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ILLUSTRATIONS

OF THE

GENUS CAREX.



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1858

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ILLUSTRATIONS

OF THE

GENUS CAREX.

BY

FRANCIS BOOTT, M.D.,

TREASURER AND VICE-PRESIDENT OF THE LINNEAN SOCIETY.

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

ROSCOMMON.



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J. D. S.

TO

JOHN AMORY LOWELL, ESQ.,

MEMBER OF THE CORPORATION OF HARVARD COLLEGE,

AND TRUSTEE OF THE LOWELL INSTITUTE IN BOSTON, NORTH AMERICA,

This Work is Dedicated

BY HIS GRATEFUL FRIEND,

THE AUTHOR.

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MY DEAR LOWELL,

My original design in this Work was limited to the illustration of the CARICES of North America, which I had studied for several years under the advantage of frequent communication with my friend Mr. Carey, who had so ably described and grouped them in Dr. Gray's 'Manual of the Botany of the Northern States,' and the lithographed impressions were made in the prosecution of that design. The extensive and beautiful collection of specimens subsequently brought by Dr. Hooker from the East Indies, which were liberally placed in my hands by that eminent man, impelled me to extend my plan, and I have endeavoured to illustrate the Genus at large.

The figures, with few exceptions, are by M. Maubert, of Paris, drawn and engraved under the guidance and inspection of M. Spach: and whatever merit the work may have, it is due chiefly to them.

In M. Spach I have not only found the talent and learning of the acute and practised observer of nature, but the warm interest of the friend; and I owe to him not only that kind sympathy in my labours which has lightened and cheered them, but an amount of knowledge which I could not have acquired elsewhere. I was introduced to him by the late excellent M. Jussieu; and among the many uncovenanted blessings which an early love of plants has bestowed upon me, I look upon the friendship of M. Spach, so cordial and disinterested, as among the most precious.

To my honoured and much-loved friend Sir W. J. Hooker I owe all those facilities which his noble disposition so habitually places before all who consult his unrivalled Herbarium; and to Dr. Hooker an

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encouragement I cannot adequately acknowledge, though I am fully sensible, from one so eminent for his attainments and labours, of the honour conferred upon me by it.

In my excellent friend Mr. Carey I ever found the fullest sympathy, and I had hoped to have been guided by his cautious judgment. But, like our friend Tuckerman, though from very opposite causes, he has been turned aside from his early pursuits.

I say nothing of the difficulties of my undertaking, undoubtedly increased by my inadequacy to meet them successfully. I might lay claim to some allowance by alluding to the imperfect success of several eminent names. I know of but one remarkable exception, and that is of the inimitable Schkuhr, whose 'Riedgräser,' from its truthfulness, simple beauty, and unpretending form, is without a rival in Botanical literature.

A few of the figures are by Miss Rees, a pupil of the Kensington School of Design, and all the lithographic copies are by her. Three of the engravings are by Mr. Castle, of London; all the rest were made in Paris.

F. B.

*London, February 1, 1858.*

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## EXPLICATIO TABULARUM.

- a.* Perigynium antice visum, interdum cum racheola.  
*a*<sup>x</sup>. Perigynii apex.  
*b.* Perigynium postice visum.  
*b*<sup>x</sup>. Perigynium latere visum.  
*c.* Perigynium transverse vel aliter sectum, sæpe cum squama.  
*c*<sup>x</sup>. Sectio baseos rostri.  
*d.* Rostris apex.  
*e.* Pistillum, interdum cum racheola.  
*e*<sup>x</sup>. Stylus.  
*f.* Achenium, interdum cum racheola.  
*f*<sup>x</sup>. Achenium, transverse sectum.  
*f*<sup>x</sup><sup>x</sup>. Achenium morbidum.  
*g.* Squama mascula.  
*g*<sup>x</sup>. Squama mascula ex inferioribus.  
*g*<sup>x</sup><sup>x</sup>. Squama mascula ex superioribus.  
*h.* Squama foeminea.  
*h*<sup>x</sup>. Squama foeminea ex inferioribus.  
*h*<sup>x</sup><sup>x</sup>. Squama foeminea ex superioribus.  
*i.* Bractea spiculæ lateralis, vel apex ejusdem.  
*k.* Bractea infima, vel apex vel sectio transversa ejusdem.  
*k*<sup>x</sup>. Bractea cum vagina et ligula.  
*l.* Folia inferioris apex supra visus.  
*m.* Folia inferioris apex subtus visus.  
*n.* Folia superioris apex supra visus.  
*o.* Folia superioris apex subtus visus.  
*p.* Folia sectio transversa vel ejus vaginæ.  
*p*<sup>x</sup>. Folia apex.  
*p*<sup>x</sup><sup>x</sup>. Folia fragmentum marginale.  
*p*<sup>x</sup><sup>x</sup><sup>x</sup>. Folia vaginæ apex.  
*q.* Culmi pars inferior.  
*r.* Culmi pars superior, sæpe cum bractea vel ejusdem basi vel vagina, antice vel postice visa.  
*r*<sup>x</sup>. Culmi apicis sectio transversa.  
*r*<sup>x</sup><sup>x</sup>. Culmi mediæ partis sectio transversa.  
*s.* Vaginæ floralis apex latere visus, vel pars ejusdem.  
*t.* Vaginæ floralis apex dorso visus.  
*t*<sup>x</sup>. Vaginæ floralis basis dorso visa.  
*u.* Spica mascula.  
*u*<sup>x</sup>. Stamen.  
*v.* Spica foeminea.  
*v*<sup>x</sup>. Spica fructifera.  
*v*<sup>x</sup><sup>x</sup>. Spicula sub anthesi.  
*v*<sup>x</sup><sup>x</sup><sup>x</sup>. Spicula terminalis vel lateralis.  
*w.* Spathella (*perigynii modificatio*).  
*x.* Rachis spiculæ cum squamis masculis.  
*x*<sup>x</sup>. Rachis paniculæ cum bracteola.  
*y.* Spiculæ basis, cum rachi intra perigynium orta.



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# ILLUSTRATIONS

OF

## THE GENUS CAREX.

1. *C. Thomsoni* (Boott); spica elongata cylindrica pallida, e spiculis androgynis apice masculis pluribus (30–50) ovatis sessilibus omnibus arcte contiguis vel demum inferioribus longe foliaceo-bracteatis subremotis composita; stigmatibus 2; perigyniis ovatis plus minus acuminato-rostratis, ore obliquo bidentato, plano-convexis utrinque nervosis, marginibus acutis serratis, viridibus demum pallidis ferrugineo-punctatis, squamam ovatam acuminatam cuspidatam margine late albo-hyalinam ferrugineo-punctatam subæquantibus vel eâ longioribus. (TAB. I.)

HAB. In regionibus tropicis Khasiæ, Drs. Thomson et Hooker! et Himalayæ, alt. 1–4000 ped., a Bhotan, Booth! ad Kumaon, Dr. Thomson!—In rupibus fluviorum crescens.

Cæspitosa. Rhizoma lignosum, reliquiis foliorum filamentosis nigris coronatum, fibris radicalibus pallidis longis desinens. Culmus validus, rigidus, 6–9-poll., lævis, obtusangulus, vaginis foliorum fere usque ad apicem tectus. Folia 1–2 lin. lata, culmo duplo longiora, rigida, basi vel omnino involuta, supra, præcipue ad margines, ferrugineo-punctata. Vagina intus membranacea, apice ciliolata, punctata. Bracteæ 1–3 inferiores foliaceæ, elongatæ: infima interdum spicâ triplo longior: supremæ squamæformes, cuspidatæ. Spica rigida, erecta, 1½–4½ poll. longa, 3 lin. lata. Spiculæ inferiores 4 lin. longæ, 2 lin. latæ: supremæ minores. Perigynium 1 $\frac{3}{10}$ –1 $\frac{5}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ad basin spiculæ latius, vix rostellatum, versus ejus apicem angustius, sensim acuminatum, in rostrum attenuatum, ore minimo clauso. Achenium  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, late ovale, obtusum, plano-convexum, demum subcompressum, fusco-olivaceum, lucidum.

This very distinct species was discovered by Dr. Thomson, in Kumaon, in May 1845, and I have named it after him. Dr. Hooker found it in the rivers of Sikkim, and in the Tambur River of East Nipal, growing among stones, from which it was difficult to extricate it. I am indebted to Mr. Nuttall for specimens found by Mr. Booth “above Gomeree in Bhootan.”

It is remarkable for the number of its spiculæ, and for the ferruginous spots or lines, most copious on the perigynia, but visible on the scales, leaves and their vaginæ, and bracts. The culm is covered by the sheathing leaves almost to the base of the spike. It is allied to *C. nubigena*, Don, in the nervation of the perigynia, and its foliaceous bracts.

2. *C. nubigena* (Don); spica ovata oblonga vel cylindrica pallida, e spiculis 5–12 pluribusve ovatis sessilibus androgynis apice masculis, superioribus congestis nudis, inferioribus sæpe compositis subremotis longe bracteatis; stigmatibus 2–3; perigyniis lanceolatis vel ovatis sensim in rostrum acuminatis bifidis margine obtusiusculis glabris, vel acutis plus minus serratis utrinque crebre nervatis pallidis interdum leviter ferrugineo-punctatis, squama oblongo-ovata acuta vel cuspidata albida nervo viridi vel pallide ferruginea margine hyalina subæquilata longioribus.—*C. nubigena*, Don, *Prod. Fl. Nepal.* 42! *Lin. Trans.* xiv. 326! (1825); Nees, *apud Wight, Contr.* 120; Kunth, *Cyp.* 385! (TAB. II.)

HAB. In montibus temperatis Indiæ totæ, alt. 6–12,000 ped. Zeylania, Gardner! Nilghiri, Wight! Khasia, Hooker! et Thomson! In Himalaya tota a Bhotan! ad Rajaori!

Culmus  $\frac{1}{2}$ –1½-ped. vel altior, obtusangulus, lævis vel apice uno angulo (rarius omnibus) scabro. Folia lineam lata, sæpius conduplicata. Bracteæ inferiores 2–4 elongatæ, spica longiores, infima interdum 9–10-poll. Spica  $\frac{1}{2}$ –2½ poll. longa, 5 lin. lata. Spiculæ omnes simplices, apice extremo parce masculæ, contiguæ, vel inferiores sæpe compositæ, subremotæ. Perigynium 1½–2 $\frac{2}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{8}{10}$  lin. latum. Achenium  $\frac{6}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{6}{10}$  lin. latum, ovale vel suborbiculatum, lucidum, basi styli apiculatum (stig. 2), compressum, biconvexum (stig. 3), obtuse trigonum, faciebus convexis.

This species is common throughout India. Though normally with two stigmas, yet three are occasionally observable with a trigonous achenium. It varies in the smoothness or roughness of the culm and margins of the perigynium even in the same specimen, but the ferruginous dots on the perigynium seem to be peculiar to certain localities. In the Ceylon, and in some of Dr. Hooker's specimens, the terminal spicula is sometimes sterile, or male. The nervation of the perigynium, long bracts, and involute leaves at once distinguish it from *C. foliosa*, Don; and the longer culm, shorter spike, fewer spiculæ, and more deeply bifid perigynium, with occasionally three stigmata and a triquetrous achenium, distinguish it from *C. Thomsoni*, which is also peculiar in its place of growth, being firmly attached by its ligneous rhizome to rocks in the bed of running streams.

3. *C. foliosa* (Don); spica oblonga vel cylindrica pal-

lida sæpe basi interrupta ramosa, e spiculis 12–30 pluribusve androgynis apice masculis, superioribus simplicibus congestis, inferioribus compositis subremotis sæpe in ramos 2–4 subpollicares insidentibus breve setaceo-bracteatis; stigmatibus 2; perigyniis ovalibus vel ovatis breve rostratis bifidis plano-convexis enerviis rarius nervatis, marginibus acutis inflexis superne serratis, pallide viridibus lucidis, squama ovata acuta vel cuspidata albida nervo viridi longioribus.—*C. foliosa*, Don, *Prod.* 42! *Lin. Trans.* xiv. 327! *C. notoleia*, Nees, 121! *Kunth*, 388. (TAB. III.)

HAB. In montibus temperatis Indiæ totæ, alt. 4–9000 ped. Nilghiri, *Wight!* Khasia, *Hooker!* et *Thomson!* et Himalaya tota a Sikkim! ad Kashmir!

*Culmus*  $\frac{1}{2}$ – $2\frac{1}{2}$ -ped., acutangulus, apice scaber, basi foliosus. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, culmo longiora, plana, graminca. *Bracteæ* setaceæ, breves: inferiores rarius spiculis vel ramis longiores. *Spica* 1– $3\frac{1}{2}$  poll. longa, 4–6 lin. lata. *Spiculæ* parvæ, ovatae, sessiles, omnes contiguæ vel inferiores subremotæ; rami sæpe pollicares, infimus rare  $1\frac{1}{2}$  poll. remotus bracteâque ramo longiori suffultus. *Perigynium*  $1\frac{5}{10}$ – $1\frac{8}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, stipitatum, lenticulare, pallide castaneum, basi styli clavata decidua.

Variat rarius in speciminibus quibusdam Royleanis perigyniis dorso trinerviis; in Thomsonianis utrinque 3–6-nerviis.

Differt a *C. nubigena* culmo acutangulo scabriore, foliis planis gramineis, perigyniis brevius rostratis enerviis vel rarius parce nervatis, bracteis brevibus setaceis;

A *C. divulsa*, Good., vix, nisi culmo sæpe altiori validiori, spiculis pluribus magis confertis, foliis latioribus, distincta. In omnibus notis gravibus culmo acutangulo, spica simplici vel ramosa, perigyniis adpresso-erectis plerumque enerviis vel parce nervatis, bracteis setaceis brevibus rarius elongatis, certe congruunt.

Nees, under *C. notoleia*, quotes *Wall.* 3387 (*ex parte*), and describes the spike as “*basi subinterrupta*,” and under *C. foliosa*, Don, for which he also quotes *Wallich*, *without any number*, and of which therefore he probably had no specimen from him, “*spiculis approximatis, inferioribus remotiusculis*.” Nees also quotes *Royle* under *C. foliosa*, without giving, as is usual with him, any number attached to the specimen; and as he adds, “*An C. vulpinæ forma?*” I do not quote his *C. foliosa* as a synonym to *C. foliosa*, Don. The specimen he had before him was one, I suspect, from *Herb. Royle*, and which he referred to the *C. foliosa*, Don, having no authentic specimen of that plant from *Herb. Wallich* to compare with it. I have a specimen from *Royle*, which is too young for a satisfactory opinion about it, but which I believe to be the *C. vulpina* of Europe, and I was told by Dr. Royle that he had received European plants which occasionally had been mixed with his Indian ones. As no other collector in India has met with a similar specimen, I suspect the one in question was from Europe, and is what Nees refers to under his *C. foliosa*. I suspect the Indian *C. foliosa* will be found inseparable from the European *C. divulsa*, which *Ledebour* finds in the Altai. Both he and *Anderson* notice the roughness on the margins of the perigynium, the absence of which Nees makes use of as a character distinguishing *C. divulsa* from his *C. notoleia*.

I have not seen any specimens of this plant from Ceylon.

4. *C. Walkeri* (Arnott); spica purpurea elongata, e spiculis plurimis plerumque androgynis apice masculis gracilibus inæqualibus laxifloris erectis vel nutantibus fasciculatis decomposita; fasciculis 6, inferioribus longe exserte pedunculatis bracteatibus, e pedunculis 4–12 longis capillaceis simplicibus vel 2–3 spiculiferis compo-

sitis; stigmatibus 3 longis; perigyniis elongatis anguste lanceolatis longe rostratis bicuspidatis triquetris nervatis superne margine serratis demum alternatim dissitis, squama lanceolata obtusa aristata purpurea margine albo-hyalina longioribus.—*C. Walkeri*, *Arnott MSS. in Herb.!* *Boott, Lin. Trans.* xx. 129 (1846). (TAB. IV.)

HAB. In Zeylania, *Walker!* *Gardner*, 942, *Herb. Heward!*

*Culmus* sub-3-pedalis, triquetrus, rigidus, lævis, apice gracilis, scabriusculus, basi foliis vestientibus purpureis tectus; pars fasciculos gerens sesquipedalis. *Folia* 3–4 lin. lata, culmo subæquantia. *Bracteæ* vaginatae, inferiores 2 lin. latae, culmo breviores. *Vaginæ* inferiores 1– $1\frac{1}{2}$ -poll., superiores 3–5 lin. longæ, 1–2 lin. longæ, purpureæ. *Spiculæ* 1– $2\frac{1}{2}$  poll. longæ, 1–2 lin. latae, sæpius androgynæ, apice plus minus masculæ, quædam (*summæ*) omnino vel fere totæ masculæ, aliæ (*inter minores*) fœmineæ, basi demum alternatim dissitifloræ. *Pedunculi* capillacei, scabri. *Squamæ* omnes longe aristatæ, conformes, masculæ imbricatæ. *Perigynium*  $3\frac{1}{2}$  lin. longum,  $\frac{4}{10}$  lin. latum, viride, superne purpureum, leviter nervatum. *Achenium* stipitatum,  $1\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, linearitriquetrum, pallide ferrugineum, basi styli apiculatum.

I first met with this species in *Herb. Arnott*, under the MS. name which it bears, and described it in the twentieth volume of the *Linnean Transactions*. I have since been indebted to Mr. *Heward* for a specimen collected by the late Mr. *Gardner* in Ceylon. It is apparently confined to that island.

5. *C. curvata* (Boott); spica oblonga pallide castanea, e spiculis 5–7 androgynis apice masculis simplicibus vel inferioribus compositis, superioribus ovatis congestis, reliquis oblongis subremotis longe foliaco-bracteatis; stigmatibus 3; perigyniis (immaturis) oblongo-ovalibus, ore hyalino obliquo, castaneis nervis marginalibus viridibus sæpe apice ad margines parce denticulatis lucidis, squama ovata acuta pallide castanea margine hyalina longioribus. (TAB. V.)

HAB. In Himalaya orientali alpina ad Sikkim, alt. 12–14,000 ped. (graminosis), *J. D. Hooker!*

Cæspitosa. *Culmus* 3–5-poll., lævis, obtusangulus, curvatus. *Folia* conduplicata, filiformia, scabra, culmo longiora, curvata. *Bracteæ* inferiores culmo longiores. *Spica* sesquipollicaris. *Spiculæ* 2–6 lin. longæ,  $\frac{1}{2}$ –2 lin. latae, apice parce masculæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{1}{2}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-ovale, triquetrum, basi styli crassiore decidua stipitatum, postice racheolâ ligulatâ nervosâ margine serratâ viridi, interdum exsertâ, præditum.

I know of no near affinity with this species. The racheola sometimes ruptures the perigynium, and in one instance I have observed an exserted axis supporting a perigynium with its scale. This tendency to composition is more frequent than has been generally supposed, and though perhaps the presence of a simple racheola is more commonly met with in the *Psyllophoræ* than any other group, I have noticed it in so many others that I suspect it is by no means uncommon. It may easily be overlooked, as where found it is not always present in every perigynium.

*Drejer* says that the *Psyllophoræ* “manifesto considerandæ sunt, ut formæ hebetatæ *Caricum genuinarum*,” and independent of the analogous forms of their perigynia, upon which he grounds the remark, I think the frequency of the racheola in them may tend to confirm it.

6. *C. setigera*,  $\beta$ , *minor* (Don); spicis 3–6, masculis 1–2 sessilibus, fœmineis 3–4 abbreviatis vel oblongis densifloris, superioribus apice masculis sessilibus, inferioribus plus minus exserte pedunculatis, omnibus bracteatibus

contiguus vel infima remota subradicali; stigmatibus 3; perigyniis obovatis vel ovalibus rostratis, ore membranaceo oblique fisso demum bidentato vel bifido, obtuse triquetris enerviis scaberrimis ciliatis pallide-olivaceis, squamam oblongam sensim vel abrupte acuminatam vel ovatam vel obovatam obtusam hispido-aristatam castaneam medio basique pallidam margine vix vel late albo-membranaceam demum decolorem subæquantibus.—*C. setigera*, *Don, Prod.* 43! *Lin. Trans.* xiv. 330; *Nees*, 126! *Kunth*, 515; *Drejer, Symb.* 20. t. 8. *C. hymenolepis*, *Nees*, 126! *Kunth*, 50. (TAB. VI.)

HAB. *a*, in Himalaya centrali et occidentali temperata a Nipal, *Wallich* (n. 3385)! ad Kashmir, alt. 6–8000 ped., *Thomson*! *β*, in Himalaya orientali temperata ad Nipal et Sikkim, alt. 7–12,000 ped., *J. D. Hooker*, etc.

*Culmus* 2½–12 poll. altus, lævis, basi vaginis ferrugineis reticulato-fibrosis tectus; pars spicas gerens ½–6 poll. longa. *Folia* ½–1½ lin. lata, culmo longiora, marginibus revoluta. *Bractea* inferiores vaginatae, omnes culmo (sæpe multum) longiores. *Vagina* 1–6 lin. longæ. *Spica mascula* 2 lin. ad pollicem longæ, sessiles. *Squamæ* acutæ vel obtusæ, cuspidatæ. *Spica feminea* 2–12 lin. longæ, 1–2 lin. latæ: superiores (vel suprema solum) parce apice masculæ, sessiles: inferiores exserte pedunculatæ: omnes simplices, congestæ vel approximatae, vel inferiores basi ramulis 1–2 brevibus compositæ, infima interdum subradicalis simplex. *Squamæ* oblongo-lanceolatæ, acutæ, obtusæ, sensim vel abrupte acuminatæ, plus minus longe aristatæ, castaneæ, demum omnino decolores. *Perigynium* ½–1½ lin. longum, ¼–⅙ lin. latum. *Achenium* ⅙–⅗ lin. longum, ¼–⅓ lin. latum, suborbiculato-triquetrum vel ellipticum, fuscum, punctulatum, basi styli obliqua vel recta apiculatum, stipitatum.

In the 'Symbolæ Caricologica' of Drejer, edited by the Danish Academy in 1844, after the death of that excellent observer, there is a figure of *C. setigera*, *Don* (t. 8. p. 20), from a specimen sent by Wallich to Hornemann, apparently from an immature plant. Drejer remarks that it varies "squamis longius breviusve aristatis; spicis longioribus brevioribusque, pluribus paucioribusque, omnibus pedunculatis et nonnisi infima pedunculata, valde approximatis et remotis non contiguus, supremis masculis, inferioribus androgynis, apice masculis et summis mere masculis, mediis androgynis, infimis mere femineis: variat porro statura humili, tenella et elata, robusta, spicis densioribus et gracilioribus, squamis femineis hyalino-albidis et fuscis, quare subduplici forma forsitan proponenda:

"*a*, *hymenolepis*; spicis tenuioribus et gracilioribus, squamis hyalino-albidis.—*C. hymenolepis*, *Nees*.

"*β*, *chroolepis*; spicis densioribus, squamis intensius pallidiusve castaneo-fuscis.—*C. setigera*, *Don*."

From an original specimen of *C. setigera*, given to me many years ago by Mr. Don, it is evident that the distinction here proposed by Drejer will not apply to it and to other specimens since brought from the East Indies; and Drejer himself had doubts on the subject, for he remarks, "Nees indicat *C. hymenolepin setigera* affinem esse sed majorem et spicis albis distinctam. Sed in herbario Hornemannii adsunt specimina *C. setigera*, a Wallichio missa, quæ etiam robustiora sunt quam *C. hymenolepidis* specimina authentica et saltem non humiliora. Ex sex speciminibus non nisi duo habebant squamas albas, cætera squamas castaneo-fuscas, et ex his rursus unum in omnibus cæteris formæ albæ simillimum fuit."

The difference in the colour of the scales depends, I think, merely on age, and is observable in the typical form and in the variety *β*. Judging from the collections I have seen, the typical form is more rare than the variety *β*. Of this last, I have figured the two most common forms,—the one tall and gracile, the other short, with densely-flowered, contiguous spikes. In the typical form the orifice of the perigynium is conspicuously membranous

and obliquely cut. Drejer describes it, "ore hyalino bilobo, lobulis interdum in setulas tenerrimas productis." In the variety *β* it varies, sometimes distinctly membranous, more or less oblique, emarginate-bidentate or bifid. In Dr. Hooker's specimens (t. 6. 2), which are not mature, it is emarginate, or almost entire, while in Dr. Thomson's (t. 6. 1) it is deeply bifid. I believe this to depend on the marginal nerves, in the short rostrum, extending to, or, in the longer rostrum, stopping short of the orifice, and the more or less shrinking of the membranous portion. I have not observed any other characters to separate these forms. The scales vary in form, and though almost glabrous, yet rarely the medial nerve is scabrous, and the limb near it slightly hairy. The bracts vary much in length, sometimes very much longer than the culm or only equalling it. In a few cases I have observed the terminal or all the spikes androgynous-male at top. The fasciculate form has only been observed by Strachey and Winterbottom in a young state.

7. *C. spiculata* (Boott); spicis 4–5 simplicibus cylindricis erectis pallidis apice quasi caudatis masculis, superioribus approximatis sessilibus, inferioribus subremotis exserte pedunculatis bracteatis; stigmatibus 3; perigyniis ellipticis acute triquetris sensim rostratis bidentatis basi productis valide nervatis glabris superne ad margines serratis, squama lanceolata acuminata vel hispido-cuspidata pallida latioribus eamque subæquantibus.—*C. spiculata*, *Boott, Lin. Trans.* xx. 139. (TAB. VII.)

*β*; spicis pluribus, inferioribus compositis, perigyniis scabriusculis.

HAB. In regionibus subtropicis Mont. Khasiæ, alt. 3–4000 ped., *Griffith*! *Hooker et Thomson*!

*Culmus* bipedalis, firmus, lævis, inter spicas scaber, basi reliquiis foliorum laccratis vaginisque reticulato-fissis rubropureis tectus. *Folia* 1–2 lin. lata, plana, culmo longiora. *Bractea* inferiores foliaceæ, culmo longiores, vaginatae: superiores setaceæ, spicis suis breviores. *Spica* 1–1½ poll. longæ, 2–3 lin. latæ, subæquales, omnes apice masculæ. *Squamæ* lanceolatæ, acuminatæ, cuspidatæ, glabræ. *Perigynium* 1½–2 lin. longum, ⅙ lin. latum, rostro sæpe ¼ lin. longo. *Achenium* 1½ lin. longum, ⅓ lin. latum, ellipticum, triquetrum, faciebibus concaviusculis angulis concoloribus, basi styli recta apiculatum.

*β*. *C. composita* affinis, tamen perigyniis longioribus acute triquetris rostro longiori valide nervatis minus scabris pallidis, squamis angustioribus, achenio elliptico basi styli recta differt.

8. *C. composita* (Boott); spicis 7–12 inæqualibus cylindricis oblongisque purpureis apice caudato masculis, superioribus simplicibus sessilibus contiguus, inferioribus remotis inserte vel exserte pedunculatis compositis, e spiculis 2–7 apice peduncolorum insidentibus longe bracteatis; stigmatibus 3; perigyniis orbiculatis ovalibus vel obovatis compressis demum subtriquetris abrupte brevirostratis bifidis enerviis vel plus minus obsolete nervatis scaberrimis margine serratis pallidis purpureo-tinctis, squama ovata vel lanceolata acuminata longe cuspidata dorso scabra purpurea medio late pallida margine anguste albo-membranacea subæquilata brevioribus. (TAB. VIII.)

HAB. In Assam, *Major Jenkins*! (*Herb. Hooker*); et in regionibus subtropicis et temperatis Khasiæ, alt. 4–6000 ped., *Hooker et Thomson*!

*Culmus* sub-3-pedalis, rigidus, obtusangulus, lævis, superne gracilis, scaber, basi vaginis foliorum reticulato-fissis pallidis tectus; pars spicas gerens subpedalis. *Folia* 1–2 lin. lata, firma, culmo longiora, basi involuta, superne marginibus revo-

lutis. *Bractea* inferiores culmo multum longiores, vaginatae: superiores setaceae, spicis suis breviores. *Spicae* superiores 5-7, simplices, sessiles: inferiores 3-5, compositae, inserte vel exserte pedunculatae: infima rarius simplex. *Spiculae* inaequales, 6 lin. ad 2 poll. longae, 2-3 lin. latae, apice subdimidiatim masculae. *Squamae* dorso scabrae, conformes. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, orbiculato-triquetrum, stipitatum, basi styli obliqua apiculatum.

I first saw specimens of *C. spiculata* in the herbarium of my late esteemed friend, Dr. Charles Lemann, gathered by Mr. Griffith on the mountains of Khasia, which I described in vol. xx. of the Transactions of the Linnean Society, and which are figured in t. 7. In 1851, Sir W. J. Hooker sent me a *Carex*, gathered in Assam by Major Jenkins, which I named in his Herbarium *C. composita*. Dr. Hooker has since brought from the East Indies specimens of both plants, and those which I have referred to a variety of *C. spiculata*, with the lower spikes compound, certainly approximate in inflorescence to *C. composita*; but as I find in that variety the perigynia are always strongly nerved, the scales pale, lanceolate, and narrower than the perigynium, and the achenium elliptic and more finely pitted than in *C. composita*, I am inclined to consider them distinct from that species. The form of the perigynium of *C. composita* varies: it is shorter than that of *C. spiculata*, less attenuate at base, at first compressed, orbicular, oval, or obovate, abruptly rostrate, with two prominent marginal nerves only, and its subtriquetrous form is dependent on the maturation of the achenium, which laterally it does not invest so closely as the perigynium of *C. spiculata* does its achenium. The more or less distinct nervation is only observable upon a few perigynia in the Khasia specimens.

9. *C. nobilis* (Boott); spica elongata, e spicis partialibus sub-12 decomposita, superioribus 4 simplicibus sessilibus contiguis, reliquis deorsum magis magisque compositis quarum superioribus 3-4 spiculiferis sessilibus evaginatiss, inferioribus subremotis exserte pedunculatis longissime bracteatis elongatis (ambitu lanceolato) e spiculis 8-12 summis vel omnibus simplicibus vel infimis binis ternis quinatisve compositis; spiculis erectis crassis densifloris sessilibus omnibus apice masculis inaequalibus olivaceis vel pallide ferrugineis; stigmatibus 3; perigyniis acute triquetris ellipticis basi spongiosis demum attenuatis rostratis rostro recto acute bifidis superne scabriusculis margineque ciliato-serratis nervatis pallidis erectis, squama lanceolata acuta breve hispido-aristata pallida vel pallide ferruginea apice marginibus hyalino-albida dorso scabriuscula brevioribus vel eam aequantibus. (TAB. IX.)

HAB. In regionibus subtropicis Mont. Khasiae, alt. 4-5000 ped., *Hooker et Thomson*.

*Culmus* 3-pedalis, validus, inter spicas gracilis, scabriusculus; pars spicas gerens 15-20 poll. longa. *Folia* 5 lin. lata, culmo longiora. *Bractea* infima 4 lin. lata, inferiores culmo longiores: superiores angustae: summæ squamæformes. *Spicae* partiales inferiores compositae, 3-5 poll. longae, 8 lin. latae. *Spiculae* 8 lin. ad 2 poll. longae, basi 3 lin. latae; pars staminifera 2-8 lin. longa. *Perigynium*  $1\frac{5}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, nervis concoloribus, sæpe superne evanidis. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-obovatum, stipitatum, fuscum, punctulatum, angulis obtusis concoloribus faciebus concaviusculis basi styli persistente apiculatum.

Var.  $\beta$ ; spica supradecomposita, spiculis plurimis brevioribus hic illic omnino masculis vel sterilibus; perigyniis glabrioribus, rostro recurvo, laciniis minus acutis, apice ferrugineis vel ferrugineo-maculatis divaricatis; squamis latoribus, achenio breviori, angulis pallidis. (TAB. X.)

Var.  $\gamma$ ; spica plus plusque supradecomposita, spicis partialibus inferioribus ramosis, spiculis innumerabilibus omnibus apice masculis; perigyniis scabris pallidis, vel apice ferrugineis vel ferrugineo-maculatis, rectis vel recurvis; squamis obtusis dorso scabris longe hispido-aristatis.—*Folia* latoria. (TAB. XI.)

I was, on the first examination of Dr. Hooker's fine collection of *Carexes* from his journey to the East Indies, inclined to consider the varieties  $\beta$  and  $\gamma$  as a distinct species, and specimens may have been distributed by him under the name of *C. pandata*, but on a closer examination I can see nothing to justify it. The apparent distinction in the form of the perigynium in Tab. XI. is the result of age, from the spongy part eventually contracting and giving an attenuate form to the base of the perigynium. I can place no reliance on the scales, either as to form or the length of the arista. The specimen from which the lower partial spike is figured in Tab. XI. was much more compound than the others, a difference always remarkable in the paniced *Carexes* of the East, dependent on luxuriance of growth, either from soil, or locality, or perhaps the age of the plant, the older root being more vigorous and profuse in its developments than younger seedling plants.

*C. nobilis* is very closely related to *C. myosurus*, a species however which maintains its gracile character in the wide range over which it is diffused, from the peninsula of India, where it has been found at Courtallum, on the Pulney Mountains, and the Nilghiries by Dr. Wight, to the mountains of Nipal, Khasia, Simla, and the Sikkim-Himalaya, whence it has been brought by Dr. Wallich, Mr. Griffith, Mr. Edgeworth, and Dr. Hooker. It was found also by Dr. Royle at Moossoree. The affinity is so close that it is difficult to find any distinguishing character beyond the more gracile curved form of the spiculae, the looser cernuous inflorescence, and the quadrifarious arrangement of the perigynia in *C. myosurus*.

10. *C. polycephala* (Boott); spica pallide straminea concolori, e spiculis plurimis inaequalibus oblongis androgynis apice parce masculis fasciculatis decomposita; fasciculis 4-5, superioribus plerumque simplicibus contiguis, inferioribus e pedunculis monostachyis aliisque superne fasciculatis vaginulatis bracteolatis simplicibus vel racemosis inaequaliter longe exserte pedunculatis foliaceo-bracteatis compositis; stigmatibus 3; perigyniis triquetris ovalibus longe subulato-rostratis ore membranaceo bilobo demum fisso nervatis oblique divergentibus, squama lanceolata acuminata acuta pallida angustioribus brevioribus vel aequantibus. (TAB. XII.)

HAB. In Himalaya orientali ad Sikkim, alt. 10,000 ped., in graminosis, *J. D. Hooker*.

*Culmus* sesquipedalis, validus, lævis, basi foliis vestientibus tectus; pars spicas gerens pedalis. *Folia* 4-5 lin. lata, rigida, culmo longiora. *Bractea* culmo longiores: infima 4 lin. lata, vaginata: summæ setaceae. *Vagina* infima  $1\frac{1}{2}$  poll. longa. *Pedunculi* inaequales, graciles. *Pedicelli* setacei. *Fasciculi* supremi e spiculis simplicibus exserte pedunculatis: reliqui e spiculis simplicibus pedunculisque superne ramosis, 2-8 spiculiferis compositi; infimus, inter alios, uno pedunculo longiore fasciculato bracteolato instructus. *Spiculae* inaequales,  $\frac{1}{2}$ -1 poll. longae, 3-4 lin. latae, omnes apice parce masculae, pallide stramineae, concolores, laxae. *Squamae* omnes conformes. *Perigynium*  $1\frac{8}{10}$ - $2\frac{2}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, olivaceum, rostro prælongo lævi pallido. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, triquetrum, ovale, fusco-olivaceum, punctulatum, basi styli obliqua apiculatum stipitatum.

11. *C. pulchra* (Boott); spica castanea, e spiculis plurimis inaequalibus cylindricis gracilibus laxifloris erectis fasciculatis decomposita; fasciculis 4-6, superioribus approximatis inserte inferioribus exserte pedunculatis brac-

teatis, e pedunculis 5-10 simplicibus vel uno 2-5-spiculifero compositis; spiculis linearibus, una (*altiori*) in quoque fasciculo basi mascula vel in summo interdum omnino mascula; stigmatibus 3; perigyniis parvis ovalibus triquetris rostratis, ore albo-hyalino obliquo, nerviis castaneis nitidis glabris, squama ovata obtusa vel acuta castanea apice hyalina longioribus. (TAB. XIII.)

HAB. In Himalaya orientali temperata, ad Sikkim et Nipal, alt. 7-11,000 ped., *J. D. Hooker*.

*Culmus*  $\frac{1}{2}$ -1-ped., gracilis, firmus, obtusangulus, lævis, basi foliatus; pars spicas gerens 4-7-poll. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmo breviora, firma, plana. *Bractea* inferiores culmo breviores vel longiores, supremæ subulatæ, omnes vaginatæ. *Vagina* infima 3-10 lin. longa. *Pedunculi* inæquales: summi vix lineam, inferiores 1-3 poll. longi, setacei, læves: plerumque monostachyi, vel unus 2-5-spiculifer. *Spicula* 3-15 lin. longæ, lineam latæ; una rarius altera in quoque fasciculo basi mascula, vel *terminalis* interdum omnino mascula. *Perigynium* 1-1 $\frac{2}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum. *Achenium*  $\frac{5}{10}$ - $\frac{6}{10}$  lin. longum, vix  $\frac{3}{10}$  lin. latum, ovale, triquetrum, stipitatum, basi styli apiculatum.

This pretty species, found by Dr. Hooker at Lachen, varies in what may be considered the terminal spicula of the fascicles. It is generally androgynous, male at base; but in the highest fascicle it is often entirely male. The perigynium figured is one of a paler colour than usual, with ferruginous spots, but these generally coalesce, giving it a uniform ferruginous or castaneous colour, except at the orifice, which is white and membranous. In some specimens the fascicles consist of monostachyous peduncles, in others there is one supporting two to five spiculæ, one or sometimes two of them being male at base.

12. *C. insignis* (Boott); spica castaneo-purpurea elongata, e spiculis plurimis inæqualibus cylindricis gracilibus androgynis apice masculis fœmineisque fasciculatis decomposita; fasciculis pluribus sub-12, summis e spiculis 2-3 simplicibus sessilibus, reliquis plerumque inserte pedunculatis longe bracteatis, e pedunculis 3-6 pluribusve simplicibus racemisque 2-6-spiculiferis compositis; spiculis linearibus laxifloris plus minus apice masculis fœmineisque; stigmatibus 3; perigyniis triquetris ovalibus rostratis, ore membranaceo obliquo, scabris margine serratis pallidis sæpe ferrugineo-punctatis demum subexcurvis, nervis marginalibus, squama oblonga obtusa vel emarginata hispido-cuspidata purpurea nervo viridi apice albo-hyalina longioribus. (TAB. XIV.)

HAB. In Himalaya orientali temperata et subtropica: Nipal, alt. 5-6000 ped., *J. D. Hooker*, et in montibus Khasiæ, alt. 4-6000 ped., *Hooker et Thomson*.

E vaginis (infimis rubro-purpureis) foliorum culmum e basi ad apicem cooperientibus insignis! *Culmus* foliosus, 4-ped. vel altior, firmus; pars fasciculos gerens 12-15-poll. *Folia* 3-3 $\frac{1}{2}$  lin. lata, culmo breviora, plana, rigida, apice attenuata, scaberrima, supra granulato-asperata, alternatim vaginantia. *Bractea* conformes: superiores culmum æquantes: summæ setaceæ. *Spicula*  $\frac{1}{2}$ -1 $\frac{1}{2}$  poll. longæ; basis fœminea, 2 lin. lata; apex masculus,  $\frac{1}{2}$  lin. latus, 3-15 lin. longus. In quoque fasciculo *racemi* 1-3, exserte vel inserte pedunculati, 2-6-spiculiferi, erecti: spiculis superioribus racemorum subsessilibus; inferioribus quandoque geminatis, e vaginula purpurea cuspidulata egredientibus. *Squamæ* fœmineæ demum deciduæ: masculæ pallidiores, imbricatæ, persistentes. *Perigynium* 1 $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, pallidum, plus minus ferrugineo-punctatum, demum olivaceo-fuscum, scabrum, enerve vel 2-3-ner-

vatum, nervis plus minus apice evanidis. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, triquetro-obovatum, stipitatum, fuscum, angulis pallidioribus, punctulatum.

The remarkable foliation of this species, like that of *C. ligulata*, distinguishes it from its allies. The perigynium varies in itservation and roughness. I believe normally, with the exception of the marginal nerves, it is nerveless, though occasionally two or three are observable, more or less extending upwards. The roughness varies, and in an Assam specimen in Herb. Hooker is absent. In the fascicles there is a large proportion of female spiculæ, and the male apex is variable in its proportion to the whole spicula, sometimes in the terminal ones having only one or two female flowers at base. In the older specimens the female scales and perigynia have fallen, and the male apex alone remains.

13. *C. decora* (Boott); spica obscure purpurea elongata, e spiculis plurimis masculis androgynisque apice masculis rarius omnino fœmineis gracilibus laxifloris elongatis inæqualibus erectis vel nutantibus fasciculatis decomposita; fasciculis 6-8, inferioribus longe exserte pedunculatis bracteatis, e pedunculis 2-8 longis inæqualibus plerumque monostachyis, uno longiori spiculas masculas 1-4 apice gerente, compositis; stigmatibus 3; perigyniis elongatis triquetris ellipticis basi attenuatis longe rostratis, ore hyalino obliquo ciliato margine incurvo superne scabro, leviter striato-nervatis fusco-olivaceis superne ferrugineo-punctatis, squama oblonga obtusa emarginata hispido-cuspidata rarius mutica obscure purpurea superne pallida vel albido-hyalina basi amplexente angustioribus longioribus vel subæquantibus. (TAB. XV.)

HAB. In Himalaya orientali temperata et subalpina, ad Sikkim, alt. 10-12,000 ped., *J. D. Hooker*.

*Culmus* 2-ped. vel altior, validus, triqueter, lævis; pars fasciculos gerens sesquipedalis. *Folia* 4-5 lin. lata, culmo longiora, tuberculato-asperata. *Bractea* inferiores 3 lin. latæ, vaginatæ: vagina infima 2 $\frac{1}{2}$  poll. longa. *Fasciculi* 6-8, exteriores minores: supremi sæpe e spiculis 2 geminatis simplicibus: medii e pedunculis 3-8, quorum longior ad apicem spiculas 1-4 plerumque masculas gerat; breviores monostachyi, spiculam apice masculam vel rarius fœmineam gerentes: infimus sæpe e pedunculis 3-4; longioribus spiculas 3, masculas, brevioribus unam vel alteram apice masculam gerentibus. *Spicula* 1-2 $\frac{1}{2}$  poll. longæ, 1-2 lin. latæ: terminales alternæ, interdum 2-6 omnino masculæ, sessiles. *Pedunculi* gracillimi, scabri, 3-6 poll. longi. *Squamæ* conformes, (sub lente) apice ciliolatæ. *Perigynium* 3 lin. longum,  $\frac{6}{10}$  lin. latum: nervis inconspicuis. *Achenium* 1 $\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetrum, oblongum, stipitatum, fuscum, basi styli apiculatum.

One of the most remarkable of the fascicled group discovered by Dr. Hooker in Sikkim. The colour of the spike is of a dull purple, variegated by the cream-coloured tips of the scales. The spiculæ, from the long capillary peduncles, are often nodding.

14. *C. Daltoni* (Boott); spica ferruginea demum fusco-purpurea elongata, e spiculis permultis masculis androgynis apice masculis fœmineisque basi laxifloris cylindricis inæqualibus nutantibus fasciculatis decomposita; fasciculis 8-10, inferioribus magis compositis longissime exserte pedunculatis bracteatisque, e pedunculis 4-20 pluribusve monostachyis et pluristachyis compositis: in quoque fasciculo pedunculis 2-8, longioribus spiculas 2-10 superiores fere vel omnino masculas, aliis brevioribus 2-13 monostachyis spiculas apice masculas rarius fœmineas gerentibus; stigmatibus 3; perigyniis triquetris ellipticis rostratis bifidis atro-purpureis, rostro ferru-

gineo serrato, ore hyalino, basi attenuatis pallidis, strigoso-scaberrimis enerviis demum deciduis, squama oblonga amplectente obtusa truncata vel emarginata vel acuta ferruginea margine albo-hyalina longe hispido-aristata decidua angustioribus brevioribus vel subæquantibus. (TAB. XVI.)

HAB. In Himalaya orientali temperata, ad Sikkim, alt. 7-9000 ped., in graminosis, *J. D. Hooker*.

*Culmus* 3-pedalis vel altior, validus, obtusangulus, lævis; pars fasciculos gerens  $1\frac{1}{2}$ - $2\frac{1}{2}$ -ped. *Folia* desunt. *Bractea* inferiores 4-5 lin. latæ, culmum subæquantes: superiores angustæ, fasciculos superantes. *Vagina* infima sub-2-poll., pallida: summæ 2-3 lin. longæ, purpureæ. *Pedunculi* 3-10-poll., longiores, superne spiculas 2-10 gerentes, nutantes, alii monostachyi, breviores, erecti: scabri. *Fasciculi* deorsum magis compositi: inferiores interdum e pedunculis 21 compositi, quorum 13 monostachyis; longioribus eorum spiculas apice masculas, brevioribus fœmineas gerentibus: et 8 (semper longioribus) 2-10-spiculiferis. *Spicula* inæquales, 7 lin.- $2\frac{1}{2}$  poll. longæ, apice 1 lin., basi 2 lin. latæ: summæ culmi (2-5) alternæ, contiguæ, sessiles, masculæ, quandoque etiam fasciculorum masculæ vel fere omnino masculæ: aliæ basi floeulis fœmineis paucis laxis, apice masculis pluribus imbricatis vel fœmineis pluribus masculis paucis præditæ. In pedunculis magis polystachyis spiculæ summæ alternæ, sessiles, contiguæ, fere omnino vel una alterave tote masculæ, reliquæ remotæ, geminatae vel ternatae, longe exserte pedicellatæ, e vaginula 2-3 lin. longa, purpurea, cuspidata egredientes. *Squamæ* omnes conformes: fœmineæ facile deciduæ. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, triquetrum, oblongo-ovale, stipitatum, basi styli æquali apiculatum, pallide ferrugineum, punctulatum, angulis pallidioribus.

This species, I think the most beautiful of the genus, I have named after Dr. Hooker. It had been found in Bhotan by Griffith, as I learn by a small specimen in the Herbarium of Sir W. J. Hooker from him, with the number 2664. Nothing can exceed the elegance of the larger specimens, with their luxuriant nodding fascicles.

15. *C. cardiolepis* (Nees); spicis 3-4 oblongo-cylindraceis purpureis erectis, terminali mascula pedunculata, reliquis fœmineis sublaxifloris remotis exserte pedunculatis; bracteis subturgide vaginatis brachyphyllis; stigmatibus 3 longis; perigyniis triquetro-obovatis abrupte rostellatis, ore emarginato-obliquo, crebre valideque nervatis strigoso-scabris oblique stipitatis, squama oblonga late emarginata cuspidata purpurea margine late albo-hyalina angustioribus longioribusque.—*C. cardiolepis*, *Nees, Wight, Contr.* 127. (TAB. XVII.)

HAB. In Himalaya occidentali temperata, alt. 7-12,000 ped., a Kumaon, *Royle*, ad Kashmir, *Thomson*.

*Cæspitosa*. *Radix* lignosa, horizontalis. *Culmus* 1- $1\frac{1}{2}$ -ped., gracilis, obtusangulus, sulcatus, scaber, basi foliatus vaginisque reticulato-fibrillosis reliquisque foliorum fibratis nigrescentibus tectus; pars spicas gerens 4-6 poll. longa. *Folia*  $\frac{1}{2}$ -1 lin. lata: *juniora* culmo breviora, plana, carinata, apice setaceo-attenuata, scabra, demum *senilia* arida, culmo longiora. *Bractea* vaginatae, spicis suis breviores vel inferior paulo longior. *Vagina* 6-12 lin. longæ, apice albo-membranaceæ, subturgidæ. *Pedunculi* semivaginati, scabri. *Spicae* 6-14 lin. longæ,  $1\frac{1}{2}$ -2 lin. latæ: fœmineæ inter se  $1\frac{1}{2}$ -3 poll. remotæ. *Squamæ* conformes: masculæ arcte imbricatæ, infima amplectens, longius cuspidata: fœmineæ demum marginibus insigniter albo-membranaceæ: omnes late emarginatæ.

*Perigynium* (cum stipite  $\frac{4}{10}$  lin. longo)  $1\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, pallidum, apice purpureo-tinctum, stipite basi curvata. *Achenium*  $1\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, triquetro-obovatum, pallidum, apice zona circulari basin styli bulbosam ciugente instructum.

Ab affinibus (inter *Digitatas*), squamis omnibus insigniter emarginatis, distincta.

16. *C. Wallichiana* (Prescott); spicis 4-6 rarius 3-8 erectis pallidis, masculis 3-2 rarius 1-4 vel 5 cylindricis, fœmineis 2-3 vel 1-4 oblongis vel cylindricis sæpe approximatis infima vel binis inferioribus vaginatis plus minus exserte pedunculatis, bracteis foliaceis sæpe culmo multum longioribus; stigmatibus 3; perigyniis ovatis vel oblongo-ovatis obtuse trigonis rostellatis breve bicuspidatis nervatis hispidis coriaceis subturgidis cinereis, squama ovato-lanceolata cuspidata pallide straminea latioribus brevioribus vel longioribus.—*C. Wallichiana*, *Prescott! in Wall. Cat. n.* 3380! *Nees ap. Wight*, 129! *Kunth*, 483. *C. Fedia*, *Nees, l. c.* 129! *Kunth*, 483; *Royle, n.* 114! (TAB. XVIII.)

HAB. In regionibus tropicis planitie Gangeticæ, Punjab et Assam, et Himalayæ inferioris, alt. 1-5000 ped., *Wallich*, etc. *Afghan, Griffith*.

*Radix* repens. *Culmus* 1-2-ped., obtusangulus, lævis, rigidus, basi foliis vestientibus vaginisque reticulato-fissis glabris tectus; pars spicas gerens 4-12 poll. longa. *Folia* 1- $2\frac{1}{2}$  lin. lata, culmo longiora, supra scabrida. *Bractea* omnes interdum culmo longiores: infima quandoque sesquipedalis semper proximaque sæpe vaginata. *Vaginae* 2-18 lin. longæ. *Pedunculus* infimus 2 lin. ad 3 poll. longus, teres, lævis. *Spicae* masculæ contiguæ (nunquam androgynæ), suprema  $1\frac{1}{2}$  poll. longa,  $1\frac{1}{2}$  lin. lata, extremæ majores, infima bracteata. *Squamæ* lanceolatae, acuminatæ, cuspidatæ vel obtusæ, muticæ, apice ciliatæ. *Spicae* fœmineæ  $\frac{1}{2}$ - $2\frac{1}{2}$  poll. longæ, 3- $3\frac{1}{2}$  lin. latæ: suprema rarius apice mascula sessilis; reliquæ breve vel plus minus longe pedunculatæ. *Perigynium* 2- $2\frac{4}{10}$  lin. longum,  $\frac{9}{10}$ -1 lin. latum, breve bicuspidatum, laciniis latiusculis, ciliatis. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, stipitatum, basi styli persistente apiculatum.

Habitus et adpectus *C. lanuginosa*, Mich. Differt culmo validiori, lævi, obtusangulo; bracteis sæpe longioribus, inferioribusque sæpius vaginatis; spicis pluribus; perigyniis minus hispidis, brevius bicuspidatis, laciniis latioribus; achenio elliptico; vaginis glabris.

I find in the specimens I have seen of this species that—

|                 |                |                  |
|-----------------|----------------|------------------|
| 5 had 3 spikes. | 17 had 1 male. | 17 had 1 female. |
| 41 „ 4          | 36 „ 2         | 61 „ 2           |
| 47 „ 5          | 62 „ 3         | 49 „ 3           |
| 33 „ 6          | 16 „ 4         | 7 „ 4            |
| 7 „ 7           | 3 „ 5          |                  |
| 1 „ 8           |                |                  |
| —               | —              | —                |
| 134             | 134            | 134              |

The specimens which Nees had seen of Wallich's Herbarium were apparently young, and he was induced to consider Royle's as specifically distinct, but I can see nothing to justify the separation. He notices the very close affinity of his *C. Fedia* with *C. lanuginosa* (*C. pellita*, Muhl.). I have pointed out the few marks of distinction that I have observed. This species, Mr. Edgeworth says in a note, is the only one he had found in the plains of India towards the mountains: his specimens were from the Delhi canal. I have it from the Brahmaputra to Kashmir and Afghanistan, varying in size as it grows in water or more or less remote from it.

17. *C. Royleana* (Nees); spicis 3 vel 2-4 albo-viridibus oblongis laxifloris comosis, terminali mascula, reliquis



fœmineis sessilibus contiguis vel approximatis, infima subvaginata interdum radicali exserte pedunculata, bractea infima (nisi radicali) culmo plerumque paulo longiore; stigmatibus 3; perigyniis ovalibus utrinque acutis emarginatis nervatis puberulis pallide viridibus, squama oblonga truncata vel emarginata albida demum flavescente longe valideque ciliato-cuspidata brevioribus.—*C. Royleana*, Nees, *Wight, Contr.* 127! (1834); *Kunth*, 441. (TAB. XIX.)

HAB. In Himalaya occid. temperata, *Royle*, n. 152! *Munro*, n. 2428! Kumaon, alt. 7–8000 ped., *Thomson*!

*Culmus* 5–8-poll., basi foliatus, gracillimus, triquetus, scaber; pars spicas gerens 7–20 lin. vel 6 poll. longa. *Folia* plana, culmo breviora: vel *radicalia* latiora,  $1\frac{1}{2}$  lin. lata, graminea, eo longiora. *Bractea* infima brevissime vaginata, culmo longior vel brevior, quandoque radicalis longius vaginata, spicâ suâ longior. *Vagina* sublineam longa, vel radicalis 6 lin. longa. *Pedunculus* radicalis  $1\frac{1}{2}$  poll. longus, scaber. *Spicæ* omnes comosæ, contiguæ vel alternæ, 3–6 lin. longæ,  $1\frac{1}{2}$ –2 lin. latæ: mascula sessilis vel pedunculata: fœminea infima quandoque subradicalis, longe exserte pedunculata. *Squamæ* omnes albidæ, demum flavescentes, longe valideque ciliato-cuspidatæ: vel masculæ superiores acutæ: fœmineæ truncatæ vel emarginatæ, superiores subacutæ, omnes plus minus apice ciliatæ. *Perigynium*  $1\frac{3}{5}$  lin. longum,  $\frac{6}{10}$  lin. latum, achenium laxè vestiens. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, oblongo-triquetrum, apice quasi cyathiforme, margine basin incrassatam styli cingente: medio, e defectu albuminis, morbide indentatum.

This species has a very close affinity with *C. breviculmis*, Brown, of Australia and New Zealand, and with *C. leucochlora*, Bunge (Mem. St. Petersburg. ii. 142, 1835), of China, and with *C. Langsdorffii*, Boott (Lin. Trans. xx. 144), of Japan, which is probably referable to Bunge's plant. A more intimate acquaintance with all these species may possibly prove their specific identity. *C. breviculmis* differs from *C. Royleana*, spicis fœmineis sæpe apice masculis squamis masculis muticis, fœmineis brevius cuspidatis bracteis foliisque longioribus; *C. leucochlora* and *C. Langsdorffii*, squamis masculis sæpe muticis, fœmineis plerumque acutis. The perigynium, achenium, and incrassate base of the style are alike in all.

18. *C. munda* (Boott); spicis 5–8 oblongis pallidis androgynis apice masculis basi laxiuscule (vel quibusdam omnino) fœmineis, superioribus sessilibus arcte contiguis, e perigyniis (*stigmata gerentibus*) egredientibus, inferioribus remotis longe exserte pedunculatis nutantibus, singulis interdum basi compositis, vel geminatis; stigmatibus 3; perigyniis triquetro-ovalibus utrinque attenuatis, rostro subexcurvo, ore subintegro albo-hyalino, enerviis tenuissime granulatis pallidis, squama obtusa sæpe emarginata vel acuta mucronata vel mutica ferrugineo-tincta longioribus. (TAB. XX.)

$\beta$ ; minor,  $2\frac{1}{2}$  poll. alta, spicis 4 infimis geminatis.

HAB. In Himalaya orientali alpina ad Sikkim, alt. 10–14,000 ped., *J. D. Hooker*.

*Culmus* 1– $1\frac{1}{2}$ -pedalis, triquetus, gracilis, scabriusculus, basi foliatus; pars spicas gerens 4–8 poll. longa. *Folia* 1– $1\frac{1}{2}$  lin. lata, graminea, plana, culmo breviora vel eum æquantia. *Bracteæ* inferiores foliaceæ, spicis suis longiores: summæ squamæformes. *Vaginæ* 6 lin. ad 2 poll. longæ. *Pedunculi* inferiores 3–7 poll. longi, scabri, setacei: fasciculorum paulo inæquales. *Spicæ* inæquales, 3–8 lin. longæ, basi  $1\frac{1}{2}$  lin. latæ, androgynæ, apice masculæ, et omnino fœmineæ: superiores singulæ, sessiles, evaginatæ: terminalis apice dimidiatim mas-

cula, ad ejus basin 1–4 breviores sitæ, apice parce masculæ, vel fœmineæ, e perigyniis (*stigmata gerentibus*) progredientes: reliquæ vel geminatæ vel inferiores singulæ interdum basi spiculâ brevi compositæ. In *fasciculis*, spica longior androgyna, apice mascula: altera brevior omnino fœminea. *Squamæ* masculæ ferrugineæ, demum pallidiores: fœmineæ apice ferrugineæ, basi vel omnino pallidæ, inferiores plerumque mucronatæ, sæpe emarginatæ. *Perigynium*  $1\frac{1}{2}$  lin. longum,  $\frac{6}{10}$  lin. latum, sub lente tenuissime granulatum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetrum, stipitatum, pallidum, basi styli sæpe obliqua apiculatum. *Racheola* filiformis, exserta, rarius adest, rudimentum axis, quæ, in spicas aliquas, perigynia et squamas gerit.

The racheola occasionally observable within the perigynium escaped the notice of M. Maubert, and is not represented in the figure. Its nature is explained by the axis of a spike issuing from a fertile perigynium at *y*. It is probable that more luxuriant specimens of this pretty species would exhibit a more compound inflorescence, and thus more closely associate it in habit with the fasciated group so abundantly found in Sikkim by Dr. Hooker.

19. *C. fragilis* (Boott); spicis 4–7 linearibus pedunculatis ferrugineis androgynis apice masculis basi laxè alternatim (vel quibusdam omnino) fœmineis longissime exserte pedunculatis nutantibus remotis singulis vel *mediis* geminatis, bracteis spicas suas subæquantibus; stigmatibus 3; perigyniis (*floriferis*) lanceolatis rostratis bifidis excurvis viridibus, rostro castaneo, parce pubescentibus, squama lanceolata obtusa castanea medio pallida margine albo-hyalina aristata (arista sæpe infra apicem egrediente) longioribus. (TAB. XXI.)

HAB. In Himalaya orientali temperata ad Sikkim, alt. 10–11,000 ped., *J. D. Hooker*.

*Culmus* debilis, nutans, lævis, basi foliatus; pars spicas gerens sesquipedalis. *Folia* 1– $1\frac{1}{2}$  lin. lata, mollia, plana. *Bracteæ* foliaceæ, longe vaginatæ, superiores setaceæ. *Vaginæ* inferiores  $1\frac{1}{2}$ –3 poll. longæ. *Pedunculi* 2–7 pollices longi, setacei, superne scabri. *Spicæ* vel singulæ vel *mediæ* geminatæ, 5–14 lin. longæ,  $\frac{1}{2}$ –1 lin. latæ, inæquales: terminales fere omnino masculæ, et in fasciculis longior sæpe plus quam dimidiatim mascula: altera brevior omnino fœminea. *Flores* fœminei 3–7 alterni: masculi primum laxi, demum imbricati. *Squamæ* conformes. *Perigynium* rostratum, ore subobliquo bifido, pubescens.

The terminal spikes in the central figure are represented as male, but they have two or three female florets at base. The specimens are too young to afford a satisfactory idea of the form of the perigynium. The general habit is that of *C. munda*, but the scabrous, bifid perigynia, long-peduncled spikes, etc., distinguish it from that species.

20. *C. macrogyna* (Turcz.); spicis 3–4 rarius 5–6 rubro-purpureis erectis ellipticis vel cylindræis, summis arcte congestis sessilibus, terminalibus (1 rarius 2) masculis vel basi fœmineis, reliquis fœmineis vel superioribus (rarius omnibus) apice extremo masculis, inferioribus subremotis exserte vel inserte pedunculatis basi attenuatis, infima brevi foliaceo-bracteata rarius radicali longe pedunculata; stigmatibus 3 longis; perigyniis ellipticis erostratis vel rostellatis, ore hyalino truncato oblique fisso, plano-subtriquetris, superne scabris marginibusque serratis, purpureis basi pallidis antice nervatis nervis lateralibus magis prominentibus, squama rotundata vel oblonga rubro-purpurea margine late albo-hyalina nervo pallido rarius extra apicem producto obtusissima angus-

tioribus longioribusque.—*C. macrogyna*, *Turczaninoff* (*Herb. Hooker! et Boott*). (TAB. XXII.)

HAB. In Tibetia occidentali alpina ad Nubra, alt. 15–17,000 ped., *Dr. Thomson*. “Ad Torrhentem Tessa,” *Turcz.*, *Herb. Hooker!* “In alpe ad torr. Dschylgyn, 1836,” *Turcz.*, *Herb. Boott!*

Dense cæspitosa. *Radix* e fibris lignosis validis nigris composita. *Culmus* 12–16-poll., validus, rigidus, obtusangulus, lævissimus, nudus, basi foliosus vaginisque marcidis reliquiisque foliorum tectus; pars spicas gerens  $1\frac{1}{2}$ –3 poll. longa. *Folia*  $\frac{1}{2}$ –2 lin. lata, culmo subduplo breviora, rigida, carinata, apice longe attenuata, curvata, pallide viridia, demum flavida. *Bractea* 2, vaginata, culmo *semper*, spicis suis *sæpe*, breviores: infima sæpius solum subfoliacea: summæ squamæformes. *Vagina* 3–8 lin. longæ. *Pedunculi* 3–15 lin. longi, glabri. *Spica* terminalis 6–11 lin. longa,  $1\frac{1}{4}$ –2 lin. lata, sessilis vel pedunculata: reliquæ 2–3, rarius 1–5 fœmineæ: superiores sæpe abbreviatæ, sessiles, spica terminali arcte contiguæ: inferiores 6–13 lin. longæ, 2–2 $\frac{1}{2}$  lin. latæ: infima 1–1 $\frac{1}{2}$  poll. remota, rarius radicalis. *Squamæ* conformes, obtusissimæ. *Perigynium*  $2\frac{5}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ –1 lin. latum, oblongo-ellipticum, sæpe in rostellum desinens, ore truncato albo-hyalino obliquo demum fisso, superne scabrum, marginibusque serratum basi glabrum, antice læviter nervatum; nervis 2 lateralibus magis prominentibus. *Achenium* (cum stipite  $\frac{4}{10}$  lin. longo)  $1\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongo-triquetrum, angulis inæqualibus, basi styli persistente apiculatum, pallidum.

Affinis *C. sempervirenti*, Vill., quæ differt spicis minoribus remotis, terminali semper mascula; squamis acutis; perigyniis longius rostratis; culmo gracili, superne scabro, inferne foliato; foliis planis gramineis, *sterilibus* longissimis.

A *C. hirtella*, Drejer, spica terminali sæpe basi fœminea, fœmineis 2–3 longioribus; squamis obtusis; vagina glabra; perigyniis brevioribus, rostellatis, ore truncato minus alte fisso; culmo rigido, crassiori, lævissimo; foliis rigidis, latioribus, differt.

In a large suite of specimens in Dr. Thomson's collection I found—

|              |                                        |
|--------------|----------------------------------------|
| 48 spicis 3. | 31 spica terminali mascula.            |
| 36 spicis 4. | 42 spica terminali basi fœminea.       |
| 5 spicis 5.  | 8 spicis terminalibus 2 masculis.      |
| 1 spicis 6.  | 9 spicis terminalibus 2 basi fœmineis. |

But it was difficult in some cases to determine whether the terminal spike was really *basi fœminea*, or whether the perigynia at its base did not properly belong to an abbreviated, very approximate, female spike. The perigynium figured is smaller and narrower than usual, and does not exhibit the rostellum or membranous orifice;—see that figured at Tab. XXXI. under the name of *C. obtusa*, as more correct. The bract at *i* is that of one of the upper spikes.

This species, with *C. hirtella*, Drejer, *C. tristis*, Bieb., *C. hamatostoma*, and *C. psychrophila*, Nees, etc., belong to the group *Ferrugineæ* of Tuckerman, and represent on the mountains of Northern India those analogous species found on the Alps of Europe. None have been brought from the Nilghiries.

In Arctic America we have *C. Franklinii*, Boott, *C. petricosa*, Dewey (of which we have no mature specimens), and *C. fuliginosa*, St. and Hop. In the United States the group has no representative, except the imperfectly known *C. juncea*, Willd., found on the mountains of Carolina. I am not aware of any published description of *C. macrogyna*. I have copied the tickets affixed to authentic specimens in Herb. Hooker. My own specimen I received from M. Fischer, of Moscow.

21. *C. uncinoides* (Boott); spica oblonga castanea, e spiculis 6–8 androgynis apice parce masculis ellipticis contiguis composita, superioribus sessilibus, inferioribus basi attenuatis laxifloris remotiusculis, infima breve vel

(subradicali) longe pedunculata bracteata rarius basi composita; stigmatibus 3; perigyniis lanceolatis plano-triquetris, ore emarginato antice altius secto, superne scabriusculis, marginibus serratis, crebre leviter nervosis (racheola exserta) pallidis demum ferrugineis, squama lanceolata obtusa vel subacuta cuspidata amplectente castanea nervo pallide viridi angustioribus subæquantibus vel longioribus. (TAB. XXIII.)

HAB. In Himalaya orientali temperata, ad Sikkim, alt. 10–15,000 ped., *J. D. Hooker*.

*Culmus* 10–18-poll., validus, obtusangulus, lævissimus, striatus, basi foliatus. *Folia* 1–2 lin. lata, culmo multum breviora, marginibus scabriusculis. *Bractea* basi squamæformes, filiformes, spiculis suis breviores: infima amplectens vel (subradicalis) vaginata, breve foliacea. *Pedunculus* infimus 3–4 lin. vel rarius 4 poll. longus. *Spica*  $1\frac{1}{2}$ – $3\frac{1}{2}$  poll. longa, 4–5 lin. lata. *Spicula* 6–10 lin. longæ, 2–3 lin. latæ, apice parce masculæ, omnes contiguæ: inferiores remotiusculæ, vel infima interdum subradicalis: in uno specimine basi spiculis 3 parvis compositæ. *Squamæ* conformes, castaneæ vel ferrugineæ: masculæ angustiores, sæpe ineonspicuæ. *Perigynium*  $3\frac{1}{2}$ –4 lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum. *Achenium* 2–2 $\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetrum, antice sulcatum, basi styli incrassata apiculatum. *Racheola*  $3\frac{1}{2}$ –5 lin. longa, ligulata, serrata, pallida, apice appendice ferruginea, demum extra os perigynii exserta.

It is probable that the inflorescence of this remarkable species may hereafter be found to be more compound than in the specimens discovered by Dr. Hooker, judging from the occasional existence of the lower spicula with lateral branches, and from its subradical position. The existence of a racheola in it and in *C. curvata* is an exception among the androgynous group of the genus, and from its constancy in *C. uncinoides*, if it be the rudiment of an axis, may be found hereafter to be developed into one, though such development has not been observed in the species furnished with a similar organ, with which we have long been familiar, *C. microglochis*, Wahl.

22. *C. notha* (Kunth); spicis 4–8 atro-demum flavido-purpureis subcontiguis clavatis cylindricisque, terminali mascula vel rarius basi mascula, reliquis fœmineis, superioribus subsessilibus, inferioribus pedunculatis bracteatibus evaginatis erectis vel nutantibus basi attenuato-laxifloris; stigmatibus 2; perigyniis ovatis vel ellipticis basi productis rostratis, ore bidentato demum integro obliquo, plano-convexusculis flavidis lineolis lucidis resinosis ferrugineis maculatis, antice 5- postice 2–3-nerviis, squama oblonga obtusa sæpe submarginata vel acuta mutica vel mucronulata purpurea nervo pallido latioribus longioribusque.—*C. notha*, *Kunth*, *Cyp.* 421. *C. punctata*, *Nees!* *apud Wight*, *Contr.* 127 (*non Gaudin*). *C. victorialis*, *Nees!*, *l. c.* 126; *Kunth*, 516. *C. Benthamiana*, *Boott*, *Royle*, *Illustr.* (*preface*). *C. rostellata*, *Gay*, *MSS.* in *Herb. Jacquemont!* (TAB. XXIV.)

HAB. In Himalaya temperata: Kumaon, *Thomson*; Simla, *Edgeworth*; Sikkim, alt. 12,000 ped., *J. D. Hooker*. Urukta, *Royle*, *n.* 110. Rogec, in Kunawur, *Royle*, *n.* 125. Mauma, *Royle*, *n.* 145, (*C. victorialis*, *Nees*.) Nohra, in Sirmoor, 9000 ped.; Karli, 5–8000 ped., *Edgeworth*. In ripas Pabur fluminis, apud Chergaon, 5000 ped., *Munro*, *n.* 2432. In herbosis humidis: Chini, Kunawur, *Jacquemont*, *n.* 1345 (*C. rostellata*, *Gay*). Kumaon et Surliwal, alt. 6–9000 ped., *Thomson*, *Herb. Hooker*.

*Culmus* 9-poll. ad 2-ped., triqueter, firmus, angulis superne

scabriusculis, basi foliatus; pars spicas gerens  $3\frac{1}{2}$ –5 poll. longa. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, culmo longiora, plana. *Bractea* infima foliacea, lin. lata, culmum subæquans vel eo longior vel angusta spica sua brevior, reliquæ sursum breviores: summæ squamæformes: omnes evaginatae, vel infima rarius breve vaginans. *Pedunculus* infimus  $1$ – $1\frac{1}{2}$ -pollicaris. *Spica* primo atro-purpureæ, demum flavido-tinctæ, omnes sæpe clavatae, vel cylindricæ, terminalis et inferiores fœminearum solum basi attenuatae. *Spica* terminalis mascula, rarius basi mascula, 17 lin. ad  $2\frac{1}{2}$  poll. longa, apice 2 lin. lata, breve pedunculata. *Spica* fœmineæ 1–3 poll. longæ, apice 2 lin. latæ, a se 2–6 lin., vel inferiores interdum 10 lin. ad  $1\frac{1}{2}$  poll. remotæ. *Squamæ* conformes, masculæ, inferiores nervo pallido infra, vel in omnibus extra apicem breve producto; fœmineæ rarius muticæ. *Perigynium*  $1\frac{6}{10}$ – $1\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, flavidum, lineolis ferrugineis crebre obsitum, ore sæpe purpureo bidentato demum integro subobliquo leviter nervatum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale vel obovatum, lenticulare, lucidum, fuscum, basi styli decidua. In uno perigynio e specimine *Roylei*, n. 110, duo achenia normalia, stylo et stigmatibus 2 prædita, inveni.

The specimens of Dr. Hooker alone have occasionally the terminal spike *basi mascula*, the orifice of the perigynium more entire, and the bracts longer than in the specimens of other collections. They are not fully mature, and the scales, often *muticæ*, are of a very dark purple. I observe also, at the apex of some of the upper female spikes, either sterile or male florets.

The specimens of *Royle*, n. 145, on which Nees founded his *C. victorialis*, were all too young for any satisfactory character. He admits that the one he had "*floribus gaudet sine fructu*." I have examined several specimens of them in my own and in the Herbarium of the Linnean Society, and in all I find 2 stigmata, and the characters of *C. notha*, as far as they can be ascertained from such imperfect data.

Nees thought that his *C. punctata* might prove to be a variety of *C. lenticularis*, Don (*C. phacota*, Spr.), and Drejer quotes it as a synonym under that species in his '*Symbolæ*;' though, in referring to it in his subsequent observations, he had doubts on the subject, from the difference he observed in the form of the perigynium. He had no means of forming a satisfactory opinion. Both he and Nees omit to notice the mucro on the scales. There can be no question of the evident and wide difference between the two species, apparent to any one by comparing t. 24 with Drejer's figure of *C. phacota*, and t. 168. They do not belong to the same group, for while *C. phacota* is placed by Drejer in his *Ærostachya*, *C. notha* belongs to his *Microrhyncha*.

23. *C. Jackiana* (Boott); spicis 4–7 oblongis erectis pallide lutescentibus concoloribus, terminali mascula sessili, reliquis fœmineis, superioribus masculæ contiguis sessilibus, omnibus simplicibus, vel inferioribus remotis longe exserte pedunculatis compositis, infima longiori basi attenuato-laxiflora longe lateque bracteata; stigmatibus 3; perigyniis oblongo-ellipticis triquetris sensim acuminato-rostratis, ore membranaceo integro vel emarginato oblique secto demum bifido, glabris leviter æqualiterque crebre nervosis olivaceis superne vacuis, squama lanceolata acuta cuspidata æquilata pallida brevioribus longioribusque.—*C. Jackiana*, *Boott*, *Lin. Trans.* xx. 132. (TAB. XXV.)

HAB. In Java, *Horsfield*, et in regionibus temperatis mont. Khasiæ, alt. 6000 ped., *Hooker et Thomson*.

*Culmus*  $1\frac{1}{2}$ –2-ped., acutangulus, lævis, debilis, basi foliatus; pars spicas gerens 3–7 etiam 14 poll. longa. *Folia* 2–4 lin. lata, culmo breviora, plana, mollia. *Bracteæ* inferiores 3–4 lin. latæ, vaginatae, elongatae: superiores evaginatae, culmo longiores. *Pedunculus* infimus 2–7 poll. longus, lævis, vagina

infima 1–2 poll. longa. *Spica* mascula 7–12 lin. longa, 1 lin. lata. *Spica* fœmineæ superiores 6–11 lin. longæ, 2–3 lin. latæ, infima interdum 2 poll. longa, 4–14 poll. remota, laxiflora: omnes simplices, vel binæ inferiores vel infima solum basi spiculis 1–2 paucifloris appressis sessilibus vel pedicellatis sæpe subremotis composita. *Squamæ* omnes conformes, pallidæ: fœmineæ inferiores perigynio longiores. *Perigynium* 3– $3\frac{1}{2}$  lin. longum,  $\frac{9}{10}$  lin. latum. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, triquetro-obcordatum, abrupte basi styli æquali apiculatum, partem inferiorem perigynii implens.

In habit and appearance this species is like *C. pubescens*, Muhl. I see no difference between the specimens from Java and those from Khasia. The orifice of the perigynium is, I think, normally entire, obliquely cut, but from its membranous texture it is easily ruptured on the protrusion of the stigmata, and then appears more or less bifid.

24. *C. maculata* (Boott); spicis 4–5 cylindricis densifloris, terminali mascula ferruginea sessili sæpe abbreviata clavata obliqua, reliquis fœmineis interdum apice masculis vel sterilibus atro-purpureis stricte erectis, superioribus masculæ arcte contiguis subsessilibus, inferioribus remotis exserte pedunculatis longissime bracteatis; stigmatibus 3; perigyniis ovalibus vel ellipticis sensim vel abrupte rostellatis rectis, ore emarginato, nervatis compresso-triuetris granulato-asperulis atro-purpureis scxfariis, squama ovata acuta vel mucronulata ferruginea medio viridi trinervi latioribus longioribusque.—*C. maculata*, *Boott*, *Lin. Trans.* xx. 128. (TAB. XXVI.)

HAB. In montibus subtropicis peninsulæ Indiæ orientalis: Nilghiri, *Wight*, et Ceyloniæ, *Walker, Gardner*, n. 944.

*Culmus*  $1$ – $1\frac{1}{2}$ -ped., gracilis, rigidus, lævis, triquetus, sæpe (ut folia vaginæque præcipue) punctis ferrugineis (sub lente) maculatus; pars spicas gerens 3–5 poll. longa. *Folia* 1–4 lin. lata, culmo longiora, glauca, plana vel marginibus revolutis, rigida, granulata. *Bracteæ* inferiores vaginatae, culmum longe superantes: suprema sæpe spica sua brevior. *Vagina* 1–14 lin. longæ, intus membranaceæ, ferrugineæ. *Pedunculus* infimus 10 lin. ad 2 poll. longus, granulato-asperulus. *Spica* mascula 4–14 lin. longa, 1 lin. lata, cylindrica vel clavata, sessilis, sæpe obliqua, spicæ fœmineæ supremæ brevior. *Spica* fœmineæ 6–22 lin. longæ, 1–2 lin. latæ, rarius alternæ, sæpius superiores 2 vel 3 masculæ arcte contiguæ, sessiles vel breve inserte pedunculatae; infima vel binæ inferiores  $1\frac{1}{2}$ –3 poll. remotæ, longe exserte pedunculatae. *Squamæ* conformes, ferrugineæ, medio viridi trinervi: fœmineæ acutæ vel mucronulatae. *Perigynium*  $1\frac{2}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, nervis concoloribus vel pallidis, achenio latius, hinc marginibus compressis. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovali-triuetrum, pallidum, basi styli æquali.

Habitus *C. granularis*, Muhl. Differt forma perigynii, spicis atro-purpureis, etc.

Since the publication of the paper in the Linnean Transactions, I have received specimens of this species from Dr. Wight, gathered on the Nilghiries. Whether it has occasionally only two stigmas I am doubtful. I find the achenium is always triquetrous.

25. *C. Moorcroftii* (Falconer); spicis 3–5 ovalibus oblongisve densifloris flavide purpureis demum plus minus decoloribus, terminali mascula sessili, reliquis fœmineis vel apice masculis, omnibus vel superioribus masculæ arcte contiguis sessilibus ebracteatis, infima nunc subremota pedicellata breve bracteata, vel rarius subradicali longe pedunculata composita; stigmatibus 3; perigyniis

ovalibus vel subglobosis ventricosis rostratis bifidis nervosis vel obscure nervatis membranaceis glabris superne granulatis rarius ad margines hispidulis flavidis purpureo-tinctis stipitatis, squama ovata vel lanceolata acuta mutica vel cuspidata fusco-purpurea nervo pallido apice marginibusque albo-hyalina brevioribus vel eam subæquantibus.—*C. Moorcroftii*, *Falconer, MSS.*; *Boott, Lin. Trans.* xx. 140. (TAB. XXVII.)

HAB. In Tibetia alpina tota, alt. 14–17,000 ped., a Balti, *Falconer, etc.*, ad Sikkim, *J. D. Hooker.*

Dense cæspitosa. *Rhizoma* prælongum, repens. *Culmus* 9 poll. ad 2 ped. altus, gracilis, apice scabriusculus, basi foliosus, vaginisque rubro-purpureis demum marcidis tectus; pars spicas gerens 15 lin. ad  $2\frac{1}{2}$  poll. longa, vel rarius 10 poll. *Folia*  $1\frac{1}{2}$ –2 lin. lata, culmo breviora vel subæquantia, rigida, carinata, stricta, apice attenuata, glauca, demum flava, glaberrima vel apice scabra. *Bractea* rarius spica sua longior, subulata. *Spica* mascula 6–10 lin. longa, 2 lin. lata, sessilis. *Spica* fœmineæ 6–12 lin. longæ,  $2\frac{1}{2}$ –4 lin. latæ, omnes congestæ, sessiles, vel infima brevi-pedunculata, 7–13 lin. remota; rarius subradicalis, 15 lin. longa, basi ramulis subrotundis sessilibus 2 vel 3 composita, pedunculo 5 poll. longo instructa. *Squamæ* conformes, ovatæ vel lanceolatæ, fusco-purpureæ, demum apice marginibusque late albo-hyalinæ, vel omnino decolors: muticæ, nervo infra apicem evanescente, vel extra producto. *Perigynium* plus minus stipitatum,  $1\frac{3}{10}$ – $2\frac{4}{10}$  lin. longum,  $\frac{3}{10}$ –1 lin. latum. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovato-triquetrum, olivaceum, basi styli æquali apiculatum.

Affinis *C. vernæ*, Schk., *C. conglobata*, Kit. Differt spicis congestis, sæpe apice masculis, bractea abbreviata, perigyniis bifidis, foliis glaucis.—An *C. sabulosa*, Turcz.?, *Kunth Cyp.* 432.

Falconer, in his letter to Professor Royle, says this *Carex* is the "Tibet grass" of Moorcroft, called by the natives of Tibet "Long-ma," or as Lieut. Cunningham spells it "Loong-mur." Moorcroft in his Travels (vol. i. 293) says of it: "A very valuable herbage occurs in the Long-ma, or Sand-grass of Ladak, which, growing on loose sandy soil and forming an intricate network both on the surface and beneath it, protects the slender covering of the primitive substratum from being blown away by the strong winds that sweep the valleys, and the whole country from being converted into a succession of bare rocks and mounds of sand. The Long-ma rarely reaches more than a height of ten or twelve inches, and frequently not more than five or six, a considerable portion of the blade being always buried in the sand. The length of the root is much more considerable, and strikes so deep that it cannot be extracted entire. At a depth of five feet it was found little diminished in circumference, throwing off numerous lateral fibres through its whole course. The grass on the surface does not extend uniformly, but affects the form of patches, by which it more effectively arrests the driving sand. Cattle will not eat it whilst it is green, or while other pasturage is procurable, but it is sufficiently hardy to outlive other herbage, and in November, when there is nothing else on the ground, it is eaten by horses and yaks. It is then of a yellow tint, but when the leaves and crown are eaten off, the brown stems are left almost level with the ground, their interstices filled with sand, and the appearance of each patch resembling that of an oakum door-mat. The plant emits a pleasant smell, and has a sweet and agreeable taste, but the leaf is stiff and harsh with sharp edges. Although cattle do not fatten on it, it is said to be very invigorating, and perhaps the extremely rich quality of the milk of the yak in winter may be due to this grass. The stories related by the carriers, of its effect in restoring vigour to overworked horses, border on the marvellous. It furnishes almost the whole of the winter food of the unstabled brood mares and colts of the Raja of Ladak, of the kiang or wild horse, of the yak, and of all cattle which are left unhoused at that season."

Very fine specimens of this species were brought by Dr. Thom-

son, one of the largest of which, with a compound radical spike, is figured in Tab. XXVII. The nerves on the perigynium are represented too strongly. The orifice varies, being occasionally shortly bifurcate with an obtuse sinus and sharp laciniæ, and the scales are sometimes sharply cuspidate.

26. *C. leucantha* (Arnott); spica elongata demum pallide straminea, e spiculis 6–7 androgynis apice masculis ovatis densifloris subdecomposita, spiculis superioribus simplicibus contiguis sessilibus, inferioribus distantibus compositis ad apicem pedunculorum insidentibus, pedunculis inserte vel exserte vaginatis longissime bracteatis; stigmatibus 3; perigyniis ellipticis triquetris basi acutis longiuscule rostratis, ore membranaceo bifido oblique secto, crebre leviter nervosis pubescentibus stramineis, squama ovato-lanceolata acuta hispido-cuspidata striato-nervosa scabra pallida concolori æquilata longioribus.—*C. leucantha*, *Arnott, MSS. in Herb.*; *Boott, Lin. Trans.* xx. 135. (TAB. XXVIII.)

HAB. In montibus peninsulæ Indiæ orientalis ad Courtallum, *Wight*, et Ceyloniæ, *Thwaites*. *Wallich* ex Herb. Heyne (sine loco natali).

*Radix* fibris lignosis validis, longis. *Culmus* 2–3-ped., gracilis, rigidus, triquetrus, scaber, basi foliatus, reliquiis foliorum fibratis tectus; pars spicas gerens 6–20 poll. longa. *Folia* 1–2 lin. lata, culmo breviora vel longiora, rigida, carinata, sæpe marginibus revolutis. *Bractea* inferiores foliaceæ, longissimæ, vaginatæ: infima sæpe culmo longior: supremæ setaceæ, spicis suis sæpe breviores, evaginatæ. *Vagina* infima 6–14 lin. longa. *Pedunculi* inferiores paulo exserti, scabri. *Spicula* 3–8 lin. longæ,  $1\frac{1}{2}$ –3 lin. latæ: superiores simplices, sessiles: reliquæ compositæ, plerumque 2 ad apicem pedunculi, altera subremota, omnes sessiles. Interdum spiculæ omnes simplices: vel media solum composita: infima simplex, basi attenuata. *Squamæ* conformes, fœmineæ longius cuspidatæ. *Perigynium*  $2\frac{3}{10}$ –3 lin. longum,  $\frac{3}{10}$ –1 lin. latum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, ellipticum, triquetrum, fuscum, punctulatum, apiculatum, basi styli incrassata decidua.

27. *C. spicigera* (Nees); spica oblonga, e spicis partialibus 10–12 pluribusve decomposita, superioribus subrotundis sessilibus contiguis, inferioribus oblongis subremotis exserte pedunculatis magis compositis basi ramosis, spiculis androgynis apice parce masculis parvis subrotundis coarctatis bracteolatis, bracteis foliaceis culmo multum longioribus; stigmatibus 3; perigyniis ovalibus triquetris erostratis emarginatis scabris nervosis ciliatis pallidis demum ferrugineis, squama ovata obtusa vel acuta hispido-aristata ferruginea duplo longioribus.—*C. spicigera*, *Nees apud Wight, Contr.*! 121; *Kunth, Cyp.* 512. (TAB. XXIX.)

HAB. In Zeylania, *Walker, Macrae! Wight, n.* 1299! Var. minor, *Gardner, n.* 949! *Herb. Hooker.*

*Culmus* 1– $1\frac{1}{2}$ -ped., rigidus, gracilis, glaber, basi vaginis foliorum ferrugineis tectus, sursum foliis vaginantibus vestitus; pars spicas gerens 4–5 pollices longa. *Folia* 1–2 lin. lata, culmo multum longiora, rigida, carinata, marginibus revolutis, vaginis longis ferrugineis. *Bractea* foliaceæ, culmo multum longiores: inferiores  $1\frac{1}{2}$  lin. latæ, vaginatæ. *Vagina* infima 8–12 lin. longa. *Pedunculi* 1– $1\frac{1}{2}$  poll. longi: infimus exsertus, scabriusculus. *Spica* 5 poll. longa, 9 lin. lata. *Spica* partiales inferiores 7–10 lin. longæ,  $2\frac{1}{2}$  lin. latæ, basi ramulo brevi instructæ: infima exserte pedunculata. *Spicula* 2–3 lin. longæ,  $1\frac{1}{2}$ –2 lin. latæ, apice flosculis masculis 2–3 vix discernendis:

ad apicem culmi pedunculorumque arcte congestis, bracteolatis. *Squamæ* conformes. *Stigmata* brevia. *Perigynium*  $1\frac{2}{10}$ – $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, pallide flavidum, demum fusco-ferrugineum. *Achenium* breve stipitatum,  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, acute triquetrum, basi styli apiculatum, castaneum vel fuscum, angulis pallidioribus.

Var. *minor*; spica lineari, simpliciori; spicis partialibus minoribus, inferioribus spiculis 3–5 singulis paucifloris alternis, infima radicali, longe exserte pedunculata; perigyniis  $1\frac{1}{2}$  lin. longis, utrinque acutis; achenio lineam longo, elliptico; antheris 2 flavis, apice purpureis; culmo pedunculisque setaceis.

28. *C. Wightiana* (Nees); spica elongata decomposita, e spicis partialibus 4–5 pallidis ambitu ovato vel oblongo pinnatim vel basi subduplicato pinnatim compositis, superioribus sessilibus contiguis, inferioribus longe exserte pedunculatis remotis longe bracteatis; spiculis oblongis erectis androgynis, apice sæpe subdimidiatim masculis, basi flosculis fœmineis 4–10 imbricatis quorum infimis sæpe sterilibus; stigmatibus 3; perigyniis ellipticis triquetris rostratis, ore membranaceo bifido oblique secto, superne inter nervos rostroque scabris marginibus ciliatis rectis striato-nervosis imbricatis congestis pallide viridibus demum ferrugineo-flavidis, squama ovata acuta mucronata striato-nervosa pallida margine albida carina viridi scabra latioribus longioribusque.—*C. Wightiana*, *Nees, apud Wight, Contr.* 122; *Kunth, Cyp.* 512. (TAB. XXX.)

Var. spicis partialibus 8–9, inferioribus elongatis infima subradicali longe exserte pedunculatis longissime bracteatis, spiculis pluribus.

HAB. In peninsula Indiæ orientalis, mont. Nilghiri, *Wight, n.* 1910, 1914, 1915, 1292, *Wallich, Cat. n.* 3400 c. Khasia, alt. 4000 ped., *Hooker et Thomson*, et in Himalaya orientali tropica ad Sikkim et Nipal, alt. 3–5000 ped., *J. D. Hooker*.

*Culmus* sub-2-ped., gracilis, rigidus, lævis, basi foliosus; pars spicas gerens pedalis. *Folia* 3–5 lin. lata, culmo longiora, plana, glaucescentia, scaberrima. *Bracteæ* inferiores vaginatae, omnes nisi summa culmo longiores. *Spicæ* partiales superiores ovatae (1 poll. longæ), sessiles, contiguæ, pinnatae: inferiores ( $2\frac{1}{2}$  poll. longæ) oblongæ, exserte pedunculatae, remotæ, basi subduplicato-pinnatae. *Spiculæ* 4–9 lin. longæ, 2 lin. latae, basi, e squamis vacuis appressis, quasi pedicellatae, erectae. *Rachis* glabra. *Squamæ* masculæ obtusæ vel subaeutæ, mucronulatae. *Perigynium*  $1\frac{2}{10}$ –2 lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium* lineam longum, fere  $\frac{6}{10}$  lin. latum, ellipticum, triquetrum, punctulatum, basi styli inerassata.

A *C. leucantha* differt inflorescentia magis composita; foliis latis, planis, glaucis; squamis fœmineis ovatis, minus mucronatis; perigyniis brevioribus, glabrioribus.

The specimens n. 1296, Wight, both in my own Herbarium and in Herb. Arnott, are too young for a positive decision about them. From the greater number and length of the partial spikes upon them (the lower ones  $3\frac{1}{2}$ –4 inches long), their insertion from the base of the culm upwards, the rather longer spiculæ, with more numerous male flowers, and the longer mucro to the lanceolate female scales, I have regarded it as a variety, though it may prove merely a more luxuriant state of the species. In Herb. Arnott it is named "*C. Indica, var.*, Nees." Nees quotes only "n. 1910, Wight," for his *C. Wightiana*; but I find in Herb. Arnott, and I have received also from Dr. Wight, specimens numbered 1914 and 1292, and from Dr. Wallich one (3400 c. *Herb. Wight*). Of these in Herb. Arnott, 1914 and 1292 are named "*C.*

*Indica, Nees*," and a specimen, n. 1915, in my own Herbarium (from Herb. Ward), and in Herb. Bentham, both equally from Dr. Wight, are named "*C. meiogyna, Nees*." I have no hesitation in referring all to *C. Wightiana*.

