

Key to Intermountain *Carex* Species _____

1. Spike solitary, terminating the culm, often with vestigial rachilla in the perigynium **Group I p. 17**
1. Spikes more than 1 (sometimes in a very dense cluster), vestigial rachilla absent
 2. Stigmas 3 or 4, achene trigonous or quadrangular
 3. Perigynium surface hairy at least near beak **Group II p. 19**
 3. Perigynium surface glabrous, margins sometimes ciliate near and on beak
 4. Style tough, bony, continuous with achene, persistent, often becoming sinuate at maturity; spikes cylindrical **Group III p. 20**
 4. Style more or less delicate, not bony, jointed with achene, deciduous; spikes various **Group IV p. 20**
 2. Stigmas 2, achene lenticular
 5. Spikes cylindrical, usually stalked; terminal spike usually staminate or with a few perigynia toward base **Group V p. 23**
 5. Spikes ovate to obovate, sessile (sometimes compound); terminal spike androgynous or gynaeandrous
 6. Spikes androgynous **Group VI p. 25**
 6. Spikes gynaeandrous
 7. Perigynium margins thin-edged, sharp-edged, or raised, but not winged **Group VII p. 27**
 7. Perigynium margins winged at least on upper body and beak **Group VIII p. 28**

Group I

Spike solitary, terminating the culm; perigynium often containing vestigial rachilla.

1. Perigynium surface hairy at least near beak
 2. Spike unisexual, more or less linear; leaf blades 1-4 mm wide; perigynia purplish; pistillate scales often hairy; inflorescence bract often present ***C. scirpoidea* var. *pseudoscirpoidea* p. 229**
 2. Spike bisexual, androgynous, conic; leaf blades less than 1 mm wide; perigynia whitish to gold; pistillate scales not hairy; inflorescence bract absent
 3. Perigynium tip tapered to 0-0.3 mm beak; achene 1.6-2.2 mm long; longest pistillate scales usually less than 2.5 mm long (excluding any awns) ***C. exserta* p. 111**
 3. Perigynium tip usually abruptly narrowed to 0.1-0.8 mm beak; achene 2.2-3 mm long; longest pistillate scales usually more than 3 mm long (excluding any awns) ***C. filifolia* p. 113**
1. Perigynium surface glabrous
 4. Perigynium beakless, with conspicuous spongy stalk at base; spike 2-3 mm wide ***C. leptalea* p. 151**

4. Perigynium with distinct, sometimes short beak, without conspicuous spongy stalk at base; spike more than 3 mm wide
5. Rachilla absent or less than one-half achene length
 6. Stigmas 2; achene lenticular ***C. dioica* p. 95**
 6. Stigmas 3; achene trigonous
 7. Perigynia ascending at maturity, elliptic, reddish brown; pistillate scales persistent; achene filling perigynium ***C. rupestris* p. 225**
 7. Perigynia widely spreading to reflexed at maturity, lanceolate to ovate, greenish brown to dark brown; pistillate scales usually deciduous before perigynia; achene not filling perigynium
 8. Leaf blades 1.5-3 mm wide; plants long-rhizomatous but sometimes forming clumps; perigynia widely spreading to reflexed at maturity...***C. nigricans* p. 181**
 8. Leaf blades 0.5-1.5 mm wide; plants forming dense tufts; perigynia spreading at maturity ***C. pyrenaica* p. 217**
5. Rachilla well-developed (at least one-half achene length)
 9. Perigynia linear-lanceolate, 0.8-1 mm wide, 3-5 mm long; rachilla projecting through beak orifice; pistillate scales deciduous before perigynia; leaves 0.3-0.6 mm wide ***C. microglochis* p. 163**
 9. Perigynia lanceolate to broadly ovate, if less than 1 mm wide then also less than 3.5 mm long; rachilla not projecting through beak orifice; pistillate scales persistent; leaves usually usually more than 0.6 mm wide
 10. Perigynia at least 4.9 mm long, only 1-6 per spike, green
 11. Lower pistillate scales leaflike, 1-15 cm long; leaf blades much shorter than culms ***C. multicaulis* p. 167**
 11. Lower pistillate scales not leaflike, less than 1 cm long; leaf blades from slightly shorter to longer than culms ***C. geyeri* p. 125**
 10. Perigynia less than 4.9 mm long, or, if longer, also more than 6 per spike, gold to brown
 12. Perigynia trigonous or terete in cross section; margins not sharp- or thin-edged; achene more or less filling perigynium
 13. Culms in dense tufts; perigynia thin-walled, pale below and brownish toward beak; leaf blades less than 1 mm wide ***C. elynoides* p. 109**
 13. Culms scattered on long rhizomes; perigynia thick-walled, dark shiny brown; leaf blades usually 1-1.5 mm wide ***C. obtusata* p. 187**
 12. Perigynia flat to plano-convex; margins sharp- or thin-edged; achene smaller than perigynium

