern Kansas, South Dakota.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 822; ed. 2. f. 893; Rob. & Fern. Man. f. 411; Boott, Ill. Carex 122. pl. 392.

NOTE: Olney's 102 from Rhode Island, cited by Kükenthal, is undoubtedly mislabeled.

16. *Macrocephalae* Kükenth. in Engler, Pflanzenreich 4^{no}: 186. 1909. XEROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 455, in small part. 1903. By L. H. Bailey (Proc. Am. Acad. 22: 134. 1886) placed in the VULPINAE Kunth; by Pax (in E. & P. Nat. Ph. 2: 124. 1887) in the CURVULAE Tuckerm.

Rootstocks elongate, slender but tough, obliquely ascending; culms aphyllodipod; culms

spikes very many, usually pistillate or staminate, but at times androgynous, forming very dense heads 3-6 cm. long; heads usually entirely pistillate or staminate, but sometimes mixed; bracts short or frequently elongate; perigynia plano-convex or becoming slightly biconvex from the enlarging achene, strongly wing-margined and jagged-serrulate, very coriaceous, many-nerved on both sides, closely enveloping the achene in the upper part of the body, strongly beaked, the beak sutured dorsally, deeply bidentate, the teeth rigid; achenes obtusely triangular, constricted in the middle, truncate at top; style slender with slightly enlarged base, jointed with the achene; stigmas three, very long, slender.

One peculiar species in sea-coast sands of the northern Pacific in North America and Asia.

81. *Carex macrocephala* Willd.; Spreng. Syst. 3: 808. 1826.

Carex anthericoides Presl, Rel. Haenk. 1: 204. 1828. (Type from Nootka Sound.)

Carex Afzelsiana Smith; Boott, Ill. Carex 27, as synonym. 1858.

Carex macrocephala var. *bracteata* Holm, Am. Jour. Sci. IV. 10: 266. 1900. (Type from Kussiloff, Alaska.)

Carex macrocephala f. *bracteata* "Holm" Kükenth. in Engler, Pflanzenreich 4²⁰: 187. 1909. (Based on *C. macrocephala* var. *bracteata* Holm.)

Culms arising one to three together from perpendicular rootstocks arising from deep-seated horizontal and long-creeping rootstocks, the culms very strongly long-black-fibrillose at base, 1.5-3.5 dm. high, obtusely triangular, very stiff and stout, often strongly roughened above, from shorter than to considerably exceeding the leaves, brown at base and clothed with the dried-up leaves of the previous year; leaves with well-developed blades 2-5 to a culm, near the base, the blades 1-2.5 dm. long, 4-8 mm. wide, thickish, yellowish-green, somewhat channeled, flat, roughened especially below and towards the apex, the margins minutely but sharply serrulate, the sheaths truncate at mouth, the ligule very short, much wider than long; heads generally dioecious, the pistillate enormous, 4-6 cm. long, 2.5-5 cm. thick, ovoid-orbicular to oblong, composed of a great many very closely aggregated and nearly undistinguishable spikes, the spikes at anthesis narrowly ovoid, 1.5 cm. long, 6-9 mm. wide, each with several to many appressed or at maturity squarrose perigynia, the bracts somewhat enlarged at base and from short and concealed by the mature perigynia to 6 cm. long and 3 mm. wide, with serrulate margins and much exceeding the perigynia, at times as many as 20 so developed; staminate heads 4 cm. long, 1 cm. wide, composed of many very closely aggregated spikes, similar to the pistillate at anthesis, but no developed bracts seen; scales ovate or ovate-lanceolate, awned, cuspidate, or acuminate, strongly many-striate, with green center and hyaline margins and chestnut-brown between, about the width of but at maturity exceeded by perigynia; perigynia plano-convex, or slightly unequally biconvex, ovate-lanceolate, thick, 10-15 mm. long, very coriaceous, smooth, shining, brownish-yellow or soon brownish-tinged, the body ovate, 6-8 mm. long, 4-6 mm. wide, substipitate, somewhat spongy and rounded at base, strongly many-nerved on both faces, strongly wing-margined ventrally nearly to base, the margin irregularly cut and serrulate to base of beak and a short distance up the beak, the perigynia tapering into a smooth beak about length of body, very sharply bidentate, the teeth subulate, very sharp, erect; achenes obtusely triangular, thick, brownish, short-oblong, narrowed at base, truncate above, deeply constricted in the middle, 4 mm. long, 2.5 mm. wide, jointed with the slightly flexuous slender style, the style slightly enlarged at base and at length deciduous; stigmas three, very long, slender, reddish-brown.

TYPE LOCALITY: "Sibir. Pallas."

DISTRIBUTION: Sands along the sea-coast, from Oregon to Alaska, and on the Asiatic coast southward to northern China and Japan. (Specimens examined from Oregon, Washington, Vancouver, Alaska Peninsula, Cook Inlet.)

ILLUSTRATIONS: Engler, Pflanzenreich 4²⁰: 185, f. 30, J-N; Hook. Fl. Bor. Am. pl. 216; Boott, Ill. Carex 27, pl. 69; Abrams, Ill. Fl. Pacif. St. f. 691; Jour. Russe Bot. 1911: 59, f. 40; Am. Jour. Sci. 43: pl. CC, f. 96; Regel, Tent. Fl. Ussur. pl. 12, f. 8-12.

NOTE: Fernald (Rhodora 32: 9-11, 1930) treats the North American plant under the name *Carex anthericoides* Presl, as differing from the Asiatic. The Asiatic plant was very fully described by Boeckler (Linnaea 39: 66, 67, 1875) and by Kunth (Enum. Pl. 2: 428, 429, 1837), apparently from the original material. These descriptions do not agree with some of the distinctions made by Fernald, and some other distinctions made by him are not borne out by the few Asiatic specimens I have seen.

Willdenow's original description calls for two stigmas and Regel's very poor detail drawings show two stigmas. Other authors have, however, always observed three stigmas. I am leaving the question of the possible lack of identity between the American plant and the Asiatic plant open for further information.

17. *Heleonastes* Kunth, Enum. Pl. 2: 393. 1837; Tuckerm. Enum. Caric. 10 (as *Heleomastea*). 1843. CANESCENTES Fries, Summa Veg. Scand. 72. 1845; Carey, in A. Gray, Man. 543. 1848; Kükenth. in Engler, Pflanzenreich 4²⁰: 212. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 127. 1917; Mackenzie, Erythra 8: 49. 1922. ELONGATAE Kunth, Enum. Pl. 2: 402, in part. 1837; L. H. Bailey, Proc. Am. Acad. 22: 142, in part. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 226, in part. 1909. TENUIFLORAE Kunth, Enum. Pl. 2: 405. 1837; Kükenth. in Engler, Pflanzenreich 4²⁰: 222. 1909; LEPORINAE Fries, Summa Veg. Scand. 72, in part. 1845. LAGOPINAE Anderss. Cyp. Scand. 62. 1849. MONASTES Nyman, Consp. Fl. Eur. 779. 1882. LOLIACEAE Nyman, Consp. Fl. Eur. 780. 1882. BRACHYSTACHYAE Holm, Am. Jour. Sci. IV. 16: 453. 1903. NEUROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 453, in greater part. 1903. Species are referred to the HYPARRHENAE Fries by Pax (in E. & P. Nat. Pfl. 2: 124. 1887). Species are referred to the genera *Facolas* Raf., *Vignea* Beauv., and *Neskiza* Raf. by Rafinesque (Good Book 26, 27. 1840). Treated as a genus *Leptovignea*, subgenus *Crossantha*, by Börner (Abh. Nat. Ver. Bremen 21: 273. 1913).

Cespitose, but in some species with slender stolons; culms triangular; sheaths not cross-rugulose; spikes 1-10, with few to many perigynia, simple, the terminal gynaeandrous, the lateral pistillate or gynaeandrous, or rarely all androgynous; bracts usually inconspicuous; perigynia plano-convex or unequally biconvex, greenish-white-punctulate, lanceolate, ovoid, oval, or obovoid, appressed to spreading, more or less nerved on both sides, not winged nor margined, but acute-angled above, the body nearly or entirely filled by the achene, beakless to prominently beaked, the beak obliquely cut and sutured dorsally, entire to bidentate; achenes lenticular, apiculate, jointed with the slender style; stigmas two.

A group of sphagnum-loving plants represented by seventeen species in the colder parts of North America, extending northward into the arctic regions and southward in the western mountains. Eleven of these species are also widely distributed in the colder parts of Eurasia. A few additional species are found in eastern Asia. The group is also sparingly represented in the mountains of southern South America, southern Australia, and New Zealand. It is absent from all the warmer parts of the world.

- Spikes androgynous; perigynia unequally biconvex. 82. *C. disperma*.
 Spikes (at least uppermost) gynaeandrous; perigynia plano-convex.
 Lowest bract bristle-form, much prolonged, many times exceeding its
 1-5-flowered spike; spikes widely separate. 83. *C. trisperma*.
 Lowest bract much shorter or none; spikes several- to many-flowered, the
 upper approximate.
 Perigynia beakless or nearly so; scales white-hyaline; rootstocks
 loosely cespitose and with slender stolons.
 Spikes closely aggregated, forming an ovoid or suborbicular
 head; perigynia with slender nerves. 84. *C. tenuiflora*.
 Spikes remote; perigynia many-ribbed. 85. *C. loliacea*.
 Perigynia very short-beaked to strongly beaked; scales often darker-
 tinged; rootstocks more densely or very densely cespitose.
 Perigynia broadest near middle; beak short, smooth or moder-
 ately serrulate.
 Spikes 1-4 (6), closely approximate; perigynia with beak
 smooth or very nearly so; scales chestnut- or reddish-
 tinged.
 Spike one (or rarely with a smaller one at base). 86. *C. ursina*.
 Spikes 2-4 (6).
 Lateral spikes gynaeandrous (arctic-alpine).
 Culms smooth or nearly so; perigynia brownish-
 yellow, the beak prominent, hyaline at apex.
 Culms very rough above; perigynia cinereous or at
 length brown, the beak ferruginous at apex. 87. *C. bipartita*.
 Lateral spikes pistillate (northern seacoast). 88. *C. Heleonastes*.
 Perigynia very abruptly short-beaked.
 Terminal spike strongly clavate; perigynia ex-
 ceeding scales, the beak conspicuous; scales
 light-chestnut to reddish-brown. 89. *C. marina*.

- Terminal spike short-clavate; perigynia exceeded by scales, the beak very short; scales dark-chestnut.
- Perigynia fusiform, tapering into beak. Spikes 3-9, the lower at least remote. Scales light-reddish-brown, obtuse, slightly enveloping the subcoriaceous perigynia; culms smooth.
- Scales usually lighter-colored, acutish to cuspidate, not at all enveloping the membranaceous perigynia (except in *C. arctaeformis*); culms rough above.
- Perigynia loosely-spreading, distinctly beaked, the beak bidentate; leaf-blades 1-2.5 mm. wide, not glaucous; spikes few-flowered.
- Perigynia appressed-ascending until over-ripe, at most very short-beaked, the beak entire or emarginate; leaf-blades usually 2-4 mm. wide (rarely narrower), glaucous.
- Perigynia 1.5-1.75 mm. long; scales strongly brown- or chestnut-brown-tinged.
- Spikes distinct, the lower separate; perigynium-beak smooth.
- Spikes densely aggregated; perigynium-beak sparingly serrulate.
- Perigynia 1.8-3 mm. long; scales hyaline with green center, usually brownish-tinged at maturity.
- Scales not at all enveloping perigynia, the latter conspicuous in the spikes; lower spikes remote.
- Scales somewhat enveloping perigynia towards base, the latter largely concealed and not conspicuous in the spikes; spikes all closely approximate.
- Perigynia ovate, broadest near base, the beak conspicuous, strongly serrulate.
90. *C. pribylovensis*.
91. *C. glareosa*.
92. *C. norvegica*.
93. *C. brunnescens*.
94. *C. bonanensis*.
95. *C. praeceptorium*.
96. *C. canescens*.
97. *C. arctaeformis*.
98. *C. arcta*.

82. *Carex disperma* Dewey, Am. Jour. Sci. 8: 266. 1824.

- Carex tenella* Schkuhr, Riedgr. 23. pl. Pp. f. 104. 1801. (Type thought to have come from Saxony.)
Not *C. tenella* Thuill. 1799.
- "*Carex loliacea* L." Schkuhr, Riedgr. Nachtr. 18. in part. 1806.
- Carex disperma* var. *tetrasperma* Beck, Bot. U. S. 432. 1833. (Type not given.)
- Vigna disperma* Raf. Good Book 27. 1840. (Based on *Carex disperma* Dewey.)
- Carex Blytii* F. Nyl. Spic. Pl. Fenn. 2: 35. 1844. (Type from Finland.)
- "*Carex gracilis* Ehrh." A. Gray, Am. Jour. Sci. II. 4: 19. 1847. (Not *C. gracilis* Curt. 1783.)
- "*Carex misera* Franchet, Bull. Soc. Philom. VIII. 7: 31. 1895. (Type from Japan.) Not *C. misera* Buckley. 1843; nor *C. misera* Phil. 1860.
- Carex tenella* var. *misera* Franchet, Nouv. Arch. Mus. Paris III. 8: 224. 1896. (Based on *C. misera* Franchet.)
- Carex tenella* f. *brachycarpa* Kükenth. Allg. Bot. Zeits. 15: 36. 1909. (Type from island of Sachalin, eastern Asia.)

Loosely caespitose, sending forth long, very slender, light-brown stolons, the culms very slender, weak, triangular, 1.5-6 dm. high, exceeding the leaves, roughened beneath head, light-brown at base and conspicuously clothed with the dried-up leaves of the previous year; leaves with well-developed blades 3-6 to a culm, bunched on lower third, the blades erect-ascending, 3 dm. long or less (usually about 1.5 dm.), 0.75-1.5 (rarely 2 mm.) wide, deep-green, flat, thin, soft, strongly minutely serrulate on the margins and on the veins, the sheaths tight, very thin and hyaline ventrally, short-prolonged beyond base of blade and continuous with ligule; spikes 2-4, androgynous, in a terminal head 1.5-2.5 cm. long, 3-5 mm. thick, the lower separated, the upper aggregated; staminate flowers 1 or 2, apical, inconspicuous, the 1-6 ascending perigynia borne below; bracts bristle-form, somewhat enlarged at base, 1 cm. long or less, often rudimentary; scales ovate-triangular, white-hyaline, the midrib green, acuminate or short-mucronate, narrower and shorter than the perigynia; perigynia unequally biconvex, oblong-ovoid, 2.25-3 mm. long, 1.5 mm. wide, very thick, light-green or in age yellowish-green, sharp-edged above, finely many-nerved on both sides, subcoriaceous, densely white-punctate, abruptly short-stipitate, spongy and rounded at base, rounded at the summit and abruptly contracted into a minute beak (0.25 mm. long or less), smooth, slender, obliquely cut dorsally, entire, hyaline at orifice; achenes lenticular, oblong-elliptic, completely filling the perigynia, 1.75 mm. long, 1 mm. wide, sessile, truncately very short-apiculate, brownish-yellow, shining; style very short, jointed with achene, at length deciduous; stigmata two, slender, reddish-brown.

TYPE LOCALITY: Massachusetts (Dewey).

DISTRIBUTION: Boggy coniferous woods, Labrador and Newfoundland to Yukon and southern Alaska, and southward to northern New Jersey, Indiana, New Mexico, and the Sierra Nevada of California; also in the northern parts of Eurasia. (Specimens examined from Labrador, Newfoundland, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ontario, Michigan, Indiana, Wisconsin, Minnesota, South Dakota, Manitoba, Saskatchewan, Alberta, Montana, Wyoming, Colorado, New Mexico, Utah, Nevada, Idaho, California, Oregon, Washington, British Columbia (including Vancouver Island), Alaska, Yukon.)

ILLUSTRATIONS: Fl. Dan. Suppl. pl. 116; Britt. & Brown, Ill. Fl. f. 834; ed. 2. f. 902; Rob. & Fern. Man. f. 394; Schkuhr, Riedgr. pl. Pp. f. 104; Engler, Pflanzenreich 4²⁰: 223. f. 36, A-C; Jour. Russe Bot. 1911: 69. f. 53; Boott, Ill. Carex 47. pl. 125, 126; Abrams, Ill. Fl. Pacif. St. f. 753; Clements, Rocky Mt. Fl. pl. 45, f. 1; Am. Jour. Sci. 9: pl. A, f. 3; Anderss. Cyp. Scand. pl. 4, f. 33; Hegi, Ill. Fl. Mittel.-Eur. 2: 77, f. 225.

83. *Carex trisperma* Dewey, Am. Jour. Sci. 9: 63. pl. C, f. 12. 1825.

Carex quaternaria Spreng. Syst. 3: 809. 1826. (Type from New Jersey.)

Neskica trisperma Raf. Good Book 27. 1840. (Based on *Carex trisperma* Dewey.)

Loosely cespitose, in large clumps, with long, very slender, light-brown stolons, the culms weak, nearly filiform, 2-7 dm. high, exceeding the leaves, triangular, roughened above, brownish at base and clothed with the dried-up leaves of the previous year; leaves with well-developed blades 3-5 to a fertile culm, on the lower fourth or third, the blades deep-green, weak, flat or canaliculate, 5-20 cm. long, 0.25-2 mm. wide, smooth, except slightly rough towards the apex, the sheaths tight, thin and white-hyaline ventrally, conspicuously prolonged beyond base of blade and continuous with ligule; spikes 1-3, usually 2, containing 1-5 ascending perigynia and about the same number of inconspicuous basal staminate flowers, the spikes 2-4 cm. apart, 4-6 mm. long, 3-4 mm. wide, the lowest subtended by an elongate, very slender bract 3-10 cm. long, often appearing like a continuation of the culm, the second bract shorter, the uppermost merely cuspidate; scales ovate, obtuse or acute or short-mucronate, whitish with green 3-nerved center, about width of but somewhat shorter than perigynia; perigynia plano-convex, thick, ovate-oval, 2.5-3.75 mm. long, 1.5-2 mm. wide, subcoriaceous, pale-green or in age brownish, strongly white-punctulate, sharp-edged, finely many-nerved on both surfaces, rounded, slightly stipitate, spongy at base, tapering at apex into a minute (0.4 mm. long), entire or minutely serrulate beak, obliquely cut dorsally, emarginate, hyaline-tipped; achenes lenticular, minutely truncately-apiculate, brownish, shining, rather closely enveloped, sessile, oval-oblong, 2 mm. long, 1.25 mm. wide; style very short, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown.

TYPE LOCALITY: Williamstown and Deerfield, Massachusetts.

DISTRIBUTION: Acid soils, wet sphagnum in swampy woods or bogs, Labrador and Newfoundland to Saskatchewan, and southward to Maryland, Illinois, and Minnesota; reported from Nebraska. (Specimens examined from Labrador, Newfoundland, St. Pierre, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, West Virginia, Ontario, Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Manitoba, Saskatchewan.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 855; ed. 2. f. 903; Rob. & Fern. Man. f. 391; Proc. Am. Acad. 37: pl. 5, f. 131, 132; Boott, Ill. Carex 29. pl. 74; Am. Jour. Sci. 9: pl. C, f. 12.

Carex trisperma var. *Billingsii* O. W. Knight, Rhodora 8: 185. 1906.

Distinguished by its narrow leaf-blades, 0.3-0.5 mm. wide. Spikelets one or two, 1-3-flowered; perigynia 2.5-3.5 mm. long. Frequently well-marked. TYPE LOCALITY: Jewett Pond, Pleasant Ridge Plantation, Maine. DISTRIBUTION: Sphagnum bogs and thickets, especially abundant on or near the Atlantic coastal plain. (Specimens examined from Newfoundland, Quebec, Prince Edward Island, Nova Scotia, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Ontario, New Jersey, Pennsylvania.)