29. *C. hirtella* (Drejer); spicis 5 oblongis vel cylindraceis erectis, masculis 3 contiguis sessilibus pallidis, fœmineis 2 purpureis, suprema sessili, infima subremota exserte pedunculata basi attenuata laxiflora, bracteis culmo brevioribus; stigmatibus 3; perigyniis lanceolatis longe rostratis, ore hyalino obliquo acute bifido, plano-subtriquetris scabris marginibus e basi ciliato-serratis nervatis purpureis basi pallidis glabris, squama lanceolata acuta purpurea margine albo-hyalina longioribus.—*C. hirtella*, *Drejer, Symb.* 21. *C. tenuis, Nees! Wight, Contr.* 128. (TAB. XXXI.)

HAB. In Himalaya et Tibetia occidentali alpina, alt. 12–16,000 ped.: Kunawur, *Royle, n.* 120, 122! (*ex parte*), *Jacquemont, n.* 482! Kishtwar, Zanskar, Ladak, *Thomson!*

Cæspitosa. *Culmus* sesquipedalis, gracilis, obtusangulus, lævis, inter spicas seaber, nudus, basi foliosus vaginisque pallidis fibrillosis tectus; pars spicas gerens  $4\frac{1}{2}$  poll. longa. *Folia*  $\frac{1}{2}$ –1 lin. lata, culmum subæquantia, graminea, plana, carinata. *Vaginæ* scabriusculæ. *Bracteæ* vaginatae: infima vix culmum æquans. *Vaginæ* 3–6 lin. longæ, scabriusculæ. *Pedunculus* infimus  $1\frac{1}{2}$  poll. longus, lævis. *Spicæ masculæ* 3: suprema 6–10 lin. longa, 1– $1\frac{1}{2}$  lin. lata: reliquæ arcte contiguæ, breviores. *Spicæ fœmineæ* 6–12 lin. longæ,  $1\frac{1}{2}$ –2 lin. latae, 2– $2\frac{1}{2}$  poll. remotæ: infima exserte pedunculata. *Squamæ* conformes, ovato-lanceolatae, acutæ, purpureæ, margine albo-hyalinae: masculæ demum pallidæ. *Perigynium*  $3\frac{2}{10}$  lin. longum, sublin. latum, antice nervis mediis magis prominentibus. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongo-ellipticum, stipitatum, apice piloso-scabridum, stylo basi dilatato piloso apiculatum.

Affinis *C. macrogyna*, Turcz. Differt spicis masculis 3; perigyniis majoribus, longe rostratis, ore acute bifido; achenio apice piloso; culmo gracili; foliis augustioribus; squamis lanceolatis, acutis.

Drejer having seen only the specimens sent to Nees from Royle's collection, which were young, judged erroneously of the affinity of his *C. hirtella*, associating it with *C. glauca*. It evidently belongs to the *Ferrugineæ*. The right-hand specimen figured is from Royle, the other from Dr. Thomson. A perigynium and achenium of *C. macrogyna*, Turcz. (which at the time of the printing of the Plate I had named *C. obtusa*), are figured to contrast with those of *C. hirtella*.

30. *C. Horsfieldii* (Boott); spica longissima pallida concolori supradecomposita, e spicis partialibus 6–8 (ambitu oblongo-ovato) solitariis, inferioribus triplicato-racemosis remotis longe exserte pedunculatis stricte erectis longissime bracteatis, rachi superne scaberrima; spiculis androgynis apice masculis basi flosculis fœmineis pluribus contiguis instructis squarrosis alternatim approximatis patentibus bracteolatis; stigmatibus 3; perigyniis ellipticis triquetris sensim rostratis, ore albo-membranaceo antice oblique secto integro vel emarginato demum bifido, glabris, rostro apice ad margines parce denticulato, arcuatim recurvis crebre nervatis pallidis, squama emarginata obtusa vel ovata acuta longe hispido-aristata albo-membranacea nervo viridi scabro longioribus.—*C. Horsfieldii*, *Boott, Lin. Trans.* xx. 131. (TAB. XXXII.)

HAB. In Java, *Horsfield*.

*Culmus* subbipedalis, validus, obtusangulus, lævis, basi fo-

liatus; pars spicas gerens 20 poll. longa. *Folia* 6-7 lin. lata, culmo florifero multum longiora, firma, glaucescentia. *Bractea* inferiores 4 lin. latae, culmo longiores. *Vaginae* inferiores 1-2 poll. longae. *Pedunculi* inferiores 3-6 poll. longi, firmi, superne scabri: bini inferiores, versus apicem, auriculis 2 ferrugineis obtusis e basi spicae pollicem remotis instructi. *Spicae* partiales inferiores 2-3 poll. longae, basi  $1\frac{1}{2}$  poll. latae, pallidae, concolores, ramis oblique adscendentibus. *Spiculae* 3-5 lin. longae, 2-3 lin. latae, apice flosculis masculis paucioribus instructae, bracteola setiformi basi dilatata suffultae. *Squamae* masculae lanceolatae, acuminatae, acutae vel mucronatae: foeminae inferiores emarginatae, obtusae, longius aristatae, superiores acutae: omnes albo-membranaceae. *Perigynium* (vix maturum) 2 lin. longum,  $\frac{6}{10}$  lin. latum, pallide viride, ore albo-membranaceo. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, oblongo-triquetrum, basi productum, basi styli incrassata decidua.

Ad *C. cruciatam*, Nees, accedens, differt spicis partialibus solitariis, magis compositis; squamis foemineis albidis, inferioribus emarginatis; perigyniis arcuatim recurvis; foliis rigidioribus, vaginis glabris; culmo pedunculisque validioribus.

I have not seen fully mature specimens of this species, in which probably there would be an elongation of the spiculae, and a consequent looser arrangement of the perigynia. The presence of the obtuse ferruginous auriculae at some distance from the base of the lower spikes would seem to indicate the possibility of branches issuing from them, giving a greater composition to the spikes.

31. *C. Rafflesiana* (Boott); spica longissima (*tripedali*) laete ferruginea concolori supradecomposita, e spicis partialibus 8 (ambitu lanceolato), inferioribus clongatis triplicato-racemosis geminatis laxis remotis exerte pedunculatis longissime lateque bracteis, inferne ramulis subclongatis alternatim subremotis pedicellatis erectis, superne pluribus brevibus ovatis alternis sessilibus compositis, spiculis numerosissimis parvis densifloris apice masculis; stigmatibus 3; perigyniis arcte congestis ovalibus triquetris rostratis, ore oblique secto demum bifido, superne scabriusculis vel glabris, rostro excurvo, ad margines ciliato-serratis ferrugineo-lineatis nervatis concoloribus, squama ovata acuta mucronata glabra lineolis ferrugineis notata longioribus. (TAB. XXXIII.)

Var.  $\beta$ ; spica fusco-ferruginea concolori, spicis partialibus inferne ramulis oblongis pedicellatis pluribus superne ovatis confluentibus, spiculis majoribus confertis, perigyniis ovali-lanceolatis longe rostratis rectis vel excurvis scabrioribus lineolis ferrugineis undique notatis, squamis foemineis dorso scabris, bracteis culmo brevioribus angustioribus.—*C. Rafflesiana*, Boott, *Lin. Trans.* xx. 132.

HAB. In Java, Horsfield.

*Culmus* validus, laevis, apice scabriusculus; pars spicas gerens tripedalis. *Folia* desunt. *Bractea* infima 6 lin. lata: superiores angustae, culmo longiores. *Spica* tripedalis, laete ferruginea, concolor. *Spicae partiales* inferiores geminatae, inaequales, 4-7 poll. longae, subpollicem latae; inferne ramulis  $1-1\frac{1}{2}$  poll. longis, erectis, alternis; superne pluribus, sursum brevioribus, sessilibus, instructae. *Spiculae* parvae, 2-3 lin. longae, sub-2 lin. latae: superiores solitariae, discretae, approximatae. *Pedunculi* graciles, scabri: inferiores 3-4 poll. longi, inaequales, exserti. *Vaginae* glabrae: infima  $2\frac{1}{2}$  poll. longa. *Rachis* scabra. *Squamae* ovatae, acutae, lineolis ferrugineis notatae: foeminae inferiores dorso scabriusculae, longius mucronatae: masculae angustiores. *Perigynium* (vix maturum)  $1\frac{3}{10}-\frac{5}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, rostro  $\frac{1}{2}$  lin. longo, mar-

ginibus ciliato-scaberrimis, glabrum vel superne scabriusculum. *Achenium*  $\frac{8}{10}$  lin. longum, plus  $\frac{2}{10}$  lin. latum, oblongo-ovale, triquetrum, pallidum, basi styli subclavata, decidua.

Var.  $\beta$ . *Spiculae* confluentes, flosculis masculis pluribus. *Squamae* longiores, dorso scabrae. *Perigynium*  $1\frac{8}{10}-2$  lin. longum,  $\frac{4}{10}$  lin. latum, rostro saepe lineam longo, scaberrimum. *Achenium* (maturum) fuscum,  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, basi styli obliqua.

The aspect of the var.  $\beta$ , from its dull ferruginous colour, the larger confluent spiculae, the more scabrous character of its scales and perigynium, with its long and often straight rostrum, and narrower bracts, contrasts with the form *a*. The elongated lanceolate outline of the partial spikes distinguishes this fine species from its allies on the continent of India.

32. *C. thrysiflora* (Boott); spica subelongata viridi ferruginea, e spicis partialibus 5-8 (ambitu ovato vel ovato-lanceolato) subduplicato-racemosis composita, superioribus agglomerato-ovatis confluentibus sessilibus, inferioribus saepe geminatis laxioribus remotis oblongis erectis longe exserte pedunculatis, bracteis culmum subaequantibus; spiculis apice parce masculis densifloris erectis squarrosis; stigmatibus 3; perigyniis turgide ovalibus triquetris longe rostratis alte bifidis divergentibus glabris, rostro margine serrato, nervatis viridibus, squama ovato-lanceolata acuta saepe subemarginata hispido-aristata dorso scabra nervata ferruginea latioribus longioribusque. (TAB. XXXIV.)

HAB. In peninsula Indiae orientalis, ad Nilghiri mont., Wight.

*Culmus* subbipedalis, rigidus, triquetrum, laevis, superne strigoso-scaber, basi foliatus, sursum foliis vaginantibus munitus; pars spicas gerens 6-8 poll. longa. *Folia* 1-3 lin. lata, firma, culmum aequantia, olivaceo-viridia. *Bractea* inferiores vaginatae, foliaceae: infima quandoque spica sua vix longior, vel clongata, culmum subaequans: supremae setaceae, breves. *Vagina* infima  $\frac{1}{2}-2$  poll. longa, apice scabra: superiores scaberrimae. *Pedunculi* scabri: infimus 1-7 poll. longus, glabrior. *Rachis* strigoso-scabra. *Spicae* partiales 1- $1\frac{1}{2}$  poll. longae, 6-8 latae: superiores agglomerato-congestae, sessiles: inferiores remotae, laxae. *Spiculae* 4-6 lin. longae, 2-3 lin. latae, densiflorae, apice flosculis masculis 4-6 basi foemineis pluribus undique imbricatis instructae: omnes congestae vel in spicis inferioribus discretae, alternae. *Squamae* ferrugineae, concolores: masculae lanceolatae, angustiores, acuminatae, mucronatae, glabrae: foeminae inferiores magis scabrae. *Perigynium* 2- $2\frac{1}{2}$  lin. longum,  $\frac{6}{10}$  lin. latum, divergens, viride, ferrugineo-tinctum. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo)  $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovali-triquetrum, basi productum, fuscum, punctulatum, basi styli clavata abrupte apiculatum.

Affinis *C. raphidocarpae*, Nees, quae tamen foliis pilosis, rostro longiori graciliori, spicis magis compositis apertis gaudet.

Forsan *C. Lindleyanae*, Nees, forma; tamen ab ea e specimenibus Wightianis! et Gardnerianis! differt spicis laxioribus, spiculis squarrosis, perigyniis divergentibus, flosculis masculis paucioribus, squamis minoribus foemineisque scaberrimis.

The species of the Indian paniculate group of *Carex* will never be well understood until they are carefully studied by some patient observer in their native habitats. They seem to me to present in the herbarium the same difficulties that I found many years ago in the Asters of North America. It will be necessary to trace the modifications resulting from the young seedling plant and from older rooted ones, and from the immature to the fully mature state. The aspect of the spikes and spiculae, the proportionate number of the male to the female florets, and the form and direction of the perigynium are materially affected by age, and by a more or less

luxuriant state of the plant. In the spiculæ, by the gradual elongation of the rachis in maturity, the female florets become more and more lax, and the size and substance of the perigynium are often materially modified by the deposition of spongy matter between the coats. Peculiar localities also will undoubtedly explain many of the characters observable in the specimens upon which some of the species have been founded.

33. *C. nivalis* (Boott); spicis 4 vel 3-5 oblongis vel cylindricis basi attenuatis atro-purpureis concoloribus interdum albido-variegatis, superioribus, rarius omnibus, basi masculis contiguis sessilibus erectis, inferioribus exserte pedunculatis nutantibus, infima subremota rarius basi composita breve bracteata; stigmatibus 3; perigyniis ellipticis erostratis vel plus minus in rostellum abrupte desinentibus, ore subintegro vel emarginato demum albo-hyalino oblique fisso, atro-purpureis basi vel medio et basi albidis enerviis tenuissimis superne granulatis marginibusque plus minus serrato-dentatis, squama lanceolata acuta vel mucronata purpurea concolori vel nervo pallido longioribus latioribusque.—*C. nivalis*, *Boott, Lin. Trans.* xx. 136. (TAB. XXXV.)

Var. *cinnamomea*; spicis cinnamomeis concoloribus, *Royle, Herb.* "C. cinnamomea," *Boott, l. c.* 136.

HAB. In Himalaya occidentali et Tibetia alpina, alt. 14-18,000 ped.: Kunawur, *Jacquemont*; Ladak et Nubra, *Thomson*; Gugi, *Strachey et Winterbottom*. "Supra Dhunrao, versus fauces montium Mana dictas, alt. 16,000 ped.," *Edgeworth*.

Stolonifera. *Culmus* 1-2-ped., acute triqueter, granulatus, erectus, sæpe apice nutans, inferne foliatus; pars spicas gerens 2-10 poll. longa. *Folia* 2-4 lin. lata, culmo breviora, plana, apice attenuata, margine scabra, granulata. *Bractea* inferiores subfoliaceæ, spiculis suis breviores, vaginatae; superiores purpureæ, squamæformis. *Pedunculus* infimus 1-5-poll., granulatus. *Vagina* infima  $\frac{1}{2}$ -1 $\frac{1}{2}$  poll. longa. *Spica* sæpius 4, rarius 3-5, purpureæ vel albido-variegatæ, 7 lin. ad 1 $\frac{1}{2}$  poll. longæ, 3-3 $\frac{1}{2}$  lin. latæ: superiores sæpius 3 (rarius 2-4 vel omnes) basi masculæ: inferiores basi attenuato-laxifloræ, nutantes. *Perigynium*  $2\frac{2}{10}$ - $6\frac{6}{10}$  lin. longum,  $\frac{1}{10}$ - $1\frac{2}{10}$  lin. latum. *Achenium* (cum stipite  $\frac{4}{10}$  lin. longo)  $1\frac{3}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, inæqualiter trigonum, pallidum.

I described this species in 1846, in the twentieth volume of the Linnean Transactions, from a solitary specimen given to me by Mr. Edgeworth. I have since had the opportunity of examining those brought from India by the distinguished botanists quoted above. Its affinity is with *C. ustulata*, *C. coriophora*, *C. cinnamomea*, etc., from the last of which it is scarcely distinguishable except by its dark purple colour and larger perigynia. In the group to which they belong we have a similar contrast in colour in other species very closely allied, as in *C. ovata*, *Rudge*, compared with *C. atrata*, *L.*, and in *C. coriophora*, *Fischer*, as compared with *C. ustulata*, *Wahl.*; and probably future observers, in seeing a larger suite of specimens from different localities, may combine these species now considered distinct. The contrast between the original specimens of *C. cinnamomea* and *C. nivalis* left no doubt on my mind, at the time, of their specific difference; but though I do not quote the one as a synonym of the other, I doubt much now.

The figure of the perigynium at *a* represents it as trigonous, which is not correct. Its texture is membranous, and in the dried state the form is compressed, taking in the middle anteriorly the impress of the small triquetrous achenium. The only nerves are the two marginal ones, which, in the compressed state, appear at some distance from the apparent margin, and the style is visible through the transparent texture. The fig. *c* is more correct.

In Dr. Thomson's specimens the spikes have a remarkably va-

riegated white and purple colour, from the blanched spots at the upper sides of the perigynium, and the rostrum is generally more decided in form than is represented in the figure. Some of the leaves are faded and torn into blanched shreds. In twenty-three specimens I find—

|              |                                         |
|--------------|-----------------------------------------|
| 3 spicis 3.  | 4 spicis 2 superioribus basi masculis.  |
| 15 spicis 4. | 17 spicis 3 superioribus basi masculis. |
| 5 spicis 5.  | 1 spicis 4 superioribus basi masculis.  |
| —            | 1 spicis omnibus (3) basi masculis.     |
| 23           | 23                                      |

34. *C. Chinensis* (Retz); spicis 5-6 cylindricis erectis subapproximatis pallidis, terminali mascula pedunculata, reliquis fœmineis laxifloris exserte pedunculatis, bracteis angustis inflatè vaginantibus, superioribus spicis suis brevioribus, infima culmo breviori; stigmatibus 3; perigyniis ellipticis acute triquetris longiuscule rostratis basi attenuatis, ore bidentato membranaceo oblique secto, pubescentibus crebre æqualiter nervosis pallidis divergentibus, squama lineari-lanceolata acuta vel sæpe emarginata obtusa longe hispido-cuspidata pallida medio viridi trinervi latioribus brevioribusque.—*C. Chinensis*, *Retz, Obs.; Wahl. Act. Holm.* iii. 155; *Willd.* iv. 283; *Schk.* 70; *Kunth*, 517; *Spr. Syst.* iii. 825. *C. Retzii*, *Nees, l. c.* 128. (TAB. XXXVI.)

HAB. In China: Canton, *Bladh, apud Wahlenberg*; Macao, *Gaudichaud, Herb. Mus. Paris.*

*Culmus* subpedalis, triqueter, scaber, basi foliosus; pars spicas gerens 6-7 poll. longa. *Folia* 1-2 lin. lata, culmo longiora. *Bractea* vaginantes: infima  $\frac{1}{2}$ -1 lin. lata. *Vagina* subinflata: infima 6-8 lin. longa. *Pedunculus* infimus 1 $\frac{1}{2}$  poll. longus. *Spica mascula* 14-18 lin. longa, 1-1 $\frac{1}{4}$  lin. lata. *Spica fœminea* 1-1 $\frac{1}{2}$  poll. longæ, 2-3 lin. latæ, a se 1-1 $\frac{1}{2}$  poll. remotæ. *Squamæ* conformes. *Perigynium* 1 $\frac{1}{2}$ -2 lin. longum, vix  $\frac{1}{2}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, utrinque acutum, perigynio arcte tectum, atro-purpureum; basi styli incrassata, triquetra, decidua.

I am indebted to M. Spach for the knowledge of this species, and for the figure taken from Gaudichaud's specimen in the herbarium at the Garden of Plants at Paris. I had previously seen it in the herbarium of Sir W. J. Hooker; but the expression of Wahlenberg, "capsulis ovali-ventricosis," had made me doubt about its being Retz's plant. As the achenium ripens, and the rostrum and attenuated base of the perigynium proportionally shrink, the epithet ventricose is to a degree applicable, though the achenium is closely invested by the perigynium. It is remarkable that Wahlenberg alone alludes to the pubescence of the perigynium. Retz remarks the resemblance of the spikes to those of *C. Pseudocyperus*, probably from the form of the scales; for the two species are not otherwise allied. He says, "Spicæ fœmineæ omnino *Pseudocyperi*, sed erectæ, remotæ, solitariae, tenuiores."

35. *C. filifolia* (Nuttall); spica simplici androgyna apice mascula oblongo-cylindrica nuda ferrugineo-demum castaneo-albida; stigmatibus 3; perigyniis triquetro-ovalibus rostellatis, ore integro albo-hyalino, pallidis apice ferrugineo tinctis scabris enerviis laxiusculis squamam latiore obtusissimam medio ferrugineam demum castaneam marginibus latissime albo-hyalinis amplexentem subæquantibus.—*C. filifolia*, *Nutt. Gen.* ii. 204 (1818); *Brown in Franklin Nar. App.* 763; *Schw. et Tor.* 298; *Dewey, Sill.* xi. 150 et xii. 296. *Uncinia breviseta*, *Tor. Mon.* 428. *Kobresia globularis*, *Dewey, l. c.* xxix. 253. (TAB. XXXVII.)

HAB. In America Boreali. Dry plains and gravelly

hills of the Missouri, *Nuttall*. Carlton House, *Sir John Richardson*. Rocky Mountains, *Drummond*.

*Cæspitosa*. *Culmus* 6–10-pollicaris, filiformis, lævis, basi foliatus, vaginisque elongatis ferrugineis tectus. *Folia* involuta, filiformia, rigida, culmo breviora vel æquantia. *Spica* 6–10 lin. longa, apice (plus minus mascula) lineam, basi 3 lin. lata. *Squamæ* ferrugineæ, demum castaneæ, nervo infra apicem evanescente: masculæ angustiores, obtusæ: fœmineæ nisi infima obtusissimæ, plus latæ quam longæ, omnes marginibus late albo-hyalinæ. *Perigynium*  $1\frac{5}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, achenium laxè vestiens, encrve vel basi obscure nervatum. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, triquetro-ovatum, olivaceum, punctulatum, basi styli crassiori apiculatum; rachicolâ ligulatâ serratâ, apice albo-ferrugineâ, membranaceâ, subæquilongâ præditum.

I have the authority of Mr. Nuttall as to the identity of the Carlton House and Rocky Mountains specimens with his own. I quote the *Kobresia* of Dewey—the description of which I have not seen—on the authority of Dr. Torrey, though in the last notice of the species Dewey makes no reference to that plant, nor to his previous mistake in considering Richardson's plant to be *C. ursina*. The larger specimen figured is from Carlton House, the smaller one from the Rocky Mountains.

36. *C. comosa* (Boott); spicis 4–6 cylindricis densifloris pedunculatis, terminali mascula elongata bracteata ferruginea, reliquis fœmineis crassis olivaceis squarrosis demum nutantibus vel pendulis, superioribus vel omnibus evaginatis approximatis vel infima remota interdum longe pedunculata plus minus vaginata; bracteis inferioribus culmo multum longioribus; stigmatibus 3; perigyniis ovatis vel ovalibus triquetris subturgidis stipitatis longe rostratis alte bicuspidatis (laciniis subulatis lævibus patentissimis recurvatis) glaberrimis nervosis demum divergentibus retroflexisque, squama lanceolata vel oblonga serrata pallida longe hispido-aristata latioribus longioribusque vel infimis (aristâ) brevioribus.—*C. comosa*, *Boott*, *Lin. Trs.* xx. 117! *Carey*, *l. c.* 530; *Sartwell*, *Ews. n.* 134! *C. furcata*, *Elliott*, ii. 552 (*non Lapeyr.*). *C. Pseudocyperus*, *Tor.*! *Dewey!* (*ex parte*). (TAB. XXXVIII.)

HAB. In America septentrionali. New England to Georgia.

*Culmus*  $2\frac{1}{2}$ -pedalis, acute triqueter, validus, seaber; pars spicas gerens 3–6, etiam 10 poll. longa. *Folia* 3–5 lin. lata, culmo longiora, nodosa. *Bractea* infima latior, longissima, interdum vaginata: aliæ sursum decrescentes, evaginatæ: summa sæpe setacea. *Vagina* 1–16 lin. longa. *Pedunculi* 2 lin. ad  $1\frac{1}{2}$  poll. longi, vel inferiores rarius 4–10 poll. *Spica mascula* 1–3 poll. longa, 3 lin. lata, ferruginea, pedunculata: squamæ lineari-lanceolatæ, hispido-aristatæ, scabriusculæ, laxè imbricatæ. *Spicæ fœmineæ*  $1\frac{3}{4}$ – $2\frac{3}{4}$  poll. longæ, 6–7 lin. latæ, e rostro laciniisque elongatis divaricatis quasi comosæ. *Squamæ* lanceolatæ vel oblongæ, medio pallide virides, lateribus ferrugineis, ciliato-serratæ, longe hispido-aristatæ. *Perigynium* 3– $3\frac{1}{2}$  lin. longum,  $\frac{7}{10}$  lin. latum, alte bicuspidatum, laciniis fere lineam longis, divaricatis, sæpe recurvatis: glaberrimum, nervosum, demum retroflexum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, triquetrum, castaneum, basi styli conica apiculatum.

Habitus *C. Pseudocyperis*, L. Differt spicis fœmineis crassioribus, comosis; perigyniis altius bicuspidatis, laciniis patentissimis, lævibus, recurvatis.

Mr. Elliott first distinguished this fine species, but gave it a name that had been adopted by Lapeyrouse. It was subsequently confounded with *C. Pseudocyperus*, with which it seems to be com-

mon in the States, as far north as New England. I have never seen any specimens from the British Provinces.

37. *C. utriculata* (Boott); spicis 6–7 rarius 5–8 cylindricis elongatis, masculis 3–4 gracilibus, inferioribus sæpe bracteatis, fœmineis 3–4 crassis remotis sessilibus vel infima basi attenuato-laxiflora pedunculata rarius vaginata, superioribus interdum apice masculis; bracteis culmo multum longioribus; stigmatibus 3; perigyniis oblongo-ellipticis sensim in rostrum cylindricum acuminatis bifurcatis glabris inflatis nervatis stramineis, squama lanceolata acuminata hispido-cuspidata purpurea medio pallida latioribus longioribusque.—*C. utriculata*, *Boott*, *Hook. Fl. Bor. Am.* ii. 221; *Journ. Bot. l. c.* (*excl. C. bullata?*  $\beta$ , *Fries*). *C. ampullacea*  $\beta$ , *Carey*, *l. c.* 534. (TAB. XXXIX.)

Var.  $\beta$ , minor, *Sartwell*, *Ews. n.* 153.

HAB. In America septentrionali. Cumberland House, etc., *Richardson*. New England to Ohio.

*Culmus* 2–3-pedalis, triqueter, validus, glaber, inter spicas seaber, basi spongiosus, crassus; pars spicas gerens 9–12 poll. longa. *Folia*  $4\frac{1}{2}$  lin. lata, culmo longiora, rigida, nodosa, glauca, basi culmum amplectentia. *Bractea* latæ, culmum longe superantes: infima interdum vaginata; auricula obtusa, purpurea, amplectens. *Vagina* 2–12 lin. longa. *Pedunculus* 8–12 lin. longus, glaber. *Spicæ masculæ* sæpius 3–4, rarius 2–5, graciles,  $1$ – $4\frac{1}{2}$  poll. longæ, lineam latæ vel sæpe angustiores, omnes vel mediæ sessiles, inferiores sæpe bracteatae, interdum apice fœmineæ: squamæ lanceolatæ, acutæ, purpureæ, medio pallidæ, margine albo-hyalinæ: demum omnino decolores. *Spicæ fœmineæ* sæpius 3 vel 2, rarius 4–5, a se  $1\frac{1}{2}$ – $3\frac{1}{2}$  poll. remotæ,  $2\frac{1}{2}$ –4 poll. longæ, 7–8 lin. latæ: superiores sessiles, densifloræ: infima basi attenuato-laxiflora, plus minus longe pedunculata; in uno specimine spiculâ semipollicari remota, basi composita. *Squamæ* lanceolatæ, acutissimæ, hispido-cuspidatæ, purpureæ, medio pallidæ. *Perigynium*  $4\frac{1}{2}$  lin. longum,  $1\frac{1}{2}$  lin. latum. *Achenium* lineam longum, triquetro-ovatum, basi styli æquali apiculatum, punctulatum.

Var.  $\beta$ ; omnibus partibus minoribus.

In speciminibus bene expositis satis a *C. vesicaria* et *C. ampullacea* distinguenda. Inter eas intermedia. In majoribus proprius ad *C. vesicariam*, in minoribus ad *C. ampullaceam* accedens. Ab utrinque squamis fœmineis hispido-cuspidatis recedit. A *C. vesicaria*, cui forma fructûs accedit, differt omnibus partibus majoribus; foliis latioribus, glaucis, insigniter venoso-reticulatis, bracteis multum longioribus; spicis pluribus, fœmineis rarius 2, sæpius 3, inferioribus basi magis attenuato-laxifloris; perigyniis rostro cylindrico longiori. A *C. ampullacea* pluribus characteribus supra notatis absimilibus præcipue perigyniis oblongo-ellipticis.

In the 'English Flora,' Sir James Smith remarks that "the fruit of *C. ampullacea* resembles a bottle or flask, *ampulla*; that of *C. vesicaria* a bladder, *vesica*; so that they ought never to have been confounded in character or name, to say nothing of the totally different shapes of their spikes when ripe." Among European botanists there is no difference of opinion on the subject of these two species. Future observation must determine in America the value to be affixed to the species of this group.

In 50 specimens of *C. utriculata*, I find—

|                  |                |                   |
|------------------|----------------|-------------------|
| 5 with 5 spikes. | 1 with 2 male. | 11 with 2 female. |
| 24 „ 6           | 27 „ 3         | 33 „ 3            |
| 18 „ 7           | 20 „ 4         | 5 „ 4             |
| 3 „ 8            | 2 „ 5          | 1 „ 5             |

In 135 specimens of *C. vesicaria*, I find—

|                  |                |                  |
|------------------|----------------|------------------|
| 6 with 3 spikes. | 6 with 1 male. | 9 with 1 female. |
| 56 „ 4           | 57 „ 2         | 110 „ 2          |



|                                                    |                 |                   |
|----------------------------------------------------|-----------------|-------------------|
| 58 with 5 spikes.                                  | 65 with 3 male. | 14 with 3 female. |
| 12 " 6                                             | 5 " 4           | 2 " 4             |
| 2 " 7                                              | 1 " 5           |                   |
| 1 " 8                                              | 1 " 6           |                   |
| In 110 specimens of <i>C. ampullacea</i> , I find— |                 |                   |
| 1 with 2 spikes.                                   | 2 with 1 male.  | 10 with 1 female. |
| 3 " 3                                              | 60 " 2          | 62 " 2            |
| 44 " 4                                             | 35 " 3          | 32 " 3            |
| 38 " 5                                             | 9 " 4           | 5 " 4             |
| 15 " 6                                             | 2 " 5           | 1 " 5             |
| 5 " 7                                              | 1 " 7           |                   |
| 2 " 9                                              | 1 " 11          |                   |
| 1 " 11                                             |                 |                   |
| 1 " 15                                             |                 |                   |

38. *C. Tuckermanni* (Boott); spicis 5 rarius 4–6, masculis 2 rarius 3 gracilibus approximatis cylindricis, infima sæpe ebracteata, fœmineis 3 rarius 2 oblongis cylindricisque subapproximatis crassis pallide viridibus demum stramineis pedunculatis vel suprema sessili infima nutanti sæpe vaginata; bracteis culmo subinde multum longioribus; stigmatibus 3; perigyniis tenuissimis pellucidis turgide ovalibus inflatis longe cylindrico-rostratis, rostro tenui, bifurcatis glabris oblique adscendentibus nervatis nitidis, squama ovata vel lanceolata acuta sæpe cuspidata ferruginea medio viridi margine albo-hyalina multum latioribus longioribusque.—*C. Tuckermanni*, *Boott, Hook. Journ. Bot.* v. 73 (1846); *Lin. Trans.* xx. 115; *Dewey, Sill.* xlix. 48, ct iv. (2 ser.) 348; *Sartwell, Eas. n.* 155. *C. bullata*, *Dewey, Sill.* ix. 71; *Kunth*, 496 (ex parte); *Schw. et Tor.* 367; *Tuck. En. Méth. p.* 20. *C. cylindrica*, *Carey*, 534 (non *Schw.*). (TAB. XL.)

HAB. In America septentrionali, in paludosis. New York to Ohio and Wisconsin.

*Culmus* 2–2½-pedalis, firmus, scaber, basi vaginis atro-purpureis reticulato-fissis tectus, sursum foliis vaginantibus vestitus; pars spicas gerens 6–10 poll. longa. *Folia* 1–2½ lin. lata, culmo longiora, scabra. *Bractea* culmo multum longiores: infima sæpe subsesquipedalis, vaginata. *Vagina* 2–10 lin. longa. *Pedunculi* 2–12 lin. longi, scabri. *Spica mascula* sæpius 2 vel 3, rarissime 1–4, alternæ: terminalis cylindrica, 1–1½ poll. longa: inferiores sæpe abbreviatæ, una vel altera nunc e perigynio egrediente: infima sæpe ebracteata: omnes castaneæ. *Spica fœminea* 8 lin. ad. 2 poll. longæ, 8 lin. latæ, sæpius 3 vel 2, rarissime 1, a se 1–2 poll. remotæ. *Squama* conformes: masculæ lanceolatæ, obtusæ vel acutæ, rarius mucronatæ: fœmineæ ovatæ vel lanceolatæ, sæpe hispido-cuspidatæ. *Perigynium* 5 lin. longum, 2 lin. latum. *Achenium* elliptico-triquetrum, pallidum, basi styli crassiori apiculatum, plerumque abnormale, uno angulo incisum, vel transversim excavatum, curvatum.

A *C. bullata*, *Schk.*, differt, perigyniis membranaceo-tenuissimis, glabris, majoribus, oblique adscendentibus; spicis fœmineis pluribus, longioribus, longius pedunculatis, minus densis; squamis sæpe cuspidatis; pedunculis scabris, culmo scabriore; bracteis longioribus.

This very distinct species has until lately been referred to the *C. bullata*, *Schk.*, and *Kunth* has described a specimen from Jacquemont under *C. bullata*, remarking that it differed from *Schkuhr*'s figure in having a smooth rostrum. *Tuckerman* says that it has not been found in New England; my specimens are generally from the western parts of the state of New York. *Sullivan* has found it in Ohio, and *Lapham* in Wisconsin. I have three authentic specimens, from different sources, of the *C. cylindrica* of *Schweinitz*, all referable to *C. bullata* of *Schkuhr*.

39. *C. bullata* (*Schkuhr*); spicis 4–3 rarissime 5, mas-

culis 2–3 cylindricis gracilibus contiguis ferrugineis, infima bracteata, fœmineis 1 rarius 2 subrotundis vel oblongo-cylindræis crassis squarrosis densifloris remotis flavidis sessilibus vel pedunculatis, infima subinde nutanti breve vaginata, bractea culmum subæquante vel infima eo longiori; stigmatibus 3; perigyniis turgide ovatis longe cylindrico-rostratis, rostro scabro, bifurcatis inflatis nervatis nitidis densis demum divaricatis, squama lanceolata acuta pallide ferruginea medio viridi margine albo-hyalina latioribus longioribusque.—*C. bullata*, *Schk. f.* 166, *u. u. u.*; *Boott, Journ. Bot.* v. 74; *Carey*, 534; *Sartwell, Eas. n.* 154. *C. cylindrica*, *Schw. (fide spec. 3, authent.)*; *Tuck. En. Méth. p.* 20. (TAB. XLI.)

HAB. In America septentrionali, in pratis humidis. New England to Pennsylvania.

*Culmus* 1½–2-pedalis, gracilis, firmus, triqueter, glaber vel scabriusculus, inter spicas scaber, basi vaginis purpureis vel fuscis tectus; pars spicas gerens 4–8 poll. longa. *Folia* 1–1½ lin. lata, culmo longiora, nodosa, firma, plana. *Bractea* culmum subæquans: infima eo longior, rarius vaginata. *Vagina* 2–4 lin. longa. *Pedunculi* 4 rarius 12 lin. longi, glabri. *Spica mascula* ½–2 poll. longæ, 1–1½ lin. latæ: infima tantum bracteata. *Spica fœminea* sæpius 1, rarius 2, a se 2–4 poll. remotæ, 10–16 lin. longæ, 7–8 lin. latæ, sessiles vel pedunculatæ: suprema interdum apice mascula. *Squama* conformes; masculæ arcte imbricatæ. *Perigynium* 3–4½ lin. longum, 1–1½ lin. latum, rostro scabro margine serrato rarius glabro, nervis 10–14. *Achenium* 1–1½ lin. longum, ½ lin. latum, elliptico-triquetrum, fuscum, papillosum, basi styli crassiori apiculatum; stylo contorto.

This species has been confounded with *C. Tuckermanni*, and I cannot quote with any confidence any other authorities than those I have mentioned above. I have three authentic specimens of it from *Herb. Schweinitz*, under the name of *C. cylindrica*: one sent to me by *Kunze*, received from *Schweinitz*, another from the same source from *Herb. Hooker*, and one from *Herb. Tuckerman*, sent to him by *Dewey*, and received from *Schweinitz* under the name of *C. cylindrica*.

40. *C. Olneyi* (Boott); spicis 5 rarius 4–6, masculis 3 rarius 2–4 cylindricis gracilibus contiguis castaneis binis inferioribus sæpe bracteis, fœmineis 2 rarissime 1–3 cylindricis crassis densifloris subapproximatis flavidis sessilibus vel pedunculatis subnutantibus, infima nunc basi attenuata vaginata; bractea infima culmo longiori; stigmatibus 3; perigyniis turgide ovatis breve cylindrico-rostratis, rostro apice laciniisque serratis bifurcatis inflatis nervatis nitidis divergentibus, squama lanceolata acuta interdum cuspidata pallide ferruginea margine albo-hyalina apice sæpe ciliata latioribus longioribusque. (TAB. XLII.)

HAB. In America septentrionali. Rhode Island, *Olney*, in limosis.

*Culmus* subsesquipedalis, subvalidus, firmus, sæpe obtusangulus, glaber, vel acutangulus, superne scaber, basi vaginis (limo pollutis) tectus; pars spicas gerens 6–8 poll. longa. *Folia* 1–2 lin. lata, culmo longiora, rigida, carinata. *Bractea* infima culmo longior, rarius vaginata. *Vagina* 1–3 lin. longa. *Pedunculus* infimus 2–6, rarius 15 lin. longus. *Spica mascula* sæpius 3, 10–20 lin. longæ, lineam latæ, binæ inferiores sæpe bracteata. *Spica fœminea* sæpius 2, rarissime 1, vel 3, a se 1–2 poll. remotæ, 15–23 lin. longæ, 5–6 lin. latæ: suprema sessilis: infima pedunculata, sæpe nutans. *Squama* conformes, masculæ arcte imbricatæ: inferiores nervo infra

apicem evanescente: superiores nervo ad apicem vel extra producto: fœmineæ acutæ, subinde cuspidatæ vel apice ciliolatæ. *Perigynium*  $2\frac{1}{2}$ –3 lin. longum,  $1\frac{4}{10}$  lin. latum: rostro glabro, apice ad margines laciniisque tantum serrato: nervis sub-12, quorum 7 magis prominentibus aliis tenuioribus superne evanidis. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, triquetro-obovatum; stylo contorto.

Aspectus potius *C. vesicariae* quam *C. bullatæ*; crescit in limosis, nec in pratis. A *C. bullata* differt culmo validiori; foliis latioribus; spicis pluribus, masculis sæpius 3, binis inferioribus bracteatis, fœmineis plerumque 2 rarissime 1, cylindricis, angustioribus, magis approximatis; perigyniis minoribus, rostro breviori; squamis interdum cuspidatis.

In twenty-four specimens I find—

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

In thirty-five specimens of *C. bullata* I find—

|                   |                 |                   |
|-------------------|-----------------|-------------------|
| 12 with 3 spikes. | 22 with 2 male. | 23 with 1 female. |
| 21 „ 4            | 13 „ 3          | 12 „ 2            |
| 2 „ 5             |                 |                   |

I have named this species after its discoverer, Mr. Olney, to whom I am exclusively indebted for it. I have not seen it in any other collection.

41. *C. Baltzellii* (Chapman); spicis 4–5 purpureis cylindricis erectis, terminali mascula pedunculata, reliquis fœmineis vel apice extremo masculis, suprema vel binis superioribus subremotis *inserte* vel omnibus radicalibus longe *exserte* inæqualiter pedunculatis subaxillaribus basi attenuatis, vaginis superioribus subaphyllis; stigmatibus 3; perigyniis ellipticis plano-triquetris stipitatis basi attenuatis rostellatis, ore integro antice oblique secto, apice subexcurvis pubescentibus crebre nervosis viridibus superne purpureo tinctis, squama oblongo-obovata truncata obtusissima sæpe emarginata vel abrupte acutata brevecuspidata apice ciliolata purpurea medio late pallida angustioribus longioribus vel subæquantibus.—*C. Baltzellii*, *Chapman, MSS.*; *Dewey, Sill. iii. (2 ser.) 355, 1847*; *Sartwell, Ews. n. 103!* *C. Chapmani, Torrey, MSS.!* (TAB. XLIII.)

HAB. In America septentrionali. Florida, *Chapman*. In sandy ravines.

*Culmus* gracillimus, debilis, 9–12-pollicaris, scaber. *Folia* radicalia 2–3 lin. lata, culmo longiora, plana, glaucescentia, supra vesiculose-scabrata. *Vaginae* superiores 4–8 lin. longæ, cuspidatæ: inferiores breve foliaceæ. *Pedunculi* inferiores inæquales,  $2\frac{1}{2}$ –4 poll. longi. *Spica mascula* 12–16 lin. longa,  $1\frac{1}{2}$  lin. lata, cylindrica, purpurea, plus minus longe pedunculata, in uno specimine basi flosculis fœmineis 2 instructa. *Spicula fœmineæ* 8–18 lin. longæ,  $2$ – $2\frac{1}{2}$  lin. latæ: suprema e mascula 2 poll. remota, altera interdum subapproximata: vel omnes radicales: sæpe apice extremo masculæ. *Squamæ* purpureæ, apice ciliolatæ: masculæ imbricatæ, apice rotundato-obtusæ, nervo extra apicem producto, inferiores latiores, emarginatæ: fœmineæ medio late pallidæ, laxiores. *Perigynium*,  $2\frac{1}{2}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, sub lente tenuissime granulatum. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, acute plano-triquetrum, ellipticum, basi styli apiculatum, stipitatum, fuscum; stipite pallido.

We are exclusively indebted to Dr. Chapman for this addition to the *Digitata* of Fries. Dewey describes the leaves as slightly pubescent. I observe nothing but copious little white vesicles, often ruptured at top, on the upper surface of them.

42. *C. Boottiana* (Bentham); dioica!, spicis 1–2 pur-

pureis cylindricis erectis pedunculatis, mascula 1 basi attenuata, fœminea 1 densiflora vel rarius 2, infima breviori contigua vaginata, vagina subaphylla; stigmatibus 3 longis capillaceis; perigyniis triquetro-obovatis eros-tratis obtusis vel abrupte rostellatis rectis, ore bidentato ciliato, stipitatis nervatis pubescentibus pallidis superne purpureo tinctis marginibusque ciliato-dentatis, squama oblonga obtusa breve abrupte apiculata vel lanceolata acuminata acuta cuspidata ciliolata purpurea medio pallida apice albo-hyalina angustioribus brevioribusque.—*C. Boottiana*, *Benth., Boston Journ. Nat. Hist. v. (1845)*. (TAB. XLIV.)

HAB. In America septentrionali. Louisiana, *Drummond, n. 560 (Herb. Bentham)*; Alabama, *Mr. Peters*.

*Culmus* 6–8-poll., gracilis, triqueter, scaber, superne nudus, basi foliis angustis brevibus vaginantibus tectus. *Folia* sterilia 1–2 lin. lata, firma, culmo multum longiora, læte viridia, basi purpurea; quædam angusta fere setacea. *Bractea* lanceolata, cuspidata, fissa, basi amplexans: inferior quandoque sterilis, 2 poll. remota. *Vagina* 3–12 lin. longa. *Spica mascula* 12–14 lin. longa, 2 lin. lata: fœminea  $1\frac{1}{2}$ –2 poll. longa, 3 lin. lata, rarius altera ad basin superioris sita, 6–8 lin. longa. *Squamæ* conformes, abrupte vel sensim acuminatæ, acutæ: vel fœmineæ inferiores latiores, oblongæ, obtusæ, abrupte apiculatæ, muticæ: superiores lanceolatæ, acuminatæ, acutæ, cuspidatæ, nervo angusto pallido. *Perigynium*  $2$ – $2\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo)  $1\frac{1}{2}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongo-triquetrum, ferrugineum, basi styli inerassata.

A *C. Baltzellii* differt inflorescentia dioica!; spica fœminea crassiori, densiflora; squamis fœmineis nusquam emarginatis; superioribus acuminatis, acutis, nervo centrali angusto; perigyniis rectis, sæpe eros-tratis, obtusis, vel rostellatis, ore bidentato; foliis radicalibus læte viridibus, angustioribus.

*C. Baltzellii* was not published by Dewey before 1847, and when I saw it, I thought for some time that the immature specimens from New Orleans, from which *C. Boottiana* was described in 1845, might prove to be a depauperate form of the Florida plant, discovered by Chapman; but having been favoured lately, through the kindness of Dr. Gray, with mature specimens of *C. Boottiana*, from Alabama, sent by Mr. Peters, I find the dioicous inflorescence to be constant, and that the scale and perigynium afford distinctive characters. Still, from the occasional presence of a subremote vaginal bract, it may be found hereafter that the inflorescence approaches more nearly that of *C. Baltzellii*, and that even radical spikes may appear, as in that species.

The specimens figured are the original ones from Drummond in a young state. The mature perigynia are from Mr. Peters's specimens, sent to me in a letter by Dr. Gray.

43. *C. marcida* (Boott); spica oblonga pallida, e spiculis androgynis apice masculis parvis ovatis congestis composita, inferioribus compositis, omnibus sessilibus coarctato-imbricatis nudis; stigmatibus 2; perigyniis suborbiculatis vel ovatis plus minus longe rostratis bifidis plano-convexis nervatis fuscis superne margine alatis serratis, squamam ovatam acutam pallide stramineam margine albo-hyalinam subæquantibus.—*C. marcida*, *Boott, Hook. Fl. Bor. Am. ii. 212. t. 213.* (TAB. XLV.)

HAB. In America septentrionali, ad ripas fl. Columbiae, *Scouler*.

*Culmus*  $1\frac{1}{2}$ – $2\frac{1}{2}$ -ped., gracilis, firmus, triqueter, superne nudus, scaber, basi foliatus. *Folia* lineam lata, culmo breviora. *Spica* 8–15 lin. longa, 4–5 lin. lata. *Spicula* 2–3 lin. longæ, lineam latæ, numerosæ: superiores simplices: inferiores e spiculis

10-12 compositæ: omnes sessiles, congestæ, imbricatæ, quasi florentes, tamen perigynia matura seclusa ferentes. *Squamæ* conformes, acutæ: infima mucronato-setacea. *Perigynium* breve stipitatum, suborbiculatum,  $1\frac{4}{10}$  lin. longum, vel ovatum, longius rostratum,  $1\frac{6}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, superne ad margines alatum, serratum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, lenticulare, basi productum, fuscum, basi styli æquali decidua.

This species was founded on a few specimens, brought from the Columbia River by Mr. Scouler many years ago, and was described and figured in the 'Flora Boreali-Americana' of Sir W. J. Hooker. I have not since seen any other specimens. The difference in the form of the perigynium may be seen by a reference to the two figures, though the winged margin, which varies in width, is not expressed in the original figure in the Fl. Bor. Am. The only species allied to it, that I know of, is the *C. Sartwellii*, of Dewey, but that, perhaps inseparable from the *C. disticha* of Hudson, varies in the distribution of the stamina, and in the lower spiculæ being simple.

44. *C. Hoodii* (Boott); spica ferruginea, e spiculis androgynis apice masculis 9-10 vel pluribus ovatis composita, spiculis in capitulum ovatum nudum vel bracteatum arcte congestis; stigmatibus 2; perigyniis ovatis rostratis acute bifidis, ore antice altius fisso, pallidis ferrugineo-tinctis demum utrinque nervatis marginibus acutis serratis, squama ovata acuta vel mucronata striato-nervata ferruginea nervo viridi margine albo-hyalina æquilata longioribus.—*C. Hoodii*, Boott, Hook. Fl. Bor. Am. ii. 211. t. 211. *C. congesta*, Meyer (in Herb. Heward). (TAB. XLVI.)

HAB. In America septentrionali, ad ripas fl. Columbiae, Douglas, Scouler; Kamtschatka, Meyer; California, in paludosis, Thurber, n. 15.

*Culmus*  $\frac{1}{2}$ -2-ped., inferne foliatus, superne nudus, acutangulus, scaber, basi rudimentis foliorum atro-purpureis tectus. *Folia* 1-1 $\frac{1}{2}$  lin. lata, partem inferiorem fere dimidiam culmi vaginantia, deorsum breviora: superius culmum æquans vel eo longius. *Spiculæ* 3-4 lin. longæ, basi 2-3 lin. latæ, in capitulum ovatum 8-10 lin. longum, 5-6 lin. latum, arcte congestæ, basi squamis hispido-cuspidatis suffultæ. *Squamæ* conformes, acutæ vel mucronatæ. *Perigynium*  $1\frac{8}{10}$ -2 lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, orbiculatum, basi productum, lenticulare, basi styli (in speciminibus e California) incrassata, decidua.

The specimens figured are those from the Columbia, in which the perigynia are not mature, and show scarcely any indications of nerves. Dr. Torrey has since sent me specimens gathered by Thurber in California, in which the nerves are distinct, and the base of the style incrassate; the stem is shorter than in the Columbia species.

I named this species after the amiable Lieutenant Hood, the companion of Sir John Franklin and Sir John Richardson. It may prove to be the *C. anthericoides* of Presl, with which it agrees, except that the spiculæ cannot be said to be "oblong-lanceolate." It is allied to *C. fœtida* and *C. curvica*, Kunth, differing from the former in a less attenuated rostrum and a serrated perigynium, and from the latter in the acutely bifid perigynium. I observe a specimen in the herbarium of Mr. Heward, named *C. congesta* by Meyer; I am not aware of his having published it.

45. *C. exilis* (Dewey); polymorpha; spica simplici cylindrica dioica, vel androgyna basi vel omnino mascula, vel e spiculis 2-6 fœmineis, terminali oblonga basi coarctato-sterili, reliquis brevioribus paucifloris contiguis sessilibus composita; stigmatibus 2; perigyniis ovatis vel lanceolatis plus minus longe rostratis bidentatis plano-

convexis demum horizontaliter patentibus superne subalatis serratis antice plus minus leviter nervatis pallidis ferrugineo-tinctis, squama ovata acuta vel obtusissima ferruginea margine albo-hyalina subæquilata longioribus.—*C. exilis*, Dewey, Sill. xiv. 351 (1828); Kunth, 419; Tor. Mon. 387; Carey, l. c. 509; Sartwell, Ews. n. 2. (TAB. XLVII.)

HAB. In America septentrionali. Massachusetts to New Jersey, in swamps and wet meadows.

Cæspitosa. *Culmus* 1-2-ped., filiformis, rigidus, obtuse triqueter, sulcatus, glaber, vel apice scabriusculus, basi vaginis longis ferrugineis fibrilloso-laceratis tectus. *Folia* basi involuta, filiformia, rigida, culmo breviora. *Spica mascula*, vel, ex eadem radice, androgyna, apice extremo, vel rarius versus apicem fœminea, 5-15 lin. longa, 1-1 $\frac{1}{2}$  lin. lata. *Spica fœminea* solitaria, vel e spiculis 2-5 composita: terminalis oblonga, 6-10 lin. longa, 3-4 lin. lata, basi e squamis paucis vacuis arcte amplectentibus coarctata: reliquæ minores, 2-5 lin. longæ, 2-3 lin. latæ, omnes contiguæ, sessiles, nudæ, vel infima rarius breve bractæata. *Squamæ* ferruginæ, margine late albo-hyalinæ: *masculæ* obtusæ vel acutæ; inferiores sæpe latiores: vel omnes lanceolatæ, acutæ: *fœmineæ* late ovatæ, omnes acutæ, vel inferiores obtusissimæ, nervo infra apicem evanescente; superiores angustiores, acuminatæ, acutæ; infima rarius spiculæ inferioris apice breve cuspidata. *Perigynium*  $1\frac{6}{10}$ - $2\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{9}{10}$  lin. latum, plus minus rostratum: ad basin spiculæ *latius*, rostro  $\frac{2}{10}$ - $\frac{3}{10}$  lin. longo; ad apicem *angustius*, rostro  $\frac{5}{10}$  lin. longo; antice plus minus leviter nervatum, nervis lateralibus obsoletis, vel superne evanidis; postice enerve, vel basi striato-nervatis: pallide viride, medio vel apice ferrugineo-tinctum, ore ad margines albo-hyalino: superne anguste alatum: sursum e medio margine serratum, demum horizontaliter divergens: plano-convexum, basi spongiosum, turgidum, marginibus rectis, vel minime spongiosum, marginibus tenuibus sæpe revolutis. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovatum, basi productum, ferrugineum. *Stylus* incrassatus, deciduus.

This species was founded by Dewey on specimens discovered by Mr. Oakes, in Massachusetts, all of which were of one spicula, male or androgynous, and female, and it was placed among the *Psyllophoræ*. Since 1828 other specimens have been found, especially by Mr. Knieskern in New Jersey, more evolute, with three to six female spiculæ, the terminal one, as in the solitary female, sterile at base, and two to five contiguous smaller ones. The existence of these distinct spiculæ necessarily separate the species from the *Psyllophoræ*. It proves the correctness of the remark of Drejer, that that artificial group is to be considered as "formæ hebetatæ Caricum; monostachyæ incipiunt, evaduntque pliostachyæ." The evident affinity of *C. exilis* is with the *Stellulata*, and from its dioicous character it is allied to *C. sterilis*, in which I observe the same modification in the form and substance of the base of the perigynium, either turgid and spongy, with obtuse margins, or with no spongy substance interposed; the margins thin and acute. It is this last form which I think induced Tuckerman's remark as to *C. sterilis*: "Species," he says, "mihi bona, non modo habitu insigni et historia, sed etiam perigyniis distincta."

I have not observed any antheræ or trace of filaments at the base of the terminal female spicula, nor any male or androgynous spiculæ on the same root with the female ones; but with the male spicula, simple androgynous ones are associated on the same root. In two specimens only, out of very many I have examined, there is an appearance as if the terminal spike occasionally was male, with the rudiment of a female one, or with two females at its base; but on close observation several of the scales on one of the specimens, and all on the other are sterile, showing no trace of anthers or perigynium.

46. *C. amplifolia* (Boott); spicis 5-6 cylindricis elon-

gatis erectis remotis ferrugineis, terminali mascula pedunculata, reliquis foemineis alternis evaginatis, suprema subsessili, inferioribus pedunculatis densifloris vel basi interrupte laxifloris, infima longe lateque bracteata; stigmatibus 3; perigyniis turgide ovalibus ventricosis rostratis, ore membranaceo integro oblique secto, enerviis glabris divergentibus olivaceis vel ferrugineis, rostro pallido, squama oblonga emarginata cuspidata ferruginea, medio late pallida latioribus longioribusque.—C. amplifolia, *Boott, Hook. Fl. Bor. Am. ii. 228. t. 226.* (TAB. XLVIII.)

HAB. In America septentrionali. Marshy places on the Columbia River, *Douglas*. Thickets in rich mould on the fertile plains, above Colville, Upper Columbia, *Geyer*, n. 573.

*Culmus* 2½-ped., triquetus, validus, scabriusculus; pars spicas gerens 15 poll. longa. *Folia* 5-6 lin. lata, culmo longiora. *Bractea* infima 4-5 lin. lata, culmo longior: superiores eo breviores: summa setacea, spica sua brevior. *Ligula* ferruginea, amplectens. *Pedunculi* 6-14 lin. longi, glabri. *Spica mascula* 2½ poll. longa, 2 lin. lata, ferruginea, pedunculata. *Spica foemineae* 1½-3½ poll. longae, 2-3 lin. latae, a se ½-4 poll. remotae, obtusae, densiflorae vel basi laxiflorae. *Squamae* masculae obtusae, muticae, nervo infra apicem evanescente, ferruginae, margine pallidae: foeminae emarginatae, inferiores longius cuspidatae, summae rarius muticae. *Perigynium* 1-1½ lin. longum, 7/10 lin. latum, rostratum: rostro basi pallido, apice ferrugineo: ore membranaceo, obliquo, integro, facile rupto: enerve, nisi nervis 2 marginalibus, glabrum, reticulato-membranaceum. *Achenium* 1/10 lin. longum, 1/10 lin. latum, ovale, triquetrum, castaneum, angulis pallidioribus, basi styli apiculatum. *Stylus* supra basin incrassatus.

*C. scabrata*, Schw., affinis. Differt omnium partium glabritie; spicis longioribus, remotioribus; perigyniis enerviis; squamis foemineis emarginatis, cuspidatis.

The specimens found by Douglas were too young to afford any satisfactory evidence as to the affinity of this species. Those from Geyer prove its close resemblance in habit to *C. scabrata*.

47. *C. crinita* (Lamarck); spicis 5-6 rarius 4-7 cylindricis pedunculatis nutantibus pallidis, terminalibus 1-2 masculis vel basi vel apice et basi masculis, reliquis foemineis saepe apice masculis alternatim approximatis densifloris crinitis evaginatis, inferioribus basi attenuato-laxifloris saepe pendulis; bracteis inferioribus culmo multum longioribus; stigmatibus 2; perigyniis suborbiculatis vel obovatis vel ovalibus abrupte vel sensim rostellatis, ore integro minimo, breve stipitatis ventricosis enerviis divergentibus pallidis demum ferrugineis, squama oblonga emarginata vel truncata vel acuta ferruginea medio viridi nervata in aristam viridem ligulatam serratam longam horizontaliter patentem producta longioribus, infimis (aristata) saepe duplo quadruplo brevioribus.—*C. crinita*, *Lam. Enc. iii. 393; Willd. iv. 300; Kunth, 415; Muhl. 229; Elliott, ii. 536; Dewey, l. c. x. 270, var. β; Schw. et Tor. 360; Tor. Mon. 400; Darlington, 348; Carey, l. c. 519; Sartwell, Ews. n. 58. C. leonura, Wahl. Act. Holm. p. 161 (1803).* (TAB. XLIX.)

β. minor.—*Schk. f. 164, t. t. t.; Sartwell, Ews. n. 78. C. gynandra, Tuckerman, aliorum (ex parte). C. crinita γ, Tor. Mon. 401?*

HAB. In America septentrionali. Canada to Georgia.

*Culmus* 2½-4-ped., acute triquetus, apice scaber, validus, rigidus, superne filiformis, basi rudimentis foliorum fuscis vaginisque ferrugineis reticulato-fissis tectus, inferne foliis longe vaginantibus vestitus, superne nudus, vaginis foliorum glabris; pars spicas gerens 4-9 pollices longa. *Folia* 2-4 lin. lata: superiora culmo longiora. *Bractea* infima latior, 2-4 lin. lata: inferiores culmo multum longiores: summa saepe setacea, spica sua brevior: omnes evaginatae, vel infima rarius vaginata. *Ligula* infima discreta, rotundata, obtusa, ferruginea, apice folio impressa. *Pedunculi* ½-2 poll. longi, filiformes, scabri. *Spica masculae* 1-2-pedunculatae, nutantes: terminalis 1½-3 poll. longa, 1-2½ lin. lata, altera proxima, brevior, bracteata: vel terminalis saepe apice et basi mascula: altera omnino vel basi mascula. *Spica foemineae* saepius 4 vel 3-5, approximatae, 1-3½ poll. longae, 2-2½ lin. (vel ex apicibus aristarum 5-6 lin.) latae: superiores vel omnes saepe apice masculae: infima 2-4 poll. remota, in uno specimine vaginata (vagina pollicem longa): densiflorae: insigniter comosae. *Squamae* masculae saepe angustiores, aliter omnes conformes, longe aristatae. *Perigynium* 1-1½ lin. longum, 1/10-1 lin. latum. *Achenium* saepius pravum, uno latere vel utrinque incisum, vel interdum, e medio transverse cavato, incurvatum.

β. minor; spicis 4-5 vel 6-7 oblongo-cylindricis 1-2-pollicaribus, erectis vel nutantibus, terminali apice vel apice et basi sparse rarius omnino mascula, reliquis foemineis, vel apice parce masculis, saepe sublaxifloris; perigyniis orbiculatis, abrupte rostellatis, ore integro vel leviter emarginato, ventricosis enerviis, squama oblonga truncata vel emarginata vel acuta plus minus aristata longioribus vel brevioribus, infimis (aristata) saepe duplo triplo brevioribus; vaginis foliorum glabris; culmo breviori graciliori; foliis bracteisque angustioribus.

From the description of this species by Lamarck, I think the plant described above is his *C. crinita*. The expressions "spicis crinitis," "écailles ouvertes," "capsules arrondies, ovales," apply to it more closely than to the following species. But it is not easy to quote its synonymy in all authors, as both, I have no doubt, have been included under *C. crinita*. Schk., f. 125, I think, belongs to *C. gynandra*, which is the *C. crinita* of Dewey, the present plant being his var. *paleacea*. Willdenow first quoted the *C. paleacea* of Wahlenberg as a synonym to *C. crinita*, Lam., probably induced by the description and the country referred to. But the expressions "ore emarginato" and "culmo laxo," used by Wahlenberg, might have suggested some doubt of the accuracy of the reference, as neither applies to *C. crinita* or to *C. gynandra*, if this last be Willdenow's plant, as I suppose it to be that of Schkuhr. All doubt however on the subject has been removed by Wahlenberg himself, who gave to Mr. Tuckerman a specimen of his *C. paleacea*, from North America, which in no respect differs from *C. maritima*. I have the specimen before me, and it is identical with those brought by Drummond from Hudson's Bay. Upon what characters Wahlenberg distinguished the two plants, I am at a loss to conjecture from his descriptions. The serratures on the female scale (in the figure, Tab. XLIX.) have escaped my observation.

48. *C. gynandra* (Schweinitz); spicis 4-6 cylindricis pedunculatis nutantibus, terminalibus 1-2 rarius masculis saepius apice et basi vel medio vel basi masculis, reliquis 3-4 foemineis, superioribus vel omnibus apice masculis alternatim approximatis laxiuscule imbricatim multifloris, saepe basi magis crinitis evaginatis, infima basi attenuato-laxiflora interdum remota longissime pedunculata pendula vaginata; bracteis inferioribus culmo longioribus; stigmatibus 2; perigyniis ovatis vel ellipticis sensim rostellatis, ore integro minimo, breve stipitatis ventricosis basi obsolete vel leviter nervatis oblique ascendentibus demum flavidis, squama lanceolata acumi-

nata vel emarginata ferruginea medio viridi nervata plus minus longe aristata longioribus vel subæquantibus, infimis (aristâ) sæpe plus duplo brevioribus; vaginis foliorum scabris.—*C. gynandra*, Schw. An. tab. *C. crinita*, Schk. f. 125, e. e. e.; Dewey, l. c. x. 270 (fide spec.).  $\beta$ . *gynandra*, Schw. et Tor. 360; Tor. Mon. 401; Carey, l. c. var. ii. 519. (TAB. L.)

HAB. In America septentrionali. Connecticut to New York.

*Culmus*, folia, bractea ut in *C. crinita*, nisi ligula infima elongata, folio impressa, vaginæque foliorum asperata! *Pedunculi* plerumque longiores, interdum glabri. *Spica mascula*  $1\frac{1}{2}$ –2 poll. longæ,  $1-1\frac{1}{2}$  lin. latæ, vel androgynæ breviores. *Spica feminea* sæpius 3,  $1\frac{1}{2}$ – $3\frac{1}{2}$  poll. longæ, 4 lin. (vel ex apicibus aristarum basi 5–7 lin.) latæ, plerumque basi magis comosæ. *Squamæ* masculæ lanceolatae, acutæ, plus minus cuspidatæ, sæpe muticæ; vel latiores, obtusæ: femineæ lanceolatae, adscendentes: inferiores longius aristatæ, magis apertæ: superiores sæpe breve cuspidatæ, perigynio breviores vel subæquantæ. *Perigynium*  $2-2\frac{2}{3}$  lin. longum,  $\frac{2}{3}$ –1 lin. latum, ovatum vel ellipticum, laxiuscule imbricatum, oblique adscendens, magis grosse granulatum, demum interdum ferrugineo-punctatum, sæpe tenuiter nervatum. *Achenium*  $\frac{2}{3}$ –1 lin. longum,  $\frac{1}{3}$  lin. latum, obovatum, basi styli apiculatum, sæpe, sed rarius quam in *C. crinita*, pravum.

A *C. crinita*, Lam., differt vaginis foliorum scabris!; spicis femineis latioribus, magis laxis; perigyniis ovatis vel ellipticis, majoribus; squamis femineis plerumque longioribus, minus patentibus, superioribus breve cuspidatis, masculis sæpe muticis.

I had separated this plant from *C. crinita* some years ago, and had alluded to it under the name of *C. asperata*; but on reference to the monograph of Schw. and Tor., I cannot doubt that it is their *C. crinita*,  $\beta$  *gynandra*, and therefore the *C. gynandra* of Schw. An. tab., as stated subsequently by Torrey in his Mon. p. 401. It is remarkable that no one has noticed the scabrous vaginæ of the leaves, a character which of itself may serve to distinguish it from *C. crinita*, as *C. Hitchcockiana* is distinguished from *C. oligocarpa*. I have no other authority for its range than the specimens in my herbarium. It is probably more limited than *C. crinita*.

49. *C. Houghtonii* (Torrey); spicis 4–5 rarius 3–6 subapproximatis erectis, masculis 2 vel 1–3 oblongis purpureis demum pallidis, reliquis 2–3 rarius 1–4, femineis subcrassis olivaceis demum ferrugineo-purpureis alternis, superioribus oblongis sessilibus vel omnibus cylindricis subsessilibus densifloris evaginatæ, infima rarius remota exserte pedunculata, bracteis foliaceis planis culmum subæquantibus; stigmatibus 3; perigyniis turgide ovalibus sensim plus minus rostratis bicuspidatis undique lucide setosis crebre valide nervosis olivaceis demum ferrugineo-purpureis, squama ovata obtusa vel lanceolata acuta cuspidata purpurea medio pallida margine albida latioribus longioribusque.—*C. Houghtonii*, Torrey, Mon. 413; Dewey, Sill. xxx. 63. (non Sartwell, Exs. n. 130, quæ *C. striata*, Mich.) (TAB. LI.)

HAB. In America Boreali. Lake La Biche, Dr. Houghton. Methye Portage, Sir John Richardson.

Stolonifera. *Culmus* 9–12-poll., strictus, rigidus, validus, acutangulus, scaber, basi rudimentis foliorum brevibus fusco-purpureis vaginisque reticulato-fissis tectus; foliisque vaginantibus usque ad mediam partem vestitus; pars spicas gerens  $2-4\frac{1}{2}$ , rarius 8 pollices longa. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, culmum subæquantia vel eo breviora, plana, firma. *Bractea* 1–2 lin. latæ,

planæ, culmum subæquantæ, vel inferiores eo paulo longiores: suprema nunc setacea, spica sua brevior: omnes evaginatæ, vel infima rarius vaginata. *Vagina* 6–14 lin. longa. *Ligula* rotundata, purpurea, amplectens. *Pedunculus* infimus 3–5 lin., rarius  $1\frac{1}{2}$  poll. longus. *Spica mascula* 2, rarius 1–3 contiguæ, spicis femineis approximatae, vel  $1-1\frac{1}{2}$  poll. ab iis remotæ: terminalis subpollicaris, 2 lin. lata, rarissime basi mascula: aliæ minores, 4–7 lin. longæ,  $1-1\frac{1}{4}$  lin. latæ, sessiles: infima sæpe bractea squamæformi vel setacea spica sua breviori suffulta. *Spica feminea* 2 vel 3, rarius 4, densifloræ, 5–14 lin. longæ, 3–4 lin. latæ, alternæ, approximatae: superiores oblongæ, sessiles: inferiores (vel omnes) cylindricæ, brevis pedunculatæ, evaginatæ, vel infima 2–4 pollices remota, vaginata. *Squamæ* masculæ purpuræ vel castaneæ, margine albo-hyalinæ, apice ciliatæ: inferiores obtusæ: superiores abrupte brevi-acuminatæ: vel omnes lanceolatae, acutæ, cuspidatæ: femineæ ovatae, acuminatæ, acutæ, vel obtusæ, plus minus cuspidatæ, purpureæ, medio pallidæ, margine albo-hyalinæ. *Perigynium*  $2\frac{2}{3}$ – $\frac{3}{2}$  lin. longum,  $1\frac{2}{3}$ – $\frac{4}{3}$  lin. latum, turgide ovale, plus minus cylindrico-rostratum; rostro  $\frac{1}{3}$ – $\frac{4}{3}$  lin. longo, medio purpureo; bifurcatum, laciniis lanceolatis, acutis, undique pilis setosis lucidis sæpe purpureis asperatum, crebre valideque nervosum, olivaceum, demum ferrugineo-purpurascens. *Achenium*  $1\frac{2}{3}$ – $\frac{3}{2}$  lin. longum,  $\frac{1}{3}$ – $1\frac{1}{3}$  lin. latum, late obovatum, trigonum, olivaceum, obtusum, basi styli æquali abrupte apiculatum.

In 68 specimens I find—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 11 with 3 spikes. | 16 with 1 male. | 1 with 1 female. |
| 28 „ 4            | 40 „ 2 males.   | 44 „ 2 females.  |
| 27 „ 5            | 11 „ 3          | 20 „ 3           |
| 2 „ 6             |                 | 3 „ 4            |
| —                 | —               | —                |
| 68                | 67              | 68               |

In one the terminal spike is male at base.

A *C. striata*, Mich., differt culmo foliisque brevioribus, ligula rotundata; spicis masculis, sæpius 2; squamis apice ciliatis, sæpe cuspidatis, femineis sæpius 2, interdum 3–4, magis approximatis, densifloris; squamis nunquam emarginatis nec muticis; perigyniis potius setosis quam pubescentibus; laciniis lanceolatis nec lobatis, demum ferrugineo-purpureis.

50. *C. siccata* (Dewey); spica oblonga pallide ferruginea demum straminea concolori, e spiculis 4–12 plerumque composita, spiculis simplicibus parvis ovatis, mediis plerumque masculis, extremis femineis vel apice masculis arcte congestis, vel inferioribus remotiusculis; bracteis squamæformibus, infimis breve cuspidatis; stigmatibus 2 longis; perigyniis ovalibus vel ovatis longe rostratis bifidis, ore antice altius fisso, utrinque nervatis margine alatis inæqualiter serratis pallidis plano-convexis, squama ovato-lanceolata acuta ferruginea margine late albo-hyalina demum straminea paulo longioribus vel subæquantibus.—*C. siccata*, Dewey, Sill. x. 278. (1826); Hook. Fl. Bor. Am. ii. 212; Tor. Mon. 391; Carey, l. c. 511; Sartwell, Exs. n. 11. *C. pallida*, Meyer, Mem. Ac. St. Pet. i. 215. t. 8 (1831). *C. Liddoni*, Carey, l. c. ed. 1. p. 545; Dewey, Wood. Bot. 581; Sartwell, Exs. n. 40 (non Boott). (TAB. LII. et TAB. CXLVI., perigynium.)

HAB. In America septentrionali et orientali. On the Pacific coast, from the Columbia to California, and from the Rocky Mountains and British America to New England, Michigan and Illinois. In Kamtschatka, Meyer. “Ad Thermas Turkenses, Turcz.” (Herb. Hooker).

*Rhizoma* repens, rudimentis foliorum fuscis striatis demum fibratis undique tectum, culmos 1–2 poll. distantes præbens. *Culmus*  $\frac{1}{2}$ – $1\frac{1}{2}$ -pedalis, gracilis, debilis, apice acutangulus, scaber,

basi rudimentis foliorum fuscis tectus, sursum foliis vaginantibus vestitus, superne nudus. *Folia* 1-1½ lin. lata, scabra, superiora culmo longiora vel breviora. *Bracteae* squamæformes: infimæ hispido-cuspidatæ, rarius spiculis suis longiores. *Spica* 9 lin. ad 2 poll. longa, 2-4 lin. lata, sæpe medio angustata. *Spiculae* 4-12 vel plures, 2-5 lin. longæ, 1-4 lin. latæ, distributione numeroque staminum variabiles: sæpius *mediæ* masculæ, *summa* et *inferiores* apice masculæ, vel fœmineæ: omnes arete congestæ, vel inferiores distinctæ vel subremotæ. *Squamæ* conformes. *Perigynium* 2- $\frac{2}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{1}{10}$ -1 lin. latum, longe rostratum, rostro sæpe ferrugineo, ore margine albo-hyalino antice alte fissis, plano-convexum, antice æqualiter 7-9-nerviis, postice nervis paucioribus sæpe minus prominentibus margine alatum, inæqualiter serratum. *Achenium* lineam longum,  $\frac{3}{10}$  lin. latum, plano-convexum, ferrugineum, basi styli æquali apiculatum.

This species, which is so widely diffused in the northern states, I have not seen till lately with any mature perigynia. The figure Tab. LII. was drawn from immature specimens, and does not exhibit the length to which the rostrum attains nor the number of nerves on the mature perigynium (see Tab. CXLVI., where it is figured). Meyer's figure is equally imperfect. The specimens from him and from Turczaninoff in Herb. Hooker are identical with American ones. The species extends from the Columbia River to California on the Pacific coast, and from the Rocky Mountains through British America to Michigan and Illinois and New England. Dr. Barratt finds it in sandy soil on pine plains. It is allied to *C. arenaria*, but is smaller in all its parts, with a longer rostrum, and a continuation of the winged margin to the base of the perigynium.

51. *C. Liddoni* (Boott); spica oblonga ferrugineo-albida, e spiculis 6 androgynis basi subdimidiatim masculis ovalibus contiguis simplicibus composita; stigmatibus 2; perigyniis lanceolatis acuminato-rostratis antice altius fissis bifidis alatis serrulatis leviter nervatis compressis laxè imbricatis superne medio ferrugineis, squama lanceolata acuminata acuta vel cuspidata læte ferruginea margine albo-hyalina nervo scabro paulo longioribus vel subæquantibus.—*C. Liddoni*, *Boott, Hook. Fl. Bor. Am. ii. p. 214. t. 215 (non Carey, Dewey, Sartwell, Ews. n. 40, quæ C. siccata)*. (TAB. LIII.)

HAB. In America septentrionali. Columbia River, *Scouler*.

*Culmus* 3-pedalis, apice acutangulus, scabriusculus, nudus; basi foliis 3-4 alternis vestitus. *Folia* 1½ lin. lata, culmo multum breviora, graminea. *Vaginae* intus albo-membranaceæ, superne fissæ. *Spica* 1½ poll. longa, ½ poll. lata. *Spiculae* 6-7 lin. longæ, 3 lin. latæ, basi subdimidiatim masculæ, apice laxiuscule fœmineæ. *Squamæ* omnes lanceolatæ, læte ferrugineæ, margine late albo-hyalinæ: masculæ obtusæ, nervo infra apicem hyalinam evanescente: fœmineæ acutæ, acuminatæ, vel breve cuspidatæ, nervo viridi scabro. *Perigynium* 3- $\frac{7}{10}$ -4 lin. longum, lin. latum, pallidum, medio sursum ferrugineum. *Achenium*, cum stipite  $\frac{3}{10}$  lin. longo, 1- $\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum.

*C. arida* affinis. Differt spiculis paucioribus, minoribus, laxiusculis; squamis omnibus lanceolatis, ferrugineis; fœmineis perigynia subæquantibus; achenio latiori; foliis gramineis; vaginis intus albo-membranaceis, fissis.

I have not seen other specimens than those originally brought by Dr. Scouler from the Columbia River; and future observation must determine whether the distinction between it and *C. arida* is valid. The foliation on the barren culms of *C. arida* is found equally on those of *C. lagopodioides*, and may exist in *C. Liddoni*. The difference in the vaginae of the leaves is striking; those of *C.*

*Liddoni*, from the hyaline texture within, being easily ruptured, while those of *C. arida* are always entire.

52. *C. arida* (Schw. et Tor.); spica elongata pallide flavide-viridi demum ferruginea concolori, e spiculis 8-10 androgynis ima basi masculis elliptico-cylindraceis utrinque acutis contiguis simplicibus nudis composita; stigmatibus 2; perigyniis lanceolatis elongatis acuminato-rostratis bifidis antice altius fissis alatis ciliato-serratis leviter nervatis compressis arete imbricatis pallidis, squama ovato-lanceolata acuta margine albo-hyalina nervo glabro plus duplo longioribus.—*C. arida*, *Schw. et Tor. 312. t. 24. f. 2*; *Carey, l. c. 515*; *Sartwell, Ews. n. 39*. *C. Muskingumensis*, *Schw. An. tab.*; *Dewey, Sill. x. 281*. *C. scoparia*, *Tor. Mon. 394 (ex parte)*; *Tuck. En. 8-17, var. γ*. (TAB. LIV.)

HAB. In America septentrionali: in pratis, Ohio, *Sullivant*; Illinois, *Mead*.

*Culmus* 2½-3-ped., validus, rigidus, superne acutangulus, scaber, e basi ad partem tertiam superiorem foliis alternis vaginantibus omnino tectus. *Folia* 2 lin. lata, rigida, crecta, apice attenuata, culmo breviora. In culmo sterili folia superiora alternatim magis magisque approximata, culmum omnino tegentia, apex vaginae inferioris basin proximæ includens. Basis foliorum postice (c vagina integra oriens) lineâ acute angulatâ impressa. *Vaginae* virides, striatæ, integræ. *Ligula* pallida, angusta, arete amplectens. *Spica* 2½-3 poll. longa, 6-8 lin. lata. *Spiculae* 8-14 lin. longæ, 2½-3 lin. latæ, ima basi attenuatæ masculæ, utrinque acutæ, nudæ, vel infima rarius squamâ cuspidatâ, spiculam æquante, suffulta. In uno specimine spicula infima, 4 pollices remota, ab axilla folii superioris egrediens, pedunculo sesquipollicari instructa, basi squamis sterilibus pluribus appressis alternis attenuata. *Squamæ* masculæ ovatæ, obtusæ: fœmineæ lanceolatæ, acutæ, tenuissimæ, hyalino-albidæ, vel omnes pallide fulvæ margine hyalinæ; nervo viridi, glabro. *Perigynium* 4-5 lin. longum,  $\frac{1}{10}$ -1 lin. latum. *Achenium* 1- $\frac{4}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, lineare, plano-convexiusculum, stipitatum, fuscum, punctulatum, basi styli apiculatum.

This fine species, which, from its resemblance in habit to *C. scoparia*, was at one time considered a variety of it by Torrey, appears confined to the Western States of North America. I have not seen it except from Ohio and Illinois.

53. *C. decomposita* (Muhlenberg); spica elongata basi interrupte ramosa pallide viridi demum olivacea vel ferruginea, e spiculis androgynis apice masculis parvis ovatis numerosis contiguis sessilibus decomposita, ramis subsesquipollicaribus omnino spiculiferis oblique adscendentibus, inferioribus breve setaceo-bracteatis; stigmatibus 2; perigyniis obovatis abrupte breve conico-rostratis bifidis olivaceis, marginibus superne acutis serratis rostroque viridibus, subbiconvexis vel plano-convexis lucidis spongiosis, antice nisi medio sæpe enerviis vel utrinque basi nervatis, nervis superne evanidis, squama ovata acuta vel breve cuspidata pallide ferruginea nervo viridi demum pallida hyalina latioribus, paulo longioribus vel æquantibus.—*C. decomposita*, *Muhl. l. c. 264*; *Dewey, Sill. xxv. 140*; *Carey, l. c. 511*; *Kunth, 390*; *Sartwell, Ews. n. 15*. *C. paniculata*, var., *Dewey, l. c. x. 276*; *Tor. Mon. 390*. (TAB. LV.)

HAB. In America septentrionali. New York, *Sartwell*. Ohio, *Sullivant*. Louisiana (in ponds), *Carpenter*.

*Culmus* 2-3-ped., triquetus, validus, scaber, basi foliosus.

*Folia* 2-4 lin. longa, culmo longiora. *Bractea* setaceæ, breves, sæpe obsoletæ. *Spica* 3-6½ poll. longa, apice 3-4 lin., basi 6-12 lin. lata: inferne interrupte ramosa: rami ½-1½ poll. longi, cylindrici, omnino spiculiferi, erecti. *Spiculæ* 2-3 lin. longæ, 2 lin. latæ, arcte contiguæ, sessiles. *Perigynium* 1-1 $\frac{9}{10}$  lin. longum,  $\frac{9}{10}$ - $\frac{9}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum, ½ lin. latum, obovatum, basi productum, ferrugineum.

The form of the perigynium sufficiently distinguishes this species from the *C. paniculata* of Europe. I have seen no specimens north of New York.

54. *C. Torreyi* (Tuckerman); spicis 3-4 abbreviatis oblongis castaneis demum ferrugineis, terminali mascula sessili, reliquis fœmineis evaginatis sessilibus contiguis vel infima subremota breve pedunculata; bracteis culmo brevioribus; stigmatibus 3; perigyniis obovatis obtuse triquetris abrupte cylindrico-rostellatis, ore albo-hyalino integro, valide nervatis punctatis, squama ovata acuta vel obtusa cuspidata pallide ferruginea margine albo-hyalina apice ciliata subæquilata longioribus; culmo foliisque hirsutis.—*C. Torreyi*, *Tuck. En. Method.* 21 (1843); *Carey*, 521. *C. abbreviata*, *Schweinitz*, n. 55 (*Herb. Kunze!*); *Boott*, *Lin. Trans.* xx. 141 (1846). (TAB. LVI. Fig. 1.)

HAB. In America Boreali. Bethlehem, Pennsylvania, *Schw.* (*Herb. Kunze*). New York, *Torrey* (*Herb. Hooker and Durand*). Carlton House, *Richardson* (1827).

*Culmus* 1-1½-ped., acute triquetet, apice scaber, hirsutus, rigidus, basi foliatus, rudimentisque foliorum purpureis tectus; pars spicas gerens 1-2 poll. longa. *Folia* 1-1½ lin. lata, culmo breviora, firma, hirsuta; *radicalia* elongata. *Bractea* breves: infima rarius culmo paulo longior: evaginata. *Pedunculus* infimus nunc 1-4 lin. longus. *Spica mascula* 3-8 lin. longa, 1-1½ lin. lata, subsessilis. *Spica fœminea* 3-6 lin. longæ, 2-2½ lin. latæ: omnes masculæ contiguæ, sessiles, vel infima longior ½-1 poll. remota. *Squama* apice ciliatæ: masculæ lanceolatæ, acutæ, sæpe cuspidatæ, nervo apice scabro, stramineæ, margine albo-hyalinæ: fœmineæ latiores, obtusæ, vel brevi-acuminatæ, cuspidatæ. *Perigynium* 1 $\frac{3}{10}$ -1 $\frac{7}{10}$  lin. longum,  $\frac{9}{10}$ - $\frac{9}{10}$  lin. latum (sub lente), lucide, demum ferrugineo-punctatum; ore ciliato. *Achenium* 1 $\frac{3}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum, obovatum, trigonum, basi styli apiculatum. *Stylus* supra basin brevis, crassus.

I first recognized this species in March 1843, in Herb. Fielding (*olim* Prescott), where I found it without a habitat, under the name of *C. abbreviata*, supposing it had been so named by Prescott, and that it was probably a plant from the Altai. In copying out the descriptions for the Paper in the Linnæan Transactions in 1846, I was wholly unconscious that I had the plant in my own herbarium, or that Tuckerman, who had discovered it in the herbarium of Sir W. J. Hooker, had described it as early as 1843 in his 'Enumeratio Methodica.' In my own and Sir William's herbarium it had been left unnoticed, through my carelessness, among many loose specimens of *C. pallescens* from Arctic America; but Sir William had also received it from New York from Dr. Torrey as *C. pallescens*, and Tuckerman consequently gave it that locality, as well as Carlton House. There was no question as to the correctness of the last habitat from the specimens brought in 1827 by Sir John Richardson; but doubts were entertained of the former, as Dr. Torrey had no specimen in his herbarium, and was unconscious of having seen the plant. None of the American botanists had met with it. Mr. Curtis however, in 1848, informed Dr. Gray in a letter, that, in looking over the *Cyperaceæ* of Mr. Durand of Philadelphia, he had found *C. Torreyi*, sent to Mr. D. by Dr. Torrey as *C. pallescens*. But the most curious part of its history is that, in 1849, Tuckerman found it in the herbarium of Prof. Kunze, at Leipsic, sent by Schweinitz from Bethlehem, Pennsylvania, as "*C. abbreviata*, Schweinitz, n. 55." That this was the source whence Prescott received his specimen, the name

it bore would render all but certain. It is remarkable that Schweinitz had preserved no specimen in his own herbarium and no indication in his MSS. of the name he had originally given to it. I am not aware that any one has found it in the States since Schweinitz.

Tuckerman places *C. Torreyi* among his *Montanæ*, but doubting whether it may not belong to the *Laxifloræ* of Kunth, in which he includes *C. pallescens*. They both belong to the same group, and though very distinct from each other, are yet closely allied. They have the same inflorescence, scales, bracts, ferruginous spots on the perigynium, achenium, and both are hirsute. The perigynium of *C. pallescens* is inflated, and less perceptibly triquetrous, but has at times a distinct though very short, abrupt rostrum, with an entire orifice. I think Carey is correct in placing it among the *Panicææ*, next to *C. pallescens*.

55. *C. alveata* (Boott); spicis 2-5, terminali mascula cylindrica sessili, altera minori rarius ad ejus basin arcte contigua, reliquis 1-3 fœmineis, superioribus (rarius omnibus) apice masculis oblongis masculæ arcte contiguis sessilibus, inferioribus vaginatis, infima basi attenuata remota exserte pedunculata; bracteis culmum subæquantibus; stigmatibus 3; perigyniis (immaturis) ovalibus obtusis vel rostellatis olivaceis, ore integro, crebre costato-nervosis granulatis, squama lata ovato-lanceolata acuminata cuspidata castanea medio 3-4-nervata pallida angustioribus brevioribusque.—*C. alveata*, *Boott*, *Journ. Nat. Hist. Boston*, v. (1845). (TAB. LVI. Fig. 2.)

HAB. Texas, *Drummond*, coll. 3. n. 440, 441. Louisiana, Arkansas, *Leavenworth* (*Herb. Carey*).

*Radix* repens, stolonifera. *Culmus* subpedalis, firmus, apice acutangulus, scaber, granulatus, basi foliatus; pars spicas gerens 3-5 poll. longa. *Folia* 1-1½ lin. lata, culmum subæquantia vel eo breviora, plana, marginibus revolutis, rigida. *Bractea* inferiores vaginatæ, culmum subæquantæ: superiores squamæformes, cuspidatæ. *Vagina* infima 4-7 lin. longa. *Pedunculus* infimus 1-1½ poll. longus, scaber. *Spica mascula* pollicaris, 2 lin. lata, sæpius sessilis; altera minor, rarius arcte contigua. *Spica fœminea* superiores (rarius omnes) apice masculæ, 6-12 lin. longæ, 1-2 lin. latæ, erectæ: inferiores a se 2-3 poll. remotæ, exserte pedunculatæ. *Squama* omnes medio granulata: masculæ ferruginæ, margine hyalino-albidæ, obtusæ, muticæ, vel inferiores lanceolatæ, acutæ, nervo viridi infra apicem evanescente vel in superioribus extra producto: infima cuspidata: fœmineæ latæ, ovato-lanceolatæ, castaneæ, basi medioque 3-4-nervatæ, pallidæ: inferiores vel omnes acuminatæ, longe cuspidatæ, vel superiores breviores, ovatæ, nervo vix vel paulo extra apicem producto. *Perigynium* 1 $\frac{9}{10}$  lin. longum, costato-nervosum; nervis albidis, ore pallidiore. *Achenium* 1 $\frac{3}{10}$  lin. longum, ½ lin. latum, oblongo-triquetrum, basi styli æquali.

Drummond's specimens are not fully mature, and those in the herbarium of Mr. Carey are too young to afford a satisfactory character. All parts of the plant are granulated. I cannot refer it to any known American species. *C. microdonta*, Torrey says, has a bidentate orifice to the perigynium; but from specimens gathered by Wright in Texas, apparently referable to it, in Herb. Carey, it is slightly bifurcate. From *C. Cravei* it is distinguished by the prominent nerves on the perigynium and female scales, and these last being broader, larger, and longer cuspidate.

56. *C. polymorpha* (Muhlenberg) (*C. Halseyana*, *Dewey*); spicis 3 rarius 2-4 ferrugineo-purpureis erectis, terminalibus masculis sæpe 2 vel 1 rarius 3, inferioribus oblongis contiguis sessilibus, fœmineis 1 rarius 2 interdum (vel suprema solum) apice masculis, *brevi* vel infima subremota *plus minus longe* exserte pedunculata, cylindricis

basi sublaxifloris rarius compositis; bracteis spicas subæquantibus; stigmatibus 3; perigyniis triquetro-ovalibus subturgidis cylindrico-rostratis, ore albo-hyalino alte oblique secto, papilloso-granulatis nervatis glaucis, rostro purpureo, squama obtusa rarius acuta purpurea margine plus minus albo-hyalina basi pallida trinervi subæquilata longioribus.—*C. polymorpha*, *Muhl.* 239 (*ex parte, var.* 2); *Carey*, 529. *C. Halseyana*, *Dewey, Sill.* xi. 313; *Carey, l. c. ed.* 1. 560; *Sartwell, Eas. n.* 128. *C. striata*, *Tor. N. York Fl. (fide Carey, non Mich.)*. (TAB. LVII.)

HAB. In America Boreali. Massachusetts to New Jersey.

*Culmus* 1-1½-ped., firmus, strictus, acute triqueter, lævis, granulatus, basi foliatus, rudimentisque foliorum fusco-purpureis reticulato-fissis tectus; pars spicas gerens 2½-7 poll. longa. *Folia* 1-2 lin. lata, rigida, stricta, marginibus revolutis: *culmea* culmo multum breviora, *radicalia* eum subæquantia. *Bractea* brevis, erecta, spicam subæquans, infima rarius eâ longior. *Vagina* 5-12 lin. longa. *Pedunculus* ½-2 poll. longus. *Spica mascula* 6-13 lin. longæ, 1-1½ lin. latæ, terminalis longior: inferiores arcte contiguæ, sessiles: infima sæpe basi squama majori amplectente mutica vel cuspidata suffulta. *Spica feminea* 10-16 lin. longa, 2-3½ lin. lata, inserta vel potius brevi-exserte pedunculata, basi sublaxiflora: vel 2, infima 2-4 poll. remota, rarius basi composita, e rachi squamas et perigynia ferente, ab ore perigynii egrediente. *Squamæ* conformes, obtusæ, rotundatæ, purpureæ, basi pallidæ, trinerves: femineæ superiores, interdum acutæ. *Perigynium* 2-2½-2¾ lin. longum, ¼-1 lin. latum. *Achenium* 1½ lin. longum, ⅓ lin. latum, oblongo-obovatum, triquetrum, fuscum, basi styli abrupte apiculatum.