- 14. Perigynia plano-convex with narrow, flat margin toward beak *C. nardina* p. 171
- 14. Perigynia flat, at least around achene
 - 15. Stigmas 2; achene lenticular; wet places *C. capitata* p. 81
 - 15. Stigmas 3; achene trigonous; moist to dry places
 - 16. Perigynia 4-7 mm long, 2.1-4.8 mm wide, at least 3 times achene width; spike broadly conic, 6-10 mm wide...*C. breweri* var. *paddoensis* p. 71
 - 16. Perigynia 2.5-4.1 mm long, 0.9-2 mm wide, less than 3 times achene width; spike elliptic to narrowly conic, 3-6 mm wide *C. subnigricans* p. 249

Group II

Stigmas 3 or 4; achenes trigonous or quadrangular; perigynia at least sparsely hairy, terete in cross section; pistillate spikes from short-ovate to cylindrical.

- 1. Leaf sheaths pubescent; style bony, continuous with achene, persistent; perigynia 5-8 mm long *C. sheldonii* p. 235
- 1. Leaf sheaths glabrous; style not bony, jointed with achene, deciduous; perigynia less than 5 mm long
 - 2. Inflorescence bracts with conspicuous sheath at least 5 mm long
 - 3. Perigynia widely ascending to spreading, usually primarily green, less than 2.5 mm from beak tip to achene; mouth of inflorescence bract sheath usually U-shaped or truncate, usually not purple-banded at top *C. luzulina* p. 157
 - 3. Perigynia ascending, usually primarily red brown or purple, more than 2 mm from beak tip to achene; mouth of inflorescence bract sheath from deeply Y- or V-shaped to U-shaped, often purple-banded at top *C. fissuricola* p. 279
 - 2. Inflorescence bracts sheathless or with short sheathlike base
 - 4. Pistillate spikes less than 1.5 cm long; perigynia membranous
 - 5. Lowest inflorescence bract purple; stigmas usually 4 and achene quadrangular; leaf blades sickle-shaped; pistillate scales ciliate *C. concinnoides* p. 83
 - 5. Lowest inflorescence bract green; stigmas 3 and achene trigonous; leaf blades not sickle-shaped; pistillate scales not ciliate
 - 6. Leaves firm; lowest inflorescence bract shorter than or equal to inflorescence; plants of dry open places in pinyon-juniper zone of the southernmost part of the Intermountain region *C. geophila* p. 123
 - 6. Leaves soft; lowest inflorescence bract longer than inflorescence; plants of coniferous forest and meadows, northern and southern parts of the Intermountain region *C. rossii* p. 223

4. Pistillate spikes cylindrical, 1.5-6 cm long; perigynia firm, thick-walled
7. Leaf blades flat, not rigid; upper ligules thin and membranous, at least 2 mm long *C. lanuginosa* p. 143
7. Leaves canaliculate or rolled, rigid; upper ligules thick and tough, less than 2 mm long *C. lasiocarpa* p. 145

Group III

Spikes cylindrical; stigmas 3; achene trigonous; style tough, bony, continuous with the achene, often becoming sinuous at maturity.

1. Leaf sheaths hairy; style straight *C. atherodes* p. 53
1. Leaf sheaths glabrous, style usually sinuous
 2. Lower pistillate spikes on long nodding stalks; pistillate scales usually white or cream with pale reddish center and long awn *C. hystricina* p. 135
 2. Lower pistillate spikes more or less erect; stalks short or absent; pistillate scales usually green to purplish, at most short-awned
 3. Perigynia ascending, not crowded in spike, usually tapering gradually to beak; beak teeth 0.2-1.5 mm long *C. vesicaria* p. 255
 3. Perigynia spreading to reflexed, densely crowded in spike, abruptly narrowed to beak; beak teeth 0.1-0.8 mm long
 4. Lowest inflorescence bract no more than twice as long as inflorescence; perigynia 3.5-8 mm long; upper spikes not crowded *C. urticulata* p. 251
(formerly called *C. rostrata*)
 4. Lowest inflorescence bract at least twice as long as inflorescence; perigynia 7-10 mm long; upper spikes crowded (occasionally spikes few and distant) *C. retrorsa* p. 221

Group IV

Stigmas 3; achene trigonous; styles deciduous; perigynia glabrous and variously shaped.

