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THE NEW YORK BOTANICAL GARDEN

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PART I

NORTH AMERICAN FLORA

(POALES)

CYPERACEAE

CYPHEREAE (pars)

KENNETH KENT MACKENZIE



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Family 2. CYPERACEAE

BY KENNETH KENT MACKENZIE

Perennial or annual grass-like or rush-like herbs, often monoecious, very infrequently dioecious. Roots fibrous, the rootstock when present from very short to elongate. Stolons frequently strongly developed. Culms usually solid or nearly so, sometimes hollow, usually triangular but occasionally terete or flattened, rarely quadrangular. Culms annual, making growth in one year, or frequently biennial, making growth in two years and bearing the dried-up leaves of the first year at the base. Sterile shoots very often developed, similar to the fertile culms or more frequently with larger leaves. Culm-leaves (when present) three-ranked, rarely two-ranked, sheathing the culm, the sheaths almost invariably closed, very rarely absent, more or less strongly hyaline opposite the blade, the ligule at the base of the blade (concealed by the culm) usually scarious, very rarely wanting. Leaf-blades usually long and narrow, occasionally wanting or much reduced; with well-developed midvein (very rarely wanting) and often with the mid-lateral veins well developed. Flowers perfect or imperfect, in spikes, each flower (or rarely two or more together) in the axil of a scale, the spikes one to very many, often in clusters or more or less strongly compound or decompound umbels, sessile or peduncled, and usually with more or less strongly developed bracts at base, usually several-to many-flowered, infrequently but one-flowered. Scales imbricate, spirally arranged in several to many rows, or sometimes two-ranked, usually long persistent, infrequently early deciduous. Perianth wanting or with hypogynous bristles or scales in its place; in some genera the pistillate or rarely both flowers within a closed or partly closed sac-like scale called the perigynium, sometimes open to the base on one side. Stamens usually three, rarely two or one or more (four, six, eight, or twelve). Filaments long, sometimes very long, usually long persistent. Anthers two-celled, usually linear, often acute or strongly mucronate, emarginate at base and there affixed to the filament. Ovary one-celled with a single erect anatropous ovule, the styles one, two, or three, the stigmas two or three or very rarely more. Style articulated to the ovary or sometimes continuous with it. Achenes lenticular or plano-convex (in species with two stigmas) or triangular (in species with three stigmas). Fruit an achene. Embryo minute at the base of the somewhat mealy endosperm.

Achene enclosed in a sac-like organ, called the perigynium, this sometimes partly or wholly split on one side. Flowers unisexual. Achene not on a hard disk.

Achene not enclosed in a sac-like organ. Flowers not unisexual (except in *Scleriaeae*, in which the bony achene is supported on a hardened disk).

Tribe 1. CARICEAE.

Spikes all of one sort, the flowers all perfect, or rarely the stamens or pistils abortive in some. Achene not borne on a hardened disk.

Scales not two-ranked, spirally imbricate in several to many rows. Spikes usually many-flowered, the flowers perfect or mainly so, with none or but one (rarely more) of the lower scales empty.

Tribe 2. SCIRPEAE.

Spikes usually with but one or two flowers, two to many of the
lower scales being empty.
Scales strictly two-ranked.
Spikes unisexual. Achene borne on a hardened disk.

Tribe 3. RYNCHOSPOREAE.
Tribe 4. CYPHEREAE.
Tribe 5. SCLERIEAE.

Tribe 1. CARICEAE

By KENNETH KENT MACKENZIE

- Elyneae* Nees, *Linnaea* 9: 304. 1834.
Cariceae Nees, *Linnaea* 9: 305. 1834.—Koch, *Syn. Fl. Germ.* 746. 1837—Böck, *Linnaea* 39: 1. 1875.—Benth. & Hook. *Gen. Pl.* 3: 1039. 1883.—Pax, in *E. & P. Nat. Pfl.* 2²: 121. 1887.—Rob. & Fern. *Man.* 172. 1908.
Caricineae Kunth, *Enum. Pl.* 2: 368. 1837.
Caricinae Steud. *Syn. Cyp.* 182. 1855.
Caricoideae Kükenth. in Engler, *Pflanzenreich* 4³⁰: 1. 1909.

Perennial herbs, densely caespitose or with rootstocks more or less strongly prolonged. Culms triangular or rarely terete, solid or sometimes hollow, usually not nodulose but sometimes so, leafy at base or to beyond the middle, rarely nearly leafless. Leaves three-ranked, grass-like, sessile, keeled below, the blade with its margins and keel generally rough or serrulate towards apex, the sheath closed or very rarely absent. Flowers staminate or pistillate, monoecious or rarely dioecious, in the axils of glume-like scales, forming one to very many spikes, the spikes sessile or peduncled, often forming a compound or decomposed inflorescence. Pistillate flowers surrounded by a scale-like organ called the perigynium, closed to the top or split down one side partly or to the base, the staminate flowers generally not surrounded by the perigynium, but in some groups the achene and a staminate flower or flowers surrounded by a common perigynium. Perianth none. Stamens three, very rarely two. Filaments free, or very rarely connate at base, very slender or very rarely dilated. Anthers linear, basifixed. Staminate scales with margins free or very rarely somewhat connate at base. Ovary one-celled (but formed from two or three carpels). Style one, but branched above and with two or three elongate stigmas. Fruit indehiscent, either compressed-lenticular or triangular. Seed solitary, erect, with copious endosperm. Embryo small, obtusely obconic, situate in the endosperm and borne near its middle and near the base.

- Perigynium split on one side either part way down or to the base, enclosing an achene and sometimes also a staminate flower or flowers. 1. **KOBRESIA.**
 Perigynium completely closed, enclosing an achene only, never a staminate flower, although sometimes a rachilla. 2. **UNCINIA.**
 Rachilla long-exserted and conspicuous, hooked at the end; spike solitary. 3. **CYMOPHYLLUS.**
 Rachilla usually absent, or included (save in one species), rudimentary and inconspicuous, never hooked at the end; spikes one to very many. 4. **CAREX.**
 Developed leaves one to a culm, without midvein, sheath, or ligule; spike solitary, its scales milk-white.
 Developed leaves several to many to a culm, with strongly developed midvein, sheath, and ligule; scales in our species never milk-white.

1. **KOBRESIA** Willd. *Sp. Pl.* 4: 205. 1805.

- Froelichia* Wulfen *Willd. Sp. Pl.* 4: 205, as synonym. 1805), *Fl. Norica* Phan. 729. 1858. (Type species, *Froelichia caricoides* Wulfen [*Kobresia Bellardi* (All.) Degland].)
Elyna Schrad. *Fl. Germ.* 1: 155. 1806. (Type species, *Elyna spicata* Schreb. [*Kobresia Bellardi* (All.) Degland].)
Trilepis Nees, *Edinb. New Phil. Jour.* 17: 267. 1834. (Type species, *Trilepis Royleana* Nees [*Kobresia Royleana* Nees].)
Friticoides ('*Friticoides*') Griff. *Itin. Notes* 140. 1848. (A mere name without description, said by C. B. Clarke, in *Hook. f. Fl. Brit. Ind.* 6: 698, to apply to *Kobresia uncinoides* (Boott) C. B. Clarke.)
Kobria St.-Lag. *Ann. Soc. Bot. Lyon* 8: 175. 1880. (A reformation of the name *Kobresia*, on the ground that Kobres should Latinize to Kobrius.)
Hemicarex Benth. *Jour. Linn. Soc.* 18: 367. 1881. (Type species, *Carex linearis* Boott [*Kobresia nepalensis* (Nees) Kükenth.], the only species a figure of which is cited in Benth. & Hook. *Gen. Pl.* 3: 1072.)

Grass-like perennial sedges, the culms densely caespitose (in one Asiatic species slenderly stoloniferous). Culms obtusely triangular, smooth, strict, solid, either (1) leafy at the base and then densely clothed at base with the old dried-up leaves of the previous year; or (2) leafy

up to the middle and then surrounded at base by blade-bearing sheaths. Leaf-blades narrow, often convolute. Flowers unisexual, monoecious or sometimes dioecious, arranged in spikes, the spikes solitary or forming a compound or sometimes somewhat paniculate head. Terminal few to several flowers in monoecious species usually staminate, the lateral or rarely all androgynous, either (1) with one pistillate basal flower and with one to six staminate flowers on a very short scarcely conspicuous secondary rachilla, or (2) reduced to one pistillate flower and an included or rarely exerted setiform rudimentary rachilla or sometimes even without a rachilla. Staminate flowers borne in the axils of more or less concave scales, with three stamens, the filaments filiform, the anthers linear. Pistillate flowers and accompanying staminate flowers surrounded by a membranaceous perigynium, the margins either free to the base or more or less united but always partly open. Achenes triangular or rarely lenticular, included or slightly exerted, jointed with the slender, generally long-persistent style; base of style slender or conic; stigmas three or rarely two, slender, exerted.

A genus of which about thirty species are known, all being confined to the higher mountains of western, central, and eastern Asia (especially the Himalayas) except those enumerated herein. Species have been referred to *Carex* L. by many authors; *Schoenus* L. by Smith, Engl. Bot. *pl.* 1410 (1805); *Scirpus* L. by Wahl. Fl. Lapp. 15 (1812); and *Uncinia* Pers. by Nees, in Wight, Contr. Bot. Ind. 129 (1834). The name is frequently spelled *Cobresia*.

Type species, *Kobresia scirpina* Willd. [*Kobresia Bellardi* (All.) Degland].

Spikes solitary; lower leaves of previous year's growth mostly reduced to bladeless sheaths at flowering time.

Spike 2-3 mm. wide; scales small, 2-3 mm. long, shining; perigynia 3-3.5 mm. long; achenes 2.5-2.75 mm. long, very nearly beakless; culms slender, mostly exceeding the leaves.

Spike 4-5 mm. wide; scales much larger, 4-5 mm. long, dull; perigynia 5.5 mm. long; achenes 3.5 mm. long, conspicuously short-beaked; culms stoutish, exceeded by the leaves.

Spikes several to many; lower leaves of previous year's growth with conspicuous dried blades at flowering time; scales small; culms slender; achenes 3 mm. long, somewhat abruptly short-apiculate.

1. *K. Bellardi*.

2. *K. macrocarpa*.

3. *K. simpliciuscula*.

1. *Kobresia Bellardi* (All.) Degland, in Loisel. Fl. Gall.

626. 1807.

Carex Bellardi All. Fl. Ped. 2: 264. *pl.* 92, *f.* 2. 1785. (Type from northern Italy.)

Carex myosuroides Vill. Hist. Pl. Dauph. 2: 194. *pl.* 6. 1787. (Type from southeastern France.)

Carex dioica var. β Lam. Encyc. 3: 378, in part. 1791. (Merely a questioned reference of *Carex myosuroides* Vill.)

Carex hermaphrodita J. F. Gmel. Syst. Nat. 2: 139. 1791. (Based on *C. myosuroides* Vill.)

Kobresia scirpina Willd. Sp. Pl. 4: 205. 1805. ("Habitat in summis alpinis Sabaudiae, Tyrolis, Carinthiae, Styriae et Delphinatus.")

Froelichia caricoides Wulfen (Willd. Sp. Pl. 4: 205, as synonym. 1805), Fl. Norica Phan. 729. 1858. (Based on *Carex Bellardi* All.)

Elyna spicata Schrad. Fl. Germ. 1: 155. 1806. (Type from central Europe.)

Scirpus Bellardi Wahl. Fl. Lapp. 15. 1812. (Based on *Carex Bellardi* All.)

Elyna Bellardi Hartm. Sv. Vet.-Akad. Handl. 1814: 107. 1814. (Based on *Carex Bellardi* All.)

Carex affinis R. Br.; Richards. in Frankl. Journey 763. 1823. (Type from 54°-64° northwestern Canada.)

Kobresia filiformis Torr.; Dewey, Am. Jour. Sci. 29: 253. *pl.* Z, *f.* 85. 1836. (Type from Carleton House, northwestern Canada.)

Carex lucida Dicks.; Steud. Nom. Bot. ed. 2. 1: 292. 1840. (Based on *Elyna spicata* Schrad.)

Elyna stricta Hoppe; Steud. Nom. Bot. ed. 2. 1: 551. 1840. (Based on *E. spicata* Schrad.)

"*Elyna filiformis* Dewey" Steud. Syn. Cyp. 245. 1855. (Based on *Kobresia filiformis* "Dewey" [Torr.])

Elyna scirpina Pax, in E. & P. Nat. Pfl. 2: 122. 1887. (Based on *Kobresia scirpina* Willd.)

Kobresia myosuroides Fiori & Paol. Ic. Fl. Ital. 52. *f.* 441. 1896. (Based on *Carex myosuroides* Vill.)

Carex scirpina Missb. & Krause, in Sturm, Fl. Deuts. ed. 2. 2: 63. 1900. (Based on *Kobresia scirpina* Willd.)

Very densely cespitose, in large to small clumps, the rootstocks very short, not at all creeping, tough, thick, lignescent, the culms 0.5-3.5 dm. high, slender but strict, stiff and wiry, obtusely triangular, smooth, from about equaling to exceeding the leaves, phyllopodic, and the lowest sheaths bladeless, dull-cinnamon-brown-tinged at base, the persistent dried-up leaves of the previous year conspicuous, mostly reduced to bladeless sheaths; leaves with well-de-

veloped blades 7-15 to a culm, densely clustered on lower fifth or sixth, the blades acicular, dull-green, 0.2-2 dm. long, 0.25-0.5 mm. wide, erect to strongly curved, long-attenuate, roughened towards apex, the tips usually dried-up, tapering into the strongly striate, chartaceous, very conspicuous, smooth, somewhat shining, cinnamon-brown sheaths, sparingly fibrillose in age, hyaline and reddish-brown-tinged and concave at mouth ventrally, the ligule little wider than long; spike solitary, bractless, linear, subclavate, 1-3 cm. long, 2-3 mm. wide, closely flowered above, somewhat loosely at base, the terminal spikelet with several staminate flowers, the lateral 10-20 appressed, androgynous with one pistillate and one staminate flower, or rarely with pistillate flower only; scales small, 2-3 mm. long, obtuse or subcuspidate, chartaceous, closely appressed, brown, shining, with midvein sharply defined below, conspicuously whitish-hyaline and scarious above, exceeding the perigynia; perigynia oblong-obovoid, 3-3.5 mm. long, 1.25 mm. wide, broadly stipitate, light-chestnut-brown, smooth, shining, very thin and chartaceous, the apex hyaline, entire, closely enveloping the achene, the margins free to base or very nearly so; achenes shorter than perigynia, oblong-obovoid, 2.5-2.75 mm. long, 1.1 mm. wide, at first greenish, soon brownish and shining, triangular and slightly concave towards base, with conspicuous, blunt, greenish angles, broadly short-stipitate, very nearly beakless, jointed with the straight slender style, its base somewhat enlarged; stigmas three, long, slender, brown; rachilla sometimes present, very slender, greenish, roughish, about equalling achene.

TYPE LOCALITY (of *Carex Bellardi* All., on which *Kobresia Bellardi* is based): "Loc. Nascitur in alpebus di Ussey prope L'Antaret in saxorum rimis Cl. Bellardi"; northern Italy.

DISTRIBUTION: Moist open places in calcareous soil, Greenland to Alaska, and southward in the western mountains to Colorado and eastern Oregon; also in Europe. (Specimens examined from Greenland, Ellesmereland, Yukon, Alaska, Alberta, Colorado, eastern Oregon.)

ILLUSTRATIONS: Vill. Hist. Pl. Dauph. pl. 6; All. Fl. Ped. pl. 92, f. 2; Am. Jour. Sci. 29; pl. Z, f. 85; Fl. Dan. pl. 2427; Engler, Pflanzenreich 4²⁰: 37. f. 8, A, B; Karst. Deuts. Fl. f. 161, 4-7; Sv. Bot. pl. 527 (right hand); Lindm. Bild. Nord. Fl. pl. 429, f. B; Garcke, Fl. Deuts. ed. 17. no. 2263; Hallier, Deuts. Fl. pl. 425; Reichenb. Ic. Fl. Germ. 8: pl. 193 (left hand); Britt. & Brown, Ill. Fl. f. 668; ed. 2. f. 867; Abrams, Ill. Fl. Pacif. St. f. 676.

2. *Kobresia macrocarpa* Clokey, sp. nov.

Very densely caespitose, in large to small clumps, not stoloniferous, the rootstocks very short, not at all creeping, tough, thick, lignescent, the culms 0.3-1 dm. high, stiff, strict, stoutish, wiry, obtusely triangular, smooth, exceeded by the leaves, phyllopodic, dull-cinnamon-brown-tinged at base, the persistent dried-up leaves of the previous year conspicuous, mostly reduced to bladeless sheaths; leaves with well-developed blades 7-15 to a culm, densely clustered on lower fifth or sixth, the blades acicular, dull-green, 0.2-1.5 dm. long, 0.25-0.5 mm. wide, erect to strongly curved, long-attenuate, roughened towards apex, the tips usually dried-up, tapering into the strongly striate, chartaceous, very conspicuous, smooth, somewhat shining, cinnamon-brown sheaths, sparingly fibrillose in age, hyaline and somewhat reddish-brown-tinged and concave at mouth ventrally, the ligule about as long as wide; spike solitary, bractless, linear-oblong, often somewhat clavate, 1-2 cm. long, 4-5 mm. wide, closely 8-15-flowered, the terminal flowers staminate, the lateral pistillate; scales broadly obovate, 4-5 mm. long, obtuse, persistent, closely appressed, rounded on back, dull-brown with midvein conspicuous below only, not extending to tip, the upper margins conspicuously whitish-hyaline and scarious, entirely concealing the perigynia; perigynia narrowly oblong-elliptic, 5.5 mm. long, 1.25 mm. wide, membranaceous, smooth, shining, whitish below, yellowish-brown above, finely many-nerved, sessile, tapering at base, hyaline at apex, the margins united towards lower part; achenes shorter than perigynia, narrowly oblong-obovoid, 3.5 mm. long, 1 mm. wide, greenish, soon dull-brown, triangular, with sides slightly concave below, the angles rounded and not conspicuous, broadly short-stipitate, tapering into the short greenish beak, obscurely jointed with the straight, slender, brownish style; stigmas three, long, slender, brown, reflexed; rachilla present, slender, whitish, about equalling achene.

Type collected in fairly moist soil among rocks, Pike's Peak, El Paso County, Colorado, alt. 3590 m., August 30, 1920, *Clokey 3651* (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Fairly moist, calcareous soil, summits of high peaks, central Colorado. (Specimens examined from central Colorado only.)

3. *Kobresia simpliciuscula* (Wahl.) Mackenzie, Bull. Torrey

Club 50: 349. 1923.

Carex simpliciuscula Wahl. Sv. Vet.-Akad. Nya Handl. 24: 141. 1803. (Type from Westmoreland, England.)*Schoenus monoicus* Smith, Engl. Bot. pl. 1410. 1805. (Type from County of Durham, England.)*Kobresia caricina* Willd. Sp. Pl. 4: 206. 1805. ("Habitat in Monte Cenisio.")*Carex lacustris* Balbis; Willd. Sp. Pl. 4: 206, as synonym. 1805.*Carex hybrida* Schkuhr; Willd. Sp. Pl. 4: 206, as synonym. 1805.*Carex mirabilis* Host, Gram. Austr. 4: 44. pl. 78. 1809. ("In alpebus tyrolensibus, carinthiacis.")*Elyna Bellardi* Hartm. Sv. Vet.-Akad. Handl. 1814: 107. 1814. (As to plant described only; not as to *Carex Bellardi* All.)*Elyna caricina* Mert. & Koch, in Roehling, Deuts. Fl. ed. 3. 1: 458. 1823. (Based on *Kobresia caricina* Willd.)*Carex lobata* Willd.; Kunth, Enum. Pl. 2: 533, as synonym. 1837.*Kobresia bipartita* Dalla Torre, Anl. Beob. Alpenpfl. 216. 1882. (As to plant described; not as to *Carex bipartita* All.)*Carex bipartita* All.)

Very densely caespitose, in large to small clumps, the rootstocks very short, not at all creeping, tough, thick, lignescent, the culms 0.5–3.5 dm. high, slender but strict, stiff, wiry, obtusely triangular, smooth, from about equaling to strongly exceeding the leaves, phyllopodic, the persistent dried-up leaves of the previous year bearing conspicuous dried blades, strongly cinnamon-brown-tinged at base; leaves with well-developed blades many to a culm, densely clustered on lower fifth or sixth, the blades acicular, dull-green, 0.2–2 dm. long, 0.25–0.5 mm. wide, erect to strongly curved, long-attenuate, roughened towards apex, the tips usually dried-up, tapering or contracted into the strongly striate, chartaceous, very conspicuous, smooth, shining, deep-cinnamon-brown sheaths, sparingly fibrillose in age, hyaline and reddish-brown-tinged and concave at mouth ventrally, the ligule much wider than long; head compound, 1–3.5 cm. long, 3–8 mm. thick, the spikes typically approximate and appressed or the lower rarely somewhat remote and rarely more or less spreading-ascending, the bracts oblong-ovate or ovate, chestnut-brown with white-hyaline upper margin, several-nerved, obtuse to cuspidate, chartaceous, closely appressed, shorter than the spikes; spikes 3–10, linear-oblong, 3–8 mm. long, 1.5–2.5 mm. wide, sessile or nearly so, the terminal spikelets staminate, the lateral androgynous or pistillate and one-flowered; scales small, ovate, obtuse or slightly cuspidate, chestnut-brown, with upper margins white-hyaline, thin, chartaceous, appressed, keeled, the keel slightly rough; perigynia narrowly oblong-elliptic, 2.5–2.75 mm. long, 0.75 mm. wide, substipitate, chestnut-brown, smooth, shining, very thin and chartaceous, closely enveloping achene, the margins free to base or very nearly so; achenes slightly exceeding perigynia, narrowly linear-oblong, 3 mm. long, 0.5 mm. wide, at first pale, at length brownish, triangular with sides somewhat concave below, broadly short-stipitate, somewhat abruptly short-apiculate, jointed with the style; stigmas three, long, slender, dark-brown; rachilla sometimes present, short, very slender.

TYPE LOCALITY (of *Carex simpliciuscula*, on which *Kobresia simpliciuscula* is based): "Hab. in Westmorlandia Angliæ, unde misit Cl. Turner ad Swartz."

DISTRIBUTION: Sunny flats and slopes (usually more or less strongly moist), in strongly calcareous districts, Greenland to Alaska, and southward to western Newfoundland and Quebec and in the western mountains to Colorado; also in Europe and Asia. (Specimens examined from Greenland, Ellesmere Land, Labrador, Newfoundland, Anticosti, Quebec, Alberta, Colorado, Alaska.)

ILLUSTRATIONS: Fl. Dan. pl. 242; Schkuhr, Riedgr. pl. Rrr. f. 161; Engler, Pflanzenreich 430: 37. f. 8, C-E; Karst. Deuts. Fl. f. 161, 1–3; Sv. Bot. pl. 527 (left hand); Lindm. Bild. Nord. Fl. pl. 429. f. A; Baxter, Brit. Bot. pl. 484; Garcke, Fl. Deuts. ed. 17. no. 2264; Engl. Bot. pl. 1410; ed. 2. pl. 1069; Reichenb. Ic. Fl. Germ. 8: pl. 193 (right hand); Britt. & Brown, Ill. Fl. f. 609; ed. 2. f. 800; Host, Gram. Austr. 4: pl. 78.

NOTE: The original specimen of *Carex simpliciuscula* Wahl. was identified by Almqvist with *Kobresia caricina*. (See A. Benn. Jour. Bot. 35: 263; Mackenzie, Bull. Torrey Club 50: 349.)

2. *UNCINIA* Pers. Syn. Pl. 2: 534. 1807.*Fusarina* Raf. Good Book 28. 1840. (Type species, *Uncinia gracilis* Thours.)*Agistrum* Raf. Good Book 28. 1840. (Type species, *Uncinia phleoides* (Cav.) Pers.)

Perennial herbs, the rootstock lignescent, short or sending forth slender stolons. Culms erect, clothed at base with leafless often early-broken sheaths. Leaf-blades linear, flat or convolute, rough above. Flowers unisexual, monoecious, arranged in solitary, androgynous, dense or lax, bracted or bractless spikes, the greater part pistillate, the apical staminate part short. Scales in few to several rows. Perianth none. Staminate flowers many or at least several, each in the axil of a more or less concave scale. Stamens three (or in one species two),

the filaments linear or dilated, the anthers linear. Pistillate flowers each borne in the axil of a scale and surrounded by the perigynium, closed except for the minute orifice. Perigynia obscurely triangular, smooth or rough or hispid, truncate at orifice. Achenes triangular. Style slender, generally thickened at base, included, jointed with achene. Stigmas three, exserted. Rachilla at the side of the achene conspicuous, exserted, setiform, terminating in a hook at the apex.

A genus of which about thirty species are known, confined to Australasia (including New Guinea) and the mountains of South America, with the exception of the two species herein enumerated. Species have been referred to *Carex* L. by various authors.

Type species, *Carex uncinata* L. f.

Upper part of pistillate scales soon disarticulating, the lower part persistent as rachis-wings; perigynia glabrous; scales few-nerved, smooth, not rigid. Scales persistent, the upper part not disarticulating; perigynia conspicuously hispid-ciliate; scales many-nerved, ciliate, rigid.

1. *U. tenuis*.

2. *U. hamata*.

1. *Uncinia tenuis* Poepp.; Kunth, Enum. Pl. 2: 525. 1837.

"*Uncinia gracilis* Poepp." Decaisne, in Urv. Voy. Pôle Sud Bot. 2: 14. Monocot. pl. 6, f. B. 1853.

Loosely caespitose and short-stoloniferous, the rootstock slender, light-yellowish-brown, the culms 1.5-3.5 dm. high, slender, not stiff, erect or more or less curved, smooth or slightly roughened beneath spike, obtusely triangular below, more sharply so above, from shorter than to somewhat exceeding the leaves, phyllopodic, light-yellowish-brown and somewhat fibrillose at base; sterile shoots aphyllodipic; leaves with well-developed blades 5-10 to a fertile culm, on lower third, the sheaths somewhat loose, not septate-nodulose, minutely granular-roughened dorsally, white-hyaline ventrally, concave and reddish-brown-tinged at mouth, the ligule short, much wider than long, the blades light-green, thinnish but firm, 0.5-2.5 dm. long, 1.5-2.5 mm. wide, long-attenuate, strongly rough-margined, flat below, somewhat channeled toward tip; spike solitary, androgynous, bractless, narrowly linear, 2.5-8 cm. long, 2.5-3 mm. wide (excluding awns), the pistillate part loosely flowered below, more closely flowered above, the 20-60 perigynia closely erect-pressed in few rows, the terminal staminate part very short, 4-8 mm. long, few-flowered; pistillate scales firm but not rigid, oblong-lanceolate, 3-4 mm. long, pale-green, the tip reddish-brown, the midvein green, sharply defined, the scales glabrous, not ciliate, articulate and somewhat cucullate at tip, obtuse or acutish, slightly exceeded by perigynia, the base conspicuously saccate and persistent as wings 1 mm. long on the rachis of the spike, the upper part articulated to base and breaking off, early deciduous; staminate scales oblong-obovate, obtuse, rounded dorsally, persistent; perigynia oblanceolate, 3.5 mm. long, 1.5 mm. wide, obtusely triangular, somewhat flattened, membranaceous, smooth, the margins not at all ciliate, green or in age brownish-green, one nerve sharply defined, otherwise nerveless except at base, tapering at base into a short stipe, somewhat contracted towards apex into a beak 0.5 mm. long, the orifice truncate, whitish; achenes oblong-obovoid, closely enveloped and about filling upper part of perigynium, 2.5 mm. long, 1.25 mm. wide, obtusely triangular, finely punctulate, dark-yellowish-brown, rounded at base, truncate at apex; style short, straight, its base strongly bulbous-thickened, jointed with achene; stigmas three, short-exserted, reddish, slender, short; rachilla long-exserted, conspicuous, 3 times as long as the perigynium, the exserted part erect or ascending, smooth, slender but rigid, very strongly uncinately.

TYPE LOCALITY: "Chile australis, in sylvis imperviis, supra saxa."

DISTRIBUTION: High mountains from Costa Rica to southern Patagonia. (Specimens examined from Costa Rica, Pittier & Durand, 1904.)

ILLUSTRATIONS: Kunze, Suppl. Riedgr. pl. 21; C. Gay, Hist. Chile Bot. Fan. pl. 72, f. 4; Engler, Pflanzenreich 4²⁰: pl. 13, f. H-J.

2. *Uncinia hamata* (Sw.) Urb. Symb. Ant. 2: 169. 1900.

Carex hamata Sw. Prodr. 18. 1788. (Type from Jamaica.)

Carex uncinata var. *hamata* Sw. Fl. Ind. Occ. 84. 1797. (Based on *C. hamata* Sw.)

"*Carex uncinata* L. f." Schkuhr, Riedgr. 13, pl. G, f. 30. 1801. (In part, i.e., as to West Indian plant.)

Uncinia jamaicensis Pers. Syn. Pl. 2: 534. 1807. (Type from Jamaica.)

"*Uncinia phleoides* Pers." C. A. Meyer; Galeotti, Bull. Acad. Brux. 9: 249. 1842.

Uncinia mexicana Steud. Syn. Cyp. 243. 1855. (Type from Mexico.)

Uncinia Galeottii Boott; C. B. Clarke, Jour. Linn. Soc. 20: 400, as synonym. 1883. (Type from Oaxaca, Mexico.)

Uncinia multifolia Bück. Bot. Jahrb. 8: 207. 1887. (Type from Tocola, Colombia.)

Uncinia hamata var. *mexicana* Kükenth. in Engler, Pflanzenreich 4²⁰: 54. 1909. (Based on *U. mexicana* Steud.)

Uncinia hamata var. *mexicana* f. *angustifolia* Kükenth. in Engler, Pflanzenreich 4²⁰: 54. 1909. (Type from Oaxaca, Mexico.)

Very densely caespitose, not stoloniferous, the culms 2.5–6 dm. high, erect, slender or stoutish, stiff, smooth, bluntly triangular, exceeded by leaves, phyllopodic, dull-reddish-brown-tinted and sometimes slightly fibrillose at base; sterile shoots aphyllopodic; leaves with well-developed blades 6–15 to a fertile culm, on lower third, the sheaths tight, not septate-nodulose, usually reddish-brown-blotched ventrally, concave and minutely hispidulous at mouth, the ligule from nearly as long as wide to very short, the blades light-green, thick, coriaceous, 1–4 dm. long, 2–12 mm. wide, long-attenuate, smooth beneath, rough above, keeled beneath and channeled above towards base, otherwise flat; spike solitary, androgynous, bractless, linear-cylindric, 6–18 cm. long, 2.5–3.5 mm. wide (excluding awns), the pistillate part closely or at base often loosely 50–150-flowered in several rows, the scales closely erect-appressed, the staminate part short, relatively few-flowered; pistillate scales obovate-orbicular to oblong-obovate, 4–6 mm. long, rounded on back, the margins united at base, many-nerved, obtuse or acutish, concealing perigynia or nearly so, rigid, persistent, green with yellowish-white cartilaginous margin, the tip narrowly purplish-margined and minutely ciliate; staminate scales smaller, fewer-nerved, more strongly purplish-margined; perigynia oblanceolate, 4.5–6 mm. long, 1.5 mm. wide, plano- or concavo-convex, membranaceous, slenderly rather many-nerved, hispidulous above, the margins setulose-ciliate, especially above, dull-brownish-straw-colored, tapering at base into a short stipe, short-tapering at apex but beakless, the orifice truncate; achenes oblong-obovoid, closely enveloped and about filling upper part of perigynium, 3.5 mm. long, 1.25 mm. wide, obtusely triangular, yellowish-white, rounded at base, truncate at apex; style short, strongly conic at base, jointed with achene; stigmas three, short-exserted, reddish, slender, rather short; rachilla long-exserted and very conspicuous, the exserted part 3–6 mm. long, ascending, ascending-spreading, or spreading, smooth, slender but rigid, very strongly unciniate.