As the *C. polymorpha* of Muhlenberg is admitted to have included *C. Halseyana* of Dewey, and what is now known to be the *C. striata* of Michaux, I should have retained Muhlenberg's anterior name for this species, had I been aware of the fact when the Plate was printed. I should refer the second variety of Muhlenberg to *C. polymorpha* from his description. Dewey (*Sill.* iii. 2 ser. 355) ascribes a two-toothed orifice by mistake to it. Carey alludes to a form with a filiform, lax female spike, which possibly may throw some light on the obscure *C. refracta* of Schk., which Willdenow received from Muhlenberg.

The affinity of *C. polymorpha* is doubtful. Tuckerman did not distinguish it from *C. striata*, and associated it with *C. hirta*: this is untenable. I suspect it may prove an aberrant form of the *Panicææ*.

57. *C. dasycarpa* (Muhlenberg); spicis 3-4 oblongis albidis, terminali mascula sessili, reliquis femineis canis approximatis evaginatæ vel infima subremota breve vaginata basi attenuata pedunculata; bracteis culmo longioribus; stigmatibus 3; perigyniis oblongo-ovalibus obtuse triquetris rostrellatis, ore emarginato, pilis longis albis densissimis tectis, basi glabris, crebre inæqualiter nervosis, squama ovata cuspidata alba apice ciliata medio viridi trinervi longioribus; culmo foliis vaginisque pilosis.—*C. dasycarpa*, *Muhl.* 236; *Elliott*, ii. 541, t. 12. f. 4! *Kunth*, 429; *Schw. et Tor.* 331! *Dewey, Sill.* xi. 148! (TAB. LVIII.)

HAB. In America Boreali. North Carolina to Florida.

*Culmus* 8-18-poll., gracilis, pilosus, basi foliatus, rudimentis foliorum ferrugineis, vaginisque pilosis intus ferrugineo-punctatis tectus; pars spicas gerens 10 lin. ad 2¼ poll. longa. *Folia* 1-1½ lin. lata, firma, plana: *culmea* vaginata, culmo breviora: *radicalia* eo longiora: omnia plus minus, præcipue basi marginibusque, pilosa: vaginæ semper pilosæ. *Bracteæ* evagi-

natæ, vel infima vaginula 1-2 lin. longa prædita, sæpe culmo plus duplo longior; pilosæ. *Spica mascula* 5-8 lin. longa, ½-¾ lin. lata, interdum inconspicua. *Spica feminea* 5-7 lin. longæ, 2-3 lin. latæ, 7-9-floræ, omnes approximatae, scssiles, evaginatæ, vel infima 1-1½ poll. remota, breve pedunculata, vaginulata. *Squamæ* albæ, medio virides; ciliatæ: masculæ obtusæ vel acutæ: femineæ inferiores valide cuspidatæ, superiores acutæ. *Perigynium* 2½ lin. longum, ⅓ lin. latum. *Achenium* 1½ lin. longum, ⅓ lin. latum, ovale, triquetrum, stramineum, basi styli apiculatum.

This species was found by Mr. Elliott in dry pastures on Paris Island, South Carolina, and was sent to Muhlenberg, who first described it. I have a specimen found by Baldwin on "Indian tumuli in Georgia," and it has been sent from Florida by Dr. Chapman. Elliott remarks that "the corolla is more villous" than that of any species he was acquainted with. The long white hairs are so dense as to conceal the texture of the perigynium. They, with the loose scattered hairs on the culm and leaves, contrast with the following closely allied species, *C. tenax*.

58. *C. aristata* (Brown); spicis 5-8 cylindricis erectis pallidis, terminalibus 3-4 rarius 5-6 masculis sessilibus alternis vel contiguis, infima bracteata sæpe subremota, reliquis femineis crassis alternis basi attenuato-laxifloris, suprema sessili evaginata, inferioribus exserte pedunculatis, omnibus longe bracteatis; bracteis culmo longioribus subtus vaginisque hirsutis; stigmatibus 3; perigyniis ovato-lanceolatis sensim longe rostratis alte bicuspidatis, laciniis subulatis demum divergentibus, nervosis glabris, vel rarius medio marginibus dentatis pallidis, squama ovata acuminata longe hispido-aristata pallida longioribus vel (aristâ) brevioribus.—*C. aristata*, *Brown, Frankl. Nar. App.* 764 (1823), (*non Dewey, Sill.* vii. 277, quæ *C. Davisii, Tor.*), *Schw. et Tor.* 364; *Tor. Mon.* 422; *Gray, Lyc. N. Y.* iii. 237; *Dewey, Sill.* xi. 161; *Carey, l. c.* 530; *Sartwell, Eas. n.* 132. *C. atherodes*, *Spr.* iii. 828. *C. mirata*, *Dewey, Sill.* xxvii. 240, v. 49, 48; *Woods, Bot. (ed. 2)* 593. *C. orthostachys*, *Meyer? Fl. Alt.* 4; *Ledebour, Icon. t.* 324. (TAB. LIX.)

HAB. In America septentrionali. Carlton House, Lake Huron, *Sir J. Richardson*. Cumberland House, *Drummond*. Watertown, New York, *Crawe*.

*Culmus* 2-3-ped., triqueter, validus, glaber, superne scaber: basi rudimentis foliorum rubro-vel atro-purpureis vaginisque reticulato-fissis tectus, foliisque vaginantibus subtus vaginisque hirsutis sursum vestitus; pars spicas gerens 8-14 poll. longa. *Folia*, bracteæque subtus, vaginæque hirsutæ. *Folia* 2-5 lin. lata, culmo longiora, nodosa. *Bracteæ* 1-4 lin. latæ, culmo longiores: inferiores plus minus (sæpe breve) vaginatæ. *Vagina* infima 2-14 lin. longa. *Pedunculus* infimus 2-18 lin. longus. *Spica mascula* 1-3 poll. longæ, 1½-3 lin. latæ, interdum versus apicem vel basi flosculis femineis paucis instructæ. *Spica feminea* 1½-2½ poll. longæ, 4-6 lin. latæ: supremæ sessiles, evaginatæ: inferiores plus minus exserte pedunculatæ: vel omnes (2) sessiles, evaginatæ: a se 2-4, vel infima 6 poll., remotæ. *Squamæ* omnes aristatæ: masculæ angustiores, lanceolatæ: femineæ ovatæ, acuminatæ, ferrugineæ, demum pallidæ. *Perigynium* 3-4 lin. longum, ⅓ lin. latum, obtuse triquetrum, in rostrum longum sensim attenuatum, alte bicuspidatum; laciniis subulatis, glabris (fere lineam longis), demum divaricatis; glaberrimum, rarius ad margines versus medium dentatum, nervosum. *Achenium* stipitatum, 1-¾ lin. longum, ⅓ lin. latum, triquetrum, basi styli recta vel obliqua apiculatum, interdum uno angulo indentatum.

The finest specimens I have seen of this species are those from



Arctic America, one of which, brought from Lake Huron by Sir John Richardson in 1849, is figured Tab. LIX. I cannot distinguish the *C. orthostachys* of Meyer from this species. I have not seen specimens from Lake Ontario, on which Dewey founds his *C. mirata*, but the plant described in Sill. xxvii. 240, is certainly that of Brown. In Wood's Bot. no mention is made of the hairy vaginae and leaves, though reference is made to the plant described in Sill. as *C. aristata*, in which this important character is given.

59. *C. tenax* (Chapman); spicis 3-4 oblongis, terminali mascula oblonga vel cylindrica albida subsessili, reliquis foemineis griseo-viridibus densifloris sessilibus contiguis evaginatiss, vel infima subremota pedunculata; bracteis culmum subaequantibus vel infima (*sterili*) eo longiori; stigmatibus 3; perigyniis ovalibus subacute triquetris rostellatis, ore pallido integro vel emarginato, pubescentibus basi glabris crebre inaequaliter nervosis, squama ovata acuta albida, medio viridi trinervi, latoribus longioribusque; culmo foliisque glabris.—*C. tenax*, Chapman, MSS.; Dewey, Sill. xviii. 254. *C. Chapmani*, Sartwell, Exs. n. 113. (TAB. LX.)

HAB. In America Boreali. Florida, Chapman. Georgia, Le Conte.

*Culmus* 12-15-poll., gracilis, firmus, basi foliatus, vaginisque pallidis scabriusculis tectus; pars spicas gerens 15 lin.  $2\frac{1}{4}$  poll. longa. *Folia* lineam lata, culmo breviora, rigida, saepe involuta. *Bractea* culmum subaequantibus, evaginatae, vel infima eo paulo longior, saepe sterilis, e spicis  $1\frac{1}{2}$  poll. remota. *Spica mascula* 6-12 lin. longa,  $1-1\frac{1}{4}$  lin. lata, subsessilis. *Spica foeminea* 6-7 lin. longae,  $3-3\frac{1}{2}$  lin. latae, densiflorae, 12-15-florae: omnes contiguae, sessiles, vel infima  $\frac{1}{2}-1$  poll. remota, brevis pedunculata. *Squamae* omnes albae, nervo viridi, acutae, muticae. *Perigynium*  $2-2\frac{1}{2}$  lin. longum,  $1-1\frac{1}{10}$  lin. latum, ore pallido, viride, pubescens, basi glabrum, ferrugineum. *Achenium*  $1\frac{3}{10}$  lin. longum, lineam latum, triquetrum, basi styli apiculatum.

*C. dasycarpa* arcte affinis. Differt culmo foliisque glabris (nec pilosis); vaginis foliorum scabriusculis; spicis foemineis densi-plurifloris; perigyniis pubescentibus, acute triquetris; squamis acutis muticis nec ciliatis; foliis angustioribus saepe involutis.

Found by Dr. Chapman on sand-hills in Florida. With the exception of the larger spikes and the simply acute scales, the main difference between it and *C. dasycarpa* is the smoothness of the first as compared with the last, a character that will be more satisfactorily estimated when we are more familiar with *C. dasycarpa*. I have not seen perfectly mature specimens of the last. In both, but especially in *C. tenax*, when the achenium is removed and the perigynium is held up to the light, it is found to be beset in the interstices between the nerves with ferruginous spots.

60. *C. pubescens* (Muhlenberg); spicis 4 rarius 5 pallidis demum pallide ferrugineis, terminali mascula oblonga vel cylindrica sessili, reliquis foemineis sublaxifloris oblongis contiguis sessilibus evaginatiss vel infima cylindrica basi laxiflora brevi vel (rarius remota) longissime exserte pedunculata nutanti; bracteis culmo brevioribus vel infima eo paulo longiori; stigmatibus 3; perigyniis obovatis basi cuneatis acute triquetris longiuscule rostratis bidentatis enerviis pubescentibus, squama ovata obtusa truncata nunc emarginata apice ciliata albida demum pallide ferruginea cuspidata longioribus vel (infimis cuspidate) brevioribus, superioribus eam aequantibus.—*C. pubescens*, Muhl. 244; Willd. iv. 281; Schk. f. 126, e.e.e.;

Kunth, 455; Schw. et Tor. 333; Dewey, Sill. ix. 73; Carey, l. c. 526; Sartwell, Exs. n. 112; Darlington, 351. (TAB. LXI.)

HAB. In America Boreali. Canada to Pennsylvania and Ohio.

Undique (praeter squamas) molliter pubescens. *Culmus* 1-2-ped., debilis, demum saepe procumbens, basi foliatus, rudimentis foliorum foliisque longe vaginatis tectus; pars spicas gerens  $1\frac{1}{2}-3$  rarius 12 pollices longa. *Folia*  $1\frac{1}{2}-4$  lin. lata, culmo breviora, mollia, plana. *Bractea* infima, vel foliacea, 1-2 lin. lata, culmo paulo longior; vel angusta, vel setacea, spica sua longior vel brevior: infima, rarius fere subradicalis, elongata, spicam longissime pedunculatam subaequans. *Pedunculus* 1-3 lin. vel rarius 6-8 poll. longus, gracillimus, debilis. *Spica mascula* 6-9 lin. longa,  $1-1\frac{1}{2}$  lin. lata, sessilis, vel brevis pedunculata. *Spica foeminea* 4-6 lin., vel infima (saepe angustior) 10-12 lin., longae, 2-3 lin. latae, omnes contiguae, sessiles, vel alternae approximatae: infima vel pollicem rarius 7-10 pollices remota, basi attenuata. *Squamae* apice ciliatae: masculae obtusae, cuspidatae, vel muticae: foemineae saepe truncatae, interdum emarginatae, cuspidatae. *Perigynium*  $1\frac{3}{10}-2$  lin. longum,  $\frac{7}{10}-\frac{8}{10}$  lin. latum, membranaceum, achenium arcte vestiens. *Achenium*  $1\frac{1}{10}-\frac{3}{10}$  lin. longum,  $\frac{7}{10}-\frac{8}{10}$  lin. latum, obovatum vel oblongo-obovatum, obtusum, acute triquetrum, basi styli crassiori decidua.

Tuckerman includes this species at the end of the *Montanae* of Fries, and Drejer, speaking of his *Spheridiophora* (the same group) says, "Terminos suos egreditur in *C. pubescens*, Muhl." It has no immediate affinity with any of this group in the States. *C. triquetra* of California is allied to it, and the *C. alpestris* of Europe. The presence of the lower subradical female spike is interesting as analogous to those of *C. alpestris*, and in two specimens of *C. pubescens* the presence of male florets on the apex of the upper female spike affords another analogy with it.

61. *C. caespitosa* (L.); "spicis 3-4 confertis, terminali mascula fusiformi solitaria, foemineis subcylindricis sessilibus; bracteis auriculato-aristatis truncatisve; stigmatibus 2; perigyniis ovatis enerviis utrinque gibbis, ore integro, brevissime rostratis sessilibus sparsis deciduis, squamas lanceolatas aequantibus; culmo acutangulo nudo foliisque bicarinatis margine deflexis flaccidis" (Fries).—*C. caespitosa*, L. Fl. Suec. p. 333, ed. 2. (1755); Fries, Nov. Fl. Suec. Mant. iii. 156 (1842), Sum. Veg. Scand. p. 227 (1846); Anderson, Cyp. Scand. p. 42. t. 6. f. 59; Reichenbach, Icon. Fl. Ger. t. 229; Lang, Car. Ger. et Scand. p. 70. (non Good., Smith, Hooker, Gay, etc.). *C. pacifica*, Drejer, Hafn. p. 292, Rev. Crit. Car. Bor. p. 39. *C. Drejeri*, Lang, Fl. Ratisb. p. 548, Koch, Syn. Fl. Ger. (TAB. LXII.)

HAB. In Europa, a Lapponia ad Germaniam, etc.: "per omnem Scandinaviam a Lapponia infima, ubi tamen rarissima, ad Scania, frequens. In Suecia media pratorum uliginosorum gramen omnium longe copiosissimum. Floret ineunte Majo, mensem ante *C. vulgarem* immixtam: prima spica florente *C. vulgaris* haec ubique fructifera." (Fries.)

"*C. caespitosa*, spicis erectis cylindricis ternis subsessilibus, mascula terminali, culmo triquetro. Distinguitur facile a reliquis foliis angustis, longis, laete viridibus, in majores fasciculos natis quam in ulla alia specie; spicis foemineis duabus, erectis, nigricantibus; capsulis flavescens, sessilibus, erectis, obtusis, ovatis, imbricatis; culmo nudo, exacte triquetro, sub infima spica foliolum spica longius, sub altera brevius ipsa

spica.—Hab. in paludibus ubi cæspitum instar turfæ et fasciculos grate virides maximosque constituit. Indicat solum cæspitosum: replet paludes, et ut felicius hoc peragat a bobus relinquenda. Succis, *Tufstarr*." (*Lin. Fl. Suec.*)

"Ita variabilis est *C. vulgaris*, adeo constantissima et monotypica *C. cæspitosa*. Non modo absolute cæspitosa nec stolonifera unquam, sed innovatione centrali in altum crescens tumulos pulvinatos format, maxime præcox, primo læte viridis, erecta, dein lutescenti-viridis; florens curta, erecta, adulta elongata, flaccida; foliis fasciculorum steriliū undique demum decumbentibus pulvinata. *Culmi* graciles, æquales, acute triquetri, angulis scabris, *aphylli*, basi modo 2-3 vaginis truncatis vestiti; foliolis brevissimis terminatis, quo a *C. vulgaris* semper dignoscitur. *Folia* fasciculorum steriliū vero longissima, angusta, mollia, lævia, margine scabrella: adulta supra bicanaliculata, margines vero deflexi nec unquam folia involvuntur, qui nisus in *C. vulgaris* angustifolia semper conspicuus. *Vaginae* inferiores tendunt quidem ad fibrillosam indolem *C. strictæ*, verum hic character adeo obscurus ut in definitione vix citetur. *Bractee* non vaginantes, eximie auriculatæ, infima vero tantum folio setaceo terminatur: reliquæ aphyllæ prorsus, nervo vel excurrente vel ante apicem evanescente. *Spicæ* omnes confertæ, unicolores (nec ut in *C. vulgaris* vulgo variegatæ): mascula fusiformis, antheris flavis, defloratis fulvis: fœmineæ sessiles, subcylindricæ, ob foliorum defectum nunquam spicam remotam eniti potest. *Squamæ* lanceolatæ, carinatæ, fœmineæ totæ atræ. *Stigmata* longissima. *Fructus* multi abortivi et facile decidui, inordinati, gibbi, hinc non ut in *C. vulgaris*, etc., adpressi, utrinque subacuti, enerves." (*Fries, Mant. 3.*)

"Spicis confertis, mascula subsolitaria, fœmineis oblongis subsessilibus; bracteis angustissimis aphyllisque; fructibus subsessilibus ellipticis obtusis utrinque convexis patentibus enervibus, squamam æquantibus superantibusque; culmo acutangulo, inferne vaginis teretibus tenuissime fibrillosis aphyllis; fructifero, foliisque supra bicarinatis, flaccidis; radice cæspitosa.

"*C. strictæ*, Good., proxima, sed tenuior. *Culmi* abortivi, quales frequentes, stricti manent: vaginae duæ superiores modo foliiferi, foliis haud marcescentibus; inferiori abbreviato. *Folia* præcipue fasciculorum steriliū, sat lata, siecitate revoluta. *Spicæ* in apice culmi sessiles, congestæ, squama vaginante vulgo tantum bracteatæ. Vidi tamen in paludosis formam raram spicis pedunculatis, pendulis, cylindricis. *Fructus* (*C. strictæ*) magis turgidi, indeque haud arcte imbricati, sed condensati, fere squaroso-patentes, ut in *C. acuta*: normaliter persistentes: variant subnervosi, punctulati, pruinosi, et subangulati: sed hi lusus atypici.

"Var. *retorta*; spicis cylindricis laxis; fructibus oblongo-acutis subcompressis deciduis, squama cuspidata brevioribus; culmis elongatis laxissimis ad terram arcuato-deflexis; fasciculis e vaginis aphyllis imbricatis ferrugineis basi triquetris.—In nemoribus paludosis. Spicis et fructibus ad *C. strictam*, Good., revergit: hi tamen enerves, et culmi gracillimi, tenues, etiam florentes laxissimi: quo a *C. stricta* recedit." (*Fries, Summa. Veg. Scand.*)

"Spicis fœmineis 2-3 subsessilibus cylindricis vel subrotundis ad masculam solitariam confertis densifloris; bracteis sæpe aphyllis auriculatis angustis; fructibus patentibus ovato-ellipticis, rostro minuto, apiculatis utrinque convexis enervibus, squamas obtusiusculas subsuperantibus; culmo scaberrimo acutangulo; vaginis teretibus tenuiter fibrillosis aphyllis; foliis flaccidis supra bicarinatis.

"Primo vere lætissime florens colore foliorum dilute viridi, spica mascula fulvo-brunnea, tumulisque pulvinatis, quos radice eximie cæspitosa format, jam e longinquo ab omnibus distinguitur gramen hocce. *Culmi* graciles, acute triquetri, primo curti et erecti, demum elongati, sæpe deflexi (nec apice nu-

tantes), vaginis aphyllis tenuissime fibrillosis inferne obtectus, quas supersedunt folia planiuscula duo brevia, quorum summum culmi apicem æquat. *Folia* fasciculorum steriliū longissima, angusta, mollia, margine scabra, supra bicarinata, marginibus deflexis. *Bractee* auriculato-cuspidatæ truncatæve, raro foliaceæ, spicam masculam æquantes. *Spicæ* in apicem culmi congestæ, sessiles, subcylindricæ, forma variabiles, sæpissime crassæ: fructus facile decidui, gibbi, acuti vel obtusi, virides, pallide flavescentes vel obscuri: squamæ ovales, obtusæ, vel lanceolatæ, acutæ, fusæ.—Est, ut vulgatissima, maxime polymorpha, quum characteribus tum habitu. Forma, colore, directione, numero fere omnes variant partes, nec unâ comprehendi possunt descriptione. In hac tamen formarum variatione ab affinibus semper facillime recognita, nec cuiquam nisi formis macris *C. strictæ*, Good., ullo modo confundenda. Quibus rationibus hæc species cum *C. vulgaris*, usque ad nostra tempora confusa, ab ea remota fuit, quæ contentio fuit de nomine, quo optime salutaretur, quæ denique sunt hujus synonyma, breviter historiam stirpis omnium congenerum primus clare extricavit et exposuit Fries.

"Var. *retorta*; culmo laxo; spiculis cylindricis subpendulis distantibus; fructibus oblongo-acutis subcompressis, squamis fere brevioribus; vaginis triquetris.—Forma inter *C. strictam*, Good., et *C. cæspitosam* quasi media videtur. *C. strictæ* congruit vaginis triquetris, fructibus glumisque. Culmo autem elongato, laxissimo, ad terram arcuato-deflexo, foliis latioribus, spicisque *C. cæspitosæ* proprior." (*Anderson, Cyp. Scand.*)

Linnaeus, in his 'Iter Scaniae' (June 19, 1749, p. 207), says: "Here and there were some moist places which bore some grass, generally excavations, where in former days the people had dug turf. In these cavities some patches had begun to grow, as it were to reclose the wound of the earth, and these patches or tufts were exclusively of a single grass called *Tuf-starr*."

I have given the graphic descriptions of Fries and Anderson of this long-mistaken species and its variety, adding the original character of Linnaeus, as the works from which they are taken may not be accessible to all. Though the specimens in the Herbarium of Linnaeus are those of the true *C. cæspitosa*, their general resemblance to what is now known as *C. vulgaris* misled the admirable Goodenough in his valuable paper on the British Carices, read to the Linnaean Society in 1792. Not that he had not misgivings on the subject, for he says (*Lin. Trans. ii. 196*) of his *C. cæspitosa* (*C. vulgaris*, Fries), "It was not till after repeated and careful examination of the Linnaean Herbarium that I could determine it; for the specimens there preserved seem chosen ones, and of course do not appear at first sight to bear that exact resemblance to the general habit which is observable with us. I was relieved from all doubt by M. Afzelius, who, from his intimate and accurate knowledge of the Swedish plants, and not less perhaps of those of our country, traced out to me certain marks of similarity."

From this time to 1841, when the 'Revisio Critica Caricum Borealiū' of Drejer was published, the true *C. cæspitosa*, L., was generally unrecognized. Under *C. cæspitosa* (*C. vulgaris*, Fries) he expresses a doubt of the correctness of Gay, who had referred the *C. cæspitosa*, L., to the *C. stricta*, Good., and he adds: "Tertia exstat species confinis, *C. pacifica*, mihi, Fl. Hafn., quæ spicam masculam solitariam cum cæspitibus densis foliisque viridibus non glaucis conjungit. Teste Vahl, Læstadius hanc quoque, quam sub nomine varietatis *C. cæspitosæ* habet, veram Linnaeanam *cæspitosam* ducit."

This observation falling under the notice of Fries, led him to the perception of the true *C. cæspitosa* of Linnaeus. But he errs in attributing the original reference of *C. vulgaris* to the *C. cæspitosa* of the Linnaean Herbarium to Smith; and in considering the *C. cæspitosa* of Goodenough to be compounded of the true *C. cæspitosa* and *C. vulgaris* (*Mant. iii. p. 158*); at least, I can detect no such evidence from the description of Goodenough, and I am not aware that any one, except Dr. Greville, on the authority of Fries (*p. 155*), has found the *C. cæspitosa*, L., in this country. I have in vain sought for it in all our Herbaria.

I can add nothing to the descriptions of this species, which Fries and Anderson ally to the *C. stricta*, Good., from its reticulated sheaths and deciduous perigynia. But the aspect is more that of *C. vulgaris*, from which the above characters, its caespitose fibrous (not creeping) root, the larger auricles, short bracts, biconvex nerveless perigynium, the solitary male spike, and the absence of male florets on the female ones, distinguish it. The scales have frequently a narrow white margin, and the form of the perigynium is often subrotund, or oval, or obovate. The specimens figured were sent to me by Fries, from Upsala. He at the same time mentioned that he has received it from Dr. Greville of Edinburgh, but no specimen exists in Dr. G.'s herbarium, and he has no recollection of ever finding it in Scotland. I have in vain sought for it in the herbaria to which I have had access; but I cannot doubt that a species so common in the North of Europe will eventually be found in Scotland.

62. *C. oligosperma* (Michaux); spicis 2-3 erectis densifloris, terminali mascula tenui cylindrica pedunculata nuda vel altera minori contigua bracteata sessili, foemineis 1-2 ovatis crassis paucifloris sessilibus evaginatissimis flavidis, suprema subinde apice mascula, infima remota saepe breve pedunculata; bracteis involutis, infima saepe culmo multum longiori; stigmatibus 3; perigyniis turgide ovatis inflatis breve rostratis, ore emarginato obliquo bidentato, nervosis glabris, squama late ovata obtusa mutica vel obtusa mucronulata ferruginea medio pallida nervata margine albo-hyalina longioribus.—*C. oligosperma*, *Mich.* ii. 174; *Dewey, Sill.* xi. 160; *Kunth, Cyp.* 499; *Tor. Mon.* 421; *Carey, l. c.* 535; *Sartwell, Eas. n.* 156. *C. Oakcsiana*, *Dewey, l. c.* xiv. 391 (1848); *Kunth, Cyp.* 499. (TAB. LXIII.)

HAB. In America septentrionali. Canada, *Michaux*. Cumberland House to Bear Lake, *Richardson*. White Mountains, New Hampshire, *Oakes, Tuckerman*. Lake Avalanche, New York, *Gray*. Michigan, *Torrey*. Oneida Lake, *Knieskern*.

*Culmus* 1-2-ped., gracilis, triquetus, laevis vel apice scabriusculus, basi vaginis foliorum rubris vel decoloribus tectus, foliisque vaginantibus inferne vestitus, superne nudus; pars spicas gerens 1-4 poll. longa. *Folia* involuta, angusta, culmo saepe longiora, demum flava. *Bractea* evaginatæ, involutæ: infima culmum subæquans vel eo multum longior. *Ligula* rotundata, ferruginea. *Spica mascula* 1-1½ poll. longa, ¾ lin. lata, ferruginea: altera minor sessilis, bracteata. *Spica foemineæ* 1-2, a se 8 lin. ad 2 poll. remotæ, 4-9 lin. longæ, 3-4 lin. latæ, plerumque sessiles, vel infima breve pedunculata. *Squamæ* ferrugineæ, margine albo-hyalinæ: masculæ arcte imbricatæ, lanceolatæ: nervo in inferioribus infra apicem evanescente, in superioribus saepe extra producto: foemineæ latiores, obtusæ vel acutæ vel mucronulatæ. *Perigynium* 2-3- $\frac{5}{10}$  lin. longum, 1- $\frac{2}{10}$ - $\frac{4}{10}$  lin. latum, abrupte vel sensim rostellatum (rostro  $\frac{2}{10}$ - $\frac{3}{10}$  lin. longo); stylo demum porrecto. *Achenium* 1- $\frac{1}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, ovali-vel obovato-triquetrum, basi styli apiculatum, fuscum.

This species, originally found by Michaux in Canada, and subsequently by Sir John Richardson, on his first journey with the late Sir John Franklin to the Polar Sea, was not known, I believe, as a native of the United States till discovered by Mr. Oakes at the base of the White Mountains of New Hampshire. His specimens were described by Dewey in 1848, under the name of *C. Oakcsiana*, the orifice of the perigynium said to be entire. I have abundant specimens from Mr. Oakes's locality, gathered by Tuckerman, which entirely agree with those from British America. I am not aware whether this species has been found south of New York.

Sir John Richardson, in his last Polar Expedition, brought very

characteristic specimens of this plant from Lake Superior, and with them, from the Methye Portage, an allied, but, I think, distinct species, which I have named after his friend and companion, Dr. Rae.

In 72 specimens of *C. oligosperma*, I find—

|                   |                 |                   |
|-------------------|-----------------|-------------------|
| 20 with 2 spikes. | 56 with 1 male. | 35 with 1 female. |
| 51 „ 3            | 16 „ 2          | 37 „ 2            |
| 1 „ 4             |                 |                   |

In 17 the upper female is male at top.

63. *C. Raeana* (Boott); spicis 3-4 erectis cylindricis, terminali mascula pedunculata nuda basi attenuata rarius altera minori sessili subremota bracteata, foemineis saepius 2 multifloris remotis olivaceo-purpureis sessilibus vel infima basi laxiflora subinde vaginata breve exserte pedunculata; bracteis culmum subæquantibus; stigmatibus 3; perigyniis oblongo-ovatis rostratis bifurcatis (laciniis acutis scabris saepe basi lobatis) inflatis nitidis nervatis fusco-olivaceis, squama lanceolata acuminata acuta vel cuspidata purpurea medio viridi margine albo-hyalina latioribus paulo longioribus.—*C. Raeana*, *Boott, Rich. Arct. Exp.* ii. 344 (1851). (TAB. LXIV.)

HAB. In America Boreali. Methye Portage, *Sir John Richardson*, 1848-9.

*Culmus* 1-1½-pedalis, gracilis, triquetus, laevis vel scabriusculus, basi vaginis pallidis reticulatis tectus; pars spicas gerens 5-8 poll. longa. *Folia* angusta, involuta, culmum æquantia, saepe curvata. *Bractea* basi amplectentes: infima interdum breve vaginata, culmum subæquans. *Vagina* 1-2 lin. longa. *Spica mascula* 1-1½ poll. longa, 1 lin. lata, laxa, basi attenuata, laxiflora, rarius altera minor bracteata, subpollicem remota. *Spica foemineæ* cylindricæ, 6-16 lin. longæ, 2½-3 lin. latæ, a se 2½-3 poll. remotæ, sessiles, vel infima saepe laxiflora, pedunculata, interdum breve vaginata. *Squamæ* masculæ lanceolatæ, pallide ferrugineæ, margine late albo-hyalinæ, laxæ, superiores mucronatæ: foemineæ lanceolatæ, acuminatæ, acutissimæ, inferiores saepe apice involutæ, ciliatæ, superiores hispido-mucronatæ. *Perigynium* (immaturum) 2-3 lin. longum, lineam latum, bifurcatum; laciniæ acutæ scabræ saepe basi lobatæ.

*C. oligosperma* affinis. Differt inflorescentia longiori; spicis 3 vel 4, rarius 2, foemineis cylindricis, multifloris, plerumque 2, omnino foemineis, infima laxiflora, interdum exserte pedunculata; perigyniis longius rostratis, bifurcatis, laciniis scabris, saepe lobatis; squamis foemineis angustioribus acuminatis.

I find in 18 specimens—

|                  |                 |                  |
|------------------|-----------------|------------------|
| 1 with 2 spikes. | 16 with 1 male. | 1 with 1 female. |
| 13 „ 3           | 2 „ 2           | 15 „ 2           |
| 4 „ 4            |                 | 2 „ 3            |

In 13 there is a sterile bract below the male spike.

64. *C. crus-corvi* (Shuttleworth); spica elongata, ambitu lanceolata, basi ramosa pallide viridi demum olivacea, e spiculis androgynis apice masculis parvis ovatis demum squarrosis arcte congestis sessilibus numerosis decomposita, ramis oblongis erectis contiguis omnino spiculiferis, inferioribus saepe longe setaceo-bractcatis; stigmatibus 2; perigyniis e basi truncata demum insigniter tumida spongiosa, ovatis sensim in rostrum longum lineare attenuatis bifidis antice alte fissis, marginibus superne acutis serratis, plano-convexis leviter nervatis stipitatis divaricatis, squama ovata acuta vel plus minus cuspidata pallida hyalina trinervi plus duplo longioribus.—*C. crus-corvi*, *Shuttleworth in litt.*; *Kunze, Riedgr. pp.*

128-166, t. 32, 42; *Carey, l. c.* 512; *Sartwell, Eas. n.* 17. *C. sicæformis*, *Boott, Bost. Journ. Nat. Hist.* v. 113 (1845). *C. Halei*, *Dewey, Sill.* ii. (ser. 2.) 248. *C. ornithorhyncha*, *Pl. Eas. Fendler (see. Kunze)*. *C. hystrix*, *Gray in litt. (see. Kunze)*. (TAB. LXV.)

HAB. In America septentrionali. New Orleans, *Drummond*, 432. Texas, *Lindheimer*. Florida, *Chapman*. St. Louis, *Engelmann*. Ohio, *Riddell*. Illinois, *Mead*.

*Culmus* 2-3-pedalis, validus, acutangulus, scaber, basi foliosus. *Folia* 3-6 lin. lata, culmo longiora, plana, apice attenuata. *Bractea* setacea: infima vel inferiores quandoque spica longiores, sæpe obsoletæ: basi bilobata. *Spica* 2½-5 vel 7-12 poll. longa, ½-1½ poll. lata: rami sæpe 1½-2½ poll. longi, vel abbreviati. *Spicula* demum squarrosæ. *Perigynium* 3-3½ lin. longum, inferne lineam latum, demum basi insigniter circumscriptione tumidum, spongiosum. *Achenium* lineam longum, ⅙ lin. latum, ovatum, basi productum, basi styli crassiori apiculatum.

I am not aware that Mr. Shuttleworth has published this species. Kunze says merely "Shuttleworth in litteris." I described it in October, 1842, for a Paper communicated to the Boston Journal of Natural History in that year, which was not published till January, 1845. It varies in the size of the spike, but I can see nothing from an extensive suite of specimens to justify making even a variety out of them. The occasional existence of exclusively male spiculae is accidental, and the greater or less elongation of the setaceous bracts and branches of the spike and the depth of the anterior fissure of the perigynium afford no constant characters. Kunze, in his description of Drummond's specimens, which are not fully mature, speaks of the perigynia as "basi membranaceo-dilatata," and so figures them; and in his subsequent description as "*dilatato-truncata*," his figure representing the remarkably prominent spongy rim of the base. This, I think, is the natural growth of the fully mature perigynium, the spongy substance being deposited between the anterior and posterior membranes as the fruit ripens, as occurs in *C. sterilis* and *C. exilis*, and occasionally throughout the perigynium in some species, making the mature form essentially different from the immature. I have a specimen from Dr. Torrey, from "the overflowed swamps of the Mississippi," where the species appears to attain its maximum development. Dewey had received it from Kentucky. Its northern limit appears to be Ohio and Illinois, extending south to Texas and Florida. Schweinitz, in his Analytical Table, has a *C. Nuttallii* from Arkansas, the spikes of which he describes as "corymbosely ramose," and as "near *C. Indica*." I am not aware of any species in the States of the habit of *C. Indica*. Does he refer to the present species?

65. *C. festiva* (Dewey); spica ovata vel subrotunda fusco-ferruginea nuda vel bracteata, e spiculis 6-12 androgynis basi masculis subrotundis simplicibus in capitulum arcte congestis composita; stigmatibus 2; perigyniis ovato-ellipticis attenuato-rostratis, ore albo-hyalino oblique antice secto demum bidentato, utrinque leviter nervatis, marginibus c basi acutis alatis, sursum e medio serrulatis, ferrugineis, squama lanceolata obtusiuscula ferruginea margine albo-hyalina paulo longioribus vel eam subæquantibus.—*C. festiva*, *Dewey, Sill.* xxix. 246; *Drejer, Rev. Crit.* 23; *Fries, Nov. Fl. Suec. Mant.* iii. 136; *ejusd. Sum. Veg. Scand.* 223; *Anderson, Cyp. Scand.* 63. t. 4. f. 27; *Lang, Car. Ger. et Scand.* 52; *Hooker, Fl. Bor. Am.* ii. 215; *ejusd. Fl. Antaret.* ii. 363. *C. incisodentata*, *Lechler, Pl. Magellanica, (Herb. Paris.)* (TAB. LXVI.)

HAB. In America septentrionali et meridionali, in Europa et Asia boreali. In Groenlandia, *Hornemann*. Una-

laschka, *Chamisso*. Cumberland House and Bear Lake, *Richardson*. Rocky Mountains, *Drummond*. Columbia River, *Seouler*. Oregon, *Nuttall*. New Mexico, *Fendler*, n. 882. Cordilleras, near Coquimbo, *Gay*. Straits of Magalhaens, *Anderson, Lechler*. Alps of Lapland and Finmark, *Fries*. Alps of Norway, *Anderson*.

Cæspitosa. *Culmus* 6-15-poll., validus, basi foliis vaginantibus rudimentisque foliorum castaneis tectus: superne nudus, acute triqueter, scaber. *Folia* 2 lin. lata, culmo longiora vel breviora. *Spica* 6-9 lin. longa, 6-8 lin. lata, nuda vel bractea sæpe subfoliacea spicam subæquante suffulta. *Spicula* 6-12, subrotundæ, 3-4 lin. longæ, 2-3 lin. latæ. *Squama* conformes, apice marginibusque albo-hyalinæ. *Perigynium* 2 lin. longum, 1 lin. latum, ferrugineum; rostro attenuato, fusco; ore albo-hyalino, antice fisso, bidentato: marginibus basi acutis, sursum alatis, serrulatis: utrinque leviter nervatum. *Achenium* ⅙ lin. longum, ½ lin. latum, oblongo-obovatum, basi styli æquali abrupte apiculatum, ferrugineum.

This species, so widely diffused from Greenland and Arctic America, along the Rocky Mountains, and from Unalaska and the Oregon to the Cordilleras and the Straits of Magalhaens, has never been found in the limits of the United States, but within a few years has been met with in the north of Europe. I am indebted to M. Spach for a sight of Lechler's *C. incisodentata* from Sandy Point.

66. *C. Purdiei* (Boott); spica oblonga fusco-ferruginea, e spiculis 8-12 androgynis basi masculis contiguis simplicibus inferioribus bracteatis composita; stigmatibus 2; perigyniis e basi ovata lanceolata plus minus attenuato-rostratis, ore integro oblique secto, nervatis inalatis apice ad margines interrupte tuberculato-dentatis ferrugineis demum fuscis, squama ovata acuta vel obtusa ferruginea nervo pallido longioribus. (TAB. LXVII.)

HAB. In America Meridionali. Bogs near the snow: Nevada de St. Martha, Columbia; Paramo de Cuchero, *W. Purdie (Herb. Hooker)*.

*Radix* repens; fibris validis, lignosis. *Culmus* 1½-ped., triqueter, scaber. *Folia* 1½-2 lin. lata, culmo breviora. *Bractea* e basi squamæformi setacea, spiculis suis longiores, vel infima angusta spicam subæquans. *Spica* 12-14 lin. longa, 6 lin. lata. *Spicula* 5 lin. longæ, 3 lin. latæ: superiores congestæ: inferiores discretæ: infima interdum subremota. *Squama* conformes, ferrugineæ, nervo pallido. *Perigynium* 1⅞-2⅞ lin. longum, ½ lin. latum, inalatum, versus apicem marginibus interrupte quasi tuberculis apiculatis dentatis. *Achenium* ⅞ lin. longum, ⅙ lin. latum, oblongo-ovatum, basi productum, biconvexum, basi styli conica apiculatum.

A *C. festiva* differt, spica oblonga, laxiori; perigyniis inalatis, nec attenuato-rostratis, apice tuberculato-dentatis; achenio oblongo-ovato; radice repente.

The peculiar roughness of the apex of the perigynium is not correctly drawn in the figure. It is not a continued series of fine serratures, as in *C. festiva*, but a more or less interrupted group of little, coloured, ovate tubercles, with short, setaceous apices, and the margins of the perigynium, as shown in the magnified apex of the perigynium at *d*, have too much the appearance of their being winged. The form of the perigynium, with its truncate orifice, the absence of winged margins, and the tuberculated roughness at their apex, with the oblong, loose spike, form evident characters to distinguish this species from *C. festiva*.

67. *C. alopecoidea* (Tuckerman); spica ovata vel oblonga demum castanea, e spiculis 8-12 androgynis apice masculis ovatis coarctato-congestis simplicibus setaceo-bracteatis, vel infima rarius composita remota subfoliaceo-

bracteata; stigmatibus 2; perigyniis ovatis acuminato-rostratis oblique sectis bifidis enerviis vel antice medio vel basi leviter 3-5-nervatis, nervis sæpius sursum evanidis, superne marginibus acutis serratis, plano-convexis basi spongiosis erecto-patulis flavidis castaneo-tinctis, squama ovata acuta hispido-cuspidata longioribus vel (cuspidem) subæquantibus.—*C. alopecoidea*, *Tuck. En. Method.* p. 18; *Carey, l. c.* 512; *Sartwell, Eas. n.* 19. *C. cephalophora*, var. maxima, *Dewey, l. c.* xliii. 92. (TAB. LXVIII.)

Var. *spica angustiori*, spiculis inferioribus discretis.—*Sartwell, Eas. n.* 74.

HAB. In America septentrionali. New York, *Sartwell*. Canada, *Maelagan*. Var., Michigan, *Cooley*.

*Culmus* sub-2-ped., latus, angulis acutissimis scabris; basi foliatus, reliquis foliorum fibratis nigrescentibus tectus. *Folia* 1½-3 lin. lata, culmo sæpe longiora, pallide viridia. *Bractea* setaceæ vel infima subfoliaceæ, spica sæpe longior. *Spica* 9 lin. ad 2 poll. longa, 4-7 lin. lata. *Spiculæ* 3-4 lin. longæ, 2-4 lin. latæ, omnes congestæ, sessiles vel inferiores discretæ: infima quandoque subremota, composita. *Squamæ* masculæ angustiores, lanceolatæ, acuminatæ, cuspidatæ, superne marginibus scabræ. *Perigynium* 1 $\frac{4}{10}$ -1 $\frac{8}{10}$  lin. longum, 1 $\frac{7}{10}$ -1 $\frac{8}{10}$  lin. latum, superne subalatum, quandoque enerve. *Achenium* 1 $\frac{8}{10}$  lin. longum, 1 $\frac{6}{10}$  lin. latum, suborbiculatum, basi productum, lenticulare, castaneum, basi styli æquali abrupte apiculatum.

A *C. muricata*, L., differt, spica congesta; spiculis pluribus, bracteatis, inferioribus plurifloris; perigyniis brevius rostratis, erecto-patulis; stylo basi æquali; squamis longius cuspidatis; culmo latiori, angulis acutissimis.

Carey refers an associated species found in Ohio, Kentucky, and Illinois, to the *C. vulpina*, Lin. It differs from the European plant in a simpler spike and a broader and more acutely angled culm, like that of *C. stipata*, of which I think it might be considered a variety with a brevi-rostrate perigynium. It differs from *C. alopecoidea* in its broader culm and nerved perigynia.

68. *C. macrocephala* (Willdenow); spica magna ovali ferruginæ demum fusca, e spiculis pluribus masculis apiceque masculis in capitulum amplum densum arcte congestis composita; stigmatibus 3; perigyniis maximis late ovatis sensim in rostrum longum attenuatis bicuspidatis antice altius sectis plano-convexis basi crasse spongiosis utrinque nervosis lucidis demum fuscis, marginibus inferne alatis irregulariter cartilagineo-dentato-laciniatis sæpe reflexis, squama ovato-lanceolata acuminata cuspidata nervosa ferruginæ latioribus longioribusque.—*C. macrocephala*, *Willd. Herb. ; Spr. Syst.* iii. 808; *Kunth, Cyp.* 428; *Hooker, Fl. Bor. Am.* ii. 215. t. 216; *Gray, Japan Exp.*, 328. *C. Menziesiana*, *Smith, Herb.* (TAB. LXIX.)

HAB. In Asia et America Boreali. Kamtschatka, *Bongard, H. Boott* (spec. e Fischero missum). Northwest coast, North America, *Menzies, Douglas*. In Japan, *Dr. Morrow (Herb. Gray)*.

*Culmus* 9-12-poll., validus, rigidus, triquetus, scaber, basi foliosus, reliquisque foliorum fibratis fuscis tectus. *Folia* 2-3 lin. lata, culmo longiora, rigida, carinata, serrato-scabra. *Bractea* filiformes, inferiores spicis suis longiores. *Spica* 1½-2 poll. longa, 12-14 lin. lata. *Spiculæ* omnino et apice masculæ, arcte congestæ. *Squamæ* conformes, masculæ angustiores. *Perigynium* 7-7½ lin. longum, 3 lin. latum, nervosum, nervis fuscis vix prominentibus. *Achenium* 2 lin. longum,

1 $\frac{2}{10}$  lin. latum, oblongum, obtusum, inæqualiter obtuse triquetrum, basi productum, fuscum, basi styli incrassata apiculatum: uno angulo indentato.

This fine species has been described as having the spiculæ male at base; but in the specimen found by Mr. Douglas they are occasionally entirely male, or male at top. In that specimen the perigynia are comparatively few to those on the specimen from Kamtschatka, sent to me by M. Fischer of St. Petersburg. Dewey alludes to a specimen found by Mr. Nuttall on the Rocky Mountains (*Sill. Journ.* xliii. 91), but he describes it as dioicous, with two stigmas, and I have not therefore ventured to quote him, especially as he says the perigynia are "marginè serrulatis." I have no idea to what species his *C. macrocephala* is referable. His *C. Nuttallii* (*Sill.* xliii. 92) is *C. Douglassii*, B. Dr. Gray includes this species among the plants found by Dr. Morrow in Japan.

69. *C. Deweyana* (Schweinitz); spica oblonga pallida albo-viridi demum lutescenti, e spiculis 3-6 parvis ovalibus laxis sessilibus plerumque androgynis basi masculis, superioribus contiguis, infima vel binis inferioribus remotis bracteatis; stigmatibus 2; perigyniis lanceolatis acuminato-rostratis bifidis plano-convexis marginè acutis serratis obsolete vel leviter nervatis tenuissimis basi spongiosis, squama ovata vel lanceolata acuta plus minus mucronata albo-hyalina nervo pallide viridi longioribus.—*C. Deweyana*, *Schw. An. tab. An. Lye. N. Y.* i. 62; *Schw. et Tor. Mon.* 310; *Tor. N. Am. Cyp.* 392; *Dewey, Sill. Journ.* ix. 62; *Kunth, Cyp.* 419; *Carey, Gray Bot.* 514; *Sartwell, Car. Easie. n.* 34. *C. remota*, *Rieh. Ap. Frank. Journ.* (ed. 2.) 35. (TAB. LXX.)

HAB. In America Boreali. Carlton House, *Richardson*. Rocky Mountains, *Drummond*. Oregon, *Nuttall, Wilkes*. Napa valley, California, *Thurber, n.* 11.

*Culmus* ½-4-ped., gracilis, debilis, sæpe decumbens, angulis acutis, scabris, basi foliosus; pars spicas gerens ½-2½ poll. longa. *Folia* 1-1½ lin. lata, culmo breviora, plana, mollia. *Bractea* infima plerumque setacea, plus minus longa, rarius culmum æquans, vel eo longior, reliquæ breviores, demum squamæformes. *Spiculæ* 3-5 lin. longæ, 2-8 lin. latæ, laxæ, 3-5, rarius 6: suprema plerumque major: infima interdum 1½ poll. remota: omnes basi parce masculæ, vel rarius quædam omnino masculæ, vel basi apiceque masculæ: vel fœmineæ. *Squamæ* albo-hyalinæ, plus minus mucronatæ. *Perigynium* 2 $\frac{1}{10}$ -2 $\frac{3}{10}$  lin. longum, 1 $\frac{6}{10}$ -1 $\frac{7}{10}$  lin. latum, tenuissimum, basi spongiose incrassatum, obsolete nervatum, vel basi leviter nervatum, nervis plus minus superne cyanidis. *Achenium* 1-1 $\frac{2}{10}$  lin. longum, 1 $\frac{6}{10}$  lin. latum, oblongo-ovatum, basi productum, castaneum, lucidum, punctulatum, compresso-biconvexum, basi styli clavato-decidua.

The specimens, not fully mature, from Oregon and California have six longer, more approximate spiculæ, shorter bracts, and a less acutely angled culm.

Drejer (*Symb.* p. 26), describing several species which he refers to his *Hymenochlænæ*, including the *Sylvaticæ* of Tuckerman, after his observations on *C. Cherokeeensis*, says: "Alia est species Americana, quæ licet diversa videatur, neque affinitatem quisquam adhuc opinatus est, huic (*C. Cherokeeensi*) intimo affinitatis vinculo connectitur. Dico *C. Deweyanam*, Schw., vulgo *Vigneis* adnumeratam."

The oval androgynous sessile spiculæ, evaginate bracts, plano-convex perigynium, lenticular achenium, and two stigmata, certainly widely separate *C. Deweyana* from the *Sylvaticæ*, and there remains only the thin membranous texture of the perigynium, the loose spiculæ, the white hyaline often mucronate scales, and the soft grassy leaves, to give plausibility to the idea of any affinity.

Tuckerman places it in the subsection "*Deweyana*" of his *Leptantheræ*, "*Vigneis inter et Carices*," associating *C. bromoides* and

*C. trisperma* with it, considering the *Leptantheræ* as "greges evolutione Vigneis nobiliores." It is to be regretted that one who had so closely studied the genus, should have omitted the characters of his sections and groups; and his having done so only proves to me how the best observers, in the present state of our knowledge, content themselves with shadowy perceptions of truth, which they feel would elude them in the grasp. If however we are, on a more enlarged acquaintance with the genus, to trace the higher groups from the *Psyllophoræ*, as the admirable Drejer supposes, future observers may be enabled to connect, by intermediate forms, *C. Deweyana* with the *Sylvaticæ*; but at present I know of no better arrangement than that of Tuckerman with respect to its affinities.

70. *C. Parryana* (Dewey); spicis 3-4 oblongo-cylindricis gracilibus erectis contiguis purpureo-albidis, terminali mascula vel basi mascula, reliquis fœmineis, infima exserte pedunculata, breve bracteata; stigmatibus 3; stylo exserto; perigyniis late ovalibus vel obovatis compresso-subtriquetris rostellatis, ore emarginato marginibusque superne ciliato-serratis, granulatis albidis purpureo-tinctis stipitatis, nervis 2 marginalibus, squamam late ovatam obtusam vel acutam mucronulatam purpuream, nervo pallido, margine late albo-hyalinam subæquantibus.—*C. Parryana* et *C. arctica*, Dewey, *Sill.* xxvii. 239 (1835); *Tor. Mon. N. Am. Cyp.* 426; *Boott, Hooker, Fl. Bor. Am.* ii. 216 (*excl. syn.!* et *hab. cit. a Bongard*). (TAB. LXXI.)

HAB. Carlton House, Am. arct., *Richardson* (1827).

*Culmus* subsesquipedalis, strictus, firmus, triquetus, granulatus, inter spicas scaber, basi foliatus; pars spicas gerens  $1\frac{1}{4}$ – $2\frac{1}{2}$  poll. longa. *Folia*  $\frac{1}{2}$ –1 lin. lata, culmo breviora, stricta, erecta, firma, linearia, carinata, apice setacco-attenuata, scabra, marginibus revoluta. *Bracteæ* 1–2, angustæ, scaberrimæ: infima rarius spicam æquans, basi vagina 1–2 lin. longa prædita: secunda spiculâ brevior amplectens. *Pedunculus* infimus 3–6 lin. longus, basi ocreatus. *Spicæ* 4–11 lin. longæ,  $1\frac{1}{2}$  lin. latæ: extremæ longiores: terminalis mascula vel basi vel apice et basi vel basi et versus apicem mascula: reliquæ omnino fœminæ, summa interdum abbreviata, infimaque basi attenuato-laxiflora; in uno specimine remota, longe pedunculata. *Perigynium*  $1-1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-obovatum, basi styli apiculatum, inæqualiter triquetrum, pallidum.

*C. arctica*, Dewey, is merely in a younger state, with shorter culms and darker scales. Though founded mainly on the terminal spike being "basi mascula," I find on reference to specimens that, of eight, six have the terminal spike male, while in *C. Parryana*, Dewey, out of nine specimens, only one has a male spike.

*C. arctica*, D. :—

|             |                                              |
|-------------|----------------------------------------------|
| 5 spicis 3. | 6 spica terminali mascula.                   |
| 3 spicis 4. | 2 spica term. basi et versus apicem mascula. |
| —           | —                                            |
| 8           | 8                                            |

*C. Parryana*, D. :—

|             |                                          |
|-------------|------------------------------------------|
| 4 spicis 3. | 1 spica terminali mascula.               |
| 5 spicis 4. | 6 spica terminali basi mascula.          |
| —           | 2 spica terminali basi et apice mascula. |
| —           | —                                        |
| 9           | 9                                        |

Torrey (*Mon. Cyp.* 426) remarks that Dewey (*Sill.* xxix. 252) in referring *C. Carltonia*, Dewey, to *C. stylosa*, Meyer, meant to refer it to *C. Parryana*. I was induced, in *Hook. Fl. Bor. Am.*, to suspect *C. Parryana* and *C. stylosa* were probably the same, judging from the description and figure of *C. stylosa* as given by Meyer, of which I had not at that time seen a specimen.

Tuckerman places *C. Parryana* in his *Acutæ*, between *C. hyperborea*, Dewey, and *C. vulgaris*, Fries; Drejer, I think more correctly, includes it in his *Melananthæ*, with *C. nigritella*, Drejer, and

*C. stylosa*. The difference, however, with reference to the immediate affinity of *C. Parryana*, is more apparent than real, though Tuckerman allies with it several species which I think, with Drejer, belong to separate and very distinct groups. The three stigmas, triquetrous achenium, the roughness of the orifice of the perigynium, and the vaginate bract separate *C. Parryana* from *C. acuta* and its allies.

*C. Carltonia*, Dewey, is *C. heleonastes*, Lin. Suppl.

71. *C. monile* (Tuckerman); spicis 4–5 rarius 3–6 cylindricis elongatis, masculis 3 rarius 2–4, infima bracteata, extremis longioribus, omnibus vel inferioribus interdum apice extremo fœmineis, fœmineis 2 rarius 1 remotis teretibus, vel infima basi attenuato-laxiflora plus minus longe pedunculata nutante nunc brevi-vaginata; bracteis culmo longioribus; stigmatibus 3; perigyniis subgloboso-ovatis breve rostratis glabris bifurcatis, ore sæpe obliquo, inflatis 8–10-nerviis lucidis pallidis sæpe purpureo-tinctis vel demum flavidis, squama lanceolata acuminata acuta ferruginea medio pallida trinervi margine albo-hyalina latioribus longioribusque.—*C. monile*, *Tuck. En. Method.* p. 20 (*ex parte*); *Boott, Journ. Bot.* v. 69; *Carcy, l. c.* 534; *Dewey, xlix.* p. 47; *C. bullata?*  $\beta$ , *Tor. Mon.* 422. (TAB. LXXII.)

HAB. In America septentrionali. Cumberland House to Bear Lake, *Richardson*. Rhode Island, *Olney*. New England, *Tuckerman*. Ohio, *Sullivant*.

*Culmus* 1– $2\frac{1}{2}$ -ped., gracilis, triquetus, acutangulus, scaber; pars spicas gerens 4–12 poll. longa. *Folia* 1–2 lin. lata, culmo breviora. *Bracteæ* culmo longiores: infima interdum breve vaginata. *Vagina* 2–4 lin. longa. *Pedunculi* 4 lin. vel infimus nunc  $1\frac{1}{2}$  poll. longi, glabri. *Spicæ masculæ* sæpius 3, alternæ, interdum remotæ, 1– $2\frac{1}{2}$  poll. longæ, 1– $1\frac{1}{2}$  lin. latæ. *Spicæ fœminæ* sæpius 2,  $1\frac{1}{4}$ – $2\frac{1}{2}$  poll. longæ, 3 lin. latæ, a se  $1\frac{1}{2}$ –5 poll. remotæ. *Squamæ* omnes conformes, lanceolatæ, acuminatæ, acutæ. *Perigynium*  $2\frac{2}{10}$ – $\frac{5}{10}$  lin. longum, 1– $1\frac{1}{2}$  lin. latum, breve rostratum. *Achenium* 1– $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, triquetro-obovatum, castaneum, basi styli apiculatum.

A *C. ampullacea* differt, culmo acutangulo, scabro; spicis fœmineis, paucioribus, gracilioribus. A *C. vesicaria*, perigyniis subglobosis, breve cylindrico-rostratis; spicis gracilioribus.

Tuckerman remarks of this species that it approaches *C. vesicaria* and his *C. bullata* (*C. Tuckermani*, B.) appearing to be intermediate between them. I find, in his herbarium, specimens associated with *C. monile*, from Penn-Yan (the *C. monile*, n. 152 of Sartwell's Collection), which do not agree with the original description of *C. monile*, or with the Ohio specimens, from which that description was made. They approach in aspect *C. vesicaria*, but differ from it and from *C. monile* in having a long cylindric serrated rostrum, an oblong-ovate perigynium, with elongated, sharp, rough lacinia. *C. monile* would seem to be a northern plant, for all the specimens I have seen from Arctic America and New England have perfect achenia, while in those from Ohio it is often abortive.

In twenty-nine specimens I find—

|                  |                |                  |
|------------------|----------------|------------------|
| 2 with 3 spikes. | 3 with 2 male. | 4 with 1 female. |
| 13 „ 4           | 24 „ 3         | 25 „ 2           |
| 13 „ 5           | 2 „ 4          |                  |
| 1 „ 6            |                |                  |

One or more of the lower male spikes—or, in one specimen, all three of them—are female at the apex.

72. *C. virescens* (Muhlenberg); spicis 2–5 cylindricis gracilibus vel oblongis approximatis erectis viridibus, terminali pedunculata basi mascula, reliquis fœmineis evaginatibus alternis, vel superioribus congestis sessilibus densifloris, infima (interdum remota breve exserte pedun-

culata) basi laxiflora; bracteis angustis culmo longioribus; stigmatibus 3; perigyniis ovalibus triquetris utrinque subacutis, vel obovatis erostratis, ore integro, nervosis strigoso-hirtis viridibus, squama ovata acuta vel obtusa acuminata vel cuspidata alba nervo viridi latioribus longioribus vel subæquantibus; foliis vaginisque hirsutis. — *C. virescens*, *Muhl.* 233; *Willd.* iv. 251; *Schk. f.* 147, *m. m. m.*; *Kunth*, 429; *Dewey, Sill.* ix. 259; *Sch. et Tor.* 321; *Tor. Mon.* 408; *Carey, l. c.* 523; *Sartwell, Ews. n.* 88; *Darlington*, 349. *C. costata*, *Schw. An. tab.* (TAB. LXXIII.)

HAB. In America septentrionali et meridionali. New England to Virginia. Venezuela, *Fendler n.* 1604 (*Herb. Gray*).

Cæspitosa. *Culmus*  $\frac{1}{2}$ –3-ped., triqueter, gracilis, sæpe filiformis, rigidus, basi rudimentis foliorum vaginisque reticulato-fissis pubescentibus purpureis tectus; sursum foliis longe vaginantibus vestitus; pars spicas gerens 2–5 poll. longa. *Folia* 1–2 $\frac{1}{2}$  lin. lata: superiora culmo sæpe longiora, vaginæque hirsuta. *Bractea* angustæ, sæpe setacæ, culmo longiores, evaginatae, vel infima vaginata, plus minus remota, sæpe sterilis. *Vagina*  $\frac{1}{2}$ –2 poll. longa. *Spicae* variant: vel 2–4 lineares, cylindricæ, 1–1 $\frac{1}{2}$  poll. longæ, 1–1 $\frac{1}{2}$  lin. latæ, alternæ; inferiores pedunculatæ, basi laxifloræ; infima interdum 1 $\frac{1}{2}$ –3 poll. remota: vel oblongæ, sæpe abbreviatæ, 2–5, densifloræ, 3–8 lin. longæ, 1–2 lin. latæ, alternæ, vel superiores sessiles, congestæ; infima subremota; terminalis pedunculata, basi subdimidiatim vel plus vel minus mascula. *Squamæ* albæ, nervo viridi: masculæ lanceolatae, acutæ: fœmineæ ovatae, acutæ vel obtusæ, acuminatae vel cuspidatae. *Perigynium* 1 $\frac{1}{10}$ – $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, triquetro-ovalc, utrinque subacutum, vel obovatum: vel latius, plano-triquetrum, utrinque obtusum, ore integro vel emarginato, undique strigoso-hirtum, viride, nervatum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, triquetrum, fuscum, punctulatum, breve stipitatum, basi styli decidua.

Tuckerman places this species in the group *Virescentes*, Kunth, between the *Montanæ* and *Laxifloræ*, associating *C. hirsuta* and *C. Shortii* with it.

73. *C. trisperma* (Dewey); spica pallida, e spiculis 2–3 remotis parvis paucifloris ovalibus androgynis basi masculis, inferioribus bracteatis; stigmatibus 2; perigyniis elongato-ovatis rostellatis, ore membranaceo integro oblique fisso, plano-convexis glabris utrinque crebre striato-nervosis, squama ovata acuta albo-hyalina nervo viridi longioribus.—*C. trisperma*, *Dewey, Sill. Journ.* ix. 63; *Schw. et Tor. Mon.* 311; *Carey, Gray, Bot.* 514; *Kunth, Cyp.* 406; *Sartwell, Car. Ews. n.* 30. (TAB. LXXIV.)

HAB. In America Boreali. Cumberland House, *Drummond*. New England to Pennsylvania and Michigan: swamps and woods on mountains, *Carey*.

*Culmus* gracillimus, debilis, acute triqueter, scaber, 1 $\frac{1}{2}$ –2-ped., basi foliatus; pars spicas gerens 8 lin. ad 2 $\frac{1}{2}$  poll. longa. *Folia* sæpe setacea, vel  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, culmo breviora. *Bractea* infima culmo brevior vel longior, altera spicâ mediâ longior. *Spiculæ* 2–3, ovales, 2–3 lin. longæ, 1 $\frac{1}{2}$ –2 lin. latæ, flosculis fœmineis 2–5 apice instructæ, basi 1–2 masculis, a se 5 lin. ad 1 $\frac{1}{2}$  poll. remotæ: infima vel binæ inferiores plus minus longe bracteatae: suprema rarius omnino mascula. *Squamæ* ovatae, acutæ, hyalino-albæ; nervo viridi. *Perigynium* 1 $\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, utrinque crebre leviter nervosum, ore integro, oblique fisso; demum fuscum. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, oblongo-ovatum, obtusum, plano-convexum, castaneum, lucidum, basi styli æquali decidua.

Allied more closely to *C. canescens*, L., than to *C. Deweyana*, with which Tuckerman places it. In inflorescence they are alike, but the form and texture of the perigynium and the entire oblique orifice prove, as Carey thought, its affinity to *C. canescens* and its allies. Torrey describes the culm as “remarkably smooth,” which all my specimens disprove; nor can I detect any roughness on the perigynium. Dewey refers *C. quaternaria*, Spr., to this species, but the description does not apply to it: “fructibus compressis, bifidis, squama obtusa multo longioribus.”

74. *C. scabrella* (Wahlenberg); spica elongata laxa pallida demum ferruginea, e spiculis singulis vel spicis partialibus 5–6 ovatis vel oblongis, superioribus sessilibus, inferioribus remotis longe exserte pedunculatis composita; spiculis parvis androgynis apice masculis 1–4 ovatis ad apicem pedunculorum congestis sessilibus; bracteis angustis spicis suis longioribus; stigmatibus 3; perigyniis ovalibus triquetris rostratis acute bifidis scabris nervosis viridibus demum ferrugineo-punctatis patentibus, squama ovata acuta hispido-cuspidata fulva lineolis ferrugineis notata longioribus.—*C. scabrella*, *Wahl. Act. Holm.* 149; *Willd.* iv. 247; *Kunth*, 513; *Schk.* 41. *C. laxa*, *Swartz, Fl. Ind. Occ. App.* (TAB. LXXV.)

HAB. In montibus Jamaica, *Swartz, Purdie, M. Nab.*

*Culmus*  $\frac{1}{2}$ –1 $\frac{1}{2}$ -ped., gracilis, rigidus, triqueter, apice scaber, basi vaginis foliorum fusco-ferrugineis tectus; pars spicas gerens sæpe e basi porrecta. *Folia*  $\frac{1}{2}$ –1 lin. lata, culmo longiora, rigida, apice attenuata, marginibus revolutis. *Bractea* inferiores vaginatae, foliaceæ: superiores setacæ. *Pedunculi* 1–8 pollices longi, setacei, scabri. *Spicae* partiales 5–6, ovatae vel oblongæ, 2–4-stachyæ, 4–10 lin. longæ, 3 lin. latæ: infima sæpe radicalis. *Spiculæ* (interdum omnes singulæ) 3–4 lin. longæ, basi 2 lin. latæ, apice plus minus masculæ, sessiles, pallidæ, demum ferrugineæ. *Squamæ* masculæ, lanceolatae, acutæ vel mucronatae, imbricatæ: fœmineæ patentes. *Perigynium* 1 $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium* 1 $\frac{1}{5}$  lin. longum,  $\frac{1}{2}$  lin. latum, stipitatum, triquetro-ovalc, fuscum, angulis pallidioribus, basi styli apiculatum.

The female scales are drawn as if ciliate at the margins, which is not correct. There is a slight roughness on the lower ones, but otherwise they are smooth, and simply marked with ferruginous lines.

In the younger specimens all the spiculæ are single, but in the older and larger ones three or four are closely approximated at the extremity of the peduncles. This species and the *C. polystachya* of Swartz are the only ones I have seen from the West Indies; nor am I aware that any others, except *C. cladostachya*, Wahl., have been found in them.

75. *C. aurea* (Nuttall); spicis 4 rarius 3–5 vel 6 pedunculatis gracilibus, terminali mascula breve cylindrica pallide ferruginea rarius basi mascula, reliquis fœmineis plerumque laxifloris olivaceis vel aurantiacis, superioribus vel omnibus approximatis, inferioribus longe bracteatis exserte pedunculatis interdum basi compositis, infima sæpe radicali subnutante; stigmatibus 2, rarissime 3; perigyniis globosis turgidis obtusissimis vel rarius minime rostellatis, ore integro, valide nervosis glabris granulatis glaucis demum olivaceis vel aurantiacis coriaceis basi spongiosis nunc apice paululum subexcurvis, squama late ovata obtusissima mutica vel abrupte cuspidata rarius acuta ferruginea medio pallida margine albo-hyalina demum pallidior subæquilata longioribus.—*C. aurea*, *Nutt. Gen.* ii. 205 (1818); *Kunth*, 408; *Schw. et Tor. Mon.* 328. *t.* 25. *f.* 2; *Hook. Fl. Bor. Am.* i. 226; *Carey, Gray,*

*Bot.* 520; *Sartwell, Eas. n.* 65. *C. mutica*, *Brown, Fr. Nar. Ap.* 763 (1823). *C. pyriformis*, *Schw. An. tab.*; *Dewey, Sill.* ix. 69; x. 48. (TAB. LXXVI.)

HAB. In America Boreali. Lake Michigan, *Nuttall*. Wooded country, Arctic America, lat. 54–64°, *Richardson*. Rocky Mountains, *Drummond*. Oregon, *Nuttall* (*Herb. Boott*). Hudson's Bay, *Keppert and Burke* (*Herb. Hooker*). Niagara, *Dewey*. Western parts of New York, *Torrey, Sartwell*.

Cæspitosa, stolonifera. *Culmus* 1–15 poll. altus, gracilis, scabriusculus, basi foliatus; pars spicas gerens 1–4, etiam 10 poll. longa. *Folia* 1–1½ lin. lata, plana, culmo breviora vel longiora. *Bractea* foliaceæ: inferiores culmo insigniter longiores, vaginatæ: infima sæpe 5–7 poll. longa: suprema sæpe spica sua brevior. *Vagina* infima 1–4 rarius 15 lin. longa, pallida. *Pedunculi* 1–15 lin. (vel infima interdum 6 poll.) longi, scabri. *Spica* terminalis mascula, 4–6 lin. longa, ⅔ lin. lata; vel androgyna, apice fœminea, 2 lin. lata. *Spica fœminea* 3–8 vel 10 lin. longæ, 2 lin. latæ: infima plus minus remota, sæpe radicalis: omnes rarius breve (vel infima solum) vaginatæ: laxifloræ, flosculis alternatim in rachim flexuosam dispositis; vel superiores subdensifloræ: infima vel binæ inferiores sæpe basi spiculis 1–2 brevioribus compositæ: spiculæ e perigynio egredientes vel e vaginula aristata exserte pedicellatæ. *Squamæ* conformes: masculæ obtusissimæ, rarissime cuspidatæ: fœmineæ rarius acutæ. *Perigynium* 1–1½ lin. longum, ⅞–1 lin. latum: sæpe stylo persistente exserto apiculatum, basi spongiosum, exsiccatione hinc pyriforme. *Achenium* ⅞–1 lin. longum, ⅞–1 lin. latum, orbiculatum, basi productum, lenticulare, eximie punctulatum, fuscum. *Stigmata* 2, rarissime 3.

The analysis of 88 specimens is as follows:—

|                 |                                          |
|-----------------|------------------------------------------|
| 1 had 2 spikes. | 75 with the terminal spike male.         |
| 16 „ 3          | 13 with the terminal spike male at base. |
| 53 „ 4          |                                          |
| 15 „ 5          |                                          |
| 3 „ 6           |                                          |

In 20 the lower or two lowest spikes were compound, and in 15 the lowest was radical. In one only were there any traces of male florets on the upper female spikes.

This very distinct species, originally found by Nuttall at Lake Michigan, extends from the western parts of the State of New York to the 60° of latitude in Arctic America, and to the Rocky Mountains and the Oregon.

Carey, I think correctly, allies it to the *Panicææ*, with which its globose, turgid, strongly nerved, and at times evidently subcurved perigynium unites it. Gay (*An. Sc. Nat.* 2 ser. xi. 191) includes it in his list of the *Acutæ*, and Tuckerman, in his group *Bicolores*, between *Limosæ* and *Atrata*. Nuttall places it among the species with three stigmata, and describes it as having three; but though I observe that number, it is the exception.

The specimens from Hudson's Bay are from one to two and a half inches high, with three to five spikes; but Sir John Richardson's, from Carlton House, are nearly as tall as the specimens from the States.

76. *C. lenticularis* (Michaux); spicis 5–6 rarius 2–7, cylindricis obtusis erectis alternatim approximatis, mascula 1 rarissime 2 vel terminali sæpe basi mascula, reliquis flavido-purpureis fœmineis, vel superioribus ima basi masculis, infima subinde remota basi attenuata sæpe vaginata pedunculata, inferioribus longe bracteatis; stigmatibus 2; perigyniis ovalibus vel ovatis cylindrico-rostellatis, ore integro, plano-convexis utrinque 2–5-nervatis pallide viridibus vel flavidis tenuissime granulatis glabris, squama oblonga rotundato-obtusa purpurea medio late

pallida 1–3-nervata apice anguste albida latioribus longioribusque.—*C. lenticularis*, *Mich. Fl. Bor. Am.* ii. 172 (*non Don*); *Kunth*, 407; *Gay, An. Sc. Nat.* xi. 191; *Hooker, Fl. Bor. Am.* ii. 219; *Carey*, 518. (TAB. LXXVII.)

HAB. In America Boreali: per tractus montium, e Sinu Hudsonis ad Canadam, *Mich.* Mackenzie's River to Canada, *Richardson, Drummond*. Lake Superior, *Loring*. Lake Avalanche, State of New York, *Torrey, Gray*. White Mountains, New Hampshire, *Tuckerman, Oakes*.

Cæspitosa. *Culmus* 6–15-poll., triqueter, firmus, erectus, lævis, apice scaber, basi foliosus; pars spicas gerens 2½–6 poll. longa. *Folia* 1–2 lin. lata, culmo longiora vel breviora, pallide flavescencia; vaginis sæpe ferrugineo-punctatis. *Bractea* inferiores foliaceæ, culmo longiores, basi involutæ, infima sæpe vaginata. *Ligula* elongata, marginibus adnata, purpurea, demum pallida. *Vagina* 2–8 lin. longa. *Pedunculus* infimus 2–9 lin. etiam 2 poll. longus. *Spica* terminalis 8–12 lin. longa, 1–1½ lin. lata, omnino vel subdimidiatim basi mascula, altera minima rarius ad ejus basin sita. *Spica* reliquæ 3–18 lin. longæ, 1½ lin. latæ: superiores sæpe plus minus ima basi masculæ: infima semper fœminea, 1½–3 poll. remota, basi attenuata, sæpe exserte pedunculata. *Squamæ* omnes obtusæ, conformes. *Perigynium* ovale, ⅞ lin. longum, ½ lin. latum, biconvexum, achenium arcte tegens: vel 1½ lin. longum, ⅞ lin. latum, superne vacuum, plano-convexum, glabrum, leviter sæpe obsolete nervatum. *Achenium* ⅞–1 lin. longum, ½ lin. latum, fuscum, ovale vel obovatum, basi styli æquali abrupte apiculatum.

Ad *C. tortam*, Boott, culmo lævi, perigyniis sæpe ovatis, superne vacuis, accedit. Tamen (æque a *C. verticillata*, Boott) spicis erectis nec compositis, superioribus basi (nusquam apice) masculis, bracteis culmo longioribus, ligula elongata, perigyniis nervatis, differt.

In 30 specimens I find—

|                  |                                    |
|------------------|------------------------------------|
| 2 with 2 spikes. | 12 with 1 male.                    |
| 14 „ 5           | 2 „ 2 males.                       |
| 13 „ 6           | 16 „ terminal spike male at base.  |
| 1 „ 7            |                                    |
|                  | 8 with upper female, male at base. |
|                  | 7 „ 2 upper females, male at base. |
|                  | 1 „ 3 upper females, male at base. |

The other specimens are too young to show the distribution of the stamens.

We have no description of this species except by Michaux and Kunth. Its discovery in the State of New York was subsequent to the publication of the first edition of Gray's Flora. Pursh confounded it with *C. granularis*, and Dewey with *C. irrigua*, next to which (*C. paupercula*, M.) Michaux had placed it. He takes no notice of the number of stamens, but describes the perigynium as lenticular, and the terminal spike as male. Kunth, who had authentic specimens, describes it as “inferne mascula.” Michaux says, “*capsulis muticis*,” but Kunth, more correctly, “*brevissime rostellatis*.” In the brief mention of it by Gay in the *An. Sc. Nat.*, he notices the variation in the terminal spike, but alludes to the perigynium as nerveless. Kunth more correctly says, “*utriculis nervosis*.” It is an alpine species, growing in moist places. Michaux says he found it “*præsertim ad Lacum Cynorum*,” Loring met with it at Lake Superior; Tuckerman at *Willey's Pond*, and Oakes at the *South Notch Pond on the White Mountains*; Torrey and Gray at *Lake Avalanche, New York*.

77. *C. longirostris* (Torrey); spicis 5–6 rarius 3–7 pallidis, masculis 2–3 rarius 1–4, terminali interdum vel infima vel omnibus rarius basi fœmineis contiguis oblongis vel cylindricis stramineis, fœmineis 2–4 laxifloris re-



motis, suprema evaginata sæpe vel binis superioribus rarius apice masculis, longe pedunculatis demum pendulis, inferioribus brevissime vaginatis, infima nunc subradicali longissime exserte pedunculata; stigmatibus 3, longis; perigyniis orbiculatis longe lineari-rostratis, rostro margine serrato, ore albo-hyalino obliquo integro vel bifido, pallide viridibus demum stramineis enerviis vel basi obsolete nervatis inflatis facile deciduis, squama ovali lanceolata acuminata acuta cuspidata albo-hyalina nervo viridi scabro latioribus longioribus vel subæquantibus.—*C. longirostris*, *Tor. N. Am. Cyp.* 370 (1825); *Dewey, Sill.* ix. 257; *Kunth, Cyp.* 518; *Carey, Gray, Bot.* 535; *Sartwell, Car. Eas. n.* 157. *C. Sprengelii*, *Dewey, Spr. Syst.* 827 (1826). (TAB. LXXVIII.)

HAB. In America Boreali, in sylvis. New England to Michigan, Illinois, Carlton House, *Richardson*. Rocky Mountains, *Drummond*.

*Culmus* 1½–4-ped., gracilis, triqueter, superne scaber, basi reliquiis foliorum fibratis pannosus, foliisque vaginantibus sursum vestitus; pars spicas gerens 6–8, etiam 12 poll. longa. *Folia* 1½–2 lin. lata, culmo breviora, plana. *Bractea* infima foliacea, culmum sæpe æquans, plerumque vaginata: suprema setacea, plus minus longa, sæpe spica sua multo brevior, evaginata. *Vagina* 1–3 lin. longæ: infima spicæ subradicalis interdum pollicaris. *Pedunculi* 3 lin. ad 5 etiam 7 pollices longi, setacei, scabri. *Spica masculæ* 5–15 lin. longæ, 1–1½ lin. latæ, contiguæ, sessiles, vel infima subremota, pedunculata, setaceo-bracteata. *Spica femineæ* 8 lin. ad 1½ poll. longæ, 3–4 lin. latæ, a se 8 lin. ad 1–2 infima interdum 5–8 poll. remotæ: suprema sæpe apice mascula: laxifloræ demum pendulæ. *Squamæ masculæ* angustiores, lineares, muticæ vel cuspidatæ, albæ, vel stramineæ vel ferrugineæ, nervo viridi, laxæ vel imbricatæ: *femineæ* ovali-lanceolatæ, acuminatæ, acutæ, cuspidatæ vel superiores muticæ. *Perigynium* 3 lin. longum, 1– $\frac{2}{10}$  lin. latum: rostro 1– $\frac{6}{10}$ – $\frac{8}{10}$  lin. longo, pallidiore, margine plus minus scabro, ore albo-hyalino demum bifido. *Achenium* 1– $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovato-tripectrum, faciebus superne convexis; inferne excavatis, flavescens, basi styli obliqua crassiori apiculatum.

This example of the *Sylvaticæ* group is found in the northern part of the United States. The analysis of 36 specimens I have examined is as follows:—

- 5 had 1 male spike; in 1 female at base.
- 15 " 2 " " in 2 the two lower female at base.
- 14 " 3 " " in 1 the terminal, and in 1 all female at base.
- 2 " 4 " " in 1 all female at base.
- 6 " 2 female spikes; in 2 the upper male at apex.
- 19 " 3 " " in 11 the upper and 2 the two upper male at apex.
- 11 " 4 " " in 7 the upper and 1 the two upper male at apex.

The female spikes issue from hyaline ocreæ, which are visible in the upper ones, and in the highest the ocrea at its base has an evident resemblance to a perigynium; but in one of the male spikes, generally the middle one, the spike issues from a distinctly modified perigynium, which is expanded at the orifice, and bearing in some cases traces of stigmata. I have observed this transition from the ocrea to a perigynium in other species, especially in *C. littorea*, from New Holland, and in *C. pumila*, from Japan; the last I think inseparable from the first, judging from specimens which Dr. Asa Gray has kindly enabled me to examine lately, collected by Dr. Morrow, of the United States' Expedition to Japan. This modification of form in the ocrea explains its nature, and also what I had considered as a saccate scale, so remarkable in many of the East Indian paniced species.

78. *C. Cherokeeensis* (Schweinitz); spicis 5–11 pallidis

cylindricis, masculis 2–3 vel terminali rarius basi fœminea contiguis, fœmineis 3–9 remotis bracteatis, suprema sæpe sessili, reliquis exserte pedunculatis nutantibus simplicibus vel mediis inæqualibus geminatis ternatisve, infima solitaria, omnibus interdum apice masculis; stigmatibus 3, longis; perigyniis ovatis vel lanceolatis attenuato-brevirostratis, ore hyalino-albo integro oblique fisso demum rupto, inflatis obsolete nervatis glabris vel superne ad margines parce dentatis pallide stramineis membranaceis, squama lanceolata acuminata acuta vel hispido-cuspidata pallida concolori latioribus longioribus.—*C. Cherokeeensis*, *Schw. An. tab.*; *Schw. et Tor. Mon.* 369. t. 25. f. 1; *Tor. Mon.* 422 (*excl. syn. Muhl. n.* 46, *C. Davisii, Tor.*); *Dewey, Sill. Journ.* xi. 160; *Drejer, Symb.* 25. t. 12; *Sartwell, Car. Easie. n.* 122. *C. recurva, Muhl. Descr. n.* 55 (*vide Dewey*). *C. Christyana, Boott, Bost. Journ.* v. p. 5. (TAB. LXXIX.)

HAB. In America Boreali et California. Louisiana, *Hale*. Alabama, *Buckley*. Texas, *Drummond*. Santa Rosa Creek, California, *Thurber, n.* 20.

*Culmus* 1–2½-ped., validus, lævis, inter spicas scaber, apice gracilis, basi foliatus, foliis vaginantibus vestitus; pars spicas gerens 8–14 poll. longa. *Folia* plana, 1½–2 lin. lata, culmo breviora vel æquantia. *Bractea* foliacea, vaginata: infima interdum culmum æquans: summa setacea. *Vaginæ* inferiores 1–1½ poll. longæ. *Ligula* brevis, ferruginea. *Pedunculi* inferiores 2–3 poll. longi, setacei, scabri. *Spica masculæ* 8–20 lin. longæ, ½–1 lin. latæ, extremæ longiores pedunculatæ, vel omnes sessiles: infima bracteata: terminalis rarius basi fœminea. *Spica femineæ* 6–20 lin. longæ, 3–4 lin. latæ: suprema sæpe rarius omnes apice plus minus masculæ: omnes simplices, vel mediæ sæpe geminatæ ternatæque: infima solitaria. *Squamæ* pallidæ, concolores: masculæ obtusæ, muticæ: fœmineæ lanceolatæ, acuminatæ, acutæ, muticæ, vel inferiores plus minus longe cuspidatæ, rarius emarginatæ. *Perigynium* 2– $\frac{4}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum, ovatum, magis turgidum: vel lanceolatum, attenuato-rostratum; rostro plus minus longo, interdum fere omnino albo-hyalino; ore integro, oblique fisso, facile rupto; membranaceum, sæpe sub lente punctis pallide ferrugineis maculatum, glabrum vel superne ad unum vel alterum marginem parce dentatum, nervis concoloribus inconspicuis. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo) lineam longum,  $\frac{7}{10}$  lin. latum, orbiculato-trigonum, angulis obtusis pallidis, faciebus ferrugineis concavusculis punctulatum, basi styli æquali apiculatum.

Drejer takes no notice of the fascicled spikes, though one of his specimens figured in his 'Symbolæ' has the upper female one geminate. He describes the orifice of the perigynium, in his specific character, as "*bilobo*," and in his description as "*obliquum, antice profundius fissum*." His admirable figure is in accordance. The orifice normally is entire and oblique, but easily ruptured. The perigynium figured Tab. LXXIX. is one of the lanceolate and less turgid form. The nerves are too distinct, and the emargination of the female scale is not typical.

My acquaintance with this species at the time I described Drummond's specimen from Texas, under the name of *C. Christyana*, was limited to the excellent figure and description of Dr. Torrey, in his monograph, and I was misled by the compound inflorescence, especially of the Texan plant, which had not been noticed by any one. The specimen of Thurber, from California, is young, but does not differ in the form of the spikes from Torrey's figure.

The analysis of the specimens I have seen of *C. Cherokeeensis* is as follows:—

|                                                  |                                 |
|--------------------------------------------------|---------------------------------|
| 2 had 5 spikes.                                  | 5 had 2 male.                   |
| 4 „ 6                                            | 3 „ 3 male.                     |
| 1 „ 7                                            | 1 terminal, female at the base. |
| 1 „ 8                                            | 2 terminal, female at the base, |
| 2 „ 10                                           | and one male.                   |
| 1 „ 11                                           |                                 |
| —                                                | —                               |
| 11                                               | 11                              |
| —                                                | —                               |
| 1 had 3 female, all single.                      |                                 |
| 4 „ 4 female, all single.                        |                                 |
| 1 „ 6 female, all single.                        |                                 |
| 1 „ 4 female, upper one geminate.                |                                 |
| 1 „ 4 female, penultimate one geminate.          |                                 |
| 1 „ 7 female, two middle ones geminate.          |                                 |
| 1 „ 7 female, second ternate, next geminate.     |                                 |
| 1 „ 9 female, second ternate, two next geminate. |                                 |
| —                                                |                                 |
| 11                                               |                                 |

79. *C. flexilis* (Rudge); spicis 3–5 ferrugineis demum pallidis subapproximatis, terminali mascula ovali vel oblonga pedunculata, reliquis foemineis 2–4 oblongis vel cylindricis alternis brevissime vaginatis longe exserte pedunculatis pendulis laxis, infima saepe subremota bracteata rarius (vel summa) geminata; stigmatibus 3, brevibus; perigyniis lanceolatis sensim rostratis pallidis, ore ferrugineo bidentato obliquo ciliato, pellucide punctatis leviter nervatis nervis superne evanidis glabris superne vacuis stipitatis, squama ovata obtusa vel acuta ciliata rarius cuspidata apice ferruginea basi pallida nervo viridi vel pallido longioribus; culmo foliisque pilosis.—*C. flexilis*, *Rudge, Lin. Trans.* vii. 98. t. 10. f. 1 (1803); *Carey, Gray, Bot.* 528; *Sartwell, Car. Ews. n.* 121. *C. blepharophora*, *Gray, An. Lyc.* iii. 237 (1835); *Dewey, Sill.* iii. 59 (1836). (TAB. LXXX.)

HAB. Newfoundland, *Rudge*. Northern part of the State of New York, *Gray, etc.*

Culmus, folia (infra et ad margines), vaginæ bractæque pilis longis albis vestitæ!—*Culmus* gracilis, 1–2-ped., firmus, obtusangulus, sulcatus, erectus, lævis, basi rudimentis foliorum purpureis tectus, foliisque vaginantibus inferne vestitus; pars spicas gerens 2–4 poll. longa. *Folia culmea* 1–1½ lin. lata; inferiora breviora, lanceolata, sursum longiora, culmo multum breviora; vaginæ inferiores ferrugineæ: *radicalia* 2–3 lin. lata, culmo longiora, subrigida, plana, nervis duobus supra notata. *Bractea* infima angusta, saepe setacea, culmo brevior: reliquæ plerumque squamæformes, aristatæ. *Vagina* infima 2–3 lin. longa, pallida: reliquæ brevissimæ, saepe hiantes. *Ligula* ad margines bractæ alligata, pallida. *Pedunculi* 4 lin. ad 1½ poll. longi, setacci, læves. *Spica mascula* 6–10 lin. longa, 1–2 lin. lata, utrinque acuta, erecta. *Spica foeminea* 4–12 lin. longæ, 2–3 lin. latæ, a se 4 lin. ad 3 poll. remotæ, erectiusculæ vel omnes demum pendulæ: rarius summa vel infima geminata. *Squamæ* omnes ciliatæ, pellucide punctatæ: masculæ imbricatæ, obtusæ vel acutæ; inferiores nervo pallido infra apicem evanescente; superiores ad apicem vel paulo ultra attingente, ferrugineæ vel demum pallidiores: foemineæ laxiores, obtusæ vel acutæ vel cuspidatæ, pallidæ vel superne ferrugineæ, basi pallidæ. *Perigynium*  $2\frac{6}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, basi obtuse triquetrum, superne vacuum, membranaceum, in rostrum sensim acuminatum; rostro ad apicem rarius dentato; ore anticæ obliquo, bidentato. *Achenium* 1–1½ lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, oblongo-triquetrum, stramineum; faciebus superne convexiusculis, inferne excavatis; basi styli æquali apiculatum.

This species, originally described by Rudge in 1803, from a

Newfoundland specimen in Herb. Banks, escaped observation till Dr. Gray discovered it in the State of New York, and described it in the 'Annals of the Lyceum' in 1834, under the name of *C. blepharophora*. Kunth and Drejer were not acquainted with it. It would seem to be local in its range in the States, and was not found by the explorers of the Arctic regions.

Dr. Gray places it between *C. sylvatica* and *C. miliacea*. It differs from the *Sylvatica* in the rigid hairy leaves and culm, the ferruginous scales without aristæ, the non-membranous orifice of the perigynium, the short stigmata and spikes; but in the occasional tendency to geminate spikes, and in the punctate perigynium, it has some affinity with *C. Cherokeeensis*; and to *C. longirostris* in the abbreviate, almost obsolete, bracteal vaginæ. Tuckerman places it in his group *Flexiles* with *C. Cherokeeensis*, and Carey adopts this arrangement, associating *C. capillaris* with it, saying nothing of *C. Cherokeeensis*, which did not come within the limits of Gray's Flora. It is remarkably constant in the solitary male spike, and in the entire absence of male florets on the female spikes. I have never observed any such at their base, as stated by Carey.

80. *C. Crawei* (Dewey); spicis 4–5 rarius 3–6 oblongis densifloris erectis remotis, terminali mascula pedunculata ferruginea rarius ad ejus basin altera minori arcte sessili, reliquis foemineis flavidis, omnibus inserte vel infima saepe subradicali plus minus longe exserte pedunculata, una vel altera saepe uno latere vel utrinque basi composita; stigmatibus 3, brevibus; perigyniis oblongo-ovalibus vel ovoideo-ovatis erostratis vel rostellatis rectis, ore leviter emarginato vel integro, teretibus vel obtuse triquetris subturgidis nervatis (nervis concoloribus, superne saepe inconspicuis) flavescenti-viridibus postea flavidis demum ferrugineis, squama late ovata obtusa vel acuta mutica, vel ad apicem spicæ breve cuspidata castanea, nervo pallido, margine hyalina latioribus longioribusque.—*C. Crawei*, *Dewey, Sill.* ii. (ser. 2) 246 (1846); *Carey, Gray, Bot.* 521; *Sartwell, Ews. n.* 69. *C. heterostachya*, *Tor., Dewey, l.c.* 248. (TAB. LXXXI.)