1. Leaf blades with long soft hairs *C. whitneyi* p. 259
1. Leaf blades glabrous
 2. Lower pistillate scales long, leaflike, looking like inflorescence bracts; inflorescence bracts absent; achene more than 2.5 mm long *C. backii* p. 61
 2. Lower pistillate scales not long and leaflike; inflorescence bracts present; achene less than 2.5 mm long
 3. Lowest inflorescence bract with definite sheath at least 5 mm long
 4. Lower inflorescence bract blades ascending-spreading, much longer than inflorescence; perigynia spreading to reflexed
 5. Perigynia 2-3.5 mm long, beak 0.6-1.2 mm long, straight *C. oederi* p. 191
 5. Perigynia 3.5-6.2 mm long, beak 1.4-2.3 mm long, falcate *C. flava* p. 115

4. Lower inflorescence bract blades erect to ascending, shorter than or more or less equaling inflorescence length; perigynia appressed to spreading
6. Perigynium tapering to conic tip; beak none or less than 0.4 mm long
 7. Perigynia 3.5-4.6 mm long, papillate, glaucous; achenes 2-3.5 mm long ***C. livida* p. 155**
 7. Perigynia 2-4 mm long, not papillate or glaucous; achenes less than 2 mm long
 8. Spikes on nodding peduncles; perigynia shiny, brown to olive green; culms in dense tufts ***C. capillaris* p. 79**
 8. Spikes erect; perigynia not shiny, green to light brown and often reddish-dotted; culms single or two or three together from long rhizomes ***C. crawei* p. 85**
6. Perigynium abruptly narrowed or tapering to a definite beak at least 0.5 mm long
 9. Terminal spike gynaeandrous or wholly pistillate; perigynia pale below and purple toward beak ***C. fuliginosa* var. *misandra* p. 121**
 9. Terminal spike staminate or androgynous; perigynia purple or green throughout
 10. Perigynia dark purple, 1.7-2.5 mm wide with conspicuous flat margin at least two-thirds as wide as achene, not ciliate; pistillate scales not ciliate; inflorescence bract sheath conspicuously tapered to mouth that is at least 2 mm wide and usually shallowly U-shaped with a wide purple band at top ***C. luzulaifolia* p. 279**
 10. Perigynia green to dark purple, less than 1.7 mm wide (if wider and with flat margin, then beak and pistillate scale tip and midrib ciliate); margin none or flat and less than one-half achene width; inflorescence bract sheath linear or slightly tapered to the mouth that is less than 2 mm wide and U-, V-, or Y-shaped with at most a narrow purple band at top
 11. Inflorescence bract sheath linear, mouth usually shallowly U-shaped or truncate; perigynia usually mostly green (purple in *C. luzulina* var. *ablata*), surface smooth, 2-ribbed with raised veins between ribs; less than 2.5 mm from beak tip to achene ***C. luzulina* p. 157**
 11. Inflorescence bract sheath linear or slightly tapering to mouth, mouth usually deeply Y- or V-shaped; perigynia usually red brown or purple, surface appearing roughened, 2-ribbed without raised veins between; at least 2 mm from beak tip to achene.. ***C. fissuricola* p. 279**

3. Lowest inflorescence bract sheathless or with sheathlike base less than 5 mm long
 12. Terminal spike staminate at tip or throughout
 13. Spikes narrow-cylindric; perigynia at least 60 per spike, obovate, spreading; leaf blades 8-20 mm wide; stem sharply 3-winged ***C. amplifolia* p. 43**
 13. Spikes ovoid to broad-cylindric; perigynia less than 50 per spike, ovate to obovate, ascending or spreading; leaf blades less than 10 mm wide
 14. Perigynium body tapered to broadly conic tip, beak usually absent; style base often persistent, black, and exerted through perigynium beak; roots covered with dense, yellow felty hairs
 15. Terminal spike 1-3 cm long; leaves often canaliculate; culms usually aphyllopodic ***C. limosa* p. 153**
 15. Terminal spike 0.7-1.5 cm long; leaves flat; culms usually phyllopodic ***C. paupercula* p. 197**
 14. Perigynium tapered or abruptly narrowed to short linear beak; style base not persistent, brown, sometimes exerted; roots glabrous or covered with white or brown nonfelty hairs
 16. Perigynia spreading, body spherical or with flat margin around achene, conspicuously many-veined or many-ribbed when dry ***C. raynoldsii* p. 219**
 16. Perigynia ascending, body flat or flat around achene when pressed or dry, more or less veinless and with only 2 ribs
 17. Perigynium broadly elliptic or broadly ovate to nearly round, the 2 ribs more toward ventral surface than at perigynium margins ***C. paysonis* p. 199**
 17. Perigynium obovate to elliptic, the 2 ribs marginal ***C. heteroneura* p. 131**
12. Terminal spike gynaeandrous or mixed
 18. Spikes 6-10, the lowest usually on long, nodding stalk; lowest inflorescence bract longer than inflorescence; perigynia very flat, more than three times as wide as achene and little distended by it ***C. mertensii* p. 161**
 18. Spikes 6 or fewer, the lowest sessile or on upright stalk except in *C. bella*; lowest inflorescence bract shorter than inflorescence; perigynia trigonous to rounded, with or without a distinct flat margin, less than three times as wide as achene and distended by it
 19. Lower leaf sheaths cross-fibrillose; pistillate scales awned; perigynia conspicuously papillate near beak ***C. buxbaumii* p. 75**
 19. Lower leaf sheaths not cross-fibrillose; pistillate scales unawned (sometimes tip attenuate); perigynia papillate or not