TYPE LOCALITY (of *Carex hamata*, on which *Uncinia hamata* is based): Jamaica.

DISTRIBUTION: Moist woodlands at higher elevations, Jamaica; Haiti; Cuba; southern Mexico to southern Brazil and northern Argentina. (Specimens examined from Jamaica; Haiti; Cuba; Vera Cruz; Oaxaca; Costa Rica; Guatemala; Panama.)

ILLUSTRATION: Schkuhr, Riedgr. pl. G, f. 30 (in part).

3. CYMOPHYLLUS Mackenzie, in Britt. & Brown, Ill. Fl. ed. 2.

1: 441. 1913.

Carex § *Physocephalae* L. H. Bailey, Proc. Am. Acad. 22: 132, in part. 1886. (As to first species cited only.)

Carex § *Leucocephalae* Holm, Am. Jour. Sci. IV. 14: 62. 1902. (Based on *Carex Fraseri* Andr.)

A perennial sedge, with short rootstocks and culms flattened in drying. Culms with four to six overlapping striate bladeless sheaths, and after flowering developing one large blade-bearing leaf without sheath, ligule, or midrib, and with undulate margins appearing minutely serrulate. Spike solitary, bractless, androgynous, the flowers monoecious, solitary in the axils of the scales. Perianth none. Staminate flower of three stamens, the filaments filiform. Pistillate flowers of a single pistil, a style, and three stigmas, the pistil and style enveloped by the somewhat swollen perigynium, the stigmas exserted. Achenes triangular, jointed with the slender style. Stigmas three, clavate-thickened. Rachilla often developed.

A monotypic genus, confined to the higher Alleghenies of the southeastern United States. The phylogenetic position of this genus is very obscure. It has no near relatives.

Type species, *Carex Fraseri* Andr.

1. *Cymophyllus Fraseri* (Andr.) Mackenzie, in Britt. & Brown,

Ill. Fl. ed. 2. 1: 441. 1913.

Carex Fraseri Andr. Bot. Repos. pl. 639. Je 1811. (Type from North Carolina.)

Carex Fraseriana Ker, Bot. Mag. pl. 1391. Jl 1811. (Type from North Carolina.)

"*Mapania sylvatica* Aublet" Pursh, Fl. Am. Sept. 47. 1814. (From the "Cherokee mountains.")

Carex lagopus Mühl. Descr. Gram. 265. 1817. (Type from "Tygher-valley," West Virginia, erroneously given as being in Pennsylvania.)

Olanblis Fraseri Raf. Good Book 26. 1840. (Based on *Carex Fraseri* Andr.)

Rootstock very short-creeping, stout, tough, blackish, the culms erect, slender at first, 1.5-4.5 dm. high, elongating and becoming 4-6 dm. high, obscurely triangular, smooth, fibrillose and brownish at base and with about 4-6 bladeless overlapping striate sheaths covering the lower portion and concealing the solitary undeveloped leaf; sterile shoots none; leaves developing after flowering, one to a culm, the blade very flat, thick and coriaceous, light-green, without midrib, finely very many-striate, at times up to 6 dm. long, 2.5-5 cm. wide, obtusish or acutish, the margin undulate, minutely serrulate, infolded at base, without sheath or ligule; spike solitary, erect, 1.2-2.5 cm. long, bractless, androgynous, the upper half oblong, staminate, the oblong-obovate obtuse staminate scales milk-white, the midrib very faint; filaments orange-yellow, elongate; anthers linear-oblong, 2 mm. long, acute; pistillate portion of spike ovoid-globose, very dense, the perigynia 20-30, in many rows, ascending or soon spreading, the scales ovate-orbicular, obtuse to acute, half the length of the perigynia, the midvein very faint; perigynia elliptic-ovoid, inflated, compressed-orbicular in cross-section, 5-6 mm. long, 2.25-2.5 mm. wide, obscurely nerved, milk-white, very membranaceous, glabrous, shining, round-tapering at base, round-tapering above, the apex contracted into a very short-cylindric, slightly obliquely cut tip; achenes ovoid or obovoid, triangular, loosely enveloped in the lower two thirds of the perigynium, strongly stipitate, jointed with the slender, often flexuous or bent, persistent style; stigmas three, short, thick, enlarged upward; rachilla setiform, white, half the length of the achene.

TYPE LOCALITY (of *Carex Fraseri* Andr. on which *Cymophyllus Fraseri* is based): Table Mountain, and banks of Catawba River near Morgantown, North Carolina.

DISTRIBUTION: Rich mountain woods, southwestern Virginia, West Virginia, eastern Tennessee, and western North and South Carolina. (Specimens examined from West Virginia, western Virginia, western North Carolina, western South Carolina, eastern Tennessee.)

ILLUSTRATIONS: Andr. Bot. Repos. pl. 639; Bot. Mag. pl. 1391; Britt. & Brown, Ill. Fl. f. 803; ed. 2. f. 1110; Rob. & Fern. Man. f. 427; Engler, Pflanzenreich 4²⁰: f. 20, A G; Addisonia pl. 36; Boott, Ill. Carex 150. pl. 484; Am. Jour. Sci. IV. 3: 120. pl. 4.

NOTE: See "Carex Fraseri Andrews, a morphological and anatomical study." T. Holm, Am. Jour. Sci. IV. 3: 120-128.

4. CAREX L. Sp. Pl. 972. 1753.

- Ulex* Adans. Fam. Pl. 2: 496. 1763. (Type species, *Carex gracilis* Curt.)
Physiglochis Neck. Elem. 3: 245. 1790. (No type species designated. Rafinesque in Good Book 27 (1840) designates *Carex dioica* L.)
Cyperoides Tourn. Elem. Augm. 3: 196. pl. 300. 1797. (Type species [*Carex riparia* Curt.].)
Schelhammeria Moench, Meth. Suppl. 119. 1802. (Type species, *Carex cyperoides* L.)
Triplima Raf. Am. Mo. Mag. 4: 195. Ja 1819. (No species given; includes all tristigmatic species, restricted to species with perigynium-beak entire in Jour. de Phys. 89: 106.)
Scuria Raf. Jour. de Phys. 89: 106. Au 1819. (No species given; includes all distigmatic species with perigynium-beak not bidentate.)
Triodex Raf. Jour. de Phys. 89: 106. Au 1819. (No species given; includes all tristigmatic species with perigynium-beak bidentate.)
Vignea Beauv.; Lestib. f. Ess. Fam. Cyp. 22. 1819. (No type species given. In Reichenbach's treatment in Moessler, Handb. ed. 2. 1604 (1829), *Carex dioica* L. is to be taken as the type.)
Travis S. F. Gray, Nat. Arr. Brit. Pl. 2: 53. 1821. (Type species, *Carex pauciflora* L. f.)
Phyllostachys Torr. Ann. Lyc. N. Y. 3: 404. 1836. (Type species, *Carex Willdenovii* Schkuhr.)
Olotrema Raf. Good Book 25. 1840. (Type species, *Carex stenophylla* Wahl. [*C. junctifolia* Host.].)
Loxotrema Raf. Good Book 25. 1840. (Type species, *Carex tuberosa* Degland.)
Loxanisa Raf. Good Book 25. 1840. (Type species, *Carex atrata* L.)
Anithista Raf. Good Book 26. 1840. (Type species, *Carex clavata* Thunb.)
Edriaria Raf. Good Book 26. 1840. (Type species, *Carex mucronata* All.)
Olambis Raf. Good Book 26. 1840. (Type species, *Carex virescens* Muhl.)
Facolos Raf. Good Book 26. 1840. (Type species, *Carex canescens* L. [*C. curta* Gooden.].)
Deweya (also *Melirema*) Raf. Good Book 26. 1840. (Type species, *Carex plantaginea* Lam.)
Diemisa Raf. Good Book 27. 1840. (Type species, *Carex lasiocarpa* Ehrh. [*C. filiformis* authors].)
Onkema Raf. Good Book 27. 1840. (Type species, *Carex globularis* L.)
Loncoyperis Raf. Good Book 27. 1840. (Type species, *Carex scoparia* Schkuhr.)
Kolerna Raf. Good Book 27. 1840. (Type species, *Carex alata* Torr.)
Ternemis Raf. Good Book 27. 1840. (Type species, *Carex Lyngbyei* Hornem. [*C. Scouleri* Torr.].)
Neskisa Raf. Good Book 27. 1840. (Type species, *Carex salina* Wahl.)
Oseulisa Raf. Good Book 27. 1840. (Type species, *Carex acuta* L.)
Ithota Raf. Good Book 28. 1840. (Type species, *Carex filifolia* Nutt. [*Uncinia brevifolia* Torr.].)
Forexeta Raf. Good Book 28. 1840. (Type species, *Carex nepalensis* (Nees) Kükenth. [*Uncinia nepalensis* Nees].)
Maukschia Heuffel, Flora 27: 527. 1844. (Type species, *Carex dioica* L.)
Psyllophora Heuffel, Flora 27: 528. 1844. (Type species, *Carex pulicaris* L.)
Leurostochin Heuffel, Flora 27: 528. 1844. (Type species, *Carex pauciflora* Lightf.)
Callistachys Heuffel, Flora 27: 528. 1844. (Type species, *Carex pyrenaica* Wahl.)

- Genesichia* Heuffel, *Flora* 27: 528. 1844. (Type species, *Carex obtusata* Lili.)
Cryptoglochin Heuffel, *Flora* 27: 528. 1844. (Type species, *Carex curvula* All.)
Pseudocarex Miq. *Ann. Mus. Lugd.-Bat.* 2: 146. 1865. (Type species, *Pseudocarex plantaginea* Miq. [*Carex siderosticta* Hance].)
Vignanthia Schur, *Enum. Pl. Transsilv.* 705. 1866. (*Carex rigida* Gooden. is taken as the type).
Neireichia Kotula, *Spraw. Kom. Fizyogr. Kraków* 17: 136. 1883. (Type species, *Carex caryophylla* Latourr.)
Caricina St.-Lag. in *Cariot, Étude Fl. ed. 8.* 2: 854, 872. 1889. (Type species; *Carex foetida* All.)
Caricinella St.-Lag. in *Cariot, Étude Fl. ed. 8.* 2: 855, 880. 1889. (Type species, *Carex dioica* L.)
Echinoclaenia Börner, *Abh. Nat. Ver. Bremen* 21: 264. 1913. (Type species, *Carex lasmanica* Kükenth.)
Dapedostachys Börner, *Abh. Nat. Ver. Bremen* 21: 265. 1913. (Type species, *Carex Steudellii* Kunth.)
Kukenhathia Börner, *Abh. Nat. Ver. Bremen* 21: 266. 1913. (Type species, *Carex secalina* Wahl.)
Proteocarpus Börner, *Abh. Nat. Ver. Bremen* 21: 266. 1913. (Type species, *Carex sylvatica* Huds.)
Limivasculum Börner, *Abh. Nat. Ver. Bremen* 21: 268. 1913. (Type species, *Carex cespitosa* L.)
Biliera Börner, *Abh. Nat. Ver. Bremen* 21: 269. 1913. (Type species, *Carex digitata* L.)
Manochlaenia Börner, *Abh. Nat. Ver. Bremen* 21: 271. 1913. (Type species, *Carex grisea* Wahl.)
Lamprochlaenia Börner, *Abh. Nat. Ver. Bremen* 21: 272. 1913. (Type species, *Carex nitida* Host.)
Rhaptoalymma Börner, *Abh. Nat. Ver. Bremen* 21: 272. 1913. (Type species, *Carex incurva* Light.)
Rhynchopera Börner, *Abh. Nat. Ver. Bremen* 21: 272. 1913. (Type species, *Carex paniculata* L.)
Leptostigma Börner, *Abh. Nat. Ver. Bremen* 21: 273. 1913. (Type species, *Carex elongata* L.)
Desmiogastis Börner, *Abh. Nat. Ver. Bremen* 21: 274. 1913. (Type species, *Carex contigua* Hoppe.)
Thysanocarex Börner, *Abh. Nat. Ver. Bremen* 21: 274. 1913. (Type species, *Carex muskingumensis* Schw.)
Indocarex Börner, *Abh. Nat. Ver. Bremen* 21: 275. 1913. (Type species, *Carex indica* L.)
Vignidula Börner, *Abh. Nat. Ver. Bremen* 21: 275. 1913. (Type species, *Carex nikkoensis* Franch. & Sav.)
Chionanthula Börner, *Abh. Nat. Ver. Bremen* 21: 275. 1913. (Type species, *Carex baldensis* L.)
The names *Polyglochin*, *Psyllophora*, *Ammorrhiza*, *Caricella*, *Agastachys*, *Heleoanastes*, *Placoseia*, *Leptostachys*, *Drymeia*, *Limonaetes*, *Chordorrhiza*, and *Baeochortus* Ehrh. (*Beitr.* 4: 146, 148, 149, 1789), cited as generic names in *Index Kewensis*, were not published as such, but are "nomina usualia" (see Barnhart, *Rhodora* 22: 180-182). Others of the same kind, *Leucoglochin* and *Phaeolorum*, are not mentioned in the *Index Kewensis*.

Grass-like sedges, perennial by rootstocks. Culms mostly triangular, rarely terete or nearly so, solid or sometimes hollow, the flowering culms often strongly phyllopodic (*i.e.*, the lower leaves with well-developed blades) or aphyllopodic (*i.e.*, the lower leaves bladeless or nearly so); making growth in one year and then without dried-up leaves at base at flowering time, or making growth in two years and then without dried-up leaves at base at flowering time, arising centrally or laterally, in a very few species branching; sterile shoots sometimes little or not at all developed, often resembling the fertile culms, often with the blades much longer or wider. Leaves three-ranked, the upper (bracts) subtending the spikes, elongate or short or sometimes wanting. Plants monoecious or in a very few species dioecious, the flowers arranged in spikes, but in a few species the spikes much reduced. Spikes one to many, either wholly pistillate, wholly staminate, androgynous (*i.e.*, with staminate flowers above and pistillate flowers below) or gynaeceandrous (*i.e.*, with pistillate flowers above and staminate flowers below), sessile or peduncled, the base of the peduncle often with a perigynium-like or spathe-like organ (cladoprophyllum) surrounding it. Flowers unisexual, solitary in the axils of scales. Perianth none. Staminate flowers of three (or rarely two) stamens, the filaments filiform and free below (in all our species), the anthers linear, the staminate scales free to base or rarely with the margins connate towards base. Pistillate flowers surrounded by a sac-like organ (the perigynium) and consisting of a single pistil with a style two- or three-branched above, and with two or three stigmas, very rarely with four stigmas. Style either (1) jointed with the apiculate-tipped or rounded achene, and withering and at length deciduous, or (2) continuous with achene, persistent, indurated and not withering. Achenes triangular, lenticular, or plano-convex, sessile or stipitate, rarely constricted at the base, completely surrounded by the perigynium or rarely rupturing it in ripening; stigmas and frequently part of the style protruding through the small terminal orifice. Perigynia chartaceous, membranaceous, or coriaceous, from closely enveloping the achene and not at all inflated to strongly inflated, sessile or stipitate, nerveless or nerved or ribbed, glabrous or pubescent or hispid or rarely vesicular-papillose, often granular or papillose, frequently punctulate, sometimes spongy at base, frequently flattened and more or less winged, beakless to strongly beaked, the beak at apex entire or obliquely cleft or bidentate, the dorsal suture in many species developed and conspicuous, in others entirely absent. A short setiform very inconspicuous rachilla developed in a very few monostachyous species.

Type species, *Carex acuta* [a] L.

Pages 11-20, comprising a conspectus of the sections of the genus *Carex* and an artificial key to these sections, will be issued with a later Part of this volume.

1. *Nardinae* Tuckerm. Enum. Caric. 7. 1843; Mackenzie, in Rydb. Fl. Rocky Mts. 119. 1917. PULICARES O. F. Lang, Linnæa 24: 498, in part, not as to type. 1851. CAPITATAE Christ, Bull. Soc. Bot. Belg. 24²: 20, in part, not as to type. 1885. NEUROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 456, in part, not as to type. 1903. By L. H. Bailey (Proc. Am. Acad. 22: 142. 1886) referred to the DIOICAE Tuckerm.; by Kükenthal (in Engler, Pflanzenreich 4²⁰: 69. 1909) referred to the MICROCEPHALAE Holm.

Very densely cespitose; leaf-blades filiform, stiff, the basal sheaths striate, very conspicuous; spike solitary, androgynous, ovoid to oblong, densely flowered, bractless, the staminate part short; scales usually not strongly hyaline-margined; perigynia appressed-ascending, plano-convex or flattened-biconvex, not inflated, oblong-ovate or lanceolate, sharp-edged, membranaceous, glabrous, obscurely striate, slenderly short-stipitate or substipitate, the beak weakly serrulate, minutely hyaline-tipped, in age emarginate or slightly bidentate, obliquely cut dorsally, and with a dorsal suture; achenes lenticular or triangular, in lower half or two thirds of perigynium-body, apiculate, jointed with the slender style; stigmas two or three. Rachilla setiform, shorter than achene.

Two species; one circumpolar in arctic Eurasia and North America; the other alpine in northwestern North America.

Sheaths tapering into the blades; spikes ovoid-orbicular; scales ovate-orbicular, obtuse, with lighter-colored midvein; achenes lenticular.

Sheaths abruptly contracted into the blades; spikes oblong; scales ovate or obovate, obtusish or acutish, the center lighter-colored, conspicuous; achenes usually triangular.

1. *C. nardina*.

2. *C. Hepburnii*.

1. *Carex nardina* Fries, Mant. 2: 55. 1839.

Carex nardina var. *atriceps* Kükenth. Repert. Sp. Nov. 8: 7. 1910. (Type from west Greenland.)

Very densely cespitose, the culms erect or curving, 1-12 cm. high, slender, wiry, obtusely triangular, smooth, usually shorter than and hidden among the leaves, at base yellowish-brown and with the old sheaths of the previous year conspicuous, shining, sometimes sparingly filamentose; leaves of the year with well-developed blades only 1 or 2 to a culm, the blades setaceous, very narrow (0.25 mm. wide) and stiff and wiry, resembling the culms, 1-10 cm. long, erect or somewhat curving, more or less roughened, the sheaths conspicuously striate dorsally, tapering into the blades, very thin ventrally and oblique at mouth, the ligule short; spikes solitary, androgynous, bractless, ovoid-orbicular, 4-10 mm. long, 3-6 mm. wide, closely flowered, the apical staminate flowers inconspicuous, the perigynia few to several, appressed-ascending; scales ovate-orbicular, dark-chestnut-brown, the lighter midvein usually inconspicuous, obtuse, slightly wider and slightly shorter than perigynia; perigynia plano-convex, oblong-obovate, membranaceous, brownish or straw-colored, 3-3.5 mm. long, 1.5-2 mm. wide, finely and obscurely several-striate on both sides, tapering at base into a short stipe, narrowly margined ventrally to base, contracted into a short (0.5 mm. long), slender, dark-tipped beak membranaceous at mouth, cleft dorsally and at length bidentate, the margins sparingly ciliate-serrulate; achenes lenticular, in lower half of perigynium, loosely enveloped, brownish-black, obovate, 1.75-2 mm. long, 1-1.5 mm. wide, tapering at base, substipitate, apiculate; style slender, not enlarged at base, jointed with achene, deciduous, dark-colored; stigmas two, slender, elongate; rachilla green, setiform, a little shorter than the achene.

TYPE LOCALITY: "In Junkersdalen Lapponiae lulensis detexit J. Ångström 1837."

DISTRIBUTION: Dry sunny localities, in calcareous districts, alpine regions, Greenland to Hudson Bay and Alaska, and southward to the mountains of the Gaspé Peninsula, Quebec, where very local; also in extreme northern Eurasia. Apparently avoiding acid soils. (Specimens examined from Greenland, Labrador, Ellesmereklund, Robertson's Bay, McCormick Bay, Hudson Bay, Alaska, Gaspé.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 814; ed. 2. f. 868; Kunze, Suppl. Riedgr. pl. 23, f. 2; Engler, Pflanzenreich 4²⁰: 71, f. 15, E-J; Ostenf. Fl. Arct. f. 14; Jour. Russe Bot. 1911: 30, f. 5; Anderss. Cyp. Scand. pl. 3, f. 5.

NOTE: The name *Kobresia nardina* appearing in Hornem. Nom. Fl. Dan. 74 (1827) was a mistaken application of the name to plate 1529 in Flora Danica, which is *Carex gynocrates* Wormsk. (Fries, Mant. 3: 134 (1842); Kunze, Suppl. Riedgr. 97). This same plate is erroneously cited by Fries in describing *Carex nardina*, but his excellent description applies to the plant to which all authors have since applied his name.

2. *Carex Hepburnii* Boott, in Hook. Fl. Bor. Am. 2: 209.

pl. 207. 1839.

"*Carex nardina* Fries" L. H. Bailey, Proc. Am. Acad. 22: 142. 1886. (Except reference to Greenland specimen.)

Carex nardina var. *Hepburnii* Kükenth. in Engler, Pflanzenreich 4²⁰: 70. 1909. (Based on *C. Hepburnii* Boott.)

Carex stantonensis M. E. Jones, Bull. Univ. Mont. 61: 20. 1910. (Type from Stanton Lake, Mont.)

Very densely cespitose, the culms very slender, but wiry and erect, triangular, 2-15 cm. high, smooth, at base yellowish-brown and with the old sheaths of the previous year conspicuous, and occasionally somewhat filamentose; leaves of the year with well-developed blades only 1 or 2 to a culm, the blades setaceous, 1-10 cm. long, very narrow (0.25 mm. wide) and stiff and wire-like, resembling the culms, erect or somewhat curving, more or less roughened, the sheaths abruptly contracted into the blades, conspicuously striate dorsally, very thin ventrally, and truncate at mouth, the ligule much wider than long; spikes solitary, oblong, 5-15 mm. long, 2-4 mm. wide, closely flowered, bearing the 5-15 erect-appressed perigynia below and the short cone of staminate flowers above; bracts absent; scales of pistillate flowers ovate or obovate, reddish-brown or brownish, with conspicuous straw-colored center and narrow or even wide white-hyaline margins, obtusish or acutish, rather wider than and from slightly longer to noticeably shorter than the perigynia; scales of staminate flowers narrower; perigynia biconvex or plano-convex, lanceolate, flattened, sharp-edged but not margined, 3.5-4.5 mm. long, 1.25-1.75 mm. wide, glabrous, very thin and membranaceous, the upper half empty, very obscurely several- to many-striate on both sides, whitish except at apex, substipitate, tapering at base, round-tapering at apex and abruptly and minutely beaked, the beak about 0.5 mm. long, chestnut-brown, cylindrical, emarginate, hyaline, the upper part of the body remotely weakly serrulate under a lens; achenes lenticular or triangular, not tightly enveloped, about 2.5 mm. long, apiculate, tapering at base, brown, when lenticular obovoid, when triangular more or less flattened; style short, slender, straight, jointed with achene; stigmas two or three, long, slender, light-reddish-brown; rachilla green, setiform, somewhat shorter than achene.

TYPE LOCALITY: "Hab. Rocky Mountains, *Drummond*."

DISTRIBUTION: Dry alpine summits and slopes in calcareous districts, Alberta to Colorado, and westward to Washington and southern Alaska. (Specimens examined from Colorado, Wyoming, Montana, Alberta, British Columbia, Washington, southern Alaska.)

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 207; Bull. Univ. Mont. 61: 19. *pl.* 3 (left hand); 70. *f.* 5-8; Abrams, Ill. Fl. Pacif. St. *f.* 677.

2. *Capitatae* Christ, Bull. Soc. Bot. Belg. 24²: 20, in part. 1885; Mackenzie, in Rydb. Fl. Rocky Mts. 120. 1917; Mackenzie, *Erythea* 8: 22. 1922. PULICARES O. F. Lang, *Linnaea* 24: 498, in part, not as to type. 1851. NARDINAE Kükenth. Bot. Jahrb. 27: 496, in part, not as to type. 1899. MICROCEPHALAE Holm, Am. Jour. Sci. IV. 16: 456. 1903; Kükenth. in Engler, Pflanzenreich 4²⁰: 69, in part. 1909. By L. H. Bailey (Proc. Am. Acad. 22: 141. 1886) referred to the DIOICAE Tuckerm.

Cespitose, the rootstocks somewhat elongate; culms dull-purplish-red at base; leaf-blades filiform, stiff; spike solitary, androgynous, ovoid, densely flowered, bractless, the staminate part short; perigynia spreading-ascending, plano-convex, ovate, sharp-edged, membranaceous, not inflated, nerveless or very nearly so, the beak smooth, conspicuously hyaline-tipped, in age slightly bidentate, the dorsal suture short; achenes loosely enveloped in the lower three fourths of the perigynium-body, lenticular, apiculate, jointed with the slender style; stigmas two. Rachilla setiform, shorter or somewhat longer than the achene.

Two species; one an arctic and alpine one of northern Eurasia and North America, extending very locally southward in isolated stations on high mountain summits to northern Mexico; also reported as found in southern South America; the other species in the mountains of western Asia.

3. *Carex capitata* L. Syst. Nat. ed. 10. 1261. 1759.

Vigna capitata Reichenb. in Mössler, Handb. ed. 2. 1606. 1829. (Based on *Carex capitata* L.)

Diemisa capitata Raf. Good Book 27. 1840. (Based on *Carex capitata* L.)

Psyllophora capitata Schur, Enum. Pl. Transsilv. 697. 1866. (Based on *Carex capitata* L.)

Carex rahuiensis Kurtz; Kükenth. Bot. Jahrb. 27: 497. 1899. (Type from Argentina.)

Loosely cespitose, the rootstocks rather short-creeping, ascending obliquely, slender, scaly, purplish-red, the culms slender but wiry, 1-3.5 dm. high, aphyllipodic, erect, triangular, roughened on the angles above, and usually somewhat longer than the leaves, dull-purplish-red at base and clothed with the dried-up leaves of the previous year; leaves of the year with well-developed blades usually 2-4 to a culm, on lower third, the blades involute, light-green, stiff, 2 dm. long or less, very narrow (0.5 mm. wide or less), erect or recurving, more or less roughened, the lowest sheaths very sparingly filamentose, the upper very tight, hyaline ventrally, and truncate at mouth, the ligule very short; spike solitary, orbicular or oblong-orbicular, 4-10 mm. long, 3-6 mm. wide, with about 6-25 ascending or at length spreading perigynia at base and a short cone of staminate flowers at the apex, bractless; pistillate scales orbicular or ovate-orbicular, obtuse, the body chocolate-brown with broad hyaline apex and margin, much shorter and somewhat narrower than the developed perigynia, the staminate narrower, more acute, lighter-colored, narrowly hyaline-margined; perigynia plano-convex, ovate, thin, membranaceous, pale-green, smooth, 2-3 mm. long, 1.5-2 mm. wide, flat and nerveless ventrally, rounded and finely few-nerved dorsally, sessile, sharp-edged to base but not serrulate, abruptly contracted into a slender, smooth, dark-colored beak less than 1 mm. long, the apex hyaline, entire or at length bidentulate; achenes lenticular, yellowish-brown, obovoid or oblong-suborbicular, loosely enveloped, apiculate, tapering below and truncate at base, 1.5 mm. long, 1 mm. wide; style slender, jointed with achene, not enlarged at base; stigmas two, slender, short, light-reddish-brown; rachilla green with white tip, setaceous, rather shorter than achene.

TYPE LOCALITY: Northern Europe (Fl. Dan. *pl.* 372).

DISTRIBUTION: Open sunny slopes and summits, in the far northern portions of North America from Greenland to Hudson Bay and Alaska, and southward very locally on mountain summits in New Hampshire, Alberta, Wyoming, Nevada, California, and northern Mexico; widely distributed in the boreal and alpine regions of northern Eurasia; also found in southern South America. (Specimens examined from Greenland, Hudson Bay, Newfoundland, Quebec (Gaspé), New Hampshire (White Mountains), Methye River, Yukon, Wyoming, Colorado, Nevada, California, Chihuahua.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. *f.* 813; ed. 2. *f.* 869; Rob. & Fern, Man. *f.* 418; Engler, Pflanzenreich 4^o; 71. *f.* 15 K-V; Schkuhr, Riedgr. *pl.* V, *f.* 80; Fl. Dan. *pl.* 372, 2060; Erythea 8: 21. *f.* 3; Jepson, Fl. Calif. 1: 211. *f.* 29 a-c; Jepson, Man. Fl. Calif. *f.* 161; Abrams, Ill. Fl. Pacif. St. *f.* 683; Jour. Russe Bot. 1911: 30. *f.* 6; Sturm, Deuts. Fl. 50: *pl.* 2; Am. Jour. Sci. IV. 23: 425. *f.* 1, 2; Ostenf. Fl. Arct. *f.* 15; Reichenb. Ic. Fl. Germ. 8: *pl.* 195, *f.* 525; Anderss. Cyp. Scand. *pl.* 3, *f.* 6; Hegl, Ill. Fl. Mittel-Eur. *f.* 210; Hallier, Deuts. Fl. *pl.* 423; Thomé, Fl. Deuts. *pl.* 88, *f.* C, D.

3. *Inflatae* Kükenth. in Engler, Pflanzenreich 4^o: 96. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 119. 1917; Mackenzie, Erythea 8: 18. 1922. *PHYSOCEPHALAE* L. H. Bailey, Proc. Am. Acad. 22: 132, in part, not as to first species given. 1886; Holm, Am. Jour. Sci. IV. 16: 464. 1903. *C. Engelmannii* is referred to the *PHYSOCARPAE* Drejer by Holm (Am. Jour. Sci. IV. 16: 464. 1903).

Cespitose, the rootstocks elongate, slender; culms phyllipodic, central; leaf-blades filiform; spike solitary, androgynous, ovoid, densely flowered, bractless; scales not strongly hyaline-margined; perigynia ascending, very membranaceous, inflated, smooth, little nerved, rounded at base, tapering or with smooth short beak, hyaline-tipped, obliquely cut, or becoming minutely bidentate; achenes very loosely enveloped, small, triangular with concave sides, apiculate, jointed with the very slender style; stigmas three, slender. Rachilla slender, exceeding achene.

Two dry-ground species confined to isolated stations on the summits of high peaks in the western part of the United States.

Pistillate scales 1-nerved; perigynia ovoid, inflated, tapering at apex; staminate part of spike scarcely conspicuous; achenes 1.25-1.5 mm. long. 4. *C. Engelmannii*.
Pistillate scales 3-nerved; perigynia broadly ovoid, strongly inflated, abruptly minutely beaked; staminate part of spike conspicuous; achenes 2 mm. long. 5. *C. Breweri*.

4. *Carex Engelmannii* L. H. Bailey, Proc. Am. Acad. 22: 132. 1886.

Carex paddoensis Suksd. Allg. Bot. Zeits. 12: 43. 1906. (Type from Mt. Adams (Paddo), Washington.)

Carex Engelmannii var. *paddoensis* Kneucker, Allg. Bot. Zeits. 17: 90. 1911. (Based on *C. paddoensis* Suksd.)