84. *Carex tenuiflora* Wahl. Sv. Vet.-Akad. Nya Handl.

24: 147. 1803.

Carex leucolepis Turcz.; Steud. Nom. Bot. ed. 2. 1: 292; hyponym. 1840. (Type from "Sibirbaical.")

Carex tenuiflora var. *setacea* Kükenth. in Engler, Pflanzenreich 4²⁰: 224. 1909. (Type from Lansing, Michigan.)

Loosely cespitose, in large clumps, the rootstocks very slender, much elongate, yellowish-brown, the nodes widely separate; the culms 1.5-6 dm. high, triangular, very slender, exceeding

the leaves, somewhat roughened beneath the head, brownish at base and conspicuously clothed with the dried-up leaves of the previous year; leaves with well-developed blades 3-7 to a fertile culm, clustered on the lower third, the blades erect-ascending, pale-green, soft, flat or somewhat canaliculate, usually 5-15 cm. long, 0.5-2 mm. wide, roughened towards the apex, the sheaths tight, hyaline ventrally, very thin, short-prolonged at mouth beyond base of blade and continuous with ligule; spikes 2-4, gynaeandrous, whitish, rather loosely flowered, closely aggregated into an ovoid or suborbicular head 6-12 mm. long, 4-9 mm. thick, the spikes short-oblong or suborbicular, 4-9 mm. long, 3-6 mm. wide, obtuse at apex, obtuse or clavate at base, with 3-15 appressed-ascending or at length more or less spreading perigynia, the basal staminate flowers inconspicuous; bracts scale-like or the lowest short-prolonged, shorter than head; scales ovate, or oblong-ovate, obtuse, whitish with green 3-nerved center, about as wide, and as long as and concealing the perigynia; perigynia plano-convex, obovate-oval, 3-3.5 mm. long, 1.5-1.75 mm. wide, thick, subcoriaceous, greenish-white, densely white-punctulate, sharp-edged, obscurely few-nerved on both surfaces, short-stipitate, spongy and rounded at base, tapering at apex and beakless or very minutely beaked, the beak 0.2 mm. long, obliquely cleft dorsally, yellowish-brown-tinged, slightly emarginate, smooth or rarely somewhat toothed; achenes lenticular, oblong-oval, closely enveloped by perigynia, sessile, short-apiculate, 2 mm. long, 1.5 mm. wide; style very short, jointed with achene, at length deciduous; stigmas two, slender, dark-reddish-brown, conspicuous, elongate.

TYPE LOCALITY: "Hab. in graminosis humidis Lapponiae."

DISTRIBUTION: Sphagnum bogs, Labrador and Newfoundland to Yukon and southern Alaska, and southward to Maine, Michigan, and Minnesota; also in northern Eurasia. (Specimens examined from Labrador, Newfoundland, Quebec, Maine, Vermont, Massachusetts, New York, Ontario, Michigan, Wisconsin, Manitoba, Minnesota, Saskatchewan, Yukon.)

ILLUSTRATIONS: Boott, Ill. Carex 144, pl. 463; Fl. Dan. Suppl. pl. 167; Britt. & Brown, Ill. Fl. f. 851; ed. 2, f. 904; Rob. & Fern. Man. f. 390; Schkuhr, Riedgr. pl. Eeee, f. 187; Proc. Am. Acad. 37; pl. 5, f. 129, 130; Jour. Russe Bot. 1911: 71, f. 54; Anders. Cyp. Scand. pl. 4, f. 36.

NOTE: Hybridizes with *Carex lisperma* Dewey. (Specimens examined from Labrador, Maine, Michigan.)

85. *Carex loliacea* L. Sp. Pl. 974. 1753.

—*Carex sibirica* Spreng. Syst. 3: 809. 1826. (Type from Siberia.)

Neskeia loliacea Raf. Good Book 27. 1840. (Based on *Carex loliacea* L.)

Loosely caespitose, sending forth long, very slender, light-brown stolons, the culms weak, very slender, 2-4 dm. high, triangular, exceeding the leaves, slightly roughened beneath the head, brownish-tinged at base and clothed with the dried-up leaves of the previous year; leaves with well-developed blades 4-8 to a fertile culm, on the lower third but not bunched, the blades flat, soft, deep-green, usually 5-10 cm. long (the sterile-culm leaves longer) 0.5-2 mm. wide, roughened towards the attenuate apex, the sheaths tight, hyaline and thin, ventrally prolonged beyond base of blade and continuous with ligule; spikes 2-5, gynaeandrous, the lower separate, the upper contiguous, forming a strict but interrupted head 1-2.5 cm. long, 4-6 mm. thick, the spikes suborbicular, rounded at apex, rounded or in the uppermost more or less clavate at base, containing 3-8 loosely ascending or at length strongly spreading perigynia above and the inconspicuous staminate flowers beneath; lower bract usually short-prolonged, 2-8 mm. long, the upper scale-like; scales ovate, thin, white-hyaline with green midrib, sharply keeled, obtuse or acutish, nearly as wide (at base) as perigynia, but only half their length; perigynia thick-plano-convex, narrowly elliptic, 2.5-3 mm. long, 1.4 mm. wide, subcoriaceous, light-green, rounded on the margins below, slightly sharp-edged above, finely but conspicuously many-ribbed on both sides, densely white-punctate, minutely stipitate, round-tapering and spongy at base, tapering and often slightly narrowed at apex, beakless; achenes lenticular, closely enveloped, short-oblong, slightly substipitate, brownish, minutely truncately apiculate, 1.75 mm. long, 1 mm. wide; style very short, jointed with achene, at length deciduous; stigmas two, light-reddish-brown, slender, short.

TYPE LOCALITY: "Habitat in Suesia."

DISTRIBUTION: Marshes and mossy banks of streams, British Columbia to Yukon and Alberta; widely distributed in boreal Eurasia. (Specimens examined from Yukon, British Columbia, Alberta.)

ILLUSTRATIONS: Fl. Dan. pl. 1403; Boott, Ill. Carex 48, pl. 127; Engler, Pflanzenreich 4²⁰: 223, f. 36 G-K; Jour. Russe Bot. 1911: 72, f. 56; Sturm, Deuts. Fl. 69: pl. 2; Reichenb. Ic. Fl. Germ. 8: pl. 211, f. 559; Anders. Cyp. Scand. pl. 4, f. 34; Hegi, Ill. Fl. Mittel-Eur. f. 224; Sv. Bot. pl. 664; Hallier, Deuts. Fl. pl. 432; Karst. Deuts. Fl. f. 164 (1).

86. *Carex ursina* Dewey, Am. Jour. Sci. 27: 240.

pl. U, f. 68. 1835.

"Carex glareosa Wahl." Malmgr. Oefv. Sv. Vet.-Akad. Förh. 19: 251. 1862.

Carex glareosa var. β . Boott, Ill. Carex 153. pl. 494, f. 5, 6. 1867. (Based on *C. ursina* Dewey.)*Carex glareosa* var. *caespitosa* Bock. Linnaea 39: 76. 1875. (Type from Kamchatka.)*Carex glareosa* var. *ursina* L. H. Bailey, Cat. N. Am. Car. 3. 1884. (Based on *C. ursina* Dewey.)

Loosely caespitose, in small clumps, the rootstocks much bunched, slender, brownish, the culms 2-6 cm. high, very low, erect or slightly curving, slender, about equaling or hidden among the leaves, smooth, bluntly triangular, brown at base and clothed with the dried-up leaves of the previous year, the lowest bladeless; leaves with well-developed blades usually 4-8 to a fertile culm, clustered near the base, the blades flat at base, involute above, light- or glaucous-green, stiffish, 1-3 cm. long, 0.75-1.5 mm. wide, roughened towards the attenuate apex, the sheaths tight, white-hyaline and thin ventrally, short-prolonged at mouth beyond base of blade and continuous with ligule; spike usually solitary, obovoid or suborbicular, 4-7 mm. long, 4 mm. wide, gynaeceandrous, obtuse at apex, rounded or more or less short-clavate at base, containing 7-15 closely appressed perigynia above and the inconspicuous staminate flowers beneath; bract absent; scales broadly ovate or broadly oblong-ovate, obtuse, chestnut-brown with very narrow hyaline margins and lighter center, thin and rounded, the midvein not extending to tip, as wide as but shorter than perigynia; perigynia plano-convex, thickish, ovate, 2 mm. long, 1.25 mm. wide, slightly sharp-angled, but not at all margined, glaucous, yellowish, membranaceous, densely white-punctate, finely several-nerved dorsally, obscurely nerved ventrally, conspicuously stipitate, rounded at base, very abruptly contracted into a very minute beak scarcely 0.2 mm. long, smooth, obliquely cut and sutured dorsally, entire; achenes lenticular, small, closely filling perigynia, obovate, 1.5 mm. long, 1 mm. wide, short-stipitate, truncately apiculate; style short, slender, jointed with achene, at length deciduous; stigmas two, slender, yellowish-brown, rather short.

TYPE LOCALITY: "Found by Dr. Richardson on the seacoast of Arctic America."

DISTRIBUTION: Arctic seacoast from Greenland to Mackenzie; also in the extreme northern parts of Eurasia. A rare but very often illustrated species. (Specimens examined from Greenland, Mackenzie.)

ILLUSTRATIONS: Am. Jour. Sci. 27: pl. U, f. 68; Fl. Dan. pl. 2429; Hook. Fl. Bor.-Am. pl. 210; Boott, Ill. Carex 153. pl. 494, f. 5, 6; Ostenf. Fl. Arct. 59. f. 29; Britt. & Brown, Ill. Fl. ed. 2. f. 905; Engler, Pflanzenreich 4²⁰: 71. f. 15, O-R; Jour. Russe Bot. 1911: 31. f. 7.87. *Carex bipartita* All. Fl. Ped. 2: 265. pl. 89, f. 5. 1785.

"Carex leptophylla L." Oeder, Fl. Dan. 5: 9. pl. 294. 1766. (From northwestern Europe.)

Carex Lachenalii Schkuhr, Riedgr. 51. pl. Y. 1801. (Type from central Europe.)*Carex approximata* Hoppe, Bot. Tasch. Hoppe 1801: 152. 1801. (Type from central Europe.)Not *C. approximata* All. 1785.*Carex lagopina* Wahl. Sv. Vet.-Akad. Nya Handl. 24: 145. 1803. (Type from northern Lapland.)*Carex parviflora* Gaudin, Etr. Fl. 84. 1804. (Type from central Europe.) Not *C. parviflora* Host. 1801.*Vigna lagopina* Reichenb. in Mössler, Handb. ed. 2. 1609. 1829. (Based on *Carex lagopina* Schkuhr.)*Carex furva* Webb, Iter Hisp. 5. 1838. (Type from the mountains of Spain.)*Carex boetica* Gay, Ann. Sci. Nat. II. 11: 181. 1839. (Based on *C. furva* Webb.) Not *C. boetica* Auserw. 1848.*Carex lagopina* var. *pleiostachya* Drejer, Nat. Tidssk. 3: 443. 1841. (Type from Iceland.)*Carex lagopina* var. *gracilescens* Th. Fries, Bot. Notiser 1857: 208. 1857. (Type from Scandinavia.)*Carex pusilla* Wulfen, Fl. Norica Phan. 743. 1858. (Type from Austria.)*Carex lagopina* var. *major* Lange, Consp. Fl. Groenl. 135. 1880. (Type from Greenland.)*Carex lagopina* var. *debilis* Lange, Consp. Fl. Groenl. 135. 1880. (Type from Greenland.)*Carex Parkeri* Petrie, Trans. N. Z. Inst. 13: 332. 1881. (Type from New Zealand.)*Carex lagopina* var. *furva* Christ, Bull. Soc. Bot. Belg. 24: 19. 1885. (Based on *C. furva* Webb.)*Carcinia approximata* St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 879. 1889. (Based on *Carex approximata* Hoppe.)*Carex Sewellii* Benn. & Clarke; Sewell, Trans. Bot. Soc. Edinb. 17: 456. pl. 8. 1889. (Type from Lapland.)*Carex lagopina* var. *boetica* K. Richt. Pl. Eur. 1: 151. 1890. (Based on *C. boetica* Gay.)*Carex lagopina* f. *angustifolia* Norman, Förh. Vid.-Selsk. Christ. 27¹⁶: 47. 1893. (Type from Norway.)*Carex lagopina* f. *pauciflora* Norman, Förh. Vid.-Selsk. Christ. 27¹⁶: 47. 1893. (Type from Norway.)*Carex lagopina* var. *laxior* Norman, Förh. Vid.-Selsk. Christ. 27¹⁶: 47. 1893. (Type from Norway.)*Carex cooplandi* C. B. Clarke, in Hook. f. Fl. Brit. Ind. 6: 707. 1894. (Type from Khasia Hills, India.)

Carex lagopina var. *longisquama* Kükenth.; J. M. Macoun, in D. S. Jordan, Fur Seals N. Pacif. 3: 572. 1899. (Type from St. Paul Island, Behring Straits.)

Loosely caespitose, in small clumps, the rootstocks slender, short-prolonged, brownish, fibrillose, obtusely triangular below, sharply so above, the culms 0.5-3 dm. high, slender but strict, sometimes curving, exceeding the leaves, smooth or slightly roughened above, brownish at base and clothed with the dried-up leaves of the previous year, the lower short-bladed or bladeless; leaves with well-developed blades 4-8 to a fertile culm, clustered on the lower fourth, the blades usually 4-10 cm. long, 1-2 mm. wide, green, rather stiff, flat with revolute margins, roughened towards the attenuate apex, the sheaths tight, hyaline ventrally, thin and short-prolonged at mouth beyond base of blade and continuous with ligule; sterile-culm leaves similar; spikes 2-4, distinct, aggregated or the lower one or two slightly separate, the head 1-2 cm. long, 5-12 mm. thick, the spikes gynaeandrous, erect, obtuse at apex, short-oblong to suborbicular, the lower 5-10 mm. long, 2.5-5 mm. wide, rounded or slightly tapering at base, the staminate flowers inconspicuous, the uppermost spike slightly larger, strongly clavate at base with conspicuous staminate flowers; perigynia 10-30, closely arranged, appressed-ascending, the beaks not conspicuous; bracts scale-like, the lower occasionally short-prolonged; scales oblong-ovate, obtuse, thin, chestnut-brown with yellowish-brown center and conspicuous white-hyaline margins, the midvein not extending to apex, keeled below, about the width of but exceeded by the tips of the mature perigynia; perigynia planoconvex, obovate, 2-3.5 mm. long, 1-1.5 mm. wide, thick, with thin and sharp but not winged margins, lightly several-nerved dorsally, nerveless or obscurely several-nerved ventrally, membranaceous, brownish-yellow, densely punctate, short-stipitate, round-tapering at base, rather abruptly contracted at apex into a short but prominent beak with entire or emarginate apex, 0.5 mm. long, dark-chestnut, hyaline-tipped, obliquely cut dorsally, smooth or nearly so; achenes lenticular, nearly filling perigynia, short-oval, sessile, short-tapering at base, truncately short-apiculate, 1.5 mm. long, 0.75-1 mm. wide; style slender, jointed with achene, at length deciduous; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: "Loc. In alpebus d'Ussey, & in monte Cenisio locis uliginosis reperit Cl. Belardi." [Piedmont.]

DISTRIBUTION: Arctic-alpine in calcareous regions, Greenland to Alaska, and southward to Quebec and northern Montana; also widely distributed in Eurasia, and reported from New Zealand. (Specimens examined from Greenland, Newfoundland, Quebec, Alberta, Montana, Yukon, Alaska.)

ILLUSTRATIONS: Hallier, Deuts. Fl. pl. 431; All. Fl. Ped. pl. 89, f. 5; Fl. Dan. pl. 294; Britt. & Brown, Ill. Fl. f. 853; ed. 2, f. 906; Engler, Pflanzenreich 4^o: 213, f. 35, A, B; Proc. Am. Acad. 37: pl. 5, f. 139, 140; Schkuhr, Riedgr. pl. Y, f. 79; Jour. Russe Bot. 1911: 64, f. 45; Sturm, Deuts. Fl. 47: pl. 5; Reichenb. Ic. Fl. Germ. 8: pl. 204, f. 543; Ostenf. Fl. Arct. 57, f. 27; Anders. Cyp. Scand. 63, pl. 4, f. 28; Coste, Fl. Fr. f. 3832; Benth. Handb. Brit. Fl. ed. 2, f. 1098; Engl. Bot. pl. 2815; ed. 2, pl. 1633; Trans. Bot. Soc. Edinb. 17: pl. 8.

NOTE: See Holm, Am. Jour. Sci. IV. 15: 145-152 (1903), and Mackenzie, Bull. Torrey Club 50: 348 (1923), as to the identity of Allioni's plant. Specimens of *Kobresia caricina* Willd. were mixed with the species usually called *Carex lagopina* Wahl., but Allioni's plate and description apply to the *Carex*.

88. *Carex Heleonastes* L.f. Suppl. 414. 1781.

"*Carex leporina* L." Schkuhr, Riedgr. Nachtr. 17, pl. Fff, f. 129. 1806.

Vigna Heleonastes Reichenb. in Mössler, Handb. ed. 2. 1609. 1829. (Based on *Carex Heleonastes* L. f.)

— *Carex Carltonia* Dewey, Am. Jour. Sci. 27: 238, pl. U, f. 64. 1835. (Type from Carleton House, Saskatchewan.)

— *Carex Sendneriana* Brügger, Jahrb. Nat. Ges. Graubünd. 23-24: 119. 1881. (Type from Germany.)

Carex elongata × *Heleonastes* Brügger, Jahrb. Nat. Ges. Graubünd. 23-24: 119. 1881. (Type from Germany.)

Carex cryptantha Holm, Am. Jour. Sci. IV. 10: 267. 1900. (Type from Kussiloff, Alaska.)

Carex dioica × *echinata* var. *grypos* Vetter, Verh. Zool.-Bot. Ges. Wien 57: (237). 1907. (Type European.)

Carex Heleonastes f. *Sendneriana* Kükenth. in Engler, Pflanzenreich 4^o: 215. 1909. (Based on *C. Sendneriana* Brügger.)

Loosely caespitose, in small clumps, the rootstocks very slender, long-creeping, light-brownish, fibrillose, the culms 1.5-3.5 dm. high, slender but stiff and strict, usually exceeding the leaves, sharply triangular, very rough on the angles at least beneath the spikes, brownish-tinged at base and clothed with the dried-up leaves of the previous year, the lower bladeless or short-bladed; leaves with well-developed blades 4-8 to a fertile culm, clustered on the

lower fourth, the blades flat to more or less involute, light-green, not glaucous, not stiff, usually 6-12 cm. long, 1-2 mm. wide, strongly roughened towards the attenuate apex, the sheaths tight, hyaline and very thin ventrally, short-prolonged at mouth beyond base of blade and continuous with ligule; sterile-culm leaves similar; spikes 2-4, distinct, closely aggregated, or the lower slightly separate, the head 8-18 mm. long, 5-10 mm. wide, the spikes gynaeandrous, rather closely flowered, erect, short-oblong to suborbicular, 4-7 mm. long, 4-6 mm. wide, obtuse and rounded at both ends, the staminate flowers few and inconspicuous, the terminal spike not conspicuously larger and not strongly clavate at base, the perigynia 5-10, appressed-ascending, the beaks inconspicuous; bracts scale-like, occasionally short-cuspidate; scales oblong-ovate, obtuse, thin, reddish-brown with yellowish-brown center and broad white-hyaline margins, the midvein sharply keeled nearly to apex, about the width of but exceeded by the tips of the mature perigynia; perigynia plano-convex, oval-obovate, 2.5-3 mm. long, 1.25 mm. wide, thick with abrupt sharp margins not at all winged, finely several-nerved on both sides, subcoriaceous, densely punctate, greenish-white below or light-yellowish-brown above or throughout, substipitate, rounded at apex into a minute beak (0.5 mm. long), smooth or nearly so, obliquely cleft dorsally, reddish-brown-tipped, the apex entire or nearly so; achenes lenticular, filling perigynia, broadly obovoid, short-tapering and sessile, truncately short-apiculate, 1.5 mm. long, 1 mm. wide; style slender, jointed with achene, at length deciduous; stigmas two, very slender, light-reddish-brown.

