

Carey. Glaucons; leaves 3" broad or more; staminate spike prominent, mostly stalked; pistillate spikes long and alternately flowered, scattered and peduncled; perigynium (as in the following varieties) elliptic, attenuate at both ends, mostly less prominently nerved, and the beak not strongly recurved. Open places, N. Eng. to Mich., and southward; frequent. — Var. *DIVARICATA*, Bailey. Tall and stout; leaves narrower; staminate spike large and stalked; pistillate spikes scattered, all but the upper one prominently peduncled, long; perigynium very large, divaricate, triangular, contracted into a stipe-like base at least half as long as the body. Near Washington, *Vasey*. — Var. *STYLOFLÉXA*, Boott. Very weak and slender; leaves 2" wide or less; staminate spike usually peduncled; pistillate 2-3, scattered, few-flowered, lowest drooping; perigynium very long-pointed. S. E. Penn., and southward; frequent. — = Perigynium sharply triangular, short, and mostly not prominently beaked.

a. Spikes drooping or flexuose.

69. *C. digitalis*, Willd. Very slender, bright green, tufted, 6-18' high; leaves very narrow (1-2" wide); staminate spike short-stalked; pistillate spikes 2-4, all on filiform stalks and all but the upper widely spreading or drooping, linear, alternately flowered; perigynium very small, impressed-nerved, longer than the acute whitish scale. — Dryish woods and glades, N. Eng. to Mich., and southward; frequent. — Var. *COPULATA*, Bailey. Leaves much broader, and the culms weak and reclined; spikes heavier and mostly shorter; perigynium larger, very sharp. Rich woods, central Mich., and probably elsewhere westward.

70. *C. laxiculmis*, Schwein. Differs from the variety of n. 69 chiefly in its more caespitose habit, its densely glaucous-blue covering, very slender culm, and very long and filiform peduncles. (*C. retrocurva*, *Dewey*.) — Glades, N. Eng. to Mich. and Va.; rare westward.

b. Spikes erect.

71. *C. ptychocarpa*, Steudel. Low, glaucous, 3-10' high; leaves flat and rather broad (2" or more), much exceeding the culm; bracts leafy and much prolonged; staminate spike very small and sessile, mostly overtopped by the upper pistillate spike; pistillate spikes 2-3, sessile or short-stalked or rarely the lowest long-peduncled, erect; perigynium tawny, much as in n. 69, twice longer than the very thin obtuse scale. — Low grounds or swamps, E. Mass., N. J., Del., and southward; local.

72. *C. platyphylla*, Carey. Low, spreading, glaucous, 6-12' high; leaves $\frac{1}{2}$ ' broad or more, mostly shorter than the culms; bracts with thin and sharp-pointed leaf-like tips 1-2' long; staminate spike stalked; pistillate spikes 2-3, scattered, all more or less peduncled, alternately 2-10-flowered; perigynium short, strongly many-striate, about the length of the acute or cuspidate scale. — Rich shady woods and banks, N. Eng. to Mich., and southward to Va.; mostly local.

73. *C. Careyana*, Torr. Tall and slender, mostly erect, 1-2° high, leaves bright green, firm, 3-4" wide or more, shorter than the long culm; bracts leafy, longer than in the last; staminate spike heavy and stalked; pistillate spikes 2-3 (mostly 2), the upper usually near the terminal spike, and nearly sessile, the other remote and long-peduncled, loosely 2-8-flowered;

perigynium very large and very sharply angled, the beak oblique, finely many-nerved, twice longer than the sharp scale. — Rich woods, N. Eng. to Mich., and southward to Washington; rare.

++ ++ Sheaths usually purple.

74. *C. plantaginea*, Lam. Slender but erect, 1-2° high; leaves $\frac{1}{2}$ -1' broad, very firm, appearing after the flowers and persisting over winter, shorter than the culm; staminate spike purple and clavate, stalked; pistillate spikes 3-4, scattered, loosely few-flowered, erect, the peduncles included in the leafless sheaths; perigynium smaller than in n. 73, prominently beaked, about as long as the sharp scale. — Rich woods, N. Eng. to Wisc., and southward; local.

* 6. — + 3. *Panicææ*.

++ Beak cylindrical and prominent; plant not glaucous.

75. *C. Saluensis*, Bailey. Very slender and more or less diffuse, strongly stoloniferous, 1-1 $\frac{1}{2}$ ' high; leaves narrow and soft, shorter than the culm; spikes 2-3, scattered, all peduncled and more or less spreading, loosely 3-10-flowered; perigynium small, nearly nerveless, thin, the beak straight and sharply toothed; scale loose, acute, shorter than the perigynium. (*C. vaginata*, last ed.) — Deep swamps, Vt. to Minn.; local.

76. *C. polymorpha*, Muhl. Stout, 1-2° high; leaves rather broad, short; spikes 1-2, short-stalked, erect, compact or rarely loose, usually staminate at the apex, 1 $\frac{1}{2}$ ' long or less; perigynium long-ovate, obscurely nerved; the very long and nearly straight beak oblique or lipped at the orifice; scale reddish-brown, obtuse, shorter than the perigynium. — Moist meadows, Mass. to N. C.; local.

