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# ILLUSTRATIONS

OF THE

# GENUS CAREX.

BY

FRANCIS BOOTT, M.D.,

M.A.

TREASURER OF THE LINNEAN SOCIETY.

PART FOURTH.

TAB. 412-600.

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"The men, who labour and digest things most,  
Will be much apter to despair than boast."

ROSCOMMON.



LONDON:

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## PREFACE TO PART IV.

THIS, the Fourth Part of Dr. Boott's 'Illustrations of the Genus Carex,' carries the work on to the 600th Plate, which, as its lamented Author himself informed me, was the limit originally proposed. Having, however, found amongst Dr. Boott's MSS. descriptions of 108 more species, I have thought it right, considering the conscientious care bestowed upon them by the Author, and his unrivalled knowledge of this difficult genus, to append them to this Part.

All the descriptions and drawings published herewith are exactly as left by Dr. Boott, and, except in some few cases, where I have appended a note (always in brackets, and signed J. D. H.), my share in the work has been confined to superintending the Engravings and printing the Descriptions.

It remains to add, that the publication of this last Part is wholly due to the munificence of Mrs. Boott, who issues it as a tribute to the memory of her late husband,—an earnest of his abiding zeal in the elucidation of his favourite genus, and of his love of science and desire to promote it. In the same liberal spirit, Mrs. Boott (in 1865) presented the whole of Dr. Boott's Botanical collections, MSS. and drawings, to the Royal Gardens of Kew, then under the Directorship of her husband's earliest surviving friend, the late Sir W. J. Hooker.

JOS. D. HOOKER.

ROYAL GARDENS, KEW,  
*October 5th, 1867.*

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# ILLUSTRATIONS

OF

## THE GENUS CAREX.

### PART IV.

292. *C. Linkii* (Schkuhr); spica viridi-ferruginea, c spiculis 2-3 rarius 1-4 androgynis apice masculis alternis approximatis vel infima subremote inserta vel rarius subradicali longe exserte pedunculata; bracteis culmum superantibus summa interdum carente; stigmatibus 3; perigyniis ovalibus triquetris rostratis ore hyalino obliquo vel bilobato zona ferruginea infra notato basi attenuato stipitatis enerviis vel obsolete nervatis glabris vel apice puberulis superne ad margines scabris, squama ovato-lanceolata acuta vel cuspidata amplectente medio viridi nervosa ferruginea margine hyalina brevioribus vel æquantibus.—*C. Linkii*, *Schk. f.* 118; *Willd.* 223; *Kunth*, 478; *Grenier et Godron*, 399. *C. distachya*, *Desfont. Fl. Atl.* *C. gynomane*, *Bertol.* 38; *Koch*, 864. *C. tuberosa*, *Degl. in Lois. Fl. Gall.* *C. sarda*, *Link, sec. Bertol.* *C. dimorpha?*, *Brot.* 64. (TAB. CCCCXII.—CCCCXIV.)

HAB. In Europa, Asia, et Africa.—France to Portugal and the South of Europe. Asia Minor, *Tchihatcheff*, 574. In woods near Sinai, *Herb. Borrer.* Algiers, *Durieu*, etc.

I am indebted to M. Spach for the following elaborate description of this species:—

“Ad specimina Numidica prope Lacalle et Algeriam a cl. Durieu lecta, 1841. *C. distachya*, Desf.

“*Planta* phylloidesmis sterilibus culmisque spiciferis basi fasciculato-foliosis densissime cæspitosa. Rhizoma prorepens, polycephalum, irregulariter ramosissimum, basibus tuberculoso-incrassatis eximie et varie nodosum, interdum submoniliforme. (*C. tuberosa*, Degl.)

“*Culmi* 5-15 poll. foliis breviores vel longiores, graciles vel subfiliformes, debiles, excepta parte summa inæqualiter triquetra angulis scabro-serrulata, obtuse trigoni et lævigati, basi (simulac phylloidesmi steriles horni) tuberculoso-incrassati et vaginis solutis fibrillosi, supra basin fasciculato-foliosi, cætero nudi, 1-3-rarius 3-spiculiferi, in parte spiculifera sæpissime flexuosi vel fractiflexi.

“*Folia* linearia, 1-1½-pedalia, siccitate conduplicata erecta vel arcuato-reclinata: *extima* breviora et apice breve acutata: *interiora* gradatim longiora et in cuspidem filiformem tortuosum attenuata: *intima* fasciculorum hornorum plerumque fere e basi filiformia. (Specimina Africana et Gallica ludunt foliis longissimis

et brevibus, linearibus vel plus minus filiformibus.)—*Bracteæ* elongatæ vel breves, ea spiculæ infimæ 2-7 poll. longa, plerumque foliacea, culmum excedens; *vagina* tubulosa vel cyathiformi, sæpius brevi quam elongata instructa, ea spiculæ peninfimæ (culmorum 2-4-spiculiferorum) nunc conformis et minor, nunc spathaceo-squamiformis (fere ad basin usque fissa) plus minus abbreviata interdum spiculum vix æquans, longe vel brevius foliaceo-cuspidata. Bractea spiculæ subterminalis (culmorum 4-spiculorum) semper, nisi fallor, spathacea squamiformis varie cuspidata spiculam vix æquans; ea spiculæ terminalis (haud raro deficiens) spathaceo-squamiformis, mutica vel varie cuspidata. In culmis monostachyiis bracteæ haud raro observantur longe foliaceo-cuspidatæ vel ex toto foliaceæ, quasi esset bractea spiculæ inferioris culmi distachyi.

“*Spiculæ* androgynæ, apice masculæ (laterales summæ etiam occurrunt mere masculæ: exemplum unicum spiculæ terminalis masculæ observavi) 4-10 lin. longæ (culmis distachyiis, spicula inferior plerumque vix aut ne vix spicula terminali brevior: culmis autem 3-4-spiculatis spicula penultima, vel spiculæ intermediæ binæ sæpissime minores suut, haud raro abbreviatæ, 2-3 lin. longæ: nec tamen desunt culmi spiculis 3 subæqualibus gaudentes), 1-9-gynanthæ (mono- vel oligo-gynanthæ observantur imprimis subterminales in culmis 3-4-spiculatis), modo plus minus remotæ imoque longissime remotæ, modo quasi in spicam ramosam approximata, erectæ vel laterales demum subdivergentes: *juveniles* lineari-lanceolatæ, *fructifera* ovoideæ vel oblongæ, parte terminali mascula quasi cuspidatæ. In plantis Africanis spiculas laxe fœminifloras, quales in Gallicis sæpissime observantur, non vidi. Spiculæ laterales sessiles vel breve pedunculatæ (raro infima longe pedunculata) *spathellulata*, more gregis *Indicarum*. Spicula terminalis nunquam spathellata, modo ebracteata, modo bractea spathaceo-squamacea. Spiculæ culmorum monostachyorum nunquam, nisi fallor, caret bractea, et sæpius bibracteata quam unica bractea instructa occurrit.

“*Squamæ* femineæ plus minus membranaceæ, fulvæ, marginibus hyalinis, cum fascia media coriaceo-herbacea viridi, concava, amplexatiles, distichæ, perigynio fructifero subæquilongæ (modo paulo breviores, modo paulo inferiores) et sæpissime angustiores, ovatæ vel ovato- aut oblongo-lanceolatæ aut ovaes, acutæ aut acuminatæ, muticæ vel mucronatæ, sæpe trinerviæ, demum plus minusve cum fructibus divergentes, cum fructu deciduæ vel saltem infimæ. Squamæ inferiores subspathacæ (ima basi vaginantes interdum præsertim culmis monostachyiis foliaceo-cuspidata vel in aristam filiformi-subulatam vel setaceam productæ. Squama infima spiculæ terminalis ebracteata omnino consimilis bracteæ spiculæ terminalis vel subterminalis. Squamæ masculæ, plerumque quadrifariam imbricatæ (nec sicut femineæ distichæ),

fere ex toto membranaceæ, uninerviæ (vel solum infimæ triner-viæ), oblongæ vel oblongo-lanceolata, obtusæ vel acutæ vel acuminatæ, muticæ rariusve mucronatæ, persistentes (fructibus cum squamis jam delapsis).

“*Perigynium* fructiferum membranaceum, achenio repletum, pallide bruneum et sublente rubro-punctulatum, obtuse trigonum (rarius et forsitan ob evolutionem imperfectam vel compressionem trigono-anceps) stipitulatum, repente cuspidato-rostellatum vel acuminato-rostellatum, bicostatum (costis viridibus latiusculis ad faciem extrorsam utrinque intramarginalibus, sæpe angulo medio magis quam margine approximatis, plerumque arcuatis: attamen haud raro observantur subrectilineæ) fere ad rostelli apicem usque productis secus basin perigynii interdum evanescentibus; cætero plerumque enervium vel rarius nervulis accessoriis paucis tenerimis vel subobsoletis striatulum; circumscriptione ovale vel ellipsoideum vel oblongum vel ovali-vel ovato-subrotundum, marginibus et facie introrsa plus minus bullato-rugosum vel transverse plicato-rugulosum. Angulus tertius semper extrorsus. Facies introrsa maturitate sæpissime plana, in perigynio juvenili autem concavo-subcomplicata qualis etiam ut rarius in perigynio maturo observatur. Rostellum oblique declinatum vel excurvum vel rarius rectum, columnare vel conicum vel pyramidatum plano-convexum, marginibus inæqualiter ciliolato-serrulatum, interdum per totam fere superficiem setulis brevissimis basi incrassatis scabridum, ore hyalino plerumque oblique fisso (nunc extrorsum nunc introrsum profundius exciso) et retuso vel oblique bilobo (lobulis æqualibus vel inæqualibus, muticis vel rarius nervo excurrente mucronatis, interdum fimbriolatis) rarius subæquiprofunde bifido. Perigynium *C. Linkii* ab auctoribus dicitur binervium vel bicostatum, quale etiam in stirpe Boreali-Africana necnon in Gallica vidi. Aliter autem se habet in stirpe Græca et orientali. Planta Boreali-Africana a Gallica differt perigyniis majoribus confertioribus secus apicem scabro-serrulatis, quo convenit cum stirpe Græca et Lydia. Achenium ellipsoideum vel ovale, obtuse trigonum, impresso-punctulatum, opacum, apice truncato. Styli basi emar-cida conica umbonatum vel apiculatum.

“Stirps *orientalis* a *C. Linkii*, Numidica, differt perigyniis (Tab. 413) præter costas binas crassiores ad faciem extrorsam utrinque intramarginalibus plus minus stricte nervulosis, et perigynia majora inæqualiter costulata, *C. gymobasis* majoris sat referentibus. Cætero omnino convenit cum stirpe Boreali-Africana foliis, habitu et inflorescentia simulac volumine fructus. Crescit Peloponneso.—*C. distachya*, Desf., *Bory et Chambard, Flore de Morée*, et Lydia, ‘*C. distachya*, Desf., *Balansa, Pl. Exs. Orient.* n. 18, Smyrne, sur les collines, 1854; et Attica, ‘*C. Linkii*, Schk., *Heldreich, Pl. Exs. Græc.* n. 2214. Squamas femineas longe cuspidatas in nullo præcitato exemplo vidi.

“Stirps *Gallica* (Tab. 414) a planta Boreali-Africana et orientali differt spiculis plerumque laxioribus, squamis præsertim inferioribus spiculæ terminalis sæpe foliaceo-cuspidatis, stylo duplo longiore, demum longe exserto, perigyniis minoribus (sæpe subduplo) plerumque squamas haud æquantibus ad margines lævigatis; occurrunt tamen perigynia rariora ad rostri margines obsolete vel remotissime ciliolata. Perigynium a Godronio dicitur ‘*angulis lateralibus acutis*.’ In exemplis omnibus maturis mihi visis reperi sectione transversa obtuse trigonum. Facies introrsa in juvenilibus (simulac in *C. Linkii* Africana et orientali) plus minus concava imove subcomplicata, accidente maturitate sæpissime plana vel planiuscula evadit.

“Quoad perigynii fabricam *C. Linkii* quam maxime accedit *C. phyllostachyæ* et imprimis *C. Geyeri*.”

Specimina delineata,—

“Tab. CCCXII. et Tab. CCCXIII. n. 1–9, Numidica, omnia legit Durieu circa urbem Lacalle.

- n. 1. Culmus elatior, folia subæquans; spicula inferior sessilis, spathellata.
- n. 2. Spicula terminalis; bractea spathacea, breve vaginante setaceo-cuspidata instructa; perigynia imbricata, disticha.
- n. 3. Culmus brevior; spiculæ laterales longe bracteatae, spathellatae, terminalis ebracteata squama infima bractæformi longe cuspidata.

- n. 4. Culmus 4-stachyus; spicula *subterminalis* brevis, mere mascula, *terminalis* ebracteata, squama infima aliis subconsimili, paululo longius cuspidulata; perigynia subimbricata.
- n. 5. Culmus tristachyus; spicula *infima* remota, longissime bracteata, exserte pedunculata, laxiuscula, bractea vaginata, *intermedia* trigynantha, *terminalis* bibracteata, bracteis brevibus subsquamaceis, setaceo-cuspidatis.
- n. 6. Culmus distachyus; spicula terminalis, mere mascula.
- n. 7. Culmus distachyus; spicula *lateralis* spathellulata, flore basilare femineo, *terminalis* bractea brevi, basi vaginante.
- n. 8. Spicula *lateralis* mere mascula, spathellulata, terminalis tricarpa; bractea brevi, squamis consimili instructa.
- n. 9. Spicula *lateralis* spathellulata, cum basi bractea foliaceæ.

“Tab. CCCXIII. n. 1–9, Numidica, cum *perigyniis* e stirpe *orientali*!”

- n. 1. Spicula terminalis (culmi distachyi) ebracteata; squama infima spathacea, longe aristata.
- n. 2. Spicula culmi monostachyi bracteata; bractea vaginata, longe subulato-filiformi; squama infima breve aristata.
- n. 3. Spicula culmi monostachyi; bractea vaginante foliacea, a squama infima longe aristata spathacea remota.
- n. 4. Culmus 4-spiculatus; spiculæ alte femineæ, *terminalis* ebracteata squamis 2 infimis longe aristatis, *lateralis* summa brevis, bractea spathacea longe aristata.
- n. 5. Culmus monostachyus, cum bractea sterili remota, spicula digynantha bracteata.
- n. 6. Culmus monostachyus; spicula trigynantha, bractea parum remota vaginata, squama infima aristata.
- n. 7. Culmus monostachyus, cum bractea sterili vaginata; spicula ebracteata, squama infima breve vaginante longe foliacea a squama sequente mucronata subremota.
- n. 8. Culmus monostachyus, foliis longior; spicula breve bracteata, tricarpa.
- n. 9. Culmus tristachyus; spicula *terminalis* bibracteata, bracteis brevibus, squamis conformibus, *subterminalis* monocarpa.

“Tab. CCCXIV. Specimina Gallica.

- n. 1. Spicula terminalis longe bracteata, bractea subremota, squamis foliaceo-cuspidatis.
- n. 2. Spicula terminalis ebracteata, squama infima longe setaceo-cuspidata.
- n. 3. Culmus bispiculatus; spiculæ terminalis bractea filiformi spathacca, squama infima foliaceo-cuspidata; spicula inferior dicarpa.
- n. 4. Trispiculatus; spicula terminalis ebracteata, squamæ infimæ longe foliaceo-cuspidatæ; spicula subterminalis monocarpa.
- n. 5. Spicula terminalis ebracteata, squama infima longe setaceo-cuspidata; spicula subterminalis dicarpa.
- n. 6. Spicula *infima* subbasilaris, longe pedunculata, *subterminalis* monocarpa, *terminalis* bractea setaceo-cuspidata.
- n. 7. Trispiculatus; spicula *infima* pedunculata, bractea tubuloso-vaginata, *terminalis* ebracteata, squamæ infimæ longe cuspidatæ.
- n. 8. Culmus 3–4-spiculatus; folia *culmorum* lata, breviora, rigida, apice parum acuminata, nec setaceo-acuminata; *intima* fasciculorum sterilium filiformia, setaceo-attenuata.”

293. *C. Halleriana* (Asso); spica castaneo-viridi, e spiculis 3–6 parvis terminali oblongo-elliptica mascula, rarius ima basi parce feminea, reliquis femineis, superioribus 1–3 masculæ contiguis sessilibus, una alterave sæpe apice mascula breveque vaginata, infimis 1–2 radicalibus longe inæqualiter exserte pedunculatis decumbentibus; bracteis inferioribus vaginatis clongatis; stigmatibus 3; perigyniis obovatis vel ellipticis basi attenuatis stipitatis obtuse triquetris rostellatis, rostello sæpe excurvo, ore membranaceo integro obliquo vel

emarginato, costato-nervosis puberulis pallide viridibus membranaceis, squama subæquilata oblongo-ovata obtusa mutica, vel lanceolata acuminata acuta vel cuspidata amplectante ferruginea medio viridi nervosa margine hyalina longioribus vel brevioribus.—*C. Halleriana*, *Asso*, *Syn. t. 9. f. 2.* (1779); *Grenier et Godron*, 416. *C. alpestris*, *Allioni*, *Ped.* 270 (1785); *Wahl. Act.* 157; *Schk. f.* 35; *Willd.* 284; *Kunth*, 479; *Biebst.* 389. *C. gynobasis*, *Vill.* (1787); *Schk. p.* 71; *Gaud. Agrost.* 138; *Koeh.* 877; *Bertol.* 91. *C. anomala*, *Pallas*, *sec. Biebst.* *C. diversiflora*, *Hort. t.* 70. *C. planostachys*, *Kunze*, 138. *t.* 35. (TAB. CCCCXV.—CCCCXVI.)

HAB. In Europa, Asia, Africa, et America septentrionali.—France to Italy and Corsica. Caspian Sea. Algiers (*Durieu*). Mexico (*Schiede*). Woods on the Colorado River, West Texas (*Wright, Herb. Torrey et Gray*). Wet Rocks, Upper Guadalupe, Texas (*Lindheimer, Herb. Gray*).

*Rhizoma* crassum, culmos cæspitiosos foliaque edens. *Culmi* 5–15-poll., debiles, graciles, sæpe reclinati, basi foliati. *Folia* rigida, filiformia, demum plana, 1 lin. lata, marginibus plus minus revolutis, apice attenuata, sæpe arcuato-recurva, culmo breviora vel longiora. *Bractea* superiores (nisi summa) vaginatae vel evaginatae, foliaceae; summa nunc squamiformis cuspidata, obcordata; inferiores vaginatae, elongatae. *Spica* terminalis mascula vel rarius basi floeculis femineis 1–2 instructa; inferiores (subinde omnes) radicales, vel 1–2 rarius 3 masculae contiguæ, 1–7- vel plurifloræ; axis demum fractiflexa. *Squamæ* castaneæ vel pallidæ, margine hyalinæ; masculae obtusæ, muticæ, ovatae; femineae conformes vel lanceolatae, acuminatae, acutæ, nervo excurrente. *Perigynium* 2 $\frac{2}{5}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium* conforme, 1 $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, triquetrum, punctulatum, basi styli æquali apiculatum.

The name which Asso originally gave to this species is generally quoted by authors as a synonym to that of Allioni or Villars, but I think with Grenier and Godron that it should be restored to it. I have had the opportunity of examining the plant of Schiede and Wright from Mexico and Texas, through the kindness of Kunze and Drs. Torrey and Gray, and cannot detect any character which justifies its separation from the European and African plant. The species resembles *C. Linkii*, and more particularly several of the *Digitata* group, differing in its foliaceous bractæ.

The specimens figured are those of Durieu, from Algiers. Those in Tab. CCCCXV. represent the usual size of the European plant. No. 1 is a male terminal spicula, with the lower squama having the form of a bract, with a solitary female floret. It may be regarded as a lateral one-flowered spicula. 2 is a lateral androgynous spicula. 3 is a radical 3-flowered spicula with lanceolate cuspidate squamæ. At *p* is a subrevolute section of a leaf, and *p\** shows the revolution with margins applied to the costa. Tab. CCCCXVI. exhibits the larger development of the plant, with elongate leaves and larger spiculæ.

294. *C. alligata* (Boott); spica brevi atro-purpurea, e spiculis 5 cylindricis erectis contiguis sessilibus, terminali mascula, reliquis femineis densifloris; bracteis inferioribus culmum superantibus, rigidis, strictis, evaginatibus vel infima brevissime vaginata; stigmatibus 2; perigyniis ovalibus, rostellatis, bidentatis, plano-convexiusculis enerviis vel antice 3–4 nervatis lucidis, glabris, fusco-ferrugineis, dense spongiosis, squama ovata obtusa vel acuta cuspidata, trinervi, firma, purpurea, margine albo-mem-

branacea, subæquilata longioribus vel brevioribus. (TAB. CCCCXVII.)

HAB. Sandwich Islands. District of Waimea, Hawaii, *Wilkes (Herb. Gray)*.

*Culmus* 2-pedalis, acute triqueter, rigidus, validus, apice scaber, basi foliatus, pars spicigera 2–3 pollices longa. *Folia* 2–3 lin. lata, culmo breviora, rigida, basi conduplicata, superne marginibus revolutis. *Bractea* inferiores 2, culmum superantes, infima 5–6 pollices longa, in uno specimine vagina 3 lin. longa instructa. *Spicula* mascula 10–12 lin. longa, 1 lin. lata; femineae 1–1 $\frac{1}{2}$  pollices longæ, 2 lin. latæ, omnes contiguæ, æquialtæ, sessiles vel infima 1 $\frac{1}{2}$  poll. remota, breve exserte pedunculata. *Squamæ* omnes breve cuspidatæ. *Perigynium* 1 $\frac{4}{10}$ – $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, laciniis denticulatis. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, plano-convexiusculum, basi styli æquali apiculatum.

I am indebted to Dr. Gray for the knowledge of this species, the specimens figured being those from his Herbarium. The affinity is with *C. lucida*  $\beta$ , of New Zealand.

295. *C. basilaris* (Jordan); spica castaneo-viridi, e spiculis 3–5, terminali, mascula oblonga, femineis ovalibus vel oblongis remotis, inferioribus (subinde apice masculis) radicalibus cernuis longe exserte pedunculatis; bracteis vaginatis culmo brevioribus inferioribus elongatis; stigmatibus 3; perigyniis obovatis rotundato-trigonis late conico-rostratis ore bidentato leviter nervatis, pilosis, squama ovata, acuminata acuta vel truncata aristata longioribus.—*C. basilaris*, *Jordan, Obs. Pl. France*, 246. *t.* 12; *Grenier et Godron*, 415. *C. depressa*, *Link? in Schrad. Diar. Bot. Willd.* 250; *Schk. f.* 120; *Kunth*, 489. (TAB. CCCCXVIII.)

HAB. In Europa et Africa.—Queen of Spain's Chair, near Gibraltar, March 25, 1841, *Dr. C. Lemann (Herb. Boott)*. Cannes, *Jordan*, 1857. Algiers, *Durieu*.

I am indebted to M. Spach for African specimens and the following detailed description and figures of this species,—the French specimens and those from Gibraltar differing from the African ones, in the lower spiculæ, being, as Grenier and Godron remark, "*quelquefois mâles au sommet*."—

"*Rhizoma* prorepens, plus minusve nodosum, foliorum basibus emarcidis vel in fibrillos solutis vestitum. *Culmi* cæspitiosi, 4–15 poll. longi, debiles, subfiliformes, basi foliosi, ima basi squamosi et quasi bulboso-incrassati. Ex culmis 27, plerique præbent spicas femineas 3, alii spicis radicalibus 1 vel 2, pauciores 2 alteram radicalem alteram subterminalem: unicum spicis radicalibus 3, et terminali 1. Raro desunt spicæ radicales. *Spiculæ* femineæ 9–15-floræ (rarius 20) vel macriores 5–7-floræ, oblongæ vel ovoideæ vel clavato-oblongæ, densæ, sæpe 6–7 lin. longæ: radicales longe pedunculatæ, superiores nunc longe nunc brevius pedunculatæ vel summa subsessilis, plerumque bractea vaginata foliacea plus minus clongata stipatæ, vel breve bracteatæ præsertim summa, in culmis spiculiferis 2 superne instructis. *Spicula* summa modo spicæ masculæ approximata modo 1–3 poll. remota, præsertim ubi culmus singula gaudet spicula. *Spica* mascula 5–8 lin. longa, erecta, stricta, densa, oblonga, sæpe squama infima vel bractea (nempe nunc sterili nunc staminifera) longe cuspidata instructa. *Squama* infima etiam occurrit feminiflora. *Squamæ* femineæ uninerviæ, fulvæ, medio virides amplexatiles perigynio sæpe latiores et longiores vel æquilongæ, polymorphæ, oblongo-vel ovali-obovatæ vel obovato-orbiculares, rarius (præsertim summæ) ovato-vel ovali-lanceolatæ apice truncato vel rotundato vel emarginato vel acuminato, aristato-cuspidatæ (nunc longe nunc brevius interdum brevissime): squamæ varie cuspidatæ absque certo ordine sitûs in omni fere spica obviæ. *Squama* infima sæpissime sequentibus brevius aristata, haud raro solum in mucronem producta.

Squamæ masculæ ovales vel oblongæ, acutæ vel acuminatæ (raro obtusæ) sæpe mucronatæ, infima haud raro aristata. Pistillum minimum. Ovarium oblongum vel subfusiforme, regulare, obtuse trigonum (angulis costula crassiuscula marginatis: angulus tertius introrsus, serius evanescens vel obsoletus), apice in collulum brevissimum in discum stylopodium cingentem expansum contractum. Stylus brevis, inclusus, e basi crassa conica filiformis, secus apicem papilloso-hirtellus. Stigmata 3, subulato-filiformia, hirtella, longe exserta. Perigynium maturum membranaceum, setulis brevibus patentibus plus minus copiosis hirtellum, achenio adpressum, stipitatum: circumscriptione varians, pyriforme vel sphaeroideum aut ovoideum aut ovale, e basi breve angustata clavatum, nunc rotundato-vel obsolete trigonum, nunc subteres, nunc subventiculari-biconvexum, plus minus gibbosum (præsertim facie extrorsa) apice repente productum in rostellum erectum vel obliquum conicum, ore emarginato vel truncato: marginibus scabroserrulatum, facie extrorsa bicostulatum (costulis nunc submarginalibus, nunc intramarginalibus, parum prominentibus ad rostelli apicem usque productis: in utraque facie plerumque nervulis plus minus copiosis subtilissimis superne sæpe obsoletis striatulum, rarius exceptis costulis binis enervium vel paucinervulosum. Basis rostelli sæpe quasi strangulata. Perigynium *juvenile* ellipsoideum vel oblongum, regulare, obtuse trigono-compressum (angulo tertio introrso) vel plano-convexum (facie introrsa planum). Achenium stipitatum, nigro-bruneum, granuloso-punctatum, obovoideo-vel subglobooso-clavatum, vel pyriforme rotundato-trigonum vel irregulariter subteres vel bigibbosum, varie lacunosum, trico-stulatum, apice repente contractum in collulum brevissimum coronatum disco coriaceo albido styli basi conica emarcida superante.

"Folia culmo nunc breviora, circa 4 poll. nunc subæquilonga, 8-10 poll. longa, 1-2 lin. lata, rigidula, planiuscula, carinata, pleraque in apicem plus minus elongatum attenuata; vaginæ striatæ obtusæ, ore membranaceo truncatæ, mox fissæ. Bracteæ spicularum *radicalium* similis, foliis radicalibus, pedunculos plerumque excedentes, spicularum *superiorum* nunc foliaceo-elongatæ spicum masculum plus minus superantes, vaginæ tubulosæ vel sursum ampliatae ore truncato instructæ, nunc dilatatae et vix aut brevissime vaginantes, biauriculatæ vel ovatae, spicam masculam vix æquant, nunc ex toto squamaceæ obovatæ vel obcordatæ vel ovatae aut ovato-lanceolatae, acuminatæ, membranaceo-marginatæ, breve vel longius cuspidatæ."

The affinity of this species, among its European allies, is with *C. præcox*, Jacq., and with the Eastern *C. breviculmis*, Br., and *C. chinensis*, etc. Whether the *C. depressa*, Link and Schk., is referable to this species or not, we have no materials for a satisfactory opinion. The plant figured by Schk. is probably the same as that of Willdenow, which Kunth refers to *C. alpestris*, All. (*C. Halleriana*, Asso). The specimen is young, with aristate male and female squamæ, 2 radical spiculæ apice masculæ, and the culm without any lateral one. Link describes his plant as having superior axillary spiculæ and one radical one, thus differing from the figure of Schk. and the description of Willdenow. Still it is more than probable that the plant, which they called by Link's name, was from his collection, and at the time Kunth wrote there was no European species known beyond *C. alpestris*, to which it was likely to be referred. The aristate squamæ and the androgynous radical spiculæ lead me to believe that it is the same as the plant of Jordan. The specimens which my late friend Dr. Charles Lemann sent me in 1841, from Gibraltar, I had referred to *C. depressa*, Link, but in the uncertainty about that plant I merely quote it as a doubtful synonym. The specimens figured are those of Durieu, from Algiers.

296. *C. pedunculata* (Muhlenberg); spica purpureo-viridi, e spiculis 4-5 apice masculis parvis ovatis vel ovalibus laxi-paucifloris remotis, superioribus vaginatis subapproximatis, inferioribus radicalibus longe exserte pedunculatis decumbentibus; bracteis brachyphyllis; stigmatibus 3; perigyniis acute triquetris pyriformibus rostellatis, rostro sæpe excurvo, ore subintegro, parce

puberulis enerviis, pallide viridibus, membranaceis, squama obovata truncata ciliolata cuspidata amplexente purpurea medio viridi angustioribus longioribus.—*C. pedunculata*, *Muhl.* 232; *Schk. f.* 131; *Willd.* 222; *Kunth*, 481; *Dewey*, ix. 259; *Tor. Mon.* 309; *Carey*, 525; *Sartwell, Exs.* 102. (TAB. CCCCXIX.)

HAB. In America septentrionali.—Norway and Cumberland House (*Richardson*) to Pennsylvania (*Carey*). Rocky Mountains, *Drummond*.

*Radix* fibrosa, cæspitosa. *Culmi* plures 4-12-pollicares, triquetri, graciles, reclinati, basi foliati vaginisque purpureis tecti. *Folia culmea* breviora; *radicalia* culmo sæpe duplo longiora, plana, viridia. *Bracteæ* vaginatæ, subulatæ, spiculis breviores. *Spiculæ* 3-6 lin. longæ, 1½-2 lin. latæ, terminalis basi flosculis femineis 1-2 instructa, superiores 1-2 subapproximatæ, reliquæ radicales longe inæqualiter pedunculatæ, una alterave sæpe omnino feminea. *Pedunculi* exserti; inferiores 1-6 poll. longi, capillares. *Squamæ* masculæ sæpe acutæ, femineæ majores truncatæ vel retusæ, omnes ciliatæ, cuspidatæ. *Perigynium* 1- $\frac{8}{10}$ -2- $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum, e basi longe attenuata pyriforme, achenium arcte vestiens. *Achenium* conforme, 1½ lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum, triquetrum, ovale, stipitatum, fuscum. *Racheola* squamæformis, apice serrata, extra os perigynii protusa, rarius adest.

I have not seen this species south of New York. It is not included in the 'Flora Cestrica' of Darlington, nor do Elliott or Chapman notice it. I have only observed the racheola in the Arctic specimens brought by Sir John Richardson. Muhlenberg and Torrey say it has rarely 2 stigmas. I have not observed this variation.

297. *C. Schiedeana* (Kunze); spica lineari-oblongata pallida, e spiculis 6-8 apice masculis attenuatim contiguous sessilibus evaginatis, extremis oblongis majoribus; bracteis inferioribus 2-3 filiformibus culmum longe superantibus; stigmatibus 3; perigyniis subgloboso-tri-quetris basi acutis rostellatis, ore hyalino integro vel bidentato obliquo, undique hispidis, nervatis pallide viridibus, squama ovata acuminata subinde cuspidata medio viridi nervata albida castaneo-tincta brevioribus vel subæquantibus.—*C. Schiedeana*, *Kunze*, 119, t. 30; *Stuedel*, 208. (TAB. CCCCXX.)

HAB. In Mexico, *Schiede*.

*Cæspitosa*. *Culmus* 9-12-pollicaris, gracilis, triquetrus, firmus, lævis, inter spiculas scabriusculus, basi vaginis ferrugineis reliquisque fibratis foliorum tectus; pars spicas gerens 2-2½-poll. longa. *Folia* marginibus eximie revolutis filiformia, mox evoluta lineam lata, culmo longiora vel breviora. *Bracteæ* inferiores foliis similes; superiores sensim breviores, demum squamæformes, omnes evaginatae vel infima vagina brevi instructa. *Spiculæ* 3-9 lin. longæ, 2 lin. latæ, laterales e spathella egredientes; superiores parvæ, ovatae, basi flosculis 2-3 femineis, masculis pluribus instructæ; extremæ majores, apice subdimidiatim masculæ. *Squamæ* conformes; masculæ muticæ; femineæ inferiores, longius cuspidatæ. *Perigynium* 1- $\frac{3}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum. *Achenium* conforme,  $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, triquetrum, pallidum, basi styli incrassata.

Affinis *C. setigeræ*,  $\beta$ , Don.

I have not found this species in any of the later collections, and am indebted to Professor Tuckerman for the specimens figured, which he received from Kunze. It differs from Himalayan plants in all its spikes being androgynous, its nerved perigynium and filiform leaves.

298. *C. amicta* (Boott); spica abbreviata congesta simplici vel elongata laxa composita castanea, e spiculis parvis apice masculis sessilibus, vel spiculis 5 simplicibus congestis infima discreta, vel pluribus, superioribus simplicibus congestis, inferioribus in spicis partialibus ovatis vel oblongis pedunculatis alternatim approximatis 3-5 spiculiferis insidentibus; bracteis inferioribus vaginatis culmo longioribus; stigmatibus 3; perigyniis ovali vel subgloboso-triquetris rostratis, ore bilobato, undique hispidis enerviis castaneis, squama ovata acuta vel emarginata cuspidata striato-nervata castanea longioribus. (TAB. CCCCXXI.)

HAB. In America meridionali.—Paramo de Cuchero, *Purdie* (*Herb. Hooker*).

*Culmus* 1-5-pollicaris, triqueter, lævis, firmus, basi foliatus, pars spicas gerens 1-4 poll. longa. *Folia* sub lineam lata, culmo longiora, firma, plana, marginibus revolutis, aperta vel sæpe arcuata. *Bractea* foliis similes; inferiores breve vaginatae. *Spicae* partiales; superiores ovatae, 4 lin. longae, 2 lin. latae, e spiculis 3 ad apicem pedunculi congestis; inferiores oblongae, pollicares, e spiculis 5 inferioribus remotis. *Spiculae* omnes ovatae, apice masculae, 3 lin. longae, superiores vel omnes simplices, congestae. *Squamae* eonformes, masculae lanceolatae. *Perigynium*  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, subinde morbide elongatum,  $2\frac{4}{10}$  lin. longum, nisi nervis 2 intramarginalibus enervi. *Achenium* conforme,  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, acute triquetrum, pallidum, stipitatum, stipite basique styli persistente depresso-curvatis. *Stylus* deciduus, incrassatus, papilloso-velutinus.

Affinis *C. scabrella*, Wahl., quæ elongata, gracilior foliisque longis, perigyniis nervatis etc. gaudet.

299. *C. Tweediana* (Nees); spica elongata demum stramineo-olivacea, e spiculis 8 cylindricis, terminali mascula reliquis androgynis apice masculis, superioribus sessilibus contiguis evaginatibus, inferioribus compositis, infima remota longe exserte pedunculata; bracteis latis, culmum longe superantibus, infima vaginata; stigmatibus 3; perigyniis turgide ovatis vel sphaeroideis rostratis bifurcatis plus minus nervatis undique scabris stipitatis olivaceis suberosis, squama ovata cuspidata straminea trinervi margine hyalina brevioribus vel æquantibus.—*C. Tweediana*, *Nees in Hook. Journ. Bot.* ii. 398; *Boott, Linn. Trans.* xx. 126; *Steud.* 206. (TAB. CCCCXXII.)

Var.  $\beta$ ; spiculis 5, simplicibus, terminali mascula, reliquis femineis. (TAB. CCCCXXIII.)

HAB. In America meridionali.—*a.* Buenos Ayres, *Tweedie, Herb. Fielding* (*Oxford*).—*\beta.* Brazil, *St. Hilaire* (*Herb. Mus. Par.*).

Var. *a.* *Culmus* validus, triqueter, scaber. *Folia* desunt. *Bractea* 4-6 lin. lata, culmum longe superantes. *Spicula mascula* 2 poll. longa,  $2\frac{1}{2}$  lin. lata, sessiles, reliquæ apice masculae; suprema simplex, flosculis femineis 2-3 basi instructa; binæ superiores 16 lin. longae; spicula altera subæquali composita quasi geminata; inferiores 2- $2\frac{1}{2}$  poll. longae, spiculis 2-4, minoribus basi auctae; infima remota longissime exserte pedunculata. *Squamae* eonformes, masculae lanceolatae. *Pedunculus* infimus 8 poll. longus, anceps, lævis. *Perigynium*  $2\frac{7}{10}$  lin. longum,  $1\frac{2}{10}$  lin. latum. *Achenium*  $1\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, ovatum, basi productum, triquetrum, olivaceum.

Var.  $\beta$ ; spiculis simplicibus perigynisque minoribus.

I am indebted to Professor Daubeny for the opportunity of giving a figure of the specimen in the Oxford Herbarium (for-

merly Herb. Fielding), and to M. Spach for that of St. Hilaire from Brazil. Different in inflorescence as the two plants are, I have no hesitation in uniting them. The affinity is with *C. setigera*, Don, in which we find the same tendency to simple or compound spiculae. As in similar cases, the supplementary spiculae issue from a proliferous perigynium.

300. *C. tristachya* (Thunberg); spica brevi pallida, e spiculis 3-5 gracilibus oblongo-cylindricis, erectis, terminali mascula sessili, reliquis femineis, superioribus confertis masculae arcte contiguis, infima remota longe exserte pedunculata; bracteis inferioribus vaginatis, subinde culmum æquantibus; stigmatibus 3; perigyniis oblongo-ellipticis triquetris rostellatis ore emarginato, nervatis puberulis, subexcurvis stipitatis pallidis, squama ovata acuta vel obtusissime truncata vel abrupte apiculata ciliolata albo-lutescenti nervo viridi longioribus.—*C. tristachya*, *Thunb. Fl. Japan*, 38; *Wahl. Act.* 157; *Schk. f.* 109; *Willd.* 258; *Kunth*, 474; *Steud.* 232. *C. monadelphæ*, *Boott in Perry's Exp. to China and Japan*, ii. 323 (1826). (TAB. CCCCXXIV.)

HAB. In Japonia et China.—Japan, *Thunb.*, *Morrow*. Whampoa, *Hance*.

*Culmus* subpedalis, gracilis, triqueter, inter spiculas scabriusculus, basi foliatus, pars spicigera 1- $3\frac{1}{2}$  poll. longa. *Folia culmea* 1 lin. lata, radicalia 2 lin. lata, culmo multum longiora. *Bractea* inferiores vaginatae, culmo longiores vel breviores. *Spiculae* 8-10 lin. longae,  $\frac{1}{2}$ -1 lin. latae; infima  $\frac{1}{2}$ - $2\frac{1}{2}$  poll. remota. *Pedunculus* infimus subinde  $2\frac{1}{2}$  poll. longus. *Vagina* infima 4-6 lin. longa. *Squamae* masculae rotundatae, obtusae; femineae variantes, acutae obtusae truncatae vel abrupte apiculatae. *Perigynium*  $1\frac{4}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, apice modice excurvum. *Achenium* oblongo-ovale, triquetrum, apice annulatum, basim styli bulbosum deciduum cingens. *Antherae* breves, filamentis latis clavatis acutis connatis? instructae. *Stigmata* 3, brevia.

This delicate species, with the habit of the *Digitata*, belongs to the group of the *Sphaeridiophorae* of Drejer, with annulate achenia, allied to *C. leucochlora*, Bunge. When describing Dr. Morrow's Japan *Carices*, at the request of Dr. Gray, I was led to separate it from *C. tristachya*, Thunberg, from the absence of all allusion to any pubescence in the perigynium of that species. But I suspect, from Schkuhr including it among species with pubescent perigynia, and from Wahlenberg's description, that it is the plant of Thunberg. Whether the broad cuneate filaments are connate, as I supposed from Dr. Morrow's specimens, I have had doubts since I have seen Dr. Hance's specimens; for, though the filaments apparently adhere, as shown in the figure (*a*), I found one to become eventually detached, and it is probable that the pressure in drying them gives the appearance of their being united.

The specimens figured are,—

No. 1. Dr. Morrow's specimens from Simada.

No. 2. Mr. Hance's specimens from Whampoa.

301. *C. manca* (Boott); spica subelongata olivacea, e spiculis 2-4 cylindricis erectis approximatis, terminali mascula, reliquis femineis vel apice masculis longe exserte pedunculatis laxifloris, bracteis vaginatis brachyphyllis; stigmatibus 3; perigyniis turgide ovalibus rostratis, ore hyalino obliquo bidentato vel bilobo obtuse trigonis puberulis crebre breviter nervosis, squama ovata acuta vel obtusa cuspidata pallide fulva longioribus. (TAB. CCCCXXV.)

HAB. In China, ad montium cacumina.—Hongkong, *Hance* (*Herb. Bentham et Hooker*).

*Culmi* 1-1½-pedales, ex eadem radice plures, filiformes, læves, nudi, basi foliis brevibus instructi, pars spicigera 5-9 poll. longa. *Folia culmea* brevia, angusta: *sterilia* 3-5 lin. lata, culmo longiora, plana, rigida. *Bractea* vaginatæ, pedunculatum subæquantæ. *Vagina* 8-12 lin. longæ. *Pedunculus* infimus 2-3 poll. longus. *Spicula* 1-1½ poll. longæ, masculæ 1 lin. reliquæ 3 lin. latæ. *Squamæ* masculæ linearis, acutæ, angustæ; femineæ ovatæ, margine hyalinæ cuspidatæ. *Perigynium* 2 $\frac{8}{10}$ -3 $\frac{1}{10}$  lin. longum, 1-1 $\frac{1}{10}$  lin. latum. *Achenium* 1 $\frac{8}{10}$ -1 $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{9}{10}$  lin. latum, obtuse trigonum, angulis indentatis, stramineum, stipitatum, basi styli persistente crassa curvata elongata ( $\frac{4}{10}$ - $\frac{5}{10}$  lin. longa) apiculatum.

Var. *a.* *C. Harlandi*, Boott, differt perigyniis puberulis, squamis masculis linearibus acutis, foliis angustioribus.

302. *C. aperta*,  $\beta$  (Boott); spica oblonga ferruginea, e spiculis 4 vel 3-5 oblongis vel cylindræis masculis 2 rarius 1-3 femineis 2 rarius 1-3 approximatis sessilibus suprema (rarius omnibus) apice parce masculis vel sæpius omnibus omnino femineis obtusis, infima subinde remota clavata basi dissitiflora pedunculata subnutante; bractea infima culmo brevior; stigmatibus 2; perigyniis orbiculatis vel ellipticis biconvexis plerumque abrupte rostellatis, ore bidentato, micanti-granulatis, superne sæpe parce dentatis enerviis dentatis rarius 2-4 nervatis sessilibus demum ferrugineis, squama lanceolata acuta aperta ferruginea, nervo pallide subæquilata brevioribus.—*C. aperta*, Boott, *Fl. Bor. Am.* 218, t. 219 (*major*); Carey, 517. *C. acuta*, var. *crecta*, Sartwell, *Evs. n.* 53. *C. Haydenii*, Dewey, in *Herb. Torrey*. *C. vulgaris*?, Maximowicz, *Mem. Act. St. Pet.* ix. 314. (TAB. CCCCXXVI.)

HAB. In America septentrionali et Asia.—*a.* Oregon, Douglas, Scowler, Nuttall, Wilkes, Lyall. Japan, Hakodadi, Wright (*Herb. Gray*). Amur River, Maxim. (*Herb. Hooker*).— $\beta$ . New England, Olney, Tuckerman. Illinois, Vasey. Nebraska, Hayden.

*Radix* estolonifera. *Culmus* 2-3-pedalis, acute triquetus, firmus, scaber vel apice scabriusculus, rarius lævis, basi rudimentis foliorum ferrugineis vaginisque rarius fibrillosis tectus; pars spicigera 2-5 poll. longa. *Folia* 1-2 lin. lata, culmo breviora: *sterilia* elongata, marginibus revolutis. *Bractea* evaginatæ; infima rarius culmum æquans vel vaginans. *Ligula* clongata vel rotundata. *Pedunculus* infimus 3-4 rarius 14 lin. longus. *Spicula* mascula 8-18 lin. longa, 1-1½ lin. lata, altera 3-8 lin. longa. *Spicula* femineæ 5-20 lin. longæ, 1½-3 lin. latæ, e squamis apertis quasi comosæ. *Squamæ* lanceolatæ; masculæ sæpe pallide-ferrugineæ, obtusæ vel inferiores acutæ; femineæ acuminatæ, acutæ, vel superiores subobtusæ, ferrugineæ concolores vel nervo pallido marginibus albo hyalinis. *Perigynium* suborbiculatum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. longum, vel ellipticum 1 $\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, achenium laxè vestiens, stylo sæpe exserto plerumque enerve. *Achenium*  $\frac{6}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, biconvexum, basi styli recta interdum contorta apiculatum.

I find in 53 specimens—

|                 |                |                  |
|-----------------|----------------|------------------|
| 8 with 3 spikes | 10 with 1 male | 2 with 1 female. |
| 34 „ 4 „        | 42 „ 2 „       | 37 „ 2 „         |
| 11 „ 5 „        | 1 „ 3 „        | 14 „ 3 „         |

In 19, the upper female, male at top.

6, all the female, male at top.

28, all were female.

The plant from the States differs from the Oregon, in smaller spiculæ and perigynia, which are sessile, and in ferruginous squamæ. It differs from *C. angustata* in the smaller, more diver-

gent female spiculæ, with few terminal male florets, acute squamæ, ferruginous often orbiculate perigynia, and the vagina rarely filamentose.

From *C. verticillata*, in its fibrous not stoloniferous root, a stouter rougher culm, firmer erect leaves, generally two male and female spiculæ, acute, longer, and divergent squamæ, and larger, perigynia.

In the Japan plant, the male spicula has a few female florets at the apex, which I have not observed in the American one; and the perigynia are more frequently nerved, approaching *C. vulgaris*.

The American specimen I have seen in Herb. Hooker.

The specimens figured are from Rhode Island, sent to me by Mr. Carey.

303. *C. bicolor* (Allioni); spica plerumque abbreviata, glauco-purpurea, e spiculis 2-5 oblongis contiguis, inferioribus pedunculatis, terminali basi mascula, reliquis femineis, infima sæpe remota subinde radicali longe exserte pedunculata nutante; bractea infima squamæformi purpureo-auriculata, cuspidata, vel foliacea breve vaginata; stigmatibus 2; perigyniis ovalibus, compressis, conico-stipitatis, obtusis, crostribus, ore integro, valide nervatis, granulato-asperulis glaucis, squama late ovata, purpurea obtusa mutica vel nervo viridi excurrente æquilata longioribus.—*C. bicolor*, Allioni, *Ped.* 267 (1785); Link, 347; Willd. 222; Schk. f. 181; Kunth, 406; Koch, 873; Gaud. *Ap.* 97, et *Helv.* 60; Bertol. 71; Reich. 12. t. 225; Fries, *Mant.* 3. 149, et *Summa*, 254; Anders. 55. t. 4. f. 43; Lang, 85; Drejer, *Rev.* 29; Fl. Ross. 285; Steud. 200; Gren. et Godron, 401; Ter. et Schw. 310. *C. androgyna* et *C. cenisia*, Balb. (TAB. CCCCXXVII.)

HAB. In Europa et America boreali.—Siberia, Greenland, Labrador, Lapland, Russia, Switzerland.

Stolonifera. *Culmus* 2-5-pollicaris, scabriusculus, basi foliatus, demum apice nutans, pars spicigera 5-20 lin. longa, vel longior. *Folia* sub lineam lata, culmo breviora. *Bractea* infima sæpe breve vaginata, vel cuspidata abbreviata, vel foliacea culmo brevior vel subæquans. *Spicula* 2-5 lin. longæ, 1½-2 lin. latæ, omnes contiguae vel infima remota sæpe subradicalis, longe exserte pedunculata. *Perigynium*  $\frac{8}{10}$ -1 $\frac{2}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, stipite conico  $\frac{2}{10}$  lin. longo, nervis concoloribus. *Achenium*  $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{6}{10}$  lin. latum, orbiculatum, lenticulare, fuscum, punctulatum, basi styli æquali apiculatum.

This pretty species, with its ally *C. aurea*, Nuttall, is allied to the *Panicææ*. Neither Fries nor Anderson give any locality in the North of Europe except that of Lapland. In North America it is found only in Greenland and Labrador.

The specimens figured are,—

1. From Greenland, from Vahl.
3. Austrian Alps.

304. *C. eleusinoides* (Turcz.); spica abbreviata viridi-purpurea, e spiculis 3-5 oblongis linearibus fastigiatis erectis, terminali basi mascula, reliquis femineis, inferioribus breve pedunculatis: bracteis evaginatæ culmo longioribus; stigmatibus 2; perigyniis ovalibus vel ovatis biconvexis rostellatis, ore integro vel emarginato, pallidis superne purpureis enerviis squama ovata subacuta vel obtusa purpurea margine albo hyalina nervo viridi latioribus longioribus.—*C. eleusinoides*, Turcz. Meyer in Kunth. *Cyp.* 407; Steud. 201. *C. cæspitosa*, Ledeb. *Fl. Ross.* 310. (TAB. CCCCXXVIII. f. 1.)



HAB. In Asia.—Alp. Baical, Davuria, Altai.

*Culmus* 9–13-pollicaris, obtusangulus, apice seabriusculus, basi foliatus, pars spicigera 9–18 lin. longa. *Folia* sub lineam lata, plana, summum subinde culmo longius. *Bractea* 2 inferioris culmum superantes, evaginatae. *Squamæ* atro-purpureæ, impunctatae. *Spiculæ* 4–8 lin. longæ, 1–1½ lin. latæ, arete contiguæ. *Pedunculus* infimus 4–6 lin. longus. *Perigynium*  $\frac{5}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, enervium vel basi obscure leviter parce nervulosum, biconvexum. *Achenium* conforme,  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, orbiculatum, biconvexum, ferrugineum.

The coarctate inflorescence, and the 4–5 alternate leaves in the lower half of the culm, and entire vaginæ separate this species from *C. cæspitosa*. It approaches *C. lenticularis*, which has distinctly nerved perigynia and a laxer inflorescence.

305. *C. vicinalis* (Boott); spica subelongata ferrugineo-purpurea, e spiculis 5–6 cylindricis, erectis, masculis 2–3 sessilibus, contiguis ferrugineis, reliquis femineis, pedunculatis remotis atro- vel glauco-purpureis inferioribus bracteatis basi attenuatis; bracteis evaginatatis, infima culmum superante; stigmatibus 2–3; perigyniis (*immaturis*) ellipticis, rostellatis, ore integro, superne granulatis, marginibus apice subinde parce dentatis, trinerviis pallidis squamam oblongam obtusam muticam purpuream margine albo-hyalinam subæquantibus. (TAB. CCCXXVIII. f. 2.)

HAB. Ind. Orient.—Nilghiris, *Schmidt* (*Herb. Hooker*).

*Culmus* 1–1½-pedalis acute triqueter scaber rigidus, pars spicigera 8 pollicibus longa. *Folia* desunt. *Bractea* infima 1–1½ lin. lata, 6–9 pollicibus longa, proxima spicula longior vel æquans. *Spiculæ* masculæ 2–3 extremæ subpollicares, femineæ 9–20 lin. longæ, 2 lin. latæ. *Pedunculus* infimus scaber 8–20 lin. longus. *Squamæ* obtusæ impunctatae, nervo simplici infra apicem evanescente, ligula elongata. *Perigynium* 1½ lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum. *Stigmatibus* 2–3.

A *C. cæspititia*, Nees, differt spiculis remotis, infima longe pedunculata, squamis nervo simplici infra apicem evanescente, stigmatibus 2–3.

306. *C. cæspititia* (Nees); spica oblonga pallida, e spiculis 4–5 sessilibus, terminali mascula cylindrica, reliquis femineis oblongis bracteatis bracteis inferioribus culmum superantibus evaginatatis; stigmatibus 2; perigyniis (*juvenilissimis*) ovalibus, ore integro apice glauco-granulatis basi brunneis nerviis squamam lanceolatam medio pallidam trinervem æquantibus.—*C. cæspititia*, Nees, apud *Wight*, *Contr. p.* 127; *Kunth*, 412; *Steud.* 212. (TAB. CCCXXVIII. f. 3.)

HAB. Ind. Orient.—Silhet, *Wallich*, *Cat.* 3392.

*Culmus* subpedalis, triqueter, scaber, rigidus, pars spicigera 2–2½ poll. longa. *Folia* 1½ lin. lata, culmum superantia. *Bractea* angustæ, infima culmo amplo longior, proxima eo subinde longior; suprema spiculam æquans. *Spicula* mascula 10 lin. longa, 1–1½ lin. lata, fulva; femineæ 6 lin. longæ, 1 lin. latæ, superiores contiguæ, infima remotiuscula. *Squamæ* omnes trinerves, nervo usque ad apicem extenso; masculæ obtusæ, majores; femineæ nunc acutæ, inter nervos punctatæ. *Perigynium* (*floriferum*)  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, erostellatum.

All the specimens are too young for any satisfactory comparison of this species with its allies. It differs from *C. vicinalis*

in its short female spiculæ, its 3-nerved squamæ, and small nerveless perigynia.

307. *C. circinata* (Meyer); spica simplici androgyna apice mascula oblonga laxa, fusco-ferruginea nuda vel bracteata; stigmatibus 3 vel 2; perigyniis lanceolatis sensim rostratis, ore albo hyalino integro plano, convexiusculis, superne ad margines scabris leviter nervatis erectis flavidis apice ferrugineis, squama oblonga obtusa mutica, vel infima cuspidata fusco-ferruginea margine pallidiore longioribus.—*C. circinata*, *Meyer. Cyp. Nov.* 15. t. 6; *Kunth*, 426; *Fl. Ross.* 268; *Steud.* 186. (TAB. CCCXXIX.)

HAB. In Asia.—In rupibus Unalaskæ, *Meyer*.

*Radix* repens. *Culmus* 6–8-pollicaris, triqueter, scaber, sæpe incurvus. *Folia* canaliculata, filiformia, firma, curvata, culmum subæquantia. *Spica* subpollicaris, 2 lin. lata; flosculis masculis 8–10; femineis 8–12, basi subinde interrupta. *Squamæ* obtusæ, infima nunc euspidata. *Perigynium* (*immaturum*)  $2\frac{3}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ore scarioso demum fisso, truncato. *Achenium* 1 lin. longum,  $\frac{3}{10}$  lin. latum. In uno flore vel ræhcola stipitata (vel perigynium?) linearis, exserta, apice hyalina, adest. *Stigmata* sæpius 3, rarius 2.

All the specimens I have seen of this species are young, and it is impossible to say whether the perigynia maintain eventually their erect direction. The affinity seems to me to incline more to the *Pyrenaicæ* than to *C. polytrichoides* and *C. pulicaris*, to which Meyer allied it, or than to *C. rupestris*, to which, in the 'Flora Rossica,' it is considered to be near.

I have copied Meyer's figure, n. 1, and given others from my own herbarium, for which I am indebted to M. Fischer and M. Kunze.

308. *C. hordeistichos* (Villars); spicis 5–7, masculis 2–3 rarius 4 approximatis vel infima remota bracteata oblongis gracilibus, femineis ovatis vel oblongis crassis, inferioribus remotis inserte vel exserte pedunculatis; bracteis culmo longioribus; stigmatibus 3; perigyniis ellipticis longe rostratis, ore bilobato, rectis vel curvatis plano-convexissimis inæqualiter trigonis marginibus plerumque plus minus alatis serratis nervatis scabris vel glaberrimis, nervis obsoletis, coriaceis fungosis pallidis vel rubescentibus, squama ovata obtusa mutica vel acuta mucronata pallide castanea margine albo-hyalina longioribus.

Var. *a.* *C. hordeistichos*, *Villars, Pl. Dauphin.* 220. t. 6 (1787); *Link*, 364; *Koch*, 883; *Reich.* 24, t. 257; *Cosson et Germ.* 601; *Grenier et Godron*, 423. *C. hordeiformis*, *Wahl. Act.* 152; *Schk. f.* 121 (*Icon. Villars*); *Willd.* 310; *Kunth*, 486; *Bertol.* 154. *C. secalina*, *Hoppe, t.* 103; *Smith, Eng. Fl.* 126; *Steudel*, 236. *C. Secale, Fl. Ross.* 300. (TAB. CCCXXX.–CCCXXXI.)

Var. *β.* *secalina*.—*C. secalina*, *Wahl. Act.* 151; *Schk. S. f.* 65; *Willd.* 309; *Kunth*, 486; *Link*, 364; *Fl. Altaica*, 232. (TAB. CCCXXXII.–CCCXXXV.)

HAB. In Europa, Asia, et Africa.—*a.* In paludosis Galliæ, Germaniæ, Corsicæ. In subalpinis Mont. Bæticæ Sierra Nevada, *Bourgeau*. Tauria. In Mont. Cappadociæ, *Aucher-Eloy* (*Herb. Mus. Par.*). Algeria.—*β.* In uliginosis Austriæ, Hungariæ, Rossicæ, Altai.

Var. *a.* *Culmus* ½–8–10-pollicaris altus, laevis. *Folia* carinata, firma, culmo longiora. *Squamæ* masculæ obtusæ, muticæ, margine albo-hyalinæ subinde eiliolatæ; femineæ inferiores

acutæ mucronatæ, superiores obtusæ muticæ. *Perigynium*  $3\frac{1}{2}$ –5 lin. longum,  $1\frac{2}{10}$ – $\frac{3}{10}$  lin. latum, scabritic nervatione colore insigniter varians; in speciminibus quibusdam Galliæ (*Bondy*) et Hispaniæ glaberrimum, lucidum, nerviis obsolete; in aliis ex Alp. Provence (*Gap*) scaberrimum, nervosum. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longum)  $1\frac{6}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongo-obovatum, inæqualiter trigonum, atro-purpureum, punctatum; stylo recto vel contorto.

Var.  $\beta$ . Habitus omnino ut in forma typica. *Culmus* altior. *Folia* plerumque angustiora. *Spiculæ* femineæ subinde compositæ. *Squamæ* sæpius mucronatæ. *Perigynia*  $2\frac{8}{10}$ –3 lin. longa,  $\frac{8}{10}$ –1 lin. lata, compressa membranacea, recta, appressa, glabra, marginibus acutis vel subalatis serratis, nervatis. *Achenio* (stipite  $\frac{2}{10}$  lin. longo)  $1\frac{3}{10}$ – $\frac{5}{10}$  lin. longo,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. lato, oblongo-obovato compresso (angulo tertio fere obsolete) inæqualiter triquetro, atro-purpureo, punctato; stylo contorto.

The variations observable in *C. hordeistichos*, a species easily recognized in all its forms, well exhibit the variable character of *Carex*. The *C. secalina* which I have from Austria (*Wahlenberg*, from *Herb. Tuckerman*), from Russia (*Fischer*), and perigynia from the Altai (*Ledebour*), certainly justified *Wahlenberg* to consider it a species, from the smooth, compressed, membranous, appressed-imbricate, smaller perigynium; and it is remarkable that those (*Koch*, *Treviranus* (*Fl. Rossica*), *Bertolini*) who quote it as a synonym to *C. hordeistichos* make no allusion to these characters, which, in the perfectly mature state of the perigynium, contrast so remarkably with the large, tumid, plano-convex, fungous perigynium of *Villars*' plant. But the observations of *M. Spach* show that, by cultivation, the one form passes into the other.

One of the variations is peculiar,—that of the upper portion of the culm, supporting the male spiculæ, suddenly assuming the appearance of a peduncle, losing the thickness and angular roughness of the culm. In the specimens from the Forest of Bondy, near Paris, and from the Sierra Nevada, the perigynium is smooth, the nerves almost entirely obliterated, and the alæ of the margins also; while in those from the Alps of Provence (*Gap*), the original habitat of *Villars*, they are scabrous and nerved. *Villars* says "*capsules velues ou rudes*." I suspect the deposition of spongy matter, as the perigynium ripens, has much to do with this smoothness and obliteration of the nerves and alæ, and the change of form from that of the var.  $\beta$  to the typical form, as is the case in other species; and, supposing that *C. secalina* is a depauperate state, one can easily conceive that nutrition would change its membranous compressed fruit into the tumid trigonous form of the type. *Reichenbach*, under *C. hordeistichos*, says:—"Specimina in variis regionibus Galliæ et Germaniæ lecta cum illis e Moravia et Rossia conveniunt omnino rigiditate, foliis latis et spicis magnis, et veram *Villarsii* referunt plantam; sed alia forma gracilis existat, haud raro ultra pedalis, obscurior, tenuis tenuifolia et microstachya, quæ vel in horto, genuinæ vicina, e seminibus educata, habitum servat. Huic convenit fig. *Schk. S. t.* 65. Partes cautius examinatæ específicos characteres dabunt."

I have figured a specimen from the garden at Goetenburg (Tab. CCCXXXII.), which certainly justifies this observation, as it has the essential character of the *C. secalina*, *Wahl.*; but the detailed observations of *M. Spach*, from the plant cultivated in the Paris Garden, lead to the conclusion that the distinction is finally lost. No dependence can be placed on the culm or leaves, or the length of the spiculæ; and the colour of the perigynium varies from a creamy whiteness to fulvous or rufescent. The alæ are at times broad and conspicuous, or narrow or obsolete. With reference to the roughness on the body of the perigynium, I find *Villars* and *Willdenow* only allude to it. *Wahlenberg* and *Link* take no notice of it, while *Kunth*, *Koch*, *Reichenbach*, *Cosson*, *Grenier*, describe it as smooth. *Smith* says that of the Scotch plant is "compressed and without any hairiness;" but in the specimens I have seen from *Drummond*, it is rough and tumid. In my own herbarium, specimens from Austria, Provence, Tauria,

and Cappadocia, have rough perigynia; and in others from Bondy, Auvergne, Sierra Nevada, and Africa, they are smooth. No one since *Drummond* has found it in Scotland. His specimens are in *Herb. Smith, Hooker*, etc.

The specimens figured are,—

Tab. CCCXXX. and CCCXXXI. *C. hordeistichos*, *Villars*. From the Paris Garden.

Tab. CCCXXXII. *C. secalina*, *Wahl.*

n. 1. A specimen from *Wahlenberg*!, given by him to *Tuckerman*, from Austria.

n. 2. A specimen from Russia, sent to me by *M. Fischer*.

n. 3. From Hort. Goet. Herb. *Tuckerman*, from *Notte*.

n. 4. Perigynium and achenium of *C. hordeistichos*, from Bondy, near Paris. To contrast with the other details.

Tab. CCCXXXIII. and CCCXXXIV. *C. secalina*, *Wahl.*, from the Paris Garden.

Tab. CCCXXXV. The Cappadocian specimens of *Aucher-Eloy*. *C. secalina*, var.

To add to the interest of these figures, all of which (except Tab. CCCXXXII.) I owe to the kindness of *M. Spach*, I give his detailed observations on the plants cultivated in the Paris Garden,—cultivation merely giving at times a greater elongation to the culm, and a more fungous tumid form to the perigynium of *C. secalina* :—

"*C. secalina*, Hort. Paris. :—

"Culmi sub anthesi 4–8 poll. longi, foliis plus minus superati propter foliorum copiam parum perspicui serius autem sæpissime folia æquant vel superant, demum  $\frac{1}{2}$ –2-pedales, cæspitiosi, obtuse trigoni, crassiusculi, excepta parte summa spicas masculas gerente lævigati, supra summam spicam femineam subito quasi in pedunculum filiformem triquetrum angulis serrulatum attenuati, basi foliosi et basibus foliorum emarcidorum demum in fibris solutorum obtecti.

"Folia (consimilia foliis *C. hordeistichi*, Hort. Paris., et æquo modo variantia) crassiuscula, subcoriacea, rigidula, glaucescenti-viridia, tenacea, erecta, nunc subfalcato-recurva, eximie canaliculata sive evoluta, lateribus rectis, in sectione transversa figuram v. referentia, ex siccatione artificiali omnino complicata, indeque ad dimidiam latitudinem reducta. (In planta viva folia emarcida persistentia sæpissime etiam complicata plana observantur) serrulata (*sub lente*) longitudine et latitudine quam maxime variantia, lineari-lanceolata, in cuspidem triquetram subulato-filiformem plus minus elongatam, nunc rectam nunc tortuosam scaberrimam angustata. Folia fascicularia  $\frac{1}{2}$ –2-pedalia, angusta vix 1 lin. lata, nunc duplo latiora (explicata 4 lin. lata) basilaria culmorum culmo breviora; vaginæ glabræ obsolete vel obtuse trigonæ.

"Bracteæ inferiores (vel saltem infima) longe, summa haud raro brevissima, vaginantes, planiusculæ vel parum canaliculatae, sæpissime subfastigiatae culmoque longiores, infima 12–15 raro 18 poll. longa; superiores plerumque semipedales; juniores erectæ substrictæ, demum supra medium plus minus reclinatae; vagina infima interdum bipollicaris.

"Spicæ masculæ 2, rarius unica, tetragonæ, graciles, lanceolato-lineares; terminalis major 10–16 lin. longa ebracteata, vel bractea parva squamacea herbaceo-cuspidata vel mutice stipata, haud raro spiculis 1–3 abbreviatis bracteolatis aucta; inferior plus minus remota sessilis, bractea longe vel breve herbaceo-cuspidata evaginata vel breve vaginante stipata (interdum basi mono-vel oligogynantha) a spica summa feminea plus minus remota, nunc internodio spica ista brevior insidens.

"Spicæ femineæ 2–5, plerumque 3–4, varie invicem remotæ vel approximatae; haud raro 2–3 superiores quasi ternato-congestæ, ab infima longe remotæ, sæpius omnes plus minus internodiis inæqualibus vel rarius subæqualibus remotæ; infima subinde subradicalis; erectæ, incluse vel exserte pedunculatae, fructiferae  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longæ, crassæ, imbricatione quadrifaria fructuum tetragonæ rostris subdivergentibus echinatae, colore albido vel stramineo perigyniorum et fascia dorsali viridi, vel violacea aut fulva squamarum variegatae.

"Squamæ masculæ hyalino-membranaceæ, albidæ vel dilute fulvæ, vel hisce coloribus aut viridi variegatae, ovaes vel oblongæ,

obtusæ vel acuminulatæ, plerumque muticæ, nunc mucronatæ vel rarius aristulatæ; inferiores 1-3-nerviæ cum fascia herbacea axili plus minus lata; superiores 1-nerviæ, fascia herbacea orbatæ.

“Squamæ femineæ, sæpius quam in *C. hordeisticho* (Hort. Paris.) mucronatæ; mucrone modo terminali modo infra-apiculari; inferiores plerumque aristulatæ; cæteræ absque ullo certo ordine, aliæ muticæ (aut obtusæ aut sensim acutatæ aut acuminatæ, aut membranaceo-cuspidatæ vel apiculatæ) aliæ mucronatæ (interdum fere omnes mucronatæ) aliæ aristulatæ, omnes plus minus hyalino-membranaceæ (parte herbacæa albida vel dilute fusca) cum fascia centrali viridi aut fulva vel violacea, 1-3-nervia, nervis viridibus, nervo medio sæpissime cristulato scabro serrulato. Circumscriptione variant ovatæ, ovales, oblongæ ovato- vel oblongo-lanceolatæ, apice haud raro emarginatæ vel retusæ vel truncatæ, sæpissime fimbriolatæ. Plerumque squamæ disco perigynii fructiferi subæquilongæ vel paulo breviores (interdum dimidio plusve breviores) et dimidio vel imo subduplo angustiores. Rarius occurrunt spicæ fructiferæ quibus perigynia (saltem pleraque) excepto rostro fere ex toto squamis obteguntur. Spicis juvenilibus floridis perigynia squamas vix aut ne vix excedunt. Delapsis perigyniis pleræque squamæ ad spicarum rachin persistunt.

“Perigynium *juvenile* (sub anthesi) haud fungosum submembranaceo-herbaceum, trigono-anceps (simillimo modo ac *C. hordeistichos*, Hort. et agri Paris.), ala membranacea subpellucida (sæpe latior quam in *C. hordeisticho*) cinctum; in disco nunc glabrum, sæpius setulis brevissimis plus minus crebris scabrum; *fructiferum* æquo modo ac in *C. hordeisticho*, Hort. Paris., polymorphum, varie rostratum, inæque crasse fungosum; secus latera plerumque crassius; raro occurrunt perigynia perfecta matura in toto ambitu subæqualiter incrassata; lucidum vel opacum, tarde deciduum; nunc trigono- vel semitereti-anceps, vel plano-convexo-anceps, inmarginatum vel obsolete marginulatum, (omnino sicut formæ quædam *C. hordeistichos*) modo trigono- vel semitereti-anceps, raro sublenticulari-anceps; angulis lateralibus cristato-marginatis alatisve, cristis vel alis haud raro inflexis. Perigynia *terminalia* observantur obtuse trigona vel subteretia, cristulis vel alis intramarginalibus. *Facies introrsa* plana vel convexiuscula, rarissime elevato-convexa; *extrorsa* plerumque elevato- vel subcarinato-convexa, interdum plus minus gibbosa; margo æqualiter vel inæqualiter vel duplicato-serrulatus. *Discus* sæpissime plus minus striatulus; nervulis æqualibus vel inæqualibus superne plerumque evanescentibus, nunc tenerrimis et in sectione transversa vix aut ne vix prominulis, nunc crassiusculis, sæpissime setulis minimis basi bulboso-incrassatis scabris, rarius lævigatis (imo in perigynio juvenili); setulæ sæpe etiam inter nervos sparse occurrunt.

“*Figura* ludit mirum, ab ovato- vel ovali-subrotundis formis, ad obovatas, ovales, ovoideas, ellipsoideas, oblongas, ovato- ovali- vel oblongo-lanceolatas, simul ac longitudine et latitudine, 4-5½ lin. long., 1-2 lin. latum, sæpius circiter 5 lin. long., 1½-1¾ lin. latum. *Rostrum* (ubi perigynium repente acuminatum) modo gracile sublineare, modo conico-columnare modo subpyramidatum; plano- vel concavo-convexum, rectum vel subincurvum, plus minus elongatum, plus minus æque vel inæque profunde bifidum, vel rarius emarginato-bidentatum (lacinii muticis vel mucronatis carinatis, sublinearibus, rectis, plus minus hyalino-membranaceis, sæpe ciliolatis) cristato-alatum vel marginatum.

“*Achenium* oblongum vel obovato-oblongum, obtuse trigonum, punctulatum, nigrum; stylo indurato recto vel tortuoso cuspidatum, stipitulatum, perigynii cavitatem replens, respectu voluminis perigynii minimum. Angulus tertius extrorsus vel rarissime (solum in perigyniis irregulariter trigonis ad apicem spicarum occurrentibus) introrsus vel oblique lateralis.

“*Stylus* elongatus, inclusus, sæpe secus medium subturgidus. Stigmata plus minus elongata, papilloso-puberula, pro parte inclusa.”

“*C. hordeistichos*, Hort. Paris. :—

“Folia omnino sicut in *C. secalina*, parissimoque modo variant quoad dimensiones. In eodem rhizomate observantur fasciculi alii *stenophylli* foliis e latere visis ¾-1¼ pleraque circiter 1 lin. latis, marginibus ½-1 rarius 1½ ped. longis; alii *platyphylli* 2-2½

lin. latis, plerumque 1 ped. longis, alii *heterophylli*, exterioribus perspicue quam aliis latioribus, vidi etiam fasciculos quorum folia multa 5-8 poll. excedunt. Culmorum folia easdem variationes præbent; modo bracteas æquant vel alte superant, modo bracteis raro culmo superantur.

“Etiam quoad *bracteas* discrimen essenziale nequidem minimum detexi, plerumque haud ultra 6-7 rarius 9 poll. longas, 2-3 lin. latis. In *C. secalina* contra infima sæpius est ultrapedalis, interdum subsesquipedalis et angustior.

“*Spicæ masculæ* ut in *C. secalina*. *Spicæ femineæ* 2-5 plerumque 3 rarissime 5, 5-10 rarius 12 vel 3-4 lin. longæ, brevius longiusve exserte vel subincluse pedunculatæ, ovales vel oblongæ vel ovoideæ, crasse tetragonæ, rostris echinatæ, colore albido vel pallide stramineo (*perigyniorum*) et viridi vel violascente vel fulvo (*squamarum*), variegatæ, varic invicem dispositæ. Spicæ 3, sæpe omnes æquales, subæqualiter remotæ vel infima interdum quasi radicalis a 2 superioribus approximatis vel subfasciculatis plus minus remota, vel omnes subfasciculatæ confertæ. Spicæ 2, approximatae vel subfasciculatæ vel inferior remota. Spicæ 4-5, infima subradicalis nunc depauperata, summa brevis locum spiculæ masculæ lateralis tenens.

“*Squamæ femineæ* ejusdem indolis ac *C. secalina*, itemque variant et forma et colore, sæpissime autem sunt muticæ, raro mucronatæ, rarissime infimæ aristulatæ.

“*Perigynium juvenile* haud fungosum trigono-anceps, submembranaceo-alatum (ala plerumque angustiore quam in *C. secalina*), costulatum, modo glabrum, sæpius nervis vel inter nervos scabro puberulum; *fructiferum* polymorphum, inæqualiter fungosum; præsertim secus latere incrassatum, lucidum, modo obtusissime trigonum vel semiteres vel subteres (tale ad spicarum apicem obvium), modo trigono- vel semitereti-anceps (angulis lateralibus quidem acutis nec tamen marginatis vel alatis): modo marginate vel anguste alato-anceps (margine vel crista haud raro inflexis): facie *introrsa* plana vel subconcava vel raro convexiuscula: *extrorsa* convexissima, haud raro plus minus gibbosa: varie rostratum, plerumque longirostre, rostra nempe disco subæquilongo, nunc brevius, 2½-4¾ lin. longum, marginibus subæqualiter vel duplicato serrulatum (rarius excepto rostro obsolete vel remotissime serrulatum); in disco nunc lævigatum, nunc parcius crebriusque setulis minimis basi plus minus incrassatis scabrum, raro ex toto enervium, plerumque nervulis tenerrimis sursum evanescentibus striatulum, rarius nervis crassioribus et copiosioribus costulatum. (Exempla haud pauca vidi quoad nervos et scabritiem a perigyniis *C. secalinae* nullo modo distinguenda.) Quoad figuram transit pari modo ac *C. secalina* a forma ovali vel ovato-subrotunda per intermedia indefinienda ad formas ovales, ellipsoideas oblongas vel obovatas. In planta Hort. Paris. formas obovoideas, contra in *Agro Parisiensi* (*Bondy*) formas ovales vel ovoideas frequentissimas esse expertus sum.

“*Color* in planta *Herb. Paris.* incunte maturitate lacteus, perinde dilute vel intensius stramineus demum brunneus, rarius castaneus vel rufescens. In speciminibus (*Bondy*) vidi spicas perigyniis maturis stramineo-fulvis.

“*Rostrum* rectum vel incurvum, etc., et *Achenium* omnino idem ac in *C. secalina*.”

*C. hordeiformis*, Aucheri.

In montibus Cappadociæ legit Aucher-Éloy, 1834.—*Aucher*, *Pl. Exsicc.* n. 3785, in *Herb. Mus. Paris.*

Hanc præter perigynia costato-nervosa nulla nota essentiali a *C. secalina*, Hort. Paris., differre video, et pro varietate *C. hordeiformis*, Wahl., habeo. Perigynia (imperfecte matura) 4¾-5¼ lin. longa, 1¼-¾ lin. lata (excepta summa quæ irregulariter subteretitrígona et vix 1 lin. lata), costato-nervosa, longirostria (nunc repente cuspidato-acuminata, nunc sensim angustata), stipitulata vel estipitata, ovalia vel ellipsoidea vel ovoidea, vel exangustata basi subrotunda aut ovato- vel oblongo-lanceolata, trigona vel rarius sublenticulari-ancipitia, ad instar *C. secalinae*, Herb. Paris.; ala latiuscula ciliato-serrulata, in disco setulis brevissimis basi tuberculoso-incrassatis, præsertim ad costulas obviis scabra, fungosa, stramineo-rufescentia. Costulæ æquales vel inæquales, approximatae, ad faciem extrorsam plerumque fere ad rostri apicem

usque protractæ, facie introrsa sæpissime ad rostri basin vel paululo altius in fasciam confluentes. Rostrum lineare vel lineari-lanceolatum vel subpyramidatum, plano-convexum, plus minusve bifidum laciniis sublinearibus rectis parallelis complicatis acutis vel obtusiusculis mucronatis vel muticis, marginibus hyalinis haud raro fimbriolatis.

309. *C. Neesiana* (Endlicher); spica elongata pallida, e spiculis 10 cylindricis erectis masculis 4, infima medio feminea, reliquis femineis, superioribus approximatis, inferioribus 3 remotis exserte pedunculatis, spiculis 3-4 brevibus (basi masculis) inferne compositis; bracteis inferioribus vaginatis longissimis; stigmatibus 3; perigyniis ovalibus rostratis bifidis, superne scabris valide nervatis marginibus laciniisque serratis pallidis, squamam ovatam acutam vel emarginatam cuspidatam pallidam subæquantibus.—*C. Neesiana*, *Endl. Prod.* 24; *Kunth*, 520; *Steud.* 242. (TAB. CCCCXXXVI.)

HAB. Norfolk Island, *Ferdinand Bauer (Herb. Vienna)*.

*Culmus* 2½-pedalis, validus, pars spicigera 2-pedalis. *Folia* 4 lin. lata. *Bractea* infima fere 3-pedalis. *Spica mascula* terminalis, 3½ poll. longa, reliquæ breviores. *Femineæ* 2-4 lin. longæ, 3 lin. latæ, striatæ, erectæ, inferiores 3 a se 4-12 poll. remotæ, basi spiculis 3-4 (basi masculis) compositæ. *Squamæ masculæ* inferiores lineares, elongatæ, emarginatæ; *femineæ* ovatæ; omnes apice ciliatæ, hispido-cuspidatæ. *Perigynium* 1½ lin. longum, ⅙-⅗ lin. latum. *Achenium* ⅙ lin. longum, ⅙ lin. latum, oblongo-ovale, triquetrum, basi styli æquali obliqua apiculatum.

a. *C. Solandri*, B., differt statura majori; foliis latioribus; spiculis pluribus longioribus, stricte erectis; perigyniis apice scabris, valide nervatis; achenio ovali.

I have never seen this plant, which, as far as I know, is unique in the Vienna Herbarium. It was collected by Ferdinand Bauer in Norfolk Island. I am indebted to Professor Fenzl, of Vienna, for the opportunity of publishing the figure, which, at the solicitation of his Excellency Mr. Mottley, M. Fenzl most kindly presented to me. The affinity is with *C. Solandri*, Tab. CLXXV.

310. *C. Olbiensis* (Jordan); spica elongata ferruginea, e spiculis 3-4 oblongis vel cylindricis laxifloris, terminali mascula reliquis femineis, superioribus 1-2 masculæ contiguas sessilibus, infima graciliore remota longe exserte pedunculata, bractea infima foliacea culmo brevior vaginata; stigmatibus 3; perigyniis ellipticis basi productis inæqualiter triquetris sæpe oblique rostellatis, ore subintegro vel emarginato, glabris superne ad margines scabris crebre leviter nervosis ferrugineis, squama elliptica obtusa vel subacuta plus minus longe hispido-cuspidata pallide castanea, nervo viridi scabro brevioribus vel subæquantibus.—*C. Olbiensis*, *Jordan, Obs. Pl. Franc.* iii. 241, t. 12; *Parlat. Fl. Ital.* ii. 201; *Bertol.* 110; *Gren. et Godron*, 408; *Steud.* 233. *C. Ardoiniana*, *Notar. Hort. Bot. Genuens.* 26 (*fide Bertol.*). (TAB. CCCCXXXVII.)

HAB. In Europa.—France, near Hyères. Italy, Sicily.

*Culmus* 1½-2-pedalis, triquetrum, lævis, gracilis, basi rudimentis foliorum purpureis foliisque vaginantibus, tectus; pars spicigera 7-2 poll. longa. *Folia* 2-4 lin. lata, elongata, culmo breviora, plana, firma. *Bracteæ* spiculis longiores; superiores emarginatæ, infima vaginata, vagina subpollicaris. *Pedunculus* infimus 2-6 poll. longus, scabriusculus. *Spicula mascula* 9-14 lin. longa, 1-1½ lin. lata, sessilis vel breve pedun-

culata; squamis lanceolatis, nervo scabro in inferioribus longe, in superioribus breve exserto. *Spiculæ femineæ* 7-9 lin. longæ, 3 lin. latæ; infima 6-8 poll. remota, 12-15 lin. longa, 2 lin. lata, magis laxiflora, squamis inferioribus longe cuspidatis. *Perigynium* 2⅙ lin. longum, 1-1⅙ lin. latum. *Achenium* 1⅙ lin. longum, 1⅙ lin. latum, oblongo-obovatum, obtusum, triquetrum, basi styli abrupte apiculatum.

The affinity of this species is with *C. laxiflora*, Lam., and its allies, differing in the marginal roughness of the perigynium and the obtuse achenium.

The specimens figured are from Hyères.

311. *C. Buxbaumii* (Wahlenberg); spica oblonga, glauco-purpurea, e spiculis 3-5 erectis, terminali basi rarius apice et basi vel omnino mascula, reliquis femineis sessilibus contiguas oblongis vel infima subinde remota breve pedunculata; bracteæ evaginatæ, infima plerumque culmo breviora; stigmatibus 3; perigyniis ovalibus, inæqualiter trigonis subventricosus breve aut vix rostellatis, ore emarginato vel integro, glaucis granulatis plus minus distincte nervatis, squama lanceolata acuminata acuta vel breve cuspidata fusco-purpurea medio pallida, latioribus brevioribus.—*C. Buxbaumii*, *Wahl. Act.* 163; *Fl. Lap.* 244; *Kunth*, 432; *Koch*, 874; *Reich.* xvi. t. 235; *Anderson*, xxxix. t. 6, f. 65; *Lang*, 86; *Fl. Ross.* 285; *Gren. et Godron*, 411; *Eng. Bot.* t. 2885; *Tor. Cyp.* 323, et *Mon.* 407; *Muhl.* 235; *Dewey*, x. 39; *Ell.* 539; *Carey*, 519; *Chap.* 537; *Sartwell, Exs. n.* 62. *C. polygama*, *Schk.* *C. canescens*, *Herb. Linn. (ex parte)*. *C. tubulata*, *Schumacher*. *C. albo-atra*, *Muhl. in Herb. Willd.* *C. oligandra*, *Müller in Herb. Hooker.* (TAB. CCCCXXXVIII.-IX.)

HAB. In Europa, Asia, et America septentrionali.—Australia. Lapland to Switzerland? Altai, Ural Mountains, Kamtchatka. Rocky Mountains, Arctic America to mountains of Carolina and Georgia, Sitcha. Cabboras mountains, 5-6000 feet, and snowy wet plains between the Cabranga and Boyang mountains, Victoria, Australia, *Müller (Herb. Hooker)*.

*Radix* stolonifera. *Culmus* 1½-pedalis, rigidus, acute triquetrum, scaber, basi rudimentis foliorum vaginisque rubro-purpureis reticulato-fissis tectus; pars spicigera 1-2½, rarius 4½ poll. longa. *Folia* 1-2 lin. lata, culmo breviora, rigida. *Bracteæ* evaginatæ, infima rarius culmo longior; auricula ferruginea, rarius amplectens. *Spiculæ* atro-purpureæ, glaucovariegatæ, interdum pallide castaneæ, terminalis basi mascula, major, crassior, sæpe pollicaris, 3-4 lin. lata, interdum apice mascula vel sterilis, rarius omnino mascula, reliquæ plerumque minores sessiles contiguæ vel infima 1½-3 poll. remota, subinde breve pedunculata. *Squamæ* omnes ovato-lanceolatæ acuminatæ acutæ vel cuspidatæ, cuspidæ sæpe lævi. *Perigynium* 1⅙-⅗ lin. longum, ⅙-⅗ lin. latum, nervis concoloribus plus minus prominentibus; ore emarginato, bidentato, rarius integro, calloso; glaucum, granulato-asperulum. *Achenium* lineam longum, ⅙ lin. latum, obovatum, ferrugineum, punctatum, triquetrum, angulo medio postico, basi styli æquali apiculatum.

A *C. Gmelini*, Hooker, differt spicis sessilibus; perigyniis glaucis, granulato-asperulis; squamis lanceolatis, acuminatis, acutis, angustioribus, longioribus; vaginis reticulato-fissis; foliis rigidis.

This species was found on an island on Loch Neagh, Ireland, in

1835, by Mr. Moore, and lately by Müller on the mountains of Victoria, Australia. It is common in the United States.

Tab. CCCCXXXVIII. n. 1, 2. Specimens from Sweden and Norway.

n. 3, from Ireland.

n. 4, with the details, from Australia.

Tab. CCCCXXXIX. Specimens from Ohio and Rhode Island, with the terminal spike male, or male at top and at the base. Some of the Ohio specimens have unusually long spiculæ (15 lines long.), and are of a pale colour, which is often the case in specimens from the North of Europe.

312. *C. Gmelini* (Hooker); spica oblonga, purpureo-ferruginea, e spiculis 3–6 oblongis vel cylindricis erectis approximatis terminali basi vel omnino mascula reliquis femineis, inferioribus pedunculatis infima rarius remota longe exserte pedunculata; bracteis inferioribus culmo longioribus subinde brevè vaginatis; stigmatibus 3; perigyniis suborbiculatis vel ovalibus compressis plano-convexis vel trigonis rostellatis lucidis ferrugineis, ore integro vel submarginato purpureo, nervatis stipitatis, squama ovata obtusa longe hispido-cuspidata purpurea nervo pallido æquilata longioribus vel æquantibus.—*C. Gmelini*, *Hooker, Bot. Beechey's Voy. t. 27*; *Gmelin, Fl. Sib. i. 139, t. 30, f. 1*; *Kunth, 434*; *Fl. Ross. 288*; *Maximowicz, Prim. Fl. Amur. ; Steud. 203*. *C. acrolepis*, *Ledeb. Soc. Bot. Ratisb. iii. 56 (fide Fl. Ross.) (non Liebm. Steud. 196)*. (TAB. CCCCXL.)

HAB. In Asia, America septentrionali (Oregon).—Cape Mulgrave and Kotzebue Sound, *Captain Beechey*. Behring's Straits, *Peters; Wright, N. Pacif. Exp.* Olga Bay, Tartary, *Wilford (Herb. Hooker)*. Baie de Castries, *Maximowicz*. Marckau, Siberia, *Turcz. ; "C. Buxbaumii, var."* (*Herb. Hooker*). N.W. coast, North America, *Menzies*. Sitcha.

*Culmus* 1–2-pedalis, sæpe validus, rigidus, acute triquetus, scaber, basi foliatus; pars spicigera  $2\frac{1}{2}$ –4 poll. longa, rarius longior (9 pollicis). *Folia* 2– $2\frac{1}{2}$  lin. lata, culmo breviora. *Bractea* inferiores 2, culmo longiores, breve vaginatae, vel infima uno specimine vagina pollicari instructa. *Pedunculi* triquetri, scabri; infimus  $\frac{1}{2}$ – $1\frac{1}{2}$ , rarius  $5\frac{1}{2}$  poll. longus. *Perigynium* lucidum, ferrugineum, rostello brevi purpureo; ore integro truncato vel submarginato; stipitatum, forma et magnitudine varians vel ovale trigonum,  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, vel ellipticum,  $1\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, vel suborbiculatum, plano-convexum, 2 lin. longum,  $1\frac{3}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{8}{10}$  lin. latum, triquetrum, suborbiculatum, breve stipitatum.

A *C. Buxbaumii*, Wahl., differt spiculis pedunculatis; perigyniis ferrugineis, plano-convexis; ore integro; squamis longe hispido-cuspidatis.

In the Fl. Rossica, the author remarks:—"Alias notas (*squamas aristatas*) quibus a *C. atrata*,  $\beta$ , differat, dicere mihi equidem non contigit. In *C. atrata*, spica terminalis omnino mascula, nunquam mihi obvia; perigynia ventricosa, enervia; bractea breves, evaginatae; squamæ semper muticae.

In a specimen of Wright's the lower spicula is 8 inches remote, on a long ( $5\frac{1}{2}$  inches) exserted peduncle, and with a vagina 14 lin. long.

The specimens figured are from Kamtchatka (*Dr. Peters*), for which I am indebted to my late friend, Dr. Charles Lemann.

313. *C. fulva* (Goodenough); spicis 3–4 castaneis, mascula 1 rarius 2 cylindricis, femineis 2–3 rarius apice masculis, ovatis vel oblongis approximatis vel remotis

vaginatis, infima exserte pedunculata erecta; bracteis vaginatis infima culmum subæquante vel eo breviora; stigmatibus 3; perigyniis ellipticis rostratis bifidis, ore margine hyalino, biconvexis plus minus nervatis rostro margine scabro erectis vel divergentibus, squama ovata acuta castanea margine superne hyalina plerumque longioribus.—*C. fulva*, *Good. in Linn. Trans. ii. 177, t. 20, f. 6 (1792)*; *Schk. T., figura dextrae (icon. Good.)*; *Smith, Eng. Fl.; Eng. Bot. t. 1295*. *C. Greeniana*, *Dewey, Sill. (TAB. CCCCXLI.)*

HAB. In Europa et America septentrionali.

*Culmus* 12–15-pollicaris, gracilis, scaber, basi foliatus; pars spicas gerens 2–7 poll. longa. *Folia* 1–2 lin. lata, culmo breviora, viridia. *Bractea* vaginatae, nisi summa; vagina infima 6–14 lin. longa. *Spiculae masculae* 6–12 lin. longae, 1 lin. latae, contiguæ. *Spicae femineae* 3–10 lin. longae, 2–3 lin. latae, a se 1–5 poll. remotæ. *Squamæ* conformes, masculæ obtusæ. *Perigynium*  $2\frac{1}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, demum fusco-brunneum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  latum, obovatum, triquetrum.

Var.  $\beta$ . *sterilis*; perigyniis flavidis, achenio abortivo. (TAB. CCCCXLII.)

Var.  $\gamma$ . *Hornschuchiana*; spicis femineis 1–5, infima subinde basi composita; bractea infima spicam suam superante; perigyniis  $1\frac{6}{10}$ –2 lin. longis,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latis, viridibus, demum flavidis, rostro fusco; achenia  $\frac{8}{10}$  lin. longa,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. lata, obovata; culmo glabro vel scabriusculo.—*C. Hornschuchiana*, *Hoppe, Regb. Bot. Stz. (1824)*. *C. speirostachya*, *Smith, Eng. Fl. iv. 98 (1828)*; *Eng. Bot. t. 2770*. *C. fulva*, *Schk. T. (figura sinistra)*. (TAB. CCCCXLIII.)

*C. fulva* was first noticed by Goodenough in 1792, and since that time two plants have been described, *C. xanthocarpa*, Desglan (1806), which has been considered as a sterile form of *C. fulva*; and *C. Hornschuchiana*, Hoppe (1824), the *C. speirostachya*, Smith (1828), which has generally been thought to be a distinct species.

That *C. fulva* (*typica*) is occasionally sterile is evident from specimens from various localities; and several authors, especially Godron, have supposed it to be a hybrid with *C. distans* or *C. flava*. Goodenough says nothing of an achenium, but Smith describes his plant as having one; while others, who consider *C. fulva* as sterile, take no notice of the fertile form. I have figured both, and the distinction between them is the yellow ventricose perigynium, with its abortive achenium, in the var.  $\beta$ , as contradistinguished from the ultimately brown perigynium, with its perfect achenium, in what I have considered as the type.

From an examination of specimens of *C. fulva* and *C. Hornschuchiana* (*C. speirostachya*, Sm.) in Smith's Herbarium, and from Hoppe, Wahlenberg, Fries, and others, I can detect no exclusive characters, nor does the investigation of those enumerated in our various Floræ lead to any satisfactory evidence of a specific distinction between them.

Hoppe distinguishes *C. Hornschuchiana* by the male spike being attenuate at base, the female sub-3, cylindrical; fruit ovate, acuminate, nerved; stem smooth; bracts short; and roots stoloniferous.

*C. fulva* by the linear-lanceolate male spike, the female 3, oblong, distant; fruit ovate, elliptical, rostrate, bidentate, yellowish; stem rough at top; longer bracts; root cæspitose, the tufts larger, of a grass-green colour.

All the specimens I have from Hoppe are the var.  $\beta$ .

Smith describes his *C. speirostachya* as having mostly 3 female spikes, a smooth stem; fruit ribbed, smooth, green, with a deeply cloven beak, which is membranous at the orifice; seed obovate, with 3 angles.

*C. fulva* as having 2 rarely 3 female spikes; stem rough, acute-angled; fruit spreading, brownish, with a shortish, cloven, rough-edged beak; seed roundish-triangular.

The specimens of *C. fulva* in his herbarium from Beattie, which he quotes under his *C. fulva*, have the orifice of the perigynium distinctly membranous; and yet, in the Eng. Fl., *C. speirostachya* is n. 28, and *C. fulva* n. 40,—thus widely separated from each other.

Koch, who, like Smith, describes the root of both plants as creeping or stoloniferous, says of—

*C. Hornschuchiana*; spicis femineis plerumque 3, infima longe remota; bractea infima spicam (suam) superante fructibus adscendentibus; culmo glabro vel apice scabriusculo.

*C. fulva*; spicis femineis 2 vel 3, superioribus approximatis; bractea infima spicam masculam attingente vel superante, fructibus patentibus, inferioribus sæpe horizontaliter expansis; culmo scabro.

A reference to the figures will show that several of these characters are not to be depended upon. The perigynia in both plants, at least the lower ones, are divergent, those of *C. fulva* more apparently so, from the larger size of the perigynia; and the stem in both is more or less scabrous, and the bracts variable in length.

It is remarkable that Goodenough originally received *C. fulva* from America, and that the late Mr. B. D. Greene found it some years ago near Boston, and that no one has since met with it there or elsewhere in the States.

The specimens figured are—

Tab. CCCCXLI. *a. fertile!* "*C. fulva.*"

n. 1. Ireland, *Ball.*

n. 2. Germany, *Nolte.*

n. 3. England, *Lemann.*

n. 4. Boston, U.S.A., *Mr. Greene.*

Tab. CCCCXLII. *β. sterile!* "*C. fulva.*"

n. 1. Sweden, *Fries.*

n. 2. Germany, *Hoppe.*

Tab. CCCCXLIII. *γ. "C. Hornschuchiana," "C. speirostachya."*

n. 1. England, *Spruce.*

n. 2. Germany, *Hoppe.*

314. *C. trifida* (Cavanilles); spica clongata ferrugineo-purpurea, c spiculis 7–9 crassis comosis cylindricis erectis densi-multifloris alternatim contiguas, masculis 1–4 sessilibus, femineis 5–6, inferioribus basi attenuatis exserte pedunculatis nunc basi compositis; bracteis inferioribus vaginatis longissimis; stigmatibus 3; perigyniis obovatis abrupte rostratis vel oblongis triquetris bifidis nervatis longe stipitatis fuscis, squama oblonga alte emarginata vel integra purpurea vel ferruginea longe hispido-aristata brevioribus.—*C. trifida*, *Cav. Icon.* v. 41, t. 465; *Wahl. Act.* 162; *Schk. f.* 202; *Willd.* 301; *Kunth*, 501; *Brongn. Voy. Coquille, Bot.* 158; *Freye. Voy. Bot.* 131; *Hook. fil. Fl. Antarct.* 89 et 368, et *Fl. N. Zeal.* 284; *Gay, Fl. Chil.* 222; *Steud.* 241. *C. incrassata*, *Solander, Herb. Banks (non Schlecht.)*. *C. aristata*, *D'Urville, Fl. Malouines; Trans. Linn. Soc. Paris*, iv. 599. (TAB. CCCCXLIV.)

HAB. In America meridionali; Asia.—Falkland Islands, *Cavanilles, D'Urville, J. D. Hooker.* Cape Tres Montes, Chili, *Darwin, n. 303, Herb. Henslow, Gay.* New Zealand, *Banks and Solander (Herb. Banks).* Lord Auckland's group and Campbell's Island, *J. D. Hooker.*

*Culmus* 2-pedalis et ultra, validus, triquetus, lævis; pars spicigera 9–15 poll. longa. *Folia* 4–7 lin. lata, longissima. *Bractee* inferiores latæ, vaginatæ, culmum longe superantes. *Spicula* crassæ, 1–4 pollices longæ, 5–7 lin. latæ. *Squama*

conformes. *Perigynium* (cum stipite  $\frac{6}{10}$  lin. longo)  $2\frac{1}{2}$  lin. longum,  $\frac{9}{10}$  lin. latum, obovatum, abrupte rostratum ventricosum vel angustius lanceolatum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, triquetrum, nervatum, spongiosum, fusco-brunneum, glabrum, vel superne ad marginem parce rarius dentatum. *Achenium* 1 lin. longum,  $\frac{1}{2}$  lin. latum, ovale, triquetrum, punctulatum; stylo basi contorto, vel in perigynio angustiore recto.

Variant spica terminali basi mascula, femineis (*superioribus*) apice masculis, aliisque interdum basi parce masculis.

This noble species is allied to *C. riparia* rather than to *C. pseudocyperus*, as Kunth was inclined to think. Cavanilles describes the squamæ "gluma apice trifida, laciniis lateralibus latioribus, media brevior, ex qua arista prodit gluma longior;" and Schkuhr so figures them, Brongniart describes them as "apice profunde bifidis e sinu longe aristatis (subtrifidis)." Dr. Hooker, after alluding to these (the upper ones) as integræ, adds, "sæpius trifidæ, segmento intermedio elongato-aristæformi." D'Urville was induced to suspect that his plant from the Falkland Islands was not the same as Cavanilles'. He says, "forsan eadem species ac *C. trifida*, Cav., verum in nostra (*C. aristata*) nunquam squamam trifidam vidi." My observation accords with that of Brongniart. The lower female squamæ are deeply emarginate, from the sinus of which the long pale arista issues; higher up in the spicula, the emargination becomes less and less, till, at the upper part, the squama is much narrower, acute and entire. The upper perigynia are also narrower than the others.

The specimens figured are from the Falkland Islands, collected by Dr. Hooker.

315. *C. procera* (Kunth).—*C. procera*, *Kunth*, 491; *Steud.* 230. (TAB. CCCCXLV.)

HAB. Brazil, *Sellow, Herb. Hooker.*

I must refer to p. 89, Tab. CCLX., *C. Brasiliensis*, for the description of this species; for, though there are some distinctions between the two plants, as may be seen on a reference to the figures, they are scarcely specific ones. The present figure is from a specimen of Sellow from Brazil in Herb. Hooker, on which Kunth founded the species. The difference between it and the plant of St. Hilaire is in the perigynium. That of Sellow is oblong-elliptic,  $1\frac{9}{10}$ – $2\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, and quite smooth, too young for any satisfactory figure of the achenium. The stigmas 3 and 2. Kunth notices only 3, otherwise his description is in every respect applicable. I should therefore refer St. Hilaire's plant as a variety.

Var. *β. Brasiliensis*, St. Hilaire, *Voy. en Brasil, Steud.* 231; perigyniis margine scabris subinde obovatis. (Illustr. tab. 260.)

316. *C. acutata* (Boott); spica abbreviata vel oblonga viridi-purpurea, e spiculis 4–6 oblongis vel cylindricis contiguas æqualitatis vel spicatim approximatis, masculis 1–2 fusco-ferrugineis, reliquis femineis vel superioribus apice masculis densifloris subsessilibus vel inferioribus pedunculatis evaginatibus; bracteis culmum longe superantibus; stigmatibus 3; perigyniis ovalibus rostratis acute bifidis ventricosis modice biconvexis, costato-nervatis glabris lucidis tessellatis pallide viridibus, squama elliptica vel ovata acuta mutica ciliata vel hispido-aristata purpurea nervo pallido longioribus vel brevioribus.—*C. acutata*, *Boott, Linn. Soc. Trans.* xx. 124 (1846). *C. physocarpa*, *Nees ms., Herb. Hooker (non Presl)*. *C. Peruviana*, *Dombey, Herb. Mus. Par. (non Presl)*. *C. feminea*, *Steudel*, 203; *Lechler, n.* 245. *C. tessellata*, *Spruce, ms. (Herb. Bentham.)* (TAB. CCCCXLVI.–VIII.)

HAB. In America meridionali.—Ins. Chiloe, *Cumming*, n. 43 (*Herb. Hooker*). In mont. Piltzhum, Columbia, 12,000 ft., *Jameson* (*Herb. Hooker*). Quitensian Andes, *Couthouy* (*Herb. Gray*). Peru, *Dombey* (*Herb. Mus. Par.*). Venezuela, Chili, *Lechler*, n. 245. Valle de Leito, Ecuador, *Spruce*, n. 5939; *Corral* (*Herb. Hooker*). Ad Caldos, Minaes Garcias, Brazil, *Dr. Widgeon*, n. 833 (*Herb. Sonder*).

*Rhizoma* repens, stoloniferum. *Culmus* 1½–2-pedalis, validus, lævis vel scabriusculus, basi foliis amplectentibus clausus; pars spicigera 1–7 poll. longa. *Folia* 3–5 lin. lata, culmo longiora, plana, carinata, reticulato-venosa, firma. *Bractea* infima 6–15 poll. longa, nunc vaginulata, reliquæ spiculis duplo triplo longiores, nisi summa brevis. *Spiculæ* superiores vel omnes æquialtæ, contiguæ, subsessiles vel spicatim dispositæ, masculæ 1–2, subinde abbreviatæ vel 1–2¼ poll. longæ, 1–1½ lin. latæ, reliquæ femineæ vel superiores apice masculæ 8 lin.–2½ poll. longæ, 4 lin. latæ, sessiles vel inferiores pedunculatæ. *Pedunculus* infimus, ½–1½ poll. longus. *Squamæ* conformes. *Perigynium* 1– $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-ellipticum, triquetrum, ferrugineum, basi styli contorta vel depresso-curvata apiculatum.

Variat spicis terminalibus (1–2) apice masculis.

This species is allied to *C. tentaculata* and its allies. Steudel describes his *C. feminea*:—"Spica infima pedunculo e vagina longissime exserto, cum spica accessoria minore, summa (vel 2–3) apice brevissime mascula." The specimens I have seen of *Lechler* vary in these respects. That in the *Herb. Mus. Paris* has the terminal spike nearly entirely male, with only two female florets at base. I have no hesitation in referring his plant to *C. acutata*. I have figured Tab. CCCXLVI. the specimen of *Spruce*. The name he had given refers to the delicate tessellated or chequered texture of the perigynium, common to many species. Tab. CCCXLVII. is the specimen from Ecuador, in *Herb. Hooker*.

317. *C. diluta* (Bieberstein); spicis 3–7 pallidis, masculis 1–3 cylindricis, reliquis femineis, glauco-viridibus, superne sæpe abbreviata sessili, inferioribus cylindricis remotis vaginatis exserte pedunculatis erectis; bracteis culmo brevioribus; stigmatibus 3; perigyniis ellipticis triquetris rostratis, ore bidentato ciliato, crebre nervatis glabris vel rostro parce dentato glaucis demum ferrugineo-punctatis, squama ovata acuta vel obtusa cuspidata ferruginea medio pallida nervata longioribus.—*C. diluta*, *Biebst.* 388 et 614; *Kunth*, 448; *Fl. Ross.* 299; *Steud.* 222. *C. dilatata*, *Un. Itin.* 1838! (TAB. CCCXLVIII.)

HAB. In Asia.—Iberia, Caucasus, Afghanistan, *Griffith*. Belochistan, *Stock*. (*Herb. Hooker*). Him. occid. temperata, Kunawur, *Munroe*.

*Culmus* 1–1½-pedalis, acute triquetet, lævis; pars spicas gerens 3–12 poll. longa. *Folia* 1–2 lin. lata, culmo breviora, carinato-plana, firma. *Bracteæ* omnes, nisi subinde summa, vaginatæ, culmo breviores. *Spica* maseula 3–15 lin. longa, 1–1½ lin. lata, pedunculata, femineæ 3–10 lin. longæ, 2–3 lin. latæ, inferiores a se 2–4 poll. remotæ. *Squamæ* masculæ obtusæ, muticæ, ciliatæ. *Pedunculi* læves. *Perigynium* 1– $\frac{6}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, triquetrum, fuseum, basi styli recta apiculatum.

*C. extensæ*, Good., affinis, differt culmo triquetet; foliis carinato-planis; bracteis brevioribus; spicis vaginatis, exserte pedunculatis, remotis, rostro subinde scabro.

In a specimen in *Herb. Fielding* there were three male spikes; in all the others I have seen only one.

318. *C. uda* (Maximowicz); spica simpliciei androgyna apice parce mascula ovata viridi sublaxiflora plerumque nuda; stigmatibus 3; perigyniis lanceolatis sensim rostellatis ore hyalino integro obliquo nervatis glabris demum horizontaliter patentibus viridibus, squama oblongo-ovata acuta, infima nunc euspidata pallide ferruginea longioribus.—*C. uda*, *Max. Primitiæ Flor. Amurensis. Mem. Acad. St. Petersb.* ix. (1859). (TAB. CCCXLIX. f. 1.)

HAB. Asia bor.-occid.—Western Amur, *Maximowicz*.

*Culmus* 8–10-pollicaris, flaccidus, lævis. *Folia* sub lineam lata, plana, mollia, culmo breviora vel subæquantia. *Spica* 4 lin. longa, 2 lin. lata, flosculis masculis 3–4 laxis, femineis pluribus. *Perigynium* (immaturum) 1– $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ore albido integro obliquo. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, triquetet-ovale, basi styli apiculatum.

"Planta flaccida, tenera, cæspites densos efformans. Radix fibrosa; culmus debilis, compresso-trigonus, lævis. Folia linearia, plana. Spica laxa; flores masculi vulgo terni, feminei 6–14, vulgo 10, demum laxi. Squamæ masculæ oblongæ, obtusiusculæ; femineæ ovatæ vel ovato-oblongæ, demum deciduæ. Utriculi lanceolati, sensim acuminati, brevissime stipitati, ob rostrum leviter deorsum curvatum subobliqui, nervis tenuibus plurimis percursi, læves, rostro acuto, ore clauso integro. Nucula ovalis, triquetra, apice rotundata, basi brevissime attenuata, intra utriculum laxa. Stylus basi æqualis, stigmatibus 3 (vel raro 2)."—*Maximowicz*.

319. *C. nana* (Boott); spica simpliciei androgyna, apice subdimidiatim maseula, ovata vel oblonga, olivaceo-ferruginea, nuda; stigmatibus 3; perigyniis late ovatis turgidis ventricosis sensim rostellatis, ore leviter emarginato, enerviis vel obscure nervatis glabris resinoso-punctatis horizontaliter patentibus deeiduis, squama ovata obtusissima mutica ferruginea latioribus longioribus. (TAB. CCCXLIX. f. 2.)

HAB. In Japonia.—Hakodadi, "on plains among grass," *Wright*, n. 44 (*Herb. Gray*).

*Culmus* 8–10-pollicaris, obtusangulus, lævis. *Folia* plana, basi  $\frac{7}{10}$  lin. lata, involuto-canaliculata, apice scabra, culmo breviora. *Spica* 4–5 lin. longa, 2–3 lin. lata; flosculi masculi plerumque plures. *Squamæ* conformes, masculæ imbricatæ. *Perigynium* 1– $\frac{6}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ovale, acute triquetrum, basi styli apiculatum.

Affinis *C. capillaceæ*; differt omnibus partibus majoribus, flosculis femineis paucioribus, perigyniis ventricosis, culmo altiore, foliis latioribus.

A *C. rara* differt spica breviora, pauciflora; perigyniis plerumque enerviis, resinoso-punctatis.

320. *C. pallescens* (L.); spica abbreviata fulvo-viridi, e spiculis 2–4 oblongis contiguis densifloris, mascula 1 cylindrica castanea, reliquis femineis obtusis evaginatis vel infima sæpe subremota rarius radicali nutante exserte pedunculata; bracteis culmum paulo superantibus; stigmatibus 3, brevibus; perigyniis obtuse ellipticis subventricosis sæpe brevissime abrupte rostellatis, ore integro, leviter nervatis glabris vel superne ad margines scabris demum ferrugineo-punctatis membranaceis pallide viridibus, squamam ovatam acuminato-cuspidatam fulvam

nervo viridi subæquantibus vel paulo longioribus.—*C. pallescens*, L.; *Leers*, 203, t. 15, f. 4; *Good. in Linn. Trans.* ii. 186; *Wahl. Act.* 161; *Willd.* 291; *Sehk. f.* 99; *Kunth*, 458; *Fl. Dan.* t. 1080; *Smith, Fl. Br.* 989; *Eng. Bot.* t. 2185; *Eng. Fl.* 105; *Gaud. Afr.* 156, et *Helv.* 91; *Koeh.* 880; *Bertol.* 102; *Reich.* t. 251; *Lange*, 103; *Anders.* 32, t. 7, f. 78; *Fl. Ross.* 306; *Gren. et Godr.* 407; *Steud.* 227; *Dewey, Sill.* vii. 267; *Tor. et Schw.* 354; *Tor. Cyp.* 427; *Carey*, 521; *Sartwell, Ews. n.* 81. *C. undulata*, *Kunze*, 23 et 203, t. 4, f. 2; *Steud.* 227. (TAB. CCCCL.)

HAB. In Europa, Asia, America septentrionali.—Lapland to Italy, Caucasus, Baikal, Arctic America to Pennsylvania.

*Radix* fibrosa. *Culmus* 1-1½-pedalis, triqueter, firmus, scaber, apice pilosus, basi foliatus; pars spicigera plerumque 1-2½ poll. longa. *Folia* 1-1½ lin. lata, culmo breviora, subtus vaginisque pilosa. *Bractea* evaginata, vel infima, subinde sterilis, 1-2½ poll. remota brevis vaginata. *Vagina* 1-5 lin. longa. *Pedunculus* infimus 3-10 lin. vel rarius radicalis 5 poll. longus. *Spicula* mascula 1, rarissime 2, 4-9 lin. longa, lineam lata, subsessilis vel brevis pedunculata, pallide fulva, femineæ, rarius apice masculæ, 3-10 lin. longæ, 2-3 lin. latæ, erectæ, vel infima nutans. *Squamæ* masculæ imbricatæ, obtusæ vel acutæ. *Perigynium* 1 $\frac{1}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, obtuse triquetrum, sæpe erostellatum, obtusum, achenium laxè vestiens, nervis concoloribus. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, obovatum, triquetrum, ferrugineum, punctatum, basi styli æquali apiculatum; angulus tertius introrsus.

The specimens figured are—

1. From Scotland.
2. Rhode Island, North America.

321. *C. Pseudo-cyperus* (L.); spicis 4-6 rarius 3-7 oblongis vel cylindricis, mascula 1 (rarius 2-3) subinde apice vel medio vel apice medio et basi feminea ferruginea, reliquis femineis rarius apice masculis olivaceo-viridibus crassis multifloris pedunculatis approximatis evaginatibus vel infima vel inferioribus remotis vaginatis longe exserte pedunculatis nutantibus vel pendulis una alterave rarius basi composita; bracteis inferioribus latis longissimis; stigmatibus 3; perigyniis ovato-vel ovalilanceolatis plus minus e latere visis arcuatis inæqualiter obtuse trigonis rostratis bicuspidatis ventricosis glabris rarius superne dentatis costato-nervatis divergentibus demum insigniter retroversis stipitatis, squama minima lineari vel ovali vel obovata acuta vel truncata longe hispido-aristata dorso scabra serrato-ciliata albida demum ferruginea longioribus vel aristata (sæpe multum brevioribus).—*C. Pseudocyperus*, *Linn. Sp. Pl.* 1387; *Pollich*, 588; *Villars*, 217; *Roth*, 451; *Retz*, 221; *Wahl. Act.* 161; *Willd.* 295; *Kunth*, 501; *Sehk. mss. Sprengel*, 825; *Link*, 361; *Gaudin*, 175; *Koeh.* 886; *Dee. Fl. Fr.* 128; *Cosson*, 604; *Grenier*, 428; *Fl. Ross.* 308; *Bertol.* 148; *Steud.* 241; *Andersson*, t. 8, f. 111; *Lange*, 132; *Good. in Linn. Trans.* ii. 188; *Smith, Fr. Brit.* 986; *Eng. Fl.* 101; *Eng. Bot.* iv. t. 242; *Lightf.* 559; *Bromfield*, 571; *Bentham*, 568; *Muhl. (ex parte)* 253; *Tor. Mon. (ex parte)* 355; *Carey*, 531; *Dewey, Sicc.* iv. 348 (1847). (TAB. CCCCLI.-CCCCLII.)

HAB. In Europa, Asia, Africa, America septentrionali.—Caucasus, Algeria.

The several forms which I have associated with *C. Pseudocyperus* afford a favourable opportunity of judging of the value of deviations from a typical form. An analysis of all I have seen leads me to the inference that there is no especial character to justify a specific difference between them. In habit they are the same. To any one familiar with the aspect of the European type, the first glance at the North or South American, African, Australian, Java, or Kashmere plants leads to the belief that they are inseparable. In the European plant, the male spike is commonly solitary, though Villars describes it as varying from 1 to 3. In specimens from Valdivia and Valparaiso, I observe 2. It is often only male at base, or with female florets at the apex, middle, or base. In the North and South American plant, we observe the same irregularity in the position of the female florets, which are very commonly found at the apex of the male spike; and in a specimen from Buenos Ayres I observe a solitary female near the base of an elongate male spike.

The female spikes in all are densely flowered, thick, the upper approximate, often subsessile or alternate, with more or less elongated peduncles, nutant or pendulous, the lower one often remote and vaginate. They are rarely male or sterile at top, and occasionally compound, with one or more small sessile spiculæ at base.

Linnaeus, Goodenough, Willdenow, Lightfoot, and Sprengel describe the female spikes as geminate; but Roth, Schkuhr, and Gaudin more correctly consider them as solitary, however approximate. In only one specimen, from Buenos Ayres, have I observed anything like gemination; and in this one it is more apparent than real, the additional spicula, except perhaps in one of the spikes, being sessile at the base of the longer one.

In the pendent spikes the perigynium is reversed, the apex pointed upwards,—a very striking character, common, perhaps, to all, as well as to *C. Forsteri*, Wahl., but not always observable in the erect or merely nutant direction of the spikes.

The perigynium varies in form, length, and breadth, and extreme forms present a marked difference; but we find intermediate proportions in specimens from the same locality. In Chili, the var. *Lechleri* has a perigynium  $3\frac{4}{10}$  lin. long, and only  $\frac{4}{10}$  lin. broad, taking the extreme form; while in Brazil it is  $2\frac{4}{10}$  lin. long,  $\frac{8}{10}$  lin. broad. But we find other Chilian specimens with close approximations to them both. In the South American specimens, for instance, I find the perigynium varies from  $2\frac{4}{10}$  to  $3\frac{4}{10}$  lin. long,  $\frac{4}{10}$  to  $\frac{8}{10}$  lin. broad; and in the European plant from  $2\frac{4}{10}$  to 3 lin. long,  $\frac{8}{10}$  to  $\frac{9}{10}$  lin. broad.

Smith and Bromfield allude to the rostrum and lacinia being rough, and Reichenbach so figures them; but this is a rare exception, which I have only observed in a few specimens from France and Italy.

The lacinia vary in length. In the European and the North and South American plants they are never much elongated, and only slightly divergent. In the Australian, they are longer and more divergent; and in the var. *comosa* very long, spreading, and curved downwards.

The female squamæ in the European and North American plant have a smaller lamina than the South American, Australian, and Java forms. They are described by European authors as setaceous, linear-lanceolate, subulate, ovate; and I would add, oval-subrotund, commonly acute, occasionally obtuse or truncate, even emarginate, at first white with a green central scabrous rib, but eventually ferruginous, terminating in a long ligulate rough arista, the length of which varies, often at the base of the spikes much elongated.

In the South American, Australian, and Java plants, the lamina is longer and broader, commonly ferruginous, with a shorter or longer arista, and the outline is an oblong-oval, acute, obtuse, rarely truncate or occasionally lanceolate or subrotund, or in the var. *Lechleri* obovate-truncate or occasionally emarginate. In all, from the various localities, they are ciliate at top.

The achenium in all is triquetrous, oval, with a straight or contorted style, except in the Java plant, in which it is subrotund.



*C. Pseudo-cyperus.* Europe.—  
 1 with 3 spikes. 30 with 1 male (fide Villars males 1-3).  
 11 „ 4 1 ter. apice feminea.  
 13 „ 5 1 „ medio feminea.  
 7 „ 6 1 „ apice medio basi feminea.  
 1 „ 7

33 spec. 33 spec.

*C. Pseudo-cyperus!* North America!—

4 with 4 spikes. 13 with 1 male.  
 6 „ 5  
 2 „ 6  
 1 „ 7

12 sp. femineæ simplices.

1 „ femineæ inferiores 2, basi 2-5 compositæ.

South America! (*C. excelsa*, Poepp.). *Lechleri*, Steud.—

2 with 4 spikes. 11 with 1 male.  
 2 „ 5 4 „ 2  
 9 „ 6 2 ter. apice feminea.  
 2 „ 7 1 with 2 apice feminea.  
 2 „ 8  
 1 „ 9

15 sp. fem. simplices.

2 „ una alterave basi spic. 1, comp.

1 „ 3 superioribus 3 quasi geminatis nempe spic. *pollicari* sessili aucta.

Australia! (*C. fascicularis*, Sol.)—

2 with 3 spikes. 27 with 1 male.  
 18 „ 4 1 ter. apice feminea.  
 8 „ 5

27 sp. fem. simplices.

1 „ fem. inf. basi spic. 1, compos.

Java!—

2 with 7 spikes 1 male.

Fem. una alterave spic. 1, basi composita.

Kashmir.—

1 with 5 spikes. 1 male. Florifera!  
 2 „ 6

North America! *C. comosa*, Boott!—

9 with 4 spikes. 25 with 1 male. Sp. fem. simplices.  
 14 „ 5  
 3 „ 6 1 ter. ap. fem.  
 26 spec. 26 spec.

Africa! *C. cognata*, Kunth, 502; Nees, Linnæa, x. 204. *C. retrorsa*, Nees.

Sp. 6, mas. 2, femineis sub-4 approximatis erectis cylindricis subsessilibus; bracteis evaginatibus longis; fructibus ovato-trigonis rostratis bifurcatis striatis glabris, squamam lanceolatam setaceo-acuminatam serrulatam scabram æquantibus, inferioribus reflexis.—HAB. Cap. Bonæ Spei.

Philippines! *C. Hænkeana*, Presl; Kunth, 502.

Sp. 5, mas. 1, femineis 4 remotiusculis longe pedunculatis pendulis cylindricis, perigynio lanceolato, ancipitibus nervosis longe rostratis bidentatis glumam ovatam longe aristatam æquantibus.

From this detail, and from an inspection of the subjoined table, I think it will be evident that there is no definite invariable character that we can fix upon for specific differences in these plants. The most perceptible is the larger lamina of the female squamæ in the varieties, the narrow perigynia in the var. *Lechleri*, and the more elongated spreading lacinia of the var. *comosa*. But we find in the Australian plant an approximation to that from North America. The lacinia in the first are from  $\frac{5}{10}$  to  $\frac{7}{10}$  lin. in length, and in the second from  $\frac{7}{10}$  to 1 lin.; while the stipes in the Australian is  $\frac{6}{10}$  lin. long, and in the var. *comosa* only  $\frac{3}{10}$ — $\frac{4}{10}$  lin.

On this view the arrangement would be:—

*C. Pseudo-cyperus*, L.;

typica: squamis minoribus, perigyniis rarius margine scabris, lacinii brevioribus parum divergentibus.

var.: squamis majoribus.

$\beta$ . *Lechleri*;

perigyniis lanceolatis angustis, squamis sæpe truncatis obovatis.

$\gamma$ . *fascicularis*;

perigyniis ovatis, lacinii longioribus divergentibus, stipite longiore.

$\delta$ . *comosa*;

perigyniis ovatis, lacinii elongatis patentissimis.

I have not seen specimens of *C. cognata*, *C. Hænkeana*, or *C. multispicata*.\* The last, as figured by Kunze, is too young for a satisfactory knowledge of it. It differs from the above forms in muticous squamæ.

|                                                         | Perigynium.                                                                    | Lacinia.                             | Stipes.                              | Achenium.                                                                |                 |
|---------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------------------------------------------|-----------------|
| <i>C. Pseudo-cyperus.</i><br>North America!             | $\frac{2\frac{3}{10}-5}{10}$<br>long.<br>$\frac{6}{10}-\frac{7}{10}$ lat.      | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$ long.                 | $\frac{7}{10}-\frac{8}{10}$<br>long.<br>$\frac{4}{10}-\frac{5}{10}$ lat. | Stylo recto.    |
| <i>C. Pseudo-cyperus.</i><br>Europe . . . .             | $\frac{2\frac{4}{10}-3}{10}$<br>lin. long.<br>$\frac{6}{10}-\frac{7}{10}$ lat. | $\frac{5}{10}-\frac{6}{10}$<br>long. | $\frac{2}{10}-\frac{3}{10}$<br>long. | $\frac{7}{10}-\frac{8}{10}$<br>long.<br>$\frac{5}{10}$ lat.              | Stylo recto.    |
| South America!<br><i>C. excelsa.</i><br>Uruguay . . . . | $\frac{2\frac{7}{10}-3}{10}$ lin.<br>$\frac{7}{10}-\frac{8}{10}$ lat.          | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$<br>long.              | 1 lin. long.<br>$\frac{5}{10}$ lat.                                      | Stylo contorto. |
| Montevideo . . . .                                      | $\frac{2\frac{5}{10}-\frac{7}{10}}{10}$<br>long.                               | $\frac{3}{10}-\frac{4}{10}$<br>long. | $\frac{1}{10}$<br>long.              | 1 lin. long.<br>$\frac{6}{10}$ lat.                                      | Stylo recto.    |
| Pampas . . . .                                          | $\frac{2\frac{4}{10}-3\frac{4}{10}}{10}$<br>long.                              | $\frac{3}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$<br>long.              | 1 lin. long.<br>$\frac{6}{10}$ lat.                                      | Stylo contorto. |
| Buenos Ayres . . . .                                    | $\frac{2\frac{2}{10}-3\frac{1}{10}}{10}$<br>long.                              | $\frac{4}{10}-\frac{6}{10}$<br>long. | $\frac{2}{10}-\frac{5}{10}$<br>long. | $\frac{9}{10}$ long.<br>$\frac{6}{10}$ lat.                              | Stylo contorto. |
| Brazil . . . .                                          | $\frac{2\frac{1}{10}-\frac{4}{10}}{10}$<br>long.                               | $\frac{4}{10}-\frac{6}{10}$<br>long. | vix $\frac{2}{10}$<br>long.          | $\frac{9}{10}$ long.<br>$\frac{5}{10}$ lat.                              | Stylo contorto. |
| Valdivia . . . .                                        | $\frac{3\frac{3}{10}}$ long.<br>$\frac{6}{10}$ lat.                            | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$<br>long.              | $\frac{9}{10}$ long.<br>$\frac{4}{10}$ lat.                              | Stylo recto.    |
| Concepcion . . . .                                      | $\frac{2\frac{9}{10}-3\frac{2}{10}}{10}$<br>long.                              | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$<br>long.              | $\frac{9}{10}$ long.<br>vix $\frac{5}{10}$ lat.                          | Stylo recto.    |
| Chiloe . . . .                                          | $\frac{3-3\frac{3}{10}}{10}$<br>long.<br>$\frac{5}{10}-\frac{6}{10}$ lat.      | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{2}{10}$<br>long.              | $\frac{9}{10}$ long.<br>$\frac{5}{10}$ lat.                              | Stylo recto.    |
| Valparaiso . . . .                                      | $\frac{3-3\frac{1}{10}}{10}$<br>long.                                          | $\frac{6}{10}-\frac{7}{10}$<br>long. | $\frac{1}{10}$<br>long.              | $\frac{9}{10}$ long.<br>$\frac{5}{10}$ lat.                              | Stylo recto.    |
| Chili!<br><i>C. Lechleri</i> , 726.                     | $\frac{2\frac{7}{10}-3\frac{3}{10}}{10}$<br>long.                              | $\frac{5}{10}-\frac{8}{10}$<br>long. | $\frac{2}{10}-\frac{3}{10}$<br>long. | $\frac{9}{10}$ long.<br>$\frac{4}{10}$ lat.                              | Stylo recto.    |
| Var. <i>minor</i> , 574.                                | $\frac{3\frac{2}{10}}{10}$<br>long.                                            | $\frac{5}{10}-\frac{7}{10}$<br>long. | $\frac{3}{10}$<br>long.              | $\frac{8}{10}$ long.<br>$\frac{4}{10}$ lat.                              | Stylo recto.    |
| Australia!<br><i>C. fascicularis</i> . . . .            | $\frac{2\frac{3}{10}-3\frac{1}{10}}{10}$<br>long.                              | $\frac{5}{10}-\frac{7}{10}$<br>long. | $\frac{3}{10}-\frac{6}{10}$<br>long. | $\frac{7}{10}-1$ lin.<br>$\frac{6}{10}-\frac{7}{10}$ lat.                | Stylo contorto. |
| Java! . . . .                                           | $\frac{2\frac{3}{10}}$ long.<br>$\frac{6}{10}-\frac{7}{10}$ lat.               | $\frac{4}{10}-\frac{5}{10}$<br>long. | $\frac{3}{10}$<br>long.              | $\frac{5}{10}$ vix $\frac{6}{10}$<br>$\frac{4}{10}-\frac{5}{10}$ lat.    | Stylo contorto. |
| North America!<br><i>C. comosa</i> . . . .              | $\frac{3-3\frac{4}{10}}{10}$<br>long.<br>$\frac{7}{10}-\frac{8}{10}$ lat.      | $\frac{7}{10}-1$<br>lin.             | $\frac{3}{10}-\frac{4}{10}$<br>long. | $\frac{7}{10}-\frac{9}{10}$<br>long.<br>$\frac{5}{10}-\frac{6}{10}$ lat. | Stylo contorto. |

322. *C. stylosa* (Meyer); spica oblonga viridi vel ferrugineo-purpurea, e spiculis 3-4 oblongis erectis approximatis, terminali mascula sessili, reliquis femineis suprema subrotunda sessili inferioribus oblongis pedunculatis; bractea evaginata culmo brevior; stigmatibus 3 rarius 2; perigyniis ovalibus vel ellipticis rostellatis, ore integro, obtuse trigonis stipitatis enerviis tenuissime granulatis subinde marginibus dentatis ferrugineis rostello purpureo oblique adscendentibus, squama lanceolata obtusa purpurea margine albo hyalina longioribus vel subæquantibus.—*C. stylosa*, Meyer, in *Act. Acad. St. Pe-*

\* I find among the engravings prepared by Dr. Boott one of *C. multispicata*, which I accordingly insert here (Tab. CCCCLIII.) (J. D. HOOKER.)