- 20. Spikes all sessile
 - 21. Perigynia more than twice as long as wide, more or less inflated or trigonous ***C. nelsonii* p. 175**
 - 21. Perigynia less than twice as long as wide, flat ***C. nova* p. 185**
- 20. At least lower spikes on short or long stalks
 - 22. Pistillate scales with distinct white-hyaline margin and usually white-hyaline tip
 - 23. Spikes on long, nodding stalks; perigynia not papillate ***C. bella* p. 65**
 - 23. Spikes on short stiff stalks
 - 24. Pistillate scales more or less covering perigynia; perigynia flattish, 1.3-2 mm wide, body at least one-fourth empty above achene; usually dry rocky habitats ***C. albonigra* p. 39**
 - 24. Pistillate scales shorter than perigynia; perigynia trigonous, 1-1.3 mm wide, body more or less filled by achene; usually wet habitats ***C. norvegica* p. 183**
 - 22. Pistillate scales usually without distinct white margin and tip
 - 25. Pistillate scales longer but much narrower than perigynia, usually less than 1 mm wide, tip attenuate; inflorescence usually dense ***C. helleri* p. 129**
 - 25. Pistillate scales shorter and narrower than perigynia, at least 1 mm wide, tip rounded to acuminate; inflorescence dense or open
 - 26. Spikes 2-4 mm wide; perigynia 1.6-3 mm long, achene nearly filling body ***C. parryana* p. 195**
 - 26. Spikes 5-8 mm wide; perigynia 3-4 mm long, achene not filling body
 - 27. Perigynia 2-3 times as long as wide, olive green to golden brown, often red dotted, flat only above achene ***C. atrosquama* p. 57**
 - 27. Perigynia 1-2 times as long as wide, green or purple, flat above and at margins of achene ***C. heteroneura* p. 131**

Group V

Stigmas 2; achenes lenticular; spikes mostly cylindrical, bicolored with green and purplish black or brownish; beak very short, entire or shallowly bidentate.

- 1. Lowest inflorescence bract with sheath at least 4.5 mm long; solitary pistillate spikes often on long stalks arising near plant base; perigynia fleshy, papillate, white or green to orange
 - 2. Pistillate scales and perigynia crowded, scales red brown to purplish, often covering perigynia; bract sheath mouth V-shaped; spikes densely clustered (except basal ones), terminal spike pistillate at least at tip ***C. garberi* p. 59**
 - 2. Pistillate scales and perigynia usually not crowded, scales white to reddish brown, shorter than perigynia; bract sheath mouth

U-shaped; spikes not densely clustered, terminal spike staminate or sometimes pistillate at tip

3. Lower pistillate scales closely appressed against perigynia, persisting for a time after perigynia have fallen; staminate portion of terminal spike (1.8)2-3.5 mm wide; perigynia appearing more or less obovate in spike, stalked, nerved but not prominently ribbed, tip conspicuously papillate at 10 times magnification, at complete maturity gold or white when fresh, greenish white or pale gold when dry, usually not squashed toward base ***C. hassei* p. 59**
3. Lower pistillate scales not appressed against perigynia, often falling before perigynia; staminate portion of terminal spike 0.9-2 mm wide; perigynium appearing spherical in spike, usually sessile, strongly several-ribbed, tip usually not conspicuously papillate at 10 times magnification, at complete maturity orange when fresh, orange or gold to purplish when dry, often white above, more or less squashed toward base ***C. aurea* p. 59**
1. Lowest inflorescence bract sheathless; solitary pistillate spikes not normally present; perigynia membranous, not fleshy, green to brown
4. Style tough, bony, continuous with achene, persistent; perigynia with marginal ribs but at most only inconspicuous nerves between ribs ***C. saxatilis* p. 227**
4. Style more or less delicate, jointed with achene, usually deciduous; perigynia with or without prominent nerves
5. Perigynia nerveless or with very indistinct nerves
 6. Perigynia with 1-5 faint nerves on each face; achene one-half to two-thirds as long as perigynium body; culm angles scabrous ***C. angustata* p. 45**
 6. Perigynium nerveless; achene about one-half as long as perigynium body; culm angles glabrous
 7. Lowest spike 1-10 cm long, bract usually more or less equaling or surpassing inflorescence length, stalk of inflorescence 0-4.2 cm long; perigynia weakly minutely papillate, green, more or less red-dotted or red-blotched; achene shiny ***C. aquatilis* p. 47**
 7. Lowest spike 0.8-3 cm long, bract usually less than one-half inflorescence length, peduncle 0-15 mm long; perigynia strongly minutely papillate, usually purple above or throughout; achene dull
 8. Lower leaf sheaths cross-fibrillose, up to 15 cm long; perigynium tip acute ***C. prionophylla* p. 213**
 8. Lower leaf sheaths not cross-fibrillose, up to 5 cm long; perigynium tip rounded ***C. scopulorum* p. 233**
5. Perigynia conspicuously nerved on both surfaces
 9. Perigynium beak 0.2-1 mm long, tip notched at least 0.1 mm, teeth minutely hairy; leaves conspicuously clustered at culm base, fresh leaves blue-glaucous ***C. nebrascensis* p. 173**