TYPE LOCALITY: "Habitat in Suecia" (Ehrhart).

DISTRIBUTION: Wet open places in calcareous regions, Ontario to Mackenzie, and southward to Alberta and British Columbia; widely distributed in northern and middle Europe and northern Asia; a rare species in North America. (Specimens examined from Cumberland House, Mackenzie, Keewatin, Saskatchewan, British Columbia.)

ILLUSTRATIONS: Fl. Dan. Suppl. pl. 31; Boott, III. Carex 152. pl. 489; Schkuhr, Riedgr. pl. II, f. 97 and pl. Ff, f. 129; Britt. & Brown, III. Fl. f. 852; ed. 2. f. 909; Proc. Am. Acad. 37: pl. 5, f. 141, 142; Jour. Russe Bot. 1911: 64. f. 46; Sturm, Deuts. Fl. 47: pl. 6; Ostenf. Fl. Arct. 57. f. 26; Reichenb. Ic. Fl. Germ. 8: pl. 204, f. 542; Anders. Cyp. Scand. 62. pl. 4, f. 30; Coste, Fl. Fr. f. 3333; Hegi, Ill. Fl. Mittel-Eur. 2: 74. f. 221; Hallier, Deuts. Fl. pl. 431; Karst. Deuts. Fl. 337. f. 163 (1); Am. Jour. Sci. 27: pl. U, f. 64 (as *C. Carltonia*); IV. 10: 268. f. E-G (as *C. cryptantha*).

89. *Carex marina* Dewey, Am. Jour. Sci. 29: 247. 1836.

"*Carex glareosa* Wahl." Lieb. Fl. Dan. 41: 8. pl. 2430. 1845. (And of most authors.)

Carex neurochlaena Holm, Am. Jour. Sci. IV. 17: 301; 303. f. 1, 2. 1904. (Type from Rink Rapids, Yukon.)

Carex glareosa var. *amphigena* Fernald, Rhodora 8: 47. 1906. (Type from Bonaventure County, Quebec.)

Carex glareosa f. *elegantissima* Kükenth. Allg. Bot. Zeits. 15: 35. 1909. (Type from island of Sachalin, eastern Asia.)

Carex amphigena Mackenzie, Bull. Torrey Club 37: 246. 1910. (Based on *C. glareosa* var. *amphigena* Fernald.)

Carex soriokfensis Lév. & Vaniot; Christ. & Lév. Bull. Acad. Géogr. Bot. 19: 35. 1919. (Type from island of Sachalin, eastern Asia.)

Loosely caespitose, the clumps small, the rootstocks very slender, dark-brown, fibrillose, the culms very slender, weak, often curved, 1.5-2.5 dm. high, much exceeding the leaves, obtusely triangular below, acutely triangular above, smooth on angles except immediately beneath head, brownish at base and conspicuously clothed with the dried-up leaves of the previous year; leaves with well-developed blades 4-8 to a fertile culm, clustered on the lower fourth, the blades canaliculate, light-green or blue-green, somewhat glaucous, usually 3-12 cm. long, 0.75-1.5 mm. wide, the sterile-culm leaves longer, roughened towards the attenuate apex, the sheaths tight, hyaline and thin ventrally, short-prolonged beyond base of blade and continuous with ligule; head 0.7-2.5 cm. long, 5-10 mm. thick, consisting of 2-4 approximate or slightly separate spikes, the terminal spike gynaeandrous, oblong, 7-12 mm. long, 4 mm. wide, the lower half long-clavate, staminate, the upper half with about 10 appressed-ascending perigynia, the lower spikes usually pistillate, oblong to suborbicular, 4-9 mm. long, 3-4 mm. wide, containing 5-8 appressed-ascending perigynia; bracts scale-like, the lowest occasionally short-cuspidate; scales ovate, obtuse, thin, light-chestnut to reddish-brown, with yellowish-brown center and hyaline margins and apex, wider than but exceeded by the mature perigynia; perigynia plano-convex, broadly elliptic-obovate, 1.5-2.25 mm. long, 1.5 mm. wide, thick, membranaceous, whitish, sharp-edged above, but not at all winged, strongly

many-nerved on both sides, densely white-punctate, substipitate, spongy and round-tapering at base, abruptly contracted at apex into a minute beak (0.4 mm. long), smooth, entire, obliquely cut dorsally; achenes lenticular, quadrate, obovate, 1.75 mm. long, 1 mm. wide, brownish, shining, substipitate, truncate minutely apiculate, closely enveloped; style very short, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown.

TYPE LOCALITY: "Found at the sea-coast of Arctic regions by Dr. Richardson."

DISTRIBUTION: Salt marshes, Greenland and Labrador to New Brunswick, and on the Pacific coast from southeastern Alaska to St. Lawrence Island; also on the coasts of northern Eurasia. (Specimens examined from Greenland, Turnavik Island, Labrador, Newfoundland, James Bay, Quebec, Alaska.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 854; ed. 2, f. 907; Rob. & Fern. Man. f. 393; Proc. Am. Acad. 37: 493, pl. 5, f. 137, 138; Fl. Dan. pl. 2430; Boott, Ill. Carex 153, pl. 494, f. 1-4; Ostenf. Fl. Arct. 57, f. 28; Jour. Russe Bot. 1911: 64, f. 47; Lindm. Bild. Nord. Fl. pl. 434B (all as *C. glareosa*); Am. Jour. Sci. 29: pl. X, f. 74; IV. 17: 303, f. 1-2 (as *C. neurochlaena*).

90. *Carex pribylovensis* J. M. Macoun, in D. S. Jordan, Fur Seals
N. Pacif. 3: 572. 1899.

Carex lagopina var. *pribylovensis* Kükenth. in Engler, Pflanzenreich 4²⁰: 214. 1909. (Based on *C. pribylovensis* J. M. Macoun.)

Loosely caespitose, in small clumps, the rootstocks long-creeping, slender, brownish, fibrillose, the culms 2.5-4 dm. high, sharply triangular, slender but stiff, exceeding the leaves, very rough on the angles on the upper half, black-fibrillose at the brownish base and conspicuously clothed with the dried-up leaves of the previous year, the lower short-bladed; leaves with well-developed blades 5-8 to a fertile culm, on the lower half but not bunched, the blades flat, yellowish-green, thickish, ascending or erect, usually 5-15 cm. long, 1.5-2.5 mm. wide, long-attenuate and very rough towards the apex, the sheaths tight, hyaline ventrally, thin and short-prolonged beyond base of blade and continuous with ligule; spikes 3 or 4, distinct but closely aggregated, forming a head 13-20 mm. long, 8-12 mm. thick, the spikes densely flowered, oblong, 7-12 mm. long, 5 mm. wide, the lateral pistillate and rounded at both ends, the terminal gynaeandrous and short-clavate at base, the perigynia 10-30, appressed; bracts scale-like; scales broadly ovate, obtuse to acute, deep-chestnut-brown with straw-colored midrib and broad white-hyaline margin, sharply keeled nearly to apex, wider and longer than the perigynia; perigynia plano-convex, broadly ovate, sharp-angled ventrally but not margined, 2.5-3 mm. long, 1.5 mm. wide, lightly several-nerved on both sides, membranaceous, strongly punctulate, light-yellowish-green, smooth, substipitate, round-tapering at base, very abruptly minutely beaked, the beak minutely emarginate, dorsally cleft, smooth, slightly tawny-tinged; achenes lenticular, nearly filling perigynia, oval, 2 mm. long, 1.25 mm. wide, tapering at base, truncate apiculate; style slender, jointed with achene, at length deciduous; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: "Uplands in moss," Pribilof Islands (*J. M. Macoun*).

DISTRIBUTION: Known only from the type locality.

91. *Carex glareosa* Wahl. Sv. Vet.-Akad. Nya Handl.
24: 146. 1803.

Neskiza glareosa Raf. Good Book 27. 1840. (Based on *Carex glareosa* Wahl.)

Loosely caespitose, in small clumps, the rootstocks slender, elongate, black, fibrillose, the culms very slender, 1-2.5 dm. high, sharply triangular, much exceeding the leaves, smooth or nearly so, brownish and strongly black-fibrillose at base, and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 4-8 to a fertile culm, clustered on the lower fourth, the blades flat, or more or less canaliculate, usually 4-12 cm. long, 1.25-2.5 mm. wide, light-yellowish-green, stiffish, roughened towards the attenuate apex; sterile-culm leaves longer, the sheaths tight, very thin, hyaline ventrally, short-prolonged at mouth beyond base of blade and continuous with ligule; spikes 2 or 3, distinct, approximate, the head 12-18 mm. long, 0.5-1 cm. thick, the terminal spike linear, 7-12 mm. long, 2 mm. wide, with a long-clavate base containing the staminate flowers and with 4-20 strongly appressed perigynia, the lower spikes pistillate, oblong-linear, 5-8 mm. long, 2.5 mm. wide, containing 5-15 appressed-ascending perigynia; bracts scale-like, rarely

short-cuspidate; scales oblong-ovate, obtuse, thin, chestnut-brown with yellowish-brown 3-nerved center and shining white-hyaline margins, the midvein sharply keeled, not extending to apex, wider than but exceeded by the mature perigynia; perigynia plano-convex, lanceolate, 3.5 mm. long, scarcely 1 mm. wide, thick, very membranaceous, light-brownish above, glaucous, white or yellowish below, densely white-punctate, finely many-nerved on both sides, stipitate, spongiose and round-tapering at base, long-tapering at apex into a very minute beak, smooth, slightly obliquely cleft dorsally, tawny-tinged, with entire tip; achenes lenticular, short-stipitate, truncately short-apiculate, narrowly oblong, 2 mm. long, 0.5 mm. wide, nearly filling perigynia; style slender, jointed with achene, at length deciduous; stigmas two, slender, yellowish-brown, short.

TYPE LOCALITY: "Hab. in littoribus maritimis glareosis Norvegiae septentrionalis & ad Sinum Bottnicum."

DISTRIBUTION: Brackish marshes, Labrador and Newfoundland to Quebec; Alaska; also in northern Europe. (Specimens examined from Quebec, Newfoundland (Quirpon Harbor), Labrador, Alaska.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 908; Schkuhr, Riedgr. pl. Aaa, f. 97. Anderss. Cyp. Scand. pl. 4, f. 31; Svensk. Bot. pl. 645.

92. *Carex norvegica* Willd.; Schkuhr, Riedgr. 50. pl. S, f. 66. 1801.

Carex norvegica var. *isostachya* Norman, Förh. Vid.-Selsk. Christ. 27¹⁶: 48. 1893. (Type from Scandinavia.)

Carex norvegica subsp. *glareosoides* E. Jørgensen, Nyt Mag. Naturvid. 34: 99. 1894. (Type from Scandinavia.)

Cespitose, the clumps small, connected by slender, not tough, long-creeping, black, fibribose rootstocks, the nodes widely separate, the culms 1-4.5 dm. high, from much exceeding to exceeded by the leaves, slender but rather stiffly erect, triangular with flat sides, smooth, light-brown at base and conspicuously clothed with the dried-up leaves of the previous year; leaves with well-developed blades 5-10 to a fertile culm, clustered on the lower fourth or third, more or less glaucous, the blades yellowish-green, thin, flat, soft, but roughened at apex, usually 5-12 cm. long, 1-3 mm. wide, the sheaths tight, thin and greenish-white or brownish-tinged ventrally, prolonged at mouth beyond base of blade and continuous with ligule; spikes 3-6, brownish, the upper approximate, the lower separate, forming an erect, rather strict head 1.5-5.5 cm. long, 1 cm. thick or less, the lower spikes oblong, 5-15 mm. long, 4-6 mm. wide, usually 1-1.5 cm. distant, rounded at base and apex, the basal staminate flowers inconspicuous or absent, the 5-20 perigynia appressed-ascending; terminal spike similar but longer, 1-2 cm. long, long-clavate and conspicuously staminate at base; bracts scale-like, the lowest often setaceous-prolonged; scales ovate-suborbicular, obtuse or obtusish, light-reddish-brown with brownish-yellow center and very narrow hyaline margins, slightly longer and slightly wider than and nearly concealing the perigynia, closely fitting and partly enveloping perigynia; perigynia plano-convex, oblong-oval, 2.5-3.3 mm. long, 1.5-2 mm. wide, thick, not winged, sharp-edged, finely many-striate on both sides, stipitate, rounded to a spongy base, glaucous-green, reddish-dotted, densely white-punctate, coriaceous, abruptly contracted into a minute beak about 0.3 mm. long, nearly smooth, obliquely cut dorsally, chestnut-brown-tinged, subentire; achenes lenticular, oblong, 2 mm. long, 1.5 mm. wide, sessile, apiculate, very closely filling the perigynia; style very short, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown.

TYPE LOCALITY: "Hab. in littoribus limosis maris Nordlandiae norvegiae."

DISTRIBUTION: Brackish soil along the sea-coasts, from Maine to Labrador on the Atlantic coast; Hudson Bay; Pribilof Islands and Seward Peninsula on the Pacific coast; also widely distributed along the coasts of northern Eurasia. (Specimens examined from Maine, New Brunswick, Nova Scotia, Prince Edward Island, Quebec, Newfoundland, Labrador, Hudson Bay.)

ILLUSTRATIONS: Fl. Dan. Suppl. pl. 103; Wahl. Fl. Lapp. pl. 15, f. 3; Britt. & Brown, Ill. Fl. f. 849; ed. 2. f. 910; Rob. & Fern. Man. f. 392; Schkuhr, Riedgr. pl. S, f. 66; Proc. Am. Acad. 37: pl. 5, f. 135, 136; Jour. Russe Bot. 1911: 65. f. 48; Ostenf. Fl. Arct. 55. f. 25; Anderss. Cyp. Scand. 61. pl. 4, f. 29.

93. *Carex brunnescens* (Pers.) Poir. in Lam. Encyc. Suppl.

3: 286. 1813.

- *Carex gracilis* Ehrh. (Beitr. 6: 83; synonym. 1791); Schkuhr, Riedgr. 48. pl. E, f. 24. 1801. (Type from Sweden.) Not *C. gracilis* Curt. 1783.
- Carex canescens* var. β Wahl. Sv. Vet-Akad. Nya Handl. 24: 147. 1803. (Type from Lapland.)
- Carex curta* var. *brunnescens* Pers. Syn. Pl. 2: 539. 1807. (Type from Mt. Fully, Valais, Switzerland.)
- Carex canescens* var. *alpicola* Wahl. Fl. Lapp. 232. 1812. (Type from Lapland.)
- *Carex Personii* Sieber, Herb. Fl. Austr. 282. 1821; Flora 5: 652. 1822. (Based on *C. curta* var. *brunnescens* Pers.)
- “*Carex Gebhardii* Schkuhr” Hoppe, in Sturm, Deuts. Fl. 50: pl. 9. 1827. (Plant from Austria.)
- Vigneia Gebhardii* Reichenb. in Mössler, Handb. ed. 2. 1613, in part. 1829. (As to plant from Germany; not as to *Carex Gebhardii* Willd.)
- Carex canescens* var. β Torr. Ann. Lyc. N. Y. 3: 393. 1836. (Based on *C. brunnescens* Poir.)
- Carex canescens* var. *brunnescens* Koch, Syn. Fl. Germ. 754. 1837. (Based on *C. brunnescens* Poir.)
- Facolos brunnescens* Raf. Good Book 26. 1840. (Based on *Carex brunnescens* Poir.)
- *Carex vitilis* Fries, Mant. 3: 137. 1842. (Type from Norway.)
- Carex canescens* var. *sphaerostachya* Tuckerm. Enum. Caric. 19. 1843. (Type from New England.)
- *Carex Buckleyi* Dewey, Am. Jour. Sci. 48: 143. 1845. (Type from “mountains of Carolina and Georgia.”)
- *Carex sphaerostachya* Dewey, Am. Jour. Sci. 49: 44. pl. EE, f. 110. 1845. (Based on *C. canescens* var. *sphaerostachya* Tuckerm.)
- Carex canescens* var. *alpestris* Trev. in Ledeb. Fl. Ross. 4: 280. 1853. (Error for *C. canescens* var. *alpicola* Wahl.)
- Carex canescens* var. *vitilis* Carey, in A. Gray, Man. ed. 2. 514. 1856. (Based on *C. vitilis* Fries.)
- *Carex vitilis* var. α Boott, Ill. Carex 219. 1867. (Based on *C. vitilis* Fries.)
- Carex vitilis* var. β Boott, Ill. Carex 219. 1867. (Based on *C. canescens* var. *sphaerostachya* Tuckerm.)
- Carex vitilis* f. *brunnea* Olney, in S. Wats. Bot. King's Expl. 364. 1871. (Type from North America.)
- Carex vitilis* f. *pallida* Olney, in S. Wats. Bot. King's Expl. 364. 1871. (Type from Uinta Mountains, Utah.)
- Carex vitilis* var. *syrtatica* Meinsh. Fl. Ingr. 402. 1878. (Type from Russia.)
- Carex canescens* var. *Personii* Christ, Bull. Soc. Bot. Belg. 24: 18. 1885. (Based on *C. Personii* Sieber.)
- Carex canescens* var. *vulgaris* L. H. Bailey, Bot. Gaz. 13: 86. 1888. (Type North American; not definitely designated.)
- Carex brunnescens* var. *gracilior* Britton; Britt. & Brown, Ill. Fl. 1: 351. 1896. (Based on *C. canescens* var. *vulgaris* L. H. Bailey.)
- Carex canescens* subsp. *brunnescens* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 61. 1902. (Based on *C. brunnescens* Poir.)
- Carex brunnescens* var. *vitilis* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 62. 1902. (Based on *C. vitilis* Fries.)
- Carex brunnescens* var. *sphaerostachya* Kükenth. in Engler, Pflanzenreich 4²⁰: 220. 1909. (Based on *C. canescens* var. *sphaerostachya* Tuckerm.)

Densely caespitose, the rootstocks very short, blackish or brownish, fibrillose, the clumps small to medium-sized, the culms very slender, lax but mostly erect, 0.7–7 dm. high, exceeding the leaves, sharply triangular with flat sides, smooth or slightly roughened immediately beneath the head, brownish at base and conspicuously clothed with the dried-up leaves of the previous year; leaves not glaucous, 5–8 to a fertile culm, clustered towards the base, the blades erect or ascending, flat, thin, deep-green, usually 5–10 cm. long, 1–2.5 mm. wide, roughened towards the attenuate apex, the sheaths tight, hyaline and thin ventrally, slightly yellowish-brown-tinged at mouth and short-prolonged beyond base of blade and continuous with ligule; spikes 5–10, the lower more or less strongly separate, the upper closely approximate, the head erect or somewhat nodding, 1.5–5 cm. long, usually about 5 mm. thick, the lateral spikes suborbicular or short-oblong, usually gynaeceandrous, 3–7 mm. long, 3–4 mm. wide, containing 5–10 at first appressed-ascending, at maturity loosely spreading green or brownish perigynia, obtuse at apex, and rounded at base, the terminal longer, gynaeceandrous and conspicuously clavate and staminate at base; lowermost bract setaceous-prolonged, from shorter than to exceeding its spike, the upper bracts much shorter, usually scale-like; scales ovate, obtusish or acute, white-hyaline with green 3-nerved center, often strongly brownish-tinged, about width of but shorter than mature perigynia; perigynia plano-convex, oval-ovate, 2–2.5 mm. long, 1–1.5 mm. wide, thick, somewhat sharp-edged above, membranaceous, white-punctate, greenish or brownish, lightly several-nerved dorsally, lightly few-nerved ventrally, often only at base, substipitate, spongy and rounded at base, tapering at apex into a

short but well-developed serrulate beak 0.5 mm. long, obliquely cut and sutured dorsally, minutely bidentate, the margins of the orifice hyaline and reddish-brown-tinged; achenes lenticular, ovate-orbicular, 1.5 mm. long, 1 mm. wide, sessile or nearly so, minutely truncate-apiculate, yellowish, very closely enveloped by perigynia; style very short, jointed with achene, at length deciduous; stigmas two, light-reddish-brown, slender, short.