Rootstock stoloniferous, slender but tough, brown, scaly, the culms numerous, erect, slender but stiff, obtusely angled and smooth or nearly so, 5–20 cm. high, from shorter than to exceeding leaves, brown at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 5–9 to a fertile culm, bunched on lower fourth, the blades involute-filiform, erect or sometimes curved, stiff, 3–15 cm. long, 0.3–0.5 mm. wide, smooth or nearly so, the sheaths loose, strongly striate dorsally, hyaline ventrally, truncate at mouth, the ligule very short; spike solitary, androgynous, bractless, densely flowered, ovoid, 1–1.5 cm. long, 6–10 mm. wide, the upper fourth staminate, scarcely conspicuous, the perigynia 15–40, appressed-ascending or at length spreading-ascending in many rows; pistillate scales ovate, sharply acute or slightly cuspidate, 1-nerved, shining, reddish-brown or straw-colored with lighter center and conspicuous hyaline margins, at base wider than perigynia, and all except lower slightly shorter than perigynia; staminate scales narrower; perigynia ovoid, 4.5–5 mm. long, 2.25 mm. wide, more or less strongly inflated, very membranaceous, nerveless and smooth, shining, straw-colored or brownish, slightly stipitate, rounded at base, and tapering at apex into a minute, smooth, white-hyaline, obliquely cleft, at length bidentulate beak 0.5 mm. long or less; achenes oblong-obovoid, triangular with concave sides, apiculate, brownish, stipitate, very minute for size of perigynia, very loosely enveloped, 1.25–1.5 mm. long, 0.6 mm. wide; style slender, jointed with achene, not enlarged at base, deciduous; stigmas three, slender, yellowish-brown; rachilla slender, exceeding achene; anthers 1.75 mm. long, sharp-tipped.

TYPE LOCALITY: Gray's Peak, Colorado (*Engelmann*).

DISTRIBUTION: Open sunny slopes and summits, isolated stations on high mountains, Colorado, Wyoming, Washington, and California (Tulare County). (Specimens examined from Colorado, Wyoming, Washington, California.)

ILLUSTRATIONS: *Am. Jour. Sci.* IV. 14: 60. *f.* 1–4; *Abrams, Ill. Fl. Pacif. St. f.* 678.

5. *Carex Breweri* Boott, *Ill. Carex* 142. *pl.* 455. 1867.

Rootstock stoloniferous, slender but tough, brown, scaly, the culms numerous, 1–2.5 dm. high, smooth on the angles, strict and stiff, obtusely triangular, more or less exceeding the leaves, brown at base and clothed with the dried-up leaves of the previous year, the lower bladeless; leaves with well-developed blades 3–10 to a fertile culm, clustered towards the base, the blades involute-filiform, erect, stiff, 5–10 cm. long, 1 mm. wide, roughened towards the attenuate apex, the sheaths loose, strongly striate dorsally, hyaline ventrally, truncate at mouth, the ligule very short; spike solitary, androgynous, bractless, ovoid or oblong-ovoid, 1–2 cm. long, 6–10 mm. wide, densely flowered, the upper third or more staminate, conspicuous, the perigynia ascending or at length spreading in many rows; staminate scales ovate-oblong, short-acuminate, reddish-brown with hyaline margins; pistillate scales ovate, broader, 3-nerved and sometimes striate, tapering-acute or short-acuminate, narrower and shorter than the mature perigynia; perigynia broadly ovoid, 5–6.5 mm. long, 3.5 mm. wide, strongly inflated, brownish-yellow, smooth, shining, very membranaceous, nerveless or nearly so, slightly stipitate, rounded at base, abruptly minutely beaked, the beak 0.5–1 mm. long, smooth, white-hyaline, obliquely cut, at length bidentulate; achenes oblong-obovoid, triangular with concave sides, apiculate, brownish, stipitate, 2 mm. long, 1 mm. wide, much smaller than perigynia and very loosely enveloped; style slender, jointed with achene, not enlarged at base, deciduous; stigmas three, slender, reddish-brown; rachilla slender, exceeding achene; anthers 1.75 mm. long, sharp-tipped.

TYPE LOCALITY: Mt. Shasta, California (*Brewer 1422*).

DISTRIBUTION: Open sunny slopes and summits, high alpine peaks, Washington, Oregon, and southward in California on the higher summits of the Sierra Nevada to Mt. Whitney. (Specimens examined from Washington, Oregon, California.)

ILLUSTRATIONS: Boott, *Ill. Carex* 142. *pl.* 455; Engler, *Pflanzenreich* 4⁹⁰: *f.* 20; *H, J, K*; *Erythea* 8: 18. *f.* 1; Jepson, *Man. Fl. Pl. Calif. f.* 159; Jepson, *Fl. Calif.* 1: 210. *f.* 28; *Abrams, Ill. Fl. Pacif. St. f.* 679; *Am. Jour. Sci.* IV. 14: 60. *f.* 5, 6.

4. *Circinatae* Meinsh. *Acta Hort. Petrop.* 18: 308. 1901; Kükenth. in Engler, *Pflanzenreich* 4⁹⁰: 96. 1909. By L. H. Bailey (*Proc. Am. Acad.* 22: 131. 1886) referred to the *LEPTOCEPHALAE* L. H. Bailey; by Pax (in *E. & P. Nat. Pfl.* 2^o: 123. 1887) referred to the

SCIRPOIDEAE Tuckerm.; and by Holm (Am. Jour. Sci. IV. 16: 460. 1903) referred to the STENOCARPAE Holm.

Loosely caespitose or with elongate rootstocks; leaf-blades narrow; spike solitary, androgynous or sometimes entirely pistillate or staminate, bractless, elongate, narrow, rather loosely several- to many-flowered, the perigynia in few rows; scales persistent; perigynia appressed, compressed-triangular, nerved, glabrous, membranaceous, empty above, lanceolate, much narrowed and stipitate at base, beaked, the beak at length obliquely cut; achenes triangular, rather closely enveloped, linear-oblong or oblong-obovoid, minutely apiculate, jointed with the slender, slightly flexuous style; stigmas three, rarely two, slender.

Two North American species, near the Pacific Coast from northwestern Washington to the Pribilof Islands; and two Japanese species.

Plants with slender, long-creeping rootstocks; leaf-blades flat; perigynia short-beaked; scales chestnut-brown-tinged.

6. *C. anthoxantha*.

Plants densely caespitose, the rootstocks little elongate; leaf-blades involute; perigynia long-beaked; scales red-tinged.

7. *C. circinata*.

6. *Carex anthoxantha* Presl, Rel. Haenk. 1: 203. 1828.

Carex leiocarpa C. A. Meyer, Mém. Acad. St.-Pétersb. Sav. Étr. 1: 208. pl. 5. 1831. (Type from Unalaska.)

Carex anthoxantha var. *leiocarpa* Kükenth. in Engler, Pflanzenreich 4²⁰: 97. 1909. (Based on *C. leiocarpa* C. A. Meyer.)

Rootstocks tough, slender, long-creeping, light-yellowish-brown, very scaly, the culms slender, 0.5-4 dm. high, erect, obtusely triangular, arising singly, usually exceeding the leaves, roughened above, aphyllopodic and light-yellowish-brown at base, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades usually 2-4 to a culm, inserted towards the base, the blades deep-green, thickish, flat, 4-40 cm. long, 1.5-2.5 mm. wide, sometimes very long and slender, erect or more or less recurved, roughened at the attenuate apex, the sheaths tight, truncate at mouth, the lower conspicuously striate dorsally, the ligule very short, much wider than long; spike solitary, 1-3 cm. long, 3-4 mm. wide, usually entirely pistillate or sometimes androgynous or entirely staminate; perigynia 6-12, erect-ascending, the lowermost alternate, the upper overlapping; bracts none; lowest pistillate scales ovate-lanceolate, cuspidate or even awned, the upper broadly obovate and very obtuse, chestnut-brown with broad 1-3-nerved straw-colored or greenish center, the lower exceeding, the upper exceeded by the perigynia; staminate scales similar; perigynia spindle-shaped, not inflated, obscurely compressed-triangular in cross-section, 4 mm. long, 1.5 mm. wide, yellowish-green, membranaceous, smooth, lightly many-nerved, short-stipitate, tapering at base, and tapering at apex into a smooth, short (0.5-1 mm. long), chestnut-brown-tinged beak, with obliquely cleft orifice; achenes rather closely enveloped, triangular with obtuse angles, oblong-obovoid, 1.5 mm. long, 1 mm. wide, apiculate, jointed with the slender, slightly flexuous, strongly exerted, deciduous style; stigmas three, rarely two, brownish, slender.

TYPE LOCALITY: "Hab. in Nootka-Sund."

DISTRIBUTION: Along or near the northwestern coast of North America, from British Columbia to the Pribilof and Shumagin islands, growing on grassy banks. (Specimens examined from Queen Charlotte Islands, British Columbia, Alaska (coast).)

ILLUSTRATIONS: Boott, Ill. *Carex* 142. pl. 456; Mém. Acad. St.-Pétersb. Sav. Étr. 1: pl. 5 (figure copied by Boott as cited).

7. *Carex circinata* C. A. Meyer, Mém. Acad. St.-Pétersb. Sav. Étr. 1: 209. pl. 6. 1831.

Carex arida Cham.; Böck. Linnaea 39: 28, as synonym. 1875. Not *C. arida* Schw. & Torr. 1825.

Very densely caespitose, the rootstocks slender, tough, brownish, very short, the culms 5-15 cm. high, erect or recurved, slender, triangular, smooth or little roughened on the angles, usually exceeded by the leaves, aphyllopodic, light-brownish-tinged at base, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades several to a culm, densely clustered towards the base, the blades light-green, stiff, strongly recurved-spreading, involute, filiform, 2-10 cm. long, 0.5 mm. wide, roughened towards the attenuate stiff apex,

the sheaths tight, concave at mouth, the lower strongly striate dorsally, the ligule much wider than long; spike solitary, androgynous, 1.5–2.5 cm. long, 3–4 mm. wide, the upper fourth staminate, the lower three fourths closely flowered above and more loosely below and containing 8–15 erect-ascending perigynia in few rows; bracts none; pistillate scales reddish, with broad 1–3-nerved straw-colored center and narrow white-hyaline apex and margins, wider than the perigynia, the lowest lanceolate, cuspidate, and exceeding the perigynia, the middle and upper obovate, very obtuse, exceeded by the perigynia; staminate scales like the upper pistillate scales; perigynia spindle-shaped, obscurely compressed-triangular in cross-section, not inflated, 4.5–6 mm. long, 1.5 mm. wide, straw-colored, membranaceous, glabrous, smooth, lightly striate, stipitate, tapering at base, and tapering at apex into a somewhat serrulate reddish-tinged beak 1.5 mm. long, the orifice white-hyaline, obliquely cleft; achenes obtusely triangular, rather closely enveloped, narrowly linear-oblong, 2.5 mm. long, 1 mm. wide, bluntly apiculate, jointed with the slender, straight, deciduous style; stigmas three, rarely two, red, slender, long.

TYPE LOCALITY: "Habitat in rupibus Unalashkae."

DISTRIBUTION: Along or near the northwestern coast of North America from northwestern Washington to the Aleutian Islands. (Specimens examined from Washington (Clallam County), Queen Charlotte Islands, Alaska (coast).)

ILLUSTRATIONS: Engler, Pflanzenreich 4²⁰: 105. f. 21, A, B; Boott, Ill. Carex 133. pl. 429; Mém. Acad. St.-Petersb. Sav. Étr. 1: pl. 6 (figure copied by Boott as cited); Abrams, Ill. Fl. Pacif. St. f. 682.

5. *Callistachys* (Heuffel) Asch. & Graebn. Syn. Mitteleur. Fl. 2^o: 17. 1902; Kükenth. in Engler, Pflanzenreich 4²⁰: 104. 1909. CALOGLCHINES O. F. Lang, Linnaea 24: 503, in part. 1851. ATHROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 459. 1903; Mackenzie, in Rydb. Fl. Rocky Mts. 120. 1917; Mackenzie, Erythea 8: 18. 1922. Treated as a genus *Callistachys* by Heuffel (Flora 27: 528. 1844); as a section *Dornera* by Heuffel (Verh. Zool.-Bot. Ges. Wien 8: 217. 1858). Referred to the PULICARES by Tuckerman (Enum. Caric. 7. 1843) and by L. H. Bailey (Proc. Am. Acad. 22: 129. 1886); and to the RUFESTRES by Pax (in E. & P. Nat. Pfl. 2^o: 123. 1887).

Cespitose or with creeping rootstocks; leaf-blades narrow; spike solitary, androgynous, bractless, narrow, densely many-flowered; pistillate scales soon falling; perigynia slenderly strongly stipitate, widely spreading or the lower reflexed, obscurely triangular, nerveless, membranaceous, long-beaked, the beak sutured dorsally, obliquely cut, becoming bidentate; achenes in lower two thirds of body, usually triangular, slightly apiculate; style very slender, straight, slightly enlarged upward at base, jointed with the achene; stigmas three or occasionally two, slender. Rachilla sometimes present, short. Perigynia rarely enveloping two achenes (Boott, Ill. Carex pl. 474, 475.)

Three dry-ground, calcareous, arctic-alpine or arctic, coastal species in the western part of North America north of Mexico, one of which is also widely distributed in northern and alpine Eurasia. A fourth very closely related species is found in New Zealand and southern Australia.

Stigmas normally three; perigynia 3–4 mm. long.

Plants densely cespitose; leaves mostly 4 to a fertile culm, the blades 0.25–1.5 mm. wide, strongly channeled; staminate flowers few; perigynia erect until full maturity.

Plants short-stoloniferous; leaves 4–9 to a fertile culm, the blades 1.5–2 mm. wide, flat or channeled; staminate flowers many, conspicuous; perigynia early deflexed.

Stigmas always two; perigynia 2.25–3 mm. long; plants densely cespitose; leaves 4–8 to a fertile culm, the blades 1.25–2 mm. wide, flat above.

8. *C. pyrenaica*.

9. *C. nigricans*.

10. *C. micropoda*.

8. *Carex pyrenaica* Wahl. Sv. Vet.-Acad. Nya Handl. 24: 139. 1803.

Carex Ramondiana DC. Fl. Fr. 3: 101. 1805. (Type from the higher Pyrenees.)

Carex pulicarioides Ramond; DC. Fl. Fr. 3: 101. 1805. (As synonym of *C. Ramondiana*.)

Carex Fontanesiana DC. Fl. Fr. 3: 102. 1805. (Type from the higher Pyrenees.)

Carex spicata Schkuhr, Riedgr. Nachtr. 35. 1806. (Habitat in Pyrenaeis.) Not *C. spicata* Schkuhr, Riedgr. 11. 1801.

- Carex acutissima* Degland, in Loisel. Fl. Gall. 628. 1807. (Type from the Pyrenees.)
Carex denudata Lapeyr. Hist. Abr. Pl. Pyr. 562. 1813. (As synonym of *C. pyrenaica*.)
Carex Marchandiana Lapeyr. Hist. Abr. Pl. Pyr. Suppl. 141. 1818. (Type from the Pyrenees.)
 "Carex Davalliana Smith" Dewey, Am. Jour. Sci. 28: 271. 1835. (From the Rocky Mountains.)
Callistachys pyrenaica Heuffel, Flora 27: 528. 1844. (Based on *Carex pyrenaica* Wahl.)
Psyllophora pyrenaica Schur, Enum. Pl. Transsilv. 697. 1866. (Based on *Carex pyrenaica* Wahl.)
Carex Grosseckii Heuffel; Schur, Enum. Pl. Transsilv. 697, as synonym. 1866.
Dornera alpina Heuffel; Schur, Enum. Pl. Transsilv. 697, as synonym. 1866. (Based on *Carex pyrenaica* Wahl.)
Carex pyrenaica var. *longibracteata* Schur, Enum. Pl. Transsilv. 698. 1866. (Type from Transylvania.)
Carex pyrenaica var. β Boott, Ill. Carex 148. pl. 476, f. 2. 1867. (Type from Transylvania.)
 "Carex pulicaris L." Boiss. Fl. Orient. 5: 397. 1882. (From eastern Caucasus.)
Carex pyrenaica f. *longibracteata* "Schur" Kükenth. in Engler, Pflanzenreich 4²⁰: 106. 1909. (Based on *C. pyrenaica* var. *longibracteata* Schur.)
Carex pyrenaica var. *articulata* Kükenth. in Engler, Pflanzenreich 4²⁰: 106. 1909. (Based on *C. pyrenaica* var. β Boott.)
Carex Crandallii Gand. Bull. Soc. Bot. Fr. 66: 295. 1920. (Type from Gray's Peak, Colo.)

Very densely caespitose, the culms 3–25 cm. high, wiry, slender, smooth, obtusely triangular, from about the length of to exceeding the leaves, the old sheaths conspicuous, yellowish-brown at base and clothed with the dried-up leaves of the previous year, the lowest bladeless; leaves best developed on the sterile culms, usually only 2–4 with well-developed blades on a fertile culm, but at times more numerous, inserted near the base, the blades 2–10 cm. long, 0.25–1.5 mm. wide, strongly channeled, light-green, slightly roughened towards the attenuate apex, the sheaths tight, obliquely truncate at mouth, the ligule very short; spike solitary, androgynous, erect, linear-oblong, closely many-flowered, 5–20 mm. long, 3–5 mm. wide, the uppermost part containing a few usually inconspicuous staminate flowers, the lower part pistillate; bracts none; staminate scales lanceolate, acute or acuminate, straw-colored or brownish with narrow hyaline margins; pistillate scales ovate, brownish or blackish-chestnut, with very narrow hyaline margins and lighter center, obtuse, shorter than and rather wider than the perigynia; perigynia 10 to many, jointed to the rachis, erect but spreading or even deflexed at full maturity when breaking away from the rachis, compressed-triangular in cross-section, not inflated, lanceolate or ovate-lanceolate at maturity, 3–4 mm. long, 0.8–1.5 mm. wide, nerveless, shining, glabrous, membranaceous, soon brownish-straw-colored, stipitate, rounded at base, tapering at apex into a smooth beak about 0.5 mm. long, with hyaline orifice obliquely cut or at length bidentulate, sulcate dorsally; achenes triangular, oblong-obovoid, 1.25 mm. long, 0.5 mm. wide, short-stipitate, apiculate; style slender, straight, jointed with achene; stigmas three, slender, elongate, light-brownish.

TYPE LOCALITY: "Hab. in Pyrenaeis, La Peyrouse: ex herb. Thunbergiano."

DISTRIBUTION: Sunny slopes in alpine localities in calcareous regions, from Mackenzie to Colorado, and westward to Oregon and British Columbia; also widely distributed in Eurasia. (Specimens examined from Mackenzie, Alberta, Montana, Wyoming, Colorado, Utah, Idaho, Oregon, Washington, British Columbia.)

ILLUSTRATIONS: Engler, Pflanzenreich 4²⁰: f. 21, L, M; Boott, Ill. Carex 148. pl. 475; pl. 476, f. 1; Abrams, Ill. Fl. Pacif. St. f. 680; Reichenb. Ic. Fl. Germ. 8: pl. 198, f. 530; Coste, Fl. Fr. f. 3805; Linnaea 31: pl. 4, f. 2a, and 2b (poor); Mém. Acad. St.-Pétersb. Sav. Étr. 1: pl. 7.

NOTE: In this and the following species the achenes rarely are lenticular and the stigmas two.

9. *Carex nigricans* C. A. Meyer, Mém. Acad. St.-Pétersb. Sav. Étr. 1: 211. pl. 7. 1831.

Carex pyrenaica var. *majuscula* Kurtz, Bot. Jahrb. 19: 415. 1894. (Type from Alaska.)

Carex nigricans f. *feminea* Kneucker, Allg. Bot. Zeits. 17: 90. 1911. (Type from Mt. Adams, Washington.)

Loosely caespitose, the rootstocks creeping, lignescent, stout, brownish-black, scaly, the culms obtusely triangular, smooth, 0.5–3 dm. high, stiff, striate, usually strongly exceeding the leaves, dark-brown at base and clothed with the dried-up leaves of the previous year, the lowest bladeless; leaves about equally developed on both sterile and fertile culms, usually 4–9 with well-developed blades to the culm, inserted near the base, the blades 4–10 cm. long, 1.5–2 mm. wide, flat or canaliculate, roughened towards the attenuate apex, shorter or longer than the culm, thickish, stiff, light-green, the sheath yellowish tinged, truncate at apex, the ligule very short; spike solitary, androgynous, erect, oblong or oblong-ovoid, 8–15 mm. long, 6–9 mm. wide, densely many-flowered, the upper part staminate, the staminate flowers con-

spicuous, the lower part pistillate; bracts none; staminate scales persistent, oblong or ovate, obtusish to acutish, reddish-brown with lighter midvein and very narrow hyaline margins, in age straw-colored; pistillate scales similar, but dark-brown and wider, much shorter than the perigynia, deciduous; perigynia 20-50, conspicuously jointed to the rachis, at first closely appressed, at maturity deflexed and early breaking away from the rachis, compressed-triangular in cross-section, little inflated, lanceolate or ovate-lanceolate, 3.5-4 mm. long, 1-1.5 mm. wide, nerveless, glabrous, shining, membranaceous, yellowish-brown or brownish, stipitate, the stipe 0.5 mm. long, rounded at base, tapering at apex into a smooth brown beak about 0.5 mm. long, with hyaline orifice, obliquely cut at maturity; achenes triangular, oblong-elliptic, 1.5-2 mm. long, 0.75 mm. wide, short-stipitate, strongly apiculate, yellowish-brown; style slender, jointed with achene, straight, deciduous; stigmas three, slender, elongate, brownish.

TYPE LOCALITY: "Habitat in Unalashka."

DISTRIBUTION: Sunny places in boreal or alpine localities in calcareous regions; Colorado to California, and northwestward to the Aleutian Islands and the Commander Islands off the Siberian Coast. (Specimens examined from Alberta, Montana, Wyoming, Colorado, Utah, Idaho, California, Oregon, Washington, Vancouver, British Columbia, Alaska.)

ILLUSTRATIONS: Mém. Acad. St.-Pétersb. Sav. Étr. 1: *pl.* 7; Boott, Ill. *Carex* 148. *pl.* 474; Erythea 8: 22. *f.* 2; Jepson, Man. Fl. Pl. Calif. *f.* 160; Abrams, Ill. Fl. Pacif. St. *f.* 681; Am. Jour. Sci. 29: *pl.* 1, *f.* 79.

10. *Carex micropoda* C. A. Meyer, Mém. Acad. St.-Pétersb.
Sav. Étr. 1: 210. *pl.* 6. 1831.

Carex nivalis Cham.; Steud. Syn. Cyp. 184. 1855. (Type from Unalaska.) Not *C. nivalis* Boott, 1846.

Very densely caespitose, the culms 5-20 cm. high, wiry, slender, smooth or nearly so, strict, obtusely triangular, sulcate, shorter than the leaves, the old sheaths conspicuous, yellowish-brown at base and clothed with the dried-up leaves of the previous year, the lowest bladeless; leaves best developed on the sterile culms, usually 4-8 with well-developed blades on a fertile culm, alternate on the lower half, not bunched at base, the blades 5-15 cm. long, 1.25-2 mm. wide, channeled at base, flat above, light-green, rough on the margins towards the attenuate apex, the sheaths tight, oblique at mouth, the ligule very short; spike solitary, androgynous, erect, ovoid or in fruit oblong-ovoid or oblong, closely many-flowered, 8-15 mm. long, 4-8 mm. wide, the uppermost part containing a few usually inconspicuous staminate flowers, the lower part pistillate with 10-20 perigynia; bracts none; staminate scales oblong-lanceolate, sharp-pointed, dark-reddish-brown with lighter center, the tip slightly hyaline; pistillate scales ovate, obtuse or the lower acute, smooth, dark-reddish-brown with lighter center and very narrowly hyaline margins, much shorter than the perigynia, but concealing their lower parts; perigynia jointed to the rachis, at first appressed-ascending, widely spreading only at full maturity when breaking away from the rachis; perigynia unequally biconvex, ovoid-lanceolate, 2.25-3 mm. long, 1 mm. wide, brownish-straw-colored, nerveless, shining, very smooth, membranaceous, sutured towards apex, not inflated, conspicuously slenderly stipitate, rounded at base, tapering at apex into a very smooth beak scarcely 0.5 mm. long, the orifice hyaline, obliquely cut; achenes lenticular, oblong-ovate, 1.5 mm. long, 0.75 mm. wide, short-stipitate, apiculate, punctate, brown; style slender, straight, exerted, jointed with achene; stigmas always two, slender, elongate, brown.

TYPE LOCALITY: "Habitat in Unalashka."

DISTRIBUTION: Coast of Alaska from Unalaska to the Pribilof Islands. (Specimens examined from Pribilof Islands.)

ILLUSTRATION: Mém. Acad. St.-Pétersb. Sav. Étr. 1: *pl.* 6.

6. Foetidae Tuckerm. Enum. Caric. 10. 1843; L. H. Bailey, Proc. Am. Acad. 22: 133, in part. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 114. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 120. 1917; Mackenzie, Erythea 8: 23. 1922. CAPITATAE O. F. Lang, Linnaea 24: 506, in part. 1851. GLOMERATAE Nyman, Consp. Fl. Eur. 782, in part. 1882. CEPHALOSTACHYAE and SPHAEROSTACHYAE Holm, Am. Jour. Sci. IV. 16: 456, in part. 1903. INCURVAE Kükenth. in Engler, Pflanzenreich 4²⁰: 112. 1909. Referred to the CHORDOR-

RHIZEAE Fries by Pax (in *E. & P. Nat. Pfl.* 2: 123. 1887); and to the VULPINAЕ Kunth by Ascherson & Graebner (*Syn. Mitteleur. Fl.* 2: 35. 1902). Treated as a genus *Rhaptocalymma* by Börner (*Abh. Nat. Ver. Bremen* 21: 272. 1913).

Rootstocks long- or short-creeping, usually dark-colored, tough, the culms arising singly or in small clumps at intervals, dark-tinged at base; leaf-blades narrow; spikes few to several, androgynous, very densely aggregated into a globose, ovoid, or oblong-ovoid bractless head, and becoming undistinguishable; perigynia spreading, plano-convex, membranaceous or submembranaceous, loosely or not closely enveloping the achene, obscurely to strongly nerved dorsally, nerveless to strongly nerved ventrally, rounded at base, stipitate, the beak sutured and obliquely cut dorsally, sometimes at length slightly bidentate; achenes small, lenticular, apiculate, jointed with the straight, slender style; stigmas two.

Dry-ground arctic-alpine species widely distributed in Eurasia. In North America represented by one arctic species and three alpine species in the western part, north of Mexico. The group is also well represented in the higher Andes of South America; it is absent from Australasia and Africa.

Leaf-blades 2-4 mm. wide; perigynia little exceeding the scales at maturity, not inflated.

Leaf-blades 1.5 mm. wide, or less.

Perigynia very membranaceous, little exceeding the scales at maturity, markedly inflated, at most substipitate; rootstocks very slender; culms slender, light-brown at base; head very globose.

Perigynia membranaceous or submembranaceous, usually much exceeding the scales at maturity, more or less inflated, slenderly short-stipitate; rootstocks stouter, lignescent; culms stoutish, brown at base; head capitate, usually ovoid.

Pistillate scales lance-ovate, narrowly hyaline-margined, acuminate or acute; perigynia oblong-oblancoleate, with many slender but conspicuous impressed nerves on both sides, scarcely inflated.

Pistillate scales ovate-orbicular, silvery-hyaline-margined, obtuse or acutish; perigynia ovate or ovate-elliptic, nerveless ventrally, obscurely striate dorsally, somewhat inflated.

11. *C. vernacula*.

12. *C. perglobosa*.

13. *C. incurviformis*.

14. *C. incurva*.

11. *Carex vernacula* L. H. Bailey, *Bull. Torrey Club* 20: 417. 1893.

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

"*Carex incurva* Lightf." L. H. Bailey; Coville, *Contr. U. S. Nat. Herb.* 4: 214. 1893.

Carex foetida var. *vernacula* Kükenth. in *Engler, Pflanzenreich* 4⁹: 115. 1909. (Based on *C. vernacula* L. H. Bailey.)

Loosely caespitose, in small clumps, from long-creeping, rather slender but tough, blackish, scaly rootstocks, the culms erect, 0.5-2 dm. high, slender but stiff, obtusely triangular, smooth, usually exceeding the leaves, brown at base and clothed with the dried-up leaves of the previous year; sterile shoots numerous; leaves with well-developed blades 5-9 to a culm, clustered towards the base, the blades erect-ascending, light-green, thickish, flat or slightly channeled, slightly roughened towards apex, 5-12 cm. long, those of the fertile culms 2-4 mm. wide, those of the sterile slightly narrower; sheaths tight, truncate at mouth, the ligule wider than long; spikes numerous, androgynous, entirely undistinguishable, very densely aggregated into an ovoid-orbicular head about 1 cm. thick and slightly longer, the staminate flowers apical, very inconspicuous (except the anthers), the perigynia several to a spike, appressed; bracts absent or the lowest cuspidate-prolonged; scales ovate-lanceolate, dark-brown or blackish, with sharply defined green midvein and narrow hyaline margin above, acute to acuminate-aristate, about the width of and from a little shorter to a little longer than the perigynia and largely concealing them; perigynia flattened-plano-convex, the upper part empty, ovate-lanceolate, 3.5-4.5 mm. long, 1.5 mm. wide, membranaceous, yellowish-straw-colored with chestnut beak, or brownish in age, not inflated, sharp-edged but not margined, not serrulate, finely several nerved dorsally, obscurely few-nerved ventrally, stipitate, round-tapering at base, contracted into a smooth beak one third the length of the body or less, obliquely cut dorsally, at length bidentulate, the orifice slightly hyaline; achenes lenticular, oblong, apiculate, tapering at base, yellowish-brown, 1.25 mm. long, 0.5 mm. wide; style slender, straight, not enlarged at base, jointed with achene; stigmas two, slender, light-reddish-brown; anthers 2 mm. long.

TYPE LOCALITY: "Mountains from Colorado and Wyoming westward."

DISTRIBUTION: Open sunny places, alpine slopes, from Washington south to Mt. Whitney, California, and east to Wyoming and Colorado. (Specimens examined from Washington, Wyoming, Colorado, Oregon, California.)

ILLUSTRATIONS: *Erythra* 8: 23. f. 4; Jepson, Man. Fl. Pl. Calif. f. 162; Abrams, Ill. Fl. Pacif. St. f. 684.

NOTE: The European *Carex foetida* All., to which this species has been referred, has longer, less rigid leaves; the globose-ovoid heads are less dense; the scales are lighter-colored, chestnut-brown, and more strongly exceed the perigynia; the anthers are longer (3 mm. long), the perigynia narrower, and the stigmas more elongate.

12. *Carex perglobosa* Mackenzie, Bull. Torrey Club 34: 606. 1908.

"*Carex incurva* Lightf." L. H. Bailey, in Coult. Man. 390. 1885.

Carex incurva var. *chartacea* Kükenth. in Engler, Pflanzenreich 4²⁰: 114. 1909. (Type from Middle Park, Colorado.)