HAB. In America septentrionali. New York to Michigan.

Stolonifera. *Culmus* 5–9-poll., rigidus, obtusangulus, lævis, erectus, saepe curvatus; pars spicas gerens 4–7 poll. longa. *Folia* 1–1½ lin. lata, culmo multum breviora, rigida, saepe conduplicata, curvata, flavescenti-viridia. *Bractæ* vaginatæ, planæ, erectæ, rigidæ, culmo breviores, omnes spicis suis duplo vel triplo longiores. *Vagina* infima ½–1½ poll. longa, suprema rarius obsoleta. *Pedunculus* infimus 1–2½ poll. longus, obtusangulus, rigidus, erectus, lævis vel scabriusculus. *Spica mascula* 7–10 lin. longa, 1–2 lin. lata, ferruginea, pedunculata, e spica foeminea 1–1½ poll. remota rarissime medio foeminea; rarius altera arcte contigua. *Spica foeminea* 3–4, rarius 2–5, densifloræ, ½–1 poll. longæ, 3–4 lin. latæ, a se 1–4 poll. remotæ, una vel altera basi composita, e ramulis 1–2 perigynio egredientibus. *Squamæ* masculæ oblongæ, obtusæ, muticæ: foemineæ vel cuspidatæ, vel inferiores obtusæ, muticæ, superiores breve cuspidatæ: omnes nervo pallido, margine plus minus albo-hyalinæ. *Perigynium*  $1\frac{5}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, (sub lente) granulatum, rectum, rarissime apice subexcurvum, demum fusco-ferrugineum. *Achenium* 1 lin. longum,  $\frac{5}{10}$  lin. latum, trigonum, basi productum, fuscum, punctulatum, basi styli æquali apiculatum.

I find that in sixty-eight specimens,—

|                 |                |                 |
|-----------------|----------------|-----------------|
| 5 had 3 spikes. | 46 had 1 male. | 4 had 2 female. |
| 32 „ 4          | 19 „ 2.        | 44 „ 3          |
| 24 „ 5          |                | 18 „ 4          |
| 7 „ 6           |                | 2 „ 5           |

In three specimens the terminal male had female florets near

the summit. In five specimens the upper female, and in five the two lower, were compound at the base.

*C. microdonta*, Tor., and *C. alveata*, B., are not yet sufficiently known.

A *C. alveata* differt squamis brevioribus uninerviis, perigyniis nervis concoloribus nec prominentibus.

A *C. microdonta* differt culmo foliis bracteisque rigidis brevioribus, spica mascula sæpius 1 nusquam 3-4, squamis masculis muticis obtusis brevioribus, spicis fœmineis brevioribus latioribusque.

In *C. microdonta* (Drummond, n. 439) bractea infima sæpe pedalis, flaccida.

81. *C. conoidea* (Schkuhr); spicis 3-4 rarius 2 oblongis densifloris, terminali mascula pallide ferruginea pedunculata, reliquis fœmineis subolivaceis bracteatis, superioribus approximatis vel subremotis, suprema sessili, inferioribus exserte pedunculatis, infima sæpe remota nutante; bracteis superioribus culmum subæquantibus; stigmatibus 3; perigyniis ellipticis utrinque obtusis vel apice conicis obtuse triquetris, ore integro, resinoso-punctatis superne pallide viridibus basi ferrugineis glabris crebre nervosis (nervis sulcatis), squama ovata acuta plus minus longe hispido-cuspidata albida medio late viridi trinervi carina scabra longioribus vel brevioribus.—*C. conoidea*, *Schk. v. v. v.*, f. 168; *Willd.* iv. 280; *Kunth*, 452; *Tuck. En.* 15; *Tor. Mon.* 414; *Carey, Gray, Bot.* 522; *Sartwell, Car. Ears. n.* 82; *Hooker, Fl. Bor. Am.* ii. 226. *C. granularoides*, *Schw. An. tab.*; *Dewey, Sill.* ix. 262, et x. 47; *Kunth*, 453. *C. tetanica*, *Schw. et Tor. Mon.* 347 (*non Schk.*). (TAB. LXXXII.)

HAB. In America septentrionali. From Canada, *Todd*, to the mountains of Virginia and North Carolina, *Gray, Carey*.

*Culmus* 1-1½-ped., gracillimus, acutangulus, scaberrimus, basi foliorum rudimentis ferrugineis tectus; pars spicas gerens 2½-6, etiam 12 poll. longa. *Folia* 1-1½ lin. lata, culmo breviora. *Bractea* (nisi suprema) vaginata: superiores culmum subæquant, sæpe longiores: infima eo brevior. *Vagina* triquetra, scabra: infima 3 lin. ad 1½ poll. longa. *Pedunculus* infimus ½-5½ poll. longus, scaber. *Spica mascula* ½-1 poll. longa, lineam lata, pallide ferruginea, plus minus longe pedunculata. *Spica fœminea* 2-3, rarius 1, a se 8 lin. ad 2½ poll., vel infima sæpe 10 poll. remotæ, 4-11 lin. longæ, 2-3 lin. latæ: suprema sessilis: inferiores insertæ vel plus minus longe exserte pedunculatæ. *Squama* masculæ pallide ferrugineæ, obtusæ, muticæ, nervo viridi infra apicem albidum evanescente, vel in superioribus paulo extra producto: rarissime lanecolatæ, acuminatæ, cuspidatæ: infima sæpe aristata: fœmineæ albidæ, margine demum plus minus ferrugineo-tinetæ, medio late viridi trinervi: inferiores plerumque longe acuminato-cuspidatæ, perigynio longiores: superiores eo breviores. *Perigynium* 1½-1¾ lin. longum, ⅙-⅓ lin. latum, obtuse triquetrum, angulis rotundatis, utrinque obtusum, vel apice subrostellatum, minime subexcurvum. *Achenium* ⅓-1⅓ lin. longum, ⅙ lin. latum, obcordatum, triquetrum, castaneum, basi styli æquali apiculatum.

In forty-six specimens I find—

|                 |                |
|-----------------|----------------|
| 5 had 2 spikes. | In all 1 male. |
| 25 „ 3          |                |
| 16 „ 4          |                |

82. *C. Meadii* (Dewey); spicis 3-2 rarius 4-5 oblongis vel cylindricis remotis, terminali mascula pedunculata sæpe elongata ferruginea demum pallida, reliquis fœmineis densifloris crassiusculis, superioribus sessilibus evaginatis sæpe abbreviatis, inferioribus exserte pedunculatis,

infima subinde remota cylindrica basi laxiflora; bracteis culmo brevioribus; stigmatibus 3; perigyniis triquetro-ellipticis utrinque attenuatis, ore integro subexcurvo, crebre nervosis flavidis, squama ovata obtusa mutica vel acuta plus minus cuspidata ferruginea nervo pallido granulato longioribus.—*C. Meadii*, *Dewey, Sill. Journ.* xliii. 90 (1842); *Tuckerman, En.* 15; *Sartwell, Ears. n.* 80. *C. panicea*, *Carey, Gray, Bot.* 521. (TAB. LXXXIII.)  
HAB. In America Boreali. Ohio, Illinois, Michigan.

*Culmus* 7-20-poll., subvalidus, firmus, apice scaber, basi foliis vestientibus tectus; pars spicas gerens 2-14 poll. longa. *Folia* 1-2 lin. lata, culmo multum breviora, rigida, pallide viridia, marginibus revolutis. *Bractea* foliaceæ, culmo semper breviores: inferiores vaginatæ. *Vagina* infima 2-22 lin. longa. *Pedunculus* infimus 4-7 poll. longus, scaber. *Spica mascula* semper unica, 7 lin. ad 1½ poll. longa, 1¼-2 lin. lata, plus minus longe pedunculata, cylindrica vel nunc basi acuta, abbreviata, obovata, ferruginea, demum sæpe pallida. *Spica fœminea* 2-1, rarius 3-4, a se subpollicem vel infima 4-9 poll. remotæ, 5-15 lin. longæ, 3-4 lin. latæ, purpureæ viridi pictæ, demum flavescentes, densifloræ: infima sæpe basi attenuata. *Squama* ferrugineo-purpureæ, demum pallidiores, præcipue ad medium granulata: masculæ sæpe decolores, obtusæ: rarius lanecolatæ, subacutæ, infima rarius aristata: fœmineæ obtusæ, muticæ, vel acuminatæ, plus minus (præcipue inferiores) cuspidatæ, medio 1-3-nervosæ. *Perigynium* 1⅓-2 lin. longum, ⅙-1⅓ lin. latum, demum flavidum, ore ferrugineo vel concolori, tenuissime granulatum. *Achenium* 1⅓-1⅔ lin. longum, ⅙-1⅓ lin. latum, trigono-obovatum, facibus basi exeavatis, pallidum, basi styli æquali abrupte apiculatum.

In 102 specimens I observe—

|                   |                |
|-------------------|----------------|
| 26 with 2 spikes. | In all 1 male. |
| 65 „ 3            |                |
| 10 „ 4            |                |
| 1 „ 5             |                |

In one specimen only was the upper female spike male at apex. In three the lower female was compound at base, from an axis bearing a perigynium and scale issuing from a perigynium.

*C. panicea*, L., cui opt. *Carey* accedit, certe valde affinis. Differt spicis crassioribus, densifloris, mascula semper unica, subinde longiori; perigyniis triquetris, nec turgidis, magis nervosis, pallidis; squamis longe cuspidatis, 1-3-nervatis; culmo rigidiori, scabro.

Forsan pro varietate majori *C. tetanica* habenda, quæ solum differt culmo graciliori, lævi; foliis angustioribus; spicis gracilioribus, magis remotis; squamis fœmineis sæpius obtusis, muticis; bracteis longioribus.

83. *C. tetanica* (Schkuhr); spicis 3-2 rarius 4 oblongis vel cylindricis remotis, terminali mascula longe pedunculata ferruginea demum pallida, reliquis fœmineis basi attenuato-laxifloris gracilibus omnibus (infima sæpe subradicali longissime) exserte pedunculatis flavidis; bracteis sæpe culmo longioribus; stigmatibus 3; perigyniis triquetro-ellipticis utrinque attenuatis rostellatis, ore integro recto vel subexcurvo, demum flavidis crebre nervosis nervis prominentibus, squama rotundata obtusissima mutica vel ovata acuta abrupte vel sensim cuspidata ferruginea margine albida nervo viridi granulato longioribus vel æquantibus.—*C. tetanica*, *Schk. t.* 100 et 207; *Tor. Mon. N. Am. Car.* 414; *Dewey, Sill.* xi. 312; *Carey, Gray, Bot.* 521; *Sartwell, Car. Ears. n.* 68. *C. Woodii*, *Dewey, Sill.* ii. 249 (*ser.* 2), 1846; *Sartwell, Ears. n.* 79. (TAB. LXXXIV.)

HAB. In America septentrionali. New England to Ohio and Michigan.

*Culmus* 12-18-poll., gracilis, striatus, lævis, inter spicas scabriusculus, basi foliatus; pars spicas gerens 4-9 etiam 18 poll. longa. *Folia* 1 rarius 2 lin. lata, graminea, pallide viridia, culmo breviora, marginibus revolutis. *Bractea* foliaceæ, vaginata, culmum æquantes vel eo breviores vel sæpe longiores: suprema sæpe evaginata. *Pedunculus* infimus 4-6 vel radicalis nunc 12 poll. longus, setaceus, scaber. *Vagina* 4-18 lin. vel infima interdum 3 poll. longa. *Spica mascula* semper unica, 7-21 lin. longa,  $1\frac{1}{2}$  lin. lata, cylindrica, ferruginea, demum pallida, a feminea suprema 1-3 poll. remota. *Spica feminea* 2 vel 1 rarius 3, a se 4-6 etiam 15 poll. remota, 5-12 lin. longæ, 2 lin. latæ, graciles, sublaxæ, basi attenuatæ: suprema, si 3 adsint, sessilis, evaginata; si 2 solum, breve *inserte*, infima sæpe longissime *exserte* pedunculata: demum flavida. *Squamæ* ferrugineæ, nervo pallido-granulatæ: maseulæ sæpius obtusissimæ, muticæ, vel inferiores cuspidatæ: infima sæpe aristata: femineæ pallidiores, obtusissimæ, vel acutæ, muticæ, vel abrupte vel sensim (interdum omnes, inferiores longius) cuspidatæ. *Perigynium*  $1\frac{3}{10}$ - $1\frac{9}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, brevius obtusum, hinc obovatum, abrupte rostellatum; vel longius, utrinque attenuatum, rectum, vel apice subexcurvum, obtuse triquetrum, crebre nervosum, nervis prominentibus, granulatum, flavidum, nunquam inflatum. *Achenium* 1- $1\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, triquetrum, obovatum, basi productum, castaneum, angulis pallidioribus, basi styli æquali abrupte apiculatum. *Stigmata* 3, brevia. *Stylus* interdum inerassatus, granulatus, ex ore perigynii exsertus.

In perigyniis quibusdam achenium invenitur formam quasi squamæ rigidæ simulans, marginibus approximatis, processum linearem, stylo cylindrico inerassato apiculatum, involventibus. Hinc stigmata quatuor videantur, tria normalia et unum c proecessu lineari!

I find in 160 specimens—

|                  |                |
|------------------|----------------|
| 37 had 2 spikes. | In all 1 male. |
| 107 „ 3          |                |
| 16 „ 4           |                |

I have specimens from Dewey from Stockbridge, Massachusetts, with perigynia distorted by the ustilago, like those represented by Schk. *g. g. g.* His figure 207 is not from a well-characterized specimen.

84. *C. granularis* (Muhl.); spicis 4-5 rarissime 3-6 cylindricis, terminali mascula sessili sæpe abbreviata obliqua, reliquis femineis longe foliaceo-bracteatis densifloris erectis, superioribus 1-2 masculæ arcte contiguas inserte vel omnibus remotis, inferioribus exserte pedunculatis pallide viridibus demum ferrugineis; stigmatibus 3, brevibus; perigyniis ovalibus vel globoso-ovatis antice gibbis turgidis rostellatis apice subexcurvis, ore emarginato pallido, crebre nervosis nervis prominentibus pallide viridibus demum ferrugineis resinoso-punctatis squama ovata acuminato-cuspidata albida nervo viridi latioribus longioribusque.—*C. granularis*, *Muhlenberg, Desc. Ub.* 247; *Schk. f.* 169. *v. v. v.*; *Willd.* iv. 279; *Kunth*, 457; *Dewey, Sill.* vii. 272; *Schw. et Tor.* 349; *Darlington*, 348; *Carey, Gray, Bot.* 521; *Sartwell, Ews. n.* 70. (TAB. LXXXV.)

HAB. In America Boreali. Canada to Florida.

*Culmus* 1-2-ped., lævis, basi foliatus, vaginisque foliorum mareidis tectus; pars spicas gerens 4-12 poll. longa. *Folia* 1-4 lin. lata, culmo breviora, plana, glaucescentia. *Bractea* foliaceæ, vaginata: infima 2-3 lin. lata: sæpe omnes culmo longiores. *Vagina* infima interdum 2 poll. longa, summa fere obsoleta. *Pedunculus* infimus 2-4 poll. longus. *Spica mascula*

5 lin. ad  $1\frac{1}{2}$  poll. longa,  $\frac{1}{2}$ - $1\frac{1}{4}$  lin. lata, semper sessilis vel subsessilis, hinc spicam supremam femineam nunquam multum superans, sæpe inconspicua, obliqua, cylindrica. *Spica feminea* 6 lin. ad  $1\frac{1}{2}$  poll. longæ, 2-3 lin. latæ: superiores 1-3, contiguæ, inserte pedunculatæ, vel omnes 1-7 poll. remotæ, plus minus exserte pedunculatæ, omnes densifloræ. *Squamæ* pallidæ, demum ferrugineæ: maseulæ lanecolatæ, acutæ, vel acuminatæ, cuspidatæ, rarius obtusæ, sæpe sublaxæ: femineæ ovatæ, acuminato-cuspidatæ, albida, nervo viridi, demum ferrugineæ. *Perigynium* ovale vel globosum, antice gibbum,  $1\frac{3}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{9}{10}$  lin. latum, plus minus turgide inflatum, (sub lente) scabriusculum. *Achenium*  $\frac{8}{10}$ -1 lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, obovato-triquetrum, demum fuscum, punctulatum, basi styli æquali sæpe eurvata apiculatum.

Affinis *C. flaccosperma*. Differt spica maseula semper sessili vel subsessili; perigyniis sæpe globosis, gibbis, semper rostellatis, apice excurvis; nervis paucioribus, prominentibus, squama acuminata; bracteis longioribus.

In 125 specimens I find—

|                 |                |
|-----------------|----------------|
| 2 had 3 spikes. | In all 1 male. |
| 65 „ 4          |                |
| 54 „ 5          |                |
| 4 „ 6           |                |

In four the lower or two lower female spikes were compound at base, and in one of these the lowest had a small branch on both sides.

This species is common in the middle States, extending from Canada to North Carolina and Florida. It has not been found in the more remote North, and Elliott had not met with it in South Carolina. I have never seen the terminal spike androgynous, as described by Torrey.

85. *C. grisea* (Wahlenberg); spicis 5 rarius 4-6 oblongis, terminali mascula abbreviata sessili obliqua rarius pedunculata cylindrica pallide ferruginea, reliquis femineis foliaceo-bracteatis sub-9- vel 4-13-floris remotis vel superioribus 2 contiguas sessilibus vel inserte vaginatis, inferioribus plus minus longe exserte pedunculatis pallide viridibus vel olivaceis demum ferrugineis; stigmatibus 3, brevibus; stylo incrassato; perigyniis oblongis utrinque obtusis subturgidis obtuse trigonis, ore integro, crebre striato-nervosis basi demum omnino ferrugineis pelucide postea ferrugineo-punctatis, squama late ovata obtusa vel acuminata plus minus longe hispido-valideque cuspidata albida medio viridi trinervi longioribus vel (*cuspidate*) brevioribus.—*C. grisea*, *Wahl. Act. Holm.* xxiv. 154 (1803); *Carey, Gray, Bot.* 522; *Sartwell, Ews. n.* 83; *Darlington*, 348. *C. laxiflora*, *Schk. f.* 141. *k. k. k. et aliorum*; *non Lamarck, Enc.* iii. 392 (1789), quæ *C. anceps*, *Willd.?* (TAB. LXXXVI.)

*β. angustifolia*.—*C. laxiflora*, *Elliott, Sk. Bot. Car.* ii. 549. (TAB. LXXXVII.)

HAB. In America Boreali. Connecticut, *Barratt*. Massachusetts, *Tuckerman*. New York, *Carey, Sartwell*. Kentucky, *Short*. Ohio, *Lesqueræus*. Indiana, *Clap*. Illinois, *Mead*. Var. *β*, Texas, *Drummond*. Louisiana, *Hale*. Florida, *Chapman*. Carolina, *Schweinitz* (*fide Elliott*).

*Culmus* 1-2-ped., triquetrum, lævis vel apice scabriusculus, basi foliis mareidis vaginantibusque vestitus; pars spicas gerens 3-12 poll. longa. *Folia* 2-3 lin. lata, culmo breviora, plana, graminea, pallide viridia. *Bractea* foliaceæ, erectæ, omnes vel superiores tantum culmo sæpe multum longiores: infima sæpe 3 lin. lata: summa nunc evaginata. *Vagina* infima 1-3 poll. longa. *Ligula* alba, membranacea, obtusa. *Pedunculus*

infirmus  $1\frac{1}{2}$ –4 poll. longus. *Spica mascula* 4–12 lin. longa,  $\frac{1}{2}$ –1 lin. lata, nuda, sessilis, obliqua, interdum inconspicua: rarius plus minus pedunculata, cylindrica. *Spica femineæ* 4 rarius 2–5, oblongæ, 4–12 lin. longæ, 2–3 lin. latæ: superiores 1, plerumque 2 masculæ arcte contiguæ: inferiores a se  $\frac{1}{2}$  ad 8 poll. remotæ, subdensifloræ: infima solum basi laxiflora. *Squamæ* albidæ, demum lineolis ferrugineis tinctæ: masculæ angustiores, lanceolatæ, acutæ vel cuspidatæ, vel nervo viridi infra apicem obtusum rotundatum evanescente, vel in eadem spica extra producto: femineæ late ovatæ, obtusæ vel acuminatæ, medio viridi trinerves: inferiores sæpe longe valideque cuspidatæ (hinc perigynio longiores), divergentes: superiores brevius cuspidatæ, eo breviores. *Perigynium*  $2\frac{2}{10}$ – $4\frac{4}{10}$  lin. longum,  $1$ – $1\frac{2}{10}$  lin. latum, demum sub lente ferrugineo-maculatum. *Achenium*  $1\frac{2}{10}$ – $1\frac{4}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, obovato-triquetrum, basi productum, castaneum, punctatum, basi styli æquali apiculatum. *Stylus* insertus, supra basin incrassatus. *Stigmata* brevia.

Var.  $\beta$ ; culmo graciliori; foliis angustioribus; spicis gracilibus, laxifloris; perigyniis minus turgidis, apice sæpe subrostellatis; squamis femineis minus nervatis, semper tenuiter cuspidatis; vaginis infimis foliorum purpureis, gaudet. In uno specimine spica infima basi composita.

This plant had been considered as the *C. laxiflora* of Lamarck, until Carey corrected the error in Gray's Botany. The only evidence we have as to the character of *C. laxiflora*, Lam., is from his description from the remarks of Schlechtendal (Linnaea, iii. 258. (1835) on a specimen in Willdenow's herbarium, which he compared with *C. blanda* and *C. oligocarpa*, sent to him by Dr. Torrey. Lamarck's character, "spicis femineis filiformibus, flosculis distantibus;" and again, "les épis femelles garnies de fleurs alternes, distantes, blanchâtres," (New York, Pennsylvania, Virginia,) will not apply to *C. grisea*, Wahl.

Slechtendal says that in Willdenow's herbarium, is a specimen, "n. 17,256, *C. nematostachya*, W.," "cum hac diagnosi: "Spica mascula oblonga solitaria, femineis 3 tenuissime filiformibus, infima pedunculata, fructibus oblongo-lanceolatis alternis squama brevioribus;" and Schlechtendal adds, "Specimen Parisiis acceptum, sub nomine *C. laxifloræ*, Lam., hæc habet in schedula, Willdenowii manu scripta, 'Est vera *C. laxiflora*, Lam.' Suppetens specimen, planta quidem integra, sed in statu juniore, ita ut difficile est dictu, quacum ex tuis conveniat. *Blandæ et oligocarpeæ* valde affinis dicitur, quarum priori adderem, nisi res ambigua esset."

From this it may safely be inferred from Lamarck's description, and from the specimen which Willdenow received from Paris, and which he considered the true *C. laxiflora*, Lam., that that plant is not *C. grisea*, Wahl., but probably a form of *C. anceps*, of which Dr. Torrey considered *C. blanda*, Dewey, to be a variety.

In 70 specimens of *C. grisea* I find—

|                   |                |
|-------------------|----------------|
| 15 with 4 spikes. | In all 1 male. |
| 49 „ 5            |                |
| 6 „ 6             |                |

In one only have I seen male flowers at the apex of the female spikes, and no tendency to composition.

This species is common from Connecticut to Kentucky, and westward. Torrey gives it a wider limit. It was not found in Arctic America by Richardson and Drummond, and the only southern form I have seen is the var.  $\beta$ , and the following (unclassically named) species, which I think is distinct from *C. grisea*.

86. *C. flaccosperma* (Dewey); spicis 5–4 rarius 6–7 cylindricis, terminali mascula abbreviata sessili obliqua vel sæpe pedunculata clavata, reliquis femineis foliaceo-bracteatis multifloris, suprema mascula arcte contigua inserte, inferioribus remotis eaverte pedunculatis, infima sæpe nutante, pallide viridibus demum ferrugineis; stigmatibus 3, brevibus; stylo æquali; perigyniis oblongis utrinque obtusis rarius rostellatis, ore integro

vel emarginato, crebre striato-nervosis basi demum omnino ferrugineis pellucide postea ferrugineo-punctatis, squama late ovata acuta mutica vel mucronata albida demum ferruginea plerumque uninervata plus duplo vel tertio longioribus rarius ad basin (*mucronem*) æquantibus. —*C. flaccosperma*, Dewey, Sill. ii. (ser. 2) 245 (1846); Sartwell, Eas. n. 84. *C. laxiflora*, var.  $\beta$ , Torr. N. Am. Cyp. 414; Carey, Gray's Bot. 522. (TAB. LXXXVIII).

HAB. In America Boreali. New Jersey, *Knieskern*. West Chester, Pennsylvania, *Townsend*. Louisiana, *Hale*. Texas, *Drummond*, 3 Coll. n. 438. 442.

*Culmus* 1– $1\frac{1}{2}$ -ped., lævis; pars spicas gerens 6–15 poll. longa. *Folia* 2–4 lin. lata, culmo breviora, glauca. *Bracteæ*  $1\frac{1}{2}$ –3 lin. latæ: superiores culmo longiores, omnes vaginatæ vel summa rarius evaginata. *Vagina* infima  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longa. *Pedunculus* 1–4 poll. longus, gracillimus. *Spica mascula* 4–14 lin. longa,  $\frac{1}{2}$ – $1\frac{1}{2}$  lin. lata, nuda vel sæpe bracteata, sessilis, inconspicua vel sæpe pedunculo unciali instructa. *Spica femineæ* 9 lin. ad  $1\frac{1}{2}$  poll. longæ, 2–3 lin. latæ, a se 1–6 poll. remotæ, rarissime superiores apice parce masculæ, densi-multifloræ, plerumque suprema solum masculæ contigua, rarius evaginata: infima sæpe demum nutans. *Squamæ* pallidæ, demum ferrugineæ: masculæ lanceolatæ, acutæ, nervo infra vel extra apicem producto; in speciminibus Pennsylvanicis obtusæ, muticæ, latiores: femineæ late ovatæ, acutæ, muticæ, vel nervo centrali sæpius solum conspicuo, plus minus in mucronem exserto. *Perigynium*  $1\frac{2}{10}$ – $2\frac{1}{2}$  lin. longum,  $\frac{2}{10}$ – $1\frac{2}{10}$  lin. latum, scabritie quadam (sub lente) obsitum, utrinque obtusum vel in speciminibus e Louisiana clare rostellatum, ore subemarginato. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, elliptico-obovatum, utrinque acutiusculum, basi styli æquali apiculatum. *Stylus* æqualis, insertus.

A *C. grisea* differt spicis longioribus, multifloris, densifloris, magis distantibus; squamis sæpe muticis, nec unquam longe valideque cuspidatis, minus nervatis; bracteis brevioribus; stylo æquali; foliis bracteisque glaucis.

I have found in 46 specimens—

|                   |             |
|-------------------|-------------|
| 13 with 4 spikes. | All 1 male. |
| 28 „ 5            |             |
| 4 „ 6             |             |
| 1 „ 7             |             |

The upper females rarely with a few male flowers at apex, and the lower as rarely compound at base.

Its range is from New Jersey to Louisiana.

87. *C. laxiflora* (Lamarck). (TAB. LXXXIX.—XCIII.)

1. Perigyniis ellipticis, apice attenuatis; rostro leviter rarius repente excurvo.

A. Foliis angustis.

\* Spicis laxifloris, cylindricis, angustis. (Tab. LXXXIX.)

- C. laxiflora*, Lam.
- C. striatula*, Mich.
- C. anceps*, Schw. et Tor. etc.
- C. ignota*, Dewey.

\*\* Spicis densifloris, oblongis, latioribus. (Tab. XC.)

- C. styloflexa*, Buckley.
- C. fusiformis*, Chapman.

B. Foliis latis.

\* Spicis laxifloris, cylindricis.

- C. plantaginea*, Schk. f. 195 (non Lam.).
- C. anceps*, var. *patulifolia*, Carey, ed. 1.

2. Perigyniis obovatis; rostro abbreviato, repente rarius leviter excurvo.

A. Foliis angustis.

\* Spicis laxifloris, cylindricis, angustis.

a. perigyniis rostro subabbreviato recto vel leviter excurvo.

C. anceps, Willd. iv. 278; Schk. f. 128.

b. perigyniis rostro breviori, repente excurvo. (Tab. XCI. Fig. 1.)

\*\* Spicis densifloris, oblongis, latioribus.

a. major. } (Tab. XCII.)

b. minor. }

c. gracillima. (Tab. XCI. Fig. 2.)

C. blanda, Dewey.

C. conoidea, Muhl. (non Schk.).

C. anceps, var. striatula, Carey, ed. 1.

B. Foliis latis.

\* Spicis laxifloris, cylindricis. (Tab. XCIII.)

C. anceps, var. latifolia, Short.

87. *C. laxiflora* (Lamarck); spicis 4-5 rarius 3-6 cylindricis, terminali mascula elongata pedunculata rarius abbreviata sessili, reliquis foemineis elongatis laxifloris remotis, vel superioribus inserte vaginatis contiguus, inferioribus longe exserte pedunculatis, infima saepe subradicali; bracteis inferioribus culmo brevioribus; stigmatibus 3; perigyniis triquetro-ovalibus utrinque attenuatis obtusangulis apice leviter excurvo vel subrecto, ore hyalino integro oblique secto, nervosis pallidis, squama acuta vel obtusa rarius truncata plus minus cuspidata vel mutica albo-hyalina nervo viridi longioribus vel (*infimis cuspide*) brevioribus.—*C. laxiflora*, Lam. Enc. iii. 392. *C. striatula*, Mich. ii. 173. *C. anceps*, Schw. et Tor. 343; Dewey, Sill. x. 36; Carey, Gray, Bot. 554. ed. 1; Sartwell, Exs. n. 95. *C. ignota*, Dewey, vi. (scr. 2.) 348; Sartwell, Exs. n. 97. (TAB. LXXXIX.)

HAB. Connecticut to Florida. Oregon, Nuttall.

*Culmus* 1-1½-ped., gracilis, vel latior, angulis acutis, seabris, basi foliis vaginatis, rudimentis foliorum pallidis tectus; pars spicas gerens 4-15 poll. longa. *Folia* 2-4 lin. lata, culmo breviora, plana. *Bractea* 1½-4 lin. lata, omnes, nisi suprema interdum setacea, spicis suis longiores: inferiores multum (saepe omnes) culmo breviores. *Vagina* infima ½-2½ poll. longa: superiores marginibus acutis, apice rarius undulatis. *Ligula* alba, membranacea, obtusa, fissa: infima demum rupta. *Pedunculus* infimus 2-6 poll. longus, seaber, acutangulus, basi compressus. *Spica mascula* 6-16 lin. longa, lineam lata, plus minus longe pedunculata, basi attenuata, rarius sessilis, inconspicua. *Spicae foemineae* 10-19 lin. longae, 1-2 lin. latae, omnes cylindricae, remotae, laxiflorae, flosculis (1-2 supremis saepe abortivis) alternatim dispositis, inferioribus magis distantibus: vel superiores interdum oblongae, subdensiflorae, masculae contiguae: una vel altera basi, e perigynio prolifero, composita: rachis apice alternatim oblique flexuosa. *Squamae* albo-membranaeae, nervo viridi, demum masculae praecipue, pallide ferrugineae: masculae lanceolatae, obtusae, rarius acutae, nervo infra apicem evanescente, vel in supremis subinde extra producto: infima breve cuspidata: foemineae aetuae, rarius obtusissimae, truncatae, plus minus cuspidatae, vel superiores praecipue obtusae, muticae. *Perigynium* 1- $\frac{6}{10}$ -2- $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum, plus minus apice attenuatum, leviter excurvum, vel subrectum; ore hyalino, oblique secto, integro, rarius emarginato. *Achenium* 1-1 $\frac{6}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, obovato-triquetrum, castaneum, punctulatum, basi styli obliqua vel recta apiculatum.

This, I think, may be considered as the typical form of *C. laxiflora*. Both Schkuhr and Willdenow refer the name of *C. anceps* to Muhlenberg, though in his 'Descriptio Uberior,' published eleven years after Schkuhr's Second Part, there is no species so named. The only reference to *C. anceps* in it is, as a synonym,

with a query, under *C. plantaginea*, to which Muhlenberg probably referred the broad-leaved variety. It is singular that if Muhlenberg had this variety he should have omitted all reference to Schkuhr's fig. 195. He quotes fig. 128, and yet, after giving *C. heterosperma*, Wahl., as a synonym, he adds, "*C. anceps*, Schk. ?," as if he had doubts of his previous reference to the figure of that species. Schlechtendal (Linnaea, iii. 1835) refers all the specimens in Willdenow's Herbarium to *C. blanda*, Dewey. In answer to Dr. Torrey, he says: "*C. anceps*, 17,227: spec. folii primi a Muhlenberg data sunt; secundi ab alio accepta. '*Carex*, Wilmington, Carol. sept.' Hæc omnia ad *C. blandam*, Dewey, abs te acceptam, pertinent." Yet Dewey (Sill. Journ. xxv. 144) remarks that the *C. conoidea* of Muhlenberg's herbarium is *C. blanda*. It is impossible from this confusion of specimens to quote accurately the synonymy of the varieties I have ventured to enumerate; but any one who will compare Dewey's description of *C. blanda* with the fig. 128 of Schkuhr will find it impossible to distinguish the one from the other, and I have not hesitated to quote that figure under the second division of the varieties I have proposed. It has not the fully attenuated apex of the perigynium, nor the greater laxity of the female spikes, which I consider to be the distinguishing character of the typical form, and in so placing it I have the authority of Schlechtendal, who pronounced Willdenow's specimens to be *C. blanda*. Dr. Torrey (Schw. and Tor. Mon. 343) says: "Willdenow received from Muhlenberg all the North American *Carexes*, of which he has given descriptions, and the identical specimens were by him communicated to Schkuhr, who had no others from this country. This fact was told us by Prof. Willdenow himself a short time before his death."

The varieties I have indicated will serve, I think, to make *C. laxiflora* better known. I can see no characters to justify a specific distinction in the southern *C. ignota*. I find nearly the same elongation of the perigynium (2-2 $\frac{4}{10}$  lin.), alluded to by Dewey, in specimens from Pennsylvania and elsewhere, and it is exceeded in this respect (2 $\frac{6}{10}$  lin.) by the specimens I have from the Oregon, from Mr. Nuttall. The greater or less attenuation of the apex of the perigynium is in fact visible occasionally on one and the same specimen; nor is there a single character, whether form of the perigynium or scale, length of the bracts or vagina, breadth of leaves or culm, but varies so much as to forbid of our availing of either for specific distinctions. Any one meeting for the first time with the specimens (Tab. XCII. Fig. 1, from Texas; and Tab. LXXXIX. from Florida), and comparing them, might reasonably consider they were different species; but on a larger acquisition of specimens, he would find intermediate forms that almost insensibly unite them: and the—perhaps inevitable—perplexity of the synonymy of *Carex* has arisen from species having thus been made from isolated specimens, rather than from a critical examination of the varied forms which now enrich our herbaria. I have had the opportunity of comparing my own with the very extensive suite of specimens in Herb. Carey, and the result is the tabular view here given of the varieties of *C. laxiflora*.

With respect to the name of this species, that of Wahlenberg, published in the Act. Holm. 1803, should have had preference over that of Muhlenberg, published by Willdenow in 1805; but Lamarck had described it as early as 1789 (Ency. iii. 392) under the name of *C. laxiflora*. His description is, "Spicis foemineis filiformibus axillaribus erectis, flosculis distantibus, foliis planis." "Ses tiges viennent en touffes, 7-9 pouces. Feuilles larges de 2½-3 lignes. L'épi mâle à peine long d'un pouce, droit, pâle ou jaunâtre. Les épis femelles 3, filiformes, long d'un pouce, garnis de fleurs alternes, distantes, blanchâtres, à écailles mucronées et membraneuses.—New York, Pennsylvania, Virginia."

Though Poiret (Suppl. Ency. iii. 243. 1813) quotes (under Lamarck's *C. laxiflora*) Willdenow and Schkuhr's fig. 141, which belong to *C. grisea*, Wahl., this affords no evidence that he had seen Lamarck's specimen, which Schlechtendal, judging from an authentic one in Herb. Willdenow (17,256), considered to be *C. blanda*. I have referred *C. striatula*, Mich., here, as his specimen in the Herbarium of the Garden of Plants at Paris clearly belongs to the typical form. I have confined myself to limit the geographical range of the different varieties by the evidence derived from specimens in my own and Mr. Carey's herbarium.

In 97 specimens of the typical form I find—

|                   |                                     |
|-------------------|-------------------------------------|
| 28 with 3 spikes. | In 2 only the lower female compound |
| 42 „ 4            | at base; in one the terminal spike  |
| 24 „ 5            | male at base.                       |
| 3 „ 6             |                                     |
| —                 |                                     |
| 97                |                                     |

87. Var.  $\beta$ . *styloflexa*; spicis 3–4 rarius 5, terminali mascula cylindrica sessili vel pedunculata, reliquis fœmineis abbreviatis vel oblongis remotis vel superioribus 1–2 masculæ contiguas sessilibus, inferioribus remotis longe exserte setaceo-pedunculatis pendulis, omnibus densifloris vel infima basi laxiflora; bracteis inferioribus vel omnibus culmo brevioribus; stigmatibus 3; perigyniis ellipticis utrinque attenuatis demum plus minus excurvis, ore membranaceo integro oblique secto vel emarginato, squama ovata vel lanceolata acuta plus minus cuspidata rarius obtusa mutica alba nervo viridi longioribus.—C. *styloflexa*, *Buckley, Sill. Journ.* xlv. 174; *Dewey, Sill.* xlviii. 141. C. *fusiformis*, *Chapman, MSS.* (TAB. XC.)

HAB. Mountains of Carolina and Georgia, Tennessee, *Buckley*. Raleigh, North Carolina, *Curtis*. Louisiana, *Hale*. New Orleans, *Drummond*, 427. Middle Florida, *Chapman*. Texas, *Wright*.

*Culmus* gracilis, 2–2½-ped. *Folia* 1–2 lin. lata. *Bractea* suprema sæpe obsoleta. *Vagina* infima 2–3 poll. longa. *Pedunculus* infimus interdum 10 poll. longus, capillaris, basi anceps. *Spica mascula* 8–16 lin. longa, rarius apice fœminea. *Spica fœminea* 4–5 vel 9 lin. longæ, 2–4 lin. latæ: inferiores nunc basi compositæ. *Squamæ masculæ* lanceolatæ, obtusæ vel acutæ, albæ, nervo viridi infra apicem, nisi in supremis, evanescente, demum ferrugineæ. *Perigynium* 2–2¼ lin. longum, 7/10 lin. latum. *Achenium* 1¼ lin. longum, 7/10 lin. latum.

*C. fusiformis*, Chapman, in my own and Mr. Carey's herbarium, is in a younger state than the specimens of Buckley and Hale, and has the perigynium less excurved, and the female spikes longer, showing a transition from the abbreviate to the cylindrical form of the spikes of the typical form, though they are all, except the lowest one at base, more densely flowered. They show also a transition into what Dewey has described as *C. ignota*. The specimens of it are more mature, and more or less lax-flowered, and the perigynium more or less excurved, its orifice oblique, entire or emarginate, and the lower peduncle often setaceous and pendulous. I can see no fixed characters that may serve to distinguish these varieties, and Mr. Curtis (*Sill. Journ.* vii. 410. 1849) observes that *C. styloflexa*, which he says is common in the lower and middle region of North Carolina, and which he has received from Louisiana and Florida, "is a doubtful species." Dewey describes the orifice of the perigynium as bidentate, though Buckley omits all allusion to such a character. I believe the normal state of it is entire or oblique, but from its delicate membranous texture it is easily ruptured.

Of 36 specimens I find—

|                   |                                          |
|-------------------|------------------------------------------|
| 13 with 3 spikes. | In 1 the terminal spike is male at base, |
| 20 „ 4            | and in 4 the lower females compound      |
| 3 „ 5             | at base.                                 |

In one floret I observed a filiform racheola, shorter than the achenium; and in the specimens from Florida there is occasionally a slight tendency to roughness at the upper margins of the perigynium.

87. Var.  $\gamma$ . *plantaginea*; foliis culmeis bracteisque inferioribus 3–4 lin. latis, radicalibus 5–7 lin. latis 6–15 poll. longis, spicis cylindricis laxifloris, mascula rarius abbreviata (*Schk. f.* 195).—C. *plantaginea*, *Schk. f.* 195. *k. k. k. k.* (non Lamarck); *Muhl.* 245. C. *anceps*, var. *patulifolia*, *Carey, Gray's Bot. l. c. ed.* 1.

This differs from the typical form only in the breadth of the radical leaves. It is distinguished from the true *C. plantaginea*, Lam., by its foliaceous bracts.

87. Var.  $\delta$ . *intermedia*.

a. Perigyniis apice subabbreviato recto vel leviter excurvo. C. *anceps*, *Willd.* iv. 278; *Schk. f.* 128. *f. f. f.*

b. Perigyniis apice breviori repente excurvo. (TAB. XCI. Fig. 1.)

Spicis 4–5 cylindricis, fœmineis laxifloris angustis 6–13 lin. longis 1½–2 lin. latis.

HAB. a. Providence, Rhode Island, *Olney*. Oriskany, New York, *Vasey*.—b. Clinton County, Pennsylvania, *M. Minn.* Fernbank, Ohio, *Short (Herb. Carey)*. Quebec, *Mrs. Shepperd*.

In a, perigyniis 1¼–7/10 lin. longis, 7/10 lin. latis; in b, perigyniis 1¾ lin. longis, 7/10 lin. latis. In both the achenium 1¼–1 lin. longum, 7/10 lin. latum, basi styli obliqua abrupte apiculatum.

The narrow lax spikes, and the subabbreviate, slightly-curved or straight apex of the perigynium connect the var. a with the typical form; while the more abbreviated and abruptly curved apex of b connect it with the following var.  $\epsilon$ . I have received them both at different times under the names of both *C. anceps* and *C. blanda*.

87. Var.  $\epsilon$ . *blanda*.—a. *major*; spicis 4–5 rarius 6 oblongis, terminali mascula sæpius abbreviata vel clavata subsessili, reliquis fœmineis undique densifloris, omnibus vel superioribus 2–3 masculæ arcte contiguas, supremis evaginatæ, inferioribus remotis longe exserte pedunculatis, infima rarius subradicali; bracteis culmo sæpe multum longioribus; perigyniis triquetro-obovatis apice brevissimo repente excurvo ore (vix membranaceo) integro vel emarginato nervosis, squama obtusa sæpe truncata vel acuta plus minus cuspidata albo-hyalina nervo viridi longioribus vel (*infimis cuspidate*) brevioribus. (TAB. XCII. Fig. 1.)

HAB. New Orleans, Texas, *Drummond*, n. 428 bis, et 437. Texas, *Wright*. Louisiana, *Hale*. Ohio, *Sullivant*. Massachusetts, *Tuckerman*.

*Culmus* 15–20-poll., angulis acutis scabris; pars spicas gerens 4–14 poll. longa. *Folia* 1–3 lin. lata, culmo longiora vel breviora. *Bractea* 1–3 lin. latæ, omnes sæpius culmo multum longiores, vel suprema interdum setacea infimaque subradicalis eum subæquantes. *Vagina* infima 1–3 poll. longa: omnes, præcipue superiores, angulis acutis, undulatis, scabris. *Pedunculus* infimus 3–6 poll. longus, vel (in spicis omnibus congestis) 6 lin. longus, basi anceps, scaber. *Spica mascula* 4–7 lin. longa, lineam lata, sessilis vel subsessilis, sæpe bractcata, albida, demum pallide ferruginea, cylindrica vel clavata, obliqua vel erecta. *Spica fœminea* 5–7 lin. longæ, 3 lin. latæ, densifloræ, (vel in speciminibus septentrionalibus angustiores, minus densæ, infima sublaxiflora,) rarius omnes vel superiores, 2–3 tantum (sessiles vel inserte vaginatæ) masculæ contiguæ: reliquæ deorsum remotiores, longe exserte pedunculatæ: superiores interdum apice extremo masculæ: una vel altera inferiorum sæpe basi (ramulis 1–3, e perigynio egredientibus) composita. *Squamæ* albo-hyalinæ, nervo viridi, demum pallide ferrugineæ: masculæ lanceolatæ, acutæ; inferiores, more bractearum, longe cuspidatæ, nervo in aliis producto: fœmineæ acutæ vel obtusæ, nunc truncatæ; inferiores, vel omnes, longe cuspidatæ. *Perigynium* 1¼–5/10 lin. longum, 7/10–9/10 lin. latum; apice brevissimo, plus minus repente excurvo; obtusangulum, basi productum. *Achenium* 1–1¼ lin. longum, 8/10

lin. latum, triquetro-obovatum, basi styli obliqua abrupte apiculatum.

Var. *c. blanda*.—*b. minor*; culmo 6-12-pollicari; foliis 1-3 lin. latis; bracteis foliaceis, infima fere semper culmo multum breviori; spicis 4-5 rarius 3-6 densifloris, superioribus masculæ plerumque contiguis, infima plus minus remota sæpe basi laxiflora, mascula sæpe abbreviata bracteata; squamis masculis latioribus obtusis muticis vel brevis cuspidatis.—*C. conoidea*, *Muhl.* 248 (*non Schk.*); *Schw. et Tor.* 346. *C. blanda*, *Dewey, Sill.* x. 45; *Sartwell, Eas. n.* 96. *C. anceps*, var. *striatula*, *Carey, l. c.* (TAB. XCII. Fig. 2.)

HAB. Canada to Kentucky.

Var. *c. blanda*.—*c. gracillima*; culmo gracili sesquipedali; foliis lineam latis; bractea infima culmo multum breviori; spicis 3-4, mascula cylindrica nuda sæpius longe pedunculata, fœmencis angustioribus remotis, summa interdum abbreviata masculæ arcte contigua sessili vel oblonga ab ea 1-2 poll. remota, reliquis distantibus, infima 5-7 poll. remota basi laxiflora; perigyniis (ut in *b.*), squama obtusa sæpe truncata cuspidata vel mutica vel abrupte apiculata longioribus. (TAB. XCI. Fig. 2.)

HAB. Ohio, *Sullivant*.

*Bractea* suprema sæpe obsoleta, spica sua abbreviata vix longior; vel omnes spicis suis semper, sæpe multum, longiores: infima culmo multum brevior. *Spica mascula* 6-13 lin. longa, erecta. *Spica fœminea* 2-3: summa nunc 2-3 lin. longa, masculæ contigua, vel oblonga, remota: reliquæ 7-9 lin. longæ, 2 lin. latæ; distantes, basi laxifloræ. *Squama* masculæ obtusæ, muticæ, nervo rarius producto; infima interdum brevis cuspidata: fœmineæ obtusæ, sæpe truncatæ; inferiores brevis cuspidatæ, superiores muticæ vel abrupte apiculatæ: vel omnes cuspidatæ.

87. Var. *ζ. latifolia*; culmo latiori, angulis acutissimis; foliis subinde 15 lin. latis, 5-15 poll. longis; bracteis 5-8 lin. latis; spica mascula sæpe inconspicua 3-9 lin. longa, fœmineis laxifloris; perigyniis ( $1\frac{7}{10}$ - $2\frac{2}{10}$  lin. longis,  $\frac{1}{10}$ -1 lin. latis) ore membranaceo integro apice abbreviato leviter vel repente excurvo, squama obtusissima truncata mutica vel abrupte apiculata latioribus duploque longioribus. (TAB. XCIII.)

HAB. New York, *Knieskern*. Ohio, *Sullivant*. Kentucky, *Short*.

I have found in 34 specimens of *a, major*—

|                   |                                       |
|-------------------|---------------------------------------|
| 12 with 4 spikes. | In 23 the lower females (1 or 2) were |
| 21 „ 5            | compound at base, with 1-3 branches   |
| 1 „ 6             | proceeding from a perigynium.         |

In one the terminal spike was male at base.

In *b, minor*—

|                   |                 |
|-------------------|-----------------|
| 13 with 3 spikes. |                 |
| 50 „ 4            | No composition! |
| 32 „ 5            |                 |
| 2 „ 6             |                 |

97 specimens.

In *c, gracillima*—

|                   |                                    |
|-------------------|------------------------------------|
| 19 with 3 spikes. | In 2 the lower female was compound |
| 35 „ 4            | at base.                           |
| 4 „ 5             |                                    |

58 specimens.

In var. *latifolia*—

|                  |                                    |
|------------------|------------------------------------|
| 3 with 3 spikes. | In 1 the lower female was compound |
| 16 „ 4           | at base.                           |
| 1 „ 5            |                                    |
| —                |                                    |
| 20 specimens.    |                                    |

I have drawn the character of this variety, *blanda*, from the southern localities, where it would seem to have its largest development. The specimen figured (Tab. XCII. Fig. 1) is one of Drummond's, from Texas; Fig. 2 I received from Dewey as *C. blanda*. Though I have separated the one from the other, they are essentially the same, and I have no doubt but that intermediate states may be easily found to connect all the three. The habit of *c* is more that of the variety *styloflexa*. It is remarkable how frequently the lower spikes are compound in *a*, probably dependent on its greater luxuriance.

The variety *latifolia* would seem to be more decidedly separated from its allies by the breadth of its leaves and bracts, than the var. *plantaginea* is from the typical form.

88. *C. plantaginea* (Lamarck); spicis 4-5 oblongo-cylindricis remotis, terminali mascula atro-purpurea concolori, reliquis fœmineis olivaceis subgracilibus laxifloris, superioribus inserte inferioribus exserte pedunculatis, infima sæpe radicali, vaginis purpureis aphyllis cuspidatis; stigmatibus 3; perigyniis ovalibus utrinque attenuatis acute triquetris apice subexcurvis, ore membranaceo integro sæpe oblique secto, crebre leviter nervosis olivaceis furfuracco-asperulis, squama ovata acuta acuminato-cuspidata purpurea margine albida vel pallida plus minus purpureo-tincta, nervo viridi, latioribus longioribusque.—*C. plantaginea*, *Lam. Encyc.* iii. 392; *Mich.* ii. 173; *Willd.* iv. 257; *Kunth*, 452 (*excl. syn. Schk. f.* 195); *Schw. et Tor.* 342; *Dewey, Sill.* vii. 272, et xi. 155; *Carey, Gray*, 523; *Sartwell, Eas. n.* 90 (*non Muhl., nec Elliott, nec Schk.*). *C. latifolia*, *Wahl. Act. Holm.*; *Schk. f.* 70. *u.* (TAB. XCIV.)

HAB. Norway to Cumberland House, Arctic America, *Drummond*. New York, *Sartwell, Knieskern*.

*Culmi* plures ex eadem radice, 1-1½-ped., graciles, triquetri, basi vaginis purpureis aphyllis tecti, erecti, demum decumbentes; pars spicas gerens 8-15 poll. longa. *Folia radicalia* ½-1 poll. lata, culmo breviora vel subæquantia, firma, nervis 2 lateralibus prominentibus notata: sæpe basi purpurea. *Vagina* floriferæ purpureæ, cuspidatæ, 4 lin. ad pollicem longæ. *Pedunculi* inferiores 2-3 poll. longi, gracillimi. *Spica mascula* 7-12 lin. longa, 1-1½ lin. lata, pedunculata vel subsessilis. *Spica fœminea* 4 lin. ad pollicem longæ, 1½-2 lin. latæ, 4-12-floræ, a se 1½-6 poll. remotæ, summa nunc masculæ arcte contigua, sæpius 1-2 poll. remotæ: infima sæpe radicalis. *Squama* masculæ atro-purpureæ, concolores, subobtusæ: fœmineæ purpureæ, nervo pallido: vel albidæ plus minus purpureo tinctæ. *Perigynium* 2 lin. longum,  $\frac{1}{10}$ - $\frac{2}{10}$  lin. latum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, acute triquetrum, faciebus concavis.

I have seen no specimen of this beautiful species south of New York; and though I have quoted Michaux, it is evident that he confounded either *C. platyphylla* or *C. laxiflora* with it, from his observation that it varies "vaginis aphyllis aut in foliolium desinentibus, spicisque castaneis et viridulis." I have never seen any foliaceous vaginae, the absence of such separating *C. plantaginea* from *C. laxiflora* and *C. Careyana*.

Schkuhr's fig. 70 *u.* is an exception to the exquisite truthfulness of his pencil. Kunth notices the anomaly of the long, stipitate achenia in it. In the mature achenium the stipes is broad, and not more than one-tenth of a line long.

In 95 specimens of *C. plantaginea* I find—

|                   |                  |
|-------------------|------------------|
| 53 with 4 spikes. | All with 1 male. |
| 42 „ 5            |                  |



89. *C. Careyana* (Torrey); spicis 3 rarius 2-4, terminali mascula ferrugineo-purpurea pedunculata vel subsessili, reliquis foemineis remotis olivaceis oblongis paucifloris, suprema inserte, infima vel inferioribus saepe longe exserte pedunculatis; bracteis foliaceis; stigmatibus 3; perigyniis ovalibus utrinque attenuatis acute triquetris apice subexcurvis, ore membranaceo integro, crebre leviter nervosis olivaceis furfuraceo-asperulis, squama ovata acuta cuspidata vel obtusa mutica purpurea vel albida plus minus purpureo tincta, nervo viridi, latioribus longioribusque.—*C. Careyana*, *Torrey, Dewey, Sill.* xxx. 60; *Tor. Mon.* 415; *Carey, Gray, Bot.* 523; *Sartwell, Ews. n.* 91; *Kunze, t.* 27. (TAB. XCV.)

HAB. New York and Ohio.

*Culmi* plures,  $1\frac{1}{2}$ -2-ped., triquetri, graciles, basi rudimentis foliorum rubro-purpureis, foliisque 2-3 brevibus vaginatis tecti; pars spicas gerens 2-15 poll. longa. *Folia culmea*  $1\frac{1}{2}$ -2 lin. lata, brevia: *radicalia* 5-6 lin. lata, culmo breviora, plana, mollia, nervis 2 lateralibus prominentibus demum notata. *Bractea* foliaceae, 1-3 lin. latae: inferiores spicis suis longiores vel breviores: vaginatae, suprema saepe obsoleta. *Vagina* infima  $\frac{1}{2}$ -2 pollices longa: suprema obsoleta vel saepe fissa: omnes virides vel basi purpureae. *Pedunculus* infimus  $\frac{1}{2}$ -6 poll. longus, gracillimus. *Spica mascula* 6-13 lin. longa, 2 lin. lata, elliptica vel cylindrica vel clavata, erecta, plus minus pedunculata. *Spica foemineae* 4-9 lin. longae, 3-4 lin. latae, 3-9-florae: summa saepe masculae arcte contigua, subsessilis, 3-4-flora, vel ab ea 1-4 pollices remota, oblonga: inferiores a se 4-10 pollices remotae, plus minus longe exserte pedunculatae: omnes subdensiflorae vel infima laxiflora. *Squamae* masculae ferrugineo-purpureae, nervo pallido, obtusae, muticae; infima saepe breve cuspidata: foemineae purpureae, vel albidae plus minus purpureo tinctae, obtusae vel acutae, cuspidatae vel superiores muticae. *Perigynium*  $2\frac{2}{3}$ -3 lin. longum,  $1-1\frac{1}{3}$  lin. latum. *Achenium*  $1\frac{2}{3}$  lin. longum, lineam latum, breve stipitatum, acute triquetrum, faciebus concavis basi styli obliqua apiculatum.

A *C. plantaginea* differt, culmo basi foliato; foliis radicalibus angustioribus; vaginis floriferis foliaceis, viridibus; spicis paucioribus, latioribus, paucifloris; pedunculis longioribus; perigyniis majoribus; squamis masculis obtusis.

This very interesting species was discovered by Mr. Carey in woods at Auburn, New York, in 1832, growing among decayed leaves, not in swamps, as stated by Dewey, and it was named after him by Dr. Torrey. For some time this was the only known habitat, until Mr. Sullivant found it plentifully near Columbus, Ohio.

90. *C. platyphylla* (Carey); spicis 3-4 rarius 5 gracilibus, terminali mascula oblongo-elliptica vel ovali pedunculata nuda, reliquis foemineis oblongis laxifloris remotis paucifloris subinserte pedunculatis erectis, infima saepe radicali; bracteis lanceolatis spicis longioribus; stigmatibus 3; perigyniis ovalibus acute triquetris apice attenuatis subinde rostellatis excurvis, ore membranaceo integro, crebre leviter nervosis olivaceis furfuraceo-asperulis, squama ovata acuta mutica vel cuspidata albida vel castanea medio viridi trinervi longioribus vel (infimis) brevioribus.—*C. platyphylla*, *Carey, Sill. Journ.* iv. (ser. 2) 23 (1847); *Carey, Gray, Bot.* 523; *Dewey, Sill.* vi. 349; *Sartwell, Ews. n.* 92; *Darlington*, 350. *C. digitalis*, var. *latifolia*, *Gray*. *C. anceps*, var. *latifolia*, (*ex parte*), *Auct.* (TAB. XCVI.)

HAB. In America septentrionali, in declivibus umbrosis. Massachusetts to New York, *Carey*.

*Culmi* ex eadem radice plures, 3-5 vel 8-12 poll. longi, debiles, laeves, patuli, demum decumbentes; pars spicas gerens 2-11 poll. longa. *Folia culmea* 2-3, brevia, 1-2 lin. lata: *radicalia* 5-8 lin. lata, 3-5 poll. longa, culmo breviora, glauca, mollia: *annotina* demum pollicem lata, saepe viridia, 8 poll. longa, nervis 2 lateralibus prominentibus notata, culmis breviora. *Bractea* 1-3 lin. latae,  $1-1\frac{1}{2}$  vel 2 poll. longae, lanceolatae, spicis suis duplo rarius triplo longiores. *Vaginae* omnes plerumque breves: infima subinde pollicaris. *Pedunculi* inserti vel breves exserti: infimus nunc  $1\frac{1}{4}$  poll. longus. *Spica mascula* 2-4 vel 7 lin. longa,  $\frac{1}{2}$ - $1\frac{1}{2}$  lin. lata, plus minus pedunculata, nuda, saepe bractea cuspidata sterili plus minus ab ejus basi remota, castanea. *Spica foemineae* 3-8 lin. longae,  $1\frac{1}{2}$  lin. latae, 2-5- vel 7-florae (flosculis alternatim dispositis, summis saepe abortivis): omnes subinserte vel breves exserte pedunculatae, erectae. *Squamae* masculae latiores, obtusae, muticae: vel subacutae, infima nunc breve cuspidata: castaneae margine pallidae: foemineae ovatae, acutae, muticae vel cuspidatae, albae vel castaneae. *Perigynium*  $1\frac{5}{10}$ - $7\frac{7}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, furfuraceo-asperulum, olivaceum, facile deciduum. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, ovale, acute triquetrum, castaneum, basi styli apiculatum.

Habitu ad *C. laxifloram*, var. *plantagineam*, accedit. Differt culmo spicis bracteisque brevioribus; spicis foemineis paucifloris, subinserte pedunculatis, nusquam compositis; perigyniis brevioribus, utrinque praecipue basi minus attenuatis, acutangulis, ore integro, nec oblique secto: nervis pluribus tenuioribus: olivaceis, furfuraceo-asperulis, facile deciduis; foliis radicalibus brevioribus, latioribus.

Ad *C. digitalem*, W., propius attinet. Tamen ab ea et a *C. retrocurva* differt, spicis erectis, paucifloris, subinserte pedunculatis; bracteis brevioribus; pedunculis validioribus; foliis latis; perigyniis deciduis. A *C. retrocurva* etiam spicis laxifloris, nec unquam basi masculis.

This pretty species has been frequently confounded with *C. laxiflora*, Lam., (*C. anceps*), and also considered a wide-leaved variety of *C. digitalis*. Its characters are so constant that I think Mr. Carey was right in separating it. I find in 240 specimens—

|                   |                |
|-------------------|----------------|
| 90 with 3 spikes. | In all 1 male. |
| 133 „ 4           |                |
| 17 „ 5            |                |

91. *C. retrocurva* (Dewey); spicis 4-6 rarius 3-6, terminali mascula pedunculata cylindrica, vel abbreviata elliptica, reliquis foemineis saepe ima basi masculis remotis densifloris abbreviatis obovatis, vel oblongo-cylindricis longe exserte pedunculatis pendulis, infima radicali; bracteis spicis longioribus; stigmatibus 3; perigyniis triquetro-ovalibus apice acutis subinde rostellatis excurvis, ore membranaceo integro, crebre leviter nervosis olivaceis furfuraceo-asperulis, squama lanceolata vel ovata acuminata albida nervo viridi longioribus vel (infimis) subaequantibus.—*C. retrocurva*, *Dewey, Wood. Bot. ed.* 2. 587 (1848); *Carey, Gray, Bot.* 523; *Sartwell, Ews. n.* 93. *C. oligocarpa*, var. *latifolia*, *Gray, Gr. et Cyp. n.* 178; *Tor. Mon.* 415. (TAB. XCVII.)

HAB. In America septentrionali. New England to Pennsylvania.

*Culmus* 8-18-poll., gracillimus, debilis, acutangulus, scaber; pars spicas gerens 7-17 poll. longa. *Folia radicalia* 3-5 lin. lata, demum firma, culmum subaequantia, nervis 2 lateralibus prominentibus notata, pallide viridia, vel glauca. *Bractea*  $1-2\frac{1}{2}$  lin. latae, spicis suis longiores, vaginatae. *Vagina* infima  $1-1\frac{1}{2}$  poll. longa. *Pedunculi* capillares: infimus saepe 4 poll. longus. *Spica mascula* semper pedunculata, cylindrica, 10 lin. longa, lineam lata, alba vel castanea nuda vel bracteata. *Spica foemineae* 3-8 lin. longae, 2-3 lin. latae, 5-8- vel 10-florae (flos-

culis congestis, summis rarius abortivis, infimis 1-2 maseulis), omnes setaceo-pedunculatæ, pendulæ, remotæ: infima fere semper radicalis. *Squamæ* albæ, demum plus minus castanæ, nervo viridi: masculæ latiores, obtusæ, nervo infra apicem evanescente: vel angustiores, lanceolata, acutæ: fœmineæ lanceolata vel ovato-auminatæ, cuspidatæ. *Perigynium*  $1\frac{6}{10}$ - $1\frac{7}{10}$  lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum, rostellatum, apice sæpius excurvo, interdum recto; ore albido, integro; olivaceum, furfuraceo-asperulum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, ovale, acute triquetrum, castaneum, angulis pallidioribus, basi styli apiculatum.

A *C. digitalis*, Willd., differt, foliis latioribus, glaucis; spicis fœmineis, sæpe basi maseulis, densifloris, brevioribus, latioribus, pendulis; squamis fœmineis lanceolatis; perigyniis majoribus, apice attenuatis, rostellatis; -bracteis brevioribus.

The male florets (one or two) at the base of the female spikes have been overlooked by observers, and this character affords, with the general habit, I think, a sufficient distinction from its allies. They have not been drawn in the figure, but, though indistinct, the filaments, and at times the anthers, are easily discernible. I have found them frequently on all the spikes, but at times, though the scale is present, they are absent, having either fallen, or the scale is sterile.

92. *C. digitalis* (Willdenow); spicis 4 rarius 3-5 gracilibus, terminali mascula cylindrica vel clavata pedunculata vel abbreviata subsessili nuda, reliquis fœmineis interdum apice masculis remotis laxi-dissitifloris cylindricis linearibus, omnibus (inferioribusque longe) exserte pedunculatis pendulis, infima sæpe radicali; bracteis elongatis; stigmatibus 3; perigyniis triquetro-ovalibus obtusis, ore membranaceo integro sæpe obliquo, crebre leviter nervosis olivaceis furfuraceo-asperulis, squama ovata acuta vel cuspidata albida medio viridi trinervi longioribus vel (*infimis*) brevioribus.—*C. digitalis*, Willdenow, iv. 298; Muhl. 225?; Carey, Gray, Bot. 524; Sartwell, Eas. 94 (non Schw. et Tor. 324. t. 26. f. 1. quæ *C. gracillima* Schw.). *C. oligocarpa*, Muhl. 242 (non Schk.); Schw. et Tor. 344; Tor. Mon. 415. *C. Van-Vleckii*, Schw. An. tab. *C. oligocarpa*, var. *Van-Vleckii*, Dewey, Sill. x. 281. (TAB. XCVIII.)

HAB. In America septentrionali. New York to Pennsylvania and Ohio.

*Culmus* 6-15-poll., gracillimus, debilis, acutangulus, scaber, basi foliatus; pars spicæ gerens 3-15 poll. longa. *Folia* 1-2 lin. lata, elongata, culmo breviora, viridia, firma, demum nervis 2 lateralibus prominentibus notata. *Bracteæ* elongatæ, vaginatæ, spicis suis pedunculisque sæpe duplo longiores: superiores, interdum omnes, culmo longiores: inferiores nunc 8-11 pollices longæ. *Vagina* infima  $\frac{1}{2}$  rarius  $1\frac{1}{2}$  poll. longa. *Pedunculi* capillares: infimus subinde 3-5 poll. longus. *Spica mascula* pollicaris, lineam lata, cylindrica vel clavata, basi attenuata, pedunculata: vel subsessilis, 4 lin. longa,  $\frac{1}{2}$  lin. lata, alba vel castanea, nuda vel bractea sterili paulo ab ejus basi remota suffulta. *Spicæ fœmineæ* 4-12 lin. longæ,  $1-1\frac{1}{2}$  lin. latæ, 3-9- rarius 12-floræ, sæpe dissitifloræ (flosculis contiguus vel alternatim dispositis, superioribus sæpe masculis vel abortivis): inferiores nutantes vel pendulæ: infima sæpe radicalis. *Squamæ* albida, nervo viridi: vel masculæ castanæ, lanceolata, obtusæ, nervo infra apicem evanescente, vel acutæ: fœmineæ ovata, acutæ, muticæ, vel inferiores plus minus euspidatæ. *Perigynium*  $1\frac{3}{10}$ - $1\frac{5}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, ovale, triquetrum, angulis subacutis, utrinque obtusum vel apice brevissimo excurvo, ore albido integro, recto vel obliquo, olivaceum, crebre nervosum, furfuraceo-asperulum. *Achenium*  $1-1\frac{2}{10}$  lin. longum, plus  $\frac{6}{10}$  vel  $\frac{7}{10}$  lin. latum, triquetro-ovale, fuscum, basi styli apiculatum.

Mr. Carey states that this species is found from New England to Michigan. Elliott inserts it in his Sketch on the authority of Schweinitz, but the only specimen so named in his herbarium, Mr. Curtis tells me, is the *C. debilis* of Michaux from Dr. Torrey. It was long considered to be the *C. oligocarpa* of Schkuhr, until Dr. Gray verified it as the plant of Willdenow by an examination of the original specimen in Berlin. Kunth inserts it in his 'Cyperaceæ,' and I should have quoted him if he had not given as a synonym the species figured by Torrey in his and Schweinitz's Monograph (t. 26. fig. 1), which is *C. gracillima*, Schw.

93. *C. oligocarpa* (Schkuhr); spicis 4-5 rarius 3 erectis, terminali mascula elongata cylindrica pedunculata vel rarius abbreviata subsessili castanea, reliquis fœmineis pallide viridibus oblongis 3-9-floris sublaxifloris remotis vel superioribus nunc approximatis, inferioribus breve exserte pedunculatis, infima subinde radicali, una vel altera sæpe basi composita; bracteis elongatis vaginisque glabris; stigmatibus 3; perigyniis oblongo-ovalibus vel obovatis apice sensim attenuatis rectis vel excurvis, ore integro, obtuse triquetris creberrime striato-nervosis, nervis tenuibus quasi undulatis, pallide viridibus demum ferrugineis concoloribus, squama alba ovata acuta vel obtusa medio viridi trinervi longe valideque cuspidata longioribus, infimis (*cuspidate*) sæpe duplo triplo brevioribus.—*C. oligocarpa*, Schk., Gray, Sill. xlii. 14; Carey, (ed. 1) 555; Sartwell, Eas. n. 98 et 99 (non Dewey, x. 280, nec Schw. et Tor. 344, nec Tor. Mon. 415, quæ *C. digitalis*). *C. oligocarpa*, var. *Sartwelliana*, Dewey, v. 176. *C. Sartwelliana*, Gay (fide Dewey). *C. Hitchcockiana*, var., Tor. Mon. 413, et Dewey in Herb. Boott. (TAB. XCIX.)

Var. minor; culmo breviori gracillimo, spicis 3-4 paucifloris, perigyniis minoribus.—*C. oligocarpa*, Schk. v. v. f. 170; Willd. iv. 279.

HAB. In America Boreali, in sylvis. New York to Ohio.

*Culmus*  $1-1\frac{1}{2}$ -pedalis, gracilis, firmus, apice scabriuseulus, stricte crectus, basi foliatus, rudimentis foliorum vaginisque glabris purpureis tectus; pars spicæ gerens 6-8 sæpe 12-15 poll. longa. *Folia*  $1-1\frac{1}{2}$  lin. lata, elongata, culmo breviora. *Bracteæ* elongatæ, vaginatæ: superiores culmo longiores. *Vagina* 2-12 lin. longæ, glabræ. *Ligula* oblonga, obtusa, alba. *Pedunculus* infimus  $1-1\frac{1}{2}$  poll. longus. *Spica mascula* cylindrica, 7-15 lin. longa, lineam lata, plus minus longe pedunculata, nuda vel bractea, castanea, erecta: vel rarius abbreviata, 4-5 lin. longa, obliqua. *Spicæ fœmineæ* 3-10 lin. longæ, 2-3 lin. latæ, sæpius omnes a se  $1\frac{1}{2}$ -6 poll. remotæ: vel superiores interdum approximata: omnes vel inferiores solum, exserte pedunculatæ, una vel altera basi utrinque composita, ramulis 1-2 e latere perigynii egredientibus. *Squamæ masculæ* castanæ, margine albo-hyalinæ, obtusæ vel acutæ, muticæ, nervo infra apicem evanescente, vel in superioribus rarius in omnibus plus minus extra producto: infima sæpe in bracteam plus minus longam desinente: fœmineæ albæ, nervo viridi, obtusæ vel acutæ: inferiores præcipue vel omnes longe hispido-cuspidatæ. *Perigynium*  $1\frac{8}{10}$ -2 lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, subacute triquetrum, basi productum, basi styli apiculatum. *Stylus* brevis, supra basin incrassatus.

I have at different times received this species from Dewey and others, as *C. Hitchcockiana* and its variety *minor*, and I cannot refer to any description of it, since Willdenow's, anterior to that of Mr. Carey in Gray's Botany. The *C. oligocarpa*, Dewey (Sill. x. 280), is *C. digitalis*. His characters, "decumbent, culm, long

slender lax peduncles, and pistillate scale often slightly awned," alone apply to it. The fact is, that as a species it was not recognized until Dr. Gray saw it in Schkuhr's herbarium. Schkuhr's fig. n. 170 had proved a stumbling-block. His usual accuracy had made it presumptuous to doubt him, and the abrupt gracile rostrum to the obovate perigynium in his figure was like nothing that had been seen. Dr. Gray proved the inaccuracy of the figure; "quandoque bonus dormitat Homerus." The plant had, no doubt, been confounded with *C. Hitchcockiana* by Dewey. In Sill. v. 2 ser. 176, where he notices the specimens from Sartwell as a variety of *C. oligocarpa*, he gives no reference to any previous description of the typical form. I cannot see any propriety in making the larger and more perfect form a variety of the smaller form, and have therefore quoted Schkuhr's figure under the var. *minor*, between which and the larger form there is in fact an insensible transition. *C. oligocarpa* and *C. Hitchcockiana* form, I think, a subgroup distinct from that of *C. laxiflora* and its allies. The perigynium is more of a spongy texture, and the thick callous orifice and the incrassate style are peculiar to them. The nerves are tortuous, and more like folds of the external membrane than the usual prominent vascular cords.

94. *C. Hitchcockiana* (Dewey); spicis 4-5 rarius 3 erectis, terminali maseula cylindrica elongata pedunculata, vel sæpe abbreviata subsessili pallida, reliquis fœmineis pallide viridibus oblongis 2-5-floris (flosculis alternatim dispositis, summa plerumque abortiva), superioribus subapproximatis, infima remota breve exserte pedunculata; bracteis sæpe omnibus eulmo longioribus subtus basi vaginisque scabris; stigmatibus 3; perigyniis turgide ovalibus utrinque attenuatis obtuse triquetris apice excurvis, ore integro, creberrime striato-nervis pallide viridibus demum ferrugineis, squama alba ovata acuta vel obtusa medio viridi trinervi longe valideque cuspidata apice sæpe ciliata longioribus vel infimis (*cuspidate*) brevioribus vel subæquantibus.—*C. Hitchcockiana*, Dewey, Sill. x. 274; Carey, 524; Sartwell, Eas. n. 100. (TAB. C.)

HAB. In America Boreali, in sylvis. New England to Kentucky.

*Culmus* 1-1½-ped., gracilis, firmus, striete erectus, apice angulis acutis scabris, basi foliatus, vaginisque pallide ferrugineis scabris tectus; pars spicas gerens 2-5, rarius 12 poll. longa. *Folia* 1-2½ lin. lata, eulmo breviora, subtus basi vaginisque scabris. *Bractea*, sæpe omnes, eulmo longiores, vel infima eo brevior, vaginata, basi plerumque subtus scabra. *Vagina* undique seabra: infima 4 lin. vel rarius 1½ poll. longa. *Pedunculus* infimus ½ vel 1-2 poll. longus. *Spica mascula* cylindrica, 12-14 lin. longa, sublineam lata, pedunculata, squamis pallide stramineis, apice albo-hyalinis, ciliolatis, obtusis, nervo infra apicem evanescente, vel in superioribus acutis paullo extra producto: vel sæpe abbreviata, 4-6 lin. longa, subsessilis, squamis albis, angustioribus, lanceolatis, acuminatis, cuspidatis. *Spica fœminea* 3-8 lin. longæ, 2 lin. latæ, 2-5-floræ, una vel altera florum apice abortiva, laxifloræ: superiores plerumque approximatae: infima sæpe remota, nunquam radicalis, omnes sæpius breve vel infima plus minus longe exserte pedunculata. *Squama* fœmineæ ovata, acutæ vel obtusæ, apice ciliolata, plus minus longe valide cuspidata, albæ, medio viridi trinervi. *Perigynium* 2-2½-3 lin. longum, 1-1½ lin. latum, nervis (ut in *C. oligocarpa*) undulatis. *Achenium* (eum stipite 1/10 lin. longo) 1-1½ lin. longum, 1/10 lin. latum, obtuse triquetrum, castaneum, basi styli obliqua apiculatum. *Stylus* brevis, supra basin incrassatus.

Aspectus omnino *C. oligocarpa*. Differt eulmo apice magis acute triquetro, scabro, basi vaginis pallide ferrugineis tecto; foliis sæpe latioribus, basi subtus, bracteisque vaginis-

que omnibus scabris; spicis fœmineis paucifloris, flosculis alternatim dispositis, summis 1-2 fere semper abortivis; squamis apice ciliolatis, plerumque minus longe cuspidatis; perigyniis majoribus, apice semper excurvis, basi magis productis.

95. *C. Willdenowii* (Schkuhr); spicis 2-5 remotis radicalibus inæqualiter plus minus longe pedunculatis pallidis erectis ovatis, simplicibus androgynis apice sæpe inconspicue imbricato masculis basi flosculis fœmineis 3-9 sublaxis instructis; stigmatibus 3; perigyniis ovalibus biconvexis acuminato-longe-rostratis rostro marginibus serratis, ore albo-hyalino integro oblique secto, glabris vel superne scabridis erectis membranaceis nervis 2 marginalibus, squama albida medio viridi nervata ad basin spicæ lanceolata longe acuminata sæpe foliiformi plus minus brevioribus, ad apicem ejus interdum obtusa ciliolata longioribus.—*C. Willdenowii*, Schk. f. 145; Willd. iv. 211; Kunth, 480; Muhl. l. c. 230; Dewey, Sill. xi. 311; Schw. et Tor. 295; Tor. Mon. 404; Carey, l. c. 510; Sartwell, Eas. n. 7. (TAB. CI. et CII.)

HAB. In America septentrionali, in sylvis. New York, Sartwell, to New Orleans, Drummond, n. 430.

Cæspitosa. *Radix* fibrosa. *Culmus* brevissimus, basi rudimentis foliorum ferrugineis foliisque vaginantibus tectus. *Folia* 1-1½ lin. lata, plana, carinata, firma, pedunculis longiora. *Pedunculi* 2-4, monostachyi, inæquales, 1-8 poll. longi, debiles, triquetri, angulis acutis, albidis, scabris: infra spicam subito latioribus. *Spica* 5-7 lin. longæ, basi 2-3 lin. latæ, rarius compositæ: basi flosculis 3-9 laxè contiguis: pars staminifera 2-5½ lin. longa, ½ lin. lata. *Rachis* recta, angulis acutis. *Squamae masculæ* arete imbricatæ, superne pallide stramineæ, medio viridi: apice marginibusque late albo-hyalinæ, nervo infra apicem ciliatum evanescente. *Squamae fœmineæ* virides, margine albo-hyalinæ; inferiores sæpe 1-3, foliiformes, bractea simulantes, spica longiores: infima interdum 1½ etiam 4 poll. longa: superiores lanceolata, acutæ, vel obtusissimæ, nervo infra apicem evanescente. *Perigynium* (eum stipite 1/10 lin. longo, rostro 1-1½ lin. longo) 2-2½ lin. longum, 1/10 lin. latum, achenium arete tegens: interdum "racheolâ viridi, squamaceâ, achenium æquante" (Tor.): vel axi exsertâ spicam maseulam vel androgynam ferente instructum (*t.* 102. *u. et v.*). *Achenium* 1-1½ lin. longum, 1/10 lin. latum, ovale, obtusissime subtrigonum, angulis inconspicuis, faciebus convexis, fuseum, punctulatum, basi margine tumida insigni pallidiori cinctum.

I have not chanced to detect the racheola within the perigynium, noticed by Dr. Torrey, and I infer, as in other species in which I have observed it, that it is not constant. Muhlenberg alludes to a variety with a linear subdistinct male spike, and three or four alternate female flowers. Elliott remarks, that the only specimen he had of this species belonged to this variety. Mr. Curtis informs me that the specimen in Herb. Elliott, received from Pennsylvania, is *C. Steudelii*, Kunth, and I infer therefore that Muhlenberg's variety belongs to that species.

The *C. Willdenowii*, Dewey, Sill. ix. 258, "perigyniis squama duplo vix longioribus," Torrey refers to a variety of *C. polytrichoides*, to which Dewey says it is "closely related." I am not aware of the limits of this species, and have given such as the specimens in my herbarium warrant. Torrey in his Monograph gives a wider range; but at the date of that publication this species was confounded with *C. Steudelii* and *C. Backii*.

The male apex of the spike on the shorter peduncles is often inconspicuous, not reaching to the extremity of the upper perigynium. In the longer ones it is more developed, and is persistent after the fall of the mature perigynia. The axis of the female portion is straight, continuous with that of the male apex, and there can be no question as to the spike being simple; and analogy would

lead to the inference that the oblique axis, with the more remote female flowers in *C. Steudelii* and *C. phyllostachys*, is equally that of a simple androgynous spike, and not a compound one, as Kunth supposed, with a distinct male and two or more one-flowered female spiculæ.

In Tab. CII. the lower perigynium is shown to have an exerted axis, bearing a solitary male or an androgynous spike. The variation in the length of the lower female scale is also represented.

96. *C. Steudelii* (Kunth); spicis 1-3 remotis radicalibus inæqualiter longe setaceo-pedunculatis pallidis erectis vel nutantibus, simplicibus androgynis apice tenui sæpe oblique masculis, basi flosculis fœmineis 1-4 alternis contiguis instructis; stigmatibus 3; perigyniis orbiculato-pyriformibus longe triquetro-rostratis, rostro marginibus serratis, ore albo-hyalino integro ciliato demum ferrugineo, glabris viridibus membranaceis, nervis 2-3 e marginibus rostri decurrentibus, squama viridi nervata margine albida sæpius longe foliacea latioribus plus minus brevioribus, vel summâ ovatâ longioribus.—*C. Steudelii*, *Kunth, Cyp.* 480; *Carey*, 510; *Kunze, l. c.* 16. t. 3. f. 2; *Dewey, Sill.* xlix. 46; *Sartwell, Eas. n.* 8. *C. Jamesii*, *Schw. An. tab.* (fide *Carey*). *C. Willdenowii*, var., *Muhl., Elliott*, ii. 527. (TAB. CIII.)

HAB. In America septentrionali, in sylvis. New York to Ohio.

Cæspitosa. *Radix* fibrosa. *Culmus* brevis, rudimentis foliorum purpureo-ferrugineis foliisque vaginantibus tectus. *Folia* 1 lin. lata, plana, mollia, graminca, longissima, sæpe bipedalia. *Pedunculi* 1-3, monostachyi, inæquales, 1-10 poll. longi, radicales, debiles, triquetri, breviores erecti; vel longiores decumbentes, angulis albidis, acutis, scabris, infra spicam subito latioribus. *Spica* 2-7 lin. longa, basi flosculis 1-3 rarius 4, alternis: pars staminifera linearis sæpius 4-6 lin. longa,  $\frac{3}{10}$  lin. lata, recta vel obliqua, sæpe quasi breve pedunculata. *Rachis* angulata, obliqua. *Squamæ masculæ* sæpe 12, parvæ, obtusæ, pallide virides, zona ferruginea infra apicem album latum ciliatum notatæ. *Squamæ fœmineæ* sæpe omnes foliaceæ, bracteas simulantes: infima interdum 4 poll. longa: summa quandoque ovata, acuta, perigynio brevior. *Perigynium* (eum stipite  $\frac{3}{10}$  lin. longo, rostro  $1\frac{3}{10}$  lin. longo) 3 lin. longum,  $\frac{3}{10}$  lin. latum, demum flavidum, achenium arcte tegens. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, obtusissime trigonum, obtusum, apice depressione circulari indentatum, basi margine tumida cinctum, pallidum, punctulatum. *Stamina* 2. *Stylus* insertus, basi triquetra incrassata. *Stigmata* 3 vel interdum 2?, longa.

Kunth, who first distinguished this species, which had been previously confounded with *C. Willdenowii*, says of it, "Utriculis planiusculo-convexis, squamam ovatam aristatam superantibus; achenium rudimento styli terminatum." His specimens must have been immature. It is singular that he should have placed it and *C. phyllostachys* in different sections, especially as he was inclined to consider the last as having a distinct male spike and two or three one-flowered female ones, a character equally applicable to *C. Steudelii*. He considers both to be allied to *C. depauperata*, Good., "cujus (*C. phyllostachys*) (he says) nonnisi forma?" Tuckerman has the same idea, and expresses some surprise that Kunze objects to this affinity on the part of *C. Steudelii*. If habit be an element of affinity, the simple androgynous radical spikes, the large foliaceous scales and absence of bracts essentially distinguish the *Phyllostachyæ*.

*C. depauperata* affords a good evidence of the difficulty attending the notions of the affinities of *Cariæces*. Kunth associates it with *C. phyllostachys*, questioning if it be anything more than a variety. Drejer places it "ultra terminos" of his *Lamprochlenæ*, the type of

which is *C. supina*. Tuckerman includes it in his *Careyanæ*, and joins *C. plantaginea* and *C. oligocarpa* with it in the same group. To me, it seems to belong to the *Sylvaticæ*, near *C. longirostris*, Torrey; the hyaline orifice of its long slender rostrum contrasting remarkably with *C. oligocarpa*, which again equally contrasts with *C. plantaginea*. Tuckerman considers *C. Hitchcockiana* a variety of *C. oligocarpa*, the general habit or aspect of which variety or species certainly at first glance closely resembles that of *C. depauperata*.

97. *C. Backii* (Boott); spicis 1-4 remotis radicalibus inæqualiter plus minus longe pedunculatis pallidis erectis, androgynis apice inconspicue masculis, basi flosculis fœmineis 2-4 alternatim contiguis instructis; stigmatibus 3 brevibus, stylo exserto; perigyniis oblongo-ovalibus conico-rostratis superne vacuis, ore albo-hyalino integro vel oblique secto glabris vel rarius superne marginibus serrulatis, nervis 2 marginalibus, squama viridi nervata lanceolata foliiformi amplectente angustioribus sæpe multum brevioribus vel summâ latioribus longioribusque.—*C. Backii*, *Boott, Fl. Bor. Am.* ii. 210. t. 209; *Carey, l. c.* 510; *Dewey, Sill.* xlix. 46; *Sartwell, Eas. n.* 9. (TAB. CIV.)

HAB. In America septentrionali, in collibus saxosis. Carlton House, *Richardson*. Rocky Mountains, *Drummond*. New York, *Vasey, Wood*. Massachusetts, *Whitney*.

Cæspitosa. *Radix* fibrosa. *Culmus* brevissimus, rudimentis vaginisque foliorum ferrugineis tectus. *Folia* 1-2 lin. lata, firma, 6-12 poll. longa. *Pedunculi* 1-4, inæquales, monostachyi, radicales, graciles,  $\frac{1}{2}$ -8 poll. longi, sæpe omnes abbreviati, semper foliis breviores, angulis albidis acutis scabriusculis infra spicam latioribus subalatis. *Spica* primo squamis erectis fere occulta, pauciflora rarius composita: pars staminifera inconspicua,  $1\frac{1}{2}$  lin. longa,  $\frac{2}{10}$  lin. lata, subtriflora, vix longitudinem dimidiam perigynii superioris attingens. *Squamæ masculæ* oblongæ, tubulosæ vel amplectentes, virides, zona ferruginea infra apicem albo-hyalinum angustum notatæ. *Squamæ fœmineæ* omnes foliiformes, bracteas simulantes, infima plerumque  $\frac{1}{2}$ - $1\frac{1}{2}$  poll. longa, interdum 3-5-pollicaris, 1-2 lin. lata, vel summa ovata cuspidata perigynium æquans vel eo brevior. *Perigynium*  $2\frac{1}{2}$ -3 lin. longum,  $1-1\frac{1}{10}$  lin. latum, sensim in rostrum late conicum attenuatum; ore hyalino, demum ferrugineo; superne vacuum; rostro rarius ad margines serrulato; sæpius omnino glabrum, membranaceum, achenium laxiuscule vestiens. *Achenium*  $1\frac{2}{10}$ - $1\frac{4}{10}$  lin. longum,  $\frac{2}{10}$  lin. latum, orbiculato-subtrigonum, basi productum, facibus convexis, pallidum, punctulatum, basi styli æquali decidua. *Stylus* exsertus, stigmataque 3, brevia, granulata, brunnea.

In uno specimine, flosculis fœmineis 4, infimus 7 lin. remotus, squamâ 5 pollices longâ, suffultus. In altero, perigynium infimum (ut in *C. Willdenowii*) proliferum.

Ab affinis differt, perigynio superne vacuo, rostro breviori, basi latiori; stylo demum exserto, stigmatibusque brevibus granulatis; flosculis masculis semper paucioribus, inconspicuis, squamisque tubulosis?, apice oblique fissis.

98. *C. Geyeri* (Boott); spica simplici androgyna apice cylindrica mascula pallida vel demum ferruginea, basi flosculis fœmineis 1-5 alternis approximatis rachi recta; stigmatibus 3; perigyniis ovali-trigonis basi productis brevissime rostellatis, ore albo-hyalino integro ciliato viridibus membranaceis glabris, nervis 2 prominentibus, squama late ovata obtusa vel acuta albida medio viridi nervata amplectente cuspidata vel foliacea plus minus brevioribus.—*C. Geyeri*, *Boott, Lin. Trans.* xx. 118; *Kunze, l. c.* 186. t. 47. (TAB. CV.)

HAB. In America septentrionali et meridionali. In declivitatibus aridis Montium Saxosorum, *Geyer*, n. 332. Near the summit of the Cordilleras, California, *Dr. C. C. Parry* (*Herb. Torrey*). Buffalo Ranch, Sierra Nevada, California, *Thurber*, n. 13 (*Herb. Gray*).

Cæspitosa. *Radix* repens. *Culmus* gracilis, firmus, triquetus, lævis vel scaber, 6-10-poll. vel demum 2-pedalis, basi reliquiis fibratis vaginisque foliorum ferrugineis tectus; superne nudus: in uno specimine folio brevi longe vaginante e basi spicæ 5 poll. remoto munitus. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmo breviora vel longiora, firma, carinata, marginibus carinaque scaberrima. *Spica* 10-15 lin. longa, recta: pars staminifera 5-10 lin. longa,  $\frac{1}{2}$  lin. lata: basi flosculis fœmineis 1-5 alternis instructa. *Squamæ masculæ* oblongæ, obtusissimæ, albidæ, ciliatæ, medio viridi, demum ferrugineæ, concolores: fœmineæ similes, breve cuspidatæ, vel inferiores foliaceæ, 10-12 lin. longæ; spicam æquantem: summa interdum mutica, nervo ad apicem vel paulo infra attingente. *Perigynium*  $2\frac{7}{10}$ -3 lin. longum,  $1-1\frac{4}{10}$  lin. latum. *Achenium* perigynio arcte tectum,  $2\frac{1}{10}$  lin. longum, lineam latum, basi productum, basi styli incrassata decidua.

*C. phyllostachys* maxime affinis, quæ tamen differt squamis fœmineis longissime foliaceis, masculis inferioribus interdum cuspidatis; perigyniis longius rostratis, nervatis, superne scabriusculis; rachis angulata, flexuosa; culmo inferne foliis vaginantibus pluribus instructo.

In *Geyer's* specimens the culm is rough, with only one or two female flowers and short cuspidate female scales, and these, but especially the male scales, are ferruginous. In one specimen the spike is wholly male. In *Dr. Prieë's* and *Thurber's* specimens the culm is smooth, the female flowers three or five, the female scales foliaceous and white, with a green-nerved centre.

99. *C. phyllostachys* (Meyer); spica simplici androgyna apice tenui cylindrica mascula basi flosculis fœmineis 3 alternis, infima subremota rachis flexuosa; stigmatibus 3; perigyniis ovato-trigonis rostellatis, ore albo-hyalino integro ciliato, glabris superne ad margines scabriusculis nervatis viridibus, squama longissime foliacea basi margine membranacea albida ciliata medio viridi nervata latioribus multoties brevioribus.—*C. phyllostachys*, *Meyer*, *Enum. Pl. Caucas.* p. 30; *Flora Ross. Ledebour*, 269; *Kunth*, 478. (TAB. CVI.)

HAB. In regione Caucasica.