TYPE LOCALITY (of *C. curta* var. *brunnescens*, on which *C. brunnescens* is based): "Hab. in Monte Touly [= Fouly or Fully]" Switzerland.

DISTRIBUTION: Boggy thickets and woods in acid soils, Greenland, Labrador, and Newfoundland to southern Alaska, and southward to northern New Jersey and the high mountains of North Carolina, Colorado, and Washington; widely distributed in Eurasia. (Specimens examined from Greenland, Labrador, Newfoundland, Miquelon, St. Pierre, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, Ontario, Ohio, Michigan, Wisconsin, Minnesota, Manitoba, Saskatchewan, Alberta, Wyoming, Colorado, Idaho, Oregon, Washington, British Columbia.)

ILLUSTRATIONS: Fl. Dan. pl. 2973; Britt. & Brown, Ill. Fl. f. 848; ed. 2. f. 912; Rob. & Fern. Man. f. 387; Proc. Am. Acad. 37: pl. 5, f. 121-124; Schkuhr, Riedgr. pl. E. f. 24; Engler, Pflanzenreich 4²⁰: 213. f. 35, F, G; Abrams, Ill. Fl. Pacif. St. f. 755; Jour. Russe Bot. 1911: 68. f. 52; Coste, Fl. Fr. f. 3829; Engl. Bot. ed. 3. pl. 1632; Hegi, Ill. Fl. Mittel-Eur. f. 223; Am. Jour. Sci. 48: pl. OD, f. 104 (as *C. Buckleyi*); 49: pl. EE, f. 110 (as *C. sphaerostachya*); Sturm, Deuts. Fl. 50: pl. 9; Reichenb. Ic. Fl. Germ. 8: pl. 206, f. 547; Ostenf. Fl. Arct. 55. f. 24; Anders. Cyp. Scand. pl. 4, f. 38.

NOTE: When growing in thickets and woods this species is slender and weak and the scales are not or but little colored; when growing in more exposed situations it is lower and stiffer and the scales become strongly brownish-tinged. The differences are apparently of a purely ecological nature.

94. *Carex bonanzensis* Britton; Britton & Rydb. Bull. N. Y. Bot. Gard. 2: 160. 1901.

Carex Cajanderi Kükenth. Oefv. Finska Vet.-Soc. Förh. 45^o: 3. 1903. (Type from eastern Siberia.)

Cespitose, with slender, elongate, light-brown rootstocks, the culms 2.5-4.5 dm. high, stiff, sharply triangular with concave sides and strongly roughened on the angles above, somewhat exceeding the leaves, light-brownish at base and clothed with the dried-up leaves of the previous year, the lower blade-bearing; leaves with well-developed blades 4-7 to a fertile culm, on the lower third, but not very closely clustered, the blades flat, with slightly revolute margins, not thick, light-green or glaucous-green, usually 1-2 dm. long, 2-3 mm. wide, long-attenuate, very rough on the margins above, the sheaths tight, hyaline ventrally and conspicuously red-dotted, thin at mouth and short-prolonged beyond base of blade and continuous with ligule; spikes about 7, all thoroughly distinct, the upper approximate, the lower 2 or 3 more or less separate (1 cm. or less), forming a head 3-4 cm. long, 1 cm. thick, the spikes gynaeandrous, densely-flowered, oblong, 5-14 mm. long, 4 mm. wide, obtuse at apex, the lower obtuse at base, the uppermost strongly clavate, the perigynia 10-20, appressed-ascending, the uppermost spike conspicuously staminate at base, the others slightly so; lower bract prolonged, 1.5-3 cm. long, shorter than the head, the upper bracts scale-like or short-cuspidate; scales broadly ovate, small, thin, strongly obtuse to acutish, brown, with a broad greenish-straw-colored 3-nerved center and very narrow hyaline margins, sharp-keeled nearly to tip, rather narrower than and much exceeded by perigynia; perigynia plano-convex, oval-obovate, 1.5 mm. long, 1 mm. wide, dark-straw-colored, sharp-angled but not margined, membranaceous, densely white-punctate, strongly several-nerved dorsally, obscurely few-nerved at base ventrally, substipitate, round-tapering and spongy at base, rounded at apex and abruptly minutely beaked, the beak 0.25 mm. long, obliquely cleft dorsally, but not sutured, smooth, entire and reddish at apex; achenes lenticular, closely filling perigynia, oval, 1.25 mm. long, 0.8 mm. wide, short-tapering at base, bluntly and minutely apiculate; style short, slender, jointed with achene, at length deciduous; stigmas two, slender, light-yellowish-brown.

TYPE LOCALITY: Mouth of Bonanza Creek, Yukon (Williams).

DISTRIBUTION: Upper Yukon Valley; also in eastern Siberia. (Specimens examined from Yukon.)

ILLUSTRATION: Jour. Russe Bot. 1911: 68. f. 51 (*C. Cajanderi*).

95. *Carex praeceptorium* Mackenzie, sp. nov.

"*Carex inaequalis* Wahl." W. Boott, in S. Wats. Bot. Calif. 2: 233. 1880.
Carex canescens var. *debilis* L. H. Bailey, Bot. Gaz. 9: 119. 1884. (Type from Bear River Cañon, Utah.)

"*Carex canescens* L." Mackenzie, Erythea 8: 49, in part. f. 22. 1922.

Cespitose, in small clumps, the rootstocks short, dark, fibrillose, the culms stiff but slender, 1-1.5 dm. high, sharply triangular with flat sides, roughened beneath head, exceeding the leaves, brownish-tinged at base and clothed with the dried-up leaves of the previous year; leaves with well-developed blades 3-5 to a culm, clustered on the lower fourth, the blades light-green, erect, stiffish, canaliculate, 5-8 cm. long, 1.25-2 mm. wide, tapering and roughened towards apex, the sheaths tight, hyaline and very thin ventrally, more or less yellowish-brown-tinged, short-prolonged at mouth beyond base of blade and continuous with ligule; spikes 4 or 5, densely aggregated in an ovoid or oblong-ovoid head 1-1.5 cm. long, 5-8 mm. thick, the spikes small, gynaeceandrous, oblong-ovoid or ovoid, 4-7 mm. long, 3.5 mm. wide, the lateral rounded at both ends, with the staminate flowers inconspicuous, the terminal short-clavate at base and the staminate flowers conspicuous, the perigynia 8-20, ascending or rather loosely spreading at maturity; lowest bract setaceous-prolonged, much shorter than head, the upper bracts scale-like; scales ovate, obtuse or acutish, as wide as but somewhat shorter than perigynia, light-chestnut-brown with lighter midvein and hyaline apex and margins; perigynia plano-convex, oval-ovate, thick, very small, 1.5-1.75 mm. long, 1 mm. wide, membranaceous, densely white-punctate, yellowish-brown, lightly many-striate on both sides, sharp-edged above ventrally, substipitate, rounded and slightly spongy at base, abruptly contracted into an entire or slightly emarginate sparingly serrulate beak about 0.25 mm. long, chestnut-brown-tinged, obliquely cut dorsally but not sutured; achenes lenticular, closely enveloped by perigynia, 1.25 mm. long, 0.9 mm. wide, broadly obovate, quadrate, yellowish-brown, substipitate, apiculate; style very short, jointed with achene, at length deciduous; stigmas two, light-reddish-brown, slender, short.

Type collected on the Simcoe Mountains, fifteen miles north of Goldendale, Washington, M. E. Peck 13, August 3, 1917. Named to commemorate Professors Morton Eaton Peck and James Carlton Nelson, from both of whom I have received many specimens.

DISTRIBUTION: Mountains of California, Oregon, and Washington. (Specimens examined from California, Oregon, Washington.)

ILLUSTRATIONS: Erythea 8: 49, f. 22; Jepson, Man. Fl. Pl. Calif. f. 180 (as *C. canescens*).

96. *Carex canescens* L. Sp. Pl. 974. 1753.

"*Carex brizoides* L." Huds. Fl. Angl. 349. 1762.

"*Carex elongata* L." Leers, Fl. Herb. 197, pl. 14, f. 7. 1775.

Carex cinerea Poll. Hist. Pl. Palat. 2: 571. 1777. (Type from central Europe.)

Carex curta Gooden. Trans. Linn. Soc. 2: 145. 1794. (Type from England.)

Carex compressa Hose, Ann. Bot. Usteri 21: 33. 1797. (Type from Crefeld, Germany.)

Carex Richardi Thuill. Pl. Par. ed. 2: 482. 1799. (Type from France.)

Carex similis Urv. Mém. Soc. Linn. Paris 4: 599. 1826. (Type from Falkland Islands.)

Vigna canescens Reichenb. in Mössler, Handb. ed. 2: 1612. 1829. (Based on *Carex canescens* L.)

Carex canescens var. *bracteata* Klett & Richter, Fl. Leipz. 752. 1830. (Type from central Europe.)

Carex canescens var. α Torr. Ann. Lye. N. Y. 3: 393. 1836. (Based on *C. canescens* L.)

Carex canescens f. *sublobata* Laest. Nova Acta Soc. Sci. Upsal. 11: 282. 1839. (Type from Lap-

land.)

Facolis curta Raf. Good Book 26. 1840. (Based on *Carex curta* Gooden.)

Vigna canescens var. *sublobata* Hartm. ~~Flora~~ Skand. Fl. ed. 4: 299. 1843. (Type from Lapland;

based by inference on *C. canescens* f. *sublobata* Laest.)

Carex canescens var. *robustior* Blytt; Anderss. Cyp. Scand. 57. 1849. (Type from Scandinavia.)

Carex canescens var. *tenais* O. P. Lang, Linnaea 24: 538. 1851. (Type from Germany.)

Carex lapponica O. P. Lang, Linnaea 24: 539. 1851. (Type from Lapland.)

Carex canescens var. *robusta* Blytt, Norges Fl. 201. 1861. (Based on *C. canescens* var. *robustior*

Blytt.)

Carex canescens var. *laetivirens* Asch. Fl. Brand. 1: 770. 1864. (Type from Germany.)

Vigna canescens var. *gracillima* Schur, Enum. Pl. Transsilv. 702. 1866. (Type from central

Europe.)

Carex canescens f. Boott, III. Carex 154, pl. 496. 1867. (From New York; basis of var. *disjuncta*

Fernald.)

Carex canescens var. *minor* Boott, III. Carex 220. 1867. (Based on *C. canescens* var. *sublobata*

Laest.)

"*Carex elongata* L.," Olney, in S. Wats. Bot. King's Expl. 365. 1871.

"*Carex lagopina* Wahl.," Olney, in S. Wats. Bot. King's Expl. 365. 1871.

- Carex Kanitzii* Porcius, Magyar Növény. Lap. 9: 131. 1885. (Type from central Europe.)
Carex canescens β *longibracteata* Porcius, Magyar Növény. Lap. 9: 131. 1885. (Based on *C. Kanitzii* Porcius.)
Caričina canescens St.-Lag. in Carlot. Étude Fl. ed. 8. 2: 878. 1889. (Based on *Carex canescens* L.)
Carex canescens var. *robustina* Macoun, Cat. Can. Pl. 5: 376. 1890. (Type from British Columbia.)
 "Carex gracilis Schkuhr" Meisn. Acta Hort. Petrop. 18: 328, in part. 1901.
Carex canescens var. *subutilis* Neuman, Sv. Fl. 710. 1901. (Type from Scandinavia.)
Carex canescens var. *fallax* F. Kurtz; Asch. & Graebn. Syn. Mitteleur. Fl. 2: 61. 1902. (Type from central Europe.)
Carex canescens var. *disjuncta* Fernald, Proc. Am. Acad. 37: 488. pl. 5, f. 118-120. 1902. (Type from New York, Boott pl. 496.)
Carex canescens var. *congesta* Domin, Sitz-ber. Böhm. Ges. Wiss. 1903²⁸: 47. 1904. (Type from central Europe.)
Carex disjuncta Bickn. Bull. Torrey Club 35: 495. 1908. (Based on *C. canescens* var. *disjuncta* Fernald.)
Carex sublobiacea Bickn. Bull. Torrey Club 35: 496. 1908. (Based on *C. canescens* var. *sublobiacea* Hartm.)
Carex canescens var. *subtenella* Kükenth. in Engler, Pflanzenreich 4²⁰: 218. 1909. (Type from Finland.)
Carex canescens var. *maxima* Kükenth. in Engler, Pflanzenreich 4²⁰: 218. 1909. (Type from central Europe.)
Carex canescens var. *heterostachya* Farwell, Rep. Mich. Acad. 19: 247. 1917. (Type from Keweenaw Peninsula, Michigan.)

Densely caespitose, the rootstocks usually very short, blackish, fibrillose, occasionally somewhat prolonged, the clumps medium-sized to large, the culms 1-8 dm. high, from shorter than to exceeding the leaves, erect but not stiff, sharply triangular with flat sides, smooth except immediately below the head, brownish at base and conspicuously clothed with the dried-up leaves of the previous year; leaves glaucous-green, 5-8 to a fertile culm, on the lower third, the blades erect or ascending, flat, not stiff, usually 7-15 cm. long, 2-4 mm. wide, roughened towards the attenuate apex, the sheaths tight, thin and hyaline ventrally and short-prolonged beyond base of blade and continuous with ligule; spikes 4-8, forming an erect or flexuous head 2-15 cm. long, usually about 8 mm. thick, the upper spikes approximate or flexuous, the lower more or less strongly separate, the spikes 3-12 mm. long, 3-5 mm. wide, suborbicular or oblong, containing 10-30 appressed-ascending perigynia, rounded at apex, at base inconspicuously staminate and rounded, or the uppermost clavate and more conspicuously staminate; lowermost bract cuspidate-prolonged, from shorter than to exceeding its spike, the upper bracts much shorter, usually scale-like; scales broadly ovate, obtusish or acute, hyaline with green 3-nerved center when young, usually brownish-tinged at maturity, about width of but shorter than mature perigynia; perigynia plano-convex, oval-ovate, 1.8-3 mm. long, 1.25-1.75 mm. wide, thick, membranaceous, densely punctate, gray-green or becoming yellowish-brown, slightly sharp-edged ventrally, more or less strongly many-nerved on both sides (usually obscurely so), the margins smooth throughout or minutely serrulate at base of beak, minutely stipitate, spongy and rounded at base, contracted into a very short inconspicuous beak, entire or very minutely emarginate, obliquely cut but not fissured dorsally, the orifice reddish-brown-tinged and slightly hyaline; achenes lenticular, oblong-obovate, yellowish-brown, closely enveloped by perigynia, 1.5 mm. long, 0.9 mm. wide, substipitate, apiculate; style very short, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown.

TYPE LOCALITY: "Habitat in Europa septentrionali."

DISTRIBUTION: Widely distributed in swamps and bogs, in acid soils, from Greenland and Newfoundland to Alaska, and southward to Virginia, Arizona, and California; also in Eurasia, South America, and Australia. (Specimens examined from Greenland, Labrador, Newfoundland, St. Pierre, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, Ontario, Ohio, Michigan, Indiana, Wisconsin, Minnesota, Alberta, Mackenzie, Wyoming, Montana, Idaho, Colorado, Utah, Arizona, Nevada, California, Oregon, Washington, Vancouver, British Columbia, Alaska.)

ILLUSTRATIONS: Fl. Dan. pl. 285; Britt. & Brown, Ill. Fl. f. 847; ed. 2. f. 911; Engler, Pflanzenreich 4²⁰: 213, f. 35, C-E; Rob. & Fern. Man. f. 384-386; Schkuhr, Riedgr. pl. C, f. 13; Proc. Am. Acad. 37: pl. 5, f. 114-120; Rep. N. J. Mus. 1910: pl. 21, f. 5. (var. *disjuncta*); Boott, Ill. Carex 4: 154, pl. 496 (var. *disjuncta*); Abrams, Ill. Fl. Pacif. St. f. 734; Jour. Russe Bot. 1911: 65, f. 49; Sturm, Deuts. Fl. 50: pl. 8; Reichenb. Ic. Fl. Germ. 8: pl. 206, f. 546; Ostenf. Fl. Arct. 55, f. 22; Anderss. Cyp. Scand. 57, pl. 4, f. 39; Host, Gram. Austr. 1: 37, pl. 48; Engl. Bot. pl. 1386; ed. 3, pl. 1631; Benth. Handb. Brit. Fl. ed. 2. f. 1101; Coste, Fl. Fr. 3: 499, f. 3828; Hegi, Ill. Fl. Mittel-Eur. pl. 47, f. 4; Lindm. Bild. Nord. Fl. pl. 434A; Karst. Deuts. Fl. f. 163 (3, 4); Hallier, Deuts. Fl. pl. 425; Leers, Fl. Hierborn. pl. 14, f. 7 (as *C. elongata*).

NOTE 1: A species varying much in the size of the spikes and in the extent to which the lower spikes are separated. The larger forms, with spikes 6-12 mm. long, the lower 2-4 cm. apart, represent the form of the species found in the more southern part of its range in eastern North America, and constitute var. *disjuncta* Fernald; but northerly it shades so much into the forms with more congested inflorescence that it there loses its distinctiveness.

NOTE 2: A hybrid between *Carex canescens* L. and *Carex norvegica* Willd. occurs not infrequently. (Specimens examined from New Brunswick, Maine, Quebec.) It has been named *Carex pseudo-helvola* (Kihlm. Medd. Soc. Faun. Fl. Fenn. 16: 71. 1889); *Carex helvola* subsp. *pseudohelvola* (Nyman, Consp. Fl. Eur. Suppl. 2: 324. 1890). It has usually been called *Carex helvola* Blytt (Fries, Bot. Notiser 1849: 58. 1849), but that name properly belongs to the hybrid *Carex canescens* L. \times *Carex bipartita* All. (according to Kihlm. loc. cit. 74). This hybrid last referred to has been recorded from western Greenland and Labrador (Kükenth. in Engler, Pflanzenreich 4²⁰: 220).

97. *Carex arctaeformis* Mackenzie, sp. nov.

"*Carex muricata* L." Meehan, Proc. Acad. Phila. 1884: 94. 1884. (Specimen from Sitka, Alaska.)
Carex canescens L. "a curious form" Macoun, Cat. Can. Pl. 4: 123. 1888. (Specimen from Langford Lake, Vancouver Island.)
 ? *Carex Heleonastes* var. *robustior* Kükenth. in Engler, Pflanzenreich 4²⁰: 215. 1909. (Type from Sitka, Alaska.)