Loosely cespitose, from creeping, slender (1.5 mm. thick), brown rootstocks, the culms erect, 6-15 cm. high, slender, striate, smooth on the angles, usually exceeding the leaves, light-brown, clothed at base with the dried-up leaves of the previous year; leaves clustered towards the base of the culms, the blades erect or somewhat spreading, 2-8 cm. long, 0.75-1.5 mm. wide, flattened at base, narrower but hardly involute above, light-green, not rigid, slightly roughened towards the apex, the sheath very thin ventrally, truncate at mouth, the ligule about as long as wide; spikes about 6-15, entirely undistinguishable, densely aggregated into a globose head about 1 cm. in diameter, the staminate flowers apical, very inconspicuous, the perigynia several to many, ascending or spreading; bracts absent; pistillate scales ovate-orbicular, very thin, brownish with silvery-hyaline apex and margin and lighter midvein, obtusish or acutish, rather wider than, exceeding or exceeded at maturity by the perigynia, the staminate scales narrower, sharper-pointed, lighter-colored; perigynia plano-convex, very membranaceous, straw-colored or yellowish-brown at maturity, ovate-elliptic, 4 mm. long, 2.25 mm. wide, very slightly sharp-margined, the margins smooth, inflated, finely many-nerved dorsally, obscurely finely several-nerved ventrally, substipitate, round-tapering at base, gradually tapering into a very sparingly serrulate or smooth beak one third of the length of the body or less, obliquely cleft dorsally, dark-colored, bidentulate, the orifice slightly hyaline; achenes lenticular, broadly oblong-obovate, 1.75 mm. long, about 1 mm. wide, substipitate, apiculate, very loosely enveloped by the perigynia; style straight, slender, not enlarged at base, jointed with the achene; stigmas two, slender, light-brown.

TYPE LOCALITY: Mt. Baldy, Summit County, Colorado (*Mackenzie 167*).

DISTRIBUTION: Sunny slopes on alpine peaks, in calcareous districts, high mountains of central Colorado, and La Sal Mountains, Grand County, Utah. (Specimens examined from Mt. Baldy, Mt. McClellan, Gray's Peak, Mt. Harvard, Lake Creek, Silver Plume, Clear Creek, Arapahoe Peak, Colorado, and La Sal Mountains, Utah.)

13. *Carex incurviformis* Mackenzie, in Rydb.

Fl. Rocky Mts. 120. 1917.

Rootstocks slender, brownish or blackish, long-creeping, scaly, the culms few together, low, 2-6 cm. high, erect or curved, slender, smooth, sharply triangular above, shorter than the leaves, brownish-tinged and fibrillose at base, the old leaves not conspicuous, the lower bladeless; leaves 4-8 to a culm, clustered near the base, thick, stiff, light-green, 1-4 cm. long, 0.75-1.5 mm. wide, flattened at base, involute above, the sheaths hyaline, truncate at mouth, the ligule very short; head globose-ovoid, 6-9 mm. long, 5-8 mm. thick, bractless, the spikes few, androgynous, densely aggregated and scarcely distinguishable, the staminate flowers inconspicuous, the perigynia few, ascending or in age spreading; scales lanceolate or ovate-lanceolate, acuminate or acute, shorter and somewhat narrower than the perigynia, brown, with narrow hyaline margins and sharply defined lighter midvein or center; perigynia thick-plano-convex, oblong-obovate, 3.25 mm. long, 1.25 mm. wide, very narrowly sharp-edged ventrally to base, the margins not serrulate, shining, membranaceous, scarcely inflated, with many slender but conspicuous impressed nerves on both sides, the upper part empty, dark-chestnut-brown at maturity, slenderly short-stipitate, round-tapering at base, contracted into a smooth beak scarcely one third the length of the body, obliquely cleft dorsally, at length bidentulate,

minutely hyaline at the orifice; achenes lenticular, quadrate-orbicular, yellowish-brown, 1.5 mm. long, 1 mm. wide, very short-stipitate, truncately apiculate, loosely enveloped; style short, slender, scarcely enlarged at base, jointed with the achene, deciduous; stigmas two, slender, elongate, light-brown.

TYPE LOCALITY: National Park, Banff, Alberta (*Macoun*, July 31, 1891).

DISTRIBUTION: Sunny places in calcareous districts, on alpine peaks of the Canadian Rocky Mountains, in Alberta and British Columbia. (Specimens examined from Alberta and British Columbia.)

14. *Carex incurva* Lightf. Fl. Scot. 544. pl. 24, f. 1. 1777.

Carex juncifolia All. Fl. Ped. 2: 264. pl. 92, f. 4. 1785. (Type from northern Italy.)

Carex banata Smith, in Rees, Cycl. 39: *Carex*. 1819. (Type from Scotland.)

Vignea incurva Reichenb. in Mössler, Handb. ed. 2. 1607. 1829. (Based on *Carex incurva* Lightf.)

Olotrema juncifolia Raf. Good Book 25. 1840. (Based on *Carex juncifolia* All.)

Carex amphilogos K. Koch, Linnaea 21: 615. 1848. (Type apparently European.)

Carex incurva var. *erecta* O. F. Lang, Linnaea 24: 507. 1851. (Type from Switzerland.)

Carex incurva var. *pratensis* Hartm. f. in Hartm. Skand. Fl. ed. 6. 302. 1854. (Type from Scandinavia.)

Carex psammogaea Steud. Syn. Cyp. 187. 1855. (Type from Straits of Magellan.)

"*Carex hyalinolepis* Steud." Lechler, Berb. Am. Centr. 56. 1857.

Carex incurva var. *selina* Christ; Scheutz, Sv. Vet.-Akad. Handl. II. 22¹⁰: 174. 1888. (Type from northwestern Siberia.)

"*Carex duriuscula* C. A. Meyer" Lange, Fl. Dan. 48: 10. pl. 2843. 1871. (Specimens from Greenland.)

Caricina incurva St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 873. 1889. (Based on *Carex incurva* Lightf.)

"*Carex arctica* Deinb." Meinh. Acta Hort. Petrop. 18: 315, in part. 1901.

Carex incurva var. *inflata* Simmons, Vasc. Pl. Ellesmereland 146. 1906. (Type from Cape Vele, Ellesmereland.)

Carex incurva f. *pallens* Kükenth. in Engler, Pflanzenreich 4²⁰: 113. 1909. (Type from Greenland.)

Carex incurva f. *erecta* "O. F. Lang" Kükenth. in Engler, Pflanzenreich 4²⁰: 113. 1909. (Based on *C. incurva* var. *erecta* O. F. Lang.)

Rootstocks long-creeping, forking, slender (2.5 mm. thick) but tough, brown, conspicuously scaly, the culms low, solitary at intervals, usually 2-10 cm. high, but at times as much as 17 cm., erect, or slightly curving at times, obtusely triangular, stoutish, smooth, sulcate, and from shorter than to exceeding the leaves, brown at base and clothed with the old leaves of the previous year; leaves clustered towards the base of the culms, the blades rigid, light-green, from erect to recurved-spreading, 2-10 cm. long, 1-2 mm. wide at base and flattened-narrower and involute above and slightly roughened towards the apex, the sheaths tight, truncate at mouth, the ligule wider than long; spikes about 4-12, androgynous, densely aggregated in a short-ovoid or subglobose head 5-15 mm. long, 5-10 mm. thick, none of the spikes distinguishable, the staminate flowers few, inconspicuous, the perigynia few or several, ascending or soon spreading; bracts absent; pistillate scales ovate-orbicular, thin, brownish-straw-colored or chestnut with silvery-hyaline margin and 1-3-nerved center, obtusish or acutish, about width of but exceeded at maturity (usually strongly) by the perigynia; staminate scales narrower and more acute; perigynia plano-convex, ovate or ovate-elliptic, 3.25-4 mm. long, 1.5-2 mm. wide, yellowish-brown or brownish-black at maturity, submembranaceous, the upper half empty, slightly inflated, flattish and nerveless ventrally, and rounded and very obscurely striate dorsally, very narrowly sharp-edged, smooth on margins, stipitate, round-tapering at base, contracted into a sparingly serrulate beak one third the length of the body or less, at length bidentulate, obliquely cut dorsally, sometimes curved, minutely hyaline at the orifice; achenes lenticular, suborbicular, 1.5 mm. long, very short-stipitate, truncately apiculate, brownish, loosely enveloped; style short, slender, scarcely enlarged at base, jointed with achene; stigmas two, slender, elongate, light-brown.

TYPE LOCALITY: "Mouth of the water of Naver, and near Skelberry, in Dunrossness in Shetland."

DISTRIBUTION: Along the sea-coast or on tundra and dry moraines in limestone districts, Greenland to northern Newfoundland, eastern Quebec, Hudson Bay region, and the Alaska coast; widely distributed in boreal and high alpine regions in Eurasia; also in southern South America. (Specimens examined from Greenland, Ellesmereland, northern Newfoundland, eastern Quebec, Mackenzie, Hudson Bay, arctic America, Alaska.)

ILLUSTRATIONS: BRITT. & BROWN, Ill. Fl. f. 818; ed. 2. f. 870; Lightf. Fl. Scot. pl. 24; Schkuhr, Riedgr. pl. 11h, f. 95; Engler, Pflanzenreich 4²⁰: 116. f. 22, A-C; Fl. Dan. pl. 432, 2843; Jour. Russe Bot. 1911: 42. f. 21; Sturm, Deuts. Fl. 47: pl. 1; Ostenf. Fl. Arct. f. 16; Reichenb. Ic. Fl. Germ. 8: pl. 199, f. 533; Anders. Cyp. Scand. pl. 3, f. 12; Hegi, Ill. Fl. Mittel-Eur. f. 213; Coste, Fl. Fr. f. 3809; Engl. Bot. pl. 927; ed. 3. pl. 1615; Benth. Handb. Brit. Fl. ed. 2. f. 1109; Hallier, Deuts. Fl. pl. 423; All. Fl. Ped. pl. 92, f. 4.

7. *Divisae* Christ, Bull. Soc. Bot. Belg. 24^o: 18. 1885; Kükenth. in Engler, Pflanzenreich 4^o: 119. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 121. 1917; Mackenzie, Erythea 8: 23. 1922. CURVULAE Tuckerm. Enum. Caric. 10, in part. 1843. CHORDORRHIZEAE Fries, Summa Veg. Scand. 73, in part, not as to type species. 1845. CAPITATAE O. F. Lang, Linnaea 24: 506, in part. 1851. SPICATAE O. F. Lang, Linnaea 24: 510, in part. 1851. BRIZOIDEAE Meinsh. Acta Hort Petrop. 18: 315, in part. 1901. XEROCHLAENAE and CEPHALOSTACHYAE and SPHAEROSTACHYAE Holm, Am. Jour. Sci. IV. 16: 455, 456, in part. 1903. Species are referred to the FOETIDAE Tuckerm. and MULTIFLORAE Kunth by L. H. Bailey (Proc. Am. Acad. 22: 133, 135. 1886). Treated as a subgenus of *Vignea*, PSEUDOVIGNEA, by Börner (Abh. Nat. Ver. Bremen 21: 274. 1913).

Rootstocks long-creeping, dark-colored, tough, the culms arising singly or in small clumps at intervals, stiff, dark-tinged at base, aphyllopodic; leaf-blades narrow; spikes few to many, ovoid or oblong, androgynous or dioecious, more or less closely aggregated into an oblong or oblong-ovoid head; heads in some species dioecious or nearly so; lower one to several bracts developed, short-prolonged, the others bract-like; perigynia appressed-ascending, plano-convex or unequally biconvex, ovate, smooth and often shining, coriaceous, more or less nerved dorsally and from nerveless to nerved ventrally, sharp-edged but not wing-margined, rounded and spongy at base, the achene filling upper part of body, closely enveloped, the perigynia beaked, the beak sutured and obliquely cut dorsally, at length slightly bidentate; achenes lenticular, apiculate, jointed with the straight, slender style; stigmas two.

Sun-loving species of either dry or swampy places, very widely distributed and abundant in the western part of North America, extending as far north as Yukon, and southward in the drier and more open parts of Mexico. A few species of the group are also widely distributed in Eurasia, reaching northern Africa, and several are widely distributed in the western part of South America. The group is not represented in Australasia.

Rootstocks slender, light-brownish; culms obtuse-angled or obtusely triangular, normally smooth; leaf-blades narrowly involute or canaliculate, at least above.

Perigynia long-beaked; heads dioecious or nearly so; styles elongate. 15. *C. Douglasii*.

Perigynia short-beaked; spikes androgynous; styles short. 16. *C. Eleocharis*.

Rootstocks stout (or slender in *C. simulata*); culms sharply triangular, normally rough above; leaf-blades flat or channeled.

Perigynia chestnut-colored, unequally biconvex, the beak one fifth to one third as long as the body; rootstocks slender and lower sheaths light-brownish. 17. *C. simulata*.

Perigynia blackish in age, plano-convex, the beak one third to one half as long as the body; rootstocks stout and lower sheaths dark-brown or black.

Scales very dark-chestnut-brown, shining; perigynia 3.5–4.5 mm. long, polished, scarcely hyaline at orifice. 18. *C. pansa*.

Scales lighter-colored, dull; perigynia 3–4 mm. long, dull, strongly hyaline at orifice. 19. *C. praegracilis*.

15. *Carex Douglasii* Boott, in Hook. Fl. Bor. Am.

2: 213. *pl.* 214, 1839.

Carex Nuttallii Dewey, Am. Jour. Sci. 43: 92. *pl. Cc. f.* 97. 1842. (Type from Rocky Mountains.)

Carex Meekii Dewey, Am. Jour. Sci. 11. 24: 48. 1857. (Type from Nebraska Territory.)

Carex Douglasii var. *densispicata* Dewey, Am. Jour. Sci. 11. 32: 41. 1861. (Type from Idaho.)

Carex Douglasii var. *minor* Olney, in S. Wats, Bot. King's Expl. 363. 1871. (Type from Nebraska.)

Carex Fendleriana Böck. Linnaea 39: 135. 1875. (Type from New Mexico.)

Carex Douglasii var. *laxiflora* L. H. Bailey, Mem. Torrey Club 1: 20. 1889. (Type from Utica,

Montana.)

Carex irrasa L. H. Bailey, Bot. Gaz. 25: 271. 1898. (Based on *C. Douglasii* var. *laxiflora* L. H. Bailey.)

Carex Douglasii f. *laxiflora* "L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4^o: 122. 1909. (Based on *C. Douglasii* var. *laxiflora* L. H. Bailey.)

Carex Douglasii f. *Meekii* Kükenth. in Engler, Pflanzenreich 4^o: 122. 1909. (Based on *C. Meekii* Dewey.)

Rootstocks long-creeping, slender (1–2 mm. thick), brown with fibrillose scales, the culms 6–30 cm. high, slender but stiff, rather obtusely triangular, smooth, usually exceeding leaves but sometimes shorter, arising 1 to few together, brown at base, and clothed at base with dried-up leaves of previous year; leaves with well-developed blades 3–8 to a culm, clustered at the

base, the blades erect to spreading, involute above and flattened or canaliculate towards the base, or involute throughout, 5-15 cm. long, 1-2.5 mm. wide, triangular and long-attenuate above, roughened towards apex, thick, light-green, the sheaths tight, truncate and thickened at mouth, the ligule very short; heads usually dioecious, the staminate and pistillate flowers normally on separate culms; staminate heads from oblong-orbicular to linear-oblong, 1.5-4 cm. long, 7-15 mm. thick, the many spikes closely aggregated, but usually readily distinguishable, linear-elliptic, about 8-15 mm. long and 2.5-4 mm. wide, the scales oblong-ovate, acute or short-acuminate, straw-colored or brownish with a broad hyaline margin; filaments slender, exserted, the anthers very conspicuous, elongate-linear, 3.5 mm. long, mucronulate; bracts inconspicuous, the lower short-cuspidate; pistillate heads from suborbicular to oblong, 1.5-5 cm. long, 1-2.5 cm. thick, the many spikes closely aggregated, but usually readily distinguishable, at maturity oblong-elliptic, 5-15 mm. long, 4-8 mm. wide, the scales lanceolate or ovate-lanceolate, straw-colored with hyaline margin or often yellowish-brown-tinged, the center 3-nerved, green, acuminate to cuspidate, wider than, exceeding, and covering the perigynia; lowest bract often conspicuous; perigynia closely appressed, plano-convex, ovate-lanceolate, 3.5-4 mm. long, 1.75 mm. wide, straw-colored, at length light-brownish, sharp-edged above, lightly many-striate ventrally, more or less strongly many-striate dorsally, stipitate, round-tapering at base, tapering into a serrulate beak about 1.75 mm. long, obliquely cut dorsally, in age bidentulate, the apex and orifice hyaline; achenes lenticular, obovate, closely enveloped, 1.75 mm. long, 1.25 mm. wide, tapering at base, truncately apiculate, yellowish-brown, shining; style very long, projecting at flowering time, slender, straight, not enlarged at base, jointed with achene; stigmas two, dark-reddish-brown, very long.

TYPE LOCALITY: "Hab. N. W. Coast, Douglas, Rocky Mountains. Drummond."

DISTRIBUTION: Dry, more or less alkaline soil, in open sunny places on the plains, foothills, and lower mountains, from Manitoba to New Mexico, westward to California and British Columbia. Very widely distributed. (Specimens examined from New Mexico, Colorado, Wyoming, Nebraska, South Dakota, North Dakota, Manitoba, Saskatchewan, Alberta, Montana, Idaho, Utah, Nevada, California, Oregon, Washington, British Columbia.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 820; ed. 2. f. 875; Hook. Fl. Bor. Am. pl. 214; Abrams, Ill. Fl. Pacif. St. f. 685; Am. Jour. Sci. 43: pl. Cc, f. 97.

16. *Carex Eleocharis* L. H. Bailey, Mem. Torrey Club 1: 6. 1889.

"*Carex stenophylla* Wahl." Boott, in Hook. Fl. Bor. Am. 2: 211. 1839.

Rootstocks very slender, 1-2 mm. thick, long-creeping, brown, scaly and fibrillose, the culms low, 2.5-20 cm. high, slender but stiff, growing in small clumps containing one to several culms, obtusely angled, smooth, brownish at base, from shorter than to exceeding the leaves; leaves with well-developed blades usually 1-4 to a culm, on the lower third, the blades from erect to recurved-spreading, light-green, stiff, short on the fertile culms and 3-15 cm. long on the sterile shoots, 1-1.5 mm. wide at base and canaliculate-flattened, much narrower and involute above, and slightly roughened towards the apex, the sheaths tight, very thin ventrally, truncate at mouth, the ligule dark-margined, wider than long; spikes several, densely aggregated in a solitary ovoid to linear terminal head 5-20 mm. long, 5-10 mm. thick, none of the spikes readily distinguishable; each spike ovoid or orbicular, bearing the conspicuous, cylindrically arranged staminate flowers above and the few (1-8) appressed-ascending perigynia below; staminate flowers conspicuous at flowering time, the upper spikes largely staminate; bracts ovate, cuspidate, and about the length of the lower spike or rudimentary; scales ovate-orbicular, chestnut or reddish-brown with a white-hyaline margin, conspicuous towards apex, varying from rounded at apex and abruptly short-cuspidate to obtusish, acutish, and tapering-short-cuspidate, rather wider than and about the length of the perigynia; perigynia plano-convex, ovate-orbicular, 2.5-3 mm. long, 1.5-1.75 mm. wide, straw-colored at first, black at maturity, coriaceous, flattish and nerveless or obscurely few-nerved at base ventrally, high-convex and few- to many-striate dorsally, the margins slightly elevated ventrally and serrulate at base of beak, substipitate, rounded at base, contracted into a serrulate beak one third to one fourth the length of the body, at length bidentulate, obliquely cleft dorsally, the orifice hyaline; achenes lenticular, orbicular-obovate, 1.75 mm. long, 1.5 mm. wide, sessile, apiculate; style short, slender, jointed with achene; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: Saskatchewan plains.

DISTRIBUTION: In dry sunny places on the plains, prairies, and foothills of the interior, from Manitoba to Yukon, and southward to Iowa, New Mexico, Utah, and eastern Oregon. (Specimens examined from northwestern Iowa, Kansas, Nebraska, South Dakota, North Dakota, Manitoba, Saskatchewan, Alberta, Yukon, Montana, Wyoming, Colorado, Utah, New Mexico, eastern Oregon.)

ILLUSTRATIONS: Bull. Lab. Nat. Hist. Univ. Iowa 4: pl. 6; Britt. & Brown, Ill. Fl. f. 819; ed. 2. f. 873; Rob. & Fern. Man. f. 416; Clements, Rocky Mt. Fl. pl. 45, f. 3; Abrams, Ill. Fl. Pacif. St. f. 686.

NOTE: This species has usually been treated as the same as the Eurasian *Carex stenophylla* Wahl. That species, however, has the perigynia many-ribbed ventrally, while in the American one they are nerveless ventrally or obscurely nerved at base. Other related Asiatic plants with long-beaked perigynia are also consistently distinct.

17. *Carex simulata* Mackenzie, Bull. Torrey Club 34: 604. 1908.

"*Carex marcida* Boott" Boott, Ill. Carex 16, in part. pl. 45. 1858.

"*Carex Gayana* Desv." Boott, Ill. Carex 126. pl. 411. 1862.

Rootstocks slender, 1.5–2 mm. thick, long-creeping, brown, scaly, fibrillose, the culms 3–5 dm. high, one or few together, sharply triangular and roughened on the angles above, slender, much exceeding the leaves, light-brownish at base, the old leaves of the previous year inconspicuous; leaves with well-developed blades 2–5 to a culm, all on its lower third, but not bunched, the blades erect-ascending, 8–30 cm. long, 2–4 mm. wide, flat or canaliculate, light-green, not thick, roughened on the margins and towards the apex, the sheaths tight, truncate at mouth, the ligule about as wide as long; spikes 5–15, densely aggregated into a linear-oblong, oblong, or oblong-ovoid head 12–25 mm. long, 6–10 mm. thick, the individual spikes not separated, but the lower distinguishable, the more strongly pistillate oblong-ovoid, 7 mm. long, 3.5 mm. wide, with about ten perigynia beneath and the inconspicuous staminate flowers above; other spikes almost entirely staminate with an occasional perigynium, and whole heads almost entirely staminate or little staminate, as the case may be; bracts absent or the lower one or two if present shorter than the head, more or less strongly cuspidate, and enlarged at base; scales ovate-triangular, brown with narrow hyaline margin and prominent lighter midvein, strongly cuspidate or short-awned, wider and noticeably longer than the perigynia and concealing them completely; perigynia unequally biconvex, broadly ovate, 1.75–2.25 mm. long, 1.5 mm. wide, ascending, yellowish-brown when young, chestnut-colored at maturity, shining, coriaceous, rounded-truncate, short-stipitate, little spongy at base, not thickened on margins or winged above, high-convex and slenderly few-nerved dorsally, flat or at length low-convex and nerveless or obscurely nerved at base ventrally, not margined, but sharp-edged, the upper part of the body and the beak serrulate, sometimes only sparingly so, abruptly narrowed into a very short beak 0.25–0.5 mm. long, obliquely cleft dorsally, at length scarcely bidentulate, the margins of the orifice overlapping and slightly hyaline; achenes lenticular, obovoid, 1 mm. long, tapering at base, bluntly apiculate, yellowish-brown; style short, slender, not enlarged at base, jointed with achene; stigmas two, slender, light-brown.

TYPE LOCALITY: Chug Creek, Albany County, Wyoming (A. Nelson 7316).

DISTRIBUTION: Wet swales and swamps, Montana to Washington, and southward to New Mexico and the Sierra Nevada of California. (Specimens examined from New Mexico, Colorado, Wyoming, Montana, Idaho, Washington, Oregon, California.)

ILLUSTRATIONS: Boott, Ill. Carex 16. pl. 45 (as *C. marcida*); 126. pl. 411; Abrams, Ill. Fl. Pacif. St. f. 687.

NOTE: The South American *C. Gayana* Desv. (C. Gay, Hist. Chile Bot. 6: 205. pl. 73, f. 3, 1853), with which this has been confused, has the heads that are entirely pistillate or nearly so on very low stiff culms 4–15 cm. high; the heads that are staminate or nearly so are on taller culms 1.5–3 dm. high; the leaf-blades are rigid and thickish, 2–15 cm. long, and except towards apex are smooth or sparingly serrulate; the perigynia are narrowly green-margined above. The original illustration here cited is good.

18. *Carex pansa* L. H. Bailey, Bot. Gaz. 13: 82. 1888.

Rootstocks long-creeping, stout, tough, brownish-black, scaly, fibrillose, the culms arising singly or few together, 1.5–3 dm. high, sharply triangular, stiff, roughened on the angles, especially above, much exceeding the leaves, dark-brown or blackish at base and clothed with leaves of previous year; leaves of the season's growth about 3 to a culm, clustered at its base, the blades from ascending to recurved-spreading, 1–2 dm. long, 1–3 mm. wide, stiff, light-green, flat or channeled at the base, somewhat nodulose, roughened on the margins and

towards the apex, the sheaths tight, truncate at apex, the ligule very short; spikes about 6-12, ovoid-lanceolate, 7-10 mm. long and about 5 mm. wide, aggregated (but distinguishable) in a terminal head 1.5-2.5 cm. long and about 1 cm. thick, the several to many appressed-erect perigynia beneath and the inconspicuous staminate flowers terminal; lowest bract scale-like or occasionally short-prolonged; scales broadly triangular-ovate, very dark-chestnut-brown or blackish with a white-hyaline margin and lighter midvein, shining, acuminate or cuspidate, wider and longer than and completely concealing the perigynia; perigynia plano-convex, oblong- or ovate-lanceolate, 3.5-4.5 mm. long, 1.5-2 mm. wide, coriaceous, shining, yellowish-brown or brownish-black at maturity, rounded and slenderly many-nerved dorsally, flat and nerveless or nearly so ventrally, with sharp-edged, thickened, slightly raised margin, serrulate above middle, stipitate, round-tapering at base, tapering at apex into a serrulate beak about 1 mm. long, obliquely cut dorsally, at length bidentulate, the margins of the orifice slightly overlapping and very slightly hyaline; achenes lenticular, quadrate-suborbiculate, 1.5 mm. long, 1.3 mm. wide, truncate apiculate, short-stipitate; style slender, straight, not enlarged at base, jointed with achene; stigmas two, slender, long, dark-reddish-brown.

A more handsome plant than *Carex praegracilis* W. Boott, to which it is closely related.

TYPE LOCALITY: "Clatsop, Oregon, and Ilwaco, Washington Territory" (L. F. Henderson).

DISTRIBUTION: Drifting sands along the seacoast from Monterey County, California, to southwestern Washington. (Specimens examined from California, Oregon, Washington.)

ILLUSTRATIONS: Erythea 8: 25. f. 5; Jepson, Fl. Calif. 1: 212. f. 29, d-f; Jepson, Man. Fl. Pl. Calif. f. 163; Abrams, Ill. Fl. Pacif. St. f. 688.

19. *Carex praegracilis* W. Boott, Bot. Gaz. 9: 87. 1884.

Carex marcida Boott, in Hook. Fl. Bor. Am. 2: 212. pl. 213. 1839. (Type from Columbia River.)

Not *C. marcida* J. F. Gmel. 1791.

Carex Douglasii var. *brunnea* Olney, in S. Wats. Bot. King's Expl. 363. 1871. (Type from California.) Not *C. brunnea* Thunb. 1784.

Carex Gayana var. *hyalina* L. H. Bailey, Proc. Am. Acad. 22: 135. 1886. (Type from Sonora, Mexico.) Not *C. hyalina* Boott, 1845.

Carex marcida var. *debilis* L. H. Bailey, Proc. Am. Acad. 22: 136. 1886. (Type from Harney Valley, Oregon.)

Carex usta L. H. Bailey, Mem. Torrey Club 1: 20. 1889. (Based on *C. Douglasii* var. *brunnea* Olney.)

Carex Sartwellii var. *occidentalis* L. H. Bailey; Macoun, Cat. Can. Pl. 5: 374. 1890. (Type from Guichon Creek, British Columbia.)

Carex marcida var. *alterna* L. H. Bailey; Macoun, Cat. Can. Pl. 5: 374. 1890. (Type from Shuswap Lake, British Columbia.)

"*Carex canescens* L." Speg. Revista Fac. Agron. La Plata 3: 579. 1897.

"*Carex Hookeriana* Dewey" Parish, Bull. So. Calif. Acad. 5: 26. 1906.

"*Carex siccata* Dewey" Parish, Bull. So. Calif. Acad. 5: 50. 1906.

Carex alterna C. B. Clarke, Kew Bull. Add. Ser. 8: 69. 1908. (Based on *C. marcida* var. *alterna* L. H. Bailey.)

Carex latebrosa Mackenzie, Bull. Torrey Club 34: 603. 1908. (Based on *C. Gayana* var. *hyalina* L. H. Bailey.)

Carex marcida f. *debilis* "L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4²⁰: 124. 1909. (Based on *C. marcida* var. *debilis* L. H. Bailey.)

Carex marcida f. *alterna* "L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4²⁰: 124. 1909. (Based on *C. marcida* var. *alterna* L. H. Bailey.)

Carex Sartwellii f. *occidentalis* "L. H. Bailey" Kükenth. in Engler, Pflanzenreich 4²⁰: 137. 1909. (Based on *C. Sartwellii* var. *occidentalis* L. H. Bailey.)

Carex Douglasii f. *brunnea* "Olney" Kükenth. in Engler, Pflanzenreich 4²⁰: 122. 1909. (Based on *C. Douglasii* var. *brunnea* Olney.)

Carex siccata var. *obscurior* Kükenth. in Engler, Pflanzenreich 4²⁰: 133. 1909. (Type from Lincoln County, Washington.)

Carex camporum Mackenzie, Bull. Torrey Club 37: 244. 1910. (Based on *C. marcida* Boott.)

Rootstocks long-creeping, stout, thick, black, fibrillose, the culms 2-7.5 dm. high, arising singly or in small clumps, sharply triangular and slender but stiff, usually roughened on the angles above and more or less strongly exceeding the leaves, dark-brown or black and clothed at base with the dried-up leaves of the previous year; leaves all near the base of the culm, those of the year's growth with well-developed blades 2-5 to a culm, the blades erect-ascending, flattened or somewhat channeled, 1-2.5 dm. long, 1.5-3 mm. wide, light-green, thickish, roughened on the margins and towards the apex, the sheaths truncate and sometimes slightly thickened at mouth, the ligule very short; spikes 5-15, densely aggregated into a linear-oblong, oblong, or oblong-ovoid head 1-5 cm. long, 6-10 mm. thick, the individual

spikes (especially the lowest) rather readily distinguishable, but little separated (or the lower several more or less markedly separate), obtusish, 4-8 mm. long, 4-6 mm. wide, containing about 10 perigynia, the terminal staminate flowers inconspicuous; bracts absent or the lower one or two present, 5-30 mm. long, normally much shorter than the heads, very narrow but somewhat enlarged at base, brownish-straw-colored (at least in age) the upper scale-like; scales ovate, light-chestnut-brown with conspicuous hyaline margins and lighter midrib, the lower cuspidate, the upper acuminate, wider and longer than the perigynia and usually completely concealing them, at maturity dull-brownish-straw-colored or frequently straw-colored; perigynia plano-convex, ovate or ovate-lanceolate, 3-4 mm. long, 1.5 mm. wide, erect-ascending, straw-colored or at maturity brownish-black, coriaceous, dull, rounded and lightly several-nerved dorsally, flat and nerveless ventrally, sharp-margined, the edges slightly elevated and serrulate above middle, short-stipitate, spongy and rounded at base, tapering into a serrulate beak half the length of the body or more, obliquely cut dorsally, at length bidentulate, the orifice with overlapping hyaline edges; achenes lenticular, obovoid, about 1.25 mm. long, tapering at base, bluntly apiculate; style slender, short, jointed with achene, not enlarged at base; stigmas two, reddish-brown, slender.