*tersb.* i. 222, t. 12; *Kunth*, 519; *Tor. Cyp.* 426; *Kunze*, 115, t. 29; *Fl. Ross.* 305. *C. nigritella*, *Drejer, Revis.* 32. *C. rigida*, *Tuck. En.* 11. (TAB. CCCCLIV.)

HAB. In America septentrionali et Asia.—Unalaska, *Meyer*. Sitka, *Bongard*. Greenland, *Vahl*.

*Culmus* 3–18-pollicaris, gracilis, triqueter, firmus, scaber, basi foliatus, rudimentis foliorum ferrugineis lucidis folisque vaginantibus tectus; pars spicas gerens 16–28 lin. longa. *Folia* sub lineam lata, culmo longiora vel breviora, marginibus revolutis. *Bractea* evaginata; infima spicam masculam attingens, angusta; auriculæ rotundata, purpureæ vel pallidæ. *Pedunculus* infimus 4–10 lin. longus, scabriusculus. *Squamæ* omnes purpureæ, margine albo-hyalinæ, nervo pallido. *Spica* mascula 5–7 lin. longa, feminea 2–7 lin. longa, 2–2½ lin. lata; infima 7–13 lin. remota, tamen omnes contiguæ. *Perigynium* (cum stipite 2 lin. longo) 1–1¼ lin. longum, ⅕–⅗ lin. latum, achenium laxè vestiens, nisi nervis 2 marginalibus encervium. *Achenium* ⅑ lin. longum, ⅒ lin. latum, obovatum, triquetrum, angulus tertius posticus, castaneum, basi styli porrecta recta, vel depressa; stigmatibus 3, rarius 2.

In aspect certainly like *C. rigida* (*hyperborea*), to which Tuckerman unites the Greenland plant; but the stigmas are, I think, normally 3, and the achenium always trigonous; and the texture of the perigynium is, I think, firmer and granulate. I have not observed any plano-convex in form.

The specimens figured are from Greenland, from *Vahl*, "*C. nigritella*, *Drejer*;" with two perigynia from a specimen from "Sitka," *Herb. Fielding*, "*C. stylosa*," *Bongard*,—the larger one rough at the margins.

323. *C. Breweri* (Boott); spica simplici apice mascula ovata vel ovali crassa densiflora fulva nuda; stigmatibus 3; perigyniis ovalibus amplis inflatis tenuissimis, leviter nervatis glabris fulvis rostellatis, ore albido oblique secto, squama lanceolata obtusiuscula mutica fulva, margine albo hyalino latioribus longioribus. (TAB. CCCCLV.)

HAB. California, on Mount Shasta, 7000–10,000 ft., in dry volcanic soil, *W. H. Brewer*, 1862, n. 1422.

*Radix* repens, stolonifera. *Culmus* 5–9-pollicaris, obtusangulus, lævis, basi foliatus, vaginisque foliorum marcidis arcte tectus. *Folia* filiformia, rigida, culmo breviora; *sterilia* eum subæquantia. *Spica* 6–10 lin. longa, 5–6 lin. lata, apice flosculis masculis paucioribus. *Squamæ* concolores, masculæ angustiores. *Perigynium* 2⅔ lin. longum, 1⅞ lin. latum. *Achenium* 1 lin. longum, ⅕ lin. latum, oblongo-obovatum, triquetrum, angulo medio postico, basi styli æquali, racheola filiformi longiore instructum.

We are indebted for this remarkable addition to the *Phyllophoræ* to Mr. Brewer, who, in addition to his labours of the Surveying Commission, has admirably illustrated the flora of California. The delicate texture of the large inflated perigynium allies it, in that respect, to *C. Banksii* and *C. Mertensii*.

324. *C. leiocarpa* (Meyer); spica simplici dioica ferruginea, mascula oblonga, feminea cylindrica teneri laxiflora nuda vel bracteata; stigmatibus 2–3; perigyniis lanceolatis sensim attenuatis stipitatis erectis, nervatis flavidis glabris, ore integro concolori, squama ovata acuta mucronata ferruginea, infima nunc cuspidata longioribus angustioribus.—*C. leiocarpa*, *Meyer, Cyp. Nov. t.* 5; *Kunth*, 369; *Bongard, Veg. Sitka. in Mem. Acad. St. Pet.* ii. 168; *Fl. Ross.* 265; *Steud.* 183; *Torrey, Cyp.* 387. (TAB. CCCCLVI. f. 1, 2, 3.)

HAB. In Amer. septentrionali et Asia.—Unalaska, *Meyer*. Sitka, *Bongard*.

*Radix* repens. *Culmus* subpedalis, triqueter, scaber. *Folia* ⅔ lin. lata, plana, culmum subæquantia. *Spica* mascula semipollicaris, 8–10-flora; feminea subpollicaris, 1–1½ lin. lata, laxiflora, basi interrupta. *Squamæ* masculæ obtusæ, muticæ vel mucronatæ; femineæ plerumque acutæ, infima subinde plus minus cuspidata. *Perigynium* 1⅞ lin. longum, ⅒ lin. latum, flavidum, concolor, inferne nervatum, nervis superne evanidis. *Achenium* (*juvenile*) compressum.

Torrey, in his *N. Amer. Cyp.*, describes the stigmas occasionally to be 3, and the same is remarked in the *Fl. Rossica*, though Meyer mentions only 2. I have figured the only specimens I have seen, which were sent to me by M. Fischer, from which the stigmas had fallen; and in the perigynium examined the achenium was compressed, implying the stigmas were 2. In the 'Flora Rossica' it is asserted, that "in basi spicæ masculæ subinde adsunt (flores) feminei aliquot, hinc species proxime accedit ad *C. polytrichoidem*, Muhl." Meyer unaccountably thought it "affinis *C. scirpoideæ*, Mich." A reference to the perigynia of either will at once show that it cannot be allied to them. If it be dioicous, as Meyer and Torrey consider it, it has no affinity with any species of that group, unless with *C. Davalliana*, from which it differs in its creeping root, plane leaves, and erect perigynium. But if the spike be occasionally androgynous, apice mascula, as is asserted in the 'Flora Rossica,' it may prove to be inseparable from the *C. anthoxanthea*, Presl, a plant I have never seen, but of which I give a figure from the specimen described by Kunth, for which I am indebted to Mr. Tuckerman, who had it taken for me some years ago when he was in Berlin.

In Tab. CCCCLVI.—

n. 1 are the figures copied from Meyer.

n. 2. The specimens sent to me by M. Fischer.

n. 3. *C. anthoxanthea*, Presl, from the Berlin Herb.

325. *C. mirata* (Dewey); spica elongata lutescentiferruginea, e spiculis 3–4 cylindricis approximatis densimultifloris, masculis 2 bracteatis, femineis 1–2 apice masculis crassis pedunculatis; bractea infima vaginata culmum longe superante; stigmatibus 3; perigyniis e basi ovata turgida in rostrum longum cylindricum sensim attenuatis, ore postice obliquo alte bifurcato, laciniis subulatis divaricatis scabris crebre nervatis glabris, marginibus plus minus sparsim denticulatis stipitatis, squama lanceolata ferruginea hispido-aristata latioribus longioribus.—*C. mirata*, *Dewey; Woods, Bot.* 593 (1848), et p. 768 (ed. 1861). (TAB. CCCCLVII.)

HAB. America septentrionali.—Greece, Monroe County, *Dr. Bradley* (1829).

*Culmus* bipedalis, triqueter, scaber. *Folia* 3–4 lin. lata, nodosa. *Bractea* foliaceæ, culmo longiores, infima extra pedalis, plus minus vaginata. *Spicula* masculæ 2 poll. longæ, 3 lin. latæ; feminea 2½–3 poll. longæ, 9 lin. latæ. *Pedunculus* infimus pollicaris. *Squamæ* conformes, masculæ lineares subinde plus minus aristatæ. *Perigynium* (*immaturum*) 6–6¼ lin. longum, basi 1⅞ lin. latum, stramineum. *Achenium* (*juvenile*) oblongum, triquetrum, racheola filiformi apice squamam unam vel duas oppositas aristatas exsertas staminibus instructas, gerente, suppeditatum. (*Vide t.* 457 c.)

It is remarkable that this noble species, discovered by Dr. Bradley in 1829, has since escaped the observation of others. I have had the opportunity of examining the specimen in *Herb. Torrey*, which has 2 male and 1 female spike, with a sterile bract 9 inches remote, furnished with a vagina 2½ inches in length. That figured is from *Herb. Dewey*, kindly sent to me for examina-

tion. From the habit and the form of the achenium, the affinity is, I think, with *C. aristata*, Br.

In these Illustrations, p. 22, I quoted *C. mirata*, Dewey, as a synonym of *C. aristata*, Br., from Dewey (Sill. Journ. xlix. p. 48), having referred to his description of *C. aristata*, Br. (Sill. xxvii. (not xxviii.) 240) as applicable to *C. mirata*. In Wood's Bot. p. 768 (1861), he quotes *C. aristata*, Boott, as a synonym of *C. mirata*, and adds "but very different." The fact is that, for a long time, he confounded *C. aristata*, Br., and *C. gigantea*, Rudge, with *C. mirata*, as pointed out to me some years ago by Mr. Carey from an examination of Herb. Torrey. In Sill. xi. 161, and xxvii. 240, the true *C. aristata*, Br., is described; but in Sill. xlix. p. 48 (1845), where merely the name of *C. mirata* is first given, he refers to Sill. xxvii. 240, for the description of it, and he gives "Lake Ontario," "Arctic America," and "Georgia" for its habitats. In Wood's Bot. 593 (1828), he has still "Lake Ontario" and "Georgia;" while, in the ed. of Wood, 1861, he confines the habitat to "Greece, New York," erroneously quoting my *C. aristata* as a synonym. Greece is, I believe, on or near Lake Ontario, but the Arctic plant mentioned above is *C. aristata*, Br., and the Georgia one is *C. gigantea*, Rudge. This explanation is necessary to show I was correct in my quotation, and to prove that *C. aristata*, Illust. t. 59, is not *C. mirata*, D.

326. *C. dioica* (Linn.); spica plerumque dioica, mascula cylindrica fulva subinde basi feminea, feminea oblonga densiflora, fusco-ferruginea; stigmatibus 2; perigyniis ovatis rostratis, ore hyalino integro antice secto demum fisso plano-convexis utrinque valide nervosis marginibus scabris horizontaliter patentibus basi spongiosis, squama ovata æquilata obtusa rarius acuta fusca margine hyalino longioribus.—*C. dioica*, Linn. *Sp. Pl.*; *Good. in Linn. Trans.* ii. 139; *Wahl. Act.* 138; *Vill.* 193; *Willd.* 207; *Schk. f.* 1; *Kunth*, 368; *Light*, 541; *Gaud. Agr.* 70, et *Helv.* 26; *Eng. Bot.* 543; *Eng. Fl.* 77; *Koch*, 862; *Drej. Rev.* 16; *Fries, Sum.* 221; *Anders.* 70, t. 3, f. 10; *Lange*, 14; *Reich.* 2, t. 294; *Bertol.* 34; *Fl. Ross.* 264 (excl. syn. Dewey); *Gren. et Godr.* 385; *Steud.* 183. *C. Linneana*, *Hort. Gr.* t. 77. *C. lævis*, *Hoppe*. *C. capitata*, *Huds. Sut.* *C. castoriana*, *Heer* (fide *Steud.*). *Maukschia lævis*, *Heuff.* (fide *Steud.*) (TAB. CCCCLVIII.)

HAB. In Europa, Asia.—Iceland. Lapland to Italy. Ural. Altai.

*Rhizoma* laxum, stoloniferum, subinde "condensatum subcæspitosum" (*Fries, Lange*). *Culmus* 3–12 poll., filiformis, teres, lævis, vel apice scabriusculus. *Folia* carinato-filiformia, culmo breviora, lævia vel apice scabra. *Spica* mascula 6–9 lin. longa, 1 lin. lata, rarius basi flosculis femineis 1–2 vel pluribus instructa, vel varie dispositis, pallide fulva; feminea 4–6 lin. longa, 3–3½ lin. lata, fusco-ferruginea. *Squamæ* masculæ obtusæ; feminea infima sæpe acuta vel cuspidata. *Perigynium* 1 $\frac{6}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{9}{10}$  lin. latum, plano-convexum, rostro plus minus longo, ore hyalino integro antice secto, facile rupto, basi spongiosum subcordatum, ferrugineum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovatum, lenticulare, castaneum, basi styli clavata.

Fries, Andersson, and Lange describe several varieties of this common species, all characterized by the presence of female florets on the male spike,—the most common one being that with one or two at its base. In the var. *isogyna* they are more numerous. Lange alludes to one in which they are variously distributed, which I have never seen. The orifice of the perigynium is normally entire, protracted downwards anteriorly with hyaline margins; but, from its delicate membranous texture, it is easily rent on the protrusion of the stigmata, and is then bilobed. The base

is at first pointed, but, from the deposition of spongy matter laterally, it becomes broad and often subcordate.

The specimens figured are from Sweden.

327. *C. gynocrates* (Wormskiöld); spica plerumque dioica, mascula cylindrica pallide castanea subinde basi feminea, feminea oblonga laxiflora pallide ferruginea; stigmatibus 2; perigyniis ovalibus vel oblongo-ovatis rostratis, ore leviter hyalino bidentato biconvexis nervosis nitidis glabris vel superne ad margines subinde scabriusculis patentibus basi crasse spongiosis, squama ovata plerumque acuta æquilata pallide ferruginea margine hyalino paulo longioribus.—*C. gynocrates*, *Wormskiöld*; *Drej. Rev.* 16; *Fries, Mant.* 3, 134, et *Sum.* 222; *Anders.* 71, t. 3, f. 8; *Lange*, 18; *Kunze*, 123, t. 31, f. 1; *Steud.* 183; *Carey, ed.* 2, 509. *Kobresia scirpina*, *Horn. Fl. Dan.* t. 1529 (fide *Anders.*). *Kobresia nardina*, *Horn. Nmcl. Fl. Dan.* (fide *Drejer*). *C. dioica*, *Carey, ed.* 1, 537; *Sartwell, Eas. n.* 1. *C. dioica*  $\gamma$ , *Fl. Ross.* *C. Redowskiana*, *Meyer, Cyp. Nov.* t. 4; *Kunth*, 369; *Kunze*, 126, t. 31, f. 2; *Steud.* 183; *Fl. Ross.* 265. *C. Fischeriana*, *Gay, Ann. Sc. Nat. ser.* 2, x. 286; *Steud.* 183. (TAB. CCCCLIX.–CCCCLX.)

HAB. In Europa, Asia, America septentrionali.—Lapponia, Norlandia, Fennia. Baikal, *Fl. Ross.* Kamtchatka, *Meyer*. Greenlandia. New York, U. S. A.

*Rhizoma, culmus, folia* ut in *C. dioica*. *Spicula mascula* 4–7 lin. longa, rarius basi flosculis femineis 1–2, vel pluribus (in Europa) instructa; *feminea* 3–6 lin. longa, 2–3 lin. lata, laxiflora. *Squamæ* conformes, plerumque acutæ, femineæ (perigyniis lapsis) sæpe persistentes, infima sæpe cuspidata. *Perigynium* 1 $\frac{6}{10}$ –2 lin. longum,  $\frac{7}{10}$ – $\frac{9}{10}$  lin. latum, ovale, basi subacuto-vel oblongo-ovatum; rostro plus minus longo; ore minus hyalino nec unquam demum bilobato, biconvexum, pallidum demum ferrugineum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obovatum, ferrugineum, basi styli clavata.

A *C. dioica* differt spica feminea pauci-laxiflora, pallidiore; perigyniis sæpius ovalibus, biconvexis sæpius glabris; squamis acutis, inferioribus perigynium subæquantibus; culmo foliisque tenuioribus.

I must refer to the observations of Drejer, Fries, Andersson, and Lange on this plant, which, in North America, is the representative of the *C. dioica* of Europe; and whether it is to merge into it I leave to future observers. I have pointed out the apparent distinctions between them. In Tab. CCCCLIX. I have figured specimens which I received from Vahl (Greenland) and from Fries (Norlandia), and in Tab. CCCCLX. those from New York State, which give a better idea of it. Lange remarks that he had never seen the dioicous form of it, though such is the most prevalent one in North America,—the existence of one or two female florets at the base of the male spike being comparatively rare. The only specimen I have seen of *C. Redowskiana* leads me to think it is not distinct.

328. *C. parallela* (Sommerfelt); spica dioica, feminea lineari basi laxiflora castanea; stigmatibus 2; perigyniis ovalibus basi subacutis stipitatis longiuscule rostratis, ore hyalino integro antice secto demum fisso plano-convexis marginibus lævibus leviter nervatis adscendentibus castaneis, squama ovata obtusa vel acuta longioribus.—*C. parallela*, *Som. Suppl. Fl. Lap.* 39 (1826); *Fries, Sum.* 222; *Anders.* 71, t. 3, f. 9; *Lange*, 16; *Steud.* 183. *C. dioica*, var. *parallela*, *Læst. Act. Holm.* (1822).

*C. dioica*,  $\beta$ , *Fl. Ross.* 264.  $\beta$ . *C. dioica*, var. parallelodes, *Anders.* 71. (TAB. CCCCLXI.)

HAB. In Europa.—Lapland, Norway.

*Rhizoma* ramosum, stoloniferum. *Culmus* sulcatus, scabriusculus vel lævis. *Folia* canaliculata, basi conduplicata. *Spica mascula* . . . ; *feminea* 5–7 lin. longa, basi 1 lin. apice 2 lin. lata. *Squamæ masculæ* . . . ; *femineæ* margine demum lato albo-hyalinæ. *Perigynium*  $1\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum.

Var.  $\beta$ ; perigyniis margine scabris.

Sommerfelt remarks of this plant:—"Habitat una cum *C. dioica* in locis madefactis Alpium Lapponiæ Lulensis et Nordlandiæ Saltensis copiose. Satis me iudice differt a *C. dioica*. Spica feminea lineari-subsparsiflora (non oblonga) densiflora; fructibus ejusdem quidem formæ sed longioribus, non superne serrulatis nec divaricatis vix patentibus; foliisque canaliculatis subconduplicatis, non teretibus filiformibus. Culmus semipedalis, lævis, profundius striatus quam in *C. dioica*. Radix stolonifera, subcæspitosa. Culmi in *C. dioica* semper magis dispersi." Læstadius says, "Magna culmorum foliorumque abundantia ex eadem surgit radice;" and Andersson, "radice stolones magis elongatas apice adscendentes agente." Lang alludes to a variety, "spicula mascula basi vel medio flore uno alterove femineo intermixta," which I have not seen, nor is it noticed by others.

It differs from *C. dioica* in its more numerous, ascending, and more compact stolons, its stouter culm, coarser leaves, linear female spike (which is always subattenuated and lax-flowered at base), its ascending rarely patent perigynium, which is much less spongy in texture, with a longer and more attenuated rostrum.

The specimens figured are from Fries, from Jemtpland.

329. *C. Davalliana* (Smith); spica plerumque dioica, mascula cylindrica fulva, feminea oblonga squarrosa basi laxiflora subcrassa fusco-ferruginea; stigmatibus 2; perigyniis lanceolato-ovatis, sensim longiuscule rostratis, ore hyalino integro antice secto demum fisso plano-convexiusculis utrinque crebre leviter nervosis marginibus dentatis vel glabris demum recurvatis ima basi spongiosis, squama ovata acuta vel obtusa fulva vel ferruginea margine hyalina angustioribus longioribus.—*C. Davalliana*, *Smith, in Linn. Trans.* v. 266 (1800); *Fl. Brit.* 964; *Eng. Bot. t.* 2123; *Willd.* 208; *Schk. Nachtr.* 3; *Kunth*, 369; *Koch*, 862; *Bertol.* 32; *Lange*, 17; *Gaud. Agr.* 71, et *Helv.* 27; *Reich.* 2, t. 194; *Fl. Ross.* 264; *Steud.* 183. *C. dioica*, *Willd. Prod.*; *Sch. f.* 2; *Benth. Brit. Fl.* 556. *C. dioica*,  $\beta$ , *Wahl. Act.* 138. *C. scabra*, *Hoppe*. *C. reflexa*, *Gaud. Etr.* *Maukschia scabra*, *Heuff.* (TAB. CCCCLXII.)

HAB. In Europa et Asia.—Germany to Italy. Sibiria Altaica, *Fl. Ross.*

*Radix* dense cæspitosa. *Culmi* plures, triquetri, scabri, 3–15 pollices alti, basi foliati. *Folia* conduplicato-filiformia, culmo breviora, scabra. *Spica mascula* 7–10 lin. longa, sub lineam lata; *femineæ* 6–10 lin. longa, 3–4 lin. lata. *Squamæ* sæpius acutæ; feminea infima subinde cuspidata. *Perigynium*  $1\frac{8}{10}$ –2 lin. longum,  $\frac{5}{10}$  lin. latum, plano-convexiusculum, ima basi præcipue postice e basi achenii crasse spongiosum, supra membranaceum, demum reflexum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, oblongum, plano-convexum, pallidum, basi styli clavato-incrassata.

Variat rarius spica masculis flosculis femineis varie sitis; feminea basi vel apice mascula.

A *C. dioica* abunde differt radice cæspitosa; "culmorum foliorumque cæspites densos edente" (*Gaudin*); culmo tri-

quetro, scabro; perigyniis lanceolatis, attenuato-rostratis, reflexis, ima basi spongiosis.

This species, first noticed by Sherard, and distinguished, as Smith remarks, by Davall, was long confounded with *C. dioica*; but, since the date of the paper in the Linnæan Transactions, has been considered as distinct, except by Bentham. I have never seen it beyond the confines of Europe. It would seem to be most abundant in Switzerland, where Gaudin says it is "in paludibus ubique vulgatissima."

330. *C. tenuiflora* (Wahlenberg); spica subovata capitata pallida, e spiculis 3 rarius 4 androgynis basi parce masculis subrotundis coarctatis composita, nudis vel infima brevi setaceo-bracteata; stigmatibus 2; perigyniis ovatis erostatis vel rostellatis, ore subintegro plano-convexiusculis glabris vel superne marginibus rarius parce dentatis, marginibus subrevolutis pallidis granulatis utrinque subvalide vel obsolete nervatis, squama ovata obtusa vel acuta pallide ferruginea vel albo-hyalina nervo viridi sæpe vix vel paulo longioribus.—*C. tenuiflora*, *Wahl. Act. Holm.* 147; *Fl. Lap.* 232; *Willd.* iv. 228; *Schk. f.* 187; *Kunth*, 405; *Fries, Sum.* 224; *Anders.* 59, t. 4, f. 36; *Lange*, 61; *Hooker, Fl. Bor. Am.* ii. 214; *Fl. Ross.* 282; *Dewey, l. c.* 39, 51; *Torrey, Mon.* 392, 443; *Carey*, 543; *Sartwell, Eas. n.* 31. (TAB. CCCCLXIII.)

HAB. In Europa, Asia, et America septentrionali.—In Lapponia, Norvegia, Succia. In Uralensi, Baikal. America arctica. Nova Anglia.

Cæspitosa. *Radix* fibrosa. *Culmus* 6–12-pollicaris, acute triquetri, superne scaber. *Folia*  $\frac{1}{2}$  lin. lata, culmo breviora. *Bractea* infima rarius spicula longior, setacea. *Spica* 3–5 lin. longa, 2–3 lin. lata. *Spiculæ* 3, rarius 4, subrotundæ, omnes basi parce masculæ. *Squamæ masculæ* obtusæ; *femineæ* superiores vel omnes sæpe acutæ. *Perigynium* ovatum,  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, vel ovato-lanceolatum,  $1\frac{5}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, glaucum, plus minus distincte nervatum, nervis concoloribus, quandoque rostellatum, rostello pallide ferrugineo, marginibus postice distinctis, subrevolutis. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obovatum.

Fries says, "fructibus nervosis, squamis longioribus;" and Anderson, "enervibus squamas subæquantibus." These characters are variable, the perigynia being more or less distinctly nerved, and more or less longer than the obtuse or acute scale. I see no other difference between the European and American specimens than that, in the last, the scales are generally pale and acute. In both the perigynium has occasionally a distinct short cylindrical rostrum, which is of a pale ferruginous colour, and the upper margins are sometimes toothed. Wahlenberg, to contrast it with *C. loliacea*, speaks of the margins as subacute. They are posteriorly distinct and subrevolute. The coarctate spiculæ, with few male florets at their base, the narrow leaves and fibrous root, are the essential characters of the species.

The specimens figured are,—

n. 1. From Lapland.

n. 2. New York.

331. *C. trichodes* (Steudel); spica simplici apice mascula subrotunda pauciflora viridi-ferruginea involucrata; stigmatibus 2; perigyniis late ovalibus rostratis bidentatis plano-convexis, encerviis marginibus scabris stipitatis divergentibus pallidis, squama ovata acuta ferruginea (ad basim spicæ) longe foliacea multum brevioribus.—*C. tri-*

chode, *Steudel, Syn. Suppl. ined. n. 3055.* *C. involu-crata, Steud. n. 2975.* (TAB. CCCCLXIV.)

HAB. In America meridionali.—Chili, ad scaturiginem Sichahue. Cordillera de Raneo, *Lechler, Pl. Chilensis; Hohenacker.*

*Radix* repens, fibris tenuibus lævibus. *Culmus* 3-9-pollicaris, capillaceus, lævis. *Folia* capillacea, canaliculata, mollia, culmum subæquantia. *Spica* 1-2 lin. longa et lata, flosculis femineis 6-8, masculis paucioribus. *Squamæ* ferrugineæ, nervo pallido, demum deciduæ, masculæ muticæ; femineæ inferiores 2-3 plus minus longe foliaceæ, infima 6-16 lin. longa, superiores sursum brevius cuspidatæ, demum muticæ perigynioque breviores. *Perigynium*  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, stipite  $\frac{1}{10}$  lin. longo clavato, antice planum, postice convexum, marginibus plus minus scabrum, pallidum, demum ferrugineum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, conforme, plano-convexum, pallidum, basi styli crassiore abrupte apiculatum.

332. *C. oreophila* (Meyer); spica ovata vel oblonga densiflora nuda fusco-ferruginea apice mascula; stigmatibus 2; perigyniis ovalibus vel suborbiculatis plus minus cylindrico-rostratis, ore emarginato vel subbifido compressis estipitatis, enerviis vel obsolete nervatis superne marginibus acutis serrulatis imbricatis tenuissimis fusco-brunneis, squama orbiculata vel oblonga obtusa fusco-ferruginea margine albido longioribus, racheola lineari inserta prædita.—*C. oreophila, Meyer, Enum. Pl. Caucas. St. Petersb.; Kunth, 371; Steud. 185; Fl. Ross. 266; Tchihatch. As. Min. 573.* (TAB. CCCCLXV.)

HAB. In Asia.—In regione alp. Cauc. occ. et orient., *Meyer.* In regione alp. Mont. Argée, Cappadocia, *Gay, Pl. Balansæ Eussic. (1857).*

*Radix* repens. *Culmus* 6-8-pollicaris, scabriusculus. *Folia* canaliculato-filiformia, culmo breviora. *Spica* 4-6 lin. longa, 2-3 lin. lata. *Squamæ* concolores, conformes, feminea infima subinde cuspidata. *Perigynium*  $1\frac{2}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, rostro plus minus elongato, ore emarginato vel brevibifido, lobulis vel laciniis obtusis vel acutis, fimbriolatis vel subintegerrimis, marginibus quasi alatis, scabris. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, orbiculatum vel ovale, lenticulare, punctulatum. *Racheola* linearis, lævis, achenium superans.

A *C. capitata*, L., differt radice repente; spica oblonga, fusca; perigyniis appressis, marginibus scabris.

The specimens figured are from Cappadocia, sent to me by M. Spach. Kunth describes the Caucasian plant "setula ad basin exteriorem ovarii uncinata," and Steudel copies him. Meyer describes it as "setiform," as in the specimens of Balansa.

333. *C. teretiuscula* (Goodenough); spica oblonga cylindrica coarctata ferruginea, e spiculis parvis apice masculis, superioribus simplicibus congestis vel inferioribus compositis discretis sessilibus subinde femineis; bractea infima rarius spicam æquante; stigmatibus 2; perigyniis suborbiculato-ovatis plano-convexis rostratis rostro conico herbaceo, ore emarginato bidentato antice altissime secto uno margine eminente hyalino basi sæpe rotundato, superne marginibus acutis scabris lucidis pallide demum purpureo ferrugineis antice medio parce nervatis linea pallida centrali usque ad basin sæpe notatis ad latera gibbis postice enerviis vel basi nervatis stipitatis paten-

tibus, squama ovata acuta mutica ferruginea margine hyalino paulo longioribus.—*C. teretiuscula, Good. in Linn. Trans.; Smith, Eng. Fl. 91; Eng. Bot. t. 1065; Willd. 244; Schk. f. 19 et 69; Kunth, 390; Gaud. Agros. t. 88, et Helv. 6, 42; Koch, 867; Reich. t. 222; Anders. 67, t. 3, f. 22; Lange, 39; Gren. et Godr. 396; Bertol. 67; Fl. Ross. 276; Steud. 194; Dewey, 7, 265; Schw. et Tor. 308; Carey, 511; Sartwell, Ews. n. 13. C. paniculata,  $\beta$ , Wahl. Act. 143; Tor. Mon. 390. C. diandra, Schrank. C. fulva, Thuillier.*

Var.  $\beta$ . *major*, Koch, 867; Carey, 511.—*C. Ehrhartiana, Hoppe.* (TAB. CCCCLXVI.)

Var.  $\gamma$ . *ramosa*.—*C. prairea, Dewey; Woods Bot. 750 (1861); Sartwell, Eussic. n. 14. C. paradoxa, Boott; Hook. Fl. Bor. Am. 213; Dewey, 4, 346 (1847).*

HAB. In Europa et America septentrionali.—New Zealand.— $\beta$ . Europa, Amer. sept. Kashmere.— $\gamma$ . Amer. sept.

*Radix* repens, nec unquam densissime cæspitosa. *Culmus* 1-2-pedalis, gracillimus, triqueter, faciebus linea centrali prominente notatis, angulis superne scabris, basi rudimentis foliorum brevibus atro-purpureis integris tectis. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmo demum plerumque breviora. *Bracteæ* squamæformes, margine hyalinæ, infima cuspidata, spica partiali plerumque brevior, rarius spicam subæquans. *Spica* in  $\alpha$  8-12 lin. longa, 3 lin. lata; in  $\beta$  pluristachya, 1-2 poll. longa, 3-4 lin. lata. *Spicæ* partiales sæpius contiguæ, inferiores ovatæ, sessiles, nusquam elongatæ, subinde discretæ, 4-6 lin. remotæ. *Squamæ* muticæ. *Perigynium*  $1\frac{3}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ore alte secto, uno margine hyalino, usque ad basin rostri vel ad mediam partem corporis perigynii decurrente, basi sæpe rotundato quasi lobato, antice sæpe linea pallida usque ad basin inter nervos notatum, ad latera gibbum, medio parce vel utrinque nervatum, vel postice enervium vel basi nervatum, nervis superne evanidis. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obpyriforme, biconvexum, basi styli æquali.

In speciminibus e Nov. Zelandia perigynia nunc prolifera, squamas masculas ferentia.

Var.  $\beta$ ; spica longiore; culmo validiore altiore; foliis latioribus.

Var.  $\gamma$ ; spica subinde basi ramosa; squamis acuminatis; perigyniis pallide ferrugineis, angustioribus, rudimentis foliorum lanceolatis, integris, longioribus—ad *C. paradoxam* accedens. Differt colore stramineo; perigyniis minoribus, plano-convexis, nervatis, ut in forma typica; squamis margine hyalinis, persistentibus.

I have not found any notice in authors of the anterior elongated fissure of the orifice of the perigynium, which is more marked in this species than in the other allied forms. Schkuhr represents hermaphrodite flowers in this species. The male florets are few, and at times wanting, at least in the lower spiculæ. I do not quote the figure of Goodenough, as it is not, I think, referable to *C. teretiuscula*, but to a depauperate form of *C. paniculata*. It perhaps misled Wahlenberg. Hoppe, from specimens he sent to me, rejected it, on his tickets accompanying the specimens.

The specimens figured are from North America, with the *C. Ehrhartiana,  $\gamma$ , Hoppe.*

334. *C. Gaudiniana* (Guthnick); spica oblonga angusta ferruginea, e spiculis 2-4 contiguis terminali cylindrica sæpius apice vel basi et apice feminea, raro omnino mascula, reliquis femineis brevioribus nudis; bractea squamæformi; stigmatibus 2; perigyniis ovato-lanceolatis sensim

in rostrum longiusculum attenuatis rostro ferrugineo, ore hyalino antice fisso patentibus marginibus e medio sursum serrulatis leviter nervatis, squama ovata subacuta ferruginea marginibus albo-hyalino longioribus.—*C. Gaudiniana*, *Guthnick, Flora*, i. 241 (1832); *Gaudin in Add. Fl. Helv.* vii. 660 (1833); *Gay, Ann. Sc. Nat.* x. 305 (1838), *sub C. microstachya*; *Koch*, 871; *Lange*, 49; *Reich. t.* 202; *Hoppe et St. icon.* *C. microstachya*,  $\beta$ , *Fl. Ross.* 285. (TAB. CCCCLXVII.)

HAB. In Helvetia, prope Thun.

Stolonifera. *Culmus* 4–8-pollicaris, apice obtusangulus, lævis, rarius scabriusculus. *Folia* culmo breviora, canaliculato-setacea, apice plano-compressis. *Bractea* squamæformis, nunc cuspidata. *Spica* 9–10 lin. longa, basi 2 lin. lata. *Spicula* terminalis 5–7 lin. longa, sæpius apice vel basi apiceque, rarius omnino feminea vel mascula, reliquæ 1–2 lin. longæ. *Squamæ* conformes, ferruginæ, margine albo-hyalinæ. *Perigynium (immaturum)*  $1\frac{5}{10}$ – $2\frac{0}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, viride, rostro ferrugineo.

Gay considers the Swiss plant to be inseparable from *C. microstachya*, while Koch, Lange, Hoppe, and Reichenbach separate it. The difference is in the shorter spike; lanceolate perigynium, which is longer than the ferruginous squamæ, and not appressed; the shorter culm, with obtuse angles, and generally smooth; and the setaceous leaves. Lange places it in his *Echinata*, next to *C. stellulata*, while he inserts *C. microstachya* in his *Canescentes*, between *C. glareosa* and *C. Norvegica*; and Andersson has nearly the same affinity. Fries, on the contrary, associates it with his *Chordorrhizæ*. Tuckerman places both *C. microstachya* and *C. Gaudiniana* in his *Arenariæ*, in juxtaposition with his *Stellulata*; while Koch separates both from the androgynous group, and places them, with *C. mucronata*, among the true *Carices* (not *Vignæ*). I think the affinity of *C. Gaudiniana* is with *C. elongata*, and the resemblance between it and *C. microstachya* is so great that they must be associated together. I have not seen mature perigynia of either species.

335. *C. Hilairei* (Boott); spica oblonga pallida involucreta apice dense imbricato-mascula basi flosculis femineis 3–5 instructa; stigmatibus 3; perigyniis late ovalibus vel orbiculatis rostratis, ore integro vel emarginato enerviis marginibus alatis serrulatis pallidis, squama rotundato-ovata infima longe foliacea summa cuspidata brevioribus, racheola lineari lævi inserta prædita. (TAB. CCCCLXVIII.)

HAB. In Brasil. merid., *St. Hilaire (Herb. Mus. Paris)*.

*Radix* cæspitosa, fibrosa. *Culmus* 10–20 pollices longus, filiformis, lævis, triqueter, rigidus, basi foliatus. *Folia*  $\frac{1}{2}$ –1 lin. lata, culmo breviora, rigida, carinata, scabra. *Spica* 5–7 lin. longa, apice 1, basi 2 lin. lata, flosculis femineis 3–5, masculis pluribus instructa. *Squamæ masculæ* arcte imbricatæ, rotundato-obtusæ, (sub lente) tenuissime ciliolatæ, muticæ, pallide castaneæ, nervo viridi, summæ steriles; *femineæ* inferiores 2, plus minus longe setaceo foliaceæ, superiores cuspidatæ. *Perigynium (vix immaturum)* 2 lin. longum,  $1\frac{3}{10}$  lin. latum, appressum, cervice, concavo-convexiusculum, superne (sub lente) asperulum, ad latera transversim corrugatum, rostro excurvo. *Achenium* trigonum. *Racheola* basi dilatata subæquans. *Stylus* basi incrassatus.

A *Sellowiana*, Schlecht., differt culmo lævi rigido; foliis rigidis; squamis infimis foliaceis, masculis obtusis ciliolatis.

I am indebted to M. Spach for a knowledge of this species. The perigynium was not fully mature, and apparently nerveless.

336. *C. polytrichoides* (Muhlenberg); spica oblonga vel abbreviata laxiflora viridi apice mascula plerumque nuda; stigmatibus 3; perigyniis ellipticis obtusis, ore emarginato striato-nervosis appressis viridibus demum pallide castaneis, squama ovata acuta vel cuspidata alba nervo viridi subduplo longioribus.—*C. polytrichoides*, *Muhl.* 230; *Schk. f.* 138; *Willd.* 213; *Kunth*, 423; *Steud.* 185; *Fl. Bor. Am.* 209; *Dewey*, 9, 258; *Tor. Cyp.* 296; *Mon.* 404; *Carey*, 510; *Chapm.* 536; *Sartwell. Fls. n.* 6. *C. leptalea*, *Wahl. Act.* 139. *C. microstachya*, *Mich.* (TAB. CCCCLXIX.)

HAB. In America septentrionali.—Rocky Mountains. Cumberland House to Florida.

Cæspitosa. *Radix* fibrosa. *Culmus* capillaceus, 4–15-pollicaris, acutangulus, scaber. *Folia*  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, sæpe involucreta, mollia, culmo breviora vel longiora. *Spica* 2–9 lin. longa, apice filiformi, mascula basi 1–1 $\frac{1}{2}$  lin. lata; flosculis masculis 2–5 vel pluribus, femineis 2–9 alternatim contiguus. *Squamæ* albidæ, nervo viridi; *masculæ* subdistichæ, muticæ, obtusæ vel acutæ; *femineæ* inferiores longius cuspidatæ; infima sæpe setaceo-foliacea, spicam superans. *Perigynium*  $1\frac{5}{10}$ – $2\frac{0}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, plano-subtriquetrum, superne vacuum, stipitatum, stipite obconico. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obovatum, triquetrum, basi styli æquali abrupte apiculatum.

Wahlenberg describes his *C. leptalea* as having two stigmas, but no other author alludes to this variation. I have not seen this species from the Rocky Mountains or the Pacific coast. Drejer, from the form of the perigynium, allies it to *C. pallescens*, L., but it is nearer to *C. loliacea*.

337. *C. microstachya* (Ehrhart); spica oblonga angusta straminea, e spiculis 1–5 contiguus, terminali cylindrica mascula vel apice vel basi apiceque feminea, reliquis femineis brevioribus nudis; bractea squamæformi; stigmatibus 2; perigyniis ovatis sensim breve rostratis, ore integro vel fisso antice oblique secto hyalino marginibus tenuiter serrulatis enerviis appressis, squama late ovata obtusa vel subacuta margine demum albo-hyalina angustioribus brevioribus.—*C. microstachya*, *Ehrh. Beitr.* 3, 72; *Wahl. Act.* 146; *Willd.* 250; *Lange*, 56; *Andersson*, 60, t. 3, f. 11; *Reichenbach*, 5, t. 202; *Koch*, 871; *Hoppe et St. icon.*; *Gay, Ann. Sc. Nat.* 10, 305 (1838); *Fl. Rossica*, 4, 285. (TAB. CCCCLXX.)

HAB. In Suecia, Lapponia, Rossia media.

Stolonifera. *Culmus* acute triqueter, scaber, 9-pollicaris–2-pedalis, gracilis. *Folia* culmo breviora, canaliculata, demum evoluta, plana,  $\frac{2}{3}$  lin. lata, apice triquetra, scabra. *Bractea* squamæformis. *Spica* 6–14 lin. longa, basi 2–3 lin. lata. *Spicula* terminalis, 6–7 lin. longa,  $\frac{1}{2}$ – $\frac{2}{3}$  lin. lata, omnino mascula, vel apice summo feminea, basique sæpe flosculis femineis 1–4 (discretis) instructa. *Spicula* femineæ 2–4, breves, paucifloræ, vel oblongæ, 2–4 lin. longæ, 1 lin. latæ; raro deficientes. *Squamæ* conformes, marginibus pallide fulvis, demum albo-hyalinis. *Perigynium (immaturum)*  $1\frac{2}{10}$ – $1\frac{3}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum.

The taller, acute-angled, rough culm, broader leaf; the ovate perigynium, which is appressed and not longer than the stramineous squama, distinguish this from *C. Gaudiniana*. The terminal spike is oftener male.

338. *C. macilenta* (Fries); spica oblonga laxa pallida, e spiculis 3-4 androgynis basi masculis alternis approximatis composita, summa basi attenuata infima remotiori sæpe brevi setaceo-bracteata; stigmatibus 2; perigyniis oblongo-ovatis erostratis, ore subfido plano-convexiusculis superne marginibus scabris pallidis utrinque leviter nervatis nervis fuscis granulatis, squama late ovata obtusa vel acuta albo-hyalina medio viridi æquilata longioribus.—*C. macilenta*, *Fries, Sum.* 224; *Andersson, l. e.* 58, t. 4, f. 35. *C. tenuiflora*, var., *Lange*, 61. (TAB. CCCCLXXI.)

HAB. In Lapponia, Norvegia, et Finlandia.—In paludibus subalpinis, *Fries*. In locis sphagnosis, *Andersson*.

*Radix* stolonifera. *Culmus* 1½-pedalis, acute triquetus, superne nudus, scaber. *Folia* plana, lineam lata, apice longe attenuata, culmo breviora. *Bractea* basi squamæformis, sæpe aristata, spicula infima longior. *Spica* 6-8 lin. longa, 1½-2 lin. lata. *Spiculæ* parvæ, alternæ, suprema basi attenuata. infima 3 lin. remota. *Perigynium* 1½ lin. longum,  $\frac{6}{10}$  lin. latum, subbifidum, sinu acuto, pallidum, nervis fuscioribus.

Inter *C. loliaceam* et *C. tenuifloram* media, ab utraque ore subbifido distincta.

A *C. tenuiflora* differt radice stolonifera; foliis latioribus; spiculis alternis, suprema basi attenuata; perigyniis subbifidis (sinu acuto), marginibus superne magis asperulis, nervis tenuibus, coloratis.

Fries and Andersson say "*perigyniis squama obtectis*," which is certainly not the case with specimens I have received from Fries, and in others from Sonder. It is a character more applicable to *C. tenuiflora*. Andersson contrasts it with *C. tenuiflora* and *C. vitilis*. I think it is more closely allied to *C. loliacea*, with which it agrees in foliage and inflorescence, but the nerves are more delicate and less prominent. I have a specimen of *C. loliacea* from Fries, in which the apex of the perigynium is more acute than usual, and occasionally slightly rough; and I suspect that *C. macilenta* may prove to be a variety of it. Both plants are comparatively rare in our herbaria. I have not seen matured perigynia of *C. macilenta*.

339. *C. panicea* (L.); spica 2-3 rarius 4-5 cylindricis remotis pedunculatis mascula 1 femineis densifloris superioribus subinde apice masculis inferioribus vel omnibus exserte pedunculatis aurantiaco-purpureis, infima nunc subradicali laxiflora; bracteis vaginatis spicis suis sæpe longioribus; stigmatibus 3; perigyniis suborbiculatis vel ovalibus turgidis rostellatis, ore integro truncato obtuse triquetris sæpe excurvis plus minus leviter nervatis flavidis demum fuscis (sub lente) granulatis, squama ovata obtusa vel acuta purpurea medio pallida margine albo-hyalina longioribus.—*C. panicea*, *L.*; *Schk. f.* 140; *Hoppe et St. icon.*; *Reich.* 20, t. 245; *Andersson*, 33, t. 7, f. 76, etc.; *Dewey, Sill.* 25, 140; *Tor. Cyp.* 416; *Carey*, 521.—(TAB. CCCCLXXII.)

HAB. In Europa, Asia, America septentrionali.—China.

Stolonifera. *Culmus* obtusangulus, lævis. *Folia* 1-2 lin. lata, glaucescentia. *Bractea* (apice laxe) vaginantia; infima spica sua brevior vel longior; vagina infima 5-21 lin. longa. *Pedunculus* infimus subinde 2-5 poll. longus. *Spica* mascula ½-1 poll. longa, 1½ lin. lata. *Spica* femineæ ½-1½ lin. longæ, 2-3 lin. latæ. *Squamæ* omnes margine albo-hyalinæ; masculæ obtusæ; femineæ subinde acutæ, nervo rarius excurrente. *Perigynium* 1½-2 lin. longum,  $\frac{7}{10}$ -1 lin. latum, brevissime

rostellatum, ore truncato purpureo. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, triquetrum, fuscum, punctulatum.

I have not given all the references to this very common European plant, which extends from Lapland throughout Europe, and in Asia. In North America I have only seen it from the neighbourhood of Boston, and the specimens figured are from that locality, differing occasionally from the European ones by the elongation of the peduncles. The species in Europe varies much in size, often not more than three inches in dry woods and sandy places, and in marshes a foot and a half high.

340. *C. macrostyla* (Lapeyrouse); spica cylindrica demum laxiflora castanea apice mascula sæpius nuda; stigmatibus 2; perigyniis elliptico-lanceolatis longe rostratis, ore hyalino oblique fisso plano-convexis, enerviis nisi postice nervis 2 intra marginalibus glabris demum olivaceis reflexis membranaceis, squama oblongo-elliptica subacuta glabra castanea superne margine albo-hyalino nervo viridi deciduo longioribus.—*C. macrostylon*, *Lapeyr. Hist. Abr. Pl. Pyr.* 562 (1813). *C. macrostyla*, *Dec. Fl. Franc.* 6, 287; *Kunth*, 370; *Steud.* 184. *C. decipiens*, *Gay, Ann. Sc. Nat.* 26, 209 (1832), et 10, 287 (1838); *Steud.* 184; *Gren. et Godron*, 386.

Var.  $\beta$ ; spica pallida; perigyniis ore hyalino antice fisso postice inter nervos intramarginales obscure nervatis, squama oblonga obtusa albida apice hyalina ciliolata subduplo longioribus.—*C. peregrina*, *Link, Hort. Berol.* 334 (1827); *Steud.* 184; *Kunth*, 370. *C. saggitifera*, *Lowe, in Camb. Ph. Soc. Trs.* 6, 531 (May, 1838). *C. Guthnickiana*, *Gay, Ann. Sc. Nat.* 10, 289 (Nov. 1838); *Steud.* 184. (TAB. CCCCLXXIII.)

HAB. In Europa.— $\alpha$ . In regione subalpina et alpina, Mont. Pyrenæorum, *Lapeyr.*; *Endress. Un. Itin.* 1831; *Billot, Exs. n.* 1569.— $\beta$ . In sylvis convallium Maderæ, in declivibus prope rivulos, *Lowe*; *Dr. C. Lemann*. In Ins. Azoricis, Fayal et Pico ad latera mont., 1500-2000 ped., *Guthnick, Watson*. St. Michael's, *Hunt*.

Var.  $\beta$ . Dense cæspitosa. *Radix* fibrosa. *Culmi* 3-21-pollicares, filiformes, glabri vel superne scabriusculi. *Folia* plana vel conduplicata,  $\frac{1}{3}$ -1 lin. lata, culmo breviora vel æquantia, margine scabra. *Spica* 6-18 lin. longa, 2-3 lin. lata. *Squamæ* ciliolatæ, obtusæ, pallidæ; femineæ demum infra apicem hyalinam zona ferruginea notatæ; infima subinde foliacea, spica plus minus longiore; demum deciduæ. *Perigynium* 2½-3½ lin. longum,  $\frac{7}{10}$ -1 lin. latum, demum reflexum. *Achenium* 1½-2 lin. longum,  $\frac{7}{10}$ -1 lin. latum, ellipticum, lenticulare, olivaceum, punctulatum, basi styli crassioris. Antice *racheola* linearis, apice dilatata, 2-4 lin. longa, rarius longior, viridis, ligulata, scabra, apice squamis 2 exsertis instructa. *Stigmata* 2, longa.

A forma typica differt spica pallida, rachi scabra, squamis obtusis ciliolatis, statura altiore.

I have only seen a young specimen of the plant from the Pyrenees, and must refer to the observations of Gay upon it. I think, with the author of the Fl. Ross. (under *C. pulicaris*, p. 265), that it is not specifically distinct from the Madeira and Azores plant. I have a specimen of *C. peregrina*, Link, from the Berlin Garden, identical with these last. Link quotes "*Wormskiold ad fluvium Zayre*" for his species, but Kunth says of it "*patria ignota*."

*C. pulicari*, L., affinis. Differt perigyniis longe rostratis, nec subventricosis; foliis explanatis, latioribus; squamis obtusis; culmo altiore.

The specimens figured are from Madeira.

341. *C. nigricans* (Meyer); spica simplici apice mascula oblonga obtusa densi-multiflora fusco-ferruginea; stigmatibus 3 rarius 2; perigyniis ovatis ventricosus sensim acuminato-rostratis, ore late albo-hyalino integro aperto antice oblique secto, postice supra achenium triquetris longe stipitatis, enerviis lucidis demum horizontaliter patentibus vel reflexis ferrugineis, squama oblonga obtusa decidua, infima rarius subfoliacea fusco-ferruginea plus minus longioribus.—*C. nigricans*, Meyer, *Cyp. Nov. t. 7*; *Kunth*, 425; *Fl. Ross.* 268; *Steudel*, 185; *Tor. Cyp.* 402; *Dewey*, 29, 249. (TAB. CCCCLXXIV.)

HAB. In Asia et America septentrionali.—Unalaska, Meyer. Rocky Mountains, Drummond, *Iyall*.

*Rhizoma* validum, repens. *Culmus* 6–12-pollicaris, compresso-obtusangulus, lævis. *Folia*  $\frac{1}{4}$ – $1\frac{1}{2}$  lin. lata, plana, culmo longiora vel breviora. *Spica* 5–10 lin. longa, 4–5 lin. lata, apice plus minus mascula, obtusa, basi squamis femineis numerosis densis imbricatis. *Squamæ* conformes. *Perigynium* (eum stipite  $\frac{3}{10}$ – $\frac{5}{10}$  lin. longo)  $1\frac{7}{10}$ – $2\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, glabrum vel uno margine rarius parce dentatum, ventricosum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, inæqualiter triquetrum, pallidum, basi styli crassiuscula apiculatum. In uno perigynio achenia 2 observavi. *Stigmata* 3, rarius 2.

A *C. Pyrenaica* satis differt rhizomate repente; culmo obtusangulo; foliis latioribus, planis; spica majore; perigyniis ventricosus, majoribus; ore conspice albo-hyalino, aperto.

The specimens figured are from the Rocky Mountains, larger than those described by Meyer. The membranous orifice is easily torn. I have always found the achenium triquetrous.

342. *C. Pyrenaica* (Wahlenberg); spica simplici apice mascula elliptica densiflora fusco-ferruginea; stigmatibus 3 rarius 2; perigyniis fusiformibus vel lanceolatis sensim attenuatis, ore antice obliquo clauso margine anguste hyalino longe stipitatis, enerviis compresso-subtriquetris vel biconvexis lucidis demum horizontaliter patentibus vel reflexis ferrugineis, squama lanceolata acuta vel oblonga obtusa decidua, infima rarius subfoliacea fusco-ferruginea longioribus.—*C. Pyrenaica*, *Wahl. Act.* 139 (1803); *Kunth*, 425; *Meyer*, *Cyp. Nov.* 212, t. 7; *Reichb.* 4, t. 198; *Lange*, 24; *Gren. et Godr.* 387; *Steud.* 185; *Hook. fil. Fl. N. Zeal.* i. 280; *Tor. Cyp.* 403; *Dewey*, 4, 346 (1847). *C. Fontanesiana*, *Dec.* *C. Ramondiana*, *Dec.* *C. Marchandiana*, *Lapeyr.* *C. denudata*, *Lapeyr.* *C. acutissima*, *Dreyf.* *C. Grosseckii*, *Heuffl.* *Callistachys Pyrenaica*, *Heuffl. Fl.* 528. (TAB. CCCCLXXV.–CCCCLXXVI.)

HAB. In Europa, America septentrionali, Asia.—In mont. Pyrenæis. Mont. Saxosis. Ruahine mont., N. Zel., *Colenso*.— $\beta$ . In alp. Transylvaniæ, prope Togarasch, *Kotsehy*.

*Radix* cæspitosa, fibrosa. *Culmus*  $1\frac{1}{2}$ –6-pollicaris, filiformis, triquetrus, lævis vel scaber. *Folia* plana,  $\frac{1}{2}$ –1 lin. lata, sæpius conduplicata, carinata, culmo breviora vel longiora. *Spica* 5–8 lin. longa, 3–4 lin. lata, apice floeulis masculis paucioribus, basi femineis pluribus imbricatis. *Squamæ* maseulæ, pallidiores; femineæ inferiores longiores; infima sæpe cuspidata vel subfoliacea. *Perigynium* (eum stipite  $\frac{3}{10}$  lin. longo)  $1\frac{8}{10}$ – $2\frac{1}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, e basi acuta (fusiforme) vel obtusa (lanceolatum), sursum sensim attenuatum vel ros-

tratum; ore antice secto, sulcoque plus minus deorsum pro lato notatum; antice planum; postice supra achenium subtriquetrum vel biconvexum, achenium laxè vestiens, enerve, rarius antice basi 2–3-nervatum, glabrum, vel uno margine rarius parce dentatum, membranaceum, demum reflexum. *Achenium*  $\frac{7}{10}$ –1 lin. longum,  $\frac{4}{10}$  lin. latum, inæqualiter triquetrum, vel lenticulare, basi styli crassiuscula apiculatum, stipitatum. *Stigmata* 3, rarius 2.

Var.  $\beta$ ; perigyniis (cum stipite  $\frac{3}{10}$ – $\frac{5}{10}$  lin. longo)  $1\frac{8}{10}$ – $\frac{5}{10}$  lin. longis,  $\frac{4}{10}$  lin. latis, basi e stipite articulo disjunctis.

I do not find any reference in authors to the two stigmas occasionally observable in the plant from the Pyrenees, with the accompanying lenticular achenium. In the specimens from the mountains of New Zealand, the perigynium, with a stipes  $\frac{3}{10}$  of a line long, is  $1\frac{4}{10}$ – $\frac{8}{10}$  line long,  $\frac{5}{10}$  line wide, with a distinct hyaline orifice, with two stigmas *biconvex*, and with three stigmas *subtriquetrous*, posteriorly from the projecting angle of a triquetrous achenium. In one was a linear racheola. In those from the Rocky Mountains, the perigynium is about the same in its measurements, with a distinct hyaline orifice; and in one there was a second perigynium within, with two stigmas by the side of a triquetrous achenium with three stigmas, shown in Tab. CCCCLXXV. 2. c.

The specimens figured in Tab. CCCCLXXV. :—

- n. 1. Specimens from the Pyrenees!
- n. 2. From the Rocky Mountains, the open perigynium showing the internal one furnished with its stipes and two stigmas by the side of the achenium with three.

Tab. CCCCLXXVI. :—

- n. 1. Specimen from New Zealand; the racheola shown.
- n. 2. The var.  $\beta$ , from Transylvania, with the articulation between the perigynium and stipes. I owe the knowledge of this plant to the kindness of M. Sonder.

343. *C. cephalotes* (Müller); spica simplici apice mascula ovali densiflora fusco-ferruginea; stigmatibus 2; perigyniis ovalibus vel ovatis sensim acuminato-rostratis, ore antice obliquo albo-hyalino breve stipitatis, enerviis biconvexis pallidis apice ferrugineis, squama ovata acuta mucronata vel apice dentata ferruginea margine anguste albo-hyalino longioribus.—*C. cephalotes*, Müller, *ms. in Herb. Hooker et Sonder.* (TAB. CCCCLXXVII.)

HAB. In Australia meridionali.—Snowy summits of the Mynyang mountains, Müller.

*Radix* fibrosa. *Culmus* 3–5-pollicaris, triquetrus, lævis, filiformis. *Folia*  $\frac{1}{2}$  lin. lata, culmo breviora vel longiora, conduplicata. *Spica* 3–5 lin. longa,  $2\frac{1}{2}$  lin. lata. *Squamæ* femineæ inferiores acutæ, mucronatæ vel apice dentatæ; superiores obtusæ. *Perigynium*  $1\frac{5}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, stipite  $\frac{1}{10}$  lin. longo, glabrum, rarius uno margine parce dentatum. *Achenium*  $\frac{1}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, lenticulare, apice basi styli crassiusculo, abrupte apiculatum.

Affinitas summa eum *C. Pyrenaica*. Differt stigmatibus 2; perigyniis biconvexis, paulo latioribus; stipite brevioribus; squamis mucronatis vel dentatis.

The few specimens I have seen of this plant, which I owe to the kindness of Dr. Hooker and M. Sonder, are not fully mature to exhibit the change of direction in the perigynium common to its allies, and the deciduous habit of the squamæ, if such occur. The stigmas are constantly two. The dentation at the apex of the lower squamæ is like what is occasionally observable in species with a hispid mucro, when such a mucro is abortive.

344. *C. vaginata* (Tausch); spicis 3–4 oblongis remotis pedunculatis, mascula 1, femineis laxi-sæpe paucifloris omnibus (infima subinde subradicali longe) exserte



pedunculatis e viridi ferrugineis; bracteis turgide vaginatis spicis brevioribus; stigmatibus 2-3 raro 4; perigyniis subrotundo-ovalibus vel ellipticis obtuse triquetris rostratis rostro sæpius excurvo, ore alte oblique secto integro vel plus minus emarginato, obscure vel leviter nervatis coriaceis, squama ovata acuta vel acuminata sæpe mucronata vel obtusa abrupte apiculata plerumque longioribus.—*C. vaginata*, *Tausch*; *Fries, Mant.* 2, 58; *Drejer, Rev.* 53; *Lange*, 96; *Kunth*, 451; *Koch*, 879; *Hoppe et St. icon. Reich.* 20, t. 246; *Kunze*, 60, t. 15; *Steud.* 224; *Fl. Ross.* 291. *C. sparsiflora*, *Steud. Nom. Synops.* 227; *Fries, Mant.* 3, 138; *Summa*, 235; *Anders.* 33, t. 7, f. 75. *C. panicea*,  $\beta$ , *Wahl. Fl. Lap.*;  $\gamma$ , *Fl. Suec.* *C. Mielichhoferi*, *Sm. Eng. Bot. t.* 2293; *Eng. Fl.* 198. *C. phæostachya*, *Sm. Eng. Fl.* 99; *Eng. Bot. t.* 2731. *C. salina* et *C. nivicola*, *Don.* *C. triflora*, *Vahl.* *C. depauperata*, *Horn.*; *Vahl.* *C. curvirostra*, *Hart.* *C. tetanica*, *Reich.* *C. Scotica*, *Spr.*; *Steud.* 229. *C. Smithii*, *Tausch, Bot. Zeit.* 559, sec. *Nolte.* *C. Sudetica*, *Presl.* *C. falcata*, *Turcz.*; *Maxim. Prim. Fl. Amur.* 311. (TAB. CCCCLXXVIII.)

HAB. In Europa, America septentrionali, Asia.—Lapland to the mountains of Scotland. Arctic America. Rocky Mountains. Greenland. Baikal, Dahuria, Amur, *Maxim.*?

Stolonifera. *Culmus* 4-18-pollicaris, gracilis, lævis, basi foliis brevibus tectus; pars spicas gerens 2-10 poll. longa. *Folia* 1-3 lin. lata, culmo breviora. *Bractea* turgidæ, vaginatae, spicis suis breviores; pedunculus infimus subinde 4 poll. longus, filiformis. *Spica mascula* 5-10 lin. longa, 1½-2 lin. lata; *femineæ* sæpe sparsifloræ, 6-10 lin. longæ, 1-3 lin. latæ. *Squamæ* variabiles, omnes obtusæ, muticæ, sensim vel abrupte acuminatæ, vel sæpe mucronatæ, ferrugineo-purpuræ. *Perigynium* late ovale, 1½ lin. longum, vel ellipticum, 2½ lin. longum, 1 lin. latum, viridi vel purpureo tinctum, plus minus longe rostratum; ore alte secto nunc integro vel emarginato, purpureo, rostro recto vel sæpius excurvo. *Achenium* orbiculatum, ⅔ lin. longum, ⅔ lin. latum, vel ellipticum, 1½ lin. longum, ⅔ lin. latum, triquetrum, vel raro angulis 4 inæqualibus præditum. *Stigmata* 2-3, raro 4.

A *C. panicea* differt spicis gracilibus, laxifloris; bracteis brevioribus, laxè vaginantibus; perigyniis rostro longiore excurvo, ore profundius oblique secto, sæpe subbifido; squamis femineis subinde acutis vel mucronatis; foliis viridibus, sæpe longioribus.

In the 'Flora Rossica' this is considered to be more nearly allied to *C. pilosa*, Allioni. Fries, in his 'Summa,' under *C. sparsiflora*, describes it as having two stigmas. Mr. Macrae finds the same number in the Canadian plant, but varying to three and four, with an occasional four-angled achenium. I observe the same variation in my European specimens, but I have never seen a lenticular achenium, and in that with four angles two of them are approximate. In the Canadian plant, the orifice is occasionally ciliate. Bentham, like Wahlenberg, considers it a variety of *C. panicea*, L.; and the only important distinction between them is in the elongate rostrum, with its oblique orifice of *C. vaginata*,—characters which, as usual in the genus, are variable. The later authorities distinguish them. I have not seen it from the United States, but it is found in Canada. *C. falcata*, Turcz., judging from a young specimen in *Herb. Gray*, from the Amur, on which the leaves were not ciliate, as in *C. pilosa*, All., I think is inseparable from *C. vaginata*, Tausch.

345. *C. aphylla* (Kunth); spica ovali obtusa densi-

flora simplici apice mascula, ina basi sterili viridi ferruginea; bractea squamæformi abbreviata; stigmatibus 3; perigyniis pyriformibus stipitatis obtuse trigonis antice planis abrupte rostellatis, ore integro puberulis, nervis 2 marginalibus pallidis, squama ovata mucronulata vel mutice arcte imbricata medio late pallida nervata margine membranacea ferruginea angustioribus brevioribus.—*C. aphylla*, *Kunth*, 421; *Desvauz in Gay, Fl. Chil.* 198; *Steud.* 183. *C. Berteroana*, *Desvauz, l. e.* 198, f. 1. *Schœnus marginatus*, *Kunze, Syn. Pl. Am. Austr. Pœpp. Col.* (TAB. CCCCLXXIX.)

HAB. In America australi.—Chili, *Pœppig*; *Dombey*. San Antonio, *Gay*. Cordill. de Ranco, ad ripas arenosas fl. Pillan Leufa, *Lechler, n.* 1316.

Repens, cæspitosa. *Culmi* 8-15-pollicares, teretes, rigidi, lævissimi, nudi, basi vaginis ferrugineis tecti. *Folia* subulata, ½-1 poll. longa; *sterilia* desunt. *Bractea* squamæformis, subulata, firma, spicæ brevior vel paulo longior. *Spica* 6 lin. longa, 4 lin. lata, apice flosculis masculis paucis inconspicuis, vel copiosis, basi squamis 3-5 sterilibus; infima bracteam fingente instructa. *Squamæ* inferiores deciduæ; *masculæ* angustiores, magis persistentes, plerumque ferrugineæ. *Perigynium*, cum stipite ⅔ lin. longo, 2⅔ lin. longum, ⅔ lin. latum, obtuse trigonum, angulo medio postico; ore truncate, ciliato vel bidentato, oblique fisso. *Achenium* conforme, triquetrum, basi productum, angulo medio postico, basi stylo incrassata. *Racheola* linearis, scabra, *achenium* subæquans.

Kunth described this singular species as dioicous, but I believe male florets are always observable at the apex of the spike. They are sometimes few and inconspicuous, at others numerous, and persistent for some time after the fall of the female and basal sterile florets. From the character and form of the perigynium, it is allied to the *Digitata*.

Of the following species we have no mature specimens, and whether it be distinct from *C. aphylla* or not, there are no satisfactory means of judging. I am indebted to M. Spach for a knowledge of them all, though subsequently, through the kindness of M. Sonder, I have received the specimens of Lechler and Philippi.

Tab. CCCCLXXIX. :—

n. 1. Specimens from Mont La Leone, *Bertero*.

n. 3. Specimens from Chili, *Dombey* (all from *Herb. Mus. Par.*)

346. *C. setifolia* (Kunze); spica oblonga apice mascula basi sterili; bracteis 2 infima foliacea elongata; stigmatibus 3; perigyniis (floriferis) puberulis, ore bilobulato, squama brevioribus.—*C. setifolia*, *Kunze, Syn.*; *Pœppig, Col. et Suppl.* 106, t. 26; *Kunth*, 422; *Steud.* 185. *C. piptolepis*, *Desvauz in Gay, Fl. Chil.* 201. *C. Berteroana*, *Hohenack, n.* 590; *Pl. Chil. Philipp.* (TAB. CCCCLXXX.)

HAB. In America australi.—Chili, Cordillera de Falcaragua. St. Antonio et St. Fernando, *Gay*; Quillota, *Bertero*; St. Jago, *Philipp*; Valparaiso, *Cuming, n.* 473.

*Culmi* (floriferi) ½-1-pedales, filiformes, reclinati, plus minus tortuosi, apice angulati, scabriusculi. *Folia* filiformia, elongata, subinde culmum æquantia. *Squamæ* inferiores steriles; inferiores 2, plus minus foliæ; infima subinde 3 poll. longa. *Perigynium* (floriferum). *Achenium* racheola lineari scabra instructum.

Var.  $\beta$ . *minor*; spica pauciflora, squamis 2 inferiori-

bus (nunc sterilibus) plus minus longe foliaceis, perigyniis pyriformibus vel ellipticis, ore bidentato, squamis mucronatis, culmis arcuatis subinde abbreviatis.—*C. setifolia*, *Desv. in Gay, Fl. Chil.* 200, f. 6. (TAB. CCCCLXXXI.)

HAB. Chili.—Coquimbo, *Gay*.

*Perigynium* (cum stipite  $\frac{3}{10}$ – $\frac{4}{10}$  lin. longo)  $1\frac{4}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Racheola* linearis, scabra.

I have seen no specimens of these plants that afford us any satisfactory means of rightly judging of them, and they must be left for future observation. The filiform culms, elongated leaves, and squamæform bracts, contrast perceptibly with *C. aphylla*.

Tab. CCCCLXXX. :—

n. 1 are specimens from St. Antonio, *Gay*.

n. 2, from St. Fernando, *Gay*.

Tab. CCCCLXXXI. Specimens from Coquimbo, *Gay*.

347. *C. scirpoidea* (Michaux); spica simplici dioica (rarius utriusque sexus spicæ duæ) cylindrica densiflora fusco-purpurea nuda vel bracteata; bractea plerumque abbreviata infima sæpe *sterili* remota; stigmatibus 3 rarius 2; perigyniis obovatis vel ovalibus rostratis, ore obliquo hyalino triquetris subventricosis strigoso-hirtis nervatis membranaceis pallidis apice purpureis, squama ovata obtusa vel acuta fusco-purpurea, margine sæpe late albo-hyalina plus minus dorso scabra ciliata brevioribus vel longioribus.—*C. scirpoidea*, *Mich.* 2, 171 (1803); *Brown, in Frankl. Narr. App.* 762; *Hooker, Fl. Bor. Am.* 208; *Tor. Cyp.* 402; *Carey*, 509. *C. Michauxii*, *Schw. Ann. Tab.*; *Kunth*, 422; *Kunze*, t. 25. *C. Wormskioldiana*, *Horn. Fl. Dan. t.* 1528; *Kunze*, 102; *Torr. et Schw.* 294; *Dewey, Sill.* xi. 154, et xiv. 312; *Steud.* 183. *C. Wormskioldii*, *Drejer, Rev.* 18; *Lange*, 21. *C. scirpina*, *Tuck. En.* (TAB. CCCCLXXXII.)

HAB. In America septentrionali, Asia.—Greenland, *Worm.*; *Vahl.* Arctic America, *Richardson.* Rocky Mountains, *Drum.*; *Bourgeau.* Cascade Mountains, Oregon, *Lyall.* White Mountains, New Hampshire, *Oakes* (1827). Great Haystack, Franconia Mountains, N. H., *Tuck.* Willoughby Mountain, Vermont, *Blake.* Katahdin Mountain, Maine, *Blake.* Drummond's Island, Michigan. Behring's Straits, *Wright (Herb. Gray).*

*Rhizoma* repens. *Culmi* 3–18-pollicares, triquetri, apice scabri, rigidi, basi foliati, rudimentis in foliorum rubro-purpureis tecti. *Folia*  $\frac{1}{2}$ – $1\frac{1}{2}$  lin. lata, culmo breviora, plana, stricta, basi ad faciem vaginæque pilosa. *Bractea* abbreviata vel squamæformis; infima sæpe sterilis, subpollicaris, 2–10 lin. remota; auriculæ rotundatæ, purpureæ, ciliatæ. *Spica* plerumque unica; *mascula* 5–9 lin. longa,  $1-1\frac{1}{2}$  lin. lata (in uno specimine, e montibus Franconiæ, basi floscula feminea 1 lin. remota distigmatica instructa); *feminea* 3–20 lin. longa, 1–2 lin. lata, basi attenuata. Rarius utriusque sexus *spicæ* duæ; infima semper brevior, contigua. *Squamæ* masculæ pallidiores, sæpe minus ciliatæ. *Perigynium* obovatum ovale vel ellipticum,  $\frac{9}{10}$ – $1\frac{5}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{5}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, obovatum vel ovale, castaneum, punctulatum, trigonum, raro tetragonum, basi styli æquali.

I see no essential difference in the specimens of this species from its various localities, in all of which the accessory lower spike is occasionally found, thus separating it strictly from the

*Psyllophoræ*, and allying it to the *Sphæridophoræ* of Drejer. In the Franconia specimen alluded to, the solitary female floret on the male plant may be regarded as the rudiment of a female spike. The achenia I have examined have been triquetrous, or in a few instances tetraquetrous, the central angle occasionally depressed. Mr. Oakes, I believe, first discovered the species in the States, in 1827, in the White Mountains of New Hampshire, since which time it has been found in other localities of that State, in Vermont and Maine. Mr. Wright (U. S. North Pacific Expedition) found it on the Arakametchetene Island, Behring Straits, —the only authority that I am aware of for its being a native of Asia. It is not included in the *Fl. Rossica*, or among the plants of the Amur.

Tab. CCCCLXXXII. :—

n. 1. Specimens from the Rocky Mountains.

n. 2. From Hayes River, Hudson's Bay.

348. *C. Lyallii* (Boott); spica oblonga flavescenti-purpurea, e spiculis 5 oblongis contiguis, terminali mascula sessili reliquis femineis summa apice mascula, superioribus 3 masculæ arcu contiguis, infima pedunculata subremota; bractea infima foliacea evaginata culmum paulo superante; stigmatibus 3; perigyniis obovatis estipitatis biconvexis ventricosus abrupte rostellatis, ore integro vel emarginato flavidis rostello purpureo medio utrinque nervatis glabris divergentibus coriaceis, squama ovata lanceolata sensim vel abrupte acutata atro-purpurea concolori latoribus longioribus.—*C. Lyallii*, *Boott.* (TAB. CCCCLXXXIII.)

HAB. In America septentrionali.—East side of the Cascade Mountains, 6500 ft., marshy ground, lat. 49° (August, 1860), *Lyall (Herb. Hooker).*

*Culmus* 2-pedalis, acute triquetus, lævis, glaucus, validus, sub lineam latus, basi foliatus; pars spicas gerens 3 pollices longa. *Folia* 3–4 lin. lata, culmo breviora, glauca, plana, firma. *Bractea* infima  $3\frac{1}{2}$  poll. longa, lineam lata; *proxima* spicula brevior; ligula lanceolata, acuta, pallida. *Pedunculus* infimus 14 lin. longus, lævis. *Spicula* mascula 8 lin. longa, 2 lin. lata, elliptico-oblonga, acuta, reliquæ 6–8 lin. longæ, 3 lin. latæ, obtusæ. *Squamæ* masculæ obtusæ, atro-purpureæ, margine angustæ albidæ; *femineæ* nervo rubro-purpureo. *Perigynium*  $1\frac{5}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{9}{10}$ – lin. latum, medio utrinque nervis pluribus (8–9) plus minus prominentibus notatum, rostello purpureo, nunc pæne obsoleto. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, ovatum, triquetrum, facibus infra medium concaviusculus, pallidum, basi styli æquali abrupte apiculatum. *Stylus* exsertus, sæpe (stigmatibus lapsis) persistens, extra os perigynii porrectus.

A *C. stylosa*, Meyer, differt spiculis pluribus majoribus; perigynio obovato, exstipitato, nervato divergente; squamis femineis acutatis, concoloribus; culmo acute triquetro, lævi, validiore, altiori; foliisque glaucis, latis.

I have seen but one specimen of this species.

349. *C. Fraseri* (Andrews); spica simplici androgyna apice mascula nuda nivea demum fusca crassa oblonga vel late ovata; stigmatibus 3; perigyniis ellipticis breve cylindrico-rostratis, ore integro glabris leviter nervatis tenuissime membranaceis inflatis divergentibus niveis, squama ovata obtusa vel acuta nivea concolori latoribus longioribusque.—*C. Fraseri*, *Andrews, Bot. Repository*, t. 639; *Link*, 335; *Schw. et Tor.* 295; *Tor. Mon.* 405; *Sartwell, Eas. n.* 28; *Chapm.* 536. *C. Fraseriana*, *Bot.*

*Mag. t.* 1391 (1811); *Kunth, Cyp.* 423; *Steudel*, 185. *Mapania sylvatica*, *Pursh*, i. 47. *C. lagopus*, *Muhl.* 265. (TAB. CCCCLXXXIV.)

HAB. In America boreali.—In montibus Carolinæ sept., *Fraser*, etc. In Virginia?, *Kin.* Tennessee, *Gray*.

*Culmus* 8-12-pollicaris, compressus, glaber, nudus, basi rudimentis foliorum involventibus turgidis clausus. *Folia* 12-16 lin. lata, 1-1½-pedalia, striato-nervosa, coriacea, viridia, marginibus pallidis, cartilagineis, undulatis. *Spica* 8-12 lin. longa, 3-5 lin. lata, nivea demum fusea; *florifera* apice e filamentis longis quasi comosa, nuda. *Squamæ* albæ vel lacteæ, conformes, concoloris; masculæ plures, imbricatæ; femineæ latiores obtusæ vel acutæ. *Perigynium* 2 $\frac{6}{10}$ - $\frac{9}{10}$  lin. longum, lineam latum. *Achenium maturum* 1 $\frac{6}{10}$  lin. longum, lineam latum, basi crasse stipitatum, ovale, acute triquetrum, faciebus concaviusculis, atro-purpureum, lucidum. *Racheola* sæpe adest oblonga, achenio juvenile brevior vel longa, et altera? lata rotundata eo brevior. In speciminibus ex montibus Carolinæ, æque ex horto, perigynium duplex vidi; apex rostri interioris paulo ab ore exterioris exsertus; unum horum speciminum stigmatibus 4 præditum. In alio specimine (ex horto), perigynium axem (squamam et antheras ferentem) ab ore proferens, vidi; antheræ albæ; filamenta aurantiaca, demum fusca longa.

This remarkable plant was first figured and described in Andrews's 'Botanist's Repository.' In the 'Botanical Magazine' that figure is referred to, and I have therefore adopted the name of *C. Fraseri*, as the first given. Fraser discovered the plant in 1808, on the banks of the Catawba, near Morgan Town, and on Table Mountain, North Carolina, though Dr. Gray remarks that Mr. Curtis has since ineffectually sought for it there. It was only known as a garden plant before Mr. Kin met with it, as Dr. Gray supposes, in Taggart's Valley, in Virginia. These specimens Pursh saw, and referred them to *Mapania*. In 1841, Dr. Gray and Mr. Carey found it on the Grandfather Mountain, North Carolina; and Mr. Curtis and Mr. Buckley have since found it in the same state. Dr. Gray also discovered it on the Little Doe River, near the Roan Mountain, in Tennessee.

At f. a the double perigynium, and at f. e the achenium with four stigmas, are shown. The specimens I have seen are (except occasionally in the cultivated plant) too young for mature achenia. In the tendency to produce racheolæ it is like many of the *Psyllophora*. The broad one (perhaps the rudiment of a second perigynium) was too much injured in dissection to admit of being accurately drawn.

I have only seen lately one mature achenium within a broken perigynium, the measure of which I have given above. From its size, I should infer that the membranous perigynium would assume the triquetrous form.

350. *C. Sellowiana* (Schlechtendal); spica oblonga simplici apice mascula e viridi ferruginea; stigmatibus 3; perigyniis suborbiculato-ovalibus stipitatis rostratis, ore integro, marginibus alatis scabris membranaceis, granulatis ferrugineis, squama ovato-lanceolata ampla obtusiuscula plus minus longe aristata medio viridi striato-nervosa, marginibus membranaceis ferrugineis latoribus brevioribus.—*C. Sellowiana*, *Schlecht. Linnæa*, x. 117; *Kunth*, 427; *Steudel*, 186. *Uncinia Sellowiana*, *Nees, Cyp. Brasil.* 205, sec. *Steud.* (TAB. CCCCLXXXV.)

HAB. In Brasilia meridionali, *Sellow*; *St. Hiltaire* (*Herb. Mus. Par.*).

Cæspitosa. *Culmus* 4-8-pollicaris, debilis, triquetus, apice paulo ampliatus, angulis acutis scabris, basi foliatus rudi-

mentisque foliorum fusco-ferrugineis tectus. *Folia* 1-2 lin. lata, culmo sæpe duplo longiora, plana, flaccida. *Spica* 6-9 lin. longa, 2-3 lin. lata. *Squamæ* ferrugineo-punctatæ; femineæ inferiores plus minus longe aristatæ, infima nunc spicam superans; masculæ inferiores aristatæ, superiores acutæ vel mucronatæ. *Perigynium (immaturum)* 3 $\frac{2}{10}$  lin. longum, 2 lin. latum, lineolis ferrugineis obsitum, marginibus plus minus late alatis, erosis, serrulatis. *Achenium* 1 $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, acute triquetrum, basi styli crassiore.

I have not seen any mature specimens of this species; and the perigynium, which no doubt in the mature state is more or less triquetrous, as described by Schlechtendal, is compressed, with inflexed sides. The specimens figured are from the Berlin Herbarium in Herb. Hooker, collected by Sellow. I have others, in a flowering state, from Brazil, gathered by St. Hiltaire, which I owe to M. Spach. In the only perigynium I opened, I observed no racheola, though I infer such occasionally exists, from Nees referring the plant to *Uncinia*. I have not seen his description of it.

351. *C. inversa* (Braun); spica abbreviata pallida, e spiculis 2-3 rarius 1-5 obovatis vel ovalibus androgyniis basi masculis congestis vel infima subremota involucratis; bracteis 1-3 spicam longe superantibus; stigmatibus 3; perigyniis ovalibus ellipticis ovatis vel suborbiculatis plus minus longe rostratis bifidis plano-convexis marginibus acutis vel alatis serrulatis nervatis pallidis spongiosis, squama ovata acuta cuspidata albida nervo viridi longioribus vel subæquantibus.—*C. inversa*, *Brown, Prod.* 242; *Kunth*, 399; *Hook. f. Fl. N. Zeal.* 281; *Steud.* 198. (TAB. CCCCLXXXVI.-CCCCLXXXVIII.)

HAB. Australia, Tasmania, New Zealand.—Port Jackson, *Br.*; *Sieber*, n. 543. Swan River, *Drummond*. Wanduc Vale, Victoria, *Robertson*. Brisbane and Dawson Rivers, *Müller*. New England, Australia, *Stuart*. Tasmania, *Gunn*; *Archer*. New Zealand, *Ralph*; *Colenso* (*Herb. Hooker*).

Var. *a. major*.—*Culmus* 15-pollicaris, validus, lævis, basi foliatus. *Folia* 1-1½ lin. lata, culmo breviora, plana, firma. *Bracteæ* 3, infima nunc 5 poll. longa. *Spica* 6-18 lin. longa, 5-6 lin. lata. *Spiculæ* 3-5, congestæ, vel infima 5-9 lin. remota. *Perigynium* ovale suborbiculatum vel ovatum, marginibus acutis serrulatis, utrinque valide nervatum, inter nervos transversim corrugatum, 1 $\frac{6}{10}$ -2 lin. longum,  $\frac{8}{10}$ -1 $\frac{1}{10}$  lin. latum, rostro  $\frac{2}{10}$ - $\frac{5}{10}$  lin. longo. *Achenium* 1-1 $\frac{3}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{9}{10}$  lin. latum, plano-convexum, basi styli incrassata.

HAB. Swan River, Wanduc Vale, Dawson River.

Var. *Perigynium* ovale, sensim longe rostratum, marginibus alatis, erosis, serrulatis, 1 $\frac{9}{10}$ -2 $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, rostro 1 lin. longo. *Achenium* 1-1 $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, lenticulare, basi styli æquali.

HAB. Brisbane River.

Var. *β. minor*.—*Culmus* 2-9-pollicaris, gracilis. *Folia* angusta. *Spica* brevis. *Spiculæ* 1-3, terminalis nunc pedunculata, obliqua. *Bracteæ* 1-3, spicam longe superantes. *Perigynium* ovale ellipticum vel ovatum, plus minus longe rostratum, nervis tenuioribus, 1 $\frac{4}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum (nec corrugatum). *Achenium*  $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{6}{10}$  lin. latum, lenticulare, basi styli æquali.

HAB. Port Jackson, Tasmania, New Zealand.

From a careful examination of the specimens I have seen of this species, I do not feel inclined to separate the two extreme forms

of it,—that of the Brisbane River and New Zealand plant. If mere diminution of form, with its consequent lessening modification of the different parts were to be considered a ground for specific distinction, we should be obliged to multiply species indefinitely. The original specimens of Braun, those of Sieber and several others from Australia and Tasmania, are not fully mature, and it would not be safe to judge from them as to the existence of the corrugations which are so conspicuous in the mature specimens from the Swan and Brisbane rivers. Those corrugations are absent or indistinct in the equally mature specimens from the Wanduc Vale, as they are in the New Zealand plant. The base of the style varies, and the form of the achenium is lenticular or plano-convex, the central portion of the convex surface being somewhat abruptly more prominent than its sides.

The specimens figured are:—

Tab. CCCCLXXXVI. A specimen of the Brisbane River plant, with perigynia from that of the Swan River, contrasting in form, length of rostrum, and breadth of alæ.

Tab. CCCCLXXXVII. :—

- n. 1. Specimen from Wanduc Vale.
- n. 2. One from Herb. Braun, from Port Jackson, given by him to Tuckerman.

Tab. CCCCLXXXVIII. :—

- n. 1. Specimens from New Zealand, *Ralph*.
- n. 2. From Tasmania, *Gunn*.
- n. 3. A specimen of Sieber, n. 543, showing the smaller and intermediate forms, and the different forms of the perigynium, the elliptic form often observable at the apex of the spiculæ.

352. *C. heleonastes* (Ehrhart); spica ovata vel oblonga castanea, e spiculis 3–5 androgynis basi masculis subæqualibus contiguis terminali subinde paulo majore obovata, reliquis subrotundis parvis; bractea squamæformi rarins spicam superante; stigmatibus 2; perigyniis ovalibus sensim rostratis basi acutis, ore antice alte secto demum hyalino plano-convexis utrinque leviter nervatis glabris vel superne margine parce dentatis granulatis pallidis demum castaneis, squama ovata obtusiuscula vel acuta æquilata castanea margine albo-hyalina longioribus vel subæquantibus.—*C. heleonastes*, *Ehrh. Phyt. n.* 28; *Wahl. Act.* 146, et *Fl. Lap.* 230, et *Suec.*; *Schk. f.* 97; *Willd.* 228; *Kunth*, 393; *Hoppe, f.* 25; *Gay, Ann. Sc. Nat.* 11, 181 (1839); *Hooker, Fl. Bor. Am.* 214; *Koch*, 870; *Reich.* 6, t. 204; *Andersson*, 62, t. 4, f. 30; *Lange*, 54; *Fl. Ross.* 279. *C. leporina*, *Schk. F. F. F. f.* 129 (*excl. syn.*, *C. lagopina*). *C. Carltonia*, *Dewey*, 27, 238; *Torr. Cyp.* 393. *C. marina*, *Dewey*, 29, 247; *Torr. Cyp.* 393. (TAB. CCCCLXXXIX.)

HAB. In Europa et Amer. arct., in paludibus turfosis.—Lapland to Switzerland. Arctic America, *Richardson*. Rocky Mountains, *Drummond*.

Cæspitosa. *Radix* stolonifera, fibris sæpe pallidis. *Culmus* 7–12-pollicaris, strictus, acute triquetus, scaber. *Folia*  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, culmo breviora vel longiora, plana, carinata, stricta, firma, glaucescentia. *Spica* 6–8 lin. longa, 3–4 lin. lata, *Spiculæ* omnes basi masculæ, æquales, vel summa major basi cuneata. *Perigynium*  $1\frac{4}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, plano-convexum, conforme, ferrugineum, basi styli deciduæ.

A *C. lagopina*, *Wahl.*, differt culmo acute triquetro, stricto, scabriore; foliis erectis, glaucescentibus, angustis, firmioribus; perigynio plano-convexo, subinde dentato, ore antice secto.

Wahlenberg describes the spiculæ as equal, which is not always the case. He, *Andersson*, and *Lange* allude to the “*sinus rimæ-*

*formis*” of the orifice, one margin of which is often hyaline, overlapping the other. *Lang* refers to the different form ascribed to the perigynium. It is certainly plano-convex, and at times distinctly nerved. *Drejer* (Rev. 25) refers the Greenland and Spitzbergen plant to his *C. lagopina*,  $\beta$ . *C. Carltonia*, *Dewey*, is erroneously described with three stigmas. His *C. marina* is young, but is clearly referable to *C. heleonastes*.

In Tab. CCCCLXXXIX., n. 1, are specimens from Sweden, from *Wahlenberg* and *Fries*; n. 2, “*C. Carltonia*,” *Dewey*, from Arctic America; n. 3, “*C. marina*,” *Dewey*, from the Arctic sea-coast (*Richardson*).

353. *C. polystachya* (Swartz); spica paniculata elongata laxa, e spicis partialibus apertis alternis composita, superioribus approximatis sessilibus pinnatim spiculiferis, omnibus singulis vel inferioribus vel mediis tantum geminatis deorsum remotioribus inæqualiter exserte pedunculatis basi ramosis, spiculis oblongis androgynis apice masculis demum horizontaliter patentibus; bracteis culmo longioribus; stigmatibus 3; perigyniis ellipticis triquetris subulato-rostratis bifidis viridibus demum olivaceis nervosis glabris vel ad margines plus minus sparsim dentatis, rectis vel subexcurvis, squama ovata acuta vel obtusa hispido-aristata striato-nervosa ferruginea apice hyalino albida patenti longioribus.—*C. polystachya*, *Swartz, Fl. Ind. Occ. App.*; *Wahl. Act. Holm. p.* 149 (1803); *Willd.* 4, 247; *Schk. p.* 41; *Kunth, Cyp.* 507. (TAB. CCCXC.—CCCXCII.)

HAB. In summis montibus Jamaicae, *Swartz*; *M. Nab. Cumana*, *Funcke, n.* 707 (*Herb. Hooker*).

*Culmus* 1–1 $\frac{1}{2}$ -pedalis, gracilis, rigidus, glaber, basi vaginis ferrugineis tectus; pars spicas gerens 9–12 poll. longa. *Folia* 1–1 $\frac{1}{2}$  lin. lata, culmo longiora, rigida, carinata, marginibus revolutis. *Bractea* foliaceæ, culmo longiores, omnes vaginatæ; vaginæ 1–12 lin. longæ. *Pedunculi* inæquales, scabri; inferiores 2–3 pollices longi, exserti. *Spica* partialis ambitu ovato 6–8-, alternæ 6–12-stachyæ, apertæ; mediæ sæpius vel inferiores geminatæ, una major longius pedunculata; superiores pinnatæ; inferiores, e ramulis 1–2 basilaribus, subduplicato-pinnatæ. *Spiculæ* 3–6 lin. longæ, 2 lin. latæ, apice flosculis masculis paucioribus, basi femineis 6–12 instructæ; demum horizontaliter patentibus, bractea squamiformi longe setacco-aristata suffultæ; omnes e squama tumida nervosa, saccata egredientes. *Squamæ* ferrugineæ; masculæ lanceolatae, mucronatæ, imbricatæ; femineæ ovatae, inferiores longius aristatæ, dorso scabriusculæ, nervosæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, glabrum, sæpius versus medium ad latera, interdum magis ad unum latus sparsim dentatum. *Achenium* stipitatum,  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovali triquetrum, fuscum, basi styli apiculatum.

I am indebted to my late much-loved friend, Charles Stokes, Esq., for Jamaica specimens of this plant, which I refer to the *C. polystachya* of Swartz; at the same time, having no distinct idea of the difference between it and *C. cladostachya*, *Wahl.*, I can see no essential characters by which to distinguish the Cumana from the insular specimens, though in them, as in *C. Hartwegii*, the contractile nature of the tumid scale at the base of the spiculæ is more apparent than in the Jamaica plant, for it evidently depresses them below the horizontal level, and before the full maturity of the perigynium. In both plants, the spiculæ are at first erect, and it is impossible, from the position and aspect of this scale, not to attribute the change of direction in the spiculæ to its action. I have called it a scale, but I have no doubt that it is a modified perigynium, for I find in many species a proliferous ten-

gency in this organ, though the contractile action of it seems to be limited to the paniced group to which *C. polystachya* and *C. Hartwegii* belong.

In Tab. CCCXCII. I have given figures of what may be *C. cladostachya*, Wahl., the middle or lower spikes of which are always geminate, the perigynium smaller, with a shorter generally straight rostrum, and commonly quite smooth, or with only a scattered tooth at the sides or in the rostrum. The scales are sometimes suborbicular or broadly ovate-obtuse, or the upper ones subacute, or they are all ovate, acute, more or less striate, the lower ones generally scabrous.

354. *C. tristicha* (Spruce); acaulis! spiculis 3-4 oblongis inter folia nidulantibus terminali mascula reliquis femineis; stigmatibus 3; perigyniis (*immaturis*) lanceolatis rostratis, ore bifido superne ad margines scabris olivaceis rostro albido, squama ovata acuta albo-hyalina nervo viridi subduplo longioribus.—*C. tristicha*, *Spruce mss. in Herb. Bentham.* (TAB. CCCXCIII.)

HAB. In America meridionali.—Ecuador, "in partis montis Titaicum," *Spruce.* New Granada, *Gaudot (Herb. Mus. Paris.)*.

Stolonifera. *Folia "insigniter tristicha"* (Spruce), 1-4 pollices longa, 1-2 lin. lata, rigida, acuta, stricta vel excurvata. *Perigynium*  $2\frac{4}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, oblongum, triquetrum, basi styli æquali apiculatum.

More fully developed specimens will necessarily lead to a modification of the character of this pretty species, and suggest its affinities; but any example of the genus from South America is too interesting to be passed over. The richness of its flora has, I suspect, led many who have explored it to neglect the *Cyperaceæ*, for *Carices* must abound in the higher regions. I have figured the specimens from Mr. Spruce, for which I am indebted to Mr. Bentham.

355. *C. glareosa* (Wahlenberg); spica abbreviata ferrugineo-albida, e spiculis 2-4 contiguis suprema basi rarius omnino mascula obovata vel oblonga, reliquis femineis minoribus; bractea squamæformi; stigmatibus 2; perigyniis ellipticis utrinque acutis vel ovalibus minus acutatis rostratis, ore hyalino, obliquo antice secto plano-convexis glabris tenuissime granulatis utrinque nervatis pallidis antice rima ferruginea notatis, squama ovata acuta vel obtusa margine late albo-hyalina longioribus vel subæquantibus.—*C. glareosa*, *Wahl. Act.* 146, et *Fl. Lapp.* 230; *Willd.* 251; *Schk. f.* 97; *Kunth*, 394; *Drejer, Rev.* 25; *Fries, Sum.* 223; *Lange*, 55; *Anders.* 62, t. 4, f. 31; *Gay, Ann. Sc. Nat.* 10, 359; *Fl. Ross.* 284; *Steud.* 197; *Torrey, Cyp.* 396; *Dewey, Sill.* 4, 344. (TAB. CCCXCIV.)

Var.  $\beta$ .—*C. ursina*, *Dewey, Sill.* 27, 240; *Hook. Fl. Bor. Am. t.* 220; *Drejer, Rev.* 21; *Steud.* 186.

HAB. In Europa, Asia, America septentrionali.—Lapland to Sweden. Behring's Straits. Greenland, *Vahl.* Newfoundland, *fide Gay.*— $\beta$ . Arctic sea coast, *Richardson.* Greenland, *Vahl.*

Cæspitosa. *Culmus* 6-12-pollicaris, acute triquetet, scaber, debilis. *Folia* plana,  $\frac{1}{2}$ - $\frac{3}{4}$  lin. lata, flaccida, vel conduplicata, firmiora, culmo breviora. *Bractea* nunc cuspidata. *Spica* 6-8 lin. longa, 2-3 lin. lata. *Spicula* 2-4, summa longior, nunc mascula 6 lin. longa, 1 lin. lata, vel basi subdimidiatim mascula; aliæ minores femineæ, 2-4 lin. longæ,  $1\frac{1}{2}$  lin. latæ.

*Squamæ* sæpius acutæ vel præcipue masculæ obtusissimæ, margine late hyalinæ. *Perigynium* ellipticum, utrinque acutum,  $1\frac{1}{2}$  lin. longum,  $\frac{1}{2}$  lin. latum, vel ovale minus acutatum,  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, ovatum vel obovatum, plano-convexum, fusco-ferrugineum, basi styli abrupte apiculatum.

Var.  $\beta$ ; spiculis 1 rarius 2, terminali basi mascula subrotunda; perigyniis ovalibus rostellatis, ore emarginato rima antice notatis plano-convexis tenuissime granulatis nervatis pallidis, squama obtusa ferruginea margine subinde hyalina nervo concolori angustioribus brevioribus vel longioribus.

Subpollicaris. *Culmus* lævis. *Folia* involuta. *Perigynium* 1 lin. longum,  $\frac{7}{10}$  lin. latum (nec granulato-asperulum). *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum.

The slender weak culm, narrow flaccid leaves, the terminal spicula male or male at base, the lower ones female, the more convex anterior surface of the perigynium with the orifice prolonged downwards, distinguish this delicate species from those allied to it in habit. The perigynium varies in form, and especially in the attenuation of the rostrum, which is occasionally much shorter than in the figure given of it.

I agree with Vahl in referring *C. ursina* to a depauperate form of *C. glareosa* (*vide Drejer, Rev.* 21). Fries was inclined to refer it to *C. bicolor*; but the subacute (not roughly granulated) perigynium with the anterior prolongation of the orifice, the ferruginous colour of the squama with the central nerve generally of the same hue, and the hyaline margin, ally it to *C. glareosa*.

Tab. CCCXCIV. :—

- n. 1. A specimen, with details, from Sweden.
- n. 2. Finmark, both from Fries.
- n. 3. Greenland, *Vahl.*
- n. 4. Arctic America, *Richardson.*
- n. 5, var.  $\beta$ . "*C. ursina.*" Greenland, *Vahl.*
- n. 6, var.  $\beta$ . Arctic seacoast, *Richardson.*

356. *C. seditiosa* (Stendel); spica elongata laxa duplicato-racemosa rubro-purpurea, e spicis partialibus pluribus superioribus approximatis inferioribus elongatis remotis decomposita, spiculis apice masculis; in quoque spica partiali floeulis superioribus spicatim dispositis, inferioribus in ramulis primum ovatis parvis sessilibus deinde longioribus pedunculatis demum compositis insidentibus; bracteis evaginatibus infima longissima; stigmatibus 2; perigyniis ovalibus compressis ventricosis rostratis, ore integro, superne marginibus dentatis eueruiis breve stipitatis divergentibus membranaceis stramineis, squama lanceolata acuminata acuta vel ovata mucronata rubro-purpurea, medio viridi brevioribus vel æquantibus. (TAB. CCCXCV.)

HAB. In America meridionali prope Tabina, Peru, *Lechler, Pl. Peruv.; Hohenacker, n.* 2074.

*Radix* fibris lignosis cinnamomeis lanata. *Culmus* 4-pedalis, triquetet, rigidus, scaber, basi vaginis foliorum longis rubro-purpureis clausus; pars spicigera 16 poll. longa. *Folia* 3-4 lin. lata, culmum subæquantia, rigida, marginibus revolutis. *Bractea* evaginata, infima bipedalis,  $2\frac{1}{2}$  lin. lata, proxima spica brevior, reliquæ breves demum obsoletæ. *Spica* 16 poll. longa, 2-3 poll. latæ. *Spica* partiales inferiores 5-6 poll. longæ,  $\frac{1}{2}$ -1 poll. latæ, basi ramosæ. *Spicula* superiores (ad apicem spicarum partialium) 1-1 $\frac{1}{2}$  poll. longæ, 2 lin. latæ; *mediæ* parvæ ovatæ, 2-3 lin. longæ, sessiles; *inferiores* sæpe sub pollicem longæ, pedunculatæ. *Squamæ* femineæ superiores

lineari-lanceolatae, acuminatae, perigynio subduplo longiores; inferiores ovatae, mucronatae, latiores subaequantur. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, enerve vel parce leviter nervatum. *Achenium* 1 lin. longum,  $\frac{3}{10}$  lin. latum, oblongum, biconvexum, distortum, marginibus indentatis vel curvatum, basi styli crassiore deflexa.

Allied in habit to *C. Pichinchensis*, Kunth.

I have not seen any description of this plant, which I owe to the kindness of M. Sonder, who procured me most of the plants of Lechler. The specimen came with a printed ticket, which I have copied. I cannot explain the singular name given to it by Steudel. It is not noticed, as far as I am aware, in his 'Synopsis.'

357. *C. canescens* (L.); spica oblonga pallida, e spiculis 5-6 vel 4-7 rarius 3-10 androgynis basi masculis ovalibus vel obovatis densifloris approximatis vel superioribus contiguis, inferioribus plus minus remotis nudis vel infima brevi rarius longiuscule bracteata; stigmatibus 2; perigyniis ovalibus vel ovatis plus minus rostratis, ore subintegro plano-convexis utrinque nervatis granulatis superne marginibus scabris viridibus vel glaucis imbricatis inferne subcoriaceis basi spongiosis, squama ovata acuta subinde cuspidata vel obtusa albo-hyalina vel fulva nervo viridi aequilata longioribus vel subaequantibus.—*C. canescens*, *Linn. Fl. Suec. n.* 842; *Wahl. Act.* 147; *Fl. Lap.* 232 (*excl. syn. Schk.*); *Læsl. Fl. Prus.* 117, t. 32; *Light. Fl. Scot.* 2, 550 (1777); *Reich Fl. Exc.* 1, 58; *Leon. t.* 206, n. 546; *Drejer, Rev.* 27 (*ex parte*); *Andersson*, 57, t. 4, f. 39; *Lange*, 57; *Fl. Rossica*, 4, 280; *Tehihatcheff, Asie Min.* 575; *Tor. Mon.* 393; *Carey*, 543; *Tuck.* 10; *Sartwell, Exs. n.* 32. *C. curta*, *Good. in Linn. Trans.* 2, 145; *Smith, Fl. Br.* 3, 967; *Eng. Bot. t.* 1368; *Eng. Fl.* 4, 81; *Hooker, Br. Fl.* 5th ed. 423; *Willd.* 4, 241; *Act. Ber.* 41, t. 2, f. 3; *Schk.* 43, c. f. 13; *Kunth*, 403; *Gaudin, Agrost.* 2, 110; *Persoon, Syn.* 2, 539; *Ledebour, Fl. Alt.* 4, 211; *Gay, Ann.* 10, 365; *Bertol. Fl. Italiae*, 54; *Hook. f. Fl. Ant.* 2, 363; *Gay, Fl. Chil.* 210; *Muhl.* 233; *Schw. et Tor.* 318; *Dewey*, 8, 93; *Bigelow, Fl. Bost.* 3rd ed. 360; *Nuttall, Gen.* 2, 204. *C. tenella*, *Ehrh. n.* 98 (*non Schk.*). *C. cinerea*, *Pollich, Fl. Palat.* 2, 571. *C. elongata*, *Leers. Fl. Herb.* 197, t. 14, f. 7. *C. brizoides*, *Hudson, Fl. Ang.* (1778), 2, 406. *C. Richardi*, *Thuill.*; *Michaux*, 2, 170. *C. leporina*, *Lapeyr. Ab. Pyr.* 564. *C. similis*, *D'Urville, Fl. Mul.*; *Kunth*, 403. *C. spicata*, *Sol. (Herb. Banks.)*. (TAB. CCCCXCVI.)

Var.  $\beta$ . *sublobiacea*.—*C. canescens*, var. *sublobiacea*, *Læstæd.*; *Anders.* *C. Lapponica*, *Lange*, 59.

*Perigynium*  $\frac{9}{10}$ -1 lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, ellipticum, utrinque nervatum, glabrum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale.

HAB. In Europa, Asia, et America septentrionali et meridionali.—Lapland to the Pyrenees and Italy. Caucasus, Tauric Pontus, Altai, Ural, Baikal, Kamtchatka, Cascade and Rocky Mountains. Arctic seacoast, Greenland to New York. Sitcha, Chili, Str. Magellan, Falkland Islands.

*Radix* stolonifera. *Culmus*  $\frac{1}{2}$ - $1\frac{1}{2}$ -pedalis, triqueter, scaber, basi foliatus. *Folia*  $1$ - $1\frac{1}{2}$  lin. lata, culmo breviora vel subaequantia, plana, mollia. *Bractea* infima plerumque spicula

brevior vel elongata, rarissime spicam subaequans vel superans, setacea. *Spica* 10 lin. ad  $2\frac{1}{2}$  vel, in speciminibus quibusdam Americanis, fere 4 poll. longa. *Spiculae* 2-3 lin. longae, 2 lin. latae, vel 6-7 lin. longae, 3 lin. latae, omnes vel superiores tantum contiguae; infima vel inferiores (rarius basi attenuatae, nunc compositae)  $\frac{1}{2}$ - $\frac{3}{4}$  poll., vel in Americanis saepe  $1$ - $1\frac{1}{2}$  poll. remotae; terminalis quandoque major, basi attenuata (rarius omnino) mascula, vel omnes aequae basi parce masculae, rarius inferiores (in speciminibus Seoticis) compositae. *Squamae masculae* lanceolatae; *feminae* late ovatae vel ovato-lanceolatae, aetate, quandoque acuminatae vel cuspidatae, vel obtusae, albo-hyalinae, tenuissimae, nervo viridi, vel fulvae coneolores, vel margine hyalinae, firmiores; perigynium subaequantur vel eo duplo breviores, vel, in Americanis, longiores. *Perigynium*  $\frac{9}{10}$  lin.- $1\frac{2}{10}$ - $\frac{3}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, vel  $1\frac{1}{2}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, ovale vel ovatum, viride vel glaucum, utrinque leviter nervatum; nervis saepe magis coloratis, subabrupte brevi, vel sensim longius rostratum, rostro pallide ferrugineo; ore integro, truncato, antice subfisso (fissura rarissime elongata); superne marginibus scabrum, vel fere glabrum, leviter vel grosse granulatum, appressum; inferne subcoriaceum, basi spongiosum, brevi stipitatum. *Achenium*  $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, ovale vel obovatum, lenticulare, pallidum, basi styli crassiore.

In comparing European and American specimens, I find—

| European!        | American!        |
|------------------|------------------|
| 1 with 3 spikes. | 3 with 3 spikes. |
| 10 " 4           | 18 " 4           |
| 22 " 5           | 27 " 5           |
| 22 " 6           | 27 " 6           |
| 9 " 7            | 15 " 7           |
| 4 " 8            | 7 " 8            |
|                  | 3 " 9            |
|                  | 1 " 10           |
| —                | —                |
| 68 specimens.    | 101 specimens.   |

Dr. Goodenough, in his admirable paper on "British Carices," in the second volume of the Linnean Transactions (1792), misled by the specimens in the Linnean Herbarium, was induced to adopt a name for this species derived from the description of Loesel, "*spicis curtis*." It had been previously described in England by Hudson as the *C. brizoides*, L., and in Scotland by Lightfoot as the *C. canescens*, L. The only specimen in the Linnean Herbarium of the true *C. canescens*, L., is there named *C. brizoides*; while that under the name of *C. canescens* is the *C. Buxbaumii* of Wahlenberg. Of this there are two specimens, one of which is not named. It is from Lapland, found by Solander, as recorded by Linnæus; and being identical with the specimen which Linnæus had in his Herbarium named *C. canescens*, Smith has added "*canescens vera*." As Goodenough could not bring himself to believe that his *C. curta* was the *C. brizoides*, L., judging from the description of Linnæus, and the Linnean Herbarium seeming to him a paramount authority for the *C. canescens*, he could not follow either Hudson or Lightfoot, and therefore adopted the name suggested to him by Loesel. When I was examining the British Carices in 1842, for the fifth edition of Sir W. J. Hooker's 'British Flora,' I was equally misled by the specimens in the Linnean Herbarium and by the high authorities of Goodenough and Smith, and in describing *C. Buxbaumii*, then recently added to the British flora, I named it *C. canescens*, L. But these misconceptions have long since been corrected by the Swedish botanists.

This species, while it has the same habit in North and South America as in Europe and Asia, presents a form in America with the lower spikes very remote, differing from any I have seen elsewhere. Those figured at Tab. CCCCXCVI. are from the State of New York. In Europe it extends from Lapland to the Pyrenees and Italy, and in America from the Arctic seacoast and Greenland to New York. It is found in the Falkland Islands and the

Straits of Magalhaens, at Sitcha and Kamtchatka, and in Chili. Ledebour has found it on the Altai, and the Fl. Rossica gives it as a native of the Caucasus, the Ural and Baikal, and Tchibatcheff of the Pontic Taurus.

The var.  $\beta$ . has small spiculæ, and the perigynium is smooth at the margins. I have not observed any other character in it which distinguishes it from the typical form. The only specimens I have seen are those from Lapland in Herb. Tuckerman, given by Wahlenberg. It resembles, in the small form of its perigynia, the plant from Lake Winnipeg, but differs in the rostellum, orifice and nervation.

358. *C. arcta* (Boott); spica oblonga capitata pallida, e spiculis 8–14 ellipticis androgynis basi parce masculis plurifloris arcte congestis, inferioribus bracteatis; bracteis setaceis, basi dilatatis spiculis longioribus; stigmatibus 2; perigyniis ovatis acuminato-rostratis, ore emarginato minimo antice alte fisso superne marginibus acutis serratis antice leviter postice parcius vel obsolete nervatis patentibus pallide viridibus demum superne ferrugineis membranaceis basi crasse spongiosis, squama ovata acuta mucronulataque albida vel ferruginea margine hyalina nervo viridi æquilata longioribus.—*C. canescens*, var. polystachya, Boott in Richardson, Journ. 2, 344. (TAB. CCCCXCVII.)

HAB. In America boreali.—Canada, *Maeræ* (Herb. Gray). Lake Superior, Rainy Lake, Lake of the Woods, Sir J. Richardson (1848–9).

*Culmus* subpedalis, acute triquetus, subvalidus, sursum scabriusculus, basi foliatus. *Folia* 1–1½ lin. lata, plana, apice longe attenuata, culmo (sæpe multum) longiora. *Bracteæ* basi late dilatatae, setacæ; inferiores 5 vel 6, elongatae; infima vix spicam æquans. *Spica* 10–16 lin. longa, 3–6 lin. lata. *Spiculæ* 5 lin. longæ, 2–2½ lin. latæ, densifloræ, basi parce masculæ nec unquam basi attenuatæ, omnes congestæ. *Squamæ* conformes. *Perigynium* 1 $\frac{3}{10}$ –1 $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, suborbiculatum, basi productum, plano-convexum, pallidum, basi styli crassiore.

*A. C. canescens* et *C. vitilis* differt spiculis pluribus, capitatis, inferioribus bracteatis, foliis longioribus.

Habitu magis ad *C. elongatam* accedit, tamen forma nervationeque perigynii longe recedit.

I have only seen this species from British America, the finer specimens brought by Sir John Richardson. It is in some respects intermediate between *C. canescens* and *C. vitilis*. In the size of the spiculæ it is nearer the former, but differs in the patent perigynia, and from both in the number and compactness of the spiculæ, the lower of which are furnished with bracts, much dilated at base.

In Tab. CCCCXCVII.—

- n. 1. Specimens of Sir J. Richardson.
- n. 2. From Macrae.

359. *C. maritima* (Müller); spicis 4–8 oblongis vel cylindricis plerumque pallidis alternatim remotiusculis bracteatis pedunculatis masculis 1–3 reliquis femineis, superioribus 1–2 apice masculis densifloris pendulis comosis; bracteis inferioribus culmo longioribus nisi subinde infima evaginatibus; stigmatibus 2; perigyniis ovalibus vel obovatis cylindricis rostellatis, ore emarginato obscure nervatis granulatis, squama obtusa emarginata vel acuta trinervata sæpe longissime hispido-aristata latoribus longioribusque arista nunc multum brevioribus.—*C. maritima*, Müller, Fl. Dan. t. 703; Retz, 222; Wall. Act. 164; Fl. Lapp. 245; Schk. 74; Willd. 300; Fries, Mant. 3, 145; Summa, 225; Anders. 40, t. 6, f. 64; Lange, 67; Fl. Ross. 313; Fl. Bor. Am. 219. *C. paleacea*, Wahl. Act. 164 (fide spec. eussice.). (TAB. CCCCXCVIII.–CCCCXCIX.)

HAB. In Europa et America septentrionali.—Finmark to Gottenburg. Hudson's Bay to Massachusetts.

*Stolonifera. Culmus* 8–15-pollicaris, triquetus, validus, lævissimus, apice inter spicas scabriusculus; pars spicas gerens 5–8 poll. longa. *Folia* 1–3½ lin. lata, culmo breviora vel æquantia; *sterilia* eo longiora, marginibus revolutis. *Spicæ* omnes pedunculatæ; mascula suprema sæpe nutans, basi attenuata; femineæ 1–3 poll. longæ, 4–6 lin. latæ. *Pedunculi* sæpe contorti. *Squamæ* omnes conformes. *Perigynium* 1–1 $\frac{3}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, vel 1 $\frac{6}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum, punctis pallide castaneis obscure notatum. *Achenium* semper sulcatum, sæpe racheola curvata instructum.

Retz, in his Fl. Scand., and Kunth, refer this species to Vahl; but I have a specimen from Vahl, who quotes Müller for it. I have never seen American specimens, except those from Arctic America, and Maine, found by Mr. Blake, whose specimens I have figured, and the perigynia of which are larger than those on the Swedish specimens, and the colour of the squamæ ferruginous, no doubt like the var. *brunnescens* of Nylander.

This species differs from *C. salina* in the frequently very long aristæ of all the squamæ. Its pendulous habit is that of *C. cryptocarpa*, which might be considered as the intermediate form, for, with the exception of the aristæ, and perhaps the more densely-flowered spikes, there is scarcely any difference except in degree between *C. maritima* and *C. salina*. There are small forms of this species with culms 4 inches in height, and 4–6 spikes lines in length, but there are intermediate forms as to size.

360. *C. punctata* (Gaudin); spicis 4–5 masculis 1–2 ferrugineis femineis oblongo-cylindricis, superioribus approximatis vel omnibus remotis, summa abbreviata sæpe apice mascula sessili, reliquis exserte pedunculatis olivaceis; bracteis vaginatis omnibus nisi subinde infima culmo longioribus; stigmatibus 3; perigyniis turgide ovalibus inflatis rostratis bidentatis lucidis glabris leviter vel obscure nervatis divergentibus olivaceis pellucide demum ferrugineo-punctatis, squama ovata obtusa vel emarginata vel acuta cuspidata pallide ferrugineo-punctata longioribus.—*C. punctata*, Gaud. in Agrost. 152 (1811); Fl. Helv. 6, 106, t. 2; Kunth, 448; Kunze, 27, t. 6, f. 1; Koeh, 885; Reich. 22, t. 251; Hoppe et Sturm. icon.; Bertol. Fl. Ital. 103; Steud. 222; Fries, Mant. 3, 138; Anders. 23, t. 8, f. 97; Lange, 125; Gren. et Godr. 427. *C. Corsicana*, Link, Hort. Berol. 359 (1827). *C. pallidior*, Desglan in Lois. Fl. Gall. (TAB. D.)

Var.  $\beta$ .—*C. lævicaulis*, Hoeh.; Kunze, 31, t. 6, f. 2; Steud. 222. *C. rigidifolia*, Hoeh.? Seubert, Fl. Azor. t. 2, f. 1.

HAB. In Europa.—Southern Norway to Italy. In Wales, Cornwall, and Channel Islands.— $\beta$ . Ins. St. Michael, Azores.

*Culmus* 1–1½-pedalis, gracilis, firmus, triquetus, lævis, inter spicas scaber; pars spicas gerens 3–9-pollicaris. *Folia* 1–1½ lin. lata, culmo breviora, firma. *Bracteæ*, nisi summa, vagi-

natae, infima saepe culmo brevior. *Pedunculi* filiformes, scabri, infimus 1-2½ poll., vagina infima ½-1½ poll. longa. *Spica mascula* ½-1 poll. longa, 1 lin. lata, altera brevior contigua sessilis saepe adest. *Spicae femineae* 3-10 lin. longae, 3 lin. latae, approximatae, vel inter se 2½ poll. remotae. *Squamae* conformes, masculae subinde muticae. *Perigynium* 1 $\frac{6}{10}$ -1 $\frac{7}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ovale, triquetrum, fuscum, punctulatum.

Var.  $\beta$ ; perigyniis minus turgidis rostro paulo longiore subinde margine scabro.

We are less familiar with the plant from the Azores than with the European one, but specimens kindly sent to me by Mr. H. Watson are not specifically distinct,—the stem at top and the peduncles are rough, as in the typical form; I have not seen authentic specimens of *C. rigidifolia*, Hoch.

[361. *C. ampullacea*. (TAB. DI.)

The specimen figured is from Cumberland House, Arctic America (*Dr. Richardson*). I find no further information regarding this plate amongst Dr. Boott's MSS.—*J. D. H.*]

[362. *C. compacta*, *R. Brown in Sillim. Journ.* 1835, p. 39. (TAB. DII.)

HAB. America arctica.

I find no specimen nor description answering to this plate in Dr. Boott's collections.—*J. D. H.*]

[363. *C. crinalis*, *Boott in Linn. Trans.* xx. p. 123. (TAB. DIII.)

HAB. Andes of Columbia and Peru. Antisana, *Hartweg*. Pilzhum, *Jameson*. Tungaragua, *Spruce*.

The specimen figured is one of *Spruce's*.—*J. D. H.*]

364. *C. Darwinii* (Boott); spica elongata composita stramineo-ferruginea, e spiculis pluribus (15) cylindricis inaequalibus masculis 3 terminali longiore inferioribus geminatis una abbreviata sessili, reliquis femineis inaequalibus remotis longe pedunculatis nutantibus vel pendulis, superioribus (3) ternatis apice masculis, inferioribus (2) geminatis vel infima solitaria; bracteis evaginatis inferioribus culmo longioribus ligula infima elongata; stigmatibus 2; perigyniis ovalibus vel ovatis stipitatis sensim rostratis, ore integro utrinque 3-5 nervatis glabris tenuiter granulatis stramineis, punctis ferrugineis notatis, squama lanceolata acuta cuspidata ferruginea nervo pallido latioribus brevioribus.—*C. Darwinii*, *Boott in Linn. Trans.* xx. 120; *Hook. f. Fl. Ant. arct.* 364, t. 145; *Gay, Fl. Chil.* 212; *Steudel*, 213. *C. nigricans*, *Hombroen (non Meyer), Herb. Paris*. *C. eleopsammoides*, *Steud.* 213; *Lechler, n.* 1226 et 2392. (TAB. DIV.-DV.)

HAB. In America meridionali.—Chonos archipelago. *Darwin, n.* 304. Straits of Magalhaen, *Lechler*; *Hombroen*.

*Culmus* tripedalis, acute triquetrum, laevis; pars spicigera pedalis. *Folia* 3-4 lin. lata, culmum aequantia. *Bractea* evaginatae, inferiores culmum longe superantes. *Pedunculi* triquetri, scabri, inaequales, ½-5 poll. longi. *Spiculae masculae* 2-3, terminalis 1½ poll. longa, 3 lin. lata, inferiores geminatae, 3-8 lin. longae, vel una (abbreviata sessili) feminea. *Spiculae femineae* inaequales, 1-2½ poll. longae, 3 lin. latae; superiores 3, ternatae, apice masculae, quarum una brevior subsessilis; in-

feriores 2, longiores geminatae, pendulae, vel infima solitaria, a se 1½-3½ poll. remotae. *Squamae* omnes lanceolatae, nervo in inferioribus plus minus producto. *Perigynium* (cum stipite  $\frac{2}{10}$ - $\frac{3}{10}$  lin. longo) 1 $\frac{6}{10}$ -2 lin. longum,  $\frac{7}{10}$ -1 $\frac{1}{10}$  lin. latum, glabrum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, castaneum, lenticulare, basi styli aequali.

For *Lechler's* specimens I am indebted to M. Sonder, of Hamburg. No. 1226 has twelve approximate spiculae; the specimen not fully mature. No. 3293 has no name on the ticket; the spiculae oblong. In both they are ternate and geminate, on the lower spicula solitary, with a peduncle eight inches in length, with two remote sterile squamae below the spicula; and the squamae often have elongate cuspides, and the perigynia are smooth.

The immediate affinity of this species is with *C. decidua* (Tab. CLXX.), from which it differs only in its elongate pendulous spiculae, acute cuspidate squamae, which are longer than the smooth dotted perigynia.

Tab. DIV. is *Hombroen's* specimen, from the Herb. Mus. Par., not mature, but showing the inflorescence.

Tab. DV. is *Darwin's* specimen, from the Cambridge Herb., for which I was indebted to the late excellent Professor Henslow. The upper part of the spike is wanting.

365. *C. diaphana* (Boott); spica lineari angusta pallida, e spiculis 12-15 androgynis apice masculis rotundis vel oblongis appressis, superioribus contiguis, inferioribus discretis; bractea capillacea brevi; stigmatibus 2; perigyniis ovalibus rostellatis, ore emarginato plano, vel biconvexusculis marginibus superne acutis scabris utrinque nervatis divergentibus membranaceis olivaceis, squama ovata albo-hyalina latioribus et longioribus. (TAB. DVI.)

HAB. In Australia.—Sydney, *Wilkes, Exp. (Herb. Gray)*.

*Culmus* 3-pedalis, ima basi foliatus, subvalidus, triquetrum, angulis dentato-scabris, dentibus (*et ad margines foliorum*) deorsum spectantibus. *Folia* 3 lin. lata, plana, subsesquipedalia, firma. *Bractea* infima capillacea pollicaris aculeato-asperrima, aculeis sursum spectantibus. *Spica* 2½ pollices longa, 2 lin. lata. *Spiculae* inferiores 3-4 lin. longae, aliae rotundatae breviores. *Squamae* conformes. *Perigynium* 1-1 $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, late ovale, vel angustius ellipticum, utrinque acutum, nervis fuscioribus. *Achenium* conforme,  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, lenticulare, ferrugineum.

I am indebted to Dr. Gray for a knowledge of this species, and for the figure of it by his artist, Mr. Sprague. It has escaped the observation of the Australian botanists, for in all their collections it is wanting. At the base of the inferior oblong spiculae, on one of the two specimens in Herb. Gray, there are two smaller spiculae about a line distant, as if the three were a compound spicula on a rachis incorporated with the culm. The aculei on the bract are longer than the teeth at the angles of the culm and margins of the leaves, with a direction towards the apex of the bract, while the teeth point downwards.

[366. *C. fuirenoides*, *Gaud. in Freyc. Voy.* 412. (TAB. DVII.)

HAB. Ins. Pacific.—*Mariae Annæ, Gaud.*

I find no reference to the figure here given amongst Dr. Boott's MSS. It probably represents the original specimen in Herb. Mus. Paris.—*J. D. H.*]

367. *C. Archeri* (Boott); spica simplici apice mascula 3-4-flora demum fusco-purpurea laxiflora involucreta



rachi obliqua; stigmatibus 3; perigyniis ellipticis sensim in rostrum breve cylindricum acuminatis, ore membranaceo integro obtuse triquetris subventricosis superne ad margines serratis basi obscure nervatis erectis fusco-purpureis, squama ovato-lanceolata in foliolum capillaceum longum producta vel cuspidata ferruginea, margine albo-hyalina decidua multum brevioribus vel æquantibus. (TAB. DVIII. f. 3.)

HAB. Tasmania, *Archer* (*Herb. Hooker*).

*Culmus* 3-9-pollicaris, lævis, vel apice scaber. *Folia* capillacea, culmo breviora. *Spica* 2 lin. longa et lata, flore masculino unico inconspicuo femineisque 2-3 laxis instructa. *Squamæ masculæ* lanceolata involuta apice dorsoque scabra, perigynio supremo subduplo brevior; *femineæ* infima subpollicaris, summa cuspidata, perigynium subæquans. *Stamina* 3; filamenta alba. *Perigynium*  $1\frac{8}{10}$  lin. longum, plus  $\frac{5}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, acute triquetrum, pallide fulvum. *Racheola* ligulata, serrata, achenium æquans, postice sita.

A *C. aciculari* differt culmo foliisque capillaccis mollibus, spica laxiore, flosculo masculino unico, rachi obliqua, perigyniis ellipticis, brevius rostratis, ore integro.

368. *C. acicularis* (Boott); spica simplici apice mascula pauciflora subrotunda involuata ferruginea; stigmatibus 3; perigyniis lanceolatis triquetris longe rostratis, ore obliquo demum fisso superne ad margines serratis stipitatis enerviis, squama lanceolata filiformifoliacea vel (in superioribus) cuspidata multum brevioribus vel æquantibus.—*C. acicularis*, *Boott in Hooker, Fl. N. Zeal.* 280, t. 63. (TAB. DVIII. f. 2.)

HAB. New Zealand, top of Ruahine Mountains, North Island, *Colenso* (*Herb. Hooker*).

*Radix* fibrosa. *Culmus* 2-4-pollicaris, filiformis, lævis, sæpe curvatus. *Folia* canaliculato-filiformia, culmum æquantia vel breviora, rigida. *Spica* 2-3 lin. longa et lata, flosculis masculis femineisque 4-6 instructa. *Squamæ masculæ* angustiores, acutæ; *femineæ* inferiores 2-3, in foliolum filiforme productæ, infima sæpe pollicaris, superiores cuspidatæ. *Perigynium* (*via maturum*) cum stipite  $\frac{2}{10}$  lin. longo, 2 lin. longum,  $\frac{1}{2}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongotriquetrum, pallidum, basi styli apiculatum. *Racheola* linearis, scabra, achenium superans, apice (rudimento squamæ?) ferrugineo.

369. *C. caduca* (Boott); spica simplici apice mascula subrotunda ferruginea involuata; stigmatibus 2; perigyniis ovato-lanceolatis sensim rostratis basi acutis, ore emarginato obliquo plano-convexiusculis superne ad margines serratis enerviis stipitatis ferrugineis demum horizontaliter patentibus, squama ovata acuta vel obtusa plus minus cuspidato-foliacea ferruginea, margine angusta hyalina caduca angustioribus brevioribus vel subæquantibus. (TAB. DVIII. f. 1.)