9. Perigynium beak usually less than 0.4 mm long, tip notched less than 0.1 mm, teeth glabrous; leaves distributed along lower culm, fresh leaves not blue-glaucous
10. Plants forming dense clumps or tussocks; perigynium green or whitish, constricted just above base, on stalk usually at least 0.1 mm long, conspicuously papillate; lower leaf sheaths glabrous *C. lenticularis* p. 147
10. Plants long-rhizomatous, sometimes forming dense swards; perigynium green, brown, or purplish, not constricted above base, sessile, weakly papillate; lower leaf sheaths scabrous *C. angustata* p. 45

Group VI

Inflorescences elongate to ovoid heads; spikes bisexual (if plants are dioecious then spikes are unisexual), sessile and short; perigynia with dorsal suture or obliquely cleft beak; stigmas 2; achene lenticular.

1. Perigynia 1-3 per spike, blackish at maturity; inflorescence only 3-4 mm wide; terminal spike often with a conspicuous narrow staminate tip *C. disperma* p. 97
1. Perigynia at least 3 per spike, usually not blackish; inflorescence more than 4 mm wide; terminal spike tip not conspicuous and narrow
 2. Lower perigynium wall thick but soft, filled with spongy tissue, base often white and lumpy
 3. Perigynium long-tapered to poorly defined beak, from beak tip to achene at least one-half total perigynium length, body widest at base
 4. Lower spikes compound; inflorescence paniculate, 2-10 cm long, 1-3 cm wide, spikes numerous
 5. Perigynia conspicuously many-nerved on both sides; larger leaf blades 4-11 mm wide *C. stipata* p. 243
 5. Perigynia few-nerved dorsally and nerveless ventrally; larger leaf blades 3-6 mm wide *C. alma* p. 41
 4. Lower spikes simple; inflorescence 1-3 cm long, 0.6-1.8 cm wide, spikes few to numerous
 6. Leaf sheath with thick, tough rim at mouth, not cross-corrugate, dorsally white-spotted *C. nervina* p. 177
 6. Leaf sheath membranous at mouth, sometimes cross-corrugate, not white-spotted dorsally
 7. Margin of perigynium beak and upper body entire; leaves usually clustered near culm base, sheaths not ventrally cross-corrugate *C. jonesii* p. 141
 7. Margin of perigynium beak and upper body ciliate-serrulate at least on 1 side; leaves distributed along lower culm, sheaths often ventrally cross-corrugate *C. neurophora* p. 179
3. Perigynium short-tapered or abruptly narrowed to conic or linear beak, from beak tip to achene less than one-half total perigynium length, body widest at or above base

8. Perigynium beak 0.2-0.6 mm long, usually less than one-fourth the length of the body; perigynium shiny brown *C. simulata* p. 239
8. Perigynium beak at least 0.7 mm long, more than one-fourth the length of the body; perigynia green to brown, shiny or dull
9. Perigynium with lengthwise groove 0.1-0.3 mm wide on dorsal surface near base; beak with conspicuous white dorsal suture flap
 10. Leaf sheath ventrally copper-colored or purplish near mouth, often cross-corrugated; inflorescence 3.5-8 cm long, flexible, paniculate, lower spikes compound *C. cusickii* p. 89
 10. Leaf sheath ventrally white or with narrow brown margin at mouth, not cross-corrugated; inflorescence 1.5-6 cm long, stiff, racemose or paniculate, lower spikes simple or compound.. *C. diandra* p. 93
9. Perigynium without dorsal lengthwise groove or with groove less than 0.1 mm wide; beak without conspicuous dorsal suture flap
 11. Culms in definite clumps; perigynia up to twice as long as wide; leaf sheath usually ventrally cross-corrugated *C. vulpinoidea* p. 257
 11. Culms single along rhizomes; perigynia more than twice as long as wide; leaf sheaths not cross-corrugated ventrally *C. praegracilis* p. 209
2. Lower perigynium wall thin, lacking spongy tissue, base not white and lumpy
 12. Spikes loosely aggregated into a more or less elongate inflorescence, individual spikes more or less distinct
 13. Perigynium very shiny, dorsally bulged so that marginal ribs are actually on ventral face *C. vallicola* p. 253
 13. Perigynium not dorsally bulged, marginal ribs at perigynium margins
 14. Perigynia conspicuously spreading; pistillate scales more or less equaling perigynia in length; plants clumped or shortly rhizomatous *C. occidentalis* p. 189
 14. Perigynia ascending; pistillate scales usually shorter than perigynia; plants long-rhizomatous
 15. Perigynia up to 4 mm long; plants of moist to wet places, tolerant of alkali *C. praegracilis* p. 209
 15. Perigynia at least 4.2 mm long; plants of dry to moderately moist places, not usually alkaline *C. siccata* p. 237
12. Spikes closely crowded, forming a globose to subglobose head, individual spikes not easily distinguishable
 16. Perigynia flat, broadly ovate
 17. Perigynia nerveless, very thin-walled *C. perglobosa* p. 201