++ ++ Beak short or none; plant often glaucous.

= Plants of ordinary habit.

77. *C. tetanica*, Schkuhr. Rather slender, rarely glaucous, somewhat stoloniferous; culm scabrous, at least above; spikes all peduncled, the upper one very shortly so, pale, all more or less attenuate below, the lower borne in the axils of bracts 3' long or more; perigynium not turgid, greenish, prominently many-nerved, the beak strongly bent; scale obtuse or abruptly mucronate, all except the lowest mostly shorter than the perigynium. — Meadows and borders of ponds from W. Mass. westward; common westward. — Var. *WOODII*, Bailey. Very slender and strongly stoloniferous; leaves narrow, very long and lax; spikes mostly alternately flowered throughout; scales often sharper. (*C. Woodii*, *Dewey*.) Rich woods, N. Y. to Mich., and south to Washington; frequent. — Var. *MEADII*, Bailey. Stiffer; leaves mostly broader and stricter; spikes thick and densely flowered, not attenuate at base, the upper one often sessile; perigynium larger. (*C. Meadii*, *Dewey*.) R. I. to Neb., and southward; rare eastward. — Var. *CANBYI*, Porter. Stout and stiff; leaves still broader (about 2" wide) and flat; spikes thick, often $\frac{1}{4}$ ' wide; perigynium long, straight or very nearly so; scale large, nearly equalling or exceeding the perigynium. E. Penn. (*Canby*); Ill. and Wisc.; little known.

C. PANICEA, L. Strict, often stiff, glaucous-blue 1-2° high; culm smooth; bracts 1-2' long; spikes 1-3, scattered, colored, peduncled, erect, rather compact or loose below, seldom 1' long; perigynium ovoid, yellow or purple, somewhat turgid, scarcely nerved, the point usually curved, mostly longer than the purple-margined scale. — Fields, E. Mass. and R. I. (Nat. from Eu.)

= = *Very strict, densely glaucous.*

78. *C. livida*, Willd. Culms 18' high or less; leaves narrow, often becoming involute; spikes 1 or 2 and aggregated or approximate, or rarely a third nearly radical, sessile or nearly so, erect, narrow; perigynium ovoid-oblong, nerved, granular, beakless, the point straight or nearly so, orifice entire; scale obtuse, mostly a little shorter than the perigynium. — Pine-barrens of N. J., and sphagnum swamps northward to N. Eng. and L. Superior; local. (Eu.)

* 6. — + 4. *Bicolores.*

79. *C. aurea*, Nutt. Low and slender, 1° high or less; bracts exceeding the culm; spikes 2-4, all but the lowest usually approximate, peduncled or the upper one or two sessile, erect, loosely few-flowered or sometimes becoming $\frac{3}{4}$ long, at maturity yellow or brown, the terminal one frequently pistillate above; perigynium fleshy at maturity, nerved, longer than the blunt scale. — Wet meadows and springy banks, throughout; rather common.

* 6. — + 5. *Digitatae.*

→ Spikes two or more.

80. *C. ebúrnea*, Boott. Exceedingly slender and capillary, erect, 4-12' high, stoloniferous; leaves shorter than the culm; staminate spike very small and very short-peduncled, overtopped by the two upper pistillate spikes; pistillate spikes 2-4, approximate or the lowest remote, all stalked, erect, 2-6-flowered; perigynium very small, almost nerveless, smooth and becoming black and shining at full maturity; scale white and thin, obtuse, shorter than the perigynium. — Tufted in sandy or light soils from N. Eng. to Ky. and Neb.; frequent.

81. *C. Richardsoni*, R. Br. Rather stiff, 4-9' high, stoloniferous; sheaths short, purple or brown; staminate spike stout and mostly short-peduncled; pistillate spikes 1-2, approximate, the very short stalks included, erect, compact, less than $\frac{1}{4}$ in length; perigynium obovoid, firm, hairy, the very short beak entire or erose; scale brown with a conspicuous white-hyaline margin, obtuse or pointless, and longer than the perigynium. — Dry ground, western N. Y. to Ill., and northwestward; rare.

82. *C. pedunculata*, Muhl. Low and diffuse, 3-10' high, forming mats; leaves abundant, very green, flat and firm, longer than the weak culms; staminate spike very small, with the uppermost pistillate spike sessile at its base; pistillate spikes 2-4 on each culm, scattered and long-peduncled from green sheaths, erect or spreading, many other spikes nearly or quite radical and very long-stalked, all 3-8-flowered; perigynium triangular-obovate, smooth or very slightly pubescent above, the short and nearly entire beak somewhat oblique; scale green or purple, truncate and cuspidate, mostly a little longer than the perigynium. — Dry woods and banks, N. Eng. to Va. (Kennedy) and Minn.; frequent northward.

→ → Spike one or rarely a rudiment of a second; plant dioecious.