HAB. In America meridionali.—Fuegia, Orange River, *Wilkes Exped.* (*Herb. Gray*).

Cæspitosa. *Culmus* 4-pollicaris, obtusangulus, lævis, rigidus, basi foliosus, vaginisque striatis ferrugineis tectus. *Folia* canaliculato-involuta, filiformia (*explanata*  $\frac{1}{2}$  lin. lata), rigida, curvata, culmum subæquantia. *Spica* 3 lin. longa et lata, flosculis femineis sub 8, masculis paucioribus, omnibus densis

instructa. *Squamæ femineæ* inferiores in foliolum filiforme 8-10 lin. longum, productæ; *masculæ* angustiores, muticæ vel cuspidatæ, acutæ. *Perigynium* (cum stipite  $\frac{4}{10}$  lin. longo, clavato)  $1\frac{8}{10}$ -2 lin. longum,  $\frac{1}{2}$  lin. latum; ore emarginato, postice oblique fisso (nec hyalino). *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, lenticulare, griseum, basi styli clavata apiculatum.

A *C. cephalote*, Müller, differt spica pauciflora; perigyniis margine scabris; ore emarginato, non hyalino; squamis inferioribus foliaceis.

[370. *C. Hartwegii*, *Boott in Benth. Pl. Hartweg*.—*C. polystachya*, var. minor, *Boott in Herb. Hooker*. *C. cladostachya*, *Wahl.* *C. Mexicana*, *Presl.* (TAB. DIX.-DX.)

HAB. Guatemala, *Hartweg*, n. 628. Venezuela, *Fendler*, n. 1605. Santa Martha, San Antonio de Nevada, *Purdie*. Mexico, Xalapa, 4000 ft., *Galeotti*. Vera Cruz, *Linden*.

The specimen figured at Tab. DIX. is Hartweg's original in Herb. Hooker. That represented in DX. is probably Fendler's, from Venezuela. I have taken the synonyms from Dr. Boott's last revision of the species as written up in Herb. Hooker, according to which it appears that he regarded *Hartwegii* and *Mexicana* as synonyms, and as a small variety of *C. polystachya*.—*J. D. H.*]

[371. *C. lasiochlæna*, *Kunth, Cyp.* 485. (TAB. DXI.)

HAB. Sardinia.

I suppose that this figure represents an authentic specimen, and was made for this purpose. I find no specimen in Herb. Boott or Herb. Hooker, and no allusion to the plant in Dr. Boott's MSS.—*J. D. H.*]

[372. *C. Mexicana*, *Presl.* (TAB. DXII.) *Vide supra*, 370.

This drawing was made from Galeotti's specimens, n. 5734 and 5721.]

[373. *C. physocarpa*, *Presl (non Nees)*. (TAB. DXIII.)

The specimen from which this figure was made was placed in the covers with *C. saxatilis*, and evidently referred by Dr. Boott to this species, which bears the following ticket:—

"*C. puella!* Stigmas 2. Rocky Mountains, *Drummond*. Marked *C. membranacea*, by Torrey and Dewey. Variat rarissime spica femineæ inferiore longissime pedunculata. An *C. physocarpa*, *Presl.*"

The original *C. physocarpa* is a native of Nootka Sound.—*J. D. H.*]

[374. "*C. purpurea*, *Boott.*" (TAB. DXIV.)

I find no specimen nor description of this species in Dr. Boott's Herbarium or MSS., but after the name on the drawing is written "Specimen Bonplandii," in Spach's handwriting.—*J. D. H.*]

375. *C. sanguinea* (Boott); spica elongata decomposita duplicato-racemosa sanguineo-purpurea, racemis remotis mediis geminatis longe exserte pedunculatis erectis, spiculis 3-8 ovatis apice masculis ad apicem pedunculorum alternatim dispositis; bracteis vaginatis culmum subæquantibus; stigmatibus 3; perigyniis lanceolato-ovatis triquetris sensim rostratis, ore hyalino bifido nervatis scabris, margine serratis superne purpureis subrecurvis, squama ovata acuta vel mucronata purpurea

angustioribus et longioribus.—*C. sanguinea*, Boott, *Linn. Trans.* xx. 137. (TAB. DXV.)

HAB. In Affghanistan, Griffith (*Herb. Hooker*).

*Rhizoma* stoloniferum, lignosum. *Culmus* 1-1½-pedalis, obtusangulus, lævis, firmus, basi foliatus; pars spicigera 15 poll. longa. *Folia* 2-3 lin. lata, carinata, marginibus revolutis, rigida. *Bractea* vaginata; vagina infima pollicaris. *Pedunculi* inæquales, seabri; inferiores longiores; infimus subradicalis, 5 poll. longus. *Spiculae* 3-4 lin. longæ, basi flosculis femineis 4-6, sublaxis, apice maseulis pluribus imbricatis instructæ. *Squamæ* conformes. *Perigynium* 1½ lin. longum, ⅓ lin. latum. *Achenium* lineam longum, ⅓ lin. latum, ellipticum, acute triquetrum, pallidum, basi styli crassiore apiculatum. *Stigmata* 3, longa. *Anthera* pallidæ, apice extremo appendice purpureæ, apiculatæ.

Affinis *C. Wahlenbergiana*, Boott. Differt inflorescentia laxiore, spiculis minoribus.

376. *C. Argunensis* (Turczaninoff); spica simplici apice mascula cylindrica undique imbricata densi-multiflora lutescenti-ferruginea nuda; stigmatibus 3; perigyniis obovatis rostellatis, ore integro hyalino, squama subrotunda obtusissima truncata angustioribus brevioribus.—*C. Argunensis*, Turcz. *ms. in Herb. Ledebour; Fl. Ross.* 267; *Steud.* 186. *C. rupestris*, Turcz. *Pl. Eas. A.* (1829). (TAB. DXVI. f. 6.)

HAB. In Asia.—In rupestribus mont. Davuriæ ad fluv. Argur, prope Zurukhaitoo, Turcz.

Stolonifera. *Culmus* 5-7-pollicaris, triquetrum, lævis, curvatus. *Folia* 1-1½ lin. lata, plana, carinata, apice longe attenuata contorta, culmum æquantia. *Spica* 7-11 lin. longa, 3 lin. lata, obtusa, cylindrica vel "oblongo-clavata" (*Fl. Ross.*). *Squamæ masculæ* angustiores, omnes lutescenti-ferrugineæ vix margine hyalinæ; infima feminea amplectens, subinde breve cuspidata. *Perigynium* (*immaturum*) 1½ lin. longum, ⅓ lin. latum. *Stylus* basi incrassatus, exsertus.

Omnino habitus *C. rupestris*, All. Differt spica majori latiore, multiflora, undique dense imbricata, obtusa, flavescens; culmo lævi.

I am indebted to M. Fischer for authentic specimens, too young for a perfect knowledge of the perigynium. The Rocky Mountain variety of *C. rupestris* is to a degree intermediate between the plant of Allioni and that of Turcz., and future observation must determine how far they differ specifically.

377. *C. rupestris* (Allioni); spica simplici apice mascula lineari vel clavata basi laxiflora fusco-purpurea nuda vel bracteata; stigmatibus 2, stylo exserto; perigyniis obovatis vel ellipticis plano-triquetris brevissimæ vel vix rostellatis, ore integro nervatis glabris vel rarius superne ad margines dentatis appressis membranaceis pallidis apice ferrugineis, squama amplectente subrotunda obtusissima mutica vel ovata acutiuscula, infima subinde plus minus longe cuspidata fusco-purpurea, margine hyalina angustioribus brevioribus vel longioribus.—*C. rupestris*, Allion. *Ped. t.* 92, f. 1; *Wahl. Lap.* 225; *Willd.* 215; *Kunth*, 426; *Koch*, 862; *Gaud. Helv.* 32; *Bertol.* 37; *Drejer, Rev.* 20; *Fl. Ross.* 267; *Gren. et Godr.* 388; *Reich. t.* 198; *Anders.* 73, t. 3, f. 3; *Lange*, 21; *Fl. Bor. Am.* ii. 209; *Eng. Bot. t.* 2814; *Benth. Brit. Fl.* 557; *Steud.* 186. *C. petræa*, *Wahl. Act.* 139; *Willd.* 214; *Schk. f.* 139; *Gaud. Agrost.* 78. *C. attenuata*, Brown,

*in Frank. Narr. App.* 763 (*fide spec. in Herb. Hooker*); *Steud.* 186. (TAB. DXVI. f. 1-5.)

Var.  $\beta$ .—*C. Drummondiana*, Dewey, *Sill.* 29, 251; *Torrey, Cyp.* 402; *Steud.* 186.

HAB. In Europa, Asia, America septentrionali.—Lapland, Norway, Scotch Alps (Glen Callater), Switzerland. Ural, Davuria, *Fl. Ross.* Greenland, *Wahl.* Arctic America, *Richardson.* Canada, *Herb. Pursh in Herb. Boott.*— $\beta$ . Rocky Mountains, *Drummond.*

Stolonifera. *Culmus* 2-8-pollicaris, acute triquetrum, seabri, basi foliatus, vaginisque foliorum marcidis longe arcteqe tectus. *Folia* sub lineam lata, plana, carinata, apice longe setaceo-attenuata, contorta, firma, demum culmo breviora. *Squamæ* tenuissimæ, nigro-fusca vel ferrugineæ, margine pallidiores, omnes obtusissimæ muticæ, vel femineæ inferiores acutiusculæ; infima nunc cuspidata, quandoque vaginans, bracteaformis, cuspidate infra apicem egrediente. *Spica* 4-8, etiam 10 lin. longa, ⅓-2 lin. lata, flosculis femineis 3-8, inferioribus subinde alternis. *Perigynium* obovatum, 1½ lin. longum, vel ellipticum 2 lin. longum, ⅓ lin. latum, plano-vel potius concaviusculo-triquetrum, leviter parve nervatum, nervis quibusdam superne evanidis, membranaceum. *Achenium* conforme, 1½ lin. longum, ⅓ lin. latum, concaviusculo-triquetrum, ellipticum, fusco-ferrugineum; basi styli clavata, persistente apiculatum. *Stylus* exsertus. *Stigmata* 3, longissima.

Var.  $\beta$ . Spica longiore, multiflora, basi attenuata (14 lin. longa); squamis margine late hyalinis, obtusissimis.

The Arctic American and Greenland plant is like the European one, but that from the Rocky Mountains is generally larger, as the specimen I have figured, which is the largest I have seen, will show. They are all too young, but, from the variable size of the spike in the typical form, and in the Greenland and even Rocky Mountains specimens, it can be regarded, I think, only as a variety. Wahlenberg finds eight female florets in the Lapland plant, which is more than is occasionally seen in the Rocky Mountain one.

Grenier and Godron quote *C. Dufourii*, Lapeyr. *Abr. Pyr.* 72, as a synonym of *C. rupestris*; but Kunth refers it to *Elyna spicata*.

378. *C. scabrata* (Schweinitz); spica subelongata fulvo-olivacea, e spiculis 5-6 rarius 4-9 cylindricis densifloris erectis, terminali mascula fulva, reliquis femineis olivaceis squarrosis, superioribus sessilibus approximatis, inferioribus deorsum sensim longius pedunculatis evaginatis vel infima remota rarius vaginulata; bracteis evaginatis inferioribus culmo longioribus vel infima subinde sterili remota vaginulata; stigmatibus 3; perigyniis subventricose ovalibus triquetris longe rostratis arcuatim divergentibus, ore integro oblique secto membranaceo ciliato demum fisso, setose scabris nervis marginalibus costatis aliis sæpe superne evanidis, squama ciliata lanceolata vel ovata acuminata cuspidata vel obtusa mutica fulva nervo viridi latioribus longioribus.—*C. scabrata*, Schw. *An. Tab. Ann. Lyc. N. York*, i. 62 (1824); *Schw. et Torr. Mon.* 345, t. 26, f. 2; *Dewey, Sill.* ix. 66; *Darlington, Fl. Cestr.* 3rd edit. 351; *Beck.* 440; *Carey*, 527; *Sartwell, Eas. n.* 115; *Kunth*, 455; *Steud.* 226. (TAB. DXVII.)

HAB. In America septentrionali.—Canada to Pennsylvania.

*Culmus* 1-2½-pedalis, triquetrum, angulis acutis, scaber, basi

foliatus; pars spicigera 3-10 pollices longa. *Folia* 3-5 lin. lata, clongata, culmo breviora, plana, scabra, graminea. *Bractea* evaginatae, vel infima 2-4 lin. lata, vagina 3 lin. longa, rarius praedita, subinde sterilis remota; inferiores eulmo longiores. *Ligula* rotundata, amplectens. *Pedunculus* infimus 1-4 poll. longus, rigidus, scaber. *Spicula mascula* 8 lin.-1½ poll. longa, 1½-2 lin. lata, sessilis vel pedunculata; *femineae* ½-2½ poll. longae, 3 lin. latae, superiores interdum abbreviatae arete contiguae. *Squamae* eiliatae, fulvae, masculae majores, lanceolatae, muticae. *Perigynium* 1 $\frac{8}{10}$ -2 lin. longum,  $\frac{8}{10}$ -1 lin. latum; ore membranaceo, ciliato, pallido vel ferrugineo, alte oblique secto, demum rupto. *Achenium*  $\frac{8}{10}$ -1 lin. longum, ovale vel obovatum, triquetrum, angulis medio inerassatis, faciebus concavis, fulvum; basi styli incrassata, decidua.

379. *C. Sitchensis* (Prescott); spicis 5-8 cylindricis atro-purpureis, masculis 2-3 rarius 4 sessilibus erectis, femineis 3-5 superioribus conspicue (raro omnibus) apice masculis inferioribus pedunculatis erectis vel nutantibus evaginatibus basi saepe laxifloris; bracteis inferioribus culmum superantibus; stigmatibus 2; perigyniis ovalibus vel obovatis vel subrotundis rostellatis biconvexis, ore integro glabris vel ad margines apice subinde parce denticulatis flavidis dense spongiosis, squama ovato-lanceolata acuminata acuta vel aristata saepe obtusa pellucide lineata, angustioribus duplo brevioribus.—*C. Sitchensis*, Prescott in *Bongard, Obs. Sitcha. Acad. Sc. de St. Petersburg. ser. 6, tome 2, p. 168* (1831); *Boott in Fl. Bor. Amer. p. 220, t. 221*; *Tor. Cyp. 401*. *C. acuta*,  $\gamma$ , *Fl. Ross. 313*. (TAB. DXVIII.-DXIX.)

HAB. In America septentrionali ad ripas fl. Columbiae, Douglas et Scouler. Sitcha, Bongard. Gray's Harbour and Paget's Sound, *Nasqually, n. 243 et 660*; *Wilkes Exp. San Francisco, California, Mr. Brewer*.

*Radix* crassa, fibris validis, lignosis. *Culmus* 1-4½-pedalis, triquetrum, rigidus, apice scaber, basi foliis vestientibus, vaginisque purpureis, reticulato-fissis, tectus; pars spicas gerens 5-8 poll. longa. *Folia* 3-4 lin. lata, culmo breviora; *sterilia* culmo longiora, rigida, marginibus revolutis. *Bractea* evaginatae, inferiores culmum superantes. *Ligula* amplectens, integra, atro-purpurea. *Spica mascula* 1½-3 poll. longae, 2-3 lin. latae, sessiles. *Spica feminea* 1-3½ poll. longae, 4-5 lin. latae, à se 9 lin.-2½ poll. remotae, erectae vel nutantes, plus minus pedunculatae. *Pedunculi* 2-12 lin. longi, scabriusculi. *Squamae* atro-purpureae (luci subjectae), lincolis pellucidis notatae; *masculae* obtusae, muticae; *femineae* apice involutae, decolores, inferiores subinde aristatae, vel omnes obtusae, muticae. *Perigynium* 1 $\frac{8}{10}$ -1 $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, stramineum, rostello purpureo, glabrum, vel ad margines apice parce dentatum. *Achenium* 1-1 $\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, fusco-olivaceum, subinde impressum, racheola capillacea, albidula, quandoque instructum.

Besides the larger size, I know of no specific character separating this plant from *C. salina*, of which I think it is the fuller development. It differs from *C. cryptocarpa* in the sessile male spikes and nerveless perigynium, and from *C. acuta* in the dense spongy texture of the perigynium.

The specimens figured are Californian.

380. *C. trinervis* (Degland); spica oblonga pallida, e spiculis 5-7 spicatum dispositis erectis sessilibus, masculis 2-3 rarius 1-4, femineis 3-4 rarius 5, superioribus saepe apice masculis, inferioribus basi acutis; bracteis

evaginatibus involutis, inferioribus culmum superantibus; stigmatibus 2; perigyniis oblongo-ellipticis vel obovatis rostellatis, ore integro compressis 5-8 utrinque nervatis resinoso-punctatis demum cinnamomeis, squama ovata mutica vel plus minus cuspidata subinde emarginata purpurea medio pallida trinervi margine hyalino latioribus longioribus.—*C. trinervis*, *Degl. in Lois. Gall. i. 731* (1807), *ed. 2, 294* (1828) (*non Nees*); *Dec. Fl. Franc. 6, 291*; *Kunth, 414*; *Kunze, 6, t. 1*; *Drejer, Symb. 20, t. 7*; *Lange, 81*; *Gren. et Godr. 403*; *Steud. 215*. *C. Friesica*, *Koch, Bot. Zeit.; Steud. 215*. (TAB. DXX.-DXXI.)

HAB. In Europa. In arenosis maritimis.—France, Germany.

*Rhizoma* longe repens, fibris radicalibus validis, lanatis. *Culmus* 6-15-pollicaris?, gracilis, laevis, obtuse triquetrum; pars spicigera 2½-4½ poll. longa. *Folia* involuta, sub lineam lata, culmo longiora. *Bractea* evaginatae, inferiores culmum superantes. *Spica mascula* saepius 2-3, summa subinde 1½ poll. longa, 1½ lin. lata; *femineae* 3-4, superiores apice masculae, 6-15 lin. longae, 3-4 lin. latae, inferiores basi attenuatae, subsessiles. *Squamae masculae* cinnamomeae, obtusae, muticae; *femineae* acutae vel obtusae, nunc truncatae vel submarginatae, purpureae, medio late viridi, nervo infra apicem evanescente vel plus minus extra producto. *Perigynium* 1 $\frac{8}{10}$ -2 $\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ -1 lin. latum, supra achenium lenticulare superne compressum, nervis utrinque 5-8 validis, saepe superne plus minus evanidis, punctis resinosis ferrugineis notatum, breve stipitatum. *Achenium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, lenticulare, basi styli abrupte apiculatum.

Variat spica terminali apice et basi mascula; spicula infima in uno specimine brevi exserte pedunculata; bractea infima vagina 4 lin. longa instructa; perigynio margine parce dentato.

Drejer allies this species to *C. glauca* and *C. hispida*. The affinity is, I think, with the last. I have copied the beautiful figure of it in Drejer's 'Symbolæ.'

The other figures are from Bordeaux, which I owe to the kindness of Mr. Bentham. The right-hand figure has the terminal spike with male florets above and below, and the lower bract is vaginate.

[381. *C. viridis*, *Schlecht. in Linnæa, vi., p. 30*. (TAB. DXXII.)

HAB. Mexico.

I find no specimen nor description of this plant in Herb. Boott, and I suspect that the drawing was made in Berlin from the original specimen, as I recognize the late Dr. Klotzsch's handwriting in an accompanying sketch and analyses.—*J. D. H.*]

[382. *C. viridula*, *Michaux.*—*C. Cederi*, *Herb. J. Carey*. (TAB. DXXIII.)

HAB. Massachusetts, *Herb. Carey*.

I find no observations on this species in Dr. Boott's collections, the drawing of which was made from Massachusetts specimens in his own herbarium.—*J. D. H.*]

[383. *C. spiculosa*, *Fries, Sum. Veg. Scand. 226*. (TAB. DXXIV.)

HAB. Lapponia.

There are no specimens of, nor observations on, this species amongst Dr. Boott's collections.—*J. D. H.*]

384. *C. salina* (Wahlenberg); spicis 4–8 cylindricis ferrugineis vel purpureis approximatis erectis, masculis 1–3, reliquis femineis pedunculatis, superioribus apice masculis, infima sæpe nutante interdum subradicali basi attenuata rarius composita; bracteis (nisi subinde infima) evaginatibus culmum subæquantibus; stigmatibus 2, rarius 3; perigyniis ovalibus vel subrotundis rostellatis, ore integro vel emarginato plano-convexis obsolete vel parce nervatis pallidis granulatis, squama lanceolata acuminata acuta mutica vel cuspidata medio viridi 1–3-nervata brevioribus.—*C. salina*, *Wahl. Act.* 164; *Fl. Lapp. ad β*, 246; *Willd.* 301; *Schk.* 185; *Kunth*, 416; *Fries, Mant.* 3, 145; *Anders.* 49, t. 5, f. 50; *Lange*, 73; *Fl. Ross.* 313. *C. cuspidata*, *Wahl. Act.* 164. *C. recta*, *Boott, Fl. Bor. Am.* 220, t. 222. *C. hæmatolepis*, *Drejer, Rev.* 44. *C. vacillans*, *Drejer?*; *Anders.* 47, t. 2, f. 36. *C. halophila*, *Nyl.*; *Fries, Sum.* 231; *Anders.* 48, t. 5, f. 51; *Lange*, 74. *C. ambusta*, *Boott, Illust.* 64, t. 172. (TAB. DXXXV.)

Var.  $\beta$ . *minor*.—*C. lanceata*, *Dewey, Sill.* 29, 249. *C. reducta*, *Drej. Rev.* 36. *C. Hoppneri*, *Boott, Fl. Bor. Am.* 219, t. 220. *C. subspathacea*, *Worms, Fl. Dan.* t. 1530; *Drejer, Rev.* 34; *Fries, Mant.* 3, 148; *Sum.* 231; *Anders.* 50, t. 5, f. 49; *Lange*, 74; *Kunze*, 98, t. 24; *Fl. Ross.* 304. *C. salina*, *Boott, Fl. Bor. Am. (spec. Horn. e Grænlandia)*. *C. bracteata*, *Giesecke (fide Drejer)*. *C. discolor*, *Nyl.*; *Andersson*, 54, t. 2, f. 38; *Fl. Ross.* 309. *C. epigejos*, *Fr. Sum.* 233. (TAB. DXXXV.–DXXX.)

HAB. In Europa et America septentrionali.—Lapland to Sweden. Gottenburg. Massachusetts. Hudson's Bay to Canada.

Stolonifera. *Culmus*  $\frac{1}{2}$ – $1\frac{1}{2}$ -pedalis, firmus, obtusangulus, lævis, vel apice acutangulus (infra spicas), scaber, basi foliatus vaginisque foliorum rubro-purpureis tectus; pars spicas gerens  $2\frac{1}{2}$ –8, etiam 15 poll. longa. *Folia* 1–2 lin. lata, culmo breviora (*sterilia* culmum æquantia), marginibus revolutis. *Bractea* evaginata, vel infima rarius vaginata. *Ligula* elongata vel subrotunda. *Spicae*  $\frac{1}{2}$ –2 poll. longæ, 2–3 lin. latæ; masculæ 1–3, intermedia sessilis, erectæ; femineæ superiores rarius omnes apice masculæ, pedunculatæ vel suprema sessilis, infima sæpe nutans subinde remotæ, basi compositæ. *Squamæ* ferrugineæ, vel rubro- vel fusco-purpureæ, medio viridæ 1–3 nervatæ; *masculæ* pallidiores, plerumque muticæ, vel mucronatæ; *femineæ* lanceolatæ acuminatæ acutæ, rarius obtusæ, truncatæ vel emarginatæ, muticæ vel plus minus longe cuspidatæ, cuspidæ lævi vel serrata, valida vel setacea; perigynia omnino tegentes vel iis angustiores. *Perigynium*  $1\frac{3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{9}{10}$  lin. latum, orbiculatum vel subobovatum, abrupte vel ovale *sensim* rostellatum, sæpe distincte nervatum, punctis pallide castaneis sæpe demum notatum. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, oblongum, basi productum, brunneum, semper? transverse sulcatum, basi styli abrupte apiculatum.

Var.  $\beta$ ; culmo foliisque gracilioribus; spicis paucioribus, sæpe sessilibus; perigyniis ellipticis; squama obtusa, mutica, vel mucronata, subinde longioribus.

The var.  $\beta$  passes insensibly, through *C. reducta* and *C. lanceata*, to the typical form,—as I think is obvious from the figures I have given. My own observations confirm those of Lange. He says, "Glumæ variant, uno eodemque loco legi specimina glumis obtusis et mucronatis, cuspidatis et serrulato-aristatis; in

uno eodemque specimine vidi glumas muticas et mucronatas, cuspidatas, cuspidæ integerrimo et aristatas serrulatas. Varietates *cuspidata* et *mutica* itaque non amplius statuendæ sint."

*C. recta*, from Labrador, like *C. hæmatolepis*, from Greenland, has stigmas 2 and 3, both in other respects typical in size and habit, but differing remarkably from the extreme form of *C. subspathacea*, which has the same number of stigmas. There is nothing constant in the three nerves of the squamæ of *C. subspathacea*, and the same character is often observable in the lower squamæ of the typical form. The occasional dentation on the margins of the perigynium of *C. reducta* may be observed in other forms. It is seen in *C. ambusta*, Boott (Tab. CLXXII.) which I think is inseparable from *C. salina*.

Tab. DXXXV.

n. 1. Norway.

n. 2. Sweden.

Tab. DXXXVI.

n. 1. North America.

n. 2. Greenland.

Tab. DXXXVII. Sweden.

Tab. DXXXVIII. *C. lanceata*, Dewey. Cumberland River, *Sir J. Richardson*.

Tab. DXXXIX.

n. 1. Hudson's Bay.

n. 2. Greenland.

Tab. DXXX.

n. 1 and 2. Greenland.

n. 3. Finmark.

385. *C. Bongardi* (Boott); spicis 4–7 stramineo-pallidis elongatis erectis, terminali mascula, reliquis femineis apice masculis, inferioribus remotis longe validè exserte pedunculatis; bracteis vaginatis, infima culmo longiore, vaginis basi tumidis triquetris glabris; stigmatibus 3, plumosis; perigyniis (*immaturis*) lanceolatis rostratis alte bicuspidatis, marginibus superne serratis crebre nervatis glabris, squama lineari-truncata vel emarginata albo-hyalina longe hispidò-cuspidata paulo longioribus (cuspidæ) brevioribus.—*C. Bongardi*, *Boott in Linn. Trans.* 20, 144. *C. Boottiana*, *Hooker, Beechey's Voy.* (TAB. DXXXI.)

HAB. Bovin Island, Loochoo, *Bongard (Herb. Hooker)*; *Wright, N. Pacific Exp. U. S. (Herb. Gray)*.

Straminco-pallida. *Radix* fibris lignosis lævibus validis. *Culmus*  $1\frac{1}{2}$ -pedalis, triquetèr, validus, lævis, basi foliatus, reliquis foliorum fibratis nigris tectus; pars spicas gerens 10–14 poll. longa. *Folia* 2–5 lin. lata, plana, firma, culmo longiora, lutescenti-viridia. *Bractea* infima angusta, sesquipedalis, reliquæ setaceæ, spiculis breviores. *Vagina* infima 21 lin. longa, basi purpurea tumida. *Pedunculus* infimus 4 poll. longus, scaber. *Spica mascula* 3 poll. longa, 4 lin. lata. *Spica femineæ*  $2\frac{1}{2}$  poll. longæ, 4–5 lin. latæ, basi attenuatæ; pars tertia suprema apice mascula, a se  $1\frac{1}{2}$ –4 poll. remotæ. *Squamæ* conformes. *Perigynium (immaturum)*  $3\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium* oblongum, basi styli incrassata. *Stylus* ad basin stigmatorum ampliatus. *Stigmata* plumosa. *Racheola* linearis, achenium subæquans.

The specimens of this species do not afford mature perigynia, and their ultimate form and that of the achenium cannot be satisfactorily ascertained to admit of a comparison with those of *C. tenebrosa*, Boott. The two plants are closely allied, and the most striking distinction is in the stigmata, which in *C. Bongardi* have the usual plumose character, while they are smooth in *C. tenebrosa*. The male portion of the spike is broader and shorter than in *C. tenebrosa*, the spikes more attenuate at base, and the colour of the entire plant pale; the scales longer, narrower, and of a white hyaline colour.

386. *C. Brownii* (Tuckerman); spica subelongata fusco-olivacea, e spiculis 3-4 oblongis cylindricis stricte erectis, terminali mascula subsessili, reliquis femineis densifloris, superioribus masculæ contiguas, infima plerumque remota longe exserte pedunculata; braeteis inferioribus vel omnibus culmum superantibus, infima vaginata; stigmatibus 3; perigyniis subglobosis vel obovatis rostratis, rostro deolori, ore bifido crebre costato-nervosis, squama obtusa vel acuta longe hispido-aristata latoribus arista brevioribus.—*C. Brownii*, *Tuckerman, Enum. C. striata*, *Brown, Prod.* 243; *Kunth*, 242; *Steud.* 226; *Drejer, Symb.* 28, t. 15; *Sieb. Exs. n.* 16 (non *Michaux*). *C. rigens*, *Boott, Ringgold and Rodgers' Exp.* (TAB. DXXXII.)

HAB. In Nova Hollandia, *Brown; Sieber.* Port Chusan, Korea, *Wilford, n.* 926 (*Herb. Hooker*). Ousima, prope Japan, *Wright, n.* 76 (*Herb. Gray*).

*Culmus* 1-2½-pedalis, triqueter, scaber, firmus, fere usque ad mediam partem foliatus; pars spicigera 1½-8 poll. longa. *Folia* 2-3 lin. lata, culmo breviora. *Bractea* inferiores vel omnes culmo longiores, infima vaginata, una alterave remota, sterilis sæpe adest. *Vagina* 2 lin.-1½ poll. longa, apice scabrida. *Pedunculus* 4 lin.-3 poll. longus. *Spiculae* 6-18 lin. longæ; femineæ 2-2½ lin. latæ; infima sæpius 2-5½ poll. remota. *Squamæ* omnes hispido-aristatæ; femineæ nunc emarginatæ. *Perigynium* 1 $\frac{5}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{8}{10}$ -1 lin. latum, inter nervos granulato-asperulum, punctis nigris conspersum. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, late ovale, triquetrum, facibus concavis; basi styli persistente obliqua æquali, portione decidua bulboso-incrassata.

Ad *C. granularem* accedit, tamen squamis aristatis facile distincta.

The specimen figured is from Ousima.

387. *C. lacistoma* (Brown); spica subelongata sanguinea albo variegata, e spiculis 5 cylindricis densifloris erectis, masculis 2 sessilibus infima abbreviata, reliquis femineis, superioribus masculæ approximatis sessilibus, infima remota pedunculata; braeteis evaginatiss, infima culmum superante; stigmatibus 3; perigyniis ovalibus late brevi rostratis rostro albido, ore integro membranaceo aperto glabris ad margines plus minus scabris eostatonervatis inter nervos punctatis superne granulatis fuscis, squama oblonga emarginata vel obtusa breve cuspidata purpureo-sanguinea nervo pallido paulo longioribus.—*C. lacistoma*, *Brown, Prod.* 243; *Kunth*, 517; *Steud.* 241. (TAB. DXXXII.)

"Trigyna; vaginis multis, spicis femineis 3 cylindraceis erectis, infima breve pedunculata, squamis obtusis mucronulatis, fructibus ovalibus ventricosis nervosis, collo brevissimo obtuso ore patulo" (*Br.*).

HAB. Nova Hollandia.—"Prospect Hill, near Sydney," *Br.*

*Culmus* 2-pedalis, acute triqueter, inter spiculas scaber; pars spicigera 5 poll. longa. *Bractea* evaginatæ, infima 1½ lin. lata, summa spicula brevior. *Pedunculus* 9 lin. longus, scaber. *Spicula mascula* pollicaris, 2 lin. lata, altera 3 lin. longa; *femineæ* 9-13 lin. longæ, 2½-3 lin. latæ; infima 3 poll. remota. *Squamæ masculæ* oblongæ, obtusæ, muticæ. *Perigynium* (*immaturum*) oblique divergens, punctis fuscis notatum, superne granulatum pallidum.

No one has met with this species since Mr. Brown discovered it near Sydney; and Mr. Moore writes to Dr. Hooker that the original habitat is much changed, and that he has sought for it in vain. I have figured the upper part of an imperfect specimen given to me by Mr. Brown. In some respects it resembles *C. Brownii*, Tuck., differing in the lower evaginate bract, and the entire open orifice of the perigynium.

388. *C. obesa* (Allioni); spicis 2-5 contiguas, mascula 1 cylindrica rarius 2-3, femineis 1-3 rotundis sessilibus suprema subinde apice mascula vel inferioribus oblongis, infima sæpe exserte pedunculata; bractea infima amplectente vel vaginata, culmo brevior vel subæquante; stigmatibus 3; perigyniis orbiculatis rostratis, ore hyalino obliquo facile rupto, glabris vel rarius seabriusculis, marginibusque serratis nitidis obsolete vel plus minus nervatis demum aurantiacis vel fuscis coriaceis, squama late ovata obtusa vel acuta mutica vel lanceolata mucronata amplectente ferruginea, margine hyalina longioribus vel æquantibus.—*C. obesa*, *All. Ped.* 270 (1785); *Gren. et Godron*, 409. *C. nitida*, *Host. Gram. t.* 71 (1801); *Willd.* 284; *Gaudin*, 162; *Koch*, 878; *Reich.* 27, t. 264; *Fl. Ross.* 306; *Lange*, 99. *C. verna*, *Schk. f.* 46, 156, et 189; *Willd.* 285; *Wahl. Act.* 158; *Steud.* 220. *C. alpestris*, *Lam. Ency.* 3, 389. *C. brevirostrata*, *Poir.* *C. liparicarpos*, *Gaud. Etr.* *C. filiformis*,  $\gamma$ , *Leers.* *C. Lamarekii*, *Sm. in Rees.* *C. lucida*, *Clairv.* (*fide Lange*). *C. badia*?, *Pers.* (TAB. DXXXIII.)

Var.  $\beta$ .—*C. conglobata*, *Kit.*; *Willd.* 281; *Kunth*, 445; *Link.* 355; *Reich.* 27, t. 264; *Kunze*, 14, t. 3, f. 1. *C. nitida*, *Ledeb. Fl. Alt.* *C. nitida*,  $\beta$ , *Fl. Ross.* 306. (TAB. DXXXIV.)

Var.  $\gamma$ .—*C. supina*, *Wahl. Act.* 158; *Willd.* 265; *Kunth*, 444; *Drejer, Rev.* 54; *Reich.* 25, t. 259; *Koch*, 875; *Lange*, 100; *Steud.* 220. *C. glomerata*, *Schk. I. f.* 41. *C. Schkuhrii*, *Willd.* 264; *Schk. f.* 158; *Biebst.* 387. *C. oligoearpa*, *Horn.*! *C. spanioearpa*, *Steud.* 225. *C. sphærocarpa*, *Willd.* 265. *C. campestris*, *Hort.* 4, t. 88. *C. globularis*, *Roth* (*fide Willd.*). *C. Turczaninofii*, *Steud. Nom.* *C. eostata*, *Turcz. (in sched.) sec. Fl. Ross.* (TAB. DXXXV.)

HAB. France, Germany, Switzerland.— $\beta$ . Hungary, Siberia, Altai.— $\gamma$ . Germany, Caucasus, Altai, Songaria, Rocky Mountains, Arctic America, Greenland.

Stolonifera. *Culmus* 2½-9-pollicaris, firmus, scaber; pars spicas gerens 8 lin. ad 2½ poll. longa. *Folia* ½-2 lin. lata, culmo breviora, firma, carinata, glaucescentia, apice attenuata sæpe circinato-curvata. *Bractea* infima amplectens, fissa vel vaginata, plerumque culmo brevior. *Vagina* 1-6 lin. longa. *Pedunculus* infimus 3-18 lin. longus. *Spica mascula* 4-9 lin. longa, 1 lin. lata, sæpe basi attenuata. *Spicæ femineæ* subinde apice masculæ, vel 2 subrotundæ, paucifloræ, evaginatæ; infima pedunculo 1-4 lin. longo prædita, vel 3 infima oblonga 6-8 lin. longa, 3 lin. lata, exserte pedunculata. *Squamæ* omnes obtusæ vel apiculatæ, muticæ, vel rarius lanceolatæ, acutæ, mucronatæ, castaneæ, margine hyalinæ. *Perigynium* 1 $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{9}{10}$ -1 $\frac{1}{10}$  lin. latum, ovale, vel demum suborbiculatum, rostratum; ore obliquo, integro, scarioso, facile rupto; nitidum, castaneum, ventricosum, plus minus distincte subinde valide nervatum, glabrum, rarius seabriusculum, marginibusque parce dentatis vel serrulatis.

*Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, triquetrum; stylo valido.

Var.  $\beta$ ; spicis masculis 1-3, squamis sæpe lanceolatis mucronatis, perigyniis sæpe scabris.

Var.  $\gamma$ . *minor*; spicis 2-3 contiguis, mascula 1 rarius 2, femineis 1-2 rotundis paucifloris sessilibus evaginatibus; bractea amplectente, culmo brevior vel æquante; perigyniis ellipticis vel orbiculatis rostellatis, ore hyalino integro vel emarginato nitidis enerviis vel obscure nervatis glabris demum aurantiacis vel fuscis coriaccis, squama ovata obtusa vel acuta mutica vel rarius mucronata longioribus vel æquantibus, foliis angustis.

*Perigynium*  $1\frac{5}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{9}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum.

Kunth is the only authority who suggests the var.  $\gamma$  being a form of *C. nitida*. I cannot distinguish it from the smaller typical plant, though it has a wider geographical range, extending to Arctic America, where it was found at Bear Lake by Sir John Richardson, and in Greenland by Vahl. I have followed Grenier and Godron in restoring the name of Allioni to this species. No one has noticed the roughness on the perigynium in the typical plant. It is but occasional, sometimes a few teeth on the rostrum only, but at others observable on the body and margins. Ledebour says of his *C. nitida*, which is the var.  $\beta$ , "rostro hispidulo." I believe in all the forms the orifice of the perigynium is entire, but, from its scarios texture, it is easily ruptured on the protrusion of the style and stigmata. The female squamæ are commonly obtuse and mucicous, but they vary to a lanceolate acute form, with the middle nerve excurrent. The habit is the same in all, viz. the stoloniferous root; the shining coriaceous perigynium, with its hyaline orifice; the cleft *amplectent*, or, in the occasional third spiculæ of the type and var.  $\beta$ , the *vaginate* bract; the leaves similar in texture and form, varying in width, sometimes as narrow in the typical plant as in the var.  $\gamma$ .

The specimens figured are,—

Tab. DXXXIII. "*C. nitida*." From Germany.

Tab. DXXXIV.  $\beta$ . "*C. conglobata*." From Altai.

Tab. DXXXV.  $\gamma$ . "*C. supina*." The details (except one from Greenland) from Germany.

n. 1. Ikkatak Bay, *Hörneman*.

n. 2. Bear Lake, North America.

n. 3. Greenland.

n. 4. Berlin.

### [389. *C. vesicaria*.

Tab. DXXXVI. Specimen from Ohio, *Sullivant*.

Tab. DXXXVII. var.  $\beta$ . Saturna Island, N.W. America, Dr. *Lyll*.

No observations of Dr. Boott's accompany either Plate.—*J. D. H.*]

390. *C. binervis* (Smith); spica elongata demum fusco-sanguinea, e spiculis 4 rarius 3-5 vel pluribus oblongis vel cylindricis densifloris, terminali mascula, reliquis femineis, superioribus rarius apice masculis approximatis, inferioribus remotis longe exserte pedunculatis sæpe nutantibus, infima vel inferioribus subinde basi compositis; bracteis semper culmo brevioribus, inferioribus longe vaginatis; stigmatibus 3; perigyniis late ovalibus vel ellipticis inæqualiter obtuse triquetris late brevi rostratis bifurcatis, superne ad margines sæpe scabris, viridibus demum plus minus fusco-sanguineis lucidis leviter vel obscure nervatis, nervis marginalibus viridibus (*antice visis*) magis prominentibus, achenium laxè ves-

tientibus, squama ovata æquilata obtusa vel acuta apice ciliata brevi cuspidata fusco-sanguinea medio viridi nervata longioribus.—*C. binervis*, *Smith*, *Linn. Trans.* v. 268; *Eng. Bot. t.* 1235; *Eng. Fl.* iv. 110; *Willd.* 271; *Schk. f.* 160; *Koch*, 885; *Reich.* 24, t. 255; *Andersson*, 22, t. 8, f. 98; *Lange*, 124; *Gren. et Godron*, 426; *Bromfield*, 565 (*non Wahl., Kunth, Dewey*). *C. distans*, *Light*. *C. distans*,  $\beta$ . *Hampeana*, *Reich.* 23, t. 254. *C. distans*, *c*, *Bentham*, 566. (TAB. DXXXVIII.—DXXXIX.)

HAB. In Europa et Asia, in ericetis.—Norway to Germany. Mount Taurus, *Kotschy* (*Herb. Bentham*).

*Culmus* 1-4-pedalis, gracilis vel validus, rigidus, obtusangulus, lævis, apice angulis acutis scabris; pars spicas gerens 4-15 poll. longa. *Folia* 1-3 lin. lata, culmo breviora, rigida, carinata, marginibus revolutis, glaucescentia. *Bractea* inferiores spicis suis longiores, superiores setaceæ, sæpe obsoletæ. *Vagina* infima quandoque  $2\frac{1}{2}$  poll. longa. *Pedunculi* filiformes, scabri, semper vaginis sæpe duplo longiores. *Spica* mascula 9-18 lin. longa, 1-2 lin. lata, sæpe sessilis, rarissime 2 vel apice feminea. *Squamæ* arcte imbricatæ, obtusæ, ciliatæ, margine albidæ, nervo in superioribus sæpe extra producto. *Spica feminea* 2-8, sæpius 4 vel 3-5, summa vel superiores sæpe abbreviatæ; *masculæ* contiguæ sessiles, vel omnes vaginatæ, inferiores remotæ, longe exserte pedunculatæ nutantes; *infima* (subinde 9 poll. remota) vel binæ inferiores, basi spiculis 1-2 brevibus (bractea squamæformi cuspidata suffultis, e perigynii apice vel latere progredientibus) compositæ, oblongæ, minores 4-8 lin. longæ,  $2\frac{1}{2}$  lin. latæ, vel cylindricæ 18-20 lin. longæ, 4 lin. latæ. *Perigynium* late ovale,  $1\frac{1}{2}$ -2 lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum; vel ellipticum,  $2\frac{1}{2}$  lin. longum,  $\frac{8}{10}$  lin. latum; antice nervis marginalibus (intra margines sitis) viridibus validioribus, aliter utrinque irregulariter leviter nervatis, vel nervis e basi sursum plus minus evanidis vel obsoletis, lucidum, quasi vervece rubro-sanguinea hic illic linitum. *Achenium* 1- $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, ovale vel obovatum, olivaceum; basi styli æquali.

I am indebted to Professor Dickie for the specimens of this plant from Aberdeen, which are here figured. He remarks that it is "*small in open moors, and from one to four feet in moist shady woods.*"

I find in 75 specimens—

|                  |                       |                     |
|------------------|-----------------------|---------------------|
| 1 with 2 spikes. | 68 with 1 male.       | In 22, lower spikes |
| 16 " 3           | 3 " 2                 | compound.           |
| 38 " 4           | 3 ter. apice feminea. |                     |
| 14 " 5           | 1 ter. versus apicem. |                     |
| 4 " 6            |                       |                     |
| 2 " 8            |                       |                     |

Smith described this species in 1800, from specimens which he had received from Aberdeen,—Lightfoot having previously considered it to be the *C. distans*, L., to which Bentham has again referred it as a variety, associating other species with it which I think are different from both, especially *C. depauperata*, Good. Smith insists principally upon the intramarginal nerves observable on the anterior surface,—a character common to *C. distans*; the absence of any other nerves; the cylindric, often compound spikes; and the vagina being shorter than the peduncles. I confess that, on a reference to the more essential characters of the two plants, the inference is that they are mere variations of one species. *C. binervis* is found often on open moors, and *C. distans* in marshes near the sea.

A *C. distanti* differt spica rubro-sanguinea; spiculis pluribus, femineis longioribus latioribus, longe exserte pedunculatis, sæpe compositis nutantibus; perigyniis rubro-sanguineis, lucidis, magis ventricosus, obscure nervatis; squamis ciliatis.

391. *C. lævigata* (Smith); spica elongata olivaceo-castanea, e spiculis 4-5 rarius 3-6 cylindricis, mascula 1 rarius 2, reliquis femineis, suprema sæpe abbreviata sessili, inferioribus distantibus exserte pedunculatis nutantibus, infima basi attenuata laxiflora; bracteis inferioribus longe vaginatis, spiculas superantibus; stigmatibus 3; perigyniis elliptico-lanceolatis, subæqualiter riquetris, longiuscule tenuiter rostratis, alte bicuspidatis, sæpius superne ad margines scabris, nervatis olivaceis, punctis rubris undique notatis, membranaceis, oblique adscendentibus, achenium arcte vestientibus, superne vacuis, squama ovato-lanceolata acuminata acuta vel cuspidata demum castanea longioribus vel æquantibus. Variat sp. terminali basi vel apice et basi mascula, inferioribus basi compositis.—*C. lævigata*, *Smith, Linn. Trans.* v. 272; *Eng. Bot. t.* 1387; *Eng. Fl.* 122; *Wahl. Act.* 153; *Willd.* 295; *Schk. f.* 116 et 162; *Kunth*, 493; *Koeh.* 886; *Reich.* 23, t. 254; *Lange*, 124; *Gren. et Godr.* 427; *Fl. Ross.* 296; *Gaud. Helv.* 104; *Bromfield*, 566; *Carey*, 528. *C. patula*, *Schk.* *C. biligularis*, *Dec. Hort. Monsp.* *C. neglecta*, *Degl. Lois. Fl. Gall.* *C. binervis*, *Dewey, Sill.* 30, 61. *C. distans*, *a, Bentham*, 566. (TAB. DXL.)

HAB. In Europa et America septentrionali.—Middle Russia to France and Germany. Near Tewksbury, Massachusetts, *B. D. Greene, Esq.*

*Culmus* 4-6-pedalis, gracilis, lævis, inter spiculas scabriusculus; pars spicas gerens 1-4½ ped. longa. *Folia* 2-6 lin. lata, culmo breviora, plana. *Spicula mascula* 1-2½ poll. longa, squamis superioribus cuspidatis; *femineæ* (nisi subinde summa) 7-24 lin. longæ, 3-4 lin. latæ, summa sessilis, quandoque parva masculæ contigua, vel omnes cylindricæ distantes, suprema sæpe inserta, reliquæ exserte pedunculatæ, infima basi attenuata, pendula, 1-2 pedes remota. *Pedunculi* filiformes, læves. *Vagina* infima 2-3 poll. longa. *Squamæ femineæ* cuspidatæ, vel muticæ, plus minus apice ciliatæ. *Perigynium* 2 $\frac{2}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium* stipitatum, vel suborbiculato-triquetrum,  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, vel ovale, cum stipite 1 $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, acute triquetrum, fuscum, punctulatum; basi styli subincrassata.

Dr. Bromfield remarks that this species invariably blooms a month before *C. binervis*. It is distinguished from that plant by its colour, more graceful female spiculæ, the acuminate and longer cuspidate squamæ, the elliptic, more equally triquetrous perigynium, which is closely applied to the achenium, of an olive-green colour dotted uniformly with small reddish points; a longer and more slender rostrum; and by its broader leaves. Smith says the male spiculæ are usually two, but, like Bromfield, I have only observed one.

I have never seen any specimen from the north of Europe, and it is not noticed by Fries or Andersson. No one has found it in North America since Greene. His specimen is in Herb. Hooker.

In 26 specimens, I find—

|                  |                                   |
|------------------|-----------------------------------|
| 4 with 3 spikes. | 23 una mascula.                   |
| 10 „ 4           | 2 sp. ter. basi mascula.          |
| 12 „ 5           | 1 sp. ter. basi et apice mascula. |
|                  | 4 with 2 female.                  |
| 10 „ 3           |                                   |
| 12 „ 4           |                                   |

In spec. 1, spiculis 2 inferioribus basi spicula altera compositis.

[Var.  $\beta$ . *Welwitschii*, Boott.—*C. Welwitschii*, *Boiss. in Herb. Lusit. M. Itin.* 841. (TAB. DXLI.)

HAB. Lusitania, *Welwitsch.*—In Trans Tagi palustr. umbrosis, prope Villa Formosa, prov. Algarba, *Welwitsch*, 574 (1848).

The specimen figured is from Welwitsch, and is accompanied with the following observation:—“*C. lævigata*,  $\beta$ ? (vix species F. B.). *C. Welwitschii*, Boissier. A forma typica differt solum culmo validiori, foliis firmis, spicis femineis densifloris, squamis apice ciliatis. In forma typica, squamæ subinde muticæ, apice ciliatæ.”—*J. D. H.*]

392. *C. aquatilis* (Wahlenberg); spica elongata viridipurpurea vel pallida, e spiculis 6-5 rarius 4-8, masculis 2-3 rarius 1-4 extremis longioribus, femineis 3-4 rarius 2-5 densifloris, superioribus apice masculis sessilibus cylindricis, infima basi attenuato-laxiflora clavata subinde pedunculata; bracteis evaginatis, culmo sæpe multum longioribus, inferioribus amplectentibus; stigmatibus 2 rarius 3; perigyniis obovatis rarius orbiculatis vel ellipticis rostellatis, ore integro, enerviis, rarius antice 1-2 nervatis, stipitatis, granulatis, pallidis, squama lanceolata acuta vel obtusa subinde cuspidata pallida castaneotincta vel purpurea margine hyalina latioribus brevioribus vel longioribus.—*C. aquatilis*, *Wahl. Act.* 165; *Fl. Lapp.* 246; *Fl. Succ.* 612; *Willd.* 303; *Kunth*, 413; *Fries, Mant.* 3, 148; *Summa*, 229; *Andersson*, 46, t. 5, f. 54; *Lange*, 78; *Reich.* 15, t. 234; *Fl. Ross.* 312; *Dewey*, 10, 267; *Torr. Cyp.* 400; *Carey*, 518; *Sartwell, Exs. n.* 56. (TAB. DXLII.-DXLV.)

Var.  $\beta$ . *minor*.—*C. aquatilis*, *Eng. Bot. t.* 2758. *C. aquatilis*, var. *epigejos*, *Fries*. *C. borealis*, *Lange*, 33. *C. stans*, *Drejer, Rev.* 40. *C. anguillata*, *Drejer, Rev.* 36. *C. arctophila*, *Nyl.* *C. cæspitosa*, *a, Bentham*.

HAB. In Europa, Asia, America septentrionali.—Lapland to the north of Europe. Behring's Straits, *Wright (Herb. Gray)*. Arctic America to New York. Rocky Mountains.

*Radix* stolonifera. *Culmus* 2-3-pedalis, obtusangulus, lævis, vel apice infra et inter spiculas angulis acutis plus minus scabris, rigidus, strictus, basi spongiosus, rudimentis foliorum vaginisque rubro-purpureis tectus; pars spicigera 6-12 poll. longa. *Folia* 1½-3 lin. lata, culmo sæpe longiora, in latioribus nodosa. *Bracteæ* omnes foliaceæ, vel suprema setacea; inferiores elongatæ; infima subinde 2 pedes longa, basi semper amplectens. *Auriculæ* parvæ, discretæ, subrotundæ vel connatæ, pallidæ vel purpureæ. *Pedunculus* infimus ½-1½ poll. longus. *Spicula mascula* 1-2 poll. longæ, infima sæpe bracteata; *femineæ* 1½-3 poll. longæ, 3 lin. latæ, erectæ, infima vel inferiores clavatæ. *Squamæ masculæ* lanceolatæ, acutiusculæ, vel oblongæ, obtusæ, purpureæ, nervo pallido, apice membranaceæ, demum ferrugineæ; *femineæ* (masculis similes) purpureæ vel pallide castaneæ, inferiores rarius (in speciminibus Europæis et Americanis) cuspidatæ. *Perigynium* 1 $\frac{2}{10}$  lin. longum, 1 lin. latum, orbiculatum; vel 1 $\frac{3}{10}$ - $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, obovatum; vel 1 $\frac{6}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum, ellipticum, enervium, rarius nervo unico centrali viridi, demum ferrugineum micante granulatum. *Achenium*  $\frac{7}{10}$  lin. longum et latum, orbiculatum, basi styli abrupte terminatum; vel  $\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, obovatum, sensim in basin styli apiculatum, lenticulare, fuscum, punctatum; vel  $\frac{8}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum, ovale, triquetrum.

Var.  $\beta$ . *minor*; culmus brevior, obtusangulus, lævis; folia

angustiora; bractæque breviores; spiculæ minores; squamæ semper intensius purpureo-coloratæ.

НAB. In Europa, in montibus Scotiæ. America arctica.—Grœnlandia. Montibus Saxosis.

The American specimens from New York are paler than those from the North of Europe, and the culm often, but not always, has sharper and rough angles. But Lapland specimens from Wahlenberg differ only in degree in these particulars. Both in Europe and America the lower female squamæ are occasionally cuspidate and 3-nerved. Sartwell's specimens exhibit rarely the central nerve or compressed angle and the triquetrous achenium; but, as this form is noticed in the var.  $\beta$ , I suspect it would occasionally be found in the typical form in the north of Europe.

As Andersson has especially noticed the variations of this species, I copy his observations, especially as they bear on the affinity of its smaller forms with other species:—

“*C. aquatilis*; sp. fem. 2–3 remotis, sessilibus vel ima pedunculata, strictis, cylindricis, obtusis, densifloris; bracteis latissimis, strictis, ima subvaginante; fructibus regulariter dispositis, rotundato-ovatis, obtusiusculis, compressis, enervibus, squamas subsuperantibus; culmo obtusangulo, stricto; foliis latis canaliculatis; radice stolonifera.

“Var. *virescens*; culmo sæpe bipedali, trigono, foliis culmum multo superantibus; bracteis latis, spicas masculas superantibus, femineis quasi involventibus; spicis clavæformibus; fructibus squamas obtusas pallidas superantibus;—viridi-cæsia.

“Var. *sphagnophila*; culmo pedali, obtusangulo; foliis culmum æquantibus; bracteis brevioribus; spicis cylindricis; fructibus squamas acutas pallidas æquantibus;—pure viridis.

“Var. *epigejos*; culmo subpedali, superne scabro; foliis planis striatissimis; bracteis spicam masculam subæquantibus; spicis femineis subrarifloris, oblongis; fructibus flavo-viridibus; squamis fusco-atris, fere brevioribus;—fusco-viridis.

“Var. *flavicans*; culmo digitali, obtusissimo; vaginis sæpe aphyllis; foliis latis, acutis; spicis confertis, lanceolatis; fructibus acutis, squamas subulatas vix æquantibus;—pallide glauca.

“Var. *cuspidata*; culmo elatiori; spicis distantibus; squamis triplinerviis, nervo medio in cuspidem integram sæpe producto; fructibus angustioribus.

“Loca quum inhabitat species hæc temperatiora et media Scandinaviæ, ab omnibus Carieibus distigmaticis luculenter diversa.—Radix valida. Culmus lævissimus, trigono-obtusangulus (ut nulla alia); basi polyphyllopodus, sesquipedalis, orgyalis. Folia, vaginis rufo-pallidis omnino ebrillosis late canaliculatis, glaucovirescentia, interdum angustiora. Spicæ sæpius valde remotæ, fere clavæformes, strictæ; bracteis longis latisque, basi quasi obvolatæ. Fructus sæpissime obtusi, pallide cæsi, squamas obtusas, pallide virides, superantes, enerves.

“Quo magis autem loca alpium adscendit, eo magis ab hac forma typica recedit, habitumque alpinum, ut ita dicam, induit. In convallibus subalpinis, ubi in societate *C. vulgaris* et *C. rigida inferalpina*, ad ripas aqua rapide fluenti subinundatas crescit, staturam obtinet minus elatiorem; folia angustiora; spicas magis confertas, fusciores, imas brevipedunculatas; fructusque squamas acutas vix superantes (*C. sphagnophila*). Hoc statu *C. limulæ* simillima, sed culmo lævi, foliis minime asperrimis, fructibusque, etc., distincta.

“Regionem arborum derelinquens et in clivibus humidis alpium vel juxta lacus minores cum *C. rigida* et *C. hyperborea* obvia, iis non dissimilis. Culmus humilior, sursum scabriusculus. Folia breviora, planiuscula, apice triquetra. Spicæ sessiles. Squamæ acutæ, fructus virides obsolete nervosos basi subinvolventes, atro-purpureæ, fuscescentes. Spica mascula (basi ut in omnibus affinis interdum feminea) sæpissime solitaria (*C. epigejos*).

“Ad eam partem regionis alpinae, quæ nive perenni undique circumdatur denique progrediens; statura contracta; culmo foliis latis glaucis et vaginis subaphyllis densissime obsito; spicis approximatis et obtusis, colore demum glauco-flavescente, ab omnibus formis alpinis diversa, sed habitu toto ad normalem evidenter accedit. Locis aqua nivali semper inundatis enata, hinc colorem,

staturam et formam omnium partium curtam obtinet (omnino ut *C. rotundata*, extrema forma stirpis glaucescentis *C. ampullaceæ*).

“Litora demum Maris Occidentalis, Glacialis et Albi, ripasque fluviorum Lapponiæ (maxime frigidæ) Tornensis Fenniæque cum *C. salina* et affinis occupans, harum specierum ita sibi præfert habitum, ut non nisi summa difficultate distinguatur; culmo procer; foliis latis viridioribus; spicis remotioribus; pedunculis exsertis, nonnunquam pendulis; squamis triplinerviis in cuspidem productis; fructus minute rostratos superantibus iis congruit. Culmo autem semper obtusangulo, foliis demum involutis, et squamis fructus compressos enerves non involventibus, sed iis angustioribus diversa. Num hæc forma speciei originaria?”

The affinity of the smaller forms to *C. rigida* and *C. hyperborea* is evident, but I have seen no specimens I could compare with *C. salina*. The American specimens, with the lower squamæ cuspidate and 3-nerved, from New York, and a larger specimen, with broad nodose leaves, from English River, have all the characters of the typical form. This form presents no invariable marks of difference from Europe and America, and certainly differs, as Andersson remarks, from all its allies; and there is a gradual transition from the smaller to the larger forms. The rigid, obtuse-angled smooth culm, and the amplectent base of the bracts, with the nerveless perigynium, distinguish the var.  $\beta$  from *C. vulgaris*, with which Bentham unites it.

Of the typical form I find—

Lapland and Denmark.

|                  |                |                  |
|------------------|----------------|------------------|
| 1 with 5 spikes. | 3 with 2 male. | 9 with 3 female. |
| 10 „ 6           | 9 „ 3          | 3 „ 4            |
| 1 „ 7            |                |                  |
| —                | —              | —                |
| 12               | 12             | 12               |

In 5, the 1–2 upper female are male at top.

Arctic America.

|                  |                |                  |
|------------------|----------------|------------------|
| 6 with 5 spikes. | 9 with 2 male. | 6 with 2 female. |
| 13 „ 6           | 11 „ 3         | 7 „ 3            |
| 3 „ 7            | 2 „ 4          | 8 „ 4            |
|                  |                | 1 „ 5            |
| —                | —              | —                |
| 22               | 22             | 22               |

In 12, the 1–2 upper female male at top.

In all, female male at top.

New York.

|                  |                |                  |
|------------------|----------------|------------------|
| 9 with 6 spikes. | 3 with 2 male. | 1 with 2 female. |
| 5 „ 7            | 12 „ 3         | 5 „ 3            |
| 2 „ 8            | 1 „ 4          | 8 „ 4            |
|                  |                | 2 „ 5            |
| —                | —              | —                |
| 16               | 16             | 16               |

In 8, the 1–2 upper female male at top.

Of the var.  $\beta$ . *minor*—

Norway and Lapland.

|                  |                |                  |
|------------------|----------------|------------------|
| 1 with 4 spikes. | 4 with 1 male. | 2 with 3 female. |
| 4 „ 5            | 3 „ 2          | 5 „ 4            |
| 2 „ 6            |                |                  |
| —                | —              | —                |
| 7                | 7              | 7                |

Scotland.

|                  |                |                  |
|------------------|----------------|------------------|
| 1 with 4 spikes. | 1 with 1 male. | 1 with 2 female. |
| 5 „ 5            | 7 „ 2          | 10 „ 3           |
| 7 „ 6            | 7 „ 3          | 3 „ 4            |
| 2 „ 7            |                | 1 „ 5            |
| —                | —              | —                |
| 15               | 15             | 15               |

In the 1–3 upper female male at top.

In 3, all male at top.

Arctic America.

|                  |                |                  |
|------------------|----------------|------------------|
| 1 with 3 spikes. | 6 with 1 male. | 7 with 2 female. |
| 5 „ 4            | 9 „ 2          | 7 „ 3            |
| 10 „ 5           | 3 „ 3          | 3 „ 4            |
| 2 „ 6            |                | 1 „ 5            |
| —                | —              | —                |
| 18               | 18             | 18               |

In 7, the upper female male at top.



| <i>Greenland.</i>       |                |                  |
|-------------------------|----------------|------------------|
| 4 with 3 spikes.        | 7 with 1 male. | 4 with 2 female. |
| 2 „ 4                   | 1 „ 2          | 3 „ 3            |
| 1 „ 5                   | 1 „ 3          | 1 „ 4            |
| 2 „ 7                   |                | 1 „ 6            |
| 9                       | 9              | 9                |
| <i>Rocky Mountains.</i> |                |                  |
| 1 with 4 spikes.        | 2 with 1 male. | 7 with 3 female. |
| 6 „ 5                   | 6 „ 2          | 2 „ 4            |
| 1 „ 6                   | 1 „ 3          |                  |
| 1 „ 7                   |                |                  |
| 9                       | 9              | 9                |

The var.  $\beta$  was found on the Clova Mountains, Scotland, by Sir W. J. Hooker and Dr. Greville, in 1824, where, Dr. G. says, "It is very common on the flat marshy table-land. In places from which the water was drained it was only 9-10 inches in height with shorter and closer spikes." The large size of the typical form noticed by Wahlenberg, Fries tells me, is exceptional. Drejer does not include *C. aquatilis* in his 'Revisio;' but I have no hesitation in referring his *C. stans* to the var.  $\beta$ , and Fries refers *C. anguillata* to *C. aquatilis*.

The specimens figured are,—

Tab. DXLII. Two specimens from New York, the culms smooth, perigynium occasionally with a central compressed angle and triquetrous achenium.

Tab. DXLIII.

- n. 1. Specimen from Rocky Mountains, *Bourgeau*.
- n. 2. Vancouver Island, with a nerved perigynium and long lower peduncle.

Tab. DXLIV.

- n. 1. Bear Lake.
- n. 2. Dcvrefeld.
- n. 3. Greenland.

Tab. DXLV. var.  $\beta$ .

- n. 1. From Clova, Scotland.
- n. 2. From Greenland. *C. stans*, Dr., from Vahl.

393. *C. suberea* (Boott); spica plus minus clongata, e spiculis 2-5 remotis erectis, masculis 1-3 gracilibus cylindricis fulvis, reliquis 1-2, femineis oblongis crassis brunncis evaginatiss vel infima nunc distanti longe exserte pedunculata; bracteis (nisi subinde infima) evaginatiss culmum superantibus; stigmatibus 3; perigyniis oblongo-ellipticis breve lateque rostratis, ore submembranacco integro antice obliquo aperto obtusissime trigonis crebre nervosis sulcatis glabris subercis fusco-brunncis, squama late ovata acuminata pallida, margine albo-hyalina latioribus longioribus. (TAB. DXLVI.)

HAB. Insula Tsus-Sima, Japan, *Wilford*, n. 768 (*Herb. Hooker*).

Cæspitosa. *Radix* fibrosa. *Culmus* 1½-pedalis, triqueter, gracilis, firmus, lævis; pars spicigera 4-11 poll. longa. *Folia* lineam lata; culmo longiora, firma, plana, apice setaceo-attenuata, curvata. *Bractea* evaginata; culmo longiores, vel infima vagina pollicari instructa. *Auricula* parvæ, rotundatæ, purpureæ. *Pedunculus* infimus 3-6 lin., vel in uno specimine 3½ poll. longus. *Spicula mascula* e *feminea* remotæ, 1-3, suprema 15 lin. longa, 1½ lin. lata, reliquæ breviores, infima nunc remota longe bractea; femineæ 1-2, erectæ, 8-12 lin. longæ, 6 lin. latæ; infima breve pedunculata, vel rarius 6 poll. remota, longe exserte pedunculata. *Squama mascula* lanceolata; majores fulvæ, margine angustæ, albo-hyalinæ; superiores acutæ. *Perigynium* 3 $\frac{3}{10}$ - $\frac{5}{10}$  lin. longum, 1 $\frac{2}{10}$ - $\frac{4}{10}$  lin. latum. *Achenium* conforme, 2 $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum,

oblongo-trigonum, stramineum; basi styli persistente crassiore.

In 20 specimens I find—

| 1 with 2 spikes. | 1 male. | 1 female. |
|------------------|---------|-----------|
| 9 „ 3            | 2       | 1         |
| 6 „ 4            | 2       | 2         |
| 2 „ 4            | 3       | 1         |
| 2 „ 5            | 3       | 2         |

A *C. nutanti* differt ore perigynii integro; à *C. Hitchcockiana*, cui accedit, differt spiculis masculis pluribus femineis crassis, plurifloris, ore membranaceo, vaginis glabris.

[394. *C. Camposii*, *Boiss. et Reuter*, *Pug. Pl. Nov.* 117. (TAB. DXLVII.)

HAB. Hispania.—Sierra Nevada, *Boissier et Reuter*, 1849; *Bourgeau*, *Coll.* 1851 et 1852.

I find no observations accompanying this Plate in Dr. Boott's collections, and I have taken the habitats from *Herb. Hooker*.—*J. D. H.*]

395. *C. acuta* (Linn.); spica elongata atro-purpurea rarius ferruginea, e spiculis 4-8 oblongis vel cylindricis, masculis 1-4 contiguis erectis sessilibus, femineis 1-5, superioribus sæpe apice masculis sessilibus, infima remota basi attenuata breve pedunculata vel binis inferioribus basi interrupte dissitifloris nunc longissime pedunculatis nutantibus vel pendulis subinde basi compositis; bracteis (nisi rarissime infima) evaginatiss, inferioribus elongatis, culmum superantibus, auriculis parvis rotundatis discretis vel confluentibus purpureis vel elongatis pallidis; stigmatibus 2; perigyniis late ovalibus vel ellipticis vel obovatis rostellatis, ore integro, biconvexis, subinflatis, plus minus nervatis, stipitatis, granulatis, flavidis, purpurco-tinctis, squama lanceolata acuta vel obtusa purpurea nervo pallido rarius excurrente latioribus longioribus vel brevioribus.—*C. acuta*, *L. Sp.* 1388; *Good.* 203; *Wahl. Act.* 165; *Willd.* 304; *Sehk. f.* 92; *Kunth*, 412; *Eng. Bot. t.* 580; *Smith, Eng. Fl.* 119; *Biebst.* 390; *Led. Fl. Alt.* 222; *Fries, Mant.* 3, 151, et *Sum.* 228; *Anders.* 44, t. 5, f. 55; *Lange*, 79; *Koeh*, 873; *Gaud. Agrost.* 123, et *Helv.* 72; *Reich.* 14, t. 231-233; *Fl. Ross.* 313; *Bertol.* 137; *Gren. et Godr.* 403; *Benth.* 562; *Steud.* 215. *C. virens*, *Thuill.* *C. gracilis*, *Curtis, Fl. Lond. t.* 62. *C. prolixa*, *Fries.* *C. tricostata*, *Fries.* *C. Panormitana*, *Guss.* (TAB. DXLVIII.-DLVI.)

Stolonifera. *Culmus* 1-4-pedalis; pars spicigera 4-12 poll. longa. *Folia* 1-3 lin. lata, elongata. *Bractea* foliaceæ, inferiores culmum superantes, infima subinde 15 poll. longa. *Spicula mascula* 1-2½ poll. longæ; *feminea* 1-4 poll. longæ, 2-4 poll. latæ. *Squama* impunctatæ vel pellucidæ, lineatæ. *Perigynium* forma et magnitudine variabile,  $\frac{2}{10}$ -1 $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$ -1 lin. latum, biconvexum, subinflatum. *Achenium*  $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{7}{10}$  lin. latum, orbiculatum vel obovatum, plano-convexum; basi styli æquali apiculatum.

Insigniter variat—

Var. *fluviatilis* (Fries, *Mant.* 3; *Andersson*); forma minor. *Spicula* plus minus oblongæ vel cylindricæ, sessiles. *Bractea* inferiores culmum superantes.—Adspectus sæpe omnino *C. vulgaris* auriculæ parvæ, rotundatæ, discretæ, nec ab ea nisi perigynio biconvexo subinflato distinguenda. De *C. acuta* *Kunthius* dicit, "Nil nisi forma paludosa *C. vulgaris*;" and *Bentham*, "probably a luxuriant variety" of it.

Transit gradatim in—

Var. *prolixa* (Fries); quæ in forma ejus "*protensa*" evolutionem maximam attinet. *Spiculæ* inferiores clongatæ, longe pedunculatæ, pendulæ, basi attenuato-dissitifloræ. *Squamæ* perigynio superantes.

Var. *personata* (Fries); habitus *prolixa*, sed *spiculæ* ferrugineæ. *Squamæ* inferiores aristatæ.

Var. *Panormitana* (Guss. Syn. 575; Parlat. 188; Bertol. 138. *C. acuta*, Parlat. Fl. Pan. 331); habitus et color *personata*. *Squamæ* inferiores sæpe aristatæ. *Perigynia* resinoso-punctata (ut in *C. trinervi*, Degl.), et vaginis reticulato-fissis (ut in *C. stricta*, Good.), auriculis clongatis.

Var. *pallida* (Oregon, *Lyall*). *Spiculæ* oblongæ, pallidæ, approximatae, terminalis mascula; femineæ 5-6. *Perigynia* plurinervia.

Var. *tricostata* (Fries). *Spiculæ* femineæ 3, oblongæ, pallidæ, approximatae, sessiles. *Perigynia* (et sæpe in forma typica) 3-4-nervia. *Folia* clongata.

Var. *staminifera* (Yorkshire); habitus vel formæ typicæ vel *prolixa*. *Perigynia* stamina 3, una vel altera inclusa ferentia, sine vestigio ovarii.

Var. *ambigua*; minor. *Spiculæ* 4, omnino masculæ, vel infima basi parce feminea. In uno specimine Reichenbachio e Germania, sub nomine "*C. vulgaris*, var. *polygama*," misso, perigynium stamina 3 ferens observavi.—*C. ambigua*, *Mœnch*. *C. Mœnchiana*, *Wendr.*; *Reich. t. 232, b*; *Steud. 206*. *C. polyandra*, *Schk. D. D.* *C. vulgaris* (forma), *Fries, Mant. 3, 153*.

The specimens figured are,—

Tab. DXLVIII.

- n. 1. A specimen from Dresden (*Reichenbach*). The spiculæ of a ferruginous colour, as in the var. *personata* and *Panormitana*, the lower one compound at base.
- n. 2. Altai, *Ledebour*. Showing the different forms of the perigynium; the upper squamæ narrow and longer than the perigynium, as in the var. *prolixa*.
- n. 3. Hertford, England, *Colenso*. The squamæ with pellucid lines. The rostellum in n. 1 and 3 longer than in n. 2.

Tab. DXLIX.

- n. 1. Yorkshire, England.
- n. 2. Banks of the Shannon, Ireland. The central specimen approaching the var. *prolixa*, but with shorter squamæ, the lower spicula vaginate, perigynium with occasionally three nerves, as in *C. tricostata*.

Tab. DL.

- n. 1. Sweden, *Fries*. With small orbicular or obovate perigynia,  $\frac{9}{10}$ – $1\frac{1}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{6}{10}$  lin. latum.
- n. 2. Germany, *Weihe*. The lower spicula compound, with small round auricles, as in *C. vulgaris*; the squamæ longer than the perigynium.

Tab. DLI. Specimens from Yorkshire. The perigynium bearing anthers, one opened to show the third anther not exerted. This remarkable variety is noticed by Mr. Brown (*Prod. Fl. Nov. Hollandiæ*, p. 242). The right-hand specimen has the habit of the var. *prolixa*.

Tab. DLII. The var. *personata*. Sweden, *Fries*. The habit of the var. *prolixa*, but the spiculæ of a pale ferruginous colour; the lower squamæ aristate.

Tab. DLIII. The var. *Panormitana*. Sicily, *Parlatore*. Allied to *C. stricta*, Good., in its reticulate vaginæ, and to *C. trinervis*, Degl., in the resinous punctæ on the perigynia; the auricles elongate, lower squamæ aristate, the inflorescence and bracts of the typical form.

Tab. DLIV. A specimen from Oregon, *Lyall*. The spiculæ pale, from the predominance of the perigynia over the squamæ, in size like those of *C. tricostata*, but the nerves on the perigynium more copious.

Tab. DLV. The var. *prolixa*, from Germany.

Tab. DLVI. The var. *tricostata*.

n. 1. From Martius.

n. 2. From Fries.

396. *C. vulgaris* (Fries); spica oblonga viridi-purpurea, e spiculis 3-5 oblongis vel cylindricis erectis contiguus vel approximatis, masculis 1-2, reliquis femineis 1-4 una alterave rarius apice mascula plerumque obtusis densifloris sessilibus vel infima breve (rarius radicali basi alternata longissime) pedunculata; bracteis evaginatæ sæpius culmo brevioribus, auriculis parvis rotundis plerumque discretis; stigmatibus 2, rarius 3; perigyniis ellipticis vel oblongo-ovatis vel suborbiculatis rostellatis, ore integro, conico-stipitatis, utrinque plus minus distincte (3-8) nervatis, granulatis, plano-convexis, rarius subtriquetris, subinde margine parce dentatis, apice sæpius purpureis, basi pallide ferrugineo-punctulatis, membranaceis, persistentibus, squama oblonga vel lanceolata obtusa vel acuta rarissime mucronata atro-purpurea pellucide lineata nervo pallido latoribus longioribus vel brevioribus.—*C. vulgaris*, *Fries, Mant. 3, 155, et Sum. 230*; *Andersson, 47, t. 5, f. 52*; *Lange, 75*; *Koch, 872*; *Reich. 13, t. 226-228*; *Bertol. 133*; *Fl. Ross. 311*; *Tchihat. 578*; *Carey, 517*; *Sartwell, Eas. n. 52*. *C. nigra vulgaris*, *Linn. Fl. Lap. 265 (fide Fries)*. *C. acuta*,  $\beta$ , *Linn. Fl. Succ. 334 (fide Fries)*. *C. cæspitosa*, *Good. Linn. Trans. 2, 195, t. 21, f. 8*; *Eng. Bot. t. 1507*; *Sm. Eng. Fl. 117*; *Willd. 287*; *Schk. f. 85*; *Wahl. Act. 166*; *Kunth, 411*; *Drejer, Rev. 37*; *Led. Fl. Alt. 222*; *Biebst. 617*; *Gaud. Agr. 119, et Helv. 69*; *Brown, Prod. 243*; *Steud. 211*; *Schw. et Torr. 359, et Torr. Mon. 400 (ex parte)*; *Dewey, Sill. 10, 266 (ex parte)*; *Thunb. Jap. 39*. *C. Goodenovii*, *Gay, Ann. Sc. Nat. 11, 191 (1839)*; *Gren. et Godr. 402*. *C. alpina*, *Sut. Helv. (fide Gaudin)*. *C. chlorocarpa*, *Wimmer (Herb. Boott e amiciss. Sonder)*; *Steud. 212*. *C. intricata*, *Tineo*; *Bertol. 127*. *C. antucensis*, *Kunze, 50, t. 13*; *Kunth, 412*; *Desv. Fl. Chil. 211*; *Steud. 212*. *C. stolonifera*, *Hoppe, Icon. n. 41*. *C. bolina*, *Lange, 71*; *Steud. 211*. *C. turfosa*, *Fries, Sum. 228*; *Anders. 43, t. 6, f. 68*; *Lange, 72*; *Steud. 211*. *C. Thunbergii*, *Steud. 221*. *C. elytroides*, *Fries, Sum. 232*; *Anders. 52, t. 5, f. 48*; *Lange, 81*; *Steud. 210*. *C. Gaudichaudiana*, *Kunth, 417*; *Steud. 212*. (TAB. DLVII.—DLXXV.)

HAB. In Europa, Asia, America septentrionali et meridionali, Nov. Hollandia.

*Radix* stolonifera, fibris lanatis. *Culmus* 2-18-pollicaris, triqueter, apice plus minus scaber, basi foliatus; pars spicigera plerumque 2-3½ poll. longa. *Folia* sub lineam lata, culmo breviora, flaccida, basi involuta. *Bractea* (nisi rarius infima radicalis) evaginatæ, culmo plerumque brevioris. *Spiculæ* masculæ 1-2, terminalis 6-18 lin. longa, sub lineam lata; femineæ 2-12 lin. longæ, 2-3 lin. latæ, sæpe sexfariæ, infima rarius radicalis clongata, basi attenuata, dissitiflora, longissime exserte pedunculata. *Squamæ* (luci subjectæ) lineolis pellucidis notatæ. *Perigynium*  $1\frac{5}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, vel  $1\frac{2}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum, nervis paucioribus vel pluribus plus minus validis. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, orbiculatum, lenticulare, vel subinde triquetrum, angulo centrali postico.

Fries, in his *Mant.* 3, 154, remarks of this species, "Formæ et varietates tam infinitæ ut de eisdem libellum facile scriberes." Its affinity, through *C. rigida* (typice perigyniis enervibus) and its variety *hyperborea* (perigyniis leviter nervatis), is with the smaller forms of *C. aquatilis*, the fuller development of which scarcely admits of any comparison, to say nothing of its smooth obtuse-angled culm, more elongated subamplectent bracts, and nerveless perigynium. It is allied also to the smaller forms of *C. acuta*, L., which Kunth considered as "nil nisi forma paludosa," and Bentham thought might be "a mere luxuriant variety;" but, assuming that its larger development is the result of luxuriance of growth, I think the distinction is tenable, from the biconvex subventricose form of the perigynium of *C. acuta*.

I have given several Plates to exhibit its very variable character, one figure in which is instructive, that of *C. stolonifera*, Hoppe (Tab. DLXI.), "e summis alpiibus ad glaciæ æternas, auf den Margaritsen," which has the recurved foliage of *C. rigida*, the nerved perigynium of *C. hyperborea*, the inflorescence and small rounded auricles of *C. vulgaris*.

Var. *alpina*; spica abbreviata vel subelongata, e spiculis 2-5 fuliginosis vel purpureis oblongis contiguis vel approximatis sessilibus, terminali mascula, reliquis femineis densifloris, superioribus sæpe apice masculis, infima subinde remota pedunculata basi laxiflora; bractea evaginata foliacea vel subulata rarius culmum superante, auriculis plerumque amplis; stigmatibus 2 rarius 3; perigyniis ovalibus obtusis vel abrupte rostellatis planoconvexis rarius subtriquetris vel ellipticis acutis, ore integro, enerviis flavidis superne purpureis vel atris, squama ovata obtusa purpurea longioribus:—foliis plus minus falcatis patentibus.—*C. rigida*, *Good. Linn. Trans.* 2, 193, t. 22; *Wahl. Act.* 166; *Willd.* 273; *Schk. f.* 71; *Eng. Bot. t.* 2047; *Smith, Eng. Fl.* 116; *Fries, Mant.* 3, 147, et *Sum.* 233; *Lange*, 83; *Anders.* 53, t. 5, f. 46; *Reich.* 12, t. 225; *Koch*, 873; *Carey*, 517. *C. saxatilis*, *Fl. Dan. t.* 159; *Wahl. Act.* 166, et *Lapp.* 247; *Willd.* 272; *Schk. f.* 40; *Kunth*, 410; *Gay, Ann. Sc. Nat.* 11, 187; *Drejer, Rev.* 41; *Led. Fl. Alt.* 223; *Fl. Ross.* 309; *Steud.* 210; *Dewey, Sill.* 11, 310, et 27, 236; *Torr. Mon.* 397. *C. cæspitosa*,  $\beta$ , *Hooker, Fl. Scot.* 268. *C. compacta*, *Kroch*; *Hoppe*. *C. ensifolia*, *Turcz.* *C. orbicularis*, *Boott, Linn. Trans.* 20; *Steud.* 210.

Var.  $\beta$ . *hyperborea*; spiculis sæpe 6-8, masculis rarissime 2, femineis inferioribus cylindricis angustis basi attenuato-laxifloris remotis, longe pedunculatis, perigyniis sæpe tenuiter nervatis, squama subinde lanceolata acuta brevioribus:—foliis elongatis erectis.—*C. hyperborea*, *Drej. Rev.* 41; *Fries, Sum.* 232; *Anders.* 52, t. 5, f. 47; *Lange*, 82; *Steud.* 210. *C. limula*, *Fries, Sum.* 229; *Anders.* 47, t. 5, f. 53; *Lange*, 77; *Steud.* 214. *C. nigra*, *Schw. et Tor.* 336. *C. Bigelowii*, *Torr. et Schw. An. Tab.* *C. saxatilis*,  $\beta$ . *Bigelowii*, *Torr. Mon.* 397. *C. rigida*,  $\beta$ . *Bigelowii*, *Tuck.* 19; *Carey*, 517; *Sartwell, Exs. n.* 50. *C. Washingtoniana*, *Dewey, Sill.* 10, 272. *C. dubitata*, *Dewey*; *Woods, Bot.* *C. anguillata*, *Drej. Rev.* 36; *Steud.* 214.

HAB. In alpiibus Europæ, Asiæ, Americæ sept.—Behring's Straits. Oregon. Rocky Mountains.

Inter *a* et  $\beta$ , nec limites dantur nec eas à *C. vulgari* et *C. aquatili* facile est distinguere, ut plane patet ex observationibus auctorum, et ex specimenibus pluribus in herbariis ad unam vel alteram ægre allatis.

Variat culmo 4-18 lin. longo, erasso, debili, acutangulo vel obtusangulo, curvato vel recto, lævi vel superne scabro; foliis  $\frac{1}{2}$ -4 lin. latis, culmo brevioribus vel elongatis æquantibus, patentibus arcuato-recurvis vel stricte erectis, marginibus deflexis; bractea foliacea, spicula vel culmo longiore, vel setacea brevioribus; auriculis amplis vel infima parva, rotundata, discreta vel connata; spiculis 2-5, vel 6-8, 3 lin. ad  $1\frac{1}{2}$  poll. longis, 1-3 lin. latis, obtusis, acutis, fuliginosis concoloribus, vel purpureis vel purpureo-ferrugineis, abbreviatis congestis sessilibus densifloris, vel ovalibus oblongis approximatis vel cylindricis subremotis, infima brevis (rarius radicali longe) pedunculata, vel inferioribus pedunculatis, clavatis, basi attenuato-laxifloris, superioribus sæpe apice masculis, rarius omnibus femineis, terminali 1 rarius 2, mascula vel summa basi vel medio vel apice feminea; squamis fuliginosis concoloribus vel purpureis, nervo pallidiore vel fusco-ferrugineis, marginibus anguste albo-hyalinis, ovatis rotundatis obtusis vel lanceolatis, acutis, perigynio brevioribus vel longioribus, nervo rarius excurrente, rarius (luce subjectis) pellucide-lineatis, masculis sæpe ferrugineis; perigyniis  $1-1\frac{7}{10}$  lin. longis  $\frac{3}{10}-\frac{5}{10}$  lin. latis, ovalibus ellipticis obovatis vel suborbiculatis, obtusis vel subacutis, crostellatis vel abrupte vel sensim rostellatis, ore integro vel rarius emarginato, achenium laxe vel arcte vestientibus, nunc apice modice excurvatis, viridibus vel flavidis superne purpureo-tinctis vel fuliginosis, basi pallidis, plus minus tenuiter granulatis, rarissime marginibus superne parce dentatis, enerviis vel basi obsolete vel tenuiter nervatis, planoconvexis vel biconvexiusculis vel ab angulo centrali postice prominente subtriquetris; achenio obovato vel ovato, vel elliptico-lenticulari vel triquetro, ferrugineo, angulis pallidioribus; stigmatibus 2, rarius 3; stylo sæpe porrecto.

*C. rigida* was established by Goodenough in 1792, on specimens from the mountains of Wales and Scotland, and was characterized by a thick, rigid, often curved culm, rigid recurved leaves, and a nerveless perigynium,—though this last character was not noticed by him, but has been insisted upon by those who have since adopted the species. Sir W. J. Hooker, in his *Fl. Scotica*, was inclined to consider it an alpine form of *C. vulgaris*, an opinion to which the author of the *Fl. Rossica* leans. On a patient examination of a large suite of specimens from Wales, Scotland, the North of Europe, Asia, and North America, I can find no character constant, and a transition to *C. vulgaris*, *C. aquatilis*, and *C. stylosa*, which renders the determination of many specimens very embarrassing. In 1841, Drejer, in his 'Revisio,' proposed *C. hyperborea*, but with some hesitation; and he has been followed, with more confidence, by Fries, Andersson, and Lange. The principal characters are a taller, gracile, straight culm; longer, narrower, straight, erect leaves; occasionally elongate, lax-flowered female spikes; and frequently an obscurely-nerved perigynium. But here the characters constantly elude us.

I must refer those who are curious upon the subject of implied distinctions to the works of the later authors I have quoted. I will only observe that one of the most accurate, Andersson, has two varieties of *C. hyperborea*, "var. *latifolia*, quæ etiam alpes summæ inhabitat, *C. rigida*, *C. limulæ*, et *C. aquatili epigejos* maxime cognata; et var. *angustifolia*, *C. vulgaris* et *C. aquatili sphagnophilæ* non dissimilis."

Of *C. rigida* Andersson has three varieties:—"Var. *inferalpina* (luxurians): pedalis et ultra, foliis latissimis, inferioribus subexcurvatis, superioribus erectis; bracteis late foliaceis, planiusculis; spicis femineis inferioribus exserte pedunculatis, clavatis, subrarifloris, ad masculam approximatis, glumis acutiusculis. Var. *saxatilis* (normalis): culmo 6-10 uncias elato; foliis excurvis, rigidis, carinatis; bracteis angustis brevibus; spicis femineis oblongis, sessilibus, remotiusculis, infima pedunculata; glumis sæpe acutis. Var. *glacialis* (*pumila*): culmo digitali; foliis patentibus, plerisque emarcidis, marginibus valde revolutis; bracteis in cuspidem herbaceam mutatis; spicis ovato-globosis, approximatis,

sessilibus; fructibus (a larvis) sæpissime inflato-degeneratis; glumis obtusis."

He remarks:—"Ex hac serie formarum judicari potest, quam sit polymorpha hæc alpibus maxime proprie species. Jam in iis Caricum speciebus, quarum distributio regionibus meridionalibus ad summum septentrionem valde est extensa (*C. ampullacea*, *C. vesicaria*, *C. aquatilis*, etc.), earumque formis primariis proponendis, probare conati sumus, quanta sit vis climatis varietatis e locorum indole diversa procreandi notabilis. Stationum enim subalpinarum perigoniorum et herbæ magis faventium incola, luxuriantes evadunt partes omnes (*inferalpina*), in locis aridis parce graminosis alpium magis contrahitur planta (*saxatilis*), donec in cacuminibus perfatis et sterilissimis alpium humilior et obesior exstat (*glacialis*). Per loca regionum alpestrium Scandinaviæ fere omnia arida aut aquis stagnantibus repleta, humo fere denudata aut graminibus densissimis vestita et in societate ceterarum Caricum borealium (præsertim *C. aquatilis*, *C. turfosa*, et *C. limulæ*) tam late frequentissime occurrens, necesse est hæc species mirum in modum variat, et formis numerosis et intricatis inconstans videatur. Qui legem hybriditatis jucundam et commodam amant, vel in speciebus novis quam plurimis ex differentiis ('characteribus') perexiguis proponendis summam capessunt lætitiâ, iis campus vastissimus hic patet. Credo tamen neminem in hac varietatum, affinitatum et formarum turba infinita Ordinem redigere posse, nisi qui plantas locis suis natalibus sedulo perscrutans et omni sententia præjudicata solutus, naturam sequi sibi propositum habet."

Var. *elytroides*; spiculis atro-purpureis contiguis erectis, masculis 1-2 cylindricis, femineis 2-3 infima clavata subsessili; bracteis culmo brevioribus, auriculis rotundis discretis; stigmatibus 2; perigyniis ovalibus vel obovatis stipitatis rostellatis, ore integro vel subemarginato, granulatis superne ad margines parce denticulatis, utrinque nervatis, squama obtusa vel acuta atro-purpurea nervo pallido lineolis pellucidis notata subæquilata brevioribus vel paulo longioribus.—*C. elytroides*, *Fries*, *Sum.* 232; *Anders.* 52, t. 5, f. 48; *Lange*, 81; *Steud.* 210. (TAB. DLXIII.)

HAB. "Ad littora marina Hollandiæ, Sueciæ australis," *Fries*.

This form is described by all the above authorities as having a nerveless perigynium and one male spicula; and by Fries and Andersson with a *smooth*, and by Lange with a *rough*, culm. I have two specimens from Fries with 1-2 male spiculæ, a distinctly-nerved perigynium, and a rough culm. Fries describes the squamæ as obtuse or mucronate.

In North America there is an analogous form, which I have from Tuckerman and Nuttall, from Cambridge, and which has some characters common to the *C. cæspitosa*, Brown, from New Holland (the *C. Gaudichaudiana*, Kunth):—

Var. spiculis 4-5 rarius 3-6, masculis 1-2 ferrugineis, femineis viridi-purpureis oblongis vel cylindricis contiguis sessilibus, superioribus 1-3 sæpe apice masculis, infima subinde basi attenuata clavata subremota brevi pedunculata; bractea culmo brevior, auriculis parvis discretis; stigmatibus 2 rarius 3; perigyniis late ovalibus vel subrotundis stipitatis plano-convexis vel (angulo centrali postico) subtriquetris rostellatis, ore integro sæpe ciliato, utrinque nervatis pallidis demum ferrugineo-punctato granulatis rarissime superne ad margines parce denticulatis, squama obtusa vel acuta apice subinde ciliolata vel mucronata pellucide lineata purpurea, nervo viridi latioribus plerumque longioribus.

*Culmus* apice scaber. *Perigynium*  $1\frac{2}{10}$ — $\frac{4}{10}$  lin. longum,

$\frac{8}{10}$ — $\frac{9}{10}$  lin. latum, nervis validis, paucioribus vel pluribus. *Achenium*  $\frac{8}{10}$ —1 lin. longum,  $\frac{7}{10}$  lin. latum, ovatum, lenticulare, vel inæqualiter triquetrum, angulo centrali postico, fusco-brunneum; perigyniis inferioribus nunc proliferis.

|                  |                 |                  |
|------------------|-----------------|------------------|
| 3 with 3 spikes. | 14 with 1 male. | 8 with 2 female. |
| 10 „ 4           | 8 „ 2           | 9 „ 3            |
| 8 „ 5            | 1 „ 4           | 6 „ 4            |
| 2 „ 6            |                 |                  |

Superioribus 1-3 apice masculis.

Var. *tricostata*; spica subelongata viridi-purpurea, e spiculis 4-6 oblongis, masculis 2-3 (vel 4 sec. Fries) purpureis sessilibus, femineis 2-4 viridi-purpureis erectis densifloris obtusis alternatim subremotis sessilibus vel infima breve pedunculata summa subinde apice mascula; bractea foliacea, culmum subæquante, auriculis rotundatis discretis; stigmatibus 2; perigyniis ovalibus vel elliptico-ovatis plano-convexis stipitatis obtusis brevissime vel vix rostellatis, ore purpureo integro vel emarginato, pallide viridibus adpressis octofariam imbricatis trineribus, squama ovata obtusa vel acuta purpurea, nervo pallido lineolis pellucidis notata latioribus longioribus.—*C. tricostata*, *Fries*, *Mant.* 3, 152, 202, et *Sum.* 220; *Anders.* 45, t. 5, f. 55; *Lange*, 80; *Steud.* 216. *C. acuta*,  $\beta$ . minor, *Fl. Ross.* 313. (TAB. DLXIV.)

HAB. In Europa.—Sweden and Finland.

*Culmus* 3-pedalis; pars spicigera 3-7 poll. longa. *Folia*  $1\frac{1}{2}$ —2 lin. lata; *culmea* eo breviora, inferiora breviora; *sterilia* culmum superantia, plana, flaccida, pallide viridia. *Bractea* foliacea, infima nunc culmum paulo superans; superiores spiculas longiores angustæ. *Spicula* subpollicares; *femineæ* 2 lin. latæ. *Perigynium* (*immaturum*) (cum stipite  $\frac{2}{10}$ — $\frac{3}{10}$  lin. longo)  $1\frac{4}{10}$ — $\frac{5}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum.

The inflorescence is that of *C. vulgaris*, and the foliage that of its variety *juncella*. The perigynium in my specimens is too young to exhibit the nerves distinctly, but I think they are occasionally more than three. Fries remarks of it, "Spicæ fere *C. vulgaris*, herba *C. aquatilis*, sed folia inferiora brevissima et pauca." Andersson says, "Inter *C. aquatilem* acutam et vulgarem media." Lange says, "Folia tandem flaccida a *C. aquatili* hanc longe removent et arcte cum *C. acuta* conjungunt."

The specimens figured are from Fries.

Var. *juncella*, Fries, *Sum.* 230; Andersson, 48. Var. *junceæ*, Fries, *Mant.* 3, 154. Var. *elatior*, Lange, 76.—*C. aquatilis*, var. *nardifolia*, *Wahl. Fl. Lapp.* 246, *fide spec. e Wahl. (Herb. Boott)*. *C. angustifolia*, *Smith, Eng. Fl.* 127. (TAB. DLXV.)

HAB. In Europa.—Lapland to England.

Dense cæspitosa; culmis folisque *planis* et convolutis, elongatis; inflorescentia et spiculis et squamis pellucide lineatis; perigyniisque ut in forma typica.

The specimen figured, identical in every respect with others from Fries, is from Esher, Surrey, sent to me by Mr. Hewet C. Watson. I have it also from Wales, found near the Menai Bridge by the late Mr. Bowman.

Var. *teres*; spiculis sesquipollicaribus acutis, femineis tertibus angustis, superioribus vel omnibus apice masculis; perigyniis parvis ovalibus subplano-convexis nervatis obconico-stipitatis, ore subemarginato denticulato, squama ovata pellucide (vel vix) lineata longioribus vel subæquantibus.

HAB. In Europa.—Ostrogotland, *Tuckerman*. Moscow, *Fischer*. Germany, *Reichenbach*, t. 228, f. b et c.

This variety approaches the *C. cæspitosa*, L. The lower squamæ are long and acute, the upper shorter, obtuse, and, in the Swedish specimens are without pellucid lines.

*Perigynium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, or  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, biconvexum; stylo curvato.

Var. *hyperborea* (*limula*); spica atro-purpurea, e spiculis 4 cylindricis gracilibus crectis, terminali mascula, femineis 1–2, superioribus apice masculis, infima breve pedunculata; bractea culmum subæquante, ligula auriculata rotundata; stigmatibus 2 (sec Fries 2–3); perigyniis ( $1\frac{1}{2}$  lin. longis,  $\frac{7}{10}$  lin. latis) ellipticis compressis minime rostellatis, ore integro purpureo, obscure nervatis granulatis, squamam oblongam obtusam fusco-purpuream margine hyalinam, nervo pallido impunctatam vel lineolis pellucidis paucis notatam æquantibus.—*C. limula*, *Fries*, *Sum.* 229; *Anders*, 47, t. 5, f. 53; *Lange*, 77; *Stead.* 214. *C. aquatilis*,  $\beta$ , *Fl. Ross.* 312. (TAB. DLXVI.)

HAB. In Lapponia.

I have figured two authentic Lapland specimens, and one from the Menai Bridge.

- n. 1. Lapland, from Fries. "*C. limula*."
- n. 2. Lapland, from Wahlenberg, given by him to Tuckerman as "*C. acuta-ripensis*, Læstad."
- n. 3. Menai Bridge, Wales, from Mr. Bowman.

The Lapland specimens are not mature, and the nerves of the perigynia are consequently not distinct. Though I can see no characters to separate it from *C. vulgaris*,—to which the Welsh plant, agreeing in habit, evidently belongs,—I think it best to refer it to *C. rigida*, var. *hyperborea*, in which three stigmas are often found. Andersson says of it, "Est, quantum e speciminibus paucis exsiccatis judicare licet, ad *C. rigidam*, *aquatilem*, et *acutam* maxime accedens. Omnium tamen *C. hyperborea* (*Carex*, quam '*C. acuta-ripensis*' inscriptam misit Læstadius, extis duabus (*C. hyperborea* et *C. rigida*) composita), vel potius *C. acuta* maxime affinis."

Fries, Andersson, and Lange place it in their group *Aquatiles*, remote from the *Rigida*; and in *Fl. Ross.* it is considered a variety of *C. aquatilis*,—so embarrassing is it in this protean group for different observers to affix specific names to specimens so constantly varying. Lange attempts to distinguish it from *C. hyperborea* and *C. aquatilis*, "*culmo scaberrimo*," a character certainly not applicable to the Lapland specimens I have figured.

Var. *Gaudichaudiana*; spica glauco-purpurea, e spiculis 3–6 ovatis oblongis vel cylindræis, masculis 1–2, femineis 2–4 evaginatæ, superioribus vel omnibus sæpe apice masculis contiguus sessilibus vel inferioribus remotis pedunculatis, infima basi attenuata subinde radicali; bracteis inferioribus culmo brevioribus vel multum longioribus, ligula oblonga; stigmatibus 2 rarius 3; perigyniis ovatis vel lanceolatis rostellatis, ore integro vel emarginato rarius bifido, plus minus nervatis stipitatis compressis glaucis punctis resinosis demum ferrugineis obsitis, squama oblonga obtusa vel subacuta rarius mucronata purpurea, margine anguste albida, nervo pallido latioribus longioribus.—*C. Gaudichaudiana*, *Kunth*, 417; *Steadel*, 212. *C. cæspitosa*, *Brown*, *Prod.* 243. (TAB. DLXVII.)

HAB. In Australia, Tasmania, Nov. Zelandia, Japonia.—Port Jackson, *Brown*. Victoria, *Robertson*, *Müller*.

Hunter's River, *Wilkes* (*Herb. Gray*). Tasmania: Lake St. Clair; Marlborough, *Gunn*; *Archer*. New Zealand: Otago, *Lindsay*. Japan: Hakodadi, *Wright* (*Herb. Gray*).

Stolonifera. *Culmus* 2–24 pollices altus, gracilis, obtusangulus, nisi inter spiculas lævis, vel acutangulus scaber; pars spicigera 2–6 poll. longa, vel longior. *Folia* 1–2 lin. lata; culmo longiora, plana, vel exsiccata plerumque basi conduplicata. *Bractea* (nisi subinde infima radicalis) evaginatæ, inferiores nunc culmum superantes vel eo breviores, infima rarius 15 poll. longa. *Ligula* oblonga, punctata. *Pedunculus*  $\frac{1}{2}$ –3 poll. longus. *Spiculae masculæ*  $\frac{1}{2}$ –2 poll. longæ, sub lineam latæ; *femineæ* 3 lin.– $2\frac{1}{2}$  poll. longæ, 2–4 lin. latæ. *Squamæ* conformes, rarius pellucide lineatæ, mucronatæque. *Perigynium* ovatum,  $1\frac{5}{10}$ – $\frac{8}{10}$ , vel ovato-lanceolatum, 2– $2\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ – $1\frac{1}{10}$  lin. latum, ore vel integro denticulato vel emarginato (rarius bifido, laciniis scabris), nervis pluribus vel paucioribus validis, glauco-viride, plano-convexiusculum, demum ferrugineum, resinoso-punctatum. *Achenium* ovale,  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum; vel orbiculatum,  $\frac{6}{10}$  lin. longum, latumque; plano-convexiusculum, rarius triquetrum, ferrugineum, punctulatum, stipitatum; basi styli æquali. *Stigmata* 2, rarius 3.

In specimens from Hunter's River, Australia, from Captain Wilkes (*Herb. Gray*), and from N. England, Australia, Stuart in *Herb. Hooker*, I observe three stigmata. Those from Tasmania, from Gunn in *Herb. Hooker*, vary remarkably in size; some from Lake St. Clair with normal perigynia only two inches in height, and others with a distinctly bifid orifice.

In 62 specimens, I find—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 15 with 3 spikes. | 39 with 1 male. | 2 with 1 female. |
| 25 „ 4            | 23 „ 2          | 20 „ 2           |
| 19 „ 5            |                 | 29 „ 3           |
| 3 „ 6             |                 | 11 „ 4           |

In 8 of the female spikes the upper one, in 9 the two upper ones, and in 18 all were male at top. In the 27 other specimens all of them were female.

Var. *intricata*; spica purpurea, e spiculis 3–4 oblongis, terminali mascula, femineis 2–3 infima longiuscule pedunculata; stigmatibus 2; perigyniis orbiculatis vel ellipticis rostellatis, ore integro, obscure nervatis ferrugineo-punctulatis, squama obtusa pellucide lineata brevioribus.—*C. intricata*, *Tineo*, *Pl. Sic.*; *Gussone*, *Syn.* 574; *Parlatore*, *Ital.* 185; *Bertol.* 127.

HAB. In Sicilia, in nemoribus montosis.

Gay (*Ann. Sc. Nat.*), in speaking of *C. Goodenowii*, says, "E terris quas mare Mediterraneum lambit nondum nisi ex montibus Corsicis missam vidi, neque ullam ejus mentionem in Floris Hispaniæ interioris, Italiæ et Græciæ aut Barbariæ factum vidi." Bertolini inserts it in his *Fl. Italiæ*, and Tchihatcheff in his list of the plants of Asia Minor, "in Tauri Pontici pratis."

Var. *turfosa*; spiculis 3–5 fusco-purpureis erectis, masculis 1–2, femineis 2–4 angustis cylindricis, superioribus approximatis sessilibus infima subremota; bractea culmum æquante vel eo brevior; stigmatibus 2; perigyniis plano-convexis, stipitatis obovatis vel orbiculatis abrupte rostellatis vel elliptico-ovatis vel lanceolatis sensim rostellatis, ore integro denticulato, granulatis nervatis, squama fusco-purpurea obtusa vel acuta lineolis pellucidis notata nervo pallido latioribus longioribus vel brevioribus.—*C. turfosa*, *Fries*, *Sum.* 228; *Andersson*, 43, t. 6, f. 68; *Lange*, 72; *Stead.* 211.

HAB. In Sweden, *Fries*.

*Radix stolonifera*, repens; foliis angustis, vaginis ad margines basi obscure fibrillosis. *Perigynium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, vel  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, *obovatum*; vel 1 lin. longum,  $\frac{8}{10}$  lin. latum, *orbiculatum*; vel  $1\frac{4}{10}$ — $\frac{5}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, *elliptico-ovatum*; vel  $1\frac{3}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, *elliptico-lanceolatum*; plus minus nervatum, ut in forma typica.

This form is described as having ovate and nerveless perigynia, though Andersson qualifies his expression "*fructibus encrivibus*" in the specific character by remarking, in the subjoined observations, "*fructus tenuissime nervoso-striati, interdum exsiccatione subcostati.*" He very correctly describes the perigynium of *C. vulgaris* (*typica*) "*nervibus plus minusve striatum,*" which is more true to nature than the unqualified expression of Fries, in his Mant. 3, of "*fructibus multinervibus.*" It is of some importance to note the variable nervation of *C. vulgaris*, as it bears upon the question of its connection with *C. rigida* and *C. tricostata*.

The following names are referable to *C. vulgaris*, *rigida*, *stricta*, or *cæspitosa*, judging from the descriptions of Steudel. I have not seen specimens of them:—

|                                                                       |                                                     |
|-----------------------------------------------------------------------|-----------------------------------------------------|
| <i>C. cerina</i> , <i>Dunn</i> , <i>Steud.</i> 212. Holland.          | } <i>C. vulgaris</i> ? or<br><i>rigida</i> .        |
| <i>C. decolorans</i> , <i>Wim.</i> , <i>Steud.</i> 211. Silesia.      |                                                     |
| <i>C. malaena</i> , <i>Wim.</i> , <i>Steud.</i> 211. Silesia.         |                                                     |
| <i>C. Dacica</i> , <i>Heuff.</i> , <i>Steud.</i> 212. Hungary.        |                                                     |
| <i>C. Reuteriana</i> , <i>Boiss.</i> , <i>Steud.</i> 211. Port Spain. |                                                     |
| <i>C. Kotschyi</i> , <i>Boiss.</i> , <i>Steud.</i> 211. Persia.       |                                                     |
| <i>C. æmulans</i> , <i>Lieb.</i> , <i>Steud.</i> 212. Denmark.        |                                                     |
| <i>C. tumida</i> , <i>Beil.</i> , <i>Steud.</i> 211. Silesia.         |                                                     |
| <i>C. macra</i> , <i>Steud.</i> , <i>Steud.</i> 212. Silesia.         |                                                     |
| <i>C. gracilis</i> , <i>Wim.</i> , <i>Steud.</i> 212. Silesia.        |                                                     |
| <i>C. spreta</i> , <i>Steud.</i> , <i>Steud.</i> 212. Saxony.         | } <i>C. cæspitosa</i> , L.?, or<br><i>stricta</i> . |
| <i>C. neglecta</i> , <i>Peter.</i> , <i>Steud.</i> 212. Saxony.       |                                                     |
| <i>C. homolocarpa</i> , <i>Peter.</i> , <i>Steud.</i> 212. Saxony.    |                                                     |
| <i>C. reticulosa</i> , <i>Peter.</i> , <i>Steud.</i> 212. Saxony.     |                                                     |
| <i>C. Fridrichsthaliana</i> , <i>Steud.</i> 212. Greenland.           |                                                     |

The specimens figured are,—

Tab. DLVII.

n. 1. From England. The typical form.

n. 2. A small form (Germany), from Reichenbach.

Tab. DLVIII. One specimen with the gall of some insect at base (*J. Woodford*).

Tab. DLIX.

n. 1. From Moscow, from *Fischer*, and n. 2 from Ostrogothland, from *Tuckerman*, of the var. *teres*.

n. 3. Cambridge, North America. With stigmas 2 and 3.

n. 4. From Sartwell, Exs. n. 52.

n. 5. From Cambridge. The "*C. acuta*, *Tuck*."

Tab. DLX. From Cambridge, U. S. A., with stigmas 2-3, and the perigynium occasionally proliferous.

Tab. DLXI.

n. 1. The "*C. stolonifera*," *Hoppe*.

n. 2. From the Swiss Alps.

n. 3. The *C. intricata*, *Tineo*, from *Parlatore*.

n. 4. Iceland, *Dr. Ræ*. Probably a form of the *C. anguillata* of *Drejer*.

n. 5. The *C. antuensis*, *Kunze*. From *Chiloe*, *Gay*.

Tab. DLXII. The "*C. turfosa*," *Fries*, Sweden. From himself.

Tab. DLXIII. The "*C. elytroides*," *Fries*, Sweden. From himself.

Tab. DLXIV. The "*C. tricostata*," *Fries*, Sweden. From himself.

Tab. DLXV. The var. *juncella*, *Fries*. From *Esher*, *Watson*.

Tab. DLXVI. The "*C. limula*," *Fries*.

Tab. DLXVII. *C. Gaudichaudiana*, *Kunth*. Tasmania.

Tab. DLXVIII.

n. 1. The copy of *Goodenough's* figure of "*C. rigida*," from the *Linn. Trans.*

The other specimens and the details from the Scotch Alps.

Tab. DLXIX. From *Fugleness*, Norway. Stigmas 2, and nerveless perigynium.

Tab. DLXX. From *Fugleness*. The stigmas 2 and 3; perigynium nerved. All the specimens from the late *Mr. Christie*, and representing the "*C. hyperborea*, *Drejer*."

Tab. DLXXI. and DLXXII. From the White Mountains, New Hampshire, U. S. A.

Tab. DLXXIII. The "*C. rigida*, var. *infra-alpina*," *Fries*. Sweden. From *Fries*, with stigmas 2 and 3.

Tab. DLXXIV. A similar form. The White Mountains, U. S. A.

Tab. DLXXV. The "*C. orbicularis*, *Boott*." From the Himalayas. Stigmas 2 and 3, with nerved perigynium.

397. *C. physodes* (*Bieberstein*); spica ovata vel oblonga densa castanea, e spiculis 3-6 apice masculis congestis; bractea cuspidata brevi; stigmatibus 2; perigyniis maximis globosis vel ellipticis insigniter inflatis abrupte rostellatis, ore hyalino acute bifido nervatis castaneis lucidis glabris, squama ovata acuta cuspidata castanea margine late albo-hyalina multum latioribus longioribus.—*C. physodes*, *Biebst. Mem. Soc. Nat. Mosc.* 2, 104, t. 7 (1809); *Claus. Ind. Des. in Göbel. It.* 2, 315; *Kunth*, 376; *Kar. et Kir. En. Pl. Songoriae*; *Bull. Soc. Imp. Mosc.* (1842); *Fl. Ross.* 274; *Steud.* 187. (TAB. DLXXVI.—DLXXVII.)

HAB. In Asia.—"Dans les vastes steppes entre le Wolga et l'Oural," *Biebst.* Sibiria Altaica, *Fl. Ross.* Afghanistan, *Griffith*.

*Culmus*  $\frac{1}{2}$ —1-pedalis, obtusangulus, lævis, basi vaginis foliorum marcidis densis tectus. *Folia*  $\frac{1}{2}$ — $\frac{3}{4}$  lin. lata, sæpe involuto-filiformia; culmo breviora. *Bractea* infima e basi squamæformi, margine hyalina, plus minus cuspidata, spiculam nunc superans. *Spica* 6-15 lin. longa, 6-8 lin. lata. *Spiculæ* apice floeulis masculis pluribus, basi femineis 3-4 insignibus instructæ. *Squamæ masculæ* lanceolatæ, angustæ. *Perigynium* globosum; sub 4 lin. longum, 3 lin. latum, vel ellipticum, 8 lin. longum, 4 lin. latum. *Achenium*  $1\frac{8}{10}$ —2 lin. longum,  $1\frac{3}{10}$ — $\frac{5}{10}$  lin. latum, orbiculatum vel ovale, compressum, pallidum; basi styli incrassata.

As the volume of the Moscow Transactions in which this remarkable species was first described and figured by *Bieberstein* is rare, from having been destroyed at the burning of Moscow, I have had the figure of it carefully copied from the volume in the library of the Royal Society, the only one existing in this country, and I subjoin the description of *Bieberstein*:—

"Spica androgyna, composita, ovata, spiculis superioribus mere masculis, inferioribus superne masculis; stigmatibus 2; fructibus inflatis, globosis, ore obsolete bidentatis."

"Radix per arenam valde repens, fibrisque copiosis firmata, nigricans. Culmi cum foliorum fasciculo e radice nodis per intervalla egredientes, antequam ex arena emergant, ad nonnullarum unciarum longitudinem, foliorum præteritorum annorum rudimentis dilute fuscis nitidis vestiti; inde nudi, erecti, circiter pedales, graciles, trigoni, striati læves luteo-virides sicut folia. Folia culmo breviora, lineam circiter lata, longe acuminata, carinata margine retrorsum scabra; ligula brevissima, obtusa, albida. Spica ovata, compacta, uncialis. Bracteæ glumis substantia coloreque consimiles, singulæ sub quavis spicula, infima longior magisque acuminata, superiores decrescentes. Spiculæ confertæ, ovatæ, in apice spicæ mere masculæ, inferiores basi femineæ apice masculæ. Glumæ masculæ lanceolatæ, acuminatæ, sature rufæ, nitidæ, margine præsertim apicis hyalino; femineæ breviores latioresque subovatæ cum acumine, fructu multoties minores. Stamina 3, filamentis capillaribus, gluma longioribus; antheris linearibus, bilocularibus,

flavis, polline emisso, ad basin usque in lobos duos dehiscentes, ut tunc filamentum apice biantheriferum appareat. Styli 2, hirsuti, albi. Fructus globosus, vesicarius, membranaceus, mollis, ut inter chartam facile comprimetur, glumis concolor, subtilissime striatus, hujus generis maximus, scilicet mole Pisi; dentibus oris duobus conniventibus exilibus, in maturo vix superstitibus. Semen ovatum, urceolo multoties minus, albidum, dorso convexum, subtus planiusculum." (*Biebst.*)

My own observations, both from Russian and Affghan specimens, confirm those of Kunth and the Fl. Ross. as to all the spiculae being *apice masculae*,—Bieberstein, I suspect, having been misled by the upper ones having many male florets. I have not observed the anthers becoming bilobed on the escape of the pollen. The Fl. Rossica compares the fruit to that of *Cornus mascula* and *Taxus*, and says "*species nulli affinis.*" I know of no affinity nearer than that of *C. baccans*, Nees."

Tab. DLXXVI. is a copy of Bieberstein's figure, from the Moscow Transactions.

Tab. DLXXVII.

n. 1 are Russian specimens.

n. 2. Affghan specimens, from Griffith (*Herb. Hooker*).

398. *C. cernua* (Boott); spica oblonga lateritia concolori, e spiculis 6–11 cylindricis pedunculatis cernuis approximatis, terminali basi mascula, reliquis plerumque ima basi masculis vel inferioribus femineis, mediis vel infima solum basi compositis, inferioribus plus minus longe bracteatis evaginatis vel infima exserte pedunculata vaginata; bracteis inferioribus culmo longioribus; stigmatibus 2; perigyniis ellipticis vel ovatis compressis sensim rostellatis, ore integro vel leviter emarginato, enerviis stipitatis punctis purpureis conspersis, squama decolori oblonga truncata vel emarginata hispido-aristata latioribus longioribus. (TAB. DLXXVIII.)

Var.  $\beta$ . *minor*; spicis 4–5 brevioribus simplicibus, terminali subinde omnino mascula, reliquis ima basi masculis, culmo gracili.

HAB. In Assam, *Griffith* (*Herb. Hooker*).— $\beta$ . In Assam et in Japonia, *Zollinger* (*Herb. Mus. Par.*).

*Culmus*  $1\frac{1}{2}$ -pedalis, triquetus, rigidus, inter spicas scaber; pars spicas gerens 6–7 poll. longa. *Folia* 2 lin. lata. *Bractea* evaginatae, vel infima (in uno specimine) vagina pollicari instructa, inferiores culmo longiores, infima subinde sesquipedalis. *Spicae* 2–2 $\frac{1}{2}$  poll. longae, 2–3 lin. latae, omnes pedunculatae, cernuae vel nutantes, media vel infima basi spicula brevi compositae, colore lateritio concolores. *Pedunculi* scabri, infimus 2 poll. longus. *Squamae* conformes. *Perigynium*  $1\frac{4}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{9}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ovale vel ovatum, lenticulare; basi styli apiculatum.

I was indebted to M. Spach for my first knowledge of this species, who sent me a specimen from Japan, collected by Zollinger, noticed by Gray in his report of Wright's plants; but I have since seen others found by Griffith in Assam, several of which in size and character are like the Japanese plant, but others more fully developed.

The specimens figured are from Assam.

399. *C. Cunninghamii* (Boott); spica elongata fusco-purpurea, e spiculis 5–8 cylindricis sessilibus, terminalibus 2–3 masculis contiguis, reliquis femineis apice masculis longissimis erectis evaginatis; bractea infima culmum longe superante; stigmatibus 2; perigyniis obovatis vel ovalibus rostellatis, ore integro vel emarginato,

resinoso-punctatis ferrugineis nervatis, squama lanceolata acuminata hispidato-cuspidata vel mutica purpurea, nervo pallido, latioribus brevioribus. (TAB. DLXXIX.)

HAB. In Nov. Hollandia.—Banks of the Turon River, near Bathurst (1822), *Allan Cunningham* (*Herb. Boott*).

*Culmus* 3-pedalis, validus, triquetus, laevis; pars spicigera 8–15 poll. longa. *Folia* 2–3 lin. lata vel latiora. *Bractea* evaginatae, infima sesquipedalis, proxime culmo longior vel brevior. *Spiculae masculae* 2 $\frac{1}{2}$ –3 poll. longae,  $1\frac{1}{2}$ –2 lin. latae; *femineae* 4–8 $\frac{1}{2}$  poll. longae, 2 $\frac{1}{2}$  lin. latae, inferiores basi laxiflorae. *Squamae masculae* vel breviores latiores obtusae muticae, margine angustae albae, vel longiores angustiores lanceolatae, inferiores acuminatae, cuspidatae; *femineae* vel acutae muticae vel inferiores longe cuspidatae. *Perigynium*  $1\frac{2}{10}$ – $\frac{3}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, obovatum, vel  $\frac{4}{10}$  lin. latum, ovale, leviter nervatum, punctis resinosis ferrugineis conspersum, rostello purpureo. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, obtusum, basi styli aequali, abrupte apiculatum.

I received the only specimens I have seen of this species from Mr. Cunningham many years ago. They are not fully mature, and are wanting the leaves. No one has since met with it.

400. *C. declinata* (Boott); spica lineari subelongata pallide viridi, e spiculis sub 15 androgynis apice masculis, superioribus rotundatis contiguis, inferioribus oblongis discretis squarrosis sessilibus; bractea infima capillacea subpollicari; stigmatibus 12; perigyniis ellipticis sensim in rostrum longiusculum attenuatis, ore antice altius secto demum bifido, biconvexusculis nervatis glabris divaricatis vel recurvatis basi spongiosis olivaceis, squama ovata acuta vel cuspidata albida, nervo viridi, duplo longioribus. (TAB. DLXXX.)

HAB. In Australia.—Brisbane River, *Müller* (*Herb. Hooker*). "*C. chlorostachys*, *R. Brown*."

*Culmus* 2 $\frac{1}{2}$ -pedalis, triquetus, scaber (*sub lente*), granulato-asperulus, inferne foliatus. *Folia* 2–2 $\frac{1}{2}$  lin. lata, culmum subaequantia, viridia, plana. *Bractea* infima capillacea subpollicaris scabra, aliae breves. *Spica* 3 $\frac{1}{2}$  poll. longa, 4 lin. lata. *Spiculae* 3–4 lin. longae. *Squamae* conformes. *Perigynium* 2–2 $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ntrinque nervatum, ad basin spicularum recurvatum. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, ovatum; basi styli clavata.

The *C. chlorantha*, Brown's Prod. 242 (not *C. chlorostachys*) is imperfectly known, all the specimens from Australia and Tasmania being too young for a satisfactory character. I have given a figure of it (B) from Mr. Brown's herbarium. "*Spica* oblonga, spiculis 5–6 approximatis indivisis; bracteam scariosam, subaequantibus, apice masculis, squamis acutis; stigmatibus 2; culmo foliisque scabris (*J.*)" (*Br. Prod.*) Tab. DLXXX. B.

The specimen of *C. declinata* is from Herb. Hooker, and is the only one I have seen. It is remotely allied to *C. nubigena*, Don, and, but for the position of the male florets, I should say more nearly to *C. elongata*, L.

401. *C. flectens* (Boott); spica elongata olivacea, e spiculis 3 distantibus pedunculatis, terminali mascula cylindracea gracili erecta, reliquis femineis ovalibus exserte pedunculatis nutantibus; bracteis vaginatis, culmo brevioribus; stigmatibus 3; perigyniis lanceolatis triquetris sensim longe acuminato-rostratis, ore membranaceo integro obliquo, crebre nervatis glabris, superne vacuis olivaceis, squama ovata obtusa cuspidata ferru-

ginea medio viridi nervata angustioribus longioribus.—*C. papulosa*, Boott in Ringgold and Rodgers' *Exp.* (TAB. DLXXXI.)

HAB. In Japan.—Hakodadi, Wright, n. 48.

*Culmus* bipedalis, gracilis, debilis, acutangulus, lævis, inferne foliatus; pars spicigera 8 poll. longa. *Folia* 2–3 lin. lata, culmo multum breviora, plana, mollia. *Bractea* vaginata, spiculis suis longiores. *Vagina* infima  $1\frac{1}{2}$  poll. longa. *Pedunculi*  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longi, scabri. *Spicula mascula* pollicaris,  $1\frac{1}{4}$  lin. lata, bracteata, e spicula feminea superiore  $2\frac{1}{2}$  poll. remota; *femineæ* 9 lin. longæ, 3 lin. latæ, à se 5 poll. remotæ, nutantes. *Squamæ* conformes, masculæ obtusæ, muticæ vel rarius nervo paulo extra apicem producto; infima cuspidata bractæformis; omnes medio (*sub lente*) papulosæ. *Perigynium*  $3\frac{1}{10}$ – $4\frac{1}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $1\frac{1}{2}$  lin. longum,  $\frac{8}{10}$  lin. latum, ovale, acute triquetrum; basi styli persistente apiculatum.

A *C. Jackiana*, Boott, inflorescentia differt spiculis femineis 2 distantibus, longe exserte pedunculatis, nutantibus; bracteis brevioribus.

I have changed the name which I originally adopted to one more appropriate.

402. *C. fluviatilis* (Boott); spica elongata cylindrica pluristachya densa pallida, e spiculis apice masculis numerosissimis (80 pluribusve) ovatis simplicibus congestis, infima subinde longe bracteata; stigmatibus 2; perigyniis late ovatis sensim acuminato-rostratis bidentatis compressis, marginibus alatis serratis, utriusque crebre nervosis pallidis membranaceis basi spongiosis, squama ovata obtusa plerumque mutica pallida latioribus longioribus. (TAB. DLXXXII.)

HAB. In India orientali.—In aquosis versus Wulloorboor (Birmah?), Griffith.

*Radix* fibrosa. *Culmus*  $1\frac{1}{2}$ –pedalis, triquetrum, scaber, flaccidus, inferne foliatus, demum nutans. *Folia*  $1\frac{1}{2}$  lin. lata, culmo longiora, flaccida, plana, apice longe attenuata, flavida. *Bractea* infima angusta, rarius spicam superans, 1–2 alia spicula longiores. *Spica*  $3\frac{1}{2}$ –7 poll. longa, 5–7 lin. lata, apice sæpe nutans. *Spicula* 4 lin. longæ,  $2\frac{1}{2}$  lin. latæ, omnes simplices congestæ, vel 1–2 inferiores subinde discretæ. *Squamæ* conformes, muticæ, rarius mucronatæ, margine hyalinæ. *Perigynium*  $1\frac{7}{10}$ – $2\frac{9}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum, basi laxè spongiosum. *Achenium* minimum  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovatum, plano-convexum, lucidum, olivaceum, basi styli æquali.

A *C. Thomsoni*, B., differt spica longiore latiori densa; spiculis pluribus congestis; perigyniis majoribus, alatis, longius rostratis, achenio minori; culmo altiore triquetrum, scabro, debili; foliis flaccidis; squamis plerumque muticis, obtusis.

403. *C. hebetata* (Boott); spica longissima luride-purpurea concolori, e spiculis pluribus oblongo-cylindricis apice masculis obtusis densifloris extremis singulis, reliquis fasciculatis longe exserte capillaceo-pedunculatis pendulis; bracteis inferioribus culmo brevioribus vaginatis; stigmatibus 3; perigyniis obovatis abrupte rostellatis, ore integro, compressis ventricosis nervatis membranaceis stipitatis olivaceis deciduis, squama lanceolata obtusiuscula mutica brevioribus. (TAB. DLXXXIII.)

HAB. In America meridionali.—Obragilia, near Lima, Wilkes's *Exped.* (Herb. Gray).

*Culmus* 4-pedalis et ultra, validus, triquetrum, lævis; pars

spicigera  $2\frac{1}{2}$  pedes longa. *Folia* 3–5 lin. lata, rigida, demum flavida. *Bractea* inferiores longe vaginata, sesquipedalia; superiores semipollicares, summæ squamæformes. *Pedunculi* capillacei, inæquales, plus minus contorti, scabri; inferiores 4–8 poll. longi. *Vagina* infima 8 poll. longa. *Spicula* (21) concolores, omnes apice masculæ, æquilatæ, 10–18 lin. longæ, 3–4 lin. latæ; *summæ* 3, singulæ, contiguæ; *mediæ* fasciculatæ, fasculis 2–6 spiculiferis; inferioribus remotis. *Spicula* infima singula. *Squamæ* conformes; *masculæ* imbricatæ; *femineæ* deciduæ; omnes muticæ. *Perigynium*  $1\frac{5}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum; ore integro denticulato. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-triquetrum, stipitatum, angulo centrali postico, basi styli æquali apiculatum.

I have only seen this species in Herb. Gray, found near Lima by the naturalist in Commodore Wilkes's expedition; and the solitary specimen, through the kindness of Dr. Gray, is here figured. In inflorescence it resembles *C. Jamesoni*, but differs in the vaginate bracts, obtuse spiculæ, muticous squamæ, and obovate perigynium.