Very densely caespitose, in large clumps, the rootstocks very short, not stoloniferous, the culms 1.5-4.5 dm. high, erect, strict, stoutish (2.5-4 mm. thick at base), rather weakly cellular, the sides strongly concave, strongly roughened on upper half, exceeding or shorter than the leaves, strongly biennial, the dried-up leaves of the first year very conspicuous; sterile shoots elongate; leaves of the flowering year with well-developed blades 2-4 to a fertile culm, on lower third, not septate-nodulose, the blades erect, mostly 1-3 dm. long, 1.5-4 mm. wide, light-green or glaucous-green, thinnish, channeled above, somewhat keeled below, long-attenuate and very rough, the sheaths white-hyaline ventrally, deeply concave at mouth, the ligule nearly as long as wide; head ovoid or oblong, 1.5-3 cm. long, 8-14 mm. thick, the spikes closely aggregated, even the lowest only slightly separate, gynaeceandrous, ovoid to short-oblong, 6-10 mm. long, 4.5-6 mm. wide, obtuse, the terminal short-clavate, the lower rounded or slightly tapering, closely flowered, the perigynia 15-40, appressed-ascending in several to many rows; lowest bract squamiform, usually shorter than but sometimes exceeding head, the upper bracts reduced; scales ovate, cuspidate to acute, closely appressed, slightly enveloping perigynia at base, somewhat narrower above and somewhat shorter than the perigynia, dull-greenish-white, slightly reddish-brown-tinged, the margins dull-white-hyaline, the midvein green, sharp, prominent to tip; perigynia plano-convex, ovate-oval (widest near middle), flattened, but thickish, 2.5 mm. long, 1.5 mm. wide, membranaceous, grayish-green, white-puncticulate, sometimes sparsely yellow-glandular, finely several- to many-nerved on both sides, the margins entire, not at all winged, substipitate, round-tapering at base, somewhat abruptly beaked, the beak 0.25 mm. long, with a very few obscure serrulations at base, entire or nearly so, dull-yellowish-hyaline, slightly obliquely cut but not sutured dorsally; achenes lenticular, oblong-quadrate, 1.75 mm. long, 1.2 mm. wide, nearly filling five sixths of perigynium-body, yellowish, substipitate, abruptly short-apiculate, jointed with the slender straight style; stigmas two, slender, reddish-brown, rather short.

Type collected at Elgin, British Columbia, Latitude 49°, June 4, 1915, *J. K. Henry* 9152.

DISTRIBUTION: Sphagnum bogs, Alaska and British Columbia, including Vancouver Island.

(Specimens examined from Elgin, Cloverdale, and Lula Island, British Columbia, and Sitka, Alaska.)
 NOTE: Brought to my attention by the late Prof. Joseph Kaye Henry, who noted its distinct appearance as contrasted with *Carex canescens* L., and who collected it for a number of years. It has the appearance of *Carex arcta* Boott, but the perigynia of *Carex canescens* L.

98. *Carex arcta* Boott, Ill. *Carex* 155, pl. 497. 1867.

Carex canescens var. *polystachya* Boott, in Richards. Arct. Exped. 2: 344. 1851. (Type from western Ontario.)

— *Carex Kunzei* Olney, Caric. Bor.-Am. 9. Mr 1872; A. Gray, Proc. Am. Acad. 8: 406. My 1872. (Based on *C. leiophryna* "C. A. Meyer" Kunze, Suppl. Riedgr., as to Hall's plant only; not as to type.)

Carex canescens var. *oregana* L. H. Bailey, Mem. Torrey Club 1: 75. 1889. (Type from Portland, Oregon.)

Carex Heleonastes var. *scabriscula* Kükenth. in Engler, Pflanzenreich 4²⁰: 215. 1909. (Type from Mt. Adams, Washington.)

Densely caespitose, the rootstocks very short, black, fibrillose, the culms 1.5-3 dm. high,

sharply triangular with concave sides, slender but strict, very rough on the angles above, usually strongly exceeded by the long leaves, light-brown at base and conspicuously clothed with the dried-up leaves of the previous year; leaves with well-developed blades 5-10 to a fertile culm, bunched towards the base, the blades 1.5-4 dm. long, 2-4 mm. wide, light-green, flat, not stiff, very rough towards the long-attenuate apex, the sheaths hyaline and very thin ventrally, not prolonged beyond base of blade, the ligule about as long as wide, the lower sheaths conspicuously purplish-dotted ventrally and loose; inflorescence consisting of 5-15 gynaeandrous, greenish or brownish-yellow-tinged spikes, closely aggregated into an ovoid-oblong or oblong head 1.5-3 cm. long, 7-12 mm. thick, the upper spikes hardly recognizable, the lower well differentiated and often slightly separated, oblong, 5-10 mm. long, 4-6 mm. wide, obtuse at both ends, the staminate basal flowers very inconspicuous, the 10-20 perigynia spreading-ascending, the beaks not very conspicuous; lower one or two bracts developed and from much shorter than to much longer than the head; upper bracts scale-like, cuspidate-pointed; scales ovate, short-cuspidate to obtusish, hyaline with a sharp green center, the mid-vein usually more or less strongly brownish-tinged, about width of but rather shorter than perigynia; perigynia plano-convex, ovate, 2-3 mm. long, 1.1-1.5 mm. wide, greenish-straw-colored or brownish at maturity, thickish, membranaceous, densely white-punctate, widest near the broad truncate base, wingless but slightly sharp-edged, strongly several-nerved dorsally, more obscurely several-nerved ventrally, short-stipitate, spongy at base, gradually tapering into a medium-sized (0.75 mm. long) flat beak, strongly serrulate, obliquely cut dorsally, bidentate, the orifice reddish-brown-tinged; achenes lenticular, closely enveloped, ovate, 1.5 mm. long, 0.8 mm. wide, substipitate, short-apiculate, brownish; style slender, jointed with achene, at length deciduous; stigmas two, dark-reddish-brown, slender, short.

TYPE LOCALITY (of *C. canescens* var. *polystachya* Boott, on which *C. arctica* is based): "In America boreali, Canada, Lake Superior, Rainy Lake, Lake of the Woods."

DISTRIBUTION: Swampy woods and thickets, Quebec and New Brunswick to British Columbia, and southward to Massachusetts, New York, Minnesota, and extreme northern California. (Specimens examined from New Brunswick, Quebec, Maine, New Hampshire, Vermont, New York, Ontario, Michigan, Wisconsin, Minnesota, Montana, Alberta, Idaho, California, Oregon, Washington, British Columbia.)

ILLUSTRATIONS: Boott, Ill. *Carex* 155. *pl.* 497; Britt. & Brown, Ill. *Fl.* f. 850; ed. 2. f. 913; Rob. & Fern. Man. f. 383; Engler. *Pflanzenreich* 4²⁰: 229. f. 37, A, B; Proc. Am. Acad. 37: *pl.* 5, f. 110-113; Abrams, Ill. *Fl. Pacif. St.* f. 756.

18. *Diocae* Tuckerm. Enum. Caric. 7, excluding *C. capitata* L. 1843; L. H. Bailey, Proc. Am. Acad. 22: 141, in part. 1886; Kükenth. in Engler, *Pflanzenreich* 4²⁰: 75, in greater part. 1909; Mackenzie, in Rydb. *Fl. Rocky Mts.* 120. 1917. *PULICARES* O. F. Lang, *Linnaea* 24: 498, in part, not as to type species. 1851. *DAVALLIANAE* Pax, in E. & P. *Nat. Pfl.* 2: 123, in part, not as to type species. 1887. *DIOECAE* Asch. & Graebn. *Syn. Mitteleur. Fl.* 2: 8. 1902. *ASTROSTACHYAE* Holm, *Am. Jour. Sci.* IV. 16: 454, in part, not as to type species. 1903. Treated as a genus *Maukschia* by Heuffel (*Flora* 27: 527. 1844).

Freely long-stoloniferous; culms very slender; leaf-blades filiform-involute; spike solitary, staminate or pistillate or androgynous, always bractless, linear to oblong-ovoid; perigynia at length widely spreading or reflexed, plano-convex or unequally biconvex, not inflated, subcoriaceous, dark-tinged at maturity, glabrous, nerved, rounded and strongly spongy at base, narrowly sharp-edged, strongly beaked, the apex hyaline, in age slightly bidentate, obliquely cut dorsally and sutured; achenes lenticular, apiculate, jointed with the style, closely enveloped in upper part of perigynium-body; stigmas two.

Four species, of sphagnum bogs and thickets, in northern and alpine Eurasia, one of them in North America.

99. *Carex gynocrates* Wormsk.; Drejer, *Nat. Tidssk.*

3: 434. 1841.

"*Carex Bellardi* All." Hornem. *Fl. Dan. pl.* 1529. 1816.

"*Carex dioica* L." Schw. & Torr. *Ann. Lyc. N. Y.* 1: 293. 1825.

Kobresia nardina Hornem. *Nomen. Fl. Dan.* 74. 1827. (As to reference to *Fl. Dan. pl.* 1529.)

"*Carex Redowskyana* C. A. Meyer" Dewey, *Am. Jour. Sci.* 29: 250. 1836. (Plant from north-western North America.)

Carex alascana Böck. *Bot. Jahrb.* 7: 277. 1886. (Type from Alaska.)

Carex gynocrates var. *substaminata* Peck; Howe, Ann. Rep. N. Y. State Mus. 48: 148. 1897. (Type from New York.)

— *Carex monosperma* Macoun; Howe, Ann. Rep. N. Y. State Mus. 48: 148, as synonym. 1897.

Carex dioica var. *gynocrates* Ostenf. Fl. Arct. 60. 1902. (Based on *C. gynocrates* Wormsk.)

Freely long-stoloniferous, the stolons very slender, 1 mm. thick, yellowish-brown, the culms erect, 4–30 cm. high, very slender but stiff, obscurely obtusely triangular, smooth, arising singly or few together, noticeably exceeding the leaves, brown and clothed at base with the conspicuous dried-up leaves of the previous year; leaves of the year with well-developed blades usually 3–5 to a culm, clustered near the base, the blades erect or somewhat spreading, 2.5–10 dm. long, 0.5 mm. wide, narrowly involute, smooth, stiff, light-green, the sheaths very tight, not prolonged at mouth, the ligule very short; spike solitary, entirely pistillate, entirely staminate, or pistillate at base and staminate above, not densely flowered, linear, 5–15 mm. long, 2–4 mm. wide, bractless; scales of pistillate flowers oblong-ovate, short-cuspidate or acute or acuminate, light-reddish-brown or brownish in age, with narrow hyaline margin and poorly defined lighter-colored midvein, usually rather wider but shorter than perigynia; scales of staminate flowers similar, but more obtusish and lighter-colored; perigynia 4–10, erect-ascending or at maturity widely spreading or somewhat reflexed, at maturity biconvex, oblong-ovate, 3–3.5 mm. long, 1.5–2 mm. wide, yellowish or at maturity brownish-black, shining, coriaceous, finely many-nerved dorsally, obscurely many-nerved ventrally, scarcely margined but minutely serrulate above, substipitate, round-tapering and spongy at base, abruptly contracted into a short beak about 0.5 mm. long, sparingly serrulate, obliquely cut dorsally, the orifice hyaline, the apex at length minutely bidentate; achenes lenticular, broadly obovate, yellowish-brown, shining, 1.5 mm. long, apiculate, tapering at base; style slender, jointed with achene, somewhat enlarged at base, not protruding; stigmas two, conspicuous, slender, light-reddish-brown.

TYPE LOCALITY: "Grönland Wormskj.! (flor.) Vahl! (fructif.)."

DISTRIBUTION: Sphagnum swamps in calcareous districts, Greenland to Yukon, and southward to New York, Michigan, Colorado, and British Columbia; also in Siberia. Recorded, apparently erroneously, from northern Europe. (Specimens examined from Greenland, Labrador, Newfoundland, Quebec, Nova Scotia, New Brunswick, Maine, New York, Pennsylvania, Ontario, Michigan, Wisconsin, Minnesota, Manitoba, Saskatchewan, Alberta, Keewatin, Mackenzie, Montana, Wyoming, Colorado, British Columbia, Yukon.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 815; ed. 2, f. 871; Rob. & Fern. Man. f. 373; Kunze, Suppl. Riedgr. pl. 31, f. 1; Proc. Am. Acad. 37: pl. 4, f. 72–77; Fl. Dan. pl. 1529; Boott, Ill. Carex 143, pl. 459, 460; Jour. Russe Bot. 1911: 33, f. 10; Am. Jour. Sci. IV. 11: 220, f. 2; Ostenf. Fl. Arct. 61, f. 30 (right hand); Am. Jour. Sci. 29: pl. V, f. 80 (as *C. Redowskiana* C. A. Meyer).

NOTE: The North American records for *Carex dioica* L., *Carex parallela* (Laest.) Sommerf., and *Carex Redowskiana* C. A. Meyer, are based on this species.

19. *Stellulatae* Kunth, Enum. Pl. 2: 399. 1837; Tuckerm. Enum. Caric. 9. 1843; Carey, in A. Gray, Man. 544. 1848; Mackenzie, in Rydb. Fl. Rocky Mts. 124. 1917; Mackenzie, Erythea 8: 34. 1922. *ELONGATAE* Kunth, Enum. Pl. 2: 402. 1837; L. H. Bailey, Proc. Am. Acad. 22: 142. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 226. 1909. *AXILLARES* O. F. Lang, Linnaea 24: 525. 1851. *ECHINATAE* O. F. Lang, Linnaea 24: 528. 1851. *REMOTAE* Asch. Fl. Brand. 1: 770. 1864. *ASTROSTACHYAE* Holm, Am. Jour. Sci. IV. 16: 454, mostly. 1903. Treated as part of the *HYPARRHENAE* Fries by Pax (in E. & P. Nat. Pfl. 2¹: 124. 1887); *Carex exilis* Dewey is frequently referred to the *DIOICAE* Tuckerm. Treated as a genus *Leptovigna*, subgenus *LEPTOVIGNEA*, by Börner (Abh. Nat. Ver. Bremen 21: 273. 1913).

Densely caespitose; culms triangular; sheaths not red-dotted nor cross-rugulose; spikes 2–10, or by reduction one, gynaeandrous, pistillate or in a few species staminate, not compound; bracts inconspicuous; perigynia plano-convex, yellow-brown or brown, ascending to reflexed at maturity, 2.5–3.5 mm. long, the body orbicular, ovate, or broadly oval, strongly spongy at base, sharp-edged nearly if not entirely to the rounded or truncate base, not punctulate, nerved on the outer, nerved or nerveless on the inner surface, the achene closely enveloped in the upper part of the perigynium-body, the beak sutured dorsally, bidentate or obliquely cut; achenes lenticular, apiculate, jointed with the straight, slender style; stigmas two.

A group of sphagnum-loving species, strongly developed in the temperate parts of North America, where 20 species occur. One of these species is also widely distributed in Eurasia,

and a closely related one is found in the mountains of New Zealand and southern Australia. There are a few additional species, widely distributed in Eurasia.

- Spike one, sometimes with a small additional one at base; leaf-blades narrowly involute, rigid. 100. *C. exilis*.
- Spikes more than one; leaf-blades 0.5–5 mm. wide, not rigid.
Beak of perigynium smooth or nearly so, the body broadest near the middle.
Perigynia with the body ascending, weakly nerved ventrally and with the beak spreading, reddish-brown-tipped and with a few weak serrulations. 101. *C. laeviculmis*.
- Perigynia with the body widely spreading, strongly nerved ventrally and with the beak hyaline-tipped and smooth. 102. *C. seorsa*.
- Beak of perigynium serrulate, the body broadest near the base (except in *C. Josselynii*).
Perigynia soon ruptured by elongating achene and appearing glume-like; achenes linear-oblong, 1.75 mm. long; perigynia 2.25 mm. long, nerved ventrally, very short-beaked; scales sharp-pointed, the midvein prominent to tip. 103. *C. elachycarpa*.
- Perigynia normally not ruptured by achene and not appearing glume-like.
Perigynia small, 2.25–3.25 mm. long, the beak very shallowly bidentate one fourth to one third length of the body; scales one half to two thirds length of bodies of perigynia.
Perigynia ascending at maturity, the bodies narrowly oval, broadest near middle, strongly nerved ventrally. 104. *C. Josselynii*.
- Perigynia widely spreading at maturity, the bodies ovate to oblong-ovoid, broadest near base.
Perigynia light-brownish-tinged, nerveless or few-nerved at base ventrally, the beak with ventral false suture inconspicuous, reddish-brown between teeth; scales yellowish-brown, with broad white-hyaline margin, very obtuse; leaf-blades flat or somewhat canaliculate, 1–3 mm. wide; culms stiffish. 105. *C. interior*.
- Perigynia deep-green, strongly nerved ventrally, the beak with the ventral false suture conspicuous, white-hyaline between teeth; scales greenish or hyaline, acute or obtusish.
Spikes strongly separate; leaf-blades 0.25–1 mm. wide. 106. *C. Howei*.
- Spikes aggregated in a dense head; leaf-blades 1–2.5 mm. wide. 107. *C. Mohriana*.
- Perigynia 2.75–4.75 mm. long, with beak sharply bidentate and ventral false suture conspicuous.
Body of perigynium suborbicular or very broadly ovate, deep-green at maturity (before over-ripe), strongly nerved ventrally, the beak less than half length of the body.
Scales acutish to short-cuspidate, two thirds length to nearly the length of the bodies of the perigynia, sharply keeled, the raised prominent midvein extending to the apex; culms slender, sharply triangular, 1.5–2.5 mm. thick at base; leaf-blades 1.5–2.5 mm. wide. 108. *C. incompta*.
- Scales obtuse, about half length of bodies of perigynia, the midvein not raised, obsolete or nearly so at the apex; culms stiff, obtusely triangular below, 2–3.5 mm. thick at base; leaf-blades 1.5–4 mm. wide. 109. *C. atlantica*.
- Body of perigynium ovate to lanceolate, straw-colored at maturity or often darker-tinged, the beak half length of the body or more (except in *C. laricinum* and *C. Townsendii*).
Staminate flowers terminal, basal, or in separate spikes; upper part of perigynium-body setulose-serrulate; culms sharply triangular, usually very rough above; scales chestnut-brown with shining white margins, not sharply keeled. 110. *C. sterilis*.
- Staminate flowers mostly at base of terminal spikes; upper part of perigynium-body serrulate or smooth; culms from little to strongly roughened above.
Pistillate scales obtuse or obtusish, chestnut-brown-tinged with broad bright white margins and apex, not sharply keeled, the midvein obscure at apex.
Leaf-blades 2–5 mm. wide; sheaths conspicuously thickened at mouth; culms somewhat flattened in drying, very rough above, 4–5 mm. thick at base. 111. *C. Wiegandii*.
- Leaf-blades 1–3 mm. wide; sheaths but slightly thickened at mouth; culms not flattening in drying, slender to base.
Culms aphyllopodic; leaf-blades little or not at all thickened and stiff.

- Perigynia ovate, abruptly short-beaked, the body nerveless ventrally or nearly so.
 Perigynia narrower, tapering into a long beak, the body many-nerved ventrally.
 Spikes widely separate, the terminal long-clavate; perigynia 3.5-4 mm. long.
 Spikes approximate, the terminal short-clavate; perigynia 3.75-4.5 mm. long.
 Culms phyllopodic, light-green or yellowish-green; leaf-blades thick, firm, and stiff; perigynia ovate, abruptly short-beaked.
- Pistillate scales obtusish to cuspidate, yellowish-brown-tinged, the margins and apex narrow, opaque or dull-whitish, the midvein sharply defined, prominent to apex; culms sharply triangular.
- Perigynium with body noticeably exceeding the obtuse to acutish scale; leaf-blades averaging 3-3.5 mm. wide; sheaths strongly thickened at mouth.
- Perigynium with body equaled or exceeded by the scale; leaf-blades 0.75-2.5 mm. wide; sheaths scarcely thickened at mouth.
- Mature developed perigynia lanceolate, the beak remotely low-serrulate, more than half the length of the body; perigynia nerveless or impressed-nerved towards base ventrally; achenes much longer than wide; culms slender; leaf-blades 0.75-2 mm. wide.
- Mature perigynia ovate, the beak strongly serrulate, much shorter than the body; perigynia with raised nerves ventrally; achenes about as wide as long; culms stouter; leaf-blades 1.5-2.5 mm. wide.
- Scales obtusish to acute; perigynia 2.75-3.5 mm. long, the beak about one third length of the body, the teeth triangular.
- Scales acute to somewhat cuspidate; perigynia 3.5-4 mm. long, the beak about half the length of the body, the teeth subulate.
112. *C. muricata*.
 113. *C. ormantha*.
 114. *C. phyllomanica*.
 115. *C. Townsendii*.
 116. *C. Ruthii*.
 117. *C. angustior*.
 118. *C. laricina*.
 119. *C. cephalantha*.