83. *C. picta*, Steudel. Rather weak, 1° high or less; leaves flat and firm, persisting through the winter, at least twice longer than the culm; a sheathing purple scale at the base of the spike; staminate spike about 1' long, clavate in anthesis, the purple scales ending in a very short and blunt whitish tip; pistillate spike narrower and mostly longer, the scales more abruptly contracted

into a colored cusp and at length deciduous; perigynium obovate, much contracted below into a stipe-like base, very strongly nerved, entirely pointless, hairy above, covered by the scale. (*C. Bootiana*, Benth.) — In a wooded ravine with *Hepatica* and *Epigaea*, near Bloomington, Ind. (Dudley); also Ala. and La.

* 7. *SPHERIDIOPHORÆ*. — + 1. *Scirpinæ.*

84. *C. scirpoidea*, Michx. Strict, the pistillate plant mostly stiff, 6-18' high; leaves flat, shorter than the culm; spike 1' long or less, densely cylindrical, very rarely with a rudimentary second spike at its base; perigynium ovate, short-pointed, very hairy, about the length of the ciliate purple scale. — Mountains of N. New Eng.; Drummond's Island, L. Huron. (Norway.)

* 7. — + 2. *Montanae.*

→ Some or all of the culms longer than the leaves (or in the type of n. 85 frequently shorter).

→ Staminate spike minute, wholly or partially concealed in the head; leaves always very narrow; radical spikes often present.

85. *C. deflexa*, Hornem. Diffuse and low, tufted; culms 1-6' high, retaceous, more or less curved or spreading, little exceeding or shorter than the leaves; staminate spike exceedingly minute and nearly always entirely invisible in the head; pistillate spikes 2-3, 2-5-flowered, green, or green and brown, all aggregated into a head, the lowest one always more or less short-peduncled and subtended by a leafy bract $\frac{1}{2}$ long or less; radical spikes few; perigynium very small and much contracted below, sparsely hairy or nearly smooth, the beak flat and very short, mostly longer than the acutish scale. (*C. Nova-Angliae*, last ed., mostly.) — High mountains of N. H. and Vt.

Var. *Déanei*, Bailey. Taller and lax, the culms 6-12' high and some or all prominently longer than the longer and loose leaves; staminate spike much larger (2-3" long), erect or oblique, sessile; pistillate spikes larger (4-8-flowered), less aggregated of the lowest usually separated, though rarely more than $\frac{1}{4}$ apart; radical spikes usually numerous; bract mostly longer. — Swales or dryish places, high or subalpine regions, Mt. Desert, Maine (Rand); Essex, Mass.; N. H., Vt., and N. Y.; scarce. In aspect like n. 86.

Var. *media*, Bailey. Rather stiff, 4-12' high, in dense tufts; most of the spikes equalling or exceeding the leaves, the staminate prominent, erect (3-5" long), sessile or very short-peduncled; pistillate spikes 2-3, all scattered, the uppermost at or near the base of the staminate spike, the lowest usually very prominently peduncled and subtended by a conspicuous bract which surpasses the culm, all rather compactly 3-8-flowered, green, or brown and green; radical spikes several; perigynium larger, much like that of short-beaked forms of n. 90. — Keweenaw Co., Mich. (Farwell); also far westward.

86. *C. varia*, Muhl. Erect, mostly strict, 6-15' high, tufted and somewhat stoloniferous; culms variable in length, often twice longer than the leaves; staminate spike 3" long or less; pistillate spikes closely aggregated, or rarely somewhat loosely disposed but never scattered, all strictly sessile, green; radical spikes none; lower bract usually present; perigynium longer-pointed than in the last, about the length of the sharp scale. (*C. Emmonsii*, Dewey.) — Banks and dry woods; frequent. — In var. *colorata*, Bailey, the scales are purple. Mostly southward.

= = *Staminate spike very prominent (or in the variety of n. 89 very small, but the leaves broad); radical spikes none.*

a. *Scales smooth.*

87. *C. Novæ-Angliæ*, Schwein. Very slender and soft, erect, stoloniferous, 6-8' high; culms little longer than the very narrow leaves; staminate spike exceedingly narrow (3-8" long by about $\frac{1}{8}$ " wide), mostly minutely peduncled; pistillate spikes 2, or rarely 3, the upper one near the base of the staminate spike, the lower very short-peduncled and removed $\frac{1}{2}$ -1' and subtended by a leafy bract which nearly or quite equals the culm, both rather loosely 3-6-flowered; perigynium very narrow, often nearly oblanceolate, small, very thinly hairy, the beak sharp and prominent; stigmas often 2.—Mountain swamps of W. Mass., and Mt. Desert, Maine (*Rand*); rare.

88. *C. Pennsylvanica*, Lam. A foot high or less, erect, strongly stoloniferous, forming large patches; leaves narrow and more or less involute, dark or dull green, mostly nearly as long as the culm; staminate spike $\frac{1}{2}$ ' (rarely $\frac{3}{4}$ ') long, usually dull brown or brown-purple, sessile or very nearly so; pistillate spikes 1-3, contiguous or the two lower rarely $\frac{1}{2}$ ' apart, all sessile and usually dark-colored, the lowest bract very short or at least rarely prominent; perigynium short- or round-ovate, hairy.—Dry fields; our commonest species.