*Radix* fibrosa. *Culmus*  $1-1\frac{1}{2}$ -ped., gracillimus, acute triquetus, angulis albidis scabriusculis basi rudimentis vaginisque foliorum ferrugineis tectus, sursum foliis vaginantibus munitus, superne nudus. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmum æquantia, earinata, marginibus demum revolutis. *Ligula* truncata, ferruginea. *Spica* 9-12 lin. longa, flosculis fœmineis 2 superioribus contiguis: infimo 4-5 lin. remoto: pars staminifera 4 lin. longa,  $\frac{4}{10}$  lin. lata, erecta. *Rachis* flexuosa, angulis acutis. *Squamæ masculæ* imbricatæ, albidæ, pallide ferrugineo-tinctæ, nervo viridi infra apicem evanescente obtusæ: inferiores lanceolatæ, laxæ: infima in uno specimine cuspidata. *Squamæ fœmineæ* omnes foliaceæ, bracteas simulantes, spica longiores: infima  $3\frac{1}{2}$ -5 poll. longa,  $\frac{3}{8}$  lin. lata, omnes basi marginibus albidis pallide ferrugineo-tinctis, medio viridi nervatæ. *Perigynium*  $2\frac{7}{10}$ -3 lin. longum,  $1\frac{4}{10}$  lin. latum. *Achenium* perigynio conforme, trigonum, punctulatum, basi styli conico-incrassata.

This species differs from all its allies in its nerved perigynium.

100. *C. concinna* (Brown); spicis 3-4 rarius 5 parvis paucifloris plerumque confertis vel approximatis, termi-

nali mascula tenui oblonga subsessili, rarius apice vel omnino fœminea, reliquis fœmineis ovalibus densifloris, inferioribus inserte vel exserte brevi-pedunculatis crectis, infima interdum subremota vel radicali angusta laxiflora longe exserte pedunculata sæpe basi composita; vaginis brevibus cuspidatis vel infima longiori subulato-foliacea; stigmatibus 3 lævibus; perigyniis triquetro-ovalibus utrinque attenuatis, vel obovatis rostellatis, ore emarginato ferrugineo, pallide viridibus strigoso-hirtis, nervis 2 marginalibus, squama late ovata obtusa purpurea margine late albo-hyalina ciliata angustioribus subduplo longioribus.—*C. concinna*, *Brown, Frank. Nar. App.* 763; *Kunth, Cyp.* 444; *Fl. Bor. Am.* ii. 223; *Schw. et Tor.* 330; *Dewey, Sill.* xi. 152. *C. ornithopoda*, *Tor. Mon.* 412 (non *Willd.*). (TAB. CVII.)

HAB. In America Boreali. Wooded and barren grounds. Arctic America, *Richardson*. Rocky Mountains, *Drummond*.

Stolonifera. *Culmus* 4-9-poll., filiformis, debilis, erectus vel nutans, apice scaber, basi foliatus, rudimentisque foliorum purpureis tectus; pars spicæ gerens 4-12 lin. longa, rarius ad basin porrecta. *Folia*  $1-1\frac{1}{2}$  lin. lata, culmo breviora, plana. *Bractææ* vaginatæ: superiores brevi-cuspidiformes, vel infima subfoliacea, pedunculo brevior. *Vaginæ* 1-2, infima nunc 6 lin. longa. *Pedunculi* scabri, 1-4 vel infimus 18 lin. longi. *Spicæ* plerumque confertæ, abbreviatæ: terminalis mascula, vel rarius apice fœminea, 1-4 lin. longa,  $\frac{1}{2}$  lin. lata: interdum omnino fœminea: fœmineæ 2-3 lin. longæ,  $1-1\frac{1}{2}$  lin. latæ, omnes contiguæ, vel infima paulo remota: vel rarius subradicalis, angusta, laxiflora, interdum basi composita: in uno specimine spica media geminata. *Squamæ* conformes, purpureæ, margine albo-hyalinæ, ciliatæ, obtusæ, muticæ, rarius eæ spicæ radicalis acutæ, etiam cuspidatæ, perigynium æquantem. *Perigynium*  $1\frac{1}{10}-\frac{3}{10}$  lin. longum,  $\frac{5}{10}-\frac{6}{10}$  lin. latum. *Achenium* stipitatum,  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovali-triquetrum, ferrugineum, punctulatum, basi styli crassiore sensim apiculatum. *Stigmata* brevia, lævia.

A *C. ornithopoda*, *Willd.*, differt spicis brevioribus, densifloris; perigyniis strigoso-hirtis; squamis ciliatis.

*Torrey*, in his Monograph, remarks that he follows *Dewey* in referring this species to *C. ornithopoda*, but he gives no reference; and I have quoted from *Silliman's Journal* the only allusion that I can find of *Dewey* to the species under the name originally given to it by *Mr. Brown*. It has not been found in the States.

101. *C. Spachiana* (Boott); spicis 4-9 oblongis vel cylindraceis pedunculatis remotis, terminali mascula vel basi vel apice et basi mascula pallida, reliquis fœmineis apice masculis singulis vel mediis geminatis inæqualibus exserte pedunculatis nutantibus pallide ferrugineis; bracteis culmo longioribus; stigmatibus 3; perigyniis ellipticis longe rostratis, ore emarginato hyalino, membranaceis ventricosis leviter nervatis superne scabriusculis marginibus serratis ferrugineo-punctatis, squama lanceolata acuta vel mucronata pallida decolori latioribus longioribusque. (TAB. CVIII.)

HAB. Prope Macao, China, *M. Calléry* (*Herb. Mus. Paris. !*).

*Culmus* 1-2-ped., triquetus, lævis, validus vel gracilis, rigidus, basi foliatus; pars spicæ gerens 5-15 poll. longa. *Folia*  $1-1\frac{1}{2}$  lin. lata, carinata, rigida. *Bractææ* vaginatæ, culmo longiores. *Vaginæ* inferiores,  $\frac{1}{2}$ -1 poll. longæ. *Pedunculi* filiformes, scabri: inferiores 2-4 poll. longi: geminati, inæquales. *Spica*

terminalis 1-1½ poll. longa, pedunculata. *Spica feminea* ½-1½ poll. longæ, 3-4 lin. latæ, omnes singulæ, vel una vel altera e mediis geminata; apice masculæ: inferiores longe exserte pedunculatæ, nutantes. *Squamæ* conformes, pallidæ. *Perigynium* 2 $\frac{6}{10}$ -3 lin. longum,  $\frac{8}{10}$  lin. latum; rostro gracili, elongato, demum superne albo-hyalino; ore facile rupto, integro, obliquo, demum emarginato vel fisso. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo)  $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovali-triquetrum, fuscum, angulis pallidis, impresso-punctulatum, basi styli æquali apiculatum.

Affinis *C. Cherokeeensi*, Schw., quæ spicis masculis 2-3 vel terminali basi feminea; fœmineis pallidis, sæpe ternatis; perigyniis minoribus, rostro breviori, obsolete nervatis, glabrioribus; foliis latioribus, minus rigidis, gaudet.

I am indebted for the knowledge of this species to my kind friend, M. Spach, and have dedicated it to him. It was found near Macao by M. Calléry, a French missionary. It is very closely allied to *C. Cherokeeensis*.

102. *C. rara* (Boott); spica simplici androgyna apice subdimidiatim mascula oblongo-cylindracea olivaceo-ferruginea sæpe nuda; stigmatibus 3; perigyniis ovatis vel lanceolatis sensim acuminato-rostellatis, ore integro obliquo, valide nervatis oblique divergentibus olivaceis, squama ovata obtusissima vel subacuta ferruginea nervo viridi infra apicem evanescente vel extra producto ciliolata infima subinde breve cuspidata longioribus.—*C. rara*, Boott, *Lin. Trans.* xx. 139. (TAB. CIX.)

HAB. In montibus subtropicis Zeylanicæ, Gardner; Khasiæ et Bhotan, Griffith.

*Culmus* 12-20-poll., filiformis, lævis, nudus, basi foliatus. *Folia* filiformia, culmo breviora. *Spica* 8-11 lin. longa, apice ½ lin. basi 2 lin. lata. *Squamæ* omnes conformes, ferrugineæ: infima subinde breve cuspidata. *Perigynium* 1 $\frac{2}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{6}{10}$  lin. longum, ½ lin. latum, ovali-triquetrum, stipitatum. *Stigmata* 3, longa.

103. *C. capillacea* (Boott); spica simplici androgyna apice mascula abbreviata ovata ferruginea plerumque nuda; stigmatibus 3; perigyniis ovatis vel oblongis rostellatis, ore integro, plano-trigonis stipitatis divaricatis vel reflexis leviter nervatis punctis resinosis obsitis, squama ovata obtusa ferruginea medio pallida trinervi decidua infima subinde cuspidata longioribus. (TAB. CX.)

HAB. In Himalaya orientali temperata (uliginosis), alt. 10-12,000 ped., ad Sikkim, J. D. Hooker; Bhotan, Griffith.

Cæspitosa. *Culmus* 3-10-poll., capillaceus, superne scaber. *Folia* capillacea, culmo breviora vel subæquantia. *Spica* 3-4 lin. longa, basi 2 lin. lata; pars tertia vel dimidia suprema mascula. *Squamæ* omnes conformes, obtusæ: infima rarius cuspidata, cuspidate spica breviora vel æquante. *Perigynium*  $\frac{6}{10}$ -1 lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, postice planum, obtuse trigonum, stipitatum, horizontaliter divergens vel reflexum. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, oblongo-ovale, triquetrum. *Stigmata* 3, brevia.

A *C. rara* differt, culmo foliisque brevioribus, capillaceis; spica abbreviata, ovata, ferruginea; perigyniis minoribus, resinosis-punctatis, reflexis; squamis fœmineis deciduis.

104. *C. fusiformis* (Nees); spicis 6 cylindricis laxis remotis gracilibus, terminali mascula pallide castanea, reliquis fœmineis olivaceis exserte pedunculatis bracteatis, inferioribus dissitifloris; stigmatibus 3; perigyniis fusiformibus triquetris longe attenuato-rostratis rostro su-

perne scarioso marginibusque scabris, ore albo-hyalino obliquo demum bilobo, nervatis stipitatis pallide ferrugineis, squama ovato-lanceolata obtusa hispido-aristata castanea margine superne albo-hyalina duplo longioribus.—*C. fusiformis*, Nees, *Wight, Contr.* p. 128; Kunth, 471; Drejer, *Symb.* 24. t. 11. (TAB. CXI.)

HAB. In Himalaya temperata ad Kumaon, alt. 6-7000 ped., Royle, n. 88. Sikkim, alt. 10-12,000 ped., Hooker.

*Culmus* 1½-ped., lævis, e basi foliatus; pars spicas gerens 9-12-poll. *Folia* 3 lin. lata, plana, mollia, graminea, culmo breviora. *Bracteæ* foliaceæ, vaginatæ: superiores culmum æquantes. *Vagina* infima 1-2 poll. longa. *Pedunculi* filiformes, scabri: infimus 3-4 poll. longus. *Spica mascula* 12-15 lin. longa, sublineam lata: rarius altera "minor et quasi rudimentaria" (Drejer). *Spica feminea* 1-2½ poll. longæ, 1½-2 lin. latæ: suprema subinde masculam superante, laxiflora: inferiores floeulis remotiusculis alternatim dispositis. *Squamæ* pallide castaneæ, superne ad margins late albo-hyalinæ: masculæ muticæ: fœmineæ aristatæ: aristâ in inferioribus perigynium subæquante. *Perigynium* 3½-4 lin. longum,  $\frac{8}{10}$  lin. latum: rostrum apice scariosum serratumque: os integrum, obliquum, demum fissum. *Achenium* stipitatum, 1 $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, oblongo-triquetrum, facibus inferne concaviusculis: basi styli persistente apiculatum, flavidum.

Ad *C. sylvaticam* prope accedit. Differt spicis laxifloris; perigyniis longioribus; ore hyalino, integro, demum bilobo.

Var.  $\beta$ ; spicis pluribus, masculis 1-2, fœmineis elongatis 4-pollicaribus; squamis longioribus; foliis latioribus, 4-5 lin. latis; bracteis culmo longioribus.—Hab. Lachen, Hooker.

I have only seen one male spike in *C. fusiformis*. The mouth of the perigynium is easily ruptured, even by the protrusion of the stigmata. I believe it is originally entire-oblique, becoming eventually ruptured and two-lobed, the lobes obtuse, by which it is distinguished from *C. sylvatica*. The specimens brought by Dr. Hooker from Lachen are not mature: I refer them to *C. fusiformis*, from the aristate scales, which distinguish them from *C. finitima*, but the greater number of the spikes (6-11) and the elongate scales, the more profuse and more crowded florets, are deviations from the typical form.

105. *C. finitima* (Boott); spicis 6-8 rarius 12 cylindricis sublaxis linearibus pallide castaneis, masculis 1-2 erectis, reliquis fœmineis elongatis exserte pedunculatis bracteatis, inferioribus nutantibus basi attenuatis; stigmatibus 3; perigyniis fusiformibus triquetris longe rostratis, rostro superne scarioso, ore albo-hyalino obliquo demum bilobo, glabris nervis 2 marginalibus, squama obovata obtusa vel lanceolata acuta mutica pallide ferruginea margine albo-hyalina nervo viridi longioribus. (TAB. CXII.)

HAB. In Himalaya orientali temperata, ad Sikkim, alt. 9-11,000 ped., J. D. Hooker, in sylvis.

*Culmus* 1-2-ped., triquetrum, validus, lævis, superne scabriusculus, e basi foliatus, inferne vaginis rubro-purpureis tectus; pars spicas gerens subpedalis. *Folia* 3-4 lin. lata, plana, graminea, firma, culmo breviora. *Bracteæ* vaginatæ, foliaceæ, culmo longiores vel breviores. *Vagina* infima 2-2½ poll. longa. *Pedunculus* infimus 4-5 poll. longus, filiformis, superne scaber. *Spica mascula* terminalis, 12-15 lin. longa, 1-1½ lin. lata; rarius altera brevis sessilis ad ejus basin sita. *Spica feminea* 1-3 poll. longæ, 1½ lin. latæ, alternatim approximatae: superiores sæpe masculam superantes, erectæ: inferiores longe exserte pedunculatæ, nutantes, basi attenuato-laxifloræ: infima

subinde basi composita. *Squamæ* omnes muticæ, pallide ferrugineæ, superne margine albo-hyalinæ: masculæ obtusæ: fœmineæ obtusæ vel lanceolatae, acutæ: nervo infra apicem late hyalinum evanescente. *Perigynium*  $2\frac{6}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, glabrum, enervium, nisi nervis 2 marginalibus; rostrum apice albo-hyalinum, demum constrictum; ore hyalino, obliquo, bilobo. *Achenium* stipitatum,  $1\frac{1}{2}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-obovatum, triquetrum, basi styli apiculatum, faciebus basi concaviusculis.

A *C. fusiformi* differt, spicis pluribus, angustioribus, subconfertifloris; squamis muticis; perigyniis minoribus, glabris, encerviis; foliis subrigidis.

The habit of this species allies it to the var.  $\beta$  of *C. fusiformis*, but the obtuse awnless squamæ and the smooth perigynia distinguish it. The scarious apex of the rostrum becomes contracted in the mature perigynium, and the hyaline bilobed orifice in both species is characteristic.

106. *C. ligulata* (Nees); spicis 5–7 cylindricis stricte erectis, mascula 1 rarius 2 sessilibus castaneis, fœmineis 4–6 griseis, superioribus contiguis, inferioribus vel omnibus alternis subremotis exserte pedunculatis subinde apice masculis bracteatis; bracteis foliis conformibus rigidis strictis culmo longioribus; vaginis scabris; stigmatibus 3; perigyniis ovalibus triquetris rostratis bifidis rectis undique scaberrimis, nervis 2 marginalibus, squama ovata subacuta hispido-aristata latioribus longioribusque.—*C. ligulata*, Nees, *Wight, Contr.* 127; *Kunth*, 516. (TAB. CXIII.)

HAB. In Himalaya subtropica et temperata. Kumaon, alt. 7000 ped., *Royle*, n. 115. Nipal, alt. 5–6000 ped., *Hooker*; et in montibus Khasiæ, alt. 4–5000 ped., *Hooker et Thomson*.

*Culmus* 2–2½-ped., triquetrum, rigidus, piloso-scaber, usque ad apicem foliis bracteisque vaginantibus fere omnino clausus; pars spicas gerens 3–10 poll. longa. *Folia* 3–4 lin. lata, plana, glauca, apice attenuato-acuta, firma, stricta, deorsum breviora: superiora culmo longiora. *Bractea* foliis conformes, culmo longiores. *Vagina* piloso-scabræ, intus apice ferrugineæ. *Ligula* ferruginea, superne ad faciem bractee alligata, apice libera. *Pedunculi* inferiores 2 poll. longi, triquetri, scabri, graciles. *Spica mascula* 9–12 lin. longa, sublineam lata, sessilis, apicem spicæ fœmineæ superioris subinde vix attingens: vel alterâ quandoque apice fœmineâ, breviori, ad basin aucta. *Spica fœminea* 1–1½ poll. longæ, 3 lin. latæ: superiores contiguæ, inserte vel omnes alternæ exserte pedunculatæ, interdum apice masculæ. *Squamæ* omnes conformes, vel masculæ submuticæ, apice ciliatæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$ – $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovali-triquetrum, breve stipitatum, basi styli decidua incrassata.

Nees remarks of this species that it is “a *Caricibus* omnibus distincta vaginis culmum totum vestientibus.” This remarkable character however becomes modified as the culm is more and more developed, leaving spaces between the sheathing leaves. Its affinity is with *C. hebecarpa*, Meyer, which Nees apparently never saw, though one of Wallich’s plants, but still more closely allied in habit with *C. Maubertiana*, B.

107. *C. Maubertiana* (Boott); spicis 7 cylindricis linearibus stricte erectis contiguis ferrugineis, terminali mascula vel apice fœminea pedunculata, fœmineis exserte pedunculatis bracteatis; bracteis foliis conformibus rigidis strictis vaginatis culmo longioribus; stigmatibus 3; perigyniis late ovalibus triquetris rostratis, rostro sæpe excurvo, bifidis undique scaberrimis, nervis 2 marginali-

bus, squama ovata subacuta vel obtusa breve hispido-aristata vel mutica ferruginea longioribus. (TAB. CXIV.)

HAB. Touran, Cochin-China, *Gaudichaud*. (*Herb. Mus. Paris*.)

*Culmus* sesquipedalis, triquetrum, validus, rigidus, omnino nisi inferne foliis vaginantibus clausus; pars spicas gerens 3 poll. longa. *Folia* 2 lin. lata, plana, sensim apice attenuata, rigida, stricta: inferiora breviora, remota: superiora 9 poll. longa, contigua, quadrifaria. *Vagina* glabræ, culmum omnino tegentes, inter se thecatæ, basis superioris in inferioris apice recepta. *Bractea* foliis conformes, culmo longiores. *Vagina foliorum* fusco-purpureæ. *Spica mascula* pollicaris, 1 lin. lata, subinde apice fœminea. *Spica fœminea* 12–15 lin. longæ,  $1\frac{1}{2}$  lin. latæ. *Squamæ* omnes conformes, plus minus apice ciliatæ, ferrugineæ, masculis sæpe conspersæ. *Perigynium*  $1\frac{6}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, perigynio conforme, basi styli incrassata decidua.

*C. ligulata* arcte affinis, sed omnibus partibus minor; spicis foliisque angustioribus, vaginis glabris; perigyniis minoribus, rostro excurvo.

I am indebted to M. Spach for the knowledge of this species, and have named it after M. Maubert, to whom I am under great obligations for the labour bestowed on the figures of this Work. The specimens in the Herbarium in Paris are the only ones I have seen gathered by M. Gaudichaud in Cochin-China.

108. *C. Prescottiana* (Boott); spicis 6–10 cylindricis elongatis densifloris contiguis sessilibus stramineis concoloribus, masculis 1–2 gracilibus, reliquis fœmineis, inferioribus longe foliaceo-bracteatis evaginatis basi attenuatis; stigmatibus 2; perigyniis late ovalibus subturgidis rostrellatis emarginato-bidentatis nervatis divergentibus stramineis sæpe ferrugineo-punctatis, squama ovata obtusa valide hispido-cuspidata purpurea medio pallida trinervi latioribus longioribusque.—*C. Prescottiana*, *Boott*, *Lin. Trans.* xx. 135. (TAB. CXV.)

HAB. In ins. Hawaii. “In Napalia?,” *Herb. Wallich*, n. 3386. Ins. Hawaii, “in the forest above the saw-mill,” *Captain Wilkes* (*Herb. Gray*).

*Culmus* 2–3-ped., triquetrum, validus, rigidus, lævis, inter spicas scaber, basi foliis vestientibus tectus; pars spicas gerens 6–9 poll. longa. *Folia* 4 lin. lata, plana, carinata, rigida, culmum subæquantia. *Bractea* evaginatæ: inferiores culmum longe superantes. *Spica mascula* 1–2½ poll. longæ, 1 lin. latæ, sessiles. *Spica fœminea* 2½–4 poll. longæ, 2½ lin. latæ, omnes contiguæ, erectæ vel cernuæ. *Squamæ* omnes purpureæ, medio pallidæ, trinerves, cuspidatæ. *Perigynium*  $1\frac{4}{10}$ – $1\frac{6}{10}$  lin. longum,  $\frac{8}{10}$ – $1\frac{1}{10}$  lin. latum, nervatum, nervis 2–4 vel 5–7 concoloribus. *Achenium*  $\frac{8}{10}$ –1 lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, lenticulare, castaneum vel atro-purpureum, punctulatum, basi styli æquali apiculatum, vix cavitatem dimidiam perigynii implens.

Affinis *C. crinita*, Lam. Differt spicis pluribus, sessilibus; perigyniis nervatis, bidentatis, ferrugineo-punctatis; squamis brevius cuspidatis; foliis rigidis.

This species, which I first met with in the herbarium of the late Mr. Prescott, to whom it was entrusted by Dr. Wallich for description, was accompanied by a ticket from Dr. Wallich’s catalogue, referring it with a query to Nipal. Dr. Gray subsequently sent it to me with the other *Carices* from Captain Wilkes’s American Exploring Expedition, by whom it was found in the woods of the island of Hawaii; and the conjecture of Dr. Wallich as to its being a native of Nipal must be considered very doubtful.

109. *C. paleata* (Boott); spicis 7–10 cylindricis densifloris, masculis 2–4 contiguis sessilibus, infima bracteata, reliquis androgynis, ima basi attenuatis masculis remotis,

inferioribus longe exserte pedunculatis cernuis longissime bracteatis olivaceis; stigmatibus 2-3; perigyniis obovatis vel ovalibus rostellatis bifidis plus minus nervatis, nervis marginalibus pallidis superne serrato-dentatis, coriaceis olivaceis purpurco-maculatis, squama ovata acuta vel obtusa paleacca longe hispido-cuspidata brevioribus longioribusque.—*C. paleata*, *Boott, Lin. Trans.* xx. 127. (TAB. CXVI.)

HAB. In ins. Juan Fernandez, *Scouler (Herb. Hooker et Fielding); Cuming, n. 1341.*

*Culmus*  $1\frac{1}{2}$ - $2\frac{1}{2}$ -ped., triquetus, validus, lævis, superne scaber, basi foliatus; pars spicas gerens 1-2-pedalis. *Folia* 3 lin. lata, culmo breviora, firma, plana. *Bractea* vaginata, culmo longiora. *Vagina* 3 lin. ad 2 poll. longæ. *Pedunculi* ligulato-compressi: inferiores 3-4 $\frac{1}{2}$  poll. longi, læves. *Spica masculæ* 7-20 lin. longæ, 1-2 lin. latæ, pallidæ: reliquæ ima basi masculæ, 1-2 $\frac{1}{2}$  poll. longæ, 2 lin. latæ: superiores subinde apice masculæ. *Squamæ* omnes valide hispidoque cuspidatæ: masculæ obtusæ, ciliatæ. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, plano-convexum vel triquetrum, ore bifido scabro, nervis marginalibus superne serrato-dentatis, aliis plus minus distinctis, rostello pallido. *Achenium*  $\frac{8}{10}$ -1 lin. longum,  $\frac{6}{10}$  lin. latum, perigynio conforme, triquetrum vel compressum flavidum, basi styli contorta.

Affinis *C. lucida*. Differt spicis longioribus, inferioribus longe pedunculatis cernuis pallidis; perigyniis olivaceis, margine scabris; foliis latoribus, planis.

This species is allied to several of the New Zealand *Cariaces* in habit, having, like them, male florets at the base of the female spikes. It has not been found beyond the limits of the island of Juan Fernandez, where it was first discovered by Mr. Scouler.

110. *C. sororia* (Kunth); spica ovata capitata longe bracteata, e spiculis androgynis apice masculis pluribus densis composita; stigmatibus 2; perigyniis late ovatis attenuato-rostratis bidentatis compressis fuscis marginibus viridibus acutis superne serratis antice enerviis postice basi nervatis, nervis superne evanidis, membranaceis patentibus, squama ovata acuta hyalina albida nervo viridi latoribus longioribusque.—*C. sororia*, *Kunth, Cyp. p. 379.* (TAB. CXVII.)

HAB. In America australi. Montevideo, *Sellow.*

Cæspitosa. *Radix* fibrosa. *Culmus* 2-pedalis, gracilis, triquetus, nudus, basi foliatus, superne scabriusculus. *Folia*  $1-1\frac{1}{2}$  lin. lata, culmo breviora, mollia, graminea, læte viridia. *Bractea* infima 2 poll. longa, refracta: altera setacea, brevis. *Spica* 8 lin. longa, 6 lin. lata, densa, utrinque obtusa. *Squamæ* conformes. *Perigynium*  $2\frac{2}{10}$  lin. longum, 1 lin. latum. *Achenium* stipitatum, 1 lin. longum,  $\frac{6}{10}$  lin. latum, ellipticum, compressum, basi styli æquali apiculatum.

The figure and description of this species are from the original specimen of Sellow, in the Berlin Herbarium. The densely capitate spike and the terete base of the style distinguish it from the allied species of the group to which it belongs.

111. *C. sychnocephala* (Carey); spica ovali capitata involucreta straminea, e spiculis 6-10 vel pluribus androgynis basi masculis plus minus dense aggregatis, infima sæpe remotiuscula discreta; bracteis longissimis; stigmatibus 2; perigyniis angustis ovato-lanceolatis in rostrum elongatum attenuatis basi spongiosis marginibus anguste alatis serratis alte bifidis utrinque nervatis, squama lanceolata acuminata cuspidata hyalina albida longioribus.—*C. sychnocephala*, *Carey, Sill. Journ.* iv. 24

(1847), in *Gray, Bot.* 515; *Sartwell, Ews. n. 38.* *C. cyperoides*, *Dewey, Sill.* iii. 171. (TAB. CXVIII.)

HAB. In America septentrionali. New York, *Vasey.*

*Culmus* 3-12-poll., obtusangulus, glaber, foliis vaginantibus munitus. *Folia* sublineam lata: superius sæpe culmo longius. *Bractea* 3-4, inæquales: inferiores spicam longissime superantes. *Spica* 7-14 lin. longa, 6 lin. lata, utrinque acuta. *Spiculæ* obovatæ, plus minus arcte congestæ: infima sæpe 2-3 lin. remota, discreta. *Squamæ* conformes. *Perigynium*  $2\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, infra basin achenii contractam spongiosum, brevissime stipitatum. *Achenium*  $\frac{1}{2}$  lin. longum,  $\frac{3}{10}$  lin. latum, plano-convexiusculum, lucidum, sub lente tenuissime punctulatum, basi styli æquali apiculatum.

A *C. cyperoides*, L., differt, spica ovali, longiori, laxiori; perigynio breviori, basi spongioso, brevissime stipitato.

112. *C. appressa* (Brown); spica ferruginea oblonga vel elongata plus minus lata compacta cylindrica, vel laxa lanceolata, basi ramosa, ramis ubique spiculiferis, omnibus abbreviatis congestis, vel inferioribus elongatis discretis approximatis, e spiculis numerosissimis androgynis apice masculis ovatis contiguis decomposita, nuda vel anguste bracteata; stigmatibus 2; perigyniis ovatis vel orbiculatis rostratis bifidis plano-convexis marginibus incurvis e medio sursum anguste alatis serratis, utrinque nervatis, nervis quibusdam superne evanidis, stipitatis demum patentibus ferrugineis, squama ovata apice serrulata acuta vel mucronata latoribus longioribusque.—*C. appressa*, *Brown, Prod.* 242; *Kunth*, 389; *Kunze*, 45. t. 11; *Hooker, Fl. Antare.* i. 90; *Lehman, Pl. Preiss.* ii. 94. (TAB. CXIX. et CXX.)

HAB. In Nova Hollandia, Tasmania, etc. Port Jackson, *Brown.* Swan River, *Drummond.* Tasmania, *Gunn, Preiss.* Lord Auckland's Group, Campbell's Island, *Dr. Hooker.*

*Rhizoma* lignosum, reliquiis fibrosis nigris foliorum vestitum. *Culmus* 1-5-ped., triquetus, validus, rigidus, scaber, basi foliis vestientibus tectus. *Folia* 3-5 lin. lata, culmum subæquantia. *Bractea* setaceæ, ramis breviores, rarius infima 4 poll. longa: sæpe obsoleta. *Spica* insigniter variat: 2-6 poll. longa, 6-12 lin. lata, quasi longe capitata, ramis omnibus abbreviatis arcte congestis: vel 8-12 poll. longa, 2-8 lin. lata, laxa, ramis inferioribus discretis: infimis sæpe 2-3 poll. longis, approximatis, appressis. *Squamæ* conformes: masculæ sæpius muticæ. *Perigynium*  $1\frac{4}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$ -1 lin. latum, basi spongiosum, rostro plus minus longo. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, suborbiculatum, basi styli crassiori apiculatum.

This species is common in Australia and Tasmania, Lord Auckland's Group, and Campbell's Island, varying in the size and compactness of the spike. The specimen figured Tab. CIX. is from Swan River; the large one in Tab. CXX. from Tasmania, and not mature. Dr. Hooker says it is found in woods near the sea, forming large harsh tufts.

113. *C. virgata* (Solander); spica ferruginea vel fusco-brunnea elongata lineari angusta laxa, basi interrupta ramosa, ramis ubique spiculiferis appressis inæqualibus e medio deorsum longioribus discretis, infimis remotis e spiculis androgynis apice masculis parvis numerosis ovatis decomposita nuda vel bracteata; stigmatibus 2; perigyniis cordatis rostratis bidentatis plano-convexis marginibus superne anguste alatis erosis, utrinque nervatis stipitatis appressis, squamam ovatam apice serrulatam acutam vel mucronatam rigidam æquilatam subæquantibus.—*C. virgata*, *Solander, MSS. (Herb. Banks); Hooker, Fl.*



*N. Zeal.* i. 282. *C. collata*, Boott, *Lond. Jour. Bot.* iii. 447. (TAB. CXXI. et CXXII.)

HAB. In Nova Zelandia. Prope Matuaro, Totaranui, Banks et Solander (1769), in sylvis. Tippoone, Wilkes. Bay of Islands, Sinclair, Dr. Hooker, etc.

*Culmus* 2-ped., triqueter, lævis vel apice scabriusculus, basi foliosus, rudimentisque foliorum brunneis, foliisque vestientibus tectus. *Folia* 2-2½ lin. lata, culmo longiora, sæpius præcipue inferne involuta. *Bractea* setacea, breves, vel infima 8 poll. longa, sæpe obsoleta. *Spica* 9-21 poll. longa, 2-5 lin. lata, apice sæpe spiculis solitariis discretis vel contiguis: inferne ramis ubique spiculiferis deorsum magis remotis, inæqualibus: inferioribus 2-5 poll. longis, erectis, appressis: infimis interdum abbreviatis. *Spicula* parvæ, ovata. *Squama* conformes. *Perigynium* lineam longum, ½ lin. latum, basi spongiosum. *Achenium* 7/10 lin. longum, vix ½ lin. latum, ovatum, basi productum, basi styli crassiori decidua.

A *C. appressa* differt, culmo lævi; foliis sæpe involutis; spica angustiori, longiori; perigyniis minoribus, marginibus erosis, erectis; squamis rigidis.

114. *C. secta* (Boott); spica ferruginea elongata laxa aperta nutanti basi ramosa, ramis inferioribus gracilibus longis, superne tantum spiculiferis, e spiculis androgynis apice masculis parvis numerosis decomposita nuda vel bracteata; stigmatibus 2; perigyniis oblongo-vel subrotundo-ovatis rostratis, antice oblique sectis bidentatis, superne marginibus acutis pallidis serratis subplano-convexis fusco-castaneis lucidis enerviis vel basi obsolete nervatis spongiosis, squama ovata acuta vel mucronata æquilata demum decolori longioribus vel subæquantibus.—*C. secta*, Boott; Hooker, *Fl. N. Zeal.* i. 281. (TAB. CXXIII. et CXXIV.)

HAB. In Nova Zelandia. Tippoone, Wilkes et Sinclair, etc. Northern and Middle Islands, Dr. Hooker, etc.

*Culmus* 2-3-ped., triqueter, gracilis, lævis, apice scaber. *Folia* 1-1½ lin. lata, culmum subæquantia, firma, carinata, scaberrima. *Spica* 1-1½-pedalis, nutans, basi laxa ramosa: rami superiores ½-1 poll. longi: inferiores quandoque pedales, gracillimi, superne tantum spiculiferi. *Squama* ferrugineæ, demum decolores. *Perigynium* 1-1 2/3 lin. longum, 6/10-7/10 lin. latum, basi crasse spongiosum. *Achenium* 6/10-7/10 lin. longum, 3/10-4/10 lin. latum, obovatum, biconvexum, pallidum.

This species, which Mr. Sinclair says "grows in marshes and generally forms a matted column about three feet high, and a foot in diameter," belongs to the *Paniculata*-group, and is easily distinguished from *C. virgata*, by its lax nodding spike, and shining nerveless perigynium.

115. *C. tenella* (Schkuhr); spica oblonga tenui pallida, e spiculis 2-6 androgynis apice masculis parvis paucifloris, inferioribus subremotis brevi-setaceo-bracteatis; stigmatibus 2; perigyniis plano-convexissimis ovalibus basi contractis obtusis abrupte rostellatis utrinque nervatis nervis quibusdam superne evanidis, vel oblongis sensim rostellatis crebrius nervatis glabris nitidis ferrugineis demum fuscis, ore integro, spongiosis, squama ovata acuta rarius obtusa quandoque mucronulata pallide ferruginea marginibus albo-hyalina demum decolori longioribus.—*C. tenella*, Schk. 28. f. 104 P. P.; Fries, *Sum. Veget. Scand.* 224; Anderson, *Cyp. Scand.* 60. t. 4. f. 33; Carey, Gray, *Bot. (cd. 2)* 514: (non Ehrh. *Cal. Beiträge*, vi. 10. n. 98, quæ *C. canescens*, L.; non Poiret, *Ency.*

*Suppl.* iii. 282, quæ Ul. tenella, Br.; non Thuillier, *Fl. Par.* 479, quæ *C. Schreberi*, W.) *C. loliacea*, Schk. *Suppl.* 18 (non Lin.). *C. disperma*, Dewey, *Sill.* viii. 266, (1824) etc.; Kunth, *Cypr.* 405: (non Kunze, *Reidgr.* 131. t. 33, quæ *C. rosea*, Schk., var.; non Steudel, *Un. Itin.* quæ *C. Steudeli*, Kunth.) *C. gracilis*, Gray, *Sill.* iv. 19 (1847); Carey, l. c. 543 (ed. 1); Sartwell, *Ews.* n. 29: (non Ehrh. *Cal. n.* 78, quæ *C. loliacea*, L.; non Schk. f. 24 E, quæ *C. vitilis*, Fr. ?; non Brown, *Prodr.*, quæ propria species.) *C. Blyttii*, Lang. *Car. Ger. et Scand.* 38. (TAB. CXXV. et CXXVI.)

HAB. In Europa et America septentrionali. "In paludibus Norvegiæ, Succia borealis, et Finlandiæ," Fries. In America Arctica, Richardson. In Montibus Saxosis, Drummond. "New England to Pennsylvania," Carey.

*Radix* stolonifera. *Culmus* 5-15-poll., gracilis, sæpe setaceus, triqueter, superne scaber. *Folia* plana, ½-5/10 lin. lata, supra granulata, culmo breviora vel subæquantia. *Bractea* ovato-lanceolata, plus minus setaceo-aristata: infima quandoque 6-12 lin. longa. *Spica* 8-14 lin. longa, sublineam lata. *Spicula* 2-5, rarius 6, parvæ, 2-6-floræ; e flosculis masculis 1-3 brevissime pedicellatis rarius perigynia superantibus, fœmineisque 1-3 rarius 4 compositæ: superiores, rarius omnes, contiguæ: inferiores subremotæ. In speciminibus quibusdam spicula infra terminalem, et summa (rarius) omnino mascula: infima rarissime composita, etiam breve pedunculata. *Squama mascula* angustiores, lanceolata, acutæ, albæ: fœmineæ ovata, acutæ vel obtusæ, muticæ vel mucronulata, pallide ferrugineæ, marginibus albo-hyalina, demum omnino decolores. *Perigynium* 1-1 2/3 lin. longum, 6/10 lin. latum, obtusum, abrupte rostellatum; nervis paucioribus, magis distantibus, quibusdam superne evanidis, basi contractum (Tab. CXXVI.): vel 1 3/10-1 5/10 lin. longum, 8/10 lin. latum, sensim rostellatum, nervis pluribus crebris magis crasse spongiosum; ore integro; plano-convexissimum, postice nervis 2 marginalibus magis prominentibus, nitidum, ferrugineum, demum fusco-atrum (Tab. CXXV.). *Achenium* 7/10-9/10 lin. longum, ½ lin. latum, ovale, utrinque obtusum, lenticulare, nitidum, ferrugineum, demum fuscum, basi styli æquali decidua. *Stigmata* longa. *Stamina* 2.

This species, overlooked in the north of Europe since the time of Schkuhr, and, until Fries distinguished it, confounded in herbaria with *C. loliacea*, L., has been familiar to American botanists since 1824, when it was described by Dewey under the name of *C. disperma*. Like *C. festiva*, Dewey, it is an example of a common American species, eventually, but rarely, found to be a native of the north of Europe; while *C. fulva*, Good., originally described as a native of Newfoundland, but rare among American species, is found very widely diffused in Europe.

Schkuhr originally received the specimen he has figured of *C. tenella* from Hedwig, who had forgotten whence he had received it; but in his 'Supplement' Schkuhr remarks he had since obtained it from Sweden. I have seen it in several herbaria sent from Sweden under the name of *C. loliacea*, with which it grows in the north of Europe, an association not hitherto found to exist in America. I have never seen *C. loliacea*, L., from any part of North America. We are much more familiar with the American than with the European specimens of *C. tenella*. Among the profuse specimens brought from Arctic America by Sir John Richardson, and sent from the States by different botanists, I observe a difference in the thickness of the culm, the breadth of the leaves, and the size and form of the perigynium; but, as is usual with other species of the genus, these differences insensibly disappear. The European plant, for which I am indebted to Fries, is identical with the more gracile forms of the American ones. In Tab.

CXXVI. the left-hand specimen, No. 1, with the separate spike over it, are from Sweden, the others from New York. In Tab. CXXV. the specimens figured were from Arctic America, brought by Sir John Richardson.

116. *C. loliacea* (L.); spica oblonga pallida, e spiculis 3-4 androgynis basi masculis subremotis composita, suprema basi attenuata, reliquis subglobosis, infima breve setaceo-bracteata; stigmatibus 2; perigyniis ellipticis crostratis utrinque obtusis vel substipitatis, ore integro antice secto, plano-convexiusculis valide nervatis pallidis, squama ovata obtusa mutica albo-hyalina medio viridi duplo longioribus.—*C. loliacea*, *L. Fl. Suec.* (ed. 2) 327. n. 840 (1755); *Wahl. Act. Holm.* 147; *Willd.* 237 (excl. *C. tenella*, *Sch.*); *Kunth*, 405 (excl. *C. tenella et gracilis*, *Schk.*); *Reichenbach*, *Icon.* ix. t. 214; *Anderson*, *Cyp. Scand.* 59. t. 4. f. 34; *Lang. Car. Ger. et Scand.* 62; *Koch, Syn.* n. 41; *Hop. et St. Car. Ger.* t. 29: (non *Schk. f.* 91, nec *Schreb.*, nec *Thuill.*, quæ *C. muricata*, *L.*, var.; non *Dewey, Sill.* xi. 306; non *Tor. et Schw.* 311, nec *Tor. Mon.* 391.) *C. gracilis*, *Ehrh. Cal.* n. 78: (non *Gray, Sill.* iv. 19, nec *Carey, l. c.* 543. ed. 1.) *C. Sibirica*, *Willd. Herb.*; *Sprengel, Syst.* 809; *Kunth*, 406; *Ledebour, Fl. Alt.* iv. 205. (TAB. CXXVII.)

HAB. In Europa boreali, Germania, et Sibiria. In Suecia, Norvegia, Lapponia, *Lin.*, *Anderson*, etc. In Germania, *Reichenbach*. In pratis siccis ad Obum fluv., *Pallas, in Herb. Willd.* “*C. Sibirica*,” *W.*

*Radix* stolonifera. *Culmus* 1-1½-ped., gracilis, superne nudus, scaber. *Folia* plana, ½-1 lin. lata, culmo breviora. *Bractea* infima setacea, sæpe spicula duplo longior, vel ea brevior. *Spica* 6-14 lin. longa, 2 lin. lata. *Spiculæ* 3-4 alternæ, suprema basi attenuato-mascula; flosculis fœmineis pluribus (sæpe 6-8) prædita: reliquæ subrotundæ, flosculis masculis paucioribus. *Squamæ* conformes. *Perigynium* 1-¾ lin. longum, ⅙ lin. latum, ellipticum, apice obtusum, rotundatum, vel rarius subacutum; ore integro vel antice secto; compressum, plano-convexiusculum, valide nervatum, nervis concoloribus, pallidum, demum ferrugineum, sub lente tenuissime granulatum, glabrum, basi productum. *Achenium* ⅞ lin. longum, ½ lin. latum, ovale, utrinque obtusum, plano-convexiusculum. *Stigmata* brevissima.

I have never seen this species from America. The apex of the perigynium is occasionally subacute.

Linnaeus describes the spiculæ as 4-8. I have never seen more than 4. The *C. Sibirica* of Willdenow's *Herb.*, first noticed, I believe, by Sprengel (who, from quoting the *C. tenella* and *C. gracilis* of Schk. as synonyms to *C. loliacea*, evidently had no distinct idea of the plant of Linnaeus), is in no respect different from *C. loliacea*, L. I have seen the specimens of Pallas, who had named them “*Panicum? pauciflorum.*” Ledebour inserts the *C. Sibirica* in his *Fl. Altaica* on the authority of Sprengel, but adds, “*Nobis non obvia fuit.*” I am not aware of any one finding it in Siberia since Pallas. Reichenbach says *C. loliacea* has been found “in turfosis inter alnos,” in Westphalia.

117. *C. triceps* (Michaux); spicis 2-4 oblongis contiguis sessilibus erectis densifloris olivaceis, terminali basi mascula, reliquis fœmineis evaginatis vel infima sæpe longiori remota exserte pedunculata; bracteis culmo longioribus; stigmatibus 3; perigyniis late ovalibus vel obovatis compresso-triquetris obtusis erostratis, ore emarginato, nervosis granulatis demum ferrugineo-punctatis glabris olivaceis, squama ovata plus minus cuspidata acuta vel obtusa alba nervo viridi latioribus longioribus

vel brevioribus; culmo foliisque hirsutis.—*C. triceps*, *Mich.* ii. 170; *Elliott*, ii. 538; *Carey, l. c.* 523; *Kunth, Cyp.* 430 (excl. *C. viridula*, *Mich.*); *Darlington*, 349. *C. hirsuta*, *Willd.* iv. 252; *Schk. f.* 172, *w. w. w.*; *Kunth*, 430; *Elliott*, ii. 538; *Muhl.* 234; *Schw. et Tor.* 322; *Tor. Mon.* 408; *Dewey, Sill.* ix. 260, et xi. 315; *Sartwell, Exs. n.* 89. *C. viridula*, *Schw. et Tor.* 320 (non *Mich.*); *Dewey, l. c.* xi. 153. *C. complanata*, *Tor. Mon.* 408. (TAB. CXXVIII.)

HAB. In America septentrionali. Canada (*Torrey*) to Texas.

Cæspitosa. *Culmus* 1-1½-ped., acute triqueter, gracilis, rigidus, apice scaber, sparsimque hirsutus, basi rudimentis foliorum purpureis vaginisque hirsutis tectus, sursum foliis vaginantibus vestitus; pars spicas gerens 1-2½ poll. longa. *Folia* 1-2 lin. lata: superiora culmo longiora, rigida, hirsuta, vaginis lanuginosis vel folia fere omnino glabra; vaginis pubescentibus. *Bractea* ½-1 lin. latæ, culmo sæpe duplo-triplo longiores, evaginatae, vel infima 1-3 poll. remota, sæpe sterilis, vaginata. *Vagina* 8 lin. longa, vel brevior. *Spicæ* 3-9 lin. longæ, 2-3 lin. latæ, omnes sessiles, contiguæ, vel infima sæpe longior, 1-3 poll. remota, breve exserte pedunculata. *Squamæ* albæ, medio virides: masculæ lanceolatae, acutæ: fœmineæ ovatae, acutæ vel obtusæ, plus minus longæ cuspidatæ: interdum spicis floriferis aspectum squarrosum ob longitudinem cuspidis præbentes. *Perigynium* 1-¾-¾ lin. longum, ⅙-⅙ lin. latum, glabrum, vel (sub lente) quasi pulverulento-scabriusculum, nunquam vere pubescens: ore integro, setulis paucis obsito: vel emarginato, glabro, pallidiori: plerumque obtusissimum, vel abrupte minime rostellatum, granulatum, demum sæpe ferrugineo-punctatum: nervosum. *Achenium* lineam longum, ⅙ lin. latum, ovale, triquetrum, flavidum, basi styli curvata apiculatum.

A *C. virescenti*, *Muhl.*, spicis olivaceis, crassioribus, sessilibus, magis approximatis; culmo hirsuto; vaginis lanuginosis; perigyniis majoribus, glabris vel scabriusculis, nusquam pubescentibus, abunde differt.

Michaux and Elliott having described the southern plant with smooth leaves, though Elliott notices their being pubescent near the sheaths, their *C. triceps* was for a long time considered obscure, and Willdenow's name of *C. hirsuta* suiting the more familiar aspect of the plant, prevailed. The difficulty in Elliott's case was increased, as he had described *C. hirsuta* in his ‘*Flora*,’ probably from the only specimen, which Mr. Curtis informs me is in Elliott's herbarium, sent to him by Muhlenberg. The species was inserted by Elliott in his ‘*Flora*’ on the authority of Dr. Baldwin, whose specimens, with “leaves somewhat hairy,” were found in Georgia. The specimens I have from Texas and the Carolinas are in no respect different from the northern plant, except in the smoothness of the leaves, and comparatively smooth sheaths. As to what has been described as pubescence on the young perigynia, I find it quite as perceptible in their mature state, nor does it seem to me to resemble pubescence. In some specimens the female scale has a long cuspidate point, giving quite a squarrose appearance to the spike, and it was this form which Schw. and Tor. supposed to be the *C. viridula* of Michaux, a plant erroneously said by Michaux to be allied to *C. triceps*, with which it has no affinity whatever, being a dwarfed state of one of the several forms of *C. Oederi*, as that very doubtful species is regarded by some authors.

118. *C. lanuginosa* (Michaux); spicis sæpius 4 vel 3-5 rarius 6 erectis purpureis demum pallidis, masculis sæpius 2 vel 1-3 rarius 4 contiguis, una vel altera interdum apice fœminea, cylindricis, fœmineis sæpius 2 vel 1-3 rarius 4 oblongis vel cylindricis remotis, sessilibus evaginatis vel infima plus minus vaginata, rarius

longe exserte pedunculata basi composita; bracteis foliaceis, infima culmo longiori vel breviori; stigmatibus 3; perigyniis ovatis vel ovalibus obtuse trigonis rostrelatis bicuspidatis nervatis hispidissimis coriaceis subturgidis pallide olivaceis vel cinereis, squama lanceolata acuminata hispido-cuspidata purpurea medio viridi plerumque brevioribus latioribusque.—*C. lanuginosa*, *Mich.* ii. 175; *Tor. Cyp.* 410; *Carey*, 529; *Darlington*, 352; *Sartwell, Eas. n.* 126. *C. pellita*, *Muhl.* 258; *Willd.* iv. 302; *Schk.* 84. f. 149, 150; *Kunth*, 483; *Schw. et Tor.* 368; *Dewey, Sill.* ix. 70; *Beck*, 444. (TAB. CXXIX.)

HAB. In America septentrionali. Arctic America to Pennsylvania, Kentucky, North-west Coast.

*Radix repens.* Culmus 1-2-ped., gracilis, triqueter, firmus, fere omnino infra spicas lævis, vel scaber: basi foliis vestientibus, sæpe rubellis, vaginisque reticulato-fissis, extus sæpe scabridis tectus; pars spicas gerens 4-15 poll. longa. Folia plana, 1-2 lin. lata, culmo sæpe longiora: inferiora, vaginaeque sæpe inconspicue leviter reticulato-venosæ. Bractea foliaceæ: omnes evaginatae, vel infima, longitudine mutabilis, plus minus vaginata. Auricula purpureæ. Vagina 1-6, etiam rarius 18-24 lin. longa. Pedunculus infimus 2-6 lin. rarius 1-4 poll. longus, scaber. Spica mascula purpureæ, demum flavidæ, cylindricæ, extremæ majores: summa 16-26 lin. longa, 1½ lin. lata, pedunculata: reliquæ sessiles, breviores, infima bracteata. Squamæ mascula lanceolata, abrupte apiculata vel acuminata, acutæ vel cuspidata, rarius obtusæ, muticæ, apice ciliatæ, purpureæ, demum stramineæ, medio viridi nervatæ. Spica feminea ½-2 poll. longæ, 3-4 lin. latæ, inter se 1-3, vel infima quandoque 9 poll. remota: summa subinde abbreviata, sæpe apice mascula, vel omnes sessiles, evaginatae, vel infima breve vel longe vaginata, exserteque pedunculata, basi subinde laxiflora, rarius composita. Perigynium 2-2½ lin. longum, 1-1½ lin. latum; rostro 1-1½ lin. longo; bicuspidatum, laciniis linearibus, scabris; nervis superne sæpe inconspicuis. Achenium 1-1½ lin. longum, 1-1½ lin. latum, triquetrobobovatum vel ovale, stipitatum, basi styli æquali persistente apiculatum, olivaceum. Stylus hirsutulus, sæpe contortus.

A *C. filiformis*, L., differt, culmo validiori, breviori; foliis planis, brevioribus; spicis masculis plerumque brevioribus, quandoque apice femineis; femineis longioribus.

In the specimens I have examined I find—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 15 with 3 spikes. | 12 with 1 male. | 8 with 1 female. |
| 30 „ 4            | 36 „ 2          | 45 „ 2           |
| 17 „ 5            | 14 „ 3          | 10 „ 3           |
| 2 „ 6             | 1 „ 4           | 1 „ 4            |

In one all the spikes were female. One or more of the male spikes were rarely female at the top, and the upper female male at top.

I have alluded to the very close affinity of this species with *C. Wallichiana* of India, which I think will be found to be merely a more luxuriant form of *C. lanuginosa*.

119. *C. evoluta* (Hartman); spicis 6 rarius 5-7 cylindricis erectis fusco-luridis, masculis 3 vel 2-4, infima bracteata, femineis 3 vel 2-4 crassis, suprema sæpe apice mascula, approximatis evaginatis, infima brevi-pedunculata; bracteis foliaceis, culmo plerumque longioribus; stigmatibus 3; perigyniis ovatis rostrelatis emarginato-bicuspidatis plus minus nervatis hispidis olivaceis, squama ovata acuta cuspidata purpurea, medio viridi, latioribus brevioribus vel longioribus.—*C. evoluta*, *Hart. Vet. Ac. Handl.* 156 (1818); *Wahl. Fl. Succ.* ii. 611; *Kunth*, 485; *Koch, Syn.* 887; *Kunze*, 33. t. 7; *Anderson*, 20, t. 8. f. 102; *Reichenbach, Cyp.* 28, t. 267; *Hoppe et St.*

t. 105. *C. filiformis*, β, *Coss. et Ger. Fl. Env. Paris*, 606. (TAB. CXXX.)

HAB. In Europa. “In fossis et ad ripas limosas lacuum Scaniae et prope Holmiam,” *Anderson*. Menecy, Paris, *Coss. et Germ.*

*Radix repens.* Culmus sub-4-ped., validus, triqueter, scaber, basi foliis longe vestientibus vaginisque purpureo-ferrugineis reticulato-fissis tectus; pars spicas gerens 6-8 poll. longa. Folia 2-4 lin. lata, plana, culmo breviora, grosse reticulato-venosa. Bractea plerumque culmo longiores, auriculatae: infima vix unquam subvaginata. Vagina sublineam longa. Pedunculus 3-8 lin. longus, triqueter, scaber. Spica mascula contiguæ, sessiles: suprema 1½-2½ poll. longa, 2-2½ lin. lata: extremæ majores, infima bracteata. Squamæ lanceolatae, obtusæ, muticæ vel superiores cuspidatæ, fusco-luridæ, demum ferrugineæ vel decolores. Spica feminea 1-2½ poll. longæ, 3-4 lin. latæ, approximatae vel infima 3 poll. remota, breve pedunculata. Perigynium 1-1½-2½ lin. longum, 1-1½ lin. latum, late emarginatum, breve bicuspidatum, nervatum, nervis plus minus prominentibus, hispidum.

Differt a *C. lanuginosa*, Mich., culmo altiori, crassiori, semper scabro; foliis latioribus, vaginisque grosse reticulato-venosis; bracteis evaginatis; spicis fuscis, magis approximatis, majoribus.

I have found in the specimens I have seen of this species—

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

*Anderson* says that it has been found growing in a marsh with *C. riparia* and *C. paludosa*. It looks like a hybrid between one of these species and *C. filiformis*. I have not been able to find any perfect achenia. Its broad flat leaves and coarser structure distinguish it from *C. filiformis*, L., though the European specimens of this last species, and especially those which I have from the neighbourhood of Paris, approach *C. evoluta* more nearly than the *C. filiformis* of America does. This last bears the same relation to *C. lanuginosa* as the *C. filiformis* of Europe does to *C. evoluta*. I have not seen any specimens of *C. evoluta* from North America, though *Cosson* and *Germain*, in their ‘Observations sur quelques Plantes Critiques des Environs de Paris,’ p. 24, quote “Green, Boston, in Herb. Guillemin,” for *C. evoluta*. I have specimens from that locality, gathered by Mr. Green, which are evidently *C. lanuginosa*, Mich.

120. *C. vestita* (Willdenow); spicis 3-4 rarius 2 densifloris purpureo-ferrugineis approximatis, mascula plerumque solitaria elongata demum castanea, femineis 2-3 rarius 1 ovatis vel oblongis sessilibus crassis, infima subinde remota pedunculata; bractea evaginata subulata vel foliacea culmo breviori; stigmatibus 3; perigyniis ovalibus triquetris rostratis, ore obliquo albo-hyalino demum sub-bilobo, hispidis nervatis olivaceis ferrugineo tinctis, squama ovata vel lanceolata acuta vel acuminato-cuspidata purpurea margine albo-hyalina latioribus longioribus vel subæquantibus.—*C. vestita*, *Willd.* iv. 263; *Schk.* 51. f. 182; *Kunth*, 518; *Muhl.* 238; *Elliott*, ii. 542; *Dewey*, ix. 261; *Schw. et Tor.* 331; *Carey*, 529; *Beck*, 437; *Sartwell, n.* 127. (TAB. CXXXI.)

HAB. In America septentrionali. New England to Georgia, in arenosis.

Culmus 1½-3-ped., triqueter, scaber, validus, superne nudus, basi foliatus, vaginisque purpureis reticulato-fissis tectus; pars spicas gerens 1½-3 rarius 4 poll. longa. Folia 1-2½ lin. lata, plana, culmo multum breviora. Bractea infima subulata, spicâ vix longior; vel foliacea, 1-2 lin. lata, culmo brevior, rarius subæquans. Spica mascula 1-2 poll. longa, 1-2 lin. lata, ses-

silis vel pedunculata: rarius altera oblonga ad ejus basin sita. *Squamæ* lanceolatae, obtusae vel acutae, apice marginibusque late albo-hyalinae. *Spicæ femineæ* 4–8 lin. longae, 3–4 lin. latae, sessiles, contiguæ; vel infima 1 rarius 2½ poll. remota, subpollinaria, basi attenuata, pedunculata: una vel rarius altera subinde apice mascula. *Perigynium* 1 $\frac{8}{10}$ –2 $\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, olivaceum, ferrugineo tinctum. *Achenium*  $\frac{9}{10}$ –1 $\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, obovato- vel ovali-triquetrum, basi styli æquali recta vel contorta apiculatum.

Muhlenberg remarks the stigmas are two or three. I have observed two only apparent occasionally, but in each case the achenium was triquetrous, and the base of a third stigma visible. Tuckerman places this species among the *Montanae*, and Carey associates it with *C. Halseyana*. I think its immediate affinity is with *C. scabrata* and *C. amplifolia*. I have never seen any specimens so far south as Georgia. Elliott gives no particular locality, but quotes Pursh for its growing in wet meadows. His specimen was from Mr. Collins, and probably from Pennsylvania. Carey describes it as growing in sandy soil, and I have very fine specimens from Tuckerman from "pine plains" at Seheneetady, New York.

121. *C. filiformis* (Lin.); spicis 3–4 rarius 2–5 erectis purpureis masculis 1–2 rarius 3–4, terminali pedunculata sæpe elongata, femineis 2 rarius 1–3 ovalibus vel oblongo-cylindricis approximatis sessilibus, vel infima rarius plus minus longe vaginata exserte pedunculata basi attenuato-laxiflora subremota; bracteis convolutis auriculatis, infima culmo longiori vel breviori; stigmatibus 3; perigyniis ovalibus vel ellipticis obtuse trigonis rostellatis bifurcatis subturgidis hispidis nervatis olivaceis vel pallide ferrugineis, squama ovata acuta cuspidata purpurea nervo viridi longioribus vel brevioribus.—*C. filiformis*, *L. Sp. Pl.* 1385; *Good. Lin. Trans.* ii. 172. t. 20. f. 5; *Willd.* iv. 303; *Schk. K.* 45; *Kunth*, 484; *Anderson*, xx. t. 8. f. 103, etc. etc.; *Dewey, Sill.* vii. 268; *Schw. et Tor.* 364; *Carey*, 529; *Beek*, 443; *Sartwell, Ews. n.* 125. *C. tomentosa*, *Light.* ii. 552. *C. splendida*, *Willd. Pr. t.* 1. f. 3. *C. lasiocarpa*, *Gaud. Agrost.* ii. 125. (TAB. CXXXII.)

HAB. In Europa et America septentrionali, in paludosis.

*Radix* repens. *Culmus* 1½–3-ped., filiformis, acute triquetter, superne lævis vel scabriusculus, basi foliatus, vaginisque purpureis reticulato-fissis tectus; pars spicas gerens 2–12 poll. longa. *Folia* convoluta, dorso convexa, facie canaliculata, culmo sæpe longiora, firma; vaginis quandoque extus scabridis, leviter reticulato-venosis. *Bractea* culmo longiores vel breviores, auriculatae, evaginatae, vel infima plus minus vaginata; vagina 1–18 lin. longa. *Pedunculus* infimus 2 lin. ad 3½ poll. longus, triquetter, scaber. *Spicæ masculæ* sæpius 1–2: suprema 1½–3 poll. longa, 1–1¼ lin. lata, pedunculata: purpureæ, demum flavidæ: infima bracteata, subremota: squamæ lanceolatae, apice sæpe ciliatæ, purpureæ, margine anguste albo-scariosæ, obtusæ, muticæ, vel subacutæ; nervo extra apicem producto. *Spicæ femineæ* sæpius 2, abbreviatæ vel oblongo-cylindricæ, 6–18 lin. longæ, 3 lin. latae: suprema rarius apice mascula: infima basi attenuato-laxiflora. *Perigynium* 2 $\frac{4}{10}$ –3 lin. longum, 1–1 $\frac{1}{10}$  lin. latum, nervis superne sæpe evanidis. *Achenium* 1 $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, triquetro-obovatum vel ovale, stipitatum, basi styli æquali apiculatum.

I find in the European specimens of this species—

|                  |                 |                   |
|------------------|-----------------|-------------------|
| 4 with 2 spikes. | 33 with 1 male. | 14 with 1 female. |
| 35 „ 3           | 25 „ 2          | 49 „ 2            |
| 20 „ 4           | 8 „ 3           | 3 „ 3             |
| 7 „ 5            | —               | —                 |
| —                | 66              | 66                |

In the American—

|                   |                 |                  |
|-------------------|-----------------|------------------|
| 17 with 3 spikes. | 15 with 1 male. | 8 with 1 female. |
| 28 „ 4            | 28 „ 2          | 41 „ 2           |
| 7 „ 5             | 8 „ 3           | 3 „ 3            |
| —                 | 1 „ 4           | —                |
| 52                | 52              | 52               |

In both European and American—

|                  |                 |                   |
|------------------|-----------------|-------------------|
| 4 with 2 spikes. | 48 with 1 male. | 22 with 1 female. |
| 52 „ 3           | 53 „ 2          | 90 „ 2            |
| 48 „ 4           | 16 „ 3          | 6 „ 3             |
| 14 „ 5           | 1 „ 4           | —                 |

The American plant is paler and generally more gracile than the European one, especially than the remarkable specimens from Menneey, near Paris, which I have from M. Gay, and from Herb. Maire, under the name of *C. filiformis*, and which in size certainly approach *C. evoluta*. All these specimens have the lower female spike conspicuously vaginate. Cosson and Germain (*Fl. des Environs de Paris*, p. 606) quote Menneey as the habitat of *C. evoluta*, which they regard as a var.  $\beta$  of *C. filiformis*, but they remark "bractées non-engainantes, même l'inférieure."

The specimens of *C. filiformis*, figured Tab. CXXXII., are from Rhode Island. It extends (as far as I am informed) from Arctic America to Ohio.

122. *C. Sullivantii* (Boott); spicis 4–6 oblongo-cylindricis gracilibus erectis albo-viridibus demum ferrugineis, terminali mascula subsessili, reliquis femineis laxifloris, suprema evaginata interdum geminata, superioribus contiguis, inferioribus exserte pedunculatis, infima plus minus remota basi attenuata sæpe composita; bracteis superioribus abbreviatis, infima culmo multum breviori vel subæquante; stigmatibus 3; perigyniis ovatis vel ellipticis rostellatis, ore emarginato vel integro hyalino, viridibus demum ferrugineis enerviis vel obscure nervatis hispido-pilosis pellucide punctatis stipitatis, squama æquilata albida medio viridi ciliata obtusa interdum emarginata cuspidata vel acuta mutica longioribus vel cuspidate brevioribus.—*C. Sullivantii*, *Boott, Gray, Sill.* xlii. 29; *Dewey, Sill.* xlix. 44; *Carey, l. e.* 527; *Sartwell, Ews. n.* 116. (TAB. CXXXIII.)

HAB. In America septentrionali, in sylvaticis. Columbus, Ohio, *Sullivant*.

*Culmus* folia vaginæque pilosæ. *Culmus* 1½–2½-ped., firmus, acutangulus, inferne foliatus, basi rudimentis foliorum atro-purpureis tectus; pars spicas gerens 2–5 rarius 9–12 poll. longa. *Folia* 2–3½ lin. lata, culmo breviora. *Bractea* infima foliacea, culmum subæquans, vel (remota) multum brevior: superiores setaceæ, spicis breviores. *Vagina* infima 3–18 lin. longa, intus albida ferrugineo punctata. *Pedunculus* infimus ½–3 poll. longus: superiores breves. *Spica mascula* 7–15 lin. longa,  $\frac{2}{3}$ –1 lin. lata, sessilis vel subsessilis. *Spicæ femineæ* 1–1½ poll. longæ, 1–1½ lin. latae: superiores contiguæ: infima 6–12 poll. interdum remota, sæpe basi composita: suprema sessilis, evaginata, interdum geminata. *Squamæ* masculæ arete imbricatæ, obtusæ, muticæ, castaneæ, margine hyalinae, apice ciliatæ, nervo scabro: femineæ albidæ; inferiores obtusæ, sæpe emarginatæ, longius cuspidatæ: superiores sæpe acutæ muticæ: ciliatæ. *Perigynium* (abortivum) 1 $\frac{6}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  latum, plerumque enerve, rarius obscure nervatum, hispido-pilosum. *Achenium* (abortivum) oblongo-triquetrum.

In 27 specimens I find—

|                  |                                            |
|------------------|--------------------------------------------|
| 1 with 3 spikes. | In all the terminal spike is male.         |
| 5 „ 4            | In 6 the upper female spike is geminate.   |
| 15 „ 5           | In 13 the lower spike is compound at base. |
| 6 „ 6            |                                            |

This species differs from *C. arctata* in the pilose culm, leaves,

sheaths, and perigynium; erect, often compound spikes, and obtuse, often emarginate, scales. Mr. Sullivant found it growing with *C. pubescens* and *C. gracillima*, and thinks it may prove to be a hybrid between them.\* *C. Knieskernii*, Dewey, found in Oneida County, New York, a plant only known from a few immature specimens, is closely allied to it, differing merely in a smooth and more distinctly nerved perigynium. Mr. Carey has referred it to *C. arctata*, but the pilose culm and leaves, and the copious pellucid spots on the perigynium ally it more closely to *C. Sullivantii*.

123. *C. venusta* (Dewey); spicis 3–5 cylindricis pedunculatis, terminali gracili mascula, reliquis fœmineis subcrassis densifloris, superioribus approximatis, inferioribus remotissimis basi attenuatis exserte pedunculatis nutantibus; bracteis inferioribus culmo multum brevioribus; stigmatibus 3; perigyniis triquetris fusiformibus utrinque acutis rostellatis, ore albo-hyalino integro oblique secto ciliato, undique scabris valide nervatis olivaceis demum ferrugineis ferrugineo punctatis, squama oblonga obtusa mutica (vel inferioribus cuspidatis) ferruginea medio viridi nervata scabra apice hyalina ciliata latioribus duplo longioribus.—*C. venusta*, Dewey, *Sill.* xxvi. 107; *Tor. Mon.* 416; *Sartwell, Eas. n.* 119. (TAB. CXXXIV.)

HAB. In America septentrionali. Florida, *Dr. Chapman*.

Var.  $\beta$ ; spicis 4 gracillimis, terminali mascula, fœmineis laxifloris; perigyniis angustioribus, rostro longiori, ore hyalino bilobo, scabris tenuiter nervatis, squama lanceolata obtusa vel acuta, infima acuminata albida duplo longioribus.—New Carolina, *Mr. Curtis*.

Var.  $\gamma$ ; spicis 3 erectis brevioribus, terminali mascula, fœmineis densifloris; perigyniis glabris rostellatis, rostro ad margines sæpe scabro, squama ferruginea obtusa vel acuta plus minus longioribus.—New Orleans, *Drummond*, n. 434.

*a. Culmus* 2–3½-ped., gracilis, apice scaber, basi rudimentis foliorum purpureis scabriusculis tectus; pars spicas gerens 1–2½ ped. longa. *Folia* 1½–3 lin. lata, culmo breviora, utrinque scabra. *Bractea* vaginata: inferiores culmo multum breviores: mediæ eo longiores: summa setacea, brevior. *Vagina* infima 2–5 poll. longa, scabriuscula. *Pedunculi* setacei, scabri: infimus 4–5½ poll. longus, plus minus exsertus. *Spica mascula* 14 lin. ad 2 poll. longa, lineam lata, basi attenuata. *Spica fœminea* 9 lin. ad 2 poll. longæ, 3 lin. latæ: inferiores 6–18 poll. remotæ, nutantes vel erectæ. *Squama* omnes ferrugineæ, ciliatæ, dorso virides, nervatæ, scabræ, obtusæ: inferiores cuspidatæ. *Perigynium* 3–3½ lin. longum,  $\frac{6}{10}$ – $\frac{9}{10}$  lin. latum, stipitatum. *Achenium* 1½ lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, triquetrum, ovale vel obovatum, stipitatum, basi styli apiculatum, stramineum.

The varieties  $\beta$  and  $\gamma$ , though differing from each other and from the typical form, I can only refer to it. The rough perigynium of  $\beta$  separates it from *C. debilis*, to which in other respects it is closely allied: and the form of the perigynium, though smooth, of the var.  $\gamma$ , and its general aspect, connect it more immediately with *C. venusta*. A more familiar acquaintance with these southern plants may lead hereafter to more definite characters, or to the propriety of uniting them to *C. debilis*, between which variable species and *C. venusta* there is certainly a very inti-

\* In a note to me he says: "It has never been found by any one, that I am aware of, but myself, and only in one small spot. I transplanted it into my garden, watched it for several years, but never could find mature achenia."

mate connection. The difference in the perigynium as to roughness or smoothness will hardly be insisted upon alone as constituting a specific distinction, since we find a palpable variation in this respect between the southern and northern forms of *C. striata*. Dewey alludes to the terminal spike of *C. venusta* being occasionally androgynous, female at top, and even to a second male spike. I have not observed either of these characters in the few specimens I have seen of this species, and the last is certainly anomalous in the group to which *C. venusta* belongs.

124. *C. arctata* (Boott); spicis 4–6 cylindricis gracilibus pallidis remotis pedunculatis, terminali mascula albida tenui erecta, reliquis fœmineis linearibus laxifloris basi attenuatis sparsifloris, longe exserte setaceo-pedunculatis nutantibus; bracteis culmo brevioribus; stigmatibus 3, brevibus; perigyniis e basi obtusa ovato-ellipticis triquetris sensim acuminato-breve-rostratis, ore bidentato albo ciliato, leviter nervatis glabris membranaceis viridibus demum ferrugineo-punctatis stipitatis, squama ovata obtusa vel acuta cuspidata albida ciliata nervo viridi sæpe scabro longioribus vel (cuspidate) brevioribus.—*C. arctata*, Boott, *Fl. Bor. Am.* ii. 227; *Carey, l. c.* 527; *Sartwell, Eas. n.* 117. *C. sylvatica*, Dewey, *l. c.* x. 40 (*non Huds.*); *Schw. et Tor.* 350; *Tor. Mon.* 416. (TAB. CXXXV.)

HAB. In America septentrionali, in sylvis et pratis. Canada, *Goldie, Todd*. New England to New York, *Carey*.

*Culmus* 1–1½-ped., gracilis, superne setaceus, scaber, inferne foliatus, basi rudimentis foliorum atro-purpureis fibrillosis sæpe scabriusculis tectus; pars spicas gerens 6–13 poll. longa. *Folia* 1–4 lin. lata, plana, graminea: *culmea* angustiora dorsum breviora, omnia culmo multum breviora: *radicalia* latiora, subrigida, eo sæpe longiora. *Bractea* infima 1–1½ lin. lata, culmo brevior, longe vaginata: superiores setacæ, spicis breviores. *Vagina* infima subinde 4 poll. longa. *Pedunculi* setacei, scabri: infimus sæpe 3–6 poll. longus, longe exsertus. *Spica mascula* 6–13 lin. longa,  $\frac{1}{2}$ – $\frac{2}{3}$  lin. lata, basi attenuata, pedunculata: fœmineæ 1–3½ pollices longæ, 1–2 lin. latæ, laxifloræ, basi flosculis remotiuscule alternis attenuatæ, nutantes: infima magis remota. *Squama* masculæ albæ, demum pallide ferrugineæ, nervo viridi, lanceolata: inferiores laxæ, apice attenuatæ vel cuspidatæ, ciliatæ: fœmineæ ovatæ, obtusæ vel acutæ: inferiores longius cuspidatæ, ciliatæ. *Perigynium* 1½ lin. longum,  $\frac{6}{10}$ –1 lin. latum, basi obtusum, stipitatum, rarius rostro apice ad margines serrato. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, oblongo-triquetrum, basi styli apiculatum.

A *C. sylvatica*, Huds., differt, spicis laxifloris, gracilioribus; perigyniis nervatis, rostro breviori, etc.

I have never seen this species from any locality south of New York, or north of Canada. It was not found by the Arctic travellers. The ferruginous spots on the perigynium are more visible in some specimens than others, apparently depending on the maturity of the perigynium. I have frequently received it under the name of *C. flexuosa*, from which it is easily to be distinguished by the cuspidate female scales and the bidentate orifice of the shorter stipitate perigynium.

125. *C. linearis* (Boott); spica simplici androgyna apice mascula lineari elongata castanea basi attenuata laxiflora nuda; stigmatibus 3; perigyniis linearibus late rostratis obtusis subplano-convexis, ore albo membranaceo obliquo, enerviis, marginibus acutis recurvis serratis, pallidis superne castaneis racheolâ intus instructis, squama oblonga obtusa mutica vel hispido-cuspidata pallide

viridi apice margine albo-hyalina amplectente angustioribus longioribusque.—*C. Essenbeckii*, *Boott, Lin. Trans.* xx. (*spec. Edgeworth*); *non Kunth*. (TAB. CXXXVI.)

HAB. In Himalaya orientali alpina, ad Sikkim, alt. 12–15,000 ped., *J. D. Hooker*. In Monte Choor, *Edgeworth*. Gurhwal, *Strachey and Winterbottom*.

Cæspitosa. *Culmus* subpedalis, obtusangulus, sulcatus, lævis vel apice scabriusculus, firmus, basi foliatus, vaginisque foliorum reticulato-fissis tectus. *Folia* filiformia, involuta, marginibus scaberrimis, culmo longiora vel æquantia. *Spica*  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longa, 1–2 lin. lata; pars tertia vel quarta suprema mascula, laxiflora, basi attenuata. *Squamæ* masculæ obtusæ, muticæ: fœmineæ inferiores longius cuspidatæ, infima quandoque bracteolam simulans: superiores subinde muticæ. *Perigynium* 3 lin. longum,  $\frac{1}{2}$  lin. latum. *Achenium* (cum stipite  $\frac{3}{10}$  lin. longo)  $1\frac{8}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, longe ellipticum, pallidum. *Racheola* linearis, ligulata, serrata, vel in specimine altero magis maturo apice dilatata, ibique uno margine ferruginea, achenio brevior. *Stylus* latus, sulcatus, apice ferrugineus.

In the paper in the Linnean Transactions, vol. xx., I referred specimens of this species, given to me by Mr. Edgeworth, to *C. Essenbeckii*, Kunth (*C. trinervis*, Nees), but on comparing Mr. Edgeworth's with Dr. Hooker's more mature specimens, I find no difference between them, and the stigmata are three, not two. Dr. Royle's very few specimens, on which Nees founded his *C. trinervis*, are dioicous, and have plane, not involute, leaves. I have not met with any specimens from the later collections which I could refer to Nees's plant.

126. *C. Forsteri* (Wahlenberg); spicis 5–8 cylindricis pallidis, terminalibus 1–3 masculis, vel suprema basi vel medio vel apice et basi mascula, spicula altera minore omnino mascula interdum ad ejus basin sita, reliquis (vel omnibus) androgynis ima basi masculis, superioribus apice sterilibus, approximatis, sessilibus, inferioribus remotis longe exserte pedunculatis demum pendulis longissime bracteatis, infima rarius basi composita; stigmatibus 3, brevibus; perigyniis triquetro-fusififormibus rostratis, bifidis vel bifurcatis nervatis arcuato-deflexis vel recurvatis pallidis sæpe maculatis, squama lanceolata acuta hispido-cuspidata ferruginea medio trinervi viridi longioribus.—*C. Forsteri*, *Wahl. Act. Holm.* 154; *Schk. p.* 44; *Willd.* 248; *Kunth*, 502; *Hook. Fl. N. Zeal.* 285. *C. recurva*, *Schk. z. n. n. p.* 120. *C. debilis*, *Forster, Prod. (Herb. Banks)*. *C. latifolia*, *Solander, MSS. (Herb. Banks)*. *C. punctulata*, *Richard, Voy. Astrol. t.* 22. (TAB. CXXXVII.)

HAB. In Nova Zelandia. Charlotte Sound, "*C. debilis*," Totaranui, "*C. latifolia*," *Banks et Sol.* 1769, *Stephenson, Colenso (Herb. Hooker)*. Akawa, *Raoul, n.* 213.

*Culmus* 2-ped. vel altior, triqueter, validus, lævis, inter spicas scaber; pars spicas gerens 7–12 poll. longa. *Folia* 2–3 lin. lata, culmo longiora, carinâ, marginibus, et (supra) nervis albidis scabris. *Bracteæ* inferiores vaginatæ: infima sæpe bipedalis, sursum decrescentes. *Vagina* infima  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longa. *Ligula* ferruginea. *Spicæ* pallidæ: masculæ 1–3: terminalis interdum  $3\frac{1}{2}$  poll. longa: reliquæ minores: vel omnes basi masculæ 9 lin. ad  $2\frac{1}{2}$  poll. longæ, 3–5 lin. latæ, sæpe, vel superiores solum, apice flosculis sterilibus instructæ. *Pedunculi* læves vel scabriusculi: infimus 3–6 poll. longus. *Squamæ* lanceolatæ, acuminatæ, hispido-cuspidatæ, ferrugineæ, medio trinervi virido. *Perigynium* 2– $2\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum,

bifidum vel bifurcatum, laciniis scabris, crebre leviter nervatum, sæpe punctis ferrugineis minimis conspersum, divergens vel arcuato-deflexum, vel demum recurvatum. *Achenium* stipitatum,  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, triquetro-ovale vel obovatum, basi styli apiculatum, ferrugineum.

This species varies remarkably in the position of the male florets in the terminal spikes. The figure of *C. punctulata*, Rich., exhibits one terminal male spike, and that of Schk. N. three; and in the description of Wahlenberg two are mentioned, and in that of Solander two rarely three. In later specimens in Herb. Hooker, all the spikes are frequently male at base, or the terminal one male in the middle, while in Herb. Banks the *C. debilis* from Charlotte Sound has the terminal spike male at base, or at the base and apex, with a small male spike beneath. Solander does not allude to the basal male florets on the lower spikes, though they exist in all the specimens in Herb. Banks, nor does Richard in his *C. punctulata*. The perigynium is recurved only in the pendulous spikes, and the spots are only visible as it becomes mature. The orifice is bifid or ultimately bifurcate,—“apice bifurca,” *Sol. MSS.*

127. *C. Courtallensis* (Nees); spicis 4–5 androgynis apice subdimidiatim masculis linearibus elongatis remotis pallidis concoloribus, terminali nuda, inferioribus longe bracteatis vaginatis, infimis radicalibus breve exserte pedunculatis; stigmatibus 3, brevibus; perigyniis ellipticis trigonis rostratis, ore obliquo bidentato, creberrime striato-nervosis, marginibus acutis ciliatis postice puberulis, squama late ovata acuta vel subrotunda obtusissima striato-nervata pallida margine albido-membranacea duplo longioribus.—*C. Courtallensis*, *Nees, MSS. in Herb. Arnott!* (TAB. CXXXVIII.)

HAB. In India Orientali. Courtallum, Penins. Ind. Or., *Wight, n.* 991! Aug. 1835.

Cæspitosa. *Radix* fibris pluribus lignosis. *Culmus* sesquipedalis, gracilis, erectus, acute triqueter, scabriusculus, basi foliis vaginantibus tectus. *Folia* 3–4 lin. lata, culmo longiora, plana. *Bracteæ* breve vaginatæ, longissimæ, 2–3 lin. latæ. *Vaginæ* 4–5 lin. longæ. *Spicæ*  $1\frac{1}{2}$ –3 poll. longæ, 3 lin. latæ; pars staminifera 1– $2\frac{1}{2}$  poll. longa: infimæ radicales, breve exserte pedunculatæ. *Squamæ* conformes: fœmineæ inferiores acutæ, superiores obtusissimæ: masculæ angustiores. *Perigynium* 3 lin. longum,  $1\frac{2}{10}$  lin. latum. *Achenium*  $1\frac{7}{10}$  lin. longum, 1 lin. latum, obovatum, trigonum, fuscum, angulis pallidum, punctulatum. *Stylus* insertus, articulatus, scabriusculus, basi triquetro-incrassatus. *Stamina* 3, brevia. *Stigmata* 3, brevia.

Variat, spicâ radicali (in uno specimine) basi spiculâ alterâ minimâ acuta.

Var.  $\beta$ . angustifolia.

Gracilior. *Spicæ* 2–3, subpollicares, lineam latæ. *Folia* 1–2 lin. lata.

Pulmy Mountains, *Wight, n.* 3175. Moflung, *J. D. Hooker*.

An a *C. speciosa*, Kunth, distincta? Differt, spicis 4–5, culmeis, alternis, longioribus, apice conspicue masculis, inserte et breve exserte pedunculatis; perigyniis majoribus, postice plane pilosiusculis; culmo validiori; foliis minus longe acuminatis.

I have adopted the name which I find given to this plant by Nees in Herb. Arnott, and which is noticed by Drejer in his ‘Symbolæ,’ p. 25; but notwithstanding the striking difference between it and the *C. speciosa*, Kunth, I have strong doubts as to its specific distinction. Neither Nees nor Kunth appear to have seen specimens of *C. speciosa* like those in Wallich's herbarium, and I add a description of them, that Indian botanists may have their attention directed to the peculiar characteristics of the Raj-

mahl plant, which, if found to be permanent, will undoubtedly sufficiently serve for a specific difference.

128? *C. speciosa* (Kunth); spicis androgynis apice masculis pallidis concoloribus pollicaribus 1-4 ex eadem radice, vel in pedunculos inæquales graciles longos radicales monostachyos, vel in culmum distachyum (infima subradicali vaginata exserte pedunculata bracteata) insidentibus; stigmatibus 3, brevibus; perigyniis ellipticis acute trigonis basi acutis rostratis bilobis creberrime striato-nervis marginibus ciliatis glabris vel postice superne puberulis, squama late ovata acuta cuspidata vel subrotunda obtusa striato-nervata pallida subduplo longioribus.—*C. speciosa*, Kunth, 504. *C. concolor*, Nees (non Brown). *C. peduncularis*, Wallich, in Herb.!

HAB. In India Orientali. In mont. Rajemahl, Wall. n. 3391.

*Radix* fibrosa. *Culmus* pedalis, gracillimus, acute triquetus, apice scabriusculus, basi foliosus. *Pedunculi* radicales, 6-12 poll. longi. *Folia* 2-3 lin. lata, plana, apice longe setaceo-acutissima, culmo subduplo longiora. *Spicæ* 12-15 lin. longæ, 2 lin. latæ; pars tertia suprema mascula; nudæ vel e squamæ infimæ cuspidate elongata, quasi bracteata: infima e suprema 9 poll. remota, vagina 3 lin. longa, pedunculo bipollicari, bracteae triplo longiori instructa: aliæ 1-2 in pedunculos monostachyos insidentes. *Squamæ* conformes: masculæ subacutæ: fœminea infima plus minus cuspidata: superiores subrotundæ, abrupte apiculatæ vel obtusæ. *Perigynium* 2½ lin. longum, 1 lin. latum, bilobum, lobis obtusis ciliatis. *Achenium* 1-1½ lin. longum, 1 lin. latum, perigynio conforme. *Stylus* insertus, scaber, basi triquetra incrassatus, articulatis. *Stamina* 3, brevia. *Stigmata* 3, brevia.

Nees and Kunth make no mention of the long monostachyous peduncles which suggested to Wallich the name of *C. peduncularis* for this species. On the ticket affixed to his specimens in the East Indian Herbarium at the Linnean Society he says, "Reperi in mont. Rajemahl, Aug. 8, 1820."

129. *C. fascicularis* (Solander); spicis 3-5 cylindricis pedunculatis, terminali mascula rarius basi mascula, reliquis fœmineis sæpe apice sterilibus demum nutantibus vel pendulis, omnibus approximatis cvaginatibus, vel infima remota longissime exserte pedunculata; bracteis inferioribus longissimis; stigmatibus 3; perigyniis ovatis longe stipitatis cylindrico-rostratis obtuse trigonis bicuspidatis glabris costato-nervis divergentibus demum recurvatis, squama lanceolata longe hispido-aristata medio exasperata serrata demum ferruginea longioribus vel (*aristata*) brevioribus.—*C. fascicularis*, Solander, MSS. (*Herb. Banks.*); *Flora of New Zealand*, Hooker, i. 283. *C. Pseudo-cyperus*, Brown, Prod. (TAB. CXXXIX. et CXL.)

*β. minor*.—"Spicæ 4, una mascula, tres fœmineæ, subæquales, erectæ, sessiles; superiores, scilicet mascula et duæ fœmineæ, subfasciculatæ, ac si ex uno eodemque centro prodeuntes."—Solander.

HAB. New Zealand, Banks et Solander, etc. Australia, Brown. Tasmania, Gunn, J. D. Hooker.

*Culmus* 2-ped., validus, triquetus, scaber. *Folia* 2-4 lin. lata, culmo longiora, reticulato-nodosa. *Bracteæ* inferiores longissimæ: infima quandoque plus minus vaginata. *Pedunculi* scabri, longitudine variables: infimus interdum 1 vel 5 poll. longus. *Spica mascula* 1-3 poll. longa, 2-3 lin. lata. *Spicæ fœmineæ* 1-3½ poll. longæ, 4-6 lin. latæ. *Squamæ* mas-

culæ majores: fœmineæque inferiores ciliato-serratæ, longe hispido-aristatæ: superiores sæpe perigynio breviores. *Perigynium* (cum stipite  $\frac{5}{10}$ - $\frac{6}{10}$  lin. longo) 3-3½ lin. longum,  $\frac{8}{10}$  lin. latum, ovatum, obtuse triquetrum, sensim in rostrum cylindricum elongatum attenuatum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  latum, obovatum, triquetrum, basi styli contorta apiculatum, castaneum, punctulatum.

Habitus et aspectus *C. Pseudo-cyperus*, L. Differt, spica mascula latiori, fœmineis sæpe apice sterilibus, squamis majoribus; perigyniis ovatis (nec lanceolatis), longe stipitatis, rostro longiori; achenio obovato.

In Dr. Hooker's 'Flora of New Zealand' I adopted Solander's name for this plant, though, as the quotation given above from his character shows, it applies to the smaller form of it only. Its mature perigynium constitutes the chief distinction between it and the European *C. Pseudo-cyperus*. In Tab. CXL. the smaller figure, *β*, minor, represents the plant of Solander.

130. *C. formosa* (Dewey); spicis 4 rarius 3-5 oblongis densifloris pallidis demum olivaceis, terminali basi *subdimidiatim* reliquis ima basi *parce* masculis, remotis nutantibus longe exserte setaceo-pedunculatis; bracteis culmum subæquantibus; stigmatibus 3, brevibus; perigyniis triquetris ovalibus ventricosis rostellatis, ore integro vel emarginato ciliato, tenuiter nervatis pellucide demum ferrugineo-punctatis, squama ovata acuta vel obtusa breve cuspidata castanea margine albo-hyalina nervo viridi scabro latioribus longioribusque; culmo foliisque pilosis.—*C. formosa*, Dewey, Sill. viii. 98; Schw. et Tor. 325; Carey, l. c. 522; Sartwell, Ews. n. 86: non Kunth (*descript.*), 430, quæ *C. Shortii*, Tor. (TAB. CXLI.)

HAB. In America septentrionali, in pratis humidis, New England to New York.

*Culmus*, folia (*infra*), vaginæ pedunculique pilosi. *Culmus* 1-3-ped., superne setaceus, basi rudimentis foliorum fibrillosis purpureis tectus; pars spicas gerens 5-9 poll. longa. *Folia* 1-3 lin. lata, culmo breviora. *Bractea* infima culmo brevior. *Vagina* infima 1½-3 poll. longa. *Pedunculus* infimus 3½-5 poll. longus. *Spicæ* 4-12 lin. longæ, 2 lin. latæ, omnes basi masculæ. *Squamæ* pallide castaneæ, margine albo-hyalinæ: masculæ longiores, rarius apice ciliatæ; inferiores obtusæ, muticæ; superiores sæpe mucronulatæ: fœmineæ ovatae, nervo viridi, breve cuspidatæ. *Perigynium* 2-2½-3 lin. longum, lineam latum, glabrum vel rarius apice ad margines parce denticulatum. *Achenium* 1-1½ lin. longum,  $\frac{8}{10}$  lin. latum, triquetro-obovatum, castaneum, basi styli apiculatum.

Neither Dewey nor Torrey notice the male florets at the base of the lower spikes, a character which distinguishes this species from all its allies.

131. *C. oxylepis* (Torrey); spicis 4 rarius 3-5 cylindricis gracilibus subdensifloris olivaceis, terminali basi mascula, reliquis fœmineis approximatis exserte pedunculatis suberectis basi attenuatis laxifloris, infima plus minus remota; bracteis culmum subæquantibus; stigmatibus 3; perigyniis elliptico-lanceolatis triquetris utrinque acutis vel rostellatis, ore emarginato bidentato, tenuiter nervatis glabris olivaceis ferrugineo punctatis, squama lanceolata acuminata acuta cuspidata albida nervo viridi scabro latioribus longioribusque; culmo foliisque pilosis.—*C. oxylepis*, Torrey, Mon. 409 (1836); Dewey, Sill. iii. 354 (1847). (TAB. CXLII.)

HAB. In America septentrionali. Texas, Drummond. Florida, Dr. Chapman.

Culmus, folia (*infra*), vaginae pedunculique pilosi. *Culmus*  $1\frac{1}{2}$ – $2\frac{1}{2}$ -ped., gracilis, foliis vaginantibus munitus, basi rudimentis foliorum purpurcis tectus; pars spicas gerens 3–10 poll. longa. *Folia*  $1\frac{1}{2}$ –2 lin. lata, culmo breviora. *Bractea* vaginata: infima culmum subaequans vel eo brevior. *Vagina* infima 1–3 poll. longa. *Pedunculi* omnes exserti, setacei: infimus  $1-3\frac{1}{2}$  poll. longus. *Spicae* 8–18 lin. longae,  $1\frac{1}{2}$ –2 lin. latae: terminalis semper basi subdimidiatim mascula; foemineae alternatim approximatae: infima  $1\frac{1}{2}$ –5 poll. remota. *Squamae* albæ, nervo viridi: masculæ lanceolatae, laxæ, acuminatae, acutæ: inferiores vel superiores cuspidatae: foemineae inferiores longius cuspidatae, perigynium sæpe subaequantur vel eo longiores. *Perigynium*  $1\frac{3}{10}$ – $2\frac{1}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum, plus  $\frac{6}{10}$  lin. latum, ovale, triquetrum, stipitatum, pallidum, punctatum.

Allied to *C. formosa*, but differing from it in the female lower spikes, etc.