404. *C. stricta* (Goodenough); spica oblonga vel subelongata glauco-purpurea, e spiculis sæpius 4 vel 3–6 cylindricis stricte erectis, masculis 2 vel 1–3, femineis 2 vel 1–4 denisfloris sessilibus, superioribus plus minus apice masculis vel infima subinde brevi pedunculata omnino feminea; bractea infima sæpe spicula semper, culmo brevior; stigmatibus 2; perigyniis ovalibus vel ovatis vel lanceolatis compressis rostellatis, ore integro vel submarginato, nervatis, nervis antice 4–6 postice 3–5 rarius obsoletis, granulatis glaucescentibus sæpe demum ferrugineo-punctatis intus violaceis stipitatis deciduis, squama lanceolata vel ovata obtusa vel acuta atro-purpurea, nervo viridi latioribus brevioribus vel longioribus.—*C. stricta*, Good. *Linn. Trans.* ii. 196, t. 21, f. 9; *Eng. Bot.* t. 914; *Smith, Eng. Fl.* 118; *Willd.* 287; *Schk. f.* 73; *Wahl. Act.* 165; *Kunth*, 414; *Gaudin, Agrost.* 121; *Fl. Helv.* 71; *Koch*, 872; *Fries, Mant.* 3, 150; *Summa*, 226; *Anders.* 42, t. 6, f. 60; *Lange*, 69; *Gren. et Godron*, 402; *Reich.* 14, t. 230; *Bertol.* 135; *Fl. Ross.* 311. *C. acuta*, var. ruffa, L. sec. Fries; Good. *C. cæspitosa*, Huds.; *Light.*; *Gay, Ann. Sc. Nat.* 2nd ser. 11, 196. *C. cæspitosa*, c. *Bentham*, 562. *C. elata*, All. (fide Bertol.). *C. melanochloros*, Thuill. *C. compressa*, Gaudin, *Etr.* *C. Buckii*, Wimmer. (TAB. DLXXXIV.–DLXXXV.)

Var. *minor*; spiculis subpollicaribus.—*C. homalocarpa*, Peter.; *Reich.* t. 228, f. d–g.

HAB. In Europa et Asia.—Norway. Sweden to Italy. Caucasus.

Densissime cæspitosa. *Culmus* 1–4-pedalis, acute triquetrum, scaber, strictus, validus; basi vaginis foliorum glabris, foliisque carinato-plicatis reticulato-fissis marcidis tectus; pars spicigera  $2\frac{1}{2}$ –8 poll. longa. *Folia* glaucescentia, 1–3 lin. lata; *sterilia* apice flaccida, elongata; *caulinia* culmo breviora, stricta. *Bractea* evaginata, vel infima sæpe spicula (culmo semper) brevior rarissime breve vaginata. *Spicula* longitudine et latitudine insigniter variantes, 1– $3\frac{1}{2}$  poll. longæ,  $1\frac{1}{2}$ –4 lin. latæ. *Squamæ* omnes obtusæ vel acutæ, muticæ; *femineæ* perigynio angustiores, nunc eo breviores, vel longiores, atro-purpureæ, nervo pallido, vel masculæ fusco-ferrugineæ. *Perigynium* æque variabile 1– $2\frac{3}{10}$  lin. longum,  $\frac{7}{10}$ –1 lin. latum, intus (dempto achenio) violaceum, plerumque 4–6-nervatum,



rarius enerve vel nervis fere obsolete, sæpe demum ferrugineo-punctatum, glabrum, stipitatum, glaucum. *Achenium*  $1-1\frac{2}{10}$  lin. longum,  $\frac{8}{10}-\frac{9}{10}$  lin. latum, vel 1 lin. longum,  $\frac{6}{10}-\frac{7}{10}$  lin. latum, oblongo-ovale; basi styli incrassata, recta vel contorta.

A reference to the Plate will show the variations of this species and the degree of its resemblance to *C. angustata* of North America. So marked is the outward resemblance, that it is impossible not to believe the American plant, on more detailed observation, will hereafter be regarded as a variety of the European one, differing in some respects, and especially in colour, as *C. lacustris* does from *C. riparia*. There is no absolute test for a specific difference, and the question of species or variety will depend on opinion. I confess to a repugnance of uniting, in the present state of our knowledge, forms, especially of different countries, that present marked differences, unless the distinctive characters are clearly pointed out, and transitions from one form to another duly noted. The question is principally of importance with respect to geographical distribution, and the modifications which country or climate may produce upon species.

In Tab. DLXXXIV. I have given forms which may be regarded as typical:—n. 1, from England, and n. 3, from Germany, having few male florets on the female spikes; n. 2, from the south of France, and one of n. 3, showing more. The perigynium  $1\frac{6}{10}-2$  lin. longum,  $\frac{9}{10}-1\frac{1}{10}$  lin. latum, 4-6-nervatum. *Achenium*  $1\frac{1}{10}-\frac{2}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum. The analogue is *C. angustata*,  $\beta$ , which differs in the smaller size of the perigynium and achenium with fewer nerves.

In Tab. DLXXXV., n. 1 is a specimen from Breslau, sent to me by M. Sonder as the "*C. Buckii*, Wimmer," which, excepting in colour, is like *C. angustata*,  $\gamma$ , with this difference from it and all other forms that the male squamæ are unusually broad, with a rounded very obtuse apex,—a character, however, which is not observable in a smaller specimen. The perigynium is  $1\frac{1}{10}-\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovatum vel ovale, enerve vel antice nervis 2. *Achenium*  $\frac{8}{10}$  lin. longum, fere  $\frac{7}{10}$  lin. latum, obovatum.

N. 2, from Saxony, and n. 4, from Montpellier, are analogons to *C. angustata*, *typica*; in n. 2 the perigynium is  $1\frac{4}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obsolete antice 3-nervatum, postice enerve; n. 3, from Sweden, perigynium  $1\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, ellipticum, 4-5-nervatum; achenium 1 lin. longum,  $\frac{7}{10}$  lin. latum, obovatum; the lower female spike is divergent and vaginate, as in some specimens I have from Ohio of *C. angustata*.

I have not observed any notice in authors of the violet colour of the inner surface of the perigynium, which is constant in all my specimens, except the Breslau and Saxony ones. In Hoppe's, from Germany, it is thus coloured. In a solitary specimen without a habitat, I find a perigynium  $2\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, intus violaceum.

405. *C. angustata* (Boott); spica sublongata viridiferruginea vel purpurea, e spiculis 3-5 rarius 2-6 cylindricis, masculis 1-2 rarius 3 ferrugineis contiguis, femineis 2-3 vel 1-4, superioribus (sæpe conspicue) vel omnibus apice masculis sessilibus vel infima pedunculata; bracteis evaginatis, infima rarius culmum superante; stigmatibus 2; perigyniis ovalibus vel ovatis sensim rarius abrupte rostellatis vel erostellatis compressis, ore integro vel submarginato, granulatis superne marginibus nunc parce denticulatis enerviis vel linita 1-4-nervatis glaucescentibus, squama lanceolata obtusa brevioribus longioribus vel æquantibus.—*C. angustata*, *Boott, Fl. Bor. Amer.* 218; *Dewey; Wood's Bot.* 756. *C. acuta*, *Dr.* 11, 265; *Torr. Mon.* 361; *Ell.* 537. *C. stricta*, *Torr. Cyp.* 400; *Carey*, 518; *Darl. Fl. Ast.* 347; *Chapman*, 535. (TAB. DLXXXVI.—DLXXXVIII.)

HAB. In America septentrionali.—Canada to Carolina. Rocky Mountains. Columbia River.

*Culmus* 2-2½-pedalis, acute triqueter, scaber, firmus, strictus, basi vaginis foliorum reticulato-fissis; pars spicigera 3½-9 poll. longa. *Folia* 1-1½ lin. lata, stricta, carinata, culmo breviora. *Bractea* infima culmo brevior vel paulo longior.

Var. *a. typica*; spiculis ferrugineis elongatis (sæpe 3-3½ pollices longis) 1-1½ lin. latis linearibus plerumque omnibus apice masculis, basi attenuatis; perigyniis  $\frac{9}{10}-1\frac{2}{10}$  lin. longis,  $\frac{6}{10}$  lin. latis, subinde enerviis, superne marginibus sæpe parce dentatis, squama lanceolata latioribus brevioribus vel æquantibus. (TAB. DLXXXVI.)

HAB. Ohio, *Sullivant*.

Var.; spiculis brevioribus, 1-2½-poll.; perigyniis majoribus  $1\frac{3}{10}$  lin. longis,  $\frac{8}{10}$  lin. latis, squama longioribus.

HAB. Common in the States. Oregon.

Var.  $\beta$ ; spiculis 5-6, masculis 2 rarius 3 ferrugineis, femineis viridi-purpureis, ½-2 pollices longis, 3 lin. latis, sessilibus, superioribus apice conspicue masculis, inferioribus femineis, infima clavata, subinde basi spicula brevi composita; bractea infima rarius culmum æquante; perigyniis ovatis spiraliter octofariis,  $1\frac{4}{10}$  lin. longis,  $\frac{7}{10}$  lin. latis, antice 2-4- postice 1-2-nervatis, brevi vel vix rostellatis, ore integro, glabris, squama purpurea vel fusco-ferruginea margine albo-hyalina obtusa vel acuta latioribus longioribus brevioribus vel æquantibus.—*C. stricta*, *Dewey*, 11, 269; *Wood's Bot.* 756; *Sartwell, Exs. n.* 54. (TAB. DLXXXVII.)

HAB. New York. Nebraska.

*Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, castaneum; basi styli incrassata, nunc contorta.

I have observed a long, contorted, filiform racheola terminated by a long solitary stigma. The perigynia are often distorted by a larva.

Var.  $\gamma$ ; spiculis pallidis plerumque 5 rarius 3-7, masculis 1-2 rarius 3, femineis apice masculis vel inferioribus omnino femineis, infima basi attenuata pedunculata; bractea sæpius culmum superante; perigyniis late ovalibus vel ovatis sensim plus minus rostellatis, ore integro, plerumque glabris enerviis vel 2-3-nervatis, squama pallide castanea latioribus longioribus vel brevioribus.—*C. strictior*, *Dewey; Wood's Bot.* 755; *Sartwell, Exs. n.* 55. *C. salina*, *Sartwell, n.* 57; *Kniesturn*. (TAB. DLXXXVIII.)

This form is generally much distorted by larvæ; one of the morbid achenia is figured at *f\*\**. I have observed a filiform racheole occasionally, and in one perigynium two achenia.

HAB. New England to New Jersey and westward.

Tab. DLXXXVI.

n. 1. A specimen from Ohio, *Sullivant*.

n. 2. Columbia River, *Scouler*.

Tab. DLXXXVII. New York, *Sartwell, n.* 54.

Tab. DLXXXVIII. Rhode Island, from Olney.

As Dewey, in Wood's Bot., has adopted the name I gave this species in the Flor. Bot. Americana, I have the less hesitation in using it, if it is to be retained as a species; for, admitting the plant to be the original *C. stricta* of Lamarck, it is hopeless, at least in Europe, to apply that name to any other than Goodenough's species, which has generally a stouter and smoother culm; longer, broader, more flaccid, glaucous leaves; shorter

bracts; and the perigynium larger, always smooth, often with more numerous nerves and ferruginous dots, and is within of a uniform violet colour.

To show the resemblance in habit between the American and European plant, I find in 58 specimens of *C. angustata*,—

|                  |                 |                  |
|------------------|-----------------|------------------|
| 1 with 2 spikes. | 24 with 1 male. | 8 with 1 female. |
| 8 „ 3            | 31 „ 2          | 18 „ 2           |
| 34 „ 4           | 3 „ 3           | 28 „ 3           |
| 12 „ 5           |                 | 4 „ 4            |
| 2 „ 6            |                 |                  |
| —                | —               | —                |
| 58               | 58              | 58               |

In 15, the lower spike was female.

In 43, all the female spikes were male at top.

In 52 of *C. stricta* of Europe,—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 13 with 3 spikes. | 13 with 1 male. | 9 with 1 female. |
| 29 „ 4            | 34 „ 2          | 29 „ 2           |
| 8 „ 5             | 5 „ 3           | 12 „ 3           |
| 2 „ 6             |                 | 2 „ 4            |
| —                 | —               | —                |
| 52                | 52              | 52               |

In 16, the lowest 1 or 2, or all, were female.

In 36, the upper 1 or 2, or all, were male at top.

The var.  $\beta$  of the American plant is the form most nearly approaching the usual appearance of the European one. Mr. Brewer has lately found in California specimens which, in habit, closely resemble the last, but differ in the perigynium being conspicuously toothed at the margin, and the vagina of the leaves externally scabrous. It differs from *C. angustata* in these respects, and in the larger size of the perigynium. It is the *C. senta*, B.

406. *C. microglochis* (Wahlenberg); spica simplici apice mascula ovata purpureo-ferruginea nuda; stigmatibus 3, stylo inserto; perigyniis subulato-lanceolatis plano-convexiusculis, ore integro obliquo scarioso, nervatis glabris, pallide viridibus, demum pendulis ferrugineis, basi spongiosis, squama ovata obtusa ferruginea margine albo-hyalina caduca angustioribus longioribus, racheola aciculari exserta.—*C. microglochis*, *Wahl. Act.* 140, et *Lapp.* 224; *Willd.* 412; *Schk. f.* 110; *Kunth*, 424; *Gaud. Agr.* 76, et *Helv.* 30; *Drejer, Rev.* 21; *Koch*, 863; *Bertol.* 37; *Fl. Ross.* 269; *Reich. t.* 196; *Anders.* 74, t. 3, f. 1; *Lange*, 24; *Steud.* 185; *Dewey, Sill.* 5, 174 (1848). *Uncinia microglochis*, *Led. Fl. Alt.* 234. *Uncinia Europæa*, *Gay, Bot. Ztg.* 28 (*fide Drejer*). *C. pulicaris*, *All. Ped.* (*fide Bertol.*). *C. pauciflora*, *Balb.* (*fide Bertol.*). (TAB. DLXXXIX.)

HAB. In Europa, Asia, America septentrionali, in paludibus montosis.—Iceland, Lapland, Switzerland, Caucasus, Altai, Dahuria, Kurile Islands. Alpine regions of Tibet and the Western Himalaya: Ladak, 14–16,000 ped., *Thomson*. Balti, *Strachey et Winterb.* Kunawur, *Jacquemont*. Greenland, *Vahl*.

Stolonifera. *Culmus* 3–8-pollicaris, obtusangulus, lævis; basi foliosus. *Folia* canaliculato-filiformia; culmo breviora, lævia. *Spica (florifera)* 3–4 lin. longa, sub lineam lata, fusco-ferruginea, demum oblonga, pallide flavescens, flosculis masculis 3–8, basi femineis 4–17, instructa. *Squamæ masculæ* angustiores, pallidiores, deciduæ; *femineæ* obtusæ vcl subacutæ, caducæ. *Perigynium*  $1\frac{5}{10}$ – $1\frac{8}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, rectum. *Achenium*  $1$ – $1\frac{1}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, lineare, fusco-ferrugineum; basi styli apiculatum. Ad ejus latus exterius racheola acicularis apice teres acuta, pallida, glabra adest. *Stylus* insertus. *Stigmata* 3.

Habitus et aspectus *C. paucifloræ*, Light., facile distincta; foliis pluribus, filiformibus; spica plurifolia; perigyniis minoribus, ore hyalino obliquo; stylo inserto; racheola exserta.

407. *C. oligantha* (Boott); spica simplici apice mascula demum olivacea; stigmatibus 2, stylo exserto; perigyniis subulato-lanceolatis plano-convexiusculis, ore integro vcl obliquo ferrugineo margine scarioso, nervatis glabris demum pendulis curvatis olivaceis stipitatis, squama?, racheola ligulata usque ad apicem canaliculata exserta. (TAB. DLXXXIX.)

HAB. In America meridionali.—Orange Harbour, Fuegia, *Wilkes's Exp.* (*Herb. Gray*).

*Culmus* 6–9-pollicaris, triquetus, apice acutangulus, validus, lævis, basi foliatus. *Folia* 3–4 ad basin culmi filiformia, lævissima, culmo breviora. *Spica (fructifera)* 4–5 lin. longa, flosculis masculis 2–3, femineis 2–4 instructa. *Squamæ masculæ* lanceolatæ, ferrugineæ (*femineæ* desunt). *Perigynium* 3 lin. longum,  $\frac{4}{10}$  lin. latum, pendulum, subarcuatum; stipite  $\frac{2}{5}$  lin. longo. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, fusco-ferrugineum, basi styli crassiore apiculatum. *Racheola* inferne ligulata, usque ad apicem canaliculata, exserta. *Stylus* exsertus. *Stigmata* 3.

Omnino *C. microglochis* referens, omnibus partibus major, validior, flosculis tamen paucioribus instructa; perigyniis paululum superne e culmo subarcuatim divergentibus, stipite magis conspicuo, axi cavata, marginibus acutis; stylo exserto.

I have seen no other specimens than those found by Commodore Wilkes, kindly communicated to me by Dr. Gray. The female squamæ had all fallen. Whether it will prove distinct from *C. microglochis* must be left to future observation. The only known station for that smaller species in North America is Greenland.

408. *C. Moniziana* (Lowe); spica elliptica straminea, e spiculis 8–10 apice masculis simplicibus congestis; bractea sæpe foliacea elongata; stigmatibus 2; perigyniis ovalibus stipitatis longiuscule rostratis, ore hyalino integro antice oblique secto, subplano-convexis utrinque crebre valideque nervosis fulvis lucidis glabris, vel superne ad margins inalatas parcissime dentatis basi spongiosis, squama lanceolata acuta margine anguste hyalina brevioribus. (TAB. DXC.)

HAB. In Maderæ declivibus siccis salebrosis maritimis hinc inde sparsim frequens, *Lowe, mss.*

*Rhizoma* lignosum, cylindricum, horizontaliter longe repens, squamis fuscis brevibus pectinatim degeneratis undique tectum, culmos foliorumque fasciculos per intervalla edens. *Culmi* 12–16-pollicares, infra obtusanguli glabri, supra acute triquetri scabri, graciles, basi rudimentis foliorum stramineis folisque vaginantibus tecti. *Folia* canaliculato-involuta, hinc quasi filiformia (*explicata*  $\frac{3}{4}$  lin. lata), apice setaceo-attenuata, curvata, culmo sæpe longiora. *Bractea* infima subinde foliacea, spica triplo longior, vel abbreviata. *Spiculæ* 3–4 lin. longæ, simplices, basi flosculis femineis paucis, apice masculis pluribus instructæ, quadam ex mediis omnino masculæ? *Squamæ* acutæ, infima nunc cuspidata. *Perigynium* 2 lin. longum,  $\frac{8}{10}$  lin. latum, apice fuscum. *Achenium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, ovatum, biconvexum, basi productum, pallide castaneum; basi styli crassiore.

Ad *C. arenarium* habitu accedens, differt et ab affinis perigynio inalato.

A *C. stenophylla*, *Wahl.*, cui affinis, differt rhizomate horizontali, longe repente; culmo altiori, apice acute triquetro,

scabro; foliis longioribus; perigynio longius rostrato, plerumque glabro, crebre nervoso, basi tantum spongioso; bractea subinde foliacea, squamis lanceolatis margine anguste hyalinis, spiculis pluribus.

409. *C. nuptialis* (Boott); spica elongata straminea, e spiculis 5-6 cylindricis erectis pedunculatis, terminali mascula, reliquis (*vel omnibus*) apice conspicue masculis, una alterave ex mediis geminatis exserte pedunculatis, infima vel inferioribus singulis nunc basi compositis; bracteis turgide vaginatis, infima angusta culmum superante; stigmatibus 3; perigyniis (*immaturis*) ellipticis rostratis alte bicuspidatis, superne ad margines dentatis striato-nervosis, squama truncata vel emarginata longe hispido aristata brevioribus. (TAB. DXCI.)

HAB. Sandwich Isles: Oahu, *Nuttall (Herb. Boott.)*; 'Voyage de Remy,' 1851-5, n. 142, *Herb. Mus. Paris (Herb. Gray.)*

*Culmus* 15-pollicaris, triqueter, rigidus, lævis, basi reliquis foliorum nigris capillaccis tectus; pars spicigera 7-10 poll. longa. *Folia* 3-4 lin. lata, culmo longiora, rigida. *Bractea* vaginata. *Vaginae* 4-12 lin. longæ, turgidæ. *Pedunculi* infimi 2½-3 poll. longi, scabri. *Spiculae* 2-2½ poll. longæ, basi 3 lin. latæ; inferiores nunc basi spiculis 2-3 brevibus compositæ. *Squamæ* conformes. *Perigynium* (*immaturum*) glabrum.

I am indebted to Dr. Gray for the larger specimen figured from the Paris Herbarium. The separate spike is from Herb. Nuttall. Its affinity is with *C. Bongardi*, B., differing from it in its geminate spiculæ, which are at times compound at base.

410. *C. Jamesii* (Torrey); spica subelongata viridi purpurea, e spiculis 5-8 cylindricis erectis, masculis 1-4 sessilibus contiguis, femineis 3-4 densifloris, superioribus subinde apice masculis, infima basi attenuato-laxiflora remota rarius subradicali longe pedunculata; bracteis evaginatis vel infima culmum superante breve vaginata; stigmatibus 2; perigyniis ovalibus vel obovatis rostratis, ore bidentato denticulato, utrinque valide nervatis glabris, superne biconvexis resinoso-punctatis demum ferrugineis, squama oblonga vel lanceolata acuta vel mucronata atro-purpurea, nervo albido, longioribus vel brevioribus.—*C. Jamesii*, *Torrey, Cyp.* 398 (*non Schw. An. Tab.*); *Dewey*, 5, 173, 2nd ser.; *Stuedel*, 217. *C. Nebraskaensis*, *Dewey in Herb. Torrey.* (TAB. DXCII.)

HAB. In America septentrionali.—Rocky Mountains, *James (Herb. Torrey)*. Santa Fé, N. Mexico, *Findler*, n. 887. Saline swamps on the Platte River, *Geyer*, n. 48. White River, Nebraska, *Heydon*. Kooskooske River, Oregon, *Wilkes*, n. 559, 980 (*bis*).—β. Riomembres, Mexico, *Bigelow (Herb. Torrey)*.

*Culmus* 1-2-pedalis, triqueter, scabriusculus, firmus, basi vaginis foliorum pallidis tectus; pars spicigera 4-7 poll. longa. *Folia* 2-4 lin. lata, culmo breviora; *sterilia* eo longiora, glauca. *Bractea* foliaceæ, evaginata; infima (rarius breve vaginata) culmum æquans vel superans. *Auriculæ* oblongæ, pallidæ vel purpureæ. *Pedunculi* 2-9 lin., vel infimus subradicalis 3 poll. longus, scabriusculi. *Spiculae mascula* 1-4, extremæ longiores, 4-12 lin. longæ, 1-4 lin. latæ, sessiles, ebracteata; *femineæ* 10-20 lin. longæ, 2-3 lin. latæ; superiores 1-2, subinde apice masculæ, sessiles; inferiores vel omnes pedunculatæ; infima rarius basi composita. *Squamæ*

conformes, masculæ inferiores obtusæ, nervo pallido infra apicem evanescente in superioribus extra producto, mucrone lævi. *Perigynium* 1½ lin. longum, ⅓-1 lin. latum, apice libero biconvexum, turgidum, ferrugineum, inferne compressum, pallidius, glabrum, sessile, demum deciduum. *Achenium* ⅔ lin. longum, ⅓ lin. latum, fuscum, basi styli æquali apiculatum.

The specimens I have seen of this species generally accord, with the exception of that found by Bigelow, on the Mexican Boundary Expedition, which has five spiculæ, all male at top. Those of Wilkes are the larger, with occasionally more numerous spiculæ.

411. *C. pocilliformis* (Boott); spica brevi viridi-fulva, e spiculis 3-5 gracilibus oblongis, terminali mascula filiformi sessili (*squamis pocilliformibus*), femineis laxifloris erectis, superioribus masculæ contiguis *subinserte*, infima vel binis inferioribus plus minus remotis longe exserte pedunculatis; bracteis breve vaginatis, infima spicula brevior summa aphylla; stigmatibus 3; perigyniis ellipticis triquetris sensim rostellatis superne modice excurvis, ore integro hyalino, puberulis crebre nervatis viridibus, squama obovata obtusissima pallide fulva mutica vel nervo viridi excurrente, superne margine albida ciliata longioribus. (TAB. DXCIII.)

HAB. Tsus-Sima, Straits of Korea, *Wilford*, n. 763 (*Herb. Hooker*).

Cæspitosa. *Culmi* plures sub-10-pollicares, capillacei reclinati vel decumbentes, læves, basi foliati; pars spicigera 1¼-4 poll. longa. *Folia culmea* angusta, culmo multum breviora; *sterilia* 1-2 lin. lata, culmum superantia, fusco-viridia. *Bractea* vaginata, infima ¼-½ lin. lata, spiculam rarius superans, summa brevissime cuspidata vel aphylla. *Vaginae* superiores sub lineam, infima nunc 6 lin. longa. *Pedunculus* infimus ½-2 poll. longus, scaber. *Spicula mascula* 7-9 lin. longa, ⅓ lin. lata; *femineæ* 4-7 lin. longæ, 1¼ lin. latæ; infima ½-3 poll. remota. *Squamæ masculæ* vaginæformes; inferne cylindricæ, apice oblique truncatæ, alternatim vaginantes, olivaceæ; superne zona fulva notatæ, margine albidæ, ciliolatæ. *Perigynium* 1½ lin. longum, ½ lin. latum. *Achenium* 1 lin. longum, ⅓ lin. latum, conforme, ellipticum, triquetrum, nigro-purpureum, tuberculis minimis albis conspersum, apice annulo albo lato basin styli incrassatam cingente apiculatum. *Stamina* 2; filamentum ligulatum.

412. *C. laciniata* (Boott); spica elongata lutescenti-ferruginea, e spiculis 6 cylindricis elongatis remotis, masculis 1-2, femineis superioribus vel omnibus apice masculis densifloris, inferioribus longe pedunculatis subnutantibus; bracteis inferioribus longissimis, auricula integra truncata vaginæformi; stigmatibus 2; perigyniis ovalibus vel suborbiculato-obovatis rostratis, ore subintegro vel emarginato vel bifido denticulato, plus minus nervatis, apice ad margines parce dentatis ferrugineo-punctatis lenticulari-compressis, squama lanceolata hispido-aristata, apice ciliata ferruginea, nervo pallido, latioribus brevioribus vel longioribus.—*C. laciniata*, *Boott.* (TAB. DXCIV.)

HAB. In California.—St. Barbara, *Nuttall (Herb. Hooker)*. Banks of the Sacramento, *Wilkes*, n. 1241; *Hartweg*, n. 2022. Ballinas Bay, West Creek. Mari-posita, *Thurber (Herb. Torrey)*. California, *Coulter*, n. 806 (*Herb. Harvey*); *Bigelow*; *Whipple's Exp. (Herb. Hooker)*. San Francisco, *Brewer*.

*Culmus* 2-3-pedalis, triqueter, firmus, apice seabriuseulus, inter spiculas scaberrimus, basi vaginis reticulato-fissis tectus; pars spicigera 10-15 poll. longa. *Folia* 2½-4 lin. lata. *Bracteæ* evaginatae, infima subinde 2½ pedes longa, proxima pedalis, summa brevis, setacea. *Pedunculus* infimus 2½ poll. longus. *Auriculæ* integræ, truncate, purpureæ. *Spiculæ masculæ* 1-2, terminalis 2-2½ poll. longa, 3 lin. lata, altera sessilis pollicaris. *Spiculæ femineæ* 2-3½ poll. longæ, 3-4½ lin. latæ, inter se 1-4½ poll. remotæ, suprema sessilis, reliquæ longe pedunculatæ; inferiores basi subattenuatæ, infima squama sterili 1-2, mediam partem pedunculi occupante. *Squamæ* omnes ciliatæ, plus minus hispido-aristatæ; *femineæ* inferiores arista longiori, perigynio longiores, superiores eo breviores. *Perigynium* ovale, 2-2½ lin. longum, 1-1½ lin. latum, vel suborbiculatum, 1-1½ lin. longum, 1-1½ lin. latum, plus minus distincte nervatum ad margines parce dentatum, flavidum, demum ferrugineum, spongiosum. *Achenium* 1 lin. longum, 7/10 lin. latum, ovatum, fuscio-olivaceum.

A *C. Jamesii*, Torr., differt culmo altiore; spiculis longioribus; squamis omnibus hispido-aristatis, apice ciliatis; perigyniis margine dentatis; achenio ovato; bracteis inferioribus longissimis; auriculis truncate, integris.

A *C. Sitchensi*, Pres., differt spiculis erectis, masculis 1-2; perigyniis majoribus, compressis, bifidis, nervatis; squamis ciliatis angustioribus, magis aristatis, ferrugineis; bractea infima longiori.

Variat culmo gracili; foliis angustis; spiculis minoribus, vix pollicaribus; squamis subinde muticis vel hispido-mucronatis, masculis inferioribus obtusis, nervo in superioribus solum producto; perigyniis ellipticis, subinde enerviis, glabris vel abrupte rostro tenui cylindrico vel sensim rostro latiori conico apiculatum, ore nunc subintegro vel bifido.

The specimen figured is that from St. Barbara (Nuttall, in Herb. Hooker), with n. 1, perigynia from Wilkes' specimen, and n. 2, from that of Hartweg; and the description is taken chiefly from Wilkes' specimen, in which the squamæ have the longer arista. Several of the specimens I have quoted are not mature. In one of Wilkes', the spiculæ are only 9-12 lin. long, and 7-8 lin. remote. In another, the perigynia (*immature*) are elliptic, gradually tapering into a conical apex; one of Whipple's is like it in these respects. In Coulter's and Thurber's, the lower male squamæ are obtuse, the nerve only produced in the upper ones. But in all the squamæ are ciliate, with a rough mucro, and the perigynia sessile (in which respect they differ from *C. decidua*, B.), and occasionally sparsely toothed at the margin. Future observation must determine whether the present plant differs from *C. Jamesii*, Torr., when that species is better known; and from *C. Sitchensis*, with which Mr. Brewer found it growing in a salt marsh at San Francisco.

413. *C. Thouarsii* (Carmichael); spica oblonga viridiferruginea, e spiculis 5-6 erectis densifloris contiguis sessilibus, terminali mascula ferruginea cylindrica, reliquis femineis vel apice masculis ovatis vel oblongis, superioribus congestis, infima remota incluse pedunculata; bracteis culmum longe superantibus, infima vaginata; stigmatibus 3; perigyniis ovalibus longe cylindrico-rostratis, rostro ad margines scabro compresso, ventricosis bidentatis, ore postice oblique secto, nervatis membranaceis ferrugineo-punctatis, squama ovata subacuta sæpe emarginata apice ciliata hispido-aristata tenui punctis pallide ferrugineis notata, nervo viridi, longioribus.—*C. Thouarsii*, *Carm. Linn. Trans.* 12, 508 (1818). "Carex spicis confertis," etc., *Aub. du Pet. Thouars*, in 'Mélanges de Botanique,' p. 36. (TAB. DXCV.)

HAB. In ins. Tristan d'Acunha, *Carmichael*.

*Culmus* 15-pollicaris, acute triqueter, rigidus, lævis, basi foliatus; pars spicæ gerens 3-6 poll. longa. *Folia* 2-2½ lin. lata, culmo longiora, glauca, rigida, carinata, marginibus revolutis. *Bracteæ* 3-4, inferiores culmum longe superantes, infima vaginata, inferiores 2; *steriles* remotæ, longe vaginatae. *Spiculæ* 9-12 lin. longæ, mascula 2 lin., reliquæ 3-5 lin. latæ, infima 1-3 poll. remota. *Vagina* ½-1 poll. longa. *Squamæ* conformes. *Perigynium* 2-2½ lin. longum, 1-1½ lin. latum, ore postice oblique secto. *Achenium* 1-1½ lin. longum, 7/10 lin. latum, obovatum, inæqualiter triquetrum, basi styli curvata apiculatum, pallidum.

A *C. Borbonica* differt spiculis brevioribus, erectis, pallidis, sæpe apice masculis, sessilibus; bracteis longioribus; perigyniis bidentatis, postice oblique sectis, squamis ovatis latioribus.

414. *C. ternaria* (Foster); spicis pluribus (15-24) cylindricis pedunculatis pendulis evaginatae fusco-purpureis, masculis 1-6, inferioribus geminatis, femineis 8-18 geminatis ternatis quaternatis etiam quinatis, vel infima singula plus minus præcipue superioribus apice masculis; bracteis inferioribus brevissimis; stigmatibus 2; perigyniis subrotundo-ovatis, ovalibus vel obovatis erostibus vel rostellatis, ore emarginato lævi vel integro ciliato, nervatis punctis ferrugineis obsitis apice granulatis, squama ovata vel oblonga truncata vel emarginata rarius acuta hispido-aristata purpurea medio viridi nervata brevioribus.—*C. ternaria*, *Forster, Prod. n.* 549; *Hook. f. Fl. Antarct.* 89; *Fl. N. Zeal.* 282. *C. geminata*, *Schk. f.* 75; *Wahl. Act.* 160; *Willd.* 249; *Kunth*, 418; *Steud.* 206. *C. polystachya*, *Rich. Voy. Astrolab.* 111, t. 21. (TAB. DXCVI.-DXCVIII.)

Var. *β. minor*; spicis paucioribus brevibus. (TAB. DXCVII.)

HAB. In Nova Zelandia.—Lord Auckland's group, *Dr. Hooker*.

*Culmus* 2-4-pedalis, triqueter, validus, seabri; pars spicæ gerens sæpe sesquipedalis. *Folia* 4-5 lin. lata, culmo longiora. *Bracteæ* inferiores 2-3-pedales, infima subinde vaginata. *Auricula* atro-purpurea, amplectens vel discreta. *Pedunculi* inæquales, ligulati, seabri, infimus subinde pedalis. *Spiculæ masculæ* 1½-2½ poll. longæ, 1-2 lin. latæ, singulæ vel inferiores geminatae. *Spicæ femineæ* 2-6 poll. longæ, 2-3 lin. latæ, infima sæpe 6-8 poll. remota. *Squamæ* conformes. *Perigynium* 1-1½ lin. longum, 7/10 lin. latum. *Achenium* 1-1½ lin. longum, 5/10 lin. latum, ovale, lenticulare, basi styli apiculatum.

This species varies in size, in the form of the squamæ, the degree of roughness on their arista, in the perigynium being erostate with a smooth emarginate orifice, or rostellate with an entire ciliate orifice. The colour of the perigynium is olivaceous or ferrugineous, varying in the number of its nerves and in its forms, partly depending on age. In the specimen figured (Tab. DXCVI.) there was a white spongy nerveless coat investing the normal achenium, conforming to the inner surface of the perigynium, but not adherent to either, the nature of which is problematical. M. Spach, who first called my attention to it, was inclined to consider it a double perigynium; but Mr. Berkeley, in a note to me, says, "It is undoubtedly some fungus in a young state, as it abounds in oil globules, possibly some species of *Hypocrea*. It is curious how exactly it simulates an arillus, but the structure is that of a fungus."

415. *C. rubella* (Boott); spica composita capitulata,

olivaceo-lateritia, e spiculis parvis pluribus ovatis apice masculis densissime congestis; capitulis rotundis arcte contiguis, terminalibus sessilibus evaginatibus, vel infima oblonga angustiore remota exserte pedunculata; bracteis superioribus evaginatibus vel infima vaginata culmo longioribus; stigmatibus 3; perigyniis ovalibus subabrupte rostellatis, ore bilobato compresso, triquetris, marginibus acutis scabris, nervatis olivaceis, squama lateritia ovata mutica latioribus longioribus. (TAB. DXCIX.)

HAB. In Ceylon, *Thwaites*, n. 2966 (*Herb. Hooker*).

*Radix* fibris lignosis validis. *Culmus* 2-2½-pedalis, triquetus, lævis, rigidus, foliatus. *Folia* 1-2 lin. lata, culmo longiora, rigida, tuberculis minimis asperata, vaginis rubro-purpureis basi triquetris subtumidis instructa. *Bractea* superiores 1-2 evaginatae, infima 2½-3 pollices remota vaginata sæpe sterilis; vagina 10 lin. longa. *Pedunculus* 14 lin. longus. *Inflorescentia* nunc capitulata, 7-8 lin. longa et lata; vel 3 pollices longa; capitulum infimum remotum oblongum laxius. *Spiculae* parvae, ovatae, subdimidiatim apice masculae. *Squamae* conformes. *Perigynium* 1 $\frac{4}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum, fusco-olivaceum, basi ferrugineum. *Achenium* 1 $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, triquetrum, stipitatum, fusco-brunneum, angulis pallidis, basi styli obliqua.

It is very probable that the inflorescence of this species, from the existence of sterile bracts on the culm, may be found to be more composite than on the specimens figured, which are the only ones I have seen. Its affinity is with *C. leucantha*, Arn.

416. *C. scitula* (Boott); spica oblonga lateritia concolori, e spiculis 5-6 oblongis erectis, terminali apice vel basi apiceque mascula, reliquis femineis densi-multifloris comosis, superioribus contiguis sessilibus, inferioribus discretis sæpe basi compositis exserte pedunculatis, infima subinde remota; bracteis involutis, inferioribus vaginatis culmum multum superantibus; stigmatibus 3 longissimis; perigyniis ovalibus triquetris stipitatis longe rostratis, ore oblique bidentato, enerviis scabris, squama lineari lanceolata acuminata cuspidata æquilata brevioribus. (TAB. DC.)

HAB. In India orientali.—“Cliffs of Paen-panee, *Griffith*.”

Cæspitosa. *Culmus* 6-10-pollicaris, filiformis, triquetus, scaber, basi vaginis reticulato-fissis ferrugineis foliorum clausus; pars spicigera 2½-4 pollices longa. *Folia* involuta, filiformia, culmo longiora, apice longe setaceo-attenuata, *explanata*, sub lineam lata. *Bractea* inferiores vaginatae, infima subinde 9 pollices longa; vagina 3-7 lin. longæ. *Pedunculus* infimus 6-12 lin. longus. *Spiculae* 8-10 lin. longæ, 3 lin. latae, comosae, inferiores sæpe spiculis 1-2 brevibus basi compositae. *Perigynium* 1 $\frac{3}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, pallide ferrugineum, scabrum, membranaceum. *Achenium*  $\frac{6}{10}$  lin. longum, plus  $\frac{2}{10}$  lin. latum, ovale, triquetrum, pallidum, basi styli apiculatum. *Racheola* setiformis, æquilonga.

Habitus omnino *C. setigera*,  $\beta$ ; differt spiculis latioribus, comosis; perigyniis ovalibus, angustis, longe rostratis; stigmatibus longissimis; squamis linearibus.

[The following species have been described by Dr. Boott, and the drawings, prepared under his own eye, are deposited in the herbarium of the Royal Gardens, Kew.—J. D. H.]

417. *C. alba* (Scopoli); spica oblonga albo-straminea, e spiculis 2-3 rarius 4 erectis pedunculatis, mascula 1 elliptica, femineis abbreviatis vel oblongis, alternatis exserte pedunculatis 3-6-floris; bracteis vaginæformibus pallidis apice late albo-hyalinis muticis; stigmatibus longis; perigyniis ellipticis vel subglobosis, conico-rostratis, ore hyalino integro, glabris plus minus subinde costato-nervatis coriaceis, squama ovato-subrotunda obtuse abrupte acutata albo-hyalina, nervo viridi, angustioribus longioribus.—*C. alba*, *Scop. Fl. Carn.* 216, ed. 2, (1772); *Wahl. Act.* 158; *Willd.* 253; *Schk. f.* 55; *Kunth*, 474; *Allioni, Ped.* 269; *Gaud. Agr.* 145; *Bertol.* 77; *Hoppe, Ic. Koch*, 878; *Reich.* 17. t. 239; *Lang.* 98; *Gren. et Godr.* 406; *Fl. Ross.* 288 (excl. *C. eburnea*) *Steud.* 232. *C. nemorosa*, *Schrank.* *C. argentea*, *Gmel. Sib. Gaud. Etr.* 30. *C. inclusa*, *Turcz.* (*fide Fl. Ross.*) (*Ic. ined. DCI. in Herb. Kew.*)

HAB. In Europa et Asia.—France, Germany to Italy, Baikal.

*Rhizoma* repens. *Culmi* plures, graciles, inter spiculas scabri, basi foliati, vaginis reticulato-fissis fulvis nervatis tecti; pars spicigera 1-3½ poll. longa. *Folia* plana, demum involuta, copiosa, culmo breviora, scabra. *Bractea* vaginæformes, pallidæ, muticæ. *Spica* mascula 3-9 lin. longa,  $\frac{3}{4}$  lin.

lata, pedunculata; femineæ 3-5 lin. longæ, 2 lin. latæ, summa sæpius masculam superante alternatim remotæ, tamen spiculæ omnes nisi rarius infima contiguæ. *Squamæ* masculæ imbricatæ, longiores. *Perigynium* 1 $\frac{8}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, ellipticum, vel 1 $\frac{4}{10}$ - $\frac{5}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, suborbiculatum, nervis subinde costatis vel inconspicuis concoloribus, glabrum, stramineum, coriaceum. *Achenium*  $\frac{9}{10}$ -1 lin. longum,  $\frac{6}{10}$  lin. latum, ovale vel obovatum, triquetrum, pallidum, basi styli incrassata obliqua vel recta apiculatum, sæpe rachcola filiformi instructum.

I find 63 with 2 spikes.

56 „ 3 „

3 „ 4 „

In one specimen the lower spike was radical.

In *C. eburnea* I find 2 with 2 spikes.

87 „ 3 „

70 „ 4 „

3 „ 5 „

The small, very inconspicuous male spike often surpassed by all the spiculæ, the minute dark-coloured perigynium, the shorter delicate culm and leaves, sufficiently distinguish the American from the European plant.

The specimens figured are from Germany.

418. *C. arenaria* (L.); spica ovata vel cylindrica acuta straminea polygama, e spiculis plus minus numerosis (5-20), superioribus plerumque lanceolatis masculis con-

gestis vel ovatis apice masculis, inferioribus ovatis femineis vel apice vel basi vel apice et basi masculis simplicibus vel infimis compositis subinde discretis; bracteis inferioribus cuspidatis spiculas sæpe vel infima spicam superantibus; stigmatibus 2; perigyniis orbiculatis vel ovato-lanceolatis plerumque sensim rostratis bifidis compressis plano-convexiusculis utrinque valide nervatis stramineis plus minus late alatis, squama ovato-lanceolata acuminata cuspidata angustioribus brevioribus vel latioribus longioribus.—*C. arenaria*, *L. Sp. Pl.*; *Wahl. Act.* 144; *Good, Linn. Trans.* ii. 153; *Willd.* 223; *Schk. f.* 6; *Kunth*, 376; *Eng. Bot. t.* 928; *Smith, Eng. Fl.* 85; *Brot.* 61; *Koch*, 865; *Anders.* 68. *t.* 3. *f.* 16; *Lang.* 32; *Reich.* *t.* 209; *Fl. Ross.* 273; *Cop. et Germ.* 593; *Gren. et Godr.* 391; *Steud.* 189; *Benth.* 560. *C. spadicea*, *Gilib. (Ic. med. DCII. DCVI. in Herb. Kew.)*

Var.  $\beta$ . *depauperata*.

Var.  $\gamma$ . *castanea*.

HAB. In Europa, Asia, in arenosis maritinis præcipue.—Norway, Sweden to Lisbon. Tauria, Ural, Baikal (*Fl. Ross.*).— $\beta$ . Bavaria, in pratis humidis.— $\gamma$ . Celandia, France, Colchis, Tauria, Caucasus.

*Rhizoma* lignosum, cylindricum, longe repens, squamosum, culmos solitarios vel fasciculatos foliaque fasciculata per intervalla edens. *Culmus* 5–16-pollicaris, gracilis, triqueter, scaber, basi rudimentis foliorum pallidis arcte vestitus, apice sæpe incurvus. *Folia* involuta, filiformia, vel canaliculato-plana, 1–2 lin. lata, rigida, apice attenuata, curvata, culmo sæpe longiora, fasciculato-divergentia. *Bracteæ* c basi ovato-lanceolata plus minus cuspidatæ. *Spica* ovata vel cylindrica, 1–3 poll. longa, 6–8 lin. lata, e spiculis omnibus congestis simplicibus vel inferioribus discretis compositis quasi lobatis. *Spiculae* superiores sæpius masculæ; inferiores femineæ, intermediæ apice rarius basi masculæ; tamen ex eadem radice insigniter dispositione staminum variant, nempe superiores sæpe apice masculæ, aliæ apice vel basi, vel apice et basi masculæ, vel omnino femineæ, vel omnes basi masculæ. *Perigynium* æque variabile; nempe in speciminibus ad littora arenosa prope Lowestoft, com. Suffolk, Angliæ, lectis, circumscriptione vel *orbiculatum* abrupte breve vel sensim longius rostratum, late alatum, ala ad margines tenuissime serrulata, vel erosa, compressum, plano-convexiusculum, 2 lin. longum,  $\frac{1.6}{10}$  lin. latum, vel  $\frac{2.3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{1.2}{10}$  lin. latum, vel  $\frac{2.5}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{1.4}{10}$ – $\frac{6}{10}$  lin. latum; vel *ovato-lanceolatum*, sensim rostratum, ala semper tenuissime serrulata, angustior, nec basi abrupte truncata, nec plerumque infra apicem achenii producta, plano-convexum,  $\frac{2.1}{10}$ – $\frac{7}{10}$  lin. latum,  $\frac{2.2}{10}$  lin. longum,  $\frac{1.8}{10}$  lin. latum,  $\frac{2.7}{10}$  lin. longum,  $\frac{1.8}{10}$ – $\frac{9}{10}$  lin. latum,  $\frac{2.8}{10}$  lin. longum, 1 lin. latum. Ala in forma perigynii orbiculari semper latior, basi sæpe subito angustata vix infra medium achenii producta; in forma perigynii ovato-lanceolata semper angusta, sæpe solum supra achenium notanda. *Achenium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, plano-convexum, lucidum, castaneum, basi styli clavata apiculatum.

Most authors describe the spiculæ of *C. arenaria* as male or female or male at top. Neither in Goodenough, Smith, Lightfoot, Koch, Willdenow, Kunth, Reichenbach, Lange, Grenier and Godron, Cosson and Germain, Bromfield, Bentham, Steudel, do I find any notice of exclusively basal male florets, though Schkuhr figures such (*D. D.*) and Andersson alludes to them. I have taken my description from copious specimens I collected in the sands at Lowestoft, which agree with others I have from Germany and other localities, and I have noticed the variation in the

spiculæ and perigynium the more particularly because it bears upon the claims of several recorded species to be considered as distinct.

Var.  $\beta$ ; spica gracillina laxa stramineo-viridi, e spiculis 6–12 parvis polygamis, superioribus (4–6) masculis contiguis, vel summa apice mascula, intermediis masculis, inferioribus (3–4) remotis femineis vel basi masculis; bractea nunc spicam superante; perigyniis lanceolatis fere e basi anguste alatis appressis, squama mutica obtusiuscula longioribus.—*C. Ohmulleriana*, *Lang.* 44; *Koch*, 861; *Reich.* *t.* 213; *Steud.* 197. *C. arenaria*  $\beta$ , *Coss. et Germ.* 593.

Lang remarks of this plant, "*habitum C. remotæ referens rhizomate longe diversa.*" It appears to me to connect *C. brizoides* (from its general habit) with *C. arenaria*.

Var.  $\gamma$ . *castanea*; spica oblonga castanea, e spiculis 4–12 plerumque basi masculis vel una alterave apice et basi mascula vel omnino feminea; perigyniis ovatis acute bifidis utrinque nervatis e medio vel e basi plus minus late alatis, squama ovato-lanceolata acuminata cuspidata castanea superne margine albo-hyalina angustioribus brevioribus.—*C. Ligerica*, *Gay, Ann. Se. Nat.* 10. 360 (1838); *Gren. et Godr.* 392; *Steud.* 189. *C. Ligerina*, *Boreau, Fl. Centr. t.* 2. 550 (*fide Gren. et Godr.*). *C. arenaria*, *Dubois, Fl. Orl. (fide Gren. et Godr.)*. *C. Schreberi*, *Desv. Fl. Ang. Fries, Mant.* 2. 56. *et Herb. Norm. n.* 91; *Anders.* 64. *t.* 4. *f.* 25 (*fide Gren. et Godr.*). *C. pseudo-arenaria*, *Reich.* *t.* 208; *Steud.* 189. *C. Colchica*, *Gay, l. c.* 303; *Steud.* 189. *C. arenaria*, *B. Fl. Ross.* *C. intermedia*, *Urv. (fide Fl. Ross.)*. *C. sabuletorum*, *Biebst. mss. (fide Fl. Ross.)*.

HAB. Ad ripas arenosas fl. Ligeris (*Gay*); Dampierre près de Paris (*Gren. et Godr.*). Ad littora arenosa Colchidis et in Tauriæ herbis.

This form connects the typical *C. arenaria* with *C. Schreberi*, Schr. Gren. and Godr. refer the *C. Schreberi*, Fries, to it, of which Andersson says, "Specimina in Celandia lecta in una eademque spicula fructus fovet ovatos vel oblongos, margine nunc sensim in alam dilatato nunc subito oblique producto," and he therefore allies it to *C. Ligerica* and *C. pseudo-arenaria*, both of which Gren. and Godr. unite. Reichenbach describes the last "*spiculis apice masculis*," but in one of his figures they are basi masculis, showing that no dependence can be placed on the position of the male florets. Gay, etc., take no notice of male florets at the top of the spicula, but in a specimen he sent to me in 1846 I observe a spicula apice et basi mascula, as shown in the figure of it. I refer *C. Colchica* here from the castaneous colour of the squamæ. There is nothing in the detailed character, unless it be the "*culmus obtuse trigonus leviusculus*" (common to the lower part of the culm in all the forms), to distinguish it from *C. arenaria*.

419. *C. Arnottiana* (Nees); spica elongata ferruginea concolori, e spiculis 8–12 cylindricis, masculis 1–3 contiguis sessilibus, reliquis femineis apice masculis, densifloris, mediis vel inferioribus geminatis, pedunculatis pendulis remotis; bracteis evaginatis, inferioribus interdum longissimis; stigmatibus 2; perigyniis obovatis abrupte cylindrico-rostellatis, ore integro, enerviis vel obscure nervatis superne granulatis ferrugineis compressis membranaceis, squama lanceolata acuminata vel obtusa vel sensim vel abrupte cuspidata lævi ferruginea, nervo viridi, latioribus vel angustioribus brevioribus.—

*C. Arnottiana*, Nees; *Drejer, Symb.* 16. t. 5. *C. socia*, Boott, *Linn. Trans.* 20. 128; *Steud.* 213. (*IC. ined. DCVII. in Herb. Kew.*)

HAB. In Ceylon, *Walker, Thwaites.*

*Culmus* 3-pedalis, validus, triqueter, lævis, inter spiculas scaber; pars spicigera 9-12 pollices longa. *Folia* 3-4 lin. lata, culmo longiora. *Bractea* (nisi infima rarius) evaginata, inferiores subinde longissimæ; ligula vel elongata acuta vel obtusa amplexans. *Spiculae masculæ* 1-2½ poll. longæ, 1-2 lin. latæ; *femineæ* 1-2½ poll. longæ, 3 lin. latæ; extremæ singulæ vel omnes, nisi summa, geminatæ, inæquales, unaque semper brevius pedunculata. *Squamæ* omnes conformes, plus minus latæ, acuminatæ, vel obtusæ, sensim vel abrupte cuspidatæ, cuspidate lævi. *Perigynium* 1 $\frac{2}{10}$ -1 $\frac{4}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, compressum, superne vacuum, obscure punctulatum. *Achenium* minus,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, obovatum, lenticulare.

*C. ternaria*, Forster, affinis. Differt perigyniis membranaceis, enerviis, cylindrico-rostellatis; squamis cuspidate lævi; spiculis geminatis.

The paper in the *Linn. Trans.* was published before I had seen the 'Symbolæ' of Drejer, in which admirable work the *C. Arnottiana* of Nees was first described.

I have figured the original specimen from Herb. Arnott, and one from Thwaites.

420. *C. Asturica* (Boissier); spica oblonga purpurea, e spiculis 3-4 oblongis approximatis, terminali mascula, reliquis femineis inferioribus subinserte pedunculatis; bracteis vaginatis, infima culmum æquante; stigmatibus 3; perigyniis oblongo-obovatis obtuse trigonis abrupte rostellatis fuscis, ore integro hyalino, lucidis glabris vel superne ad margines parce denticulatis, nervis 4 prominentibus, squama suborbiculato-ovata obtusa purpurea margine albo-hyalina æquilata paulo longioribus vel æquantibus.—*C. Asturica*, Boiss.; *Steud.* 233. *C. leiocarpa*, Gay, *Ann. Sc. Nat.* (1836), (*non Meyer*). *C. Gayana*, *Steud. Nomen.* (*non Desv.*). (*IC. ined. DCVIII. in Herb. Kew.*)

HAB. Europa, in pascuis alpinis.—Puerto de Leitariegos et Pico de Arvas, *Durieu, Pl. Hispano-Lusit. n.* 206.

*Radix* repens. *Culmus* 1½-pcd., obtusangulus, lævis, rigidus, basi foliatus; pars spicigera 2½-4 poll. longa. *Folia* 1½-2 lin. lata, culmo subduplo breviora, plana, carinata, rigida. *Bractea* vaginatæ; infima culmo breviora vel æquans. *Vagina* 6-8 lin. longæ. *Pedunculus* infimus 6-10 lin. longus, scaber. *Squamæ* conformes. *Spiculae* 4-7 lin. longæ; *mascula* 1, *femineæ* 2-3 lin. latæ; summa masculæ arcte contigua, abbreviata, subinde uniflora; infima inserte vel breviter exserte pedunculata. *Perigynium* achenium arcte vestiens, 1 $\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum, sessile, nervis plerumque 4 extramarginalibus prominentibus duobus quasi paribus in utroque latere opposito approximatis, aliter enerve vel nervulis paucis notatum, lucidum, fusco-brunneum, (sub lente) reticulato-confectum. *Achenium* conforme, 1 $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, oblongum, obtuse trigonum, atro-purpureum, basi styli æquali abrupte apiculatum.

The affinity is with *C. obesa*, All., differing in the taller culm, broader leaves, purple squama, orifice truncate and obtuse, always mucous squama, and larger achenium.

421. *C. axillaris* (Goodenough); spica elongata pal-

lida interrupta, rachi recta, e spiculis 6-12 polygamis, superioribus congestis basi vel apice masculis, inferioribus remotis compositis quasi lobatis fere vel omnino femineis; bractea infima elongata, altera spiculam sæpe superante; stigmatibus 2; perigyniis ovato-vel elliptico-lanceolatis sensim rostellatis bifidis superne margine serrulatis erectis plano-convexis utrinque medio nervatis, nervis superne convergentibus pallidis, squama ovata acuta vel cuspidata pallide straminea longioribus.—*C. axillaris*, Good. *Linn. Trans.* 2, 151. t. 19. f. 1; *Eng. Bot. t.* 993; *Eng. Fl.* 84; *Willd.* 239; *Schk. f.* 62; *Kunth*, 403; *Reich. t.* 219; *Koch*, 869; *Lang.* 46; *Fl. Ross.* 283; *Bromfeld*, 555; *Benth. Brit. Fl.* 559; *Steud.* 200. (*IC. ined. DCIX. in Herb. Kew.*)

HAB. In Europa, Asia.—England, Germany, Caucasus (*Fl. Ross.*).

Cæspitosa. *Culmus* 1-3-pedalis, validus, erectus, acute triqueter, scaberrimus. *Folia* 1-2 lin. lata, plana, carinata, culmo breviora. *Bractea* infima foliacea, sæpe lineam lata, spicam duplo superans, vel setacea brevior; proxima setacea, spicula longior; aliæ cuspidatæ, breves. *Squamæ* acutæ, vel inferiores præcipue cuspidatæ. *Spica* 2-4 pollices longa. *Spiculae* ellipticæ, plerumque apice extremo parce masculæ, rarius basi vel apice et basi masculæ, vel inter superiores quædam minores omnino masculæ, inferiores sæpe femineæ; inferiores 3-4, compositæ, lobatæ; infima sæpius 1½-2½ pollices remota e spiculis partialibus 3-5 congestis basi aucta. *Perigynium* 1 $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, oblongo-ovatum vel ovale, lenticulare, basi styli apiculatum.

Goodenough says this species was first observed by Curtis at Putney, on the banks of the Thames. It has not been found in the north of Europe, nor in Italy. A plant, closely allied to it, *C. Bœnninghauseniana*, has since been noticed, having a wider range, and opinions differ as to its specific distinction. The difficulty of determining the question is increased by authors disagreeing as to the character of *C. axillaris*. Goodenough, Smith in the 'Flora Britannica,' Koch, and Lange describe the male florets of *C. axillaris* as inferior, while Coleman, who, in 'English Botany,' elaborately compares the two, which he finds at Hertford, describes them in both species as superior.

Bentham, under *C. axillaris*, to which he unites *C. Bœnninghauseniana*, says there are a few male florets at the top of the terminal spikelets and usually a few at the base of most of them. My own observations of specimens from Surrey, sent to me by Mr. Hewett C. Watson, are in accordance with those of Mr. Bentham. But in all the specimens the male florets were only 1 or 2, and later in their development than the female ones. I can have no doubt, judging from the difference between the Hertford plant, in which the male florets were generally superior, and the Surrey one, in which they were occasionally inferior, that specimens from other localities would be found to vary in their position, and that *C. Bœnninghauseniana* may be considered a variety exhibiting this variable disposition.

The Plate represents a specimen of the *C. axillaris* from Hertford, from Mr. Coleman.

422. *C. Baldensis* (L.); spica subrotunda vel ovata capitata nivea involucreta, e spiculis apice masculis ovatis 1-8 patentibus congestis; bracteis inferioribus 1-4 foliaceis spicam superantibus; stigmatibus 3 validis; perigyniis oblongis triquetris brevissime vel vix rostellatis, ore integro, nervatis niveis demum fulvis, squama ovata obtusiuscula vel acuta nivea concolori angustioribus brevioribus.—*C. Baldensis*, L. *Sp. Pl.*; *Wahl. Act.* 141;

*Willd.* 216; *Schk. f.* 81; *Kunth*, 427; *Gaud. Helv.* 61; *Bertol.* 40; *Reich. t.* 224; *Koch*, 863; *Lang*, 63; *Steud.* 188. ( *Ic. ined. DCX. in Herb. Kew.*)

HAB. In Europa, in montibus.—Tyrol, Italy, Germany.

*Rhizoma* validum. *Culmus*  $\frac{1}{2}$ –1-pedalis, triquetus, lævis, basi foliatus vaginisque foliorum ferrugineis tectus. *Folia* 1– $1\frac{1}{2}$  lin. lata, culmo breviora vel æquantia, rigida, apice attenuata, sæpe curvata. *Bracteæ* plerumque foliaceæ; infima subinde 3 pollicibus longa,  $1\frac{1}{2}$  lin. lata, nunc reflexa, rarius ovata, spicula brevior. *Squamæ masculæ* lanceolatae, angustiores, omnes niveæ, coneolores, vel demum lineolis fulvis plus minus notatae. *Spica* 4–6 lin. longa, 4–9 lin. lata. *Spiculæ* patentis, floseulis masculis imbricatis pluribus; inferiores sæpe e perigynio egredientes. *Perigynium* 2– $2\frac{1}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, oblongum, triquetrum, faeibus concavis, ferrugineum, basi styli crassiore apiculatum. *Stigmata* 3, valida, dense rugosa.

This remarkable plant is almost as local in its haunts as its still more remarkable ally *C. Fraseri* in the Southern States of America. In one of the specimens figured the spike is of 1 spicula. The lower spiculæ frequently issue from a perigynium; and the perigynium, which in the recent state is, I suspect, more or less ventricose, is at times proliferous, bearing an axis with female and male florets.

423. *C. Bœnninghauseniana* (Weihe); spica elongata gracili pallida interrupta, rachi recta, e spiculis 10–16 ovalibus vel lineari-oblongis parvis inæqualibus polygamis apice vel omnino masculis vel rarius basi masculis vel omnino femineis, superioribus congestis sæpe masculis, inferioribus remotis compositis nunc omnino femineis; bracteis inferioribus elongatis, superioribus muticis; stigmatibus 2; perigyniis ovato-acuminatis rostellatis bidentatis plano-convexis e medio margine serratis utrinque nervatis, nervis antice convergentibus erectis, demum pallide brunneis punctis ferrugineis maculatis, squama ovato-lanceolata acuta vel cuspidata pallide brunnea margine late albo-hyalina longioribus vel subæquantibus.—*C. Bœnninghauseniana*, *Weihe, Regensb. Bot. Ztg.* (1826); *Kunth*, 404; *Koch*, 868; *Kunze, t.* 22; *Reich. t.* 219; *Fries, Sum.* 72; *Anders.* 56. *t.* 4. *f.* 41; *Lange*, 45; *Eng. Bot. t.* 2910; *Bromfield*, 555; *Steud.* 197.—*C. axillaris*, *Fries, Mant.* 2, 57; *Bentham*, 559. *C. axillaris*,  $\beta$ , *Meyer, Fl. Ross.* 283. *C. Hailstoni*, *Gibson. (Ic. ined. DCXI. in Herb. Kew.)*

HAB. In Europa et Asia.—Denmark, Sweden, England, France, Germany, Caucasus (*Fl. Ross.*).

Dense cæspitosa. *Culmi* numerosi, 2–4-pedales, graciles, firmi, patentis, acute triquetri, scabri, basi squamis fusco-brunneis tecti. *Folia* 1– $1\frac{1}{2}$  lin. lata, culmum subæquantia, eanaliculata. *Bractea* infima sæpe foliacea, spica longior vel setacea brevis; 2 proximæ nunc breves setaceæ; aliæ squamiformes, muticæ. *Squamæ masculæ* obtusæ, brunneæ, margine late albo-hyalinæ, nervo viridi infra apicem evanescente; *femineæ* angustiores, acutiores, nervo sæpe excurrente. *Spica* 3–6 pollicibus longa. *Rachis* stricta, inæqualiter angulata. *Spiculæ* superiores 4–10, congestæ, ovatae vel oblongæ, acutæ, sæpe omnino masculæ; mediæ minus congestæ, floseulis femineis pluribus basi sitis; inferiores 1–4, remotæ, nunc omnino femineæ, sæpius spiculis partialibus 2–8 alternis compositæ,  $\frac{1}{2}$ – $1\frac{1}{4}$  poll. longæ. *Perigynium*  $1\frac{7}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ –

$\frac{7}{10}$  lin. latum, ovato-lanceolatum, bifidum, membranaceum, basi et ad latera spongiosum, pallidum, demum punctis fulvis notatum, antice 7–8- postice 3–4-nervatum, nervis superne versus apicem achenii convergentibus evanidis, ubi sulcus inter latera lucida spongiosa usque ad fissuram oris currit. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovatum vel ovale, punctulatum, ferrugineum, basi styli apiculatum. In uno perigynio racheola linearis,  $1\frac{3}{10}$  lin. longa adest.

I have taken the character of this plant chiefly from the specimens and the report given of them by Mr. Coleman in the 'English Botany.' He distinguishes it from *C. axillaris* by its forming much larger hassocks, the culm being more slender, but more rigid, and much more scabrous, the foliage of a darker green, the leaves channelled, like the half of a hollow cylinder, the spike more white (from the broad scarious margins of the squamæ), longer, less dense, and more gracile; the partial spikelets in the lower compound spiculæ being alternately arranged, and the upper bracts not cuspidate.

Both are distinguished from *C. remota* by the longer, more scabrous, and acute-angled culm, the inferior compound spiculæ, the variable position of the male florets, those of *C. remota* being always inferior.

There is a difference in authors as to the position of the male florets in *C. Bœnninghauseniana*. Fries, in his 'Mantissa,' says, "Spiculæ certe basi masculæ." He makes no mention of compound spiculæ, and says the culm is "tactu lævis." Andersson, equally describing the northern plant, says, "culmo scaberrimo, spica infima composita," but he says nothing of the position of the stamens. Hoppe says, "spicis omnibus superne masculis." Lange says, "in situ florum masculorum quam maxime varians." Kunze says, "spiculis plerisque basi apiceque masculis, superioribus sæpe mere masculis, inferioribus raro femineis." Bromfield, in his 'Flora Vectensis,' says, "Staminate florets apparently few at the base of each of the lower spikelets, often scarcely any, one or two occasionally in the centre or upper part of them, more numerous in the terminal and subterminal spikelets, which are sometimes wholly staminate or nearly so." Coleman says, "The upper spikelets are wholly barren, or fertile at the base only, the lower fertile, or barren only at the top;" and he adds, "In neither *C. axillaris* nor in *C. Bœnninghauseniana* do we find the barren florets inferior, as is asserted by most authors. In both, the upper portion of the main spike is chiefly barren and the lower fertile, and the same arrangement always prevails in the ultimate spikelets; very rarely a single barren floret or even 2 or 3 occur among the fertile ones on the same ultimate spikelets, but never in any specimens at the base. In *C. Bœnninghauseniana* some of the spikes (chiefly from the circumference of the tuft) have the barren florets much more numerous than the fertile. In one fine specimen 236 barren to 41 fertile, while in those from the centre the proportion is reversed,—in one 9 barren to 104 fertile. In *C. axillaris* the proportion is much more constant." Coleman remarks, that it has much the habit of *C. paniculata*; and Lang says, "fortasse nil nisi forma sterilis *C. paniculata*." But the form and texture of the perigynium are very different, and ally it to *C. remota* and *C. axillaris*.

*C. ludibunda*, Gay, is a variety with a shorter coarctate spike and more numerous spiculæ.—

"Spica coarctata, 1– $1\frac{1}{2}$  poll. longa, 30–58-stachya, e spiculis 7–12 confertis plerumque ex toto masculis et glomerulis 2–5 polystachyis, spiculas in ramulo brevi imbricatas sexu plerumque distinctas femineas masculis intermixtas gerentibus.—Spiculæ femineæ ovoideæ vel ellipsoideæ. Intermixtæ occurrunt spiculæ androgynæ, apice summo vel ima basi masculæ; aliæ maxima parte masculæ, apice summo femineæ. Paniculam vidi totam et aliam fere masculam, in qua nempe spiculæ tantum 3 ad glomerulos inferiores pertinentes apice summo vel ima basi femineæ fuerunt."—*C. ludibunda*, *Gay, Ann. Sc. Nat.* 10, 357 (1838); *Steud.* 197.

The specimen figured is from Mr. Coleman, Hertford.

424. *C. bracteosa* (Kunze); spica ovata vel oblonga densa involucreta flavescenti-viridi demum brunnea, e spi-



culis apice masculis pluribus congestis inferioribus laxis compositis longe bracteatis; stigmatibus 3; perigyniis ovatis rostratis bidentatis basi contractis plano-convexis utrinque valide nervosis inferne antice ad latera turgide spongiosis postice foveolatis demum brunneis glabris vel superne ad margines scabriusculis, squama ovata acuta vel mucronata flavida longioribus.—*C. bracteosa*, Kunze, *t.* 2; *Kunth*, 379; *Gay*, *Fl. Chil.* 207; *Steud.* 191. *C. luteola*, Nees in *Herb. Hooker*. *C. illustranda*, *Steud.* 190. ( *Ic. ined. t.* DCXII. in *Herb. Kew.*)

HAB. In America meridionali.—Chili, *Gay*; *Cuming*, *n.* 456; *Gillies* (*Herb. Hooker*), *etc.*; *Philipp.* *n.* 194 (*Herb. Hooker et Herb. Mus. Par.*); *Lechler*, *n.* 3292 (*sine nomine*), *et n.* 697, “*C. illustranda.*” South Brasil, *St. Hilaire* (*Herb. Mus. Par.*).

*Rhizoma* repens. *Culmus*  $\frac{1}{2}$ – $1\frac{1}{2}$ -pedalis, obtusangulus, lævis, apice tantum acutangulus, scabriusculus. *Folia* 1–2 lin. lata, culmum subæquantia. *Bractea* inferiores 2–3 foliaceæ; infima subinde 4–5 poll. longa, reliquæ breviores, summæ squamæformes, cuspidatæ. *Spica* ovata, 6–8 lin., vel oblonga, 16 lin. longa, 6 lin. lata; in uno specimine spicula infima subradicalis, longe exserte pedunculata. *Perigynium*  $1\frac{6}{10}$ –2 lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, membranaceum, inferne antice utroque latere turgidum, spongiosum, postice cavatum. *Achenium*  $\frac{8}{10}$ – $1\frac{1}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, ovatum, ferrugineum, basi styli clavata.

Kunze's figure of the perigynium does not accurately represent the turgid spongy base in a mature state. It is not a ring, but two lateral protuberances with a central line between them. In the young state they are not apparent, though there is a discoloration marking the site of the eventual deposition of spongy matter. I am indebted to M. Sonder for the specimens of Lechler; *n.* 679, *Arrique*, was marked “*C. illustranda*,” *St.* In Steudel's *Syn. Car.*, this species is “*Herb. Philippii*, *n.* 194,” a specimen of which I have seen in *Herb. Hooker* and in that of Paris, both identical with those of Lechler. Steudel describes the perigynia of *n.* 194 as sterile, but in one I found a normal perigynium.

The affinity of the species is with *C. Bonariensis*, Desf.

The specimens figured are,—

- n.* 1. Chili, *Bridges*.
- n.* 2. Valdivia, *Gillies*.
- n.* 3. Valdivia, *Lechler*, *n.* 3292.
- n.* 4. *Lechler*, *n.* 697, “*C. illustranda*,” *Arrique*; and perigynium and achenium of *Philipp.* *n.* 194.

425. *C. brevicollis* (De Candolle); spica oblonga castanea, e spiculis 2–3 ovalibus vel cylindraccis densifloris, terminali mascula, reliquis femineis crassis approximatis inserte vel infima exserte pedunculatis; bracteis vaginatibus brachyphyllis, vaginis turgidis; stigmatibus 3; perigyniis ellipticis demum globosis late rostellatis, rostello ad margines scabro, ore aperto emarginato bilobato ciliato, puberulis nervatis basi productis castaneis, squama oblonga truncata vel emarginata cuspidata æquilata castanea brevioribus vel subæquantibus.—*C. brevicollis*, *DC. Fl. Franc.* 6, 295 (1815); *Kunth*, 447; *Kunze*, 20, *t.* 4, *f.* 1; *Gren. et Godr.* 416; *Steud.* 233. *C. rhyncocarpa*, *Heuffl. Flora*, 364 (1833); *Hoppe*, *t.* 90; *Reich.* 20, *t.* 244. *C. Michellii*,  $\beta$ , *Fl. Ross.* 293. ( *Ic. ined.* DCXIII. in *Herb. Kew.*)

HAB. In Europa.—South of France. Hungary.

*Culmus* 9–18-pollicaris, obtusangulus, debilis, scabriusculus,

basi foliis brevibus tectus; pars spicigera  $1\frac{1}{2}$ –4 poll. longa. *Folia radicalia* culmo longiora, 2 lin. lata, firma, marginibus revolutis. *Bractea* vaginatæ, cuspidatæ, spiculis breviores. *Vagina* 6–10 lin. longæ, apice laxæ, turgidæ. *Pedunculus* infimus 1– $1\frac{1}{2}$  poll. longus, scaber. *Squamæ* conformes, femineæ inferiores subinde acutæ. *Spicula mascula* 8–12 lin. longa,  $1\frac{1}{2}$ –3 lin. lata, late ovalis vel elliptica vel clavata; *femineæ* 6–12 lin. longæ, 4 lin. latæ. In uno specimine summa quasi geminata, infima spicula altera brevi composita. *Perigynium* (*non maturum*) ellipticum, rostello longiore, demum globosum,  $2\frac{1}{2}$  lin. longum,  $1\frac{4}{10}$  lin. latum, rostello brevioris lato, puberulum, demum glabrum. *Achenium*  $1\frac{1}{2}$  lin. longum,  $1\frac{3}{10}$  lin. latum, orbiculatum, angulis 3 prominentibus, obtusum, basi productum, basi styli incrassata abrupte apiculatum, fusco purpureum.

A *C. Michellii*, *Host.*, differt spicis densifloris; perigyniis globosis, brevi lateque rostellatis, ore emarginato bilobato, lobulis latis brevibus, squamis sæpe emarginatis; bracteis spicula brevioribus; vaginis magis turgidis.

Hoppe's figure exhibits the perigynium as it occasionally is seen before the maturity of the achenium, with a larger rostellum than in the mature state. Kunth figures the squama as acute, which is rather an exceptional form. The pubescence on the perigynium more or less disappears as it ripens. De Candolle describes it as smooth.

The specimens figured are,—

- n.* 1. From Hoppe, sent to me by him as the “*C. rhyncocarpa*, montosis Bannatis.” The separate spike from Kunze.
- n.* 2. A specimen from *Herb. Hooker*, from Belley, near Lyons.

426. *C. breviculmis* (Brown); spica abbreviata vel oblonga albo-viridi, e spiculis 3–5 congestis vel attenuatim approximatis, terminali mascula, reliquis femineis infima exserte pedunculata subinde remota; bractea infima breve vaginata culmum superante; stigmatibus 3; perigyniis ellipticis triquetris conico-rostratis stipitatis, ore hyalino subintegro, plus minus nervatis pubescentibus pallide viridibus, squama ovata acuta vel truncata longe hispido-cuspidata albida, nervo viridi, longioribus vel cuspidate sæpe multum brevioribus.—*C. breviculmis*, *Br. Prod.* 242 (1810); *Kunth*, 522; *Hook. f. Fl. N. Zcal.* *t.* 63; *Steud.* 213. *C. Royleana*, *Nees apud Wight, contr.* 127 (1834); *Kunth*, 441; *Boott, Illust.* *t.* 19; *Steud.* 219. *C. leucochlora*, *Bunge, Mem. St. Pet.* 2, 142 (1835). *C. Langsdorffii*, *Boott, Linn. Trans.* 20, 144 (1846); *Steud.* 228. *C. Japonica*, *Fischer, mss.* (*Herb. Boott*). *C. puberula*, *Boott; Morrow; Parry's Exp.* 234. ( *Ic. ined.* DCXIV.–DCXVI. in *Herb. Kew.*)

Var.  $\beta$ . *C. discoidea*, *Boott; Wright; Ringgold and Rodgers' Exp.* 1856.

HAB. In Australia.—Port Jackson, *Brown*. Mungyang Mountains, 5000 ft., *Mueller* (*Herb. Hooker*). Tasmania, *Archer*. N. Zealand, *Colenso*. Himalaya occ. temp., *Royle*, *n.* 152; *Munro*, *n.* 2428. Kamaon, *Thomson*. China, *Bunge*. Japan, *Langsdorff*; *Morrow; Wright*. Port Hamilton, Corea, *Wilford* (*Herb. Hooker*).— $\beta$ . Loochoo, *Wright*.

*Culmus* 1–5-pollicaris vel 1–2 pedes altus, gracilis, triquetus, scaber, basi foliatus; pars spicigera 8 lin.– $2\frac{1}{2}$  poll. longa. *Folia* 1– $1\frac{1}{2}$  lin. lata, culmo longiora. *Bractea* infima breve vaginata, culmum superans vel eo brevior. *Vagina*  $1\frac{1}{2}$ –7 lin.

longa, vel obsoleta. *Spicula mascula* pedunculata, 8 lin. longa, vel sessilis, abbreviata, inconspicua, 2-3 lin. longa, 1 lin. lata; *femineæ* (raro apice masculæ) 3-8 lin. longæ, 1½-3 lin. latæ, demum laxifloræ, congestæ, sessiles, vel alternæ; infima nunc 1-3 poll. remota, rarius subradicalis. *Squamæ masculæ* obtusæ, muticæ, vel acutæ, vel hispidocuspidatæ, albæ vel pallide castaneæ; *femineæ* ovatæ, acutæ, truncatæ, vel emarginatæ, obovatæ vel obcordatæ, plus minus longe cuspidatæ. *Perigynium*  $1\frac{2}{10}$ - $\frac{3}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, achenio  $\frac{6}{10}$  lin. longo,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. lato; vel  $1\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, achenio 1 lin. longo, fere  $\frac{6}{10}$  lin. lato, plus minus (in eadem spicula) valide nervatum pubescensque. *Achenium* apice annulosum, basin styli bulbosam cingens. *Stigmata* 3.

On a careful examination of the specimens from the various localities, I have no hesitation in referring them to the *C. breviculmis*, Br., though his name is very inapplicable to the Japan specimen (Tab. DCXIV. f. 2), which I owe to the kindness of Dr. Gray. In all essential characters they are uniform, and I have no doubt that specimens will be found hereafter in Australia and India more closely approaching those from Japan and Port Hamilton. The perigynium varies in size, the degree of nervation and pubescence, and the male squamæ in being obtuse and muticous, or cuspidate, like the female one. In one of Archer's specimens the perigynium is long and occasionally excurved, and in the Port Hamilton plant almost glabrous, while in the tall specimen from Japan the pubescence is pilose.

Var.  $\beta$ . *stolonifera*; spiculis parvis paucifloris, evaginatis; foliis angustis; perigyniis  $\frac{9}{10}$  lin. longis  $\frac{4}{10}$  lin. latis. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum.

The specimens figured are,—

Tab. DCXIV.

- n. 1. *C. breviculmis*. From Tasmania, Archer.
- n. 2. Japan, Wright.

Tab. DCXV.

- n. 1. Port Hamilton, Wilford.
- n. 2. Japan. The "*C. Langsdorffii*, Boott," from Fischer.
- n. 3. China. "*C. leucochloræ*," Bunge. From Herb. Hooker.

Tab. DCXVI.

- n. 1. Japan. "*C. puberula*," Boott (Morrow).
- n. 2.  $\beta$ . Loochoo. "*C. discoidea*," Boott (Wright).

427. *C. brizoides* (L.); spica oblonga viridi-straminea nuda, e spiculis 5-8 vel 10, basi masculis ellipticis subinde curvatis demum obovatis patentibus contiguis vel inferioribus discretis; bractea squamæformi breve cuspidata; stigmatibus 2; perigyniis lanceolatis vel oblongo-ovatis sensim rostratis, ore antice secto bifido, e basi anguste alatis serrulatis leviter vel obsolete nervatis plano-convexiusculis divergentibus pallide viridibus, squama ovata obtusiuscula mutica pallida angustioribus longioribus.—*C. brizoides*, *L. Sp. Pl.*; *Wahl. Act.* 145; *Willd.* 223; *Schk. f.* 12; *Kunth*, 394; *Gaudin, Agrost.* 102, et *Helv.* 50; *Koeh.* 868; *Bertol.* 49; *Reich. t.* 207; *Andersson, t. 3, f.* 24; *Lange*, 43; *Gren. et Godr.* 393; *Steud.* 197. *C. brizoides*,  $\beta$ , *Wimmer, Fl. Ross.* 284. (*Je. ined. DCXVII. in Herb. Kew.*)

HAB. In Europa, Asia, in nemorosis.—Germany, France, Switzerland. Tauria, Caucasus, Altai. Kamtchatka, *Fl. Ross.*

*Rhizoma* gracile, squamosum, longe repens, folia culmosque fasciculatos per intervalla edens. *Culmus* 1-2½-pedalis, gracillimus, triquetus, scaber, sæpe reclinatus, basi foliatus, rudimentisque foliorum ferrugineis tectus. *Folia* plana, 1-1½

lin. lata, mollia, graminea, culmo breviora vel longiora, quædam involuta. *Bractea* spiculam infimam nunc superans. *Spica* 1-2 poll. longa, 4 lin. lata. *Spiculæ* omnes basi subdimidiatim clavato-masculæ. *Squamæ masculæ* arcte imbricatæ, stramineæ, obtusæ; *femineæ* pallidiores, vel albidæ acutæ, omnes muticæ. *Perigynium* lanceolatum,  $1\frac{8}{10}$ - $2\frac{1}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, achenio oblongo,  $\frac{7}{10}$  lin. longo,  $\frac{3}{10}$  lin. lato; vel oblongo-ovatum,  $1\frac{6}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, achenio  $\frac{9}{10}$  lin. longo,  $\frac{5}{10}$  lin. lato, sæpe obsolete vel leviter nervatum, ala nunc ad basin producta. *Achenium* castaneum, lucidum, basi styli subclavata.

A *C. Schreberi* differt spiculis pluribus omnibus basi imbricato-clavatoque masculis; perigyniis sæpe lineari-lanceolatis, semper demum divaricatis, minus nervatis; ala ad basin extensa; squamis muticis; colore pallido.

Wimmer thought this might be a *forma nemoralis* of *C. Schreberi*. I have pointed out the characters in which it differs. Fries, in his 'Summa,' includes it as found sparingly in Denmark; but Andersson, though he figures it, does not insert it in his *Cyp. Scandinaviæ*.

#### 428. *C. cæspitosa* (L.)

At p. 23, t. 62, I gave in detail the observations of Fries and Andersson on this species, which, notwithstanding the assertion of Fries of its being in character "*constantissima et monotypica*," is found, like others of the genus, to vary essentially in form. In examining specimens received since I noticed it, I find the perigynium varies from an orbicular nerveless form ( $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum) to an obovate, obscurely nerved one ( $1\frac{5}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum), the inner surface occasionally of a reddish-purple colour (as in *C. stricta*, Gaud.), the lower impunctate squamæ longer than the perigynium; and it is very doubtful whether the two plants, on looking at their respective varieties, can be distinguished by any satisfactory characters. I have figured two varieties of *C. cæspitosa*.

Var. *filifolia*; spiculis ut in forma typica; perigyniis (cum stipite cylindrico  $\frac{3}{10}$  lin. longo)  $1\frac{2}{10}$  lin. longis  $\frac{5}{10}$  lin. latis, intus pallidis ovalibus biconvexis basi obscure nervatis; foliis involutis filiformibus (*explicatis*  $\frac{1}{2}$  lin. latis).—*C. aperta*,  $\beta$ , *Boott, in Hook. Fl. Bor. Am.* *C. aquatilis*, var. *nardifolia*, *Wahl. Lapp. (Je. ined. DCXVIII. in Herb. Kew.)*

HAB. In Suecia, Lapponia, America septentrionali.

The specimen figured is from Fries, from the Alps of Ferntland, with the name above quoted, though neither he nor Andersson has any such variety. I have a specimen of Wahlenberg, sent by him to the late Mr. Brown.

Var. *retorta* (Fries, *Sum.* 227; Andersson, 43; Lange, 70); spiculis cylindricis laxis; perigyniis ( $1\frac{3}{10}$  lin. longis  $\frac{6}{10}$ - $\frac{9}{10}$  lin. latis enervibus, marginibus apice rarius denticulatis; culmo elongato debili reclinato; foliis planis 1-1½ lin. latis. (*Je. ined. DCXIX. in Herb. Kew.*)

HAB. In Suecia.

The specimens figured are from Fries, who admits that "spicis et fructibus ad *C. strictam* revergit; hi tamen enerves et culmi gracillimi tenues etiam florentes laxissimi; quo ab hac stirpe recedit." Andersson says, "Inter *C. strictam* et *C. cæspitosam* quasi media. Priori congruit vaginis triquetris, fructibus glutinisque. Culmo autem elongato laxissimo ad terram arcuato-deflexo, foliis latioribus spicisque *C. cæspitosæ* propior."

429. *C. capillaris* (L.); spica abbreviata vel subelon-

gata castaneo-alba, e spiculis 3-5 gracilibus paucifloris pedunculatis, mascula 1 ovali vel elliptica, femineis nutantibus laxifloris exserte pedunculatis alternatim remotis vel superioribus vel omnibus contiguis umbellatis, summa rarius sessili basi feminea, inferioribus rarius compositis; bracteis vaginatis, infima spiculam superante; stigmatibus 3; perigyniis ovato-ellipticis basi acutis sensim rostratis rostro apice hyalino margine scabro, ore integro, enerviis lucidis castaneis, squama ovata obtusa vel acuta pallide castanea margine albo-hyalina decidua longioribus.—*C. capillaris*, *L. Sp. Plant.*; *Light.* 557; *Good. Linn. Trans.* 3, 180; *Seop. Fl. Carn.* 220. t. 59; *Altoni*, 271; *Wahl. Act.* 155, et *Lapp.* 238, et *Succ.* 600; *Willd.* 290; *Schk. f.* 56; *Kunth*, 472; *Gaud. Agr.* 177, et *Fl. Helv.* 124; *Ledeb. Fl. Alt.* 227; *Drejer, Rev.* 53; *Koch*, 880; *Reich.* 18, t. 241; *Lange*, 105; *Anders.* 32, t. 7, f. 77; *Bertol.* 126; *Fl. Ross.* 295; *Gren. et Godr.* 407; *Steud.* 231; *Eng. Bot. t.* 2069; *Smith, Eng. Fl.* 100; *Dewey, Sill.* 11, 149; *Torr. et Schw.* 350; *Torr. Cyp.* 416; *Carey*, 527. (*Je. ined.* DCXX. in *Herb. Kew.*)

HAB. Europa, Asia, et America septentrionali.—Iceland. Feroe Islands. Lapland to Italy. Caucasus, Altai, Kamtchatka, Unalaska. Greenland, Arctic America. Rocky Mountains. White Mountains, N. Hampshire.

*Culmus*  $\frac{1}{2}$ -17-pollicaris, filiformis, lævis, basi foliatus; pars spicigera  $\frac{1}{2}$ -7 poll. longa. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmo breviora, plana. *Bractea* vaginata, summa setacea, infima spiculam superans. *Pedunculi* capillares. *Spicula mascula* 2-5 lin. longa,  $\frac{1}{2}$ - $\frac{3}{4}$  lin. lata, rarius basi feminea; *femineae* 3-6 lin. longae, 1-1 $\frac{1}{2}$  lin. latae, superiores vel omnes sæpe masculam superantes, ex eadem vagina egredientes quasi umbellatae; summa nunc sessilis, basi feminea masculae eontigua; vel omnes alternatim dispositae, infima magis remota, inferiores subinde basi spicula brevi sessili compositae, omnes erectae vel nutantes. *Squamae* conformes; *femineae* facile deciduae. *Perigynium* 1- $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum, plus  $\frac{4}{10}$  lin. latum, ellipticum, triquetrum, basi styli æquali apiculatum. *Stigmata* 3, brevia.

I do not observe any material difference in this species from its various localities. It varies remarkably in height. Drejer describes Greenland specimens a foot in height, while Gaudin says the culm is from 9 lines to 5 inches high. I have never seen the terminal spike male at base, as described by Drejer. The affinity is with the *Strigosæ*.

The specimens figured are—

- n. 1. From Scotland.
- n. 2. From Greenland.
- n. 3. From Arctic America.

430. *C. capitata* (L.); spica simplici apice mascula subgloboso-ovata densiflora nuda viridi-ferruginea; stigmatibus 2; perigyniis subrotundis vel ovalibus cylindrico-rostratis, ore emarginato hyalino, plano-convexiusculis, marginibus acutis glabris enerviis imbricato-patulis tenuissimis lucidis pallide viridibus superne ferrugineis, squama subrotunda obtusa vel ovata acuta pallide demum fusco-ferruginea margine albo-hyalina longioribus.—*C. capitata*, *L. Sp. Pl.*; *Wahl. Act.* 139, et *Lapp.* 223; *Willd.* 210; *Schk. f.* 80; *Kunth*, 371; *Drejer, Rev.* 20; *Koch*, 862; *Bertol.* 35; *Anders. t.* 3, f. 6;

*Lange*, 19; *Fl. Ross.* 266; *Reich. t.* 195; *Steud.* 184; *Fl. Bor. Amer.* 203; *Dewey, Sill.* 39, 51; *Torrey, Cyp.* 387; *Carey*, 509; *Sart. Eas. n.* 4. (*Je. ined.* DCXXI. in *Herb. Kew.*)

HAB. In Europa, Asia, et America septentrionali, in alpibus.—Iceland. Lapland to Tyrol and Bavarian Alps. Baikal. Davuria, *Meyer, Fl. Ross.* Greenland, *Vahl.* Arctic America. Rocky Mountains, *Richardson.* White Mountains, N. Hampshire, *Robbins, Blake.*

*Radix* crassiuscula, dense caespitosa, ut monet Wahlenb. "ex uno latere tantum innovatur." *Culmus* 4-16-pollicaris, filiformis, angulatus, firmus, apice scabriusculus, basi foliatus, rudimentis foliorum vaginisque plus minus reticulato-fissis ferrugineo-purpureis tectus. *Folia* filiformia, culmo breviora. *Spica* pisiformis, apice cylindrico mascula, 2-4 lin. longa, 2-3 lin. lata. *Squama* infima rarius cuspidata. *Perigynium* 1 $\frac{1}{2}$  lin. longum,  $\frac{7}{10}$  lin. latum, achenium laxe vestiens. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, compresso-biconvexusculum, pallidum, basi styli æquali abrupte apiculatum, antee racheola lineari longiore instructum.

The compact pisiform spike, with its cylindrical male apex, distinguishes this pretty species.

431. *C. clavata* (Thunberg); spica oblonga glaucoferruginea, e spiculis 3-5 contiguis, masculis 1-2 ferrugineis, reliquis femineis vel apice masculis glaucoferrugineis crassis densifloris cylindricis erectis incluse pedunculatis; bracteis subangustis vaginatis culmo longioribus; stigmatibus 3; perigyniis late ovalibus subcompresso-inflatis breve rostratis bifidis marginibus scabris plurinerviis glaucis ferrugineo-punctatis demum omnino ferrugineis coriaceis, squama ovata acuta vel obtusa ciliata cuspidata lineolis ferrugineis notata latioribus longioribus.—*C. clavata*, *Thunberg, Prod.* 14; *ejus Flora*, 1, 341; *Wahl. Act.* 150; *Willd.* 267; *Schk.* 55; *Kunth*, 495; *Nees, Linnæa*, 7, 535, et 10, 204; *Schlecht. Linnæa*, 14, 352; *Kunze*, 67. t. 17; *Steud.* 239. *C. vesicaria*, *Thunb. l. e.?* (*Je. ined.* DCXXII. in *Herb. Kew.*)

HAB. Cap. Bonæ Spei!

*Culmus* 2-3-pedalis, validus, rigidus, apice scabriusculus; pars spicas gerens 2-6 poll. longa. *Folia* 2-4 lin. lata, glaucescentia, margine scabra, vaginis longis basi tumidis. *Spicula mascula* 1-1 $\frac{1}{2}$  poll. longa, 2 lin. lata, breve pedunculata, nunc obliqua, altera brevior sessilis bracteata sæpe prope sita. *Spicula femineae* 14-21 lin. longae, 6-7 lin. latae. *Squamae* conformes, masculae obtusiores. *Perigynium* 3- $\frac{5}{10}$ - $\frac{7}{10}$  lin. longum, 1- $\frac{6}{10}$ -2- $\frac{1}{10}$  lin. latum. *Achenium* 1- $\frac{6}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum, ovali-obovatum, triquetrum, basi styli erecti æquali apiculatum.

Var. spiculis abbreviatis.

Var.  $\gamma$ . *Wahl., Nees.*—" *C. clavata*, *Thunb.*"

There are intermediate forms between the var. and the more developed specimens. The perigynium at first is of a glaucous hue, distinctly punctulate, but as it matures it becomes of a uniform ferruginous colour, and of a more coriaceous texture.

The *C. lutensis*, *Kunth*, has a remote inflorescence, with a smaller, more turgid, smooth perigynium, with fewer nerves and emarginate squamæ, and, I suspect, is rather referable to *C. æthiopica* than to *C. clavata*, to which *Meyer*, in his commentary on *Drege's* plant, allies it.

432. *C. Colensoi* (Boott); spica capitata castanea, e spiculis 1-4 ovalibus arcte contiguis basi masculis, inferioribus bracteatis; bractea infima spicam superante; stigmatibus 2; perigyniis ovalibus vel ovatis erostratis, ore integro antice fisso, marginibus superne acutis scabris antice leviter vel obsolete nervatis plano-convexis, lucidis castaneis, squama ovata acuta castanea margine albiohyalina, nervo pallido, angustioribus brevioribus.—*C. Colensoi*, *Boott in Hook. f. Fl. N. Zeland*, 281. t. 63 B. ( *Ic. ined. DCXXXIII. in Herb. Kew.*)

HAB. In Nova Zelandia, *Colenso, Herb. Hooker.*

*Rhizoma* lignosum, repens. *Culmus* 3-9-poll., gracillimus, firmus, obtusangulus, lævis, vel apice angulis subacutis scabriusculis, curvatus, basi rudimentis foliorum vestitus. *Folia* involuto-filiformia, culmo breviora, firma. *Bractea* 1-2; infima spicam superante 1-2 poll. longa. *Spiculae* 2-4 vel 1, ovales, 3-4 lin. longæ, 1½-2 lin. latæ. *Perigynium* 1- $\frac{4}{10}$ - $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, basi spongiosum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, subrotundum, lenticulare, obtusum.

In inflorescence like *C. leporina*, L., with the habit of *C. Schreberi*.

433. *C. confertiflora* (Boott); spica subelongata fusco-brunnea, e spiculis 6 alternatim approximatis erectis, terminali mascula cylindrica ferruginea, femineis oblongo-cylindræis obtusis densifloris, superioribus sessilibus, summa abbreviata apice mascula, infima breve exserte pedunculata; bracteis inferioribus late foliaceis culmum superantibus, infima breve vaginata; stigmatibus 3; perigyniis ovatis ventricosis rostratis, ore ferrugineo membranaceo margine albo-hyalina integro obliquo demum fisso, glabris confertis arcuatim divergentibus obscure nervatis membranaceis fuscis concoloribus, squama lineari-lanceolata longe attenuata ferruginea nervata triplo latioribus longioribus vel subæquantibus.—*C. confertiflora*, *Boott in Ringgold et Rodgers's Expedition. (Ic. ined. DCXXIV. in Herb. Kew.)*

HAB. In Hakodadi, Japan, *Wright, n. 55. (Herb. Gray.)*

*Culmus* pedalis, validus, lævis, triquetus, angulis acutissimis; pars spicigera 5 poll. longa. *Folia* 5 lin. lata, culmum æquantia, plana, graminea, glabra. *Bractea* infima 4 lin. lata, vagina 6 lin. longa instructa, omnes nisi summa culmum superantes. *Pedunculus* 8 lin. longus. *Spicula mascula* 16 lin. longa, 1 lin. lata, breve pedunculata; *femineæ* inferiores 12-14 lin. longæ, 3-4 lin. latæ, a se ½-2 poll. remotæ. *Squama masculæ* lineari-lanceolatæ, obtusæ, muticæ. *Perigynium* 2 lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium (vix maturum)*  $\frac{7}{10}$  lin. longum, ½ lin. latum, ovale, triquetrum, pallidum, basi styli persistente obliqua apiculatum. *Stylus* æqualis.

A *C. dispalata* et *C. mollicula* differt spiculis femineis confertifloris latioribus, etc.

The slight membranous texture of the perigynium and the ventricose form of the species of this group, scarcely admit, through the pressure of drying them, of a satisfactory idea of its form. I have seen but few specimens from Japan, and not all of them fully mature.

434. *C. curvula* (Allioni); spica capitata oblonga vel obovata fusca, e spiculis 5-6 congestis apice masculis vel

inferioribus discretis; bractea squamæformi emarginata cuspidata brevi; stigmatibus 3; perigyniis elliptice lanceolatis antice planis postice subtriquetris, laxè ventricosis rostratis, ore bifido hyalino, marginibus superne scabris, tenuissime membranaceis nervis vel obscure nervatis fuscis stipitatis, squama ovato-lanceolata obtuse vel emarginata cuspidata vel acuta mutica fusca margine pallidiore angustioribus longioribus.—*C. curvula*, *All. Ped.* 264. t. 92. f. 3 (1785); *Villars, Dauph.* 195 (1787); *Wahl. Act.* 141; *Willd.* 218; *Schk. f.* 17; *Kunth*, 427; *Gaud. Agrost.* 113 et *Helv.* 63; *Bertol.* 41; *Koch*, 864; *Reich. t.* 201; *Gren. et Godr.* 400; *Steud.* 188. ( *Ic. ined. DCXXV. in Herb. Kew.*)

HAB. In Europa.—In alpebus Helveticis, Pyrenæicis.

Cæspitosa. *Radix* fibrosa. *Culmus* 2-9-pollicaris, teres, lævis, sæpe curvulus, basi foliosus, vaginisque aphyllis marcidis arcte tectus. *Folia* ½ lin. lata, plana, mollia, demum canaliculato-involuta, rigida, glaucescentia, "sæpe cum culmis ad unum latus curvata" (*Gaudin*), culmo *altiori* breviora, *abbreviato* longiora. *Bractea* amplectentes, sæpe emarginatæ, margine hyalinæ; infima longius cuspidata, spica brevior, subinde breve vaginata. *Spica* 6-9 lin. longa, 3-5 lin. lata, congesta vel basi laxa. *Spiculae* simplices; inferiores oblongæ, interdum discretæ; infima rarius exserte breve pedunculata. *Perigynium* 3- $\frac{2}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, glabrum vel superne ad margines plus minus scabrum, antice planum, postice ex angulo centrali prominente achenii triquetrum, achenium laxissime vestiens, ore demum bilobato. *Achenium* 1- $\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongum, plano-triquetrum, angulo centrali postico punctulatum, griseum, basi styli clavata. *Racheola* ligulata, viridis, lævis vel serrata, apice ferrugineo-membranacea, vel acuta, achenium æquans vel superans, ad mediam partem faciei anticæ planæ achenii sita.

The occasionally lax inflorescence at the base of the spike, the three stigmas, and triquetrous achenium separate this species from *C. foetida* and its allies, and perhaps ally it with *C. mucronata* to the *Ferrugineæ*. Kunth alone notices the racheola, which I have observed in every perigynium I have examined.

435. *C. cyperoides* (L.); spica globosa capitata involu-crata straminea, e spiculis 2-5 basi masculis dense congestis vel infima subinde discreta; bracteis 2-4, inferioribus foliaceis spicam longe superantibus; stigmatibus 2; perigyniis e basi ovata longe stipitatis in rostrum lineare longissimum attenuatis, alte bicuspidatis nervatis marginibus anguste alatis scabris undulatis, squama lanceolata cuspidata longioribus.—*C. cyperoides*, *L. Syst. Veg.* 703; *Wahl. Act.* 144; *Willd.* 215; *Schk. f.* 5; *Kunth*, 392; *Ledeb. Fl. Alt.* 206; *Koch*, 863; *Bertol.* 70; *Reich. t.* 224; *Fl. Ross.* 271; *Gren. et Godr.* 401; *Lang.* 41; *Steud.* 196; *Anders.* 55. t. 4. f. 42. *C. Bohemica*, *Schreb. Gram. t.* 28. f. 3. *Schelhammeria capitata*, *Mærch. S. cyperoides*, *Reich. Fl. Germ. (Ic. ined. DCXXVI. in Herb. Kew.)*

HAB. In Europa, Asia.—Denmark?, France, Germany, Italy. Siberia ad fluv. Irtysh (*Ledebour*). Caucasus, Ural, Altai, Davuria (*Fl. Ross.*).

*Radix* fibrosa, cæspitosa. *Culmus* 3-12-pollicaris, lævis, inferne foliatus. *Folia* ½-2 lin. lata, culmum subæquantia. *Bractea* inferiores foliaceæ, infima nunc 7 pollices longa. *Spica* plus minus ampla, sæpe 8 lin. longa et lata, vel minor.

*Spicula* infima nunc 3-4 lin. remota. *Perigynium* (cum stipite 8 lin. longo)  $3\frac{8}{10}$ - $4\frac{6}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongum, lenticulare, lucidum, castaneum.

A *C. sychnocephala*, Carey, differt spica globosa densa, perigyniis longioribus, ore alte bicuspidato, laciniis longis setaceis, alis undulatis, achenio oblongo.

Andersson includes this among the species found in Denmark, remarking, however, "in fovea sicca prope Hafniam semel a Holboell (adventitia?) inventa." It varies in the breadth of the culm and leaves, as in the size of the spike.

The specimens figured are from Germany.

436. *C. depauperata* (Goodenough); spica elongata olivacea, e spiculis 3-5 remotis erectis, mascula 1 cylindrica pedunculata, femineis oblongis 2-6-floris exserte pedunculatis; bracteis vaginatis foliaceis, superioribus culmum subæquantibus; stigmatibus 3; perigyniis turgide ovalibus obtuse trigonis basi acutis longe rostratis, ore hyalino integro obliquo, glabris, rostro ad margines scabro, copiose leviter nervatis, squama ovata acuta mucronata medio viridi nervata latioribus pallide castaneis margine hyalina latioribus longioribus.—*C. depauperata*, *Good. Linn. Trans.* 2, 181; *Wahl. Act.* 155; *Willd.* 278; *Schk. f.* 50; *Kunth*, 477; *Eng. Bot. t.* 1098; *Smith, Eng. Fl.* 97; *Hooker, Br. Fl.* 431; *Koch*, 883; *Bertol.* 109; *Reich.* 24. t. 256; *Lange*, 130; *Fl. Ross.* 292; *Gren. et Godr.* 422; *Steud.* 233. *C. ventricosa*, *Curt. Lond. t.* 68. *C. triflora*, *Wild. Phyt. t. 1. f.* 2; *Schk. n.* 79. *C. monolifera*, *Thuill. Par.* 490. (*IC. ined.* DCXXVII. in *Herb. Kew.*)

HAB. In Europa, Asia.—Scotland to Italy, Tauria, Caucasus, Kamtchatka.

*Culmus* 1-2-ped., gracilis, firmus, lævis, subinde usque ad basin spicigerus, basi foliatus; pars spicigera 5-15 poll. longa. *Folia* 1-2 lin. lata, culmo breviora, plana, graminæ. *Bracteæ* vaginatae, foliaceae, elongatae; inferiores culmo breviores; superiores angustae. *Vagina*  $\frac{1}{2}$ - $1\frac{1}{2}$  poll. longæ. *Pedunculi* inferiores 1-3 poll. longi. *Spicula mascula* 10-16 lin. longa, lineam lata, squamis pallide castaneis imbricatis margine hyalinis lanceolatis; *femineæ* 7-10 lin. longæ, 3-4 lin. latæ, inter se 2-6 poll. remotæ, infima subinde radicalis. *Perigynium* olivaceum,  $4-4\frac{3}{10}$  lin. longum,  $1\frac{3}{10}$  lin. latum, rostro apice albo, ore integro obliquo facile rupto. *Achenium* conforme,  $2\frac{1}{10}$  lin. longum,  $1\frac{3}{10}$  lin. latum, obovatum, obtuse trigonum, basi styli clavata decidua.

I have alluded, p. 42, to the different views entertained as to the affinity of this species, expressing my own opinion that it belongs to the *Sylvaticæ*. It is generally described as having a bifid or bilobed orifice to the perigynium, but Schkuhr correctly says it is entire and oblique, but from its delicate hyaline texture it is easily ruptured. This character allies it rather to the *Supinæ*, where Drejer places it.

The specimens figured are English ones.

437. *C. digitata* (L.); spica oblonga castaneo-purpurea, e spiculis 3 rarius 4-2 linearibus, mascula 1 oblonga sessili inconspicua, femineis superioribus una vel altera masculam superantibus pauci-laxifloris cylindraceis infima plus minus remota, exserte pedunculatis; bracteis vaginæformibus purpureis, infima cuspidata; stigmatibus 3; perigyniis ovalibus acute triquetris longe stipitatis rostellatis, ore subintegro, puberulis enerviis

fuscis, squama obovata basi amplectente truncata mutica vel abrupte mucronulata medio viridi lateribus castaneo-purpureis apice albo-hyalina angustioribus subæquantibus.—*C. digitata*, *L. Sp. Pl.*; *Good. Linn. Trans.* 2, 166; *Wahl. Act.* 158; *Fl. Lapp.* 239 et *Suec.* 603; *Willd.* 256; *Schk. f.* 38; *Kunth*, 473; *Gaud. Agr.* 142 et *Fl. Helv.* 85; *Biebst.* 385; *Koch*, 878; *Hoppe, Icon. Reich.* 18. t. 240; *Anders.* 28. t. 7. f. 88; *Lange*, 114; *Bertol.* 80; *Eng. Bot. t.* 615; *Smith, Eng. Fl.* 93; *Fl. Ross.* 289; *Gren. et Godr.* 417; *Steud.* 231. (*IC. ined.* DCXXVIII. in *Herb. Kew.*)

HAB. In Europa et Asia.—Lapland to Switzerland. Italy. Caucasus, Ural, Altai.

*Radix* fibrosa. *Culmi* plures,  $\frac{1}{2}$ -1-pedales, debiles, filiformes, apice triquetri, scabri vel læves, nudi, basi vaginis elongatis purpureis cuspidatis tecti; pars spicigera  $1\frac{1}{2}$ - $2\frac{1}{2}$  poll. longa. *Folia* 1-2 lin. lata, radicalia, culmo sæpe longiora, viridia, margine serraturis ad basin deorsum ad apicem sursum spectantibus, scabra. *Bracteæ* vaginæformes, purpureæ, apice albo-hyalinæ, infima cuspidata. *Pedunculus* infimus 6-10 lin. longus, scaber. *Vagina* 3-6 lin. longæ. *Spicula mascula* 4-6 lin. longa,  $\frac{3}{4}$  lin. lata, sessilis, squamis imbricatis; *femineæ* 7-9 lin. longæ,  $1\frac{1}{2}$ -2 lin. latæ, laxifloræ, inferiores breve exserte pedunculatæ, superiores 1 vel 2 masculam superantes, infima 8-21 lin. remota. *Perigynium* (cum stipite albo  $\frac{6}{10}$  lin. longo clavato) 2 lin. longum,  $\frac{8}{10}$  lin. latum, ovale, acute triquetrum, rostello recto, membranaceum, parce puberulum, achenium arctissime vestiens. *Achenium* conforme,  $1\frac{4}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, acute triquetrum, faciebus concaviusculis, fuscum, basi styli recti crassiore apiculatum.

A *C. ornithopoda* differt inflorescentia laxa; spiculis longioribus purpurascens, infima remota exserte pedunculata, plurifloris; vaginis bractearum paulo longioribus cuspidatis; perigyniis squamam subinde mucronulatam subæquantibus; culmo foliisque longioribus.

The specimens figured are from Germany.

438. *C. distans* (L.); spica elongata viridi-ferruginea, e spiculis 4 vel rarius 3-5 oblongis remotis, mascula 1 rarius 2 pedunculata, femineis 3 rarius 2-4 ovatis vel cylindraceis distantibus erectis, suprema (vel omnibus) abbreviata sessili, reliquis inserte vel plus minus exserte pedunculatis, infima sæpe radicali; bracteis vaginatis, spicula longioribus; stigmatibus 3; perigyniis late ovalibus vel ellipticis inæqualiter triquetris plus minus rostratis acute bifidis valide nervatis, nervis marginalibus sæpe anticis visis glabris vel superne margine scabris viridibus ferrugineo-punctatis vel purpureo-tinctis, squama rotundata obtusa vel subacuta mucronata ferruginea subæquilata longioribus.—*C. distans*, *L.*; *Good. Linn. Trans.* 2, 178; *Wahl. Act.* 150; *Retz.* 222; *Poll.* 589; *Vill.* 208; *All.* 269; *Willd.* 271; *Schk. f.* 168; *Kunth*, 449; *Biebst.* 387; *Koch*, 885; *Bertol.* 105; *Fl. Ross.* 298; *Gaud. Agr.* 151; *Fl. Helv.* 103; *Reich. t.* 253; *Anders.* 23. t. 8. f. 96; *Lange*, 125; *Gren. et Godr.* 425; *Smith, Fl. Br.* 992; *Eng. Bot. t.* 1234; *Eng. Fl.* 109; *Bromfield*, 563; *Tchihatch.* 577; *Benth. Handb.* 566. *C. sicula*, *Presl, sec. Parlatore (non Tineo)*. (*IC. ined.* DCXXIX.-DCXXX. in *Herb. Kew.*)

HAB. In Europa, Asia, Africa, in palustr. maritimis.—Norway to Spain. Italy. Sicily. Tauro-Caucasus,

*Biebst.* Asia Minor, *Tchihatcheff.* Mauritania, *Delestre* (*Herb. Mus. Par.*).

*Culmus*  $\frac{1}{2}$ – $2\frac{1}{2}$ -pedalis, obtusangulus, lævis, gracilis, rigidus, basi foliatus, rudimentisque foliorum marcidis fusco-ferrugineis tectus; pars spicigera 4–18 poll. longa. *Folia* 1–2 lin. lata, eulmo breviora, firma, glauco-viridia; inferiora basi involuta, demum sordide ferruginea. *Bracteæ* (nisi summa) vaginatae. *Ligula* integra, ampla, ferruginea, margine hyalina. *Vagina* 2– $2\frac{1}{2}$  poll. longæ. *Pedunculus* infimus subinde 3 poll. longus, filiformis, lævis. *Spicula mascula* 8–15 lin. longa, 1–2 lin. lata, rarius sessilis, alteraque minori eontigua stipata; *femineæ* rarius apice maseulæ, 4–12 lin. longæ, 2– $2\frac{1}{2}$  lin. latæ, a se 3– $6\frac{1}{2}$  poll. remotæ, omnes (nisi summa) inserte vel breve exserte pedunculatæ, vel infima longe exserta. *Squamæ masculæ* obtusæ, muticæ, nervo rarius excurrente, eastanæ. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, subrotundo-ovale, breve rostratum; vel 2– $2\frac{3}{10}$  lin. longum,  $\frac{1}{10}$ –1 lin. latum, ellipticum, rostro paulo longiore, valide nervatum, nervis marginalibus sæpius (intra margines) antee visis, ore bifido, læiniis acutis scabris. *Achenium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, obovatum, basi styli abrupte apiculatum; vel  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, ellipticum, acutum, stipitatum, aete triquetrum, stylo recto vel eurvato. *Stigmata* 3, in uno speimine 4; achenio angulis 4!

A *C. fulva* differt colore; spiculis femineis sæpius 3; squamis obtusis mueronatis (nee margine late hyalinis); perigyniis sæpe late ovalibus, ore aete bifido nee hyalino, læiniis scabris ferrugineo-punctatis; foliis demum sordide ferrugineis nee flavidis.

A *C. binervi*, spica viridi-ferruginea; spiculis paucioribus, femineis minoribus erectis sæpe inserte pedunculatis nee compositis; perigyniis valide nervatis; foliis angustioribus.

I find in 119 specimens,—

|                   |                  |                   |
|-------------------|------------------|-------------------|
| 27 with 3 spikes. | 111 with 1 male. | 28 with 2 female. |
| 78 „ 4            | 8 „ 2            | 83 „ 3            |
| 14 „ 5            |                  | 8 „ 4             |

Rarissime apice masculæ.

The specimens figured are from Scotland.

439. *C. divisa* (Hudson); spica oblonga vel abbreviata castanea, e spiculis apice masculis 1–12 simplicibus congestis, vel inferioribus discretis compositis nudis vel bracteatis; bractea infima cuspidata vel subulata recta spicam superante; stigmatibus 2; perigyniis ovalibus stipitatis vel ovatis plus minus rostratis, ore hyalino obliquo integro vel bifido, marginibus superne acutis scabris plano-convexis utrinque vel subobsolete nervatis appressis lucidis spongiosis pallidis plus minus vel omnino ferrugineis, squama ovata acuminata vel acuta cuspidata firma castanea margine hyalina brevioribus vel longioribus.—*C. divisa*, *Hudson, Fl. Ang.* 348 (1762); *Good. Linn. Trans.* 2, 157, t. 19; *Schk. R.; Wahl. Act.* 143; *Willd.* 233; *Schk. V. V. f.* 61; *Kunth*, 372; *Koch*, 865; *Eng. Bot. t.* 1096; *Smith, Eng. Fl.* 87; *Bertol.* 51; *Reich. t.* 205; *Gay, Ann. Sc. Nat.* 10, 209 (1838); *Drejer, Symb.* 5; *Lange*, 30; *Fl. Ross.* 272; *Gren. et Godr.* 390; *Tchihatch.* 573; *Benth. Handb.* 561; *Bromfield*, 550; *Steud.* 186. *C. schœnoides*, *Host. Gram. t.* 45; *Thuill.*; *Desfont. Urv. Tenore*; *Biebst.*; *Hoppe.* *C. lobata*, *Lam. Enc.* 379; *Schk. I. f.* 18; *Kunth*, 373; *Link*; *Duby*; *Steud.* 187. *C. tripartita*, *Lam. Encyc.* 339; *Dcc.* *C. cuspidata*, *Bertol.* *C. Bertolonii*, *Schk. D. f.* 18, et 208. *C. hybrida*, *Lam. Enc.* 382; *Brot.*

*C. ammophila*, *Willd.* 226; *Kunth*, 373; *Steud.* 187. *C. rivularis*, *Schk. f.* 87; *Wahl. Act.* 143; *Willd.* 226; *Kunth*, 373; *Steud.* 187. *C. Austriaca*, *Schk. f.* 157. *C. Fontanesii*, *Poir. Encyc. Suppl.* 257. *C. fuscescens*, *Willd. Herb.* *C. leporina*, *Pall. Ind. Taur.* *C. splendens*, *Thuill.* *C. Hostii*, *Hoppe.* *C. Schreberi*, *Ten. (Herb. Boott).* *C. paradoxa*, *Benth. Cat. Pl. Pyr.* *C. consanguinea*, *Kunth*, 374; *Steud.* 187. *C. spicata*, *Brot.* *C. setifolia*, *Godron, Fl. Montp.; Gren. et Godr.* 390. *C. chætophylla*, *Steud.* 187. ( *Ic. ined.* DCXXXI. in *Herb. Hook.*)

HAB. In Europa, Asia, Africa, præcipue in maritimis.—Great Britain to Spain. Italy, Sicily, Canaries, Madeira, Egypt, Algiers, Cape of Good Hope. Caucasus, Ural. Afghanistan, *Griffith.* Himalaya occid. temp. Kashmir, *Jacquemont.*

*Rhizoma* lignosum, validum, ramosum, repens. *Culmus*  $\frac{1}{2}$ –2-pedalis, triquetus, seabriusculus, firmus, subinde filiformis. *Folia* 1 lin. lata, eulmo breviora, vel canaliculato-filiformia. *Bractea* intima subulata, recta, spicam superans, vel squamæformis cuspidata. *Spica* admodum variabilis, nunc oblonga,  $1\frac{1}{2}$ -polliaris, 5–6 lin. lata, spiculis inferioribus discretis subinde compositis, vel subrotunde capitata, spiculis paucioribus eongestis, vel elliptica, vel ovali, omnino depauperata, 1–4 lin. longa, 1–2 lin. lata. *Squamæ* firmæ, subinde muticæ. *Perigynium*  $1\frac{8}{10}$ – $2\frac{1}{10}$  lin. longum,  $\frac{8}{10}$ – $1\frac{1}{10}$  lin. latum, ellipticum, utrinque acutum, stipitatum, vel ovatum, basi obtusum, ore hyalino integro obliquo vel plus minus bifido, plerumque utrinque erebre nervosum, vel nervis paucioribus fere obsoletis spongiosum. *Achenium* orbiculatum vel oblongum,  $\frac{8}{10}$ – $1\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, plano-convexiusculum, ferrugineum; basi styli æquali.

This species is common in the middle and south of Europe, attaining its fullest development in marshes near the sea, and in inland dryer situations often reduced to a very dwarfed state,—the smallest specimens I have seen being those of Godron, of which I have several through the kindness of M. Spach, but no mature perigynia, the spike reduced to a solitary spicula, 2 lines long and 1 wide. For the copious synonymy I must refer to Gay's elaborations in the *Ann. Sc. Nat.*, to those of Drejer in his 'Symbolæ,' and to Kunth. I have not seen any specimens from America, the analogue to it in the States being, I think, *C. Muhlenbergii*, Schk. The species is variable as to the size of the spike in all its localities, often depauperate by the sea. In Griffith's Afghan specimens every size is found, some fully as large as any I have seen from Europe; and several I have from Malaga are as dwarfed as the larger specimens of *C. setifolia*, sent by M. Vertot from the south of France.

440. *C. Durieui* (Steudel); spica abbreviata viridi-purpurea, e spiculis 2–3 contiguis, terminali mascula cylindrica, femineis 1–2 subinde apice masculis subrotundis squarrosis sessilibus evaginatibus flavide purpureis; bractea spica breviora vel æquante; stigmatibus 3; perigyniis orbiculatis compressis alatis longe cylindrico-rostratis, ore emarginato postice fisso demum bilobato, leviter nervatis flavidis, rostro divaricato fusco, margine serrato, squama rotundata obtusa mutica fusco-purpurea medio viridi margine pallida longioribus latioribus.—*C. Durieui*, *Steudel*, 221; *Kunze*, 149, t. 38. *C. filifolia*, *Gay, Ann. Sc. Nat.* (1836) (*non Nuttall*). ( *Ic. ined.* DCXXXII. in *Herb. Kew.*)

HAB. In Hispania.

*Culmus* 1-1½-pedalis, gracilis, lævis, filiformis. *Folia* filiformia, eulmo breviora. *Spicula mascula* 9-10 lin. longa, 1¼ lin. lata, subsessilis, squamis pallidioribus obtusis muticis. *Spiculæ femineæ* 4-5 lin. longæ et latæ. *Perigynium* 2 $\frac{4}{10}$ - $\frac{7}{10}$  lin. longum, 1 $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, alatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, triquetrum, pallidum, basi elongata persistente styli terminatum, apice basi decidua paulo crassiore puberula exserta. In uno perigynio, achenium angulis 4 inæqualibus raheolamque achenio breviora observavi.

The affinity of this species is obscure. The winged perigynium and elongated persistent base of the style are peculiar. The orifice of the perigynium is, I think, emarginate posteriorly, obliquely cleft.

441. *C. elongata* (L.); spica subelongata viridi-ferruginea, e spiculis 6-12 oblongis simplicibus basi masculis, superioribus vel omnibus contiguis vel inferioribus subremotis plerumque nudis; bractea squamæformi cuspidata rarius spicam superante; stigmatibus 2; perigyniis elliptico-lanceolatis rostratis, ore emarginato, superne ad margines scabris utrinque nervatis plano-convexiusculis basi spongiosis patentibus vel recurvatis demum ferrugineis, squama ovata ferruginea superne hyalina subduplo longioribus.—*C. elongata*, *L. Sp. Pl.*; *Wahl. Act.* 146; *Willd.* 240; *Schk. f.* 25; *Kunth*, 402; *Gaud. Agrost.* 103, et *Helv.* 55; *Koch*, 870; *Anders.* 60, t. 4, f. 32; *Reich. t.* 218; *Eng. Bot. t.* 1920; *Eng. Fl.* 82; *Gren. et Godr.* 397; *Fl. Ross.* 278; *Bertol.* 55; *Steud.* 199.

Var.  $\beta$ . *minor*.—*C. Gebhardi*, *Schk. f.* 192; *Willd.* 240; *Steud.* 199; *Reich. t.* 218, n. 566. *C. multiculmis*, *Ehrh.* *C. canescens*, *Poll.* *C. divergens*, *Thuill.* *C. pinnata*, *Mænch.* *C. multiceps*, *Gaud. Etr.* *C. loliacea*, *Stephan. Fl. Masj. sec. Fl. Ross.* (*ic. ined.* DCXXXIII.—DCXXXIV. in *Herb. Kew.*)

HAB. In Europa, Asia, America septentrionali.—Norway to Italy. Ural. Davuria. Sitcha, *Bongard.*

*Radix* repens, cæspitosa. *Culmus* 1-2-pedalis, triquetrum, seaber, debilis. *Folia* 1-2 lin. lata, eulmo longiora, plana, graminea. *Bractea* rarius elongata. *Spica* 1-2½ poll. longa, 3-6 lin. lata. *Spiculæ* 5-6 lin. longæ, 3 lin. latæ, vel minores; summa basi euneata maseula; reliquæ ima basi flosculis masculis paucis vel inconspicuis præditæ. In uno specimine infima basi spicula altera ecomposita, in alio infima subradicalis cylindrica basi attenuata; feminea (10 lin. longa) longe exserte pedunculata, bractea foliacea pedali suffulta. *Squamæ* ferrugineæ, obtusæ vel acutæ, apice hyalino-albæ. *Perigynium* 1 $\frac{6}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$ -1 lin. longum,  $\frac{1}{2}$  lin. latum, vel angustius, oblongum, obtusum, basi styli subæquali abrupte apiculatum.

I have never seen this species from any portion of North America. *Bongard* includes it among the plants of Sitcha.

442. *C. foetida* (Allioni); spica subrotunda capitata fusca concolori, e spiculis apice masculis arcissime congestis; bractea squamæformi cuspidata; stigmatibus 2; perigyniis ellipticis vel ovatis sensim longiuscule rostratis, ore antice secto bifido, plano-convexiusculis, marginibus acutis superne scabris basi leviter parce nervatis lucidis tenuissime membranaceis fuscis basi pallidis stipitatis, squama ovato-lanceolata acuta vel mucronata fusca longioribus.—*C. foetida*, *All. Ped.* 265; *Wahl. Act.* 142; *Willd.* 217; *Schk. f.* 96; *Kunth*, 375; *Gaud. Agrost.*

83, et *Helv.* 36; *Bertol.* 44; *Koch*, 865; *Reich. t.* 199; *Steud.* 187; *Gren. et Godr.* 389. *C. lobata*, *Vill. Dauph.* 195, et *C. Baldensis*, *Vill.* 196, t. 6 (*vide Gren. et Godr.*). (*ic. ined.* DCXXXIV. in *Herb. Kew.*)

HAB. In Europa, America septentrionali.—In summis Alpibus Helvetiæ et Pyrenaicis. *Mout. Saxosis*, *Perry*, n. 385 (1861) (*Herb. Gray*). "Head-waters of Clear Creek, and alpine ridges east of Middle Park, Colorado Territory."

*Rhizoma* lignosum, validum, repens. *Culmus* 3-8-pollicaris, sæpe curvatus, acute triquetrum, seaber, basi foliosus. *Folia* 1½-2 lin. lata, eulmo subinde longiora, plana, vel earinatosuplicata. *Bractea* spica brevior. *Spica* 6-7 lin. longa, 4-6 lin. lata. *Squamæ* acuminatæ, acutissimæ, vel mucronatæ, fuscae, margine pallidiores. *Perigynium* (eum stipite  $\frac{2}{10}$ - $\frac{3}{10}$  lin. longo) 2 $\frac{3}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, achenium laxè vestiens. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, oblongum vel obovatum, lenticulare, basi styli subelavata apiculatum.

A *C. curvica*, *K.*, differt spica subrotunda, breviora; squamis sæpe mucronatis; perigyniis longioribus tenuissimis basi leviter parce nervatis, bifidis; eulmo breviora.

*Gaudin* remarks, in reference to the name, "Recens odore peculiari, nobis non omnino ingrato, quem in loco natali, sæpius antequam planta oculis discerni posset, percepimus, certo certius gaudet. Specimina exsiccata mensem unum alterumve hunc odorem spargunt, sed diutius sensim amittunt. Hinc bene *Hallerus*, 'recens siccaque foetet.'"

I am indebted to Dr. Gray for the specimens from the Rocky Mountains,—a very interesting discovery of Parry. No one previously had found it in North America. They are not mature, and the perigynia have not their full development.

Tab. DCXXXIV.:

n. 1. From Switzerland.

n. 2. Rocky Mountains.

443. *C. gibba* (Wahlenberg); spica oblonga foliacea pallida, e spiculis 6-9 basi masculis approximatis ovalibus simplicibus vel inferioribus compositis omnibus longe bracteatis; stigmatibus 3 brevibus; perigyniis ovalibus sensim vel suborbiculatis abrupte rostratis bidentatis plano-convexis encerviis marginibus acutis sursum tenuissime serrulatis membranaceis late viridibus, squama subrotunda obtusa vel apiculata alba, nervo viridi, aristata latioribus longioribus vel (arista) brevioribus.—*C. gibba*, *Wahl. Act.* 148; *Willd.* 238; *Kunth*, 420; *Steud.* 200. *C. remota*, *Thunb. Jap.* 37. *C. anomala*, *Boott*; *Perry's Exp.* 2, 327. (*ic. ined.* DCXXXV. in *Herb. Kew.*)

HAB. In Asia.—Japan, *Thunb.*; *Morrow*, n. 22; *Wright*, n. 39. Port Hamilton and Port Chusan, *Wilford* (*Herb. Hooker*).

*Radix* fibrosa. *Culmus* 1½-2-pedalis, gracilis, lævis, inferne foliatus. *Folia* 1-1½ lin. lata, eulmo longiora vel breviora, plana, graminea. *Bractea* foliaceæ, omnes culmo longiores; inferiores 1-1½ lin. latæ; infima nunc pedalis; subinde superiores setaeæ, breves. *Spica* 2-3½ poll. longa, 3-4 lin. lata. *Spiculæ* extremæ majores, 3-6 lin. longæ, 1½-2 lin. latæ; inferiores inter se 6-12 lin. remotæ, nunc basi spiculis 2 brevibus ecompositæ, vel omnes simplicies; summa basi clavata, e flosculis masculis pluribus; aliæ ima basi parce maseulæ. *Squamæ* inferiores longe aristatæ. *Perigynium* 1 $\frac{5}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$ -1 $\frac{1}{10}$  lin. latum, plano-convexum, antice linea centrali albida notatum. *Achenium* 1 $\frac{1}{10}$ - $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$

lin. latum, ovale, basi productum, apice annulatum, annulo basin styli incrassatum cingente, postice costa media modice elevata (rudimento anguli) notatum, stramineum.

I have never seen an authentic specimen of Thunberg's *C. remota*, nor of the *C. gibba* of Wahlenberg, neither of whom refer to the stigmata, though Willdenow says it has two. When examining the Japanese plants of Morrow, which were described in the second volume of Perry's 'Expedition to Japan,' I was led to infer, from the three stigmata and the annulated achenium, that the plant before me could not be safely referred to *C. gibba*, and I described it under the name above quoted; but, on reconsideration, I am inclined to consider it as Wahlenberg's plant. The margins of the perigynium are rather acute than winged, as Wahlenberg says, "*marginibus extenuatis*." They are more or less (*sub lente*) very delicately serrulate, especially at the rostrum. The posterior central angle of the achenium is not prominent. I know of no immediate affinity with this species, though in habit it has a resemblance to the *C. alta* of Java.