89. *C. communis*, Bailey. Habitually taller and stricter, 8-18' high, in small tufts, never stoloniferous; leaves proportionately shorter, broad (about 2"), flat and pale; staminate spike mostly longer, often short-peduncled and usually paler; pistillate spikes 2-4, scattered on the upper part of the culm, green or tawny, the lowest one or two sometimes peduncled and often with prominent leafy bracts. (*C. varia*, last ed.)—Dry hill-sides; common.

Var. *Wheeleri*, Bailey. Mostly greener, 3-14' high; leaves soft and flat and much shorter than the culm; staminate spike $\frac{1}{4}$ ' long or less, very narrow, sessile and oblique; pistillate spikes mostly closer together.—Knolls in woods, Ionia Co., Mich. (*Wheeler*), and Alcona Co. (*Bailey*); Middletown, Conn. (*Barratt*), and Cheshire Co., N. H. It has much the aspect of n. 86, but is readily distinguished by the broad leaves and more scattered spikes.

b. *Scales rough-cuspidate.*

C. PRÆCOX, Jacq. Rather stiff, the culm sometimes curved, 3-10' high, leaves flat, shorter than the culm; staminate spike prominently clavate, mostly sessile; pistillate spikes 2-3, all contiguous, sessile or the lowest very short-peduncled and subtended by a bract scarcely as long as itself, all oblong or short-cylindric, the lowest about 6" long; perigynium triangular-obovoid, the very short beak entire or erose, thinly hispid-hirsute, about the length of the scale.—Fields, E. Mass. (Nat. from Eu. early in the century.)

++ Part or usually all of the culms much shorter than the leaves.

90. *C. umbellata*, Schkuhr. (Pl. 6, fig. 11-14.) Low, growing in small and dense mats (1-3' across); leaves short and often stiff (2-6" long), flat, the earliest very narrow but the later often 2" broad; spikes all on separate scapes which rarely exceed 1-2' in length (or rarely one or two short true culms), usually densely aggregated at the surface of the ground and hidden by the leaves, the pistillate spikes green or tawny and rather loosely few-flowered; perigynium slenderly beaked, toothed, very lightly pubescent, about the length of the acute and often rough-tipped scale.—Dry banks and knolls, N. Eng.

to N. J. and N. Y., and perhaps farther westward; infrequent.—Var. *vicina*, Dewey. Tufts looser and larger; leaves longer (often 1° or more) and laxer, sometimes broader; some pistillate spikes borne near the base of the staminate on a true culm which is 3-8' high, one or two on each culm. With the species and farther westward; infrequent.

91. *C. nigro-marginata*, Schwein. Leaves mostly stiffer than in n. 90, often broader, and some of the culms prolonged; perigynium smooth or nearly so, shorter beaked; scales purple-margined, giving the spikes a very dark or variegated appearance, considerably larger and longer than in the last.—Dry hillsides, N. J., and southward; local.

* 7. — + 3. *Triquetra*.

92. *C. pubescens*, Muhl. Strict, 1-2° high, pubescent throughout; leaves flat and soft, shorter than the culm; spikes 2-4, the lower 1 or 2 short-peduncled, and about $\frac{1}{2}$ ' long, loosely flowered, erect; perigynium very hairy, conspicuously beaked and minutely toothed, straight, about the length of the truncate and rough-cuspidate thin scale.—Copses and moist meadows, N. Eng. to Ky., and westward; frequent.

* 8. *PHYLLOSTACHYÆ*.

93. *C. Jamésii*, Schwein. (Pl. 5, fig. 17-21.) Diffuse, 6-10' high; leaves very narrow (1" or less), much surpassing the culm; spike very small, the staminate portion inconspicuous, the pistillate flowers 1-3 and loosely disposed; perigynium globular, produced into a very long and roughened nearly entire beak; scale narrow, the lowest often 1-2' long, the upper often shorter than the perigynium. (*C. Stendelii*, Kunth.)—Woods, N. Y. to Ill., and southward; frequent.

94. *C. Willdenovii*, Schkuhr. Lower, stiffer, the leaves broader and pale; spike larger, the pistillate flowers 3-9, compact; perigynium bearing a prominent two-edged very rough beak; scales chaffy, nerved, as broad as and somewhat longer than the perigynium, or the lowest rarely overtopping the spike.—Copses, Mass. to Mich., and southward; rare.

95. *C. Bäckii*, Boott. Forming dense mats; leaves still broader (2" or more), very abundant; staminate flowers about 3; pistillate 2-5; perigynium more gradually beaked, smooth throughout; scales very broad and leaf-like, all exceeding the culm and entirely enveloping the spike.—W. Mass. to Ohio, and far westward; local and rare, especially eastward.

* 9. *LEPTOCÉPHALÆ*.