100. *Carex exilis* Dewey, Am. Jour. Sci. 14: 351. *pl. Q, f. 53.* 1828.

Carex exilis var. *squamacea* Dewey, Am. Jour. Sci. 14: 351. *pl. O, f. 54.* 1828. (Type from Massachusetts.)

Vigna exilis Raf. Good Book 27. 1840. (Based on *Carex exilis* Dewey.)

Carex exilis var. *androgyna* Dewey, in Wood, Class-Book ed. 1861. 750. 1861. (Type from New York.)

Very densely caespitose, the rootstock not at all prolonged, the culms 1.5-7 dm. high, slender, stiff and wiry, obtusely triangular, roughened beneath head, noticeably exceeding the leaves, dark-brown at base and clothed with the conspicuous dried-up leaves of the previous year, the lowest short-bladed; leaves with well-developed blades usually 2 or 3 to a culm, somewhat clustered near the base, the blades stiff, light-green, erect, usually 5-10 cm. long on the fertile culms, longer on the sterile, 0.5 mm. wide, narrowly involute, attenuate, slightly roughish above, the sheaths tight, hyaline ventrally, thin, concave and yellowish-brown-tinged at mouth, the ligule short; spike solitary, usually gynaeceandrous, but sometimes entirely staminate or entirely pistillate or androgynous or frequently or occasionally with one or two small lateral spikes, linear or linear-oblong, often somewhat clavate at base, 1-3 cm. long, 3-6 mm. wide, the lower 2-3 scales short-cuspidate, empty; pistillate scales ovate-orbicular, obtuse or sharp-pointed, reddish-brown with green midrib and conspicuous white-hyaline margins, narrower and about length of bodies of the perigynia; staminate scales similar; perigynia on well-developed spikes numerous (20-35), spreading, plano-convex, ovate, 3 mm. long, 1.5 mm. wide, coriaceous, thick, olive-green or at maturity yellowish-brown, sharp-edged to base, the edges slightly raised, strongly serrulate above middle, several-nerved dorsally, nerveless or nearly so ventrally, rounded and spongy at base, contracted into a strongly serrulate beak half length of body, bidentate, chestnut-brown-tipped, the apex and dorsal suture more or less hyaline; achenes lenticular, ovate-reniform, substipitate, apiculate, yellow, 1.75 mm. long, 1.5 mm. wide; style slender, straight, jointed with achene, at length deciduous; stigmas two, dark-reddish-brown, slender, rather long.

TYPE LOCALITY: Danvers, Massachusetts (*Oakes*).

DISTRIBUTION: In sphagnum bogs and acid soils, Labrador to Delaware, mostly near the coast. Locally inland in Vermont, New York, northwestern New Jersey, Ontario, Michigan, and Minnesota. (Specimens examined from Labrador, Newfoundland, St. Pierre, Quebec (including Magdalen Island), Nova Scotia (including Cape Breton Island), Maine, Vermont, Massachusetts, Rhode Island, New York, New Jersey (pine barrens and Sussex County), Delaware, Ontario, Michigan.)

ILLUSTRATIONS: Kunze, Suppl. Riedgr. *pl.* 41; Boott, *Ill. Carex* 17. *pl.* 47; Britt. & Brown, *Ill. Fl.* 816; ed. 2, *f.* 916; Proc. Am. Acad. 37: *pl.* 4, *f.* 78-83; Rob. & Fern. *Man. f.* 374; Rep. N. J. Mus., 1910: *pl.* 20, *f.* 13; Am. Jour. Sci. 14: *pl.* O, *f.* 53, 54 (var. *squamacea*).

NOTE: A hybrid with *Carex sterilis* Willd. is known (Mingan Islands, Quebec, *Bros. Victorin & Rolland 20116*).

101. *Carex laeviculmis* Meinh. Bot. Centr. 55: 195. 1893.

"*Carex elongata* L." Bong. Mém. Acad. St.-Pétersb. VI. 2: 168. 1832.

"*Carex remota* L." Trev. in Ledeb. Fl. Ross. 4: 283, in part. 1853.

Carex Bolanderi var. *sparsiflora* Olney; A. Gray, Proc. Am. Acad. 8: 407. 1872. (Name only; type from Oregon.)

Carex Deweyana var. *sparsiflora* L. H. Bailey, Bot. Gaz. 13: 87. 1888. (Based on *C. Bolanderi* var. *sparsiflora* Olney.)

Densely caespitose, but with slender, short-creeping, brown, fibrillose rootstocks, the culms very slender, weak, sharply triangular, 3-7 dm. high, exceeding the leaves, roughened beneath the head, light-brownish at base and clothed with the short-bladed dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 3-5 to a fertile culm, on the lower fourth, but not bunched, the blades weak, flat, 5-30 cm. long, 1-2 mm. wide, light-green, roughened on the margins and towards the apex, the sheaths tight, hyaline and thin ventrally, the ligule short; inflorescence consisting of 3-8 spikes, widely separated or the upper 1-3 aggregated, the head 2-6 cm. long, the lower spikes pistillate, suborbicular or short-oblong, 3-10 mm. long, 3-6 mm. wide, containing 3-10 appressed or ascending or in age slightly excurved spreading perigynia, the beaks spreading; uppermost spike gynaeandrous, with a long clavate staminate base; lowermost bract developed, from very short to 4 or 5 cm. long, exceeded by head, the upper bracts scale-like or short-cuspidate; scales ovate, obtusish or acutish, sharply keeled to tip, yellowish-brown with green 3-nerved center, and in age narrow hyaline margins; as wide as but rather shorter than body of perigynia; perigynia plano-convex or concavo-convex, oblong-obovoid, thick, 2.5-4 mm. long, 1.5 mm. wide, light-green or brownish-green, membranaceous, broadest above middle, sharp-edged, lightly several-nerved dorsally, faintly few-nerved ventrally, short-stipitate, rounded and spongiöse at base, tapering at apex into a sparingly subserrulate beak one fourth to one third the length of the body, with entire or emarginate tawny-tipped apex, obliquely cut dorsally; achenes lenticular, sessile, short-obovoid, 1.25-1.75 mm. long, 1 mm. wide, tapering at base, minutely apiculate; style straight, slender, slightly enlarged at base, jointed with achene, at length deciduous; stigmas two, yellowish-brown, slender, rather short.

TYPE LOCALITY: "Aus Kamtschatka und von der Insel Sitcha."

DISTRIBUTION: Southern Alaska to middle California, and eastward to Montana. (Specimens examined from southern Alaska, British Columbia, Washington, Oregon, California, Idaho, Montana.)

ILLUSTRATIONS: Engler, Pflanzenreich 4²⁰: 229. *f.* 37, *E, F*; Jour. Russe Bot. 1911: 73. *f.* 58; Erythea 8: 34. *f.* 14; Jepson, *Man. Fl. Pl. Calif.* *f.* 172; Abrams, *Ill. Fl. Pacif. St.* *f.* 709; Am. Jour. Sci. IV. 11: 219. *f.* 1; 221. *f.* 4.

102. *Carex seorsa* Howe; Gordinier & Howe,

Fl. Renss. Co. 39. 1894.

Carex rosacoides Howe; Gordinier & Howe, Fl. Renss. Co. 33. 1894. (A name for which *C. seorsa* was substituted.)

"*Carex canescens* var. *vulgaris* L. H. Bailey" Deane, Fl. Metrop. Park Comm. 95. 1896.

In large dense clumps, the rootstocks not at all prolonged, the culms weak, 3-7 dm. high, sharply triangular, flattened in drying, roughened above, usually exceeding the leaves, light-brown at base, conspicuously clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades about 3 to a fertile culm, on the lower third, but not bunched, the blades erect-ascending, flat, green, thin, usually 2.5-3.5 dm. long, 2-4 mm. wide, very rough towards the apex, the sheaths tight, very thin and hyaline ventrally,

concave at mouth, the ligule short; spikes 3-7, in a head 3-7 cm. long, the lower separate, the upper approximate, the lower spikes 1-2 cm. apart, the terminal spike 6-12 mm. long, peduncled and varying from narrowly linear, 1 mm. wide and all staminate, to oblong, 4-6 mm. wide and the staminate flowers occupying the clavate base, the lower spikes oblong to short-orbicular, 4-7 mm. long, 4-6 mm. wide, containing 5-20 at length widely radiating excurved perigynia and a few staminate flowers at base; bracts scale-like or the lowest occasionally prolonged, shorter than the head; scales orbicular-ovate, obtusish or acutish to cuspidate, dull-whitish-hyaline, prominently keeled to apex with the brownish or greenish midrib, narrower and from little to much shorter than bodies of perigynia; staminate scales longer; perigynia concavo-convex, broadly oval, 2.5 mm. long, 1.5 mm. wide, membranaceous, deep-green, the body broadest near middle, somewhat spongy at base, narrowly sharp-edged, the edges thick, not serrulate, strongly several-nerved both dorsally and ventrally, short-stipitate, round-truncate at base, abruptly narrowed into a short beak about one fourth to one fifth of length of body, white-tipped, shallowly bidentate, smooth-margined (or nearly so), its teeth very short and erect, the false suture on ventral face obscure, obliquely cut dorsally and with the suture more pronounced; achenes lenticular, occupying upper part of body of perigynium, short-stipitate, broadly ovate, minutely apiculate, 1.25 mm. long, 1 mm. wide; style very short, somewhat enlarged at base, jointed with achene, at length deciduous; stigmas two, slender, light-reddish-brown, rather short.

TYPE LOCALITY: Lansing's Grove, Rensselaer County, New York.

DISTRIBUTION: Acid soils in swampy woods, Massachusetts to Georgia, mostly east of the mountains, and locally westward to Ohio and northwestern Indiana. (Specimens examined from Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, Georgia, Ohio, Indiana.)

ILLUSTRATIONS: Proc. Am. Acad. 37: pl. 4, f. 106-109; Rob. & Fern. Man. f. 382; Britt. & Brown, Ill. Fl. ed. 2, f. 923.

103. *Carex elachycarpa* Fernald, Proc. Am. Acad. 37: 492. pl. 5,
f. 133, 134. 1902

Kobresia elachycarpa Fernald, Rhodora 5: 251. 1903. (Based on *Carex elachycarpa* Fernald.)

Very densely cespitose, the rootstocks very short, black, fibrillose, the culms slender, wiry, 2-5.5 dm. high, striate, triangular, roughened beneath head, strongly exceeding leaves, dark-brown at base and clothed with the short-bladed leaves of the previous year, the lowest bladeless; leaves with well-developed blades 2 or 3 to a fertile culm, on lower fourth, but not bunched, the blades erect or ascending, light-green, stiffish, up to 12 cm. long, 1-2 mm. wide, canaliculate or involute, the sheaths tight, thin and hyaline ventrally, short-prolonged at mouth beyond base of blade and continuous with ligule; head narrow, 12-25 mm. long, the spikes 4-6, the lower more or less separated, the upper approximate, short-ovoid or suborbicular, 4-7 mm. long, 4-5 mm. wide, gynaeandrous, rounded at apex, rounded or short-tapering at base, the perigynia 15 or less, closely appressed, many abortive, whole spikes being often sterile; bracts scale-like or lowest slightly prolonged; scales ovate, acutish to short-cuspidate, light-chestnut-brown with lighter 1-3-nerved center and narrow dull-hyaline margins, sharply keeled, the midvein prominent to apex, as wide as but shorter than perigynia, nearly concealing them; perigynia plano-convex, oblong-lanceolate, 2.25 mm. long, 0.8 mm. wide, thick, yellowish-green or straw-colored or light-brownish, sharp-edged to base but not serrulate except at base of beak, lightly several-striate on both faces, tapering and truncate at base, tapering at apex into a serrulate beak one fourth to one fifth length of the whole, hyaline-tipped, chestnut-brown-tinged, obliquely cut dorsally, bidentulate, the dorsal suture conspicuous, the ventral false suture obsolete, the walls extremely membranaceous and fragile and broken by elongation of maturing achene; achenes lenticular, linear-oblong, 1.75 mm. long, 0.6 mm. wide, substipitate, short-apiculate, yellowish, nearly as thick as wide; style slender, jointed with achene, deciduous; stigmas two, dark-reddish-brown, slender, short.

TYPE LOCALITY: Fort Fairfield, Maine (Williams, Collins & Fernald).

DISTRIBUTION: Known only from gravelly river banks at the type locality.

ILLUSTRATIONS: Proc. Am. Acad. 37: pl. 5, f. 133, 134; Rob. & Fern. Man. f. 339; Britt. & Brown, Ill. Fl. ed. 2, f. 917.

NOTE: This is probably a hybrid between *Carex interior* L. H. Bailey and *C. angustior* Mackenzie.

104. *Carex Josselynii* (Fernald) Mackenzie; Pease, Proc. Bost. Soc. Nat. Hist. 37: 188. 1924.

Carex interior var. *Josselynii* Fernald, Rhodora 8: 115. 1906. (Type from Fort Kent, Maine.)
Carex scirpoides var. *Josselynii* Fernald, Rhodora 10: 48. 1908. (Based on *C. interior* var. *Josselynii* Fernald.)

Densely caespitose, the culms slender but rather stiff, 2–3.5 dm. high, sharply triangular, roughened beneath head, about equaling leaves, aphyllopodic, brownish-tinged at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 2–4 to a culm, the blades flat, thin, light-green, usually 1–2 dm. long, 1.5 mm. wide, the sheaths tight, hyaline ventrally, thin, but somewhat thickened at mouth, short-prolonged beyond base of blade and continuous with ligule; spikes 3 or 4, approximate, forming a head 1.5–3 cm. long, rounded at apex, the lower gynaeandrous or pistillate, short-oblong or oblong, 4–10 mm. long, 4–5 mm. wide, rounded or short-clavate at base, with 10–20 appressed-ascending or in age ascending-spreading perigynia, the uppermost longer, gynaeandrous with conspicuous clavate base; bracts scale-like or lowest setaceous, short; scales broadly ovate, obtuse, narrower than and half length of bodies of perigynia, yellowish-brown or chestnut-tinged with greenish center and conspicuous hyaline margins, not sharply keeled, the midvein becoming obsolete above; perigynia plano-convex, linear-oval, thick, 2.5–3.25 mm. long, scarcely 1 mm. wide, membranaceous but firm, widest near middle of body, green or in age stramineous, sharp-edged to base, the body narrowly oval, not serrulate, strongly nerved on both faces, substipitate, tapering and spongy at base, tapering at apex into a sparingly but sharply serrulate beak one fourth length of body, very shallowly bidentate, chestnut-brown-tipped, obliquely cut dorsally, slightly white-hyaline at tip, the ventral false suture obsolete, the dorsal suture conspicuous; achenes lenticular, closely enveloped, short-stipitate, light-brownish, oblong, 1.75 mm. long, 0.75 mm. wide, truncately subapiculate; style slender, short, jointed with achene, at length deciduous, slightly enlarged at base; stigmas two, slender, reddish-brown, short.

TYPE LOCALITY (of *C. interior* var. *Josselynii* Fernald, on which *C. Josselynii* is based): Fort Kent, Maine (Fernald).

DISTRIBUTION: Known only from the vicinity of the type locality.

105. *Carex interior* L. H. Bailey, Bull. Torrey Club 20: 426. 1893.

Carex scirpoides Schkuhr; (Willd. Sp. Pl. 4: 237, in smaller part. 1805) Muhl. Descr. Gram. 225. 1817. Not *C. scirpoides* Michx. 1803.

Carex stellulata var. γ Torr. Ann. Lyc. N. Y. 3: 392. 1836. (Based on the synonym immediately preceding.)

Carex stellulata var. *scirpina* "Torr. & Gray" Tuckerm. Enum. Caric. 9. 1843. (Based on *C. scirpoides* Schkuhr, in part.) Not *C. scirpina* Tuckerm. Enum. Caric. 8. 1843.

Carex stellulata var. *scirpoides* Carey, in A. Gray, Man. 544. 1848. (Based on *C. scirpoides* Schkuhr, in part.)

"*Carex echinata* Murray" Böck. Linnaea 39: 124–125, in part. 1875.

"*Carex norvegica* Wahl." E. P. Sheldon, Bull. Torrey Club 20: 284. 1893.

Carex sterilis f. *flexibilis* Farwell, Rep. Mich. Acad. 21: 362. 1920. (Based on *C. interior* L. H. Bailey.)

Very densely caespitose, the rootstocks dark-colored, not at all prolonged, the culms 1.5–5 dm. (usually 2.5–3.5 dm.) high, slender but wiry and strict, sharply triangular, slightly roughened on the angles immediately beneath the head, mostly longer than the leaves, aphyllopodic, light-brownish at base, the old leaves of the previous year few, short-bladed; leaves with well-developed blades about 3 to a fertile culm, on the lower third, but not bunched, the blades erect-ascending, yellowish-green, thin, flat or somewhat canaliculate, usually 1–3 dm. long, 1–2 mm. or even 3 mm. wide, roughened on margins and towards apex, the sheaths tight, hyaline ventrally, thin and concave at mouth, the ligule wider than long; spikes usually 2–4, or rarely up to 6, close together in a strict terminal head 1–2 cm. long, the terminal spike 5–10 mm. long, peduncled, usually gynaeandrous and long-clavate, but varying from narrowly linear, 0.5 mm. wide and all staminate, to oblong, 4 mm. wide and pistillate with a few inconspicuous basal staminate flowers; lower spikes suborbicular, about 4 mm. long and as wide, containing 1–10 perigynia widely radiating at maturity, and usually without staminate flowers; bracts scale-like or the lowest occasionally short-prolonged; scales broadly ovate, very obtuse,

yellowish-brown with broad 3-nerved green center and broad white-hyaline margin, the mid-vein obsolete or nearly so at apex, as wide as but only one half length of bodies of perigynia; staminate scales more acute; perigynia concavo-convex, oblong-ovoid or ovoid, 2.25-3.25 mm. long, 1.5-2 mm. wide, firm, thick, the body broadest just above the base, very narrowly but thickly sharp-edged, serrulate at base of beak only, olive-green, stramineous or light-brownish, subcoriaceous, several-nerved dorsally, nerveless or few-nerved at base ventrally, substipitate and truncate-rounded at base, the lower third spongy, rather abruptly narrowed into a beak about one third or one fourth the length of the body, reddish-brown-tinged, sparingly serrulate, dorsally cleft, shallowly bidentate, its teeth very short and erect, the ventral false suture short and inconspicuous, the dorsal suture conspicuous; achenes lenticular, occupying upper part of perigynia, short-stipitate, broadly ovate-orbicular, 1.5 mm. wide, 1.25 mm. long, short-apiculate; style slender, very slightly enlarged at base, jointed with achene, at length deciduous; stigmas two, slender, brown, short.

TYPE LOCALITY: Penn Yan, New York (*Sartwell Exs. no. 36*).

DISTRIBUTION: Very widely distributed in swampy meadows, in calcareous or non-acid soils, Labrador and Newfoundland to Vancouver, and southward to Pennsylvania, Indiana, Kansas, Chihuahua, and northern California. (Specimens examined from Labrador, Newfoundland, Quebec (including Magdalen Islands), Prince Edward Island, Nova Scotia, New Brunswick, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ontario, Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota, Manitoba, Saskatchewan, Alberta, Montana, Wyoming, Colorado, New Mexico, Arizona, Chihuahua, Utah, Idaho, British Columbia (including Vancouver Island), Washington, Oregon, northern California.)