444. *C. globosa* (Boott); spica elongata purpurea, e spiculis 4-6, terminali mascula cylindrica, reliquis femineis subinde apice masculis oblongis pauci-laxifloris, superioribus sessilibus evaginatibus, inferioribus subradicalibus longe exserte pedunculatis; bracteis inferioribus foliaceis vaginatis spiculas superantibus; stigmatibus 3; perigyniis globosis rostratis stipitatis, ore hyalino bilobato, hirsuto-scabris nervosis purpureis basi pallidis, squama lanceolata acuta vel mucronata purpurea medio viridi latioribus brevioribus vel æquantibus.—*C. globosa*, Boott, *Trans. Linn. Soc.* 20, 125; *Steud.* 233. (*Te. ined.* DCXXXVI. in *Herb. Kew.*)

HAB. In Upper California, Nuttall.

Stolonifera. *Radix* fibris validis lignosis. *Culmus* 5-9-pollicaris, gracilis, firmus, triquetus, scaber, basi foliatus vaginisque foliorum laceratis vel reticulato-fissis tectus; pars spicigera 6-8 poll. longa. *Folia*  $\frac{1}{2}$ - $1\frac{1}{4}$  lin. lata; *sterilia* culmo longiora, carinata, plus minus conduplicata, firma, scaberrima. *Spica mascula* 7-12 lin. longa, lineam lata; *femineæ* interdum apice masculæ, 3-6 lin. longæ, 2 lin. latæ, 2-9-floræ; suprema sessilis, plus minus masculæ approximata; inferiores subradicales, longe exserte pedunculatæ; infima in uno specimine basi composita. *Bracteæ* spiculas superantes, summa evaginata; inferiores foliaceæ, vaginatæ. *Pedunculi* 1-4 $\frac{1}{2}$  poll. longi, inæquales; extremi breviores, scabri. *Squamæ masculæ* purpureæ, marginibus albo-hyalinis acutis muticis; *femineæ* angustiores, purpureæ, medio viridi, nervo sæpe paulo extra apicem producto. *Perigynium* 2-2 $\frac{3}{10}$  lin. longum, vix lineam latum. *Achenium* conforme, 1 $\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, globoso-trigonum, pallidum, punctulatum, basi styli æquali apiculatum.

Habitus *C. Michellii*,  $\beta$ ; differt spicis femineis nunc apice masculis radicalibus; squamis masculis muticis; perigyniis ore hyalino bilobato, pube scabriore.

I have only seen this species in Herb. Nuttall.

445. *C. humilis* (Leys); spica elongata albo-castanea, e spiculis 3-6 remotis erectis, mascula 1 elliptica acuta pedunculata pluriflora, reliquis femineis 2-7-floris inserte, inferioribus demum exserte pedunculatis; bracteis vaginæformibus apice late albo-scariosis muticis, infima cuspidata; stigmatibus 3 longis; perigyniis obovatis obtuse triquetris, rostello breve excurvo, ore integro, pubescentibus plus minus nervatis pallidis, squama rotundata

obtusa ampla amplectente medio castanea margine late albo-scariosa mutica vel mucronulata ciliolata angustioribus subæquantibus.—*C. humilis*, Leys, *Fl. Hol.* 175 (1761); Koeh, 877; Gaud. *Fl. Helv.* 84; Lange, 112; Reich, 17, t. 239; *Fl. Ross.* 289; Gren. et Godr. 417. *C. clandestina*, Good. *Linn. Trans.* 2, 167 (1792); Wahl. *Act.* 158; Willd. 254; Schk. f. 43; Kunth, 476; Gaud. *Agr.* 140; Ledeb. *Fl. Alt.* 224; Biebst. 384; Eng. Bot. t. 2124; Sm. *Eng. Fl.* 94; Bertol. 75; Steud. 232. *C. argentea*, Vill. 2, 206. *C. prostrata*, All. 2, 267; Sut. *Fl. Helv.* *C. scariosa*, Lam. *Encyc.* 3, 388, et *Suppl.* 240. *C. Gesneri*, Sut. l. e. sec. Gaud. (*Te. ined.* DCXXXVII. in *Herb. Kew.*)

HAB. In Europa et Asia.—Russia media. Germany to Italy. Caucasus. Altai.

*Rhizoma* lignosum, repens, fibris atris validis. *Culmi* 2 $\frac{1}{2}$ -5-pollicaris, usque ad basin spicigera, compressi, læves, basi foliati, reliquis foliorum fibratis vaginisque pallide ferrugineis tecti; pars spicigera 2 $\frac{1}{2}$ -5 poll. longa. *Folia novella* plana, erecta,  $\frac{3}{4}$  lin. lata; *senilia* canaliculata, involuta, persistentia, pedalia, rigida, prostrata. *Bracteæ* vaginæformes, pallide virides, apice castaneo tinctæ, margine late albo-scariosæ, infima cuspidata, lævæ. *Squamæ* ciliolatæ, conformes; masculæ subinde acutæ. *Spicula mascula* 6-8 lin. longa, lineam lata, acuta; *femineæ* 3-4 lin. longæ, 2 lin. latæ, 3-7-floræ. *Perigynium* 1 $\frac{4}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, obovatum, obtuse inæqualiter triquetrum, plus minus valide nervatum, basi late breve spongioso-stipitatum. *Achenium* conforme, 1-1 $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, basi styli obliqua crassiore apiculatum.

Schkuhr figures the perigynium more nerved than I have observed it. Gaudin describes the female spiculæ 4-6. I have found the smaller number only.

The specimens figured are from Germany.

446. *C. incisa* (Boott); spica oblonga pallida, e spiculis 4-5 cylindricis linearibus gracilibus alternatim contiguis æquialtis, terminali mascula vel basi mascula sessili, reliquis femineis laxifloris, inferioribus basi attenuatis capillaceo-pedunculatis pendulis, infima subinde basi composita; bracteis evaginatibus spiculis suis brevioribus; stigmatibus 2; perigyniis elliptico-ovatis rostellatis, ore integro, enerviis plano-convexiusculis olivaceis leviter resinoso-punctulatis membranaccis, squama subobcordata albida punctulata medio viridi trinervi emarginata breve lateque hispido-cuspidata longioribus.—*C. incisa*, Boott, *Perry's Exp.* 2, 327 (1826). (*Te. ined.* DCXXXVIII. in *Herb. Kew.*)

HAB. In Japan.—Hakodadi, Morrow. "On the banks of ditches," Wright, n. 65; Ringgold's *Exp.*

Cæspitosa. *Radix* fibris lanosis. *Culmus* 1-2 $\frac{1}{2}$ -pedalis, triquetus, apice scaber, basi foliatus; pars spicigera 3-5 $\frac{1}{2}$  poll. longa. *Folia* 1 $\frac{1}{2}$ -3 lin. lata, culmo breviora, plana, vaginis resinoso-punctatis. *Bracteæ* evaginatæ; infima vel binæ inferiores foliaceæ, spiculis breviores; superiores setaceæ, brevissimæ. *Spiculæ* 1-3 poll. longæ, 1-1 $\frac{1}{2}$  lin. latæ, alternæ, æquialtæ. *Pedunculi* capillacei, scabri; infimus 1-2 poll. longus. *Squamæ* conformes, sæpius emarginatæ vel truncatæ, demum fulvæ. *Perigynium* 1 $\frac{1}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, obscure punctulatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, lenticulare, basi styli æquali apiculatum, ferrugineum.



*C. nothæ*, Kunth, affinis; differt perigyniis cernviis, squamis late cuspidatis, etc.

The specimens of Wright are mature, and on one of them the lower spicula has a small branch at base.

447. *C. juncea* (Willdenow); spica brevi viridi ferruginea, e spiculis 2-4 gracilibus pedunculatis erectis approximatis, terminali mascula filiformi, reliquis femineis laxifloris evaginatibus cylindricis, inferioribus basi attenuatis; bracteis evaginatibus, infima spiculam superante vel culmum æquante; stigmatibus 3; perigyniis fusiformibus triquetris, ore integro, apice et præcipue marginibus scabris leviter nervatis viridibus demum sanguineo-purpureo tinctis, squama obtusa mutica longioribus vel acuminata subæquantibus.—*C. juncea*, Willd. *Enum. Pl. Hort. Berol.* 63 (1809); *Link*, 362; *Kunth*, 468; *Schlechtendal*, *Lin.* 3 (1835); *Boott*, *Linn. Trans.* 20, 116; *Steud.* 229; *Chap.* 542; *Dewey*; *Woods*, *Bot.* 762 (1861); *Kunze*, *t.* 48, *d.* *e.* *C. miser*, *Buckley*, *Sill. Journ.* 45, 173; *Dewey*, 48, 141; *Steud.* 225. *C. Rugeliana*, *Kunze (ex parte) (Herb. Hooker)*. (*Je. ined.* DCXXXIX. in *Herb. Kew.*)

HAB. In America septentrionali.—Mountains of North Carolina and Georgia. Roan Mountain, North Carolina, *Buckley*.

*Culmus* subpedalis, gracillimus, acute triquetus, scaber, basi foliatus, rudimentisque foliorum rubro-sanguineis tectus; pars spicigera 2-3 poll. longa. *Folia culmea*  $\frac{1}{2}$ -1 lin. lata, elongata, summa interdum spiculas attingens, plus minus vaginæque pilis albidis longis sparsis vestita marginibusque ciliata. *Bracteæ* evaginatæ, spiculis suis vel infima culmo longiores. *Spicula mascula* 8 lin. longa,  $\frac{1}{2}$  lin. lata, pedunculata; *femineæ* 1-3, laxifloræ, basi attenuatæ, 6-15 lin. longæ, 1 lin. latæ, a se 9 lin. ad 2 poll. remotæ. *Squamæ* ferrugineæ, obtusæ vel acuminatæ, sanguineo-purpureæ, nervo pallido, margine anguste hyalinæ. *Perigynium*  $1\frac{7}{10}$ - $2\frac{1}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, utrinque attenuatum, apice et præcipue ad margines scabrum, tenuissime nervatum vel nervis obsoletis, viride sanguineo tinctum, nervis marginalibus prominentibus intra margines demum sitis. *Achenium*  $\frac{8}{10}$  lin. longum, fere  $\frac{4}{10}$  lin. latum, oblongum, pallidum, triquetrum, stipitatum, basi styli æquali apiculatum.

Kunth thought this species was a form of *C. brachystachys*, Schrank; but it essentially differs from it in its evaginate bracts, and the roughness of the perigynium at the apex, and the scattered hairs on the leaves and vaginæ. Kunze confounded it with *C. æstivalis*, Curtis, as I have remarked, p. 54. I have figured the best specimens I have. Those of n. 1 are the *C. miser* of Buckley, which I owe to the kindness of Dr. Gray and Mr. Tuckerman; and n. 2 is a specimen from Herb. Hooker, sent by Kunze from Rugel as *C. Rugeliana (ex parte)*.

448. *C. lagopina* (Wahlenberg); spica ovali vel oblonga rubro-ferruginea nuda, e spiculis 3 rarius 4-6 basi masculis extremis majoribus, superioribus vel omnibus arcte congestis, infima vel inferioribus nunc femineis; bractea squamæformi ampla cuspidata rarius spiculam superante; stigmatibus 2; perigyniis ovalibus vel elliptico-lanceolatis plus minus longe sensim attenuato-rostratis, vel subrotundato-obovatis breve subabrupte rostellatis, ore hyalino integro antice secto, utrinque nervatis inalatis plano-convexiusculis glabris vel superne ad margines dentatis basi pallidis sursum fulvescentibus,

squama ovata obtusa fusca margine late albo-hyalina longioribus.—*C. lagopina*, *Wahl. Act.* 145, et *Fl. Lap.* 229; *Gay*, *Ann. Se. Nat.* ii. 177 (1839); *Drejer*, *Rev.* 25; *Anders.* 63, *t.* 4, *f.* 28; *Lange*, 53; *Reich.* *t.* 204; *Fl. Ross.* 279; *Benth.* 558; *Steud.* 196; *Torr. Cyp.* 393; *Dewey*, 5, 172 (1848). *C. leporina*, *L. Fl. Lap.*; *Willd.* 229; *Kunth*, 393; *Bertol.* 46; *Eng. Bot. t.* 2813. *C. Lachenalii*, *Sehk. f.* 79. *C. approximata*, *Hoppe*; *Gaud. Agrost.* 107, et *Helv.* 54. *C. parviflora*, *Gaudin*, *Etr.* *C. furva*, *Webb. H. Hisp.*; *Steud.* 197. (*Je. ined.* DCXL. in *Herb. Kew.*)

HAB. In Europa, Asia, et America septentrionali.—Lapland. Iceland to Alps of Switzerland and Spain. Siberia. Baikal. Kamtchatka. Greenland. Rocky Mountains.

*Radix* fibrosa. *Culmus* 4-12-pollicaris, subvalidus, sæpe obtusiusculus triquetus, apice tantum scabriusculus. *Folia*  $\frac{1}{2}$ -1 lin. lata, plana, laxa, graminea, culmum sæpe subæquantia. *Spica* 6-12 lin. longa, 3-6 lin. lata; forma variabilis, typice spiculis 3 alternatim contiguis, suprema major; vel spiculis 4-6, omnes congestæ, in formam subrotundam vel ellipticam vel oblongam dispositis, infima nunc subremota, extremæ majores. *Perigynium* ovale vel elliptico-lanceolatum, rostro tenui  $\frac{3}{10}$  lin. longo, basi acutum,  $1\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum; vel subrotundum,  $\frac{9}{10}$ -1 lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, abrupte breve rostellatum, ore nunc antice alte secto, pallidum sursum aurantiacum vel fulvum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obovatum.

This was undoubtedly the *C. leporina* of the Fl. Lap. of Linnæus, and is in his herbarium under that name; but in the Fl. Suecica he described the *C. ovalis*, Good., under the name of *C. leporina*, quoting the Fl. Lap. plant,—thus confounding the two. Authors have since generally adopted the name of *C. leporina* for the plant of the Fl. Suecica. As Andersson remarks, there are forms very like *C. festiva*, but distinguished by the inalate perigynium. Wahlenberg says "Capsulæ tantum acutæ et breviter rostellatæ (nec acuminatæ), colore fulvescentes vel rufescentes, unde tota spica eundem colorem acquirit." I find they vary in size and form, often acuminate with a cylindric elongate rostrum. The form with 4-6 spiculæ is the "var.  $\beta$ . *pleiostachya*" of Drejer. It is distinguished from *C. leporina* by its spike, perigynium, and alpine habitat.

- n. 1. A specimen from Lapland, from Wahlenberg.
- n. 2. Norway, from Wahlenberg.
- n. 3. Finlaud Alps, from Fries.
- n. 4. Rocky Mountains, *Drummond*, n. 268.
- n. 5. Greenland, from Hornemann.

449. *C. leiorhyncha* (Meyer); spica oblongo-cylindracea compacta viridi, e spiculis numerosis apice masculis plurifloris bracteatibus, inferioribus compositis; bractea infima sæpe spicam superante; stigmatibus 2; perigyniis oblongo-ovatis rostratis bidentatis glabris inalatis utrinque nervosis resinoso-punctatis plano-convexis erectis membranaceis pallidis, squama oblongo-ovata acuta cuspidata ferrugineo-lineata longioribus.—*C. leiorhyncha*, *Mey. Cyp. Nov. Mem. Acad. Petersb.* i. *t.* 9; *Kunth*, 388; *Kunze*, 9, *t.* 2, *f.* 1 (*excl. eit. Torrey*); *Steud.* 193; *Bongard*, *Mem. Acad. Petersb.* n. 168. *C. setariæformis*, *Turez. mss.* (*fide Fischer in Herb. Boott*). *C. nemorosa*, *Hort. Berol.* (*fide Kunth*). (*Je. ined.* DCXLI. in *Herb. Kew.*)

HAB. In Asia et America septentrionali.—Davuria, Meyer. Sitcha, Bongard.

*Radix* fibrosa. *Culmus* 1-1½-pedalis, gracilis, obtuse triquetus, scabriusculus, inferne foliatus. *Folia* 1-1½ lin. lata, culmo longiora vel breviora, plana, graminca; vaginis longis, intus hyalinis, transversim corrugatis. *Bracteae* angustae, inferiores longiores, infima saepe spicam longe superans, sursum sensim breviores spiculis plerumque longiores. *Spica* 1½-2 poll. longa, 4-5 lin. lata, in cultis demum straminea. *Spiculae* sub 30, inferiores oblongae densiflorae compositae, apice parce masculae. *Perigynium*  $1\frac{7}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, superne compressum, achenium laxè vestiens. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, lenticulare, lucidum, castaneum; basi styli aequali.

I am indebted to M. Fischer for authentic specimens of this species, and to M. Spach for cultivated ones from the Paris Garden, grown from seed sent from Russia, which exactly accord with the wild ones, except that the lower bracts are more elongated. Its affinity is with *C. nubigena* and *C. Thomsoni*. Kunze quotes Torrey, apparently mistaking the name *leiocarpa* (which is the plant of Torrey) for that of *leiorhyncha*.

450. *C. leporina* (L.); spica oblonga fulvo-brunnea, e spiculis 5-6 rarius 2-10 subrotundis vel obovatis basi masculis alternatim contiguis rarius in capitulum ellipticum congestis obtusis, summa basi clavato-mascula; bractea nunc spicam aequante filiformi; stigmatibus 2; perigyniis e basi ovata sensim acuminatis rostratis, ore oblique secto, marginibus e medio sursum alatis serrulatis utrinque nervatis fulvis, squamam ovato-lanceolatam acutam fulvam margine albo-hyalinam subaequantibus.—*C. leporina*, L. *Fl. Suecica* (excl. cit. *Fl. Lap.*); *Wahl. Act.* 145; *Gaud. Agrost.* 105, et *Helv.* 52; *Koch*, 869; *Reich. t.* 211; *Anders.* 63, t. 4, f. 26; *Lange*, 51; *Fl. Ross.* 278; *Gren. et Godr.* 397; *Tchihatch.* 575; *Benth. Handb.* 557. *C. ovalis*, Good. 148; *Eng. Bot. t.* 306; *Eng. Fl.* 82; *Willd.* 229; *Schk. f.* 8; *Kunth*, 395; *Bertol.* 47; *Steud.* 198. *C. mollis*, Gilib. (fide *Schk. p.* 40, et *Fl. Ross.*). *C. petasata*, Dewey, 29, 246; *Steud.* 197. (*l.c. ined.* DCXLII. A. et DCXLII. B. in *Herb. Kew.*)

Var.  $\beta$ ; spica albo-virescenti; culmo foliisque flacidis.—*C. argyroglochis*, Horn. *Fl. Dan.*; *Steud.* 198. *C. leporina*,  $\beta$ . nemoralis, *Fl. Ross.* *C. leporina*,  $\beta$ . pallescens, *Gren. et Godr.*

HAB. In Europa, Asia, et America septentrionali.—Lapland to Italy and Spain. Pontus, Cappadocia, Serbia, Caucasus, Ural, Altai. Rocky Mountains, Drummond.— $\beta$ . In Europa. Ural.

*Radix* lignosa, fibrosa. *Culmus* 1-1½-pedalis, obtuse triquetus, scaber, fistulosus, inferne foliatus. *Folia* 1-1½ lin. lata, culmo breviora, plana. *Bractea* squamæformis, quandoque spicam aequans, angusta. *Spica* 1-1½ poll. longa, 3-5 lin. lata. *Spiculae* 3-6 lin. longae, 3 lin. latae, summa basi magis conspicue mascula. *Perigynium*  $1\frac{9}{10}$ - $2\frac{3}{10}$  lin. longum,  $\frac{8}{10}$ -1 lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, oblongum, stipitatum, lenticulare, lucidum, castaneum, basi styli apiculatum.

A *C. festiva* differt spica laxiore, fulva; spiculis plerumque alternis, nusquam arcte congestis; ore non hyalino nec antice alte secto; squamis acutis, perigynia aequantibus.

I have never seen the typical form of this common European

species from any portion of North America. Dewey, in *Sill.* 26, 377, inserts *C. ovalis*, Good., as found in the Rocky Mountains, but quotes no authority. I have seen only the plant found there by Drummond, and which Dewey has described under the name of *C. petasata*. All the specimens are too young, but they do not essentially differ from the forms we meet with in Europe. The spiculae are 3-4, and of an elliptic form, as is usual in the earlier stage of development. The analogous species in North America is *C. scoparia*, forms of which are all but identical with *C. leporina*, differing merely in a narrower perigynium and achenium.

The distinction of *C. festiva* from *C. leporina* lies in the dark-coloured dense capitulum, its more numerous spiculae, the orifice anteriorly more prolonged, and the obtuse shorter squamæ, and its more alpine habitat. The leaves and bracts are often broader. It is very uniform in character in its much wider range. I have it from the island of Hawaii, and Mr. Brewer has lately sent it to me from San Francisco, with a capitulum an inch long and wide. I should refer the *C. propinqua*, Nees, and the *Macloviana*, Durv. (smaller forms), to it, and also the *C. allomacros*, Steud. 189, an authentic specimen of which I have, through the kindness of M. Sonder, and *C. pachystachya*, Cham. (*Steud.* 197).

Tab. DCXLII. A. is a specimen of *C. leporina*, from Germany.

Tab. DCXLII. B.:

n. 1. are Woodford, near London; all from the same root.

n. 2. From Germany, the terminal spicula sterile.

n. 3. The *C. petasata*, Dy., from the Rocky Mountains (*Drummond*), with a perigynium and squama.

451. *C. lobulirostris* (Drejer); spica fusco-olivacea, e spiculis 3-6 cylindricis coarctatis subaequalitatis densifloris, terminali mascula sessili fusco-ferruginea, reliquis femineis crassis superioribus sessilibus, infima plus minus remota inserta vel exserte pedunculata; bracteis inferioribus 2 vaginatis culmum conspicue superantibus; stigmatibus 3; perigyniis ovalibus vel ovali-obovatis rostratis, ore subintegro vel emarginato, ventricosis nervatis glabris divergentibus membranaceis fuscis, squama lanceolata hispido-aristata latioribus longioribus vel (arista) brevioribus.—*C. lobulirostris*, Drejer, *Symb.* 27. t. 14. *C. Neesiana*, Arnott mss. (non Endl.). *C. Arnottiana*, Boott, *Linn. Trans.* 20, 129 (non Nees). (*l.c. ined.* DCXLIII. in *Herb. Kew.*)

HAB. In Ceylon, Wight, 1295; Gardner, n. 946; Thwaites, n. 2623.

*Culmus* 1-3-pedalis, validus, rigidus, lævis, basi foliatus; pars spicigera 3-8 poll. longa. *Folia* 4-6 lin. lata, culmo longiora, plana. *Bracteae* 2 inferiores vaginatae, vagina 3-18 lin. longa; infima saepe sterilis, 6-8 pollices remota. *Pedunculus* infimus 9 lin.-2½ pollices longus, insertus vel breve exsertus. *Spiculae* plerumque 1½-2½ poll. longae, mascula 2 lin., reliquae 4 lin. latae, omnes coarctatae, vel infima inserte vel brevi exserte pedunculata, plus minus remota. *Squamæ* omnes aristatae. *Perigynium*  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, fuscum, rostro apice purpureo, ore subintegro demum fisso lobato. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, ellipticum, triquetrum, basi styli apiculatum. *Stigmata* 3, brevia.

Affinis *C. Japonicae*, Th. (*C. Donianae*, Spr.) differt bracteis inferioribus vaginatis, perigyniis magis ventricosis fuscis.

Drejer describes the orifice as lobed. It seems to me nearly entire, emarginate, ultimately ruptured.

452. *C. longipes* (Don); spica elongata læte viridi demum olivacea vel straminea, e spiculis 4-8 apice masculis basi attenuatis sterilibus, superioribus oblongis ovatisve contiguis vel approximatis evaginatis sessilibus, inferioribus cylindricis plus minus laxifloris, simplicibus vel com-

positis distantibus longe exserte pedunculatis; bracteis inferioribus vaginatis omnibus vel inferioribus spiculas suas superantibus; stigmatibus 2; perigyniis late ovalibus compressis basi acutis sensim rostratis bifidis, laciniis demum patentibus crebre nervatis glabris, marginibus superne scabris, squama ovato-lanceolata acuta vel obtusa plus minus hispido-aristata dorso scabra nervata brevioribus vel æquantibus.—*C. longipes*, *Don, Linn. Trans.* 14, 329 (1823); *Prod. Fl. Nep.* 43 (1825); *Spr. Syst.* 810 (1826); *Nees, Ap. Wight*, 124 (1834); *Kunth*, 418 (1838); *Drejer, Symb.* 24. t. 10 (1844); *Steud.* 188. (*Je. ined.* DCXLIV. in *Herb. Kew.*)

Var.  $\beta$ . perigyniis scabris.—*C. macrolepis*, *Don. l. e.* (*non Dec.*). *C. Nepalensis*, *Spr.* 811; *Nees*, 125; *Kunth*, 391; *Drejer*, 23. t. 9; *Steud.* 194. (*Je. ined.* DCXLV. in *Herb. Kew.*)

HAB. In Ind. orient. regione temperata Himalayæ.—var.  $\alpha$ ,  $\beta$ . Nipal, *Wallich, Cat.* 3388. Sikkim, 7000 ft., *Dr. Hooker*. Khasia, 5000–6000 ft., *Hooker, Thomson*.— $\alpha$ . Nilghiri, *Wight*, n. 1919; *Perrottet*, n. 838 (*Herb. Mus. Paris*).

*Radix* fibrosa. *Culmus* 1–2½-ped., lævis; pars spicigera 1–2-pedalis. *Folia* 1–1½ lin. lata, culmo breviora. *Spiculae* superiores ½–1 poll. longæ, contiguæ vel alternæ; inferiores sesquipollicares, plus minus laxifloræ, singulæ vel basi spiculis brevibus 1–3 compositæ, deorsum magis magisque remotæ. *Pedunculi* 2–4 poll. longi, scabri. *Vaginae* ½–1 poll. longæ. *Squamæ* albidæ, nervo viridi, demum stramineæ. *Perigynium* 2–¾ lin. longum, ¾–1 lin. latum; in  $\alpha$ , nisi ad margines glabrum; in  $\beta$ , superne scabriusculum, vel undique scaberrimum. *Achenium* 1–¾ lin. longum, ¾ lin. latum, lenticulare, demum brunnescens; in  $\alpha$ , basi styli persistente æquali recta, supra basi decidua bulbosa; in  $\beta$ , basi persistente recta vel tortuosa.

Both var.  $\alpha$  and  $\beta$  are included in n. 3388 of Wallich's *Herb.* Don separated them under the names above quoted, Sprengel changing that of *C. macrolepis* to *C. Nepalensis*. Kunth described the last, not having seen *C. longipes*; and Nees described *C. longipes* from a specimen of Wight, not having seen *C. Nepalensis*. Drejer, in his 'Symbolæ,' described and figured both from Wallich's specimen; under *C. Nepalensis*, quoting Kunth doubtfully, and under *C. longipes* omitting to quote Nees. All this shows the confusion that is apt to arise from descriptions taken from single specimens. I have specimens from Don, Wallich, and Wight, and others since collected by Dr. Hooker, and believe that they all form one species, varying in the smoothness or roughness of the perigynium and the straight or tortuous base of the style. Dr. Hooker's specimens are intermediate, having perigynia which are scabrous only at top and smooth elsewhere, except at the margins, and with the base of the style straight or tortuous. Nees took his description from a specimen of Wight, of which I have the counterpart, with loose flowered spiculae and elongated bracts, growing perhaps in the shade. In my specimen the perigynia are immature, but are, like Dr. Hooker's specimens, rough at top. On this specimen, from the same root, are 2 culms, one of which has simple, and the other, one compound spicula. Drejer hesitated under *C. longipes* to quote Nees, as the description differed from his own specimen, "spicis longioribus multo laxioribus, bracteis culmum multo superantibus." And he adds, "In hac (Nees) spicæ inferiores quandoque compositæ, cujus vestigia in nostra non apparent, nec sine dubio apparere poterunt." Any one familiar with the variations in every species will see that no dependence can be placed on these characters, nor in the present species is there any dependence to be placed upon colour, the direction of the lacinia of the orifice of the perigynium, the length of the arista of the squamæ, or that of

the bracts. The chief difference in the var.  $\beta$  is the uniform roughness of the perigynium and the tortuous base of the style, characters which are found modified in Dr. Hooker's Sikkim specimens.

n. 1, is a specimen of Wallich, n. 3388, var.  $\beta$ .

n. 2, one from Sikkim, of Dr. Hooker, with the partially rough perigynium.

453. *C. Mairii* (Cosson et Germain); spica oblonga ferrugineo-olivacea, e spiculis 3–4 densifloris contiguis vel approximatis, mascula 1 rarissime 2 cylindrica ferruginea sessili, femineis 2–3 ovatis vel oblongis olivaceis, infima inserte vel rarius remota exserte pedunculata; stigmatibus 3; perigyniis ovalibus subplanotriangonis sensim rostratis, rostro compresso, ore bifido, plus minus nervatis olivaceis demum ferrugineo-punctatis marginibus subacutis e medio sursum ciliato-aculeatis patentissimis vel inferioribus recurvatis, squama ovata ciliata hispido-cuspidata longioribus. *C. Mairii*, *Coss. et Germ. Obs. Pl. Crit.* 18. t. 1 et 2; *Fl. Env. de Paris*, 602. t. 35. f. 1; *Gren. et Godr.* 424; *Steud.* 223; *Bourgeau, Fl. Hisp.* n. 981 (*fide Gren. et Godr.*). (*Je. ined.* DCXLVI. in *Herb. Kew.*)

HAB. In Gallia, Hispania.

Dense cæspitosa. *Culmus* 1½–2-pedalis, obtusangulus, lævis, apice scabriusculus, firmus; pars spicigera 1½–5 poll. longa. *Folia* 1–2 lin. lata, culmo breviora, carinato-plana, firma, læte viridia. *Bractea* infima vaginata, culmo sæpius brevior, subinde refracta, sæpe sterilis remota longius vaginata. *Vagina* triquetra. *Spicula mascula* 8–15 lin. longa, sub lineam lata, rarissime altera brevior contigua; *femineæ* 3–8 lin. longæ, 2–4 lin. latæ, summa nunc abbreviata, infima quandoque 2–4 poll. remota. *Squamæ masculæ* obtusæ, muticæ, ciliatæ, vel inferiores nunc cuspidatæ. *Perigynium* 1–¾ lin. longum, ¾ lin. latum, achenium ad latera laxè vestiens, estipitatum, rostro recto vel plus minus excurvo. *Achenium* ¾–¾ lin. longum, ¾–¾ lin. latum, obovatum vel ovale, triquetrum, angulo medio postico, fuscum, punctulatum, basi styli æquali apiculatum.

454. *C. Michellii* (Host); spica abbreviata vel oblonga pallida, e spiculis 2–3, terminali mascula elliptica fulva, reliquis femineis brevibus vel cylindraceis remotis inserte vel exserte pedunculatis; bracteis vaginatis brachyphyllis; stigmatibus 3; perigyniis ellipticis longe rostratis, ore bifurcato antice alte recto, laciniis lanceolatis acutis nervatis puberulis rostro ad margines scabro, divergentibus pallidis, squama oblonga acuta vel truncata sensim vel abrupte cuspidata albida longioribus.—*C. Michellii*, *Host, Syn.* 507 (1797), et *Gram.* t. 72; *Wahl. Act.* 155; *Schk. n.* 59; *Willd.* 277; *Kunth*, 476; *Biebst.* 388; *Hoppe, t.* 74; *Reich.* 24. t. 256; *Koeh.* 883; *Fl. Ross.* 293; *Bertol.* 108. (*Je. ined.* DCXLVII. in *Herb. Kew.*)

HAB. In Europa et Asia.—Germany, Italy, Tauria, Caucasus.

Var.  $\beta$ . spiculis femineis paucifloris, squamis castaneis.—*C. bispicata*, *Hooker, Beechey's Voy.* 3. t. 28; *Kunth*, 520. *C. longerostrata*, *Meyer, Cyp. Nov.* t. 12; *Fl. Ross.* 293; *Maxim. Prim. Fl. Amur.* 312. *C. Camtschatscensis*, *Kunth*, 477; *Steud.* 233. *C. vexilis*, *Wormskiold (Herb. Hooker)*. (TAB. DCXLVIII. in *Herb. Kew.*)

HAB. In Asia.—Kamtchatka, *Meyer, Wright; Flora Amur. Maxim.* Japan, Hakodadi, *Wright (Herb. Gray)*.

Var. *a.* *Culmus* 6–12-poll., debilis, scaber, basi foliis brevibus tectus; pars spicigera  $1\frac{1}{2}$ –4 poll. longa. *Folia radicalia* 1–2 lin. lata, marginibus revolutis, culmo sæpe longiora. *Bractea* vaginata, spicula breviores vel paulo longiores. *Spica mascula* 5–12 lin. longa,  $1\frac{1}{2}$ –3 lin. lata, elliptica, fulva; *femineæ* 6–12 lin. longæ, 4 lin. latæ. *Squamæ masculæ* obtusæ, mucronatæ, apice ciliatæ. *Squamæ femineæ* albidæ, nunquam emarginatæ. *Perigynium (floriferum)*  $3\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, rostro  $1\frac{6}{10}$  lin. longo, laciniis antice  $\frac{9}{10}$ – $1\frac{8}{10}$  lin. longis, postice  $\frac{8}{10}$ – $\frac{6}{10}$  (*maturum*) 3 lin. longum,  $1$ – $1\frac{1}{10}$  lin. latum, rostro  $1\frac{2}{10}$  lin. longo, ellipticum vel e basi producta obovatum. *Achenium*  $1\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, obovatum, inæqualiter trigonum, basi oblique incrassata.

I cannot discover any specific difference in the var. *β*. The colour of the spikes is castaneous, they are smaller, with fewer florets, often 4–6, and the male squamæ are sometimes subemarginate.

In Tab. DCXLVII. the specimens figured are from Germany.

In Tab. DCXLVIII., var. *β*.

n. 1, is from Kamtchatka, sent to me by Mr. Fischer.

n. 2, from Petropaulowski, Kamtchatka, from *Wright, N. Pac. Exp.*, sent to me by Dr. Gray.

n. 3, from Hakodadi, Japan, *Wright*, also from Dr. Gray.

455. *C. micropoda* (Meyer); spica simplici apice mascula ovata densiflora ferruginea; stigmatibus 2; perigyniis oblongo-ovatis sensim in rostellum brevissimum acuminatis basi subacutis longe stipitatis, ore hyalino antice alte fisso, enerviis glabris membranaceis superne ferrugineis biconvexusculis demum horizontaliter patentibus, squamam ovatam obtusam vel acutam ferrugineam subæquantibus ea angustioribus.—*C. micropoda*, *Meyer, Cyp. Nov. Mem. St. Petersb.* 1, 210. t. 6; *Kunth*, 371; *Fl. Ross.* 267; *Steud.* 184. *C. nivalis*, *Chamiss. Steud.* 184. ( *Ic. ined. DCXLIX. in Herb. Kew.*)

HAB. In Asia, America septentrionali.—Unalaska, *Meyer*. Columbia River, *Barclay*, (*Herb. Boott*).

*Culmus* 4–10-pollicaris, triqueter, apice scabriusculus, inferne usque ad mediam partem alternatim foliatus. *Folia* plana,  $\frac{2}{3}$  lin. lata, culmo breviora, flaccida; juniora canaliculato-involuta. *Spica* 6 lin. longa, 4 lin. lata, apice flosculis masculis 5–7 femineis pluribus 10–20 instructa. *Squamæ masculæ* lanceolatæ, acutæ; *femineæ* latiores, infima nunc cuspidata, deciduæ. *Perigynium* cum stipite  $\frac{4}{10}$  lin. longo,  $1\frac{7}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, late ovale, lenticulare, punctulatum, griseum, basi styli æquali.

Vix a *C. pyrenaica*, *Wahl.*, distinguenda. Differt culmo sæpe altiore; foliis flaccioribus ejus partem inferiorem alternatim occupantibus; perigyniis oblongo-ovatis paulo brevioribus; achenio latiore; stigmatibus semper 2.

A *C. pulicari*, *L.*, facile distincta, culmo triquetro; foliis planis; spica confertiflora; perigyniis et achenio lenticularibus minoribus.

I have not seen an authentic specimen of this plant, but am indebted to Mr. Heward for specimens from Oregon, collected by Mr. Barclay, who has alone found it there.

456. *C. mollicula* (Boott); spica abbreviata albo-olivacea, e spiculis 3–4 oblongis sessilibus, terminali mascula tenui albida, reliquis femineis pallide olivaceis contiguus vel infima paulo remota; bracteis evaginatis, infima

culmum superante; stigmatibus 3; perigyniis ovatis triquetris rostratis, ore integro obliquo albo, olivaceis punctis ferrugineis conspersis arcuatim divergentibus glabris subdistichis, squama ovata acuminata albo nervo viridi latioribus longioribus. ( *Ic. ined. DCL. in Herb. Kew.*)

HAB. Tsus-Sima, Korea, *Wilford*, n. 842 (*Herb. Hooker*).

*Culmus* 6–9-pollicaris, debilis, reclinator, angulis acutis scabris; pars spicigera 10–20 lin. longa. *Folia* 2–4 lin. lata, culmum subæquantia, plana, mollia, glabra. *Bractea* evaginata; infima  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, nunc sterilis pollicem remota, culmum paulo superans; superiores spiculis longiores; summa setacea, brevior. *Spicula mascula* 5–6 lin. longa,  $\frac{1}{2}$  lin. lata, sessilis; *femineæ* 5–9 lin. longæ, 3 lin. latæ, contiguæ vel infima sub pollicem remota. *Squamæ* omnes albæ, nervo viridi; masculæ lanceolatæ, acutæ. *Perigynium*  $1\frac{6}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ferrugineo punctatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, triquetrum, fulvum, basi styli æquali persistente obliqua.

A *C. dispalata* differt spiculis parvis contiguus; culmo brevi debili; squamis albis; foliis mollissimis; perigyniis ferrugineo punctatis; achenio ovali.

457. *C. muricata* (L.); spica oblonga viridi-castanea, e spiculis 6–8 apice masculis rotundis simplicibus squarrosis contiguus vel inferioribus discretis; bractea rarius spicam superante; stigmatibus 2; perigyniis ovatis acuminato-longiuscule vel suborbiculatis breve rostratis bifidis marginibus acutis scabris enerviis vel basi antice rarius utrinque nervatis plano-convexis divaricatis membranaceis basi spongiosis pallidis demum plus minus castaneis, squama ovata acuta vel cuspidata plus minus viride castanea longioribus.—*C. muricata*, *L. Sp. Pl.*; *Good. Linn. Trans.* 2, 158; *Wahl. Act.* 143; *Willd.* 234; *Schk. E. f.* 22 (*opt.*) et *E. E. f.* 91; *Kunth*, 384; *Eng. Bot. t.* 1097; *Smith, Eng. Fl.* 88; *Gaud. Afr.* 93, et *Helv.* 46; *Biebst.* 383; *Brot.* 163; *Led. Fl. Alt.* 212; *Koch*, 866; *Reich. t.* 215; *Anders.* 65. t. 3. f. 19; *Fl. Ross.* 275; *Gren. et Godr.* 394; *Tchihatch.* 574; *Benth.* 560; *Steud.* 192; *Dewey, Sill.* 11, 307; *Tor. Cyp.* 389; *Carey*, 512. *C. spicata*, *Huds.* *C. canescens*, *Leers. t.* 14. f. 3. *C. contigua*, *Hoppe.* *C. loliacea*, *Thuill.* ( *fide Gren. et Godr.*)

HAB. In Europa, Asia, et America septentrionali.—Denmark, Norway, Sweden, Finland, to Constantinople, Pontus, Altai. Japan, *Wright*. New England, Ohio, Kentucky, North-west Coast, *Douglas et Scouler*. Rocky Mountains, *Hall et Harbour*, n. 592 (*Herb. Gray*).

*Radix* fibrosa. *Culmus* 1– $1\frac{1}{2}$ -pedalis, triqueter, gracilis, scaber, uno angulo lævi, inferne foliatus, basi rudimentis foliorum reliquisque setaceis nigrescentibus tectus. *Folia* 1– $1\frac{1}{2}$  lin. lata, plana, culmo longiora vel subæquantia. *Bractea* rarius spica longior. *Spica* 12–15 lin. longa, 4 lin. lata. *Spicula* 3 lin. longæ et latæ, rotundatæ, squarrosæ, contiguæ vel inferiores 1–2 discretæ approximatae. *Squamæ* plus minus castaneæ. *Perigynium*  $1\frac{8}{10}$ – $2\frac{9}{10}$  lin. longum,  $1$ – $1\frac{4}{10}$  lin. latum, enerve, vel antice, vel utrinque plus minus nervatum, membranaceum, demum basi spongiosum, pallidum vel plus minus castaneo-tinctum, divaricatum, demum stellulatum patentissimi-

mum. *Achenium* subrotundum, 1 lin. longum,  $\frac{8}{10}$ — $\frac{9}{10}$  lin. latum, vel oblongum vel ovatum  $1\frac{8}{10}$ — $\frac{9}{10}$  lin. longum  $\frac{8}{10}$ —1 lin. latum, ferrugineum, plano-convexiusculum, basi styli clavata.

Var.  $\beta$ . *gracilis*; spica castanea angusta, e spiculis ovatis paucifloris bracteatis; perigyniis erectis enerviis vel nervatis, squama lanceolata acutissima cuspidata castanea brevioribus. *C. Hookeriana*, *Dewey, Sill.* 29, 248; *Fl. Bor. Amer. t.* 212; *Steud.* 192. *C. muricata*, *Torrey, Cyp.* 389. ( *Ic. incd.* DCLVII. in *Herb. Kew.*)

HAB. In America septentrionali.—Carlton House (*Richardson*). North Mexico, *Fendler, n.* 884; *St. Rita del Cobro*, North Mexico, *Bigelow (Herb. Torrey)*. *Angel Island*, San Francisco, California (*Brewer*).

*Culmus* 1— $1\frac{1}{2}$ -ped., gracillimus. *Folia* sub lineam lata. *Bractea* inferiores longiores, infima 1—2 poll. longa. *Spiculae* 5—10, ovatae, omnes bracteatae. *Perigynium* (*Carlton House*)  $1\frac{2}{10}$ — $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, enerve, pallidum, vel (*St. Ritae*) 2— $2\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ — $\frac{9}{10}$  lin. latum, utrinque subvalide nervatum, pallidum, vel (*Angel Island*)  $2\frac{2}{10}$ — $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ — $\frac{8}{10}$  lin. latum, plus minus nervatum, castaneum. *Achenium* (*Carlton House, St. Ritae*)  $\frac{8}{10}$ — $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ — $\frac{7}{10}$  lin. latum, ovale, vel (*Angel Island*) 1 lin. longum,  $\frac{7}{10}$  lin. latum, obovatum.

A forma typica differt spica graciliori; spiculis ovatis paucifloris bracteatis; perigyniis erectis, squama acutissima brevioribus.

Var.  $\gamma$ . *virens*; spica albo-viridi elongata basi saepe interrupta composita, e spiculis pluribus subinde majoribus, inferioribus nunc remotis simplicibus vel compositis, omnibus bracteatis; bractea infima rarius foliacea spicam superante; perigyniis ovato-lanceolatis pallidis demum plus minus castaneis, squama alba cuspidata longioribus, culmo subinde altissimo, foliis latoribus.—*C. virens*, *Lamarck, Enc.* 3, 384; *Steud.* 192. *C. muricata*, *Schk. D. D. f.* 22? *b.* *C. muricata*, *Hoppe, Icon.* *C. muricata, v. virens*, *Fries, Sum.* 73; *Andersson, t.* 3. *f.* 18; *Koch, 866*; *Gren. et Godr.* 394. *C. nemorosa*, *Lumnitz.* *C. tenuis*, *Schleicher.* *C. loliacea*, *Bellard. (fide Bertol.)*. *C. divulsa*, *Gaudin, Helv.* 47 (*fide Koch*); *Agrost.* 95. *C. furculata*, *Peterm. Steud.* 192. *C. tergestina*, *Hoppe, (Herb. Boott)*.

HAB. In Europa, in nemorosis.

*Culmus* 1—5-pedes altus, subinde validus. *Folia* 2 lin. lata. *Spica* pallida, nunc abbreviata, semipollicaris, spiculis simplicibus contiguis, vel 1— $4\frac{1}{2}$  pollices longa. *Spiculae* inferiores plus minus remotae, nunc 1— $1\frac{1}{2}$  pollices distantes e spiculis partialibus 2—4 contiguis compositae, infima 9 lin. longa. *Bractea* infima plerumque angusta, subpollicaris, rarius foliacea  $3\frac{1}{2}$  pollices longa, sub lineam lata. *Spiculae* squarrosae. *Perigynium*  $2\frac{3}{10}$ — $\frac{5}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Squamae* albae, nervo laete viridi.

Var.  $\delta$ . *divulsa*; spica albo-viridi elongata basi interrupta saepe ramosa, e spiculis 12 pluribusve, inferioribus remotis simplicibus vel plus minus compositis, sessilibus vel ad basin spicae in ramum pedicellatum subpollicarem dispositis, bractea infima angusta subinde elongata; perigyniis suborbiculatis rostro brevi vel oblongo-ovalibus acuminato-rostratis, bifidis marginibus inferne obtusis laevibus, superne tantum acutis scabris, enerviis vel antice basi nervatis vel nervis 2 notatis, membranaceis

pallidis squama ovata alba mutica vel cuspidata, nervo viridi longioribus.—*C. divulsa*, *Good. Lin. Trans.* 2, 160; *Eng. Bot. t.* 629; *Smith, Eng. Fl.* 89; *Willd.* 235; *Schk. D. D. et W. W. f.* 89; *Kunth*, 385; *Koch*, 866; *Andersson*, 66. *t.* 3. *f.* 20; *Gren. et Godr.* 394; *Steud.* 193; *Tchihatch.* 574. *C. canescens*, *Huds. Thwill. (sec. Gren. et Godr.)*. *C. muricata*  $\beta$ , *Wahl. Act.* 143; *Cosson et Germ.* 594. *C. muricata*, var., *Gay, Ann. Sc.* 2, 355; *Benth.* 560. *C. paniculata*  $\beta$ , simplex, *Fries, Herb. Norm.* *C. virens*, *Suec. (fide Fries)*. *C. Guestphalica*, *Boning.*

HAB. In Europa.—Norway to Portugal, Constantinople, Madeira, and the Canaries.

*Culmus* 2—3-pedalis, debilis, saepe reclinatus. *Spica* 2— $4\frac{1}{2}$  poll. longae. *Perigynium*  $1\frac{8}{10}$ — $2\frac{2}{10}$  lin. longum,  $1$ — $1\frac{2}{10}$  lin. latum, membranaceum. *Achenium*  $1$ — $1\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ — $\frac{9}{10}$  lin. latum, subrotundum vel ovatum, castaneum, basi styli clavata.

Var.  $\epsilon$ . *Indica*; spica pallida e spiculis pluribus (12—30), inferioribus in ramos (2—4) subpollicares dispositis, culmo validiore.—*C. foliosa*, *Don, Prod.; Boott, Illustr.* 2. *t.* 3; *Steud.* 192. *C. notoleia*, *Nees, Ap. Wight*, 121; *Kunth*, 388; *Steud.* 193.

There is no dependence to be placed upon the size or colour of the spike, or upon the form, size, nervation, or degree of acuteness or roughness of the margins of the perigynium of *C. muricata* and its varieties. Any one comparing the perigynium of Schkuhr's admirable figure  $\epsilon$ . 22, with that of  $\epsilon$ .  $\epsilon$ . 91, will see, that while the former represents the typical form, the other, saving the castaneous colour of the spike, is like that of the typical *C. divulsa*, which in its simpler development is to *C. muricata* what *C. argyroglochin* is to *C. leporina*. Koch, alluding to the var.  $\gamma$ , says, "characterem vere distinguentem inter hanc varietatem et plantam vulgarem reperiri non potui." And Andersson, alluding to the same variety, says, "modificatio nemoralis sub umbra orta ad *C. divulsam* praebet transitum." Goodenough and Smith evidently considered it as *C. muricata*, or as *C. divulsa*. I find the perigynium of the typical form varies from  $1\frac{8}{10}$ — $2\frac{2}{10}$  lin. longum,  $1$ — $1\frac{4}{10}$  lin. latum, that of the var.  $\gamma$ ,  $1\frac{6}{10}$ — $2\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ —1 lin. latum, and that of the var.  $\delta$ ,  $1\frac{6}{10}$ — $2\frac{3}{10}$  lin. longum,  $\frac{8}{10}$ — $1\frac{3}{10}$  lin. latum, in all the orifice bifid, the nervation variable, and the style clavate at base.

*C. Hookeriana* has no essential specific character, and I have no hesitation in referring the *C. foliosa*, Don, of India, to a mere slight variation of the var.  $\delta$ . As to the geographical distribution of it, I would refer to Gay's observations, *Ann. Sc. Nat.* 10, 355 (1838).

458. *C. neurocarpa* (Maximowicz); spica oblonga, e spiculis 20 pluribusve apice masculis dense congestis, inferioribus compositis; bracteis inferioribus spicam longe superantibus; stigmatibus 2; perigyniis orbiculato-ovatis sensim rostratis bidentatis compressis utrinque nervosis membranaceis, marginibus e medio late alatis serrulatis, ala basi subito desinente pallidis demum ferrugineo-punctatis, squama ovata acuta, cuspidata aequilata pallide straminea, nervo viridi longioribus.—*C. neurocarpa*, *Maxim. Mem. Acad. Petersb.* 9, 306 (1859). ( *Ic. incd.* DCLII. in *Herb. Kew.*)

HAB. In Asia, ad fluv. Amur, *Maxim.*

*Caespitosa*. *Radix* fibrosa. *Culmus* subpedalis, laevis. *Folia* 1— $1\frac{1}{4}$  lin. lata, culmo longiora, plana. *Bractea* inferiores 5—10 poll. longae. *Spica*  $1\frac{1}{2}$  poll. longa, 5—6 lin. lata.

*Spiculæ* ovatae, inferiores compositæ. *Squamæ masculæ* paucæ, minores lanceolatae, acutæ. *Perigynium*  $1\frac{2}{10}$  lin. longum, 1 lin. latum, plurinervium. *Achenium* minimum,  $\frac{6}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, ellipticum, lenticulare, lucidum, ferrugineum.

I am indebted to Dr. Gray for an authentic specimen of this species. The perigynium, with its broad ala, truncate at base, is like that of *C. arenaria*, but the habit is different, and, like that of *C. leiorhyncha*, Meyer, which, however, has an inalate perigynium.

459. *C. nexa* (Boott); spica elongata pallide viridi demum fulva, e spiculis 4-7 gracilibus remotis erectis, terminali mascula densiflora elongata, reliquis femineis brevioribus laxifloris, superioribus inserte, inferioribus exserte pedunculatis; bracteis vaginatis omnibus setaceis spiculis suis brevioribus, vel inferioribus foliaceis culmo longioribus; stigmatibus 3; perigyniis fusiformibus utrinque acutis excurvatis, ore albido emarginato, parcissime puberulis demum glabris nervatis pallide viridibus, squama lanceolata acuta vel acuminata paulo angustioribus longioribusque. ( *Ic. ined. DCLIII. in Herb. Kew.*)

HAB. In China.—Hongkong, *Wright*; *Ringgold*, and *Rodgers's Exp.* (*Herb. Gray.*)

Cæspitosa. *Culmi* plures, subsesquipedales, filiformes, læves, basi breve foliati, vaginis purpureis, rudimentisque foliorum tecti; pars spicigera 9-12 poll. longa. *Folia radicalia* 2-2½ lin. lata, culmo longiora, plana; *culmea* 4, anguste brevia. *Bracteæ* vaginatae, in uno specimine inferiores elongatae; infima subpedalis. *Vagina* tumidulae, basi purpureae; infima subpollicaris. *Pedunculus* infimus subinde 3 poll. longus, scaber. *Spicula mascula* 2-4 poll. longa, 1-1½ lin. lata; *femineæ* 9-16 lin. longæ, 1-¾ lin. latæ, a se 1-5 poll. remotæ, summa nunc sessilis, evaginata. *Squamæ masculæ* lanceolatae, obtusiusculæ. *Perigynium*  $1\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum. *Achenium* conforme,  $1\frac{2}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, infra mediam tumidum, supra, infra et ad angulos lacunose indentatum, nigro-purpureum, apice annulo albo basin styli bulbosum cingente apiculatum.

460. *C. nigella* (Boott); spicis 4-5 oblongis erectis approximatibus, terminalibus 1-3 masculis fusco-ferrugineis, femineis 2-3 atro-purpureis concoloribus bracteatis, inferioribus pedunculatis; bracteis foliaceis evaginatis, inferioribus culmum paulo superantibus; stigmatibus 3; perigyniis ellipticis cylindrico-rostratis, ore antice obliquo bidentato, enerviis granulatis atro-purpureis basi pallidis, squama lanceolata acuta atro-purpurea nervo concolori extra apicem producta latioribus brevioribus. —*C. nigella*, *Boott in Hooker, Fl. Bor. Americana*, 2, 225. ( *Ic. ined. DCLIV. in Herb. Kew.*)

HAB. Ad fluv. Columbia, America septentrionali, *Tolmie*.

*Radix* repens, fibris lignosis lanatis. *Culmus* subpedalis, triquetus, apice scabriusculus, basi foliatus; pars spicas gerens 2 poll. *Folia* 1-2 lin. lata, culmo breviora. *Bracteæ* foliaceæ; auriculis purpureis. *Spicæ masculæ* 4-6 lin. longæ, 2 lin. latæ, inferiores sessiles; squamæ lanceolatae, nervo extra producto. *Spicæ femineæ* 5-7 lin. longæ, 2-2½ lin. latæ, erectæ. *Perigynium*  $1\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, triquetrum, flavidum, basi styli æquali apiculatum.

*A. C. Tolmiei*, Boott, differt spicis paucioribus masculis 2-3, perigynio bidentato majore, squamis lanceolatis mucronatis.

461. *C. nutans* (Host); spica subelongata subflavida demum fusco-purpurea, e spiculis 3-5 erectis densifloris, masculis 1-3 linearibus, femineis 2 rarius 1-3 remotis oblongis vel cylindricis crassis summa nunc apice mascula evaginatis, vel infima basi laxiflora sæpe exserte pedunculata; bracteis evaginatis vel infima culmum superante subinde vaginata; stigmatibus 3; perigyniis turgidis oblongo- vel lanceolato-ovatis obtuse trigonis, angulis rotundatis sensim subrostratis, ore bifurcato, rostro apice laciniisque dentatis nervatis, nervis demum latentibus striato-sulcatis pallide demum sanguineo-punctatis vel atro-purpureis spongiosis, squama ovata acuminato-acutata ciliata vel longe aristata purpurea medio pallida latioribus longioribus.—*C. nutans*, *Host, Gr.* 61, t. 83; *Willd.* 299; *Schk. f.* 205; *Kunth*, 488; *Biebst.* 391, et 3, 618; *Ledeb. Alt.* 220; *Koch*, 887; *Reich.* 27, t. 265; *Lange*, 140; *Parlat. Fl. Ital.* 219; *Fl. Ross.* 315; *Gren. et Godr.* 430; *Tchihatch.* 579; *Stued.* 237. *C. melanostachya*, *Biebst.* (*vide Willd.*); *Willd.* 299. *C. acuminata*, *Reich.* 27, t. 267 (*non Willd.*). *C. heterostachya*, *Bunge, Mem. Petersb.* 2, 142 (*non Tor.*).

HAB. In Europa et Asia.—France, Germany, Italy, Armenia, Caucasus, Ural, Altai. Pekin, China, *Bunge*.

*Rhizoma stoloniferum.* *Culmus* subpedalis (*florifer nutans*, Host), gracilis, lævis, vel superne scaber, basi vaginis purpureis vel pallidis fibrilloso-laceris tectus; pars spicigera 4-5, rarius 12 poll. longa. *Folia* 1-1½ lin. lata, culmo longiora vel breviora. *Bracteæ* foliaceæ, evaginatae, auricula ferruginea amplectente, vel infima, culmo longior, vaginata. *Vagina* 3-10 lin. longa. *Pedunculus* 3-12 lin. longus. *Spicula masculæ* 6-15 lin. longæ, 1-2 lin. latæ, contiguæ; *femineæ* 9-18 lin. longæ, 4 lin. latæ, remotæ; suprema interdum apice mascula; infima basi laxiflora, raroque composita. *Squamæ masculæ* ovatae latiores, vel lanceolatae angustiores; inferiores obtusæ, muticæ, apice plus minus ciliatæ; superiores hispido-cuspidatæ, fusco-purpureæ, nervo pallido, demum ferrugineæ. *Perigynium* turgidum, ventricosum, oblongo-ovatum, obtusissime trigonum, opacum (*nusquam lucidum*),  $2\frac{5}{10}$ - $\frac{8}{10}$  lin. longum,  $1\frac{1}{10}$  lin. latum, vel lanceolato-ovatum  $\frac{8}{10}$  lin. latum, vix vel breviter late rostratum, ore purpureo bifurcato, rostro laciniisque dentatis, aliter glabrum vel (*sub lente*) pube rara minuta obscure conspersum, sulcatum, nervi in sulcis latentes, pallidum, sanguineo-punctatum, demum atro-purpureum, spongiosum. *Achenium*  $1\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, ovale vel ellipticum, triquetrum, castaneum, basi styli æquali apiculatum.

The spongy sulcate perigynium, with the absence of any perceptible nerves, at once distinguish this species from *C. paludosa*, to which Kunth was inclined to refer it. Both Bieberstein and Ledebour allude to the perigynium having a slight pubescence. It is scarcely perceptible even under a strong lens. The nerves apparent in the immature perigynium become latent in the sulci, formed evidently by the increasing thickening of the spongy interstices. The specimen from Pekin, though young, is evidently referable to *C. nutans*.

The specimens figured are from France and Germany.

462. *C. obtusata* (Liljebad); spica simplici mascula ovata vel oblonga castaneo-ferruginea nuda; stigmatibus 3; perigyniis ovatis vel ellipticis turgidis trigonis conicis

rostratis, ore hyalino oblique fisso, glabris obscure nervatis nitidis ferrugineis demum fusco-purpureis corneis stipitatis, squama ovata obtusa vel acuta, infima sæpe cuspidata, castanea margine late albo-hyalina longioribus.—*C. obtusata*, *Lilj. Act. Holm.* 69, t. 4 (1793); *Wahl. Act.* 139; *Willd.* 212; *Schk. f.* 159; *Kunth*, 425; *Koch*, 862; *Fl. Ross.* 267; *Reich. t.* 197; *Anders.* 73, t. 3, f. 4; *Lange*, 22; *Steud.* 186; *Torrey, Cyp.* 403. *C. spicata*, *Schk. f.* 15; *Kunth*, 425; *Reich. t.* 197; *Steud.* 185. *C. leucoglochis*, *Wahl.* (fide *Schk.*). *C. microcephala*, *Meyer*; *Led. Fl. Alt. et Icon.*; *Fl. Ross. t.* 319 (fide *Meyer in litt. Kunth*). *C. decipiens*, *Turcz. Cat. Baikal* (fide *Fl. Ross.*). *C. affinis*, *Brown*; *Rich, App.* 35; *Kunth*, 423; *Dewey, Sill.* xi. 305, 317; *Torrey, Cyp.* 297; *Steud.* 145 (fide spec. *Rich. in Herb. Hooker*). *C. Backiana*, *Dewey, Sill.* 29, 250; *Steud.* 185. (*IC. ined. DCLV. in Herb. Kew.*)

HAB. In Europa, Asia, et America septentrionali.—Oleand and Saxony. Altai, *Ledeb.* Irkutsk, *Fischer (Herb. Boott)*. Arctic America, *Richardson*. Mont. Saxos., *Drum., Hall, and Harbour*.

*Rhizoma* longe repens, culmos foliaque per intervalla edens et (ut basis culmorum) rudimentis foliorum purpureis striatis tectum, radicibus capillaceis copiosissimis implexis. *Culmi* 3–11-pollicares, graciles, triquetri, scabriusculi, basi foliati. *Folia* plana vel involuta, graminea,  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, culmo breviora, apice setaceo-attenuata, scabra. *Spica* 3–9 lin. longa, 2–3 lin. lata, basi flosculis femineis 4–12 instructa, apice sæpe plus quam dimidiatim mascula. *Squamæ* sæpe demum decolores; *femineæ* deciduæ, inferiores 1–2 cuspidatæ; *masculæ* angustiores, omnes margine albo-hyalinæ. *Perigynium*  $1\frac{1}{2}$ – $2\frac{2}{3}$  lin. latum, demum corneum. *Achenium*  $\frac{6}{10}$ – $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ellipticum, plano-triquetrum, castaneum, basi styli apiculatum. *Racheola* subulata, lævis, acuta vel biloba, achenium sæpe superans, antice adest. *Stylus* basi bulbosus. *Stigmata* 3.

Drejer justly notices the resemblance of this species to *C. supina*. He associates it with *C. rupestris*, but the almost horny texture of the perigynium is unlike that plant.

463. *C. ornithopoda* (Willdenow); spica abbreviata castaneo-straminea, e spiculis 3–4 rarius 2–5 oblongis coarctatis, mascula 1 abbreviata sessili inconspicua, femineis pauci-laxifloris inserte breve pedunculatis masculam (nisi subinde infima) superantibus; bracteis vaginæformibus muticis vel infima cuspidata viridibus apice castaneis margine albo-hyalinis; stigmatibus 3; perigyniis ovali-obovatis longe clavato-stipitatis obtuse inæqualiter triquetris rostellatis, ore subintegro, enerviis puberulis pallidis, squama obovata truncata mutica basi amplectente medio viridi lateribus castaneis margine albo-hyalina subæquilata longioribus.—*C. ornithopoda*, *Willd.* 225; *Kunth*, 473; *Gaudin, Agrost.* 144, et *Fl. Helv.* 87; *Wahl. Suec.* 603; *Koch*, 878; *Bertol.* 79; *Hoppe, Ic.*; *Reich.* 18, t. 240; *Anders.* 28, t. 7, f. 87; *Lange*, 114; *Fl. Ross.* 290 (excl. syn. *Br.*); *Gren. et Godr.* 418; *Steud.* 232. *C. pedata*, *Schk. f.* 37 (non *Linn.*). *C. digitata*,  $\beta$ , *Wahl. Act.* 158. (*IC. ined. DCLVI. in Herb. Kew.*)

HAB. In Europa.—Sweden to Italy. Russia, Uralian province.

*Radix* fibrosa. *Culmi* plures, capillares, scabri, 4–7 pollices longi; pars spicigera 6–10 lin. longa. *Folia* 1–1 $\frac{1}{2}$  lin. lata, culmo breviora, scabra (ut in *C. digitata*). *Bracteæ* vaginæformes, infima cuspidata, vel omnes muticæ, obtusæ; vagina 2–4 lin. longa. *Spicula mascula* 2–3 lin. longa,  $\frac{1}{2}$  lin. lata; *femineæ* 4–5 lin. longæ, arcte contiguæ, 4–6-floræ. *Squamæ* muticæ. *Perigynium* (cum stipite  $\frac{6}{10}$ – $\frac{7}{10}$  lin. longo)  $1\frac{5}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium* (cum stipite  $\frac{6}{10}$  lin. longo)  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovale, triquetrum, fuscum, basi styli subæquali apiculatum.

A *C. digitata* differt spiculis minoribus coarctatis inserte pedunculatis colore pallidioribus; bracteis sæpe muticis; perigyniis pallidis squama mutica longioribus, pube paulo longiore.

The specimen figured is from Germany.

464. *C. paniculata* (L.); spica plus minus elongata ambitu ovata breviori albido-ferruginea, e spiculis pluribus apice masculis densifloris, inferioribus in ramis elongatis pedicellatis approximatis vel remotis dispositis decomposita; bractea cuspidata vel setacea subinde rimum superante; stigmatibus 2; perigyniis ovatis planoconvexis conico-rostratis rostro herbaceo, ore hyalino antice secto bifido, marginibus acutis subalatis scabris obsolete vel antice parce postice sæpe plurinervatis, nervis concoloribus superne evanidis ferrugineis lucidis basi crasse spongiosis, squama ovata subacuta vel mucronulata pallide ferruginea margine late albo-hyalina subinde pallida persistente longioribus.—*C. paniculata*, *L. Sp. Pl.* 1383; *Willd.* 244; *Schk. f.* 20; *Kunth*, 389; *Good. Linn. Trans.* 2, 164; *Smith, Eng. Fl.* 92; *Eng. Bot.* 1064; *Koch*, 867; *Gaudin, Agrost.* 86, et *Helv.* 6, 40, *Reich. t.* 223; *Fries, Mant.* 2, 56; *Andersson*, 67, t. 3, f. 21; *Lange*, 40; *Bertol.* 65; *Fl. Ross.* 277; *Gren. et Godr.* 395; *Steud.* 194. (*IC. ined. DCLVII.–DCLIX. in Herb. Kew.*)

HAB. In Europa et Asia.—Denmark to Italy. Caucasus. Ural.

*Rhizoma* lignosum, crassum, fibris longis validis, dense cæspitosum. *Culmus* 3–5-pedalis, acute triquetus, faciebus planis validis, scaberrimus, basi rudimentis foliorum lanceolatis integris atro-purpureis tectus. *Folia* 3–4 lin. lata, plana, elongata, scaberrima. *Bractea* infima setacea, subinde rimum inferiorem superante. *Spica* plus minus composita, nunc plenius evoluta, ovata, ramosa, 4 $\frac{1}{2}$  poll. longa, 2 poll. lata, ramis inferioribus 1–1 $\frac{1}{2}$ -pollicaribus apertis approximatis; vel elongata, fere pedalis, ramis inferioribus 3 poll. longis, dorsum magis remotis; vel simplex, lineari-angusta, spicis inferioribus plus minus simplicibus oblongis sessilibus, ferruginea, griseo-variegata, vel rarius pallida concolori. *Squamæ* pallidæ vel fusco-castaneæ, margine late hyalinæ vel pallidæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, planoconvexum, vel basi subturgidum, basi leviter vel obsolete nervatum, nervis postice sæpe pluribus superne evanidis, lucidum, marginibus superne acutis subalatis scabris. *Achenium*  $\frac{8}{10}$ –1 lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovatum, basi productum, subbiconvexum, basi styli bulbosa.

A *C. paradoxa* differt statura majore; culmo foliisque planis latis scaberrimis; inflorescentia (plane evoluta) ampliore; flosculis minus laxis; squamis acutis nec acuminatis margine conspicue albo-hyalinis persistentibus; perigyniis planoconvexis lucidis pallidioribus, rostro brevior conico, nervis paucioribus vel fere obsoletis; stylo basi magis bulboso.

Mr. Bentham, in his 'Handbook,' on his view of the variation of species, considers *C. paradoxa* and *C. teretiuscula* as varieties of *C. paniculata*; but they have been almost universally thought to be distinct. On Mr. Darwin's view, it may be argued that they have all sprung from one common source, or have separated into forms with more or less varying distinctions. Goodenough first distinguished *C. teretiuscula*, but the figure given in his paper in the Linnean Transactions does not represent the plant as it is now understood. I have given a figure of a specimen from Epping Forest, which is certainly a degenerate form of *C. paniculata*, and which the late Mr. Edward Forbes told me had been transplanted in Mr. Borrer's garden, and there fully developed into *C. paniculata*. I have copied Goodenough's figure on the same plate. The other figures, showing the variable inflorescence, are from Norfolk specimens.

465. *C. paradoxa* (Willdenow); spica subelongata ferruginea ambitu lanceolata basi ramosa, e spiculis pluribus apice masculis laxis, inferioribus subinde omnino femineis in ramis oblongis sessilibus vel pedicellatis subremotis dispositis; bractea ramo plerumque brevior; stigmatibus 2 longis; perigyniis orbiculato-vel suboblongo-ovatis rostratis, rostro herbaceo apice subtereti attenuato, ore hyalino obliquo bidentato, basi turgidis biconvexis marginibus acutis serrulatis utrinque valide nervatis crasse spongiosis obscure fuscis abrupte stipitatis, squama acuminata acutissima margine subhyalina decidua brevioribus vel subæquantibus.—*C. paradoxa*, Willd. Act. Berol. 39, t. 1, f. 1 (1794); Wahl. Act. Holm. 142; Willd. Sp. 243; Schk. f. 21; Kunth, 390; Gaudin, Agrost. t. 90, et Helv. 6, 43; Ledebour, Fl. Alt. 6, 214; Eng. Bot. t. 2896; Koch, 867; Reichenb. 11, t. 222; Anders. 68, t. 3, f. 23; Lange, 41; Gren. et Godr. 395; Steud. 194; Fl. Ross. 277. *C. canescens*, Host. t. 57. *C. paniculata*, Wahl. sec. Fries. (Ic. ined. DCLX. in Herb. Kew.)

HAB. IN EUROPA.—Norway to Switzerland. Asia: Caucasus, Altai.

Dense cæspitosa. Culmus 1-2-pedalis, triquetus, striatus, plus minus scaber, basi rudimentis foliorum lanceolatis atropurpureis reliquisque eorum fibrilloso-laceratis tectus. Folia 1-1½ lin. lata, eulmo breviora vel subæquantia, sæpe conduplicata. Bractea e basi lanceolata, rarius ramo inferiore longior, angusta. Spica 2-3½ vel 5½ poll. longa, plus minus composita. Rachis gracillima. Spicæ partiales inferiores sæpe omnino femineæ vel abbreviatæ subsimplices, vel in ramis pollicaribus pedicellatis gracilibus erectis dispositæ. Spiculæ laxæ. Squamæ acuminatæ, nervo sæpe in inferioribus excurrente, sæpe ferrugineæ, eoneolores, vel ad margines pallidæ, vel subhyalinæ, demum patentcs deciduæ. Perigynium 1½-2 lin. longum, ⅙-⅓ lin. latum, utrinque valide nervatum, nervis fuseioribus, ore obliquo antice plus minus secto, basi in stipitem abrupte contractum turgideque biconvexum. Achenium ⅙-⅓ lin. longum, ⅙ lin. latum, biconvexum, basi contractum, lucidum, fusco-castaneum, basi styli inerassata decidua.

466. *C. pauciflora* (Lightfoot); spica simplici apice mascula ovata ferruginea demum oblonga straminea pauciflora; stigmatibus 3; stylo subulato exserto; perigyniis subulatis acutis, ore integro, striato-nervatis glabris sessilibus basi spongiosis demum pendulis, squama ovato-lanceolata obtusiuscula vel acuta pallide ferruginea medio viridi caduca angustioribus longioribus.—*C. pauciflora*,

Light. Fl. Scot. 543, t. 6, f. 2; Good. Linn. Trans. 2, 143; Eng. Bot. t. 2041; Smith, Eng. Fl. 79; Willd. 211; Schk. f. 4; Kunth, 424; Gaud. Agr. 74, et Helv. 29; Koch, 863; Bertol. 36; Drejer, Rev. 20; Reich. t. 196; Anders. 74, t. 3, f. 2; Lange, 23; Fl. Ross. 268; Gren. et Godr. 387; Benth. 557; Steud. 185; Torrey, Mon. 298; Carey, 519; Sartwell, Exs. n. 5. *C. patula*, Huds. (fide Smith). *C. leucoglochis*, Ehrh. Wahl. Act. 139, et Lap. 224; Dewey, Sill. 10, 42; Torr. Cyp. 404. *C. pulicaris*, L. Fl. Suec. et Lap. (fide Kunth et Andersson). (Ic. ined. DCLXI. in Herb. Kew.)

HAB. IN EUROPA ET AMERICA SEPTENTRIONALI.—Iceland, Lapland, etc., to Switzerland. Sitcha, Bongard. Rocky Mountains, Drummond. New England, New York.

*Radix* repens. Culmus 4-8-pollicaris, demum ultra pedalis, triquetus, lævis vel scaber, basi parve foliatus. Folia inferiora breviora, summum earinato-planum subinde culmum æquans, ½-¾ lin. latum. Spica florifera 3-4 lin. longa, 1 lin. lata, ovata, ferruginea; fructifera laxiflora flavescens, flosculis masculis 2-3 deciduis, femineis 2-4 erectis, demum divaricatis vel pendulis. Squamæ masculæ lanceolatæ, acutæ, angustiores deciduæ; femineæ margine vix hyalinæ, eadueæ. Perigynium 2½-3½ lin. longum, ½ lin. latum. Achenium 1 lin. longum, ⅙ lin. latum, triquetrum, pallidum. Stylus teres, exsertus. Stigmata 3.

This delicate species is apt to be mistaken for *C. microglochis*, for when the stigmas have fallen, the exserted style is taken for the rachis of that plant. Lightfoot says the stigmas are sometimes 2, I have always observed 3, and no author describes less. Linnæus confounded it with *C. pulicaris*, and specimens of it are in his herbarium under that name. Drejer thinks that through *C. subulata*, Mich., it forms the first rudiment of the *Vesicariæ*. Though so common in Europe, it has not been found in Asia.

467. *C. pediformis* (Meyer); spica oblonga vel subelongata albo-castanea e spiculis 3-4 rariis 5-7 oblongis vel cylindraceis mascula 1 abbreviata sessili vel elliptica pedunculata reliquis femineis laxifloris pauci-vel plurifloris superioribus contiguis vel omnibus alternatim dispositis exserte pedunculatis; bracteis vaginatis muticis vel cuspidatis vel brachyphyllis; stigmatibus 3; perigyniis obovatis obtuse triquetris late spongioso-stipitatis, rostello excurvo, ore obliquo, plus minus sæpe costato-nervatis strigoso-hirtis viridibus ferrugineo-tinctis, squama ovata acuta vel mucronata rubro-castanea margine late albo hyalina longioribus vel brevioribus.—*C. pediformis*, Meyer, Mem. St. Pct. 1, 219, t. 10; Ledeb. Fl. Alt. 225; Kunth, 475; Kunze, 65, t. 16; Fries, Mant. 2, 57, et Summa, 235; Anders. 28, t. 7, f. 86; Lange, 115; Fl. Ross. 290; Maxim. Prim. Fl. Amur. Mem. St. Pet. 9, 308, a et β. *C. pellucida* et *C. obliqua*, Turcz. *C. rhizodes*, Blytt. *C. obovata*, Goldbach. (Ic. ined. DCLXII. in Herb. Kew.)

Var. *rostrata*, Maxim. l. c.

HAB. IN EUROPA ET ASIA.—Norway and Finland. Russia: Siberia, Altai, Baikal, Amur, Kamitchatka.

*Rhizoma* lignosum, obliquum, repens. Culmus ½-1-ped., gracilis, apice scaber, basi foliatus, vaginisque purpureis reticulato-fissis tectus, pars spicigera 1½-6 poll. longa. Folia ½-1½ lin. lata, eulmo (præcipue sterilia) longiora, copiosa, ea anni prioris marcida novellis mixta. Bracteæ virides, apice ad



latera castaneæ, margine albo-hyalinæ, vaginæformes, muticæ, vel brevi subulato-cuspidatæ vel subfoliaceæ. *Vaginæ* 4-12 lin. longæ. *Pedunculus* infimus 4-18 lin. longus, undique piloso-scaber. *Spicula mascula* 2-10 lin. longa, 1-1½ lin. lata, sessilis, inconspicua vel elliptica, pedunculata; *femineæ* 6-12 lin. longæ, 1-2 lin. latæ, summa vel superiores masculæ contiguæ eamque superantes, vel alternæ, subremotæ, erectæ, infima longe exserte pedunculata. *Squamæ masculæ* lanceolatæ, acutæ vel mucronatæ; *femineæ* sensim vel abrupte acutæ vel mucronatæ, medio virides, lateribus castaneis marginibus late albo-hyalinis. *Perigynium* 1½-2 lin. longum, ⅙-⅓ lin. latum, vel 1⅙-⅓ lin. longum, ⅙-⅓ lin. latum, obovatum, vel 2⅙-⅓ lin. longum, ⅙-⅓ lin. latum, ellipticum, rostello plus minus longo, nervis subinde inconspicuis. *Achenium* 1⅙-1⅓ lin. longum, ⅙-⅓ lin. latum, obovatum, triquetrum, basi styli obliqua incrassata, abrupte apiculatum.

Var. *rostrata*; perigyniis magis orbiculatis, rostro late conico recto, ore emarginato, 1⅙-⅓ lin. longum, ⅙-⅓ lin. latum.

Variat spiculis paucifloris, superioribus masculæ contiguæ eam superantibus, vel plurifloris alternis subremotis, mascula abbreviata sessili inconspicua vel elliptica pedunculata recta; bracteis muticis vel subfoliaceis, squamis femineis perigynia longioribus vel subæquantibus; perigyniis obovatis brevioribus vel ellipticis longioribus, rostello plus minus distincto.

There is a gradual transition between the *α* and *β* of Maximowicz, the last being the more frequent form, his variety *rostrata* differing from them in the conic straight rostrum and emarginate orifice. In Herb. Hooker the lower bract has a foliaceous elongation an inch in length. *C. obliqua*, Turcz., is in Herb. Fielding, Oxford. It has a longer cylindrical rostrum than the other forms.

The specimens figured are:—

- n. 1. From the Altai, from Ledebour.
- n. 2. From Irkutch (*Turez.*), from Fischer.
- n. 3. From Kasan, "*C. obovata*," Goldbach.
- n. 4. From Christiania, Norway.
- n. 5. From Russia.
- n. 6. The var. *rostrata*, Maxim., from the Amur.
- n. 7. The "*α. genuina*" of Maxim., from the Amur (*Herb. Hooker*).

468. *C. pendula* (Hudson); spica longissima viridi ferruginea, e spiculis 6-9 longis cylindricis vel clavatis multi-densifloris remotis, mascula 1 vel 2 ferrugineis, femineis arcuatim pendulis, summis sæpe apice masculis sessilibus, inferioribus inserte vel exserte pedunculatis basi attenuata laxifloris viridibus; bracteis superioribus angustis brevibus, inferioribus longe vaginatis latis culmum sæpe superantibus; stigmatibus 3; perigyniis ellipticis inæqualiter triquetris ventricosis cylindrico-rostratis, ore integro vel emarginato ciliato, glabris vel superne ad margines parce dentatis rectis vel excurvis obscure nervatis membranaccis viridibus demum ferrugineo-punctatis, squama lanceolata acuta vel truncata cuspidata purpurea medio viridi latoribus longioribus.—*C. pendula*, *Huds. Fl. Angl.* 382, *Ed.* 1 (1762); *Light.* 564; *Good. Linn. Trans.* 2, 168; *Curtis, Lond. t.* 63; *Willd.* 288; *Schk. f.* 60; *Kunth*, 469; *Brot. Fl. Lusit.* 65; *Eng. Bot. t.* 2315; *Sm. Eng. Fl.* 95; *Biebst.* 3, 617; *Gaud. Agr.* 154; *Bertol.* 145; *Reich.* 19, *t.* 243; *Fl. Ross.* 296; *Tchihatch.* 877; *Steud.* 230. *C. maxima*, *Scop. Carn.* 229, *Ed.* 2, (1772); *Vill.* 217; *Desf. Fl. Atl.* 338;

*Allion*, 272; *Gaud. Helv.* 107; *Koch*, 880; *Lange*, 104; *Gren. et Godr.* 405. *C. agastachys*, *Ehrh. Phyt. Wahl. Act.* 153; *Hoppe, Ic. C. mutabilis*, *Willd. Prod. Fl. Berol.* 37, *t.* 11, *f.* 6 (1787) *sec. Schk.*

Var. *β. myosuroides*; *Lowc, Camb. Trs.* 4, 10 (1833); *Steud.* 230. (*Ic. ined. DCLXIII. in Herb. Kew.*)

HAB. In Europa, Asia, et Africa.—Scotland, Germany to Italy, Portugal, Constantinople, Tauria, Caucasus. La Calle, *Desf.*

*Radix* fibrosa. *Culmus* 3-6-ped., validus, triqueter, apice gracilis, scaber, basi foliatus, pars spicigera, 9 poll.-2 ped. longa. *Folia* 4-8 lin. lata, culmo breviora. *Bracteæ* inferiores longe vaginatæ, latæ, subinde culmum superantes; summæ angustæ, spiculis breviores, evaginatæ. *Spicula mascula* 3-4 poll. longa, 3 lin. lata, sæpe clavata, ferruginea; *femineæ* 2½-6 poll. longæ, 2-3 lin. latæ; superiores apice masculæ; inferiores basi attenuatæ infima rarius basi spicula brevi composita. *Vaginæ* inferiores 3-4 poll. longæ. *Squamæ* conformes, masculæ majores. *Perigynium* 1⅙-⅓ lin. longum, ⅙-⅓ lin. latum, plus minus ventricosum. *Achenium* ⅙-⅓ lin. longum, ⅙-⅓ lin. latum, ovale, stipitatum, triquetrum, castaneum, basi styli æquali recta apiculatum.

Var. *γ*; spiculis longioribus angustioribus 7 poll. longis 2 lin. latis apice masculis, inferioribus longe exserte pedunculatis, pedunculo infimo nunc pedali. (*Ic. ined. DCLXIV. in Herb. Kew.*)

HAB. Madeira, *Lowe, Dr. C. Lemann.* Azores, Fayal, *Watson.*

*Perigynium* 1⅙-⅓ lin. longum, ⅙-⅓ lin. latum, vix ventricosum. *Achenium* 1 lin. longum, plus ⅙-⅓ lin. latum, ellipticum, basi styli clavata obliqua.

The specimens from Sicily and Lisbon approach the var. *β* in the length and breadth of the spiculæ. (*Perigynium* 1⅙-⅓ lin. longum, ⅙-⅓ lin. latum. *Achenium* ⅙-1 lin. longum, ⅙-⅓ lin. latum, fuscum, ellipticum, basi styli æquali recta.) Those from Lisbon have the lower spiculæ long exserted, all male at top. (*Perigynium* 1⅙-⅓ lin. longum, vix ⅙-⅓ lin. latum. *Achenium* ⅙-1 lin. longum, ⅙-⅓ lin. latum, ellipticum, basi styli recta vel obliqua castanea.)

Scopoli, in the first edition of his 'Flora,' 1760, had not adopted any specific names, but in his second edition (1772), (ten years after Hudson's first edition of his 'Flora'), he adopted the name *C. maxima*. Hudson, therefore, has the priority as to name, but Scopoli as to description.

Tab. DCLXIV. is a specimen from Hampstead, near London.

Tab. DCLXIII., one from Madeira, *Lowe*, his *C. myosuroides*.

469. *C. podocarpa* (Brown); spica oblonga atro-purpurea, e spiculis 3-5 ovalibus vel oblongo-cylindricis alternatim approximatis, masculis 1-2, reliquis femineis vel superioribus vel omnibus apice masculis inferioribus pedunculatis, infima basi attenuata nutante vel pendula; bracteis evaginatæ, infima culmum æquante; stigmatibus 3-2; perigyniis elliptico-lanceolatis rostellatis, ore integro, trigonis vel compressis nervatis pallidis purpureo-tinctis demum fulvis, squama oblonga vel lanceolata sæpe inæqualiter emarginata vel acuta atro-purpurea nervo pallido plus minus longehispido-aristata brevioribus vel subæquantibus.—*C. podocarpa*, *Brown, App. Franklin Nar., Ed.* 2, 36 (1823); *Fl. Bor. Amer. t.* 224; *Steud.* 228; *Torr. Mon.* 352, *et Cyp.* 426; *Dewey*, xi. 162 *et* 29, 251. *C. macrochæta*, *Meyer, Mem. St. Petersb.* 1, 224, *t.* 13,

(1125); *Fl. Ross.* 305; *Steud.* 228; *Torr. Cyp.* 424. *C. spectabilis*, *Dcwey*, 29, 248; *Torr. Cyp.* 426; *Steud.* 228. *C. trichostachya*, *Fischer, mss. (Herb. Boott)*. *C. excurrens*, *Chamis. (fide Steudel)*. (*Je. ined.* DCLXV.—DCLXVI. in *Herb. Kew.*)

HAB. In Asia et America septentrionali.—Unalashka, *Meyer*. Sitcha, *Bongard*. Kodiack Island, *Barclay, Herb. Boott*. Fort Vancouver, *Garry*; and Lower Fraser River, *Lyall, Herb. Hooker*; Rocky Mountains, *Drummond, (Herb. Hooker)*.

*Radix* repens, fibris lanosis. *Culmus* 1–2-pedalis, triquetus, scabriusculus, debilis, basi foliatus, pars spicigera 2–5 poll. longa. *Folia* 1–2 lin. lata; inferiora brevia; superiora nunc quasi opposita, culmo breviora vel æquantia. *Bractea* evaginata; infima culmum æquans, auriculis obtusis. *Spiculae*  $\frac{1}{2}$ –1 poll. longæ, 2–3 lin. latæ, approximatae vel infima 2–2 $\frac{1}{2}$  poll. remota, summa sessilis, reliquæ pedunculatae; femineæ vel superiores vel omnes apice masculæ, in uno specimine spicula media basi spicula altera brevi composita; masculæ 1–2, sæpe sessiles, inferior abbreviata. *Squamæ* omnes atro-purpureæ, plus minus longe aristatae, nunc muticæ, sæpe inæqualiter truncatae vel emarginatae, subinde subacutæ. *Pedunculus* infimus 1–1 $\frac{1}{2}$ -poll., capillaceus, scabriusculus. *Perigynium* 1 $\frac{3}{10}$ –2 $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, compressum vel trigonum, superne vacuum; *floriferum* albidum, purpureo-tinctum, demum fulvum, antice nervis sub-5- postice 2-notatum, brevissime rostellatum, ore integro, achenium laxè vestiens. *Achenium* cum stipite  $\frac{2}{10}$ – $\frac{3}{10}$  lin. longo, 1–1 $\frac{1}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, trigonum vel lenticulare, oblongum.

The affinity of this species is with *C. Gmelini* and the *Limosa*. It differs from *C. Gmelini* in its slender culm, male spiculae, the lower female nutant, emarginate squamæ, and gracile peduncles. Drummond's specimens from the Rocky Mountains have short aristæ, but do not otherwise differ from the other specimens. The original specimen of Richardson is in Herb. Banks, and I have the *C. trichostachya* from Mr. Fischer; most of the specimens we have are not mature.

Tab. DCLXV.

- n. 1. From Unalashka, the *C. trichostachya*, Fischer.
- n. 2. Unalashka. A small authentic specimen of *C. macrochæta*, from Meyer, sent by him to Reichenbach (*Herb. Tuckerman*).
- n. 3. Fort Vancouver, *Garry*.
- n. 4. Kodiack Island, *Barclay*.

Tab. DCLXVI., specimens of Drummond from the Rocky Mountains, not mature.

470. *C. pruinosa*, var.  $\beta$  (Boott); spiculis 2–3, terminali mascula, ad ejus basin subinde squamis 2 cuspidatis sterilibus (*rudimentis spicularum*) prope sitis, reliquis omnino femineis sæpe abbreviatis crassioribus; bractea infima culmum paulo superante; perigyniis *floriferis* ellipticis leviter nervatis, *maturis* suborbiculatis enerviis marginibus sæpe dentatis.—*C. pruinosa*,  $\beta$ . *C. picta*, *Boott, Pl. Japon. Wrightii (Herb. Gray)*. *C. dimorpholepis?*, *Steud.* 214. (*Je. ined.* DCLXVII. in *Herb. Kew.*)

HAB. In Japonia et Korea.—Hakodadi, *Wright*. Nangasaki, *R. Oldham (Herb. Hooker)*. Port Chusan, *Wilford (Herb. Hooker)*.

Since the publication of Tab. CLXXIV. I have, through the kindness of Dr. Hooker, had the opportunity of examining specimens of *C. pruinosa*, collected by Griffith in Khasia, in which the female spiculae are male at apex, and the male are occasionally with female florets at base or in the middle, and the lower bract

at times 15 inches in length. The plant from Japan and Korea has the lower spiculae entirely female, these are generally shorter and broader, and the mature perigynium larger ( $2\frac{1}{10}$ – $\frac{3}{10}$  lin. long,  $1\frac{3}{10}$ – $\frac{5}{10}$  lin. wide). In both, half the papillæ are of a black colour, giving a spotted appearance to it. I had called the Japan specimen of Wright in Herb. Gray *C. picta*, under which name it has been published by him in the report of the Japanese *Carices*, but I should refer it and the Korea plant to a variety of the Java and Khasia one.

471. *C. pulicaris* (L.); spica simplici apice mascula cylindrica ferruginea demum inferne laxiflora; stigmatibus 2 longis; perigyniis oblongo-ellipticis utrinque acutis, ore hyalino integro, plano-convexiusculis enerviis glabris membranaceis stipitatis demum fusco-ferrugineis retroflexis pendulisque, squama ovata obtusa vel acuta ferruginea margine superne albo-hyalina mutica decidua longioribus.—*C. pulicaris*, *Linn. Sp. Pl.*; *Good. Linn. Trans.* 2, 142; *Willd.* 213; *Sehk. f.* 3; *Kunth*, 370; *Eng. Bot. t.* 1051; *Smith, Eng. Fl.* 78; *Drejer, Rev.* 20; *Koch*, 862; *Gaudin, Agrost.* 73, et *Helv.* 28; *Bertol.* 35; *Reich. t.* 195; *Gren. et Godr.* 386; *Fl. Ross.* 265; *Anders.* 72, t. 3, f. 7; *Lange*, 18; *Benth.* 557; *Steud.* 184. *C. psyllophora*, *Ehrh.*; *Wahl. Act.* 139. (*Je. ined.* DCLXVIII. in *Herb. Kew.*)

HAB. In Europa et Asia.—Faro Isl. Denmark. Norway. Sweden to Switzerland and the Pyrenees. Caucasus, Ural, Altai, Baikal, *Fl. Ross.*

Stolonifera, cæspitosa. *Culmus* 2–12-pollicaris, teres, filiformis, lævis. *Folia* capillacea, canaliculato-convoluta, culmo breviora vel æquantia. *Spica* 6–12 lin. longa, 2 demum 5 lin. lata, flosculis femineis imbricatis, demum laxis 6–12 instructa, apice anguste subinde subdimidiatim mascula. *Squamæ* conformes; *masculæ* arete imbricatae; *femineæ* deciduæ. *Perigynium*  $2\frac{1}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium* conforme,  $1\frac{3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, oblongum, plano-convexiusculum, punctulatum, griseum, basi styli clavata abrupte apiculatum. *Racheola* linearis, viridis, achenium superans, apice squamæ rudimento apiculata, vel rarius squamam masculam cum staminibus exsertam ferens, subinde adest.

472. *C. remota* (L.); spica elongata gracili interrupta pallide viridi, rachi recta vel flexuosa, c spiculis 4–10 ovalibus basi masculis, superioribus contiguis, inferioribus plus minus remotis; bracteis inferioribus elongatis; stigmatibus 2; perigyniis elliptico-lanceolatis rostellatis, ore bidentato, plano-convexis superne margine serrulatis utrinque leviter nervatis, nervis antice convergentibus basi spongiosis viridibus, squama ovata vel lanceolata acuta mutica alba demum straminea longioribus.—*C. remota*, *L. Sp. Pl.* 1383; *Good. Linn. Trans.* 150; *Wahl. Act.* 48; *Willd.* 239; *Sehk. f.* 23; *Kunth*, 404 (*excl. syn. Richard.*); *Eng. Bot. t.* 832; *Eng. Fl.* 84; *Gaud. Agrost.* 99, et *Helv.* 59; *Koch*, 869; *Anders.* 56, t. 4, f. 40; *Lange*, 47; *Reich. t.* 212; *Gren. et Godr.* 399; *Bertol.* 69; *Biebst.* 1, 384; 3, 614; *Fl. Ross.* 283; *Nees, apud Wight*, 121; *Gay, Se. Nat.* 10, 365 (1838); *Steud.* 200. *C. axillaris*, *L. Sp. Pl.* 1382 (*fide Smith*). (*Je. ined.* DCLXIX.—DCLXX. in *Herb. Kew.*)

HAB. In Europa, Asia, et America septentrionali.—Norway to Italy. Caucasus, Ural, Altai. Himalaya, *Royle, Munro, Thomson*. Sikkim, *Dr. Hooker*. Japan, *Wright*. Newfoundland, *Gay*. Sitcha, *Fl. Ross.*

*Radix* caespitosa, fibrosa. *Culmus* 1-1½-pedalis, gracilis, debilis, reclinatus, obtuse triqueter, lævis, vel superne tantum inter spiculas scabriusculus. *Folia* sub lineam lata, culmo longiora vel breviora, mollia. *Bractea* 3; inferiores elongatae; infima (nunc pedalis) spicam longe superans; superiores breves. *Spica* 3-8 poll. longa. *Spiculae* ovaes vel ellipticae; infima 1½-5 poll. remota; summa quandoque mascula vel sterilis. *Perigynium* 1 $\frac{6}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum (sub lente) pallide fulvo-punctulatum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, oblongo-ovatum, basi productum, plano-convexiusculum, basi styli decidua erassiore.

Variat in India orientali perigyniis ovalibus subulatis, nervis obsoletis, 1 $\frac{2}{10}$ - $\frac{3}{10}$  lin. longis (Royle, etc.), et perigyniis angustis  $\frac{4}{10}$  lin. latis, achenio plus  $\frac{3}{10}$  lin. lato (Hooker).

Koch, Andersson, and Lange describe the lower spicula as occasionally compound, and Reichenbach figures a variety with a creeping root. I have not seen any American specimen of this common European plant, but Gay says it is found in Newfoundland, and the 'Flora Rossica' reports it as a native of Sitcha, though Bongard does not include it in his list.

Tab. DCLXIX. is a specimen from England.

Tab. DCLXX.

- n. 1. A specimen of Royle, from Kunawur.
- n. 2. Monro.
- n. 3. Dr. Hooker, Sikkim.

473. *C. Ringoldiana* (Boott); spica elongata olivacea, e spiculis 4-5 cylindricis stricte erectis gracilibus, terminali mascula angusta inconspicua sessili laxiflora, reliquis femineis apice sterilibus, superioribus 1-2 masculæ contiguas sessilibus vel *inserte*, inferioribus distantibus laxifloris breve exserte pedunculatis; bracteis foliaceis vaginatis, superioribus vel omnibus culmum paulo superantibus; stigmatibus 3; perigyniis oblongo-ovatis obtuse triquetris sensim tenuiter rostratis rostro decolori, ore leviter emarginato denticulato, undique crebre nervosis fusco-olivaceis glabris, squama parva ovata acuta mutica ciliata vel mucronata albida latioribus triplo longioribus.—*C. Ringoldiana*, Boott in Ringgold and Rodgers's *N. Pac. Exp.* (Ic. ined. DCLXXI. in Herb. Kew.)

HAB. Ousima, Japan, Wright, n. 74 (Herb. Gray).

*Radix* fibrosa. *Culmus* 1-1½-pedalis, gracilis, triqueter, lævis vel apice scabriusculus, foliatus, basi rudimentis foliorum fusco-purpureis tectus; pars spicigera 3-14 poll. longa. *Folia* 2 lin. lata, graminea, culmo breviora, plana. *Bractea* vaginata, omnes nisi interdum inferiores culmo longiores. *Vaginae* 2-22 lin. longæ, scabriusculæ, ferrugineo-punctulatae. *Pedunculus* infimus ½-2 poll. longus, scabriusculus. *Spicula mascula* 6-12 lin. longa,  $\frac{4}{10}$  lin. lata, sæpe inconspicua, femineis brevior, castanea; *femineæ* 8-18 lin. longæ, vix 2 lin. latae, inferiores a se 3-7 poll. remotæ, omnes apice externo inconspicue steriles vel masculæ. *Squamae masculæ* laxè dispositæ, obtusæ, muticæ, castaneæ, nervo viridi, apice albo-hyalinæ, ciliatæ. *Perigynium* 1 $\frac{8}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, achenium laxè vestiens. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, ovali-triquetrum, fulvum, punctulatum, basi styli decidua (supra basin obliquam æqualem persistentem) elavata.

474. *C. riparia* (Curtis), var. (Ic. ined. DCLXXII. in Herb. Kew.)

Var. 1; spiculis 7, terminali ima basi mascula, reliquis femineis, superioribus abbreviatis, infima solum longe bracteata.

HAB. In Helvetia.

Var. 2; spiculis 4-5 abbreviatis oblongo-ovalibus crassis pallidis 7-13 lin. longis 4-6 lin. latis, omnibus femineis vel terminali apice mascula, inferioribus longissime bracteatis cvaginatibus vel infima exserte pedunculata; perigyniis 2 $\frac{2}{10}$ - $\frac{7}{10}$  lin. longis  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latis pallidis, squama pallida sæpe brevioribus.—Infra spiculam terminalem rudimenta spicularum 2 adsunt.

HAB. Banks of the Lect, Coldstream, Herb. Balfour et Boott.

At page 112, Tab. CCCLV., I described and figured the *C. lacustris*, Willd., referring it to the *C. riparia*, Curtis, but omitted to say that the specimen figured was from Rhode Island, and to allude to the European and Asiatic habitats of the species. In Europe it is found from Norway, Sweden, Denmark, to Constantinople; and in Asia, on the Caucasus and Altai. Lange, 140, and Bromfield, 575, allude to a variety with a variable distribution of female florets on the solitary male spicula, like the n. 1 I have figured from Switzerland, which I owe to the kindness of M. Spach; but I have not met with any description which applies to the n. 2, from the banks of the Lect. For, though De Candolle (Fl. Franc. vi. 297) has a variety "*spicis omnibus femineis*," he says nothing of their form, which is so peculiar in the specimens figured from my own and Professor Balfour's herbarium.

475. *C. Schreberi* (Schrank); spica ovali brevi castanea plus minus polygama, e spiculis 3-7 congestis vel alternatim contiguas ellipticis acutis deinde obovatis vel subrotundis plerumque basi (summa clavata) masculis, infima nunc feminea una alterave rarius omnino vel apice vel medio mascula; bractea spiculam superante; stigmatibus 2; perigyniis ovalibus rostratis, ore antice secto bifido, plano-convexis superne marginibus anguste alatis vel acutis serrulatis utrinque nervatis inter nervos demum ferrugineo-punctatis castaneis, squama ovata acuta cuspidata castanea margine anguste hyalina angustioribus brevioribus vel subæquantibus.—*C. Schreberi*, Schrank, Baier. 278 (1789); Willd. Act. Berol. (1794); Wahl. Act. 145; Willd. Sp. Pl. 225; Schk. f. 9 (*perigynium maturum*); Kunth, 395; Gaudin, Agr. 109, et Helv. 51; Bieb. 382; Ledebour, Fl. Alt. 210; Koeh, 868; Bertol. 50; Reich. t. 207; Lange, 42; Coss. et Germ. 595; Gren. et Godr. 392; Steud. 197. *C. præcox*, Schreb. Spie. Fl. Lips. 63. *C. angustifolia*, Sequier (fide Schreb.). *C. curvula*, Lam. (fide Kunth). *C. tenella*, Thuill. (fide Coss. et Germ.). *C. bromoides*, Dubois (fide Gay). *C. brizoides*, Pallas (fide spec. e Fischer in Herb. Boott). *C. brizoides*, a. campestris, Wimmer, Siles. 401; Fl. Ross. 284. (Ic. ined. DCLXXIII. in Herb. Kew.)

HAB. In Europa et Asia.—France, Germany, Switzerland. Tauria, Caucasus, Altai, Kamtchatka, Fl. Ross.

*Rhizoma* gracile, cylindricum, longe repens, squamosum, culmos fasciculatos, folia radicesque tenues implexas per intervalla edens. *Culmi* sæpe plures ex eodem nodo 4-12-polliarces, gracillimi, triquetri, scabri, basi foliati, rudimentisque foliorum pallidis arete tecti. *Folia* plana, mollia, ½-1 lin. lata, vel involuta, filiformia, firmiora, culmo breviora vel longiora. *Bractea* ovato-lanceolata, cuspidata, infima rarius spicam æquans. *Spica* 4-14 lin. longa, 2-4 lin. lata, in specimenibus pauperrimis spiculis 1-2 fere abortivis instructa. *Spiculae* congestæ vel laxæ, ellipticæ, demum obovatæ, ima basi (nisi summa subdimidiatim) masculæ, infima sæpe sub-

rotunda omnino feminea, una alterave ex inferioribus rarius mascula, vel flosculis masculis ad apicem vel mediam partem spicularum superiorum sitis. *Squamæ* conformes, plerumque cuspidatæ, nunc muticæ. *Perigynium*  $1\frac{3}{10}$ – $1\frac{4}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, vel (cum stipite  $\frac{3}{10}$  lin. longo) 2 lin. longum,  $\frac{7}{10}$  lin. latum, ore antice secto ad margines anguste albo-hyalino, superne supra achenium anguste alatum vel marginibus acutis serrulatis, infra marginibus obtusis lævibus demum utrinque nervatis et inter nervos ferrugineo-punctatis. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ellipticum vel oblongo-ovatum, lenticulare, castaneum, basi styli clavata. *Stylus* hirsutulus. *Stigmata* 2, longa.

Authors differ in describing the perigynium of this species, which, notwithstanding the spiculæ are generally male at base, is closely allied to *C. arenaria*. Lange says, "*A basi fere margine anguste alatis serrulato-ciliatis.*" Kunth, on the contrary, says, "*Utriculi superne marginato-alati, alis ciliato-scabris;*" and Gay, "*Utriculis exalatis, non nisi in rostro serrulatis.*" My own observation agrees with that of Kunth and Gay, the upper margin being slightly winged or merely acute. I observe the ferruginous spots in specimens from France and the Altai. The anthers are dentate at the apex, not mucronate as in *C. arenaria*, as shown in Schkuhr's figure. His figure of the perigynium of *C. Schreberi* is inaccurate, wanting the distinct rostrum. I do not quote Fries or Andersson, as I have not seen a specimen from the north of Europe, and Grenier and Godron refer the *C. Schreberi* of Fries, Herb. Normale, to *C. Ligerica*.

476. *C. sociata* (Boott); spica subinde subelongata pallida, e spiculis 6–7 oblongo-cylindraceis erectis alternatim approximatis, terminali mascula, reliquis femineis ima basi parce masculis densifloris vaginatis extremis singulis una alterave geminatis, inferioribus exserte pedunculatis; bracteis vaginatis brevibus; stigmatibus 3; perigyniis ovalibus obtuse triquetris basi acutis sensim rostratis, ore acute bifido, valide nervatis pubescentibus membranaceis pallidis viridibus, squama oblonga truncata vel emarginata vel subacuta hispido-cuspidata albida subæquilata longioribus.—*C. sociata*, Boott in Ringgold and Rodgers's Exp. (Ic. ined. DCLXXIV. in Herb. Kew.)

HAB. Ins. Loochoo et Ousima, Wright (Herb. Gray).

*Culmus* 5–16 pollices altus, triquetus, subvalidus, erectus, lævis, basi breve foliatus; pars spicigera  $3\frac{1}{2}$ –6 poll. longa. *Folia radicalia* 2–3 lin. lata, culmo longiora, rigida, plana; *culmea* brevia, angusta. *Bracteæ* omnes vaginatæ, spiculis suis brevioribus. *Vaginæ* subtumidæ, intus scabriusculæ; infima 6–9 lin. longa. *Pedunculus* infimus 9 lin. ad  $2\frac{1}{2}$  poll. longus, scaber. *Spiculæ* 6–15 lin. longæ, 1–2 lin. latæ. *Squamæ* omnes hispido-cuspidatæ; *masculæ* obtusæ, fulvæ, trinervatæ, dorso scabræ; *femineæ* inferiores longiores, subacutæ. *Perigynium*  $1\frac{4}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, acute triquetrum, faciebus ad mediam transverse tumidis aliter concavis, nigro-purpureum, apice insigniter albo-annulatum, annulo basin styli bulbosam cingente. In uno perigynio racheola minima lineari observata.

477. *C. Songarica* (Karelin et Kirilow); spica oblonga vel elongata stramineo-purpurea, e spiculis 4–6 approximatis vel remotis, masculis 1–3 stramineis, femineis 2–4, superioribus vel omnibus oblongis sessilibus evaginatibus, vel infima remota cylindrica vaginata longe exserte pedunculata nutante; bractea infima culmum subæquante; stigmatibus 3; perigyniis ovatis vel ellipticis teretibus

abrupte vel sensim cylindrico-rostratis, ore bifurcato, ventricosis lucidis glabris nervatis spongiosis aurantiacis demum atro-purpureis, squama ovato-lanceolata acuminata cuspidata brevioribus vel longioribus.—*C. Songarica*, Karelin et Kirilow, Bull. Soc. Imp. Mosc. 3, 521 (1842); Fl. Ross. 4, 316; Steud. 237. *C. Gebleri*, Prescott; Boott, Linn. Trans. 20, 141 (1846); Steud. 234. (Ic. ined. DCLXXV. in Herb. Kew.)

HAB. In Asia.—In herbosis insularum fl. Lepsa in Songaria, K. et K. Affghanistan, Griffith (Herb. Hooker).

*Culmus* 1– $1\frac{1}{2}$ -pedalis, triquetus, scaber, firmus; pars spicas gerens  $2\frac{1}{2}$ –9 poll. longa. *Folia* 1–2 lin. lata, culmo breviora, firma, carinata. *Bractea* infima subinde vaginata, sæpe culmum subæquans. *Pedunculus* infimus 1 lin. ad 2 poll. longus, filiformis, scabriusculus. *Vagina* infima 5–7 lin. longa. *Spiculæ masculæ* 1–3; terminalis pollicaris, 2 lin. lata; alteræ 2 breviores, sessiles; in uno specimine e perigynio rupto egredientes. *Spiculæ femineæ* 5–16 lin. longæ, 2–4 lin. latæ, omnes approximatae, sessiles, evaginatæ, vel a se  $1-1\frac{1}{2}$ , vel infima (longe pedunculata vaginata nutans) 5 poll. remotæ. *Squamæ masculæ* lanceolatae, acutæ, nervo in superioribus excurrente. *Perigynium*  $1\frac{6}{10}$ – $2\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, demum ferrugineo-vel atro-purpureum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongum, triquetrum, fulvum, basi styli oblique apiculatum.

Var.  $\beta$ . *minor*; spicis 3 brevibus, femineis subrotundis; foliis angustis.

A *C. nutante*, Host., differt perigyniis lucidis glaberrimis nec sulcatis, nervis prominentibus.

In the paper in the twentieth volume of the Linnean Transactions, I adopted the name which Prescott had given to this species; and, being without a habitat, I conjectured that it might have come from the Altai. I had not at that time seen the paper in the Moscow Bulletin, by Karelin and Kirilow, published in 1842. The *C. melanostachya*, Willd., is referred by Bieberstein and by Ledebour and the Fl. Rossica, to *C. nutans*, Host., though Kunth alludes to some differences between the two; but in both the utriculi are described as "*sulcati*," which is not the case in *C. Songarica*. I have since seen several specimens found by Griffith in Affghanistan. The bifurcate orifice of the perigynium separates this species from the *Supinæ*, and its affinity, I think, is with the *Lucidæ*.

The specimens figured are those of Griffith, from Affghanistan.

478. *C. stenophylla* (Wahlenberg); spica capitata rotundata vel ovata vel oblonga nuda ferruginea sæpe albo-variegata, e spiculis 3–6 arcte congestis vel inferioribus subdiscretis apice masculis; bractea squamæformi cuspidata; stigmatibus 2 rarius 3; perigyniis ovalibus vel ovatis rostratis, ore integro vel emarginato obliquo albo-hyalino, plano-convexis superne ad margines scabris stipitatis demum spongiosis nervatis atro-purpureis lucidis, squama ovata acuta vel obtusiuscula ferruginea margine sæpe late albo-hyalina longioribus vel subæquantibus.—*C. stenophylla*, Wahl. Act. 142; Willd. 218; Schk. f. 32; Kunth, 374; Bieb. 380; Ledebour, Fl. Alt. 208; Koch, 864; Reich. t. 200; Lange, 29; Fl. Ross. 270; Steud. 187. *C. glomerata*, Host, t. 44. *C. juncifolia*, Schk. C. Hosti, Schk. f. 32. *C. duriuscula*, Meyer, Mem. St. Petersb. 214, t. 8; Kunth, 374; Drejer, Rev. 22; Steud. 187. *C. stenophylla*,  $\gamma$ , Fl. Ross. *C. arctica*, Deimb.; Fries, Mant. 3, 135, et Sum. 222; Anders. 70, t. 3, f. 13. *C. Deinbolliana*, Gay, Ann. Sc. Nat. 11, 183; Lange, 27; Steud. 190. *C. in-*

curva,  $\beta$ . arctica, *Hart.* *C. stenophylla*,  $\beta$ , *Fl. Ross.* *C. pachystylis*, *Gay, Ann. Sc. Nat.* 10, 301; *Steud.* 187. ( *Ic. ined.* DCLXXVI. in *Herb. Kew.*)

HAB. In Europa, Asia, et America septentrionali.—Lapland. Russia to the Tyrol. Songaria, Caucasus, Altai, Dahuria. Affghanistan, *Griffith.* Tibet occid. temp. et alpina, *Thomson.* Greenland, *Drejer.* Arctic America, *Richardson.* Fort Kearney, *Fendler, n.* 154 (*Herb. Gray.*) Rocky Mountains, *Drummond, Hall, et Harbour.* N.W. Coast, *Douglas.*

*Rhizoma* stoloniferum, repens. *Culmus* 2–8-pollicaris, plano-convexusculus, lævis vel apice scabriusculus, basi vaginis foliorum marcidis tectus. *Folia* convoluto-caniculata, sæpe curvata, nunc explicata, sub lineam lata, vel angustiora. *Spica* 2–9 lin. longa, 2–3 lin. lata, ferruginea, demum squamis marcidis perigyniisque atro-purpureis variegata. *Squamæ* ferrugineæ, plus minus conspicue ad margines albo-hyalinæ, demum flavidæ. *Perigynium* (cum stipite  $\frac{2}{10}$ – $\frac{3}{10}$  lin. longo)  $1\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, plus minus distincte nervatum, ferrugineum, demum spongiosum, atro-purpureum, lucidum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovatum, basi productum, fuscum, basi styli incrassata. *Stigmata* 2, in speciminibus Indicis nunc 3, achenio triquetro.

Gay remarks that there is a racheola in this species, but I have not chanced to observe it. Most of the Indian specimens are young; those of *C. duriuscula* are so, as may be seen by Meyer's figure; but I think, with the author of the *Fl. Rossica*, it is inseparable from *C. stenophylla*. I have two specimens of *C. arctica* from Fries, both of which have the terminal spicula with the male florets at top, as he describes them in his third 'Mantissa.' In his 'Summa' he says they are at base, and is followed by Anderson, but not by Lange. I have referred it to *C. stenophylla*, judging from the culm and leaves; at the same time doubting whether, as Hartman thought, it might not be referable to *C. incurva*, from the colour of the spike.

Tab. DCLXXVI.

- n. 1. Specimens of Dr. Thomson, from Tibet, with three stigmas.
- n. 2. A specimen from Germany, with the other details.
- n. 3. A specimen from the Rocky Mountains.
- n. 4. From the N. W. Coast of America.

479. *C. strigosa* (Hudson); spica elongata viridi, e spiculis 5–6 rarius 3–7 gracilibus cylindricis, terminali mascula, reliquis femineis, superioribus rarius apice masculis, inferioribus remotis exserte pedunculatis nutantibus laxifloris basi attenuatis, subinde infima basi composita; bracteis vaginatis culmo brevioribus; stigmatibus 3; perigyniis fusiformibus triquetris brevissime cylindrico-rostellatis, ore integro obliquo, nervatis viridibus demum olivaceis ferrugineo-punctatis, squama lanceolata acuta vel cuspidata medio viridi margine albo-hyalina longioribus.—*C. strigosa*, *Hudson, Fl. Angl.* 411, ed. 2 (1778); *Good. Linn. Trans.* 2, 169, t. 20, f. 4; *Sm. Fl. Brit.* 982; *Eng. Bot. t.* 994; *Eng. Fl.* 95; *Willd.* 289; *Schk. f.* 53; *Kunth*, 471; *Koch*, 880; *Allioni*, 270; *Bertol.* 113; *Gaud. Helv.* 109; *Reich.* 19, t. 242; *Anders.* 22, t. 8, f. 99; *Lange*, 104; *Fl. Ross.* 293; *Gren. et Godr.* 406. *C. leptostachys*, *Elrh. Phyt.*; *Wahl. Act.* 151; *Hoppe, Ic.*; *Steud.* 231. ( *Ic. ined.* DCLXXVII. in *Herb. Kew.*)

HAB. In Europa et Asia.—Denmark to Italy. Caspian. Caucasus.

*Rhizoma* repens. *Culmus* 1–2½-pedalis, gracilis, lævis, debilis; pars spicigera 1½ ped. longa. *Folia* 3–5 lin. lata, culmo breviora, mollia, flaccida. *Bracteæ* inferiores spiculis plus minus longiores, vaginatæ. *Vaginæ* 2 lin.–1½ poll. longæ. *Pedunculus* infimus nunc 3 poll. longus, lævis. *Spicula mascula* ½–2 poll. longa,  $1\frac{1}{4}$  lin. lata; *femineæ* 1–2½ poll. longæ,  $1\frac{1}{2}$ –2 lin. latæ, a se 2–6 poll. remotæ, superiores (rarius omnes) apice masculæ. *Squamæ* conformes; *masculæ* inferiores muticæ, vel omnes cuspidatæ; *femineæ* demum ferrugineo-punctatæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum, fere  $\frac{5}{10}$  lin. latum, ovale, triquetrum, basi styli æquali recta apiculatum.

*C. gracillima*, Schw. (Tab. CXLV.) is closely allied to this species, differing in the terminal spike being generally male at base, and the perigynium more obtuse and ventricose. I have never seen the description of *C. Godefrini*, Willem. Phyt. In the *Fl. Ross.* it is quoted as a synonym of *C. strigosa*; but De Candolle (*Fl. Franc.* 6, 297) refers it to *C. sylvatica*.

The specimens figured are English.

480. *C. subdola* (Boott); spica subelongata purpurea, e spiculis 5–9 cylindricis erectis alternatim approximatis, terminalibus 1–3 masculis, inferioribus nunc geminatis, reliquis femineis, una alterave ex superioribus geminatis inæqualibus, inferioribus pedunculatis singulis evaginatis vel infima exserte pedunculata; bracteis culmum longe superantibus; stigmatibus 2; perigyniis ovalibus vel ovatis rostellatis, ore integro vel emarginato, stipitatis nervatis ferrugineo-punctatis, squama oblonga emarginata aristata vel ovata acuta vel obtusa mutice purpureo-pellucida lineata nervo viridi longioribus vel subæquantibus.—*C. subdola*, *Boott, Linn. Trans.* 20, 142; *Hooker, Fl. N. Zeal.* 282; *Steud.* 216. ( *Ic. ined.* DCLXXVIII. in *Herb. Kew.*)

HAB. In New Zealand, *Dr. Hooker, Travers.*

*Culmus* 1–2-pedalis, triquetus, inter spiculas scaber, basi foliatus; pars spicigera 5–10 pollices longa. *Folia* 1–1½ lin. lata, culmo longiora. *Bracteæ* foliaceæ, culmo ter quaterve longiores; infima subinde 12–15 pollices longa, evaginata, vel infima vagina 3–12 lin. longa instructa, in uno specimine (*radicalis*) 2½ pollices longa. *Spiculæ masculæ* ½–1¾ poll. longæ, singulæ, alternæ, vel infima cum spicula feminea vel androgyna basi feminea summa geminata, vel binæ inferiores geminatæ. *Spiculæ femineæ* 3 lin.–2 pollices longæ, 2 lin. latæ, summa nunc singula apice mascula; vel superiores 2 geminatæ, inæquales, cum spicula una brevi sessili altera longa pedunculata; inferiores longiores, singulæ; infima nunc remota, *brevi* vel in uno specimine *radicalis longe* vaginata, exserte pedunculata. *Pedunculi* triquetri, scabri, inæquales, 3–9 lin. vel infimus 1–3 poll. longi. *Squamæ masculæ*, nisi inferiores, muticæ, obtusæ; *femineæ* in eadem spicula ovatæ, muticæ, vel inferiores oblongæ, emarginatæ, hispido-aristatæ, lineolis pellucidis obsitæ. *Perigynium*  $1\frac{3}{10}$ – $\frac{5}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, lenticulare, basi styli obliqua.

This plant is intermediate between the *C. Gaudichaudiana*, Kunth, and the small forms of *C. ternaria*, Forster, and may hereafter, when better known, be referred to one or the other. Its general aspect is rather that of the former, differing in the geminate spiculæ and emarginate aristate squamæ. The erect spiculæ, squamæ, and more membranous perigynium distinguish it from the latter.

481. *C. sylvatica* (Hudson); spica elongata viridi, e spiculis 4–6 oblongis vel cylindricis, mascula 1 rarius 2,

reliquis femineis laxifloris, superioribus raro apice masculis approximatis, inferioribus remotis longe exserte pedunculatis pendulis subinde basi compositis; bracteis vaginatis spiculas superantibus; stigmatibus 3 longis; perigyniis ovalibus triquetris longe rostratis, ore hyalino bifido, enerviis, glabris vel rostro margine scabro olivaceis membranaceis, squama lanceolata acuta cuspidata albida nervo viridi scabro longioribus.—*C. sylvatica*, *Huds. Fl. Angl.* 353 (1762); *Fl. Dan. t.* 404; *Good. Linn. Trans.* 2, 183; *Light.* 562; *Eng. Bot. t.* 995; *Smith, Eng. Fl.* 96; *Schk. f.* 101; *Ledeb. Fl. Alt.* 230; *Koch*, 886; *Gaud. Agrost.* 173, et *Helv.* 110; *Reich.* 19, t. 242; *Lange*, 123; *Anders.* 21, t. 8, f. 100; *Fl. Ross.* 295; *Gren. et Godr.* 422; *Maxim. Fl. Amur.* 312; *Tchihatch. As. Min.* 577. *C. Drymeja*, *Ehrh. Phyt. Wahl. Act.* 153; *Willd.* 296, et *Act. Berol. t.* 3, f. 3 (1794); *Biebst.* 390; *Kunth*, 470 (excl. syn. *Dewey*, etc.). *C. patula*, *Scop. Fl. Carn.* 226, t. 59 (1772); *Allioni, Ped.* 271; *Brot.* 66; *Vill.* 214. *C. capillaris*, *Leers.* 202, t. 15, f. 2 (non *Linn.*). *C. psilostachya*, *Kit. Willd.* 289 (fide *Kunth*), (non *C. psilostachya*, *Steud.* 215, quæ *C. paleata*, *Boott*). *C. emarcida*, *Sut. Fl. Helv.* 263; *Gaud. Agr.* 173; *De Cand. Fl. Franc.* 6, 297 ("C. patula  $\beta$ "). *C. laxula*, *Tin. mss.*, fide *Parlatore, Herb. Boott.* (Ic. ined. DCLXXIX.—DCLXXX. in *Herb. Kew.*)

HAB. In Europa, Asia.—Norway, Sweden, Denmark, to Italy, Portugal, Constantinople. Caucasus, Ural, Altai, Baikal, Davuria, Amur.

*Radix* fibrosa. *Culmus* 1–2-ped., lævis, basi foliatus, pars spicigera 3–12 poll. longa. *Folia* 1–3 lin. lata, culmo breviora, plana, graminea. *Bracteæ* foliaceæ, vaginatæ, spiculas superantes. *Vagina* infima sæpe 1½–2 poll. longa. *Pedunculus* infimus nunc 6–7 poll. longus, triquetus, filiformis, scaber. *Spicula mascula* ½–2½ poll. longa, lineam lata, rarius 2, flosculisque femineis versus apicem instructa. *Spiculæ femineæ* ½–2½ poll. longæ, 2 lin. latæ, rarius superiores apice masculæ, inferioresque vel omnes basi spiculis 1–3 brevibus compositæ, omnes alternatim remotæ vel superiores approximate; infima longissima exserte pedunculata. *Squamæ* conformes. *Perigynium* 2 $\frac{1}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, rostro apice membranaceo albido. *Achenium* conforme, 1 $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ellipticum, faciebus basi concaviusculis, basi styli æquali reeta apiculatum.

I cannot detect any characters to justify even varieties of this species, unless we were to multiply them beyond what authors have described. It varies in the length of the spikes, the occasional presence of female florets on the male spicula, and of male florets at the top of the female ones, and the female being occasionally compound. The *C. patula*,  $\beta$ , of De Cand., is probably the var.  $\beta$ . *Thomasoni* of Reich., and the *C. laxula* of Tineo, but I do not find any marked difference in them from the typical form, which occasionally, as may be seen in Tab. DCLXXIX., has very abbreviate spiculæ on the same root with others of the average length. I find the perigynium in them varies from 1 $\frac{5}{10}$ –2 $\frac{4}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum.

*Wahlenberg, Fl. Lapp.* 244, has corrected the error of Smith, who had referred the *C. vesicaria*,  $\beta$ , *Linn. Fl. Lapp.*, to *C. sylvatica*. Under *C. ampullacea* he says, "Nec quis Botanicorum Suecanorum unquam dubitavit, quin hæc sit *Floræ Lapp. n.* 328, quod synonymon a *C. sylvatica*, *Huds.*, longe abhorret, quæ planta nonnisi ducenta miliaria Svecana a Lapponia crescit."

The specimens figured are English ones.

482. *C. transversa* (Boott); spica oblonga fusca, e

spiculis 3–4 contiguis erectis, terminali mascula cylindrica vel oblonga tenui ferruginea subsessili, reliquis femineis oblongis fuscis inserte vel infima subremota exserte pedunculata; bracteis vaginatis culmo longioribus; stigmatibus 3; perigyniis ovalibus triquetris in rostrum longum tenue sensim attenuatis, ore membranaceo pallido integro alte oblique secto, crebre nervosis glabris divergentibus, squama ovata acuminata acuta longe setaceo-aristata albida latioribus longioribus.—*C. transversa*, *Boott, Perry Exp.* 2, 324 (1826). (Ic. ined. DCLXXXI. in *Herb. Kew.*)

HAB. Japan, *Dr. Morrow, Wright (N. Pacific Exp.)*.

*Culmus* 2½-pedalis, gracilis, obtuse triquetus, lævis, inferne foliatus; pars spicas gerens 1½–4½ poll. longa. *Folia* 1½ lin. lata, culmo longiora, viridia. *Bracteæ* vaginatæ, culmum longe superantes; infima nunc sterilis, 3 poll. remota. *Vagina* infima 3–12 lineas longa. *Spicula mascula* 12–15 lineas longa, 1 lineam lata, vel abbreviata 6 lin. longa, spicas superiores vix superans, squamis longius aristatis. *Spiculæ femineæ* 8–15 lineas longæ, 4 lineas latæ; infima 2–3 pollices remota. *Squamæ* omnes aristatæ. *Perigynium* 2 $\frac{8}{10}$ –3 lineas longum,  $\frac{8}{10}$  lin. latum (rostrum 1 $\frac{3}{10}$ – $\frac{5}{10}$  lin. long., ima basi demum constricto supra tumescente), fusco-olivaceum, ore demum ferrugineo. *Achenium* 1 $\frac{3}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, ovale, triquetrum, angulis acutis, faciebus concaviusculis, pallidum, basi styli decidua (supra basin persistentem æqualem) tumida.

A *C. tumida*, *Boott, Illustr.* 66, t. 181, differt inflorescentia brevior, spicis oblongis, latioribus approximatis; perigyniis majoribus divergentibus, rostro longiore, ore integro oblique secto, basi styli incrassata; foliis angustioribus.

483. *C. vacillans* (Solander); spica elongata cinnamomea concolori e spiculis 5–9 cylindricis, masculis 1–4 vel terminali apice medioque feminea, reliquis ima basi masculis, superioribus approximatis, inferioribus longe exserte pedunculatis nutantibus subinde compositis, infima sæpe radicali; bracteis inferioribus vaginatis culmo longioribus; stigmatibus 3; perigyniis fusiformibus plano-triquetris rostratis acute bifidis nervosis deciduis glabris, laciniis oris scabris, squama lanceolata cuspidata longioribus.—*C. vacillans*, *Solander, mss. Herb. Banks; Boott in Hooker Fl. N. Zealand*, 1, 285 (non *Steudel, p.* 235, quæ *C. riparia*, *Curt.*). (Ic. ined. DCLXXXII. in *Herb. Kew.*)

HAB. In Nova Zelandia.—Prope Oporagi, *Solander, Herb. Banks.* Bay of Islands, *Dr. Sinclair, Colenso, Herb. Hooker.* Falls of the Keri Keri, *J. D. Hooker, Wellington, Ralph.*

*Culmus* 1½-pedalis, gracilis, scaber, basi foliatus; pars spicas gerens 6–9 poll. longa vel longior. *Folia* 2–3 lin. lata, culmo breviora vel longiora, rigida. *Spicula mascula* 1–2 pollices longæ, 1–1½ lin. latæ, in uno specimine apice medioque femineæ; reliquæ ½–3½ pollices longæ, 1½–2 lin. latæ; superiores contiguæ, sessiles vel incluse vaginatæ; infima remota, sæpe radicalis, longissime exserte pedunculata, omnes basi attenuatæ parce masculæ; inferiores subinde basi spicula 1 alterave composita. *Pedunculi* 3 lin. ad 10 pollices longi, filiformes, scabri. *Vagina* ½–1½ pollices longæ, purpureæ. *Squamæ* omnes conformes. *Perigynium* 1 $\frac{5}{10}$ –2 $\frac{5}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, demum inter nervos validos pallidos purpureo-maculatum. *Achenium* 1 lin. longum, ½ lin. latum, oblongo-triquetrum, castaneum, basi styli apiculatum, stipitatum.