96. *C. polytrichoides*, Muhl. Capillary, erect or slightly diffuse, 6-18' high; leaves mostly shorter than the culm; spike 2-4" long, linear, the staminate portion very small; perigynium thin and green, nerved, about twice longer than the obtuse caducous scale.—Bogs; common.

* 10. *PHYSOCÉPHALÆ*.

97. *C. Fraseri*, Andrews. Cespitose; culm 6-15' high, naked or the lower portion included in loosely sheathing abortive leaves, smooth and stiff; leaves 1' broad or more, destitute of midrib, very thick and persistent, pale, 1-2° long; spike whitish; perigynium ovoid, faintly nerved, much longer than the scale.—Rich mountain woods, Va. and southward; very local and rare. A most remarkable plant.

§ 2. VIGNEA. — * 11. ACROARRHÈNÆ. — + 1. Fétidæ

98. *C. chordorhiza*, Ehrh. Very extensively stoloniferous; culm mostly erect, 1-1½° long; leaves involute, shorter than the culm; perigynium globular, very strongly nerved, short-pointed and entire, about the length of the acute scale. — Cold bogs and soft lake-borders, Vt. to Iowa, and northward; infrequent. (Eu.)

99. *C. stenophylla*, Wahl. Stiff, 3-8' high; leaves involute and shorter than the culm; perigynium ovate, flat on the inner face, lightly nerved, gradually contracted into a short and entire rough-edged beak, tightly enclosing the achene, at maturity longer than the hyaline acutish scale. — Dry grounds, Thayer Co., Neb. (Bessey); Emmet Co., Iowa (Cratty), and westward. (Eu.)

* 11. — + 2. Vulpinæ.

++ Beak shorter than or about as long as the body of the perigynium.

100. *C. conjuncta*, Boott. Strict but rather weak, 1½-3½° high; culm soft and sharply triangular or nearly wing-angled, becoming perfectly flat when pressed; leaves soft, about 3" broad; head 1-3' long, interrupted, often nearly green, infrequently bearing a few setaceous bracts; perigynium lanceolate, light colored, whitish and thickened below, the beak lightly notched and roughish, about equalling or a little exceeding the cuspidate scale. — Swales and glades, N. J., Ky., and westward; usually rare.

++ Beak twice the length of the body of the perigynium or longer.

101. *C. stipata*, Muhl. Stout, 1-3° high, in clumps; culm rather soft, very sharp; head 1-3' long, rarely somewhat compound at base, interrupted, the lowest spikes often ½' long; perigynium lanceolate, brown-nerved, the beak toothed and roughish, about twice the length of the body, and much longer than the scale. — Swales; common and variable.

102. *C. crus-córvi*, Shuttlew. Stout, glaucous, 2-3° high; culm rough, at least above; leaves flat and very wide; head much branched and compound, 3-6' long; perigynium long-lanceolate, the short base very thick and disk-like, the roughish and very slender beak thrice the length of the body or more, 3-4 times the length of the inconspicuous scale. — Swamps, S. Minn. to Neb. and Ky., and southward; rare northward.

* 11. — + 3. Multifloræ.

++ Spikes conspicuously panicled.

103. *C. decomposita*, Muhl. Stout, exceedingly deep green, 1½-3° high, in stools; culm very obtusely angled, almost terete below; leaves firm, channelled below, longer than the culm; head 2-4' long, the lower branches ascending and 1-2' long; perigynium very small, round-obovate, few-nerved, hard and at maturity shining, the abrupt short beak entire or very nearly so; scale acute, about the length of the perigynium. — Swamps, N. Y. to Mich., and southward; local.

++ Spikes in a simple or nearly simple head.

= Leaves very narrow (1" broad or less), becoming more or less involute.

104. *C. teretiúscula*, Gooden. Slender but mostly erect, 1½-2½° high, in loose stools; culm rather obtuse, rough at the top, mostly longer than the leaves; head 1-2' long, compact or somewhat interrupted, narrow (¼' wide or

less); perigynium very small, ovate and truncate below, bearing a few inconspicuous short nerves on the outer side, stipitate, firm and at maturity blackish and shining, the short beak lighter colored; scale chaffy and acute, about the length of the perigynium. — Swales, N. Eng. to Penn., and westward; common. (Eu.) — Var. *RAMOSA*, Boott. More slender; head mostly longer, the upper portion often somewhat nodding, the spikes scattered and the lowest ones often slightly compound. N. Y., and westward; common.

= Leaves broader and flat (occasionally involute in n. 106).

a. Scales very sharp, mostly rough-tipped.

1. Perigynium large (2" long or more), nerveless on the inner face.

105. *C. alopecoidea*, Tuckerm. Stout but rather soft, 2-3° high; culm rather sharp, thick and soft in texture; leaves 2-3" wide, about the length of the culm, very green; head 1½' long or less, sometimes green, and occasionally a little compound, the spikes many and compactly or somewhat loosely disposed or the lowest often separate and all mostly short-oblong; perigynium ovate, tapering into a rough beak, very prominently stipitate, with a few brown nerves on the outer face, ascending, about equalling or a little exceeding the scale. — Open swales, N. Y., Penn., and Mich.; local. In aspect like n. 101.