TYPE LOCALITY: San Diego, California (*Miss Scott*).

DISTRIBUTION: Moist open places, plains, prairies, foothills, and mountains, very widely distributed and variable, Manitoba, Iowa, and Kansas to Yukon, British Columbia, California, and central Mexico; also in South America. Adventized eastward, western Missouri, eastern Kansas. (Specimens examined from Manitoba, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, New Mexico, Colorado, Montana, Saskatchewan, Wyoming, Alberta, Idaho, Utah, Arizona, Yukon, British Columbia, Washington, Oregon, California, Nevada, Lower California, Chihuahua, Durango, Hidalgo, Michoacán, Federal District.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 826; ed. 2. f. 874; Bull. So. Calif. Acad. 5; pl. 22; Hook. Fl. Bor. Am. pl. 213 (not Boott, Ill. Carex pl. 45); Abrams, Ill. Fl. Pacif. St. f. 689; Am. Jour. Sci. 49; pl. EE, f. 108.

NOTE: This is, I believe, the most widely distributed species of *Carex* in the western part of the United States. Its European relative is *Carex divisa* Hudson, which is found in similar situations. It and *Carex pansa* are distinguished from the species with which they are most apt to be confused by their blackish stout rootstocks. Young plants of this species present an aspect markedly different from mature specimens. Also plants in which the pistillate flowers are well-developed often contrast strongly with those in which the staminate flowers are well-developed. In some localities too the plants are often desiccated. As a result of these factors a considerable number of different names have been applied to this species.

8. *Intermediae* Nyman, Consp. Fl. Eur. 782. 1882. CHORDORRHIZAE Fries, Summa Veg. Scand. 73, in part. 1845. SICCATAE Carey, in A. Gray, Man. 539, in part. 1848; Kükenth. in Engler, Pflanzenreich 4²⁰: 132, in part. 1909. HOLARRHENAE Döll, Fl. Bad. 245, in part. 1856. DISTICHAE Christ, Bull. Soc. Bot. Belg. 24⁵: 17, in part. 1885. XEROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 455, in part. 1903. Referred by Tuckerman (Enum. Caric. 9. 1843) to the ARENARIAE Kunth; by L. H. Bailey (Proc. Am. Acad. 22: 137. 1886) to the MULTIFLORAE Kunth; by Mackenzie (in Rydb. Fl. Rocky Mts. 121. 1917) to the DIVISAE Christ.

Rootstocks long-creeping, darkish-colored, tough, the culms arising singly or in small clumps at intervals, stiff, dark-tinged at base, aphyllodiodic; leaf-blades narrow, the sheaths green-striate ventrally nearly to mouth; spikes very many, ovoid or oblong, androgynous or dioecious, rather closely aggregated into an oblong or oblong-ovoid head; lower one to several bracts developed, short-prolonged, the others bract-like; perigynia appressed, plano-convex, broadly ovate, smooth, dull, membranaceous, many-nerved both dorsally and ventrally, sharp-edged, substipitate, spongy and rounded at base, abruptly beaked, the beak sutured and obliquely cleft dorsally, at length bidentate; achenes closely enveloped in upper part of perigynium-body, lenticular, apiculate; style enlarged at base, jointed with achene; stigmas two.

A small group of species growing in open swamps, two in the temperate parts of Eurasia, and one in North America.

20. *Carex Sartwellii* Dewey, Am. Jour. Sci. 43: 90.

pl. CC, f. 95. 1842.

"*Carex intermedia* Gooden." Dewey, Am. Jour. Sci. II, 4: 343. 1847.

"*Carex disticha* Huds." Boott, Ill. Carex 125. (pl. 410, in part). 1862.

Carex disticha var. *Sartwellii* Dewey, Am. Jour. Sci. II. 41: 330. 1866. (Based on *C. Sartwellii* Dewey.)

Carex Sartwellii var. *occidentalis* L. H. Bailey; Macoun, Cat. Can. Pl. 5: 374, in part. 1890. (As to Kamloops specimen only.)

"*Carex Sartwelliana* Dewey" B. D. Jackson, Ind. Kew. 1: 438. 1893. (Error for *C. Sartwellii* Dewey.)

Rootstocks long-creeping, slender but tough, black, fibrillose, the culms 4-8 dm. high, arising singly or in small clumps, stiff, sharply triangular above, bluntly so below, roughened on the angles, especially above, much exceeding the leaves, strongly aphyllopodic, brown at base; leaves with well-developed blades about 3 to a culm, all on its lower third or half, widely separated, the lower nodes exposed, the blades erect-ascending, 1.5-3 dm. long, flat, light-green, 2.5-4 mm. wide, long-tapering, roughened on the margins and towards the apex, the sheaths loosely enveloping the stem, green-striate ventrally to base of blade, short-prolonged, thin and hyaline and truncate at mouth, the margins adnate; sterile shoots conspicuous, the leaves bunched at apex; spikes numerous, densely aggregated into an elongate oblong head 3-6 cm. long and about 1 cm. thick, the upper spikes hardly distinguishable, the lower distinguishable but little separated, androgynous, broadly ovoid, 6-9 mm. long, 4-6 mm. wide, the larger containing 15-20 appressed perigynia, the staminate flowers apical, usually conspicuous; most of the middle and upper spikes entirely staminate or sometimes only the middle ones; bracts broadly ovate, hyaline, conspicuous in the young heads, the lower short-cuspidate; scales ovate-triangular, slightly shorter and slightly narrower than the perigynia, dull-reddish-brown with green midvein and white-hyaline margins, obtuse to short-cuspidate; perigynia thick-plano-convex, ovate-orbicular, 2.5-3 mm. long, 1.5-1.75 mm. wide, straw-colored or light-brownish, substipitate, rounded at base, membranaceous, sharp-edged to base, serrulate above middle, the body not spongy at base, finely many-nerved dorsally, and flat and finely several- to many-nerved ventrally, abruptly contracted into a serrulate beak about one fourth the length of the body, dorsally cleft, at length bidentulate, the orifice minutely hyaline; achenes lenticular, broadly oblong-obovoid, 1.5 mm. long, less than 1 mm. wide, substipitate, apiculate; style slender, short, straight, enlarged at base, jointed with achene; stigmas two, slender, elongate, light-reddish-brown.

TYPE LOCALITY: Junius, Seneca County, New York (*Dr. "S. P." [H. P.] Sartwell*).

DISTRIBUTION: Marshes and bogs in calcareous regions, Ontario and western New York to British Columbia, and southward to Illinois, Missouri, Nebraska, and Colorado. (Specimens examined from New York, Ontario, Ohio, Michigan, Indiana, Wisconsin, Illinois, Missouri, Iowa, Minnesota, Manitoba, Saskatchewan, North Dakota, South Dakota, Nebraska, Colorado, Wyoming, Montana, Alberta, British Columbia.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 833; ed. 2. f. 876; Rob. & Fern. Man. f. 415; Boott, Ill. Carex 125. pl. 410 (except perigynia marked "2") (as *Carex disticha*); Am. Jour. Sci. 43: pl. CC, f. 95.

NOTE: *Carex intermedia* Gooden., the European ally of this species, is a very slender plant with narrow glaucous-green leaf-blades; the lower nodes are not exposed, the sheaths are scarcely prolonged beyond base of blade, the spikes are very unequal in size and ovoid or oblong, the scales are reddish, the perigynia are 4-5 mm. long, coriaceous, strongly nerved, spongy at base, and with a beak one third to one half the length of the body. The two species are well-marked.

9. *Arenariae* Kunth, Enum. Pl. 2: 376. 1837; L. H. Bailey, Proc. Am. Acad. 22: 137. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 128. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 122. 1917. *OVALES* Kunth, Enum. Pl. 2: 394, in very small part. 1837; L. H. Bailey, Proc. Am. Acad. 22: 147, in very small part. 1886. *LEPORINAE* Fries, Summa Veg. Scand. 72, in part. 1845. *CHORDORRHIZAE* Fries, Summa Veg. Scand. 73, in part. 1845. *SICCATAE* Carey, in A. Gray Man. 539, in greater part. 1848. *HERPORRHIZAE* O. F. Lang, Linnaea 24: 522, in greater part. 1851. *HOLARRHENAE* Döll, Fl. Bad. 245, in part. 1856. *INTERMEDIÆ* Nyman, Consp. Fl. Eur. 782, in part. 1882. *DISTICHAE* Christ, Bull. Soc. Bot. Belg. 24²: 17, in part. 1885. *HYPARRHENAE* Pax, in E. & P. Nat. Pil. 2²: 124, in part. 1887. *BRIZOIDÆ* Meinsh. Acta Hort. Petrop. 18: 315, in part. 1901. *XEROCHLAENAE* and *ATHIROSTACIYÆ* Holm, Am. Jour. Sci. IV. 16: 455, in part. 1903. *AUSTRALES* Kükenth. in Engler, Pflanzenreich 4²⁰: 139. 1909. Species are referred to the genus *Vignea* Beauv. by Rafinesque (Good Book 27. 1840). Treated as a subgenus of *Vignea*, *VIGNEA*, by Börner (Abh. Nat. Ver. Bremen 21: 274. 1913).

Rootstocks ongl-creeping, dark-colored, tough, the culms arising singly or in small clumps

at intervals, mostly stiff, dark-tinged at base, aphyllodipodic; leaf-blades narrow, the sheaths hyaline ventrally; spikes numerous, more or less closely aggregated, some or all gynaeandrous or staminate, some usually pistillate or androgynous; heads in some species with a tendency to be dioecious; lower one to several bracts short-prolonged, the others bract-like; perigynia appressed-ascending, plano-convex, narrowly margined or winged (at least above), serrulate, closely enveloping the achenes, conspicuously beaked, the beak sharply bidentate, sutured dorsally; achenes lenticular, bluntly apiculate, jointed with the slender style; stigmas two.

A small group of dry-ground species, widely distributed in the temperate parts of Eurasia. In North America represented by one widely distributed species and one very sparingly adventized. Some half dozen species occur in New Zealand and southern Australia.

Spikes numerous; head heavy; perigynia abruptly green-winged from below the middle to the apex; perigynia shorter than the scales; terminal spike staminate. 21. *C. arenaria*.
Spikes fewer; head slender; perigynia narrowly margined to base and serrulate from below the middle; perigynia exceeding the scales; terminal spike gynaeandrous. 22. *C. siccata*.

21. *Carex arenaria* L. Sp. Pl. 973. 1753.

- Carex spadicea* Gilib. Exerc. Phyt. 546. 1792. (Type from Grodna, Lithuania.)
Carex Witheringii S. F. Gray, Nat. Arr. Brit. Pl. 2: 48. 1821. (Type from England.)
Vignea arenaria Reichenb. in Mössler, Handb. ed. 2. 1618. 1829. (Based on *Carex arenaria* L.)
Carex arenaria var. *remota* Marsson, Fl. Neu-Vorpomm. 523. 1869. (Type European.)
Carex arenaria var. *pseudoarenaria* Marsson, Fl. Neu-Vorpomm. 523. 1869. (Type European.)
Carex arenaria f. *pallida* Lackowitz, Fl. Berlin ed. 12. 21. 1900. (Type from Berlin, Germany.)
Carex arenaria f. *pumila* Lackowitz, Kneucker, Allg. Bot. Zeits. 7: 171. 1901. (Type from Mecklenburg, Germany.)
Carex arenaria var. *typica* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 30. 1902. (Type European.)
Carex arenaria var. *lenuis* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 30. 1902. (Type European.)
Carex arenaria var. *spiralis* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 30. 1902. (Type European.)
Carex arenaria f. *remota* "Marsson" Kükenth. in Engler, Pflanzenreich 4²⁰: 138. 1909. (Based on *C. arenaria* var. *remota* Marsson.)

Rootstocks long-creeping, slender (2.5-3.5 mm. thick) but tough, clothed with brown fibrillose scales, the culms 1-5 dm. high, slender but stiff, sharply triangular, smooth or slightly roughened on the angles above, exceeding the leaves, arising one to few together, brown at base, the dried-up leaves of the previous year very inconspicuous; well-developed leaves 3-6 to a culm, or rather more on the sterile culms, clustered towards the base, the blades flat or somewhat channeled, 5-20 cm. long, 1.5-3 mm. wide, light-green, thick, erect or recurving, smoothish towards the base, scabrous towards the apex, long-attenuate, the sheaths very tight, yellowish-hyaline ventrally, thickened and yellowish-brown at mouth, truncate or concave and scarcely prolonged beyond base of blade, the ligule as long as wide, with colored margin; heads oblong or linear-oblong, 2-6 cm. long, 7-20 mm. thick, containing numerous closely aggregated spikes or the lower somewhat separated; spikes pistillate, staminate, or androgynous, 6-12 mm. long, 3-6 mm. wide, the upper usually oblong-elliptic and staminate, the middle ones androgynous, and the lower ovoid and pistillate; lower spike or spikes provided with a cuspidate-prolonged scale-like bract from much shorter to longer than the head; scales ovate-triangular, thin, light-reddish-brown or in age straw-colored, the margins hyaline, the center 3-nerved, green, acuminate-aristate, about as wide as and slightly longer than and concealing the perigynia; filaments conspicuously exerted, the anthers linear, 3 mm. long, mucronulate; perigynia appressed or at length spreading-ascending, flattened-plano-convex, 4-5.5 mm. long, 2.5 mm. wide, coriaceous, straw-colored or light-ferruginous-tinged, the body ovate-lanceolate, flat and many-striate ventrally and rounded and many-striate dorsally, rounded, minutely stipitate, more or less spongy at base, abruptly strongly wing-margined above from below the middle, the wings green, serrulate, wingless towards base, rather abruptly contracted into a serrulate beak one third the length of the body, hyaline at mouth, very strongly bidentate, the teeth subulate, very sharp; achenes lenticular, broadly oblong-quadrate, 1.75 mm. long, 1.25 mm. wide, slightly ridged, substipitate, bluntly minutely apiculate; style short and little exerted at flowering time, slender, straight, scarcely enlarged at base, jointed with achene; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: "Habitat in Europae arena praesertim mobili."

DISTRIBUTION: Sea beaches near Norfolk and Buckroe, Virginia; in ballast, Linnton, Oregon;

adventive from Europe, where widely distributed. Scarcely well enough established to be treated as a member of the North American flora. (Specimens examined from Virginia and Oregon.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 821; ed. 2, f. 877; Rob. & Fern. Man. f. 414; Engler, Pflanzenreich 4²⁰: 130, f. 23, A, B; Schkuhr, Riedgr. pl. B; pl. Dd, f. 6; Fl. Dan. pl. 1766; Sturm, Deuts. Fl. 69: pl. 3; Reichenb. Ic. Fl. Germ. 8: pl. 209, f. 551; Leers, Fl. Herb. pl. 14, f. 2; Anderss. Cyp. Scand. pl. 3, f. 16; Host, Gram. Austr. 1: pl. 49; Engl. Bot. pl. 928; ed. 3. pl. 1618; Benth. Handb. Brit. Fl. ed. 2, f. 1107; Coste, Fl. Fr. f. 3815; Hallier, Deuts. Fl. pl. 424; Karst. Deuts. Fl. f. 168; Lindm. Bild. Nord. Fl. pl. 432; Sv. Bot. pl. 156; Thomé, Fl. Deuts. pl. 91, f. B.

22. *Carex siccata* Dewey, Am. Jour. Sci. 10: 278.

pl. F, f. 18: 1826.

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

"*Carex Liddoni* Boott" Carey, in A. Gray, Man. 545. 1848.

Carex siccata var. *hispida* Olney (Caric. Bor.-Am. 9, name only. 1872); L. H. Bailey, Proc. Am. Acad. 22: 147, as synonym. 1886.

Rootstocks long-creeping, slender (2.5 mm. thick) but tough, clothed with brown fibrillose scales, the culms arising one to three together, phyllopodic, 2-9 dm. high, slender, sharply triangular above, exceeding the leaves, roughened on the angles above, brown and clothed at base with the dried-up leaves of the previous year; leaves with well-developed blades 4-7 to a fertile culm, rather bunched on lower fourth, the sheaths much overlapping, the erect-ascending blades flat or somewhat channeled, 1-3 dm. long, 2-3 mm. wide, light-green, firm; sterile culms very leafy, the blades elongate; sheaths tight, thin and hyaline ventrally, truncate and scarcely prolonged beyond base of blade at mouth, the ligule wider than long; spikes 6-12, in a linear-oblong head 2-3.5 cm. long, 5-10 mm. thick, the lower 1-3 slightly separate, the upper closely aggregated, the lowest spikes usually pistillate with a few perigynia, the middle linear-oblong, 6-10 mm. long, 3-5 mm. wide, and staminate, and the terminal spike larger and with more perigynia and staminate at base; bracts scale-like with broad hyaline margins, the lower short-cuspidate; scales ovate-lanceolate, obtusish to acute, light-reddish- or yellowish-brown with green 3-nerved center and often conspicuous silvery-white-hyaline margin and apex, as wide as but shorter than perigynia; perigynia appressed-ascending, plano-convex, oblong-lanceolate, 4.5-6 mm. long, 1.75-2 mm. wide, coriaceous, smooth, pale-green or soon ferruginous-tinged, narrowly green-margined to base, serrulate from below middle, strongly many-nerved on both sides, substipitate, round-tapering to a spongy base, somewhat abruptly contracted into a serrulate beak nearly or fully the length of the body, obliquely cleft dorsally, bidentate, the teeth sharp, reddish-brown-tinged, the orifice minutely hyaline; achenes lenticular, quadrate-orbicular, brownish, substipitate, short-apiculate, closely enveloped, 2 mm. long; style slender, straight, jointed with achene, slightly enlarged at base; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: "Grows on the sandy plains in Westfield, Mass., where it was found by Mr. E. Davis, principal of the academy."

DISTRIBUTION: Dry sterile open soil, Maine to New Jersey, westward to Washington (Kittitas County) and Mackenzie, and southward to Indiana and Nebraska and in the mountains to Arizona; erroneously recorded from California. (Specimens examined from Maine, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Ontario, Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Manitoba, Saskatchewan, Alberta, Mackenzie, South Dakota, Nebraska, Colorado, New Mexico, Arizona, Utah, Washington.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 860; ed. 2, f. 878; Rob. & Fern. Man. f. 345; Proc. Am. Acad. 37: pl. 1, f. 9-11; Boott, Ill. Carex 19. pl. 52, pl. 146 (perigynia only); Abrams, Ill. Fl. Pacif. St. f. 690; Clements, Rocky Mt. Fl. pl. 45, f. 5; Am. Jour. Sci. 10: pl. F, f. 18; 30: pl. BB, f. 93; Ostenf. Fl. Arct. f. 19.

NOTE: This species is frequently confused with *Carex praegracilis* W. Boott. That species has stout blackish rootstocks, while this has slender brown rootstocks.

10. *Potosinae* Mackenzie. XEROCHLAENAE Holm, Am. Jour. Sci. IV. 16: 455, in small part. 1903. By L. H. Bailey (Proc. Am. Acad. 22: 138. 1886) referred to the ARBNARIAE Kunth; by Kükenthal (in Engler, Pflanzenreich 4²⁰: 148. 1909) referred to the BRACTEOSAE Kunth.

Rootstocks short- or long-creeping, dark-colored, tough, the culms in small clumps, wiry, dark-tinged at base, phyllopodic; leaf-blades narrow; spikes few, androgynous, with few perigynia; lower one to three spikes with conspicuous bracts, usually exceeding head; perigynia at length spreading, plano-convex, thick, spongy at base, thick-walled, closely enveloping

achene in upper part of body, narrowly margined or sharp-edged, tuberculate, conspicuously rough-beaked, the beak sutured dorsally, bidentate; achenes lenticular, strongly apiculate, jointed with the style; style-base slightly thickened; stigmas two, very slender.

Dry-ground species in open sunny places, one Mexican, the remainder South American.

23. *Carex potosina* Hemsl. Biol. Centr. Am. Bot. 3: 474. 1885.

Carex Schaffneri W. Boott; S. Wats. Proc. Am. Acad. 18: 172. 1883. (Type from San Luis Potosí.)
Not *C. Schaffneri* Bock. 1878.

Carex fuscolutea Bock. Bot. Jahrb. 7: 278. 1886. (Type from San Luis Potosí, Mexico, *Schaffner* 221.)

Cespitose in small clumps, from deep-seated, long-running, slender but tough, brown, scaly rootstocks, the culms 1.5–3 dm. high, slender but stiff, roughened on the angles above, from shorter than to noticeably exceeding the leaves, brownish at base and clothed with the dried-up inconspicuous leaves of the previous year; leaves with well-developed blades usually 4–10 to a culm, more or less clustered on the lower fourth, the blades ascending or spreading, 1–2 dm. long, 2–3 mm. wide, flat, canaliculate, light-green, thickish, roughened on the margins and towards the apex, the sheaths tight, thin and hyaline ventrally, slightly thickened at mouth and short-prolonged beyond base of blade, the ligule much wider than long; heads 1–3 cm. long, about 7 mm. thick, composed of usually few (2–5) spikes, the lowermost often more or less strongly separate; spikes oblong-ovoid, about 7 mm. long and 5 mm. wide, androgynous, the perigynia few, erect-ascending or in age somewhat spreading, the staminate flowers inconspicuous; lower two or three bracts conspicuous and much elongate, 3–12 cm. long, about 1 mm. wide, green, slightly enlarged at base, much exceeding the heads; upper bracts much shorter and scale-like; scales ovate, acuminate, cuspidate or short-awned, yellowish-brown with 3-nerved green center and very narrow hyaline margins, narrower and rather shorter than the mature perigynia; perigynia plano-convex, ovate, 5 mm. long, 2.5 mm. wide, very thick, coriaceous, spongy, very short-stipitate, truncate at base, sulcate-nerved dorsally, nerveless or obscurely nerved at base ventrally, sharp-edged ventrally to base, serrulate to middle, dark-chocolate-brown with green upper margins, strongly granular-tuberculate, rather abruptly narrowed into a serrulate beak about 2 mm. long, obliquely cut dorsally, sharply bidentate, the tip light-reddish-brown, the orifice slightly hyaline; achenes lenticular, short-oblong, substipitate, narrowed at base, strongly apiculate, thick, closely enveloped by perigynia, 2.5 mm. long, 2 mm. wide; style jointed with achene, slightly enlarged at base, deciduous; stigmas two, very slender, 4–9 mm. long, reddish-brown.

TYPE LOCALITY (of *Carex Schaffneri* W. Boott, on which *C. potosina* is based): San Luis Potosí, Mexico (*Schaffner* 546).

DISTRIBUTION: Dry plains, San Luis Potosí and Zacatecas. (Specimens examined from San Luis Potosí and Zacatecas.)

11. **Chordorrhizeae** Fries, Summa Veg. Scand. 73, as to type species. 1845; Carey, in A. Gray, Man. 543, in part. 1848; Mackenzie, in Rydb. Fl. Rocky Mts. 121. 1917. CEPHALOSTACHYAE Holm, Am. Jour. Sci. IV. 16: 456, in part. 1903. Referred to the FOETIDAE Tuckerm. by L. H. Bailey (Proc. Am. Acad. 22: 133. 1886); to the DIVISAE Christ by Kükenthal (in Engler, Pflanzenreich 4²⁰: 119. 1909).

Culms aphyllopodic, elongate, prostrate, branching, sending up at apex and from some lower nodes fertile culms and from other lower nodes sterile culms, which in succeeding seasons become prostrate and branching; rootstocks and roots little developed; leaf-blades narrow; spikes few to rather many (3–10), ovoid-oblong, androgynous, rather few-flowered, closely aggregated into an ovoid or ovoid-oblong head; bracts absent or inconspicuous; perigynia appressed-ascending, very thick-plano-convex, oblong-ovate, smooth, shining, coriaceous, closely many-nerved, rounded on margins, rounded and spongy at base, the achene closely enveloped in upper part of body, the beak short, hyaline-tipped, sutured dorsally and obliquely cut, not becoming bidentate; achenes lenticular, bluntly apiculate, jointed with the slender style; stigmas two.

Two species of sphagnum bogs, found in northern Eurasia, extending southward in the mountains; one of these also occurring in northern North America in the Canadian and Hudsonian zones.

24. *Carex chordorrhiza* L. f. Suppl. 414. 1781.

- Carex funiformis* Clairv. Man. 287. 1811. (Type from "les marais près de Neufchâtel.")
Vigna chordorrhiza Reichenb. in Mössler, Handb. ed. 2. 1608. 1829. (Based on *Carex chordorrhiza* L. f.)
Carex fulvicoma Dewey, Am. Jour. Sci. 29: 249. 1836. (Type from arctic seacoast, North America.)
Carex chordorrhiza var. *sphagnicola* Laest.; Th. Fries, Bot. Notiser 1857: 208. 1857. (Type from Lapland.)
 "Carex uliginosa L." Wulfen, Fl. Norica Phan. 734. 1858. (Plant from Central Europe.)
Carex chordorrhiza var. *genuina* Trautv. Acta Hort. Petrop. 5: 123. 1877. (Based on *C. chordorrhiza* L. f.)
Carex chordorrhiza var. *aestivalis* Asch. & Graebn. Syn. Mitteleur. Fl. 2^e: 23. 1902. (Type European; not definitely given.)

Culms branching, flattened-triangular, the very long prostrate old culms of the previous year retaining the old brown leaves of the previous year and bearing erect branches from the nodes; fertile culms terminal or from the upper nodes, 1-3 dm. high, smooth, slender but firm, obtusely triangular, bearing 1 or 2 short-bladed leaves above the base, if lateral leafless at base, if terminal with several to many dried-up leaves of the previous year at base; sterile culms from the lower nodes, leafy, erect, geniculate, the second year prostrate and branching; leaves several to each sterile culm, the blades more or less scabrous, erect, slender, long-attenuate, 5-25 cm. long, about 1 mm. wide above, slightly wider at base, or in age up to 2.5 mm. wide, light-green, canaliculate, the sheaths tight, concave at mouth, in age becoming loose, the ligule very short; fertile-culm blades very short, 1-5 cm. long; spikes few to several, distinguishable but densely aggregated into a short-oblong head 5-12 mm. long, 3-7 mm. wide, bearing the few (usually 1-3) erect-ascending or at maturity spreading-ascending perigynia beneath and the usually conspicuous staminate flowers above; bracts absent; scales ovate-orbicular, chestnut-brown with a hyaline apex and margin and lighter center, acute or short-acuminate, wider below and rather shorter than and partly enveloping and largely concealing the perigynia until broken in age; perigynia thick-plano-convex, oblong-obovate, coriaceous, glabrous, shining, yellowish-brown or brownish at maturity (at least upper half), the body 2.5-3.5 mm. long, 2 mm. wide, strongly many-nerved on both sides, rounded, short-stipitate, spongy at base, sharp-edged but not margined to base, the margins slightly thickened, not serrulate, rounded and very abruptly short-beaked at apex, the beak 0.5 mm. long, very slender, sparingly serrulate, obliquely cut dorsally and finally emarginate, hyaline-tipped; achenes lenticular, thick, suborbicular or short-oblong, 1.75-2 mm. long, 1.25 mm. wide, sessile, bluntly apiculate, closely enveloped, brownish, densely punctate; style straight, very short, jointed with achene, exserted; stigmas two, slender, short.

TYPE LOCALITY: "Habitat in Suecia. Ehrhart."

DISTRIBUTION: A species with an unusual and very well-marked habit of growth, found in very wet sphagnum bogs and lake-borders in calcareous districts, Labrador and Newfoundland to Keewatin, south to Maine, New York, Indiana, Iowa, and Saskatchewan; also widely distributed in northern Eurasia. Recorded from Pennsylvania. (Specimens examined from Labrador, Newfoundland, Quebec (including Anticosti), Maine, Vermont, New York, Ontario, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Keewatin, Saskatchewan.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 817; ed. 2, f. 872; Rob. & Fern. Man. f. 417; Engler, Pflanzenreich 4²⁰: 116. f. 22, M; Schkuhr, Riedgr. pl. G; pl. II, f. 31; Jour. Russe Bot. 1911: 48. f. 27; Fl. Dan. pl. 1408; Sturm, Deuts. Fl. 55: pl. 1; Ostenf. Fl. Arct. f. 18; Reichenb. Ic. Fl. Germ. 8: pl. 200, f. 535; Anders. Cyp. Scand. pl. 3, f. 14; Coste, Fl. Fr. f. 3811; Hegi, Ill. Fl. Mittel-Eur. pl. 46, f. 6; Karst. Deuts. Fl. f. 162 (3, 4); Hallier, Deuts. Fl. pl. 423; Am. Jour. Sci. 29: pl. Y, f. 78; Jour. Bot. 36: pl. 383.

NOTE: A specimen of this species exists in the Linnaean herbarium under the name *Carex uliginosa* L., but the Linnaean name properly applies to a species of *Scirpus*.

12. **Bracteosae** Kunth, Enum. Pl. 2: 378. 1837; Kükenth. in Engler, Pflanzenreich 4²⁰: 148. 1909. **VULPINOIDEAE** Kunth, Enum. Pl. 2: 381, in part. 1837. **VULPINAEE** Kunth, Enum. Pl. 2: 383, in part. 1837. **MULTIFLORAE** Kunth, Enum. Pl. 2: 387, in part. 1837. **MURICATAE** Fries, Summa Veg. Scand. 73, in part. 1845. **MUHLBERGIANAE** Tuckerm. Enum. Caric. 9. 1843; Carey, in A. Gray, Man. 542. 1848; L. H. Bailey, Proc. Am. Acad. 22: 138. 1886; Kükenth. in Engler, Pflanzenreich 4²⁰: 152. 1909; Mackenzie, in Rydb. Fl. Rocky Mts. 122. 1917; Mackenzie, Erythraea 8: 26. 1922. **ACANTHOPHORAE** Holm, Am. Jour. Sci. IV. 16: 454, in part. 1903. Species are referred to the **STELLULATAE** Kunth by Meinhansen (Acta Hort. Petrop. 18: 323. 1901). Species are referred to the genera *Vigna*

Beauv. and *Diemisa* Raf. by Rafinesque (Good Book 27. 1840). Treated as a genus *Desmiograsis* by Börner (Abh. Nat. Ver. Bremen 21: 274. 1913).

Densely caespitose, or in some species the rootstocks short-elongate, tough and dark-colored; spikes three to fifteen, usually ten or less, androgynous (or pistillate) but never gynaeandrous, rarely at all compound; bracts from little to strongly developed; perigynia plano-convex or unequally biconvex, green or brownish, from appressed to reflexed, little to strongly spongy at base, usually ribbed or nerved dorsally, sometimes nerveless, nerveless to strongly nerved ventrally, narrowly sharp-margined, conspicuously beaked, the beak sutured dorsally, usually sharply bidentate, rarely only obliquely cleft; achenes lenticular, nearly filling upper part of perigynium-bodies; style jointed with the achene, its base more or less thickened; stigmas two.

A group of dry-ground species, of which twenty-six are native in the temperate and warmer parts of North America; three European species are also adventized or sparingly introduced. The group is represented in Europe by four or five species which extend into western Asia and northern Africa. One endemic species occurs in the Canary Islands, and a few in the more open parts of South America. It is not represented in eastern Asia or in Australasia.

Sheaths tight, inconspicuously if at all green-and-white-mottled or septate-nodulose dorsally.

Perigynium-body with lower third to half corky-thickened; perigynia usually widely radiating or reflexed at maturity.