- 17. Perigynia at least dorsally nerved,
thin-walled *C. foetida* var. *vernacula* p. 117
- 16. Perigynia plano-convex; lance-ovate or elliptic
 - 18. Perigynia spreading, body coppery brown with green margins; plants caespitose *C. hoodii* p. 133
 - 18. Perigynia ascending or appressed-ascending, body stramineous to blackish; plants long-rhizomatous but sometimes forming dense clumps
 - 19. Stigmas less than 4 mm long, deciduous; style less than 1.5 mm long, included; perigynium 2.5-3.5 mm long; inflorescence on bisexual or pistillate plants less than 2 cm long; plants monoecious or dioecious *C. eleocharis* p. 107
 - 19. Stigmas 4-6 mm long, persistent; style 1.8-3.5 mm long, exserted; perigynium 3.5-4.6 mm long; pistillate inflorescences 1.5-3.5 cm long; plants usually dioecious *C. douglasii* p. 99

Group VII

Spikes short and sessile; perigynia plano-convex with thin-edged, sharp-edged, or raised margins; terminal spikes gynaeandrous, lateral ones wholly pistillate.

- 1. Inflorescence a dense suborbicular head 0.6-1.5 cm long, usually dark brown or blackish green, lowest internode less than 1 mm long; perigynium margins entire to beak tip *C. illota* p. 137
- 1. Inflorescence elongate, at least 1.5 cm long, green to medium brown, lowest internode at least 2 mm long; perigynium margins entire or ciliate-serrulate on beak
 - 2. Perigynium filled at least in lower one-half of body with spongy tissue, upper body more or less papillate
 - 3. Perigynium 2-3.4 mm long; beak 0.6-1.2 mm long, more than one-fourth total perigynium length, conic; lower leaf sheaths at least sparsely red-dotted ventrally *C. arcta* p. 51
 - 3. Perigynium 1.5-3 mm long; beak less than 0.55 mm long, less than one-fourth total perigynium length, widely conic; lower leaf sheaths not ventrally red-dotted
 - 4. Perigynia usually no more than 10 per spike, ventrally nerveless or only faintly nerved *C. brunnescens* p. 73
 - 4. Perigynia usually 15-30 per spike, conspicuously nerved ventrally
 - 5. Perigynium beak with brown dorsal suture flap or stripe; pistillate scales light brown with white margins and tip; inflorescence 1-2.5 cm long *C. praeceptorum* p. 207
 - 5. Perigynium beak without brown dorsal suture flap or stripe; pistillate scales white or sometimes gold or pale brown; inflorescence 2-5 cm long *C. canescens* p. 77
- 2. Perigynium with spongy tissue lacking or only near the base, upper body not papillate

6. Perigynium margins thin-edged; spikes closely clustered; plants alpine ***C. bipartita* p. 67**
6. Perigynium margins raised into ribs; at least lower spikes not closely clustered with upper ones; plants of lowlands to moderate elevations
 7. Perigynia appressed to ascending, widest above base ***C. deweyana* p. 91**
 7. Perigynia spreading to reflexed, widest at base
 8. Perigynium 1.9-3.3 mm long, beak densely serrate, one-fourth to one-third body length; 0.5-1 mm from beak tip to achene; wet places but usually not in sphagnum bogs ***C. interior* p. 139**
 8. Perigynium 1.6-4 mm long, beak sparsely serrate, at least equaling body length; 0.8-2 mm from beak tip to achene; in sphagnum bogs ***C. echinata* p. 103**

Group VIII

J. Mastrogioseppe

Spikes gynaeandrous, ovoid to oblong, sessile, aggregated into compact or elongated heads; perigynia plano-convex to flattened, margins winged or thin-edged; beaks ill-defined or abruptly tapering, smooth or serrulate, beak tip usually obliquely cleft.