Var. *sparsispicata*, Dewey. Weak, the leaves much narrower and lax; head 1-3' long and linear or nearly so, the spikes smaller and separated or scattered. — S. E. Mich. (Cooley, Clark); little known.

106. *C. grávida*, Bailey. Lower and the culm thinner and more sharply angled, 1-2° high; leaves rather narrower and firmer, shorter than the culm; head short, always simple, globular or short-oblong, the lowest spikes rarely distinct; spikes few (4-7), globular, or broader than long; perigynium broadly ovate, nearly twice larger, sessile, plump and somewhat polished at maturity, prominently spreading. — N. Ill. to Iowa and Neb. — Var. *LAXIFOLIA*, Bailey. Much larger, 2-3½° high; leaves broader (about ½') and lax; head large and dense, ovoid or oblong, scarcely interrupted. N. Ill. to S. Dak.

2. Perigynium very small, mostly nerved on the inner face.

107. *C. vulpinoidea*, Michx. Mostly rather stiff, 1-2½° high; culm very rough, at least above; leaves various, mostly flat and longer than the culm; head 1-4' long, usually much interrupted and frequently somewhat compound, varying from dull brown to almost green at maturity, commonly provided with many very setaceous short bracts; spikes very numerous, ascending and densely flowered; perigynium ovate or lance-ovate, mostly ascending. — Low places, variable; very abundant, especially northward.

b. Scales blunt, smooth and hyaline-tipped.

108. *C. Sartwellii*, Dewey. Stiff and strict, 1½-2½° high; leaves produced into a long slender point, mostly shorter than the culm; staminate flowers variously disposed, frequently whole spikes being sterile; head 1-3' long and rather narrow, the individual spikes usually clearly defined, or occasionally the head interrupted below, tawny-brown; perigynium elliptic or lance-elliptic, nerved on both sides, very gradually contracted into a short beak; scale about the length of the perigynium. (*C. disticha*, last ed.) — Bogs, central N. Y., west and northward; frequent.

* 11. — 4. *Arenaria*.

C. ARENARIA, Linn. Extensively creeping, 1° high or less; leaves very narrow and very long-pointed, shorter than the culm; head about 1' long, dense or sometimes interrupted, ovoid or oblong; spikes few to many, those at the apex of the head usually staminate, the intermediate ones staminate at the summit, the lowest entirely pistillate and subtended by a bract about 1' long; perigynium very strongly nerved on both faces, wing-margined above, sharply long-toothed, about the length of the scale. — Sea-beaches near Norfolk, Va. (McMinn). (Adv. from Eu.)

* 11. — 5. *Muhlenbergiana*.

++ Heads narrow, the spikes scattered (or often aggregated in *C. muricata*).
= Perigynium almost terete.

109. **C. tenella**, Schkuhr. Exceedingly slender, 6'–2° high, in tufts; leaves flat, soft, and weak, mostly shorter than the culm; spikes 1–3-flowered, or the terminal 4–6-flowered, all distinct and scattered on the upper part of the culm, the bracts obsolete or the lowest present and very short; perigynium elliptic-ovate, very plump, finely nerved, the minute beak entire, longer than the white scale, usually at length splitting and exposing the blackish achene. — Cold swamps, N. Eng. to Penn., and far westward; common. (Eu.)

= = Perigynium flattish.

110. **C. rosea**, Schkuhr. Always slender and weak, erect, 1–2½° high, exceeding the narrow leaves; spikes 5–8, 6–14-flowered, the upper 3–4 aggregated, the others 3–9" apart, the lowest usually with a setaceous bract; perigynium lance-ovate, thin and shining, nerveless, scarcely margined, rough on the edges above, perfectly squarrose, very green, about twice longer than the translucent white scale. — Rich woods, N. Eng. to Minn. and Neb.; frequent. — Var. *RADIATA*, Dewey. Lower and much more slender, the culms sometimes almost capillary; spikes 2–5, scattered, 2–4-flowered; perigynium mostly narrower and more ascending. Open places and drier woods; common.

Var. *Texensis*, Torr. Very slender but strict, 1° high or less; spikes 3–4, all contiguous or the lower ones approximate, 2–6-flowered; perigynium lanceolate, the base prominently spongy, smooth or nearly so, conspicuously divaricate. — Dry places, S. Ill. (Schneck), and southward.

Var. *retroflexa*, Torr. Often rather stiff, 1–1½° high; spikes 4–8, the upper ones aggregated, the lower 1 or 2 separated and commonly subtended by a conspicuous bract, often brownish; perigynium ovate, smooth throughout, very prominently corky and swollen at the base, which is frequently contracted almost to a stipe, at maturity usually widely spreading or reflexed; scale brownish and sharp, at length deciduous. (*C. retroflexa*, Muhl.) — Copses, throughout; rare northward.