Beak of perigynium smooth; scales acuminate, deciduous; spikes except lower 1-3 aggregated.

Body of perigynium broadly ovate, unequally biconvex, deep-green, many-striate at base ventrally, abruptly short-beaked; leaf-blades 1-3 mm. wide.

25. *C. retroflexa*.

Body of perigynium lanceolate or ovate-lanceolate, plano-convex, light-green, nerveless, tapering to a conspicuous beak; leaf-blades 0.75-1.5 mm. wide.

26. *C. texensis*.

Beak of perigynium serrulate; scales obtuse or acutish, persistent; spikes except the upper ones separate.

Stigmas slender, usually not twisted, elongate, light-brownish-red; perigynia light-green, tapering or but little contracted into the beak, inconspicuously white-hyaline at the orifice.

27. *C. rosea*.

Stigmas stouter, twisted, short, deep-brownish-red; perigynia deep-green, abruptly contracted into the beak, conspicuously white-hyaline at the orifice.

Leaf-blades 1.5-3 mm., averaging 2.5 mm. wide; spikes with 6-20, usually 9-12, perigynia; perigynia 3.25-4.5 mm. long, widely spreading.

28. *C. convoluta*.

Leaf-blades 1-1.75 mm., averaging little more than 1 mm. wide; spikes with 2-6 perigynia; perigynia 2.25-3 mm. long, more ascending; lowest bract very strongly developed.

29. *C. radiata*.

Perigynium-body inconspicuously corky-thickened at base.

Beak of perigynium obliquely cleft dorsally, little or not at all bidentate; spikes with few (1-6, rarely 10) erect or ascending perigynia.

Perigynium-body not serrulate; scales with conspicuous 1-3-nerved green center, acuminate to awned, little brown-tinged; culms densely caespitose, the rootstocks very short.

30. *C. Rusbyi*.

Perigynium-body serrulate above; scales 1-3-nerved, acute to short-cuspidate, strongly brown-tinged; rootstocks conspicuously short-creeping.

31. *C. vallicola*.

Beak of perigynium bidentate, usually strongly so.

Inflorescence ovoid, oblong-ovoid, or suborbicular, the spikes densely capitate.

Perigynia soon brownish (green-margined); scales strongly chestnut-brown-tinged.

32. *C. Hoodii*.

Perigynia green or straw-colored; scales green (except in 35. *C. onusta*).

Scale (excluding awn) much exceeded by perigynium-body.

Perigynia with raised margins ventrally, narrowly to broadly ovate, round-tapering at base, broadest below middle; scales acuminate to aristate; sheaths slightly thickened at mouth; culms densely caespitose.

33. *C. cephalophora*.

Perigynia flat ventrally, broadly ovate, broadest at the truncate-cordate base; scales acute to cuspidate.

Head 8-20 mm. long; scales greenish-hyaline with green midvein; culms densely caespitose; sheaths not thickened at mouth, not cross-rugulose ventrally.

34. *C. Leavenworthii*.

- Head 1.5-3 cm. long; scales yellowish-brown-tinged; rootstocks short-creeping; sheaths strongly thickened at mouth, cross-rugulose ventrally.
- Scale (excluding awn) from little shorter than to exceeding perigynium-body; sheaths thickened at mouth; rootstocks short-creeping.
- Lower 1-4 bracts leaf-like, much exceeding head.
- Lower bracts not leaf-like, usually inconspicuous and usually shorter than head.
- Culms normally spreading; perigynia lightly nerved dorsally; stigmas short.
- Culms stiff, erect; perigynia ribbed dorsally; stigmas long. Depauperate forms of
- Inflorescence oblong or linear-oblong to elongate and interrupted, not capitate.
- Perigynia almost entirely covered by the scales, inconspicuous in head; scales strongly brownish or reddish-brown; perigynia soon brownish; head presenting a brownish appearance.
- Head oblong or linear-oblong, the bracts not strongly developed; perigynia loosely ascending or spreading-ascending at maturity.
- Head linear, the bracts very strongly developed; perigynia appressed.
- Perigynia 2.75-3.5 mm. long, very membranaceous, serrulate to base of beak only, nerveless ventrally, the teeth subulate, whitish within; achenes 1.25 mm. long; scales strongly awned.
- Perigynia 3.5-5 mm. long, submembranaceous, the body serrulate to middle, often nerved ventrally, the teeth triangular-subulate, reddish-brown; achenes 2.25 mm. long; scales acute to short-awned.
- Perigynia conspicuous in the head, the upper parts not covered by the scales.
- Lower 2-4 bracts much prolonged and leaf-like, much exceeding head; culms densely cespitose, obtusely triangular, smooth.
- Lower bracts not leaf-like, not at all or little exceeding the head; rootstocks short-prolonged, the culms sharply triangular, rough above.
- Spikes all aggregated.
- Scales reddish-brown or yellowish-brown or purplish-red-tinged; perigynia few-nerved dorsally.
- Scales very thin, yellowish-brown-tinged, two thirds length of perigynium-bodies; perigynia strongly bidentate; sheaths strongly thickened at mouth.
- Scales firmer, reddish-brown or purplish-red-tinged, about length of perigynium-bodies; perigynia less strongly bidentate; sheaths slightly or not at all thickened at mouth.
- Perigynia 3-3.5 mm. long; sheaths slightly thickened at mouth; scales reddish-brown-tinged; ligule wider than long.
- Perigynia 4-4.5 mm. long; sheaths very thin at mouth; scales purplish-red-tinged; ligule much longer than wide.
- Scales greenish; perigynia strongly ribbed dorsally.
- Perigynia strongly ribbed and very low-convex ventrally, the margins slightly raised; achenes suborbicular.
- Perigynia nerveless or short-nerved at base and flat ventrally, the margins not raised.
- Perigynia spreading, 3-3.5 mm. long; bracts not broadly dilated at base; scales about length of and narrower than bodies of perigynia, cuspidate or aristate.
- Perigynia ascending, 3.5-4 mm. long; bracts broadly dilated at base; scales (especially lower) exceeding and as wide as perigynia, strongly awned.
- Spikes not at all aggregated, the lower ones more or less strongly separate; sheaths thickened and concave or truncate at mouth. (Species very sparingly adventized.)
- Perigynia widely spreading, suborbicular; ligule wider than long; achenes orbicular.
- Perigynia appressed or ascending, ovate; ligule longer than wide; achenes ovoid-quadrate.

35. *C. onusta*.36. *C. involucrella*.37. *C. mesochorea*.45. *C. plana*.38. *C. occidentalis*.39. *C. Hookerana*.40. *C. tumulicola*.41. *C. arkansana*.35. *C. onusta*.42. *C. xalapensis*.43. *C. spicata*.44. *C. Muhlenbergii*.45. *C. plana*.46. *C. austrina*.47. *C. Pairaei*.48. *C. sirens*.

Sheaths conspicuously green-and-white-mottled and septate-nodulose dorsally, loose, membranaceous and usually easily breaking ventrally.

Perigynia not deep-green, the beak one third to one fourth length of the ovate or suborbicular body.

Perigynia with ovate body tapering into beak, at most faintly nerved dorsally; beak very sharply bidentate, the teeth about 1 mm. long; pistillate scales usually strongly awned; leaf-blades 3.5-5 mm. wide; ligule wider than long.

49. *C. gravida*.

Perigynia with orbicular body abruptly beaked, strongly several-ribbed dorsally; beak less sharply bidentate, the teeth about 0.5 mm. long; pistillate scales acuminate to short-awned; leaf-blades 4-8 mm. wide; ligule longer than wide.

50. *C. Lunelliana*.

Perigynia deep-green, the beak one third length of ovate body or more. Perigynia membranaceous, flat ventrally; leaf-blades 3-7 mm. wide; spikes approximate or lower separate.

Scales half length of perigynium-bodies, acute to obtusish; sheaths truncate at mouth, not thickened and not reddish-brown-tinged, the lower transversely rugulose; ligule longer than wide; stigmas rather short.

51. *C. cephaloidea*.

Scales about length of perigynium-bodies, acuminate to cuspidate; sheaths concave at mouth, thickened and reddish-brown-tinged, usually not at all transversely rugulose; ligule wider than long; stigmas long.

52. *C. aggregata*.

Perigynia submembranaceous, with raised border ventrally; leaf-blades 5-10 mm. wide; lower sheaths usually transversely rugulose; lower spikes usually separate; ligule wider than long; stigmas short.

53. *C. sparganioides*.

25. *Carex retroflexa* Muhl.; Willd. Sp. Pl. 4: 235. 1805.

Carex rosea var. *retroflexa* Torr. Ann. Lyc. N. Y. 3: 389. 1836. (Based on *C. retroflexa* Muhl.)

Diemisa retroflexa Raf. Good Book 27. 1840. (Based on *Carex retroflexa* Muhl.)

Carex bicostata Olney, Caric. Bor.-Am. 9. 1872. (Based on *C. retroflexa* Muhl., as treated by Carey.)

Densely caespitose, the rootstocks very short-prolonged, slender, dark-colored, fibrillose, the culms 1.5-4.5 dm. high, slender, but erect and rather stiff, sharply triangular, smooth, or rough immediately beneath the head, usually somewhat exceeding the leaves, light-brownish at base; leaves with well-developed blades 3-6 to a fertile culm, on the lower fourth, the blades flat, green, erect or ascending, 5-25 cm. long, 1-3 mm. wide, roughened on the margins and towards the apex, the sheaths very tight, not septate-nodulose, concave at mouth, not cross-rugulose nor readily breaking, the ligule very short; spikes 4-9, in an elongate terminal head 1-4 cm. long, 5 mm. thick, the lower 1-3 separated, the upper close together; staminate flowers apical, usually inconspicuous, except sometimes in the terminal spike; perigynia usually less than 10 to a spike, ascending, spreading, or at maturity much reflexed; lower bract bristle-form, 0.5-5 cm. long, the upper much smaller; scales ovate, hyaline, with a green midrib, acuminate to cuspidate, usually a little narrower and shorter than the perigynia, falling before the perigynia; perigynia unequally biconvex, broadly ovate, 3 mm. long, 1.75 mm. wide, membranaceous, deep-green or brownish-green at full maturity, rounded at base, very narrowly smooth-margined to base, finely and faintly several-striate dorsally, finely many-striate at base ventrally, fully one half of the lower part of the body spongy and empty, the achene being borne in the upper part, contracted into a smooth bidentate beak one third to one fourth length of body, the teeth short, sharp, hyaline; achenes lenticular, ovoid, 1.3 mm. long, rounded at base and tapering to the apex; style short, slender, strongly enlarged at base, jointed with achene; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY: "Habitat in Pennsylvania."

DISTRIBUTION: Dry woods and thickets, Vermont and Massachusetts to Ontario and Michigan, and southward to Florida and Texas. (Specimens examined from Massachusetts, Vermont, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, Ohio, Indiana, Kentucky, Illinois, Missouri, Arkansas, Oklahoma, Louisiana, Texas, Mississippi, Florida.)

ILLUSTRATIONS: Schkuhr, Riedgr. *pl. Kkk, f. 140*; Britt. & Brown, Ill. Fl. *f. 836*; ed. 2. *f. 879*; Rob. & Fern. Man. *f. 396*; Boott, Ill. *Carex 81. pl. 226*.

26. *Carex texensis* (Torr.) L. H. Bailey, Mem. Torrey Club 5: 97.

10 Mr 1894; Contr. U. S. Nat. Herb. 2: 483. 10 My 1894.

Carex rosea var. *texensis* Torr. (Ann. Lyc. N. Y. 3: 389, name only. 1836); L. H. Bailey, Mem. Torrey Club 1: 57. 1889. (Type from Texas.)

Carex retroflexa var. *texensis* Fernald, Rhodora 8: 166. 1906. (Based on *C. rosea* var. *texensis* Torr.)

Densely cespitose, the rootstocks very short-prolonged, slender, dark-colored, fibrillose, the culms 1.5-3 dm. high, very slender but erect and rather stiff, smooth, sharply triangular, exceeding the leaves, light-brownish at base; leaves with well developed blades 3-6 to a fertile culm, on the lower fourth, the blades flat, light-green, erect or ascending, mostly 4-8 dm. long, 0.75-1.5 mm. wide, roughened on the margins and towards the apex, the sheaths very tight, not septate-nodulose, truncate or concave at mouth, not cross-rugulose nor readily breaking, the ligule very short; spikes 3-8, in an elongate terminal head 1-3 cm. long and about 5 mm. thick, the lower 1-3 separate and subglobose, the upper close together; staminate flowers apical, conspicuous except in the lower spikes; perigynia usually 3-10 to a spike, erect or ascending, or soon widely spreading or reflexed; lowest bract bristle-form, short, the others much reduced; scales ovate, hyaline with a green midrib, acuminate to cuspidate, usually a little narrower than and about the length of the bodies of the perigynia, falling before the perigynia; perigynia plano-convex lanceolate or ovate-lanceolate, 3 mm. long, 1 mm. wide, light-green, membranaceous, very narrowly margined to base, the margins not serrulate, slightly raised, nerveless, rounded and strongly spongy at base, tapering into a bidentate smooth beak about one third length of body, the teeth short, sharp, hyaline; achenes lenticular, ovoid, 1.3 mm. long, rounded at base and tapering to apex; style short, slender, strongly enlarged at base, jointed with achene; stigmas two, slender, light-reddish-brown.

TYPE LOCALITY (of *C. rosea* var. *texensis* Torr., on which *C. texensis* is based): "Texas, *T. Drummond*."

DISTRIBUTION: Dry woodlands, Georgia to Texas, and northward to North Carolina and in the Mississippi Valley to southern Illinois and Kentucky. Adventized in Ohio. (Specimens examined from North Carolina, South Carolina, Georgia, Tennessee, Kentucky, Ohio, Arkansas, Mississippi, Louisiana, Texas.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 837; ed. 2. f. 880.

27. *Carex rosea* Schkuhr; Willd. Sp. Pl. 4: 237. 1805.

"*Carex echinata* var. *rosea* Wahl." Pursh, Fl. Am. Sept. 36, as synonym. 1814.

Diemisa rosea Raf. Good Book 27. 1840. (Based on *Carex rosea* Schkuhr.)

Carex flaccidula Steud. Syn. Cyp. 199. 1855. (Type from Miami, Ohio.)

Carex rosea var. *minor* Boott, Ill. Carex 81. pl. 224. 1860. (Type from eastern United States.)

Carex rosea var. *staminata* Peck; Howe, Ann. Rep. N. Y. State Mus. 48: 132. 1897. (Type not given but from Cooperstown Junction, New York, in herb. E. C. Howe.)

Carex rosea var. *minor* f. *debilis* Farwell, Papers Mich. Acad. 2: 19. 1923. (Type from Trenton, Michigan.)

Densely cespitose, the rootstocks very short, dark, fibrillose, the culms 2-5 dm. high, slender, 1-1.75 mm. wide at base, aphyllopodic, smooth or slightly serrulate above, sharply triangular, usually exceeding but at times equaled by the leaves, light-brownish-tinged and fibrillose at base; leaves with well-developed blades 3-6 (usually 4 or 5) to a culm, on lower fourth, but not bunched, the blades erect-ascending, 3 dm. long or less, 1-2 mm. wide, light-green, flat, strongly minutely serrulate on the margins and on the veins towards the apex, the sheaths tight, not septate-nodulose, concave and slightly thickened at mouth, the ligule about as long as wide; spikes 4-8, androgynous, in an elongate terminal head 3-5 cm. long, 5-8 mm. thick, the lower 3-5 separate, the upper 3 or 4 aggregated; staminate flowers apical, inconspicuous, with the 4-12 ascending or at maturity widely radiating perigynia below; bracts bristle-form, that of the lowest spike conspicuous, 10 cm. long or less, those of the upper spikes much smaller and often rudimentary; scales triangular-ovate, greenish-hyaline, thin, rounded, the midrib not strong, green, the scales obtusish, about width of and half length of bodies of perigynia; perigynia soon widely spreading, plano-convex with slightly raised margins ventrally, 3-3.5 mm. long, 1.5 mm. wide, submembranaceous, light-green, nerveless on both sides or obscurely striate, serrulate on margins above, spongy and rounded at base, tapering or somewhat contracted into a bidentate beak one fourth length of body, inconspicuously hyaline between teeth, the teeth short, triangular, only the dorsal suture conspicuous; achenes lenticular, broadly obovoid, filling perigynia, 1.75 mm. long, 1.25 mm. wide, substipitate and minutely apiculate; style short, slender, enlarged at base, jointed with achene, deciduous; stigmas two, elongate, slender, usually not twisted, light-reddish-brown.

TYPE LOCALITY: "Habitat in America boreali."

DISTRIBUTION: Dry woodlands, Nova Scotia and Quebec, westward to North Dakota, and southward to Georgia and Louisiana. (Specimens examined from Nova Scotia, Quebec, Ontario,

Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Ohio, Kentucky, Tennessee, Mississippi, Louisiana, Michigan, Indiana, Wisconsin, Illinois, Minnesota, South Dakota, North Dakota, Iowa, Missouri, Arkansas.

ILLUSTRATIONS: Schkuhr, Riedgr. *pl. Zzz*, f. 139; Boott, Ill. *Carex* 81. *pl.* 224.

NOTE: See "*Carex rosea* Schk. and its allies." Mackenzie, Bull. Torrey Club 43: 423-434. 1916.

28. *Carex convoluta* Mackenzie, Bull. Torrey Club 43: 428. 1916.

"*Carex rosea* Schkuhr" Boott, Ill. *Carex* 81. *pl.* 223. 1860.

Carex rosea var. *pusilla* Peck; Howe, Ann. Rep. N. Y. State Mus. 48: 132. 1897. (Type not given, but from Portage, New York, in herb. E. C. Howe.)

Densely caespitose, the rootstock very short, the culms 3-6 dm. high, strict, 2.5 mm. wide at base, aphyllodopic, roughened above, sharply triangular, equaling leaves, light-brownish-tinged and fibrillose at base; leaves with well-developed blades 4-6 to a fertile culm, on lower fourth, but not bunched, the blades flat, 1.5-3 mm. wide, thin, deep-green, the sheaths tight, somewhat septate-nodulose, concave and somewhat thickened at mouth, the ligule very short, much wider than long; spikes 4-7, androgynous, the upper closely contiguous, the lower strongly separate, with 6-20 perigynia, the staminate flowers few and inconspicuous; lowest bract setaceous, prolonged, and often overtopping the culm, the others less developed; scales broadly ovate, obtuse, thin, rounded, white-hyaline with green midvein, about width of and half length of bodies of perigynia; perigynia soon widely spreading, plano-convex with slightly raised margins ventrally, 3.25-4.5 mm. long, 1.75 mm. wide, deep-green, submembranaceous, nerveless on both sides, or obscurely striate, serrulate on margins above, spongy and rounded at base, abruptly contracted into a bidentate beak one third length of body, conspicuously white-hyaline between teeth, the teeth short, triangular, both sutures conspicuous; achenes lenticular, orbicular-obovoid, filling perigynia, 2 mm. long, 1.6 mm. wide, broadly substipitate, very minutely apiculate; style slender, short, enlarged at base, jointed with achene, deciduous; stigmas two, short, thickish, twisted, dark-brownish-red.

TYPE LOCALITY: Budd's Lake, Morris County, New Jersey (*Mackenzie 2088*).

DISTRIBUTION: Dry woods, Nova Scotia and Quebec to Manitoba and South Dakota, and southward to Alabama, Tennessee, and Arkansas. (Specimens examined from Quebec, Nova Scotia, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, West Virginia, Virginia, North Carolina, South Carolina, Alabama, Ontario, Ohio, Michigan, Indiana, Kentucky, Tennessee, Wisconsin, Illinois, Minnesota, Manitoba, Iowa, northeastern Nebraska, South Dakota, Missouri, Kansas, Arkansas.)

ILLUSTRATIONS: Boott, Ill. *Carex* 81. *pl.* 223; Rob. & Fern. Man. f. 395; Britt. & Brown, Ill. Fl. f. 835; ed. 2. f. 881; Wood, Bot. & Fl. 368. f. 13-15 (all as *C. rosea* Schkuhr).

NOTE: See "*Carex rosea* Schk. and its allies." Mackenzie, Bull. Torrey Club 43: 423-434. 1916.

29. *Carex radiata* (Wahl.) Dewey; Chapm. Fl. S. U. S. 534. 1860.

Carex stellulata β *C. radiata* Wahl. Sv. Vet.-Akad. Nya Handl. 24: 147. 1803.

Carex radiata Wahl.; Muhl. Descr. Gram. 224, as synonym. 1817; Small, Fl. SE. U. S. 218. 1903.

Carex rosea var. *radiata* Dewey, Am. Jour. Sci. 10: 276. 1826. (Based on *C. stellulata* β *C. radiata* Wahl.)

"*Carex trisperma* Dewey" A. Gray, N. Am. Gram. & Cyp. 151. 1835. (Specimen from Utica, New York.)

Carex neglecta Tuckerm. Enum. Caric. 19. 1843. (Type from Montpelier, Vermont.) Not *C. neglecta* Degland, 1807.

"*Carex disperma* Dewey" Kunze, Suppl. Riedgr. 131. *pl.* 33. 1844.

Carex echinata var. *radiata* B. S. P. Prel. Cat. N. Y. 63. 1888. (Based on *C. stellulata* β *C. radiata* Wahl.)

Densely caespitose, the rootstock very short, the culms 2.5-5 dm. high, very slender, 1.5 mm. thick at base, weak, aphyllodopic, sharply triangular and roughened above, equaling leaves, from light-brownish to blackish-tinged and fibrillose at base; leaves with well-developed blades 4-6 to a fertile culm, on lower fourth, but not bunched, the blades flat, thin, 1-1.75 mm. wide, light-green, the sheaths tight, not septate-nodulose, very thin ventrally, concave and scarcely thickened at mouth, the ligule very short, much wider than long; spikes mostly 4, androgynous, the two upper closely contiguous, the lower strongly separate, with 2-6 perigynia, the staminate flowers few and inconspicuous; lowest bract setaceous, erect, prolonged, and often overtopping the culm, the others less developed; scales ovate, obtuse, thin, rounded, white-hyaline with green midvein, about width of but shorter than bodies of perigynia; perigynia at first erect, at maturity more or less strongly spreading, plano-convex with slightly

raised margins ventrally, 2.25–3 mm. long, 1.5 mm. wide, deep-green, submembranaceous, nerveless on both sides or obscurely striate, serrulate on margins above, spongy and rounded at base, abruptly contracted into a bidentate beak half length of body, conspicuously white-hyaline between teeth, the teeth short, triangular, both sutures conspicuous; achenes lenticular, orbicular-obovoid, filling perigynia, 1.5 mm. long, nearly as wide, substipitate and minutely apiculate; style short, slender, enlarged at base, jointed with achene, deciduous; stigmas two, short, twisted, dark-brownish-red.

TYPE LOCALITY (of *C. stellulata* β *C. radiata* Wahl., on which *C. radiata* is based): "Hab. in America boreali, *Rev. Hultgren*; secundum herbarium Thunbergianum."

DISTRIBUTION: Dry woods, especially in the Appalachian system, Quebec and Maine to Michigan, and southward to North Carolina and Tennessee. (Specimens examined from Quebec, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Ontario, New Jersey, Pennsylvania, Ohio, Michigan, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, western North Carolina, eastern Tennessee.)

ILLUSTRATIONS: *Am. Jour. Sci.* 10: *pl. H, f. 24*; Boott, *Ill. Carex* 81. *pl. 225*; Kunze, *Suppl. Riedgr. pl. 33*.

NOTE: See "*Carex rosea* Schk. and its allies." Mackenzie, *Bull. Torrey Club* 43: 423–434. 1916.

30. *Carex Rusbyi* Mackenzie, *Smithson. Misc. Coll.* 657: 2. 1915.

Densely caespitose, the culms strictly erect, 2.5–3.5 dm. high, sharply triangular, much exceeding the leaves, roughened above, dark-brown at base, the rootstocks very short-prolonged and dark-fibrillose; leaves with well-developed blades usually 3 or 4 to a culm, clustered near the base, the blades erect-ascending, light-green, flat, with somewhat revolute margins, 1–2 dm. long, 1.5–3 mm. wide, roughened on margins, the sheaths tight, not readily breaking, not septate-nodulose, the opaque part neither transversely rugulose nor red-dotted, but thin and truncate or concave at mouth, the ligule wider than long, not dark-margined; spikes about 5, all aggregated into a rather stiff head 1.5–2.5 cm. long and about 7.5 mm. thick, the upper spikes scarcely distinguishable, the lower readily distinguishable but little separated, each spike bearing the rather inconspicuous staminate flowers above and the 1–5 ascending perigynia below; bracts (except lowest) inconspicuous and resembling the scales, the lowest bract exceeding its spike, 1 cm. long, enlarged at base and terminating in a long cusp; scales ovate, white-hyaline, with conspicuous 1–3-nerved green center, faintly tinged with light-chestnut-brown, acuminate to awned, about the width of and rather shorter than the perigynia, these not completely concealed, but half enveloped at base; perigynia strongly plano-convex, narrowly ovate, 4 mm. long, about 1.75 mm. wide, with slightly raised borders, ventrally extending nearly to base and not serrulate, somewhat spongy at base, nerveless ventrally, obscurely many-striate dorsally, deep-green, submembranaceous, substipitate, round-tapering to the base, tapering to a minutely serrulate or nearly smooth beak about one third the length of the body, minutely hyaline-tipped, obliquely cut or in age very shallowly bidentate; achenes lenticular, with short-oblong face, 2.75 mm. long, 1.5 mm. wide; style slender, straight, not enlarged at base; stigmas two.

TYPE LOCALITY: Yavapai County, Arizona (*Rusby 859*).

DISTRIBUTION: Dry soil, mountains of Arizona and New Mexico. (Specimens examined from Arizona, New Mexico.)

31. *Carex vallicola* Dewey, *Am. Jour. Sci.* II. 32: 40. 1861.

Carex vagans Holm, *Am. Jour. Sci.* IV. 17: 301. 1904. (Type from Stein mountains, Oregon.)

Carex phaeolepis Holm, *Am. Jour. Sci.* IV. 17: 302. 1904. (Type from eastern Oregon.)

Carex brevisquama Mackenzie, *Bull. Torrey Club* 34: 152. 1907. (Type from Sweetwater County, Wyoming.)

Cespitose, from short-prolonged, tough but not thick, dark, fibrillose rootstocks, the culms erect, slender, sharply triangular, roughened on the angles immediately beneath the head, 2.5–6 dm. high, much exceeding the leaves, dark-brown-tinged at base; leaves with well developed blades about 3 to a culm, on lower fifth, the narrow blades erect or somewhat recurved, thin, light-green, 8–30 cm. long, 1 mm. wide, roughened on the margins and especially towards the long-attenuate apex, the sheaths tight, not septate-nodulose nor cross-rugulose, thin ventrally but not readily breaking, truncate or concave and scarcely thickened at mouth, the ligule very short, broader than long; spikes closely aggregated in a dense terminal head

1.5-3 cm. long, 5-7 mm. thick, the individual spikes poorly defined and having from 2 or 3 to about 10 ascending or somewhat spreading perigynia at the base of the rather inconspicuous terminal staminate flowers, these forming a short cylinder; bracts absent or occasionally the lowest one present, 8 mm. long or less, awl-shaped, long-attenuate; scales broadly triangular, hyaline with the central portion brownish or straw-colored and 1-3-nerved, greenish, acute to short-cuspidate, noticeably exceeded by the perigynia; perigynia plano-convex, flat on the inner surface and margined except at base, oblong-elliptic, 3.5 mm. long, 2 mm. wide, deep-green, submembranaceous, serrulate above middle, round-tapering at base, obscurely nerved dorsally, nerveless ventrally, more or less polished at maturity, rounded and abruptly narrowed into a short, minutely serrulate beak about 1 mm. long, obliquely cut and bidentulate, the teeth very short, reddish-tinged within; achenes lenticular, orbicular, short-apiculate, substipitate, 2 mm. long, 2 mm. wide; style short, slender, jointed with achene, scarcely enlarged at base; stigmas two, light-reddish-brown, slender, elongate.

TYPE LOCALITY: "Jackson's Hole on Snake River, June 18, 1860, 6000 ft. altitude, *Dr. F. V. Hayden*." [Southeastern Idaho.]

DISTRIBUTION: Dry slopes, Black Hills of South Dakota to eastern Oregon and Nevada. (Specimens examined from South Dakota, Wyoming, Idaho, Oregon, Nevada.)

ILLUSTRATION: Abrams, *Ill. Fl. Pacif. St. f.* 693.

NOTE: Erroneously recorded from California by W. Boott, in *S. Wats. Bot. Calif.* 2: 235.

32. *Carex Hoodii* Boott, in Hook. Fl. Bor. Am.

2: 211. *pl.* 211. 1839.

Carex muricata var. *confixa* L. H. Bailey, *Bot. Gaz.* 10: 203. 1885. (Type from Wyoming.)

Carex Hoodii var. *nervosa* L. H. Bailey, *Mem. Torrey Club* 1: 14. 1889. (Type from California.)

Carex Hoodii var. *neurocarpa* Piper, *Contr. U. S. Nat. Herb.* 11: 167. 1906. (Based on *C. Hoodii* var. *nervosa* L. H. Bailey.)

Very densely caespitose, the rootstocks very short, black, fibrillose, stout and tough, the culms slender but strict, 2.5-8 dm. high, exceeding the leaves, sharply triangular, roughened above, dark-brown-tinged at base; leaves with well-developed blades usually 2 or 3 to a culm, on lower fifth, the blades erect-ascending, 1-3.5 dm. long, 1.5-3.5 mm. wide, green, flat or channeled at base, roughened especially on the margins; sheaths tight, not cross-rugulose nor septate-nodulose, very thin and truncate at mouth ventrally, the ligule wider than long, colored on the margin; spikes 4-8, closely aggregated in an orbicular or ovoid-oblong, dense, erect head 1-2 cm. long and 8-15 mm. thick, the lowermost rarely slightly separate; staminate flowers apical, not conspicuous, with the 5-10 ascending or at length somewhat spreading perigynia beneath; bracts absent or occasionally a small awl-shaped one (1 cm. long) at the base of the head; scales ovate-triangular, chestnut-brown with conspicuous hyaline margins and sharp green midrib, acute, acuminate, or short-cuspidate, about the width of and from slightly shorter to slightly longer than the perigynia and largely concealing them; perigynia flat, or slightly concave and nerveless ventrally, rounded and nerveless or more or less nerved dorsally, ovate-elliptic, 3.5-5 mm. long, 1.75-2 mm. wide, green or soon brownish, membranaceous, green-margined nearly to base, serrulate from above middle, somewhat spongy, round-tapering at base but scarcely stipitate, tapering or contracted into a serrulate beak about one third the length of the body, bidentate, the teeth triangular-subulate, sharp but short, colored within, both sutures conspicuous; achenes lenticular, quadrate-orbicular, yellowish-brown, 2 mm. long, 1.75 mm. wide, minutely truncately apiculate and short-substipitate; style slender, straight, jointed with achene, scarcely enlarged at base; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY: "Hab. Columbia River. *Douglas, Scouler*."

DISTRIBUTION: Mountain meadows and slopes, from Alberta to South Dakota and Colorado, and westward to California (the Sierra Nevada) and north to British Columbia. (Specimens examined from South Dakota, Colorado, Wyoming, Montana, Alberta, Idaho, Utah, Nevada, California, Washington, Oregon, British Columbia (including Vancouver Island).) Erroneously recorded from Alaska.