This species belongs to the group of the *Lavigata*. Solander, in his mss. in Herb. Banks, describes the male spikes, "2-3, raro 4." I have never seen so many. He takes no notice of the basal male florets in the other spikes, a character common to several New Zealand species. The spikes vary in length, but from the deciduous habit of the squamæ and perigynia, many specimens, larger than those figured, are wholly deprived of these organs. The perigynia equally vary. In Dr. Hooker's specimens they are occasionally only  $1\frac{6}{10}$  lin. in length, while in those of Ralph, from Wellington, they are  $2\frac{5}{10}$ — $7\frac{7}{10}$  lin. long, and in one of his specimens there are others 4 lin. long, in the same spike with those of the medium length, apparently rendered morbid from some cause. The achenium in these is occasionally abortive, or equally elongated,  $1\frac{6}{10}$  lin. longum, lanceolatum, stylo contorto.

484. **C. villosa** (Boott); spica oblonga fulvo-olivacea, c spiculis 3-4 subapproximatis erectis, terminali mascula cylindræa pedunculata fulva, reliquis femineis oblongis subcrassis evaginatæ vel infima exserte pedunculata olivaceis; bracteis culmo paulo longioribus vel brevioribus, infima nunc vaginata; stigmatibus 3; perigyniis lanceolato-ovatis triquetris sensim breve rostratis, ore obliquo bifido, laciniis scabris crebre nervatis glabris olivaceis, squama ovata emarginata vel acuta late cuspidata ciliata fulva medio viridi nervata longioribus.—*C. villosa*, Boott in *Perry's Exp.* 2, 327. ( *Ic. ined. DCLXXXIII. in Herb. Kew.*)

HAB. In Japan, *Dr. Morrow, Wright, Ringgold and Rodgers' Exp.*

*Culmus* 1- $1\frac{1}{2}$ -pedalis, triquetrum, gracilis, superne scaber, inferne foliatus, pilosus; pars spicigera  $3\frac{1}{2}$ -5 pollices longa. *Folia* 2-3 lin. lata, culmo breviora, plana, graminea. *Bracteæ* 1-3 lin. latæ, in speciminibus spiculis femineis 2, culmo breviores, evaginatæ; in altero spiculis 3, latiores, eo paulo longiores, infima vaginata. *Vagina* 6 lin. longa, villosa. *Pedunculus* infimus 3-15 lin. longus, lævis, villosus. *Spicula mascula* 10-13 lin. longa, sub lineam lata; *femineæ* 6-12 lin. longæ, 4-5 lin. latæ, a se 1-2 pollices remotæ. *Squamæ masculæ* obtusæ, muticæ, ciliatæ, fulvæ, margine albo-hyalinæ. *Perigynium*  $2\frac{7}{10}$ — $9\frac{9}{10}$  lin. longum,  $\frac{7}{10}$ -1 lin. latum, superne vacuum, glabrum. *Achenium* (cum basi styli persistente  $\frac{9}{10}$  lin. longa)  $1\frac{6}{10}$  lin. longum,  $\frac{7}{10}$ — $\frac{8}{10}$  lin. latum, obovatum, triquetrum, abrupte basi styli æquali apiculatum, pallidum, punctulatum.

In its habit this species is like *C. Gunniana*  $\beta$ , and in its pilose character like *C. pilosa*, Scop., but differing in the leaves of the culm and form of the perigynium from Scopoli's plant.

485. **C. Vulcani** (Hochstetter); spica elongata viridi-olivacea, e spiculis 4-5 rarius 3-6 cylindricis gracilibus erectis pallidis, masculis 1-2, femineis superioribus contiguis inferioribus remotis longe exserte pedunculatis, infima subinde composita; bracteis spiculis vel culmo longioribus vaginatis; stigmatibus 2-3 longis; perigyniis ellipticis vel obovatis lenticularibus vel plano-triquetris longe rostratis, rostro scabro ore hyalino bifido, cuerviis vel antice basi obscure leviter nervatis membranaceis olivaceis demum ferrugineo-punctatis, squama elliptica acuminata vel cuspidata alba medio nervata viridi longioribus vel subæquantibus.—*C. Vulcani*, Hoch. in *Seubert, Fl. Azorica, t. 3, f. 2*; *Stcud.* 210. *C. Watsoni*, Boott, mss. ( *Ic. incl. DCLXXXIV. in Herb. Kew.*)

HAB. In Ins. Pico, Fayal, *Watson*.

Var.  $\beta$ . *minor*.—*C. Floresiana*, Hoch. *l. c. t. 3, f. 1*; *Stcud.* 210.

HAB. In Ins. Flores, *Watson*.

*Culmus* 1- $2\frac{1}{2}$ -pedalis, gracilis, lævis, firmus; pars spicas gerens 9-18 poll. longa. *Folia* 1-2 lin. lata, elongata. *Bracteæ* inferiores vaginatæ. *Vaginæ* 1- $2\frac{1}{2}$  poll. longæ. *Pedunculi* inferiores 3-8 poll. longi, scabri. *Spicula mascula* 1-2 poll. longæ,  $\frac{3}{4}$  lin. lata; rarius altera brevior, sessilis, contigua adest. *Spicula femineæ* 8 lin.-2 pollices longæ,  $1\frac{1}{2}$ -2 lin. latæ, infima subinde basi spicula brevi composita, basi laxiflora. *Perigynium*  $2\frac{9}{10}$ — $6\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, in eadem spica lenticulare vel plano-triquetrum, achenium arcte vestiens, rostro cylindrico marginibus scabro. *Achenium* 1- $1\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ellipticum lenticulare vel triquetrum fusco-brunneum, basi styli decidua crassior. *Stigmata* 2-3, elongata.

Var.  $\beta$ ; spicis perigynisque brevioribus.

I am indebted to Mr. H. Watson for specimens of this species, which I had proposed to name after him, in 'Hooker's Journal of Botany,' iii. 610, before I had met with the 'Flora Azorica' of Seubert. It belongs to the *Sylvaticæ*, in the form of the perigynium resembling *C. longipes* and *C. sylvatica*.

[The following descriptions of Species, of which no drawings were prepared, complete the series of materials left by Dr. Boott for his 'Illustrations of the Genus Carex.'—J. D. H.]

486. **C. brachystachys** (Schrank); spica subelongata castaneo-viridi, e spiculis 3-5 gracilibus cylindricis pedunculatis, terminali mascula, reliquis femineis laxifloris remotis longe exserte pedunculatis nutantibus subinde basi compositis; bracteis vaginatis spiculis brevioribus; stigmatibus 3; perigyniis lanceolatis triquetris sensim in rostrum attenuatis, ore bidentato ciliato, nervatis glabris vel apice ad margines parce dentatis viridibus mem-

branaccis, squama ovata subacuta vel obtusissima vel emarginata mucronata castanea nervo pallido subduplo longioribus.—*C. brachystachys*, Schrank, *Fl. Baier.* 294 (1789); *Wahl. Act.* 154; *Dec. Fl. Fr.* 3, 123; *Willd.* 276; *Schk. f.* 58; *Kunth*, 467; *Gaud. Agr.* 170, et *Helv.* 120; *Hoppe, Ic.* 95; *Stcud.* 229. *C. compressa*, *Kit.*; *Willd.* 276. *C. tenuis*, *Host, Gram.* 51, t. 92; *Koch*, 883; *Reich.* 18, t. 241; *Bertol.* 115; *Gren. et*

Godr. 421. *C. linearis*, Clairv.; Lange, 122. *C. Valesiaca*, Suter. *C. Scheuchzeri*, Gaud. Etr. *C. strigosa*, Allioni.

HAB. In Europa.—Alps of France, Germany, Switzerland, Italy.

*Radix* fibrosa, caespitosa. *Culmus*  $\frac{1}{2}$ –1-pedalis, gracilis, laevis, basi foliatus, rudimentis vaginisque foliorum sanguineis tectus; pars spicigera 3–7 pollices longa. *Folia*  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, plerumque involuta, filiformia, culmo breviora. *Bractea* vaginata, spiculis breviores. *Vagina* infima 6–14 lin. longa. *Pedunculus* infimus 2–4 $\frac{1}{2}$  pollices longus, capillaceus. *Spica mascula* 7–10 lin. longa,  $\frac{1}{2}$ –1 lin. lata, basi attenuata, rarissime apice feminea. *Spicula feminea* 6–12 lin. longae, 2 lin. latae, basi attenuato-laxiflorae, rarius spicula altera brevi compositae. *Squamae* omnes obtusae, mucronatae, margine superne anguste albo-hyalinae, plus minus ciliolatae; masculae majores spathulatae; femineae oblongae, obtusae, saepe emarginatae. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, viride, subinde purpureo tinctum, achenium laxè vestiens. *Achenium* cum stipite pallido  $\frac{2}{10}$  lin. longo, 1 lin. longum,  $\frac{4}{10}$  lin. latum, ellipticum, triquetrum, fuscum, basi styli aequali apiculatum; angulus tertius posticus.

This delicate species, though allied to the *Ferrugineae*, contrasts in its perigynium especially, with the characteristic forms of that group, but I do not know where it can be more appropriately placed. Lange associates it with *C. sylvatica*, but I think Gaudin more correctly allies it with his *C. Scopoli*. I do not find any reference in authors to the terminal spike being occasionally male at base. Several specimens I have from Schleicher so exhibit it, and one is figured; nor do I find any allusion to the female spiculae being compound. The specimen from Reichenbach, from the Tyrol, occasionally has such. The other specimen is from the Jura, from Mr. Bentham.

487. *C. cataractae* (Brown); spicis 4–6 parvis densifloris congestis, terminali mascula vel apice mascula sessili, reliquis femineis flavis longe bracteatis subrotundis, suprema quandoque apice mascula infimaque remota brevi exserte pedunculata; stigmatibus 3; perigyniis ovalibus turgidis recte rostratis bidentatis demum bilobis ore pallidis membranaceis nervosis glabris vel rostro apice plus minus ad margines dentato divergentibus, inferioribus recurvatis flavis, squama ovata obtusa fulva margine albo-hyalina nervo viridi longioribus.—*C. cataractae*, Brown, Prod. 242; Kunth, 522.

HAB. In Tasmania, Brown, Gunn.

*Culmus* saepe abbreviatus, 2–3, vel elongatus, 6–12 poll. altus, obtusangulus, laevis, firmus; pars spicas gerens 1–4 $\frac{1}{2}$  poll. longa. *Folia* 1–1 $\frac{1}{2}$  lin. lata, culmo longiora. *Bractea* foliaceae, 2–3, culmum longe superantes; infima plus minus vaginata. *Vagina* 4–7 lin. longa, vel prorsus obsoleta. *Pedunculus* infimus quandoque 5–10 lin. longus. *Spicae* omnes saepe arcte congestae, sessiles, vel infima 3 poll. remota, in uno specimine basi composita; *terminalis* vel mascula 5 lin. longa, sub lineam lata, recta vel obliqua; vel superiores 2 apice masculae, reliquae femineae, 3–4 lin. longae, 3 lin. latae. *Squamae* conformes. *Perigynium*  $1\frac{2}{10}$  vel 2 lin. longum,  $\frac{1}{2}$  vel  $\frac{7}{10}$  lin. latum, ore albido demum bilobo-rupto, flavum, glabrum, vel rostro superne parce dentatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, orbiculato-obovatum, ferrugineum, punctulatum, basi styli decidua abrupte apiculatum.

A *C. flava*, L., vix distinguenda, quae species mirum in modum variat.

488. *C. chordorrhiza* (Ehrhart); spica ovata parva

capitata fusco-ferruginea, e spiculis 2–5 apice masculis nudis; stigmatibus 2; perigyniis turgide ovalibus plano-vel convexiusculo-convexissimis abrupte vel sensim rostellatis, ore hyalino integro vel emarginato, marginibus obtusis laevibus vel superne scabriusculis utrinque crebre nervosis appressis lucidis ferrugineis crasse spongiosis, squama ovata acuta vel acuminata fusco-ferruginea margine hyalina involvente longioribus vel subaequantibus.—*C. chordorrhiza*, Ehrh. Phyt. n. 77; Wahl. Act. 142, et Fl. Lap. 227; Willd. 219; Schk. f. 31; Kunth, 371; Gaud. Agr. 82, et Helv. 35; Koch, 864; Drejer, Rev. 23; Anders. 60, 3, f. 14; Lange, 29; Reieh. t. 200; Fl. Ross. 271; Steud. 186; Gray, Ann. Lye. 235; Torrey, Mon. 388; Carey, 513; Dewey, Sill. 49, 44; Sartwell, Ews. n. 27. *C. fulvicoma*, Dewey, Sill. 29, 249; Steud. 188.

Var.  $\beta$ .—*C. Curaica*, Maxim. Prim. Fl. Amur. (non Kunth) (Herb. Hooker).

HAB. In Europa et America septentrionali; Asia, in paludibus sphagnosis.—Iceland. Lapland to Switzerland. Arctic America to New York. Wisconsin.— $\beta$ . Ad fluv. Amur.

*Rhizoma* cylindricum, repens, articulatum, squamosum, longe excurrans, culmos foliorumque fasciculos ex articulis proferens. *Culmus* 6–12-pollicaris, teretiusculus, apice triquetus, laevis vel scabriusculus, basi foliatus, ramosus. *Folia culmea* brevia, 1 $\frac{1}{2}$  poll. longa, plana, sub lineam lata; *sterilia* angustiora vel canaliculato-involuta, saepe pedalia. *Bractea* squamaeformis. *Spica* 4–9 lin. longa, 3–5 lin. lata; spicula terminalis, apice subdimidiatum mascula. *Squamae* masculae lanceolatae, longiores. *Perigynium*  $1\frac{5}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum, glabrum vel (*sub lente*) apice parum scabriusculum, stylo saepe porrecto. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, ovali-subrotundum, plano-convexiusculum, olivaceum, basi styli subaequali apiculatum.

Var.  $\beta$  vix a forma typica differt nisi foliis paulo latioribus, rhizomate horizontali.

Wahlenberg remarks that in habit it differs from all other species, no doubt in allusion to the branched culm. The American plant has acuminate squamae. Carey places it with *C. tenella*, from the resemblance of the perigynium. I have no hesitation in referring *C. fulvicoma* here, though the specimens are too young for any positive opinion.

489. *C. Curaica* (Kunth); spica oblongo-ovata capitata fusco-ferruginea, e spiculis sub 10 simplicibus apice masculis; bractea cuspidata; stigmatibus 2; perigyniis ovalibus rostratis, ore obliquo hyalino, plano-convexis firmis (*nec inflatis*), superne margine serratis utrinque valide nervatis pallidis apice ferrugineis, squama ovata obtusa vel acutiuscula mutica ferruginea superne albo-hyalina angustioribus longioribus.—*C. Curaica*, Kunth, 375 (non Maxim.); Steud. 187. *C. ovata*, Meyer, Fl. Alt. 207; Ledeb. Icon.; Fl. Ross. t. 323. *C. pycnostachya*, Kar. et Kir. Bull. Soc. Mosc. 3, 521; Steud. 187. *C. incurva*,  $\beta$ , Griseb.; Fl. Ross. 269.

Var.  $\beta$ .—*C. vulpinaris*, Nees, apud Wight. 121; Kunth, 383; Steud. 192.

Var.  $\gamma$ .—*C. coarcta*, Boott, Linn. Trans. 20, 133; Steud. 192.

HAB. In Asia.—*a*. Insulis Curaicis, Meyer. In her-



bosis Alpium Alatau, et Songoriæ collibus apricis, *Kar. et Kir.*— $\beta$ . Himalaya oecid. subalpina. Kunawur, *Royle*, n. 73; *Munro*, n. 2417; *Jaquemont*, n. 473 (*flo-rifera*).— $\gamma$ . Affghanistan, *Griffith*, n. 79.

*Culmus* pedalis, erectus, strictus, triqueter, scaber, inferne foliatus. *Folia*  $1\frac{1}{2}$ –2 lin. lata, plana, recta, culmo breviora. *Bractea* cuspidata, brevis. *Spica* 8–12 lin. longa, 4 lin. lata. *Perigynium*  $1\frac{5}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, nervis antice 8 postice 4–5 usque ad apicem conspicuis, plano-convexum, nec inflatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, oblongo-ovale, basi styli æquali.

Var.  $\beta$ ; spica ovata vel oblonga densa castanea nuda, e spiculis pluribus, inferioribus compositis subinde discretis; perigyniis ovatis vel lanceolatis antice 3–5-nervatis, squamam lanceolatam acutam muticam castaneam margine hyalinam subæquantibus.

*Culmus* subbipedalis. *Folia* 2 lin. lata, plana. *Spica* 12 lin. longa, 6–9 lin. lata. *Perigynium*  $1\frac{7}{10}$ –2 lin. longum,  $\frac{4}{10}$ – $\frac{6}{10}$  lin. latum, postice nunc enerve. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, plano-convexum.

Var.  $\gamma$ ; spica oblonga castanea densa, e spiculis pluribus inferioribus compositis; bracteis cuspidatis brevibus; perigyniis ovalibus rostratis, ore hyalino demum bifido, utrinque crebre nervosis, squama ovata acuta cuspidata castanea margine hyalina longioribus.

*Culmus* sesquipedalis, apice triqueter, scaber. *Folia*  $1\frac{1}{2}$  lin. lata. *Spica*  $1\frac{1}{2}$  poll. longa, 6 lin. lata. *Squamæ* cuspidatæ. *Perigynium*  $1\frac{8}{10}$ –2 lin. longum,  $\frac{8}{10}$  lin. latum, plano-convexum, nervis utrinque pluribus (12–15). *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, basi styli abrupte apiculatum.

There is a confusion about the *C. Curaica*, K. Maximowicz says the original Altai specimen was without root or fruit, and that the one figured by Ledebour was probably from a specimen of Turczaninow, though that figure exhibits a nerved perigynium, while a specimen of Turczaninow, from the Baikal, in Herb. Hooker,—the only one of his I have seen,—has a nerveless one, agreeing with *C. incurva*. A specimen like this must, I think, have been seen by Grisebach, for, in the Fl. Ross., he refers *C. ovata*, Meyer, to *C. incurva*; and, quoting the observations of the Fl. Altaica as to *C. ovata* having “*folia plana*,” he adds, “*non observo in siccis*.”

Karelin and Kiriloff described in the Moscow ‘Bulletin’ (1842), a plant from the Alatau, under the name of *C. pycnostachya*, which was afterwards distributed with this ticket:—“2067. *C. Curaica*, Kunth, in *Songoriæ collibus apricis, nec non in subalpinis humidis Alatau ad fluv. Sarchan, leg. Kar. et Kir.* 1841, Soc. Imp. Nat. Cur. Mosqu.” In Herb. Hooker there are four specimens with the above ticket, two of which are the *C. pycnostachya* of the Bull. Mosc., and one with involute leaves, which is *C. incurva*; the fourth is probably the same, but the perigynia are all morbidly elongated. The habitat of *C. pycnostachya* in the Bull. Mosc. is “*in herbosis Alpium Alatau, ad fluv. Lepsa*.” In my own herbarium I have a specimen with the same ticket as that in Herb. Hooker, except that the specimen is named “*C. pycnostachya*,” 2067,” and not, as in the Hooker ticket, “*C. Curaica*.”

Lastly, Maximowicz, in his Prim. Fl. Amurensis, has a *C. Curaica*, which, as he suspected, is referable to *C. chordorhiza*, Ehrh.

*C. Curaica*, Kunth, a *C. incurva* differt culmo validiore altiore triquetro scabro recto; foliis planis latioribus rectis; spica longiore basi angustiore pluristachya; perigyniis plano-convexis (*nec inflatis*) valide nervatis firmis angustioribus; achenio oblongo-ovali angustiore.

I have no hesitation in referring *C. vulpinaris* and *C. coacta* to *C. Curaica*. We have but few specimens of any one of them, and the slight differences do not amount to any specific distinction.

I have given separate figures of each, that this may be more distinctly understood.

Tab.

- n. 1. Two specimens from Herb. Hooker, “*C. Curaica*, 2067.”
- n. 2. The third specimen from Herb. Hooker, with the above, and which I refer to *C. incurva*, the perigynia varying in size.
- n. 3. A morbidly elongated perigynium of the fourth specimen, with involute leaves.
- n. 4. A perigynium from the “*C. ovata*, Turcz. *Baikal*,” from Herb. Hooker.”

Tab.

*C. vulpinaris*, Nees.

- n. 1. From Royle.
- n. 2. From Munro.

Tab.

*C. coacta*, B. From Griffith.

490. *C. dispalata* (Boott); spica subelongata olivacea, e spiculis 4–6 elongatis cylindricis alternatim approximatis, terminali mascula, reliquis femineis, superioribus sessilibus, infima pedunculata basi laxiflora longe bracteata; bracteis evaginatæ, infima culmum subæquante vel superante; stigmatibus 3; perigyniis ovatis triquetris rostratis areuatim divergentibus, ore integro obliquo membranaeco, glabris nervatis, squama lanceolata acuminata purpurea margine albo-hyalina medio viridi trinervata latioribus subæquantibus.—*C. dispalata*, *Boott in Perry's Exp.* 2, 225.

HAB. Hakodadi, Japan, *Dr. Morrow; Wright in Ringgold and Rodgers's Exp.* (*Herb. Gray*).

*Culmus* sub-2-pedalis, acute triqueter, lævis, inter spiculas seabriusculus; pars spicigera 6–9 poll. longa. *Folia* 3–4 lin. lata, clongata, culmo breviora, glabra. *Bracteæ* evaginatæ; infima lata, culmum subæquans; superiores spiculis suis breviores. *Spicula mascula* 2–2½ poll. longa, 2 lin. lata; *feminea* 1–4 poll. longæ, 2–2½ lin. latæ. *Squamæ masculæ* lineares, acutæ. *Perigynium*  $1\frac{1}{2}$  lin. longum,  $\frac{6}{10}$  lin. latum, ore obliquo purpureo, margine albo-hyalino. *Achenium* (*vix maturum*)  $\frac{6}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, obovatum, triquetrum, pallidum, basi styli persistente obliqua; *stylo* æquali, contorto.

Affinis *C. scabrata* et *C. amplifolia*; a priori differt culmo foliisque glabris, etc., ab altera squamis femineis acutis (nec inferioribus emarginatis), basi styli æquali.

491. *C. echinata* (Desfontaines); spica elongata purpurco-viridi, e spiculis 4–10 cylindricis longis densifloris, terminalibus 3–6 maseulis gracilibus contiguis, reliquis crassis femineis vel superioribus apice maseulis sessilibus approximatis vel remotis evaginatæ singulis vel mediis geminatis ternatisve, infima sæpe exserte pedunculata; bracteis inferioribus foliaceis longissimis, infima sæpe vaginulata; stigmatibus 3–2; perigyniis ovalibus vel obovatis abrupte cylindrico-rostellatis, ore integro, seabris margine dentatis nervatis compressis firmis demum ferrugineo-punctatis rubescentibus, squama lineari-lanceolata truneata vel acuta plus minus aristata vel mutica purpurea margine albo-hyalina latioribus longioribus vel (arista) brevioribus.—*C. echinata*, *Desf. Atl.* 338 (1798); *Degl. in Lois. Gall.* 637. *C. hispida*, *Sehk. f.* 64 (1801); *Wahl. Aet.* 165; *Willd.* 302; *Kunth*, 415; *Drejer, Symb.* 16; *Bertol.* 143; *Gren. et Godr.* 412; *Steud.* 215. *C. fasciculata*, *Link (ap. Schk. f.)* 114; *Wahl. Aet.* 163; *Willd.* 248; *Kunth*, 521; *Steud.* 206.

*C. acutæformis*, Brot. *Fl. Lusit.* 66 (1804). *C. longearistata*, Bivon, *Manip.* 8, t. 2 (1816); *Guss. Pl. Neap.* 367; *Kunth*, 520; *Steud.* 367. *C. provincialis*, Degl. in *Lois. Gall.* t. 31 (1828); *Kunze*, t. 18. *C. retusa*, Degl. l. c. 307, t. 30. *C. cuspidata*, Degl. l. c. 294? *C. Soleirolii*, Duby, *Fl. Gall.* 491 (1828); *Kunth*, 520; *Steud.* 237. *C. serrulata*, Mutcl. *Fl. Franc.* 395 (1836). *C. obtusangulus*, Salzm. *Pl. Cors. Eas.*

HAB. In Europa meridionali et Africa.—South of France to Greece. Barbary.

*Rhizoma* crassum, lignosum. *Culmus* 2–6-pedalis, validus, obtusangulus, lævis, basi foliosus, vaginis atro-purpureis foliorum grosse (fibris coloratis) reticulato-fissis; pars spicigera 9–18 poll. longa. *Folia* 3–6 lin. lata, longissima, glauca, carinata, rigida. *Bractea* infima subinde bipedalis, evaginata, vel vagina 2–6 lin. longa instructa. *Spiculæ masculæ* 1–3 poll. longæ, 1–2½ lin. latæ; inferiores nunc ternatæ; *femineæ* 2–4 poll. longæ, 3–7 lin. latæ, singulæ vel geminatæ (una earum omnino apice masculæ) vel ternatæ, extremæ singulæ; superiores sæpe subdimidiatim apice masculæ; inferiores nunc remotæ, rectæ, vel rarius basi attenuatæ, subnutantes, longe exserte pedunculatæ. *Pedunculus* plerumque brevis, vel 4½ poll. longus. *Squamæ masculæ* obtuse muticæ, purpureæ, margine angustæ, hyalinæ; *femineæ* in una eademque spicula sæpe muticæ, vel plus minus aristatæ. *Perigynium* 2½ lin. longum, 1½–1¾ lin. latum. *Achenium* ¾ lin. longum, ⅙ lin. latum, obovatum, triquetrum, basi styli æquali apiculatum.

I must refer to Drejer's elaborate observations, in his 'Symbolæ,' on the synonymy and affinity of this species. In Europe its more immediate allies are *C. glauca* and *C. trinervis*, Degl.; but in South America there is a species, *C. laciniata*, B., more closely resembling it. The stigmata are occasionally two, but I have not found a corresponding lenticular achenium. But most of the specimens I have want mature perigynia. I think the name of Desfontaines, as the first and most appropriate, should be adopted, as the species once known by it is now universally known as the common *C. stellulata*.

Tab. . . . . is a specimen from Algiers, which I owe to the kindness of M. Spach.

Tab. . . . .

- n. 1. A specimen from Sicily, from Parlato, the "*C. longearistata*, Bivon."
- n. 2. A specimen from Cintra, Portugal, sent to me by the late Daniel Sharpe, F.G.S.; the lower male spiculæ ternate, the upper geminate, one composed of a male and a female conspicuously male at top.
- n. 3. A specimen of "*C. Soleirolii*," from the Paris Garden, grown from seed from Corsica, sent by M. Spach.

Tab. . . . . Specimens from Cintra, with the female spiculæ narrow, alternate at base, on long peduncles and subnutant, the squamæ generally muticæ, or the lower mucronate.

492. *C. Ecklonii* (Nees); spicis 4–5 contiguis oblongis sessilibus, mascula 1 sæpe abbreviata bracteata, reliquis femineis congestis evaginatibus glauco-ferrugineis, infima subinde remota inserte vel brevi exserte pedunculata; bracteis planis culmum longe superantibus erectis; stigmatibus 3; perigyniis ovalibus obtuse triquetris sensim rostellatis bifidis glabris vel rostro ad margines scabro costato-nervatis glaucescentibus demum ferrugineo-punctatis, squama ovata obtusa emarginata vel acuta valide cuspidata ferruginea medio pallida nervata longioribus.

Var.  $\beta$ . *angustifolia*.—*C. Ecklonii*, Nees, *Linnaea*, 10, 203; *Kunth*, 517; *Kunze*, 25, t. 5.

HAB. Cape of Good Hope.

*Culmus* 3–9-pollicaris, obtusangulus, validus, lævis; pars spicigera 8 lin.—2½ poll. longa. *Folia* 1–2 lin. lata, culmo longiora, carinato-plana, rigida, flaccida. *Bractea* evaginata, vel infima sæpe sterili 1½–4 poll. remota vaginata. *Vagina* infima 8–18 lin. longa. *Spica mascula* 3–5 lin. longa, ferruginea, bractea squamæformi cuspidata subæquilonga suffulta. *Spica femineæ* 4–6 lin. longæ, 3 lin. latæ, congestæ; vel infima 1½ poll. remota. *Squamæ* omnes longiuscule valideque cuspidatæ, truncatæ vel emarginatæ, vel subcutatæ. *Perigynium* 2–2¾ lin. longum, 1 lin. latum. *Achenium* 1½ lin. longum, ⅙ lin. latum, obovatum, triquetrum, stipitatum, castancum, angulis pallidis, basi styli æquali obliqua apiculatum.

So like in habit, especially the var.  $\beta$ , to *C. extensa*, that I think it must be considered a variety of that widely-diffused plant.

The culm is more robust; the leaves plano-carinate, yellowish; the squamæ often emarginate, with a longer cuspidation; the perigynium rather larger, more bifid, with the margins of the rostrum occasionally scabrous.

In *C. extensa*, the involution of the leaves is certainly a very constant character, though the old ones are unfolded. Cosson and Germain, in their *Fl. des Env. de Paris*, p. 606, refer the Menecy *C. evoluta* with plane leaves to *C. filiformis*; and the specimens I have seen from that locality are intermediate in development between the northern *C. evoluta*, Hart., and the *C. filiformis*, L. Upon this view, I think that future observers may see cause to unite the *C. lanuginosa*, Mich., *C. Wallichiana*, Prescott, and *C. amathorhyncha*, Desv., to the typical form of Linnaeus.

493. *C. ericetorum* (Pollich); spica brevi ferruginea albida, e spiculis 2–4 approximatis densifloris sessilibus, terminali mascula clavato-oblonga, femineis 1–3 subinde apice masculis oblongis; bractea infima amplectente vel brevissime vaginata purpurea, spicula brevior; stigmatibus 3; perigyniis obovatis obtuse trigonis rostellatis, ore integro ciliato strigoso, hirtis enerviis fuscis basi pallidis, squama oblonga obtusa mutica fusco-ferruginea margine late albo-hyalina ciliata subæquilata paulo longioribus.—*C. ericetorum*, *Poll. Pal.* 886; *Wahl. Act.* 159; *Schk. f.* 42; *Hoppe, Ic.* 70; *Koch*, 876; *Bertol.* 85; *Gaud. Helv.* 6, 81; *Lange*, 108; *Reich.* 26, t. 262; *Anders.* 30, t. 7, f. 83; *Fl. Ross.* 303; *Gren. et Godr.* 414; *Steud.* 217. *C. ciliata*, *Willd.* 261; *Gaud. Agr.* 133. *C. globularis*, *Gaud. Etr. (non Willd.)*. *C. montana*, *Leers.* t. 16, f. 6 (*fide Koch*). *C. brachyphylla*, *Turcz. (fide Fl. Ross)*. *C. inornata*, *Turez. (fide Fl. Ross)*. *C. membranacea*, *Hoppe, Ic.* 71; *Reich.* 26, t. 262. *C. approximata*, *Allioni (fide Koch, Bertol.)*.

HAB. In Europa et Asia.—Norway. Sweden to Italy. Caucasus, Altai, Baikal, Davuria.

*Rhizoma* repens, stoloniferum, reliquis foliorum fibratis ferrugineis vestitum. *Culmus* 3–12 pollices altus, gracilis, lævis, obtuse trigonus, basi foliatus; pars spicigera 9–20 poll. longa. *Folia sterilia* 1–2 lin. lata, rigida, plana, carinata, culmo breviora, demum patentia; *culmea* brevia, angusta. *Bractea* purpureæ; infima subinde vaginulata, cuspidata, spicula ejus brevior. *Vagina* 1–1½ lin. longa. *Spicula mascula* 4–10 lin. longa, 1–1½ lin. lata; *femineæ* 3–6 lin. longæ, 2 lin. latæ, infima nunc brevissime pedunculata, subinde apice flosculis masculis paucis instructæ. *Squamæ* conformes, apice conspicue albo-hyalinæ, ciliatæ; *masculæ* rotundato-obtussimæ, imbricatæ; *femineæ* subinde obtusiusculæ. *Perigynium* 1½–1¾ lin. longum, ⅙–⅚ lin. latum. *Achenium* conforme, ⅙–⅚ lin. longum, ⅙–⅚ lin. latum.

lin. longum,  $\frac{5}{10}$ — $\frac{6}{10}$  lin. latum, obovatum, obtuse triquetrum, pallidum, basi styli æquali apiculatum.

I have specimens of *C. membranacea*, Hoppe, from Hoppe, and cannot see that it differs from the plant of Pollich. Hoppe describes the squamæ as elliptic and entire, "glumam integerrimam." His specimens distinctly show that they are occasionally ciliate. Koch says merely, "glumis magis oblongis;" and Reichenbach, "squamis non ciliatis fructus æquantibus;"—the last character contradicted by his own figure, as seen in the enlarged spicula, and in the figure Hoppe has given of it.

The inflorescence, form of the perigynium, and rigid leaves, distinguish this species from *C. montana*.

The specimens figured are from the Palatinate.

494. *C. extensa* (Goodenough); spicis 3–5 contiguis abbreviatis vel oblongis, masculis 1–2 sessilibus, reliquis femineis subinde apice masculis glauco-ferrugineis subrotundis vel cylindræis, superioribus vel omnibus evaginatis contiguis sessilibus vel infima remota inserte vel brevi exserte pedunculata rarius basi composita; bracteis culmum longe superantibus demum patentibus vel deflexis, infima nunc vaginata; stigmatibus 3; perigyniis ovalibus vel obovatis compresso-subtriquetris sensim vel abrupte rostellatis bidentatis glabris costato-nervatis glaucis vel olivaceis pellucide demum ferrugineo-punctatis, squama ovata obtusa mucronata ferruginea medio viridi nervata longioribus.—*C. extensa*, *Good. Linn. Trans.* 2, 175, t. 21, f. 7 (1792); *Willd.* 268; *Schk. V. et xx.*; *Wahl. Act.* 151; *Kunth*, 447; *Link, Hort. Ber.* 358; *Koeh.* 885; *Hoppe et St. Leon.*; *Biebst.* 614; *Reich.* 30, t. 274; *Andersson*, 26, t. 7, f. 91; *Lange*, 129; *Fl. Ross.* 299; *Smith, Eng. Fl.* 108; *Eng. Bot. t.* 833; *Bertol.* 100; *Gren. et Godron*, 426. *C. Balbisii* sp.; *Reich.*; *Bertol.* *C. nervosa*, *Desf. Fl. Alt.* 2, 337 (1798); *Gusson, Fl. Sic.* 572. *C. Peruviana*, *Presl*; *Kunth*, 447; *Steud.* 221. *C. Genuensis*, *Dec.*?; *Steud.* 206.

HAB. In Europa.—Shores of the Baltic to Italy, Sicily, and Spain. Africa: Algiers. Asia: Tauria, Caucasus. North America: seashore, New York, *Mr. Allen* (1861). South America, *Perer.* San Pueblo, Mexico, *Gregg.* Rio Negro, Patagonia, *Wilkes (Herb. Gray)*.

*Culmus*  $\frac{1}{2}$ — $1\frac{1}{2}$ -pollicaris, obtusangulus, lævis; pars spicas gerens  $\frac{1}{2}$ —8 poll. longa. *Folia* involuta; *senescentia* sæpe explicata, 1–2 lin. lata. *Bracteæ* involutæ; infima solum subinde vaginata. *Spica mascula* 3–9 lin. longa, sæpe obliqua, altera brevior sæpe adest, ferruginea, sessilis. *Spica feminea* 3–12 lin. longæ, 2–3 lin. latæ; infima quando remota vaginata. *Vagina* 2–16 lin. longa. *Squamæ* omnes mucronulatæ, vel masculæ inferiores muticæ. *Perigynium*  $1\frac{2}{10}$ — $\frac{6}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, achenium laxè vestiens. *Achenium*  $\frac{9}{10}$ —1 lin. longum,  $\frac{6}{10}$ — $\frac{7}{10}$  lin. latum, ovale triquetrum, basi styli æquali oblique apiculatum.

This species, common in Europe, has lately been found near New York by Mr. Allen; and I have no hesitation in referring the *C. Peruviana*, Presl, to it, as I have had the opportunity of examining, through the kindness of Dr. Torrey, a specimen from Mexico, found by Mr. Gregg; and of Dr. Gray, three specimens from the Wilkes expedition, found on the banks of the Rio Negro, Patagonia, one of which resembled the more vigorous form described by Desfontaines under the name of *C. nervosa*.

In 70 specimens, I find only 10 with 2 male spikes; and in 4, the lower female compound. In one from Sicily, the terminal

spike had some female florets in the middle, and in one of Wilkes at the top. The involution of the leaves is very constant, except that they expand by age.

I have never seen the *C. Genuensis*, Dec., nor do I find any allusion to it by later authors; but I suspect from the description that it is not distinct.

495. *C. ferruginea* (Scopoli); spica sæpe elongata viridi-ferruginea, c spiculis 2–4 rarius 5 gracilibus remotis, terminali mascula subinde elongata, reliquis femineis laxifloris exserte pedunculatis nutantibus, suprema rarius sessili, infima sæpe distantia longissime pedunculata pendula; stigmatibus 3; bracteis vaginatis culmo brevioribus; perigyniis fusiformibus angustioribus vel ellipticis subturgidis triquetris breve rostratis, ore purpureo aperto ciliato emarginato vel integro, superne pilis brevibus marginibusque (semper) scabris vel glabris nervatis demum fusco-purpureis, squama ovata obtusa mutica vel mucronata ferruginea margine anguste albo-hyalina longioribus.—*C. ferruginea*, *Scop. Carn.* 882 (1772); *Wahl. Act.* 154; *Koeh.* 882; *Reich.* 21, t. 248; *Gren. et Godr.* 420. *C. Mielichhoferi*, *Sehk. f.* 198 (*non Smith*); *Willd.* 275; *Kunth*, 466; *Link*, 361. *C. Scopoliæ*, *Willd.* 292; *Sehk. f.* 199. *C. Scopoli*, *Gaud. Agrost.* 168, et *Helv.* 6, 118; *Bertol.* 118. *C. brevifolia*, *Host, Kunth*, 466. *C. geniculata*, *Host, Kunth.* *C. spadicea*, *Dec. Fl. Fr.* 3, 120.

HAB. In Europa.—Alps, Switzerland, Tyrol.

*Radix* stolonifera, repens. *Culmus* 1– $1\frac{1}{2}$ -pedalis, gracilis, obtuse trigonus, apice scabriusculus, basi foliatus; pars spicigera 3–12 poll. longa. *Folia* sub lineam lata, sæpe involuta; *culmea* culmo multum breviora; *sterilia* elongata, graminea. *Bracteæ* vaginatæ, spiculas superantes. *Vagina* infima subsemipollicaris. *Pedunculi* capillacei; infimus 1–9 poll. longus. *Spicula mascula* 8–21 lin. longa, sub lineam lata; *femineæ* 4–14 lin. longæ, 1–2 lin. latæ, plerumque laxifloræ, remotæ, pedunculatæ; in uno specimine apice parce masculæ, infima basi spicula altera brevi composita. *Squamæ masculæ* longiores, obtusæ, sæpe truncatæ; *femineæ* rarius acutæ; omnes sæpe nervo centrali plus minus extra producto scabro, margine anguste albo-hyalinæ, rarius in muticis apice ciliatæ. *Perigynium* fusiforme vel oblongo-ellipticum, stipitatum,  $1\frac{8}{10}$ — $2\frac{2}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, achenium arcte vestiens, superne pilis brevibus asperatum, marginibus scabris, demum fusco-purpureum, vel ovale subturgidum, nisi marginibus glabrum,  $1\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ — $\frac{7}{10}$  lin. latum, achenium laxè vestiens, ore purpureo, aliter pallidum. In utraque forma ore aperto ciliato integro vel emarginato. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, basi acutum, triquetrum, purpureum, punctulatum, basi styli clavata recta abrupte apiculatum.

Gaudin says, "fructus superficiei in nostris omnino læves," but I find in all my specimens except those from Hoppe (*Mont. Untersberg*) that the perigynium is rough at top.

The specimens figured are—

1. From the Bavarian Alps, from Zuecarini.
2. Switzerland, from Wahlenberg.
3. From Hoppe, Mont. Untersberg.

496. *C. fimbriata* (Schkuhr); spica oblonga purpureo-albida, c spiculis 2–4 oblongis remotis erectis, mascula 1 rarius 2 longiore, femineis 1–3, suprema sæpe sessili ovata, infima basi attenuato-laxiflora brevi exserte pedunculata; bracteis inferioribus vaginatis, infima spicam masculam attingente; stigmatibus 3; perigyniis ovalibus

breve rostratis, ore emarginato bidentato margine angusto albo-hyalino, pilis brevibus subinde undique vel sursum asperatis, marginibus scabris nervatis apice purpureis, squama ovata obtusa vel acuta mutica vel mucronata fusco-purpurea, marginibus albo-hyalinis, nervo pallido sæpe scabro, paulo longioribus vel subæquantibus.—*C. fimbriata*, Schk. f. 165 (1806); Kunth, 465; Reich. 21, t. 248; Steud. 229. *C. hispidula*, Gaud. Agrost. 136 (1811), et Helv. 6, 88; Dec. Fl. Fr. 6, 292; Koch, 882; Lange, 119; Gren. et Godr. 419.

HAB. In Europa.—Alps of Switzerland.

*Rhizoma* repens, stoloniferum. *Culmus* 2–15-poll., acute triqueter, scaber, gracillimus, basi foliatus vaginisque foliorum ferrugineis tectus; pars spicigera 1–3½ poll. longa. *Folia* sub lineam lata, apice longe attenuata, carinata, rigida, culmo breviora vel æquantia; *culmea sterilia*que æquilonga. *Bracteæ* brevi vaginatæ, vel summæ evaginatæ; omnes spiculis suis longiores; infima subinde fere culmum æquans. *Vagina* 2–6 lin. longæ. *Pedunculus* infimus 2–18 lin. longus. *Spicula mascula* 6–12 lin. long., sub lineam lata, basi attenuata, rarius ad basin spicula altera brevi; *femineæ* 3–9 lin. longæ, 1½ lin. latæ; suprema sessilis, evaginata, vel omnes breve exserte vel *floriferæ* inserte pedunculatæ. Ad basin spiculæ masculæ subinde adsunt flosculæ femineæ 1–2, ei contiguæ, quasi rudimenta spicularum. In uno specimine spicula feminea suprema apice parce mascula. *Squamæ* omnes atro-purpureæ, nervo pallido, infra apicem evanido vel producto, margine albo-hyalinæ, firmæ. *Perigynium* 1½–2 lin. longum, 1/10–1/10 lin. latum. *Achenium*, cum stipite 1/10 lin. longo, 1/10 lin. longum, 1/10 lin. latum, ellipticum, triquetrum, griseum, basi styli æquali recta apiculatum.

A *C. sempervirente*, Vill., differt rhizomate repente stolonifero, culmo acutangulo, foliis culmis longioribus rigidis attenuatis; bracteis longioribus; pedunculis brevioribus; perigyniis ovalibus, breve rostratis, ore bidentato, pilis magis diffusis, squamam subæquantibus.

I have retained the name of Schkuhr as the earliest, and if not applicable to the squamæ it is to the perigynium. Schkuhr in his figure corrected the error of his description, for the squamæ in it are not fimbriate. The short rostrum and bidentate orifice, hyaline only at the margin, and the creeping rhizoma and acute angles of the culm distinguish this species.

The specimens figured are—

1. From the Zemat Alps, from M. Gay.
2. From Swiss Alps, from Reichenbach.
3. From the Zemat, from Kunze.
4. From Switzerland, Schleicher, with 2 male spiculæ and a male floret at the top of the upper female.

497. *C. firma* (Host); spica plerumque abbreviata ferruginea, e spiculis 2–4 parvis ovalibus erectis, terminali mascula, reliquis femineis remotiusculis vel contiguis, suprema sessili, inferioribus vaginatis, infima sæpe radicali longissime exserte pedunculata; bracteis spicula brevioribus; stigmatibus 3; perigyniis lanceolatis triquetris longiuscule rostratis, ore bilobato truncato vel integro obliquo hyalino subinde ciliato, glabris marginibus acutis scabris pallidis, rostro ferrugineo, obscure leviter nervatis vel enerviis, squama oblongo-ovata acuta vel obtusa mutica vel mucronata ferruginea nervo pallido angustioribus longioribus.—*C. firma*, Host, Syn. 509 (1797), et Gram. t. 75; Lam. Enc. 3, 274; Wahl. Act. 157; Willd. 286; Schk. O. et Y. f. 54; Kunth, 464;

Koch, 882; Lange, 120; Reich. 21, t. 247; Bertol. 123; Gaud. Agrost. 164, et Helv. 116; Gren. et Godr. 421; Steudel, 229; Hoppe, Icon. 89. *C. pauciflora*, Urter. (fide Schk.). *C. spadicea*, Gmel. (fide Schk.). *C. rigida*, Schrank (fide Willd.). *C. strigosa*, Suter. (fide Gaudin).

HAB. In Europa.—Alps of Germany, Tyrol, Switzerland.

*Radix* dense cæspitosa. *Culmus* 2½–6-poll., lævis, obsolete trigonus, rectus vel apice curvatus, basi breve foliatus; pars spicigera 1–2 poll. longa. *Folia culmea* brevina, angusta; *radicalia* copiosa, culmo breviora, 1–2 lin. lata, acuta, rigida, patentia, plana, apice triquetra, scabra. *Bracteæ* vaginatæ, spiculis suis breviores. *Vagina* 2–5 lin. longa. *Pedunculus* infimus subinde 1½ poll. longus. *Spiculæ* 3–6 lin. longæ, 1½–2 lin. latæ; omnes contiguæ, sessiles, vel alternatim remotiusculæ, pedunculatæ; infima sæpe radicalis. *Squamæ* conformes; masculæ obtusæ, muticæ, margine hyalinæ; femineæ subinde mucronatæ. *Perigynium* 2–2½ lin. longum, 1/10–1/10 lin. latum, ore emarginato bilobato, lobulis truncatis angustissime margine albo-hyalinis, vel integro obliquo hyalino subinde ciliato, glabrum, marginibus acutis scabris. *Achenium* 1½ lin. longum, 1/10 lin. latum, conforme, ellipticum, triquetrum, fuscum, basi styli clavato apiculatum.

The orifice of the perigynium remarkably varies. It is, as figured by Schkuhr, Reichenbach, and Hoppe, entire, oblique, and hyaline, or bilobed with truncate lobes, but slightly hyaline at the margin, as Koch says. Kunth describes it as bidentate, and Gaudin says “quandoque obliquo.” The cilia, so conspicuous in Schk. f. y, are not always present.

The specimens figured are:—

- Tab. , from the Righi and the Alps of Salzburg.  
Tab. , a specimen from Hoppe, evidently cultivated, though the ticket sent with it does not say so.

498. *C. frigida* (Allioni); spica atro-purpurea elongata, e spiculis 4–8 oblongis, terminali mascula rarius basi mascula subsessili, reliquis femineis superioribus contiguis sessilibus, inferioribus remotis exserte pedunculatis nutantibus; bracteis vaginatis culmo brevioribus; stigmatibus 3; perigyniis lanceolatis sensim rostratis, ore bifido concolori, nervatis glabris marginibus serratis lucidis fusco-purpureis basi albidis, squama ovata acuminata vel mucronata fusco-purpurea, nervo pallido scabro, subduplo longioribus.—*C. frigida*, Allioni, Ped. 270 (1785); Villars, Dauph. 215; Willd. 275; Schk. f. 47; Kunth, 462; Koch, 881; Gaud. Agrost. 172, et Helv. 6, 121; Parlat. Fl. Ital. 195; Bertol. 121; Lange, 117; Gren. et Godr. 419; Steud. 228. *C. fuliginosa*, Wahl. Helv. 170, et Carp. 299; Host, t. 93; Reich. 21, t. 249. *C. geniculata*, Host, t. 94. *C. approximata*, Allion, 267?; Schk. f. 137; Willd. 283 (fide Willd. et Schk.); Gaud. Bertol. Pl. Allioni ad *C. ericetorum*, refert. *C. spadicea*, Schk. *C. cæspitosa*, Ten. Viag. in Calab. (fide Kunth).

HAB. In Europæ alpibus.—Switzerland, Pyrenees, Corsica.

*Rhizoma* repens, stoloniferum. *Culmus* 3–12-poll., triqueter, inter spiculas scaber, basi ad medium foliatus. *Folia* 2 lin. lata, culmo breviora. *Bracteæ* inferiores vaginatæ, spiculis sæpius longiores. *Spiculæ* (nisi femineæ 1–2 superiores abbreviatæ) subpollicares, 3–4 lin. latæ; terminalis sessilis vel breve pedunculata, rarius basi plerumque omnino mascula;

femineæ superiores 1 vel 2, masculæ arcte contiguæ, sessiles, evaginatae; inferiores basi attenuatae, remotæ, exserte pedunculatae, nutantes vel pendulae. *Vagina* infima 4-12 lin. longa. *Pedunculus* infimus 1-2½ poll. longus, scaber. *Squamæ masculæ* obtusæ vel acutæ, muticæ; *femineæ* obtusæ vel acutæ, mucronatae. *Perigynium* 2½-3 lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, marginibus primo viridibus infra medium sursum serratis, ore acute bifido (nec hyalino). *Achenium* cum stipite  $\frac{6}{10}$  lin. longo,  $\frac{1}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, triquetrum, basi styli æquali apiculatum; angulus tertius posticus.

In the Fl. Ross. this species is said to be found in the Caucasus, Baikal, and Kamtchatka, but associated with it is the *C. stenocarpa*, Turcz., and the *C. fuliginosa*, St. and Hoppe, both of which differ from the plant of Allioni, and are natives of Asia. I do not, therefore, feel justified in quoting the Fl. Ross., believing that the author exclusively referred to the two plants above noticed and not to the true *C. frigida*, Allioni, which differs from *C. fuliginosa*, St. and Hoppe, in its stoloniferous rhizoma, terminal male spiculæ, —the upper female ones sessile, the orifice of the perigynium not being hyaline at the margins, and the occasional mucronate squamæ. The whole plant is larger, and with longer and broader leaves.

499. *C. globularis* (Linn.); spica brevi grisea purpurea, e spiculis 2-4 sessilibus, terminali mascula tenui cylindrica, reliquis femineis, superioribus globosis contiguis, infima oblonga remota; bractea infima foliacea amplectente vel vaginulata rarius culmum æquante; stigmatibus 3; perigyniis ellipticis vel oblongo-ovatis triquetris brevissime rostellatis, ore integro, strigoso-hirtis valide nervatis-ferrugineo-punctatis griseo-viridibus, squama late ovata obtusa purpurea margine pallidiore latioribus longioribus.—*C. globularis*, Linn. *Fl. Lapp.* 336, et *Suec.* 759; *Wahl. Act.* 159, et *Lapp.* 240, et *Suec.* 605; *Willd.* 265; *Schk. f.* 188; *Kunth*, 441; *Fries, Sum.* 235; *Anders.* 30, t. 7, f. 81; *Lange*, 107; *Maxim.* 313; *Fl. Ross.* 304; *Steud.* 219. *C. tomentosa*, *Fl. Dan. t.* 1404.

HAB. In Europa et Asia.—Lapland to Sweden. Ural, Baikal, Amur.

*Rhizoma* ramosum, rubro-purpureum. *Culmus* gracillimus, triquetrum, scaber, 8-15-poll., basi foliatus vaginisque rubro-purpureis reticulato-fissis tectus; pars spicigera 9 lin. ad 2 pollices longa. *Folia culmea* brevia, sterilia, lineam lata, carinata, marginibus revolutis, culmum demum æquantia. *Bractea* infima foliacea, culmo brevior vel æquans, amplectens vel vagina 1-2 lin. longa instructa. *Spicula mascula* 4-9 lin. longa, sub lineam lata, sessilis; *femineæ* 2-6 lin. longæ, 2 lin. latæ; superiores masculæ contiguæ; infima subpollicem remota, nunc brevipedunculata. *Squamæ masculæ* oblongæ, obtusæ, sæpe laxæ. *Perigynium*  $1\frac{2}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, achenium plus minus laxè vestiens, ore integro, stylo protruso, intus (dempto achenio) magis conspicue ferrugineo-punctatum. *Achenium*  $\frac{7}{10}$ -1 lin. longum,  $\frac{4}{10}$ - $\frac{6}{10}$  lin. latum, obovatum, triquetrum, basi styli subcrassa apiculatum, castaneum.

I think the affinity of this delicate species is, notwithstanding the difference in the inflorescence, with *C. virescens*, Muhl., especially the form with abbreviate spiculæ. It is true the American plant has the terminal spiculæ always basi mascula, and we do not observe this in *C. globularis*, but the perigynia are so alike, that, if affinity more especially depends on that important organ, the two cannot be widely separated. I observe the same ferruginous spots in *C. virescens* that are visible in *C. globularis*.

The specimens figured are from the north of Europe.

500. *C. Griolietii* (Römer); spica elongata viridi-castanea, e spiculis 5 erectis bracteatis, terminali mascula cylindrica clongata, reliquis femineis brevibus densifloris, suprema sessili, inferioribus oblongis exserte pedunculatis, infima remota; bracteis foliaceis, inferioribus vel omnibus culmum superantibus; stigmatibus 3; perigyniis obovatis triquetris rostellatis, ore hyalino subintegro superne grisco-hirtis basi flavidis lævibus parce nervatis antice linea centrali glabra percursis membranaceis, squama ovata acuta sæpe mucronata albida nervo viridi latioribus longioribus.—*C. Griolietii*, *Roemer in Selk. f.* 209; *Kunth*, 441; *Bertol.* 95; *Steud.* 218. *C. tomentosa*, *Meyer, Pl. Cauc.* 192 (*fide spec. Herb. Fielding.*). *C. grisea*, *Vir. Ann. Bot.* 1, 186 (*fide Bertol.*).

HAB. In Europa et Asia.—Liguria, Toscana. Caucasus.

*Rhizoma* "crassiusculum, horizontale, tuberculoso-nodosum" (*Bertol.*). *Culmus*  $1\frac{1}{2}$ -pedalis, gracilis, firmus, triquetrum, apice scaber, basi foliatus, vaginis rudimentisque foliorum ferrugineis tectus; pars spicigera  $\frac{1}{2}$ -1 pedem longa. *Folia* 1-2 lin. lata; culmea elongata, culmo breviora, radicalia subæquantia, carinata, marginibus revolutis. *Bractea* vaginatae; inferiores longe foliaceæ. *Vagina* infima 9 lin. ad 2 pollices longa. *Pedunculus* infimus  $2\frac{1}{2}$ -5 poll. longus, filiformis, scaber. *Spicula mascula* 1-2 poll. longa, sub lineam lata, fulva; *femineæ* 2-6 lin. longæ, 2 lin. latæ; omnes pedunculatae, vel suprema orbicularis, sessilis; infima 4-6 pollices remota, obtusa, densiflora. *Squamæ masculæ* obtusæ muticæ vel mucronatae, fulvæ, lanceolatae, nervo viridi sæpe scabro. *Perigynium*  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, apice hirtum, basi flavidum, glabrum, antice sæpe linea centrali e nervis confluentibus constructa glabra flavida percursum, rostello lævi sæpe obliquo, ore integro facile rupto. *Achenium* conforme,  $\frac{8}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, obovatum, triquetrum, basi styli obliqua apiculatum.

The authentic specimen of *C. tomentosa*, Meyer, from the Caucasus, in Herb. Fielding (Oxford), confirms Kunth's conjecture that it was referable to *C. Griolietii*, but I agree with Bertoloni that this is distinct from *C. tomentosa*, L., of which Kunth thought it a variety. It differs from *C. tomentosa*, L., in its elongated inflorescence, long vaginate bracts, oblique rostellum, membranous and less hairy perigynium.

501. *C. hirta* (L.); spica elongata viridi demum rubro-purpurea, e spiculis 4-7 oblongo-cylindricis, terminalibus 2-4 masculis approximatis, reliquis 1-3 femineis remotis erectis exserte pedunculatis subinde compositis; bracteis vaginatis foliaceis culmum sæpe æquantibus, vaginis plus minus hirtis; stigmatibus 3; perigyniis oblongo-ovatis sensim rostratis, ore bifurcato, nervosis hirtis subinflatis viridibus demum rubro-purpureis, squama ovata acuta plus minus longe aristata sparse pilosa vel glabra latioribus longioribus vel arista brevioribus.—*C. hirta*, L. *Sp. Pl.*; *Light, Fl. Scot.* 568; *Good. Linn. Trans.* 2, 208; *Wahl. Act.* 152; *Eng. Bot. t.* 685; *Willd.* 311; *Selk. f.* 108; *Kunth*, 485; *Biebst.* 394; *Gaud. Agrost.* 178, et *Helv.* 128; *Bertol.* 152; *Koeh.* 888; *Reich. t.* 257; *Fl. Ross.* 319; *Anders.* 21, t. 8, f. 101; *Lange*, 143; *Gren. et Godr.* 431; *Tehihateh.* 579; *Benth.* 565; *Steud.* 235.

Variat vaginis folisque glabris, rarius perigyniis subglabris (var. *glabrata*, Fl. Ross.).

HAB. In Europa, Asia.—Britain, Denmark, Norway, Sweden, to Constantinople. Tauria, Caucasus, Baikal, Davuria, *Fl. Ross.*

*Rhizoma* cylindricum, squamosum, longe repens. *Culmus* 7–15-pollicaris, lævis, apice inter spiculas scaber, foliatus; pars spicigera 4–12 poll. longa. *Folia* plana, 1–3 lin. lata, subtus præcipue vaginæque ad faucem dense pilosæ. *Bractea* foliaceæ, elongatæ, vaginata. *Spicula masculæ* e femineis remotæ, alternatim contiguæ, sessiles; suprema sæpe pollicaris; infima nunc subremota, bracteata; *femineæ*  $\frac{1}{2}$ –2 pollices longæ, 3–4 lin. latæ; inferiores longe exserte pedunculatæ, sæpe compositæ, distantes. *Squamæ masculæ* apice dense pilosæ, purpureæ, margine hyalinæ, ciliatæ, obtusæ vel abrupte apiculatæ, vel acutæ, mucronatæ; *femineæ* plus minus longe aristatæ, sparse pilosæ vel glabræ. *Perigynium* 3–3½ lin. longum, 1–1 $\frac{2}{10}$  lin. latum. *Achenium* 1 $\frac{3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, ovale vel obovatum, triquetrum, angulus centralis posticus, pallidum, basi styli apiculatum.

Goodenough, in a note in the appendix to his paper says, “*planta in aquis variat vaginis glabris.*” The degree of smoothness is very variable. All the parts, except the culm and sometimes the female squamæ, but especially the under surface of the leaves, the apex of the vaginæ of the leaves, and of the male squamæ, are hairy. In the *Fl. Ross.* a variety is noticed from Turcz. Davuria with nearly smooth perigynia. I have 2 specimens from him, sent to me by M. Fischer, on which the upper part of the perigynium is slightly pilose. The degree of composition in the spiculæ is variable, sometimes, as in Schkuhr’s admirable figure, all the female are compound, or the lower one only partially so, these accessory spiculæ issuing from a modified perigynium.

I find in 32 specimens:—

|                  |                |                  |
|------------------|----------------|------------------|
| 8 with 4 spikes. | 9 with 2 male. | 3 with 1 female. |
| 16 „ 5           | 19 „ 3         | 20 „ 2           |
| 5 „ 6            | 3 „ 4          | 8 „ 3            |
| 3 „ 7            | 1 „ 5          | 1 „ 4            |
| —                | —              | —                |
| 32               | 32             | 32               |

A *C. Houghtonii*, Tor., differt spicis femineis remotis vaginatis, perigyniis longioribus alte bicuspidatis, squamis (longe aristatis) foliis (mollibus) vaginisque pilosis.

The specimens figured are:—

Tab. , specimens from Germany, with creeping rhizome, partially pilose.

2 spikes, more pilose, England.

Tab. , varieties:—

- n. 1. Denmark, *Wahl.*, with long squamæ.
- n. 2. Copgrove, branched spiculæ, *Schk. f. B. u. u.*
- n. 3. Terminal spiculæ male at base, England.

502. *C. holostoma* (Drejer); spicis 3 glaucescenti-purpureis, mascula abbreviata sæpe inconspicua vel obsoleta sessili, femineis 2 oblongis gracilibus erectis contiguis breviter pedunculatis masculam superantibus; bractea auriculata spicam sæpe superante; stigmatibus 3 brevibus; perigyniis (*immaturis*) obovatis (“subgloboso-ovalibus,” *Drejer*) obtusis minime aut vix rostellatis, ore integro, glaucescentibus superne purpureo-tinctis obscure nervatis tenuissime granulatis glabris, squama late ovata obtusa vel subacuta purpurea, nervo concolori extra apicem sæpe producto, longioribus.—*C. holostoma*, *Drejer, Rev.* 29; *Lange*, 87.

HAB. In Grœnlandia, *Vahl.*

*Radix* stolonifera. *Culmus* 4–8-pollicaris, erectus, triquetter, scaber. *Folia* 1–1½ lin. lata, culmo breviora. *Bractea*

auriculata, auriculis amplis purpureis sæpe amplectentibus. *Spica mascula* sessilis, 2 lin. longa, squamis longioribus sæpe ferrugineis. *Spicæ femineæ* 3–5 lin. longæ, 1½ lin. latæ, nonnunquam æquialtæ, semper masculam superantes. *Squamæ femineæ* superiores subacutæ, nervoque paulo exserto. *Perigynium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum. *Achenium* immaturum.

I have only seen Greenland specimens of this plant, sent to me by Vahl in 1842. Drejer quotes the *C. alpina*,  $\beta$ . *infer-alpina*, of Wahlenberg, as a synonym, though he does not appear to have seen it. But Andersson, *Cyp. Scand.* 39, says, “*C. holostoma*, Drejer, in terris nostris nondum observata.” Lange is in doubt whether the Lapland plant is the same. I have not seen any specimen of Wahlenberg’s variety of *C. alpina*, which, he says, has often a terminal male spike; and Andersson, under Wahlenberg’s variety, has a subvariety, “*heterostachya*; spica terminali mascula.” The immature perigynia on my specimens of *C. holostoma* prevent any satisfactory comparison of them with *C. alpina*. I have never seen *C. alpina* with a male spike, and should infer that such a form was rare in the north of Europe. Neither Wahlenberg nor Andersson afford any evidence as to its inflorescence being peculiar. In the *Fl. Rossica*, *C. holostoma* is made to be the same as the *C. aterrima* of Hoppe, and with that plant considered as a var.  $\beta$  of *C. atrata*.

503. *C. incurva* (Lightfoot); spica ovata vel subrotunda vel triquetra capitata flavida demum fusco-ferruginea, e spiculis sub 6 apice masculis densifloris; bractea squamæformi cuspidata; stigmatibus 2; perigyniis turgide ovatis vel ovalibus inflatis membranaceis divergentibus rostratis, ore hyalino obliquo, stipitatis marginibus obtusis lævibus vel superne parce scabriusculis enerviis vel obscure rarius plano-nervatis flavidis superne vel demum omnino fuscis, squama ovata obtusa vel acuta fusca margine hyalina longioribus.—*C. incurva*, *Light. Fl. Scot.* 544, t. 24, f. 1; *Good.* 152; *Eng. Bot.* t. 927; *Smith, Eng. Fl.* 85; *Retz, Prodr. ed.* 2, 217; *Wahl. Act.* 141, et *Lap.* 425; *Willd.* 217; *Schk. f.* 95; *Kunth*, 375; *Koeh*, 864; *Drejer, Rev.* 22; *Anders.* 70, t. 3, f. 12; *Lange*, 26; *Reich. t.* 199; *Bertol.* 43; *Fl. Ross.* 269; *Steud.* 187. *C. juncifolia*, *Allioni, Ped.* 264, t. 92, f. 4; *Gaud. Agrost.* 85, et *Helv.* 39. *C. amphilogos*, *Koch in Linnæa (fide Fl. Ross.)*. *C. capitata*,  $\beta$ . *maritima*, *Retz, Prodr. ed.* 1. *C. maritima*, *Gunn, Fl. Norv.* *C. arenaria*, *Mohr.* *C. stenophylla*, *Thien. Reise in Isl.* *C. melanocystis*, *Desv. Fl. Chil.* *C. psammogæa*, *Steud.* 187; *Lechler, n.* 1134 a.

HAB. In Europa, Asia, America septentrionali et meridionali; in arenosis maritimis et apinis.—Iceland. Lapland, Færo to Switzerland. Behring’s Straits, *Wright.* Afghanistan, *Griffith, n.* 89. Himalaya occid. et Tibetia temp. et alpina, 12–16,000 ft. Kunawur, *Jaquemont.* Nubra, Kishtwar, Ladak, Zanskar, *Thomson, Hooker, Royle.* Greenland, *Vahl.* Arctic America: Bear Lake, *Richardson.* Minto Inlet, *Andersson, Voy. Enterprise*, 1852. Rocky Mountains, *Drummond, Bourgeau.* Straits of Magellan, *Lechler.* Chili, *Gay.*

*Rhizoma* sublignosum, longe repens, radicibus capillaceis aurantiacis copiosissimis implexis. *Culmus* incurvus,  $\frac{1}{2}$ –3-pollicaris, subtus lævis, vel in albis 6–8 poll. rectus, apice angulatus. *Folia* filiformi-canaliculata, plus minus curvata, lævia vel superne scabriuscula, culmo longiora vel breviora. *Bractea* spica brevior. *Spica* 3–6 lin. longa et lata. *Perigynium* (cum stipite  $\frac{2}{10}$ – $\frac{4}{10}$  lin. longo) 2–2½ lin. longum,  $\frac{8}{10}$ – $\frac{1}{10}$

latum, ovatum vel ellipticum, obscure basi nervatum, vel enerve; vel in speciminibus e montibus Saxosis (ellipticum,  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum) plane nervatum. *Achenium*  $\frac{8}{10}$ —1 lin. longum,  $\frac{7}{10}$ — $\frac{8}{10}$  lin. latum, orbiculatum, basi productum, lenticulare ferrugineum, basi styli æquali.—In speciminibus e mont. Saxosis  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale.

This species, first observed in Scotland, is widely diffused, nor does it differ in habit in its various localities,—the typical form, as found in maritime sandy shores, and the erect taller form from higher altitudes, being observable in all. But in the Rocky Mountains, while the habit is typical, the perigynium is not inflated, and is regularly nerved. In Europe, Greenland, India, and South America, the perigynium is inflated, and in the dried state lies loosely in folds over the achenium. The leaves are commonly involute, occasionally at base plane, from  $\frac{1}{2}$  to 1 lin. broad. In the 'Flora Rossica' the *C. Curvica* of Kunth is referred to it, but I have preferred to give a distinct description and figure of that plant. I have authentic specimens of both the South American plants, which are undistinguishable from *C. incurva*.

Tab.

- n. 1. Specimens from Scotland.
- n. 2. From Norway.

Tab.

- n. 1. Specimens from India.
- n. 2. Arctic America: Bear Lake.
- n. 3. Rocky Mountains.
- n. 4. The "*C. psammogæa*, Steud.," from the Straits of Magellan.

504. *C. lepida* (Boott); spica oblonga pallida, e spiculis 4 apice masculis contiguis extremis oblongis, infima discreta pedunculata longe bracteata; stigmatibus 2 brevibus; perigyniis ovalibus rostellatis, ore emarginato, plano-convexis enerviis glabris tenuissime membranaceis lucidis appressis pallide viridibus, squama ovata obtusa cuspidata alba, nervo viridi, latioribus longioribus.

HAB. In America meridionali.—In the forest on the western side of Pichincha, 10,000 ft., Jameson, 881 (*Herb. Hooker*).

Stolonifera. *Culmus* subpedalis, filiformis, lævis, basi foliatus. *Folia* 2 lin. lata, plana, culmo longiora, læte viridia. *Bractea* 3; infima  $1\frac{1}{2}$  lin. lata, 4 poll. longa; proxima pollicaris, altera spicula longior. *Spica* 13 lin. longa. *Spicula* extremæ 4–5 lin. longæ, 2 lin. latæ; infima 6 lin. remota, pedunculata. *Pedunculus* 3 lin. longus. *Squamæ masculæ* pauciores, acutæ, muticæ. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovale, lenticulare, pallidum, basi styli incrassata apiculatum. *Rachæola* linearis, sub lineam longa.

The only specimen I have seen is in Herb. Hooker. The delicate, nerveless, light green perigynium is like that of *C. divulsa*; but the bracts and short stigmata essentially differ from it.

505. *C. ligata* (Boott); spica subinde subelongata pallida, e spiculis 3–4 gracilibus cylindricis pedunculatis erectis remotis, terminali mascula lineari angusta elongata, reliquis femineis brevioribus laxifloris inserte vel exserte pedunculatis; bracteis vaginatis setaceis brevibus, vaginis basi purpurcis tumidulis; stigmatibus 3; perigyniis (in achenio notabili arcte fuis) oblongo-ovatis infra mediam transverse tumidis basi cuneatis subito (supra achenium) in rostro tenui margine scabro contractis, ore bidentato albido, parce puberulis nervatis membranaceis pallide viridibus, squama lanceolata obtusa vel acuta mutica alba, nervo viridi, paulo latioribus longioribus.—*C. ligata*, Boott in Benth. Fl. Hongkong. 402.

HAB. In China.—Hongkong, *Herb. Bentham*; Wright, Ringgold and Rodgers's *Exp.* (*Herb. Gray*).

Cæspitosa. *Culmi* plures, subpedales, capillacei, debiles, reclinati, basi foliati; pars spicigera 3–7 poll. longa. *Folia culmea* brevia, angusta; *sterilia* 2–2½ lin. lata, culmo longiora, plana, scabrida. *Bractea* vaginata, setacea, spiculis suis breviores. *Vaginæ* basi tumidulæ, purpureæ; infima 3–8 lin. longa. *Pedunculi* scabri. *Spicula mascula* 15–22 lin. longa,  $\frac{6}{10}$  lin. lata; *femineæ* 9–12 lin. longæ, 2 lin. latæ, a se 1–3 poll. remotæ. *Squamæ masculæ* arcte imbricatæ, obtusissimæ, muticæ, pallide fulvæ, medio viridi, margine late albo-hyalinæ, ciliolatæ. *Perigynium*  $1\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, figuram achenii exacte referens. *Achenium* conforme,  $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, triquetrum, infra mediam transverse tumidum, faciebus aliter concaviusculis, nigro-purpureum, angulis pallidis, tuberculis minimis albis conspersum, apice insigniter annulatum vel pocilliforme, rima basin styli discoideam cingente.

506. *C. macrostachys* (Bertoloni); spica brevi pallide fulva, e spiculis 3 approximatis pedunculatis erectis, terminali mascula tenui cylindrica, reliquis femineis oblongis sublaxifloris exserte pedunculatis; bracteis vaginatis, infima culmum subæquante; stigmatibus 3; perigyniis ellipticis basi productis cylindrico-rostratis, ore hyalino obliquo, obtuse triquetris valide nervosis superne pilis appressis asperatis, marginibus scabris pallidis, rostro castaneo tincto, squama oblonga truncata emarginata mucronata fulva margine angusta hyalina latioribus longioribus.—*C. macrostachys*, Bertoloni, *Amæn. Ital.* 421; *Misc. Bot.* 14, p. 20, t. 2; *Fl. Ital.* 117. *C. macrostachys*, Spr. 824; *Kunth*, 521; *Steud.* 217. *C. cœlopleura*, Drejer, *mss.* (in *Herb. Schouw*).

HAB. In Europa.—In alpibus Apuanis, mont. Sagro et Tambura.

*Culmus* pedalis, gracilis, lævis, obtusangulus, nudus, basi foliis 4 brevibus tectus; pars spicigera 3 poll. longa. *Folia* sub lineam lata; *culmeum* supremum 2½ poll. longum; *sterilia* culmum subæquantia vel eo breviora. *Bractea* vaginata, spiculas superantes; infima fere culmum æquans. *Vaginæ* 2–5 lin. longæ. *Pedunculi* 3–8 lin. longi. *Spicula mascula* 1–1½ lin. longa,  $1\frac{1}{4}$  lin. lata; *femineæ* 5–7 lin. longæ, 2 lin. latæ, 5–8-floræ. *Squamæ* conformes, nervo sæpe extra apicem producto, obtusæ, sæpe emarginatæ; *masculæ* laxæ. *Perigynium*  $2\frac{6}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum.

A *C. platystachya* differt spicula mascula tenui subelongata, femineis exserte pedunculatis subremotis; squamis laxis angustioribus minus hyalinis fulvis; perigyniis obtuse triquetris basi magis productis plurinerviis minus pilosis; foliis angustis.

I have only seen one specimen of this plant in Herb. Tuckerman, given to him by Schouw, with the name provisionally applied to it by Drejer. It is singular that Bertoloni should ally it to the *Ferrugineæ*, "media inter *C. tenuem*, Host, et *C. Scopoliæ*, Gaudin," and yet not refer *C. platystachya* to the same group, as the affinity of the two is so evident.

507. *C. melanantha* (Meyer); spicis oblongis congestis sessilibus erectis atro-purpureis concoloribus, terminali (sæpe apice sterili) basi mascula, reliquis femineis, infima subinde paulo remota breve pedunculata; bractea infima evaginata, culmo breviora; stigmatibus 3; perigyniis subrotundo-ovalibus vel obovatis turgidis vel ellipticis compressis brevissime rostellatis, ore integro

vel denticulato, enerviis vel obscure nervatis flavidis apice purpureis granulatis, squama ovata acuta vel obtusa fusco-purpurea superne ad margines albo-hyalina angustioribus brevioribus.—*C. melanantha*, *Mey. Led. Fl. Alt.* 4, 216, t. 317; *Kunth*, 432.

HAB. In Asia.—Altai, *Ledebour*. Mongolia, *Turcz.* Tibet, *Strachey et Winterbottom*. Afghanistan, *Griffith* (*Herb. Hooker*).

*Radix* repens. *Culmus* 6–15-pollicaris, strictus, scaber, basi foliatus. *Folia* 1½–3 lin. lata, culmum æquantia vel eo breviora, plana. *Bractea* infima culmo brevior, auriculata, evaginata, auriculis atro-purpureis; superiores squamæformes. *Spicæ* 6–10 lin. longæ, 3–5 lin. latæ, omnes congestæ, sessiles, vel infima sub 10 lin. remota; suprema apice sterilis, “*germinibus et staminibus orbata*” (*Meyer*), basi mascula; reliquæ femineæ. *Squamæ* conformes. *Perigynium* 1¼–1½ lin. longum, 7/10–8/10 lin. latum, turgide ovale vel obovatum; vel ellipticum, 17/10–9/10 lin. longum, 8/10 lin. latum (*immaturum*), compressum, ore integro, margine albido, vel ciliato-denticulato. *Achenium* 9/10–1 lin. longum, 6/10 lin. latum, obovatum, triquetrum, punctulatum, basi styli æquali apiculatum.

A *C. Moorcroftii*, cui habitu similis, differt spicis atro-purpureis, terminali basi mascula apice sterili; perigyniis brevius rostellatis, ore integro; foliis planis mollioribus.

I have several specimens from the Altai of this species, sent to me by M. Fischer, but they are not all fully mature. The inflorescence is that of *C. Moorcroftii*, except that the terminal spike is male at base, sterile often at the summit. In one only is there apparently a terminal male spike, but this is unusually short, and the upper female portion may have been broken off, though I cannot detect any evidence of fracture. The perigynia on this specimen are elliptic and compressed, and have a ciliate mouth, contrasting with other specimens in this respect. *Meyer* describes the perigynium “subtrigonis ellipticis, ore hyalino integerrimo;” but *Kunth* says, “utriculi obovati, ore emarginato bidenticulato.”

508. *C. Mertensii* (*Prescott*); spica oblonga vel subelongata viridi demum ferrugineo-purpurea, e spiculis 4–10 basi masculis densifloris pedunculatis nutantibus approximatis vel infima plus minus remota; bracteis inferioribus foliaceis evaginatis, infima culmum superante rarius vaginata; stigmatibus 3; perigyniis tenuissimis ovalibus brevissime cylindrico-rostellatis, ore integro, enerviis pellucide demum ferrugineo-punctatis, squama oblongo-obovata vel elliptica acuta vel obtusiuscula mutica vel mucronata purpurea latioribus longioribus.—*C. Mertensii*, *Presc. ap. Bongard, Mem. Acad. St. Petersb.* 6, ser. 2, 168; *Hook. Fl. Bor. Amer. t.* 217; *Dewey*, 30, 62; *Tor. Cyp.* 406; *Fl. Ross.* 287; *Boott, Linn. Trans.* 20, 119; *Stued.* 203.

HAB. In America septentrionali et Asia.—North-west coast, *Mcnzies*, *Scouler*, *Barclay*. Sitcha, *Bongard*. Cascade Mountains, *Lyall* (*Herb. Hooker*). Unalashka, Caucasus, *Fl. Ross.*

*Radix* fibris longis lanatis flavidis. *Culmus* 2–3½-pedalis, acute triquetra, scaber, basi foliatus; pars spicigera plerumque 5–9 poll. longa. *Folia* 3–3½ lin. lata, culmo breviora, glaucoviridia; *sterilia* culmum superantia. *Bracteæ* evaginatae, nisi rarius infima remota, vagina semipollicari instructa; superiores spiculis breviores. *Pedunculi* filiformes, infimus 2–3 poll. longus. *Spiculæ* 9–22 lin. longæ, 2½–4 lin. latæ, omnes (summa magis conspicue) basi masculæ, rarius summa om-

nino vel apice et basi mascula, omnes alternatim contiguæ, vel infima plus minus rarius longe remota. *Perigynium* 17/10–2 lin. longum, 9/10–1 2/10 lin. latum, vel 2 6/10–8/10 lin. longum, 1 2/10–6/10 lin. latum, hyalino-tenuissimum, nervis 2 marginalibus (intra margines sitis) percursum. *Achenium* longe stipitatum (stipite 7/10–8/10 lin. longo), 7/10–1 lin. longum, 4/10 lin. latum, triquetrum, ellipticum, pallidum, basi styli apiculatum. *Stigmata* 3.

*Prescott* describes this species as having two stigmas, but in specimens from Sitcha and other localities I find always three. *Lyall's* specimens from “the stream flowing into *Chilukweyuk Lake*” have broader spiculæ and larger perigynia than those from Sitcha and the coast; but there is an insensible gradation as to size in the specimens I have seen, several of *Lyall's* in no respect differing from the typical form. In some of his specimens the perigynia were morbidly elongated (4–5 lin. longa, 9/10 lin. lata), with abortive achenia. The specimen figured is one of *Lyall's* from the stream alluded to, and may be contrasted with the figure in *Fl. Bor. Amer.*, which represents the coast form. The affinity is with *C. Banksii*, B.

509. *C. Meyeriana* (*Kunth*); spica abbreviata glaucopurpurea, e spiculis 2–3 contiguis, terminali mascula cylindrica, reliquis femineis subrotundis densifloris sessilibus vel summa ima basi mascula; bractea infima spiculam nunc superante; stigmatibus 3 vel 2; perigyniis ellipticis plano-subtriquetris vel suborbiculatis compressis rostellatis, ore integro, glaucis nervatis tenuissime granulatis glabris, squama ovato-lanceolata acuta vel obtusa purpurea margine hyalina latioribus longioribus vel æquantibus.—*C. Meyeriana*, *Kunth*, 438; *Fl. Ross.* 304; *Stued.* 217. *C. asperula*, *Turcz. Cat. Baikal.* 1239.

HAB. In Asia.—Baikal, Irkutsk.

*Culmus* 1–1½-pedalis, gracillimus, debilis, lævis. *Folia* ad basin culmi angustissima, involuta, biuncialia. *Bractea* 6 lin. longa, setacea. *Ligula* purpurea, amplectens; suprema mutica. *Spica* 10–12 lin. longa. *Spicula mascula* 7 lin. longa, sub lineam lata, sessilis vel breve pedunculata; *femineæ* 3–5 lin. longæ, 2–3 lin. latæ, in uno specimine summa ima basi masculæ. *Squamæ* conformes; masculæ obtusæ. *Perigynium* 1 2/10–8/10 lin. longum, 7/10–1 1/10 lin. latum, glaucum, plus minus nervatum, nervis concoloribus (sub lente) ferrugineo-punctatum. *Achenium* 9/10 lin. longum, 7/10 lin. latum, inæqualiter triquetrum, obtusum, basi productum, basi styli æquali apiculatum, fulvum. *Stigmata* 3 vel 2. *Stylus* exsertus.

The affinity is, I think, with the *Limosa*. In the *Fl. Rossica* the stigmas are said to be rarely 2, generally 3. I observe both numbers, but the only mature achenium I have found is triquetrous.

Tab. \_\_\_\_\_, specimens from Irkutsk, sent to me by M. Fischer as the *C. asperula*, *Turcz.*

510. *C. montana* (*Linn.*); spica brevissima atro-purpurea, e spiculis 2–3 congestis sessilibus, terminali mascula oblonga, reliquis 1–2 parvis subrotundis; bracteis squamæformibus evaginatis brachyphyllis; stigmatibus 3; perigyniis oblongo-obovatis trigonis rostellatis, ore emarginato ciliato, pilosis nervatis basi spongiosis pallidis, squama oblonga obtusa vel emarginata mutica vel mucronata fusco-purpurea ciliata angustioribus longioribus.—*C. montana*, *Linn. Fl. Suec. Ed.* 2 (1755), *Sp. Pl.* 1385 (1763); *Wahl. Act.* 159; *Vill. Dauph.* 211; *Gaud. Agr.* 129, et *Helv.* 6, 76; *Schk. n.* 45, f. 29; *Koch*, 876; *Hoppe, Ic.* 65; *Lange*, 107; *Reich.* 26,



t. 261; *Anders.* 29, t. 7, f. 85; *Fl. Ross.* 301; *Gren. et Godr.* 415; *Eng. Bot. Suppl.* t. 2924; *Benth.* 564. *C. collina*, *Willd.* 260; *Kunth*, 437; *Bertol.* 83; *Steud.* 217. *C. globularis*, *Willd. Aet. Berol.* t. 2, f. 1. *C. emarginata*, *Willd. Schk. f.* 153; *Kunth*, 437. *C. pubescens*, *Gaud. Etr. Gilib.* (*fide Fl. Ross.*). *C. conglobata*, *Allioni, fide Gaudin.*

HAB. In Europa, Asia.—Norway, Sweden to Italy. Britain. Ural.

*Rhizoma* lignosum, ramosum, reliquis foliorum marcidis undique tectum, radices tortuosas emittens. *Culmus* 6–12 pollices longus, apice triqueter, scaber, gracilis, debilis, demum recliuatus, basi foliatus, vaginisque foliorum rubellis reticulato-fibrillosis tectus; pars spicigera 5–9 lin. longa. *Folia sterilia* sub lineam lata, culmo breviora, mollia; *novella* sæpe ad faciem pilosa; *annotina* elongata, persistentia; *culmea* brevia, angusta. *Bractea* evaginata; infima sæpe spicula brevior. *Spicula mascula* 6–8 lin. longa, 1–1½ lin. lata, oblongo-elliptica, sessilis vel breve pedunculata; *femineæ* 3–4 lin. latae, 2½ lin. latae, sessiles, arcte contiguæ. *Squamæ* omnes ciliatæ, concolores, atro-purpureæ vel ferrugineæ, obtusæ, sæpe truncatæ, vel emarginatæ, mucronatæ, plus minus ciliatæ; *masculæ* imbricatæ, subinde acuminato-apiculatæ. *Perigynium* 1½–2 lin. longum, ⅓ lin. latum, oblongo-trigonum, basi crasse spongiosum, demum pyriforme, superne fuscum. *Achenium* conforme, cum stipite albo ⅓ lin. longo, 1½ lin. longum, ⅓ lin. latum, triquetrum; basi styli *decidua* incrassata.

There is no specimen of *C. pilulifera* in Herb. Linn., the one under that name, from Solander, Lapland, “ad *C. Vahlîi*, Auct., maxime accedit, vel etiam, licet habitus sit paulo diversus, pertinet.” (*Hartman, Annot. de Pl. Scand. Herb. Linn. p.* 158.) The specimen of *C. montana* in the Herbarium, Sir James Smith mistook for *C. pilulifera*, and in his Eng. Flora he quotes it as a synonym to that plant. Hartman has corrected this error, recognizing the *C. montana* (Herb. Linn.) as the plant admitted on all hands to be that of the Fl. Suec. The description of Linnæus, both in the Fl. Suec. and the Sp. Pl. 1385, can alone apply to it. It would seem, however, that Linnæus had not seen any specimen of *C. pilulifera*. It is not included in his Fl. Suecica, nor does he give any character of it of his own in the Sp. Plant., merely quoting that of Van Rayen and Plukenet. De Candolle, however, in his Bibl. Botanica, intimates that Linnæus was the author of Van Rayen’s work, and if so, the character given of *C. pilulifera* may be ascribed to him. But his not having preserved a specimen in his Herbarium might lead to a doubt. Hartman, p. 157, in alluding to the specimen of *C. montana*, Herb. Linn., which name he says is in Linnæus’s own handwriting, adds, “Nisi notissimum haberem atque mihi persuasissimum, Herbarium Linnæi semper summa fuisse religione conservatum, facile crederem Smith et Goodenough, qui specimen hujus nominis in Herbario ad *C. piluliferam* nec ad *C. montanam* veram pertinere docuerint, vix præsens specimen ante oculos vel in mente habuisse, sed aliud potius, nunc temporis deficiens. Ex hac enim planta ne minime quidem causa afferri potest, cur a forma *C. montanæ* solita distinguatur, aliorumne referatur.”

I have alluded to this error of Smith to vindicate Linnæus, who is said (Eng. Fl. 113) to have adopted *C. pilulifera* from Plukenet’s figure alone (which is in fact probable) and to have described at the same time a specimen of the same by the name of *C. montana*.

This species was first discovered in England in 1846, near Tunbridge Wells. I do not find any allusion to the hairs on the leaves by authors, with the exception of Koch. Gaudin says the female spiculæ are “1–3, infima quandoque distans, rarius brevissime pedunculata.” I have never observed more than 2, and always sessile and contiguous.

511. *C. mucronata* (Allioni); spica brevi fusco-purpurea, e spiculis 2–4 congestis, terminali mascula oblonga sæpe brevi pedunculata obliqua, reliquis femineis sessilibus parvis ovatis paucifloris, infima subinde paulo remota; bractea amplectente spicam sæpe superante; stigmatibus 2 longis; perigyniis lanceolatis rostratis, ore hyalino bidentato antice oblique secto, plano-convexis, crebre valideque nervosis undique pilosis castaneis rostro marginibusque superne acutis scabris pallidis, squama ovata obtusa vel lanceolata acuta purpurea, nervo viridi, longioribus.—*C. mucronata*, *Allioni, Ped.* 268 (1785); *Wahl. Aet.* 146; *Willd.* 264; *Schk. f.* 44; *Kunth*, 409; *Gaud. Agr.* 117, et *Helv.* 68; *Koch*, 871; *Hoppe, Ic.* 39; *Lange*, 62; *Reich.* 5, t. 201; *Fl. Ross.* 308; *Bertol.* 95; *Steud.* 209. *C. juncifolia*, *Gmelin.* *C. gracilis*, *Honk.* *C. setacea*, *Froel.* *C. bracteata*, *Suter.* *C. nitida*, *Hoppe.*

HAB. In Europa et Asia.—Alps of France, Germany, Switzerland, Caucasus, Baikal.

Dense cæspitosa. *Culmi* setacei, ½–1-pedales, læves vel apice scabri, superne obtuse trigoni, basi foliati, sæpe apice curvati; pars spicigera 5–12 lin. longa. *Folia* eximie involuta, setacea, rigida, marginibus scabra, sæpe tortuosa, culmo breviora. *Bractea* infima vel cuspidata, brevi vel spicam superans, basi amplectens. *Spicula mascula* 4–7 lin. longa, ½–1½ lin. lata, plerumque breve pedunculata, sæpe obliqua; *femineæ* 2–4 lin. longæ, 2 lin. latae, 1–3 sessiles, congestæ, vel infima subremota. *Squamæ masculæ* obtusæ, margine hyalinæ; *femineæ* ovatæ, obtusæ, vel lanceolatæ, acutæ. *Perigynium* 2½–6 lin. longum, ⅓ lin. latum, nervis validis vel demum minus conspicuis, undique piloso-scabrum, marginibus acutis pallidis. *Achenium* 1½ lin. longum, ⅓ lin. latum, oblongo-ellipticum; plano-convexum, castaneum, basi styli clavata apiculatum. *Racheola* interdum forma squamæ adest ex ore perigynii projecta.

Drejer, Symb. p. 10, I think correctly allies this species to the *Ferrugineæ*.

512. *C. nardina* (Fries); spica simplici apice mascula ovali vel ovata pauci-densiflora purpureo-ferruginea; stigmatibus 2; perigyniis ovalibus utrinque acutis rostellatis, ore hyalino emarginato, plano-convexis superne margine serratis nervatis erectis membranaceis ferrugineis, squama ovata obtusa purpurea margine late albo-hyalina, nervo pallido, longioribus.—*C. nardina*, *Fries, Mant.* 2, 55, et 3, 134; *Summa*, 222; *Drejer, Rev.* 18; *Andersson*, 72, t. 3, f. 5; *Lange*, 20; *Kunze*, 94, t. 23, f. 2; *Fl. Ross.* 267; *Steud.* 184. *C. Hepburnii*, *Boott, Fl. Bor. Amer.* 209, t. 207.

HAB. In Europa, Asia, America septentrionali.—Lapland, Finmark, Norway. Kamtchatka, *Wright (Herb. Gray)*. Greenland, *Vahl.* Rocky Mountains, *Drummond (Lyall)*. Cascade Mountains, Oregon, *Lyall (Herb. Hooker)*.

Densissime cæspitosa. *Radix* fibrosa. *Culmus* 1–6-poll., filiformis, teres, lævis, strictus vel curvatus, basi foliatus, vaginisque striatis fulvo-ferrugineis arcte tectus. *Folia* plurima, fasciculato-cæspitosa, “*cæspites Nardi strictæ bene referentia*” (Fries), capillacea, rigida, sæpe curvata, culmo longiora. *Spica* 2–5 lin. longa, 1½–2 lin. lata, ut monet Drejerus, “ad dioicam vergit, quum flores masculi aut paucissimi sunt ita ut

vix conspicantur aut numero flores feminos fere æquant." *Squama* infima subinde cuspidata. *Perigynium*  $1\frac{4}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $1$ – $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, plano-convexiusculum, pallide ferrugineum, stipitatum, basi styli crassiore apiculatum. *Racheola* linearis, achenio brevior, scabra, antice sita adest.

The American plant is often larger than the European one. The racheola, though figured in the Fl. Bor. Americana, is not noticed by authors. The remarkable cæspitose mode of growth, with its profusion of capillary leaves, at once distinguishes this species.

513. *C. Norvegica* (Wahlenberg); spica oblonga fulvo-brunnea, e spiculis 3–6 rarius 7 oblongis turgidis, terminali longiore basi attenuata (rarius omnino) mascula, reliquis femineis vel ima basi parce masculis contiguis vel approximatis, infima subinde subradicali longe exserte pedunculata; bractea squamæformi rarius elongata; stigmatibus 2; perigyniis suborbiculatis vel ovalibus conico-rostellatis, ore subintegro, antice magis convexis nervatis glabris vel superne ad margines denticulatis tenuissime granulatis coriaceis, squama late ovata vel subrotunda obtusa obvolvete brunnescente medio margineque fulva longioribus vel subæquantibus.—*C. Norvegica*, *Wahl. Act.* 146, et *Fl. Lap.* 233, t. 15, f. 3; *Willd.* 227; *Schk. f.* 66; *Kunth*, 393; *Fries, Sum.*, 223; *Anders.* 61, t. 4, f. 29; *Lange*, 56; *Fl. Ross.* 280; *Steud.* 197.

HAB. In Europa, America septentrionali ad littora limosa maris.—Lapland to Sweden. Arctic America, Kotzebue Sound. Sitcha (*Fl. Ross.*). Wells, Maine, United States, America, *Blake* (1858).

Cæspitosa, stolonifera. *Culmus* 6–14-pollicaris, triqueter, acutangulus, lævis vel apice scabriusculus, modo subvalidus, erectus, vel debilis et demum in altioribus reclinatus. *Folia*  $\frac{1}{2}$ –1 lin. lata, plana, mollia, culmo breviora. *Bractea* sæpius spicula brevior, quandoque subradicalis, foliacea. *Spica*  $1$ – $1\frac{1}{2}$  poll. longa, 3–4 lin. lata, et ut tota planta demum flavescens; *spicula* terminalis 6–8 lin. longa, basi sæpe elongato-cuneata mascula, vel oblonga omnino mascula; inferiores 6 lin. longæ, 2–3 lin. latæ, subinde mediæ minores; infima rarius subradicalis, pollicaris, nunc basi composita, pedunculo exserto 3–5 pollices longo bracteaque foliacea suffulta. *Squamæ* obtusæ, vel superiores subacutæ. *Perigynium*  $1\frac{4}{10}$ – $\frac{5}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, convexiusculo-convexum, pallidum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovale, lenticulare, basi styli abrupte apiculatum, ferrugineum.

Affinis *C. canescenti* et *C. glareosa*, differt spiculis turgidis; perigyniis coriaceis; foliis brevioribus mollibus, colore fulvo-brunnea.

Drejer has not inserted this species among the plants of Iceland or Greenland. Its southern limit in Europe is Gottenburg, where it was first observed by Tuckerman, in June, 1842. Mr. Blake discovered in a salt-marsh at Wells, Maine, in 1858.

Tab.

- n. 1. Specimens from Gottenburg, *Tuckerman*.
- n. 2. Wells, Maine, U. S. A., *Blake*.

514. *C. paludosa* (Goodenough); spica elongata fusca, e spiculis 3–8 cylindricis densifloris erectis, masculis 1–5 contiguis sessilibus, femineis 2–6 alternatim approximatis sessilibus superioribus sæpe apice masculis, inferioribus subinde pedunculatis rarius basi compositis; bracteis

foliaceis omnibus nisi rarius infima (culmum superante) evaginatis; stigmatibus 3 rarius 2; perigyniis late ovalibus vel ovatis *subabrupte* vel elliptico-lanceolatis *sensim* rostratis stipitatis, ore bidentato, utrinque costato-nervis apice sæpe parce ad margines dentatis compressis fuscolivaceis demum ferrugineo-punctatis, superne granulato-asperulis, rostro albido vel purpureo, membranaceis subinde excurvis, squama lanceolata acuminata sæpe truncata cuspidata vel aristata latioribus longioribus vel arista brevioribus.—*C. paludosa*, *Good. Linn. Trans.* 2, 202; *Wahl. Act.* 163, et *Suec.* 611; *Willd.* 305; *Schk. f.* 103; *Kunth*, 487; *Eng. Bot. t.* 807; *Eng. Fl.* 120; *Gaud. Agr.* 182, et *Helv.* 6, 129; *Biebst.* 393; *Koeh.* 887; *Fries, Mant.* 3, 143; *Anders.* 17, t. 8, f. 109; *Lange*, 139; *Reich.* 28, t. 266; *Bertol.* 139; *Fl. Ross.* 315; *Gren. et Godr.* 429; *Steud.* 236; *Tchihatch.* 579. *C. acuta*, *Curtis, Fl. Lond. t.* 61. *C. acutiformis*, *Ehrh. Cal.* *C. rigens*, *Thuill. Par.* 488. *C. rufa*, *Lam. Enc.* 3, 324; *Gaud. Etr.* *C. palustris*, *Sut. Helv.* 261. *C. riparia*, *Geners (fide Wahl.)*. *C. Kochiana*, *Dee. Hort. Monsp. Reich.* 29, t. 271; *Gussone, Fl. Sic.* 576. *C. spadicea*, *Roth.* *C. intermedia*, *Suter*.

HAB. In Europa, Asia, America septentrionali et meridiana, Africa?—Norway to Sicily, Constantinople. Tauria, Caucasus. Himalaya occid. temp., Kashmir, *Royle, Thomson*. Brazil (*fide Nees*). Cape of Good Hope?, *Nees*. Sitcha.

*Radix* repens. *Culmus*  $1$ – $2\frac{1}{2}$ -pedalis, validus, acute triqueter, scaberrimus, basi foliatus; pars spicigera 5–14 pollices longa. *Folia* 1–4 lin. lata, culmo breviora vel longiora, vaginis longis purpureis reticulato-fissis. *Bractea* sæpius evaginata, vel infima amplectens, rarius remota vagina  $1\frac{1}{2}$  poll. instructa. *Pedunculus* infimus  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longus. *Spicula mascula* 1–2 pollices longæ, 2–3 lin. latæ; *femineæ*  $1\frac{1}{2}$ – $2\frac{1}{2}$  pollices longæ, 2–5 lin. latæ, summa vel superiores apice masculæ omnes sessiles evaginatae, vel inferiores plus minus longe pedunculatae, infima subinde 5–7 pollices remota vaginata, una alterave rarius basi composita. *Squamæ* omnes ferrugineæ; *masculæ* (typice) latiores obtusæ, muticæ; superiores angustæ, nervo excurrente; *femineæ* ellipticæ acutæ vel lanceolatae, plus minus longe cuspidatae, vel aristatae subinde truncatae vel emarginatae; semper perigynio angustiores. *Perigynium* (cum stipite  $\frac{2}{10}$ – $\frac{3}{10}$  lin. longo)  $2$ – $2\frac{3}{10}$  lin. longum,  $1$ – $1\frac{1}{10}$  lin. latum, ovale vel ovatum, subabrupte brevi cylindrico-rostratum, vel lanceolatum, sensim rostratum, rostro albido demum ferrugineo, ore bidentato, superne granulato-asperulum, ad margines sæpe parce dentatum, crebre nervosum, compressum, solum super achenium, angulo ejus centrali prominente, subtriquetrum, demum ferrugineo-punctatum, membranaceum. *Achenium*  $1$ – $1\frac{1}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, ovale, triquetrum, angulus centralis introrsus, vel lenticulare, compressum, basi styli æquali apiculatum. *Stigmata* 3, rarius 2.

*C. Kochiana* was supposed to have claims for a specific distinction, in the long aristate female squamæ, and the narrower perigynium, gradually tapering into the rostrum; but there is no constancy in either of these characters, and I cannot see that it even forms a fixed variety. The occasional occurrence of 2 stigmata, with a lenticular achenium, is observable in both forms, and the female squamæ and rostrum are variable in them.

In 48 specimens I find—

|                  |                |                   |
|------------------|----------------|-------------------|
| 2 with 3 spikes. | 5 with 1 male. | 11 with 2 female. |
| 6 „ 4            | 27 „ 2         | 25 „ 3            |
| 21 „ 5           | 13 „ 3         | 11 „ 4            |

14 with 6 spikes.    2 with 4 male.    1 with 6 female.  
 4 „ 7                    1 „ 5  
 1 „ 8

In 20 the upper female spikes, most often the uppermost male at top, rarely 1 or more compound at base.

The membranous compressed bidentate perigynium, granular at top, with the occasional 2 stigmas and lenticular achenium, certainly ally this species to *C. stricta*, Good., though its habit and inflorescence are those of *C. riparia*, with which it is generally associated.

The specimens figured are from Europe. I have never seen any specimens from South America or the Cape of Good Hope.

515. *C. pedata* (Wahlenberg); spica abbreviata purpureo-albida, e spiculis 2-4 parvis sparsi-paucifloris alternatim contiguis, terminali mascula ovali, reliquis femineis, infima exserte pedunculata; bractea breve vaginata spiculam sæpe superante; stigmatibus 3; perigyniis obovatis vel subrotundis abrupte rostratis, ore hyalino emarginato, obtuse trigonis enerviis membranaceis, squama ovata obtusa purpurea margine hyalina subæquilata longioribus.—*C. pedata*, *Wahl. Fl. Lap.* 239, t. 14; *Willd.* 255; *Schk. p.* 57; *Kunth*, 475; *Drejer, Rev.* 55; *Reich. t.* 240; *Fries, Sum.* 236; *Anders.* 27, t. 7, f. 89; *Lange*, 100; *Fl. Ross.* 292; *Steud.* 232.

HAB. In Europa, Asia, et America septentrionali.—Lapland, Finmark, Norway, Sweden. Altai, and Bay of St. Lawrence, *Fl. Ross.* Greenland, *Vahl.*

Dense cæspitosa. *Radix* fibrosa. *Culmus* 2-5-pollicaris, obtusangulus, lævis, basi foliosus, vaginis foliorum purpureis tectus. *Folia*  $\frac{1}{2}$ - $\frac{3}{4}$  lin. lata, culmo breviora, apice attenuata, curvata, rigida, copiosa. *Bractea* vaginata vel amplexans, cuspidata; spica sæpe spicula brevior. *Spica* 5-12 lin. longa,  $1\frac{1}{2}$  lin. lata. *Spiculæ* 2-4 lin. longæ; *femineæ* 2-5-floræ; rachis flexuosa. *Vagina* sub lineam longa. *Perigynium*  $\frac{8}{10}$ -1 lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum. *Achenium* conforme,  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, triquetrum, basi styli crassiore apiculatum.

The *C. pedata*, L. Sp. Pl., from there being no specimen in his herbarium, and his giving Switzerland and England, as well as Lapland, for its habitat, and describing the “*capsulæ obsolete pubescentes*,” is unknown. Fries says of it, “*Est obscura planta; nomen et synonyma ad C. ornithopodam spectant, descriptio vero ad C. globularem.*”

It is allied to *C. supina*, differing in its smaller membranous perigynium and squamæ.

Tab.

- n. 1. A specimen from Lapland, from Wahlenberg.
- n. 2. Norway, from Sonder.
- n. 3. Greenland, from Vahl.

516. *C. petricosa* (Dewey); spica brevi ferrugineo-purpurea, e spiculis 4-5 oblongis erectis approximatis, terminalibus 1-2 masculis vel apice masculis sessilibus, inferioribus femineis exserte pedunculatis, infima subremota; bractea infima vaginata vix culmum æquante; stigmatibus 3; perigyniis elliptico-ovatis, ore hyalino obliquo, superne pilis brevibus asperatis marginibus scabris apice purpureis basi pallidis, squama ovata obtusa vel acuta subinde emarginata sæpe mucronata purpurea margine hyalina, nervo pallido, brevioribus.—*C. petricosa*, *Dewey, Sill.* 29, 246; *Hooker, Fl. Bor. Am.* 216; *Steud.* 201.

HAB. In America septentrionali.—Summit of the Rocky Mountains, *Drummond, n.* 283.

Stolonifera. *Radix* fibris validis nigris. *Culmus* 5-8-pollicaris, obtusangulus, lævis, inter spiculas scabriusculus, basi foliatus; pars spicigera  $\frac{1}{2}$ -3 poll. longa. *Folia*  $\frac{1}{2}$ - $1\frac{1}{2}$  lin. lata, culmum sæpe æquantia, apice longe triquetro-attenuata, tortuosa. *Bractea* infima vaginata, spiculam terminalem attingens, proxima spiculam ejus superans. *Spiculæ* 4-10 lin. longæ, 1-2 lin. latæ; superiores contiguæ; inferiores 1-2, exserte pedunculatæ; infima nunc  $2\frac{1}{2}$  poll. remota; *terminales* 1-2, rarius omnino sæpius apice masculæ; inferiores 2, plerumque femineæ; intermedia masculæ vel femineæ, vel apice et basi masculæ; infima basi attenuato-laxiflora. *Squamæ* conformes. *Perigynium (floriferum)*  $2\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, vix rostellatum, ore hyalino oblique fisso.

No one has met with this plant since Drummond's early visit to the Rocky Mountains. All his specimens are too young to afford a satisfactory opinion about it, or to compare it with other species. It is perhaps nearer *C. fimbriata*, Schk., but differs in the culm and orifice of the perigynium. It differs from *C. sempervirens*, Vill., and *C. tristis*, Biebst., in the absence of any rostrum and in the longer bracts.

I have not hesitated to figure it, unsatisfactory as the figure and description of it are, because our knowledge of alpine plants is often for a while imperfect from the immature state in which they are often collected upon high mountains, and any information respecting them is of value until we are in possession of perfect specimens. Drummond does not afford any evidence of the particular locality whence he obtained it, but I should infer it was not a common plant, as it has escaped the observation of Bourgeau—an admirable collector,—Lyll, and others.

517. *C. pilosa* (Scopoli); spica elongata viridi-purpurea; e spiculis 3-5 remotis pedunculatis, terminali mascula elliptica vel cylindracea densiflora purpurea, reliquis femineis linearibus laxifloris exserte pedunculatis demum nutantibus; bracteis vaginatis spiculis suis brevioribus; stigmatibus 3; perigyniis subgloboso-obovatis conico-rostratis, rostro sæpe excurvato, ore obliquo membranaceo truncato vel bifido, crebre nervosis glabris viridibus demum castaneis, squama ovata vel lanceolata acuta vel cuspidata purpurea medio pallida longioribus vel æquantibus.—*C. pilosa*, *Scop. Carn.* 226 (1772); *Allioni, Ped.* 269 (1785); *Wahl. Act.* 156; *Willd.* 278; *Schk. f.* 49; *Kunth*, 452; *Gaud. Agrost.* 160, et *Helv.* 6, 112; *Koeh*, 878; *Lange*, 97; *Bertol.* 114; *Reich.* 19, t. 244; *Gren. et Godr.* 408; *Fl. Ross.* 290; *Steud.* 224. *C. nemorensis*, *Gmel.*

HAB. In Europa.—France, Germany, Switzerland, Middle Russia.

Stolonifera. *Culmus* 1- $1\frac{1}{2}$ -pedalis, obtuse triquetus, debilis, lævis, pilosus, basi breviter foliatus, vaginis rudimentisque foliorum purpureis tectus; pars spicigera 6-8 poll. longa. *Folia* ad margines nervosque ciliato-pilosa; *senescentia* glabra evadunt; *culmea* brevia; *radicalia* 3 lin. lata, mollia, demum annotina, rigida, marginibus revolutis, culmum æquantia vel superantia. *Bractea* vaginata, spiculis brevioribus. *Vagina* infima 1- $1\frac{1}{2}$  poll. longa. *Pedunculus* infimus 3 vel radicalis 7 poll. longus, pilosus, filiformis. *Spicula mascula* 9-12 lin. longa, 2 lin. lata, fusco-purpurea; *femineæ* 8 lin. ad 2 poll. longæ,  $2\frac{1}{2}$ -3 lin. latæ. *Squamæ masculæ* imbricatæ, obtusæ. *Perigynium* 2- $2\frac{1}{2}$  lin. longum,  $\frac{8}{10}$  lin. latum, ore obliquo truncato vel plus minus bifido purpureo. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, orbiculato-trigonum, basi productum, castaneum, punctulatum, basi styli æquali abrupte apiculatum.

This species resembles very much the *C. vaginata*, Tausch, but its pilose leaves at once distinguish it. In the *Fl. Ross.* there is

a var.  $\beta$  with glabrous leaves, which I have not seen. The old ones are generally glabrous. The orifice of the perigynium varies, occasionally entire, truncate, oblique, bidentate or bilobed.

The specimens figured are from Germany.

518. *C. platystachya* (Tenore); spica brevi purpureo-vel ferrugineo-albida, e spiculis 2-4 oblongis contiguis sessilibus densifloris, mascula 1, femineis 1-3, infima subinde paulo remota inserte vel brevi exserte vaginata; bractea infima subinde culmum æquante vel spicula sua brevior; stigmatibus 3; perigyniis oblongo-ellipticis triquetris rostratis, ore hyalino integro obliquo ciliato, nervatis superne pilis adpressis asperatis marginibus scabris demum fuscis, squama late ovata plerumque mutica, margine albo-hyalina angustioribus longioribus.—*C. platystachya*, *Ten. Fl. Neap. Prod.* (1811). *C. macrolepis*, *Dec. Fl. Monsp.* (1813); *Kunth*, 438; *Kunze*, 141, *t.* 36; *Reich.* 20, *t.* 246; *Bertol.* 86; *Steud.* 217. *C. Tenorii*, *Kunth*, 437 (1837); *Steud.* 217.

HAB. In Europa.—In pascuis montosis Neapolitanis.

*Rhizoma* lignosum, dense cæspitiferum. *Culmus* 1-1½-pedalis, obtusangulus, lævis vel superne scaber, gracilis, nudus, basi foliis 2-3 subpollicaribus, rudimentis reliquisque foliorum purpureis fibrillosis tectus; pars spicigera 1-2 poll. longa. *Folia sterilia* sub lineam lata, plana, firma, culmo breviora, quædam angustiora etiam capillacea. *Bractea* infima vel amplectens, vel vaginata, culmum æquans vel spicula brevior. *Vagina* 2-3 lin. longa. *Spicula mascula* 7-8 lin. longa, 2-3 lin. lata, scissilis; *femineæ* 1-3, sessiles, contiguæ vel infima subinde pollicem remotæ, 6-8 lin. longæ, 4 lin. latæ. *Squamæ* omnes obtusæ, muticæ, vel femineæ infimæ nunc mucronatæ, margine conspicue albo-hyalinæ, interdum apice ciliolata. *Perigynium* 2-2 $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ -1 $\frac{1}{10}$  lin. latum, acute vel inæqualiter triquetrum, ore integro hyalino facile rupto. *Achenium* 1 $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, basi productum, triquetrum, basi styli apiculatum, ferrugineum.

This species belongs to the *Ferrugineæ*, and not to the *Montanae*, as suggested by Kunze, etc. It varies in the length and form of the perigynium, at times oval and shorter, or oblong-elliptic. The orifice is normally entire, obliquely cut, but, from its hyaline texture, is easily ruptured. I have a specimen from Tenore, who, in his ticket, claims the priority as to name, which I have therefore adopted. Its nearest affinity is with *C. semper-virens*, Vill.

519. *C. præcox* (Jacquin); spica brevi fusco-ferruginea, e spiculis 2-4 contiguis oblongis densifloris sessilibus, terminali mascula, femineis nunc apice masculis, infima inserte vel brevi (subinde radicali longe) exserte pedunculata; bractea infima vaginata, spicula ejus brevior vel (rarius culmum) subæquante; stigmatibus 3; perigyniis ellipticis vel globoso-obovatis obtuse triquetris, basi productis sensim conico-rostellatis, ore integro vel emarginato, obscure nervatis pubescentibus viridibus apice ferrugineis, squama ovata obtusa vel acuminato-hispido-apiculata vel mucronata angustioribus subæquantibus.—*C. præcox*, *Jacq. Fl. Austr.* 5, 25, *t.* 446; *Good. Linn. Trans.* 2, 170; *Wahl. Act.* 157; *Gaud. Agrost.* 131; *Willd.* 262; *Sehk. f.* 27; *Kunth*, 439; *Biebst.* 385; *Dec.* 3, 115; *Led. Fl. Alt.* 226; *Drejer, Rev.* 54; *Hoppe, Ic.*; *Koch*, 877; *Bertol.* 87; *Anders.* 29, *t.* 7, *f.* 84; *Reich.* 26, *t.* 261; *Fl. Ross.* 301; *Gren. et Godr.* 412; *Cosson et Germ. Obs. Crit.* 15, *et Fl. Par.* 599;

*Steud.* 217; *Sm. Eng. Fl.* 111; *Eng. Bot. t.* 1099; *Benth.* 564; *Dewey, Sill.* 11, 314; *Carey*, 526; *Sartwell, Eas. n.* 111. *C. stolonifera*, *Ehrh.*; *Lange*, 109, *sec. Smith.* *C. verna*, *Vill.* 204 (*non Sehk.*). *C. filiformis*, *Leers, t.* 16, *f.* 5, *sec. Koch.* *C. montana*, *Poll.*; *Light.* 551, *sec. Koch et Smith.* *C. saxatilis*, *Huds. sec. Smith.* *C. globularis*, *Leyss. (fide Kunth).* *C. caryophyllca*, *Latour (fide Dec.).* *C. pilulifera*, *Geners. (fide Wahl. Carp.).* *C. Sabynensis*, *Leyss.*; *Kunth*, 440; *Steud.* 218. *C. princeps*, *Brkh. (fide Reich.).* *C. mollis*, *Host, t.* 82 (*fide Koch*); *Steud.* 218. *C. umbrosa*, *Host, t.* 69; *Steud.* 218. *C. sicyocarpa*, *Lebel. Breb. Fl. Norm., "perigyniis sterilibus" (fide Gren. et Godr.).* *C. reflexa*, *Hoppe, "culmo apice refracto," Kunth*, 439; *Steud.* 218. *C. præcox,  $\beta$ , Reich.*; *Anders. Fl. Ross.* *C. refracta*, *Roth. sec. Hoppe.*

HAB. In Europa, Asia, et America septentrionali.—Ferro Islands, Norway. Sweden to Italy. Caucasus, Mongolia, Altai, Kamtchatka, Japan. Salem, Ipswich, Massachusetts, North America.

*Rhizoma* stoloniferum; stolones undique rudimentis foliorum fusco-ferrugineis demum fibrilloso-tritis tecti. *Culmus* 2-12 pollices altus, obtuse triquetrum, apice scaber, basi foliatus; pars spicigera 8 lin. ad 2 poll. plerumque longa. *Folia* 1-2 lin. lata, culmo breviora, firma, sæpe patenti-arcuata. *Bractea* infima plerumque brevi vaginata, vel squamæformis apice emarginata; spicula brevior vel æquans, rarius spiculam masculam attingens. *Vagina* 1-3 lin. longa. *Pedunculus* infimus insertus vel paulo exsertus, scaber. *Spiculae* omnes 3-8 lin. longæ; *mascula* 1-2 lin.; *femineæ* 2-2½ lin. latæ, contiguæ, sessiles, vel infima paulo remota, subinde radicalis, rarius apice masculæ. *Squamæ masculæ* ferrugineæ, obtusæ, muticæ vel superiores acutæ, nervo excurrente. *Perigynium* 1 $\frac{2}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, trigonum, faciebus subplanis vel plus minus convexis, subinde convexissimis, rostro conico brevi, ore integro vel emarginato, plerumque tenerrime pubescens, leviter sæpe obscure nervatum, pallidum, apice ferrugineum. *Achenium* conforme,  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, obovatum, ferrugineum, angulis parum elevatis pallidis, ima basi styli incrassata, annulo circulari elevato lato pallido laxè cincta, apiculatum. *Stylus* exsertus.

This early-flowering species is very common in Europe, but has only been found, as far as I am aware, in two localities (probably introduced and naturalized) in New England, North America. In open dry situations it is of small stature, but in woods is often a foot high, with long erect leaves, and is then *C. umbrosa*, Host, which Koch describes with a creeping rhizoma. In the more developed form, in habit at least, it resembles the *C. polyrhiza*, Wallroth, which in several respects differs essentially from *C. præcox*.

Var. *polyrhiza*, Wallroth; spica brevi, e spiculis 2-5 densifloris oblongis approximatis, terminali mascula majore, femineis subinde apice masculis sessilibus vel inferioribus exserte pedunculatis; bracteis vaginatis brevibus; stigmatibus 3; perigyniis obovato-pyriformibus triquetris pilosis, rostro longiore cylindrico emarginato bidentato leviter nervatis, squama ovata mucronata longioribus.—*C. polyrhiza*, *Wallr. Schred.* 492; *Koch*, 877; *Lange*, 110; *Gren. et Godr.* 413. *C. præcox, var.*, *Wahl. Carp.*; *Gaud. Agrost.*; *Fl. Ross.*; *Coss. et Germ. C. longifolia*, *Host, Gr. t.* 85; *Bertol.* 89; *Steud.* 218.

*C. umbrosa*, Hoppe; Kunth, 439; Reich. 27, t. 263; *Sehk. f.* 190; Willd. 277.

HAB. In Europa et Asia.—France, Germany, Switzerland, Italy. Japan.

*Radix* caespitosa, fibrosa, fibris pallidis. *Culmi* pedales, magis acutanguli, scabri, basi reliquiis foliorum fibrillostritis, dense tecti. *Folia* recta, elongata. *Bractea* spicula saepius breviores. *Spiculae*, ut in *C. praecoci*, saepe minus contiguæ. *Perigynium* fusiforme, demum obovatum, pyriforme, triquetrum, rostro subelongato, cylindrico, ore emarginato bidentato, pilis longis vestito. *Achenium* obovatum, castaneum, angulis magis prominentibus, acutis, annulo angustiore, basin styli plus minus incrassatam arcte cingente.

The essential difference of this plant is in the fibrous, not stoloniferous root, and the narrow annulus on the achenium; for, if the *C. umbrosa*, Host, is distinct from it, we cannot insist on the elongated culm and leaves. Koch describes Host's plant with a creeping root, and Grenier and Godron remark that it is not even a variety of *C. praecox*. Neither Koch, Hoppe, Reichenbach, Lange, Grenier and Godron, etc., make any allusion to the annulus of the achenium or base of the style, and their specific character is mainly taken from the fibrous root. Drejer, *Symb.* p. 7, remarks, "Species proximæ et habitu simillimæ, quæ aliis notis ægre distinguuntur, saepe caryopsidis forma egregie differunt. Ut exemplum adducam *C. praecocem*, Jacq., et *C. polyrhizam*, Wallr., quæ tam inter se appropinquant, ut multi eas ut species distinguere hæsitent. Caryopside hæ insigniter differunt. In *C. praecocem* caryopsis est brevis, crassa, lateribus irregulariter convexis, angulis subprominulis apice in annulum apicem truncatum cingentem confluentibus, ex cujus annuli spatio medio stylus subæqualis vel subconicus sese extollit. In *C. polyrhiza* autem caryopsis magis elongata, subobovata, lateribus irregulariter convexo-subgibbis, angulis valde prominentibus, apice in apiculum conniventibus, ex quo apiculo stylus egreditur sub basi tumidulo constrictus et cum apiculo articulatus. Notæ et foliis et radice desumptæ fallaces sunt nisi secundaria."'

This description of the achenium of *C. polyrhiza* seems to me to have been drawn, not from nature, but from the figure of Schkuhr, fig. 190, taken from an immature perigynium. In this early state the annulus is not fully developed, the apex of the achenium presenting the appearance of a cylindrical permanent base of the style; but at a later stage the annulus is perceptible, but is always of a much smaller diameter than that on *C. praecox*. In size and form, with the exception of the more prominent angles in *C. polyrhiza*, there is no constant difference. In many perigynia of *C. polyrhiza* the rostrum is more abrupt, or from a conical base ending in a cylindrical upper portion, the orifice of which is more distinctly cleft than in *C. praecox*.

Cosson and Germain (*Obs. Pl. Critiques Par.* p. 15) remark, under *C. praecox*, "Dans les lieux ombragés les chaumes deviennent plus élevés, les feuilles s'allongent, la plupart égalent le chaume ou même le dépassent; c'est à cette modification qu'il faut rapporter le *C. umbrosa*, Host. Cette modification elle-même dans certains terrains compactes varie en ce que les stolons avortent, en ce que le collet de la racine se couronne des nervures persistantes des feuilles détruites; à cet état, elle constitue le *C. longifolia*, Host."

Gaudin (*Agrost.* 133), whose *C. praecox*, B., "fructus pilis magis conspicuis hirti," is, I think with Kunth, referable to *C. polyrhiza*, says, "Nullus dubito quin planta  $\beta$  ad *C. praecocem* pertineat. Est ejusdem varietas ex solo pinguiori umbrosoque orta;" and he quotes Haller, who says, "Diversam habuissem speciem nisi transplantatio in hortum plantæ vulgaris in siccissimis natæ me docuisset eam mire mutari."

A reasonable doubt, therefore, may, I think, be entertained whether there is any specific difference between the *C. umbrosa* and *C. longifolia* of Host, and whether both are not merely varieties of *C. praecox*.

The specimens figured are—

Tab. . . . *C. praecox*.

- n. 1. From Italy. Spic. femineæ apice masculæ.
- n. 2. From England.
- n. 3. From Sweden.
- n. 4. From Salem, North America.
- n. 5. From Mongolia. "*C. Sabyensis*," from Fischer.
- n. 6. From Germany. "*C. reflexa*," from Hoppe.

Tab. . . . *C. polyrhiza*, from Germany, the "*C. umbrosa*, Hoppe," from him. Hoppe quotes Host, showing that he considered it as his plant, though Koch, etc., refer Host's *C. umbrosa* to *C. praecox*, and Hoppe's to *C. polyrhiza*.

520. *C. pumila* (Thunberg); spica oblonga ferrugineo-purpurea, e spiculis 3–6 approximatis, terminalibus 1–4, masculis cylindricis gracilibus, reliquis femineis subrotundo-ovatis vel oblongis crassis, infima brevi exserte pedunculata; bracteis foliaceis rigidis culmum longe superantibus; stigmatibus 3; perigyniis turgide ovatis sensim late rostrellatis bifurcatis basi contractis teretibus glabris leviter nervatis dense spongiosis ferrugineis, squama ovata acuta vel cuspidata purpurea margine albo-hyalina duplo longioribus.—*C. pumila*, *Th. Fl. Jap.* 39; *Wahl. Act.* 152; *Willd.* 310; *Sehk. f.* 112; *Kunth*, 517; *Boott, Perry Exp.* 2, 322 (1856); *Steud.* 239. *C. littorea*, *Labill. Nov. Holl.* 2, 69, t. 219; *Brown, Prod.* 243; *Kunth (add.)*, 592; *Hook. Fl. N. Zeal.* 284; *Steud.* 238. *C. Urvillei*, *Brongn. in Duperrey, It. Bot.* 157; *Kunth*, 517; *Steud.* 238; *Gay, Fl. Chil.* 220. *C. fusca*, *Solander, mss. (Herb. Banks)*.

HAB. In Asia et America meridionali, in arenosis maritimis.—Japan, *Th.*; *Morrow (Herb. Gray)*. New Zealand, Australia, Tasmania, Korea, *Wilford (Herb. Hooker)*. Chili, *Durville (Herb. Mus. Par.)*.

*Rhizoma* longum, repens, stoloniferum. *Culmus* 3–10-polliaris, saepe omnino vaginis foliorum longis ferrugineo-purpureis clausus. *Folia* bracteaque  $\frac{1}{2}$ – $1\frac{1}{2}$  lin. lata, culmum longe superantia, carinata, rigida, apice triquetra, longe attenuata, curvata, marginibus præcipue basi cartilagineo-asperimis, quasi erosis. *Vagina* bractea infima 3–6 lin. longa. *Pedunculus* infimus saepe subpollicaris, basi ocreatus. *Spiculae masculæ*  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longæ, sub lineam latæ, infima nune bractea; *femineæ* 6–14 lin. longæ, 4–5 lin. latæ; suprema subinde parce sparsiflora; rarius spiculæ omnes apice masculæ. *Squamæ* omnes purpureæ, margine albo-hyalinæ; *masculæ* longiores, angustiores, lanceolatae; superiores acuminatae, nervo saepe excurrente. *Perigynium* 3– $3\frac{2}{10}$  lin. longum,  $1\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, breve obtuseque bifurcatum, ore margine hyalino, nervis superne evanidis demum in sulcis fere oblitteratis. *Achenium*  $1\frac{1}{2}$  lin. longum, lineam latum, ovale vel obovatum, triquetrum, ferrugineum, basi styli apiculatum.—In uno specimine (e Nova Zelandia) racheola ligulata ferruginea, margine hyalina, achenium æquans.

The specimens figured are—

- n. 1. From Moreton Island.
- n. 2, Tasmania.

The Japanese specimens collected by Morrow I have noticed in Perry's Exp.; and I have, through the kindness of M. Spach, since examined the specimens from Concepcion of Durville, and those from Port Chusan of Wilford in Herb. Hooker,—all of which I have no hesitation in referring to Thunberg's plant, which is figured by Schkuhr. The affinity of the species is with *C. nutans*, Host.

521. *C. sempervirens* (Villars); spica abbreviata sæ-

pius clongata purpureo-vel ferrugineo-albida, e spiculis 2-4 oblongis erectis, mascula 1 rarius 2, femineis 1-3, suprema sæpe masculæ contigua sessili vel omnibus remotis exserte pedunculatis; bracteis vaginatis pedunculo brevioribus; stigmatibus 3; perigyniis lanceolatis compresso-triquetris longe rostratis, ore integro obliquo hyalino (demum rupto bilobato), superne pilis adpressis scabris rarius glabris, marginibus scabris nervatis viridibus plus minus ferrugineo-tinctis, squama ovata obtusa vel acuminata acuta mutica ferruginea vel purpurea margine albo-hyalina longioribus.—*C. sempervirens*, *Vill. Dauph.* 214; *Gaud. Agrost.* 165, et *Helv.* 89; *Koch.* 881; *Lange.* 120; *Reich.* 21, t. 247; *Gren. et Godr.* 420. *C. ferruginea*, *Schk. f.* 48 (non *Scopoli*); *Willd.* 274; *Kunth.* 464 (excl. ejus descr.); *Link.* 360; *Dec. Fl. Franc.* 3, 123; *Bertol.* 119; *Steud.* 229. *C. variegata*, *Lam. Enc.* 3, 389. *C. varia*, *Host.* t. 80. *C. lævis*, *Kit.*; *Willd.* 292. *C. firma*,  $\beta$ , *Wahl. Carp. et Helv.* *C. alpestris*, *Gaud. Etr.* *C. saxatilis*, *Sut.* *C. alpina*, *Schrank.* *C. arida*, *Schleicher.* *C. chlorostachys*, *Stev.*; *Biebst.* 3, 615. *C. erecta*, *Dec. Fl. Franc.* 3, 120, et 6, 292 ("capsule prolongée en un bec pointu obliquement tronqué," *Dec.*).