ILLUSTRATIONS: Schkuhr, *Riedgr. pl. Zzz. f. 180* (plant with gynaeandrous spikes only); Boott, *Ill. Carex 56. pl. 146***; Britt. & Brown, *Ill. Fl. f. 846*; ed. 2, *f. 918*; Proc. Am. Acad. 37: 485. *pl. 4, f. 101-105*; Rob. & Fern. *Man. f. 381*; Rep. N. J. Mus. 1910: *pl. 26, f. 10*; Abrams, *Ill. Fl. Pacif. St. f. 710*.

106. *Carex Howei* Mackenzie, *Bull. Torrey Club* 37: 245. 1910.

Carex interior var. *capillacea* L. H. Bailey, *Bull. Torrey Club* 20: 426. 1893. (Type from eastern Massachusetts.)

Carex scirpoides var. *capillacea* Fernald, *Rhodora* 10: 47. 1908. (Based on *C. interior* var. *capillacea* L. H. Bailey.)

Carex delicatula Bickn. *Bull. Torrey Club* 35: 495. N 1908. (Based on *C. interior* var. *capillacea* L. H. Bailey.) Not *C. delicatula* C. B. Clarke, S 1908.

Carex stellulata var. *scirpoides* f. *capillacea* Kükenth. in Engler, *Pflanzenreich* 4²⁰: 231. 1909. (Based on *C. interior* var. *capillacea* L. H. Bailey.)

Very densely cespitose, in large clumps, the rootstocks not at all prolonged, the culms 2-7 dm. high, aphyllodipod, very slender, usually weak, sharply triangular, little or not at all roughened above, usually exceeded by the leaves, light-brownish at base, and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 3 or 4 to a fertile culm, on lower third, but not bunched, the blades deep-green, thin, canaliculate, or more or less involute, 1-6 dm. long, 0.25-1 mm. wide, much roughened towards the apex, the sheaths tight, thin and hyaline ventrally, the ligule short; spikes 2-4, occasionally 5, more or less strongly separate and forming a head 1-2.5 cm. long, the terminal gynaeandrous and more or less long-clavate at base or occasionally staminate, the lateral sessile and usually pistillate, suborbicular, 4-6 mm. long and about as wide, the 5-10 perigynia in several rows, at first ascending, at length widely excurved-spreading; lowest bract usually setaceous, much shorter than the head, the others seale-like; scales broadly ovate, very thin, obtusish or acutish, narrower and one half to two thirds the length of bodies of the perigynia, whitish or greenish-hyaline with green 3-nerved midvein, the midvein mostly obsolete at apex; perigynia concavo-convex, ovate with entire sharp-edged but not winged margins, 2.25-2.5 mm. long, 1.25 mm. wide, deep-green, membranaceous, strongly many-nerved dorsally, more lightly but strongly several-nerved ventrally, slightly stipitate, spongy-rounded at base, abruptly contracted into a shallowly serrulate beak one third or one fourth its length, dorsally cleft, light-reddish-tinged, shallowly bidentate, the teeth very short and the dorsal suture and false ventral suture white-hyaline-margined; achenes lenticular, filling upper part of perigynia, ovate, 1.25 mm. long, 1 mm. wide, short-stipitate and short-apiculate; style short, somewhat enlarged at base, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown, rather short.

TYPE LOCALITY: "Eastern Massachusetts, New Jersey, and central Pennsylvania." (Specimens collected in eastern Massachusetts by *Wm. Boott*, who first called attention to the plant, are taken as the type of *C. interior*, var. *capillacea* L. H. Bailey, on which *C. Howei* is based.)

DISTRIBUTION: Acid soils, wet sphagnum in swampy woods, Florida to Louisiana and northward to southwestern Nova Scotia, and locally westward to Ohio and Michigan. (Specimens examined from Nova Scotia, Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, District of Columbia, Ohio, Michigan, Virginia, South Carolina, Georgia, Alabama, Florida, Mississippi, Louisiana.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. ed. 2. f. 919; Francis, Grasses 310 (as *C. scirpoides*).

107. *Carex Mohriana* Mackenzie, sp. nov.

Very densely caespitose, in large clumps, the rootstock not at all prolonged, the culms 2-7 dm. high, aphyllopodic, very slender, usually weak, sharply triangular, little or not at all roughened above, usually exceeded by the leaves, light-brownish at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 3 or 4 to a fertile culm, on lower third, but not bunched, the blades thin, deep-green, canaliculate or more or less involute, 1-6 dm. long, 1-2.5 mm. wide, much roughened towards the apex, the sheaths tight, thin and hyaline ventrally, concave, purplish-dotted and scarcely thickened at mouth, the ligule as long as wide; spikes 2-5, aggregated into an ovoid to oblong head 0.75-1.5 cm. long, the terminal gynaeceandrous and inconspicuously staminate at base, the lateral sessile and usually pistillate, suborbicular, 4-6 mm. wide and nearly as long, the 4-10 perigynia in several rows, at first ascending, at length widely excurved-spreading; lowest bract usually setaceous, much shorter than the head, the others scale-like; scales broadly ovate, acute to obtusish, much narrower and about two thirds length of bodies of perigynia, white-hyaline with green 3-nerved midvein, the midvein usually not extending to the tip; perigynia concavo-convex, deep-green, membranaceous, ovate, with sharp-edged but not winged margins, serrulate above, 2.25-2.5 mm. long, 1.75 mm. wide, strongly many-nerved both dorsally and ventrally, substipitate, spongy and truncate-cordate at base, contracted into a serrulate beak about one fourth length of body, dorsally obliquely cleft, shallowly bidentate, the teeth minute and the beak white-hyaline save for green margins; achenes lenticular, filling upper part of perigynia, ovate, yellowish, 1.5 mm. long, 1.25 mm. wide, broadly short-stipitate and slightly apiculate; style short, enlarged at base, jointed with achene, at length deciduous; stigmas two, slender, reddish-brown, short.

Type collected in a swamp near Wauchula, Florida, April 15, 1901, *A. H. Curtiss* (Second Distr. Pl. S. U. S.) 6761.

DISTRIBUTION: Known definitely from Florida only. (Specimens examined from Florida.)

108. *Carex incomperta* Bickn. Bull. Torrey Club 35: 494. 1908.

Carex sterilis Willd. Sp. Pl. 4: 208, in part, not as to type. 1805.

"*Carex sterilis* Willd." Schkuhr, Riedgr. Nachtr. pl. *MMM*, f. 146, in part. 1806.

Carex sterilis var. δ Muhl. Descr. Gram. 217. 1817.

"*Carex stellulata* Gooden." Torr. Fl. N. Y. 2: 380. 1843.

Carex sterilis var. β Boott, Ill. Carex 1: 56, pl. 146*. 1858. (Type from Penn Yan, N. Y.)

Carex sterilis var. *excelsior* L. H. Bailey, Bull. Torrey Club 20: 424. 1893. (Type from Penn Yan, N. Y.)

Carex echinata var. *excelsior* Fernald, Proc. Am. Acad. 37: 484. 1902. (Technically based on *C. sterilis* var. *excelsior* L. H. Bailey.)

Carex stellulata var. *excelsior* Fernald, Rhodora 4: 222. 1902. (Technically based on *C. sterilis* var. *excelsior* L. H. Bailey.)

Carex stellulata var. *sterilis* f. *excelsior* "L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4²⁰: 231. 1909. (Based on *C. sterilis* var. *excelsior* L. H. Bailey.)

Densely caespitose, the rootstock not at all prolonged, the clumps large, the culms usually 2.5-6 dm. high, slender (1.5-2.5 mm. thick) to base, wiry, erect, sharply triangular, roughened above, from shorter to longer than the leaves, light-brownish at base, and conspicuously clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades usually 3 or 4 to a fertile culm, on the lower third, but not bunched, the blades erect-ascending, thin, deep-green, flat or canaliculate, usually 5-20 cm. long, 1.5-2 mm. wide, or occasionally up to 2.5 mm. wide, roughened on the margins and towards the apex, the sheaths tight, hyaline ventrally, slightly thickened and reddish-brown-tinged and truncate at mouth, the ligule wider than long; spikes 3 or 4, approximate, or somewhat separate in a strict terminal head 1-3 cm. long, the spikes 4-5 mm. wide, containing 6-15 spreading or retrorse perigynia,

the terminal spike 6-10 mm. long, clavate and staminate at base, the lower 4-6 mm. long, usually not staminate at base; bracts scale-like or the lowest occasionally short-prolonged; scales ovate, acutish to short-cuspidate, yellowish-brown, shading into the dull-white-hyaline margin, sharply keeled to apex by the conspicuous green midrib, narrower than and from two thirds to nearly length of bodies of perigynia; staminate scales longer, more acute; perigynia unequally slightly biconvex, suborbicular or broadly ovate-orbicular, 3 mm. long, 2 mm. wide, broadest just above base, deep-green, or brownish-green in age, sharp-edged, thick, firm, strongly many-nerved on both sides, the lower half spongy, short-stipitate, round-truncate at base, abruptly narrowed into a beak one half to one third the length of the body, bidentate, the teeth prominent, sharp, erect, the dorsal suture and false ventral suture conspicuous, somewhat reddish-tinged, extending more than half way down the beak, the serrulations of the margins extending a short distance down the body; achenes lenticular, broadly ovate, 1.5 mm. long, 1.25 mm. wide, occupying upper part of perigynia, short-stipitate, slightly apiculate; style short, slightly enlarged at base, jointed with achene, at length deciduous; stigmas two, light-reddish-brown, slender, rather short.

TYPE LOCALITY: Wet bog below the Sea Cliff Inn, Nantucket Island, Massachusetts (*Bicknell*).

DISTRIBUTION: Acid soils, swampy woods, Florida to Texas, and northward to Indiana, Michigan, central New York, and Massachusetts. (Specimens examined from Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Michigan, Ohio, Indiana, Virginia, North Carolina, South Carolina, Kentucky, Tennessee, Georgia, Alabama, Florida, Mississippi, Louisiana, Texas.)

ILLUSTRATIONS: Schkuhr, *Riedgr. pl. Mmm. f. 146* (excluding immature plant and details thereof); Boott, *Ill. Carex 56, pl. 146**; Britt. & Brown, *Ill. Fl. ed. 2, f. 921*.

NOTE: *Carex incompta* in one direction is a close ally of *C. cephalantha*, which in turn is closely related to *C. laricina* and to *C. angustior*; this last species is a close ally of the series *C. muricata*, *C. ormantha*, and *C. phyllomanica*. In another direction *C. incompta* is closely related to *C. Howei* and to *C. Mohrii*, and *C. Howei* in turn is a close relative of *C. interior*. In another direction *C. incompta* is closely allied to *C. atlantica* and its allies *C. Wiegandii* and *C. Ruthii*, while the last-named species shows many features of *C. cephalantha*.

109. *Carex atlantica* L. H. Bailey, *Bull. Torrey Club* 20: 425. 1893.

Carex stellulata var. *conferta* Chapm. *Fl. S. U. S.* 534. 1860. (Type from Apalachicola, Florida.)
Carex echinata var. *conferta* L. H. Bailey *Cat. N. Am. Car.* 2. 1884. (Based on *C. stellulata* var. *conferta* Chapm.)

"*Carex sterilis* Willd." Fernald, *Proc. Am. Acad.* 37: 484. 1902.

Very densely cespitose, the rootstocks not at all prolonged, dark-colored, fibrillose, the clumps large, the culms usually 2-7 dm. high, stiff, thickish (2-3.5 mm.) at base, obtusely triangular below, less so and roughened on the angles above, usually exceeded by the long leaves, light-brown at base, and clothed with the dried-up leaves of the previous year, the lower short-bladed or bladeless; leaves of the year with well-developed blades usually 3 or 4 to a fertile culm, on the lower third, but not bunched, the blades erect, light-green, firm, canaliculate, 2.5-4 dm. long, 1.5-4 mm. wide (usually about 2.5 mm. wide), roughened on margins and towards apex, the sheaths tight, hyaline ventrally, concave or truncate and yellowish-brown-tinged and thickened at mouth, the ligule wider than long; spikes 3-5, more or less separate, rarely aggregated in a strict terminal head 2-6 cm. long, the spikes 6-7 mm. wide and containing 8-40 at length widely spreading perigynia, the terminal gynaeandrous, 8-15 mm. long, strongly clavate at base, the lateral 8-12 mm. long and entirely pistillate; bracts scale-like or the lowest often prolonged but much shorter than head; scales ovate-orbicular, typically obtuse, occasionally slightly acutish, narrower than and only half length of bodies of perigynia, light-yellowish-brown-tinged, with green 3-nerved center and broad white-hyaline margin, rounded on back and not sharply keeled, the midvein becoming obsolete at apex; staminate scales similar; perigynia concavo-convex, plano-convex, or even slightly biconvex, very broadly ovate or suborbicular, broadest just above base, 3 mm. long, slightly more than 2 mm. wide, thick, subcoriaceous, sharp-edged to base, serrulate above to base of beak, deep-green until over-ripe, strongly many-nerved dorsally and strongly several-nerved ventrally, the lower part spongy, cordate or truncate at base, abruptly narrowed into a serrulate beak one fourth to one third length of body, obliquely cleft dorsally, yellowish-brown-tipped, bidentate, the teeth short, sharp, erect, both dorsal suture and false ventral suture prominent,

the dorsal white-margined; achenes lenticular, occupying upper part of bodies of perigynia, slightly stipitate, short-apiculate, ovate-suborbicular, 1.75 mm. long, nearly as wide; style short, somewhat enlarged at base, jointed with achene, at length deciduous; stigmas two, light-reddish-brown, slender, rather short.

TYPE LOCALITY: "Pine barren swamps." (Chapman's specimens of *C. stellulata* var. *conferta* Chapm., on which *C. atlantica* is based, came from Apalachicola, Florida.)

DISTRIBUTION: Acid soils, pine barren bogs, mostly on the coastal plain, Nova Scotia to Florida and Texas. (Specimens examined from New Brunswick, Nova Scotia, Maine, New Hampshire, Massachusetts, Connecticut, New Jersey, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Alabama, Georgia, Florida, Texas.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 845; ed. 2, f. 922; Proc. Am. Acad. 37: pl. 4, f. 98-100; Rob. & Fern. Man. f. 380; Rep. N. J. Mus. 1910: pl. 26, f. 11.

110. *Carex sterilis* Willd. Sp. Pl. 4: 208, in greater part. 1805.

Carex scirpoides Schkuhr; Willd. Sp. Pl. 4: 208, in greater part. 1805. (Type from North America.)

Carex stellulata var. β Torr. Ann. Lyc. N. Y. 3: 387. 1836. (Based on *C. sterilis* Willd.)

Carex stellulata var. *scirpoides* Darl. Flora Cestr. 31. 1837. (Technically based on *C. scirpoides* Schkuhr.)

Carex stellulata var. *sterilis* Carey, in A. Gray, Man. 544. 1848. (Based on *C. sterilis* Willd.)

Very densely cespitose, the rootstocks very short, black, fibrillose, the culms slender but strict, usually 3-6 dm. high, dark-brown or brownish-black at base, exceeding leaves, sharply triangular and usually much roughened on angles above, clothed at base with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 3 or 4 to a fertile culm, on lower fourth, but not bunched, the blades 1-3 dm. long, 1.25-2.5 mm. wide, canaliculate or involute, green, stiff, very rough towards the long-attenuate apex, the sheaths tight, hyaline ventrally, thickened, concave, and yellowish-brown-tinged at mouth, wider than long; sterile culms similar, slender, well-developed; head 2-3 cm. long, the spikes 3-6, approximate or the lower more or less separate, very variable, pistillate, staminate, androgynous, or gynaeandrous, the culms frequently dioecious or nearly so, the spikes then being often entirely staminate or pistillate; pistillate spikes suborbicular to short-oblong, 4-6 mm. long and nearly as wide, the perigynia 3-15, widely spreading or somewhat reflexed at maturity; bracts short and scale-like, or the lowest more or less setaceous-prolonged; scales ovate, obtuse or somewhat cuspidate, with 3-nerved green center, a chestnut-brown (or in age brownish) intermediate band, and conspicuous shining white margins, the midvein obscure at apex, not sharply keeled, narrower but slightly longer than bodies of perigynia; staminate scales more obtuse and with more obscure midvein; perigynia plano-convex, ovate or ovate-lanceolate, 3 mm. long, 1.5-1.75 mm. wide, thick, subcoriaceous, yellowish-brown or brownish, sharp-edged to base, the margins little elevated, lightly several- to many-nerved both dorsally and ventrally, substipitate, spongy and truncate at base, rather abruptly contracted into a beak about half its length, the beak chestnut at apex, usually minutely white-hyaline dorsally at orifice, sharply bidentate, the upper margins of the body and the beak setulose-serrulate; achenes lenticular, broadly ovate, yellow, short-stipitate, apiculate, 1.5 mm. long, 1 mm. wide; style slender, straight, jointed with achene, at length deciduous; stigmas two, dark, slender, rather long.

TYPE LOCALITY: "Habitat in Pennsylvania"; according to Schkuhr, "Hab. in Pennsylvaniae graminosis humidis" (probably near Lancaster, Muhlenberg).

DISTRIBUTION: Swampy meadows in calcareous regions, Newfoundland and Anticosti Island to Minnesota, and southward to New Jersey, Pennsylvania, and Illinois. (Specimens examined from Newfoundland, Quebec, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Ontario, Michigan, Indiana, Wisconsin, Illinois, Minnesota.)

ILLUSTRATIONS: Schkuhr, Riedgr. pl. Mmm. f. 146 (immature plant only; pl. Zzz. f. 180 (pistillate plant and details, as *C. scirpoides*); Boott, Ill. Carex/55. pl. 146.

NOTE: A hybrid with *Carex exilis* Dewey is known (Mingan Islands, Quebec, *Bros. Victorin & Rolland 20116*).

111. *Carex Wiegandii* Mackenzie, sp. nov.

Very densely cespitose, the rootstock not at all prolonged, dark-colored, fibrillose, the clumps large, the culms usually 1-5 dm. high, stiff, thick (4-5 mm.) at base, sharply triangular, but somewhat flattened in drying, very rough on the angles above, usually exceeded by the long leaves, light-brown at base and very conspicuously clothed with the dried-up leaves of

the previous year, the lower short-bladed; leaves of the year with well-developed blades usually 3 or 4 to a fertile culm, on the lower third or half, but not bunched, the blades erect, dull-green or yellowish-green, rather thinish, flat or somewhat canaliculate towards base, usually 1.5-3 dm. long, 2-5 mm. (usually about 3 mm.) wide, roughened on margins and towards apex, the sheaths tight, strongly hyaline ventrally, concave or truncate and yellowish-brown-tinged and thickened at mouth, the ligule wider than long; spikes 3-6, closely approximate in a short, stiff, terminal head 1.5-2.5 cm. long, the spikes 5-7 mm. wide, and containing 6-15 at length widely spreading perigynia, the terminal gynaeandrous, 8-12 mm. long, strongly and abruptly clavate at base, the others 5-7 mm. long and entirely pistillate; bracts scale-like or the lowest often prolonged but much shorter than the head; scales ovate-orbicular, obtuse or acutish, somewhat narrower than and about two thirds length of bodies of perigynia, dull-yellowish-brown-tinged with green 3-nerved center and broad bright-white hyaline margins, rounded on back and not sharply keeled, the midvein usually becoming obsolete at apex; staminate scales similar; perigynia plano-convex or slightly biconvex, ovate, broadest somewhat above base, 3-3.5 mm. long, 1.5-1.8 mm. wide, thick, coriaceous, sharp-edged to base of beak, dull-green or at maturity yellowish-brown and shining, strongly many-nerved dorsally, nerveless or obscurely nerved towards base ventrally or rarely throughout, the lower part spongy, truncate at base, tapering into a serrulate beak one third to one half length of body, green-margined, obliquely cleft dorsally, chestnut-brown-tipped, bidentate, the teeth triangular, sharp, erect, the dorsal suture prominent, narrowly white-margined, the ventral false suture nearly obsolete; achenes lenticular, occupying upper part of bodies of perigynia, ovate, 1.75 mm. long, 1.25 mm. wide, broadly substipitate and broadly minutely apiculate, yellowish; style shorter than achene, straight, enlarged at base, green, jointed with achene and at length deciduous; stigmas two, light-reddish-brown, slender, short.