1. Lower 2-3 inflorescence bracts elongate, more or less leaflike, at least the lowest one usually longer than inflorescence; inflorescence dense and headlike, less than 3 cm long ***C. athrostachya* p. 55**
1. Lower 2-3 inflorescence bracts not elongate and leaflike, shorter than inflorescence except sometimes the lowest one; inflorescence dense or open, shorter or longer than 3 cm
 2. Ligule at least 2.5 mm long; leaf sheath usually prolonged ventrally at least 4 mm above collar; inflorescence pale green, silvery green, or whitish ***C. fracta* p. 119**
 2. Ligule less than 2.5 mm long; leaf sheath usually prolonged less than 4 mm ventrally above collar; if ligule more than 2.5 mm long and ventral sheath prolonged, inflorescence not pale green, silvery green, or whitish
 3. Perigynia flat in cross section except over achene
 4. Pistillate scales more or less covering perigynia, sometimes exposing beak tip
 5. Spikes more or less distant, lowest inflorescence internode 5-15 mm long, second internode 4-14 mm long; perigynia 0.5-0.8 mm thick
 6. Perigynium beak tip flat and ciliate-serrulate; achenes 1.1-1.75 mm wide ***C. xerantica* p. 261**
 6. Perigynium beak tip cylindrical and more or less entire for 0.5-1 mm from tip; achenes 1.2-2 mm wide ***C. praticola* p. 211**
 5. Spikes densely to loosely aggregated, lowest inflorescence internode 2-10 mm long, second internode 0.5-4.5 mm long; perigynium 0.25-0.5 mm thick

- 7. Leaf blades flat, 2.3-4 mm wide; lowest inflorescence internode usually 2-3.5 mm long; perigynia usually dark brown at maturity, often green above ***C. arapahoensis* p. 49**
- 7. Leaf blades folded or margins revolute, 0.5-2.5(3) mm wide; lowest inflorescence internode 4-10 mm long; perigynia white, pale gold, coppery, or medium brown ***C. phaeocephala* p. 205**
- 4. Pistillate scales shorter than perigynia, exposing beak and upper body margin
 - 8. Individual spikes usually indistinct, densely clustered in inflorescence
 - 9. Perigynia 2-3 times as wide as pistillate scales ***C. proposita* p. 215**
 - 9. Perigynia 1-1.5 times as wide as pistillate scales
 - 10. Achenes 1.3-2.4 mm long, 1-1.6 mm wide; spikes 9-12 mm long; perigynium wing margins crinkled at least above ***C. straminiformis* p. 245**
 - 10. Achenes 1-1.8 mm long, by 0.7-1.3 mm wide; spikes 5-10 mm long; perigynium wing margins usually not crinkled
 - 11. Perigynia 4.2-6.5 mm long, usually at least 2.5 mm from beak tip to achene, flat margin including wing 0.3-0.7 mm wide; alpine ***C. haydeniana* p. 127**
 - 11. Perigynia 2.9-5 mm long, usually less than 2.5 mm from beak tip to achene, flat margin including wing 0.2-0.5 mm wide; lowland to subalpine ***C. microptera* p. 165**
- 8. Individual spikes distinct, loosely aggregated in inflorescence
 - 12. Flat margin of perigynium including wing less than 0.4 mm wide; perigynia less than 2 mm wide, lanceolate to ovate or obovate
 - 13. Perigynia 0.2-0.3 mm thick, 0.9-1.25 mm wide, wings 0.1-0.2 mm wide; achene 0.8-1.5 mm long ***C. crawfordii* p. 87**
 - 13. Perigynia 0.4-0.6 mm thick, 1.2-2.5 mm wide, wings 0.2-0.6 mm wide; achene 1.5-2.3 mm long ***C. phaeocephala* p. 205**
 - 12. Flat margin of perigynium including wing less than 0.4 mm wide; perigynia at least 1.8 mm wide, round to broadly ovate
 - 14. Spikes fusiform or elliptic; achene 0.5-0.9 mm wide ***C. scoparia* p. 231**
 - 14. Spikes lanceolate to broadly ovate; achene 0.85-2 mm wide