132. *C. Davisii* (Torrey); spicis 3–4 rarius 2–5 cylindricis vel oblongis crassiusculis pedunculatis pallidis, terminali basi rarius omnino mascula, reliquis foemineis approximatis, superioribus sæpe evaginatibus, erectis, inferioribus basi laxifloris subinserte vel plus minus exserte pedunculatis, infima sæpe subremota nutanti; bracteis culmo longioribus; stigmatibus 3 brevibus; perigyniis ellipticis turgide ventricosis rostratis, ore emarginato bidentato, rostro ad margines sæpe scabro, tenuiter nervatis pellucide demum ferrugineo-punctatis flavescenti-viridibus, squama ovata acuta vel obtusa sæpe truncata vel emarginata albida medio viridi nervata longe valideque cuspidata latioribus longioribus vel (*cuspidem*) subaequantibus; culmo foliisque pilosis.—*C. Davisii*, *Schw. et Tor.* l. c. 326; *Carey*, l. c. 522; *Sartwell*, *Exs.* n. 85. *C. aristata*, *Dewey, Sill.* vii. 277 (*non Brown*). *C. Torreyana*, *Dewey, Sill.* x. 47. *Carex*, n. 46, *Muhl.* l. c. 254. (TAB. CXLIII.)

HAB. In America septentrionali, in pratis humidis. New England to Ohio and Illinois.

Culmus, folia (*infra*), vaginae pedunculique pilosi. *Culmus* 1– $2\frac{1}{2}$ -ped., firmus, foliis vaginantibus munitus, basi rudimentis foliorum purpureis fibrillosis tectus; pars spicas gerens  $2\frac{1}{2}$ –8 poll. longa. *Folia*  $1\frac{1}{2}$ –3 lin. lata: superiora sæpe culmo longiora. *Bractea* inferiores vaginatae, culmo subinde multum longiores. *Vagina* infima  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longa: superiores breves vel obsoletæ. *Pedunculi* sæpe inserti, vel inferiores plus minus exserti: infimus 2– $2\frac{1}{2}$  poll. longus. *Spicae* 8–20 lin. longae, 2– $2\frac{1}{2}$  lin. latae, omnes subcontiguæ, erectæ, vel infima 2–4 poll. remota, nutans: summa rarius omnino, plerumque subdimidiatim basi mascula. *Squamae* albæ, medio viridi, plus minus cuspidatae, masculæ lanceolatae: foemineae ovatae: inferiores acutæ, longius cuspidatae; superiores obtusæ, sæpe subtruncatae vel emarginatae. *Perigynium*  $1\frac{3}{10}$ – $\frac{8}{10}$  lin. longum,  $1-1\frac{3}{10}$  lin. latum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovale, utrinque acutum, triquetrum, stipitatum, basi styli apiculatum, flavidum, punctulatum.

I have never met but with one specimen, among very many in which the terminal spike was entirely male, but Muhlenberg and Torrey allude to such as having been observed by them. Muhlenberg describes the stigmas as two or three. I have never seen less than three. The upper leaves and sheaths in the Illinois specimens are occasionally glabrous.

The broader spikes, more ventricose perigynium, and larger cuspidate scales, distinguish this species from its allies. It is more common than *C. formosa* or *C. oxylepis*.

133. *C. æstivalis* (Curtis); spicis 4 rarius 3–5 cylindricis

anguste linearibus laxifloris erectis olivaceis demum castaneis, terminali basi mascula, reliquis foemineis approximatis evaginatibus, superioribus subsessilibus vel infima remota breve vaginata exserte pedunculata basi dissitiflora; stigmatibus 3; perigyniis oblongo-ovalibus utrinque acutis triquetris, ore integro, tenuiter nervatis olivaceis ferrugineo-punctatis, squama ovato-lanceolata acuta cuspidata vel obtusa mutica castanea margine pallida latioribus longioribusque; foliis inferioribus vaginisque pilosis.—*C. æstivalis*, *Curtis, Gray, Sill.* xlii. 28 (1841); *Dewey, Sill.* iii. 172, et iv. 347; *Carey*, 522; *Curtis, Sill.* vii. 410; *Tuck. En.* 15; *Kunze, Riedgr.* 112. t. 28; *Darlington, Fl. Cest. ed.* 3. 349. *C. Darlingtonii*, *Schweinitz, Herb.* *C. tabularia*, *Curtis, MSS.* (*Herb. Torrey*.) *C. Rugeliana*, *Kunze, l. c.* 189. t. 48. (TAB. CXLIV.)

HAB. In America septentrionali, in montibus. Pokono Mountain, Pennsylvania, *Dr. Darlington and Mr. Townsend*, June, 1828. West Chester, Pennsylvania, on Slaty Hills, *Townsend*. Table Mountain, North Carolina, *Curtis*. In montibus altioribus Carolinae Septentrionalis, passim, *Dr. Gray et Mr. Carey*, 1841. In montibus Tennessee, *Rugel*, 1842.

Folia inferiora (*utrinque*) bracteaque ad margines vaginaeque pilosæ. *Culmus* 1–2-ped., setaceus, scaber, basi foliatus, foliisque vaginantibus munitus; pars spicas gerens  $1\frac{1}{2}$ –4 vel 9 poll. longa. *Folia* 1– $1\frac{1}{2}$  lin. lata, graminea: *radicalia* culmo longiora: *culmea* eo breviora: inferiora juvenilia utrinque pilosa, omnia basi ad margines ciliata: demum omnino glabra evadunt. *Bractea* infima culmo longior, foliacea, basi ad margines ciliata: reliquæ setaceæ, breviores. *Vaginae* foliorum pilosæ: ea bractea inferioris sæpe obsoleta, vel 1–8 lin. longa, glabra vel intus apice pilosiuscula. *Pedunculi* setacei, scabri: infimus 3–18 lin. longus. *Spica terminalis* sessilis, basi sæpe subdimidiatim mascula, 9–20 lin. longa. *Spica foeminea* 5 lin. ad 2 poll. longæ, 1 lin. latae, erectæ: superiores sessiles vel subsessiles: omnes evaginatae, approximatae, vel infima 2–3 rarius 6 poll. remota, breve vaginata, basi flosculis alternis dissitis attenuata. *Squamae* pallide castaneæ: masculæ majores, obtusæ, muticæ, vel inferiores acutæ, cuspidatae: foemineae inferiores ovato-lanceolatae, acutæ, cuspidatae; superiores obtusæ, muticæ vel mucronatae. *Perigynium*  $1\frac{5}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, utrinque (præsertim plene maturum) acutum, achenium arcte vestiens. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ellipticum, stipitatum, basi styli apiculatum.

A *C. oxylepis* differt, culmo setaceo; foliis inferioribus utrinque vaginisque solum pilosis; spicis gracilioribus, laxifloris; perigyniis minoribus, erostratis, ore integro; squamis sæpe muticis.

A *C. gracillima* differt, culmo setaceo; spicis laxifloris, erectis, evaginatibus vel infima breve vaginata; perigyniis utrinque acutis, nec ventricosis; squamis longioribus; foliis angustioribus, vaginisque pilosis.

Dr. Darlington, in company with Mr. Townsend, discovered this well-marked species in 1828, on the Pokono Mountain, Pennsylvania, and M. Schweinitz named it after him, but omitted to publish it. Mr. Curtis (I believe subsequently) found it on the Table Mountain, North Carolina, and his description of it is given by Dr. Gray (*Sill. Journ.* xlii. 28) in his interesting account of the excursion he made with Mr. Carey, in 1841, to the mountains of that State. Kunze (t. 28) has given a good figure of it. I have referred his *C. Rugeliana* (t. 48) to it, on the authority of specimens which he sent to Sir W. J. Hooker under that name, and which included *C. æstivalis*, mixed with *C. debilis*, and a *Carex* which I referred in the paper in vol. xx.



of the Linnean Transactions, p. 116, to the *C. juncea*, Willd. This last has always a terminal male spike, and a nerveless perigynium, the upper margins of which are hispid, and is identical with the *C. miser* of Buckley. Kunze describes *C. Rugeliana* with the terminal spike male or androgynous; his figure (t. 48), showing the androgynous spike, and a smooth perigynium, which from the specimens sent to Sir W. J. Hooker as *C. Rugeliana*, I refer to *C. æstivalis*. Whether the other species, with the male spike and hispid perigynium, be the *C. juncea* of Willdenow I have no precise means of knowing, as I have not seen authentic specimens of that plant, but it agrees generally with the description of it given by Kunth and Link. That Kunze had no definite conception of his *C. Rugeliana*, the mixed specimens sent to Sir W. J. Hooker under that name would prove; and that he confounded *C. arctata*, or some allied species, with *C. gracillima*, is evident, from his ascribing a rostrate perigynium to the last, both in his description and figure of it.

In 23 specimens I find—

20 with 4 spikes. The terminal spike male at base.  
3 „ 5

134. *C. gracillima* (Schweinitz); spicis 4–5 rarius 3–6 gracilibus cylindricis oblongis vel elongatis densifloris pedunculatis viridibus demum olivaceis, terminali basi rarius omnino mascula, reliquis fœmineis sæpe pendulis, superioribus approximatis, inferioribus remotis longe exserte setaceo-pedunculatis basi laxifloris interdum compositis, infima sæpe longissime vaginata; bracteis culmum subæquantibus vel eo brevioribus; stigmatibus 3; perigyniis oblongo-ovalibus vel obovatis obtusis turgidis trigonis, ore integro, nervatis olivaceis vel ferrugineis, nervis pallidioribus pellucide demum ferrugineo-punctatis, squama albida nervo viridi oblonga obtusa abrupte brevi-cuspidata vel mutica rarius acuta latoribus longioribusque.—*C. gracillima*, Schw. An. tab.; Dewey, Sill. viii. 98; Tor. Mon. 408; Carey, l. c. 522; Sartwell, Ees. n. 87; Kunth, 454; Kunze, 36. t. 8 (ex parte); Darlington, Fl. Cest. ed. 3. 349. *C. digitalis*, Schw. et Tor. 324. t. 27. f. 1 (non Willd.); Beck, Bot. 436. (TAB. CXLV.)

HAB. In America septentrionali, in pratis humidis. Norway House, Richardson. New England to Michigan, Carey.

*Culmus* 1–2½-ped., gracilis, apice setaceus, scaber, foliis vaginantibus munitus, basi rudimentis foliorum purpurcis fibrillosis tectus; pars spicas gerens 5–9 etiam 21 poll. longa. *Folia* 1–4 lin. lata, culmo breviora, graminea, vaginæque glabræ. *Bractea* infima foliacea, 1–1½ lin. lata, culmum subæquans vel eo brevior: superiores setacæ. *Vagina* infima 1–4½ poll. longa. *Pedunculi* capillares, scabri: infimus 2–5½ poll. longus. *Spicæ* omnes pedunculatæ, 8 lin. ad 2 poll. longæ, 1–2 lin. latæ: terminalis rarius omnino plerumque basi plus minus mascula: fœmineæ superiores approximatae, inferiores remotæ, omnes, nisi summa, vaginatae, demum pendulæ: infima basi laxiflora. *Squamæ* albæ, nervo viridi demum castaneo: masculæ inferiores, laxæ, lanceolatae, acutæ, superiores obtusæ: fœmineæ oblongæ, obtusæ, abrupte cuspidatæ; vel inferiores acutæ, superiores sæpe muticæ vel mucronulatæ. *Perigynium* 1½–7⁄10 lin. longum, 7⁄10–8⁄10 lin. latum. *Achenium* 7⁄10 lin. longum, 5⁄10–6⁄10 lin. latum, triquetro-ovale vel obovatum, basi styli apiculatum, flavidum, punctatum.

A *C. æstivali* differt, culmo validiori; foliis latoribus; spicis longioribus, longe pedunculatis, demum sæpe pendulis, inferioribus longe vaginatis; perigyniis obtusis, turgidis; squamis abrupte cuspidatis: foliis vaginisque glabris.

This species varies in the breadth of the spikes, in their being more or less loosely flowered, more or less pendulous; in the

degree of obtuseness of the perigynium, the distinctness of the nerves, and the form and proportionate length of the scales. The male terminal spike is exceptional. I have observed it only in specimens out of sixty-five.

I have quoted Kunze's f. 8, as it evidently represents this species, though in the details, at *f* and *g*, and in his description "*utriculis rostratis, rostro bidentato*," he confounds probably *C. arctata* with it.

In 65 specimens I find—

|                  |                                 |
|------------------|---------------------------------|
| 1 with 3 spikes. | 3 terminal spike male.          |
| 27 „ 4           | 62 terminal spike male at base. |
| 36 „ 5           |                                 |
| 1 „ 6            |                                 |

In one the two lowest spikes compound at base, the lowest having three short branches.

In one the lowest compound at base, with an elongated branch.

135. *C. sterilis* (Willdenow); spicis polygamis e spiculis 4–5 rarius 6 nudis contiguis dioicis, masculis vel rarius fœmineis, plerumque androgynis basi vel apice, vel apice et basi masculis, vel superioribus masculis, inferioribus fœmineis vel androgynis; spiculis masculis oblongis, fœmineis androgynisque subrotundis, infima sæpe oblonga pluriflora, summa reliquisque androgynis plerumque basi parce masculis; stigmatibus 2; perigyniis e basi utrinque tenui arguta cordatis sensim rostratis acute bifidis antice alte sectis plus minus nervatis superne marginibus acutis serratis compressis divergentibus vel inferioribus recurvatis, squama ovata castanea margine albo-hyalina acuta vel cuspidata paulo longioribus vel subæquantibus.—*C. sterilis*, Willd. iv. 208; Schk. f. 146 (*optima*); Muhl. 217; Schw. et Tor. 293; Dewey, xi. 304; Elliott, ii. 525; Sartwell, Ees. n. 37. *C. stellulata*, β, Tor. Mon. 392. *C. stellulata*, var. *sterilis*, Carey, 515. (TAB. CXLVI.)

HAB. In America septentrionali. Canada to Carolina.

*Cæspitosa*. *Radix* fibrosa: fibris tenuibus minime lignosis. *Culmus* 9–14 poll. altus, rigidus, scaber, basi rudimentis foliorum vaginisque obscure ferrugineis tectus. *Folia* involuta, quædam setacea, vel alia ½, demum senilia evoluta lineam lata, culmo breviora vel longiora. *Spicæ* ex eadem radice distributione florum admodum variabiles: sæpe omnino masculæ, rarius totæ fœmineæ, sæpius androgynæ, basi parce vel apice vel apice et basi masculæ: vel spiculæ superiores masculæ: inferiores fœmineæ vel androgynæ. *Spiculæ* 4–5, rarius 6, plerumque contiguæ, nudæ: infima tantum subinde subremota: masculæ pallide castaneæ, 4–6 lin. longæ, 1 lin. latæ: fœmineæ vel androgynæ (*summa* nusquam vel rarissime basi attenuato-mascula) subrotundæ, 3 lin. longæ et latæ, vel infima pluriflora, 4 lin. longa, nuda, rarius bractea spicâ suâ longiori. *Squamæ* castaneæ, margine albo-hyalinæ, acutæ: in spicis fœmineis vel androgynis inferiores acutæ, nervo infra apicem evanescente: superiores acutissimæ, cuspidatæ, perigynium æquant. *Perigynium* 1½–7⁄10 lin. longum, 7⁄10–8⁄10 lin. latum, compressum, basi utrinque marginibus tenuibus argutis, cordatum, acute bifidum, superne e medio serratum, demum olivaceum vel ferrugineum, divergens, apice recurvum vel ad basin spicæ omnino recurvatum, utrinque nervatum, nervis postice paucioribus. *Achenium* 8⁄10 lin. longum, 6⁄10 lin. latum, suborbiculatum, basi productum, basi styli crassiori abrupte apiculatum.

A *C. stellulata*, Good., differt, inflorescentia polygama; spiculis pluribus, plurifloris, summa vix unquam basi attenuato-mascula; perigyniis ad basin marginibus tenuibus argutis compressis cordatis, acute bifidis, nervis paucioribus, magis remotis; squamis acutissimis, cuspidatis, perigynia sæpe æquan-

tibus; foliis involutis, angustioribus, pallidioribus; culmo altiori; radice fibris tenuioribus.

Var.  $\beta$ ; spica straminea concolori, e spiculis oblongis plurifloris 4-6 androgynis, terminali inferne longe attenuata, reliquis *ima basi* masculis; culmis 15-24-poll., ex eadem radice pluribus cespitosis.—*C. sterilis*, *Muhl.*, var. *d.* *C. stellulata*, *Tuck. etc.*; *Sartwell*, *Ews. n.* 35. (TAB. CXLVI\*.)

I agree with Tuckerman in considering *C. sterilis* to have specific characters distinguishing it from *C. stellulata*, Good., which plant Muhlenberg has not included among the American species of the genus. His var. *d.* is generally referred to it, but it differs in having more spiculæ, which are oblong, with more numerous flowers, a taller culm, and cordate perigynium. As in the case of *C. ampullacea*, Good., I have not seen specimens which I can satisfactorily refer to the European *C. stellulata*, south of the British provinces of North America. Willdenow says the habit of *C. sterilis* is that of *C. curta*, Good. (*C. canescens*, L.). I think Schlechtendal explains this, for in the Linnea he says a specimen of *C. canescens* from Muhlenberg is in Herb. Willd. united with *C. sterilis*, also from Muhlenberg.

In Tab. CXLVI. are figured mature perigynia of *C. siccata*, referred to under that species, p. 19.

136. *C. stellulata* (Good.) var. *scirpoides*; spica oblonga, e spiculis 2-4 approximatis vel contiguis androgynis, terminali basi sæpe longe attenuato-mascula recta vel obliqua, reliquis subrotundis paucifloris basi parce masculis nudis; stigmatibus 2; perigyniis e basi truncata vel cordata spongiosa ovatis rostratis bidentatis superne marginibus serratis plano-convexis antice nervatis patentibus, squama subrotunda obtusa pallide ferruginea margine albo-membranacea subduplo longioribus.—*C. stellulata*, var.  $\gamma$ , *Tor. Mon.* 392; var. *scirpoides*, *Carey*, 515. *C. scirpoides*, *Schk. f.* 180; *Willd.* 237; *Kunth*, 400; *Muhl.* 225; *Schw. et Tor.* 317; *Dewey*, *Sill.* viii. 96; *Sartwell*, *Ews. n.* 36. (TAB. CXLVI\*\*.)

HAB. In America septentrionali.

*Culmus* 9-18-poll., gracillimus, sursum scaber, sæpe ut folia fere setacea, debilia. *Spica* 6-10 lin. longa: spicula terminalis quandoque omnino sterilis. *Perigynium*  $1\frac{2}{10}$ - $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, inferne marginibus spongiosis. *Achenium*  $\frac{6}{10}$  lin. longum, fere  $\frac{5}{10}$  lin. latum.

The thickened basal margins of the perigynium distinguish this plant from *C. sterilis*. It can scarcely be regarded as distinct from *C. stellulata*, though the European form is more rigid, with a shorter culm, longer and acuter scales, and a larger and often an oval-based perigynium.

137. *C. radicalis* (Boott); spicis androgynis apice masculis pallidis concoloribus parvis paucifloris ovatis nudis 2-5 ex eadem radice, vel in pedunculos graciles inæquales plus minus elongatos radicales monostachyos vel in culmum 2-3-stachyum insidentibus, inferioribus remotis longe exserte pedunculatis bracteatis, infima radicali; stigmatibus 3; perigyniis late ovalibus triquetris basi alatis rostellatis emarginatis pubescentibus, marginibus usque ad basin ciliatis nervatis lutescentibus (racheolâ sæpe instructis), squama ovata acuta plus minus longe cuspidata longioribus vel (ad basin spicæ *cuspidate*) sæpe multum brevioribus. (TAB. CXLVII.)

HAB. In Himalaya orientali temperata, ad Sikkim, alt. 9-10,000 ped., *J. D. Hooker*.

*Culmus* subpedalis. *Pedunculi* 6-12 poll. longi, filiformes,

apice cernui, infra spicas clavati, angulis acutis scabris, basi reliquis foliorum filamentosis atris tecti. *Folia* 1-1 $\frac{1}{4}$  lin. lata, plana, culmo sæpe longiora. *Bractea* spicæ mediæ vaginata, foliacea, culmo longior. *Vagina* 2-6 lin. longa. *Spica* 3 lin. longæ, 2 $\frac{1}{2}$  lin. latæ, apice flosculis masculis pluribus imbricatis basi fœmineis 4-7 instructæ: spica media 2-6 pollices remota, longe exserte, infima radicalis brevius pedunculata. *Squamæ* pallidæ, concolores: masculæ obtusæ, muticæ, sæpe ciliolatæ: fœmineæ plus minus longe setaceo-cuspidatæ; inferiores sæpe bracteas simulantes. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, sæpe racheola lineari scabra instructum. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, turgide ovatum, stipitatum, trigonum, angulis 3 prominentibus pallidioribus, faciebus convexis: ferrugineum, punctulatum. *Stylus* basi insigniter incrassatus, articulatus, deciduus. *Stigmata* 3, contorta.

Affinis *C. speciosa*, Kunth. Differt spicis parvis, ovatis, paucifloris; perigyniis minoribus, emarginatis, scabrioribus; foliis angustioribus; culmo pedunculisque filiformibus.

M. Spach remarks that the prominent angles of the achenium do not always correspond to the real angles of it, deviating a little to the right or left, though all meeting at the base of the conic incrassate style. On some roots all the spikes are solitary, on others they are alternate on a culm; confirming Drejer's idea that the *Psyllophora* are "formæ hebetatæ Caricum genuinarum."

138. *C. parva* (Nees); spica simplici androgyna apice mascula purpureo-ferruginea concolori oblongo-elliptica nuda; stigmatibus 3; perigyniis lineari-lanceolatis triquetris longe sensim acuminato-rostratis, ore integro obliquo, leviter nervatis ferrugineis demum reflectis racheolâ lineari intus instructis, squama lanceolata acuta mutica vel longe hispido-cuspidata purpureo-ferruginea marginibus demum albo-membranaceis decidua angustioribus brevioribus longioribusque.—*C. parva*, *Nees*, *Wight*, *Contr.* 120 (1854). *C. macrorhyncha*, *Kar. et Kir. Bull. Soc. Imp. Moscow*, n. 3. 521 (1842)! (TAB. CXLVIII.)

HAB. In Himalaya temperata. Kunawur ad Yuerpo, in sylvis, *Jacquemont*, n. 484. Sikkim, alt. 12,000 ped., *J. D. Hooker*. Mourn, *Royle*, n. 138. In humidis subalpinis. Alatau, ad fluv. Sarchan, *Karelin et Kirilow*.

*Radix* repens. *Culmus* 1-2-ped., subvalidus, lævis. *Folia*  $\frac{1}{2}$ - $\frac{3}{4}$  lin. lata, subulata, canaliculata, lævia, culmo breviora. *Spica* 8 lin. longa, sub-2 lin. lata, basi flosculis fœmineis 2-8 apice masculis pluribus imbricatis instructa. *Squamæ* lanceolatæ: masculæ acuminatæ, acutæ: fœmineæ inferiores cuspidatæ; infima spicam subæquante: superiores muticæ. *Perigynium* 4 lin. longum,  $\frac{1}{2}$  lin. latum. *Achenium*  $1\frac{1}{2}$  lin. longum,  $\frac{4}{10}$  lin. latum, longo-ellipticum, triquetrum, pallidum, racheolâ 3 lin. longâ lineari-ligulatâ ciliatâ antice instructum.

Affinis *C. paucifloræ*, Light.

The few specimens of this species found by Dr. Royle were too young to exhibit the reflexed perigynium. I have figured one of them (the smallest figure with two leaves), the other figures being from Dr. Hooker's specimens. I have no hesitation in referring *C. macrorhyncha* to the plant of Nees, though it is described as having only two stigmata. An authentic specimen in Herb. Banks has three stigmata; and M. Spach informs me the same number are observable in the specimens in the Herb. Mus. Paris.

139. *C. olivacea* (Boott); spicis 6-8 vel pluribus (14) fuscis cylindricis elongatis erectis, terminalibus 2 masculis ferrugineis, vel apice masculis, aliis 2-3 minoribus masculis proxime sitis, reliquis fœmineis fusco-olivaceis concoloribus, superioribus (vel omnibus) apice masculis alternatim approximatis evaginatis, infima remota lon-

gissime bractcata sæpe inserte vel longe exserte pedunculata; stigmatibus 3; perigyniis turgide ovalibus ventricosis rostratis, rostro plerumque deflexo, ore ferrugineo emarginato-bidentato demum bilobato, leviter nervosis rugosis divaricatis, squama lanceolata obtusa vel acuta cuspidata ferruginea nervo pallido latioribus longioribus vel (*cuspidate*) brevioribus.—*C. olivacea*, *Boott, Lin. Trans.* xx. 138. (TAB. CXLIX.)

HAB. In Assam tropica, *Jenkins*, et Himalaya tropica ad Sikkim, alt. 1–2000 ped., *J. D. Hooker*.

*Culmus* 2–3-ped., validus, triquetus, lævis, superne gracilis, scaber; pars spicas gerens 7–18 poll. longa. *Folia* 5–8 lin. lata, culmo longiora. *Bractea* infima sæpe vaginata, 3–6 lin. lata, subinde tripedalis: superiores evaginatae, angustae, demum spicis suis breviores. *Vagina*  $\frac{1}{2}$ –2 poll. longa, intus atro-purpurea. *Ligula* elongata, alligata. *Pedunculus* infimus  $\frac{1}{2}$ –7 poll. longus, validus, lævis. *Spicae masculae* 2: terminalis  $2\frac{1}{2}$ –6 poll. longa, 2 lin. lata; altera subpollicaris, sessilis, arcte ad ejus basin sita, ferruginea: vel spicae terminales 1–2, apice masculae; aliae 2–3 minores proximae, omnino masculae; reliquae foemineae  $1\frac{1}{2}$ –6 poll. longae, 3 lin. latae, densiflorae, a se 1–2 vel infima 3–9 poll. remotae: superiores vel omnes apice masculae interdum sessiles vel infima inserte vel longe exserte pedunculata. *Squamae* ferrugineae: masculae lanceolatae, obtusae, muticae, vel inferiores cuspidatae: foemineae superiores acutae; inferiores longe hispido-cuspidatae. *Perigynium*  $1\frac{7}{10}$ –2 lin. longum, lineam latum, fusco-olivaceum; ore ferrugineo membranaceo facile rupto. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, obovato-triquetrum, stipitatum, basi styli apiculatum.

Habitus *C. pendulae*, Hudson.

The perigynium is occasionally abortive and of a lanceolate form. The rugose character arises from the drying of the perigynium, and disappears when soaked in water:

140. *C. excurva* (Boott); spicis 5–8 stricte erectis elongatis cylindricis multifloris plerumque basi attenuatis sessilibus, terminali mascula gracillima lincari pallide straminea, reliquis foemineis subcrassis densifloris olivaceis, superioribus vel omnibus contiguis evaginatibus, vel infima subinde remota vaginata plus minus longe exserte pedunculata sæpe longe foliaceo- vel breve bracteata; stigmatibus 3; perigyniis ovalibus triquetris longe subulato-rostratis divergentibus olivaceis, rostro pallido deflexo, ore membranaceo oblique fisso vel bidentato, nervatis pilosis, squama lanceolata acuminata longe hispido-cuspidata pallida latioribus brevioribus vel longioribus. (TAB. CL.)

HAB. In regione temperata et subtropica Khasia, alt. 4–6000 ped., *Hooker et Thomson*.

*Radix* e fibris lignosis validis fibrillisque setaceis ramosissimis constans; stolones longos, vaginis striatis, vel reliquiis setaceis vaginarum undique tectos, proferens. *Culmus* 1–3-ped., validus, triquetus, superne scaber, basi foliis vestientibus clausus; pars spicas gerens 3–12 poll. longa. *Folia* 2–4 lin. lata, glauco-viridia, culmo longiora, basi conduplicata reliquiisque vaginarum pannosis membranaceis ferrugineis marginata. *Bractea* infima vel angusta, evaginata, spica sua brevior vel longior; vel in speciminibus pluristachyis foliacea, 2–3 lin. lata, culmo multum longior, quandoque subpedalis, plus minus longe vaginata: sæpe *sterilis*, e spica infima 6–9 poll. remota: superiores vel brevissimae vel obsoletae. *Vagina*  $\frac{1}{2}$ –2–3 poll. longa. *Ligula* ferruginea, ad margines alligata. *Pedunculus* 4 lin. ad 4 poll. longus. *Spicae* omnes in speciminibus minoribus 1– $1\frac{1}{2}$  poll. longae, 1–2 lin. latae, cylindricae, contiguae,

sessiles: in *majoribus* sæpe 6 poll. longae, 3–4 lin. latae, cylindricae vel basi plerumque longe attenuato-laxiflorae: mascula semper unica gracillima: foeminae 4–7, flavidae, demum olivaceae: infima subinde 4 poll. remota. *Squamae* omnes conformes, e basi ovata longe acuminato-cuspidatae: foemineae inferiores perigynio longiores, superiores breviores. *Perigynium*  $1\frac{7}{10}$ –2 lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium* perigynio conforme,  $\frac{8}{10}$ – $1\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovali-triquetrum, pallidum, basi styli aequali decidua.

Affinis *C. amplifoliae*, B.

In one specimen there were a few female florets scattered about the middle of the male spike. It is only the lowest female spike, in those specimens having six or seven of them, that has a long, broad, vaginate bract. This is occasionally sterile, and more or less remote. It belongs to the *Trachychlænae* of Drejer, and in habit is like *C. amplifolia*.

141. *C. striata* (Michaux); spicis 4–5 rarius 3–6 distantibus erectis, masculis 3 rarius 2–4 pallide ferrugineis, una alterave sæpe abortiva, infima plus minus longe setaceo-bracteata, reliquis 1–2 foemineis olivaceis demum pallidis oblongis vel cylindricis basi attenuatis sessilibus evaginatibus, vel infima remota sæpe inserte vel exserte pedunculata interdum laxiflora; bracteis longissimis angustis basi amplectentibus apice longe attenuato-setaceis; stigmatibus 3; perigyniis turgide ovatis rostratis bifurcatis (laciniis plerumque basi lobatis) undique vel apice solum pubescenti-scabris crebre nervosis olivaceis demum pallidis, squama ovata vel lanceolata acuta sæpe subemarginata brevi-cuspidata vel mutica purpurea vel pallide ferruginea margine albida latioribus longioribusque.—*C. striata*, *Mich.* ii. 174; *Carey*, 530; *Sartwell, Eas.* n. 129. *C. polymorpha*, *Tor. Mon.* 413. (*excl. syn.*); *Dewey*, iii. (*ser.* 2) 355; *Carey, ed.* 1. 561. *C. bullata*, *Elliott*, ii. 556? *C. Houghtonii*, *Sartwell, Eas.* 130. (TAB. CLI)

HAB. In America Borcali. Carolina to Florida.— $\beta$ . New Jersey, *Greene, Knieskern*.

Stolonifera. *Culmus* sub-2-pedalis, acutangulus, firmus, sæpe gracilis, scaber, basi vaginis longis vel marginibus amplectentibus foliorum rubro-purpureis vel pallidis reticulato-fissis clausus, foliisque vaginantibus inferne vestitus; pars spicas gerens 3–8 vel etiam 12 pollices longa. *Folia* semper basi vel sæpius omnino involuta culmo longiora, 1–2 lin. lata, sæpe angustiora, apice longe attenuata, insigniter nodosa, firma. *Bractea*  $\frac{1}{2}$ –1 lin. lata, evaginata vel vaginâ 2–4 lin. longâ prædita, semper culmo multum longior: infima sæpius vaginata, longissima, 1- etiam interdum 2-pedalis: binæ basi involutæ, apice longe attenuato-setaceae. *Vagina* infima 2–10 lin. vel rarius 1– $2\frac{1}{2}$  poll. longa, interdum basi rubro-purpurea. *Ligula* elongata, ad margines alligata. *Pedunculus* 2–5 lin. vel 1– $1\frac{1}{2}$  poll. rarius  $4\frac{1}{2}$  poll. longus. *Spicae masculae* sæpius 3, rarius 2–4, alternæ vel contiguæ, spicis foemineis 3–6 poll. remotæ, terminalis plerumque 1– $1\frac{1}{2}$  poll. longa, 1–2 lin. lata: aliae minores, infima sæpe longe setaceo-bracteata: una alterave inferiorum sæpe abortiva. *Spicae foemineae* 1–2, nunquam plures,  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longae, 2–4 lin. latae, densiflorae, basi attenuatae, sessiles, vel inserte vel infima nunc laxiflora, plus minus exserte pedunculata: a se  $2\frac{1}{2}$  6-vel 8–12 poll. remotæ. *Squamae* masculae obtusae, muticae, pallide vel fusco-ferrugineae, margine albo-hyalinae, nervo infra apicem evanescente; foemineae ovatae vel lanceolatae, acutae vel obtusae, sæpe subemarginatae, breve cuspidatae vel muticae, purpureae vel pallidae, plus minus purpureo tinctae. *Perigynium*  $2\frac{1}{2}$ –3 lin. longum.  $1\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, olivaceum, demum pallidum, ovatum vel globo-

sum, inflatum, rostratum, bifurcatum, laciniis sæpe basi lobatis, crebre nervosum, undique pubescenti-scabris, vel superne solum scabris; basi glabrum: coriaceum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{9}{10}$  lin. latum, stipitatum, late obovatum, trigonum, castaneum, basi styli æquali abrupte apiculatum.

A *C. Houghtonii* differt, culmo altiori; foliis bracteisque involutis, multum longioribus; ligula elongata; spicis fœmineis 1-2, nunquam pluribus, basi attenuatis, distantibus; perigyniis magis molliter pubescenti-scabris; laciniis lobatis, olivaceis, demum pallidis; squamis fœmineis sæpe muticis, interdum emarginatis, masculis semper muticis nec ciliatis.

Var.  $\beta$ ; bracteis sæpe culmum subæquantibus, foliisque planis; perigyniis interdum omnino glabris, sæpe minus alte bicuspidatis; squamis plerumque muticis, magis coloratis.

This species is generally referred in the States to *C. polymorpha*, Muhlenberg, but as that plant is admitted to have included the *C. Halseyana* of Dewey, I have affixed the name of Muhlenberg to it. His variety n. 2 I have no doubt is referable to it. What n. 1 and 3 may prove to be, I know not, but neither apply to *C. striata*; I have not therefore quoted Muhlenberg for this species. I have the authority of Michaux' herbarium, which I examined in 1850, for referring the Florida plant to his *C. striata*. Dewey and Elliott quote *C. striata* under *C. lanuginosa*, Mich. (*C. pellita*, Muhl.), and Torrey, in his Mon., quotes it under *C. filiformis*. I suspect the *C. bullata* of Elliott is *C. striata*, that form which Chapman has sent from Florida, with the roughness limited to the upper part of the perigynium. *C. bullata*, Schk., has not been found south of Pennsylvania.

The New Jersey plant of Greene and Knieskern, though it has developed leaves, always a smoother perigynium, and shorter bracts, is essentially the same as the southern plant. It will be found to vary in all these particulars. The species in fact varies much in the breadth, degree of involution of the leaves, in more or less diffused roughness of the perigynium, the greater or less bifurcation of its orifice, the length or entire absence of the mucro on the female scales, the breadth, and greater or less denseness of the female spikes. These are invariably one or two. Lesqueux has found one or two specimens in Ohio with loose cylindrical spikes and long linear cuspidate scales, which I suspect are referable to *C. striata*.

The affinity between *C. striata* and *C. Houghtonii* is very close, but I think they are distinct. In the Florida specimens of Chapman I find—

|                  |                |                   |
|------------------|----------------|-------------------|
| 1 with 3 spikes. | 3 with 2 male. | 15 with 1 female. |
| 12 „ 4           | 21 „ 3         | 13 „ 2            |
| 14 „ 5           | 4 „ 4          |                   |
| 1 „ 6            |                |                   |
| 28               | 28             | 28                |

In eighteen, one or more of the lower male spikes are abortive.

In eight, the lower female is from two to twelve inches remote, evaginate or vaginate, the vagina 1-2½ inches long.

In the New Jersey plant I find—

|                  |                |                  |
|------------------|----------------|------------------|
| 2 with 2 spikes. | 1 with 1 male. | 9 with 1 female. |
| 16 „ 4           | 9 „ 2          | 15 „ 2           |
| 6 „ 5            | 14 „ 3         |                  |

In seven, one or more of the lower male spikes are abortive.

In two, the upper female is male at top.

In seven, the lower female is from one to eight inches remote, evaginate or vaginate, the vagina ½-1½ inches long.

In Tab. CLI. a perigynium of *C. Houghtonii* is figured, to show the difference in the orifice and hairiness between it and those of *C. striata*.

142. *C. trichocarpa* (Muhlenberg); spicis 6-7 rarius 5-8 vel etiam 12 cylindricis erectis, masculis 3-5 etiam rarius 9 gracilibus alternis sessilibus, vel superioribus congestis, infimis 1-2 remotis bracteatis plus minus

longe pedunculatis, ferrugineis, reliquis 2-3 rarius 4 fœmineis subcrassis alternis pallidis, superioribus sessilibus evaginatis, infima remota basi attenuato-laxiflora exserte pedunculata; bracteis culmo longioribus vaginisque glabris; stigmatibus 3; perigyniis ovatis vel ovato-lanceolatis sensim plus minus longe rostratis alte bicuspidatis, laciniis lanceolatis margine membranaceis scabris, crebre nervosis pubescentibus, squama ovata acuta mutica vel plus minus longe aristata ferruginea medio pallida nervata carina sæpe scabra longioribus vel rarius (aristâ) brevioribus.—*C. trichocarpa*, Muhl. 257; *Carey*, 530; *Willd.* iv. 302; *Schk. f.* 148. n. n. n.; *Kunth*, 484; *Dewey, Sill.* vii. 274, xi. 158; *Schw. et Tor.* 362; *Sartwell, Ews. n.* 133. *C. striata*, *Carey, ed.* 1. 561. (TAB. CLII.)

HAB. In America septentrionali. New England to Michigan, *Carey*. Canada to Georgia, *Torrey*.

*Culmus* 2-3-ped., triqueter, validus, rigidus, lævis, apice gracilis, scaberrimus, basi rudimentis foliorum purpureis vaginisque reticulato-fissis foliisque vaginantibus vestitus; pars spicas gerens 8-14 poll. longa. *Folia* 1-3 lin. lata, culmo longiora, vel breviora, superne marginibus carinaque scaberrima. *Bractea* foliis similes, culmo longiores, omnes vel infima solum plus minus vaginatae, basi supra scabrae, sæpe transversim corrugatae. *Vagina* glabrae, 2-8 rarius 16 lin. longae. *Ligula* purpurea, integra, concava, amplectens. *Pedunculus* infimus ½-2 poll. longus, superne scaber. *Spica mascula* sæpius 4 vel 5, rarius 3 vel interdum 2, vel 9, graciles, ferrugineae, demum castaneae, 4-18 lin. longae, 1-1¼ lin. latae; infima (vel inferiores 2) sæpe remota, pedunculata, bracteata: rarius apice fœmineae. *Spica fœminea* sæpius 2 vel 3, rarius 4, 16 lin. ad 2½ poll. longae, 4-6 lin. latae, a se 1½-3, vel infima 7 poll. remotae, omnes subdensiflorae, vel basi attenuatae, laxiflorae; sessiles, vel inferiores plus minus longe exserte pedunculatae, una vel altera rarius basi composita: suprema rarius apice mascula. *Squamae* masculae inferiores obtusae, muticae, nervo infra apicem albo-hyalinum, ciliatum, evanescente; superiores acutae, cuspidatae: fœmineae inferiores interdum ovatae, acutae, muticae; superiores vel omnes plus minus aristatae. *Perigynium* 3-3 $\frac{9}{10}$  lin. longum, 1-1 $\frac{3}{10}$  lin. latum, ovatum, vel ovato-lanceolatum, plus minus longe rostratum (rostro 1-2 lin. longo), pubescens, alte bicuspidatum, lacinae scabrae, basi ad margines membranaceae. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, obovatum, triquetrum, pallidum, basi styli apiculatum.

Var.  $\beta$ ; perigyniis glabris, rostro ad margines laciniisque scabris; vaginis scabris.

HAB. Red River, *Douglas, n.* 257. Pen-Yan, *Sartwell*.

In 29 specimens I find—

|                  |                |                   |
|------------------|----------------|-------------------|
| 4 with 5 spikes. | 1 with 2 male. | 18 with 2 female. |
| 11 „ 6           | 5 „ 3          | 9 „ 3             |
| 9 „ 7            | 14 „ 4         | 2 „ 4             |
| 4 „ 8            | 8 „ 5          |                   |
| 1 „ 12           | 1 „ 9          |                   |

In only one specimen the two lower of three males were female at top.

A *C. aristata*, Br., differt, foliis vaginisque glabris; bracteis basi supra scabris; perigyniis pubescentibus; laciniis margine basi membranaceis, scabris; squamis masculis inferioribus muticis, ciliatis; fœmineis sæpe muticis.

I have referred the var.  $\beta$  to *C. trichocarpa* from its male scales and the lacinae of the perigynium agreeing with it, rather than with *C. aristata*. The roughness of the vagina shows no tendency to hairiness.

143. *C. alta* (Boott); spica pallida elongata lanceolata e spiculis pluribus (16–20) androgynis basi masculis oblongis simplicibus sessilibus, superioribus contiguis, inferioribus plus minus remotis longissime bracteatis; stigmatibus 2; perigyniis ellipticis rostellatis bidentatis plano-convexis marginatis serratis utrinque medio nervatis spongiosis pallidis, squamam ovatam acuminatam vel mucronulatam pallidam subæquantibus.—*C. alta*, *Boott, Lin. Trans.* xx. 130. *C. Brizopyrum?* *Kunze*, 169, t. 43. (TAB. CLIII.)

HAB. In Java, *Dr. Horsfield*.

*Culmus* 3–4-ped., lævis vel apice inter spiculas seabriuseulus, superne nudus, inferne foliatus, basi reliquiis foliorum fibratis teetus. *Folia* 1–1½ lin. lata, plana, culmum subæquantia. *Bracteæ* inferiores foliaceæ, elongatæ: infima spicam longe superans: superiores basi dilatatae, setaceæ, spiculis breviores. *Spica* 4–5 poll. longa, 4 lin. lata. *Spiculæ* 5–7 lin. longæ, 2 lin. latæ: superiores (*infra terminalem*) abbreviatæ, congestæ, inferiores deorsum plus minus remotæ: infima quandoque 1–½ poll. distans. *Perigynium* 1½ lin. longum, ½ lin. latum, ad latera superne erasse spongiosum, marginatum, serratum. *Achenium* ½ lin. longum, ⅓ lin. latum, stipitatum.

This species is allied to *C. remota*, L. Judging from the figure of *C. brizopyrum* of Kunze, I should doubt any specific difference existing between it and *C. alta*, especially as the composition of the lower spiculæ is not constant in *C. brizopyrum*. In *Dr. Horsfield's* specimens the spiculæ are simple, as they are in four of the five spikes figured by Kunze. The achenium is not more than a third of the length of the perigynium, which laterally is of a thick spongy substance, as in *C. remota*, from which it differs in its more numerous crowded elongated spiculæ and longer bracts.

144. *C. gracilis* (Brown); spica oblonga vel elongata ferruginea composita, e spiculis 5–12 pluribusve oblongo-cylindricis laxifloris androgynis apice masculis omnibus (vel superioribus solum) simplicibus, inferioribus inæqualiter exserte pedunculatis remotis bracteatis geminatis ternatisve sæpe compositis, infima subinde solitaria; stigmatibus 2; perigyniis late ovalibus compressis rostratis bifidis conico-stipitatis striato-nervatis scabris fusco-ferrugineis membranaceis, squama ovata acuta mucronata vel aristata vel obtusa mutica ferruginea latioribus longioribusque.—*C. gracilis*, *Brown, Prod.* 242 (1810). *C. lachnosperma*, *Wallich, Cat.* 3379 (*ex parte*); *Nees, apud Wight, Contr.* 124; *Kunth, Cyp.* 505 (*excl. descript. auctoris, quæ C. hebecarpam, Mey., pingit*). *C. flexilis*, *Don, Fl. Nep.* 42 (*non Rudge*). *C. lenta*, *Don, Lin. Trans.* xiv. 327; *Spreng. Sys.* iii. 811; *Kunth, Cyp.* 418. *C. Commersoniana*, *Kunth, Cyp.* 391. (TAB. CLIV., CLV., and Var.  $\beta$ , TAB. CLVI. TAB. CLIV. Fig. 1, spec. e Nova Hollandia, *Herb. Brown*; Fig. 2, e Nepalia, *Herb. Wallich*. TAB. CLV., spec. ab Ins. Mauritius, *Herb. Commerson*.)

HAB. In Australia, Port Jackson, *Brown*. Ins. Mauritius et Bourbon, *Commerson, etc.* In montibus subtropicis Himalayæ, Punjab, *Fleming*; Nipal, *Wallich*; Kumaon, *Royle, n.* 103. Peninsula Ind. Or., Pulny Mountains, *Wight*. In Zeylaniam, *Thwaites*.

*Culmus* sub-3-ped., gracilis, rigidus, acutangulus, lævis, inter spicas scaber, basi foliatus; pars spicas gerens 7–12 poll. longa. *Folia* 1–½ lin. lata, culmo breviora, firma, plana, basi involuta. *Bracteæ* inferiores foliaceæ, culmo breviores: supre-

mæ setaceæ. *Vaginæ* 3–12 lin. longæ, striatæ, scabræ, intus vel summæ omnino ferrugineæ. *Pedunculi* inæquales, 6 lin. ad 3½ poll. longi, capillares: superiores *inserte* inferiores longe *exserte* vaginati, scabri: infimus inferne vaginulis muticis, sæpe sterilibus, vel monostachyis intructus. *Spiculæ* inæquales, 6–10 lin. longæ, basi 2 lin. latæ; apice setaceæ, imbricatoperculæ sub 3 lin. longo; laxifloræ: a se 8 lin. ad 5 poll. remotæ: omnes vel superiores solum simplices: inferiores geminatae vel ternatae, sæpe compositæ: vel infima solitaria. *Squamæ* femineæ latiores, patulæ, acutæ, vel præcipue inferiores mucronatæ vel aristatæ, rarius obtusæ, muticæ. *Perigynium* 1–⅞ lin. longum, ⅞ lin. latum, utrinque nervatum, antice plurinerviolum, scabrum. *Achenium* ⅞ lin. longum, ⅞ lin. latum, ovale, lenticulare, flavidum.

$\beta$ . *minor*; spiculis ovatis densifloris, rostro breviori. (TAB. CLVI.)

HAB. Ins. Bourbon. *Boivin, n.* 935 (Herb. Mus. Paris).

I see no specific characters by which I can distinguish the New Holland from the East Indian, Ceylon, Mauritius, and Bourbon specimens. The perigynium of the former is rather smaller (1–⅞ lin. long.), and the scales are obtuse and muticæ, but I observe the same occasionally in the Indian and Mauritius plant. In one of *Dr. Wallich's* specimens, in a young state, the lower peduncle has a spicula arising from each of its two vaginulæ, and is thus racemose; while in another, equally young, the peduncle is geminate, and the vaginulæ on one are sterile. I observe one of these fertile vaginulæ on the peduncle of one of the two specimens I have seen from New Holland. They are absent in *Dr. Wight's* specimen. I have no doubt that a more accurate knowledge of the species will show that the inflorescence, in more luxuriant specimens, approaches in some degree that of *C. longicruris*, Nees, in which the longer peduncles of the fascicles have simple or geminate spiculæ issuing from alternate vaginulæ. It is more compound in Tab. CLV. than in the New Holland and Nipal specimens. In one specimen of *Dr. Royle's* all the spiculæ are simple. We observe the same variation in *C. Cherokeeensis*, Schw., which was originally described and figured with *simple* spikes; and before I was aware of the tendency of certain species to vary in this respect, I described a specimen of the same plant, with geminate and ternate spiculæ, under the name of *C. Christyana*, in the Boston Journ. of Nat. Hist.

I am indebted to M. Spach for authentic specimens of the *C. Commersoniana*, Kunth, one of which is figured in Tab. CLV., and also for the var.  $\beta$  *minor*, from the Island of Bourbon, *Boivin, n.* 935, figured in Tab. CLVI. The short ovate and more compact spiculæ, with the often abbreviate rostrum, led me to think at first it was distinct, but I can see no essential characters to distinguish it. The rostrum varies in length. The emargination of the lower female squama is accidental, and by no means constant.

I have not seen specimens of *C. brunca*, Thunberg, from Japan, but I suspect that it may be found inseparable from the *C. gracilis*, Br., as I believe *C. pumila*, Th., is from *C. littorea*, Labill. (*C. Urvillei*, Brongn. ! fide spec. ! ex Herb. Mns. Paris).

145. *C. longicruris* (Nees); spica prælonga castanea duplicato-fasciculata; fasciculis sub-12 vaginatis, superioribus inserte pedunculatis approximatis, inferioribus exsertis remotis bracteatis elongatis magis compositis e pedunculis 3–4 setaceis inæqualibus nutantibus, brevioribus spiculas simplices alternas, longioribus simplices geminatas ternatasque gerentibus; spiculis permultis inæqualibus oblongis cylindricisque androgyniis apice masculis laxifloris; stigmatibus 2, longissimis; perigyniis ellipticis longe rostratis subbifidis plano-convexis glabris marginibus incurvis serratis leviter nervatis stipitatis castaneis membranaceis, squama lanceolata acuta striata cas-

tanea nervo viridi longioribus vel subæquantibus.—*C. longicruris*, Nees, *Wight, Contr.* 124. (TAB. CLVII.)

HAB. In Himalaya occidentali subtropica, alt. 5–7000 ped. Kumaon, *Royle, n.* 87 (*ex parte*) et 93. Simla, *Thomson*. In Mont. Pen. Ind. Or., Nilghiri, *Wight*.

*Culmus* 4-ped., rigidus, obtusangulus, lævis; pars spicas gerens  $2\frac{1}{2}$  ped. longa. *Folia*  $2\frac{1}{2}$  lin. lata, culmo breviora, plana. *Bracteæ* inferiores foliaceæ, culmo breviores: supremæ setaceæ. *Pedunculi* capillares, scabri. *Fasciculi* superiores inserte pedunculati, a se  $\frac{1}{2}$ –3 poll. remoti: inferiores plus minus exserti, 4–10 poll. remoti: in quoque fasciculo pedunculus adest longior, spiculas vaginulatas simplices vel inferiores geminatas ternatasque gerens. *Spiculæ* inæquales, 6–15 lin. longæ, apice imbricato-masculæ (2–6 lin. longo), basi laxifloræ, 2 lin. latæ, flosculis alternatim dispositis. *Squamæ* lanceolatae, acutæ, plerumque omnes muticæ. *Perigynium*  $1\frac{2}{3}$  lin. longum,  $\frac{6}{10}$  lin. latum, leviter nervatum, nervis antice sæpius inconspicuis, marginibus incurvis. *Achenium*  $\frac{6}{10}$  lin. longum, plus  $\frac{5}{10}$  lin. latum, ellipticum, lenticulare, pallidum.

This fine species, originally found by Dr. Royle, near Mussoorie, is closely allied to *C. teinogyna*, but the smooth perigynium, with its inverted margins, less deeply cleft mouth, and often indistinct anterior nerves, the absence of the arista on the scales, the diffuse elongated inflorescence, and the broader leaves distinguish it.

147. *C. teinogyna* (Boott); spica oblonga vel elongata castanea composita, e spiculis 5–20 pluribusve inæqualibus oblongis cylindricisque laxifloris androgynis apice masculis vaginatis, superioribus simplicibus inserte, inferioribus exserte pedunculatis remotis bracteatis geminatis ternatisve vel racemosis; stigmatibus 2, longissimis; perigyniis oblongo-ellipticis longe rostratis acute bifidis plano-convexis utrinque leviter nervatis scabris margine serratis stipitatis membranaceis, squama lanceolata acuta cuspidata vel longe aristata striata dorso scabra castanea nervo viridi angustioribus brevioribus vel subæquantibus. (TAB. CLVIII.)

HAB. In Bengalia orientali temperata et subtropica, ad Khasia, alt. 4–6000 ped., *Hooker et Thompson*.

*Culmus*  $1\frac{1}{2}$ –2-ped., gracilis, acutangulus, lævis; pars spicas gerens 3–12 poll. longa. *Folia* lin. lata, sæpius involuta, apice setaceo-attenuata, firma, culmo breviora vel eum æquantia. *Bracteæ* vaginatae, angustæ: inferiores foliaceæ, culmo breviores: superiores setaceæ. *Vaginæ* dorso striatæ, scabræ: inferiores 6–15 lin. longæ, intus vel superiores (3 lin. longæ) omnino ferrugineæ, apice hiantes, aristatæ. *Pedunculi* scabri: inferiores pollicem longi, subexserti, inæquales: infimus interdum  $2\frac{1}{2}$ –5 poll. longus, longe exsertus. *Spiculæ* inæquales, 5–16 lin. longæ, basi 2 lin. latæ, laxifloræ, apice imbricato-masculæ, 2–4 lin. longo: superiores simplices, approximatae, insertæ: inferiores geminatae vel ternatae, subexsertæ vel infimæ racemosæ, vaginulatæ, longe exsertæ. *Squamæ* femineæ lanceolatae, acuminatæ, acutæ, striatæ, scabræ: inferiores cuspidatæ, superiores longe aristatæ: masculæ angustiores, aristatæ. *Perigynium*  $2\frac{1}{2}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum. *Achenium*  $1\frac{2}{3}$  lin. longum, plus  $\frac{5}{10}$  lin. latum, oblongo-ellipticum, lenticulare, basi styli incrassata. *Stigmata* 4 lin. longa.

This species, for which we are indebted to Dr. Hooker and Dr. Thomson, is intermediate between *C. gracilis*, Br., and *C. longicruris*, Nees, having the inflorescence and rough perigynia of the first and the elliptic perigynium and long stigmata of the last. This remarkable character of the stigmata allies it more decidedly to *C. longicruris*, from which it differs in its simpler inflorescence, rough and more strongly-nerved perigynium, long aristate scales, and narrower involute leaves.

The perigynium figured does not exhibit the depth or acuteness of the bifid orifice, and the female scales are generally more acuminate and acute than those drawn.

148. *C. intumescens* (Rudge); spicis 2–4 approximatis, terminali mascula lineari erecta pedunculata pallide ferruginea, reliquis femineis amplis rotundatis 2–10-floris evaginatibus contiguis sessilibus vel infima pedunculata, olivaceis rarius apice masculis; bracteis erectis culmum longe superantibus; stigmatibus 3; perigyniis maximis ventricosis oblongo-ovatis in rostrum cylindricum sensim attenuatis bifidis glabris vel superne marginibus laciniisve scabris nervosis olivaceis divergentibus, squama ovato-lanceolata acuta plus minus hispido-cuspidata pallida medio nervata latioribus longioribusque.—*C. intumescens*, *Rudge, Lin. Trans.* vii. 97. t. 9. f. 3; *Gray, Ann. Lyc.* iii. 236; *Darlington, Fl. Cest.* 353; *Carey*, 531; *Sartwell, Ews. n.* 139. *C. folliculata*, *Wahl. Act. Holm.* 152 (*non Lin.*); *Michaux*, ii. 171; *Willd.* iv. 281; *Schk. N. f.* 52; *Muhl.* 243 (*excl. β*); *Schw. et Tor.* 338; *Beck*, 438; *Schlechtendal, Linnæa*, x. 263; *Kunth*, 498; *Dewey, Sill.* x. 32; *Bigelow*, 361; *Tuckerman*, 13. (TAB. CLIX. et CLX.)

HAB. In America septentrionali. Arctic America to New Orleans.

*Culmus* 1–2-ped., gracilis, triquetus, scaber, basi rudimentis foliorum purpureis sursumque foliis vaginantibus tectus; pars spicas gerens 1–3 $\frac{1}{2}$  poll. longa. *Folia* 2–3 lin. lata, culmo longiora, graminea, nodosa, fusco-viridia, demum flavida. *Bracteæ* foliaceæ, 3–6 poll. longæ, erectæ, evaginatae: 1–2 steriles vaginatae, paulo infra spicas sitæ. *Auriculæ* rotundatae, pallidæ. *Pedunculus* 4–5 lin. longus, scaber. *Spica* mascula  $\frac{1}{2}$ –2 poll. longa, 1–1 $\frac{1}{4}$  lin. lata, rarius sessilis, basi attenuata, nuda vel bractcata: bractea sæpe paulo infra basin sita. *Squamæ* vel lanceolatae, longe acuminatæ, acutæ: vel omnes obtusæ, muticæ, vel supremæ mucronatæ, pallide ferrugineæ, medio virides, margine albo-hyalinæ. *Spicæ femineæ* 1–2, rarius 3, ovatae, demum rotundatæ, 8–12 lin. longæ latæque, arcte contiguæ, sessiles, vel infima, rarius inferiores, brevi-pedunculatæ, a se 6–10 lin. remotæ, 2–6 vel rarius sub-10-floræ, rarius apice masculæ. *Squamæ* latiores, acutæ vel plus minus longe hispido-cuspidatæ. *Perigynium* 6–6 $\frac{1}{2}$  lin. longum,  $2\frac{1}{2}$  lin. latum. *Achenium*  $2\frac{1}{2}$  lin. longum,  $1\frac{6}{10}$  lin. latum, ovale, triquetrum, pallidum, basi styli contorti crassiori apiculatum.

This species is common in North America, extending from Norway House to New Orleans. It has not been described by Elliott, his *C. folliculata* being, as I am informed by Mr. Curtis, the true plant of Linnæus. The specimen of Michaux, in the herbarium of the Garden of Plants, is certainly *C. intumescens*, though Kunth (pp. 496 and 499) appears to have had *C. tentaculata* (*C. rostrata*, Muhl.) under the name of *C. folliculata*, Michaux.

148. *C. Grayi* (Carey); spicis 2–3 approximatis, terminali mascula lineari erecta pedunculata castanea, reliquis femineis amplissimis globosis densifloris undique squarrosis 25–30-floris pedunculatis evaginatibus contiguis fusco-olivaceis; bracteis culmum longe superantibus; stigmatibus 3; perigyniis maximis ventricosis lanceolato-ovatis sensim in rostrum breve acuminatis bifidis glabris laciniis solum scabris nervosis fusco-olivaceis undique divergentibus, squama ovata acuta vel cuspidata castanea medio nervata margine albo-hyalina latioribus terties longioribus.—*C. Grayi*, *Carey, Gray, Man. edit.* 1. 563, *edit.* 2. 531; *Dewey*, 4–22 (1847); *Sartwell, Ews. n.*

140. *C. intumescens*, var. *globularis*, Gray, *Ann. Lyc.* iii. 236; *Tor. Cyp.* 420. (TAB. CLXI.)

HAB. In America sept. New York and Ohio.

*Culmus* 3-ped., validus, triqueter, lævis, apice scabriusculus, basi foliatus, foliis vaginantibus sursum tectus; pars spicas gerens 2-4 poll. longa. *Folia* 3-4½ lin. lata, culmum longe superantia, fusco-viridia, graminca. *Bractea* foliaceæ, 3-10 poll. longæ, evaginatae, 1-2 steriles vaginatae paulo infra spicas sitæ. *Auricula* rotundatae, pallidæ. *Pedunculus* 8-12 lin. longus, scaber. *Spica mascula* 1-1½ poll. longa, 1-1½ lin. lata, pedunculata, sæpe obliqua, nec spicam fœmineam longe superans, nuda vel bractea: bractea sæpe subfoliaceæ, spicâ longior. *Spica fœminea* globulares, 1½ poll. longæ lataeque, multifloræ. *Squamæ* castanæ, margine albo-hyalinæ, masculæ muticæ; fœmineæ latiores, muticæ vel cuspidatæ. *Perigynium* sæpe 8 lin. longum, 3 lin. latum, plurinervium. *Achenium* 2 lin. longum, 1-1½ lin. latum, ovali-triquetrum, pallidum, basi styli crassiori apiculatum.

This species was found by Dr. Gray in meadows at Utica, and described in 1834, in the *Ann. Lyc. N. York*, as a variety of *C. intumescens*, from which species Mr. Carey separated it in 1848, in Dr. Gray's 'Manual.' The large globular female spikes, the smooth perigynium with its gradual acumination into a short rostrum, its more copious nerves, stouter and smoother culm, and broader leaves, sufficiently distinguish it. It has been found by Mr. Sullivant in Ohio.

149. *C. lupulina* (Muhlenberg); spicis 3-6 erectis contiguis, terminali 1 rarius 2 mascula cylindrica bracteata, reliquis fœmineis crassis densifloris ovatis vel cylindræis, superioribus sessilibus, inferioribus exserte pedunculatis, infima quandoque plus minus remota, olivaceis demum fulvis; bracteis latis longissimis; stigmatibus 3; perigyniis e basi ovata ventricosa in rostrum cylindricum attenuatis, ore obliquo bifurcato, glabris vel superne ad margines plus minus serrato-scabris nervosis stipitatis oblique adscendentibus, squama lanceolata acuminata acuta vel longe hispido-aristata medio viridi nervosa marginibus membranaceis fulvis latioribus longioribusque.—*C. lupulina*, *Muhl.* 141; *Willd.* 266; *Schk.* 54. f. 123 et 194; *Elliot*, 544; *Dewey*, xi. 165; *Schw. et Tor.* 337; *Darlington*, 353; *Beck*, 438; *Tor. Cyp.* 420; *Kunth*, 497; *Bigelow*, 361; *Carey*, 532; *Sartwell*, *Ess. n.* 146. *C. lurida*, *Wahl. Act.* 153. (TAB. CLXII.)

HAB. In America sept. Hudson's Bay to Georgia.

*Culmus* 2-3-ped., validus, lævis, foliatus; pars spicas gerens 4-8 etiam 14 poll. longa. *Folia* 3-5 lin. lata, firma, nodosa, culmo longiora. *Bractea* culmum longe superantes: inferiores plus minus vaginatae, latæ. *Vagina* infima ½-3 poll. longa. *Pedunculus* infimus ½-7 poll. longus, lævis. *Spica mascula* 1-2½ poll. longa, 1-2½ lin. lata, rarius altera minor prope infra sita. *Squamæ* lanceolatae, plus minus latæ, medio virides, plurinerviæ, margine membranaceæ, demum fulvæ, rarius muticæ, cuspidatæ vel inferiores elongatæ, longe subulato-acuminatæ, plus minus hispido-aristatæ. *Spica fœminea* 1-2 poll. longæ, 1 poll. latæ, arcte contiguæ, vel alternæ: suprema sessilis, evaginata, reliquæ pedunculatæ, vaginatae: infima quandoque 9-10 poll. remota, longissime exserte pedunculata. *Perigynium* 6½-7½ lin. longum, 2-3 lin. latum, ore obliquo bifurcato, stipitatum. *Achenium* 2 lin. longum, 1-1½ lin. latum, ovale, acute triquetrum, angulis ad medium subnodosis, facibus concaviusculis, pallidum, punctulatum, basi styli contorti crassiori apiculatum.

150. *C. lupuliformis* (Sartwell); spicis 5-8 erectis contiguis, terminalibus 1-2 masculis cylindricis, suprema sæpe elongata, bracteatis, reliquis fœmineis crassis densifloris, superioribus sessilibus sæpe abbreviatis, inferioribus subremotis cylindricis exserte pedunculatis, infima quandoque remota, olivaceis demum fulvis; bracteis latis longissimis; stigmatibus 3; perigyniis e basi ovata ventricosa in rostrum longum cylindricum attenuatis bifidis glabris vel superne ad margines serrato-scabris nervosis sessilibus oblique adscendentibus, squama lanceolata acuminata acuta hispido-aristata medio viridi nervata margine membranacea fulva latioribus longioribusque.—*C. lupuliformis*, *Sartwell*, *Ess. n.* 147; *Dewey*, ix. (ser. 2) 290. *C. lupulina*, β? polystachya, *Schw. et Tor.* 337; *Carey*, 532. (TAB. CLXIII.)

HAB. In America septentrionali. New York, *Sartwell*.

*Culmus*, *folia*, *squamæ* ut in *C. lupulina*. *Spica mascula* 1-2: terminalis sæpe 4 poll. longa, 3 lin. lata. *Spica fœminea* 3 poll. longæ. *Perigynium* 7½-8 lin. longum, 3 lin. latum, sessile, bifidum. *Achenium* 1-1½-2-1½ lin. longum, 1½ lin. latum, acute triquetrum, angulis ad medium insigniter nodosis, facibus concavis, pallidum.

The larger and more numerous spikes, their always alternate arrangement, the sessile perigynium and broader achenium, with its more distinctly mammillated angles, are the chief characters which distinguish this species from *C. lupulina*. In ten specimens of *C. lupulina* I find five with two male spikes, while in twenty-seven specimens of *C. lupulina* I find only one with as many. The perigynia in both vary in the roughness of the margins of the rostrum. The orifice is, I think, generally oblique in *C. lupulina*, and the laciniae longer, though exceptions may be found to either of these characters. In both, the lower female spike is sometimes remote, on a long exserted peduncle. In one specimen of *C. lupuliformis* the upper female spike is male at base, and the penultimate lower one compound at base. I have never seen it beyond the limits of New Jersey and New York, while the range of *C. lupulina* is from Hudson's Bay to Georgia.

151. *C. gigantea* (Rudge); spicis 4-6 rarius 2-8 cylindricis, terminalibus 2-4 rarius 1-5 masculis contiguis, inferioribus bracteatis, reliquis fœmineis vel apice masculis remotis erectis vel inferioribus longe exserte pedunculatis sæpe nutantibus vel pendulis, olivaceis demum fulvis; bracteis latis culmum longissime superantibus; stigmatibus 3; perigyniis e basi ovata vel suborbiculata ventricosa in rostrum longissimum tenue cylindricum attenuatis, ore sæpe obliquo bifido, horizontaliter divergentibus glabris nervosis, squama ovato-lanceolata acuminata acuta (rarius mutica) cuspidata medio viridi nervata margine membranacea latioribus longioribusque.—*C. gigantea*, *Rudge*, *Lin. Trans.* vii. 99. t. 10. f. 2; *Elliot*, ii. 544; *Muhl.* 240; *Dewey*, xi. 164; *Kunth*, 503. (TAB. CLXIV.)

HAB. In America septentrionali. Kentucky to Florida.

*Radix* stolonifera. *Culmus* 1½-3-ped., firmus, triqueter, lævis, foliatus; pars spicas gerens 6-18 poll. longa. *Folia* 3-5 lin. lata, culmo longiora, nodosa. *Bractea* inferiores vaginatae: infima 3-4 lin. lata, bipedalis. *Vagina* infima 4 lin. ad 2½ poll. longa. *Pedunculus* infimus 1-8 poll. longus. *Spica mascula* 1-2½ poll. longæ, 1-1½ lin. latæ: inferiores sæpe longe bracteatae, una vel altera e perigynio, apice fisso, oriens: infima quandoque basi flosculis fœmineis paucis instructa. *Spica fœminea* 1-3 poll. longæ, 1 poll. latæ, sæpe

omnes vel superiores apice masculæ vel steriles: suprema sessilis, evaginata, reliquæ plus minus longe exserte pedunculatæ: infima subinde 10 poll. remota, pendula: olivaceæ, demum fulvæ. *Squamæ* conformes, lanceolatæ, muticæ vel sæpius cuspidatæ. *Perigynium*  $5\frac{1}{2}$ – $7\frac{1}{2}$  lin. longum, sub-2 lin. latum, horizontaliter divergens, rarius (*sub lente*) rostro ad apicem scabriuseulo. *Achenium*  $1-1\frac{3}{10}$  lin. longum,  $1\frac{4}{10}$  lin. latum, angulis acutissimis prominentibus, faciebus concavissimis, basi styli contorti crassiori abrupte apiculatum.

I am indebted to Mr. Carey for a large suite of beautiful specimens of this species, sent to him by Dr. Short from Louisville in Kentucky. I find in 104 specimens—

| 1 with 3 spikes. | 1 with 1 male. | 70 with 2 female. |
|------------------|----------------|-------------------|
| 24 " 4           | 34 " 2         | 33 " 3            |
| 39 " 5           | 46 " 3         | 1 " 4             |
| 32 " 6           | 21 " 4         |                   |
| 6 " 7            | 2 " 5          |                   |
| 2 " 8            |                |                   |

The more numerous male spikes, the remote, fewer female ones, the horizontally diverging perigynia, and the acute even angles of the achenium, distinguish this species from the preceding ones.

152. *C. hystericina* (Muhlenberg); spicis 3–4 rarius 5 stramineis densifloris approximatis, terminali mascula (rarius androgyna apice vel basi mascula) gracili cylindrica subsessili, reliquis fœmineis oblongis vel cylindricis crassis squarrosis, suprema sessili, superioribus vel omnibus evaginatis cernuis vel infima remota exserte pedunculata nutanti subinde basi composita; bracteis culmo longioribus; stigmatibus 3; perigyniis elliptico-ovatis in rostrum longiusculum attenuatis bifidis inflatis glabris nervosis, squama ovata acuta vel emarginata longe hispidocuspidata ciliata latioribus longioribusque.—*C. hystericina*, *Muhl.* 252; *Willd.* 282; *Schk. f.* 127; *Kunth*, 497; *Dewey*, x. 35; *Schw. et Tor.* 355; *Elliott*, 550; *Darlington*, 352; *Beck*, 441; *Carey*, 531; *Sartwell*, *Exs.* 136. *C. Cooleyi*, *Dewey*, xlviii. 144. (TAB. CLXV.)

HAB. In America septentrionali, Canada to Georgia.

*Culmus*  $1-1\frac{1}{2}$ -ped., rigidus, acutangulus, scaberrimus, basi foliatus, rudimentis foliorum purpureis vaginisque reticulato-fissis tectus; pars spicas gerens 2–8 poll. longa. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, culmo breviora, firma. *Bracteæ* foliaceæ: inferiores culmo longiores: infima rarius plus minus vaginata. *Vagina* 3–12 lin. longa. *Pedunculi* graciles,  $\frac{1}{2}$ – $3\frac{1}{2}$  poll. longi, scabri. *Spica mascula* 8–16 lin. longa,  $1-1\frac{1}{4}$  lin. lata, rarius androgyna, apice vel basi mascula. *Spica fœminea* 6–18 lin. longæ, 6–7 lin. latæ, approximatae vel contiguæ: superiores vel omnes evaginatae: suprema sessilis: reliquæ pedunculatæ, cernuæ, vel infima remota, vaginata, plus minus longe exserte pedunculata, subinde basi composita. *Squamæ* omnes apice ciliatæ: inferiores longius cuspidatæ: superiores acutæ. *Perigynium*  $2\frac{3}{10}$ –3 lin. longum,  $\frac{3}{10}$  latum, utrinque plurinervium; ore postice sæpe oblique secto. *Achenium*  $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, acute triquetrum, faciebus concaviseulis, basi styli crassiori apiculatum, castaneum.

Affinis *C. tentaculata*, *Muhl.*, quæ planta robustior perigynisque majoribus magis turgidis, nervis magis distantibus, rostro sæpe scabro, achenio elliptico, stylo contorto, spicis brevius pedunculatis nee nutantibus, bracteis longioribus, gaudet.

153. *C. echinocloe* (Kunze); spica decomposita pallida, e spicis partialibus ambitu lanceolatis 6–10 pluribusve, superioribus simplicibus sessilibus confertis, inferioribus basi ramosis laxis exserte pedunculatis remotis longe foliaceo-bracteatis; spiculis oblongis apice parce

masculis basi flosculis fœmineis pluribus laxè dispositis, in quaque spica 5–6 simplicibus, vel inferioribus remotiusculis 2–4 compositis; bracteis inferioribus culmo longioribus; stigmatibus 3; perigyniis ovalibus trigonis rostratis bifidis (laciniis truncatis) glabris superne margine ciliato-serratis nervatis pallidis rectis vel excurvis, squama ovata acuta vel obtusa sæpe emarginata hispidaristata striato-nervosa apice scabriuscula pallide castanea æquilata longioribus.—*C. echinocloe*, *Kunze*, 47. t. 12; *Richard*, *Fl. Abyssin.* ii. 513. (TAB. CLXVI.)

HAB. In Abyssinia. "Locis apricis lapidosis, inter gramina partis superioris Montis Scholoda," *Schimper*, n. 26, *Un. Itin.*; "Alsega, ad montes, 6000 ped.," *Schimper*, n. 538.

*Culmus*  $1\frac{1}{2}$ –2-ped., triquetrum, validus, lævis, foliatus; pars spicas gerens 7–10 poll. longa. *Folia* 3– $4\frac{1}{2}$  lin. lata, culmo longiora, flavescientia. *Bracteæ* inferiores 2–3 lin. latæ, culmo longiores: supremae setaceæ, spicis suis breviores. *Vagina* superiores scabræ: infima 1–2 poll. longa. *Pedunculus* infimus  $2\frac{1}{2}$ – $3\frac{1}{2}$  poll. longus, scaberrimus. *Spica* partiales inferiores  $1\frac{1}{2}$  poll. longæ, 4–5 lin. latæ. *Spicula* 5 lin. longæ, 2 lin. latæ. *Squamæ* conformes, apice ciliatæ: masculæ angustiores. *Spathella* apice ciliata, integra vel emarginata. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ad basin spiculæ plus minus excurvum, rostrum oblique vel æqualiter bifidum; laciniæ truncatæ vel rotundato-obtusæ, barbulatæ. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, trigonum, fuscum, angulis pallidioribus.

One of the *Indica*-group, with the spiculæ issuing from a *spathella* or modified perigynium, exhibiting that constant composition of spike which is occasionally only observable from almost normal perigynia in other and simpler groups.

154. *C. teres* (Boott); spicis 6–11 cylindricis elongatis teretibus approximatis nutantibus fusco-purpureis, superioribus 3–4 basi rarius apice et basi masculis, reliquis fœmineis evaginatis pedunculatis cernuis, inferioribus late foliaceo-bracteatis, infima interdum remota vaginata basi composita; stigmatibus 2; perigyniis (*immaturis*) ovalibus rostrellatis, ore integro vel emarginato, ferrugineo-punctatis nervatis, squama oblonga truncata vel emarginata longe hispidocuspidata medio viridi trinervi atro-purpurea latioribus brevioribusque. (TAB. CLXVII.)

HAB. In Himalaya orientali temperata, ad Sikkim, alt. 8–9000 ped., *Hooker*; Khasia, 5–6000 ped., *Hooker et Thomson*.

*Culmus* sub-2-ped., acutangulus, firmus, lævis, vel superne scabriusculus, foliatus, basi rudimentis ovatis ferrugineis foliorum vaginisque reticulato-fissis tectus; pars spicas gerens 5–8 pollices longa vel longior. *Folia* 3–4 lin. lata: superiora culmum subæquantia, plana, firma, tricostata. *Bracteæ* inferiores 2– $3\frac{1}{2}$  lin. latæ, culmo longiores: superiores demum spicis suis breviores, setaceæ. *Auricula* ferrugineæ, elongatæ, alligatæ. *Pedunculi* 1–6 lin. longi, graciles, læves. *Spica* 2– $4\frac{1}{2}$  poll. longæ, 1–2 lin. latæ: infima rarius remota, subradicalis, vaginata. *Squamæ* omnes conformes. *Perigynium* (*floriferum*)  $1\frac{1}{2}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium* immaturum.

A *C. notha*, *Kunth*, differt, spicis pluribus, angustioribus, teretibus, superioribus 3–4 basi vel apice et basi masculis; squamis majoribus, omnibus longe hispidocuspidatis; perigyniis ore integro, foliis bracteisque latioribus.

Though the specimens of this species are not mature, I think they are separable from *C. notha*. I have figured a perigynium (the lower one) from some imperfect specimens, found by Dr.



Hooker at Nyrung and Nunklow, which is turgid, and without the ferruginous spots, the apex occasionally subexcurved, characters which may be found in the mature *C. teres*.

155. *C. phacota* (Sprengel); spicis 5 rarius 4–6 linearibus cylindricis pedunculatis, terminali mascula ferruginea, reliquis fœmineis, superioribus sæpe apice masculis, subcomosis erectis vel demum nutantibus contiguis evaginatis vel infima subremota exserte pedunculata fuscis; bracteis inferioribus culmum longe superantibus; stigmatibus 2; perigyniis subrotundo-obovatis ovatisve vel ovalibus rostellatis, ore integro vel emarginato, papilloso-micantibus compressis encerviis fuscis marginibus pallidis, squama oblonga plus minus truncata vel emarginata, subulato-hispido-que aristata ferruginea medio viridi nervata longioribus vel brevioribus.—*C. phacota*, *Spr. Syst.* iii. 826; *Nees, ap. Wight*, 126; *Kunth*, 420; *Drejer, Symb.* xv. t. 4. (excl. *C. punctata* et *C. notha*.) *C. lenticularis*, *Don, Lin. Trans.* xiv. 331; *Fl. Nepal.* 43 (non *Michaux*). *C. platycarpa*, *Hochst. n.* 1292 (*Pl. Ind. Or. Hohenacker*). (TAB. CLXVIII.)

HAB. In montibus tropicis et subtropicis Zeylaniae, *Gardner*. Pen. Ind. Or., Nilghiri, *Wight*; Khasia, alt. 5000 ped., *Hooker et Thomson*; Sikkim, alt. 6–7000 ped., *Hooker*; Nipal, *Wallich*, n. 3394, 3395 a, (ex parte); Garwhal, *Jacquemont*, n. 642. Java, *Horsfield*.

*Radix* fibris lignosis validis. *Culmus* 1–2½-ped., triqueter, rigidus, scaber, basi foliis vestientibus vaginisque membranaceis ferrugineis laceratis tectus; pars spicas gerens 3–7 poll. longa. *Folia* 2–3 lin. lata, plana, marginibus demum revolutis, glauco-viridia, firma, culmum æquantia. *Bractea* inferiores culmum longe superantes: infima rarius plus minus vaginata: quandoque *sterilis*, remota. *Pedunculi* graciles, scabri. *Spica* 1–3 poll. longæ, 1½–2½ lin. latæ: mascula castaneo-ferruginea, rarissime flosculis fœmineis paucis obsita: fœmineæ demum fuscae, erectæ, vel plus minus nutantes: superiores, rarius omnes, sæpe apice masculæ. *Squamæ* conformes, subulato-hispido-que aristatæ, truncatæ vel emarginatæ vel rarius subacutæ, fœmineæ plerumque perigynio breviores angustioresque: arista in inferioribus semper, vel in omnibus eo longior, adspectum comosum spicis præbens. *Perigynium* 1½ lin. longum, 7/10–1 lin. latum, abrupte vel sensim rostellatum, ore integro vel emarginato, breve stipitatum, rarius nervis 2–3 notatum, marginibus quandoque superne parce denticatis. *Achenium* 8/10–9/10 lin. longum, 6/10–7/10 lin. latum, suborbiculatum, ferrugineum, basi styli apiculatum.

I see no essential difference in the specimens of this plant from its various localities. In the Ceylon and Nilghiri plant the scales are larger, almost concealing the perigynium; and in the last the male spike has female flowers at the base and middle. The Lachung specimens, from Dr. Hooker, have the perigynium occasionally dentate at the margins, and the orifice emarginate. Its immediate affinity is with *C. crinita*, Lam. A specimen (five spikes) from Ceylon, and one from Lachung (six spikes), are figured in Tab. CLXVIII.

156. *C. torta* (Boott); spicis 4–5 rarius 3–6 cylindricis gracilibus, terminali mascula castanea rarissime altera minori, reliquis fœmineis viridi-purpureis, suprema vel omnibus sessilibus subinde apice masculis erectis vel inferioribus pedunculatis nutantibus basi verticillatim laxifloris vel attenuatis rarius compositis; bractea infima sæpe foliacea spicam æquante vel subulata abbreviata; stigmatibus 2; perigyniis ellipticis vel oblongo-ovatis rostratis, ore emarginato vel integro, plano-convexis encerviis palli-

dis obliquis vel recurvis vel superne vacuis oblique tortis, squama ovata vel lanceolata obtusa purpurea nervo viridi margine albo-hyalina latioribus longioribusque.—*C. torta*, *Boott, Tuck. Enum.* p. 11; *Carey, Gray*, (ed. 1) 547, (ed. 2) 517; *Sartwell, Ews. n.* 51. *C. acuta* et *C. cæspitosa* (ex parte), *Torrey, etc.* (TAB. CLXIX.)

HAB. In America septentrionali. New England to New York.

*Radix* fibris lignosis ferrugineis fibrillisque capillaceis implexis. *Culmus* 1–1½-ped., gracilis, flaccidus, tactu lævis, (sub lente) granulato-asperulus, basi vaginis foliorum purpureis folisque sursum longioribus tectus; pars spicas gerens 2–5 poll. longa. *Folia* 1–2 lin. lata, mollia, viridia, culmo breviora. *Bractea* infima rarius lineam lata, culmum æquans, plerumque angustior vel setacea, spicâ suâ brevior, interdum brevissime vaginans: summa squamæformis. *Pedunculi* 2–12 lin. longi, læves. *Auricula* rotundatæ vel elongatæ, discretæ vel amplectentes, ferrugineæ vel purpureæ vel pallidæ. *Spica mascula* 8–18 lin. longa, 1–1½ lin. lata, castanea: squamæ obtusæ. *Spica fœminea* ½–4½ poll. longæ, 1½–2 lin. latæ, inter se 3–5 lin. vel 1–2 poll. remotæ. *Perigynium* 1½ lin. longum, 8/10 lin. latum, supra achenium vacuum, compressum, oblique tortum. *Achenium* 8/10 lin. longum, 6/10–7/10 lin. latum, suborbiculatum vel obovatum, basi styli abrupte apiculatum.

The smooth flaccid culm, the soft grassy leaves, and the tortuous empty apex of the perigynium distinguish this species from its allies.

157. *C. decidua* (Boott); spicis 4–6 atro-purpureis oblongis cylindricisque, terminali 1–2 mascula vel basi vel apice et basi mascula, reliquis fœmineis sæpe apice masculis simplicibus, vel omnibus vel superioribus geminatis ternatisve vel basi compositis sessilibus, inferioribus pedunculatis evaginatis simplicibus; bracteis culmo longioribus; stigmatibus 2; perigyniis ovalibus rostellatis, ore integro, valide nervosis glabris vel superne parce ad margines denticulatis papillosis deciduis pallide ferrugineis stipitatis, squama oblongo ovata obtusa vel subacuta atro-purpurea nervo pallido longioribus brevioribusve.—*C. decidua*, *Boott, Lin. Trans.* xx. 119; *Fl. Antarct.* 363. *C. Andersoni*, *Boott, Hook. Fl. Ant.* 364. *C. cæspitosa*, *Solander, MSS.* (*Herb. Banks*). (TAB. CLXX.)

HAB. Tierra del Fuego, Good Success Bay, *Banks and Sol.* (*Herb. Banks*). Port Famine, *Anderson*. Falkland Islands, *J. D. Hooker*. California, *Trubner*. Oregon, *Douglas, Nuttall, Hinds*.

*Culmus* 1–1½-ped., lævis vel superne scaber; pars spicas gerens 2–5 poll. longa. *Folia* 1–3 lin. lata, culmo longiora. *Bractea* foliacea: inferiores culmo longiores. *Auricula* subrotundæ vel amplectentes, purpureæ. *Spica terminalis* 12–14 lin. longa, 2–3 lin. lata, mascula nunc altera abbreviata ad ejus basin sita: vel androgyna basi vel apice et basi mascula. *Spica fœminea* 6–17 lin. longæ, 2–4 lin. latæ, approximatae, omnes simplices vel geminatae ternatae: vel basi spiculis 1–2 compositæ; vel inferiores longiores, simplices. *Squamæ* atro-purpureæ, nervo pallido: masculæ obtusæ, in inferioribus nervo infra apicem evanescente, in superioribus sæpe paulo exserto: fœmineæ conformes vel inferiores quandoque lanceolatæ mucronulatæ, demum deciduæ. *Perigynium* 1 8/10 lin. longum, 8/10 lin. latum, glabrum, vel ad margines parce denticulatum, stipitatum, utrinque valide nervosum; ore subinde leviter emarginato. *Achenium* 8/10 lin. longum, 7/10 lin. latum, lenticulare, punctulatum.

I have figured in Tab. CLXX. No. 1, a specimen from the Falkland Islands; and No. 2, specimens of Anderson from Port Famine. The last have a stouter culm and broader leaves, and two male spikes; while in Dr. Hooker's specimens from the Falklands, the terminal spike was generally androgynous. The difference is hardly specific, and I have therefore referred *C. Andersoni* to *C. decidua*. The compound spikes, deciduous squamæ, and perigynia, and the occasional dentation on the margins of the perigynium, separate it from *C. vulgaris*, Fries. This species extends northwards to Oregon, where the spikes are only occasionally compound at base.

158. *C. cryptocarpa* (Meyer); spicis 4-6 oblongis vel cylindricis fusco-purpureis, omnibus pedunculatis remotis, masculis 2-3, intermedia quandoque sessili infima bracteata, fœmineis 3-4 apice masculis pendulis evaginatis, vel infima subinde omnino fœminea rarius vaginata; bracteis culmum subæquantibus; stigmatibus 2; perigyniis ovalibus vel obovatis rostellatis, ore subintegro, tenuiter nervatis coriaceis flavidis, squama lanceolata acuminato-cuspidata vel mutica brevioribus.—*C. cryptocarpa*, Meyer, *Mem. Ac. St. Pct.* i. 226. t. 14; *Fl. Bor. Am.* 219; Anderson, *l. c.* 41. t. 6. f. 61; Fries, *Sum.* 226. *C. Scouleri*, *Tor. N. Am. Cyp.* 399. *C. Filipendula*, Drejer, *Rev.* 46; Lang. *Car. Ger. et Scand.* 68. *C. salina*, Boott, *Fl. Bor. Am.* 219. (TAB. CLXXI.)

HAB. In Europa, Asia, America Boreali, et Islandia.

*Culmus* 1-2½-ped., triquetus, lævis, superne inter spicas scaber, inferne foliatus; pars spicas gerens 4-8 poll. longa. *Folia* 1½-2 lin. lata, culmo breviora, longe vaginantia: exsiccatione flavida. *Bracteæ* foliaceæ, culmo sæpe paulo longiores, evaginatae, vel infima rarius breve vaginans. *Auriculæ* purpureo-ferrugineæ, amplectentes. *Vagina* 5 lin. longa. *Pedunculi* 1-3 poll. longi, gracillimi, læves vel basi scabri. *Spicæ* 1-1½ poll. longæ: fœmineæ 3-4 lin. latæ: omnes (nisi intermedia mascula) pedunculatae. *Squamæ* lanceolatae vel ovatae, acutæ vel acuminatae, vel hispido-cuspidatae, perigynia tegentes, vel iis angustiores. *Perigynium* 1 $\frac{6}{10}$ -1 $\frac{7}{10}$  lin. longum, 1 $\frac{8}{10}$ -1 $\frac{9}{10}$  lin. latum, biconvexum, glabrum. *Achenium* 1 $\frac{8}{10}$  lin. longum, 1 $\frac{6}{10}$  lin. latum; obovatum, plano-convexum, basi styli abrupte apiculatum, sæpe ad margines indentatum.

Though Anderson places this plant in a different section, and remote from *C. salina*, Wahl., and neither he, or Meyer, or Fries, or Drejer have particularly contrasted it with that species, I know of no sufficient characters by which it can be distinguished from it. Schkuhr's f. n. 185 of *C. salina* represents the smaller form of *C. cryptocarpa*. Anderson remarks, "Fructus squamis nunc obtecti, nunc iis fere latiores, quare nomen *cryptocarpa* minus aptum videtur." Drejer also says of his *C. Filipendula*, "squamæ perigyniis angustiores." At the time of my arranging the *Carices* for the Flor. Bor. Americana, I was puzzled how to distinguish the specimens collected by Tolmie, and referred those from Clemencitty Harbour to *C. cryptocarpa*, and those from Hood's Canal to *C. salina*. The former are not mature, and exactly agree with Meyer's figure. I should refer both to *C. salina*,  $\beta$ , of Wahlenberg. I have figured one of the specimens from Hood's Canal (the right-hand figure). The other is from Kamtschatka, collected by Mr. Peters. The "squamæ muticæ vel cuspidatæ" are characteristic of both plants, and the place of growth on the sea-shore is the same. If I am correct in my view, while Meyer's excellent figure represents the *C. salina*,  $\beta$ , *mutica*, that here given, Tab. CLXXI., would represent the var. *cuspidata* of the same species.

159. *C. ambusta* (Boott); spicis 3-4 fusco-purpureis approximatis terminalibus 2, masculis oblongo-cylindricis, infima sessili, reliquis fœmineis oblongis crassis pedunculatis evaginatis erectis vel infima nutanti; bractea

infima culmum paulo superante; stigmatibus 2, longis; perigyniis oblongo-ovatis rostellatis, ore obliquo scabrido purpureo, inferne biconvexis superne vaeuis compressis, enerviis vel 1-2-nervatis marginibus parce denticulatis flavidis spongiosis, squama ovata obtusa vel acuta mutica fusco-purpurea apice albo-membranacea nervo concolori angustioribus brevioribusque. (TAB. CLXXII.)

HAB. Sitcha?

*Culmus* subpedalis, strictus, firmus, acutangulus, scaberrius; pars spicas gerens 2½-4 poll. longa. *Folia* 1½-2 lin. lata, culmo longiora vel breviora, firma, marginibus revolutis. *Bractea* infima culmum paulo superans. *Auriculæ* purpureæ. *Pedunculi* apice scabri: infimus 1-1½ poll. longus. *Spicæ masculæ* 7-12 lin. longæ, 1-1½ lin. latæ, contiguæ: infima sessilis, ebracteata, vel subscissilis, bractea breve cuspidata. *Spicæ fœmineæ* 9-10 lin. longæ, 4-5 lin. latæ, 1-2: infima longius pedunculata, nutans. *Squamæ* fusco-purpureæ, apice albo-membranaceæ, nervo unico concolori, muticæ: masculæ obtusæ, fœmineæ inferiores subacutæ. *Perigynium* 1 $\frac{6}{10}$ -1 $\frac{8}{10}$  lin. longum, 1 $\frac{8}{10}$  lin. latum. *Achenium* 1 lin. longum, 1 $\frac{7}{10}$  lin. latum, obovatum, pallidum, basi styli subincrassata apiculatum.

A *C. Sitchensi*, Prescott, differt, spicis oblongis, squamis obtusis muticis; perigynii ore obliquo.

A *C. cryptocarpa*, Meyer, spicis masculis sessilibus; perigyniis ovatis, denticulatis, subnervatis; culmo scabro.

I am indebted to my friend Mr. Heward for this plant, which he received (from Herb. Prescott) from the late Mr. Fielding. There was no habitat given, but I cannot doubt that it is from Sitcha or its neighbourhood. Its nearest affinity is with *C. Sitchensis*, Prescott, from which it differs in its fewer and oblong spikes, the lower of which are entirely female, and in its ovate perigynium, the orifice of which is oblique and one-lobed. The upper part of the perigynium, above the achenium, is compressed, the lower part taking the biconvex form of the achenium.