TYPE LOCALITY: Curling, Newfoundland, July 21, 1910, *Fernald & Wiegand 2776*.

DISTRIBUTION: Sphagnum bogs, Newfoundland to Massachusetts, northern New York, and Ontario. (Specimens examined from Newfoundland, Maine, Massachusetts, Ontario.)

112. *Carex muricata* L. Sp. Pl. 974. 1753.

- *Carex echinata* Murr. Prodr. Stirp. Gotting. 76. 1770. (Type from Germany.)
- *Carex Leersii* Willd. Fl. Berol. 28. 1787. (Based on "*C. muricata* L." of Leers.)
- *Carex vulpina* var. β Lam. Encyc. 3: 383. 1791. (Type from Europe.)
- *Carex stellulata* Gooden. Trans. Linn. Soc. 2: 144. 1794. (Type from England.)
- *Carex stellulata* var. *masculina* S. F. Gray, Nat. Arr. Brit. Pl. 2: 50. 1821. (Type from England.)
- *Carex hydrophila* Dumort. Fl. Belg. 146. 1827. (Type from Belgium.)
- *Vignea stellulata* Reichenb. in Mössler, Handb. ed. 2. 1610. 1829. (Based on *Carex stellulata* Gooden.)
- *Vignea hydrophila* Reichenb. Fl. Germ. Exc. 140^r. 1832. (Based on *Carex hydrophila* Dumort.)
- *Carex stellulata* var. *pseudodivulsa* F. Schultz, Fl. Pfalz 499. 1846. (Type from Germany.)
- *Carex pseudodivulsa* F. Schultz, Fl. Pfalz 499, as synonym. 1846. (Synonym of preceding.)
- *Carex leptophylla* Heuffel, Linnaea 31: 728. pl. 5, f. 5. 1862. (Identified with *C. stellulata* Gooden.)
- *Carex echinata* var. *pseudodivulsa* F. Schultz, Pollichia 20/21: 259. 1863. (Based on *C. stellulata* var. *pseudodivulsa* F. Schultz.)
- *Carex echinata* \times *canescens* Brügger, Jahresh. Nat. Ges. Graubünd. 23-24: 119. 1881. (Type from Germany.)
- *Carex Caffischii* Brügger, Jahresh. Nat. Ges. Graubünd. 23-24: 119. 1881. (Type from Germany.)
- *Carex stellulata* var. *oligantha* Callmé, Deuts. Bot. Monats. 6: 49. 1888. (Type from Sweden.)
- *Caricina stellulata* St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 878. 1889. (Based on *Carex stellulata* Gooden.)
- *Carex stellulata* var. *hylogiton* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 56. 1902. (Type from Bohemia.)
- *Carex stellulata* f. *hylogiton* Kükenth. in Engler, Pflanzenreich 4²⁰: 230. 1909. (Based on *C. stellulata* var. *hylogiton* Asch. & Graebn.)
- *Carex stellulata* f. *pseudodivulsa* Kükenth. in Engler, Pflanzenreich 4²⁰: 230. 1909. (Based on *C. stellulata* var. *pseudodivulsa* F. Schultz.)
- *Carex stellulata* f. *hydrophila* Kükenth. in Engler, Pflanzenreich 4²⁰: 230. 1909. (Based on *C. hydrophila* Dumort.)
- *Carex stellulata* f. *oligantha* Kükenth. in Engler, Pflanzenreich 4²⁰: 230. 1909. (Based on *C. stellulata* var. *oligantha* Callmé.)

Densely caespitose, the rootstock not at all prolonged, the culm slender but wiry, usually 1.5-3.5 dm. high, longer than the leaves, more or less roughened beneath the head, rather bluntly triangular, aphyllipodic, light-brownish at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades usually 3-5 to

a fertile culm, on the lower third, but not bunched, the sheaths usually overlapping, tight, slightly thickened at mouth, the blades flat or somewhat canaliculate, thickish, rather light-green, ascending, usually 1-2.5 dm. long, 1-2 mm. wide, roughened towards the apex, the sheaths tight, hyaline ventrally, concave and slightly thickened at mouth, the ligule short; spikes usually 2 or 3, approximate or more or less separate, forming a head 1-3.5 cm. long, 4-6 mm. wide, the lateral spikes suborbicular, 3-5 mm. wide, mostly pistillate, the 3-10 perigynia widely spreading, the terminal spike similar, but with long-clavate basal staminate portion 2-5 mm. long; lower bract often cuspidate-prolonged, the upper scale-like; scales ovate, obtusish, chestnut-brown with lighter 3-nerved green center and shining white-hyaline margins, not sharply keeled, the midvein obsolete at apex, nearly as wide as but much shorter than bodies of perigynia; perigynia plano-convex, ovate, 2.5-3 mm. long, 1.2-1.8 mm. wide, green or at maturity yellowish-brown, thick, subcoriaceous, sharp-edged to base, the margins serrulate at base of beak only, scarcely raised, several- to many-nerved dorsally, nerveless or nearly so ventrally, the lower part spongy, round-truncate at base, abruptly contracted at apex into a chestnut-tinged beak one third the length of the body, its margins serrulate, the dorsal suture and ventral false suture chestnut-brown-tinged, conspicuous, bidentate, the teeth short, triangular; achenes lenticular, broadly ovate, substipitate, slightly apiculate, yellow, 1.5 mm. long, 1 mm. wide; style slender, slightly enlarged at base, jointed with achene, at length deciduous; stigmas two, chestnut-brown, slender, short.

TYPE LOCALITY: "Habitat in Europae nemoribus humentibus" (or, as given in Flora Suecica, "Habitat in udibus nemorosis umbrosis praesertim Nordlandiae").

DISTRIBUTION: Swampy soil in calcareous districts, Greenland to Newfoundland, Quebec, and southern Alaska; widely distributed in northern Eurasia. (Specimens examined from Labrador, Newfoundland, Quebec (Mingan Islands), Alaska, Alberta.)

ILLUSTRATIONS: Schkuhr, Riedgr. *pl. C, f. 14*; Jour. Russe Bot. 1911: 73. *f. 57*; Sturm, Deuts. Fl. 50: *pl. 7*; Fl. Dan. *pl. 284*; Britt. & Brown, Ill. Fl. *f. 844*; ed. 2. *f. 920*; Proc. Am. Acad. 37: *pl. 4, f. 84-8*; Rob. & Fern. Man. *f. 375*; Engler, Pflanzenreich 4²⁰: 229. *f. 37, C, D*; Am. Jour. Sci. IV. 11: 221. *f. 5*; Reichenb. Ic. Fl. Germ. 8: *pl. 214, f. 500*; Anderss. Cyp. Scand. *pl. 4, f. 37*; Engl. Bot. *pl. 806*; ed. 2. *pl. 1626*; Benth. Handb. Brit. Fl. ed. 2. *f. 1100*; Coste, Fl. Fr. *f. 3827*; Hegi, Ill. Fl. Mittel-Eur. *pl. 47, f. 3*; Hallier, Deuts. Fl. *pl. 425*; Karst. Deuts. Fl. 338. *f. 164 (2, 3)*; Thomé, Fl. Deuts. *pl. 89, f. C*; Leers, Fl. Herborn. *pl. 14, f. 8*; Linnaea 31: *pl. 5, f. 5 (C. leptophylla Heuffl., poor)*.

NOTE 1: Britten (Jour. Bot. 45: 163), Briquet (Prodr. Fl. Corse 1: 199), and Fernald (Rhodora 19: 154) have pointed out that Murray founded his *Carex echinata* entirely on a description of Haller and on plate 284 of *Carex muricata* L. in Fl. Danica; that both these are plainly the plant later described as *Carex Leersii* Willd. and *Carex stellulata* Gooden.; and that the fact that Murray's herbarium specimens are *Carex Pairaei* F. Schultz does not warrant the application of the name to that species, as done by C. B. Clarke (Fernald, Rhodora 4: 225. 1902).

NOTE 2: Concerning the applicability of the name *Carex muricata* to this species, see Mackenzie in Bull. Torrey Club 50: 346 (1923). (Fl. Dan. *pl. 284*; Leers, Fl. Herborn. 196; Huds. Fl. Angl. ed. 2. 406; Lightf. Fl. Scot. 549; Pollich, Hist. Pl. Palat. 2: 565; Wulfen, Fl. Norica Phan. 737, 741; Kit. Linnaea 32: 317.)

113. *Carex ormantha* (Fernald) Mackenzie, Erythea 8: 35. 1922.

Carex echinata var. *ormantha* Fernald, Proc. Am. Acad. 37: 483, excluding Connecticut and Rhode Island specimens. *pl. 4, f. 89*. Mr 1902. (Type from California.)

Carex stellulata var. *ormantha* Fernald, Rhodora 4: 222. N 1902. (Based technically on *C. echinata* var. *ormantha* Fernald.)

Densely caespitose, the rootstocks very short, the culms 1.5-4 dm. high, slender but rather stiff, obtusely triangular below, sharply triangular above, smooth, exceeding leaves, light-brownish at base, the dried-up leaves of the previous year not conspicuous, the lower bladeless; leaves with well-developed blades 3-5 to a fertile culm, on lower fourth, but not bunched, the blades flat or canaliculate, light-green or yellowish-green, not stiff, mostly 0.5-2 dm. long, 1.5-2 mm. wide, the sheaths tight, hyaline ventrally, thin and concave at mouth, the ligule very short; spikes 3 or 4, widely separated, forming a head 2-6 cm. long, the terminal gynaeandrous, conspicuously long-clavate and staminate at base, the lateral pistillate or obscurely gynaeandrous, 3-5 mm. long, 6-8 mm. wide, with 2-12 widely radiating or even reflexed perigynia; lowest bract more or less setaceous-prolonged, the others scale-like; scales ovate, obtuse, chestnut-brown with lighter 3-nerved center and bright white-hyaline margins and apex, not sharply keeled, the midvein not prominent to apex, as wide as and nearly length of bodies of perigynia; perigynia plano-convex, lanceolate, 3.5-4 mm. long, 1.5 mm. wide, the margins of the body scarcely raised, not serrulate except at base of beak, yellowish-green or

soon brownish-yellow, thick, subcoriaceous, many-nerved dorsally, many-striate ventrally, rounded and spongy at base, tapering into a serrulate beak more than half length of body, the dorsal suture with chestnut-brown margins, the ventral face chestnut-brown-tinged, bidentate, the teeth triangular, short, erect, chestnut-brown; achenes lenticular, ovate, yellowish, substipitate, 1.75 mm. long, 1 mm. wide, short-apiculate; style slender, jointed with achene, at length deciduous; stigmas two, slender, short, chestnut-brown.

TYPE LOCALITY: Strawberry Creek, El Dorado County, California (*Brainerd 160*).

DISTRIBUTION: Mountains, from Washington to southern California, chiefly in the Sierra Nevada. (Specimens examined showing range as given.)

ILLUSTRATIONS: Proc. Am. Acad. 37: pl. 4, f. 89; Rob. & Fern. Man. f. 370; Abrams, Ill. Fl. Pacif. St. f. 711.

114. *Carex phyllomanica* W. Boott, in S. Wats. Bot. Calif.

2: 233. 1880.

Densely caespitose, from short-prolonged ascending rootstocks, the culms slender but strict, 2.5-6 dm. high, sharply triangular at least above, smooth or slightly roughened immediately below head, shorter than or exceeding leaves, light-brown at base and conspicuously clothed with the dried-up leaves of the previous year, the lower bladeless; leaves 3 or 4 to a fertile culm, on lower third, but not bunched, the blades flat or somewhat canaliculate, mostly 1-2 dm. long, 1.75-2.75 mm. wide, green, rather stiff, roughened towards apex, the sheaths tight, hyaline ventrally, concave and scarcely thickened at mouth, the ligule short; spikes usually 3 or 4, approximate, forming a head 1.5-3.5 cm. long, the terminal gynaeandrous and clavate at base, the lateral obscurely gynaeandrous or pistillate, suborbicular, 7 mm. long and about as wide, with 8-15 widely spreading perigynia; lowest bract somewhat setaceous-prolonged, the others scale-like and inconspicuous; staminate scales ovate, obtuse, chestnut-brown with 3-nerved green center and shining white-hyaline margin; pistillate scales similar, as wide as but only about two thirds length of bodies of perigynia, not sharply keeled, the midvein obscure towards apex; perigynia plano-convex, ovate-lanceolate, thick, 3.75-4.5 mm. long, 1.5 mm. wide, subcoriaceous, green or in age olive-green, round-truncate and spongy at base, conspicuously many-striate, both dorsally and ventrally sharp-edged to base, the margins scarcely raised, entire, tapering into a serrulate beak about half length of the body, the apex chestnut-brown-tinged and somewhat hyaline-tipped, bidentate, the teeth short, both ventral false suture and dorsal suture conspicuous; achenes lenticular, ovate, 2 mm. long, 1.5 mm. wide, yellowish, substipitate, short-apiculate; style slender, jointed with achene, at length deciduous; stigmas two, slender, chestnut-brown, short.

TYPE LOCALITY: Sphagnum swamps, Mendocino City, California (*Bolander 4746*).

DISTRIBUTION: Sphagnum swamps, southern Alaska to northern California, near the coast and in the coast ranges. (Specimens examined from northern California, Oregon, Washington, Vancouver, southern Alaska.)

ILLUSTRATION: Abrams, Ill. Fl. Pacif. St. f. 712.

115. *Carex Townsendii* Mackenzie, sp. nov.

Cespitose, the rootstocks short, blackish, fibrillose, the culms 2-3.5 dm. high, stiff, sharply triangular, smooth or slightly roughened beneath head, exceeding leaves, brownish and somewhat fibrillose at base, the dried-up leaves of the previous year inconspicuous, the lower short-bladed; leaves 5 or 6 to a culm, on lower third, but not bunched, the blades mostly 1-2 dm. long, about 2.5 mm. wide, canaliculate, thickish, light-green, stiff, roughened above, erect or recurved-spreading, the sheaths tight, hyaline and yellowish-green-tinged ventrally, convex and slightly thickened at mouth, very little prolonged beyond base of blade, the ligule wider than long; spikes 5-8, the upper aggregated, the lower approximate, forming a head 2-4 cm. long, the spikes pistillate or the uppermost gynaeandrous, short-oblong or suborbicular, 5-8 mm. long, 5-6 mm. wide, with 8-20 at length spreading perigynia, the staminate flowers few and inconspicuous; lower bract short-setaceous, exceeded by spike, the upper ones scale-like; pistillate scales broadly ovate, obtusish, narrower than and two thirds length of bodies of perigynia, chestnut-brown with prominently 3-nerved green center and broad hyaline margins, not sharply keeled and the midvein not prominent to apex; staminate scales similar,

but with sharper midvein; perigynia plano-convex, ovate, 3.25 mm. long, 1.75 mm. wide, thickish, membranaceous but firm, sharp-edged to base, serrulate at base of beak, substipitate, spongy and round-truncate at base, lightly several-nerved dorsally, nerveless or nearly so ventrally, abruptly contracted into a serrulate beak about 1 mm. long, obliquely cut dorsally, both dorsal suture and false ventral suture conspicuous, sharply bidentate, the teeth subulate-triangular, slender, reddish-brown; achenes lenticular, ovate, yellowish-brown, short-stipitate, apiculate, 1.75 mm. long, 1.5 mm. wide, in upper part of perigynium-bodies; style slender, jointed with achene, deciduous; stigmas two, slender, yellowish-brown, long.

Type collected five miles southeast of Colonia Garcia, Chihuahua, Mexico, at 2250 meters altitude (*Townsend & Barber 157*, July 21, 1899).

DISTRIBUTION: Wet soil, Sierra Madre Mountains, Chihuahua. (Specimens examined from Chihuahua.)

116. *Carex Ruthii* Mackenzie, sp. nov.

Densely cespitose, the rootstock very short, fibrillose, the culms stoutish, 3 mm. thick at base, sharply triangular, stiff, roughened above, strongly aphyllipodic, brownish at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves 3 or 4 to a fertile culm, on lower half, not at all bunched, the blades flat or canaliculate, light-green, not stiff, usually 1-2 dm. long, 2.5-4 mm. (averaging 3-3.5 mm.) wide, the sheaths tight, hyaline ventrally, concave, reddish-brown-tinged and strongly thickened at mouth, the ligule wider than long; spikes 5 or 6, the lower widely separate, forming a head 3.5-6 cm. long, the lateral spikes subglobose, closely sessile, pistillate, 3-6 mm. long, 5-7 mm. wide, with 5-15 widely spreading perigynia, the terminal spike similar, but longer, gynaeandrous, and clavate at base; lowest bract short-setaceous, the upper scale-like; staminate scales obovate, obtuse or obtusish, light-reddish-brown-tinged with broad hyaline margins, the midvein green, not extending to apex; pistillate scales similar, but with less conspicuous hyaline margins and 3-nerved green center, the midvein rather sharp, extending to apex, narrower and markedly shorter than bodies of perigynia; perigynia plano-convex, lance-ovate, 3.25-3.75 mm. long, 1.5 mm. wide, yellowish-green, becoming yellowish-brown, thick, subcoriaceous, round-truncate and spongy at base, several-nerved dorsally, nerveless ventrally, sharp-edged to base, serrulate above, tapering into a beak half length of body, reddish-tinged ventrally and dorsally, strongly bidentate, the teeth sharp, subulate, erect; achenes lenticular, substipitate, apiculate, golden-yellow, broadly ovate, about 1.5 mm. long, somewhat narrower; style straight, very slightly enlarged at base, jointed with achene, withering and at length deciduous; stigmas two, slender, light-reddish-brown.

Type collected on Craggy Mountain, North Carolina, *Albert Ruth*, July, 1900. (Type in herb. K. K. Mackenzie.)

DISTRIBUTION: Higher mountains of northern Georgia, western North Carolina, and eastern Tennessee. (Specimens examined showing range as given.)

117. *Carex angustior* Mackenzie, in Rydb. Fl. Rocky Mts.

124. 1917.

Carex stellulata var. *angustata* Carey, in A. Gray, *Man.* 544. 1848. (Type not given, but from Fairfield, New York.)

Carex echinata var. *microstachys* Böck. *Linnaea* 39: 125. 1875. (Type from North America.)

Carex echinata var. "*microcarpa* Böck." L. H. Bailey, in *Coult. Man.* 395. 1885. (Excluding synonyms; error in citation.)

Carex echinata var. *angustata* L. H. Bailey, *Mem. Torrey Club* 1: 59. 1889. (Based on *C. stellulata* var. *angustata* Carey.)

Carex sterilis var. *angustata* L. H. Bailey, *Bull. Torrey Club* 20: 425. 1893. (Based on *C. stellulata* var. *angustata* Carey.)

Carex Leersii var. *angustata* Mackenzie, in Small & Carter, *Fl. Lanc. Co.* 55. 1913. (Based on *C. stellulata* var. *angustata* Carey; same combination by Burnham, *Torrey* 19: 131. 1919.)

Very densely cespitose, the rootstocks not at all prolonged, the culms 1-6 dm. high, very slender but strict, sharply triangular and somewhat roughened above, about equaling the leaves, yellowish-brown at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 2-4 to a fertile culm, on lower third, but not bunched, the blades flat or canaliculate, averaging about 1.5 dm. long, 0.75-2 mm. wide,

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