*Radix* fibrosa. *Culmus* 6-15-pollicaris, obsolete trigonus, lævis, basi foliatus. *Folia* 1-2 lin. lata; *culmea* brevia, radicalia, e medio sursum marcida. *Bractea* vaginata, spiculis breviores. *Vagina* infima 3-9 lin. longa. *Pedunculus* infimus 6 lin.-3 poll. etiam 9 poll. longus. *Spicula* 3-8 lin. longæ, 1-2½ lin. latæ; omnes pedunculatæ, remotæ, vel summa feminea sessilis, masculæ arcte contigua; inferiores longe exserte pedunculatæ; infima rarius radicalis, longissime pedunculata. *Squamæ* conformes, sæpius obtusæ, muticæ, margine late albo-hyalinæ, vel acuminatæ, acutæ. *Perigynium* 2 $\frac{6}{10}$ -3 $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{9}{10}$  lin. latum, superne pilis brevibus adpressis exasperatum, ad margines pilis longioribus apertis scabrum, sæpe crebre nervatum, ore obliquo integro demum bilobato plus minus (sæpe conspicue) albo-hyalino, plano-triquetrum. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo) 1 $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, inæqualiter triquetrum, pallidum, basi styli clavata erecta, apiculatum.

Var.  $\beta$ ; perigyniis brevius rostratis, ore bifido vix hyalino, squamis femineis mucronatis masculis acutatis.

HAB. Bavaria, from Martius.

Var.  $\gamma$ ; spiculis 3-4 rarius 5-7, masculis 1-2 proximis apice vel apice et basi masculis, infima feminea; bracteis spiculis suis brevioribus; perigyniis glabris vel apice asperatis, squama obtusa mutica purpurea, nervo plerumque concolori, longioribus.—*C. tristis*, *Biebst.* 3, 615; *Led. Fl. Alt.* 228; *Kunth.* 465; *Fl. Ross.* 294; *Steud.* 236. *C. ferruginea*, *Stev. Masc.* 4, 68. *C. stenocarpa*, *Turcz. (Herb. Boott).* *C. Schottii*, *Boiss. (Herb. Hooker).*

HAB. In Asia.—Caucasus, *Biebst.* Altai, *Ledeb.* Dahuria, *Turcz.* Cilicia, *Kotschy.*

Villars says, "Il n'y a rien de si commune que cette plante;" and Gaudin, "Omnium nostrarum in Alpium locis siccioribus, etiam in jugis meridionalibus Italiam spectantibus vulgatissima." Villars adds, "Les bergers la nomment *la Barbe de père*, à cause de la ténacité de ses feuilles et de la propriété qu'elles ont de blanchir. Elles sont longues, flexibles, et passent l'hiver jusqu'à ce que l'accroissement des nouvelles les fait dépêcher, en obli-

térant les canaux de leur séve. Les moutons et les chèvres n'en mangent pas. La raison en est que ses nouvelles feuilles ne paraissent qu'à la fin de Mai, temps auquel les autres plantes sont déjà venues. Celle-ci est des plus dures, des moins savonneuses que je connaisse."

In the Alps of Switzerland and the Tyrol there are other species allied to it, especially *C. fimbriata*, Schk. (the *C. hispidula*, Gaudin), and *C. ferruginea*, Scopoli, which in herbaria are not easily distinguishable, and about which botanists, judging from specimens sent under different names, are not agreed. There are also other species recorded in Asia, and one in North America, which are imperfectly known from the immature state of the specimens, which are perhaps not separable from the plant of Villars. These last, however, have the male florets on the upper, or at times in all the spiculæ variously distributed; while on a reference to European authors, I find no allusion to any such irregularity in *C. sempervirens*. They all describe it with one male and one to three female spiculæ, and all the specimens I have confirm this description, with the exception that several have two male spiculæ. I find in 27 specimens,—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 6 with 2 spiculæ. | 21 with 1 male. | 8 with 1 female. |
| 12 „ 3            | 6 „ 2           | 12 „ 2           |
| 9 „ 4             |                 | 7 „ 3            |

In one specimen from the Pyrenees (Tab. ) the upper female has male florets at top, and in two others the lower female was radical, with long peduncles.

The essential character of *C. sempervirens* is the entire, oblique, hyaline orifice of the perigynium, as shown by Schkuhr, fig. 48. This is easily ruptured, and thus becomes bifid or bilobed. The perigynium is rough upwards with appressed hairs, though Koch alludes to its being at times smooth, and Laugé had always found it so. I find the perigynium to vary in length and breadth, the rostrum longer or shorter, but the often conspicuously hyaline orifice is pretty constant. The squamæ also are generally as conspicuously hyaline at the margins, and without a mucro, though occasionally acuminate. Kunth could not have had clear conceptions of this plant, as the description he has given was from a Norwegian specimen, which must have been *C. fuliginosa*, St. and Hop., the only one of the group found in the north of Europe.

The obtuse-angled smooth culm, and short bracts, separate the var.  $\beta$  from *C. fimbriata*, Schk. In its bifid orifice, scarcely at all hyaline, it differs from the typical form. The perigynium is 2 $\frac{1}{10}$ - $\frac{4}{10}$  lin. long,  $\frac{6}{10}$  lin. wide, rough with setæ upwards.

In the var.  $\gamma$  the spiculæ are occasionally more numerous, and the intermediate ones with a variable disposition of male florets on them; but the orifice of the perigynium, its form, the short bracts, and smooth obtuse-angled culm, agree with the typical form of *C. sempervirens*.

Ledebour describes the perigynium as bidentate, but he adds, "denticulis membrana alba subconvexis."

The specimens figured are,—

- n. 1. From the Pyrenees, from M. Spruce, on one of which the upper female spicula has male florets at base.
- n. 2. Var.  $\beta$ . From Bavaria, from Martius.

522. *C. tomentosa* (Linn.); spica brevi purpurea grisea demum castaneo-straminea, e spiculis 2-3 densifloris contiguis vel subremotis, terminali mascula cylindrica, femineis 1-2 brevioribus, suprema rarius apice mascula, infima sæpe breve pedunculata cylindrica; bractea infima auriculata vel brevissime vaginulata, culmum nunc æquante; stigmatibus 3; perigyniis turgide obovatis vel oblongis vix rostellatis, ore emarginato bidentato ciliato, densissime strigoso-hirtis enerviis obtuse vel obsolete trigonis divergentibus griseis demum stramineis spongiosis, squama ovata acuta vel cuspidata purpurea demum castanea medio late viridi latoribus longioribus.—*C. tomentosa*, *Linn. Mant.* 123; *Wahl.*

*Act.* 159; *Willd.* 263; *Schk.* f. 28; *Gaud. Agrost.* 127; *Helv.* 75; *Smith, Linn. Trans.* 5, 269; *Eng. Bot. t.* 2046; *Eng. Fl.* 113; *Biebst.* 386; *Koch,* 876; *Hoppe, Ic.* 72; *Lange,* 106; *Reich.* 27, t. 263; *Anders.* 31, t. 7, f. 80; *Grcn. et Godr.* 413; *Steud.* 218; *Bertol.* 93; *Fl. Ross.* 303. *C. sphærocarpa, Ehr. Cul.* 89. *C. filiformis, Thuill. Par.* *C. subvillosa, Biebst.* 386. *C. cæsia, Griseb.; Steud.* 218, e *descript.* *C. Grassmanniana, Reben.* (fide *Koch, Lange*).

HAB. In Europa et Asia.—Gottland. Oeland to Italy. Caucasus. Tauria.

Stolonifera. *Rhizoma* repens, articulatum. *Culmus* subpedalis, gracilis, triquetus, scaber, basi foliatus, vaginisque foliorum rubro-purpureis, reticulato-fibratis tectus; pars spicigera 1–2 poll. longa. *Folia* sub lineam lata, plana, culmo breviora; *culmea* consimilia. *Bractea* evaginata, vel infima brevissime vaginulata; spicula longior, sæpe culmum æquans. *Spicula mascula* 6–14 lin. longa, sub lineam lata; *femineæ* 5–7 lin. longæ, 2 lin. latæ, contiguæ, sessiles, vel infima paulo remota breve pedunculata. *Squama masculæ* muticæ, vel nervo excurrente. *Perigynium* 1–1 $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, triquetrum, punctulatum, basi styli abrupte apiculatum.

The spongy perigynium and the dense hairs separate this species from *C. montana* and *C. ericetorum*, with which it is associated by European authors, and ally it to *C. lanuginosa* and *C. filiformis*. Kunth refers *C. Thuringiaca*, Schk. f. 155, to *C. glauca*, and I defer to his opinion, though Koch refers it to *C. tomentosa*. Why he should suppose that Willdenow's plant was different from Schkuhr's, I know not. Kunth had examined Willdenow's specimen, and there is no evidence that Koch or Lange, who equally refers Schkuhr's to *C. tomentosa*, had seen either.

523. *C. triquetra* (Boott); spica castaneo-viridi, e spiculis 3–5 oblongis, terminali mascula subsessili, reliquis femineis erectis, superioribus approximatis, inferioribus basi attenuatis vaginatis, *inserte* vel infima remota longe exserte pedunculata, omnibus apice inferioribus præsertim basi flosculis femineis abortivis instructis; bracteis inferioribus vaginatis elongatis; stigmatibus 3; perigyniis ovalibus acute triquetris rostrellatis, ore emarginato bidentato, pilosis rectis sub-4-nerviis pallide viridibus, squama ovata uninervata mucronata castanea margine hyalina longioribus latioribus.—*C. triquetra, Boott, Linn. Trans.* 20, 126. *C. monticola, Dewey, Sill. Journ.* 29, 26. (TAB. CCCCXVII.)

HAB. Upper California, *Nuttall*. Mountains east of St. Diego, California, *Parry, in Emory's Expedition (Herb. Torrey)*.

*Culmus* 5–12-poll., triquetus, scabriusculus, firmus, basi foliatus, vaginis foliorum ferrugineis tectus; pars spicas gerens 2–3 vel 7 poll. longa. *Folia* plana, 1–2 $\frac{1}{4}$  lin. lata, culmo breviora vel subæquantia. *Bractea* superiores breves; inferiores vaginatae, culmum subæquantes vel infima remota eo brevior. *Spica mascula* 8 lin. longa, lineam lata; *femineæ* 2–3 approximatae, vel 4; infima 5 poll. remota; omnes apice flosculis paucis abortivis apiculatae, basi præsertim infima basi flosculis similibus attenuatae. *Squama* omnes mucronatae, obtusæ vel acutatae, uninerviæ. *Perigynium* 2–2 $\frac{4}{10}$  lin. longum, 1 $\frac{2}{10}$  lin. latum, utrinque acutum, sessile, pilis longis albis instructum, acute triquetrum, faciebus planis, ad mediam partem facierum duarum et ad angulos duos nervo unico prominente præcursum, vel ad faciem unam nervis 2 similibus, vel (in uno fructu)

nervis 4–5 tenuibus ad unam solum faciem notatum, aliter enerve. *Achenium* conforme, 1 $\frac{7}{10}$ –2 lin. longum, 1 $\frac{1}{10}$ – $\frac{2}{10}$  lin. latum, inæqualiter acute triquetrum, fuscum, punctulatum.

A *C. Halleriana*, Asso, differt foliis planis latis; spicis inferioribus omnino femineis; perigyniis majoribus pilosis, nervis paucis remotis, faciebus planis; squamis masculis mucronatis.

On the death of Mr. Nuttall, I obtained the Carices in his Herbarium, and have been enabled to correct the description I gave of this species in the 'Linnean Transactions,' in which I mistook the terminal abortive female florets for male ones. I noticed in that description the resemblance of the species to the *C. gynobasis*, Villars, which has since been discovered in New Mexico.

Through the kindness of Dr. Torrey, I have had the opportunity of seeing the plant of Parry, from St. Diego, a very poor specimen. There are but five in Nuttall's collection, of which I have figured the best.

524. *C. vitilis* (Fries); spica oblonga, e spiculis 4–7 androgynis basi masculis parvis paucifloris; stigmatibus 2; perigyniis ovalibus vel ovatis conico-rostratis, ore antice alte secto, arrecto-patentibus irregulariter nervatis, nervis concoloribus postice obsolete vel sursum evanidis, marginibus superne scabris membranaceis basi spongiosis, squama ovata obtusa vel acuta longioribus.

Var. *a*; spica brunnescente, e spiculis 4–7 contiguis, infima subremota; perigyniis fusco-ferrugineis, squama obtusa vel subacuta margine late albo-hyalina æquilata longioribus.—*C. vitilis, a et β, Fries, Mant.* 3, 137; *Sum.* 223; *Anders.* 58, t. 4, f. 38. *C. canescens, β, alpicola, Wahl.* *C. curta β, Gaudin, Agrost.* 111. *C. Gebhardi, Hoppe, t.* 30; *Kunth,* 402; *Reich. t.* 206 (non *Schk. et Willd.*). *C. Persoonii, Lange,* 59 (ex parte); *Koch,* 870; *Dewey,* 18, 253 (ex parte). *C. Buckleyi, Dewey,* 48, 143.

HAB. In locis alpinis sylvaticis humidiusculis Lapponiæ, Sueciæ, Norvegiæ, *Andersson*. In alpihus Helvetiæ, Carinthiæ; America arctica, *Richardson*. In montibus Novæ Angliæ, Carolinæ et Georgiæ, *Buckley, Tuckerman*.

*Culmus* subpedalis. *Folia* lineam lata. *Bractea* infima rarius elongata. *Spica* 7–14 lin. longa. *Spicula* sæpe oblongæ, contiguæ; infima subinde 4–5 lin. remota. *Perigynium* 1–1 $\frac{2}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, superne sæpe fusco-ferrugineum, ore usque ad basin rostri fisso albo-hyalino. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ovale.

Var. *β*; spica pallida laxa, e spiculis 4–5 rarius pluribus paucifloris alternatis vel superioribus approximatis inferioribus remotis, infima subinde longe bracteata; perigyniis magis patentibus rostro longiore pallidis, squama acuta albo-hyalina, nervo viridi, longioribus.—*C. canescens β, Torr. Mon.* 393. *β. sphærostachya, Tuck.* 19. *C. canescens var. vitilis, Carcy,* 514. *C. sphærostachya, Dewey,* 49, 44; *Sartwell, Exs. n.* 33.

HAB. In paludibus, ad basin Mont. Alborum, N. Hampshire, *Tuckerman*. In paludibus Americæ arcticæ (*Richardson*) usque ad Nov. Ebor. (*Sartwell, etc.*).

*Culmus* 12–20 pollices altus, gracillimus, debilis. *Folia*  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, culmo breviora. *Bractea* sæpe elongata, spicam subinde æquans. *Spica* albo-virescens, 8–18 lin. longa, laxa. *Spicula* paucifloræ, rotundatae, omnes alternæ, discretæ vel superiores approximatae vel contiguæ, reliquæ semper distantes, terminalis sæpe basi attenuata. *Perigynium* 1–1 $\frac{4}{10}$  lin. lon-

gum,  $\frac{7}{10}$  lin. latum, viride, in rostrum longius tenue acuminatum, membranaceum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum.

A *C. canescente*, L., differt, spica brunnescente vel pallide viridi; spiculis paucifloris; perigyniis longius rostratis, ore antice alte fisso, arrecto-patentibus membranaceis minime granulatis; nervis concoloribus magis irregulariter dispositis; postice sæpe obsoletis; culmo foliisque (præsertim in  $\beta$ ) gracilibus; locis alpinis et subalpinis nascente.

I have followed Fries in the name of this species, as there is a confusion, as Andersson remarks, attending that of *C. Persoonii*, originally applied by Schkuhr to an Indian species, and his *C. Gebhardi* is undoubtedly a small form of *C. elongata*, L. That of Hoppe is certainly *C. vitilis a*, though Fries says, "ad *C. canescentem b. brunnescentem* spectat." Neither he nor Andersson, however, mention any such form of *C. canescens*, and whether any such exists distinguishable from *C. vitilis a*, I know not. Fries takes no notice of the prolonged anterior fissure of the orifice of the perigynium, upon which Andersson insists as an essential character, "fructibus in rostrum emarginatum rima tenui longitudinali notatum acuminatis." This character, which in the var. *a* is more conspicuous from the fissure having one of the margins white, constitutes with the more patent membranous texture of the perigynium, and more attenuated apex of the rostrum, the essential distinction of the species. The delicate texture of the perigynium is apparent from the fact of pressure in the mature state giving rise frequently to the escape of the achenium, which is favoured by the fissure naturally existing in the rostrum. On several of Hoppe's specimens of his *C. Gebhardi* in my Herbarium the achenium is thus fully exposed. This character, it would seem, had been overlooked by such accurate observers as Gaudin and Drejer, for the first considered his *C. curta*  $\beta$ , and the last *C. Gebhardi*, as inseparable from *C. canescens*, L.

The var. *a* is alpine, found on the mountains of North America, as far south as Carolina and Georgia, and in Arctic America, and in Europe on the Alps, and is common in Scandinavia. Andersson describes it, "colore viridi demum fulvo-brunneo," thus uniting the two forms, *a* and *b*, of Fries.

The var.  $\beta$  is subalpine, and so far as I know peculiar to North

America, contrasting with the var. *a* in its laxer inflorescence and pale green colour, and more gracile culm and leaves. Tuckerman finds it, "in paludibus Novæ Angliæ," at the base of the White Mountains, passing on the mountains into the var. *a*. Sartwell finds it in New York, and Sir John Richardson at Lake Winnipeg. The spiculæ have fewer florets and the inflorescence is nearer that of *C. canescens*. In both forms the terminal spicula is occasionally male or sterile.

The specimens figured are—

Tab. , var. *a*.

n. 1. From the Methye Portage, Arctic America, *Sir John Richardson*.

n. 2. Monadnuck Mountains, Vermont, *Russell*.

Tab. , var. *a*.

n. 1. A small form from Lake Winnipeg, *Sir J. Richardson*.

Perigynium  $\frac{8}{10}$ — $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$ — $\frac{5}{10}$  lin. latum, enerve vel obsolete nervatum, ore antice fisso, rostello margine scabro. Achenium  $\frac{6}{10}$  lin. longum,  $\frac{3}{10}$ — $\frac{4}{10}$  lin. latum, ovatum vel ovale.

It differs from *C. canescens*,  $\beta$ . *subliacea*, in smaller spiculæ, the perigynium nerveless, with a longer rough rostellum, and the orifice anteriorly deeply cleft.

n. 2. "*C. vitilis*," from Fries, Sweden.

Tab. , var.  $\beta$ , from New York, *Sartwell*.

I have given separate figures and descriptions of these allied forms (*C. canescens*, etc. etc.), leaving, as in other instances, the question of species or variety to future observers. I find it impossible myself to maintain a consistency of opinion upon the subject, judging from my notes, at one time inclining to the idea of varieties, and on a subsequent examination to the opposite view. When I first saw the specimen I have figured as *C. arcta*, I referred it in Sir John Richardson's Journal of a Botanical Voyage, to *C. canescens*, placing it and the other forms as varieties of the original Linnæan species.

*C. canescens*, L.

$\beta$ . *minor, subliacea*.

$\gamma$ . *brunnescens*.

$\delta$ . *vitilis*.

$\epsilon$ . *polystachya, C. arcta*.

#### NOTE.

Part I. p. 41.—*CAREX OLIGOCARPA*.—The venerable Dr. Dewey informs me that it was, through inadvertence, stated, in the 'Illustrations,' under *C. oligocarpa*, that he had confounded this species with *C. Hitchcockiana*, and refers me to 'Silliman's Journal,' 1847, vol. iv. p. 349, as evidence of the contrary, Dr. Dewey having there pointed out the very manifest difference between them.—J. D. H.

FINIS.



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| <i>Thunbergii</i> , Steud. . . . .                              | iv. 166       | varia, Host. . . . .                                                  | iv. 218                |
| thyrsiflora, <i>Boott</i> (Tab. 34) . . . . .                   | i. 13         | variegata, Lam. . . . .                                               | iv. 218                |
| thyrsiflora, <i>Boott</i> . . . . .                             | ii. 86        | ventricosa, Curt. . . . .                                             | iv. 185                |
| Tolmici, <i>Boott</i> (Tab. 299) . . . . .                      | ii. 100       | venusta, Dewey (Tab. 134) . . . . .                                   | i. 51                  |
| tomentosa, L. . . . .                                           | iv. 218       | venusta, Dewey . . . . .                                              | ii. 93                 |
| tomentosa, Fl. Dan. . . . .                                     | iv. 209       | verna, <i>Sehk.</i> . . . . .                                         | i. 10; iv. 161         |
| tomentosa, Light. . . . .                                       | i. 50         | verna, Vill. . . . .                                                  | iv. 216                |
| tomentosa, Meyer . . . . .                                      | iv. 209       | verrucosa, <i>Muhl.</i> . . . . .                                     | ii. 89                 |
| <i>Torreyana</i> , Dewey . . . . .                              | i. 54         | verticillata, <i>Boott</i> (Tab. 183. fig. 2) . . . . .               | i. 30, 67              |
| Torreyi, <i>Tuckerman</i> (Tab. 56) . . . . .                   | i. 21         | vesicaria (Tab. 536; $\beta$ , Tab. 537) . . . . .                    | iv. 162                |
| torta, <i>Boott</i> (Tab. 169) . . . . .                        | i. 30, 63     | vesicaria, L. . . . .                                                 | i. 14, 28; ii. 91      |
| torta, <i>Boott</i> . . . . .                                   | ii. 101       | vesicaria, <i>Thunberg</i> . . . . .                                  | iv. 183                |
| transversa, <i>Boott.</i> . . . . .                             | iv. 202       | vesiculosa, <i>Boott</i> (Tab. 323) . . . . .                         | iii. 107               |
| tribuloides, <i>Wahl.</i> . . . . .                             | iii. 117      | vestita, <i>W.</i> (Tab. 131) . . . . .                               | i. 49                  |
| trieeps, <i>Michaux</i> (Tab. 128) . . . . .                    | i. 48         | vevilis, <i>Wormskiöld</i> . . . . .                                  | iv. 191                |
| trichocarpa, <i>Muhl.</i> . . . . .                             | i. 58         | vicinalis, <i>Boott</i> (Tab. 428. fig. 2) . . . . .                  | iv. 133                |
| trichodes, <i>Steud.</i> (Tab. 464) . . . . .                   | iv. 144       | victoralis, <i>Nees</i> . . . . .                                     | i. 8                   |
| trichostachya, <i>Fisch.</i> . . . . .                          | iv. 198       | villosa, <i>Boott</i> . . . . .                                       | iv. 203                |
| tricostata, Fries . . . . .                                     | iv. 165, 168  | virens, Lam. . . . .                                                  | iv. 193                |
| trifida, <i>Cavanilles</i> (Tab. 444) . . . . .                 | iv. 138       | virens, <i>Suec.</i> . . . . .                                        | iv. 193                |
| triflora, <i>Vahl.</i> . . . . .                                | iv. 149       | virens, Thuill. . . . .                                               | iv. 165                |
| triflora, Willd. . . . .                                        | iv. 185       | virescens, <i>Muhl.</i> (Tab. 73) . . . . .                           | i. 28, 48              |
| trinervis, <i>Desgländ</i> (Tab. 520, 521) . . . . .            | iv. 159       | virgata, <i>Sol.</i> (Tab. 121, 122) . . . . .                        | i. 46, 47              |
| trinervis, <i>Nees</i> . . . . .                                | i. 52         | viridis, <i>Schlecht.</i> (Tab. 522) . . . . .                        | iv. 159                |
| tripartita, Lam. . . . .                                        | iv. 186       | viridula, <i>Mich.</i> (Tab. 523) . . . . .                           | iv. 159                |
| triquetra, <i>Boott</i> (Tab. 417) . . . . .                    | iv. 219       | viridula, Mich. . . . .                                               | i. 48                  |
| trisperma, Dewey (Tab. 74) . . . . .                            | i. 28, 29     | vitis, <i>Fries</i> . . . . .                                         | i. 47; iv. 219         |
| trisperma, Dewey, Gray . . . . .                                | ii. 81        | Vuleani, <i>Hochst.</i> . . . . .                                     | iv. 203                |
| tristaehya, <i>Thunb.</i> (Tab. 424) . . . . .                  | iv. 131       | vulgaris, <i>Fries</i> (Tab. 557-575) . . . . .                       | iv. 166                |
| tristieha, <i>Spruce</i> (Tab. 493) . . . . .                   | iv. 153       | vulgaris, Fries . . . . .                                             | i. 25, 28, 64; iv. 166 |
| tristis, <i>Biebst.</i> . . . . .                               | i. 8; iv. 218 | vulgaris?, <i>Maxim.</i> . . . . .                                    | iv. 132                |
| tuberculata, <i>Nees.</i> . . . . .                             | ii. 76        | vulpina, L. (Tab. 393) . . . . .                                      | iii. 122               |

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| <i>vulpina</i> , L. . . . .                                 | i. 2; ii. 76, 81 | <i>Xalapensis</i> , Kunth . . . . .            | iii. 124   |
| <i>vulpina</i> ( <i>papillosa</i> ), Nees . . . . .         | ii. 76           | <i>Zanthophysa</i> , Wahl. . . . .             | ii. 91     |
| <i>vulpina</i> , $\beta$ . <i>glomerata</i> , Wahl. . . . . | ii. 81           | <i>Kobresia globularis</i> , Dewey . . . . .   | i. 13      |
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| <i>vulpinaris</i> , Nees . . . . .                          | iv. 204          | <i>nardina</i> , Horn. . . . .                 | iv. 143    |
| <i>vulpinoidea</i> , Mich. (Tab. 404-409) . . . . .         | iii. 124         | <i>Mapania sylvatica</i> , Pursh . . . . .     | iv. 151    |
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| <i>Wallichiana</i> , Prescott (Tab. 18) . . . . .           | i. 6, 49         | <i>S. cyperoides</i> , Reich. . . . .          | iv. 184    |
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| <i>Watsonii</i> , Boott . . . . .                           | iv. 203          | <i>Uncinia brevisetis</i> , Torrey . . . . .   | i. 13      |
| <i>Welwitschii</i> , Boiss. . . . .                         | iv. 163          | <i>U. digyna</i> , Hoch. . . . .               | ii. 80     |
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| <i>Willdenowii</i> , Schk. (Tab. 101, 102) . . . . .        | i. 41            | <i>microglochis</i> , Led. . . . .             | iv. 147    |
| <i>Willdenowii</i> , var., Muhl. . . . .                    | i. 42            | <i>Sellowiana</i> , Nees . . . . .             | iv. 151    |
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| <i>Wormskioldiana</i> , Horn. . . . .                       | iv. 150          |                                                |            |





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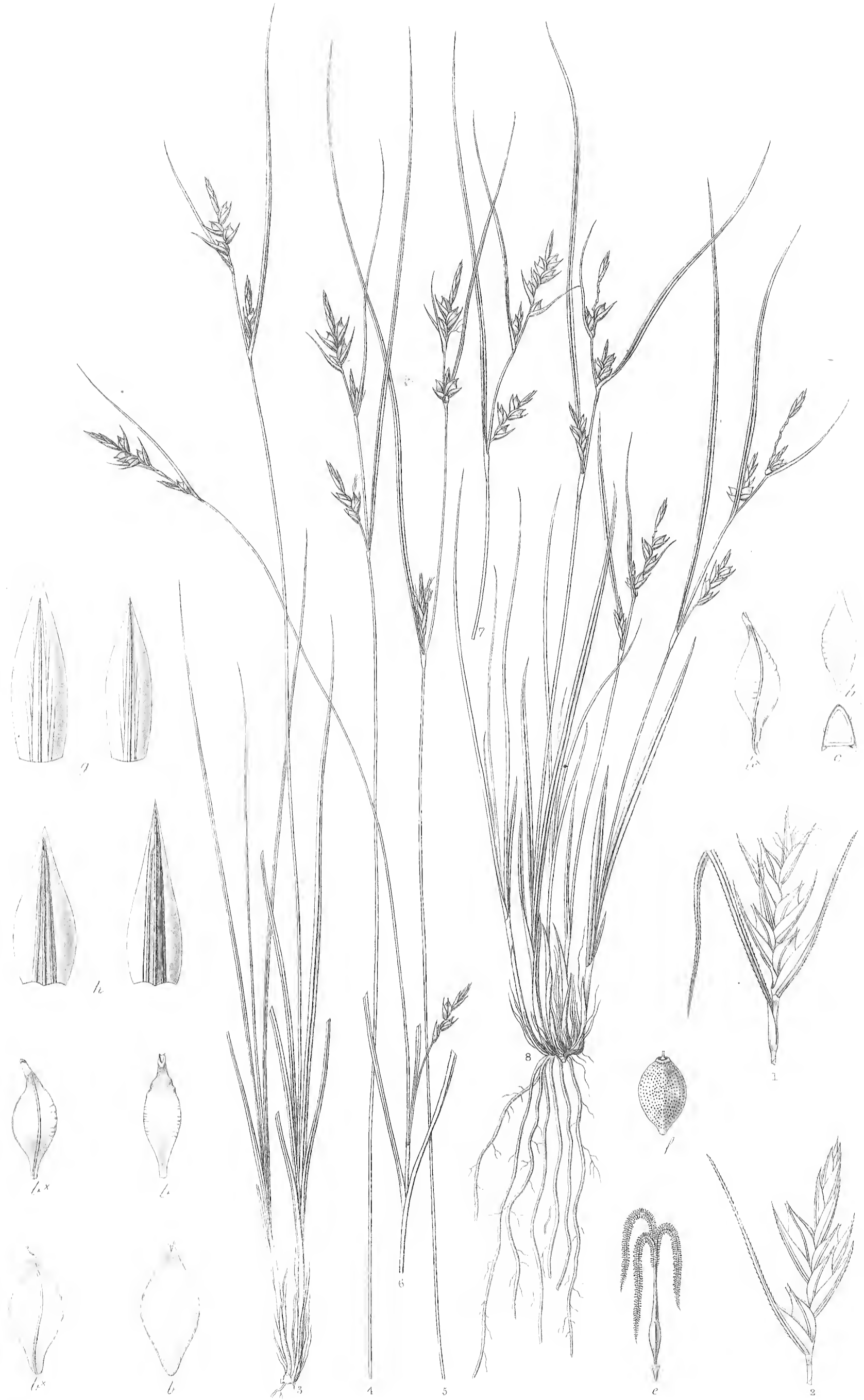


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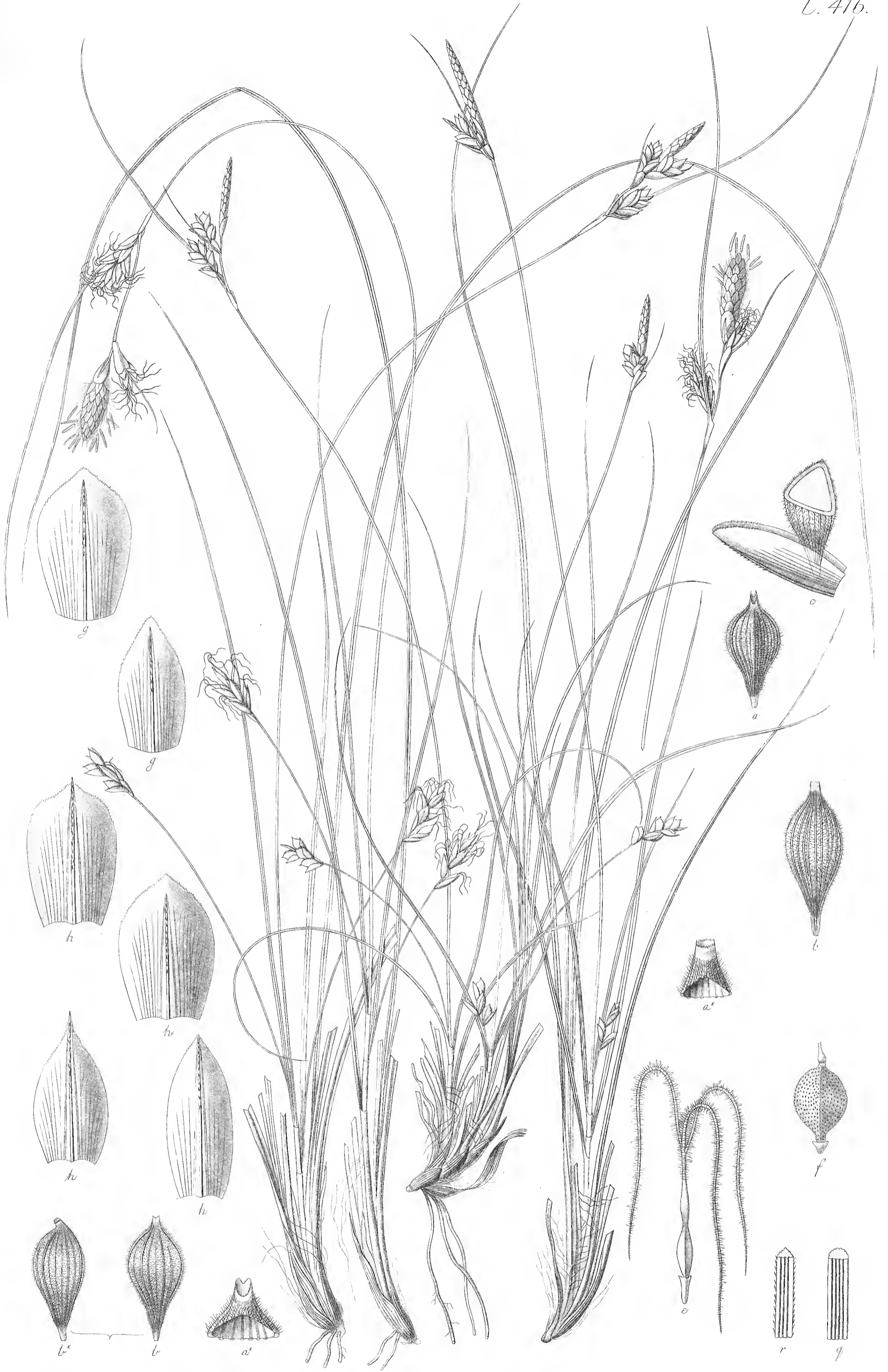
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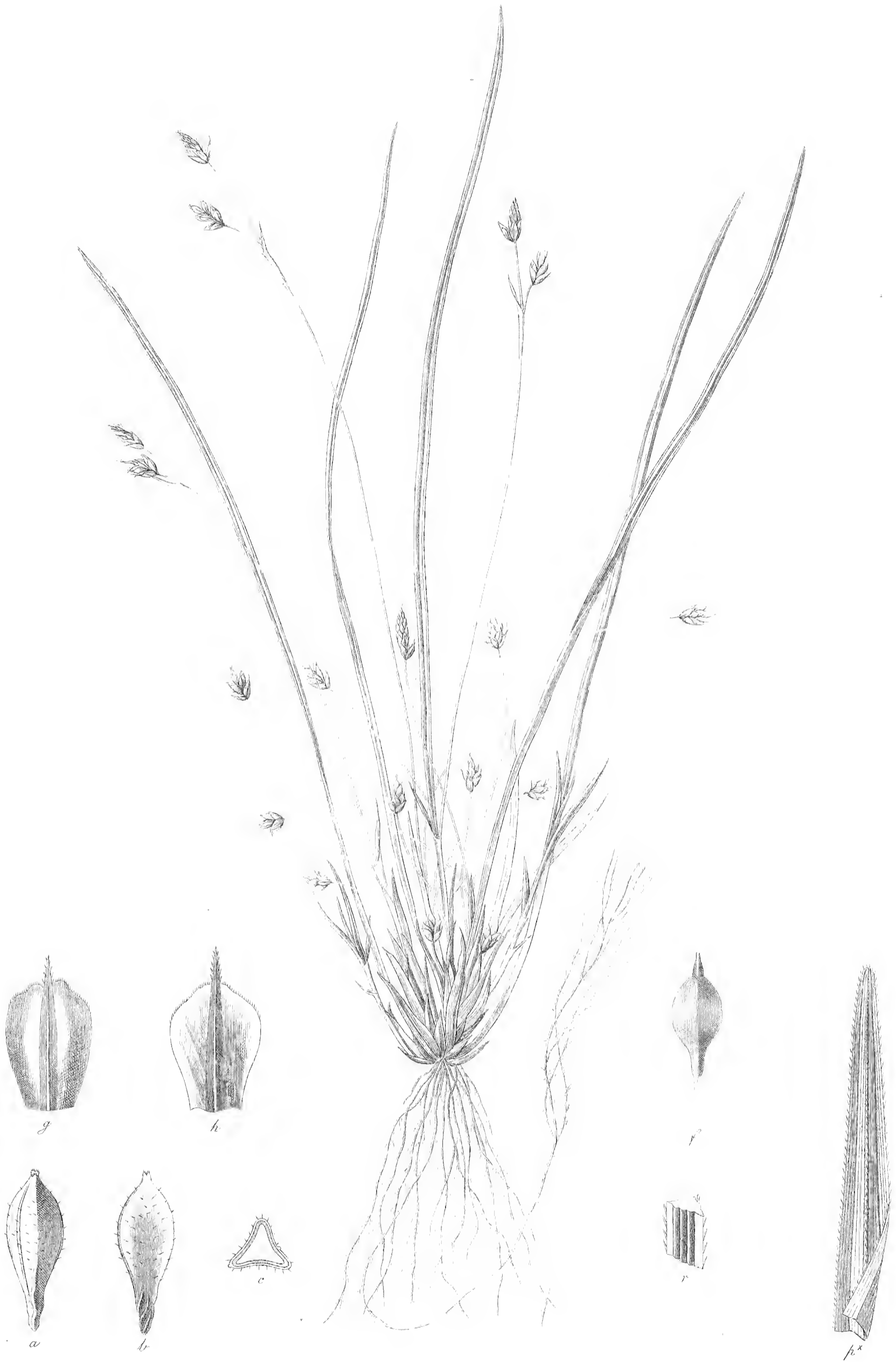
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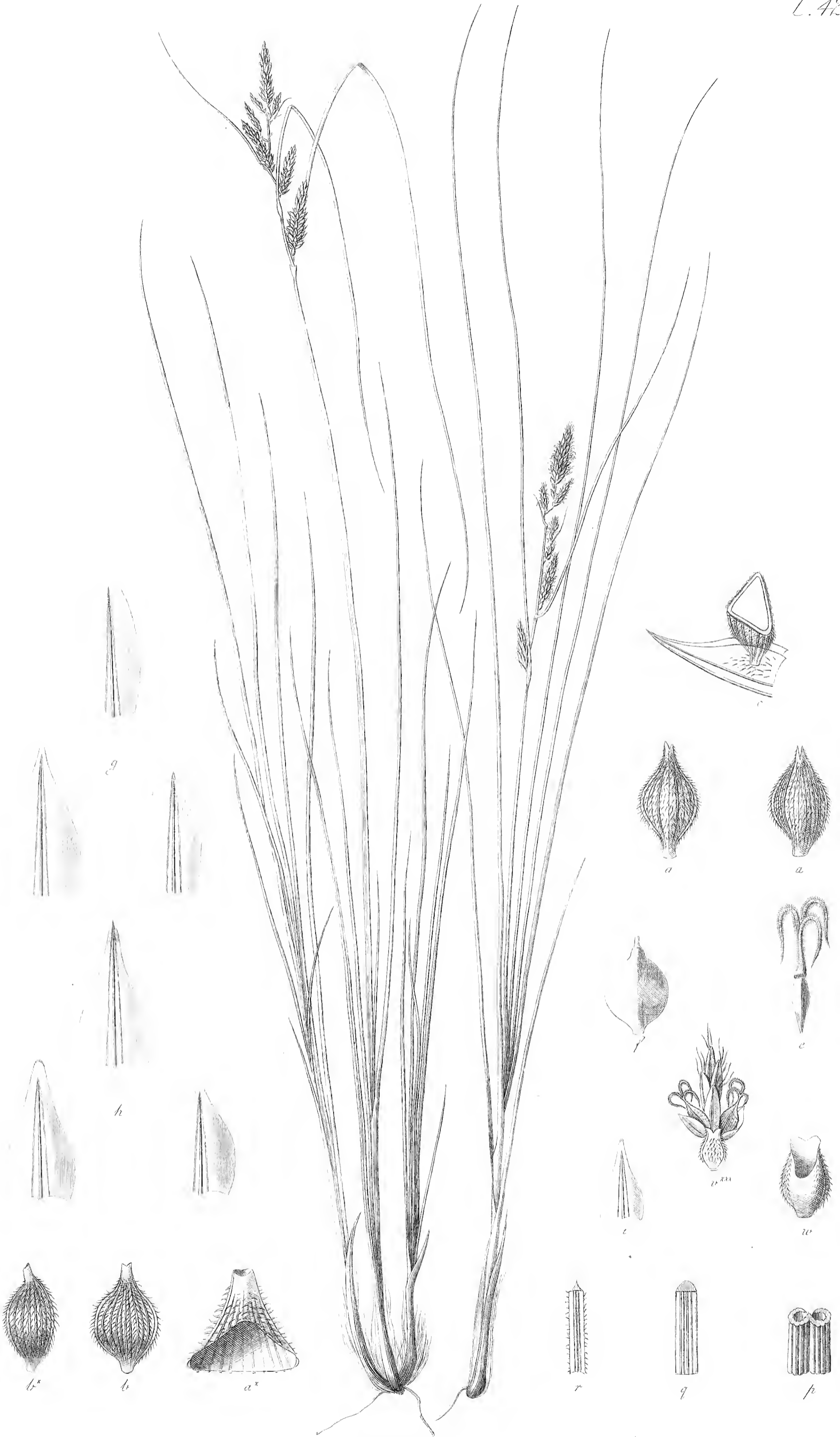
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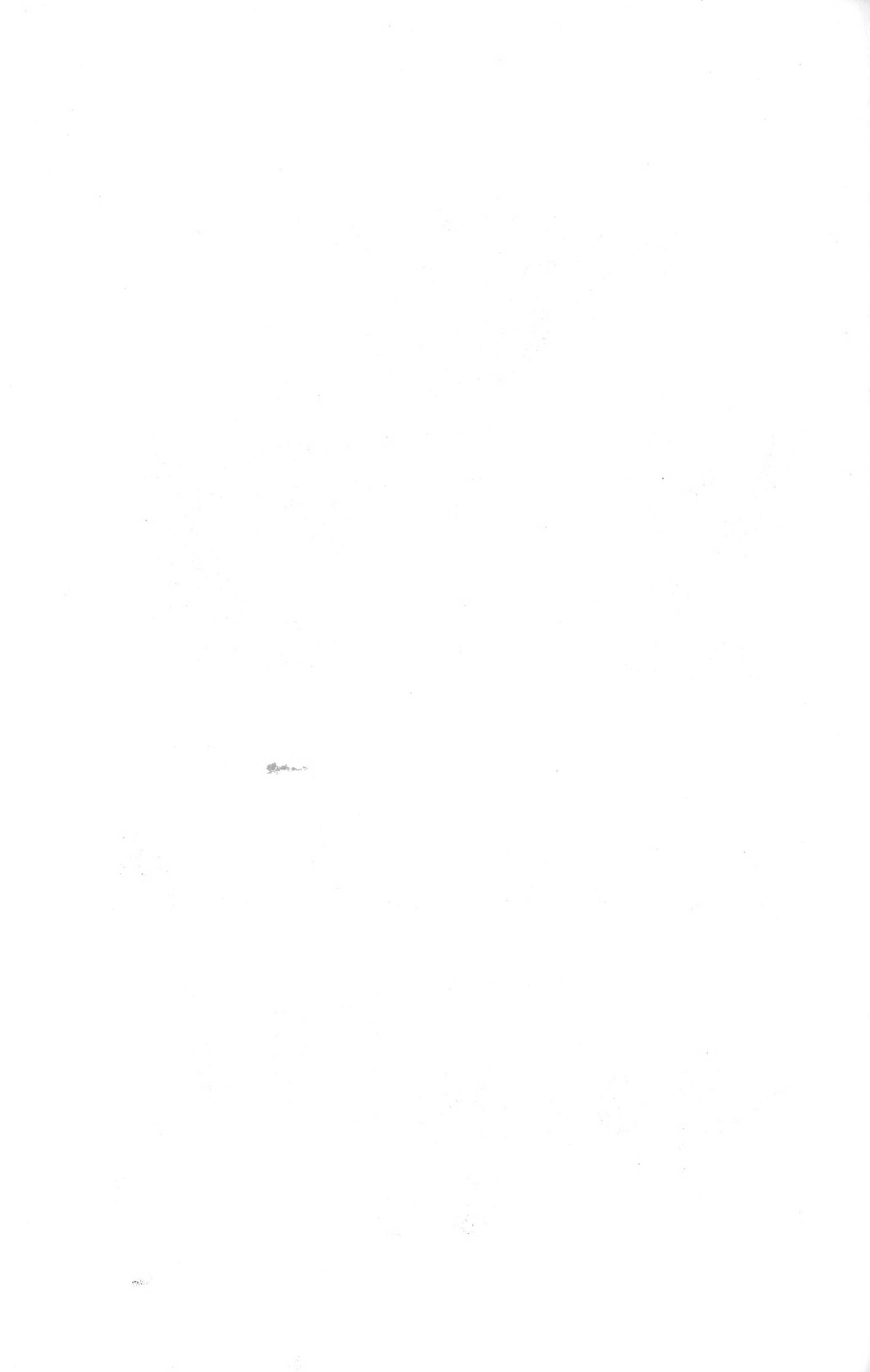


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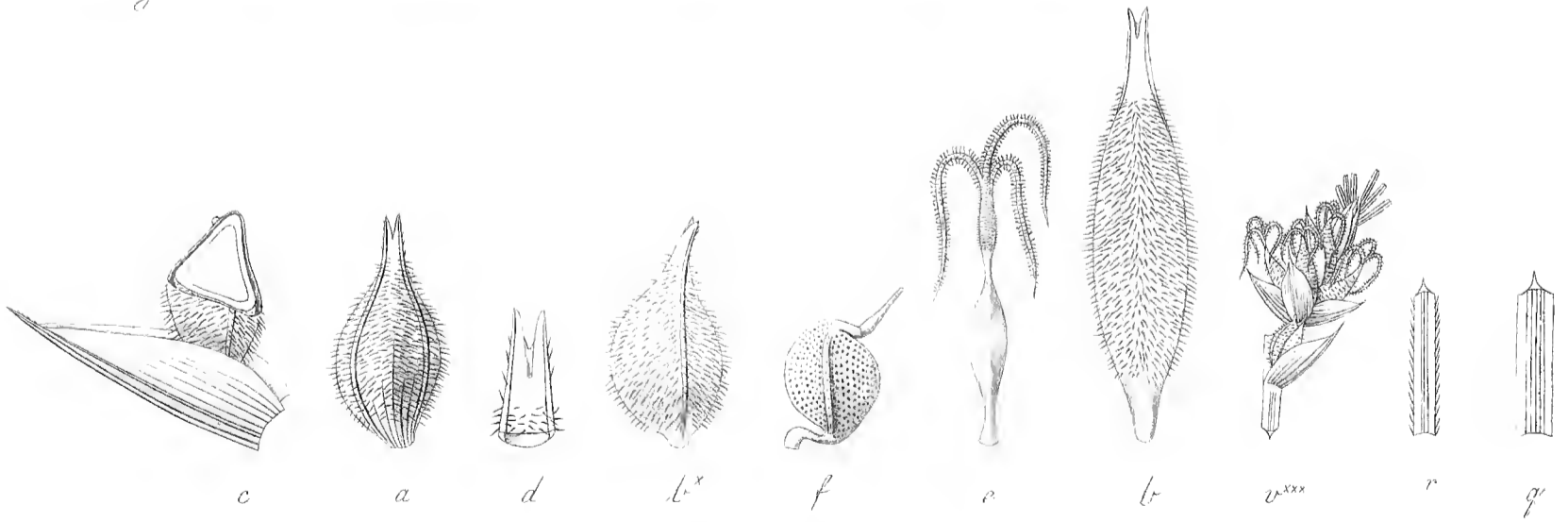
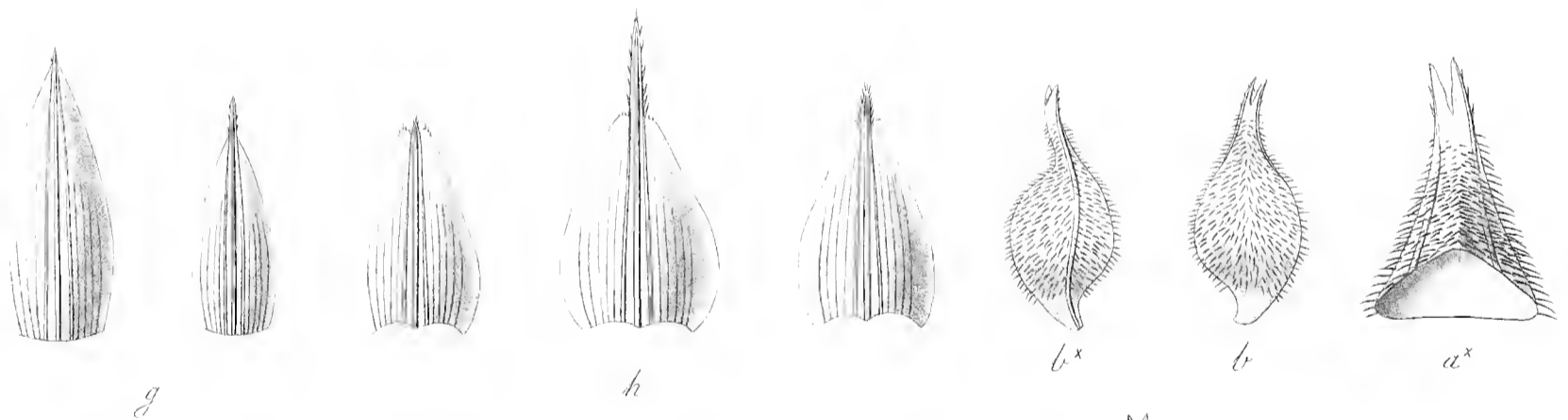




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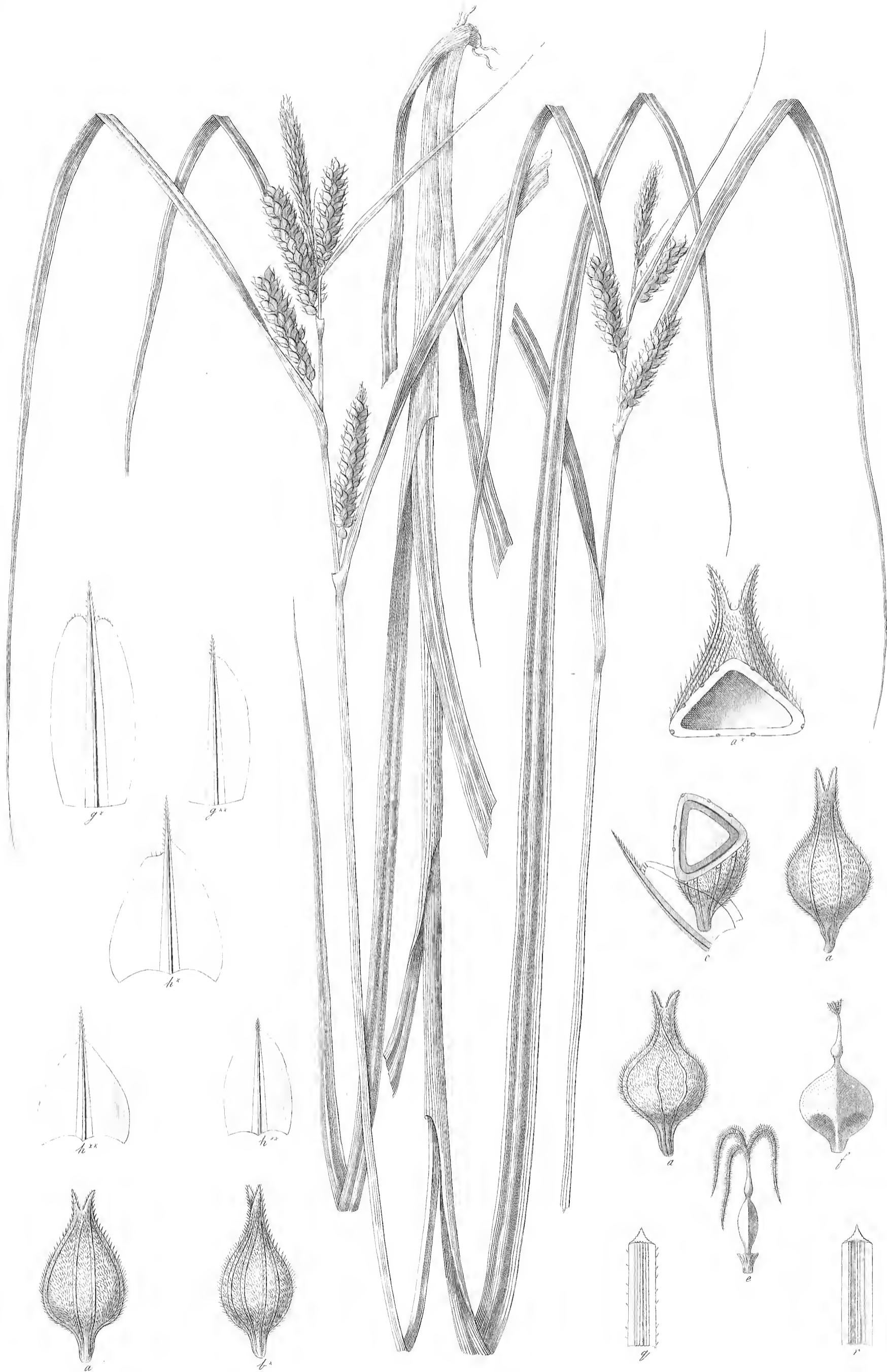
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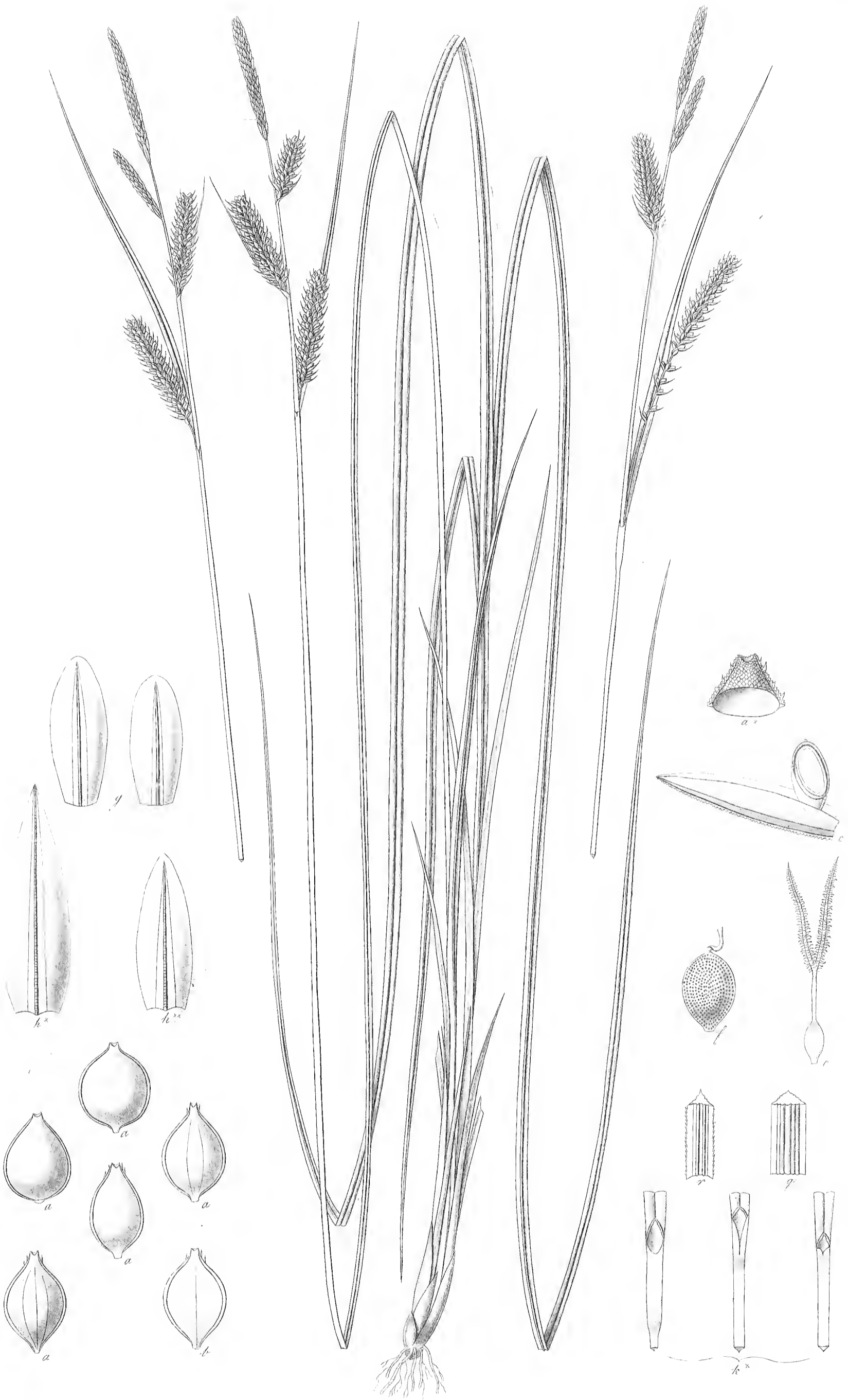






C. MANCA.





C. APERTA. 72.





iris japonica.





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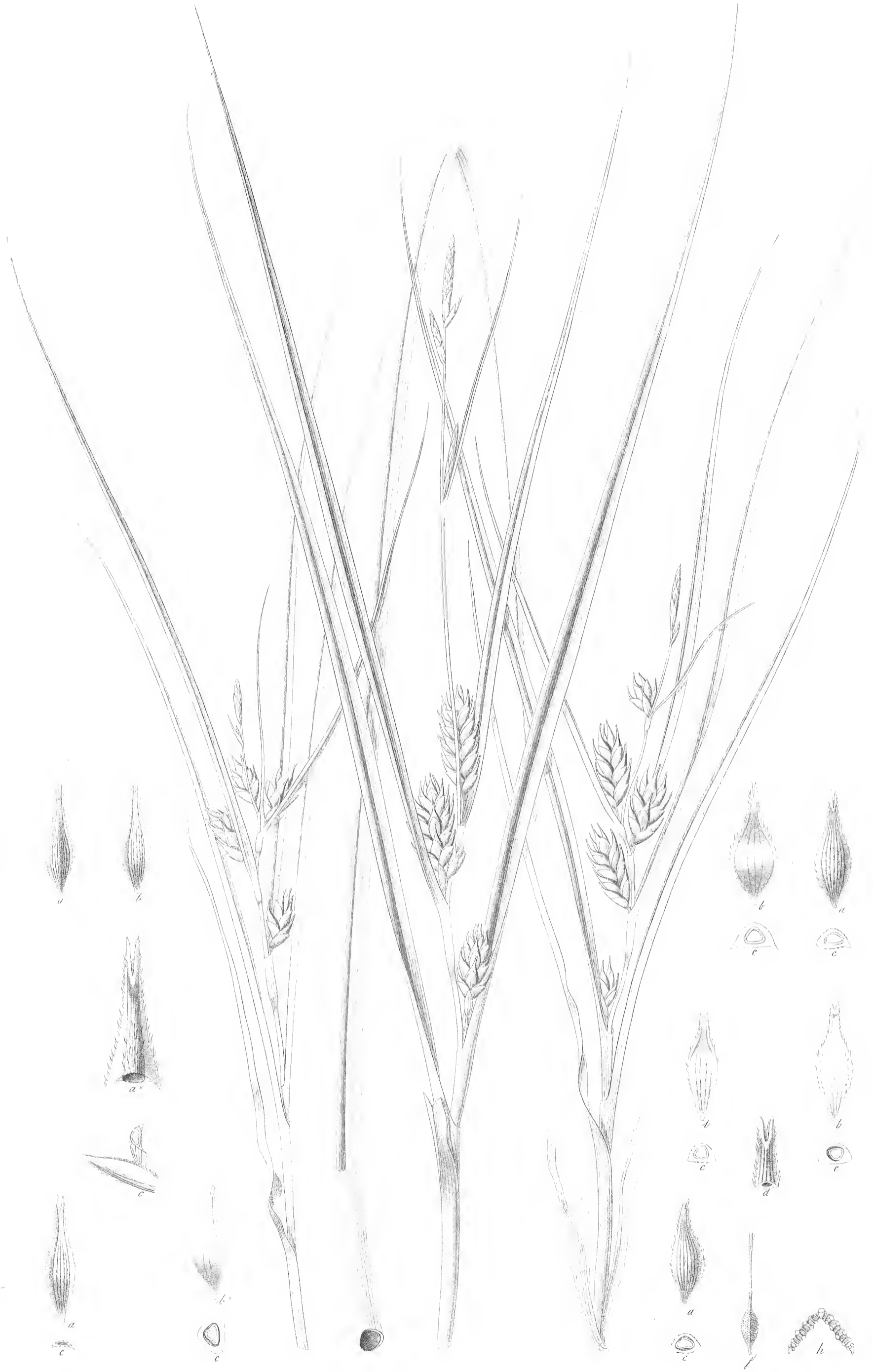






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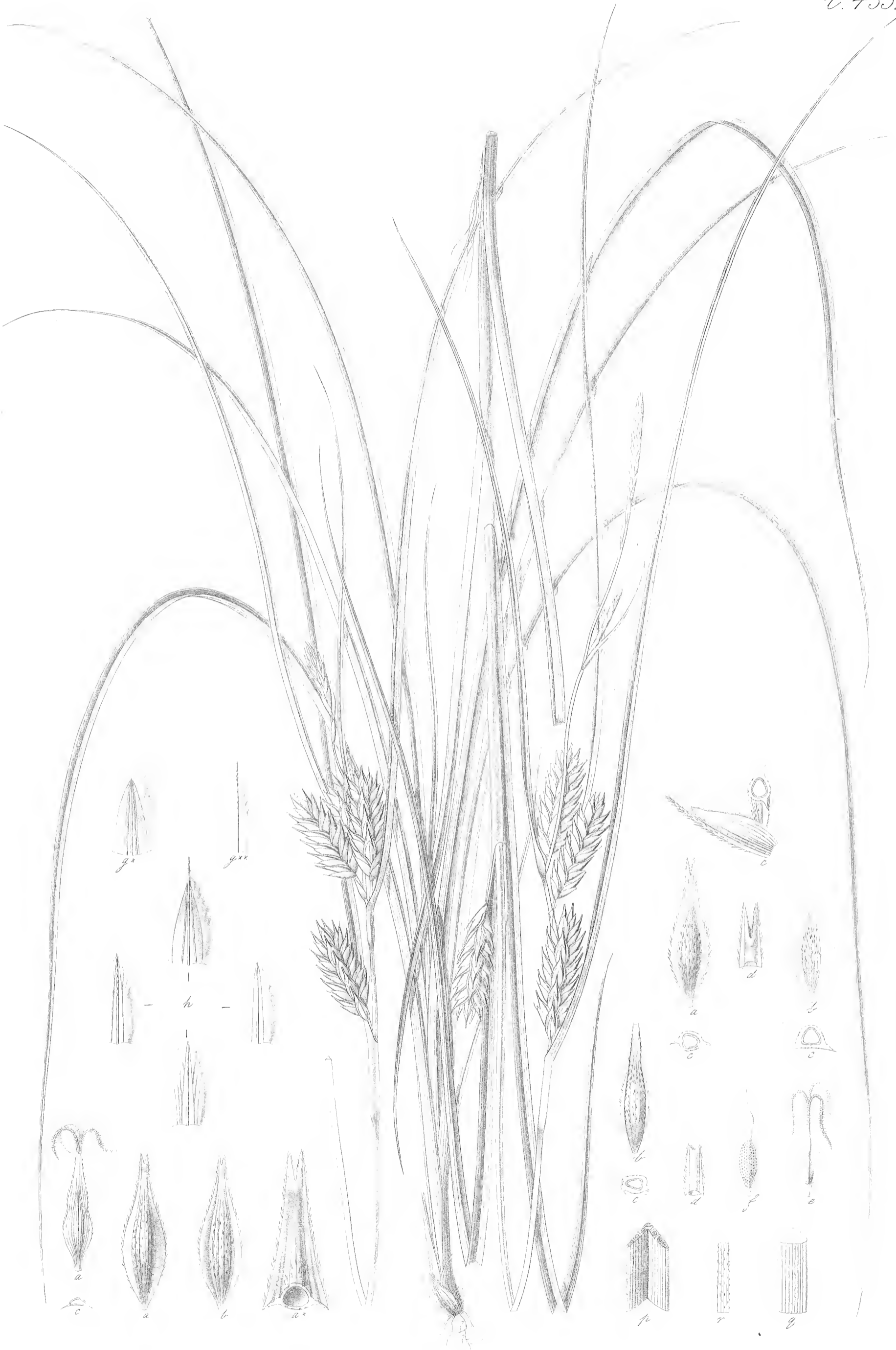
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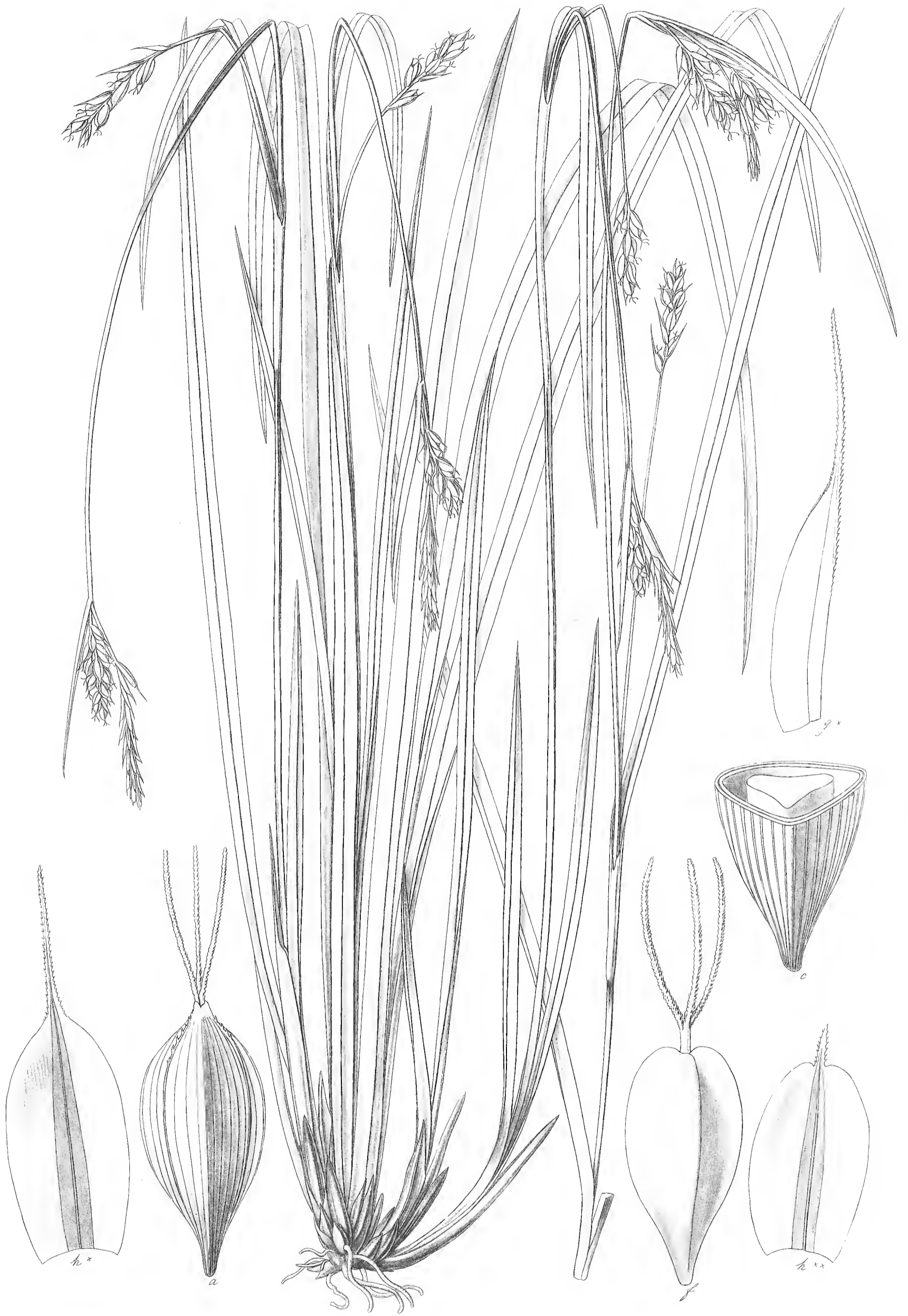




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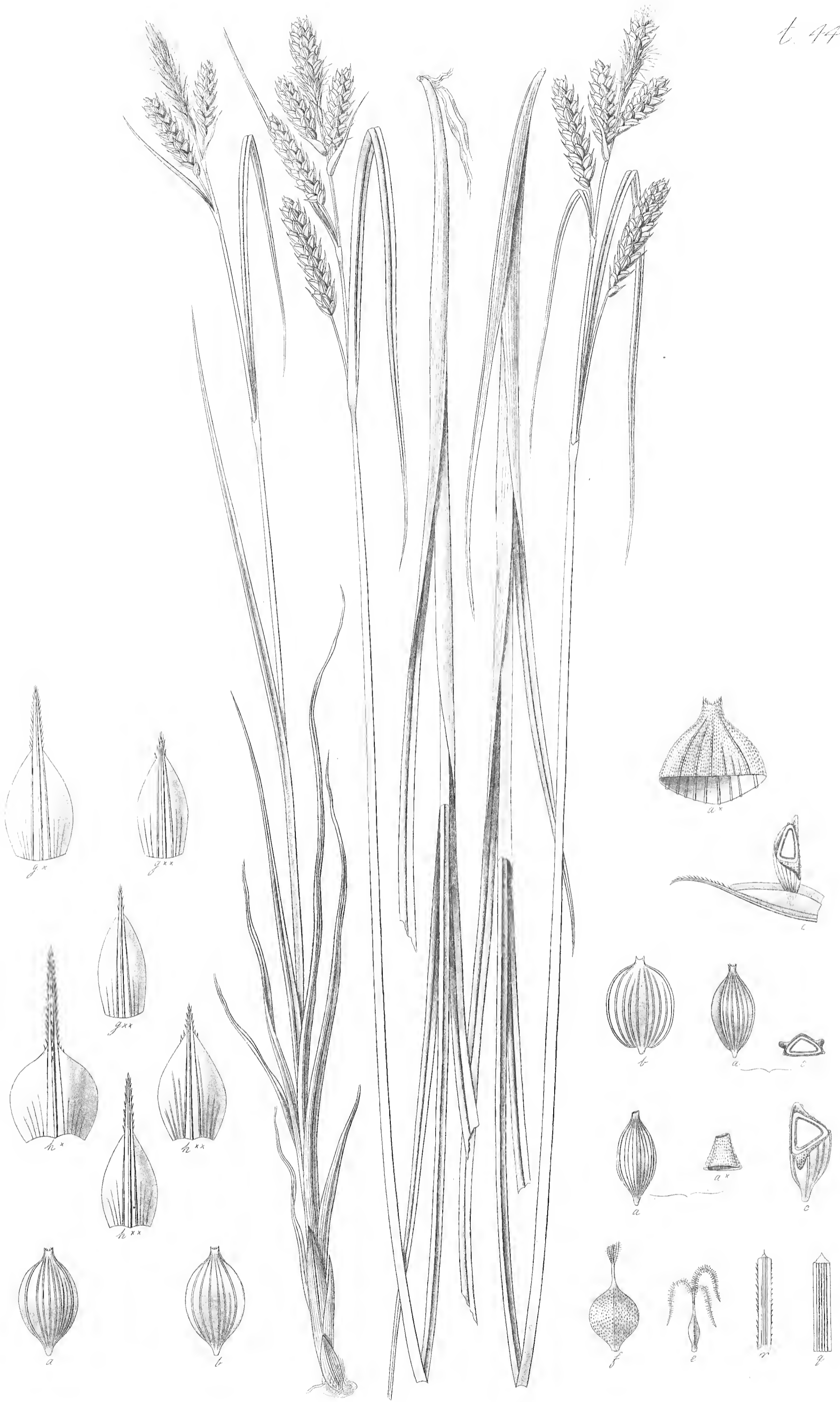




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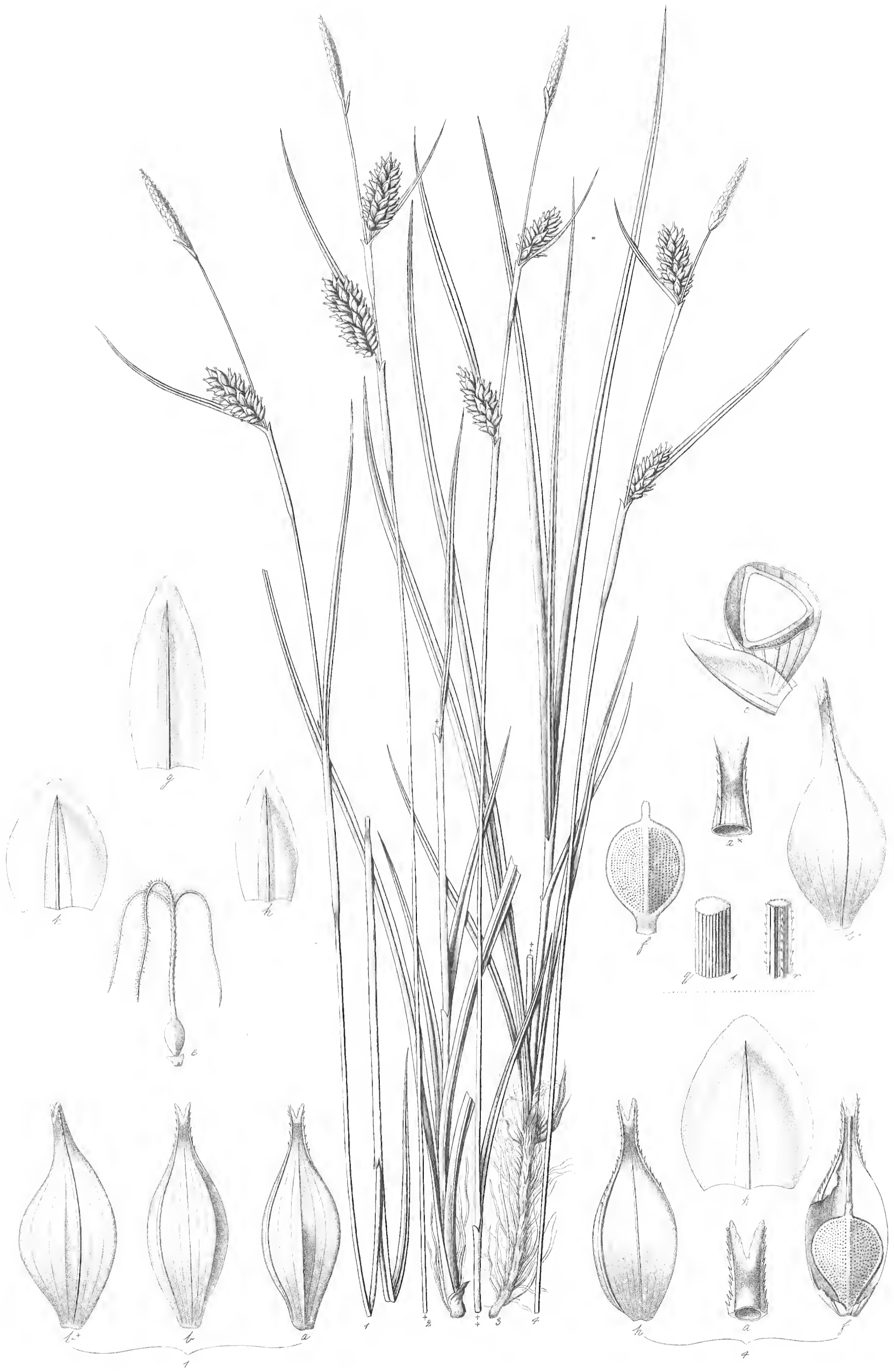




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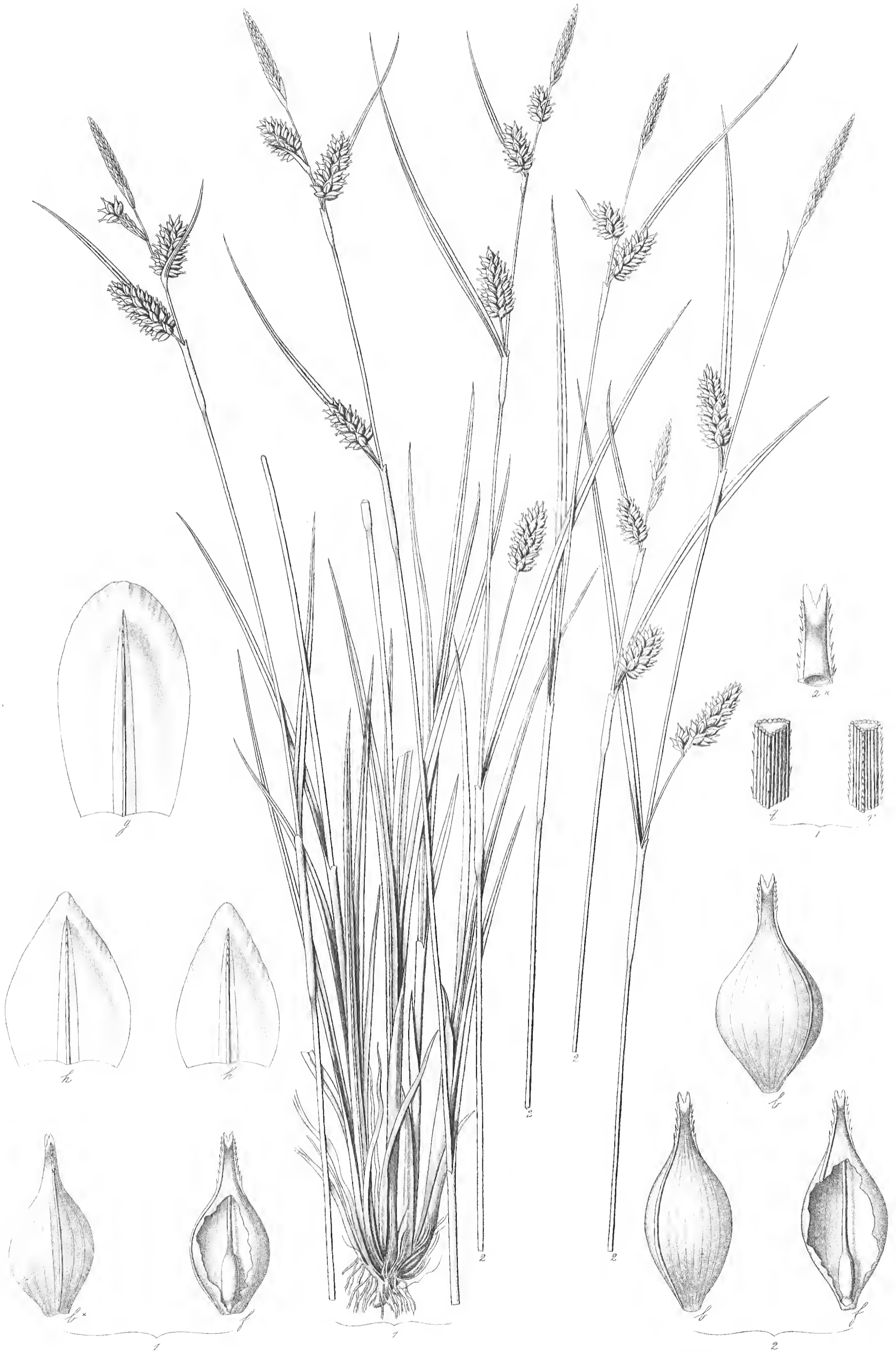






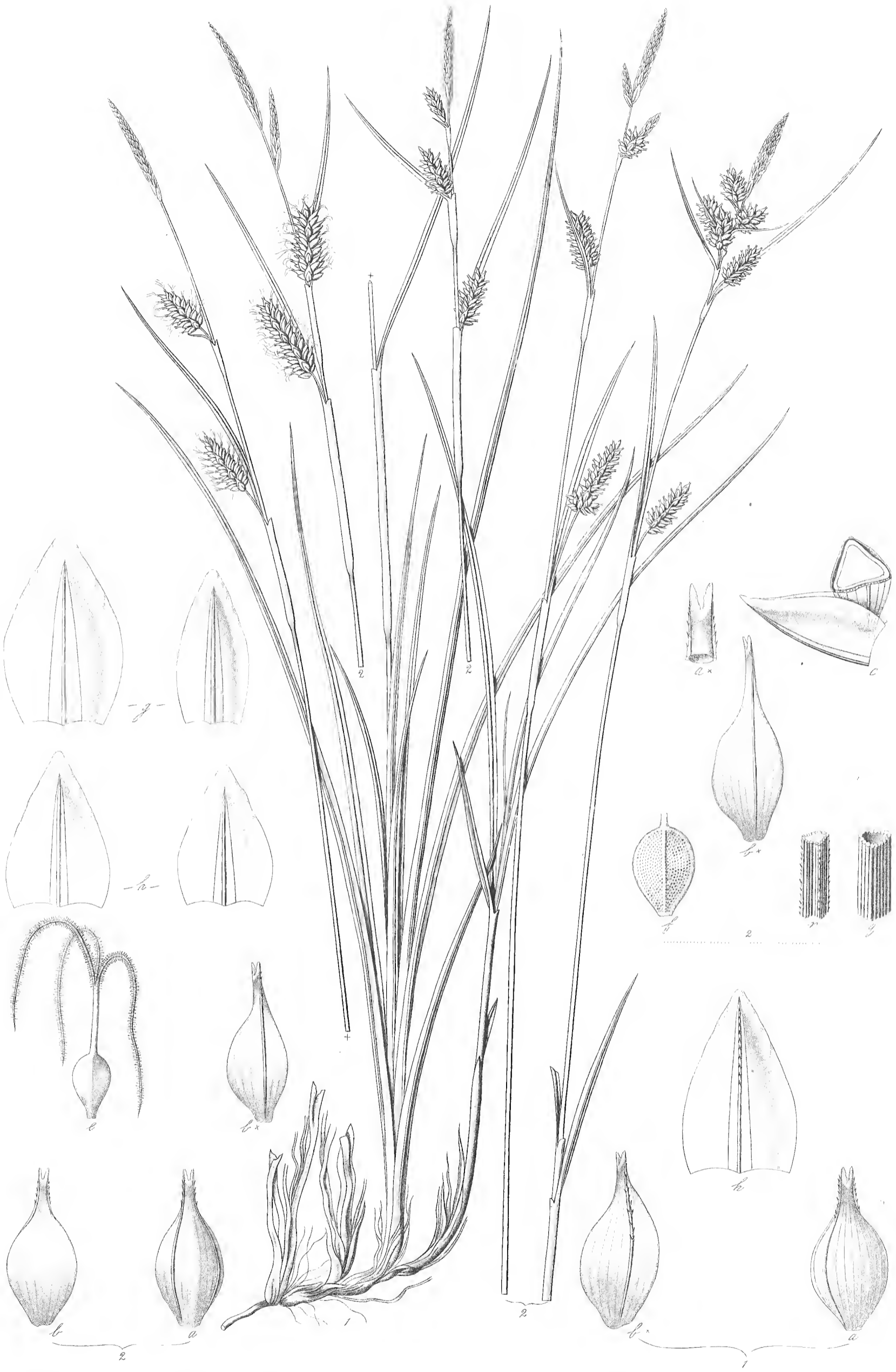
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C. FULVA. J





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C. PROCERA.

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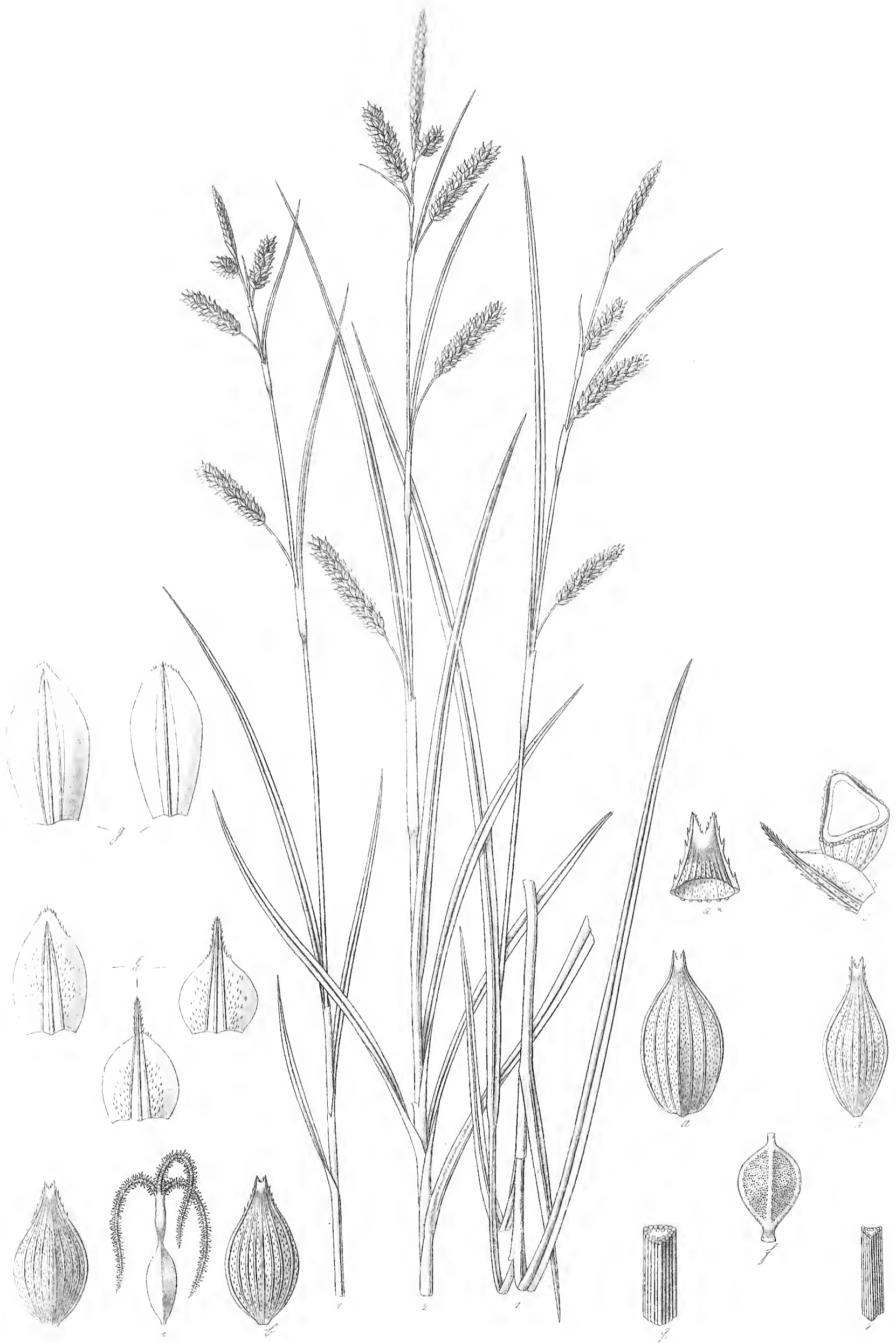
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C. ACUTATA.





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2 C. NANA.

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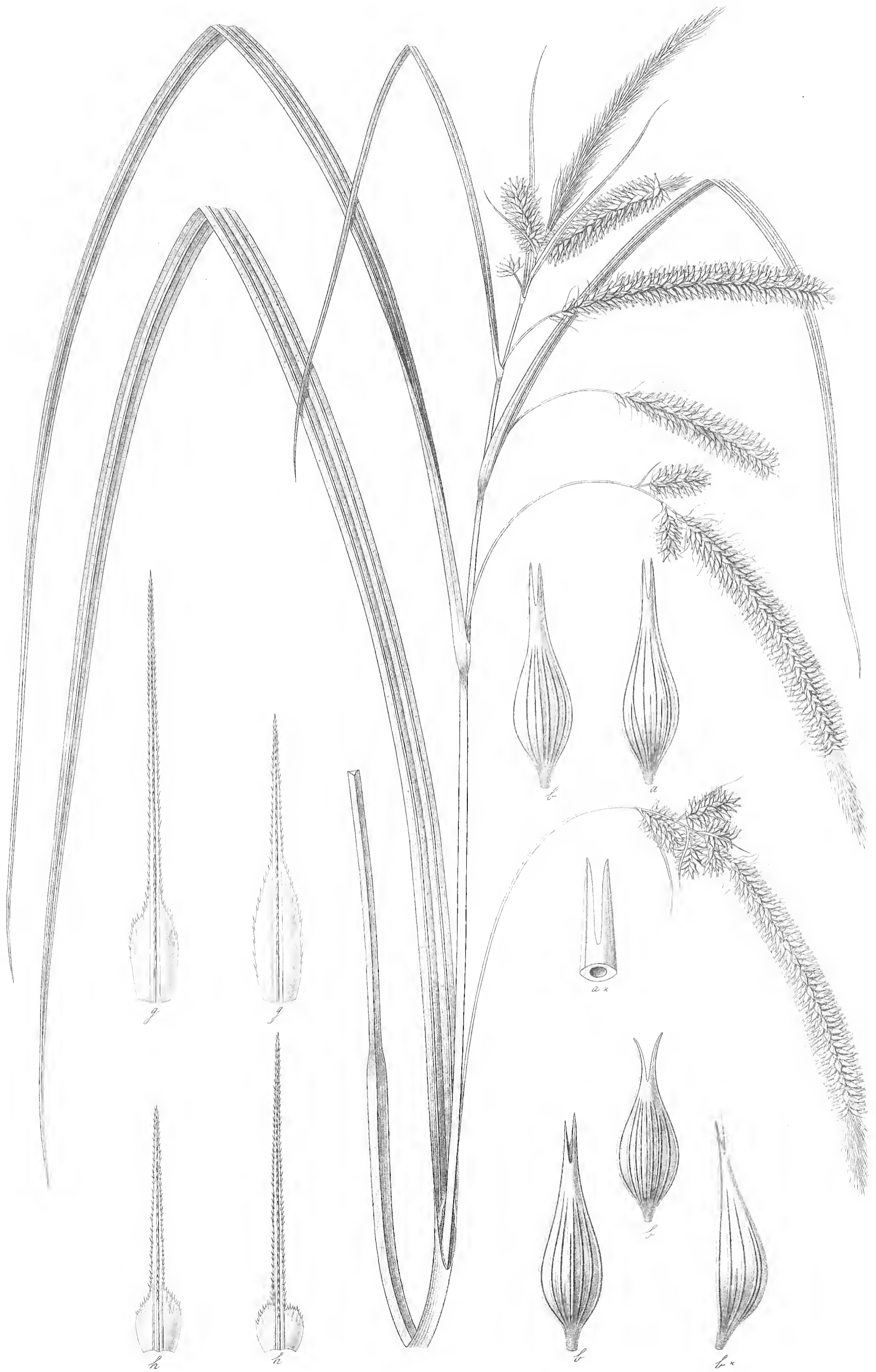
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C. PSEUDO-CYPERUS.





C. PSEUDOCYPERUS.







C. MULTISPICATA.





STYLOSIS





C. 草 根 葉 花 果 圖 示





LEIOCARPA JUNCEA

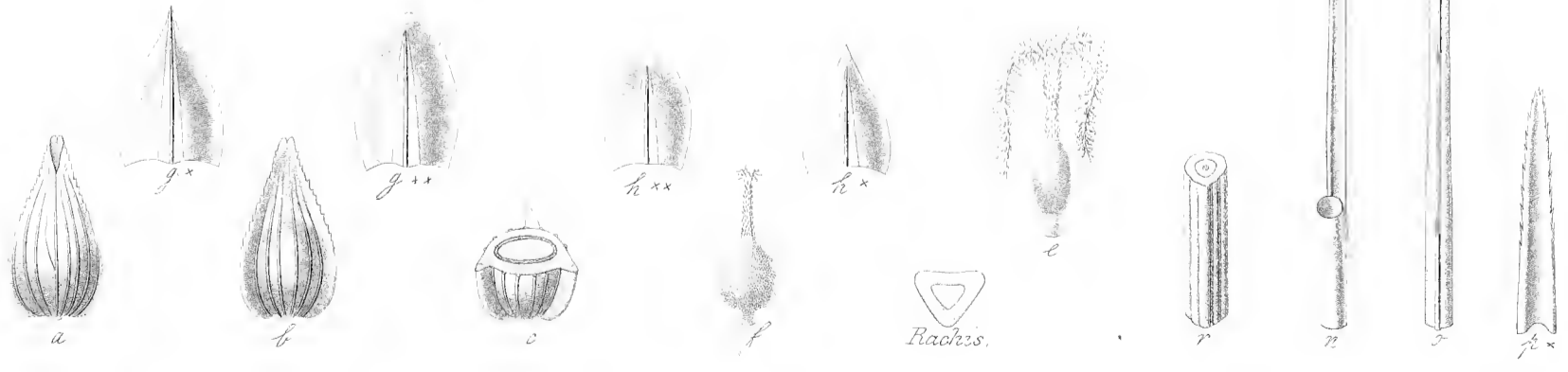






MIRATA.





Rachis.

C. DIOICA.





C. CYNOCRATES.





CYNOCRATES.







C. PARALLELA.





C. DAVALLIANA.

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C. TENUIFLORA.

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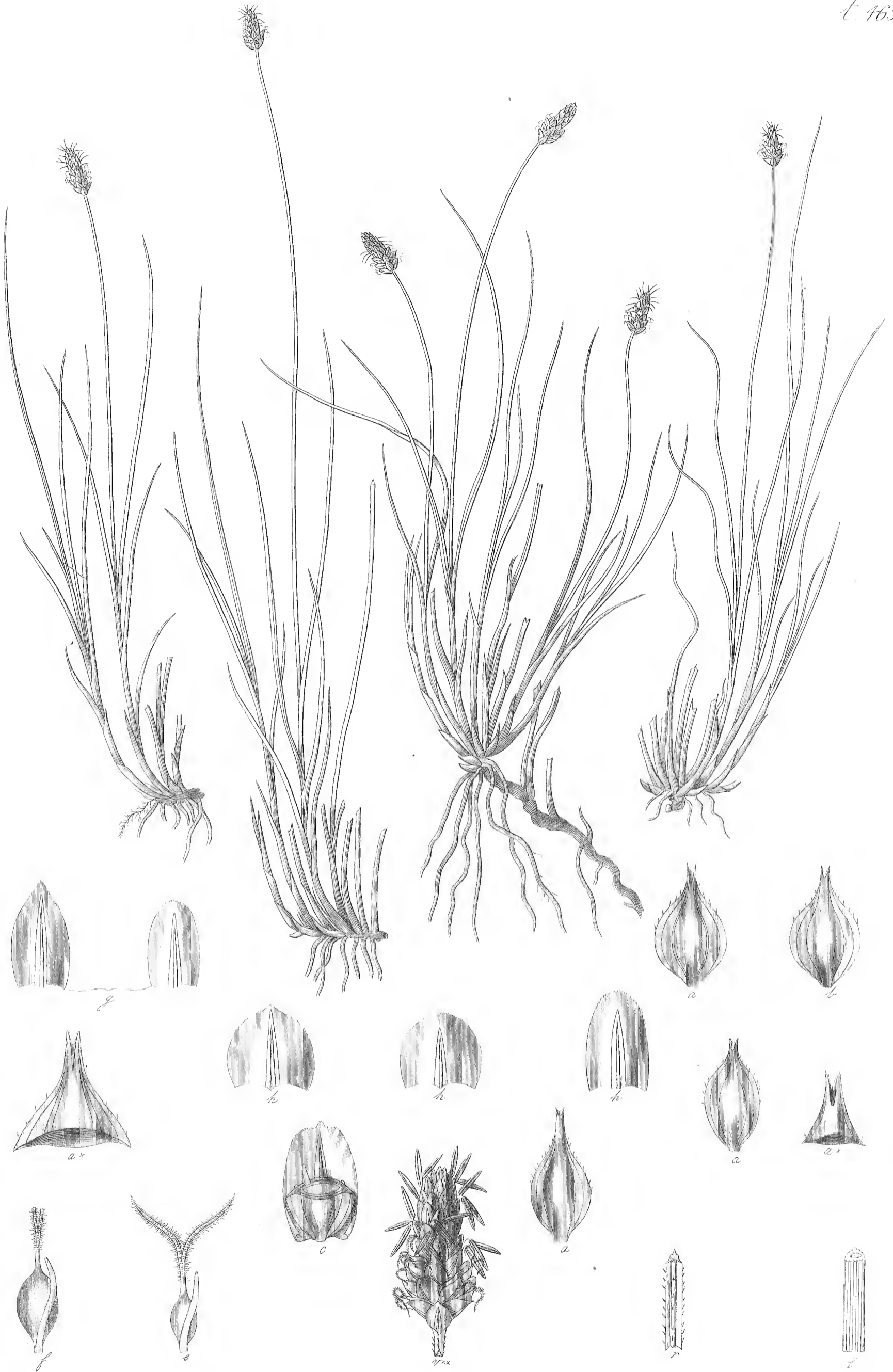




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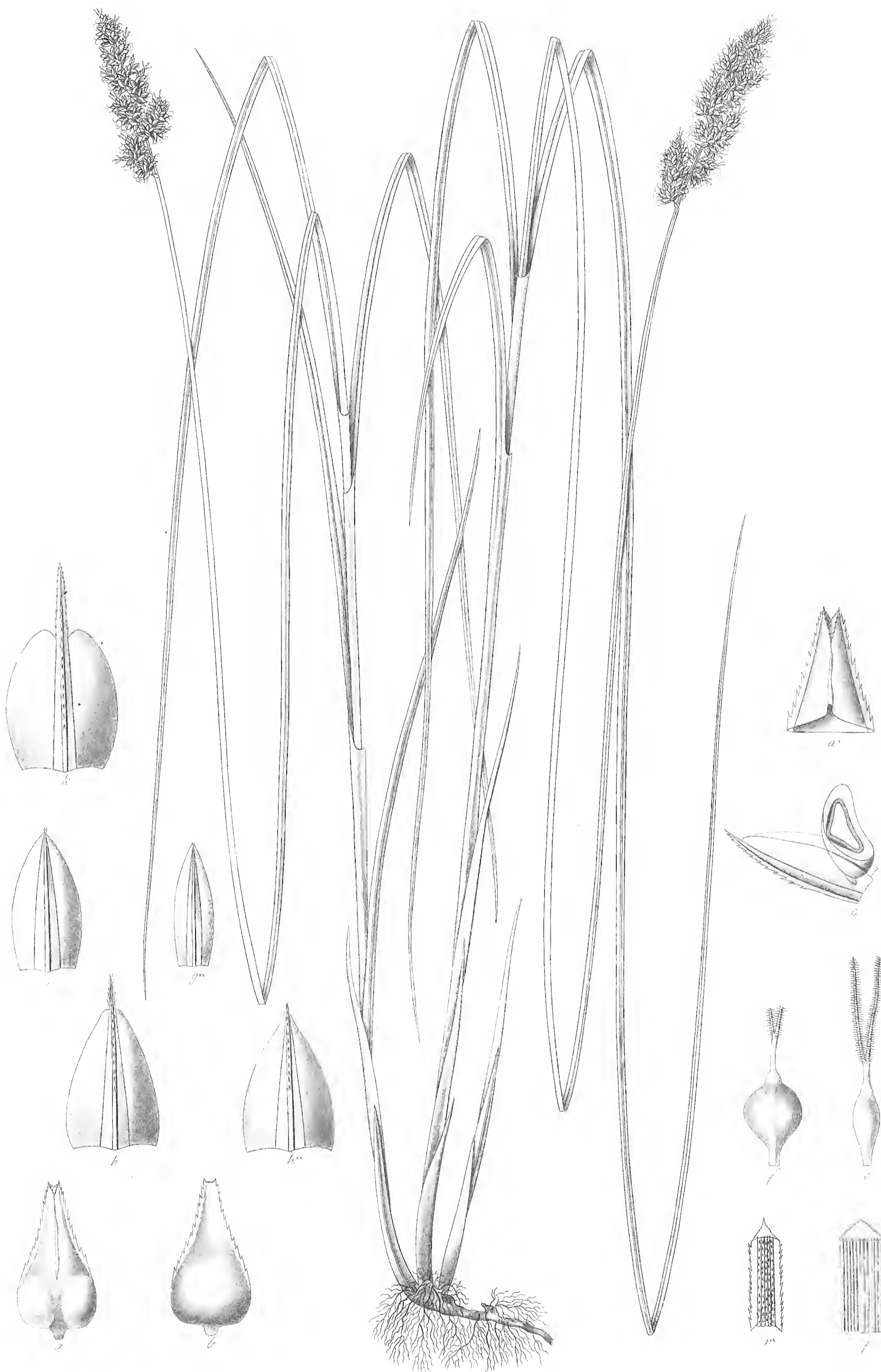




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*M*



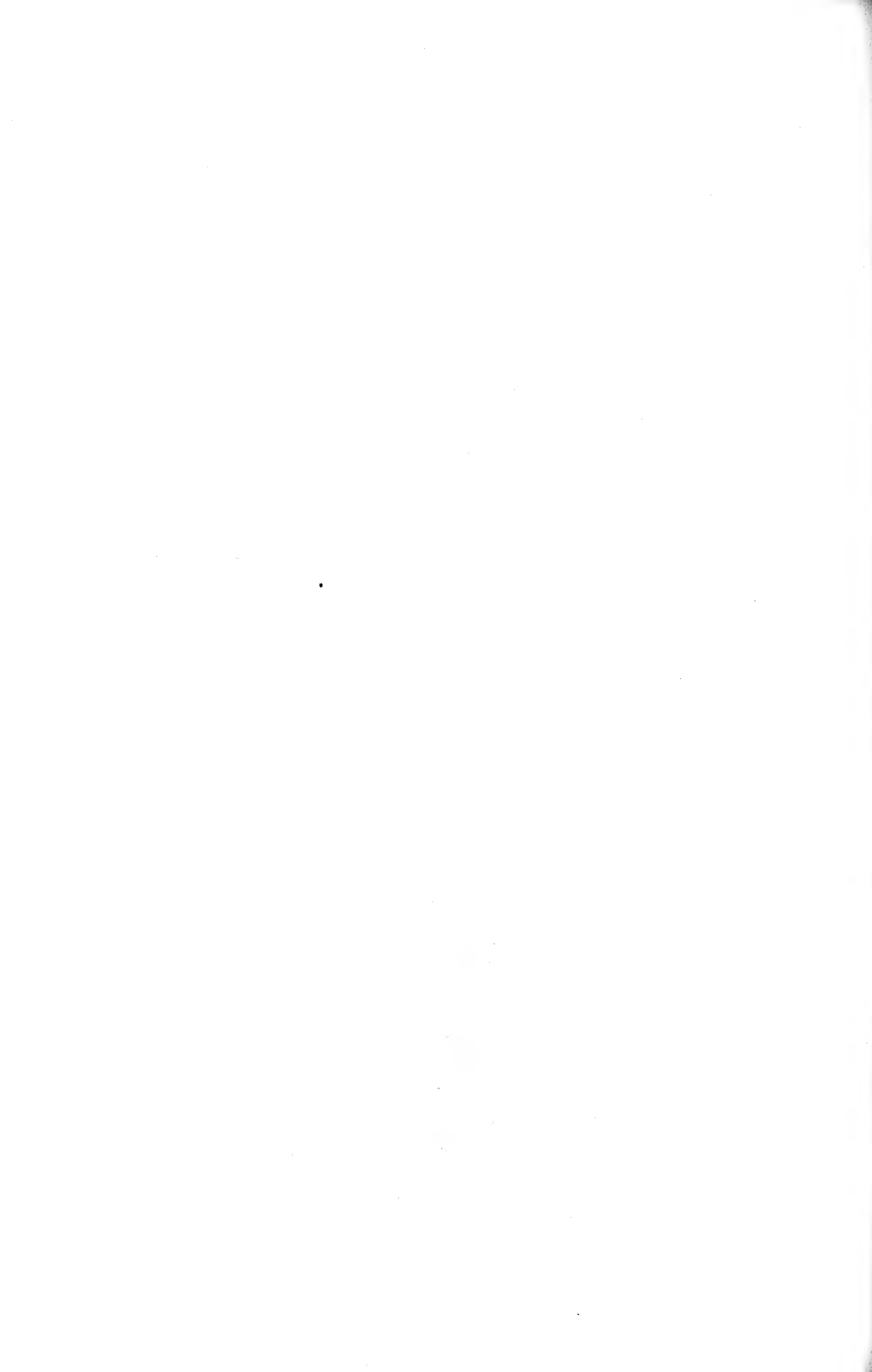


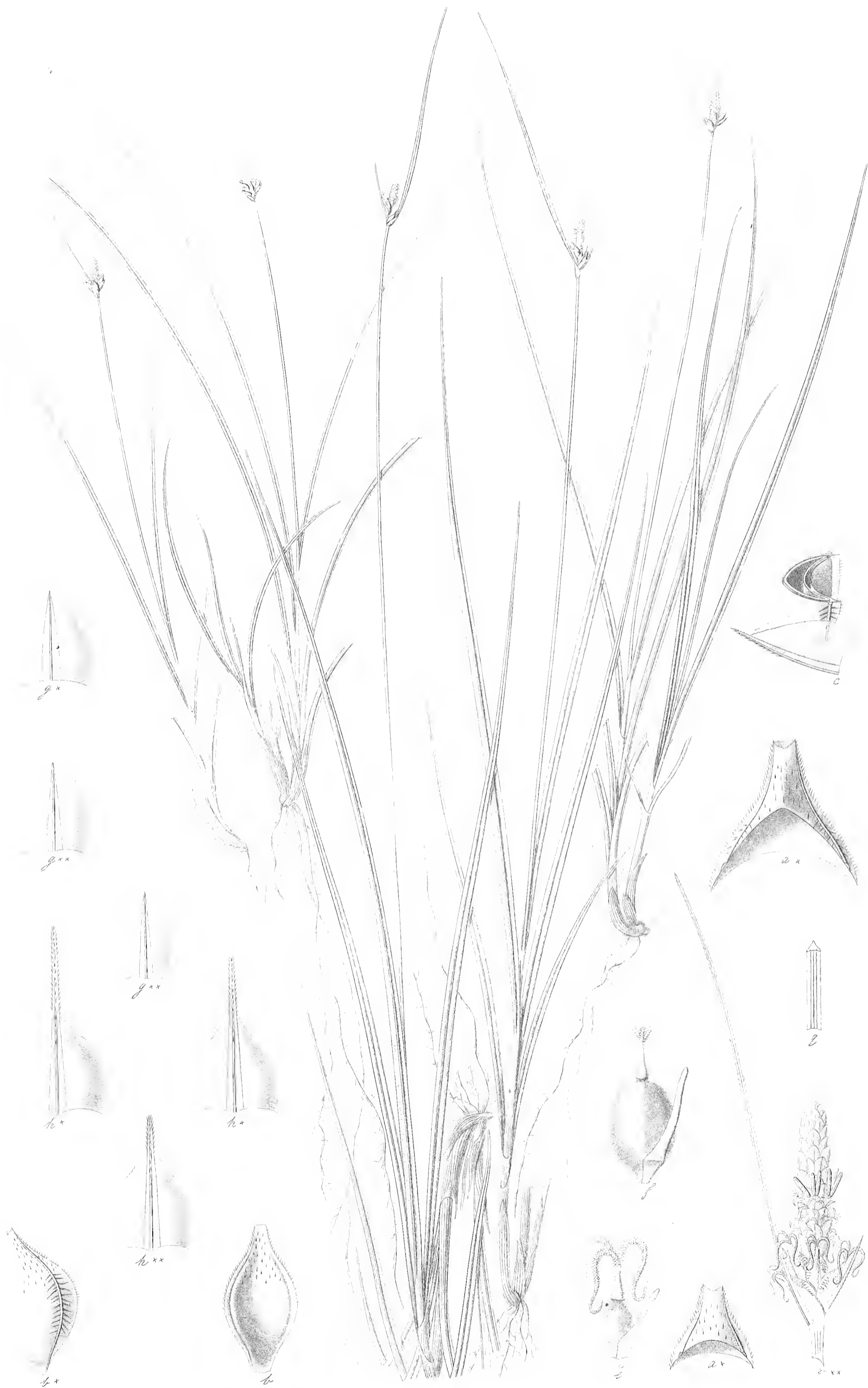
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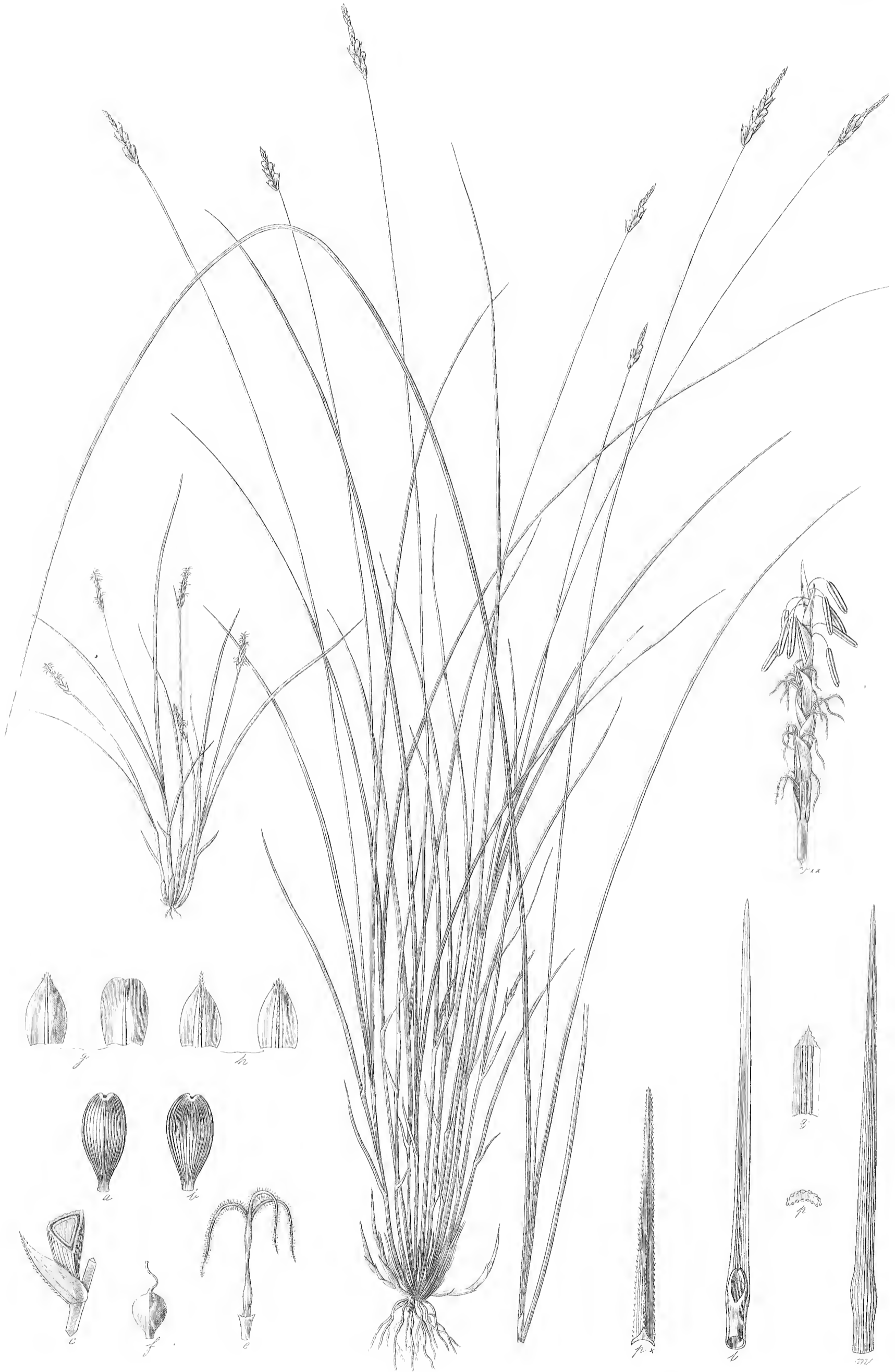




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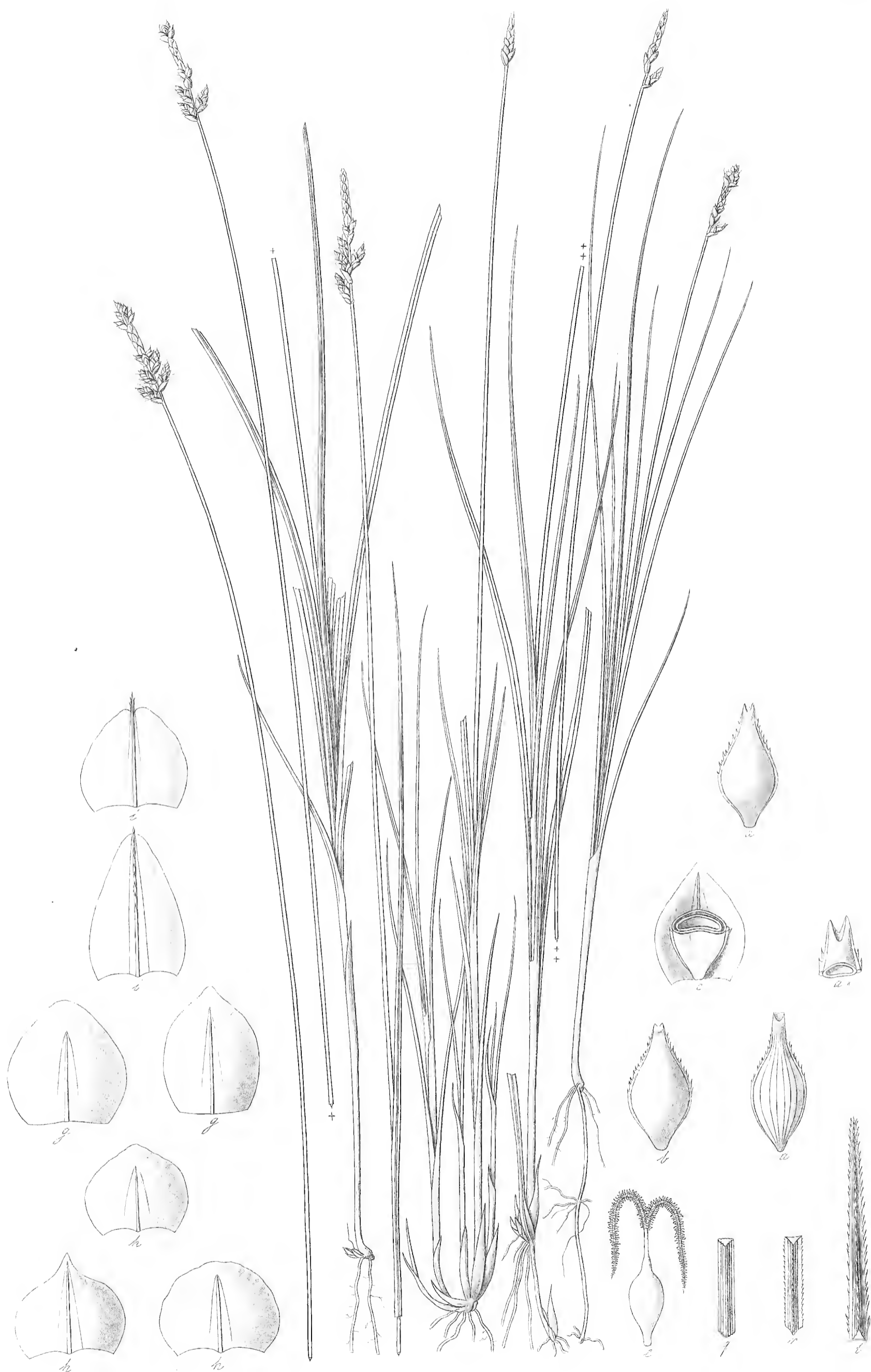






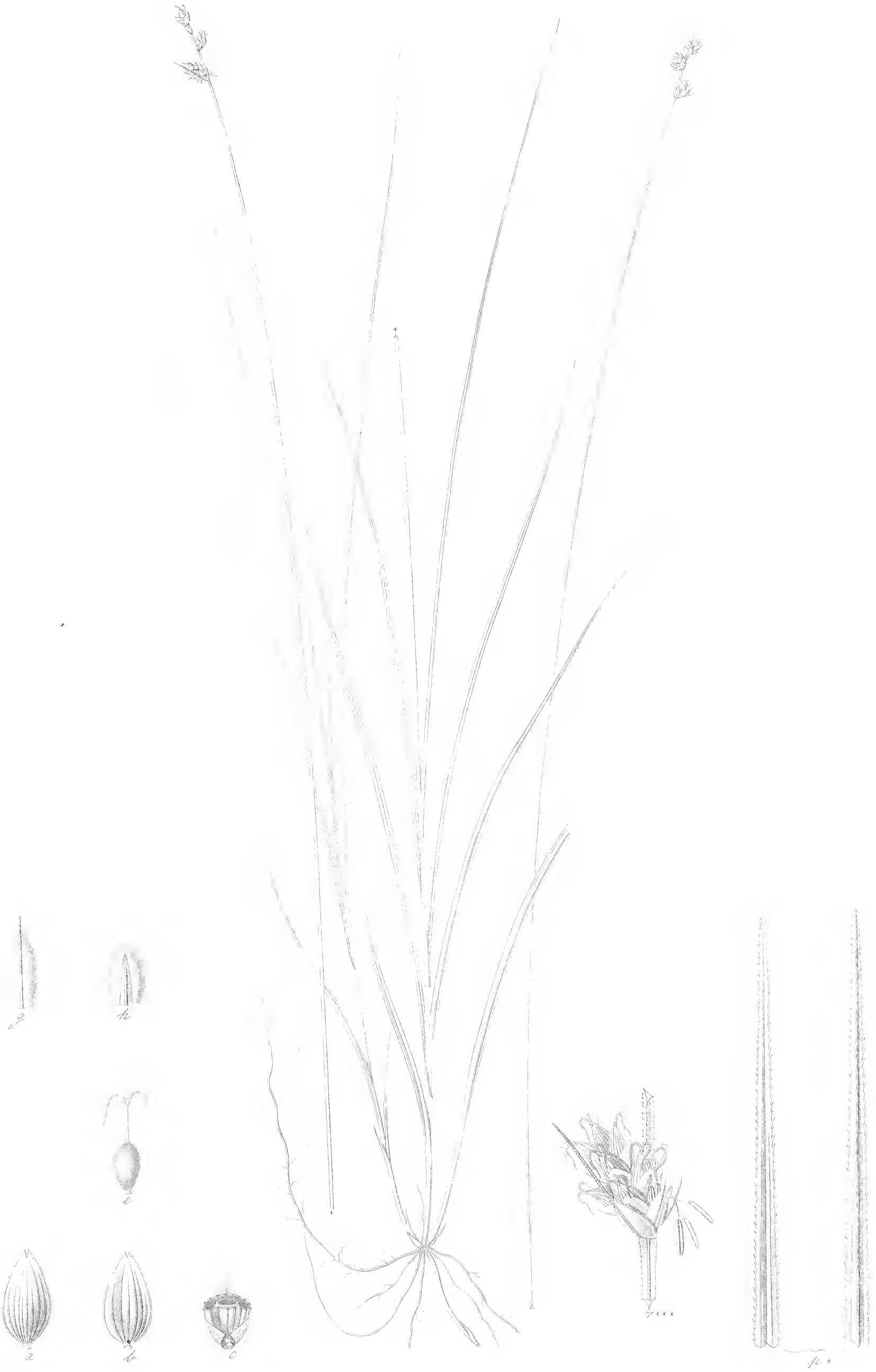
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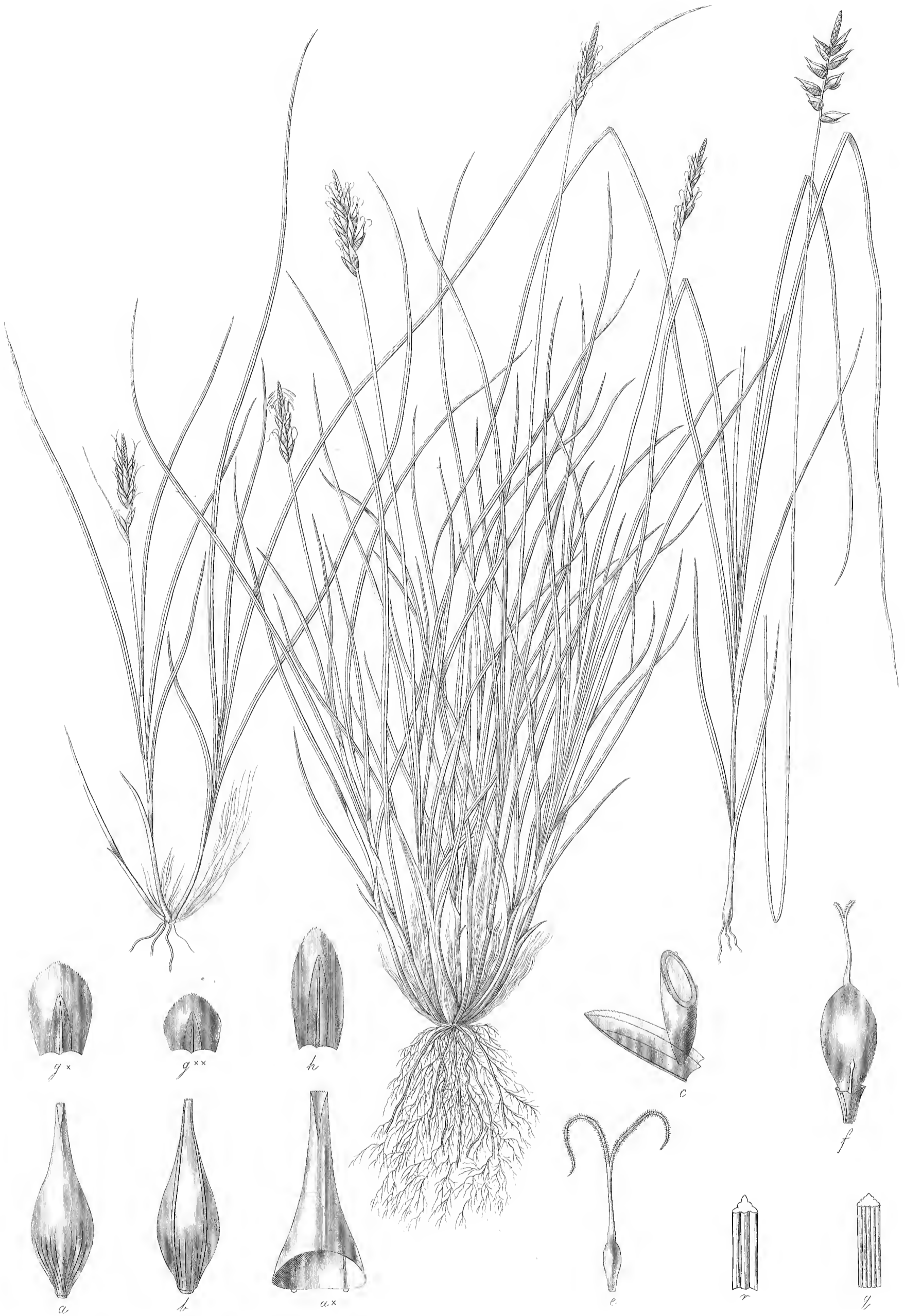




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C. MACROSTYLA  $\beta$ .