160. *C. lucida* (Boott); spicis 5-8 erectis, mascula 1 vel 2-3, suprema elongata gracili ferruginea rarius apice fœminea, reliquis fœmineis ferrugineo-purpureis, superioribus sessilibus oblongis sæpe abbreviatis, inferioribus subinde ima basi masculis cylindricis remotis longissime bracteis inserte vel exserte pedunculatis; stigmatibus 2, rarius 3; perigyniis ovatis vel ovalibus vel subrotundis rostratis bifidis atro-purpureis basi rostroque pallidis lucidis obsolete nervatis glabris vel rarius apice marginibus scabriusculis corneis biconvexis, squama ovata acuta vel obtusa rarius emarginata ciliata hispido-cuspidata firma ferrugineo-purpurea nervo pallida longioribus vel brevioribus.—*C. lucida*, Boott, *Hook. Fl. N. Zeal.* 283. *C. pulla*, Solander, MSS. (*Herb. Banks*). (TAB. CLXXIII.)

HAB. In Nova Zelandia. Prope Tigadu, Opuragi, Totaranui, Banks et Solander, 1769. (*Herb. Banks*). Bay of Islands, Sinclair, Colenso, Stephenson, Captain Wilkes, Dr. Hooker (*Herb. Hooker*). Wellington, Ralph. Auckland, Sinclair.

*Culmus* gracilis, superne sæpe filiformis, lævis, apice scaber, rigidus, basi foliis vestientibus rudimentisque foliorum purpureis tectus; pars spicas gerens 10-15 poll. longa. *Folia* planâ, carinata, lineam lata, vel conduplicata, culmo longiora, rigida. *Bracteæ* inferiores vaginatae, longissimæ, sæpe sesquipedales: superiores setaceæ, culmo longiores. *Vaginæ* inferiores 1-2 poll. longæ. *Pedunculi* scabri: inferiores plus minus exserti. *Spicæ masculæ* 1-3: suprema 1-2 poll. longa, ½-1 lin. lata.

*Spica fœminea*  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longæ, 3 lin. latæ: superiores sessiles, sæpe abbreviatæ, rotundæ, rarius apice masculæ: inferiores inter se 3–8 poll. remotæ, ima basi attenuatæ, parce masculæ; inserte vel plus minus exserte pedunculatæ: infima quandoque basi spicula minima composita. *Squamæ* omnes ovatæ, ferrugineo-purpureæ, demum pallidiores, cuspidatæ, firmæ: fœmineæ inferiores sæpe emarginatæ. *Perigynium*  $1\frac{2}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovatum vel ellipticum, sensim rostratum; vel subrotundum, abrupte rostratum, emarginato-bifidum, laciniis scabris. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, lenticulare vel triquetrum, punctulatum, fuscum. *Stigmata* 2, rarius 3. *Stylus* basi oblique tortus.

Affinis *C. paleata*, B. Differt spicis brevioribus, purpureis; perigyniis ovatis; foliis angustioribus, sæpe conduplicatis.

161. *C. pruinosa* (Boott); spicis 5 oblongo-cylindricis contiguis, terminali mascula clavata sessili ferruginea, reliquis fœmineis pedunculatis evaginatis griseo-ferrugineis, superioribus apice masculis, inferioribus longissime bracteatis cernuis; stigmatibus 2; perigyniis late ovatis rostellatis, ore integro, nervatis albo-tuberculatis griseis, squama ovato-lanceolata acuta cuspidata ferruginea nervo viridi latioribus longioribusque.—*C. pruinosa*, Boott, *Lin. Trans.* xx. 131. (TAB. CLXXIV.)

HAB. In Java, *Herb. Horsfield.*

*Culmus* 3-ped., lævis, triquetus, subvalidus, inter spicas scaber; pars spicas gerens biuncialis. *Folia*  $1\frac{1}{2}$ –2 lin. lata, culmo breviora, glauco-viridia, firma, apice serrato-scabra. *Bracteæ* 2 inferiores 8–10 poll. longæ, erectæ; reliquæ spicis suis breviores. *Spica mascula* subpollicaris,  $1\frac{1}{2}$  lin. lata: reliquæ 8–14 lin. longæ, 2–3 lin. latæ: superior sessilis: inferiores breve pedunculatæ. *Squamæ* omnes conformes, ferrugineæ: fœmineæ inferiores longius cuspidatæ: masculæ sæpe muticæ. *Perigynium*  $1\frac{7}{10}$  lin. longum,  $1$ – $1\frac{2}{10}$  lin. latum, 3–4-nervatum, tuberculis albis minimis conspersum, quasi pruinatum. *Achenium* orbiculatum,  $\frac{8}{10}$  lin. longum et latum, lenticulare, basi styli apiculatum, pallidum.

Though there is an external resemblance in this species to *C. glaucescens*, Ell., its affinity is with *C. crinita*, Lam. I know of no East Indian species to which it is more immediately allied, unless it may be to *C. cæspititia*, Nees, of which we have no specimens sufficiently mature for a satisfactory character.

162. *C. Solandri* (Boott); spicis 6–7 cylindricis, masculis 1–4 gracilibus ferrugineis contiguis, reliquis androgynis basi clavatis masculis remotis exserte pedunculatis longe bracteatis simplicibus vel inferioribus plerumque compositis nutantibus ferrugineo-purpureis; stigmatibus 3; perigyniis oblongo-ovatis vel ovalibus rostratis bidentatis obsolete nervatis atro-purpureis lucidis subcoriaceis glabris vel superne marginibus scabriusculis, squama ovata acuta vel emarginata hispido-cuspidata ferruginea longioribus vel brevioribus.—*C. Solandri*, Boott, *Hooker, Fl. N. Zeal.* 284. *C. debilis*, Solander (*Herb. Banks*), non Michaux nec Forster. (TAB. CLXXV.)

HAB. In Nova Zelandia, prope Totaranui, Opuragi, Motuaro, *Banks et Solander*, 1769 (*Herb. Banks*), Stephenson, Colenso, Ralph (*Herb. Hooker*).

*Culmus*  $1\frac{1}{2}$ –3-ped., superne filiformis, lævis, inter spicas scaber; pars spicas gerens 6–18 poll. longa. *Folia*  $1\frac{1}{2}$ –2 lin. lata, culmo longiora, carinata, firma. *Bracteæ* vaginatæ, culmo longiores: supremæ setacæ. *Vaginæ* 3 lin. ad  $2\frac{1}{2}$  poll. longæ. *Pedunculi*  $\frac{1}{2}$ –4 poll. longi, filiformes, debiles. *Spica mascula* suprema 1–3 poll. longa, lincam lata: reliquæ bre-

viores, sessiles: infima subinde apice extremo fœminca. *Spica androgynæ* 1– $1\frac{1}{2}$  poll. longæ, 2– $2\frac{1}{2}$  lin. latæ: suprema basi subdimidiatim mascula: superiores approximatae: inferiores  $2\frac{1}{2}$ –6 poll. remotæ, nutantes, longe exserte pedunculatæ, simplices vel inferiores, basi spiculis 1–5 brevibus alternis compositæ: omnes basi masculæ. *Squamæ* superiores ovatæ, acutæ: inferiores leviter emarginatæ, sinu parvo, nervosæ, medio trinerves, hispido-cuspidatæ, ferrugineæ. *Perigynium*  $1\frac{4}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, leviter vel obsolete nervatum: nervis superne evanidis. *Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, obovato-triquetrum, pallidum, punctulatum, basi styli apiculatum.

A *C. lucida* et affinibus differt, spicis gracilioribus, nutantibus, inferioribus plerumque compositis, superioribus basi magis conspicue masculis; squamis superioribus acutis vel leviter emarginatis.

163. *C. dissita* (Solander); spicis 5–7 oblongis ferrugineis, mascula 1–2 sessili sæpe abbreviata (vel 3–4 masculis *sec. Solander*), reliquis androgynis ima basi attenuatis masculis, superioribus contiguis sessilibus, inferioribus remotis exserte pedunculatis longe foliaceo-bracteatis, infima subinde cernua; stigmatibus 3; perigyniis ovatis vel obovatis basi attenuatis rostratis bifurcatis utrinque nervatis, marginibus sæpe e medio sursum aculeato-serratis rubro-ferrugineis basi pallidis subcoriaceis, squama ovata emarginata hispido-cuspidata nervosa medio viridi trinervi purpurea demum ferruginea longioribus.—*C. dissita*, a, Solander MSS. (*Herb. Banks*), *Hooker, Fl. N. Zeal.* 284. (TAB. CLXXVI.)

HAB. In Nova Zelandia, prope Tigadu, Opuragi, *Banks et Solander*, 1769 (*Herb. Banks*); Auckland, *Sinclair, Colenso*, n. 170; Bay of Islands, *Capt. Wilkes*.

*Culmus* 1–3-ped., gracilis, lævis, apice filiformis, scaber; pars spicas gerens 9–12 poll. longa. *Folia* 2 lin. lata. *Bracteæ* vaginatæ, culmo longiores. *Vaginæ* 2 lin. ad  $1\frac{1}{2}$  poll. longæ. *Pedunculus* infimus  $1\frac{1}{2}$ –4 poll. longus, gracilis, scaber. *Spica mascula* 6–11 lin. longa,  $1\frac{1}{2}$ –2 lin. lata, sessilis; altera minor bracteata sæpe ad ejus basin sita (vel 3–4, *sec. Solander*). *Spicæ* reliquæ 4–12 lin. longæ, 2–3 lin. latæ, ima basi parce masculæ: inferiores a se 1–9 poll. remotæ: infima quandoque cernua. *Squamæ* ovatæ, emarginatæ, cuspidatæ, nervosæ, purpureæ, demum ferrugineæ, medio virides, nervis 3, prominentibus, pallidis. *Perigynium*  $1\frac{3}{10}$ – $\frac{5}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, ovatum vel obovatum vel ovale, rostratum, bifurcatum; laciniis plus minus longis, acutis, scabris vel marginibus superne aculeatis; pallidum, demum atro-purpureum, lucidum, nervosum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, obovato-triquetrum, pallidum, basi styli apiculatum.

164. *C. Lambertiana* (Boott); spicis 4–6 cylindricis stricte erectis, terminali mascula sessili clavata bracteata, reliquis androgynis ima basi attenuatis masculis, superioribus approximatis, inferioribus remotis exserte pedunculatis longe bracteatis; stigmatibus 3; perigyniis ovalibus vel lanceolatis rarius obovatis rostratis bifidis nervatis glabris vel apice plus minus marginibus scabris ferrugineis vel atro-purpureis subcoriaceis lucidis, squama emarginata hispido-cuspidata ferruginea medio pallida trinervi brevioribus vel longioribus.—*C. Lambertiana*, Boott, *Hooker, Fl. N. Zeal.* 284. *C. dissita*,  $\beta$ , Solander MSS. “*Spica mascula unica. Gramen est majus, alias simillimum forte distincta species.*” Solander MSS. (*Herb. Banks*). (TAB. CLXXVII.)

HAB. In Nova Zelandia, prope Totaranui, *Banks et*

*Solander*, 1769; Auckland, *Sinclair*, *Ralph*; Bay of Islands, *Captain Wilkes*.

*Culmus* validus, lævis, vel apice scaber; pars spicas gerens 4–12 poll. longa. *Folia* 3 lin. lata, culmo longiora, rigida. *Bractea* vaginatae, culmo longiores. *Vagina* infima 1–2 poll. longa. *Pedunculi* validi, scabri: inferiores sæpe longe exserti: infimus 3 poll. longus. *Spica mascula* 7–12 lin. longa, 1–2 lin. lata, clavata: reliquæ cylindricæ,  $\frac{1}{2}$ –2 poll. longæ, 3–4 lin. latæ, stricte erectæ, a se 1–4 poll. remotæ. *Squamæ* omnes emarginatæ (sinu lato), hispido-cuspidatæ. *Perigynium* (in una eademque spica) sæpe insigniter varians; ovale vel obovatum,  $1\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, squama brevius: vel lanceolatum,  $1\frac{8}{10}$ – $2\frac{1}{2}$  lin. longum,  $\frac{6}{10}$  lin. latum, squama longius: bifidum, laciniis scabris: nervatum, glabrum vel marginibus plus minus scabris. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetro-obovatum vel  $1\frac{1}{2}$  lin. longum, lineare: basi styli contorta apiculatum, ferrugineum, punctulatum.

A *C. dissita* differt, culmo validiori; foliis latioribus; spicis cylindricis, stricte erectis, mascula unica; perigyniis minus alte bifidis, sæpe lanceolatis; squamis majoribus, sinu latiori.

I received this species in 1837 from the late A. B. Lambert, Esq., before I had seen the descriptions of the New Zealand *Carices* by Solander in Herb. Banks. Whether future observation will establish its specific distinction from *C. dissita* I am in doubt. If it should merge into that species it should be considered as the typical form, from its ampler development. I have never seen more than one male spike. The perigynia are less deeply bifid, and are often glabrous. Solander, in his description of *C. dissita*, takes no notice of the male florets at the base of the lower spikes, a character that is common to several of the New Zealand *Carices*, and to *C. paleata* of Juan Fernandez.

165. *C. æquabilis* (Boott); spicis 7 cylindricis elongatis gracilibus erectis pallidis concoloribus laxiuscule floriferis, terminalibus 3 basi masculis sessilibus contiguis, reliquis fœmineis deorsum remotioribus longiusque exserte pedunculatis basi attenuatis; bracteis culmo brevioribus; stigmatibus 3; perigyniis ovali-lanceolatis sensim acuminato-rostratis bifurcatis plano-subconvexis crebre æqualiterque nervosis pallidis purpureo-maculatis glabris erectis, squama ovata acuminata vel cuspidata pallida purpurcomaculata nervosa longioribus.—*C. longifolia*, *Herb. D. Turner!* “cæspitosa, culmi foliis breviores.” (TAB. CLXXVIII.)

Hab. In insula St. Helena, in umbrosis sylvaticis montis High Peak (*Herb. Hooker*).

*Culmi* sub-3-pedales, rigidi, læves; pars spicas gerens 18 poll. longa. *Folia* 3 lin. lata, culmo longiora. *Bractea* vaginatae: inferiores spicis suis longiores. *Vagina* infima 2 poll. longa. *Pedunculus* infimus 6 poll. longus, lævis. *Spicae* 1–3 poll. longæ,  $1\frac{1}{2}$  lin. latæ, pallide stramineæ, concolores. *Squamæ* pallidæ, nervosæ: fœmineæ ovatæ vel ovales: masculæ lanceolatæ. *Perigynium* 2 lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium* 1 lin. longum,  $\frac{1}{2}$  lin. latum, plano-subtriquetrum, stipitatum, fuscum, angulis pallidis. *Stylus* rectus, basi incrassatus.

Allied in some respects to the simpler forms of *C. Boryana*, Schk., but differing essentially from that variable species in the terminal spikes being male at base, and the lower ones all female, and in the incrassate base of the straight style.

166. *C. præalta* (Boott); spicis 9 cylindricis erectis densifloris, terminalibus 4 masculis pallidis, reliquis fœmineis apice masculis viridibus, suprema sessili, proximis 3 contiguis incluse vaginatis, infima remota longe exserte

pedunculata; bractea infima culmum superante; stigmatibus 3; perigyniis lanceolatis sensim acuminato-rostratis bifurcatis plano-subtriquetris crebre nervosis viridibus basi rostroque pallidis glabris demum oblique divergentibus, squama ovata acuta hispido-cuspidata, pallida nervosa longioribus.—*C. elata*, *Herb. D. Turner!* “culmi graciles, 4–6-pedales, foliis longiores.” (TAB. CLXXIX. et CLXXX.)

HAB. In insula St. Helena, in umbrosis sylvaticis montium Diana's Peak et Halley's Mount (*Herb. Hooker*).—Var.  $\beta$ . (*C. peduncularis* et *C. pedunculata*, *Pritchard's List*.) “among grass on the summit of Diana's Peak, 3000 feet, rare, February, 1849,” *J. D. Hooker* (*Herb. Hooker*).

*a. Culmus* firmus, lævis; pars spicas gerens 12 poll. longa. *Folium* culmi supremum solum adest, 3 lin. latum. *Bractea* infima 2 lin. lata, culmum paulo superans: superiores angustæ, spicis suis longiores, omnes nisi suprema vaginatae. *Vagina* 2 lin. ad  $1\frac{1}{2}$  poll. longæ. *Pedunculus* infimus 3 poll. longus, lævis. *Spica mascula* 7 lin. ad 2 poll. longæ,  $\frac{1}{2}$ – $1\frac{1}{4}$  lin. latæ, extremæ longiores, 3 superiores contiguæ: infima subremota, breve bracteata. *Spica fœminea*  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longæ, 3 lin. latæ: superiores contiguæ, incluse pedunculatæ: infima 6 poll. remota, omnes, nisi suprema (quæ conspicue), apice paræ masculæ. *Squamæ* masculæ longiores, acuminatæ, hispido-cuspidatæ: fœmineæ superiores, lanceolatæ, cuspidatæ: inferiores breviores. *Perigynium*  $2\frac{1}{10}$ – $\frac{3}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, nervis quibusdam sæpe confluentibus. *Achenium*  $1\frac{9}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, ellipticum, triquetrum, stipitatum. (TAB. CLXXIX.)

Var.  $\beta$ ; spicis 8, terminalibus 4 masculis, reliquis apice plus quam dimidiatim masculis, infima apice et basi mascula vel sterili; perigyniis brevioribus latioribus  $1\frac{6}{10}$ – $\frac{8}{10}$  lin. longis  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latis; foliis  $2\frac{1}{2}$ –3 lin. latis vix culmum æquantibus basi involutis vaginantibus fuscorubris margine filamentosis. (TAB. CLXXX.)

This species more nearly approaches some forms of *C. Boryana*, in which the terminal spikes are male, but it seldom has any so rigidly erect.

167. *C. tumida* (Boott); spicis 3–5 linearibus cylindricis teretibus elongatis erectis, terminali mascula gracillima sessili pallida, reliquis fœmineis exserte pedunculatis longe bracteatis, inferioribus remotis fusco-olivaceis; stigmatibus 3; perigyniis triquetro-ovalibus longe rostratis, rostro medio tumente, ore pallido emarginato, nervatis oblique adscendentibus, squama pallida lanceolata acuta vel obtusa longe hispido-aristata latioribus brevioribusque. (TAB. CLXXXI.)

HAB. In Himalaya orientali temperata. Sikkim, alt. 8–10,000 ped., *J. D. Hooker*.

*Culmus* 2– $2\frac{1}{2}$ -ped., triquetus, subgracilis, scaber, inferne foliatus; pars spicas gerens 6–15 poll. longa. *Folia* 2–3 lin. lata, plana, culmo longiora. *Bractea* vaginatae, 2–3 lin. latæ, culmo longiores: infima subpedalis. *Vagina* infima 1– $2\frac{1}{2}$  poll. longa: suprema 4 lin. longa. *Ligula* pallida. *Pedunculus* infimus 2–4 poll. longus, rigidus, scaber. *Spica mascula* 1–2 poll. longa,  $\frac{1}{2}$  lin. lata, bracteata: fœmineæ  $1\frac{1}{2}$ –3 poll. longæ,  $2\frac{1}{4}$  lin. latæ; superiores contiguæ, vel omnes a se  $2\frac{1}{2}$ –6 poll. remotæ. *Squamæ* omnes aristatæ: masculæ inferiores longius aristatæ. *Perigynium*  $1\frac{6}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, fusco-olivaceum; rostro superne pallido, medio demum tumido:

membranaceum, leviter nervatum. *Achenium* lineam longum,  $\frac{6}{10}$  lin. latum, perigynio conforme, ovali-triquetrum, pallidum, basi styli persistente apiculatum.

*C. olivaceæ* affinis, quæ differt spicis pluribus, longioribus, evaginatis; foliis latioribus; perigyniis ventricosis, divaricatis, rostro breviori; bracteis longissimis.

The peculiar tumidity of the rostrum in this species appears to depend on the shrinking of the membranous apex and of the base, in the more mature state of the perigynium.

168. *C. Beecheyana* (Boott); spicis 5-6 cylindricis erectis densifloris purpureis vel ferrugineis comosis, terminalibus 2 masculis, reliquis fœmineis, suprema subinde apice mascula, superioribus sessilibus evaginatis approximatis, infima sæpe remota longe exserte pedunculata basi attenuata longissime bracteata; stigmatibus 3; perigyniis ellipticis sensim attenuato-rostratis bifidis obtuse trigonis setis brevibus scabris, nervatis coriaceis ferrugineis, squama lanceolata acuminata vel obtusa longe hispido-cuspidata purpurea longioribus.—*C. hebecarpa*, *Hooker, Beechey, Voy.* 50 (non Meyer). *C. Hookeri*, *Kunth*, 490 (non Dewey). (TAB. CLXXXII.)

HAB. In America meridionali. Chili, Conception, *Captain Beechey*. Valdivia, *Gay*.

*Culmus*  $1\frac{1}{2}$ -ped., triqueter, validus, lævis, inter spicas scaber; pars spicas gerens 6-15 poll. longa. *Folia* 3 lin. lata, nodosa. *Bractea* culmo longiores: infima vaginata, nunc sesquipetalis. *Vagina* 4 lin. ad  $1\frac{1}{2}$  poll. longa. *Pedunculus* infimus 1-4 poll. longus, lævis. *Spica mascula* suprema  $1\frac{1}{2}$ - $2\frac{1}{2}$  poll. longa, 2- $2\frac{1}{2}$  lin. lata, altera arcte contigua, sessilis. *Spica fœmineæ* 1-2 poll. longæ, 4-5 lin. latæ: infima interdum 7 poll. remota. *Squamæ* omnes conformes: masculæ inferiores brevius cuspidatæ. *Perigynium*  $2\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, intus (dempto achenio) punctis nigris notatum. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovali-triquetrum, basi styli contorta apiculatum, punctulatum.

The rostrum of this species is commonly more elongated than the figure exhibits it. Its affinity is with *C. lanuginosa*, Michaux.

169. *C. æmathoryncha* (Desvaux); spicis 4 cylindricis erectis approximatis densifloris, terminalibus 2 masculis purpureis, reliquis fœmineis evaginatis purpureo-ferrugineis, infima pedunculata; bractea culmum subæquante; stigmatibus 3; perigyniis ovatis rostratis emarginato-bidentatis, setis longis asperrimis, nervatis ferrugineis basi pallidis, rostro purpureo, squama lanceolata vel ovata acuminata acuta purpurea brevioribus vel paulo longioribus.—*C. æmathoryncha*, *Desv. Fl. Chil.* vi. 224. (TAB. CLXXXIII. Fig. 1.)

HAB. In America meridionali. Chili, humid. arenos., ad Talcahuano, *Pæppig*. Valdivia, near rivers, *Gillies*, 854 (*Herb. Hooker*).

*Culmus*  $1\frac{1}{4}$ -ped., triqueter, gracilis, scaber; pars spicas gerens 4 poll. longa. *Folia* 1-2 lin. lata, culmum subæquantia, firma, carinata, pallide viridia. *Bractea* infima angusta, evaginata, culmo paulo longior: summa spicâ suâ longior. *Auricula* purpureæ. *Spica masculæ* 8-16 lin. longæ, 1-2 lin. latæ. *Spica fœmineæ* 13-17 lin. longæ, 3 lin. latæ, contiguæ. *Squamæ* masculæ inferiores obtusæ, rotundatæ, purpureæ, nervo pallido infra apicem evanescente, ciliatæ, margine albidæ; superiores nervo egrediente apiculatæ: fœmineæ inferiores lanceolatæ, perigynio longiores: superiores ovatæ, acutæ. *Perigynium*  $1\frac{8}{10}$ -2 lin. longum,  $\frac{8}{10}$  lin. latum, intus (dempto

achenio) maculatum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovale, triquetrum, basi styli contorta apiculatum.

Affinis *C. Beecheyana*, differt culmo graciliori; foliis angustioribus, nec nodosis; perigyniis minoribus, ovatis, setis longis asperrimis; squamis masculis obtusis, muticis, ciliatis, fœmineis acuminatis.

170. *C. verticillata* (Boott); spicis 5-6 gracilibus, terminali mascula, reliquis fœmineis, superioribus apice masculis oblongis erectis sessilibus densifloris, infima pedunculata evaginata cernua basi attenuata, flosculis verticillatim dispositis; bractea infima foliacea culmo breviori; stigmatibus 2; perigyniis minimis orbiculatis vel ovalibus abrupte cylindrico-rostratis, ore integro, enerviis superne ad margines sæpe dentatis compresso-biconvexis, squama ovata obtusa fusco-purpurea nervo pallido brevioribus.—*C. angustata*, var. *verticillata*, *Boott, Fl. Bor. Am.* 218. (TAB. CLXXXIII. Fig. 2.)

HAB. In America septentrionali. Columbia River, *Scouler*. Oregon, *Nuttall*.

*Radix* stolonifera. *Culmus*  $1\frac{1}{2}$ -ped., gracilis, lævis, inter spicas scaber, basi foliatus, rudimentisque foliorum fusco-purpureis tectus; pars spicas gerens 4-5 poll. longa. *Folia* 1- $1\frac{1}{2}$  lin. lata, culmo breviora, mollia, plana, viridia. *Bractea* infima foliacea, culmum subæquans, vel brevior: proxima nunc culmo vel spicâ suâ (sæpe multum) brevior: superiores obsoletæ. *Auricula* oblonga. *Spica mascula* 8-12 lin. longa,  $1\frac{1}{2}$ -2 lin. lata. *Squamæ* fusco-ferrugineæ, obtusæ. *Spica fœmineæ*  $\frac{1}{2}$ -3 poll. longæ, 2 lin. latæ, densifloræ, erectæ vel infima cernua, breve pedunculata; flosculis inferne verticillatim interruptis. *Squamæ* ovatæ, obtusæ, fuscae vel concolores vel nervo pallido infra apicem evanescente. *Perigynium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, glabrum vel superne ad margines parce dentatum, glauco-viride, demum fuscum. *Achenium*  $\frac{6}{10}$  lin. longum, fere  $\frac{1}{2}$  lin. latum, perigynio conforme, orbiculatum, fuscum, basi styli abrupte apiculatum.

A *C. torta* satis, notis pluribus, distincta, et affinis omnibus, perigyniis minoribus, spica infima vel inferioribus basi verticillatim interruptis. Ad *C. strictam*, Lam. (non Good.), proprius accedit, quæ tamen spicis appressis, squamis linearibus, vaginis foliorum reticulato-fissis, perigyniis nervatis, gaudet.

171. *C. indecora* (Kunth); spicis 3-6 oblongis erectis ferrugineo-purpureis, terminali mascula sessili, reliquis fœmineis subinde apice masculis, superioribus vel omnibus masculæ contiguis evaginatis sessilibus, vel infima remota inserte vel exserte pedunculata; bracteis superioribus culmo longioribus; stigmatibus 3; perigyniis oblongo-ovalibus vel ovatis obtuse trigonis sensim attenuato-rostratis bidentatis, nervis 2 marginalibus, aliis sæpe inconspicuis, lutescenti-viridibus lineolis maculisve rubro-purpureis notatis lucidis glabris vel superne ad margines plus minus serratis, squama ovata acuta vel subrotunda obtusa vel emarginata valide hispido-cuspidata rubro-purpurea nervo pallido longioribus.—*C. indecora*, *Kunth, Cyp.* 448; *Hooker, Fl. Antarct.* 367. *C. distenta*, *Kunze, Kunth*, 449. *C. fuscata*, *D'Urv., Brong., Dup. It.* 154. t. 28 b. *C. hymenina*, *Nees, MSS.* (*Herb. Hooker*). *C. inconspicua*, *Steudel (Herb. Mus. Paris.)*. *C. brachycephala*, *Pæppig (Herb. Mus. Paris.)*. (TAB. CLXXXIV.)

HAB. In America meridionali. Ins. Falkland., Valparaiso, *Cuming*, 419, 458; *Pæppig*. Valdivia, *Gay*,

*Gillies*, 834; *Lechler*, 695. Santiago, ins. Chiloe, *Gay*, Falkland Islands, *D'Urville*, *Dr. Hooker*.

*Culmus*  $\frac{1}{2}$ – $1\frac{1}{2}$ -ped., obtusangulus, lævis; pars spicas gerens  $\frac{1}{2}$ –5 poll. longa. *Folia*  $1\frac{1}{2}$ –2 lin. lata, culmo breviora, plana, rigida. *Bractea* superiores vel omnes culmo longiores, erectæ: inferiores vaginatæ. *Vagina* 2–7 lin. longæ. *Pedunculus* infimus 6–12 lin. longus, scaber. *Spica mascula* 3–8 lin. longa,  $1-1\frac{1}{2}$  lin. lata. *Spica fœminea* 4–9 lin. longæ, 3 lin. latæ: omnes masculæ contiguæ, vel infima 1–5 poll. remota. *Squamæ* omnes plus minus valide hispido-cuspidatæ: masculæ obtusissimæ vel emarginatæ. *Perigynium*  $1\frac{5}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, oblongo-ovale vel obovatum, triquetrum, castaneum, basi styli apiculatum.

A *C. extensa*, Good., differt, perigyniis leviter nervatis; squamis omnibus cuspidatis; foliis bracteisque erectis, planis.

This species varies in the form, degree of nervation, and smoothness of the perigynium, and in the form of the squamæ. I am indebted to M. Spach for a specimen of the *C. inconspicua*, Steudel, which in no respect differs from those of Cuming, Gay, and Dr. Hooker.

172. *C. Gunniana* (Boott); spicis 4–5 oblongis vel cylindraceis erectis, terminali mascula clavata sessili straminea, reliquis fœmineis pallide flavescenti-viridibus, superioribus 1–2 sessilibus masculæ arcte contiguæ, inferioribus exserte pedunculatis, infima remota sæpe nutante; bracteis superioribus culmo longioribus; stigmatibus 3; perigyniis elliptico-ovatis trigonis sensim acuminato-rostratis bidentatis ventricosis nervatis superne ad margines scabris flavescenti-viridibus demum punctis nigrescentibus maculatis, squama late ovata acuta vel obtusa plus minus hispido-cuspidata ferruginea nervo scabro longioribus.—*C. Gunniana*, *Boott*, *Lin. Trans.* xx. 143. (TAB. CLXXXV.)

HAB. In Tasmania, *Gunn*, n. 578.

*Culmus* 1–2-ped., triquetrum, lævis; pars spicas gerens 4–18 poll. longa. *Folia* 2–4 lin. lata, culmo longiora, plana. *Bractea* superiores, vel omnes culmo longiores. *Vagina* infima 1–2 poll. longa. *Pedunculus* infimus 3–5 poll. longus, gracillimus, scaber: superiores inserti vel paulo exserti. *Spica mascula* 5–15 lin. longa, 1–2 lin. lata, sæpius clavata, obliqua, sessilis. *Spica fœminea* 5–18 lin. longæ, 3–4 lin. latæ: infima subinde sub-10–12 poll. remota, erecta vel sæpe nutans. *Squamæ* conformes: masculæ longiores. *Perigynium*  $2-2\frac{8}{10}$  lin. longum, lineam latum, punctis nigrescentibus (sub lente) demum notatum. *Achenium* (cum stipite  $\frac{8}{10}$  lin. longo)  $1\frac{4}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, triquetrum-obovatum, fuscum, angulis pallidioribus, punctulatum, basi styli abrupte apiculatum.

Ad *C. lævigatam*, Sm., et ejus affines accedit.

173. *C. Preissii* (Nees); spicis 4–6 erectis glaucoviridibus vel demum stramineis, terminali mascula vel ima basi fœminea cylindrica vel clavata sessili, reliquis apice masculis oblongis, superioribus 1–2 sessilibus masculæ arcte contiguæ, inferioribus remotis longiuscule exserte pedunculatis, infima subradicali, rarius omnino fœminea; bracteis foliaceis, superioribus culmo sæpe paulo longioribus; stigmatibus 3; perigyniis oblongo-ellipticis plano-triquetris sensim rostellatis, ore pallido bidentato, superne marginibus serratis nervatis glaucoviridibus vel stramineis sæpe purpureo-punctatis, squama ovata hispido-acuminata glauca vel straminea concolori

medio nervata sæpe punctata longioribus.—*C. Preissii*, *Nees*, *Lehmann*, *Pl. Preissiana*, ii. 94 (1846). *C. thecata*, *Boott*, *Lin. Trans.* xx. 143 (1846). (TAB. CLXXXVI.)

HAB. In Australia, in arenosis. Prope Pointwater, ins. Rottneest, *Preiss*. Swan River, *Drummond*.

Cæspitosa. *Culmus* subpedalis, gracilis, triquetrum, scaber, usque ad basin spicifer. *Folia*  $1-1\frac{1}{2}$  lin. lata, culmum subæquantia, firma, carinata. *Bractea* inferiores culmo breviores, vaginatæ: superiores sæpe eo longiores. *Vagina* scabræ: infima subpollicaris. *Pedunculus* infimus  $1\frac{1}{2}$  poll. longus, gracilis, scaber. *Spica mascula* castanea, 8–12 lin. longa, 2 lin. lata, sæpe obliqua, ima basi subinde fœminea: reliquæ (nisi infima) apice masculæ: superiores abbreviatæ, sessiles, evaginatae: inferiores 6–8 lin. longæ,  $1\frac{1}{2}$ –3 lin. latæ. *Squamæ* conformes, medio costato-nervatæ, punctis purpureis conspicue notatæ, vel immaculatæ: masculæ longiores, subinde cuspidatæ. *Perigynium*  $2\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $1\frac{3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, oblongo-triquetrum, fuscum, basi styli apiculatum.

I described this species in the *Lin. Trans.* under the name of *C. thecata* from immature specimens from Herb. Preiss, sent to me by Mr. Ward. Nees had previously named it after its discoverer, and it was published by Lehmann in his 'Plantæ Preissianæ' in 1846, the year in which my paper was read. Drummond's later specimens are more mature, and exhibit the purple spots on the squamæ and perigynia, as shown in Tab. CLXXXVI. They are more conspicuous at the base of the perigynia. The aspect and habit are those of *C. alveata*, B., but the affinity is rather with *C. extensa* and its allies.

174. *C. barbata* (Boott); spicis 4–5 ovalibus vel oblongis gracilibus fusco-purpureis erectis contiguæ, terminali mascula sessili, reliquis fœmineis, superioribus sessilibus evaginatæ, infima subremota inserte vel paulo exserte pedunculata; bractea infima culmum longe superante; stigmatibus 3; perigyniis ellipticis acute triquetris emarginato-bidentatis superne vel ore marginibusque scabris punctis resinosis ferrugineis notatis pallide castaneis leviter nervatis, squama ovata acuta mucronata vel obtusa mutica apice ciliata purpurea medio pallida carina scabra duplo longioribus. (TAB. CLXXXVII.)

HAB. In Tasmania. New Norfolk, *Gunn*, 1407 (*Herb. Hooker*).

*Culmus* subpedalis, gracilis, triquetrum, lævis, basi foliatus, rudimentis foliorum vaginisque maculatis tectus; pars spicas gerens  $1\frac{1}{4}$ – $2\frac{1}{2}$  poll. longa. *Folia*  $1-1\frac{1}{2}$  lin. lata, culmo breviora, plana, rigida. *Bractea* culmo longiores: infima vaginata, elongata, sæpe altera sterilis longius vaginata,  $2\frac{1}{2}$ –5 poll. remota. *Vagina* 3–6 lin. longa, maculata. *Spica mascula* 5–9 lin. longa,  $1-1\frac{1}{2}$  lin. lata. *Spica fœminea* 4–8 lin. longæ,  $1\frac{1}{2}$ –2 lin. latæ. *Squamæ* omnes conformes: masculæ sæpe muticæ. *Perigynium*  $1\frac{4}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetrum-ovale, pallidum.

A *C. Preissii* abunde differt, spicis minoribus, approximatis, inferioribus fœmineis, purpureis; perigyniis minoribus; squamis sæpe muticis; bracteis culmo longioribus; culmo gracili. A *C. lacistoma*, Br., spicis majoribus evaginatæ; perigyniis crebre costato-nervosis, ore insigniter albo-hyalino, integro, aperto, sæpe lacerato, gaudet.

The only specimens I have seen of this species are those in the herbarium of Sir W. J. Hooker. They are not fully mature. From the presence of the sterile bract below the spikes it is probable that the inflorescence may be found to extend to it. The nerves are generally less distinct than the figure exhibits them.

175. *C. læta* (Boott); spicis 3-4 remotis oblongis pedunculatis, terminali mascula elliptica, reliquis fœmineis sublaxifloris longe exserte pedunculatis nutantibus, suprema masculam sæpe superante, infima basi attenuata subradicali; bracteis brachyphyllis; stigmatibus 3; perigyniis obovatis trigonis obtusis vel rostellatis, ore integro excurvo, oblique stipitatis pubescentibus superne ciliatis enerviis vel basi obsolete nervatis flavidis purpureo-tinctis, squama amplectente purpurea medio pallida scabra apice anguste albo-hyalina ciliata subacuta vel obtusissima mutica vel cuspidata angustioribus demum longioribus. (TAB. CLXXXVIII.)

*β. major*; spicis paulo majoribus, squamis quandoque submarginatis, masculis cuspidatis; perigyniis basi obsolete nervatis.

HAB. In Himalaya orientali temperata et alpina. Sikkim, alt. 12-14,000 ped., *J. D. Hooker*.

*Culmus* 6-12-poll., gracillimus, apice curvatus, triquetet, lævis. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmo multum breviora. *Bractea* angustæ, vaginata: inferiores subfoliaceæ, omnes pedunculis multum breviores. *Vagina* 3-9 lin. longæ. *Pedunculi* 1-6 poll. longi, setacei, superne scabri. *Spica mascula* 3-4 lin. longa,  $\frac{3}{4}$  lin. lata, pedunculata: squamæ omnes, nisi infima, muticæ, obtusæ. *Spica fœminea* 5-8 lin. longæ, 1 lin. latæ. *Perigynium*  $1\frac{6}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, stipite curvato. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, triquetetro-obovatum, stipitatum, basi styli crassiori obliquo terminatum.

A *C. pediformi*, Meyer, differt, culmo gracillimo; foliis angustis, brevibus; spicis minoribus remotis, longe pedunculatis; squamis sæpe obtusissimis; perigyniis minoribus, enerviis, ore integro aperto.

Var. *β.* ad *C. cardiolepidem* spectans, quæ differt spicis subinserte pedunculatis; squamis masculis emarginatis cuspidatis.

I am not aware of any published description of the *C. pellucida*, Turcz., having only seen a specimen in Herb. Hooker, and an imperfect one sent to me by M. Fischer from Siberia. In both the margin of the scales is broadly hyaline, as in *C. pediformis*, to which I think it belongs.

176. *C. Barrattii* (Torrey); spicis 4-5 rarius 3-6 cylindricis pedunculatis subapproximatis, mascula sæpius 1 purpurea demum ferruginea elongata erecta vel 2, reliquis fœmineis apice masculis pendulis vel nutantibus rarius erectis purpureis vel ferrugineis viridi pictis simplicibus vel inæqualibus geminatis; bracteis evaginatibus, superioribus breve cuspidatis, infima angustissima spicâ breviori, vel rarius foliacea plus minus vaginata; stigmatibus 3; perigyniis ovalibus vel ovali-lanceolatis obtuse triquetris sæpe oblique divergentibus erostratis obtusis vel abrupte vel sensim rostellatis, ore integro vel submarginato, granulatis glabris leviter nervatis demum lutescentibus apice ferrugineis, squama ovata obtusa vel subacuta mutica fusco-purpurea vel ferruginea margine pallida nervo concolori longioribus.—*C. Barrattii*, *Schw. et Tor. Mon.* 361; *Kunth*, 518; *Dewey, Sill.* xi. 162; *Beck*, 443; *Sartwell, Eæs. n.* 59. *C. flacca*, *Carey*, 519. (TAB. CLXXXIX.)

HAB. In America septentrionali. New Jersey, *Knieskern*. North Carolina and Alabama, *Curtis*.

*Culmus* 1-2 $\frac{1}{2}$ -ped., triquetet, strictus, firmus, lævis vel superne scabriusculus, basi foliatus vaginisque foliorum leviter reticulato-fissis tectus; pars spicas gerens 2-5 $\frac{1}{2}$  poll. longa.

*Folia* 1-2 lin. lata, culmo breviora, glauca, marginibus recurvis, stricta, firma, apice extremo scabra. *Bractea* superiores squamæformes, ferrugineæ, euspidatæ vel muticæ: infima sæpe setacea, spicâ brevior, cuspidata; vel rarius foliacea, vaginata, subinde culmo longior. *Auriculæ* elongatæ, ferrugineæ. *Pedunculi*  $\frac{1}{2}$ -1 $\frac{1}{2}$  poll. longi, filiformes, glabri: infimus in uno specimine subradicalis setaceus, 6 poll. longus. *Vagina* 2-6 lin. longa, intus ferruginea. *Spica mascula* 1-2 poll. longa, 2 lin. lata, acuta, sæpe spicula altera brevior, sessilis. *Squamæ* arcte imbricatæ, obtusæ, margine pallidæ, nervo eoncolori infra apicem evanescente. *Spica fœminea*  $\frac{1}{2}$ -2 $\frac{1}{2}$  poll. longæ, 2-3 lin. latæ, rarius erectæ, nutantes vel pendulæ, apice plerumque conspicue masculæ; vel simplices, vel una vel altera vel omnes geminatæ, rarius ternatæ, quarum una abbreviata, sessilis, sæpe omnino fœmineæ. *Perigynium*  $1\frac{4}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, brevissime vel vix rostellatum, ore integro vel emarginato; (sub lente) granulatum, glabrum. *Achenium* 1 lin. longum,  $\frac{7}{10}$  lin. latum, obovatum, triquetrum, castaneum, angulis pallidis, basi styli apiculatum.

*C. flacca*, Schreb., arcte affinis. Differt spica mascula sæpius unica, fœmineis sæpe geminatis; squamis muticis, nervo subconcolori; bracteis plerumque brevibus; perigyniis sæpe ovali-lanceolatis glabris; vaginis foliorum reticulato-fissis.

I find in this species—

|                  |                 |                  |
|------------------|-----------------|------------------|
| 5 with 3 spikes. | 32 with 1 male. | 1 with 1 female. |
| 24 „ 4           | 14 „ 2          | 13 „ 2           |
| 12 „ 5           | 1 „ 5           | 19 „ 3           |
| 5 „ 6            |                 | 11 „ 4           |
| 1 „ 10           |                 | 3 „ 5            |

In sixteen the upper or lower, or the two upper and lower spikes were geminate; and in one, the middle spike ternate. All, except the abbreviate spicula of the geminate spikes, conspicuously male at top. I have never seen any specimens from the United States, except those from the seacoast of New Jersey, but Mr. Curtis (*Sill. Journ.* vii. 410. 1849) notices *C. flacca*, Schreb., as a native of Raleigh, North Carolina, and of Alabama.

177. *C. elata* (Lowe); spicis 7 cylindricis elongatis, terminali mascula gracili basi attenuata subsessili ferruginea, reliquis fœmineis duplo latioribus pallidis, superioribus apice parce masculis approximatis, inferioribus remotis, omnibus laxifloris nutantibus inserte pedunculatis; bracteis foliaceis spicis suis longioribus; stigmatibus 3; perigyniis obovatis obtuse triquetris cylindrico-rostratis alte bifidis glabris laciniis scabris nervatis nervis quibusdam superne evanidis viridibus demum superne (sub lente) punctis ferrugineis maculatis, squama ovato-lanceolata acuminata acuta longe hispido-aristata ferruginea medio maculata nervo viridi longioribus (aristâ) brevioribus.—*C. elata*, *Lowe, Trans. Camb. Phil. Soc.* iv. 10 (1833); *Kunth*, 514. (TAB. CXC.)

HAB. In ins. Maderæ, convallibus umbrosis sylvaticis.

*Culmus* 4-ped., lævis, inferne foliatus; pars spicas gerens bipedalis. *Folia* 3-4 lin. lata, culmo breviora. *Bractea* foliaceæ, culmo breviores: infima 3 lin. lata: superiores angustæ: omnes, nisi summa, vaginatæ. *Vagina* (præcipue intus) maculata: infima 2 poll. longa. *Spica mascula* 3 poll. longa, 1 $\frac{1}{2}$  lin. lata. *Spica fœminea* 3-4 poll. longæ, 2-3 lin. latæ, laxifloræ, inferne floeulis alternatim dispositis: omnes, nisi summa sessilis, incluse pedunculatæ, nutantes: superiores contiguæ, apice extremo masculæ: inferiores 4-8 poll. remotæ. *Squamæ* aristatæ: masculæ ferrugineæ; superiores emarginatæ: fœmineæ pallidiores, acuminatæ, acutæ, sæpe medio maculatæ; inferiores longius aristatæ, aristâ perigynia longe superante. *Perigynium*  $2\frac{3}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, membranaceum, glabrum, cylindrico-rostratum. *Achenium*

perigynio conforme,  $1\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, triquetrum, fuscum, angulis pallidioribus, punctulatum.

Affinis *C. Boryanae*, Schk. Differt spicis apice parce masculis, magis laxifloris, incluse pedunculatis; squamis foemineis acuminatis, acutis; perigyniis obovatis nec lanceolatis, achenio elliptico conformibus, nec subinflatis; bracteis brevioribus.

This species, like *C. Boryana*, has simple or compound spikes, and may on future investigation perhaps be found to be inseparable from that species. The specimen figured was sent to me from Madeira by Mr. Lowe, differing from his description, "spicis basi compositis ramosis," in having simple spikes. The same variation is observable in the allied *C. sylvatica* of Europe. I have never seen *C. Boryana* reduced from its typical form (Schk. fig. 191) to simple spikes, with any so long and lax as in *C. elata*. They are generally too erect.

178. *C. psychrophila* (Nees); spicis 4-3 rarius 5-6 oblongis contiguus purpureo-flavidis, terminali basi (rarius omnino) mascula sessili, reliquis foemineis, inferioribus pedunculatis demum cernuis bracteatis evaginatis, infima saepe subremota; stigmatibus 3; perigyniis ovalibus cylindrico-rostratis, ore obliquo bidentato, obtuse triquetris flavidis saepe rostro (*medio atro-purpureo*) margine serrato, tuberculato-asperulis, 5-7-nervatis, squama ovata acuminata acuta vel hispido-cuspidata atro-purpurea nervo pallidiori longioribus.—*C. psychrophila*, Nees, *Wight, Contr. p.* 127; *Kunth*, 463. *C. asperula*, Nees, *l. c.* 124 (*non Turcz.*); *Kunth*, 433. (TAB. CXCI.)

HAB. In Himalaya temperata tota, alt. 6-12,000 ped. Kadarkanta, *Royle, n.* 113. Choor, *Royle, n.* 111, 112. Kishingunga Valley, *Strachey et Winterbottom*. Sikkim, *J. D. Hooker*. Marri, *Fleming*.

Caespitosa. *Culmus* 1-2-ped., gracilis, acute triquetrum, scaber, basi foliatus, rudimentisque foliorum purpureis, albo-nervatis, reticulato-fissis, vaginisque longis membranaccis (sub lente) ferrugineo-maculatis, tectus; pars spicas gerens  $1\frac{1}{2}$ -3 poll. longa. *Folia* 1-2 lin. lata, culmo longiora vel aequantia, fusco-viridia. *Bractea* infima angusta, spica sua longior vel culmum aequans: una, saepe sterilis, nunc infra spicas subpollicem remota: omnes evaginatae. *Auriculae* purpureae. *Pedunculus* infimus 5-12 lin. longus, setaceus, scaber. *Spicae* 8-12 lin. longae, 3-4 lin. latae: suprema plerumque basi mascula: infima saepe basi attenuata, nunc  $1-1\frac{1}{2}$  poll. remota, cernua; in uno specimine subradicalis, longe pedunculata. *Squamae* masculae lanceolatae, colore dilutiores: omnes acutae vel cuspidatae. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, obovato-triquetrum, inaequaliter obtuse triquetrum, basi faciebus concaviusculis, pallidum, basi styli obliqua abrupte apiculatum.

I find in 110 specimens of this species—

|                   |                                      |
|-------------------|--------------------------------------|
| 34 with 3 spikes. | 24 with terminal spike male.         |
| 66 „ 4            | 86 with terminal spike male at base. |
| 8 „ 5             |                                      |
| 2 „ 6             |                                      |
| 110               | 110                                  |

In 106 the lower spikes were female.

In one the upper female was male at base, and in three the two upper ones.

In three the lower spike was compound at base.

In one the lowest spike was subradical.

Nees founded this species on Royle's specimens, n. 113, of which I have seen ten, and in only one of which the terminal spike was male. His *C. asperula* was founded on Royle n. 111, all of which that I have seen were young, but unquestionably the same species. I should have adopted this last name had it not

been given by Turczaninoff to another species. The affinity to *C. frigida*, alluded to by Nees under *C. psychrophila*, is the true one.

179. *C. obscura* (Nees); spicis 3-8 oblongis vel cylindraceis atro-purpureis concoloribus contiguus densifloris erectis, terminali basi rarius omnino mascula sessili, reliquis foemineis evaginatis, superioribus arcte congestis, inferioribus plus minus longe pedunculatis bracteatis, infima saepe subremota; stigmatibus 3; perigyniis ovalibus trigonis rostellatis, ore emarginato, superne subinde scabris marginibus dentatis nervatis, flavidis apice purpureis granulatis squama ovata obtusa vel apiculata rarius mucronata aequilata concolori longioribus vel aequantibus.—*C. obscura*, Nees, *Wight, Contr.* 126; *Kunth*, 515. (TAB. CXCII.)

HAB. In Himalaya temperata. Kumaon, *Royle, n.* 112, 118!, alt. 10-11,000 ped. Ralum River, 10,500 ped., *Strachey et Winterbottom!* Kunawur, *Jacquemont, n.* 476! Sikkim, alt. 10-12,000 ped., *J. D. Hooker*.

*Culmus* 1-3-ped., triquetrum, scaber, validus, stricte erectus, basi foliatus; pars spicas gerens 1-3 poll. longa. *Folia*  $1\frac{1}{2}$ -2 lin. lata, culmo breviora vel longiora. *Bractea* evaginatae: infima saepe subfoliacea, culmo longior vel subaequans: altera (sterilis) saepe infra spicas  $1\frac{1}{2}$ -2 poll. remota, culmo longior. *Auriculae* rotundatae, atro-purpureae. *Pedunculus* infimus 3-12 lin. longus, scaber. *Spicae* 6-15 lin. longae, 2 lin. latae, concolores, omnes congestae: vel infima 1-2 poll. remota, in uno specimine basi composita. *Squamae* conformes, apice (sub lente) ciliolatae. *Perigynium*  $1\frac{1}{10}$ - $\frac{4}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, superne subinde scabrum, marginibus dentatis, apice tenuiter granulatum, leviter nervatum, nervis interdum inconspicuis; ore emarginato, demum truncato. *Achenium*  $\frac{8}{10}$ -1 lin. longum,  $\frac{1}{2}$  lin. latum, triquetrum-ovale, fuscum, punctulatum.

The affinity of this species is with *C. alpina*, Vahl, and not, as Nees supposed, with *C. alopecuroides*, Don, and *C. punctata*, Nees (*C. notha*, Kunth). It is very closely allied to *C. infusata*, Nees, itself perhaps inseparable from *C. alpina*, differing from it in its more numerous cylindrical spikes, rostellate perigynium, elongated, stout, rigidly erect culm, and broader leaves. Nees quotes Royle, n. 118 under his *C. infusata*, but my specimen under that number belongs to *C. obscura*.

180. *C. ustulata* (Wahl., var.  $\gamma$ , Ledebour); spicis 4-6 cinnamomeis vel fusco-brunneis, terminali mascula vel basi vel apice et basi mascula, reliquis foemineis ovalibus pedunculatis nutantibus, inferioribus vaginatis, infima subinde basi composita subremota; bracteis brachyphyllis; stigmatibus 3; perigyniis late ovalibus obtusis abrupte rostellatis, vel ellipticis sensim rostellatis, ore albido emarginato bidentato, superne marginibus hispidulis, cinnamomeis vel brunneis, inferne pallidis tenuissimis compressis, squama oblongo-ovata vel elliptica vel lanceolata acuminata acuta vel obtusa bis-triplo latioribus longioribusque.—*C. ustulata*, *Wahl., \gamma*, *Ledebour, Fl. Altaica*, 232. *C. coriophora*, *Fisher; Kunth*, 463. (TAB. CXCIII. Fig. 1, 2.)

Hab. In Dahuria, mont. Altaicis, etc.

*Radix* fibrosa; fibris flavidis. *Culmus* 12-21-poll., validus, obtusangulus, laevis, superne nudus; pars spicas gerens 2-3 poll. longa. *Folia* 1-2 lin. lata, 3-4 poll. longa. *Bractea* inferiores vaginatae, breves,  $\frac{1}{2}$ -1 poll. longae: suprema squamiformis: rarius altera sterilis longior e spicis 3 poll. remota.



*Spica terminalis* 6 lin. longa, 3 lin. lata: *femineæ* 5-9 lin. longæ, 3-4 lin. latæ. *Squamæ* masculæ latiores, obtusæ: *femineæ* latitudine variabiles. *Perigynium* late ovale, obtusum, abrupte rostellatum,  $2\frac{1}{2}$  lin. longum,  $1\frac{7}{10}$  lin. latum, squamâ sæpe triplo latius: vel ellipticum, sensim rostellatum, 1 lin. latum; ore albidò, emarginato, bidentato. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo) 1 lin. longum,  $\frac{2}{10}$  lin. latum, triquetro-ellipticum, pallidum.

Var. *minor*, spicis 2-3 rarius 1 nutantibus ovalibus omnino *femineis* vel superioribus apice vel medio masculis. (TAB. CXCIV. Fig. 1.)

HAB. In Himalaya orientali alpina ad Sikkim, alt. 14-17,000 ped., *J. D. Hooker*. In Tibetia occidentali alpina, alt. 17,000 ped., *Strachey et Winterbottom*, ad Nubra, *Dr. Thomson*, 15-17,000 ped.

In Tab. CXCIII. I have figured (n. 1) a specimen from Dahuria sent to me by M. Fischer as his "*C. coriophora*;" (n. 2) a specimen from the Altai from Ledebour, as his "*C. ustulata*  $\gamma$ ;" and (n. 3) a specimen from Dovrefield, Norway, "*C. ustulata*." In examining the specimens I have of *C. ustulata* from Europe, North America, and the Himalayas, I can detect no characters by which *C. coriophora* can be distinguished. In Europe, *C. ustulata* has one or two male spikes, though I have specimens from Hoppe in which the terminal spike is male at the base or apex; and in North American specimens it is male at the apex or in the middle. The cinnamon-colour of the typical *C. coriophora* is observable more or less in specimens I have of *C. ustulata* from Lapland, from Wahlenberg, in one of which the lower spicula is compound, and the scales lanceolate, and longer than the perigynium. The scales vary in breadth, broader at the base of the spiculæ, becoming narrower, very acuminate, and at times mucronate at the top.

The var. *minor* from the high mountains of India passes from the single spike to the usual number of spiculæ found in *C. ustulata*, but it is remarkable for the occasional absence of male florets, and the orifice of the perigynium is more acute than usual. There is however an insensible transition from it to the usual habit of *C. ustulata* in the specimens brought by Dr. Hooker from the Himalaya. Anderson (Cyp. Scand. p. 39), in his description of *C. alpina*, alludes to a similar dwarfed state of that species: "Quo altius in loca alpina ascendit, eo magis contrahuntur partes omnes; ut demum in cacumina summa alpium fere bipollicaris emergit culmus: spicæ 2-3 quasi in unam (immo sola sæpe evadit) collectæ." The details given in Tab. CXCIII. are of n. 1, and of n. 3, the last on the right-hand of the plate.

*C. ustulata*, Wahl., has a very wide range, extending in Europe from the mountains of Scotland to those of Norway, Lapland, and Iceland. In Asia from the Altai to the Himalayas, Nipal (Wallich, n. 3389 a), Sikkim (*J. D. Hooker*), Tibet (*Strachey et Winterbottom*), Nubra (*Dr. Thomson*); and in North America, from Labrador (*Torrey*), Igloolik (*Sir Ed. Parry*), Minto Inlet (*Anderson*), to the Arctic seacoast (*Sir John Richardson*).

The Asiatic and Indian specimens vary from the European ones in the variable distribution of the male florets.

Specimens from Norway, Finmark, and Lapland:—

|                  |                       |
|------------------|-----------------------|
| 3 with 3 spikes. | 12 with 1 male spike. |
| 8 „ 4            | 3 „ 2                 |
| 4 „ 5            |                       |

In 2 the lower female spike was compound.

Specimens from India:—

|                  |                                           |
|------------------|-------------------------------------------|
| 5 with 3 spikes. | 4 with 1 male spike.                      |
| 3 „ 4            | 1 „ 2                                     |
| 2 „ 5            | 4 with terminal spike male in the middle. |
|                  | 1 with terminal spike male at apex.       |

In one the second spike was male at the base, and in one male at the apex.

Specimens from North America:—

|                  |                                              |
|------------------|----------------------------------------------|
| 1 with 3 spikes. | 1 male.                                      |
| 3 „ 4            | 3 with terminal spike male towards the base. |

Var. *coriophora*, Dahuria and Altai:—

|                  |                                              |
|------------------|----------------------------------------------|
| 3 with 4 spikes. | 3 with 1 male.                               |
| 3 „ 5            | 2 with terminal spike male at base.          |
| 2 „ 6            | 2 with terminal spike male at base and apex. |
|                  | 1 (of six spikes) all female.                |

In one the second spike was male at apex (the terminal one being male at base and apex).

Var. *minor*, India:—

|                 |                                               |
|-----------------|-----------------------------------------------|
| 8 with 1 spike. | 27 all female.                                |
| 15 „ 2          | 8 with terminal spike male at apex.           |
| 15 „ 3          | 3 with the two upper spikes male at the apex. |

181. *C. alpina* (Vahl), var. *erostrata*, Boott; spicis 3-5 oblongis obtusis sessilibus congestis densifloris atropurpureis flavisque, terminali basi mascula, reliquis *femineis*, infima brevissime bracteata; stigmatibus 3; perigyniis ovalibus vel oblongo-obovatis erostribus flavidis, ore purpureo integro vel leviter emarginato, glabris plus minus nervatis superne tenuiter granulatis, squama ovata obtusissima vel acutiuscula æquilata atropurpurea concolori longioribus. (TAB. CXCIV. Fig. 2.)

HAB. In Himalaya alpina, ad Kumaon, *Royle*, n. 61, et ad Gugi, alt. 14,500-15,500 ped., *Strachey et Winterbottom*.

Culmus 4-9-poll., acute triquetus, scaber, gracillimus, curvatus, basi rudimentis foliorum purpureis albo-nervatis tectus; pars spicas gerens 6-7 lin. longa. Folia 1-1 $\frac{1}{4}$  lin. lata, culmo breviora, plana; demum marcida, flavida. Bractea squamæformis, subulato-apiculata, spiculâ brevior: vel mutica: altera sterilis foliacea, culmum subæquans, sæpe e spicis subpollicem remota, brevissime vaginans. Auricula purpurea. Squamæ omnes conformes. Spicæ 4-5 lin. longæ,  $2\frac{1}{2}$  lin. latæ, subæquales vel mediæ minores. Perigynium 1-1 $\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, crostre, obtusum, glabrum, superne solum (sub lente) granulatum, leviter nervatum, flavidum, nervis concoloribus, sæpe inconspicuis. Achenium  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, triquetrum, pallidum, basi styli persistente apiculatum.

A formâ typicâ *C. alpina* differt, culmo debiliore, curvato, scabriore; bracteis abbreviatis, infima sterili solum foliacea; spicis majoribus, oblongis, sæpe pluribus; perigyniis erostribus, ore subintegro, solum apice leviter granulatis.

Anderson (Cyp. Scand. p. 39), in his description of *C. alpina*, speaks of it as "mirum in modum varians planta." I have examined specimens from all countries, but have found none which entirely agree with Dr. Royle's. The habit however is that of *C. infusata*, Nees, which I think cannot be separated from *C. alpina*, though it has cuspidate squamæ. The only form which has an erostrate perigynium is the *C. holostoma*, Drejer; but this variety or species has the rigidly erect culm of *C. alpina*, and its most striking character is the "color perigynii viridescenti-glaucescens," for the terminal spike is certainly occasionally androgynous, male at base.

The specimens of Strachey and Winterbottom are young, and some only two inches high.

182. *C. Banksii* (Boott); spicis 3-7 fusco-purpureis rarius ferrugineis oblongo-ovalibus vel cylindraceis pedunculatis, terminali mascula vel basi mascula, reliquis *femineis* crassis, superioribus contiguis, inferioribus exserte pedunculatis plerumque nutantibus, infima remota; bracteis vaginatis culmo longioribus; stigmatibus 3; perigyniis ovatis vel ovalibus rostratis, rostro tenui purpureo, ore obliquo bidentato, hyalino-tenuissimis albidis

tenuiter nervatis glabris, squama lanceolata vel spathulata emarginata vel subtruncata vel acuta cuspidata fusco-purpurea nervo pallido latioribus brevioribusque.—*C. Banksii*, *Boott, Lin. Trans.* xx. 119; *Hooker, Fl. Antarct.* ii. 365. t. 142. *C. germana*, *Boott, Fl. Antarct.* ii. 336. (TAB. CXCIV.)

HAB. In America meridionali. Tierra del Fuego, *Banks et Solander*. "*C. atrata* et *C. magellanica*" (*Herb. Banks*). *Darwin, n.* 299, 300, 301 (*Herb. Henslow et Hooker*). Port Famine, *Anderson*. Orange Harbour, *Capt. Wilkes*. Cape Tres Montes, *Darwin, n.* 302.

Stolonifera. *Culmus* 6–18-poll., triquetrum, lævis, apice inter spicas scaber, basi foliatus; pars spicas gerens 4–10 poll. longa. *Folia* 2–4 lin. lata, culmo breviora vel longiora, rigida, carinata, basi nervis carina marginibusque tuberculato-asperima. *Bracteæ* inferiores late foliaceæ: superiores angustæ: omnes vaginatae, sæpe culmo longiores. *Vaginae* intus purpureæ: infima  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. longa. *Ligula* elongata, pallida. *Pedunculus* infimus 1–5 poll. longus, lævis. *Spica terminalis* mascula 8–12 lin. longa, 2 lin. lata, rarissime spicula altera minori ad basin ejus sita: vel androgyna, basi mascula, 1– $1\frac{1}{2}$  poll. longa, 4–6 lin. lata. *Spicæ fæmineæ*  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longæ, 4–6 lin. latæ, densifloræ: omnes pedunculatæ: infima 1–5 poll. remota, basi attenuata. *Squamæ* omnes conformes. *Perigynium*  $2\frac{6}{10}$ – $4\frac{9}{10}$  lin. longum,  $1\frac{2}{10}$ – $1\frac{9}{10}$  lin. latum. *Achenium* minimum, longe stipitatum (stipite  $\frac{1}{2}$  lin. longo), 8 lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, triquetrum, castaneum. *Stylus* stigmataque longa.

Affinis *C. Mertensii*, Prescott, quæ spicis pluribus angustioribus longioribus abunde differt.

Since the publication of the 'Flora Antarctica' of Dr. Hooker, I have seen a large suite of specimens (eighteen) collected in Orange Harbour, Fuegia, by Captain Wilkes, one half of which (nine) had the terminal spike male, agreeing thus with the plant from Cape Tres Montes, collected by Mr. Darwin. It is singular that all the specimens found by Sir Joseph Banks and Mr. Solander have the terminal spike male at base. Of twenty-five specimens I find—

|                  |                                        |
|------------------|----------------------------------------|
| 6 with 3 spikes. | 13 with terminal spike male.           |
| 11 „ 4           | 12 with terminal spike male at base.   |
| 5 „ 5            | In one there was a small male spike at |
| 2 „ 6            | the base of the terminal one.          |
| 1 „ 7            |                                        |

I find the size of the perigynium to vary in the same specimen. The colour of the spikes is generally of a dull purple, but occasionally of a ferruginous colour. The perigynium in the dried state is compressed, but naturally is probably inflated.

183. *C. hæmatostoma* (Nees); spicis 4–10 cylindricis purpureis demum ferrugineis, superioribus 1–6 masculis vel apice rarius basi masculis arcte contiguis sessilibus, reliquis (rarius omnibus) 3–6 fæmineis, superioribus sæpe apice masculis subremotis exserte pedunculatis, vel singulis, vel mediis, vel inferioribus (subinde omnibus) geminatis, vel infima basi attenuata, sæpe composita; bracteis vaginatis culmum subæquantibus; stigmatibus 3, stylo pubescenti; perigyniis elliptico-lanceolatis compresso-triquetris, ore obliquo bidentato, nervatis strigoso-hirtis marginibus serratis purpureis basi pallidis, squama ovata acuta vel hispido-cuspidata purpurea margine albo-hyalina carina albida medio scabriuscula angustioribus longioribusque.—*C. hæmatostoma*, *Nees, Wight, Contr.* 125; *Kunth*, 514. (TAB. CXCVI.)

HAB. In Himalaya temperata et alpina, ad Kumaon, *Royle, n.* 116; *Jacquemont, n.* 481, etc. Kumaon, *Strachey et Winterbottom*. Sikkim, alt. 10–17,000 ped., *J. D. Hooker*.

Cæspitosa. *Culmus* 1–3-ped., teres, lævissimus, basi foliatus; pars spicas gerens 3–9-pollicaris. *Folia*  $\frac{1}{2}$ – $1\frac{1}{2}$  lin. lata, culmo breviora. *Bracteæ* vaginatae, culmo breviores vel longiores. *Vagina* infima  $\frac{1}{2}$ – $1\frac{1}{2}$  poll. longa. *Pedunculi* scabri. *Spiculae* 2–14. *Spicæ* 6–15 lin. longæ, 1–3 lin. latæ: superiores masculæ, vel apice masculæ, vel rarius spica terminalis basi mascula: fæmineæ superiores sæpe apice masculæ: omnes singulæ vel geminatae vel inferiores vel infima (sæpe singula) basi spiculis 1–4 sessilibus minoribus composita. *Squamæ* omnes conformes. *Perigynium* 2–3 lin. longum,  $\frac{4}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium* (cum stipite  $\frac{4}{10}$  lin. longo)  $1\frac{4}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, compresso-triquetrum, pallidum. *Stylus* pubescens.

This species, which Nees founded on a specimen of Dr. Royle's, with six female spikes, and which he considered approached *C. atrata*, belongs to the *Ferrugineæ*. In its simpler forms it has commonly a terminal male spike, and three or four female ones; but in the more developed forms the number of male spikes is increased, and the female ones are geminate or compound. The position of the male florets is often capricious. It is allied to *C. obtusa*, but differs from it in its cuspidate squamæ and compound inflorescence.

184. *C. eburnea* (Boott); spicis 3–5 albidis parvis paucifloris erectis approximatis, terminali mascula ovali sessili, reliquis fæmineis ovatis exserte pedunculatis, superioribus vel omnibus masculam superantibus, infima subremota; vaginis aphyllis; stigmatibus 3; perigyniis triquetro-ovalibus demum obovatis rostratis, ore hyalino obliquo nitidis leviter nervatis pallidis demum fusco-olivaceis, squama hyalina obtusa angustioribus longioribusque.—*C. eburnea*, *Boott, Fl. Bor. Am.* 226. t. 225; *Carey*, 524; *Sartwell, Ears. n.* 101. *C. alba*, *Dewey, Sill.* vii. 266; *Schw. et Tor.* 341; *Beck*, 439. *C. alba*, var. *setifolia*, *Dewey*, xi. 316. *C. pauperula*, *Tor. Mon.* 415 (*non Michaux*). (TAB. CXCVII.)

HAB. In America septentrionali. Arctic America and Rocky Mountains to Kentucky.

Cæspitosa. *Radix* repens. *Culmi* plures ex eadem cæspite, setacei, obtusanguli, læves, 4–15-pollicares; pars spicas gerens  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longa. *Folia* setacea, involuta, culmo breviora. *Vaginae* spicigeræ aphyllæ, pallide castaneæ, apice albo-hyalinæ, muticæ: rarius infima brevissime cuspidata. *Pedunculi* 2–14 lin. longi, læves, stricte erecti. *Spica mascula* 2–3 lin. longa,  $\frac{1}{2}$  lin. lata, inserte vel breve exserte pedunculata. *Spicæ fæmineæ* 3–6-floræ, superiores vel omnes masculam superantes, infima subinde 1– $1\frac{1}{2}$  poll. remota: 2–3 lin. longæ, 1 lin. latæ. *Squamæ* masculæ arcte imbricatæ, oblongæ, obtusæ, albæ, concolores: fæmineæ ovatae, obtusæ, hyalinæ, nervo pallide castaneo. *Perigynium*  $\frac{8}{10}$ –1 lin. longum,  $\frac{4}{10}$  lin. latum. *Achenium* perigynio conforme, fuscum, basi styli incrassata apiculatum.

Habitus omnino *C. alba*, Scop., sed gracilior et omnibus partibus minor.

This elegant species extends from the Mackenzie River and the Rocky Mountains to Kentucky.

185. *C. Lemanniana* (Boott); spica ferrugineo-purpurea, e spiculis pluribus androgynis apice acutato-masculis inæqualibus cylindricis composita, superioribus sessilibus simplicibus congestis, reliquis in spicas par-

tiales 5-7 subremotas deorsum magis compositas pedunculatas evaginatatas, inferiores longe foliaceo-bracteatas insidentibus; stigmatibus 2; perigyniis ovalibus rostellatis, ore subbifurcato, marginibusque superne aeuleato-serratis, leviter nervatis pallidis, squama lanceolata acuminata acuta rarius hispido-mucronata ferruginea glabra nervo pallido subduplo brevioribus.—C. Lemanniana, B., *Lin. Trans.* xx. 121. (TAB. CXCVIII.)

HAB. In America meridionali. In locis humidis montis Cotopaxi, Columbia, *Hartweg*, n. 1446; *Herb. Lemann!* *Jameson*, n. 220, Columbia!

*Culmus* bipedalis, validus, acute triqueter, scaber; pars spicas gerens 5-7 poll. longa. *Folia* plana, 3-5 lin. lata, culmo longiora, ad carinam marginesque scabra. *Bractea* inferiores 3-4 lin. latae, culmo longiores, sursum decrescentes; infima subpedalis. *Spica* 6-7 poll. longa, 2-5 poll. lata. *Spica* partiales plures, e spiculis 2-7 cylindricis sessilibus pedunculatisque compositae: inferiores longe pedunculatae bracteataeque: infima rarius simplex. *Spiculae* 20-35: superiores simplices, congestae,  $\frac{1}{2}$ -1 $\frac{1}{2}$  poll. longae, 1-4 lin. latae, omnes apice masculae. *Pedunculi* scabri. *Squamae* conformes: inferiores saepe mucronatae. *Antherae* longae, apiculatae, ferrugineo-maculatae. *Perigynium* (immaturum) 1 $\frac{1}{2}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, bifidum vel subbifurcatum, dentibus serratis superne ad margines aculeatum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ellipticum, fuscum, basi styli crassiori apiculatum.

A *C. Pichinchensis* differt, spica ampliori; bracteis longioribus; perigyniis subbifurcatis dentibus marginisque scabris; achenio elliptico, basi styli incrassata.

We are but imperfectly acquainted with the *Carices* of the Andes of South America. This species may prove to be inseparable from *C. Pichinchensis*. The principal distinction is the distinctly subbifurcate orifice of the perigynium, the size of which, notwithstanding the more luxuriant growth, is more that of the var.  $\beta$  than the typical form; the rostrum too is shorter.

186. *C. Pichinchensis* (Kunth); spica fuliginco-purpurea oblonga, e spiculis pluribus androgynis apice masculis inaequalibus ovatis cylindricisque composita; superioribus sessilibus simplicibus congestis, reliquis in spicas partiales subquaternas deorsum magis compositas pedunculatas, inferiores breve bracteatas evaginatatas insidentibus; stigmatibus 2; perigyniis (*immaturis*) ellipticis stipitatis cylindrico-rostratis, ore emarginato bidentato ciliato, enerviis vel leviter nervatis glabris ferrugineis basi pallidis, squama lanceolata acuminata acuta involuta mutica vel cuspidata glabra concolori vel nervo pallido subduplo brevioribus.—C. *Pichinchensis*, *Kunth*, *Nov. Gen. Pl. Amer.* i. 223; *Cyp. p.* 392! (TAB. CXCIX.)

HAB. In America meridionali. In regno Quitensi, Rucu Pichincha, *Humboldt et Bonpland!* In montibus Quito, *Jameson*, *Herb. Hooker*, 143!—VAR.  $\beta$ . Columbia, in monte Pillylum, 13,000 ped., *Jameson*, *Herb. Hooker!* Peru, in montibus, *C. Gay*, *Herb. Mus. Paris!* *C. dura*, *Boott*, *Lin. Trans.* xx. p. 121.

*Culmus* 1 $\frac{1}{2}$ -ped., acute triqueter, scaber; pars spicas gerens 3 poll. longa. *Folia* plana, 1 $\frac{1}{2}$ -3 lin. lata, culmum aequantia. *Bractea* infima 1-1 $\frac{1}{2}$  lin. lata, rarius spicam aequans. *Ligula* ampla, amplectens, ferruginea. *Spica* e spiculis 20-37, supremis 6-12 simplicibus composita. *Spicae* partiales 3-4 pedunculatae, deorsum (e spiculis 5-12) magis compositae. *Spiculae*

3-10 lin. longae, 1-4 lin. latae. *Pedunculi* scabri: inferiores vix pollicares. *Squamae* omnes conformes. *Perigynium* (*in specimine Bonpland*) 1 $\frac{9}{10}$ -2 lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, sensim cylindrico-rostratum; ore emarginato, ciliato; glabrum, leviter nervatum, fusco-purpureum.

Var.  $\beta$ ; spica minus composita, ferrugineo-purpurea; perigyniis minoribus, obovatis vel ovalibus, glabris vel ad margines superne parce dentatis; squama ovata, apice ciliata, nervo pallido scabro brevioribus.—C. *dura*, *Boott*, *l. c.* (TAB. CC. Fig. 1.)

*Culmus* gracilis, scaber, serraturis deorsum spectantibus. *Folia* rigida, angustiora, marginibus recurvis. *Perigynium* 1 $\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, abrupte rostellatum, ore subintegro vel emarginato obliquo superne parce dentatum, vel (*in specimine Peruviano*, *Gay*) glabrum.

Since the description of *C. Pichinchensis*, in vol. xx. of the *Linnean Transactions*, from specimens gathered by Mr. Jameson on the mountains of Quito, I have obtained, through the kindness of Mr. Tuckerman, a figure of the original specimen in the Berlin Herbarium described by Kunth (which I have engraved in Tab. CXCIX.), and subsequently, through the kindness of M. Spach, have seen a specimen of Bonpland in the Herb. Mus. Paris, and also one from the Andes of Peru, gathered by M. Gay. The result from an examination of these specimens, has been to induce me to refer *C. dura* to a var. of *C. Pichinchensis*, and to doubt the specific difference of *C. Lemanniana*.

Future observation must determine the character of *C. Pichinchensis*, and the variations to which it is liable. Like many other species it was unfortunately described (to use Kunth's words) from a "specimen valde juvenile." Any one familiar with the variable forms of *Carex* from youth to age, and from differences of soil or elevation, will understand the difficulty of arriving at a positive opinion drawn from a few specimens. I have no doubt of the correctness of my referring Jameson's plant to that of Kunth, and should have considered *C. dura* to be distinct, but for the specimen of M. Gay, which in some respects unites the two. The perigynium in Gay's plant is the same in size and form as in *C. dura*, but is entirely smooth, as in the typical *C. Pichinchensis*. The scales are lanceolate and acuminate, and smooth as in *C. Pichinchensis*, while in *C. dura* they are rather ovate, and without the acuminate apex, and the central nerve is scabrous. The achenium in Gay's plant is indented at the central margins, an abnormal defect, not observable in any of the other specimens.

Tab. CXCIX. is a figure of the original specimen in the Berlin Herbarium, described by Kunth, the lower details, taken from Bonpland's specimen in Herb. Mus. Paris; and Tab. CC. fig. 1. is Jameson's specimen from Columbia, which I originally described as *C. dura*. The perigynium *a!* and achenium *f!* are from M. Gay's specimen.

187. *C. miliaris* (Michaux); spicis 2-3, terminali mascula cylindrica, foemineis 1-2 parvis ovatis obtusis approximatis sessilibus purpureis; bracteis culmo brevioribus; stigmatibus 2; perigyniis late ovalibus biconvexis ventricosis abrupte cylindrico-rostratis lucidis purpurcis basi pallidis, ore emarginato albo-membranaceo, enerviis, squama late ovata obtusa purpurea longioribus.—C. *miliaris*, *Michaux*, ii. 174, "erecta, gracilis; foliis planis, angustissimis; culmis superne asperis; spica foeminea sessili, ovoidea, fusca (interdum 2 distantes inferiori etiam sessili); bractea setacea, brevi, mascula pallida longius pedicellata; capsulis sphaeroideis, laevibus," *Mich. l. c.* (TAB. CC. Fig. 2.)

HAB. In paludosis borealibus Canadae, praesertim ad lacus Mistassins dictos.

*Culmus* subbipedalis, basi foliatus; pars spicas gerens sub

2 poll. longa. *Folia* culmo breviora. *Spica mascula* 5–10 lin. longa, 1–1½ lin. lata, pallida. *Spica femineæ* 4–5 lin. longæ, 3 lin. latæ. *Squamæ masculæ* lanceolatæ. *Perigynium* 1– $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum ovali-orbiculatum, basi styli persistente, lenticulare.

This species is the only one, of those described by Michaux, which has not been satisfactorily ascertained by recent observers. My friend, the late Charles Lemann, Esq., kindly interested M. Heldreich, then resident in Paris, about it, and he had the two specimens, here figured, drawn by Thiolat, from the herbarium of Michaux. M. H. says in a note: "Il y a trois échantillons du

*C. miliaris* dans l'herbier d'Achille Richard, et les étiquettes de l'écriture de Richard père disent: 'Spica mascula, squamis anguste linearibus, urceoli turgidi ovati læves glabri, rostello mutico, stigmatibus 2.' La tige est trigone, à angles non très aigus. J'ai observé un caractère curieux, que les urceoli sont couverts en partie, surtout vers le haut, de glandes ou poils glanduleux, qui le plus souvent disparaissent sur le fruit mûr, et se détachent par le frottement."

I have not had an opportunity of examining the specimens, and the plant must be left to the judgment of those who may hereafter find it in Canada, but I suspect that it will be found inseparable from *C. saxatilis*, L. (*C. pulla*, Good.).

CORRECTION. (*Vide p. 13.*)

*C. Chinensis* (Retz); spica elongata e spiculis 5–6 cylindricis pallidis pedunculatis erectis remotis composita, terminali mascula, reliquis fœmineis, ima basi parce masculis comosis exserte pedunculatis; bracteis (nisi infima) spicis suis plerumque brevioribus vaginatis, vaginis inflatis glabris; stigmatibus 3; perigyniis ellipticis basi productis sensim longiuscule rostratis, ore albo membranaceo obliquo bidentato, triquetris angulis medio magis prominentibus crebre nervosis pubescentibus flavide viridibus divergentibus, squama lineari-lanceolata acuminata acuta rarius truncata longe hispido-cuspidata alba nervo viridi latioribus longioribus (*cuspide*) sæpe duplo brevioribus. (TAB. XXXVI.)

HAB. Hongkong, China, *Wright, American North Pacific Expedition under Captains Ringgold and Rogers, 1853–1856.*

*Culmus* subpedalis, triqueter, scaber, basi foliis brevibus

angustis munitus; pars spicas gerens 6–10 poll. longa. *Folia sterilia* 1–3 lin. lata, culmo longiora, rigida, carinata, marginibus revolutis, supra vesiculis minimis albis sparsis asperata. *Bracteæ* omnes vaginatæ, angustæ: infima quandoque elongata; vaginæ inflatæ, glabræ, 6–8 lin. longæ. *Pedunculi* ½–2 poll. longi, omnes exserti, scabri. *Spica mascula* 1–1½ poll. longa, 1–2½ lin. lata: aliæ a se 1½–3 poll. remotæ, omnes basi parce masculæ. *Squamæ* omnes conformes: masculæ longiores. *Perigynium* 1– $\frac{5}{10}$ –1– $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum. *Achenium* conforme, pallidum, demum nigrum, 1 lin. longum,  $\frac{6}{10}$  lin. latum, acute triquetrum, angulis medio prominentibus, faciebus ibi linea elevata transcursis, supra lineam et infra concavusculis, basi styli persistente apiculatum: basis *decidua* incrassata. *Racheola* linearis, brevissima, 1 lin. longa.

I am indebted to Dr. Asa Gray, of Cambridge, U. S. A., for a specimen of this plant, gathered by Wright at Hongkong, which has enabled me to correct my account of it. I had overlooked the male florets at the base of the female spikes, a character peculiar to several New Zealand species.

THE END.



C. THOMSONI





C. NUBIGENA.

11

6







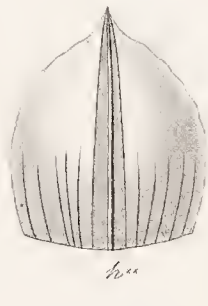
C. FOLIOSA.





C. WALKERI.





C. CURVATA.





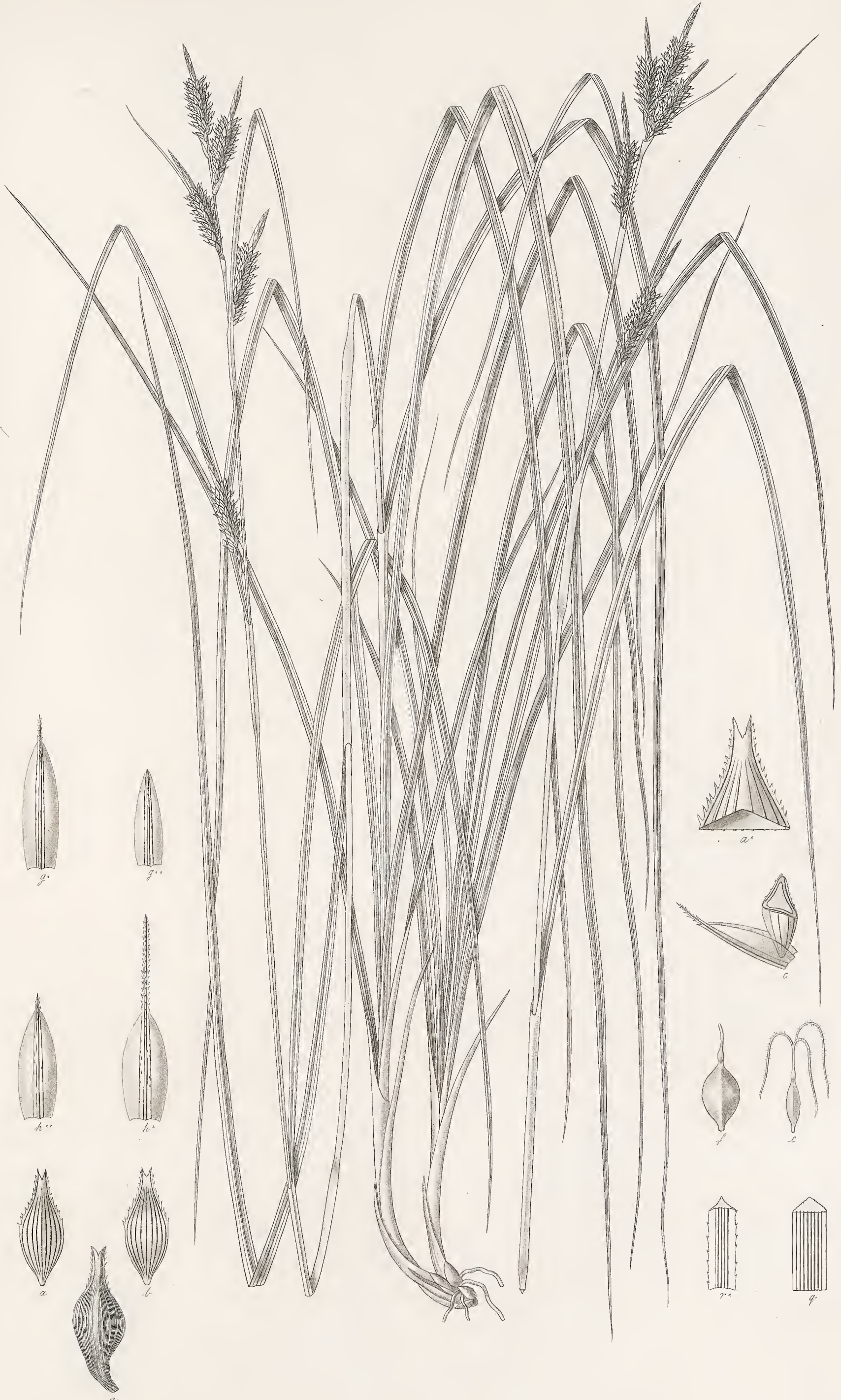
C. SETIGERA. VAR.

M

C







C.SPICULATA.





C. COMPOSITA.

M





C. NOBILIS.





C. NOBILIS. B.







C. NOBILIS, Y.





C. POLYCEPHALA.

M.

P.





C. PULCHRA.





C. INSIGNIS.







C. DECORA.





C. DALTONI.





C. CARDIOLEPIS.





C. WALLICHIANA.







C. ROYLEANA.

M.





C. MUNDA.





C. FRAGILIS.





C. MACROGYNA.

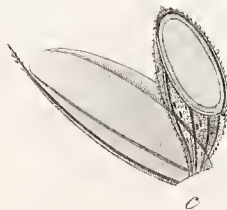






C. UNCINOIDES.





C. NOTHA.





*S. JACKMANA.*





C. MACULATA.







C. MOORCROFTII.





C. LEUCANTHA.

M

C.





C. SPICIGERA.





C. WIGHTIANA.







C. HIRTELLA.

M.

C.





C. HORSFIELDII.

M









C. THYRSIFLORA.







C. NIVALIS.





C. CHINENSIS.

M.

P.





C. FILIFOLIA.





C. COMOSA.







C. UTRICULATA.

M.

C





C. TUCKERMANI.





C. BULLATA.





C. OLNEYI.







C. BALTZELLI.

M.

C.



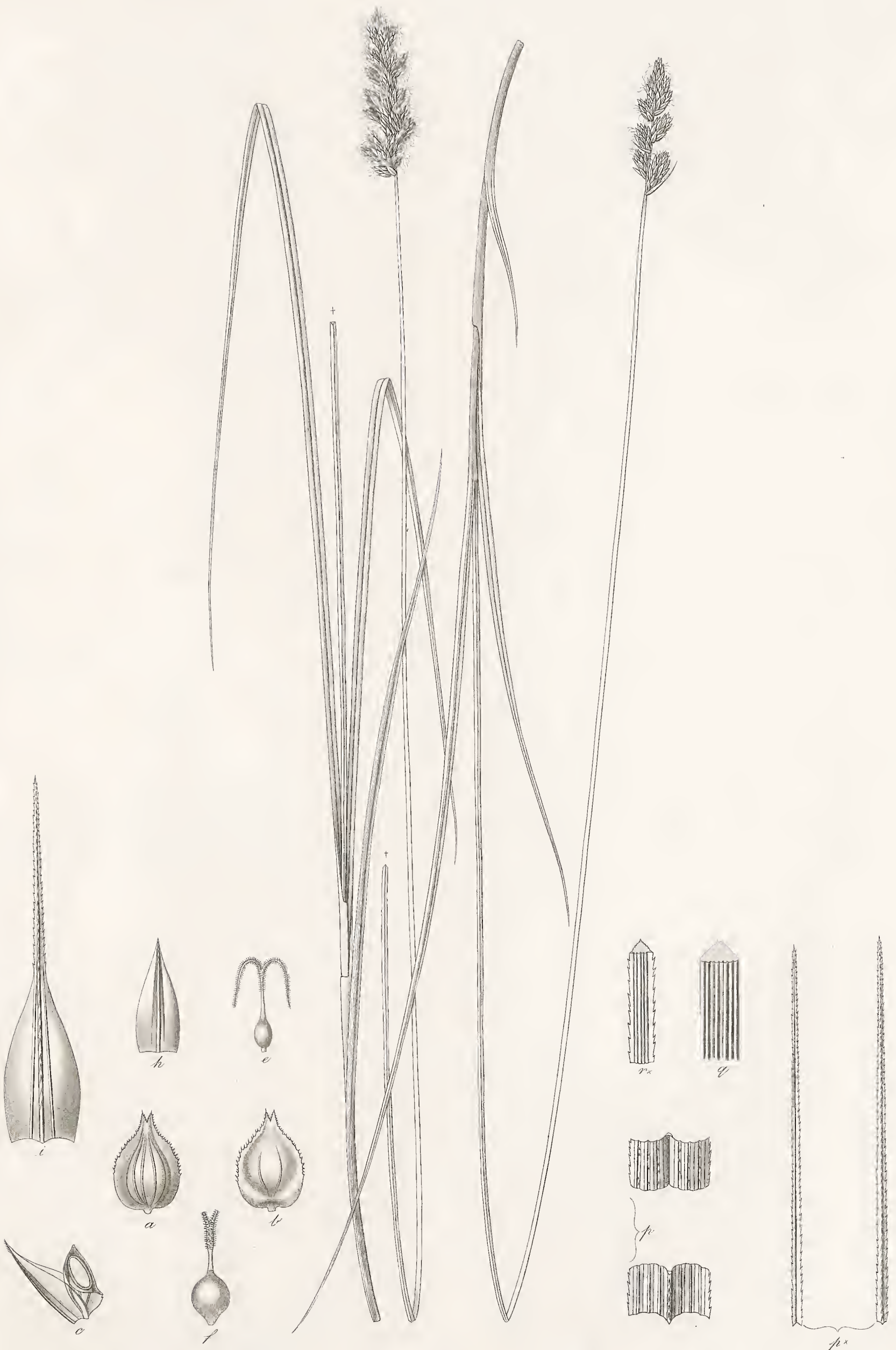


C. BOOTTIANA.

M.