111. **C. sparganioides**, Muhl. Stouter, stiff; culm 2–3° high; leaves very broad (usually ¼ or more) and flat, their sheaths conspicuously clothing the base of the culm; spikes 6–10, the 2 or 3 upper ones contiguous, the remainder entirely separate, very green, oblong or short-cylindric, the lowest often compound, all truncate at top; perigynium ovate, wing-margined, rough on the short beak, often obscurely nerved on the outer face, considerably longer than the rough-pointed scale. — Rich woods; frequent.

C. MURICATA, L. Culm 1–2° high, rough, longer than the narrow leaves; spikes 5–10, variously disposed, but usually some of them scattered, frequently

all aggregated, rarely tawny; perigynium heavy, ovate, thin and shining, nerveless, the long beak minutely rough, spreading, a little longer than the sharp green or brownish scale. — Dry fields, E. Mass., where it is common, and sparingly south and westward to Va. and Ohio. (Nat. from Eu.)

++ Heads short-oblong or globular, the spikes all aggregated, or only the lowest one or two separate.

= Plant very stiff throughout.

112. **C. Muhlenbergii**, Schkuhr. Pale, growing in small tufts, 1–2½° high; culms much prolonged beyond the few narrow and at length involute leaves; head ¼ long or less, the individual spikes clearly defined; spikes globular, 4–8; perigynium nearly circular, very strongly nerved on both faces, broader than the rough-cuspidate scale and about as long. — Open sterile soils; frequent. — Var. *ENÉRVIS*, Boott. Perigynium nearly or entirely nerveless. Southeastern N. Y., and southward; rare.

= = Plant strict but not stiff.

113. **C. cephaloidea**, Dewey. Lax, very green, 2–3° high; leaves broad (2–3") and thin, shorter than the long culm; head rather loose, ¼ long or more, all but the very uppermost spikes clearly defined; perigynium ovate, entirely nerveless, long rough-pointed, spreading, twice longer than the very thin scale or more. — Shady banks, W. Mass. to Mich.; frequent.

114. **C. cephalophora**, Muhl. Mostly smaller and stricter, pale; leaves half as wide or less; head small, rarely ½ long, globular or very short-oblong, never interrupted, the lower 1 or 2 spikes usually bearing a very setaceous short bract; perigynium twice smaller than in the last, scarcely longer than the rough-cuspidate scale. — Dry and mostly sterile knolls; common.

Var. *angustifolia*, Boott. Low, 8' high or less; leaves very narrow; head smaller, usually tawny; perigynium mostly broader. — West and southward; rare.

* 11. — 6. *Didica*.

++ Perigynium nerveless or very nearly so.

115. **C. capitata**, L. Rigid, 3'–1° high; leaves filiform, shorter than the culm; head globular, uniformly staminate above, brown, very small; perigynium broadly ovate, very thin, whitish, prominently beaked, erect and appressed, longer than the very thin and obtuse scale. — Alpine summits of the White Mountains. (Eu.)

++ Perigynium prominently nerved.

116. **C. gynocrates**, Wormsk. Stiff but very slender, 3–6' high, diceous; leaves filiform and setaceous, about the length of the culm; spike oblong, 2–4" long; perigynium elliptic-ovate, nearly terete, stipitate, widely spreading or reflexed at maturity, 1 or 2 sometimes borne at the base of the staminate spike. — Cold sphagnum swamps, Penn., north and westward; local, particularly southward.

117. **C. exilis**, Dewey. Very stiff, slender, 1–2° high; leaves involute-filiform and very stiff, shorter than the culm; spike varying from almost globular to cylindrical (frequently 1' long), either unisexual or the sexes variously placed, very rarely a supplementary spike at base; perigynium elliptic-ovate, flattish, stipitate and somewhat cordate at base, strongly brown-nerved

* 11. — 4. *Arenària*.

C. ARENÀRIA, Linn. Extensively creeping, 1° high or less; leaves very narrow and very long-pointed, shorter than the culm; head about 1' long, dense or sometimes interrupted, ovoid or oblong; spikes few to many, those at the apex of the head usually staminate, the intermediate ones staminate at the summit, the lowest entirely pistillate and subtended by a bract about 1' long; perigynium very strongly nerved on both faces, wing-margined above, sharply long-toothed, about the length of the scale. — Sea-beaches near Norfolk, Va. (McMinn). (Adv. from Eu.)

* 11. — 5. *Muhlenbergiæ*.

++ Heads narrow, the spikes scattered (or often aggregated in *C. muricata*).
= Perigynium almost terete.

109. **C. tenella**, Schkuhr. Exceedingly slender, 6'-2° high, in tufts; leaves flat, soft, and weak, mostly shorter than the culm; spikes 1-3-flowered, or the terminal 4-6-flowered, all distinct and scattered on the upper part of the culm, the bracts obsolete or the lowest present and very short; perigynium elliptic-ovate, very plump, finely nerved, the minute beak entire, longer than the white scale, usually at length splitting and exposing the blackish achene. — Cold swamps, N. Eng. to Penn., and far westward; common. (Eu.)