ILLUSTRATIONS: Boott, *Ill. Carex* 17. *pl.* 46; Hook. *Fl. Bor. Am.* *pl.* 211; *Am. Jour. Sci.* 49: *pl.* EE, *f.* 106; *Erythraea* 8: *f.* 6; Jepson, *Fl. Calif.* 1: 213. *f.* 30 a-c; Jepson, *Man. Fl. Pl. Calif.* *f.* 164; Abrams, *Ill. Fl. Pacif. St. f.* 692.

33. *Carex cephalophora* Muhl.; Willd. Sp. Pl. 4: 220. 1805.

Diemisa cephalophora Raf. Good Book 27. 1840. (Based on *Carex cephalophora* Muhl.)
Carex cephalophora var. *bracteosa* Farwell, Rep. Mich. Acad. 22: 180. 1921. (Type from Ypsilanti, Michigan.)

Carex cephalophora var. *anomala* Farwell, Papers Mich. Acad. 1: 90. 1923. (Type from Wayne County, Michigan.)

Densely caespitose, the rootstocks very short-prolonged, black, fibrillose, the culms erect, 2-5 dm. high, slender but stiff, triangular, the lower fourth leafy, smooth, except immediately beneath head, shorter than or exceeded by the leaves, light-brownish-tinged at base; leaves with well-developed blades 3-5 to a culm, ascending or more or less spreading, flat, flaccid, 1-4 dm. long, 2-4.5 mm. wide, pale-green, glabrous, but roughened towards the apex and on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, concave and slightly thickened at the mouth, the ligule longer than wide; spikes 3-8, densely capitate in an ovoid-oblong or orbicular head 0.75-2 cm. long, 5-9 mm. thick, only the lower one or two distinguishable, bearing the few inconspicuous staminate flowers above and the several to many ascending or somewhat spreading perigynia below; bracts bristle-form, 1-5 cm. long, usually short; scales ovate, greenish-hyaline, with a green midrib, acuminate to aristate, about half the length of and narrower than the perigynia; perigynia plano-convex, lance-ovate to broadly ovate, broadest below middle, 2.5 mm. long, 1.5 mm. wide, light-green or at full maturity becoming yellowish, sharp-margined to base, the margins forming a raised border ventrally, substipitate, round-tapering at base, submembranaceous, scarcely spongy at base, nerveless on both sides, or lightly 2-3-nerved dorsally, rather abruptly narrowed into a serrulate beak about one half to one fourth the length of the body, bidentate, the teeth short, triangular, white-hyaline within, the sutures on both sides conspicuous; achenes lenticular, apiculate, short-stipitate, suborbicular, 1 mm. long, filling perigynium-body; style slender, straight, jointed with achene, enlarged at base; stigmas two, slender, short, reddish-brown.

TYPE LOCALITY: "Habitat in Pennsylvania."

DISTRIBUTION: Dry woodlands, Maine and southwestern Quebec to Manitoba, and southward to Florida and Texas. One of the most characteristic and widely distributed species, of dry woodlands, in the eastern United States. (Specimens examined from southwestern Quebec, Ontario, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Ohio, Michigan, Indiana, Kentucky, Tennessee, Illinois, Minnesota, Manitoba, Iowa, South Dakota, Missouri, Kansas, Arkansas, Oklahoma, Louisiana, Texas.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 841; ed. 2. f. 886; Rob. & Fern. Man. f. 399; Schkuhr, Riedgr. pl. IIIh, f. 133; Boott, Ill. Carex 123. pl. 396, 397; Rep. N. J. Mus. 1910: pl. 21, f. 4.

34. *Carex Leavenworthii* Dewey, Am. Jour. Sci. II. 2: 246. 1846.

Carex cephalophora var. *angustifolia* Boott, Ill. Carex 123. pl. 398. 1862. (Based on *C. Leavenworthii* Dewey.)

Carex cephalophora var. *Leavenworthii* Kükenth. in Engler, Pflanzenreich 4²⁰: 158. 1909. (Based on *C. Leavenworthii* Dewey.)

Densely caespitose, the rootstocks dark, fibrillose, the culms erect or decumbent, slender, 1-6.5 dm. high, sharply triangular, smooth, except immediately beneath the head, shorter than or exceeded by the leaves, light-brownish at base; leaves with well-developed blades 3-5 to a culm, on lower third, the blades ascending or spreading, flat, 0.5-2.5 dm. long, 1-3 mm. wide, pale-green, glabrous, but roughened towards the apex and on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, concave and not thickened at the mouth, the ligule longer than wide; spikes 3-8, densely capitate or in an ovoid-oblong head 8-20 mm. long, 5-9 mm. thick, only the lower one or two distinguishable, bearing the few inconspicuous staminate flowers above and the rather numerous ascending or somewhat spreading perigynia below; bracts bristle-form, 2 cm. long or less; scales ovate, greenish-hyaline with a green midrib, acute to cuspidate, usually about half the length of and narrower than the perigynia; perigynia plano-convex, broadly ovate, broadest at base, 2-3.5 mm. long, 1.25-1.75 mm. wide, flat and nerveless ventrally, sharp-margined to base, the margins not serrulate except at base of beak, obscurely few-nerved dorsally, yellowish-green, submembranaceous, scarcely spongy at base, substipitate, truncate-cordate at base, contracted into a serrulate beak about one fourth the length of the body, bidentate, the teeth short; achenes

lenticular, substipitate, apiculate, orbicular, 1-1.5 mm. long, filling body of perigynium; style slender, straight, jointed with achene, enlarged at base; stigmas two, slender, short, reddish-brown.

TYPE LOCALITY: "Louisiana, *Dr. Leavenworth*."

DISTRIBUTION: Dry open woodlands, Florida to Texas, and northward to southern New Jersey and Lehigh County, Pennsylvania, and in the Mississippi Valley to Iowa and extreme southwestern Ontario. This species is becoming introduced northeastward along roads, and the Maryland, Pennsylvania, and New Jersey records are based on such plants. (Specimens examined from Pennsylvania (Lehigh County), southern New Jersey, District of Columbia, Maryland, Ontario (including Pelee Island), Indiana, Illinois, Kentucky, Tennessee, Alabama, Florida, Georgia, Iowa, Missouri, Kansas, Arkansas, Oklahoma, Texas, Louisiana, Mississippi.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 842; ed. 2. f. 887; Rob. & Fern. Man. f. 400; Boott, Ill. Carex 123, pl. 398.

35. *Carex onusta* Mackenzie, Bull. Torrey Club 42: 618. 1915.

Cespitose, from stout, short-creeping, black, fibrillose rootstocks, the culms aphyllodipodic, 2-3.5 dm. high, stiff but rather slender, bluntly triangular below, sharply triangular and roughened above, exceeding leaves, brownish at base, biennial, the dried-up leaves conspicuous; leaves with well-developed blades 3 or 4 to a fertile culm, the sheaths tight, very inconspicuously septate-nodulose dorsally, cross-rugulose ventrally and strongly thickened at mouth, the ligule wider than long, the blades light-green, flat, thick, mostly 1-2 dm. long, 2.5-4.5 mm. wide; head oblong or oblong-ovoid, dense, 1.5-3 cm. long, 8-13 mm. thick, containing 8-15 androgynous spikes, only the lower readily distinguishable; lower bracts setaceous, shorter than head, the upper scale-like; spikes with 5-15 appressed or at length spreading or ascending perigynia, the apical staminate flowers usually forming a conspicuous but short cone; scales ovate, very thin, cuspidate, hyaline, yellowish-brown-tinged, with green midvein, narrower than and about two thirds length of bodies of perigynia; perigynia plano-convex or slightly biconvex, oblong-ovate, 3 mm. long, 1.5 mm. wide, submembranaceous, green or in age yellowish-green, nerveless ventrally, obscurely few-nerved dorsally, sharply margined to the rounded non-spongy base, the margins not elevated, serrulate towards beak, abruptly beaked, the beak 0.75 mm. long, serrulate, bidentate, the teeth short, the dorsal suture and false ventral suture conspicuous; achenes lenticular, filling body of perigynium, 2.5 mm. long, 1.5 mm. wide, minutely truncately apiculate, the style short, slender, with much enlarged base, jointed with achene; stigmas two, short, slender, reddish-brown.

TYPE LOCALITY: Sandy woods, Tarrant County, Texas (*A. Ruth 458*).

DISTRIBUTION: Known only from the type locality.

36. *Carex involucatella* Mackenzie, sp. nov.

Rootstocks woody, stout, short-elongate, black, fibrillose, the internodes short, the culms 3-7 dm. high, light-brownish at base, slender but strict, 3 mm. thick at base, biennial, phyllopodic, the dried-up leaves conspicuous, sharply triangular with flat sides, rough above, exceeding leaves; leaves with well-developed blades 6-8 to a fertile culm, clustered on lower fourth, the sheaths tight, not septate-nodulose dorsally nor cross-rugulose ventrally, not red-dotted, concave and slightly thickened at mouth, the ligule conspicuous, wider than long, colored on the margin, the blades shallowly channeled or flat, thickish, dull-green, 1.5-3 dm. long, 3-5 mm. wide, smooth except on margins; spikes closely aggregated into an ovoid or oblong-ovoid head 2-3 cm. long and about 1.5 cm. thick, the individual spikes 12-20, scarcely distinguishable, androgynous, with 10-20 appressed or at length spreading perigynia, the staminate flowers very inconspicuous; lower 1-4 bracts elongate, much exceeding the head, the upper scale-like; scales ovate, acute or short-cuspidate, somewhat narrower than and about length of bodies of perigynia, 3-nerved, greenish or whitish with light-yellowish-brown hyaline margins; perigynia plano-convex, 4.25 mm. long, 2.5-3 mm. wide, straw-colored, submembranaceous, the body suborbicular, sharp-margined nearly to base, nerveless ventrally except obsolete at base, rounded and more or less ribbed dorsally, short-stipitate, rounded and scarcely corky-thickened at base, serrulate above the middle, contracted rather abruptly into a serrulate beak half length of the body, dorsally cleft, bidentate, the teeth short, triangular-subulate, appressed, somewhat reddish-brown-tinged, the ventral false suture and dorsal suture

conspicuous; achenes lenticular, filling upper part of perigynium-body, quadrate-suborbicular, 2 mm. long, 1.75 mm. wide, substipitate, short-apiculate; style enlarged at base, slender, straight, short, jointed with achene; stigmas two, short, slender, light-reddish-brown.

Type collected at Las Canoas, San Luis Potosí, Mexico, *C. G. Pringle 3126* (in herb. E. Brainerd).

DISTRIBUTION: Hillsides, San Luis Potosí and Hidalgo. (Specimens examined from San Luis Potosí and Hidalgo.)

NOTE: Strongly resembles the South American *Carex involucrata* Boott, but the perigynia are thicker-walled and not membranaceous as in that species.

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

Carex mediterranea Mackenzie, Bull. Torrey Club 33: 441. 1906. (Type from Washington, District of Columbia.) Not *C. mediterranea* C. B. Clarke, 1896.

Cespitose, from lignescent, short-prolonged, dark, fibrillose rootstocks, the culms 1.5–10 dm. high, normally spreading, sharply triangular, rough above, leafy on lower third, exceeding leaves, light-brownish at base; leaves with well-developed blades 5–7 to a culm, the blades erect-ascending, thickish, light-green, usually 7–15 cm. long, 2.5–4 mm. wide, flat, long-acuminate, roughened below, especially towards the apex; sheaths tight, not septate-nodulose, little if at all cross-rugulose, deeply concave and more or less thickened and yellowish-brown-tinged at mouth, the ligule conspicuous, somewhat wider than long; spikes 4–8, androgynous, densely capitate, in an ovoid or oblong-ovoid head 10–17 mm. long, 10 mm. thick, the staminate flowers few, with ovate-lanceolate cuspidate scales, the 8–20 perigynia ascending or at length spreading; lowest bract or bracts bristle-form, much shorter than head, the upper scale-like; scales ovate, brownish or greenish-hyaline, with 3-nerved green center, cuspidate or aristate, narrower than and (excluding awn) about length of bodies of perigynia; perigynia flattened-plano-convex, ovate, 3–3.5 mm. long, 2–2.25 mm. wide, broadest below middle, round-tapering and not spongy at base, lightly several-nerved dorsally, nerveless and flat or nearly so ventrally, submembranaceous, sharp-edged to base, serrulate above middle, tapering or abruptly contracted into a serrulate beak about 1 mm. long, bidentate, the teeth short-triangular, both sutures conspicuous; achenes lenticular, strongly flattened, nearly orbicular, 1.5 mm. long, substipitate, minutely apiculate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, short.

TYPE LOCALITY (of *C. mediterranea* Mackenzie, on which *C. mesochorea* is based): Washington, District of Columbia (*E. S. Steele*).

DISTRIBUTION: Dry open places, sometimes introduced along roads, southern Massachusetts and New York to the District of Columbia and Tennessee. (Specimens examined from Massachusetts, New York (Long Island), New Jersey, Pennsylvania, Maryland, District of Columbia, Tennessee.)

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 885.

38. *Carex occidentalis* L. H. Bailey, Mem. Torrey Club 1: 14. 1889.

"*Carex muricata* L." Olney, in S. Wats. Bot. King's Expl. 362, in part. 1871; W. Boott, in Rothr. Bot. Wheeler's Surv. 277. 1878; L. H. Bailey, in Coult. Man. 390. 1885.

Carex muricata var. *americana* L. H. Bailey, Proc. Am. Acad. 22: 140. 1886. (Type from Colorado to New Mexico and Arizona.)

Carex neo-mexicana Mackenzie, Bull. Torrey Club 34: 153. 1907. (Type from New Mexico.)

Carex Hookerana var. *occidentalis* Kükenth. in Engler, Pflanzenreich 4²⁰: 162. 1909. (Based on *C. occidentalis* L. H. Bailey.)

Rootstocks conspicuously short-creeping, black, fibrillose, stout and tough, the culms rather slender but stiff, sharply triangular, 2.5–7 dm. high, exceeding the leaves, roughened above, dark-brown-tinged at base; leaves with well-developed blades about 3 to a culm, the blades light-green, erect-ascending, 1–2.5 dm. long, 1.5–2.5 mm. wide, flat, the margins slightly revolute, roughened especially on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, thin and concave and not thickened at mouth, the ligule longer than wide; spikes 5–10, the lower one or two little separate, the upper aggregated and undistinguishable, the whole head stiff but rather slender, oblong or linear-oblong, 1.5–3 cm. long, 6–8 mm. thick, each spike bearing the few inconspicuous staminate flowers above and the few (10 or less) loosely ascending or in age spreading-ascending perigynia at base; bracts when present usually much shorter than the head, somewhat enlarged at base and with a short cusp, or acuminate;

scales ovate-triangular, the bodies brownish with opaque margins and green 3-nerved center, acuminate to short-awned, rather wider than and about the length of and largely concealing the perigynia; perigynia plano-convex, oblong-elliptic, 2.5–3.5 mm. long, 1.75 mm. wide, light-green or in age brownish, submembranaceous, flat or slightly convex and sharp-edged to base ventrally, the margins serrulate at base of beak only, very obscurely nerved on both sides, stipitate, somewhat spongy and round-tapering at base, abruptly narrowed into a serrulate beak usually about one third the length of the body of the perigynium, bidentate, the teeth short, triangular, the sutures not conspicuous; achenes lenticular, oblong-orbicular, 2 mm. long, 1.5 mm. wide, apiculate, substipitate; style slender, straight, short, enlarged at base, jointed with achene; stigmas two, slender, light-reddish-brown, elongate.

TYPE LOCALITY: "Mountains, Montana to Arizona."

DISTRIBUTION: Dry places, Wyoming to Utah, and southward to New Mexico and Arizona. (Specimens examined from Wyoming, Colorado, Utah, Nevada, New Mexico, Arizona.)

ILLUSTRATION: Clements, Rocky Mt. Fl. *pl.* 45, *f.* 2 (as *C. muricata* L.).

39. *Carex Hookerana* Dewey, Am. Jour. Sci. 29:

248. *pl.* X, *f.* 75. 1836.

"*Carex muricata* L." Torr. Ann. Lyc. N. Y. 3: 389, in part. 1836.

Carex muricata var. *gracilis* Boott, Ill. Carex 193. 1867. (Based on *C. Hookerana* Dewey.)

Cespitose, from short-creeping, stout, tough, black, fibrillose rootstocks, the culms slender, 1.5–2 mm. wide at base, 1.5–3 dm. high, usually exceeding the leaves, sharply triangular, roughened above, brownish at base; leaves with well-developed blades about 4 to a culm, on lower fourth, the blades erect-ascending, 1–2.5 dm. long, 1.5–2.5 mm. wide, light-green, flat, thin, roughened, especially on the margins, the sheaths tight, not cross-rugulose nor septate-nodulose, thin, not thickened, truncate, nor concave at the mouth, the ligule wider than long, dark-margined; spikes 5–10, the lower 3–6 separate, the upper aggregated and undistinguishable, the whole head slender, often rather flexuous, 2–5 cm. long and less than 1 cm. thick, each spike bearing the few inconspicuous staminate flowers above and the few (10 or less) appressed perigynia beneath; bracts, especially the lower, well-developed, somewhat enlarged at base, prolonged into a long cusp, usually or often exceeding their spikes and the lower at times exceeding the head; scales ovate-triangular, the bodies brown with narrow hyaline margins and conspicuous green midrib, strongly awned, rather wide and longer than and concealing the perigynia; perigynia plano-convex, narrowly ovate-lanceolate, 2.75–3.5 mm. long, the body about 1.25 mm. wide, very membranaceous, light-green or light-brownish-tinged in age, flat and nerveless ventrally, rounded and obscurely few-nerved dorsally, margined above, marginless below, short-stipitate, round-tapering at base, serrulate at base of beak only, rather abruptly narrowed into a serrulate beak scarcely half the length of the body, obliquely cleft dorsally, deeply bidentate, the teeth subulate, whitish within, both sutures conspicuous; achenes lenticular, quadrate-suborbicular, 1.25 mm. long and a little narrower, truncately very short-apiculate and minutely substipitate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY: "Found at Carlton House by Dr. Richardson."

DISTRIBUTION: Prairies and plains, Manitoba and North Dakota to Alberta. (Specimens examined from North Dakota, Manitoba, Saskatchewan, Alberta.)

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl.* 212; Am. Jour. Sci. 29: *pl.* X, *f.* 75.

NOTE: The name of this species was originally spelled "*Hookerana*" but it has usually been given as "*Hookeriana*."

40. *Carex tumulicola* Mackenzie, Bull. Torrey Club 34: 154. 1907.

"*Carex muricata* var. *gracilis* Boott" W. Boott, in S. Wats. Bot. Calif. 2: 232. 1880.

"*Carex Hookeriana* Dewey" Kükenth. in Engler, Pflanzenreich 4²⁰: 161. 1909. (As to Californian plant.)

Rootstocks conspicuously short-creeping, black, fibrillose, tough, rather stout, the culms erect, slender, sharply triangular, 2–8 dm. high, exceeding the leaves, roughened above, dark-brown or blackish-tinged at base; leaves with well-developed blades about 3 or 4 to a culm, on lower fifth, the blades erect-ascending, 1–3 dm. long, 1.5–2.5 mm. wide, light-green, flat

or channeled at base, thickish, roughened especially on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, thin, not thickened, truncate, nor concave at mouth, the ligule short, wider than long, dark-margined; spikes 5-10, the lower 3-6 separate, the upper aggregated and undistinguishable, the whole head slender and often rather flexuous, 2-5 cm. long and 6-8 mm. thick, each spike bearing the few staminate flowers above and the few (10 or less) appressed perigynia beneath; bracts, especially the lower, well-developed, somewhat enlarged at base, prolonged into long cusps, usually or often exceeding their spikes, and the lower at times exceeding the head; scales ovate-triangular, the bodies strongly reddish-brown-tinged with narrow hyaline margins and conspicuous green midrib, acute, cuspidate, or short-awned, rather wider and from slightly longer to slightly shorter than the perigynia and usually largely concealing them; perigynia plano-convex, oblong-elliptic to ovate, 3.5-5 mm. long, 1.5-2 mm. wide, light-green or brownish in age, submembranaceous, flat and nerved or nerveless ventrally, sharp-edged to base, serrulate to middle, rounded and several-nerved dorsally, somewhat spongy and round-tapering at base into a stipe 0.5 mm. long, gradually or abruptly contracted into a serrulate beak one third to one half the length of the body of the perigynium, sharply bidentate, the teeth slender, triangular-subulate, reddish-brown, both sutures conspicuous; achenes lenticular, short-oblong, quadrate, 2.25 mm. long, 1.5-2 mm. wide, truncate very short-apiculate and minutely substipitate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY: Lake Temescal, Alameda county, California (*Bioletti*).

DISTRIBUTION: Dry soil, from southwestern Washington southward through western Oregon and the coastal counties of California to Monterey County. (Specimens examined from all parts of range as given.)

ILLUSTRATIONS: *Erythra* 8: f. 7; Jepson, Man. Fl. Pl. Calif. f. 165; Abrams, Ill. Fl. Pacif. St. f. 694.

41. *Carex arkansana* L. H. Bailey, Bot. Gaz. 21: 6. 1896.

Carex rosea var. *arkansana* L. H. Bailey, Bot. Gaz. 13: 87. 1888. (Type from Arkansas.)

Densely caespitose, the culms 2-6 dm. high, slender but firm, obtusely triangular, smooth, usually noticeably exceeding the leaves, light-brownish-tinged at base; leaves with well-developed blades usually about 3 to a culm, the blades erect-ascending, 1-2 dm. long, 1.5-2 mm. wide, flat, not thickish, light-green, roughened towards the apex and on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, thin and concave at mouth, the ligule wider than long, colored on the margin; spikes 4-6, subglobose, densely flowered, aggregated or more or less separate in a solitary terminal head 15-30 mm. long, usually about 1 cm. thick, all except the upper one or two readily distinguishable, each spike bearing the few inconspicuous staminate flowers above and the 8-20 ascending or at length strongly spreading perigynia beneath; lower 2-4 bracts much prolonged and many times exceeding the head, 6-25 cm. long, 1-2 mm. wide, roughened below, often enlarged and strongly nerved at base; scales ovate-triangular, acutish to short-acuminate or even cuspidate, white-hyaline with several well-developed central green ribs, narrower and from somewhat shorter than to exceeding the perigynia; perigynia plano-convex, ovate-orbicular, 3.5-4 mm. long, 2.25 mm. wide, sharp-margined to base, the margins serrulate above the middle, light-green, membranaceous, few-nerved dorsally, nerveless ventrally, short-stipitate, rounded and rather spongy at base, abruptly narrowed into a serrulate beak one half the length of the body, bidentate, the teeth triangular, reddish within, both sutures conspicuous; achenes lenticular, ovate-orbicular, 2 mm. long, 1.75 mm. wide, bluntly short-apiculate and substipitate; style slender, straight, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, short.

TYPE LOCALITY (of *C. rosea* var. *arkansana* L. H. Bailey, on which *C. arkansana* is based): "Plentiful in the bottom of La Fourche creek, near Little Rock, Ark., growing beneath underbrush where heavy timber has been cut. Dr. H. E. Hasse."

DISTRIBUTION: Woodlands, southwestern Missouri, eastern Oklahoma, western Arkansas, and northeastern Texas. (Specimens examined from all parts of range as given.)

42. *Carex xalapensis* Kunth, Enum. Pl. 2: 380. 1837.

"*Carex glomerata* Thunb." Böck. Linnæa 39: 59. 1875. (As to Mexican plant.)

Carex Muhlenbergii var. *xalapensis* Britton; L. H. Bailey, Mem. Torrey Club 5: 86. 1894. (Based on *C. xalapensis* Kunth.)

Cespitose, from short-creeping, tough, rather stout, black, fibrillose rootstocks, the culms 6-9 dm. tall, slender but strict, sharply triangular with flat sides, roughened above, much exceeding the leaves, 2.5-3 mm. thick and dull-brown at base, biennial, the old dried-up leaves usually conspicuous; leaves with well-developed blades about 5 to a culm, all on the lower third but not crowded, the blades 1-3 dm. long, 2.5-3 mm. wide, light-green, flat, or shallowly channeled above, rather stiff, roughened on the margins and towards the apex, the sheaths tight, not septate-nodulose nor cross-rugulose, concave, and only slightly thickened and yellowish-brown-tinged at mouth, the ligule conspicuous but wider than long, dark-margined; heads narrowly to broadly oblong, 1.5-3.5 cm. long, about 1 cm. thick, composed of 6-12 closely aggregated but usually distinguishable spikes, the spikes androgynous, orbicular or nearly so, 5 mm long, with 10-20 ascending-spreading (or at maturity spreading) perigynia, and inconspicuous staminate flowers; two or three of the lower bracts developed, setaceous, 2-4 cm. long, slightly enlarged at base, shorter than to exceeding the head; scales ovate, acuminate or short-cuspidate, rather narrower than and about as long as the bodies of the perigynia, reddish-brown or in age yellowish-brown-tinged, with 3-nerved green center and narrow hyaline margins; perigynia plano-convex, 3-3.5 mm. long, 2-2.5 mm. wide, the body ovate to nearly orbicular, light-green or yellowish-brown at maturity, nerveless ventrally, faintly few-nerved dorsally, the lower part slightly corky-thickened, membranaceous, substipitate, truncate or rounded at base, sharply margined to base, and serrulate above the middle, rather abruptly narrowed into a serrulate beak about half the length of the body, dorsally cleft, narrowly bidentate, the teeth subulate-triangular, reddish-brown-tinged, very short, erect, the dorsal suture and false ventral suture conspicuous; achenes lenticular, filling perigynium-body, short-stipitate and apiculate, suborbicular, 1.5 mm. long; style short, slender, jointed with achene, enlarged at base; stigmas two, reddish-brown, slender, elongate.

TYPE LOCALITY: Jalapa, Mexico, *Schiede & Deppe*.

DISTRIBUTION: Dry soil, Hidalgo. (Specimens examined from Hidalgo.)

43. *Carex spicata* Huds. Fl. Angl. 349. 1762.

Carex muricata L. Sp. Pl. 974, possibly as to some citations, but not as to type. 1753.

Carex muricata var. *gracilis* S. F. Gray, Nat. Arr. Brit. Pl. 2: 48. 1821. (Type from England.)

Carex muricata var. *densa* Wallr. Sched. Crit. 493. 1822. (Based on "*C. muricata* L.," of most authors.)

Carex viridis Spenner, Fl. Frib. 48. 1825. (Based, as to type, on "*C. muricata* L.," of most authors.)

Carex viridis var. *muricata* Spenner, Fl. Frib. 48. 1825. (Type variety of *C. viridis*.)

Vignea muricata Reichenb. in Mössler, Handb. ed. 2. 1611, in part, but not as to type. 1829.

Carex contigua Hoppe, in Sturm, Deuts. Fl. 61: pl. 2. 1833. (Type from Germany.)

Carex muricata var. *vulgaris* Anderss. Cyp. Scand. 65. 1849. (Type from northwestern Europe.)

Carex muricata var. *incrassata* Crépin, Bull. Acad. Belg. II. 7: 112. 1859. (Type from Belgium.)

Carex muricata var. *genuina* Gren. Mém. Soc. Emul. Doubs III. 10: 835. 1869. (Based on *C. contigua* Hoppe.)

Carex muricata var. *fumosa* Gren. Mém. Soc. Emul. Doubs III. 10: 835. 1869. (Type from France.)

Carex muricata var. *remota* F. Schultz, Flora 53: 459. 1870. (Type from Germany.)

Caricina muricata St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 875, mostly, but not as to type. 1889.

Caricina muricata var. *compacta* St.-Lag. in Cariot, Étude Fl. ed. 8. 2: 875. 1889. (Type from France.)

Carex muricata f. *pallida* Appel; Woerl. Ber. Bayer. Bot. Ges. 3: 164. 1893. (Type from Germany.)

Carex muricata subsp. *macrocarpa* var. *typica* Neuman, Sv. Fl. 716. 1901. (Based on "*C. muricata* L.," of most authors.)

Carex muricata var. *submonostachya* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 39. 1902. (Type from Germany.)

Carex contigua var. *pseudo-guestphalica* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 39. 1902. (Type from Germany.)

Carex contigua var. *mediterranea* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 39. 1902. (Type from Italy.)

Carex contigua var. *typica* Vollm. Denks. Bot. Ges. Regensb. 8: 81. 1903. (Based on *C. contigua* Hoppe.)

Carex contigua var. *typica* subvar. *pallida* Vollm. Denks. Bot. Ges. Regensb. 8: 81. 1903. (Based on *C. muricata* f. *pallida* Appel.)

Carex contigua var. *remota* Vollm. Denks. Bot. Ges. Regensb. 8: 81. 1903. (Based on *C. muricata* var. *remota* F. Schultz.)

Carex contigua var. *remota* subvar. *umbrosa* Vollm. Denks. Bot. Ges. Regensb. 8: 81. 1903. (Type from Germany.)

Carex contigua var. *longissima* Tauscher; Vollm. Denks. Bot. Ges. Regensb. 8: 76, 81. 1903. (Type from Hungary.)

- Carex contigua* f. *submonostachya* "Asch. & Graebn." Kükenth. in Engler, Pflanzenreich 4²⁰: 156. 1909. (Based on *C. muricata* var. *submonostachya* Asch. & Graebn.)
Carex contigua f. *remota* "F. Schultz" Kükenth. in Engler, Pflanzenreich 4²⁰: 156. 1909. (Based on *C. muricata* var. *remota* F. Schultz.)
Carex contigua f. *pallida* "Appel" Kükenth. in Engler, Pflanzenreich 4²⁰: 156. 1909. (Based on *C. muricata* f. *pallida* Appel.)
Carex contigua f. *pseudo-guestphalica* "Asch. & Graebn." Kükenth. in Engler, Pflanzenreich 4²⁰: 156. 1909. (Based on *C. contigua* var. *pseudo-guestphalica* Asch. & Graebn.)
Carex contigua f. *fumosa* "Gren." Kükenth. in Engler, Pflanzenreich 4²⁰: 156. 1909. (Based on *C. muricata* var. *fumosa* Gren.)

Cespitose, from very short-prolonged, dark, fibrillose rootstocks, the culms 2-8 dm. high, slender but strict, leafy on lower fourth, sharply triangular, serrulate beneath the head, usually exceeding the leaves, dark-brown-tinged at base; leaves with well-developed blades 3-6 to a culm, the blades ascending or erect, thin and not stiff, deep-green, 1-3 dm. long, 1.5-3 mm. wide, flat, roughened on the margins and towards the apex, the sheaths tight, not septate-nodulose nor cross-rugulose, very thin ventrally, varying from deeply concave at mouth to short-prolonged and convex (in lower sheaths), the ligule conspicuous, much longer than wide, white, sometimes yellowish-brown-margined; spikes 4-9, aggregated in an oblong terminal head 1.5-3 cm. long, 1 cm. or less thick, the lower 1-3 slightly separated; staminate flowers apical, inconspicuous, with the 5-10 ascending or spreading perigynia below; bracts bristle-like, 2 cm. long or less, often rudimentary; scales ovate-triangular, acuminate to aristate, about the width of and slightly shorter than the perigynia, narrowly hyaline-margined, greenish-hyaline and more or less strongly purplish-red-tinged, the center green, strongly 1-3-ribbed; perigynia plano-convex, 4-5.5 mm. long, 2.25 mm. wide, ovate, flat on inner surface, sharp-margined to base, the margins scarcely if at all elevated, not serrulate, green, submembranaceous, substipitate, rounded and spongy at base, nerveless ventrally, several-nerved dorsally, rather abruptly contracted into a serrulate beak about half the length of the body, bidentate, the teeth triangular, short, hyaline within, both sutures conspicuous; achenes lenticular, filling body of perigynium, orbicular-quadrate, 2-2.25 mm. long, 2 mm. wide, substipitate and short-apiculate; style short, slender, jointed with achene, enlarged at base; stigmas two, red, slender, 2 mm. long.