C. NIGRICANS.





C. PYRENAICA.





C. PYRENAICA.







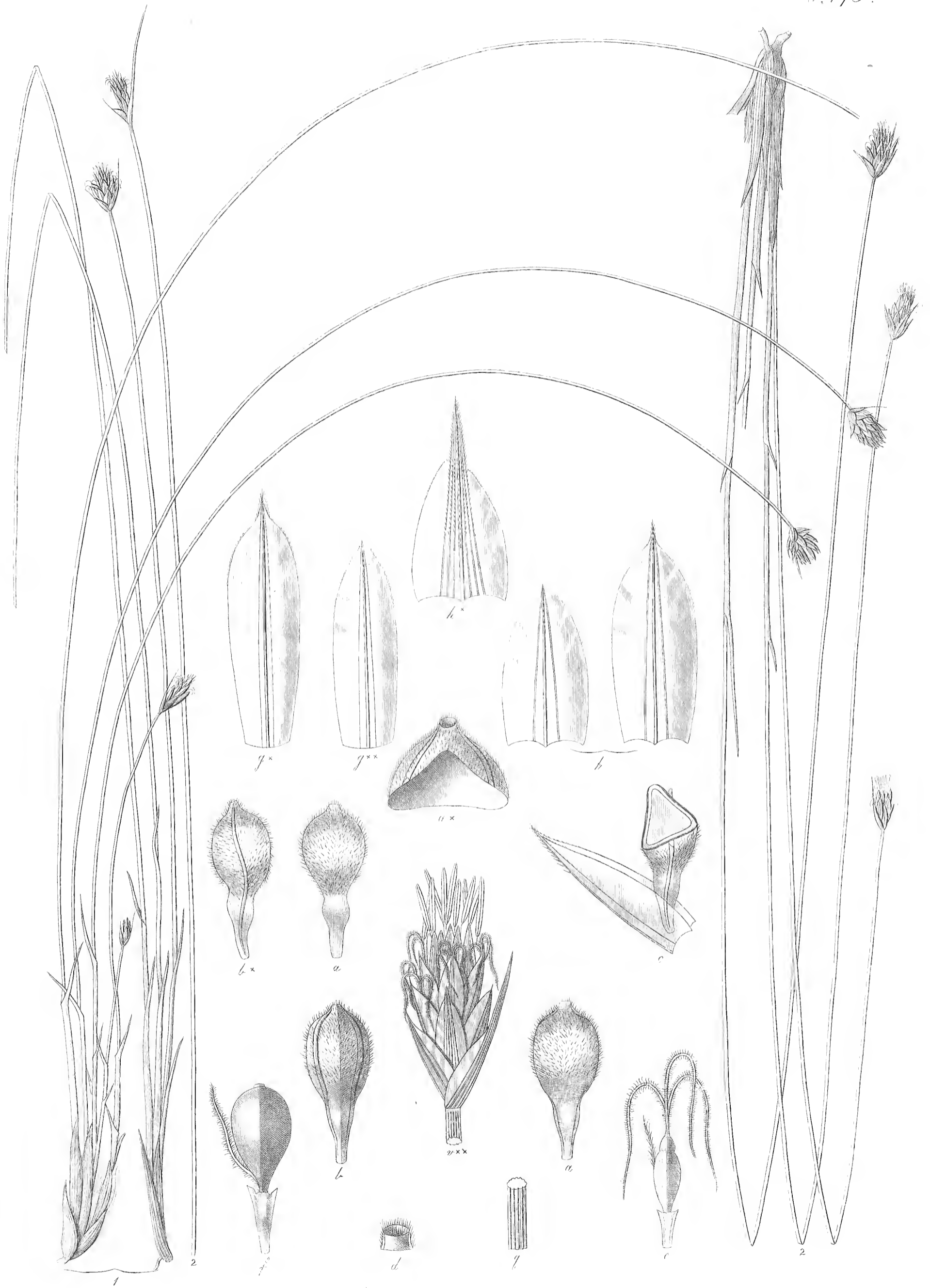
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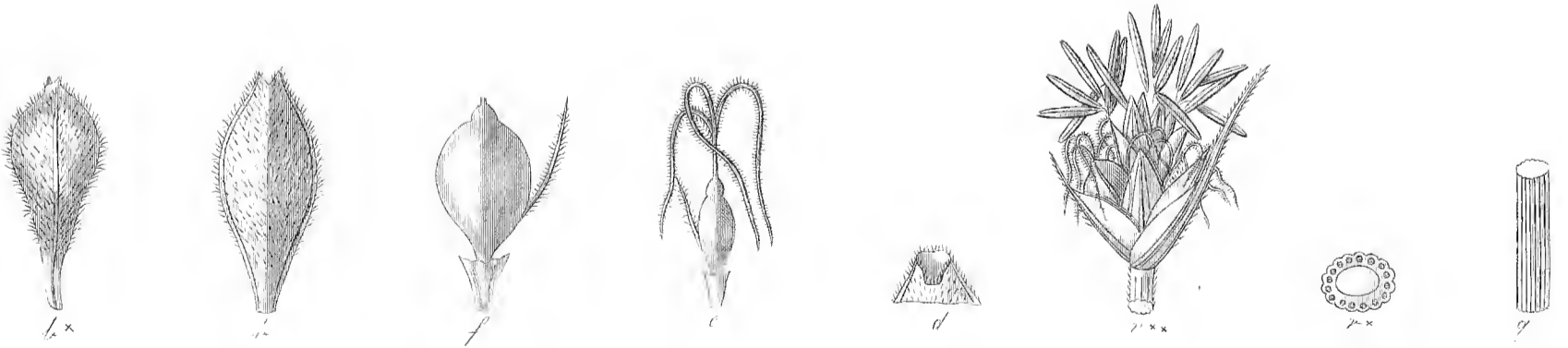
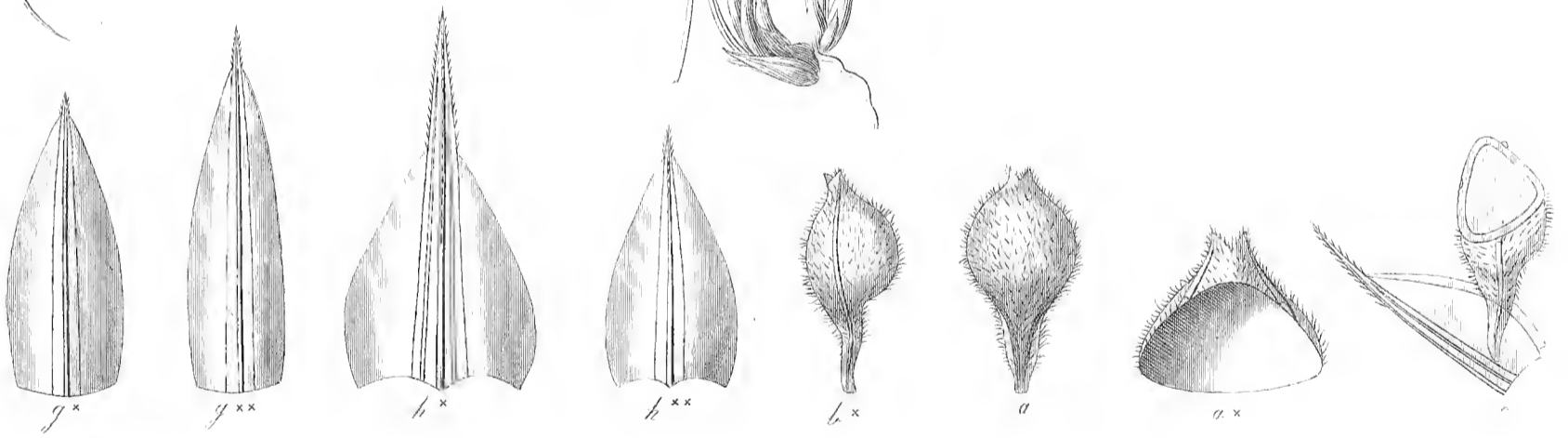




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C. SETIFOLIA.  $\beta$ .





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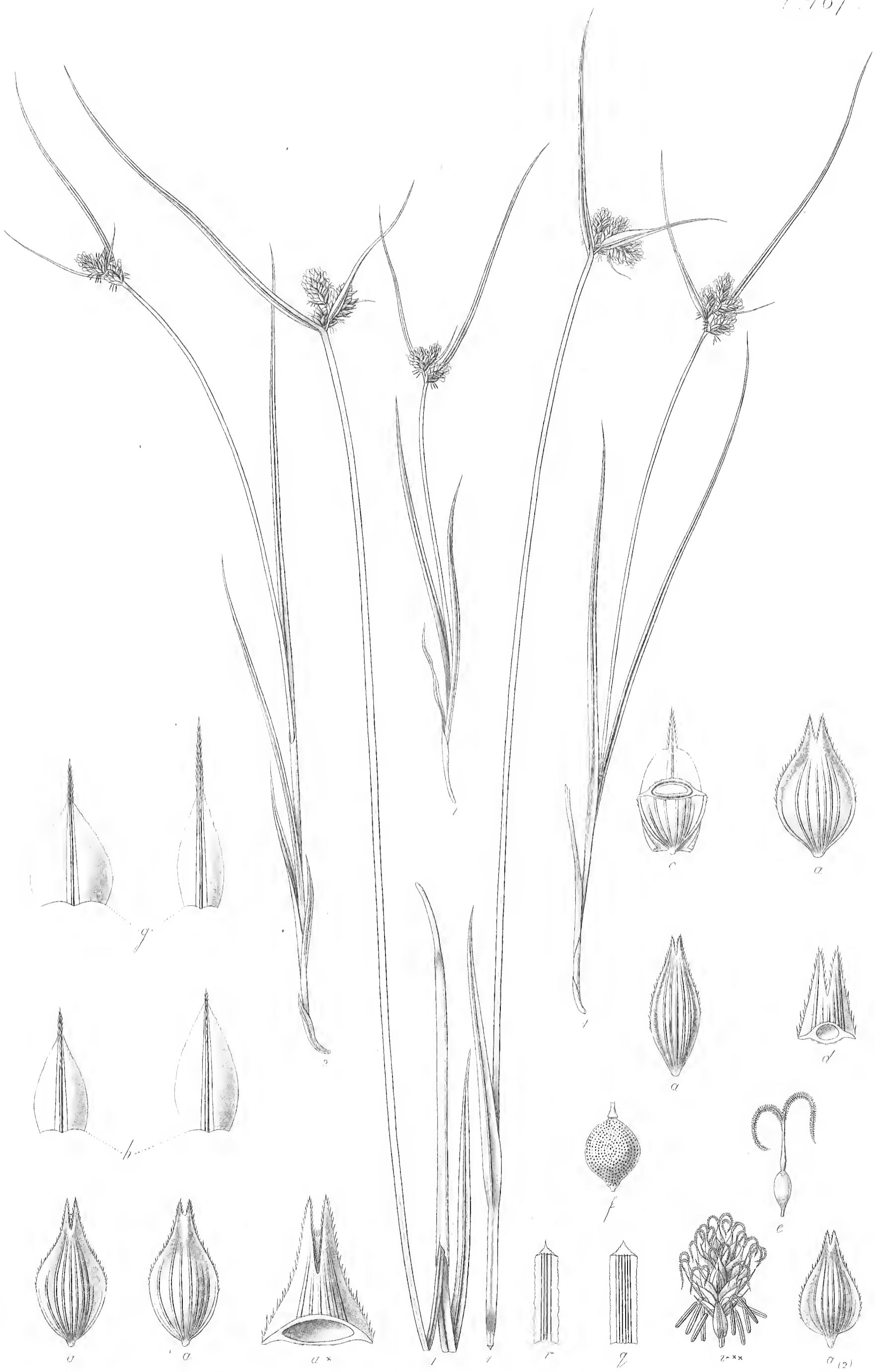
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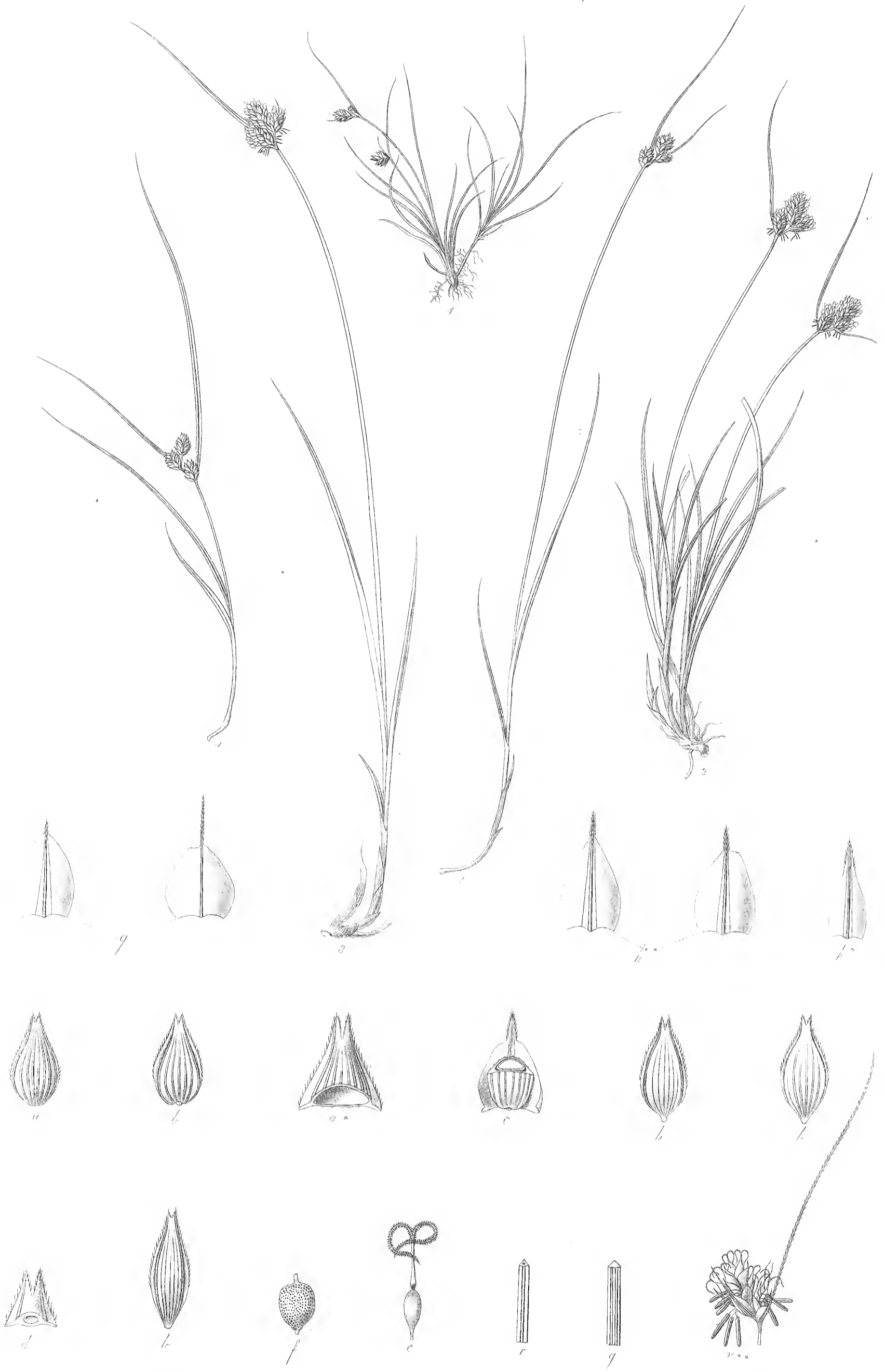
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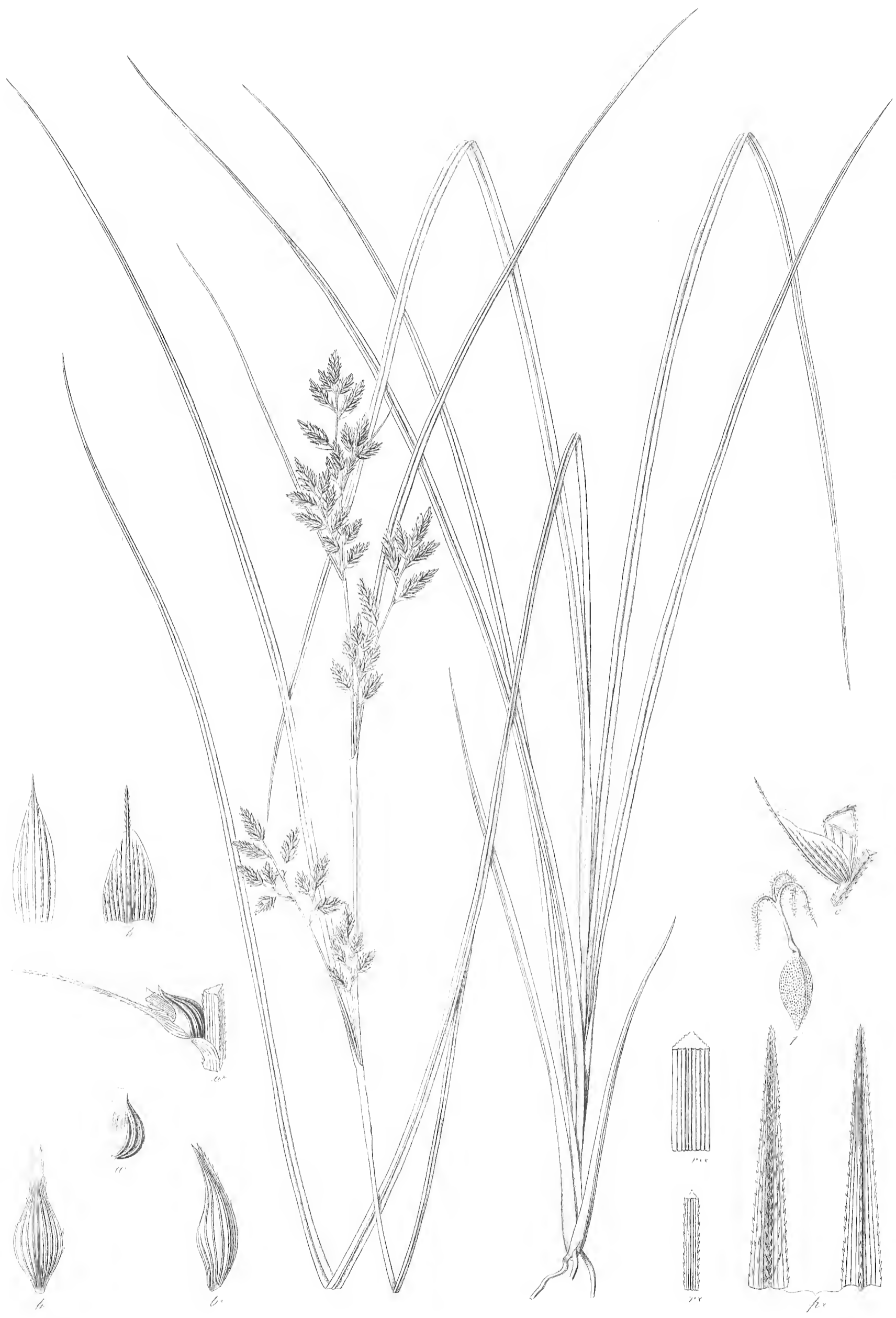






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C. POLYTACHYA





C POLYSTACHYA





C. POLYSTACHYA.







C. TRISTICHA.



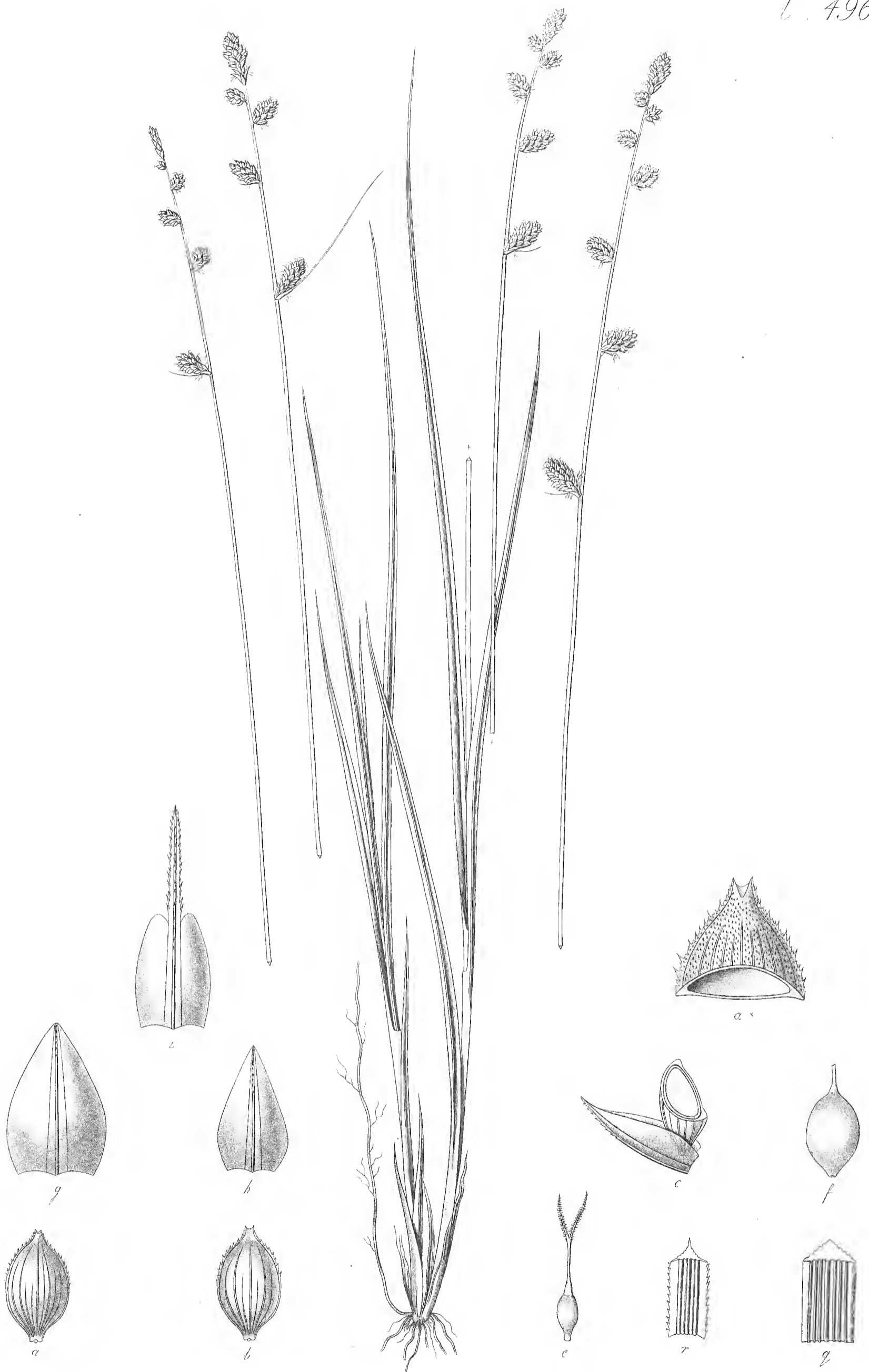






SPERMATOPHYTES.





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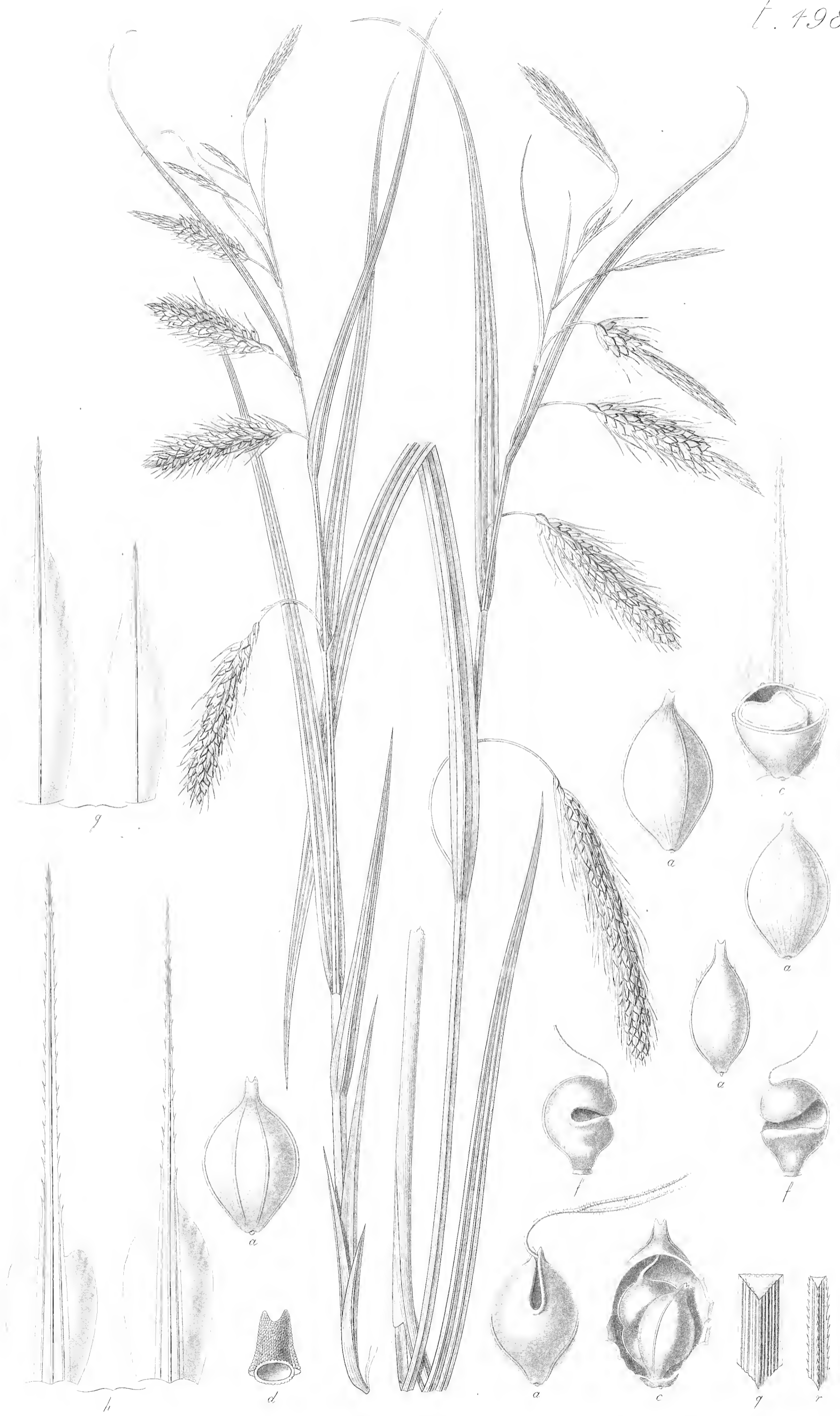




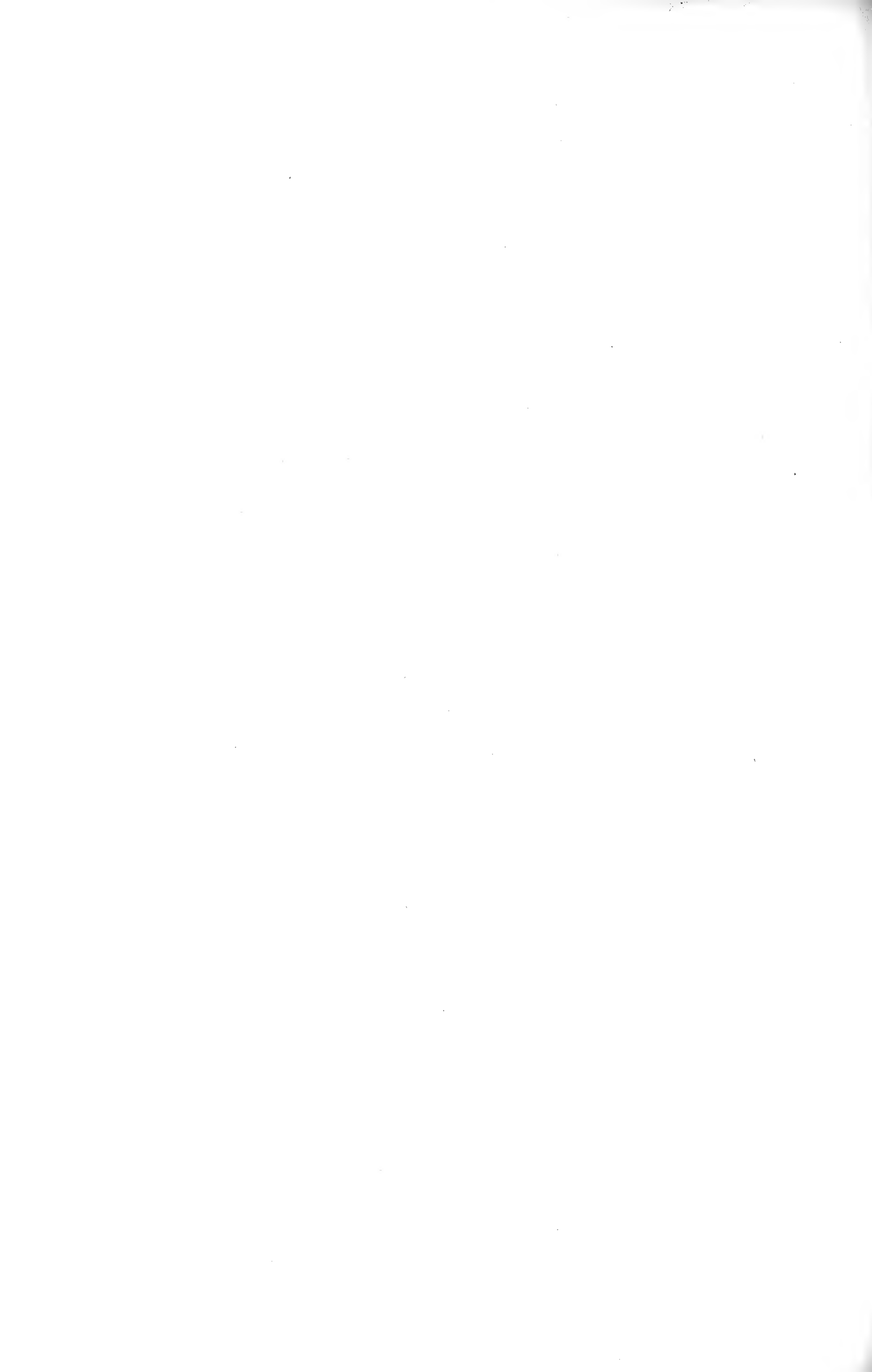


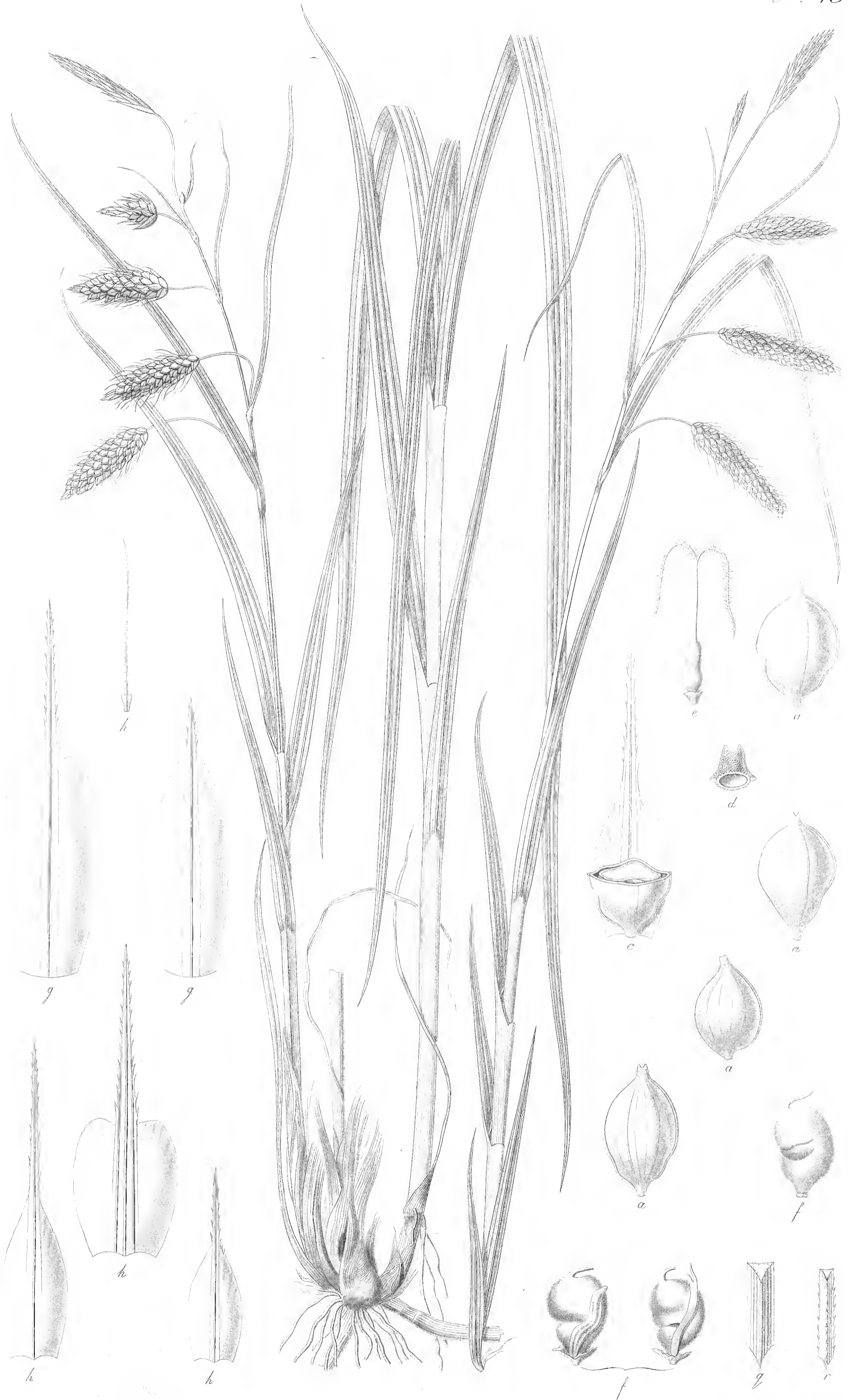
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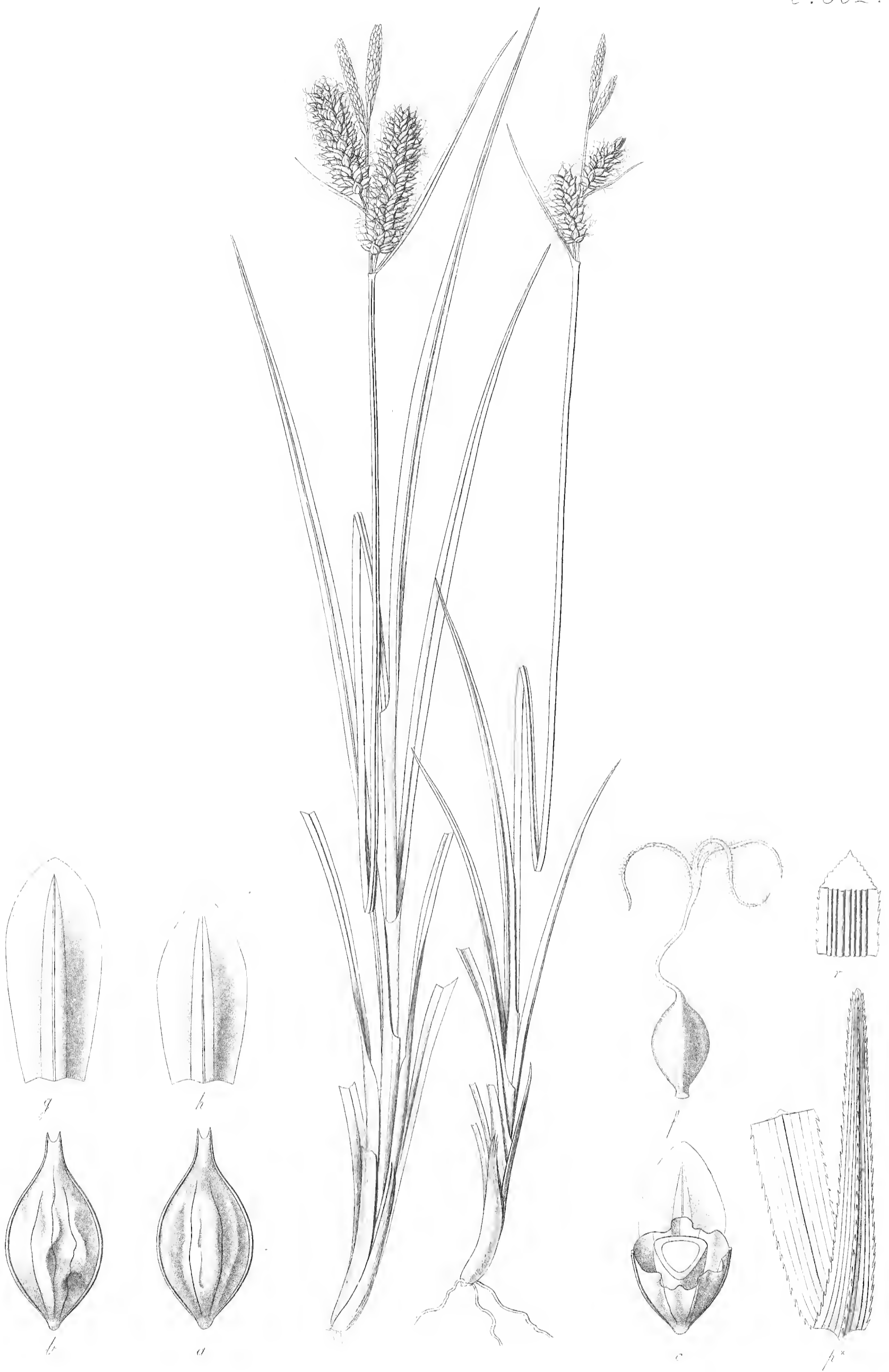






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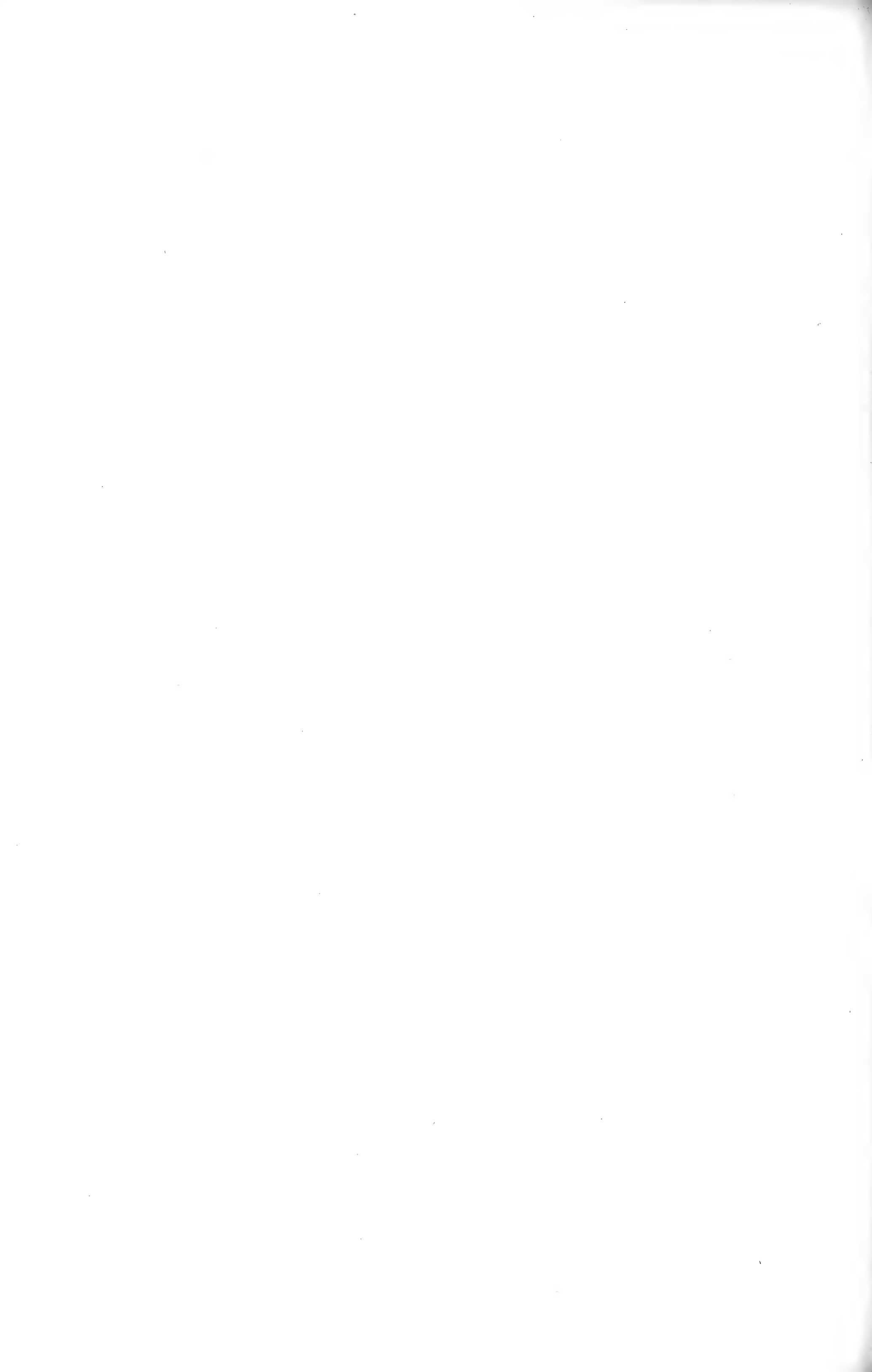


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C. DARWINII.







C. DARWINII .



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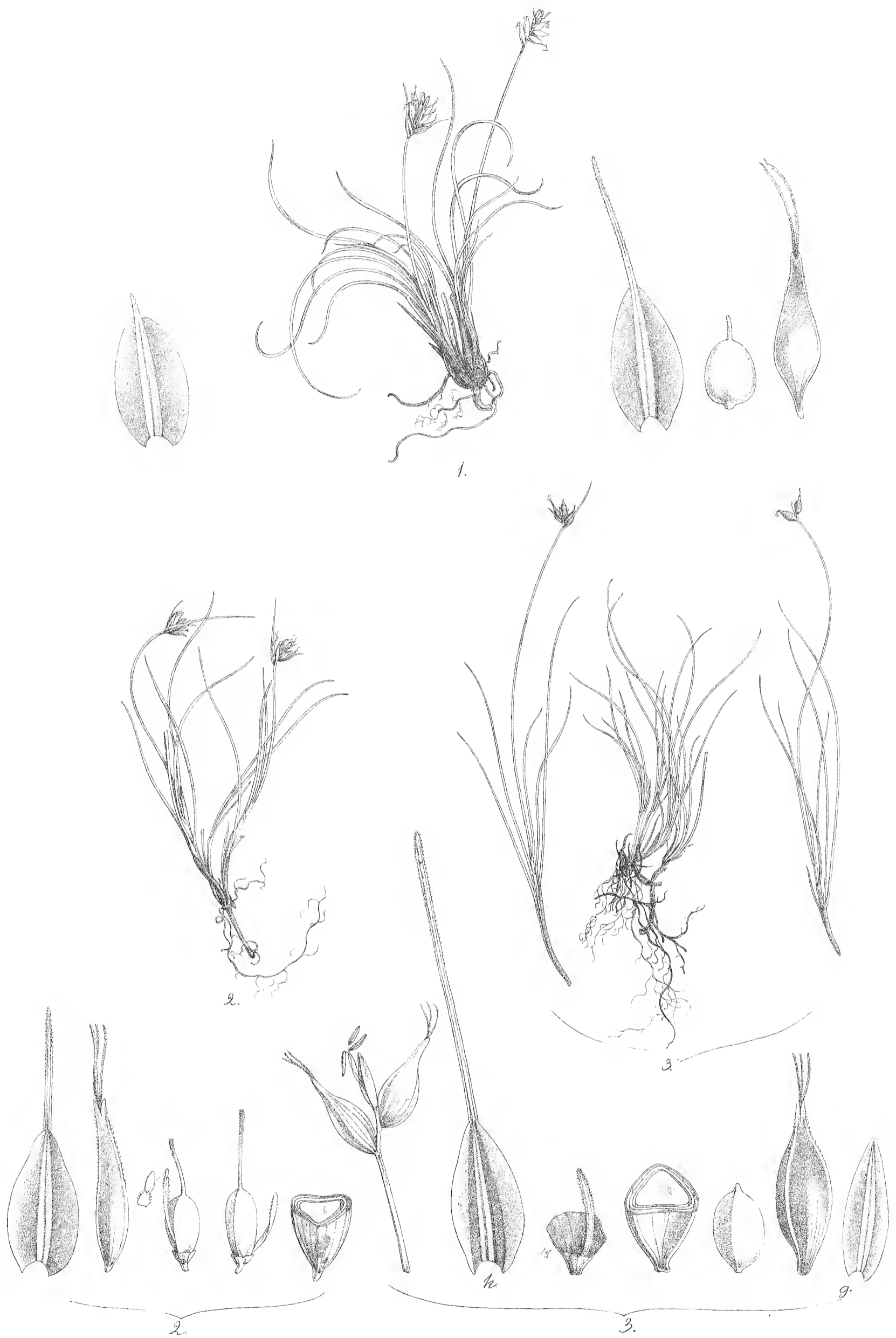
STAPLEA





CAREX RENOIDES.



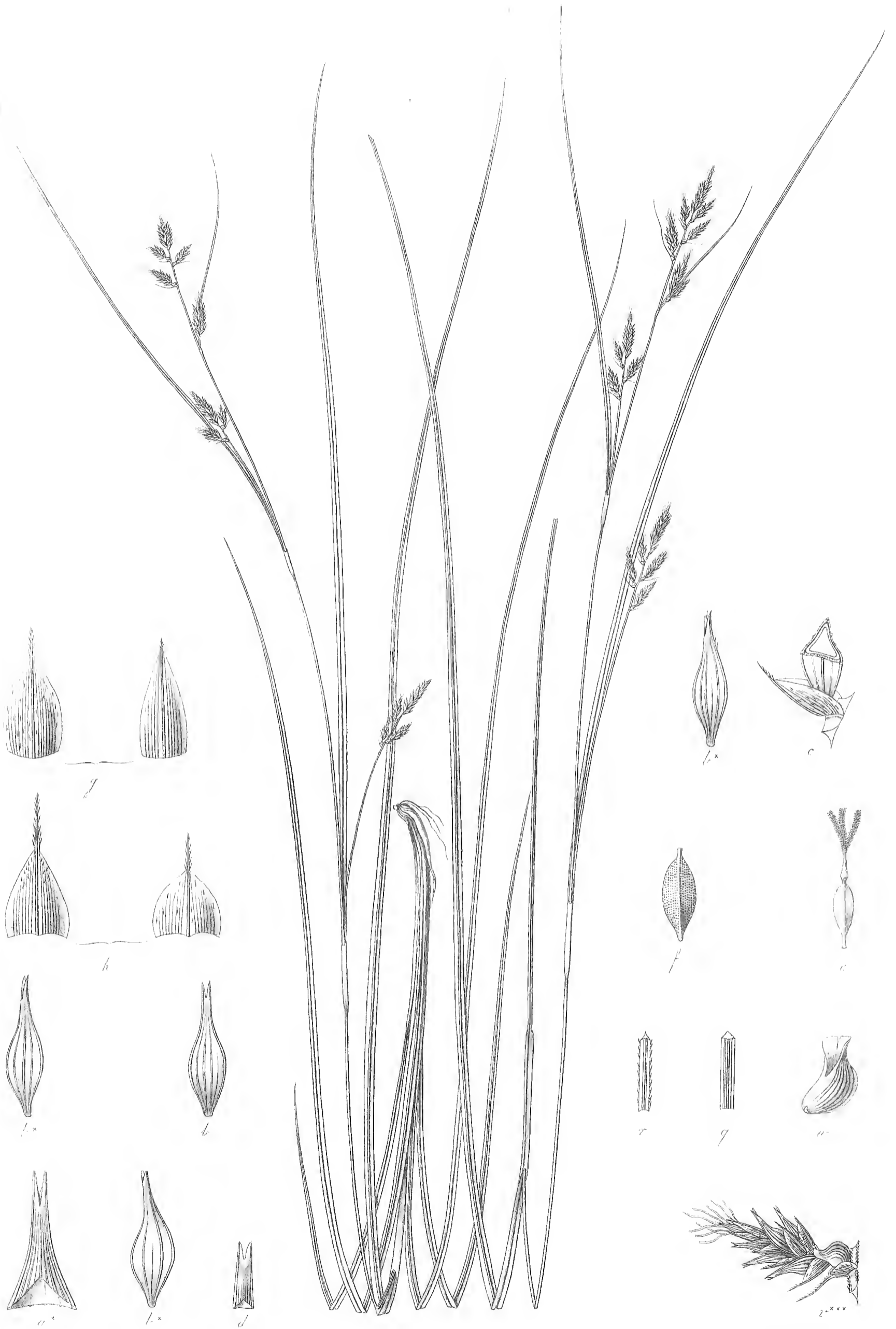


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 3. C. ARCHERI.

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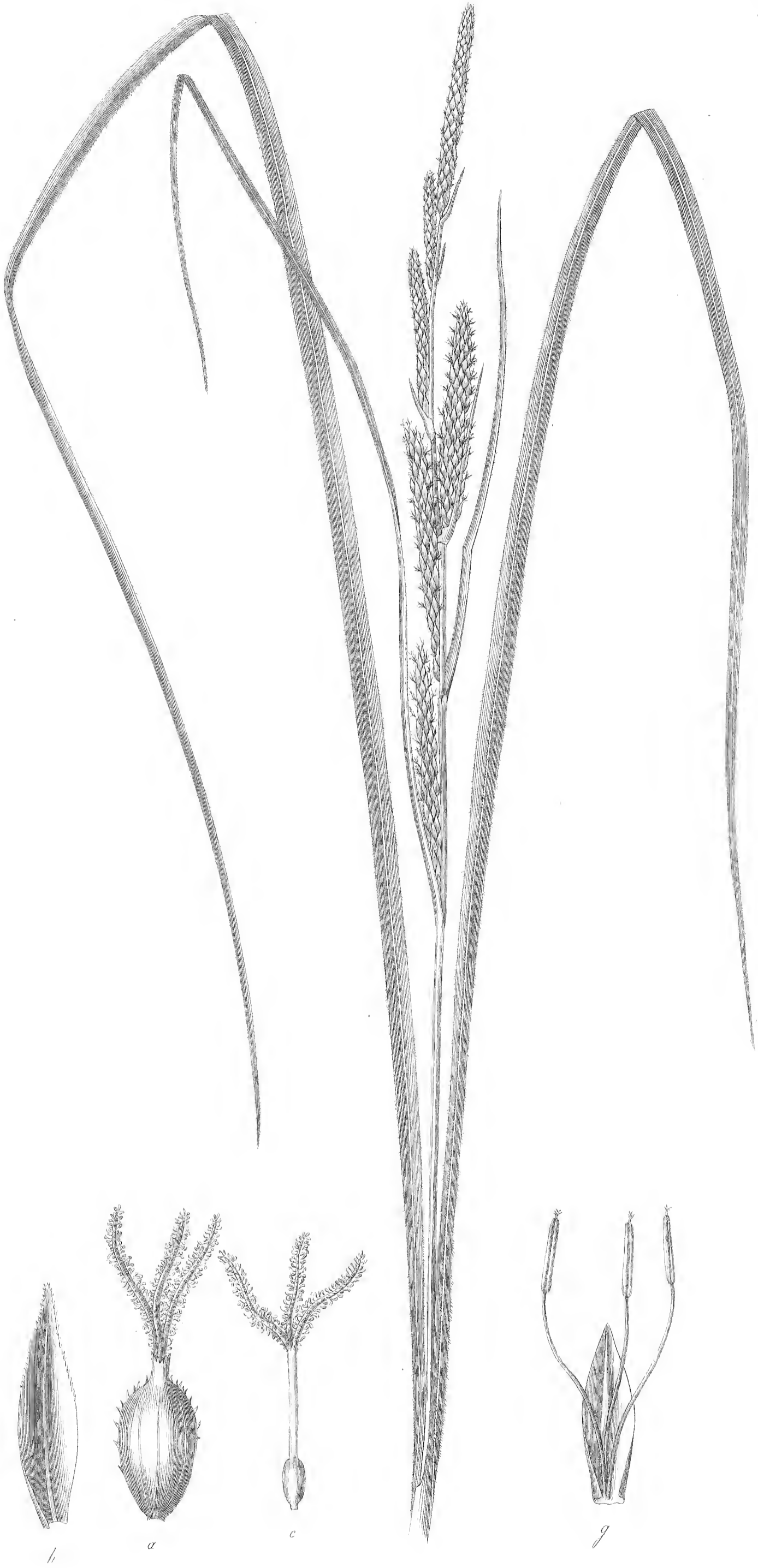
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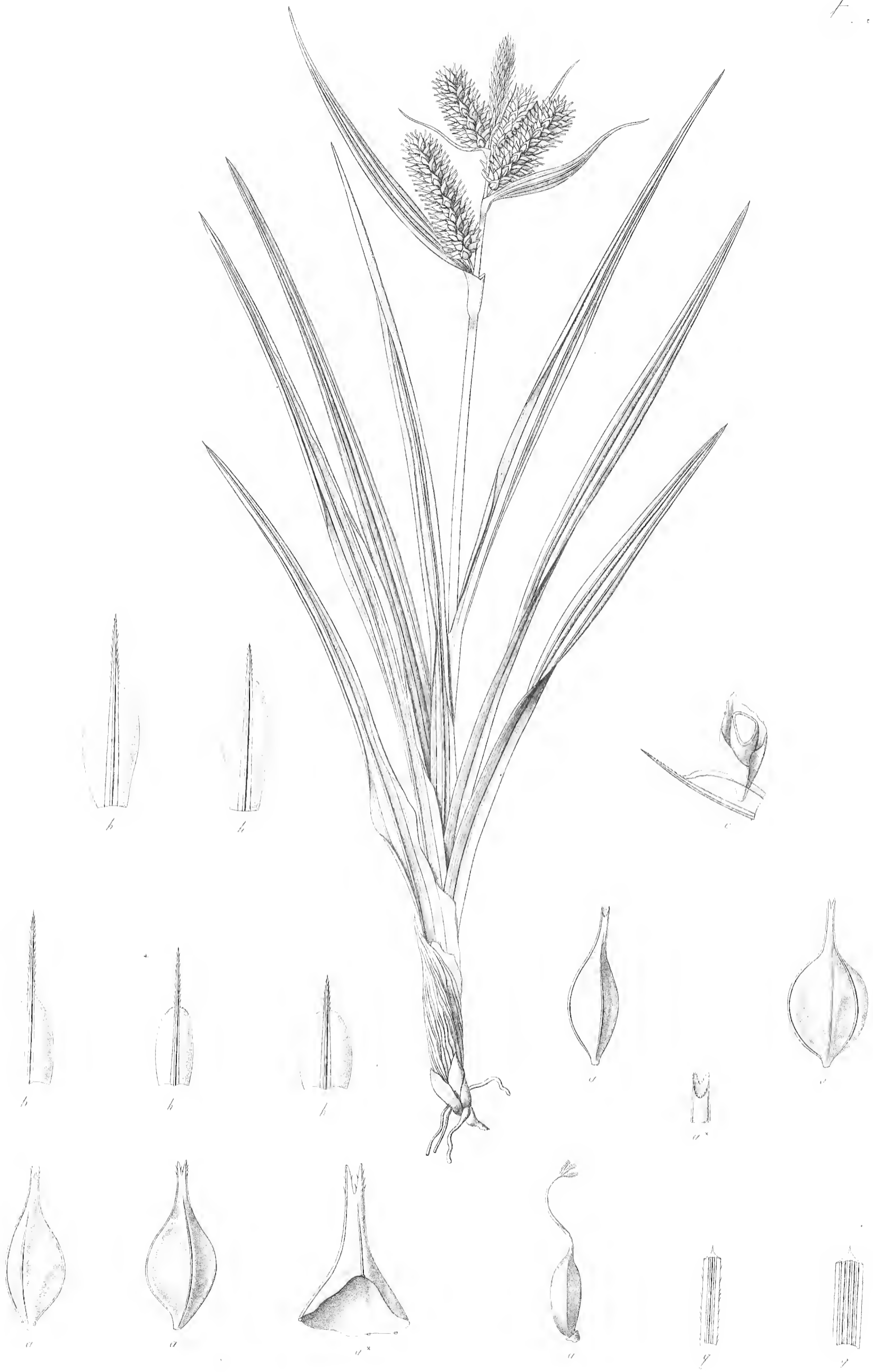






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C. PURPUREA





C. SANGUINEA.





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6. C. ARGUNENSIS.







C. SCABRATA.

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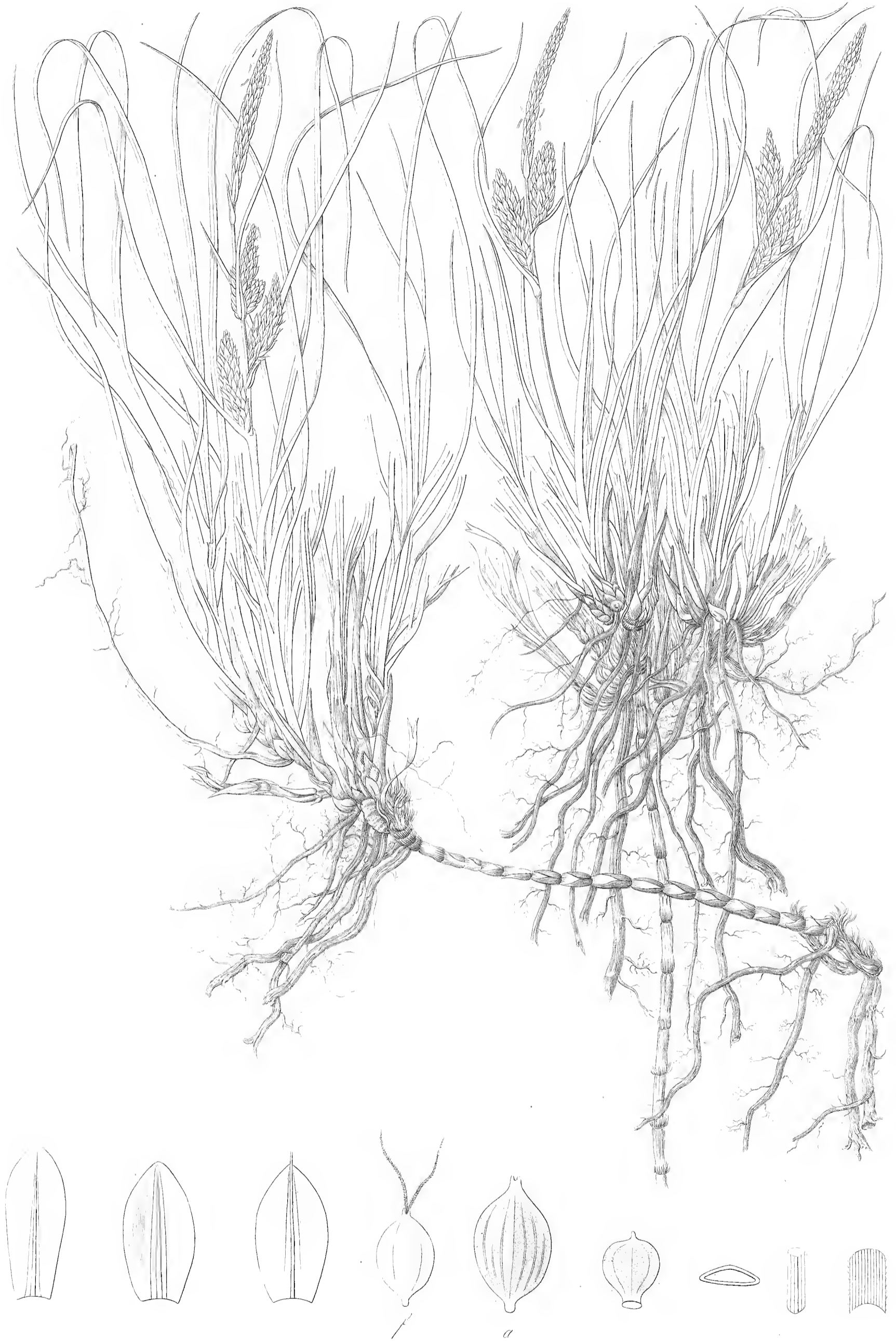
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C. SITCHENSIS.





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C. TRINERVIS.





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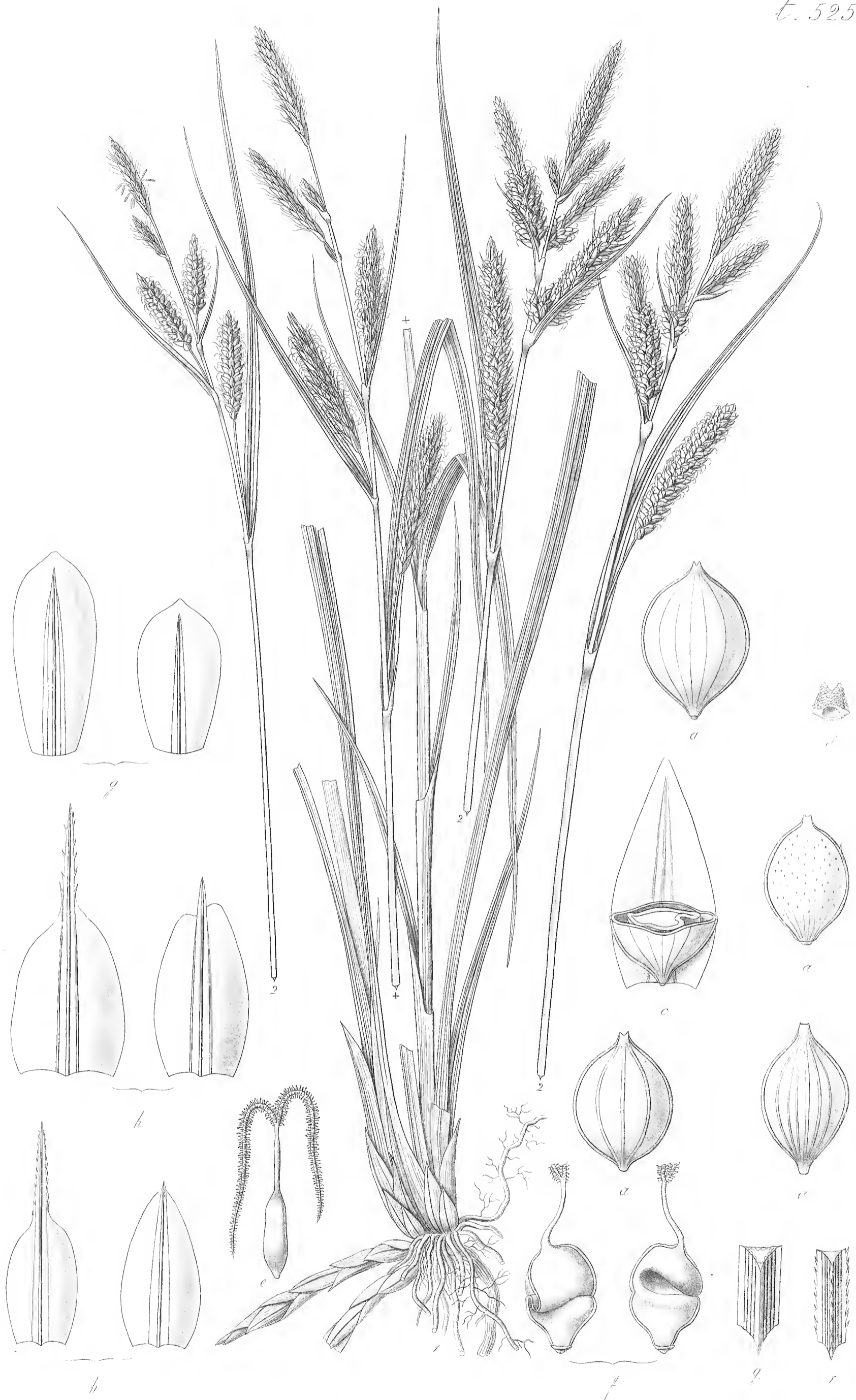




C. SPICICLOSA.

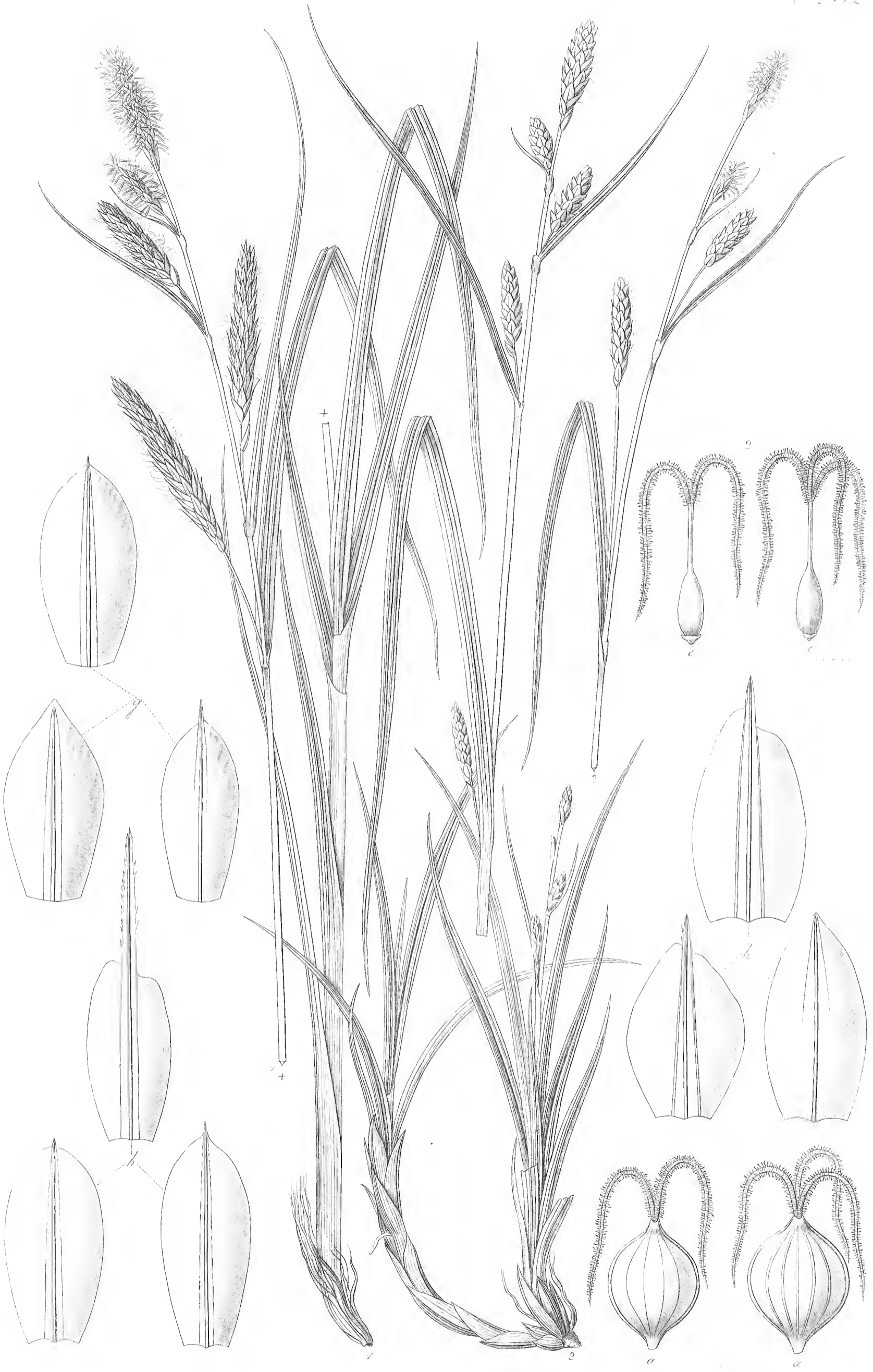






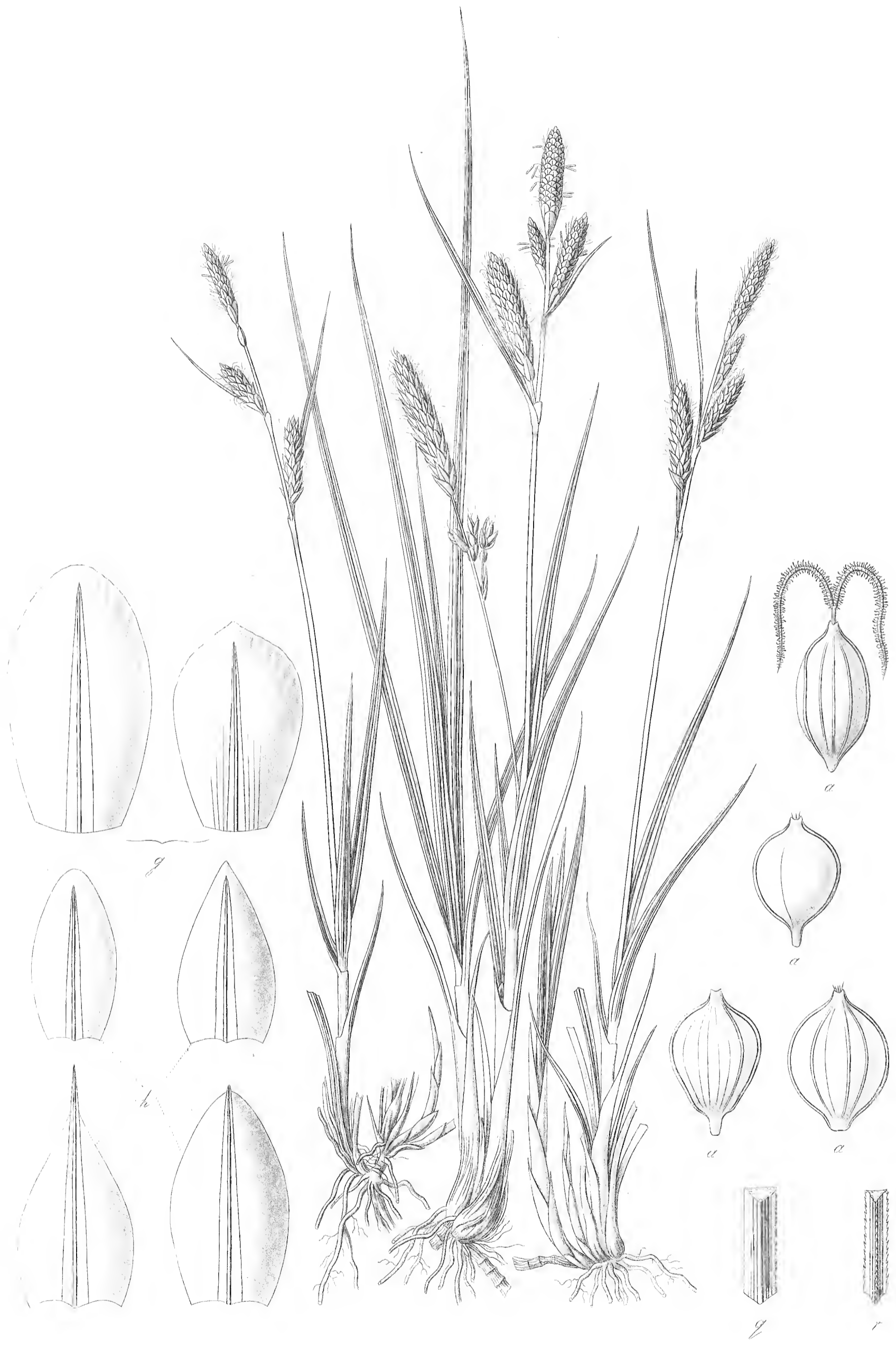
C. SALINA.





C. SALINA.





C . SALINA .

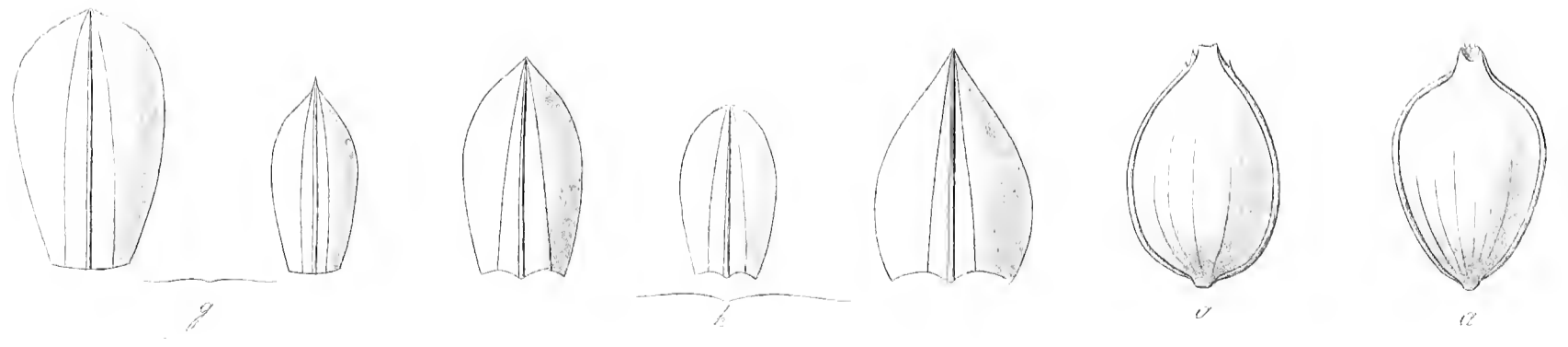
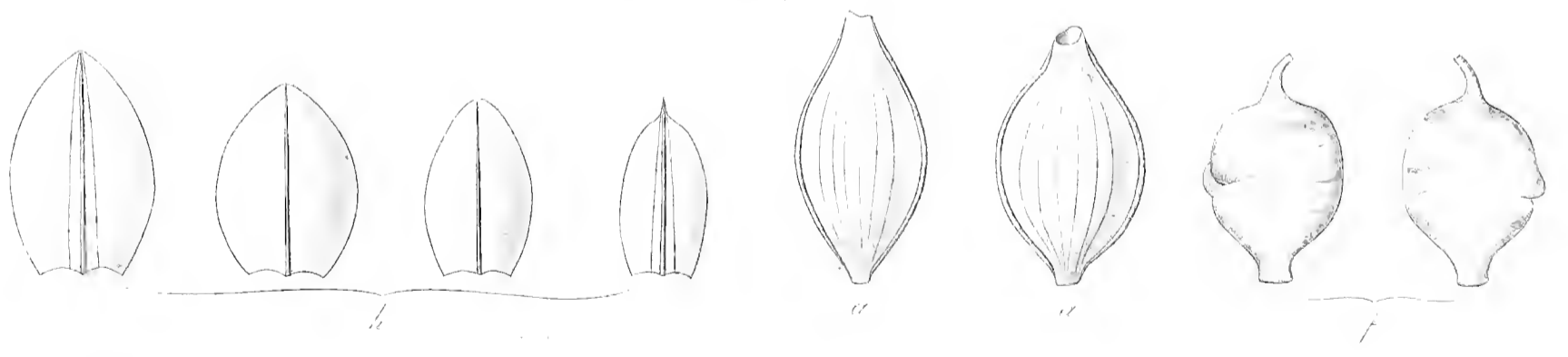
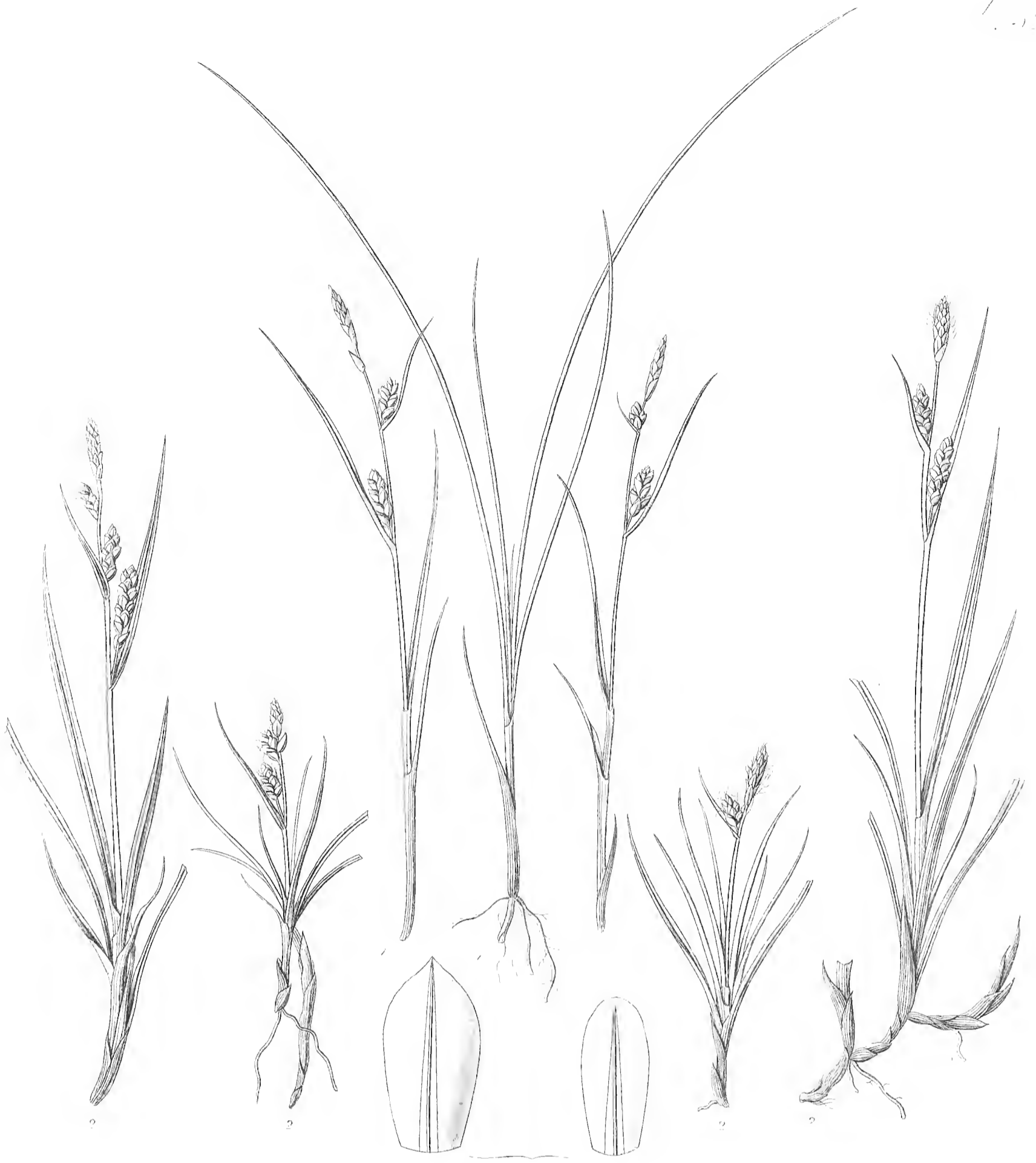




C. SALINA .VAR.

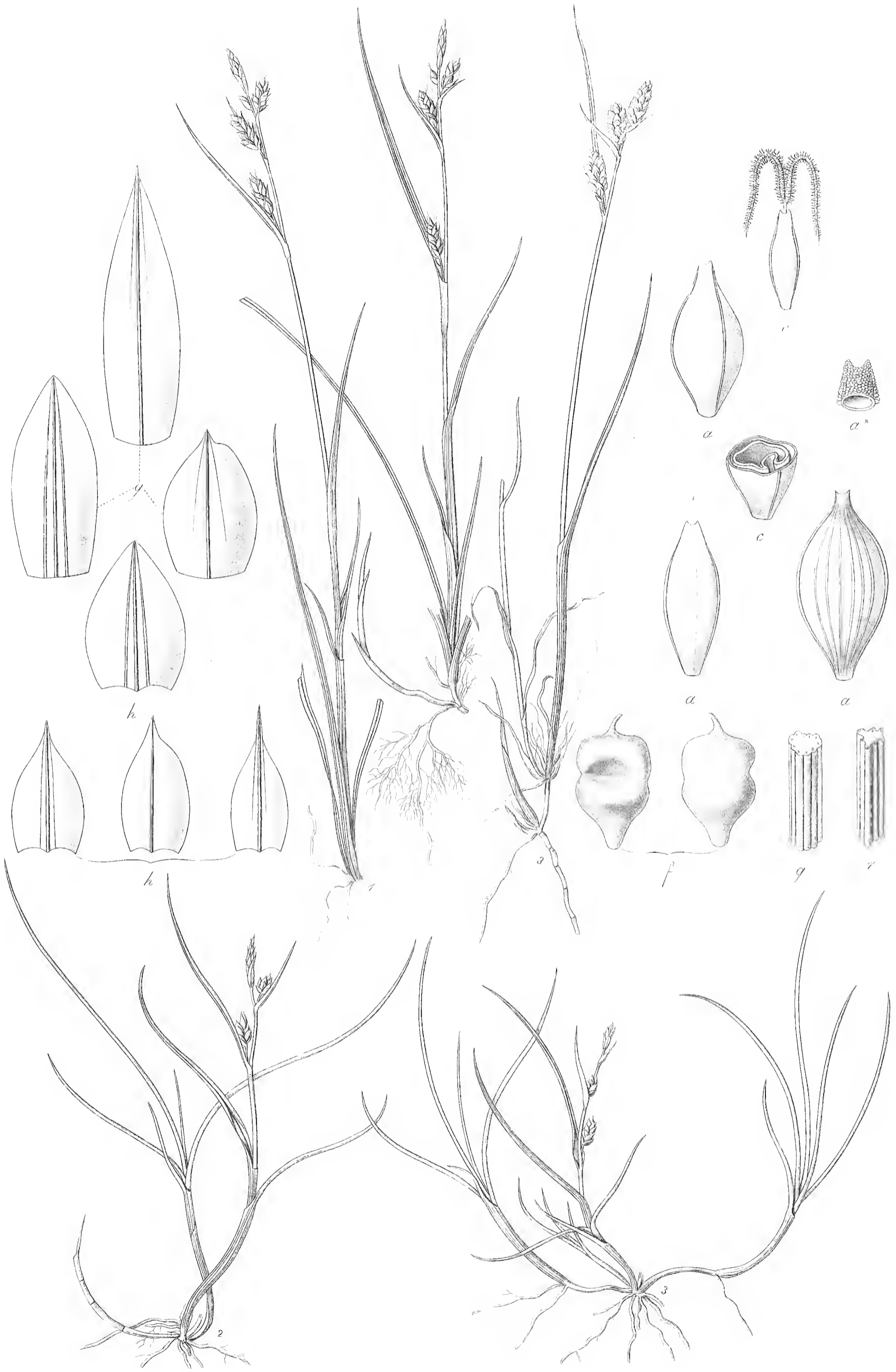






C. SATIVA. VAR.





C. SALINA.





C. BONGARDI.

3





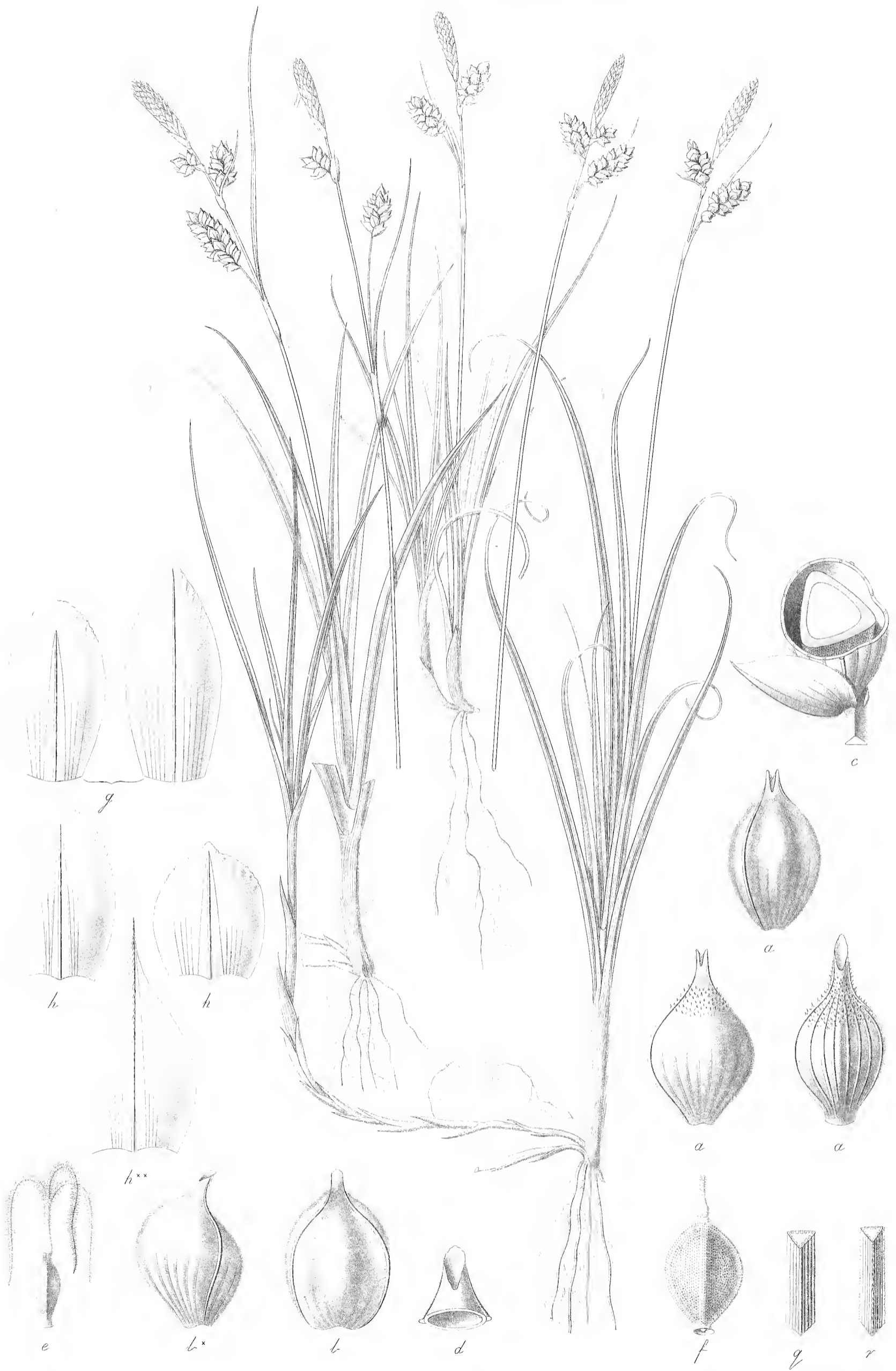
C. lacistoma.

C. BROWNII.

7

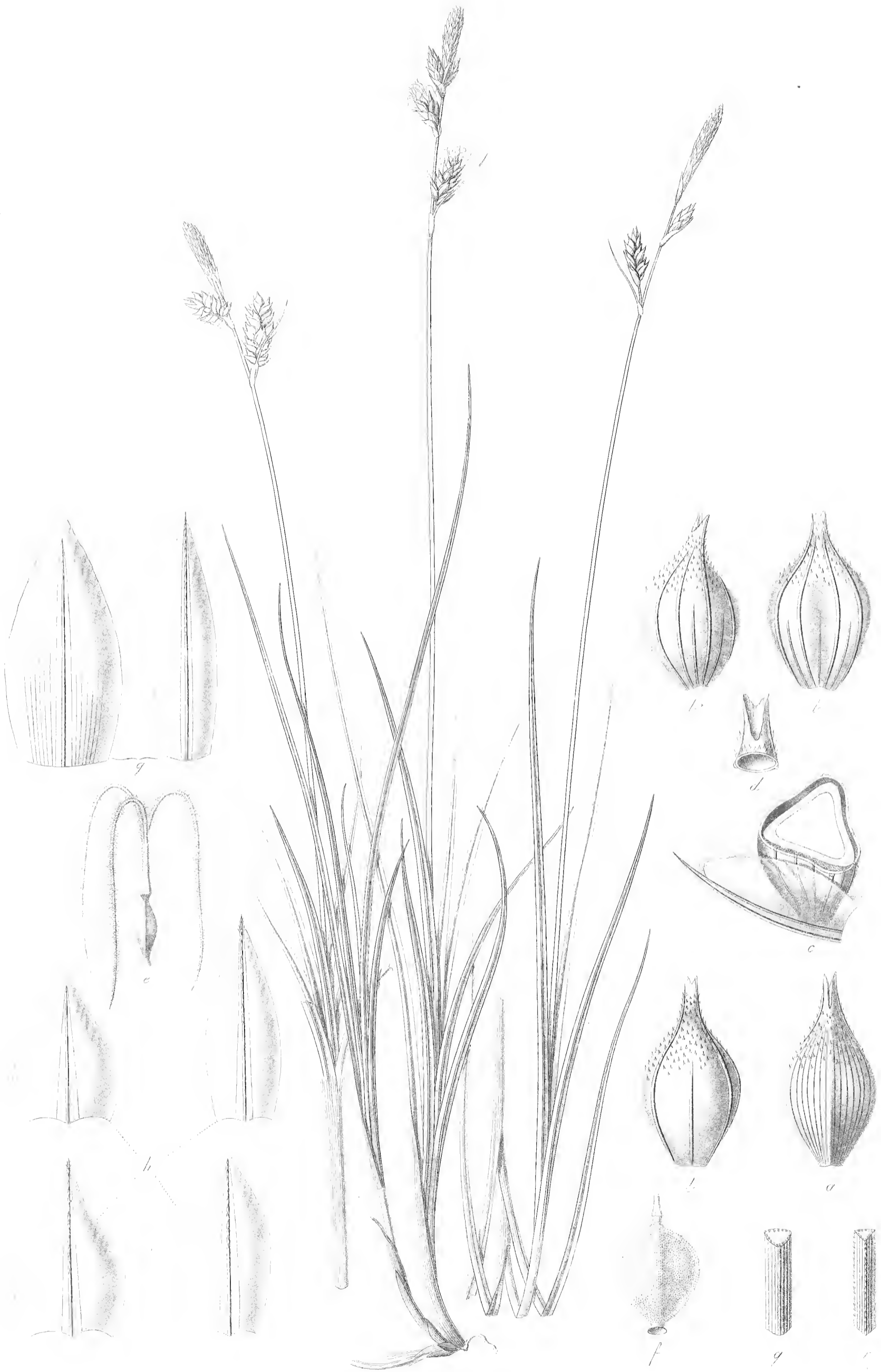






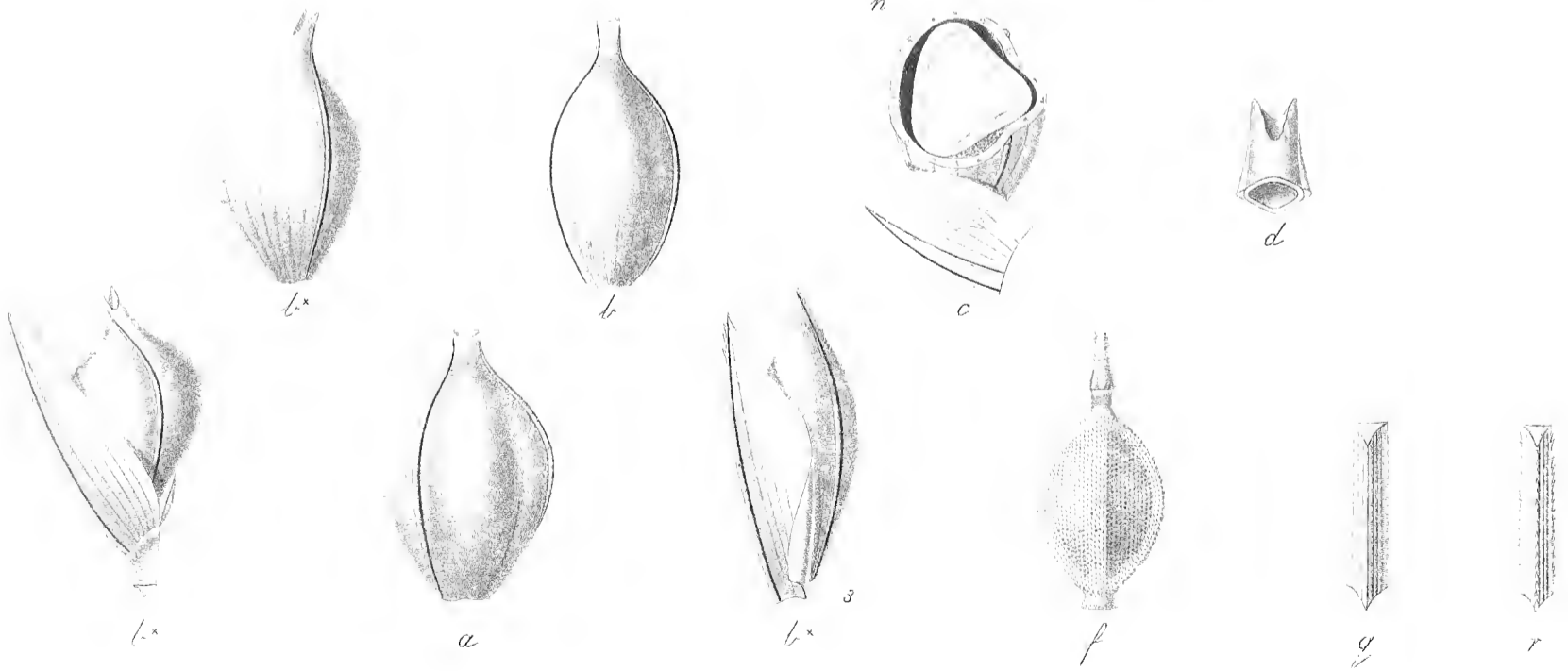
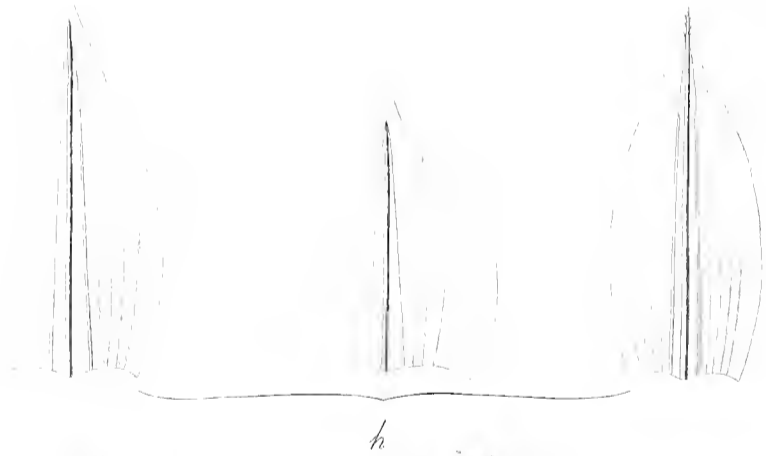
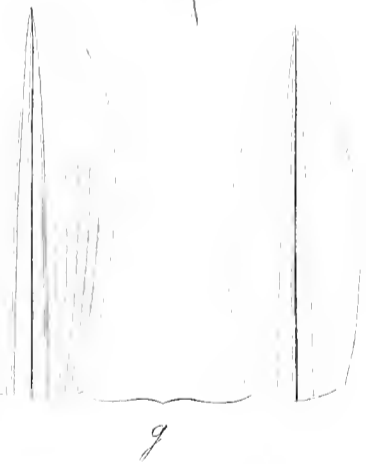
C. OBESA.





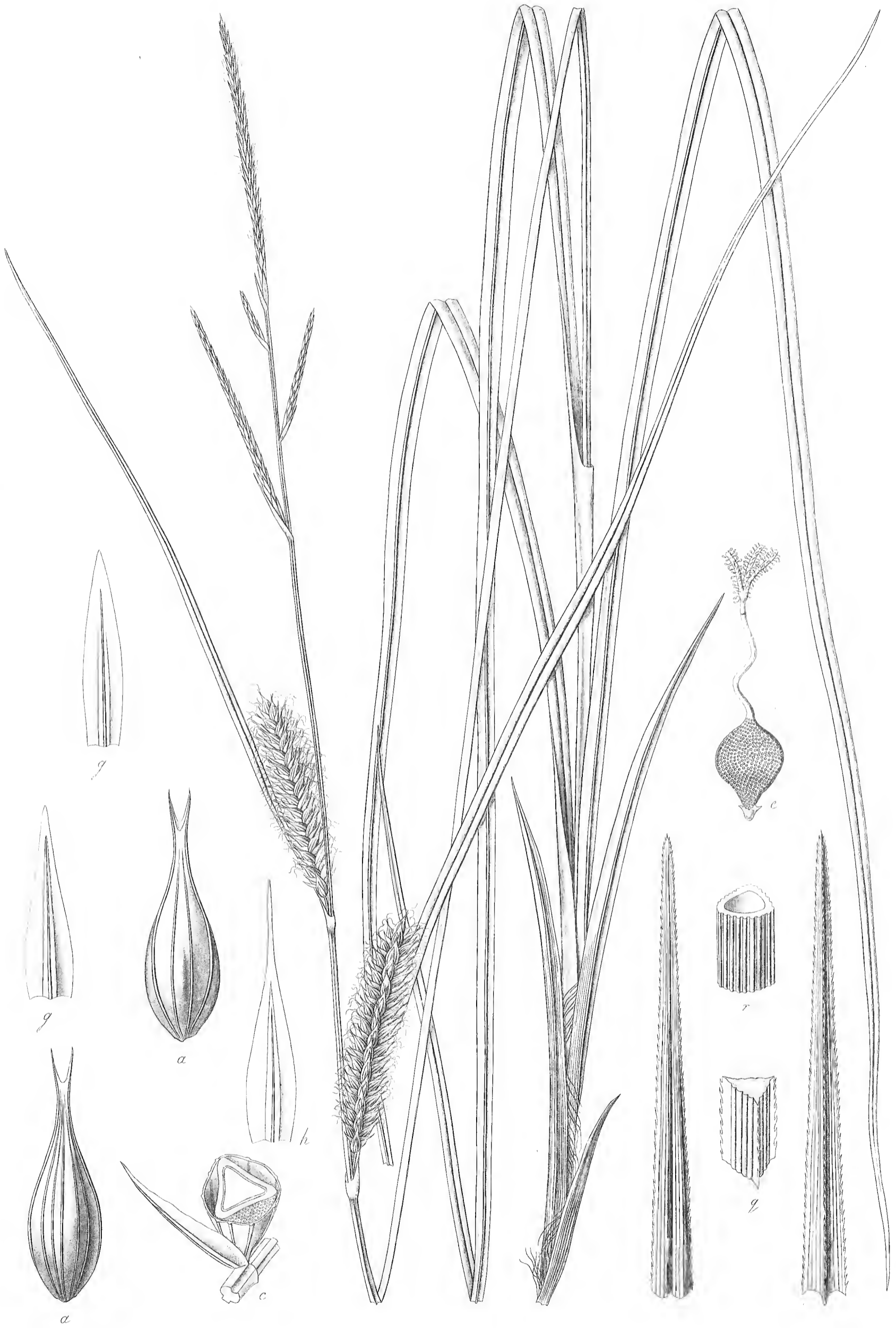
C. OBESA. beta





C. OBESA. γ.





C. VESICARIA.

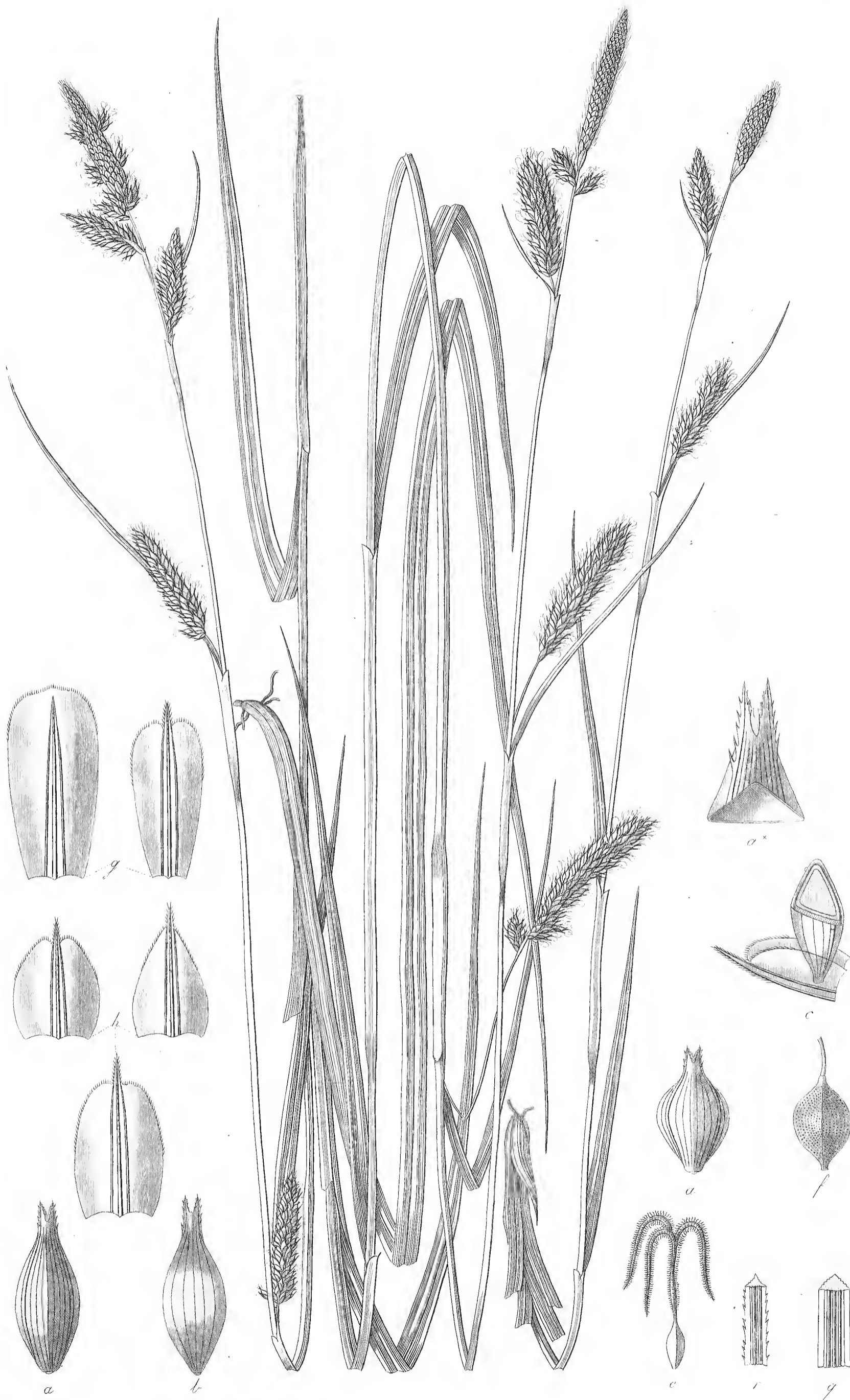






C. VESICARIA.β.





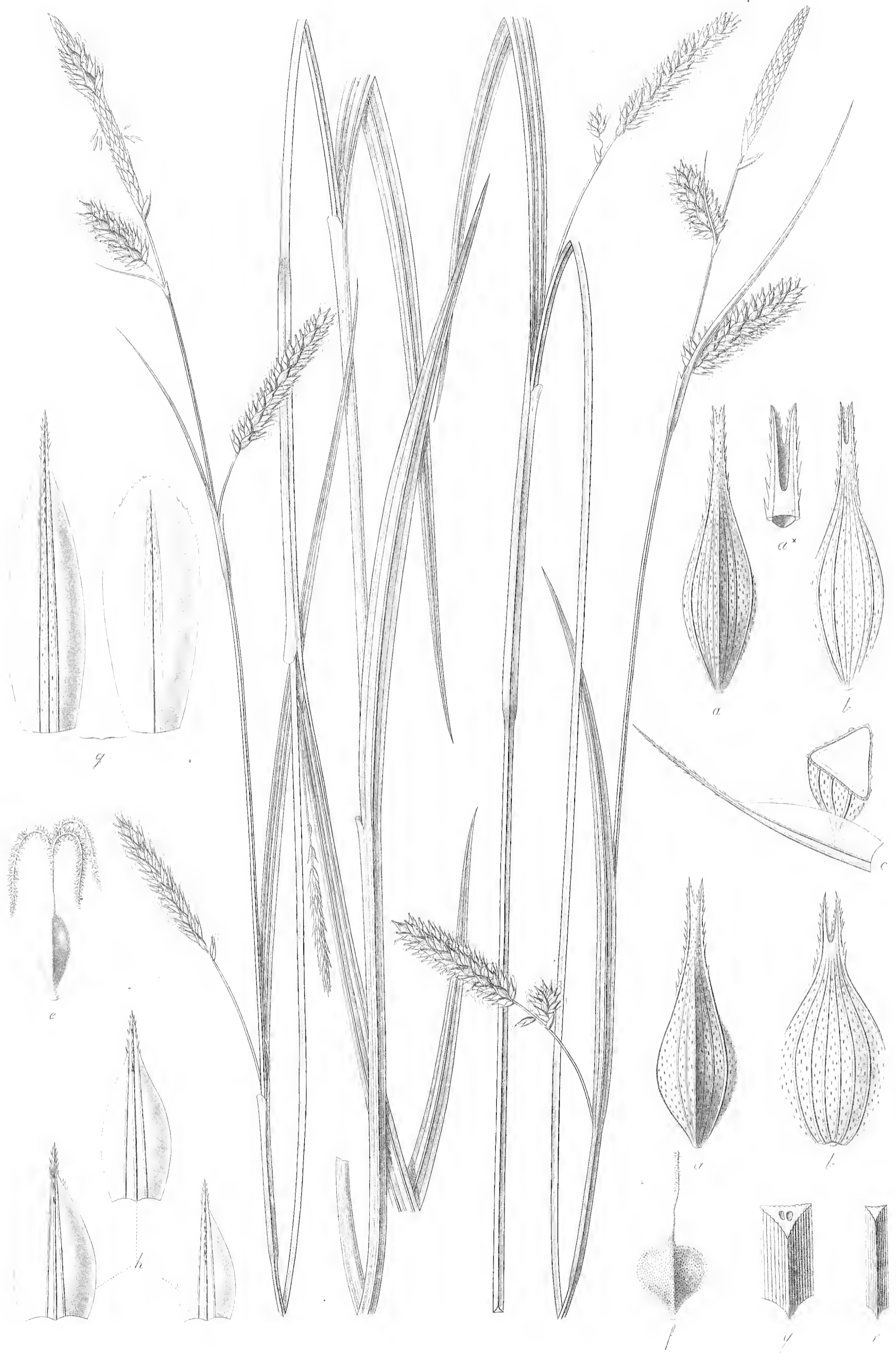
C. BINERVIS.





C. BINERVIS .

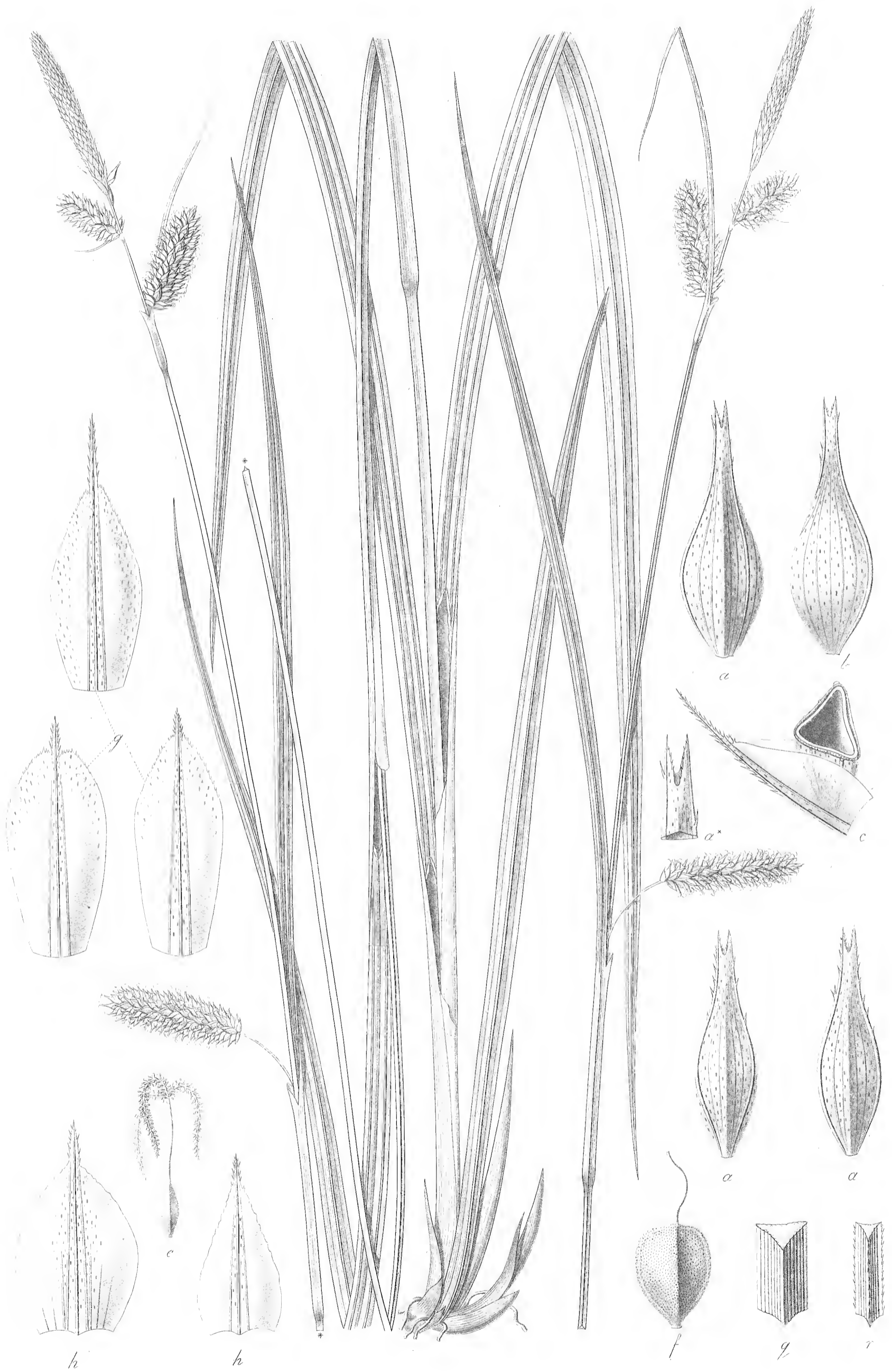




C. LAEVIGATA.







C. LAEVIGATA B.





C. AQUATILIS.

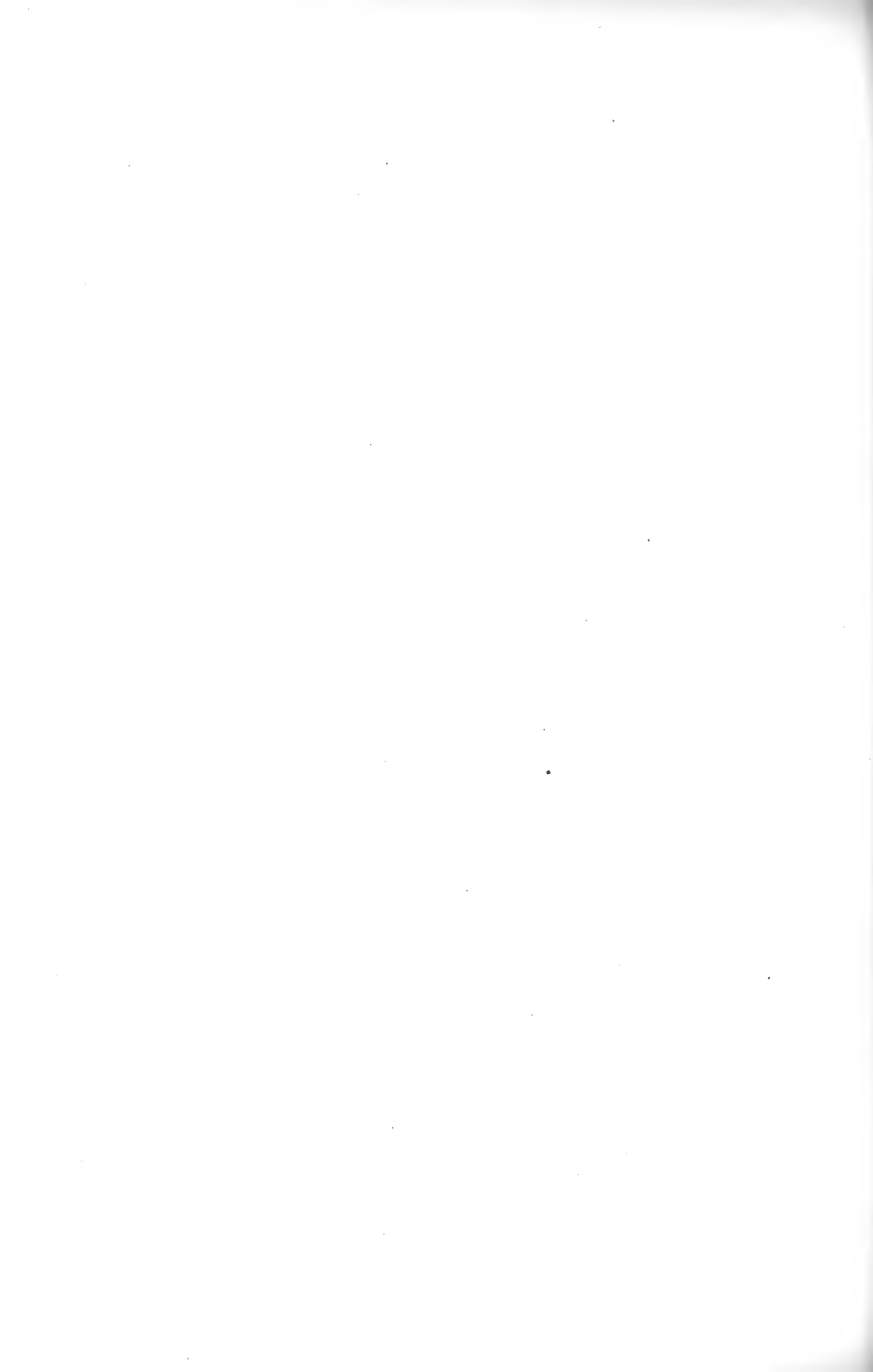
3.





C. AQUATILIS.

3





C. AQUATILIS, var. STANS.

f







C. AQUATILIS, var. MINOR.

2

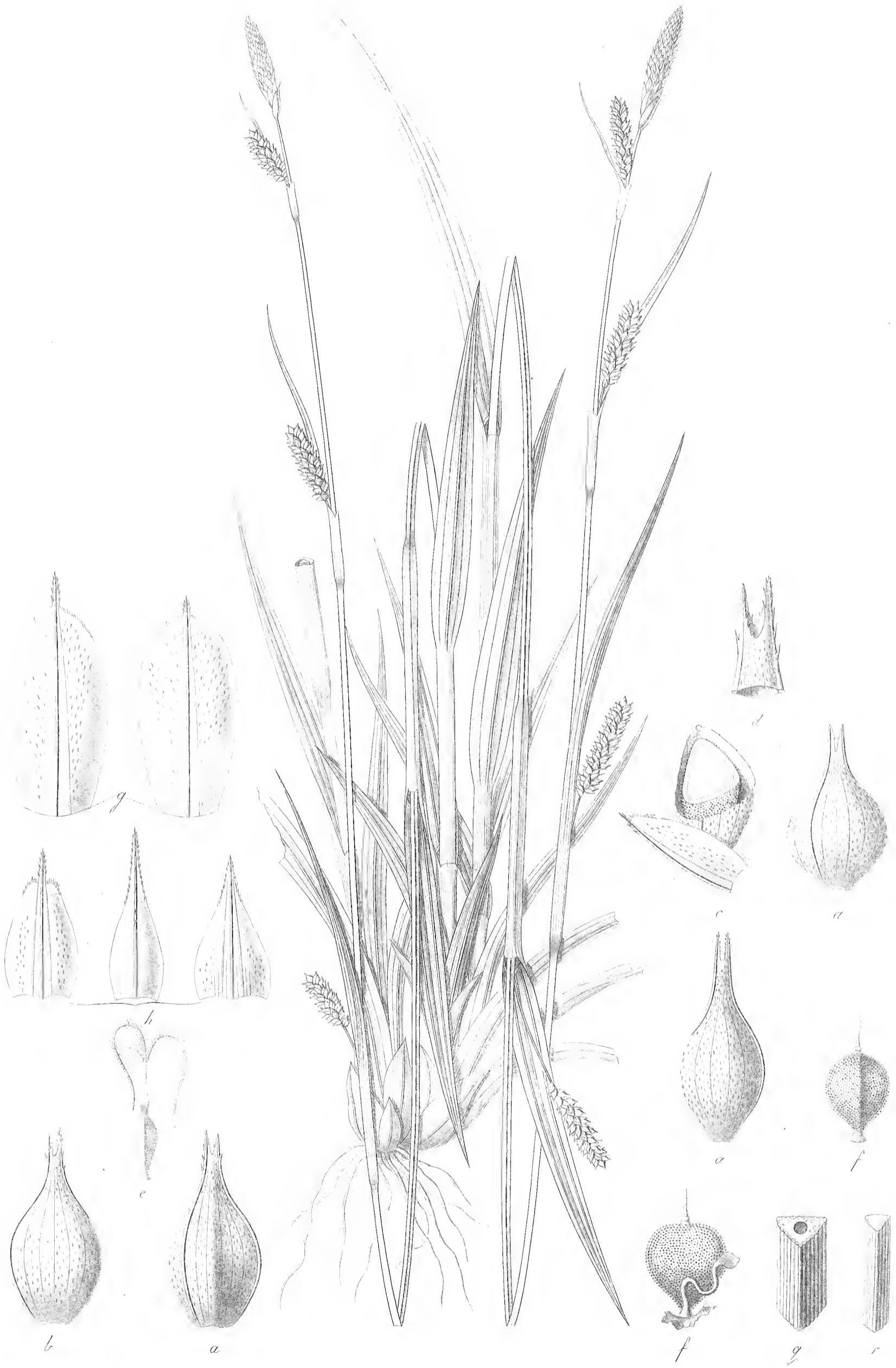




C. SUBEREA, BOOTT.

f





C. CAMPOSII.





C. ACUTA, L.







C. ACUTA, L.

3





C. ACUTA, L.

3





C. ACUTA, var. STAMINIFERA.





C. ACUTA, var. PERSONATA.

J.







C. ACUTA, var. PANORMITANA.

J





C. ACUTA, L.

J





C. ACUTA; var. PROLIXA.

J.





3.

*C. ACUTA, var. TRICOSTATA.*







C. VULGARIS.

g

6





C. VULGARIS.





C. VULGARIS.





C. VULGARIS VAR.







C. VULGARIS.





C. VULGARIS (TURFOFA)





*Andropogon furcatus* (L.) Nees





C. VULGARIS (TRICOSTATA)







C. VULGARIS (JUNCILLA)





C. VULGARIS (LIMULA.)





C. VULGARIS, var. GAUDICHAUDIANA.

7





C. RIGIDA.







C. RICIDA



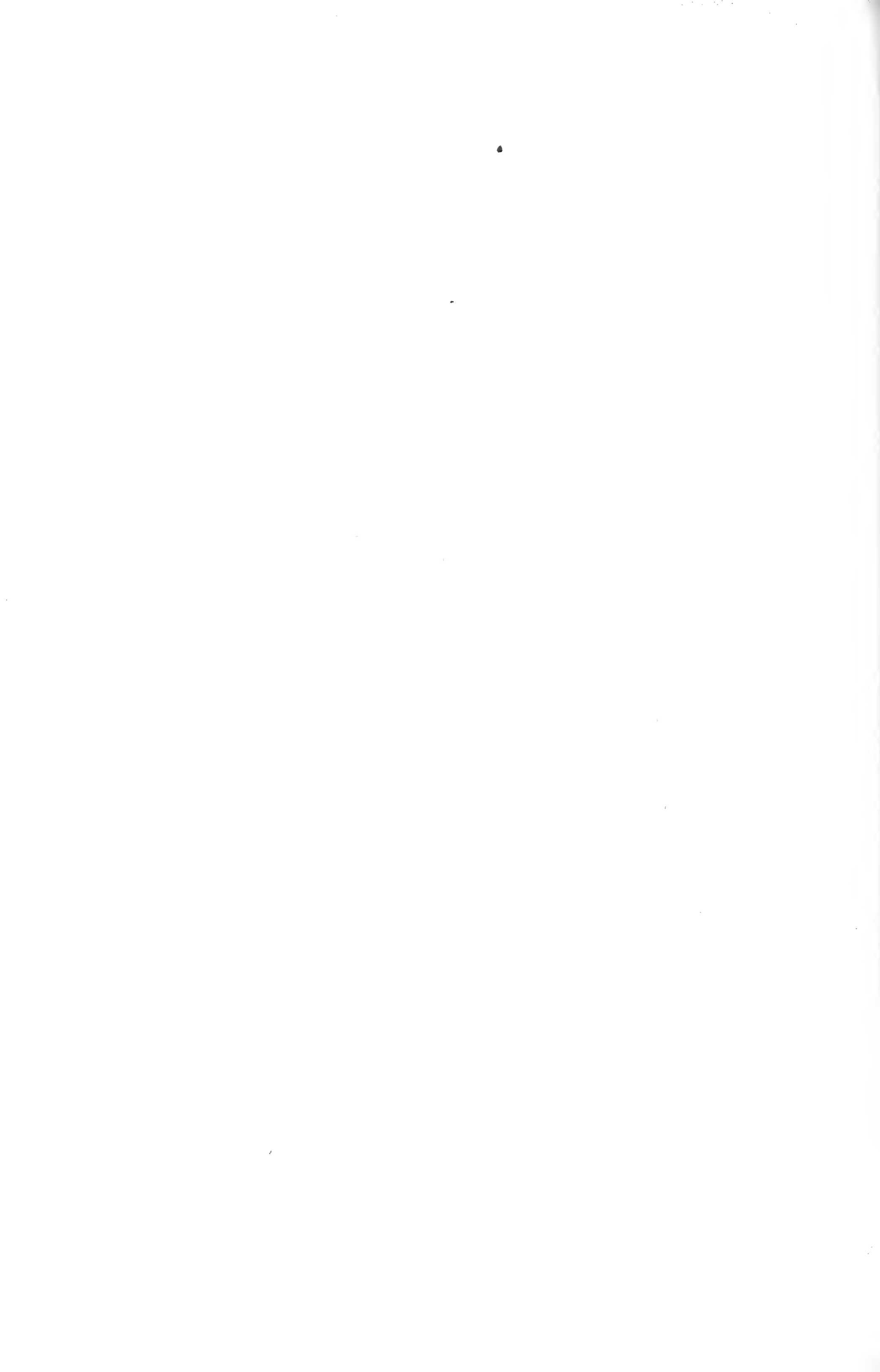


C. RIGIDA.





C. RIGIDA.





C. RIGIDA.







C. RIGIDA. VAR.





C. RICIDA.





C. RIGIDA.





C. PHYSODES.







C. PHYSODES.

71





C. CERNUA.

7





C. CUNNINGHAMII.

J.





A. C. DECLINATA.

B. C. CHLORANTHA.







C. FLECTENS.

3





C. FLUVIATILIS.

f.

h.

c.

a.

a.





C. HEBETATA.

z





C. STRICTA. (GOOD)

of

6







C. STRICTA. (GOOD)

70

6





C. ANGUSTATA.





C. ANGUSTATA. A.





C. ANGUSTATA. γ.





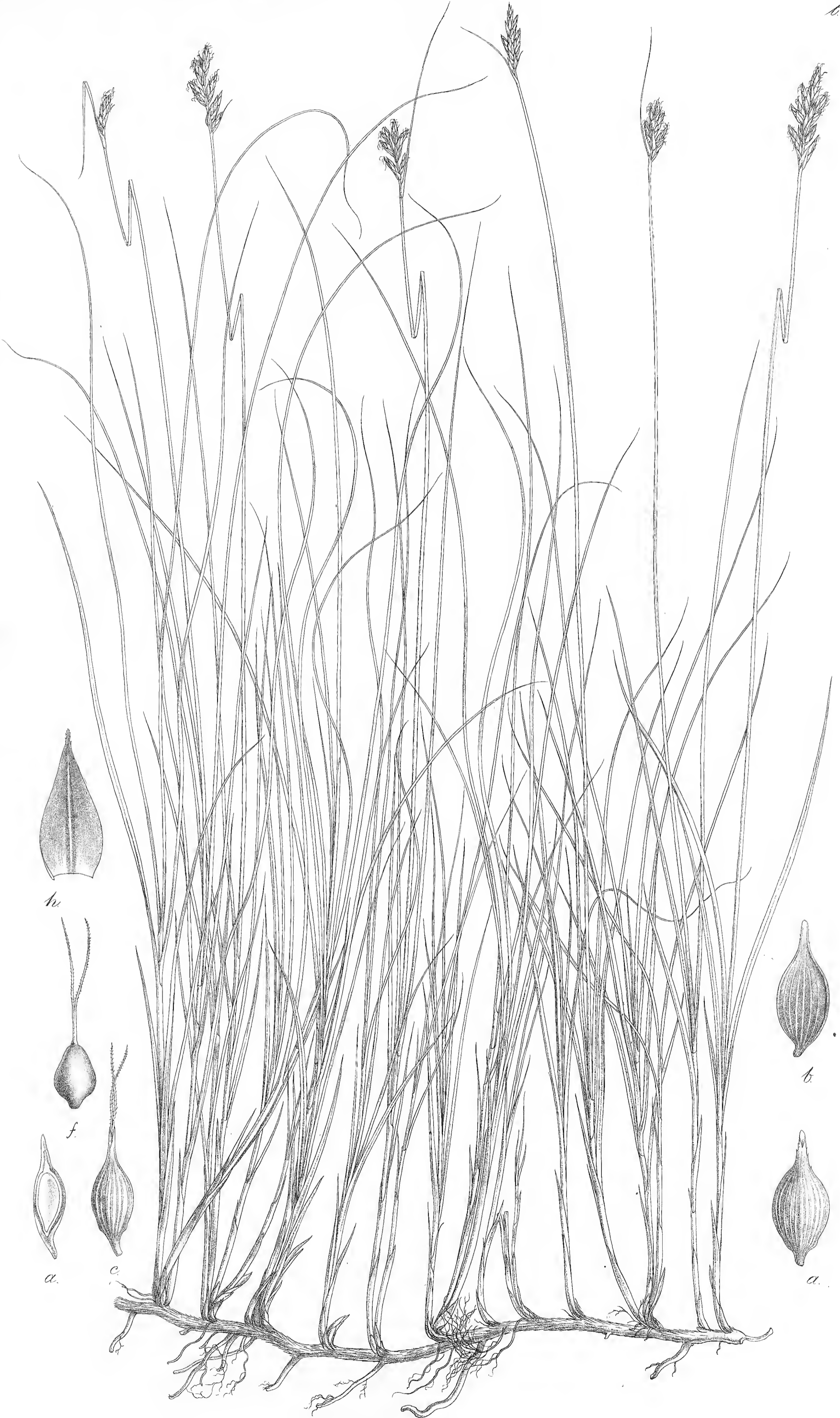


C. MICROGLOCHIN.

C. OLIGANTHA.

7





f

C. MONIZIANA.





C. NUPTIALIS.

7





C. JAMESII.







C. POCILLIFORMIS.





C. LACINIATA.





C. THOUARSII.





C. TERNARIA .







C. TERNARIA.

J







C. TERNARIA.

g.





C. RUBELLA.





27

C. SCITULA.

1383













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