- 15. Perigynia with at least 9 nerves on dorsal face, nerves thin, longer than achene; achene more or less at perigynium base ***C. straminiformis* p. 245**
- 15. Perigynia with less than 9 nerves on dorsal face, nerves thick, often shorter than achene; achene often well above perigynium base
 - 16. Perigynia 2-3 times as wide as pistillate scales ***C. proposita* p. 215**
 - 16. Perigynia 1-1.5 times as wide as pistillate scales
 - 17. Perigynia 5.5-7.2 mm long, 2.6-3.8 mm wide, 0.5-0.7 mm thick; leaf blades 2-6 mm wide ***C. egglestonii* p. 105**
 - 17. Perigynia 3.5-6 mm long, 1.2-2.5 mm wide, 0.3-0.5 mm thick; leaf blades 0.5-2.5(3) mm wide ***C. phaeocephala* p. 205**
- 3. Perigynia plano-convex to biconvex in cross section
 - 18. Perigynia 5.5-8.1 mm long, beak cylindric and more or less entire for at least 0.5 mm from tip
 - 19. Perigynia broadly ovate, 2.6-3.8 mm wide, flat margin including wing 0.5-1.1 mm wide ***C. egglestonii* p. 105**
 - 19. Perigynia lanceolate to ovate, 1.1-2.5 mm wide, flat margin including wing 0.15-0.5 mm wide
 - 20. Perigynia 0.4-0.5 mm thick; spikes densely aggregated, 1.5-3 mm between the lowest two ***C. ebenea* p. 101**
 - 20. Perigynia 0.5-0.9 mm thick; spikes distant or loosely aggregated, 4-14 mm between the lowest two
 - 21. Perigynia with 3-10 strong nerves on ventral face at least one-half as long as achene... ***C. petasata* p. 203**
 - 21. Perigynia with at most a few nerves on ventral face less than one-half achene length... ***C. praticola* p. 211**
 - 18. Perigynia less than 5.5 mm long, beak tip cylindric and entire or flat and ciliate-serrulate
 - 22. Perigynia boat-shaped, less than 4.2 mm long, wings curved toward ventral face, less than 0.12 mm wide, beak tips inconspicuous in inflorescence; pistillate scales covering at least perigynium bodies ***C. leporinella* p. 149**
 - 22. Perigynia not boat-shaped, wings not curved toward ventral face, less than or more than 0.12 mm wide; or if perigynia boat-shaped and wings curved toward ventral face, then beak tips conspicuous in inflorescence and most pistillate scales shorter than perigynia
 - 23. Ventral perigynium face with at least 3 conspicuous nerves longer than achene
 - 24. Dorsal perigynium face with at least 9 fine nerves longer than achene
 - 25. Perigynia usually more than 1.8 mm wide, ovate to broadly ovate, less than 2.5 mm from beak tip to achene; inflorescence usually more or less triangular ***C. multcostata* p. 169**

25. Perigynia usually less than 1.8 mm wide, lanceolate to fusiform, usually more than 2.5 mm from beak tip to achene; inflorescence usually oblong ***C. specifica* p. 241**
24. Dorsal perigynium face with at most 9 thick nerves shorter or longer than achene
26. Pistillate scales more or less covering perigynia; perigynium beak tip red brown with white-hyaline margin ***C. phaeocephala* p. 205**
26. Pistillate scales shorter than perigynia, or, if covering perigynia, perigynium beak tip not red brown with white-hyaline margin
27. Inflorescence dense, lowest two internodes together less than one-third, usually about one-fifth, total inflorescence length; perigynia 0.4-0.5(0.6) mm thick ***C. abrupta* p. 35**
27. Inflorescence more or less open, lowest two inflorescence internodes together less than one-half, usually about one-third, total inflorescence length; perigynia 0.5-0.6(0.7) mm thick ***C. mariposana* p. 159**
23. Ventral perigynium face nerveless or with up to 4 nerves that do not reach top of achene.
28. Perigynia 0.9-1.25 mm wide, 0.2-0.3 mm thick ***C. crawfordii* p. 87**
28. Perigynia 1.2-3.4 mm wide, 0.35-0.7 mm thick
29. Achenes 1-1.6 mm long; perigynia usually less than 3.5 mm long
30. Perigynium beak cylindric and more or less entire at least at tip, tip gold to light brown; pistillate scales usually shorter than perigynia ***C. subfusca* p. 247**
30. Perigynium beak flat to tip, tip rust brown; pistillate scales more or less covering perigynia, at most the beaks exposed ***C. bebbii* p. 63**
29. Achenes at least 1.6 mm long; perigynia usually over 3.5 mm long
31. Perigynium beak cylindric and more or less entire for at least 0.5 mm from tip
32. Perigynia usually gold brown or coppery with a metallic sheen; lowest inflorescence internode usually less than 4 mm; spikes closely aggregated at least near inflorescence tip ***C. pachystachya* p. 193**
32. Perigynia cream-colored to brown, without a metallic sheen; lowest inflorescence internode at least 4 mm; spikes loosely aggregated at least near inflorescence base
33. Achenes 0.5-0.7 mm thick; inflorescence resembling a string of beads; plants 20-95 cm tall; lowlands to mid-montane ***C. praticola* p. 211**

- 33. Achenes 0.2-0.5 mm thick; inflorescence not resembling a string of beads; plants 5-40 cm tall; subalpine to alpine ***C. phaeocephala* p. 205**
- 31. Perigynium beak flat and more or less ciliate serrulate to tip or cylindric for less than 0.5 mm
- 34. Pistillate scales white or tinged with gold or rusty brown; achenes at least 1.3 mm wide
- 35. Inflorescence dense, stiff; pistillate scales shorter than perigynia, exposing upper bodies; perigynia (2)2.4-3.4 mm wide, 0.5-0.6 mm thick ***C. brevior* p. 69**
- 35. Inflorescence open, flexible; pistillate scales more or less covering perigynia or beak tips exposed; perigynia 1.5-2.5 mm wide, 0.6-0.8 mm thick ***C. aenea* p. 37**
- 34. Pistillate scales gold, orangish, or brown, often with green center; achenes 1.3 mm wide or less ***C. phaeocephala* p. 205**