TYPE LOCALITY: "Habitat in aquosis," England.

DISTRIBUTION: Fields and waste places, Nova Scotia to Ohio and Virginia; locally naturalized from Europe, where it is widely distributed. Also recorded from western Asia and the Canary Islands. (Specimens examined from Nova Scotia, Maine, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, District of Columbia, Virginia.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 838; ed. 2. f. 882; Rob. & Fern. Man. f. 397; Engler, Pflanzenreich 4²⁰: 155. f. 26, A-E; Jour. Russe Bot. 1911: 55. f. 35; Sturm, Deuts. Fl. 61: pl. 2; Reichenb. Ic. Fl. Germ. 8: pl. 215, f. 561; Anders. Cyp. Scand. pl. 3. f. 19; Host, Gram. Austr. 1: pl. 54; Engl. Bot. pl. 1097; ed. 3. pl. 1624; Benth. Handb. Brit. Fl. f. 1106; Coste, Fl. Fr. f. 3823; Hegi, Ill. Fl. Mittel-Eur. pl. 46. f. 4; Hallier, Deuts. Fl. pl. 426; Karst. Deuts. Fl. 339. f. 166, 2, 3; Lindm. Bild. Nord. Fl. pl. 433 A; Micheli, Nov. Pl. Gen. pl. 33, f. 14; Flora 54: pl. 2, in part.

NOTE: F. Schultz (Flora 54: 27. pl. 1, 2. 1871) carefully brought out and illustrated the differences between this and related European species. See also Jour. Bot. 36: 74, 75. Later, the European synonymy of this and related species was gone into at length by Vollmann (Denks. Bot. Ges. Regensb. 8: 55-90. 1903).

The original description of *Carex spicata* Hudson does not make reference to any illustrations. However, in the second edition of his "Flora anglica," published in 1778, Hudson (page 405) added the reference "Mich. gen. 69. t. 33. f. 14." Micheli's figure so referred to undoubtedly belongs to the present species, and English writers have all been unanimous in referring Hudson's name to the present species. It does not, however, grow "in aquosis" as stated by Hudson, unless he is to be taken as meaning poorly drained places where water may stand after a rain. It seems to me that we are not justified in abandoning the traditional use of Hudson's name.

The species has been generally known as "*Carex muricata* L." but references to it formed very little if any part of the Linnaean description of that species. Nor is the name "*muricata*" one which Linnaeus could ever have applied to a species not at all muricate.

44. *Carex Muhlenbergii* Schkuhr (Willd. Sp. Pl. 4: 231, name only. 1805), Riedgr. Nachtr. 12. pl. Yyy, f. 178. 1806.

- Carex pinetorum* Willd.; Schlecht. Linnaea 10: 265. 1835. (Type from North Carolina.)
Carex piniaria Bosc; Schlecht. Linnaea 10: 265. 1835. (As synonym of *C. pinetorum* Willd.)
"*Carex muricata* L." Schlecht & Cham. Linnaea 6: 29. 1831.
Vignea Muhlenbergii Raf. Good Book 27. 1840. (Based on *Carex Muhlenbergii* Schkuhr.)

Cespitose, from lignescens, short-prolonged, dark, fibrillose rootstocks, the culms 2-9 dm. high, stiff, sharply triangular, very rough above, leafy on lower fifth, much exceeding

leaves, light-brownish at base, the dried-up leaves of the previous year very conspicuous; leaves with well-developed blades 5-10 to a culm, the blades ascending or spreading, thick, light-green, usually 1-3 dm. long, 2-4 mm. wide, flat or channeled at base, long-tapering, much roughened towards apex and on the margins, the sheaths tight, not septate-nodulose, little if at all cross-rugulose, concave and thickened and yellowish-brown-tinged at mouth, the ligule about as wide as long; spikes 3-10, androgynous, densely aggregated into an oblong head 1.5-4 cm. long, about 1 cm. thick, the lower at least well-defined and distinguishable, the staminate flowers few and inconspicuous, with lanceolate, cuspidate scales, the 8-20 perigynia ascending or at length spreading; bracts bristle-form, short but usually conspicuous; scales ovate, greenish-hyaline with 3-nerved green center, cuspidate or aristate, narrower than and (excluding awn) from somewhat shorter than to about length of bodies of perigynia; perigynia plano-convex, 3-3.5 mm. long, 2.25-2.5 mm. wide, broadly ovate or orbicular, broadest below middle, and round-tapering and scarcely spongy at base, subcoriaceous, pale-green, the dorsal side strongly many-ribbed, the ventral side many-ribbed, slightly elevated in the center and with slightly elevated sharp margins to base, serrulate from above the middle, abruptly short-beaked, the beak 1 mm. long, rather broadly bidentate with short-triangular teeth, hyaline within, both sutures conspicuous; achenes lenticular, suborbicular, 2 mm. long, 1.75 mm. wide, filling body of perigynium, abruptly substipitate, not at all or very shortly apiculate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, long.

TYPE LOCALITY: "Habitat in America boreali," *i. e.*, Pennsylvania (*Muhlenberg*).

DISTRIBUTION: Sand hills and dry sterile fields and hills, especially on the coastal plain and around the Great Lakes, Maine to Minnesota, and southward to Florida and Texas. (Specimens examined from Ontario, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Florida, Louisiana, Texas, Kentucky, Ohio, Indiana, Michigan, Wisconsin, Minnesota, Illinois, Iowa.)

ILLUSTRATIONS: Schkuhr, *Riedgr. pl. Yyy, f. 178*; Britt. & Brown, *Ill. Fl. f. 843*; ed. 2. *f. 883*; Rob. & Fern. *Man. f. 398*; Boott, *Ill. Carex 124. pl. 399*; Rep. N. Y. Mus. 1910: *pl. 21, f. 3*.

45. *Carex plana* Mackenzie, *Bull. Torrey Club* 50: 350. 1923.

Carex Muhlenbergii var. *enervis* Boott, *Ill. Carex 124. pl. 400*. 1862. (Type from Highlands, New York.) Not *C. enervis* C. A. Meyer, 1833.

Carex Muhlenbergii var. *xalapensis* Britton; Britt. & Brown, *Ill. Fl. 1: 349*. 1896. (As to plant described only.)

Cespitose, from lignescent, short-prolonged, dark, fibrillose rootstocks, the culms 3-9 dm. high, slender but stiff, sharply triangular, rough above, leafy on lower fifth, much exceeding the leaves, light-brownish at base, the dried-up leaves of the previous year conspicuous; leaves with well-developed blades 5-10 to a culm, the blades erect-ascending, thickish, green, usually 1-3 dm. long, 2-3 mm. wide, flat or channeled at base, long-tapering, roughened towards apex and on the margins, the sheaths tight, not septate-nodulose, little if at all cross-rugulose, concave and thickened and yellowish-brown-tinged at mouth, the ligule conspicuous, about as wide as long; spikes 5-10, androgynous, densely aggregated into an oblong head 2-4 cm. long, 8-10 mm. thick, the lower at least well-defined and distinguishable, the staminate flowers few, with ovate-lanceolate cuspidate scales, the 8-20 perigynia ascending or at length spreading; bracts bristle-form, short but at least the lowest conspicuous; scales ovate, greenish-hyaline with 3-nerved green center, cuspidate or aristate, narrower than and (excluding awn) from somewhat shorter than to about length of bodies of perigynia; perigynia plano-convex, 3-3.5 mm. long, 2-2.25 mm. wide, ovate, broadest below middle, round-tapering and slightly spongy at base, subcoriaceous, light-green or in age yellowish-green, narrowly margined nearly to base, several- to rather many-ribbed dorsally, nerveless or short-nerved at base ventrally, flat or nearly so ventrally, serrulate from above the middle, abruptly short-beaked, the beak 1 mm. long, rather broadly bidentate with short triangular teeth, hyaline within, both sutures conspicuous; achenes lenticular, ovoid-orbicular, 2 mm. long, 1.75 mm. wide, filling body of perigynium, abruptly substipitate, not at all or very shortly apiculate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, long.

TYPE LOCALITY (of *C. Muhlenbergii* var. *enervis* Boott, on which *C. plana* is based): Highlands, Hudson River, New York (*Russell*); figured by Boott.

DISTRIBUTION: Dry hillsides, especially in calcareous regions, Maine and Ontario to Nebraska, and southward to Alabama and Texas. Especially well distributed and abundant in the strongly calcareous districts of the Mississippi Valley. (Specimens examined from Maine, Massachusetts, Rhode Island, Connecticut, Ontario, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Alabama, Mississippi, Kentucky, Tennessee, Ohio, Indiana, Michigan, Illinois, Iowa, Nebraska, Missouri, Kansas, Oklahoma, Arkansas, Texas.)

ILLUSTRATION: Boott, Ill. *Carex* 124. pl. 400.

46. *Carex austrina* (Small) Mackenzie, Bull. Torrey Club 34: 151. 1907.

Carex Muhlenbergii var. *australis* Olney; (E. Hall, Pl. Tex. 25, name only. 1873) L. H. Bailey, Proc. Am. Acad. 22: 141. 1886. (Type from Texas.) Not *C. australis* Kirk, 1894.

Carex Muhlenbergii var. *austrina* Small, Fl. SE. U.S. 218. 1903. (Based on *C. Muhlenbergii* var. *australis* Olney.)

Cespitose, from lignescent, very short-prolonged, dark, fibrillose rootstocks, the culms erect, 2-9 dm. high, usually low, slender but stiff, sharply triangular, more or less roughened above, leafy on lower fourth, usually noticeably exceeding the leaves, light-brownish at base; leaves with well-developed blades 3-8 to a culm, the blades ascending, usually 1-3 dm. long, 2.5-4 (rarely 4.5) mm. wide, thickish, light-green, flat or slightly channeled at base, long-tapering, glabrous, but roughened towards the apex and on the margins, the sheaths tight, not septate-nodulose nor cross-rugulose, concave and slightly thickened at mouth, the ligule very short, about as wide as long; spikes 5-10, androgynous, densely aggregated in an oblong terminal head 1.5-3.5 cm. long, 8-15 mm. thick, the lower 2-4 well defined and distinguishable, each spike bearing the few inconspicuous staminate flowers above and the 8-20 appressed-ascending, or in age somewhat spreading-ascending perigynia below, the staminate scales ovate-lanceolate, cuspidate; lower bracts or all 1-5 cm. long, dilated and much nerved at the base, long-cuspidate and conspicuous, the upper scale-like; scales broadly ovate, greenish or whitish-hyaline with strongly 3-nerved green center, strongly awned, about as wide as and largely covering the perigynia, conspicuous; perigynia plano-convex, ovate or suborbicular, 3.5-4 mm. long, 2.5-3 mm. wide, broadest below middle, flat, and without raised margins ventrally, sharp-edged to base and serrulate above middle, light-greenish, submembranaceous, substipitate, rounded but scarcely spongy at base, nerveless or nearly so ventrally, strongly several-nerved dorsally, abruptly narrowed into a serrulate beak one third to one fourth the length of the body, bidentate, the teeth subulate-triangular, hyaline within, both sutures conspicuous; achenes lenticular, suborbicular, 2.25-2.5 mm. long, 2 mm. wide, filling body of perigynium, abruptly short-stipitate, very short-apiculate; style short, slender, enlarged at base, jointed with achene; stigmas two, reddish-brown, slender, long.

TYPE LOCALITY (of *C. Muhlenbergii* var. *australis* Olney, on which *C. austrina* is based): Houston, Texas (Hall).

DISTRIBUTION: Dry sunny places in calcareous districts, Missouri and eastern Kansas to Arkansas and Texas. (Specimens examined from Missouri, Kansas, Oklahoma, Arkansas, Texas.)

ILLUSTRATION: Britt. & Brown, Ill. Fl. ed. 2. f. 884.

47. *Carex Pairaei* F. Schultz, Flora 51: 302. 1868.

Carex muricata L. Sp. Pl. 974, as to some citations, but not as to type. 1753.

"*Carex loliacea* L." Schkuhr, Riedgr. 22. pl. Ee, f. 91. 1801. (Probably from Germany.)

Carex muricata L. var. (*C.*) *loliacea* Schkuhr, Riedgr. Nachtr. 12. 1806. (Based on "*C. loliacea* L." of Schkuhr.)

Vignea muricata Reichenb. in Mössler, Handb. ed. 2. 1611, in part, but not as to type. 1829.

Vignea virens Reichenb. in Mössler, Handb. ed. 2. 1611, mostly, but not as to type. 1829.

Carex muricata var. *virens* Reichenb. Ic. Fl. Germ. 8: 9. pl. 215, f. 562, as to plant described and figured, but not as to type. 1846.

Carex muricata var. *monostachya* Asch. Fl. Brand. 1: 766. 1864. (Type from Brandenburg.)

Carex muricata var. "*spica depauperata*" Hampe, Fl. Hercyn. 290. 1873. (Type from Germany.)

Carex virens var. *Pairaei* Garecke, Fl. Deuts. ed. 13. 418. 1878. (Based on *C. Pairaei* F. Schultz.)

Carex muricata var. *Pairaei* Celak, Prodr. Fl. Böhm. 731. 1881. (Based on *C. Pairaei* F. Schultz.)

Carex muricata subsp. *microcarpa* Neuman, Bot. Notiser 1894: 107. 1894. (Type from Sweden.)

Carex virens var. *monostachya* Asch. & Graebn.; Beyer, Nordostd. Schulfl. 81. 1902. (Based on *C. muricata* var. *monostachya* Asch.)

Carex Pairaei var. *monostachya* Asch. & Graebn. Syn. Mitteleur. Fl. 2: 40. 1902. (Based on *C. muricata* var. *monostachya* Asch.)

- Carex Pairaei* var. *capitata* Christ; Chenev. Bull. Herb. Boiss. II. 2: 780. 1902. (Type from Switzerland.)
- "*Carex echinata* Murr." C. B. Clarke; Fernald, *Rhodora* 4: 225. 1902. (From Germany, collected by Murray; but see Kükenth. in Engler, *Pflanzenreich* 4²⁰: 161.)
- Carex Leersii* var. *angustifolia* Vollm. Denks. Bot. Ges. Regensb. 8: 80. 1903. (Based on *C. Pairaei* F. Schultz.)
- Carex Leersii* var. *angustifolia* subvar. *virescens* Vollm. Denks. Bot. Ges. 8: 80. 1903. (Type probably from Germany.)
- Carex Leersii* var. *depauperata* Vollm. Denks. Bot. Ges. Regensb. 8: 81. 1903. (Based on *C. muricata* var. "spica depauperata" Hampe.)
- "*Carex echinata* Murr." Kükenth. in Engler, *Pflanzenreich* 4²⁰: 160. 1909.
- Carex echinata* f. *monostachya* "Asch. & Graebn." Kükenth. in Engler, *Pflanzenreich* 4²⁰: 161. 1909. (Based on *C. muricata* var. *monostachya* Asch. & Graebn.)
- Carex echinata* f. *capitata* "Christ" Kükenth. in Engler, *Pflanzenreich* 4²⁰: 161. 1909. (Based on *C. Pairaei* var. *capitata* Christ.)
- Carex echinata* var. *tenuior* Kükenth. in Engler, *Pflanzenreich* 4²⁰: 161. 1909. (Type from the Azores.)

Cespitose, from lignescence, short-prolonged, dark, fibrillose rootstocks, the culms 3-7 dm. high, rather stiff, sharply triangular and strongly serrulate above, leafy on lower third, exceeding the leaves, dark-brown-tinged at base; leaves with well-developed blades 4-6 to a culm, the blades erect, usually 1-3 dm. long, 2-3 mm. wide, flat, green, not stiff, roughened on the margins and towards the apex, the sheaths tight, not septate-nodulose nor cross-rugulose, truncate or concave and slightly thickened at mouth, the ligule wider than long, white, often with colored margins; spikes 4-8, androgynous, globose-ovoid, 5-7 mm. long, the upper aggregated, the lower strongly separate, the head 2-3.5 cm. long, about 8 mm. thick, the spikes with inconspicuous staminate flowers and 5-10 ascending or at length squarrose perigynia; lower bracts bristle-form, short, the upper scale-like; scales ovate, mucronate, reddish-brown with 3-nerved green center, much shorter and narrower than bodies of perigynia; perigynia planoconvex, broadly ovate, olive-green, 3-3.5 mm. long, 2 mm. wide, sharp-margined to base, the margins serrulate at base of beak and scarcely elevated ventrally, nerveless or obscurely few-nerved on both sides towards base, submembranaceous, rounded, subtipitate and slightly spongy at base, contracted into a serrulate beak about 0.75 mm. long, reddish-tipped, bidentate, the teeth triangular-subulate, reddish within, both sutures conspicuous; achenes lenticular, filling body of perigynium, quadrate-orbicular, 2 mm. long and nearly as wide, subtipitate, short-apiculate; style short, slender, jointed with achene, enlarged at base; stigmas two, slender, red, 2 mm. long.

TYPE LOCALITY (of "*C. loliacea* L." of Schkuhr, on which *C. Pairaei* is based): Probably Germany.

DISTRIBUTION: A widely distributed species of Europe and western Asia, locally naturalized or adventized in Kent County, New Brunswick, and at Easton, Pennsylvania. (Specimens examined from Pennsylvania.)

ILLUSTRATIONS: Engler, *Pflanzenreich* 4²⁰: 155, f. 26, F-K (as *C. echinata*); Schkuhr, *Riedgr. pl. Ee*, f. 91; Jour. Russe Bot. 1911: 55, f. 36; Reichenb. Ic. Fl. Germ. 8: pl. 215, f. 562; Leers, *Fl. Herborn. pl.* 14, f. 8; Coste, *Fl. Fr.* f. 3824; *Flora* 54: pl. 2, in part.

NOTE: The first citation under *Carex muricata* L. is: "*Carex spiculis subovatis sessilibus remotis androgynis, capsulis acutis divergentibus spinosis*" (Fl. Suec. 752). This undoubtedly refers to *Carex stellulata* Gooden., and as it is the only one from a work of Linnaeus himself, it should be taken as fixing the application of the name. In his herbarium specimens labeled *Carex muricata* represent *Carex stellulata* Gooden. and the present species. (See Wulfen, *Fl. Norica Phan.* 737, 741. 1858; Mackenzie, *Bull. Torrey Club* 50: 346. 1923.) As to the identity of *Carex echinata* Murr., see note under *C. muricata* (no. 112).

48. *Carex vires* Lam. *Encyc.* 3: 384. 1791.

Carex nemorosa Lumn. *Fl. Poson.* 418. 1791. (Type from central Europe.) Not *C. nemorosa* Schrank, 1789.

Carex divulsa Gooden. *Trans. Linn. Soc.* 2: 160. 1794. (Type from England.)

"*Carex muricata* L." Desf. *Fl. Atlant.* 2: 335. 1800. (Northwestern Africa.)

Carex muricata β *divulsa* Wahl. *Sv. Vet.-Akad. Nya Handl.* 24: 153. 1803. (Based on *C. divulsa* Gooden.)

Carex viridis var. *divulsa* Spenner, *Fl. Frib.* 48. 1825. (Based on *C. divulsa* Gooden.)

Carex viridis var. *longibracteata* Spenner, *Fl. Frib.* 48. 1825. (Based on *C. vires* Lam.)

Vigna vires Reichenb. in Mössler, *Handb.* ed. 2. 1611. 1829. (Based on *Carex vires* Lam.)

Vigna divulsa Reichenb. in Mössler, *Handb.* ed. 2. 1619. 1829. (Based on *Carex divulsa* Gooden.)

Vigna guesphalica Bönningh.; Reichenb. *Fl. Germ. Exc.* 140^f. 1832. (Type from Germany.)

Carex muricata β *vires* Koch, *Syn. Fl. Germ.* 751. 1837. (Based on *C. vires* Lam.)

Carex muricata var. *subramosa* Neir. *Fl. Wien* 67. 1846. (Based on *C. divulsa* Gooden.)

Carex divulsa var. *vires* Durieu. *Bull. Soc. Bot. Fr.* 6: 633. 1859. (Based on *C. vires* Lam.)

- Carex subramosa* Kit. *Linnaea* 32: 317. 1863. (Based solely on *C. nemorosa* Lamn.)
Carex virens var. *Duriaei* F. Schultz, *Pollichia* 20/21: 257. 1863. (Based on *C. divulsa* var. *virens* Durieu.)
Carex virens var. *divulsa* F. Schultz, *Pollichia* 20/21: 257. 1863. (Based on *C. divulsa* Gooden.)
Carex divulsa var. *intermedia* Lange, *Haandb. Danske Fl.* ed. 3. 678. 1864. (Based on *C. virens* Lam.)
Carex divulsa f. *guestphalica* F. Schultz, *Étude Car.* 8. 1868. (Based on *C. guestphalica* Bönningh.)
Carex Duriaei F. Schultz, *Flora* 53: 458. 1870. (Based on *C. virens* var. *Duriaei* F. Schultz.)
 Not *C. Duriaei* Steud. 1840.
Carex Chaberti F. Schultz, *Flora* 54: 21. 1871. (Based on *C. Duriaei* F. Schultz, not Steud.)
Carex virens var. *guestphalica* Garcke, *Fl. Deuts. ed.* 11. 421. 1873. (Based on *C. guestphalica* Bönningh.)
Caricina muricata var. *elongata* St.-Lag. in Cariot, *Étude Fl.* ed. 8. 2: 875. 1889. (Based on *Carex guestphalica* Bönningh.)
Caricina muricata var. *virens* St.-Lag. in Cariot, *Étude Fl.* ed. 8. 2: 875. 1889. (Based on *Carex virens* Lam.)
Caricina divulsa St.-Lag. in Cariot, *Étude Fl.* ed. 8. 2: 875. 1889. (Based on *Carex divulsa* Gooden.)
Carex divulsa var. *Chaberti* Kneucker; Seubert, *Exc.-fl. Baden* ed. 5. 52. 1891. (Based on *C. Chaberti* F. Schultz.)
Carex muricata subsp. *macrocarpa* var. *divulsa* Neuman, *Sv. Fl.* 716. 1901. (Based on *C. divulsa* Gooden.)
Carex divulsa var. *polycarpa* Vollm. *Denks. Bot. Ges. Regensb.* 8: 81. 1903. (Type from central Europe.)
Carex divulsa var. *guestphalica* Vollm. *Denks. Bot. Ges. Regensb.* 8: 81. 1903. (Based on *C. guestphalica* Bönningh.)
Carex divulsa var. *miseria* Kükenth.; Vollm. *Denks. Bot. Ges. Regensb.* 8: 82. 1903. (Type from central Europe.)
Carex divulsa f. *miseria* Kükenth. in Engler, *Pflanzenreich* 4²⁰: 163. 1909. (Based on *C. divulsa* var. *miseria* Kükenth.)
Carex divulsa f. *polycarpa* Kükenth. in Engler, *Pflanzenreich* 4²⁰: 163. 1909. (Based on *C. divulsa* var. *polycarpa* Vollm.)

Cespitose, from thick, woody, black, conspicuously fibrillose, very short-prolonged root-stocks, the culms 2.5–10 dm. high, slender (3 mm. thick at base) but stiff, sharply triangular, rough above, exceeding the leaves, brown at base, the old leaves of the previous year not conspicuous; leaves with well-developed blades 5–7 to a culm, on lower fourth, but not bunched, the blades flat or slightly canaliculate, light-green, thin but firm, erect-ascending, usually 1.5–2.5 dm. long, about 2.5 mm. wide, roughened towards apex, long-attenuate, the sheaths tight, truncate and slightly thickened at mouth, not prolonged beyond base of blade, the ligule longer than wide; spikes 5–12, androgynous, forming a head 2.5–8 mm. long, about 8 mm. thick, the upper spikes closely contiguous, the lower several from little to strongly separate, suborbicular, the perigynia 3–10, appressed-ascending or at maturity spreading-ascending; lower few bracts short-prolonged, setaceous, not conspicuous, the upper scale-like; scales ovate, acute or mucronate, narrower and somewhat shorter than bodies of perigynia, straw-colored and chestnut- or yellowish-brown-tinged, with 3-nerved green center and narrow hyaline margins; perigynia plano-convex, rather narrowly ovate, 3.5–4.5 mm. long, 1.75 mm. wide, light-green, membranaceous, very obscurely nerved on both sides, sharp-margined to base, the margins slightly elevated, little thickened, serrulate at base of beak, rounded and little spongy at base, tapering into a serrulate beak 0.75 mm. long, bidentate, the teeth short, subulate-triangular, reddish-tipped, whitened within; achenes lenticular, yellowish, ovoid-quadrate, substipitate, apiculate, 2.5 mm. long, 1.75 mm. wide; style slender, straight, enlarged at base, jointed with achene; stigmas 2, reddish-brown, slender, short.

TYPE LOCALITY: "Cette plante croit dans les lieux humides & couverts, les bois, en Angleterre, en France, &c."

DISTRIBUTION: Sparingly adventized in the eastern United States. (Specimens examined from Pennsylvania, District of Columbia.) Widely distributed in Europe, western Asia, and northern Africa.

ILLUSTRATIONS: Engler, *Pflanzenreich* 4²⁰: 155. *pl. 26, L-O*; Schkuhr, *Riedgr. pl. Dd, f. 89; pl. Ww, f. 89*; Sturm, *Deuts. Fl.* 57: *pl. 3*; Reichenb. *lc. Fl. Germ.* 8: *pl. 220, f. 569, 570*; Anderss. *Cyp. Scand. pl. 3, f. 20*; Host, *Gram. Austr.* 1: *pl. 55*; Engl. *Bot. pl. 629*; ed. 3. *pl. 1625*; Coste, *Fl. Fr. f. 3825*; Hegi, *Ill. Fl. Mittel-Eur.* 2: 68. *f. 218*; Hallier, *Deuts. Fl. pl. 426*; Thomé, *Fl. Deuts. pl. 90, f. C*; *Flora* 54: *pl. 1*.

49. *Carex gravida* L. H. Bailey, *Mem. Torrey Club* 1: 5. 1889.

"*Carex cephaloidea* Dewey" Boott, *Ill. Carex* 123, *pl. 395*. 1862.

Carex gravida var. *laxifolia* L. H. Bailey, *Mem. Torrey Club* 1: 6. 1889. (Type from northern Illinois.)

Carex gravida f. *laxifolia* "L. H. Bailey" Kükenth. in Engler, *Pflanzenreich* 4²⁰: 157. 1909. (Based on *C. gravida* var. *laxifolia* L. H. Bailey.)

Cespitose, from short-creeping, blackish, woody, fibrillose rootstocks, the culms 3-6 dm. high, aphyllopodic, slender and rather weak, sharply triangular, roughened above, exceeding leaves, light-brown at base; leaves with well-developed blades 4-6 to a fertile culm, not bunched, the sheaths green-and-white-mottled and septate-nodulose dorsally, tardily breaking, truncate or convex and slightly if at all thickened at mouth, the blades erect, scarcely stiff, green, flat, mostly 1.5-2.5 dm. long, 3.5-5 mm. wide, the ligule wider than long; head ovoid or oblong, dense, 1-2.5 cm. long, 8-12 mm. thick, containing 6-12 androgynous spikes, only the lower distinguishable; bracts setaceous, much shorter than head; spikes with 5-15 ascending or spreading perigynia, the apical staminate flowers inconspicuous; scales ovate, thin, reddish-tinged, with green midvein excurrent as a long rough cusp, the scales somewhat narrower and (excluding cusp) shorter than perigynia; perigynia plano-convex, oblong-ovate, 4 mm. long, 2 mm. wide, greenish-straw-colored or at maturity shining and light-yellowish-brown, submembranaceous, serrulate to middle, nerveless ventrally, obscurely nerved dorsally, the body ovate, sharply smooth-margined nearly to the truncate more or less spongy base, the margins green, not raised, the body tapering into a serrulate beak one third its length, strongly bidentate, the teeth about 1 mm. long, very sharp, hyaline within, and the sutures on both sides conspicuous; achenes lenticular, filling body of perigynium, 2 mm. long and as wide, brownish-yellow, very minutely apiculate; style slender, with much enlarged base, jointed with achene; stigmas two, slender, light-reddish-brown, short.

TYPE LOCALITY: "Northern Illinois, *Vasey, Bebb*, to northwestern Iowa, *Cratty*."

DISTRIBUTION: Prairies and plains in calcareous districts, southwestern Ontario and Ohio to North Dakota and Wyoming, and southward to northwestern Missouri and Kansas. (Specimens examined from Ontario, Ohio, Indiana, Illinois, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Missouri, Kansas, Wyoming.)

ILLUSTRATIONS: Britt. & Brown, Ill. Fl. f. 829; ed. 2. f. 888; Rob. & Fern. Man. f. 404; Boott. Ill. Carex 123. pl. 395.

50. *Carex Lunelliana* Mackenzie, Bull. Torrey Club 42: 615. 1915.

"*Carex gravida* L. H. Bailey" Mackenzie & Bush, Man. Fl. Jackson Co. 51. 1902.

"*Carex gravida* var. *laxifolia* L. H. Bailey" Mackenzie & Bush, Man. Fl. Jackson Co. 51. 1902.

Cespitose, from short-creeping, dark-colored, woody, fibrillose rootstocks, the culms 3-6 dm. high, aphyllopodic, stout, 5-8 mm. thick at base, rather stiff, sharply triangular, roughened above, equaling or exceeding leaves, light-brown at base; leaves with well-developed blades 4-6 to a fertile culm, on lower half, not bunched, the sheaths green-and-white-mottled and conspicuously septate-nodulose dorsally, tardily breaking, truncate and only slightly colored or thickened at mouth, the blades light-green, rather stiff, flat, mostly 1-2 dm. long, 4-8 mm. wide, the ligule longer than wide; head ovoid or oblong-ovoid, dense, 1-3 cm. long, 8-15 mm. thick, containing 6-12 androgynous spikes, only the lower distinguishable; lower bracts at least setaceous-prolonged, usually shorter than the head; spikes with 5-15 ascending or, at maturity, spreading perigynia, the apical staminate flowers inconspicuous; scales ovate, tawny-tinged with 3-nerved green center, acuminate or cuspidate or short-awned, narrower and usually shorter than perigynia; perigynia plano-convex, 4.25 mm. long, 3.5 mm. wide, submembranaceous, serrulate to the middle, the body orbicular, greenish-straw-colored, or at maturity light-yellowish-brown and rather shining, obscurely nerved at base ventrally, several-ribbed dorsally, sharply smooth-margined nearly to the round-truncate, somewhat spongy base, the margins green, not raised, the body somewhat abruptly contracted into a serrulate beak one fourth its length, strongly bidentate, the teeth about 0.5 mm. long, sharp, hyaline within, the sutures on both sides conspicuous; achenes lenticular, filling body of perigynium, 2 mm. long and as wide, brownish-yellow, minutely apiculate, jointed with the deciduous style, the latter with much enlarged base; stigmas two, light-brown, short, slender.

TYPE LOCALITY: Oak Grove, Jackson County, Missouri (*Bush 7020*).

DISTRIBUTION: Dry prairies in calcareous districts, Illinois and Iowa to Texas and New Mexico. (Specimens examined from Illinois, Iowa, Missouri, Kansas, Oklahoma, Texas, New Mexico.)

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