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110. **C. rosea**, Schkuhr. Always slender and weak, erect, 1-2½° high, exceeding the narrow leaves; spikes 5-8, 6-14-flowered, the upper 3-4 aggregated, the others 3-9" apart, the lowest usually with a setaceous bract; perigynium lance-ovate, thin and shining, nerveless, scarcely margined, rough on the edges above, perfectly squarrose, very green, about twice longer than the translucent white scale. — Rich woods, N. Eng. to Minn. and Neb.; frequent. — Var. *RADIATA*, Dewey. Lower and much more slender, the culms sometimes almost capillary; spikes 2-5, scattered, 2-4-flowered; perigynium mostly narrower and more ascending. Open places and drier woods; common.

Var. *Texensis*, Torr. Very slender but strict, 1° high or less; spikes 3-4, all contiguous or the lower ones approximate, 2-6-flowered; perigynium lanceolate, the base prominently spongy, smooth or nearly so, conspicuously divaricate. — Dry places, S. Ill. (Schneck), and southward.

Var. *retrofléxa*, Torr. Often rather stiff, 1-1½° high; spikes 4-8, the upper ones aggregated, the lower 1 or 2 separated and commonly subtended by a conspicuous bract, often brownish; perigynium ovate, smooth throughout, very prominently corky and swollen at the base, which is frequently contracted almost to a stipe, at maturity usually widely spreading or reflexed; scale brownish and sharp, at length deciduous. (*C. retrofléxa*, Muhl.) — Copses, throughout; rare northward.

111. **C. sparganioides**, Muhl. Stouter, stiff; culm 2-3° high; leaves very broad (usually ¼' or more) and flat, their sheaths conspicuously clothing the base of the culm; spikes 6-10, the 2 or 3 upper ones contiguous, the remainder entirely separate, very green, oblong or short-cylindric, the lowest often compound, all truncate at top; perigynium ovate, wing-margined, rough on the short beak, often obscurely nerved on the outer face, considerably longer than the rough-pointed scale. — Rich woods; frequent.

C. MURICATA, L. Culm 1-2° high, rough, longer than the narrow leaves; spikes 5-10, variously disposed, but usually some of them scattered, frequently

all aggregated, rarely tawny; perigynium heavy, ovate, thin and shining, nerveless, the long beak minutely rough, spreading, a little longer than the sharp green or brownish scale. — Dry fields, E. Mass., where it is common, and sparingly south and westward to Va. and Ohio. (Nat. from Eu.)

++ Heads short-oblong or globular, the spikes all aggregated, or only the lowest one or two separate.

= Plant very stiff throughout.

112. **C. Muhlenbergii**, Schkuhr. Pale, growing in small tufts, 1-2½° high; culms much prolonged beyond the few narrow and at length involute leaves; head ½' long or less, the individual spikes clearly defined; spikes globular, 4-8; perigynium nearly circular, very strongly nerved on both faces, broader than the rough-cuspidate scale and about as long. — Open sterile soils; frequent. — Var. *ENÉRVIS*, Boott. Perigynium nearly or entirely nerveless. Southeastern N. Y., and southward; rare.

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113. **C. cephaloidea**, Dewey. Lax, very green, 2-3° high; leaves broad (2-3") and thin, shorter than the long culm; head rather loose, ½' long or more, all but the very uppermost spikes clearly defined; perigynium ovate, entirely nerveless, long rough-pointed, spreading, twice longer than the very thin scale or more. — Shady banks, W. Mass. to Mich.; frequent.

114. **C. cephalophora**, Muhl. Mostly smaller and stricter, pale; leaves half as wide or less; head small, rarely ½' long, globular or very short-oblong, never interrupted, the lower 1 or 2 spikes usually bearing a very setaceous short bract; perigynium twice smaller than in the last, scarcely longer than the rough-cuspidate scale. — Dry and mostly sterile knolls; common.

Var. *angustifolia*, Boott. Low, 8' high or less; leaves very narrow; head smaller, usually tawny; perigynium mostly broader. — West and southward; rare.

* 11. — 6. *Didicæ*.

++ Perigynium nerveless or very nearly so.

115. **C. capitata**, L. Rigid, 3'-1° high; leaves filiform, shorter than the culm; head globular, uniformly staminate above, brown, very small; perigynium broadly ovate, very thin, whitish, prominently beaked, erect and appressed, longer than the very thin and obtuse scale. — Alpine summits of the White Mountains. (Eu.)

++ Perigynium prominently nerved.

116. **C. gynocrates**, Wormsk. Stiff but very slender, 3-6' high, diocious; leaves filiform and setaceous, about the length of the culm; spike oblong, 2-4" long; perigynium elliptic-ovate, nearly terete, stipitate, widely spreading or reflexed at maturity, 1 or 2 sometimes borne at the base of the staminate spike. — Cold sphagnum swamps, Penn., north and westward; local, particularly southward.

117. **C. exilis**, Dewey. Very stiff, slender, 1-2° high; leaves involute-filiform and very stiff, shorter than the culm; spike varying from almost globular to cylindrical (frequently 1' long), either unisexual or the sexes variously placed, very rarely a supplementary spike at base; perigynium elliptic-ovate, flattish, stipitate and somewhat cordate at base, strongly brown-nerved