C





C. MARCIDA.



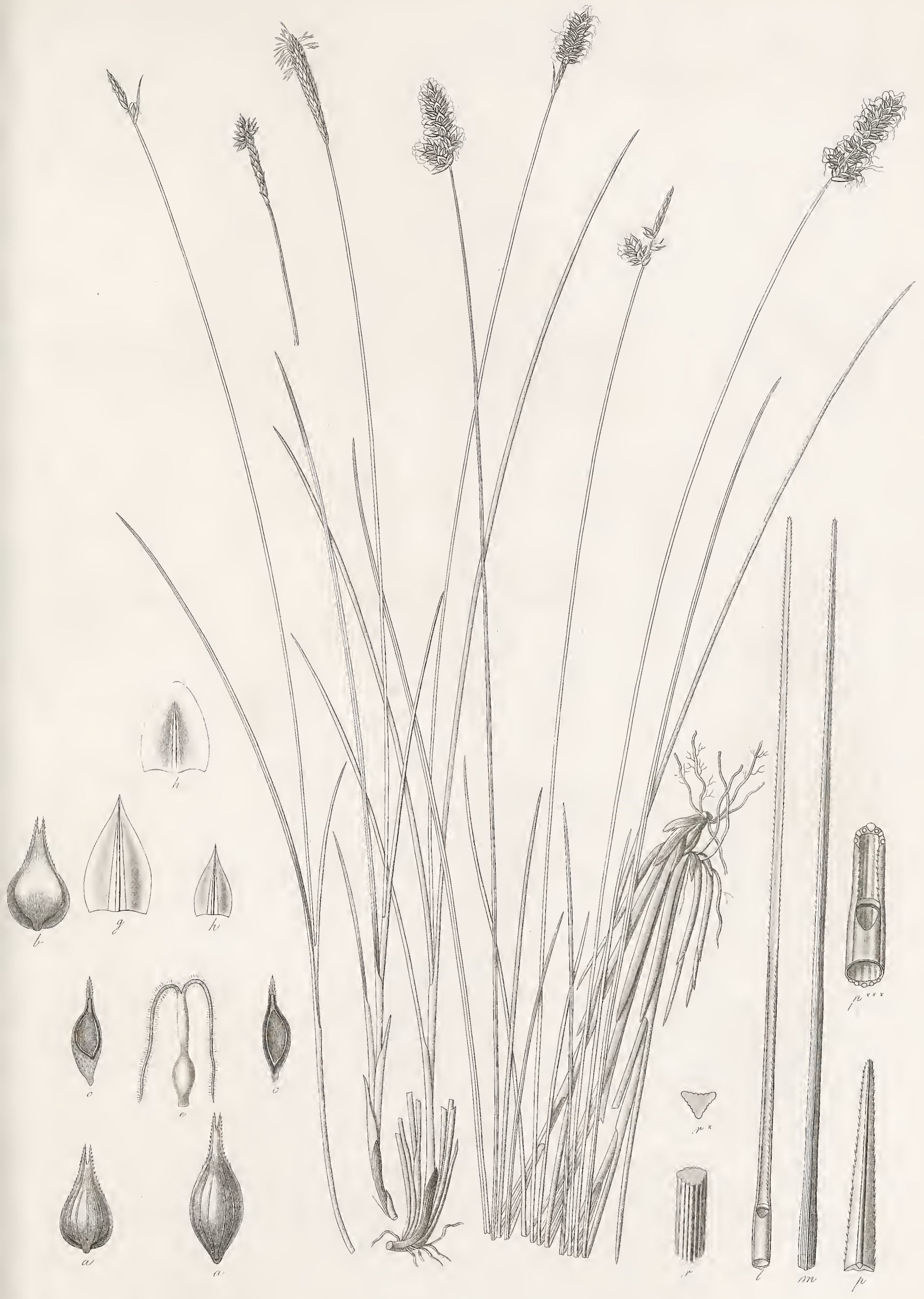


C. HOODII.

Al.







C. EXILIS.

M

C





C. AMPLIFOLIA.

M

c





C. CRINITA.





C. GYNANDRA.







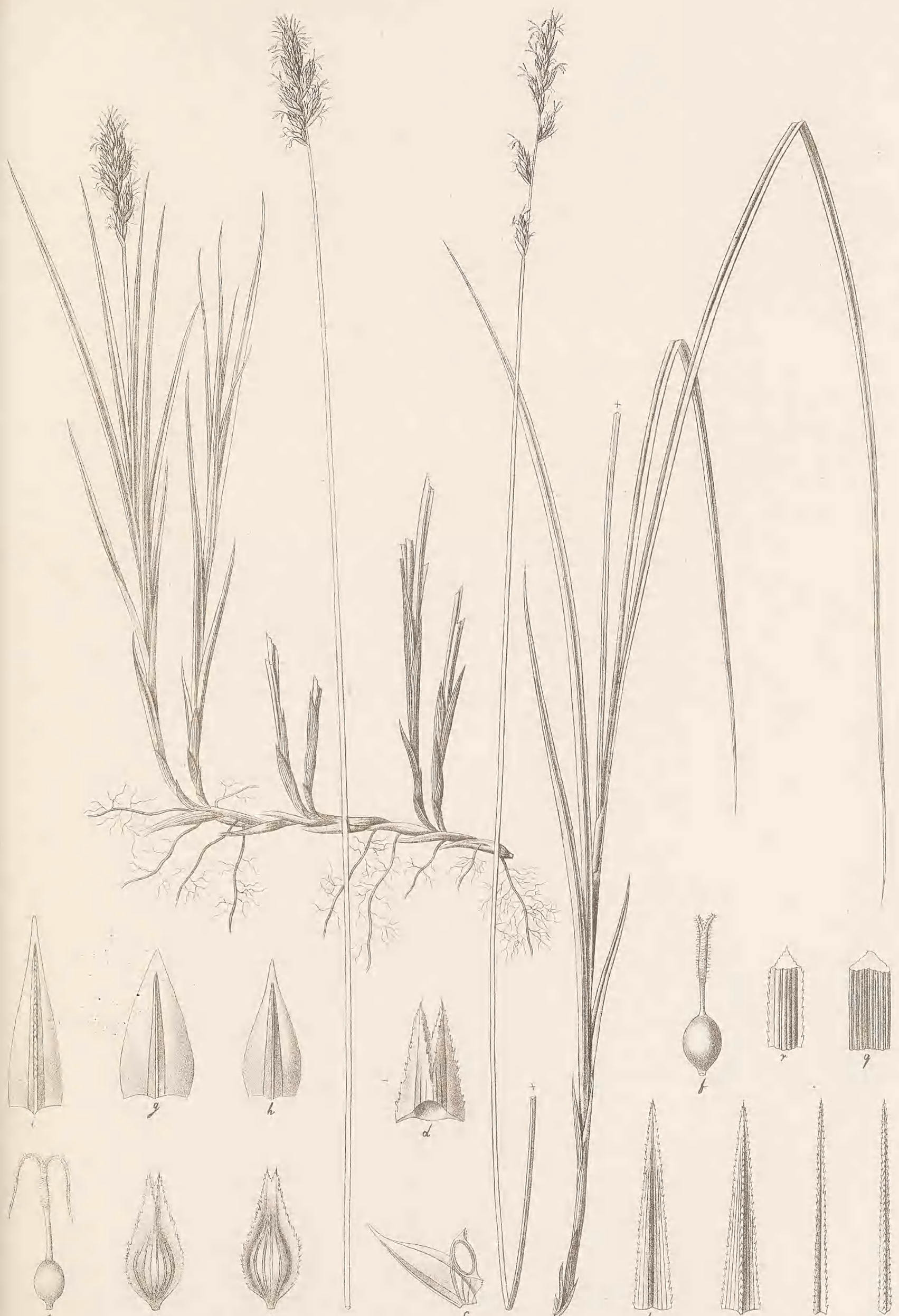
Masbert del.

Rees. lith.

*C. Houghtonii*

Vincent Brooks Imp.





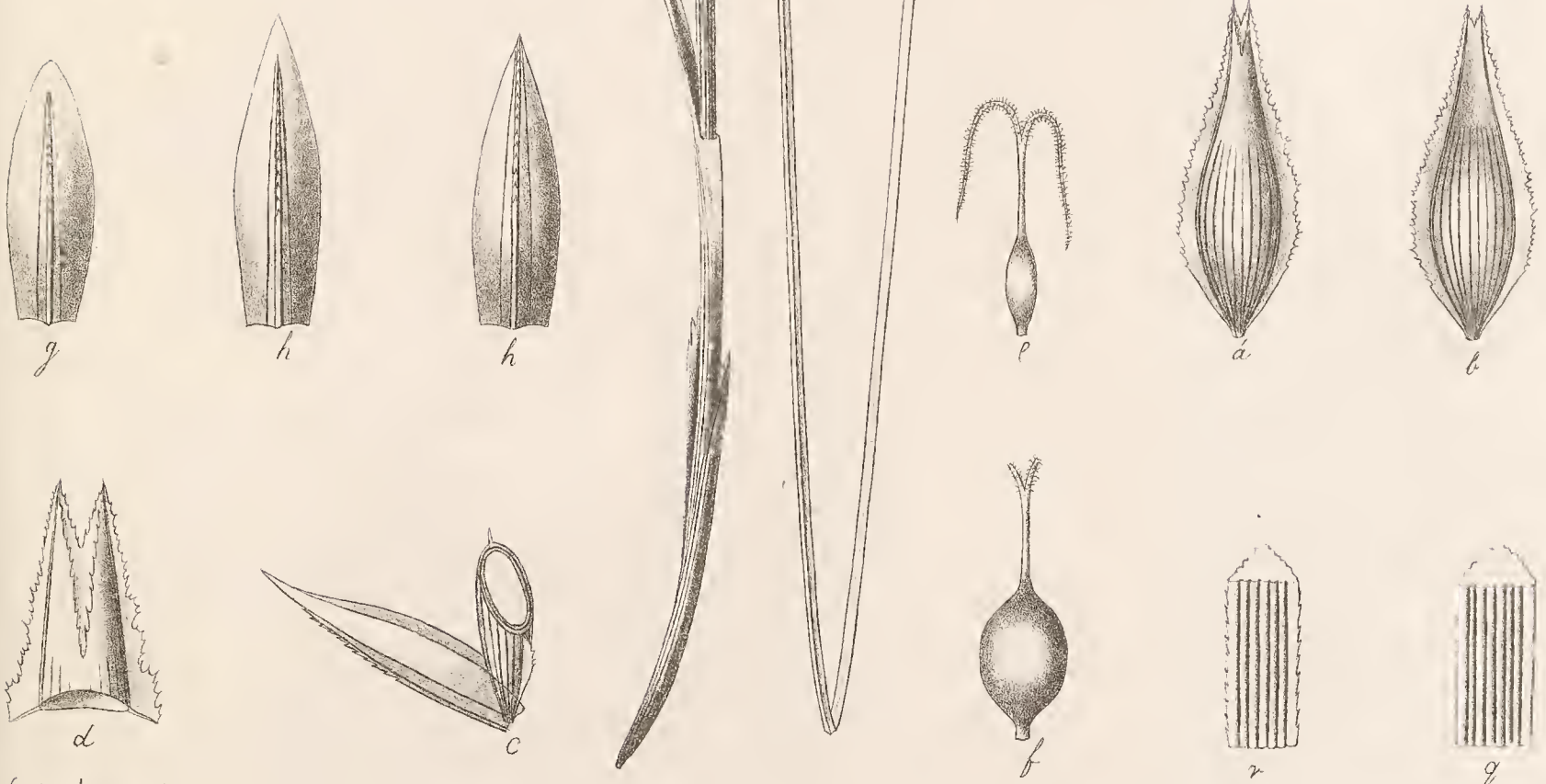
Massey del.

Rees lith.

*C. succata*

Vincent Brooks imp.





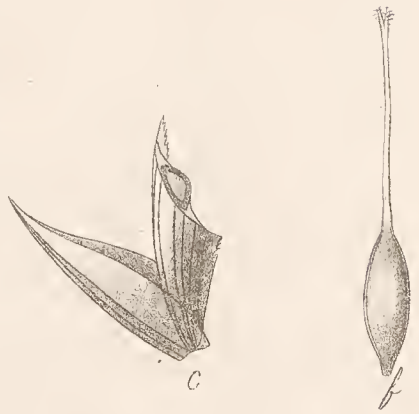
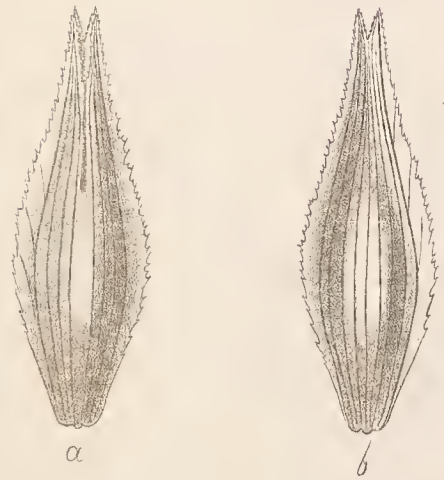
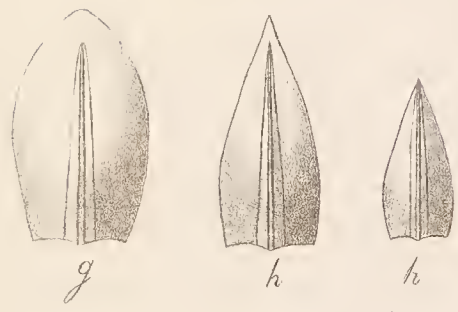
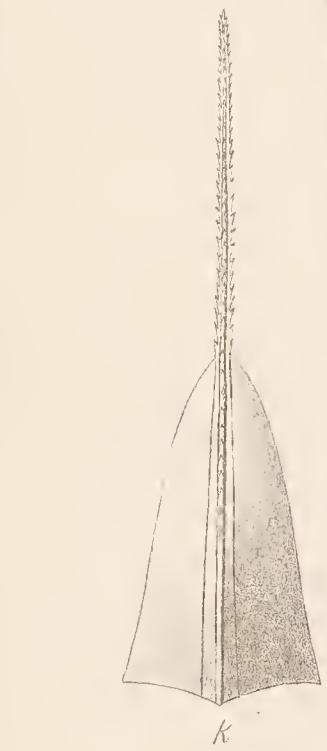
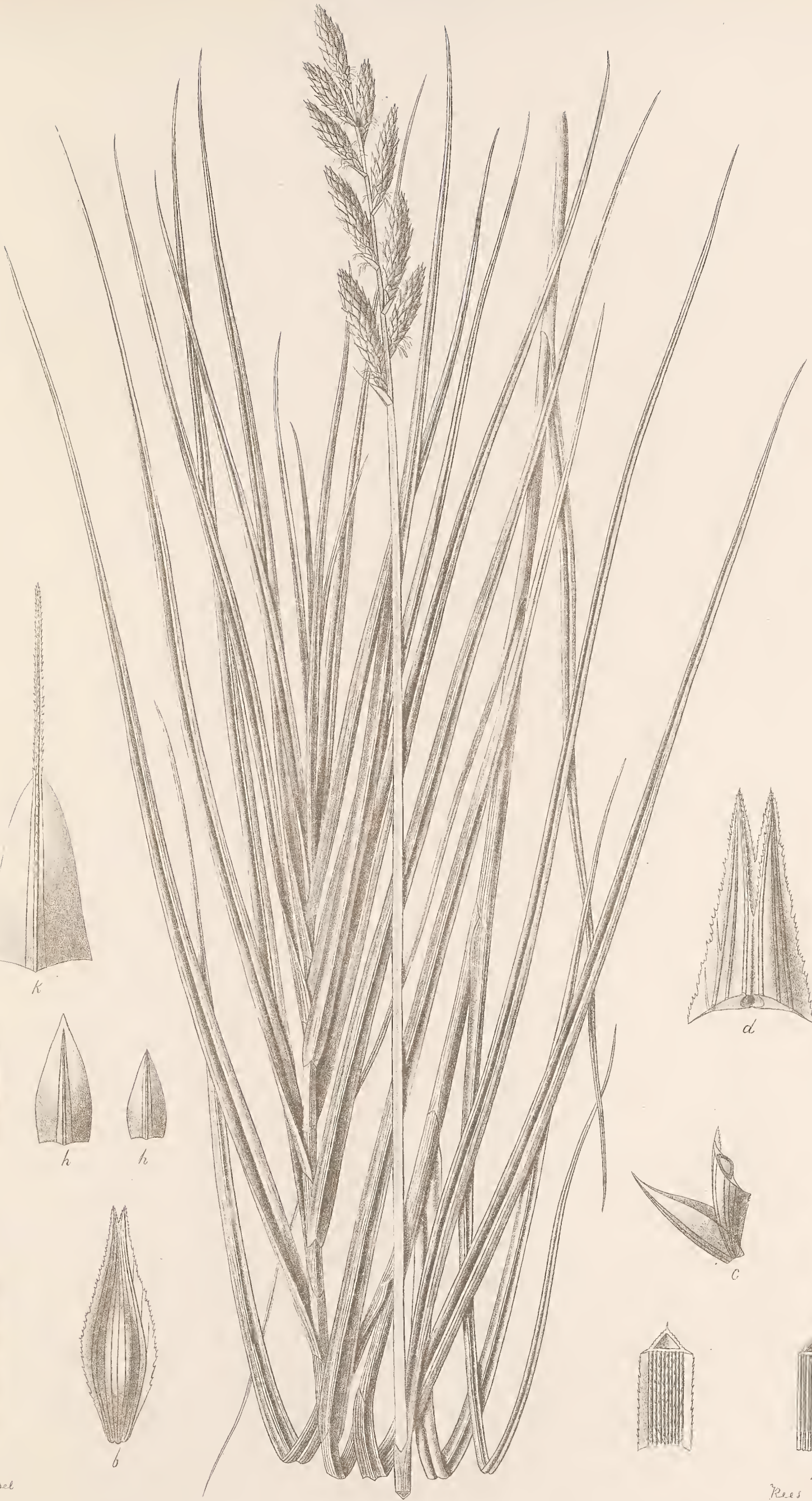
Maubert del

Rees lith

Vincent Brooks imp

*C. Liddoni*





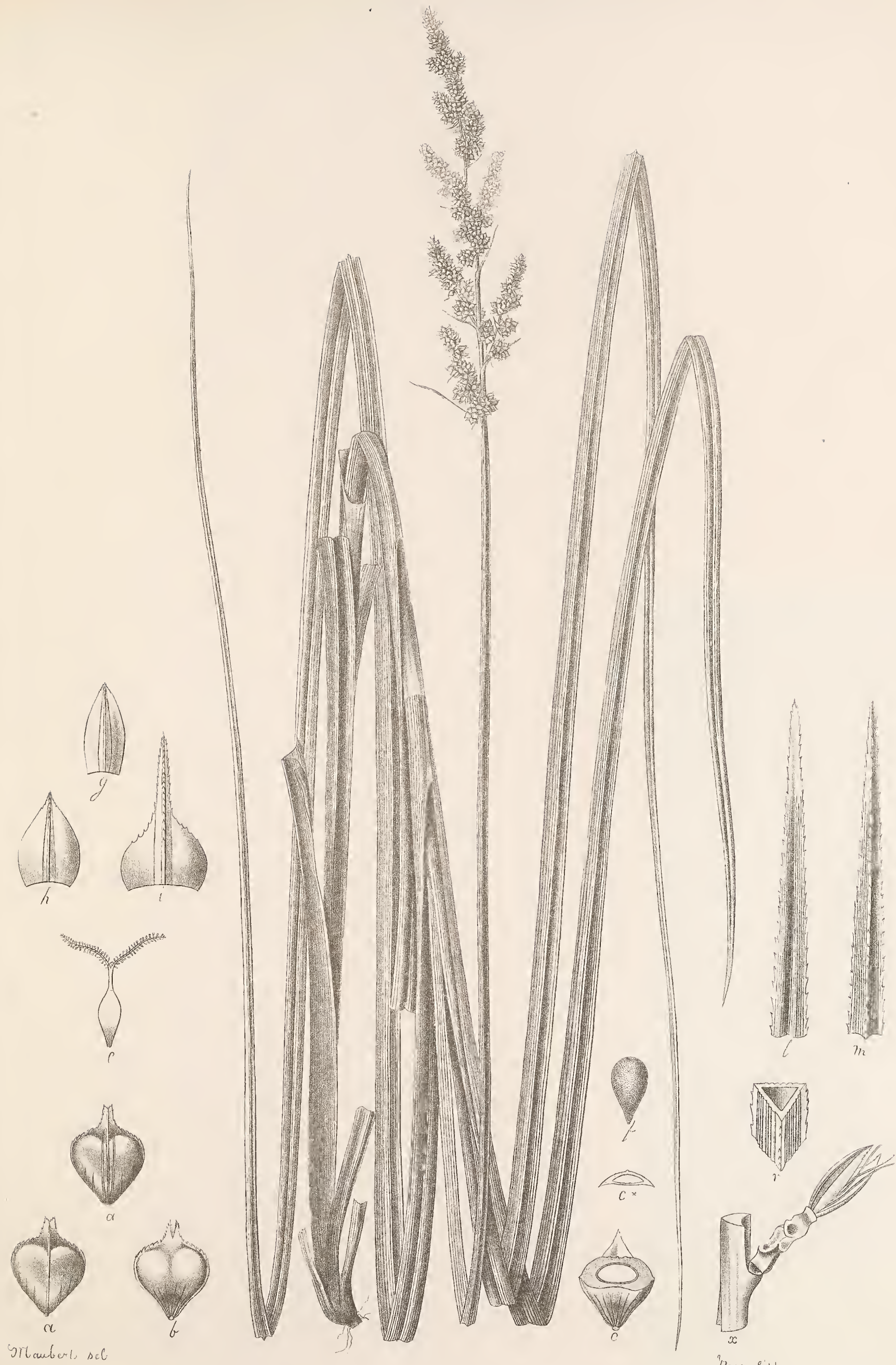
Maschert del

Rees Lith

*C. Arida.*







Thauber del

Rees Lith

Vucent Brooks imp

*C. decomposita*





Maubert del.

Rees Lith.

Vincent Prodr. imp.

1. *C. Torregi*
2. *C. alveata*





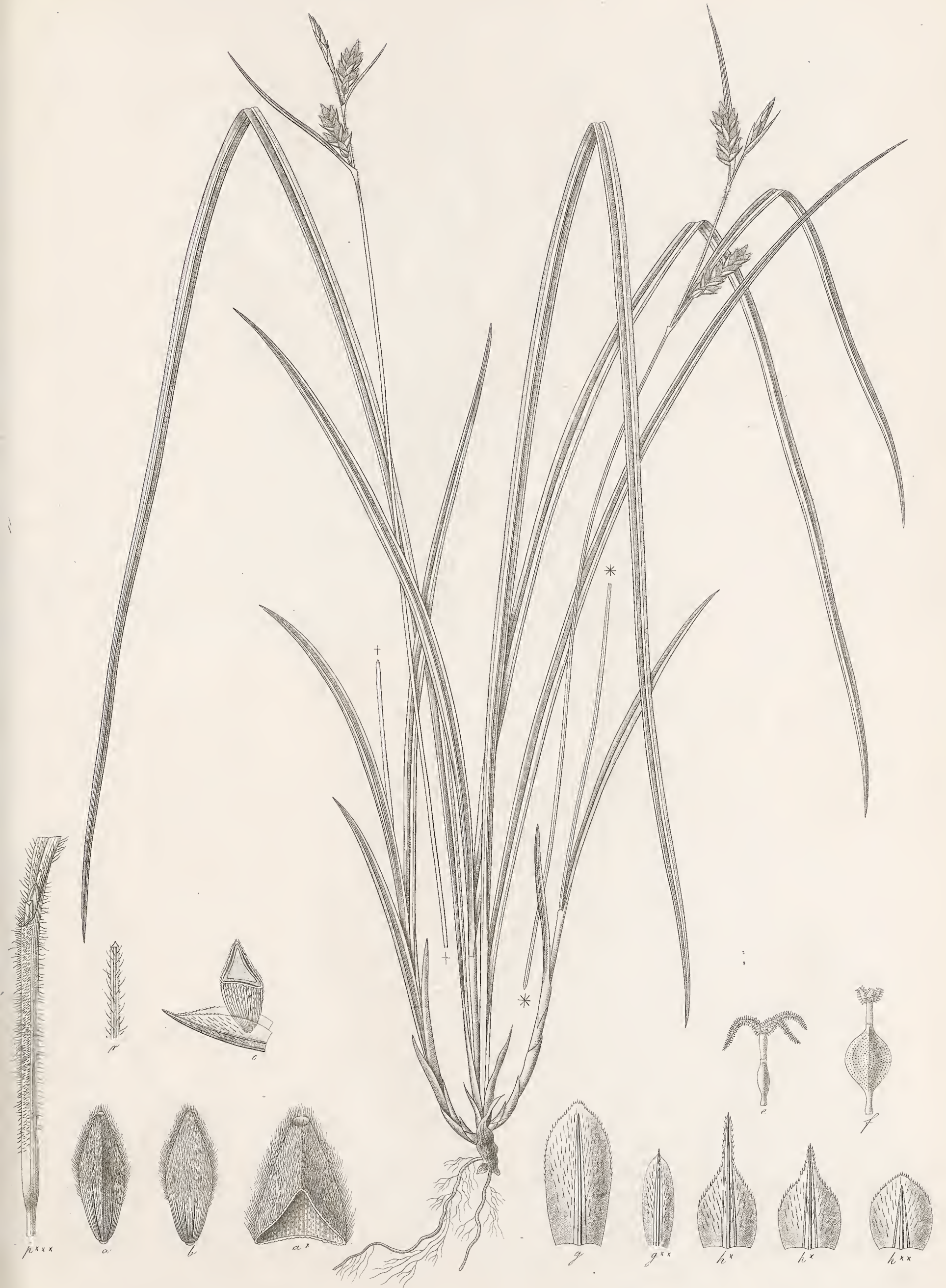
Maubert . Del

Rees Lith.

Vincent Brooks, imp.

*C. Halseyana*





C. DASYCARPA.

M.

o.







C. A R I S T A T A .

M.

c.





C. TENAX.





C. PUBESCENS.





Maubert del

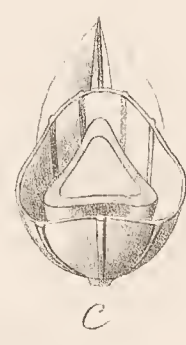
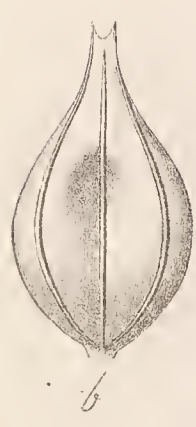
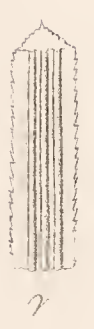
Rees Lith

*C. caespitosa*

Vincent Brooks, imp







Mauviel del

Rees lith  
Vincent Brooks imp

*C. oligosperma*





Maubert del

Rees lith

Vincent Brooks imp

*C. Raeana.*





Maubert. del.

Rees Lith

Vincet. Brooks imp

*C. crus-corvi*





Maubert. del

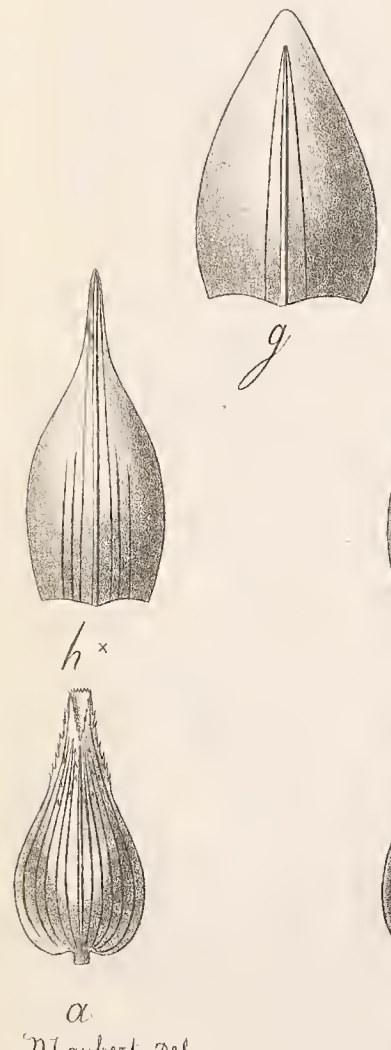
Rees. lith

Vineat Bro des imp

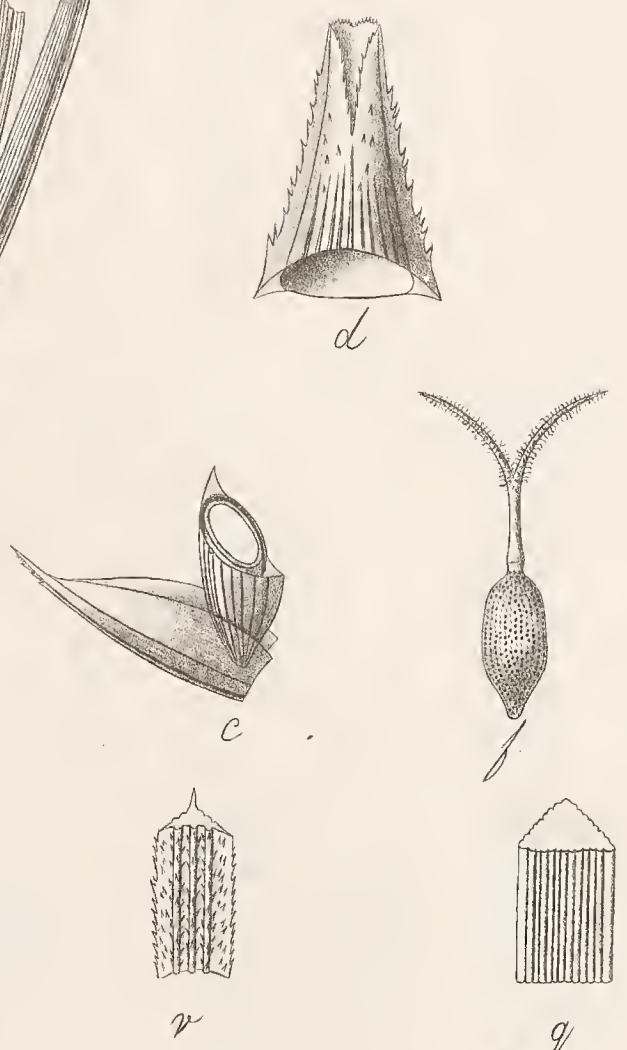
*C. festiva.*







a  
Maunder del



Rees Lith

*C. Purdici*

Virent Brooks imp.





Mauvri del

Rees Lith

Vincent Brooks imp.

*C. alopecoidea*





Maubert. del.

Rees Sculp.

*C. macrocephala*

Vincent Brookes imp.





Maubert del.

Rees. lith.

*C. Deweyana*.

Vincent Brooks imp.







Maubert et Rees. del.

Rees Lith

Vincent Brooks imp.

*C. Parryana.*





Maubert del

Rees Lith

*C. monile*

Vincent Brooks imp





Maubert. del.

Rees lith.

*C. virescens*

Vincent Brooks imp.





Maubert. del.

Rees. Lith.

Vincent Brooks imp.

*C. trisperma.*







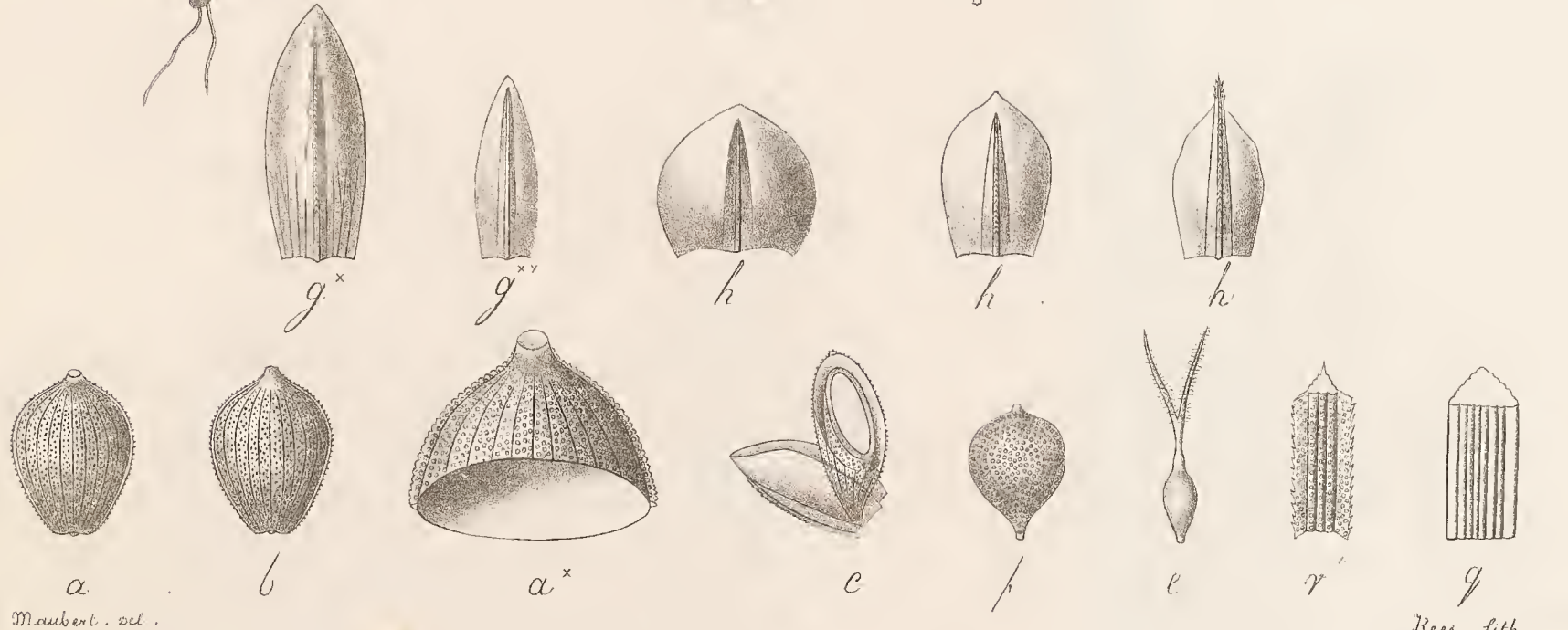
Maubert. del.

Rees. lith.

*C. scabrella.*

Vincent Brooks imp





Maubert. del.

Rees. Lith.

Vincent Brooks imp

*C. aurea.*





g



h



c



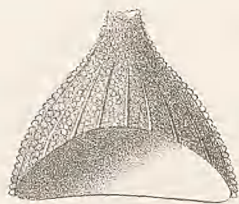
f



a



b



a\*



e



r



g

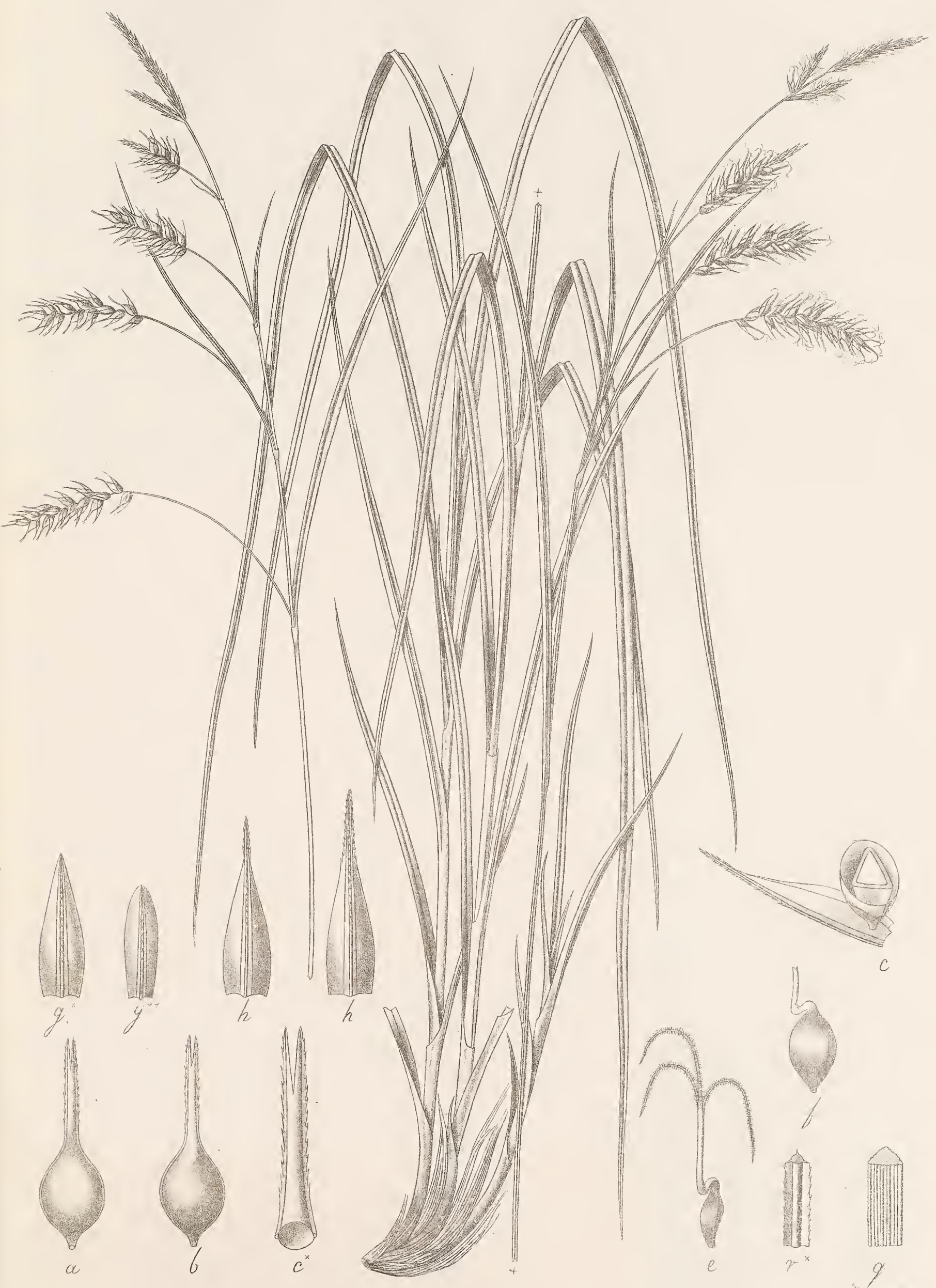
Maubert. del.

Rees. Lith.

*C. lenticularis.*

Vincent Brooks imp.





Maubert del

Rees. Lith.

*C. longirostris*

Vincet Brocas imp







Maubert, del.

Rees, Lith.

*C. Cherokeeensis.*





Maubert et Rees del

Rees Lith

*C. flexilis*.





Maubert et Rees. del.

Rees. Lith.

*C. Cwarwei.*





*C. conoidea*.







Maubert et Rees. del

Rees. Lith.

*C. Meadii.*





Maubert. del.

Rees. lith.

*C. tetanica.*





Maubert. del.

Rees. Lith.

*C. granularis.*





Maubert. del.

Rees. Lith.

*C. grisea.*







Maubert. del.

Rees. Lith.

*C. grisea*. var.





*C. flaccosperma*.





C. LAXIFLORA.





Maubert. del.

Rees. Lith.

*C. laxiflora*. var. *styloflexa*.







Rees. Del.

Rees. Lith.

*C. laxiflora*. 1. var. *intermedia*.  
 2. *gracillima*.





C. LAXIFLORA.  
 var. BLANDA, 1 & 2.





C. LAXIFLORA.  
var. LATIFOLIA.





C PLANTAGINEA.







C. CAREYANA.





M.

C. PLATYPHYLLA.

P.





C. RETROCURVA.

M.

c.





C. DIGITALIS.

M.

c.







M.

C. OLIGOCARPA.

P.





C. HITCHCOCKIANA.

M.

c.





M.

C. WILLDENOWII.

e.





h<sup>x</sup>

u. 8. 12

u. 8. 12

M.

C. WILLDENOWII.

v.





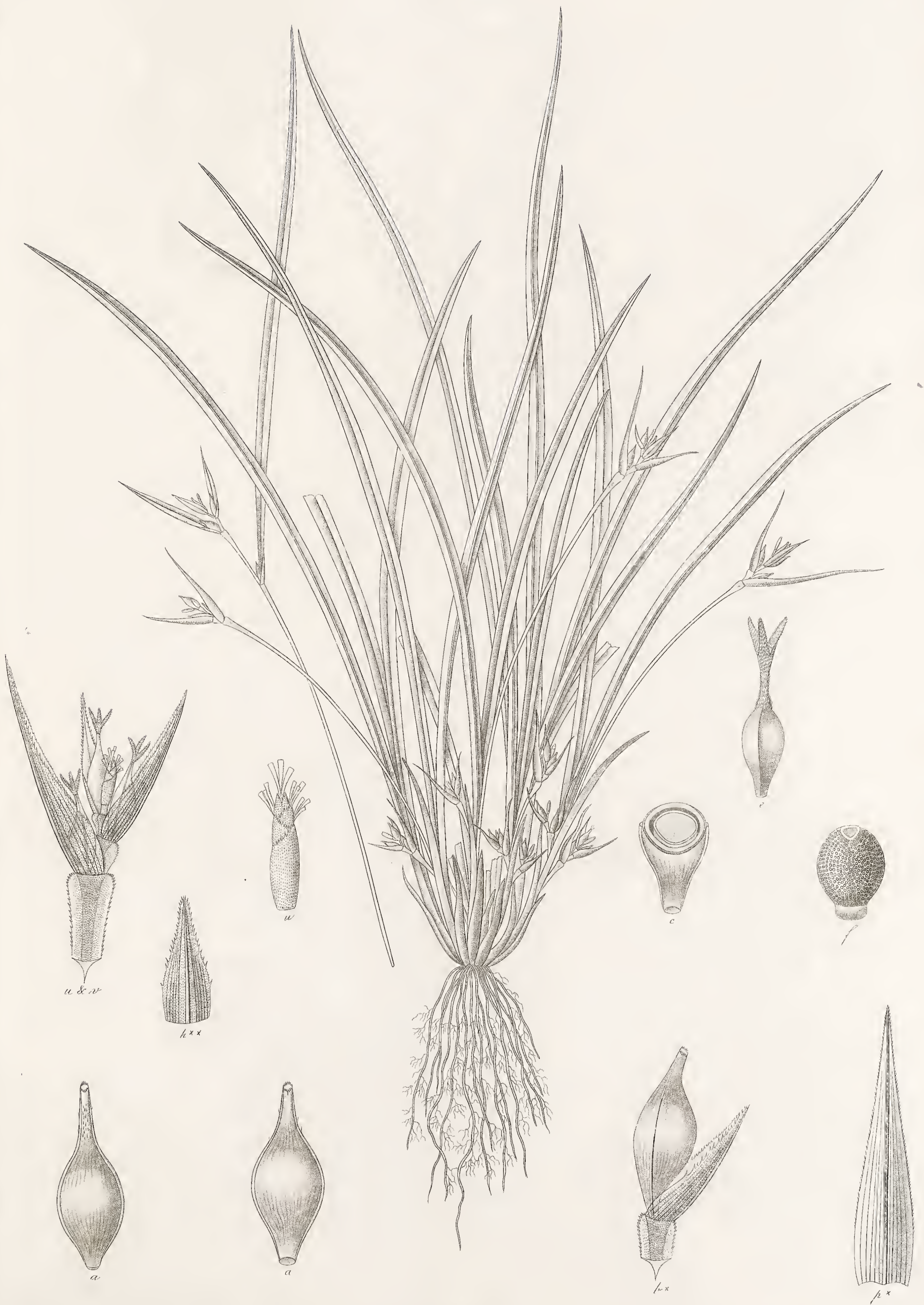


C. STEUDELII.

M.

e.





M.

C. BACKII.

c.





C . G E Y E R I .

M.

P.





C. PHYLLOSTACHYS.







Maubert. et Rees. del.

Rees. Lith.

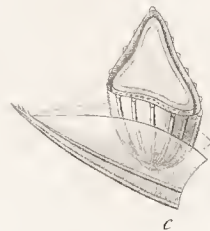
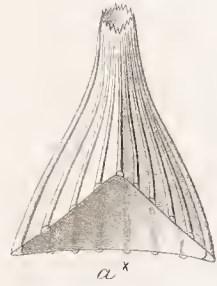
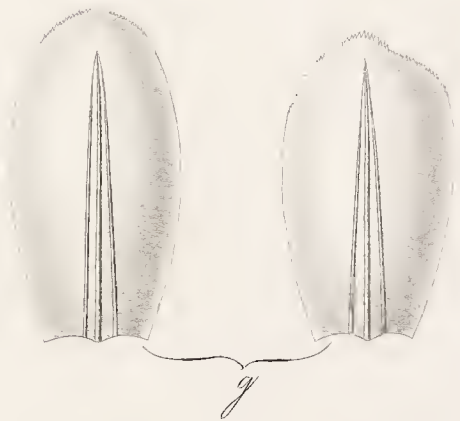
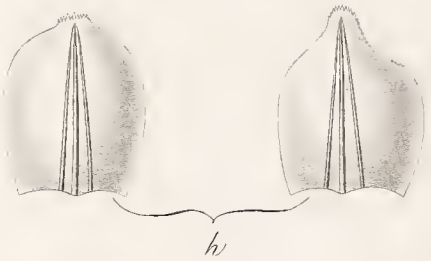
*C. concinna.*





C. SPACHIANA.





C. R A R A .





C. CAPILLACEA.







C. FUSIFORMIS.





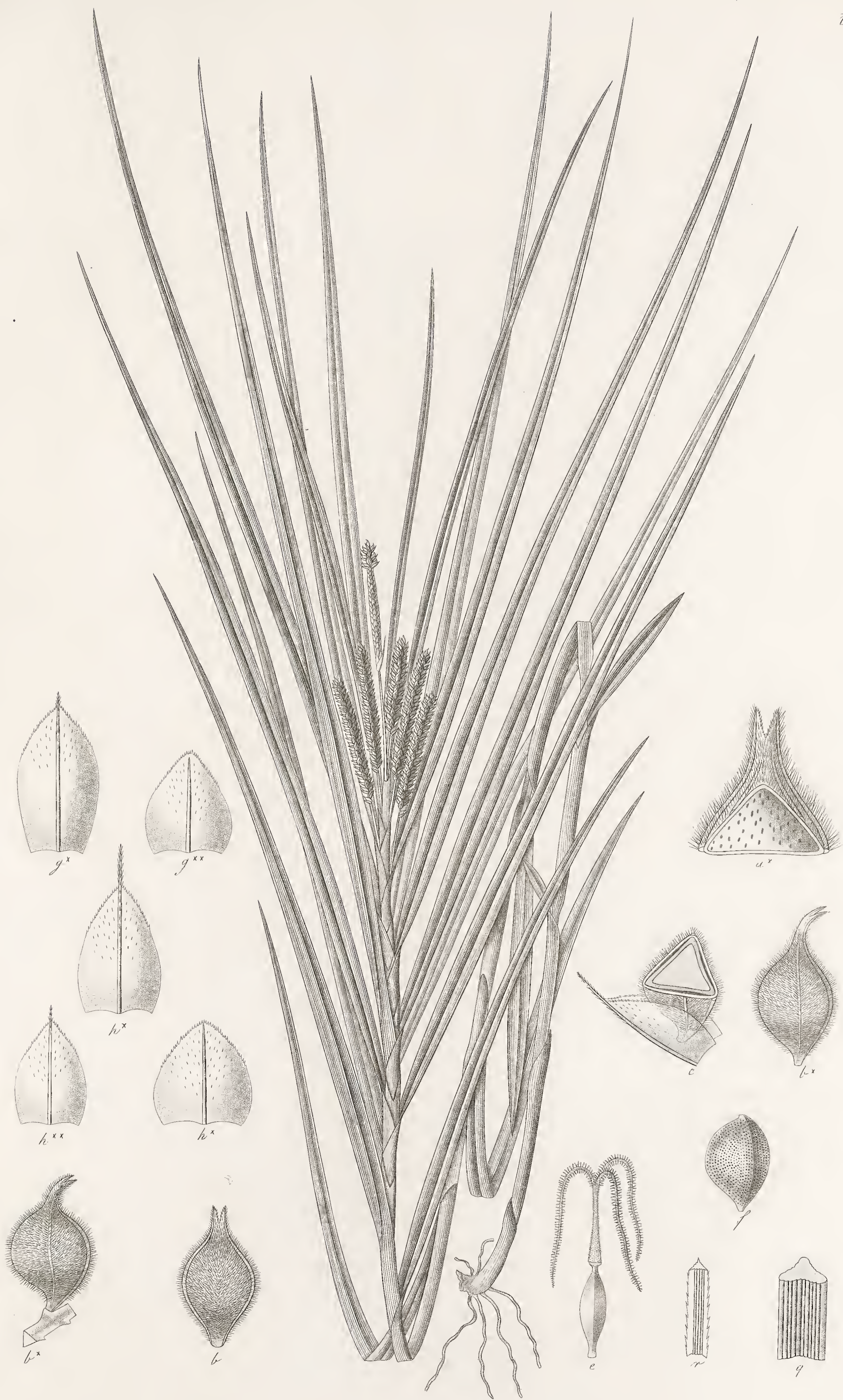
C. FINITIMA.





C. LIGULATA.





C. MAUBERTIANA.

M

c







C. PRESCOTTIANA.

m

fu





C. PALEATA.





Maubert, del

Rees, lith

*C. sororia*

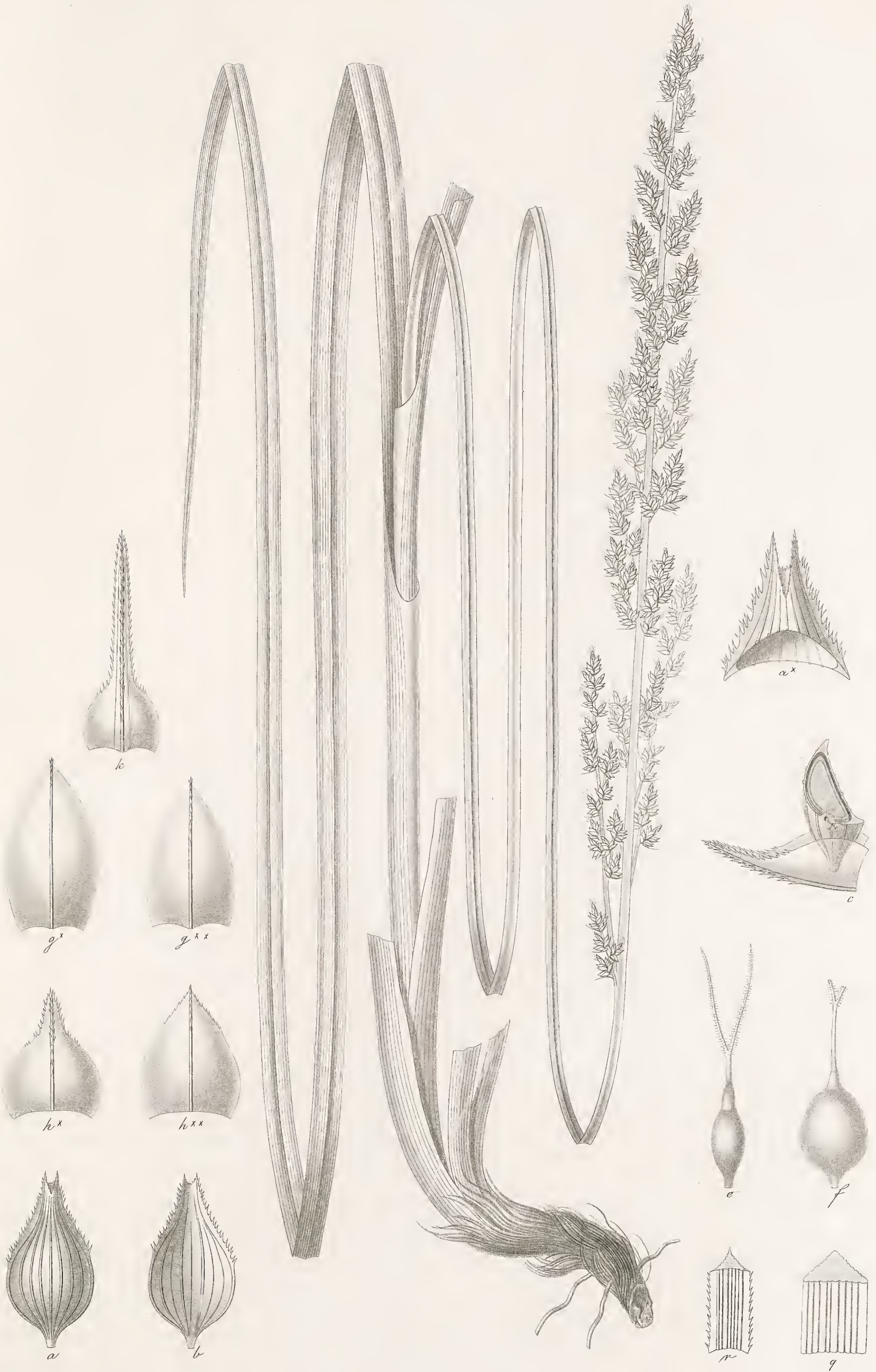




C. SYCHNOCEPHALA.







M.

C. APPRESSA.

P.





Roes. del.

Roes. lith.

*C. appressa.*





C. VIRGATA.





Rees. del.

Rees. Lith.

*C. virgata*





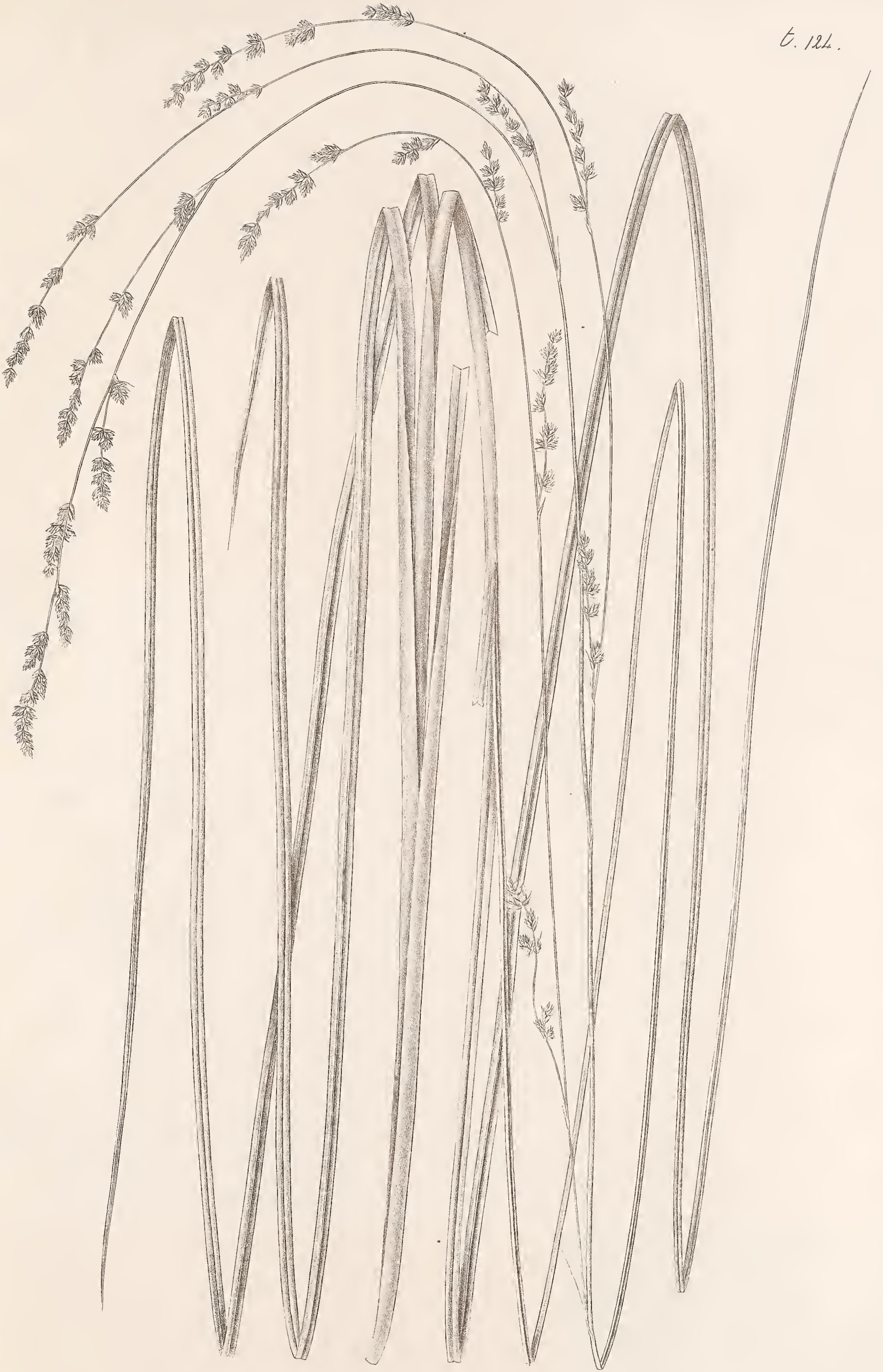


M.

C. S E C T A .

P.



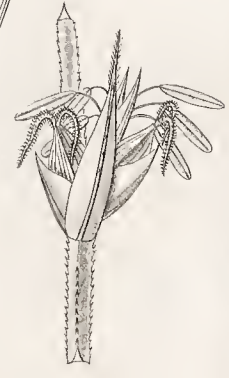


Rees. del.

Rees. Lith.

*C. secta.*

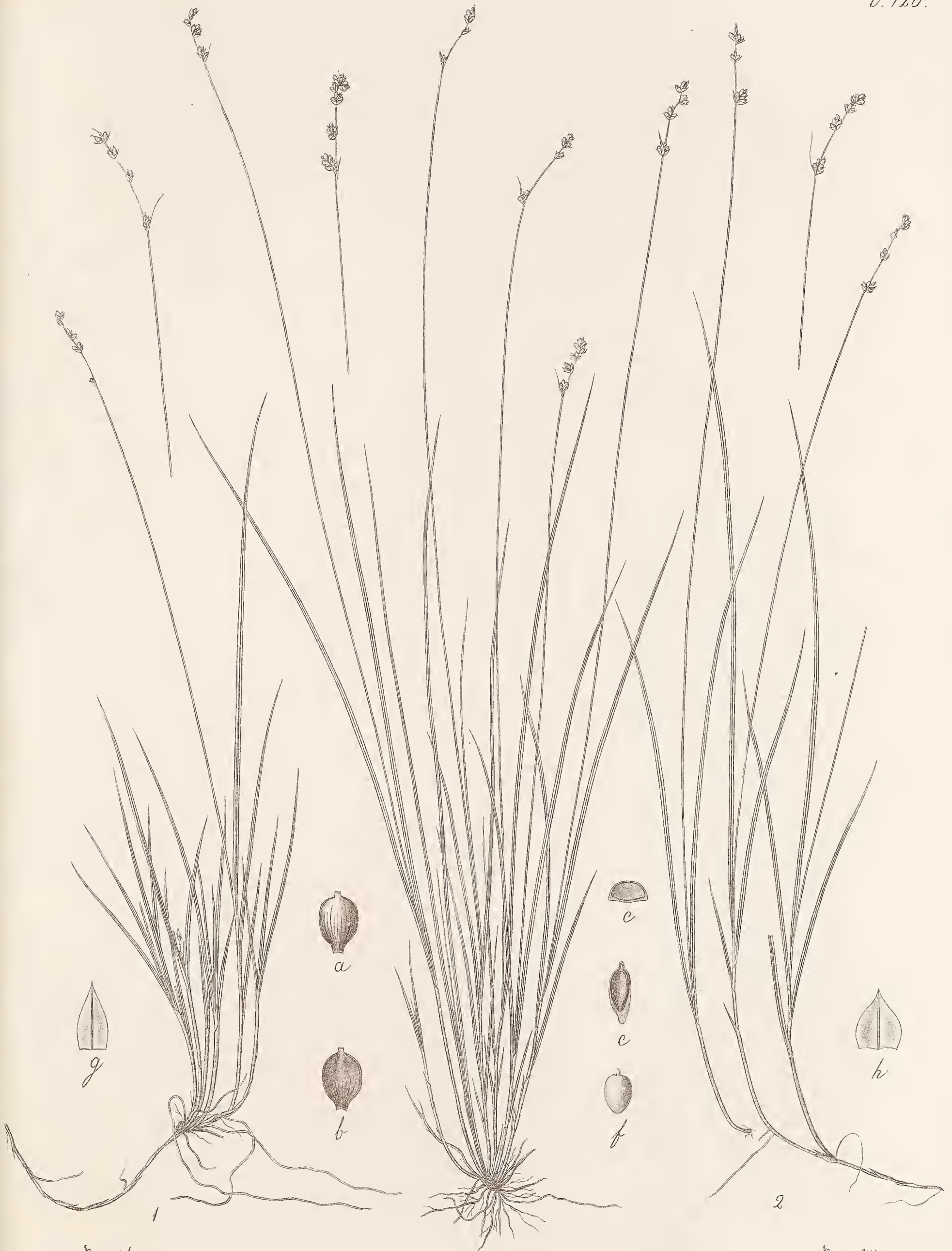




C. TENELLA.

M





Rees. del.

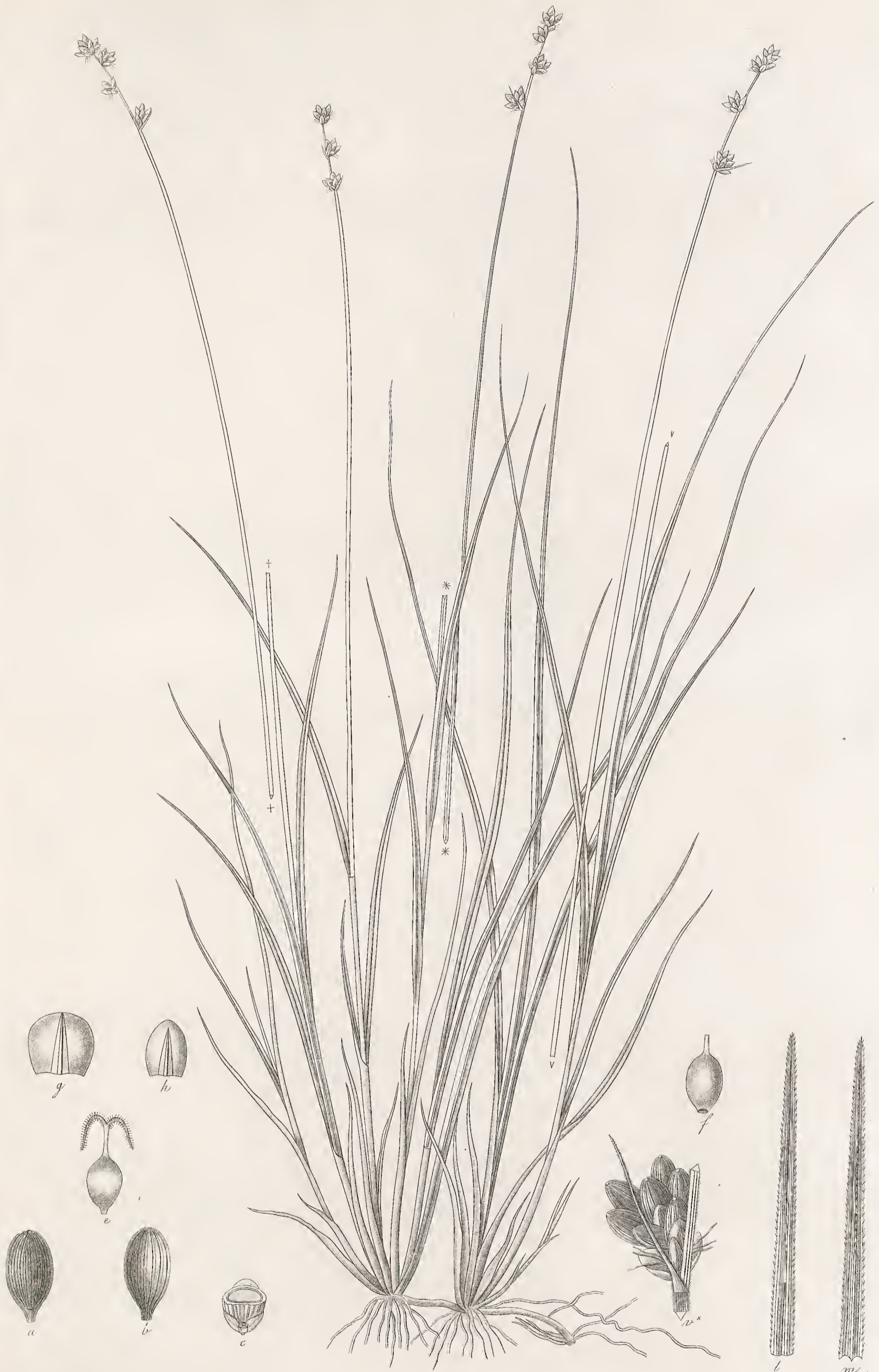
Rees. Lith.

*C. tenella.*

1. Sweden. Fries.  
2. U.S.A.







C. LOLIACEA.

M

C.





Maubert. Del.

Rees Lith

*C. triceps.*





C. LANUGINOSA.





C. EVOLUTA.







C. VESTITA.

M.

c.





M.

C. FILIFORMIS.

P.





M.

C. SULLIVANTII.

c.





C. VENUSTA.

M.

c.







Maubert et Rees. Del.

Rees. Lith.

*C. acutata.*





C. LINEARIS.





C. FORSTERI.

M.

c.





C. COUMFALLENSIS.







C. FASCICULARIS.

M.

c.





Rees. Bot.

Rees. Lith

*C. fascicularis*





Maubert. Del.

Rees. Lith.

*C. formosa.*





Maubert. Del.

Rees. Lith.

*C. oxylepis.*







Maubert. Del.

Rees. Lith.

*C. Davisii.*









M.

C. GRACILLIMA.

c.





C. STERILIS.

C. siccata







C. SPERILIS B.





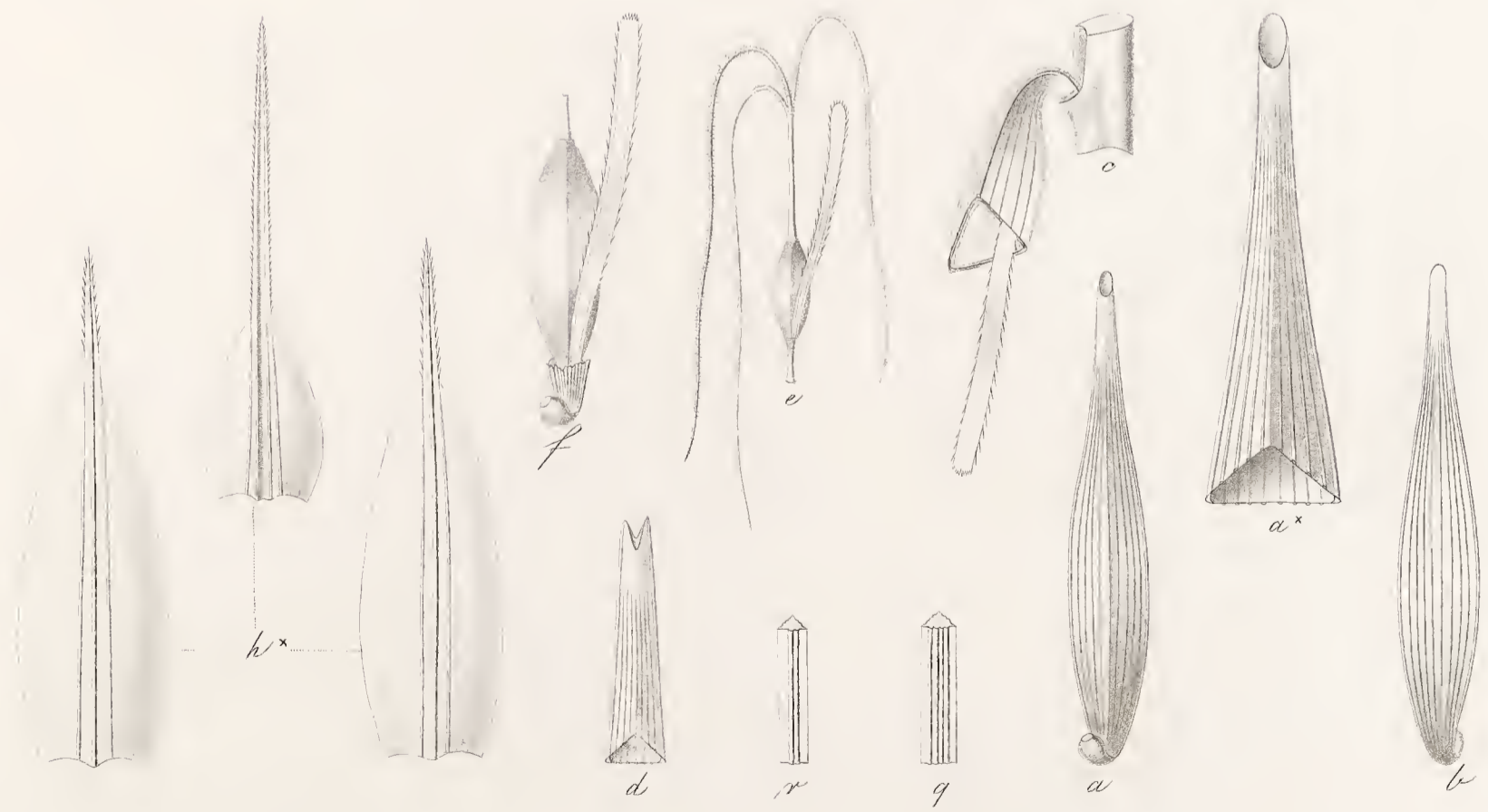
C. STELLULATA. VAR. SCIRPOIDES.





C. RADICALIS.





C. P A R V A .







C. OLIVACEA.





C. EXCURVA.

M.

P.





C. STRIATA.

M.

a.





C. TRICHOCARPA.







C. ALTA.





C. GRACILIS.



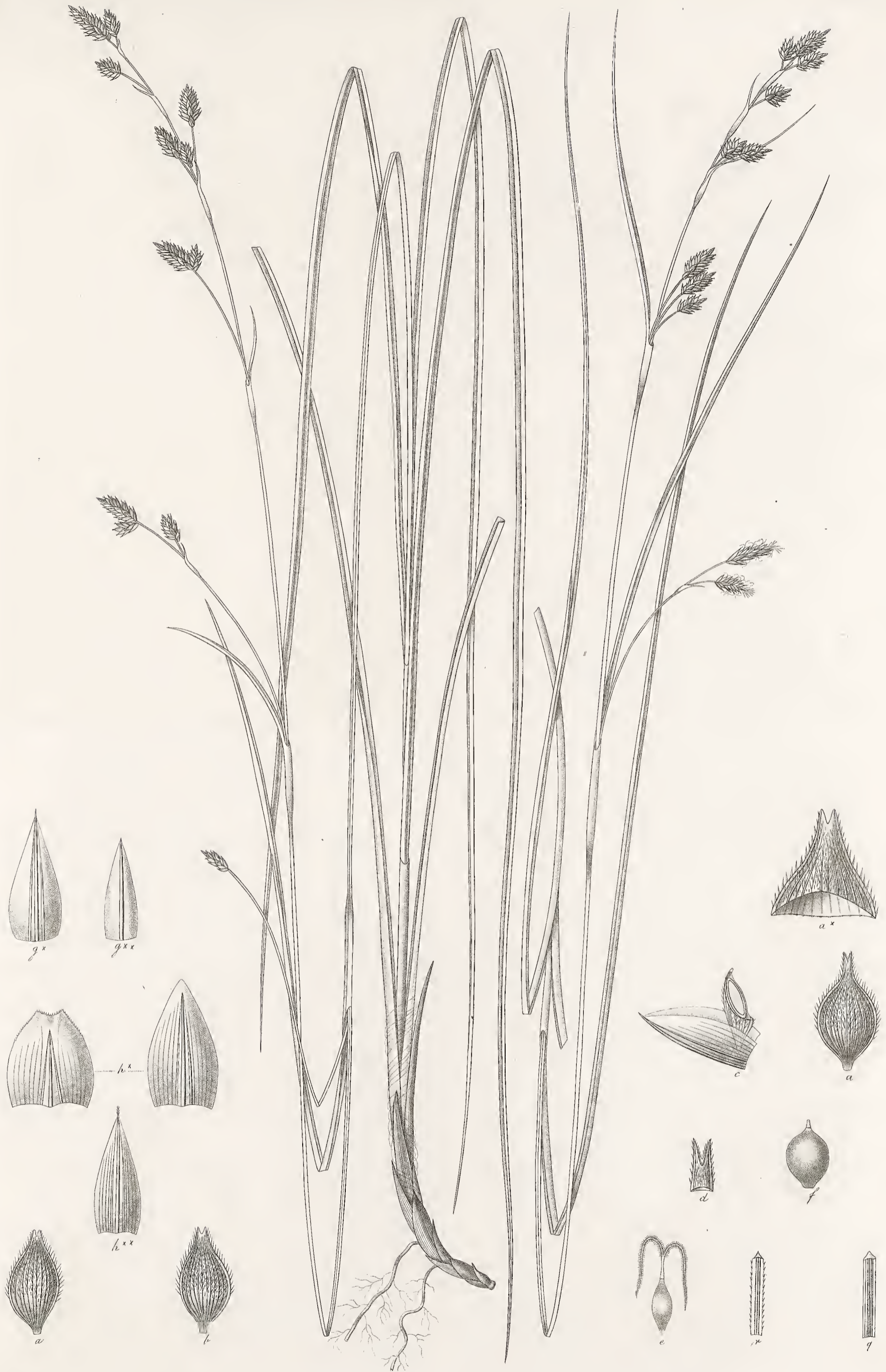


C. GRACILIS.

M.

P.





C. GRACILIS. B.

M.

c.



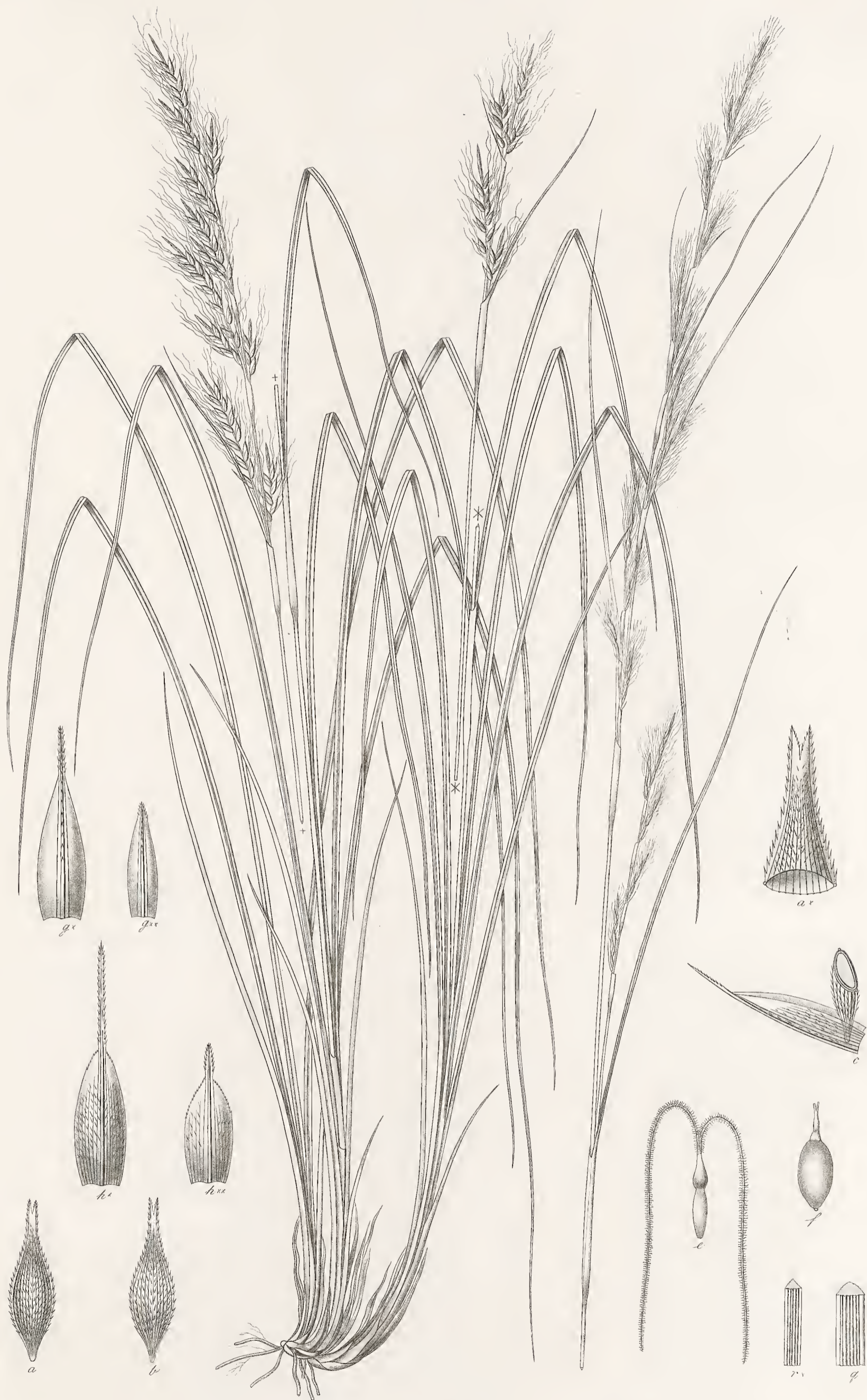




C. LONGICRURIS.

M





C. TEINOBYNA.

M.

11





C. INTUMESCENS.

G.

M.





C. INTUMESCENS.

g

At.







C. GRAYI.

g.

M.





C. LUPULINA.

P.

M.





C. LUPULIFORMIS.











C. HYSTRICINA.





C. ECHINOCHLOE.

M.

p





C. TERES.





C. PHACOTA.

M

P







C. TORTA

M.

a





C. DECIDUA.

M.





C. CRYPTOCARPA.





C. AMBUSTA.







C. LUCIDA.





C. PRUINOSA.





C. SOLANDRI.

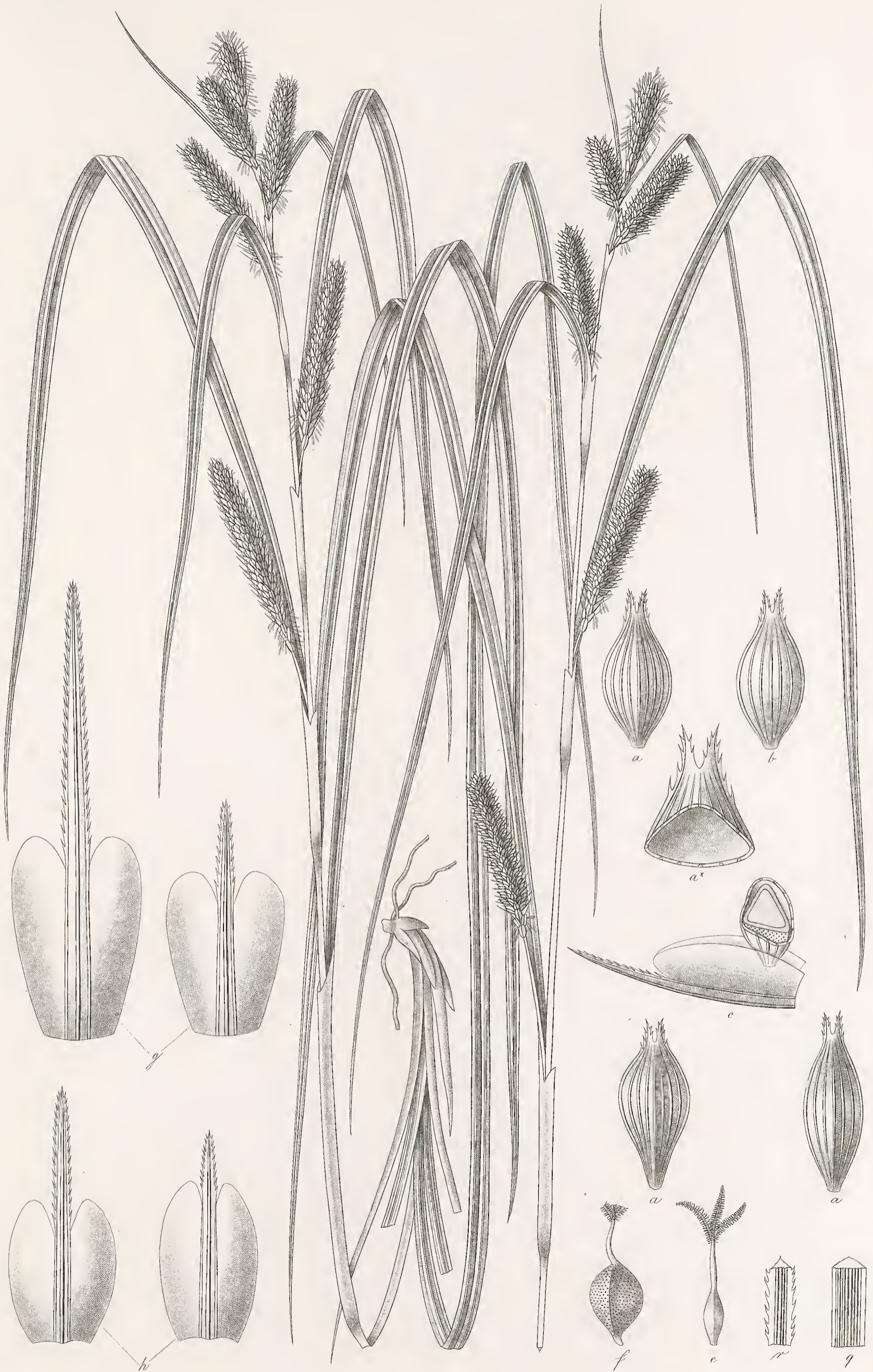




C. DISSITA.







C. LAMBERTIANA.





C . CEQUABILIS .

M.

p.





C. PRÆALTA.

M.

P.





C. PROEALTA, VAR.

M.

P.







C. TUMIDA.





C. BEECHEYANA.





1. C. CERNUORHYNCHA.  
 2. C. VERTICILLATA.





C. INDECORA.

M.

a.











C. PREISSII.





C. BARBATA.





C. L Œ T A.

P.

M.







C. BARBATII.





C. E L A T A.

c.

M.





C. PSYCHROPHILA.





C. OBSCURA.







C. USTULATA.





2. C. ALPINA V. EROSTRATA.

1. C. USTULATA V. MINOR.

M.

a.





C. BANKSII.

c.

M.





C. HÆMATOSTOMA.







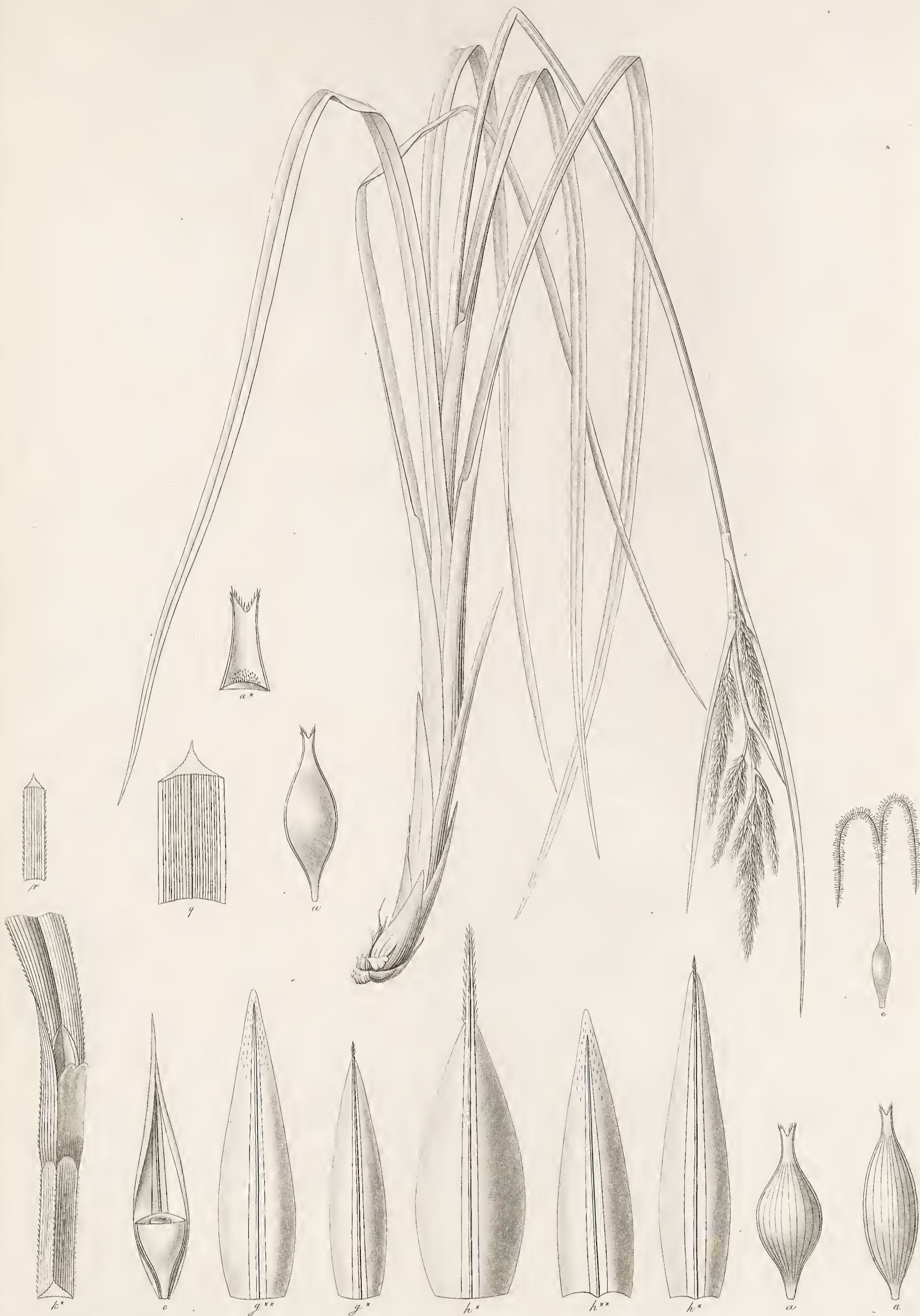
C. EBURNEA.





C. LEMANNIANA.





C. PICHINCHENSIS.





1. C. PICHINCHENSIS. VAR.  
2. C. MILIARIS.

1683













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# ILLUSTRATIONS

OF THE

# GENUS CAREX.

BY

FRANCIS BOOTT, M.D.,

TREASURER OF THE LINNEAN SOCIETY.

PART SECOND.

TAB. 201-310.

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

ROSCOMMON.



LONDON:

WILLIAM PAMPLIN, 45, FRITH STREET, SOHO.

1860.

PRINTED BY
JOHN EDWARD TAYLOR, LITTLE QUEEN STREET,
LINCOLN'S INN FIELDS.

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 J.D.S.

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ILLUSTRATIONS

OF

THE GENUS CAREX.

PART II.

188. *C. cruenta* (Nees); spicis 4-5 pedunculatis remotis oblongo-cylindricis, terminalibus 1-3 masculis fusco-ferrugineis nutantibus, reliquis fœmineis atro-purpureis crassis basi attenuatis longe exserte pedunculatis pendulis, infima rarius basi composita; bracteis inferioribus foliaceis vaginatis pedunculo brevioribus; stigmatibus 3; perigyniis ovato-vel ovali-lanceolatis rostratis bifidis superne margine plus minus serratis enerviis atrosanguineis basi albidis superne tenuissime granulatis membranaceis, squama lanceolata acuminata acuta hispido-aristata atro-purpurea, nervo pallidiore latioribus longioribusque.—*C. cruenta*, Nees, *apud Wight*, 128; *Kunth*, 463. (TAB. CCI.)

HAB. In Himalaya et Tibetia temperata et alpina, Kashmir, et Kishtwar, alt. 8-10,000 ped., *Dr. Thomson, Jacquemont*. Kumaon et Garhwal, *Wallich*, n. 3389. Kunawur, *Munro*, n. 2435, alt. 15-17,000 ped. Gugi, *Strachey et Winterbottom*, alt. 15,500 ped. Sikkim, *J. D. Hooker*, alt. 13,000 ped.

Radix fibris junioribus lanuginosis. *Culmus* 1½-pedalis, lævis, inferne foliatus; pars spicas gerens 6-14 poll. longa. *Folia* 2-4 lin. lata, culmo multum breviora. *Bracteæ* inferiores vaginatae, foliaceae, pedunculis breviores: superiores squamæformes. *Vagina* infima 1½-2 poll. longa. *Pedunculi* setacci, scabri, superne contorti: infimus sæpe 4-5 poll. longus; interdum superne bracteolâ squamæformi, paulo infra apicem sita, munitus. *Spica mascula* 7-11 lin. longæ, 1-2 lin. latæ, pedunculatæ, bracteolatæ, nutantes, 1-2, rarius 3, una alterave sæpe abortiva, bracteola squamæformis sterilis solum exposita. *Spica fœminea* 2-3, plerumque simplices, vel infima rarius spicula minori basi aucta, 8-16 lin. longæ, 4-6 lin. latæ, a se 3-5 poll. remotæ, atro-purpureæ, concoloris. *Squamæ* conformes. *Perigynium* 2 $\frac{7}{10}$ -3 $\frac{1}{10}$ lin. longum, $\frac{8}{10}$ -1 lin. latum, nervis 2 marginalibus sæpe viridibus, tenuissimum, inferne (ubi achenium tegens) compresso-trigonum, superne complanatum; rostri laciniæ obtusæ vel subulatæ; ore subobliquo, (sub lente) ciliato; rarius glabrum. *Achenium* (cum stipite ½ lin. longo) 1 $\frac{4}{10}$ lin. longum, $\frac{3}{10}$ lin. latum, ellipticum, triquetrum, pallidum.

A *C. ustulata*, Wahl., differt inflorescentia longiori; spicis

masculis pluribus, fœmineis longioribus, remotis; perigyniis longius rostratis; achenio longe stipitato; squamis omnibus aristatis.

Magis ad *C. frigidam*, All., accedit. Differt spicis masculis pluribus, squamis aristatis.

The specimens from Herb. Wallich (Tab. CCI.), on which *C. cruenta* was founded by Nees, are fully mature, and all have simple spikes, with a rudimentary bracteola occasionally on the peduncle, showing a tendency to composition. The male spikes are pedunculate, and more contracted from the absence of anthers which have fallen, and the consequent closer imbrication of the squamæ. On one specimen only, from Munro, is the lower spike compound, and in one from Jacquemont (Tab. CCII. No. 1) the terminal spikes are male at base, all simple. In some young specimens from Dr. Thomson and Dr. Hooker the squamæ are often muticæ (probably from age), but the longer and more remote spikes distinguish them from *C. ustulata*. A slight emargination of the squamæ is occasionally perceptible in Wallich's specimens.

Var. β . *major*; spicis 6-9, terminalibus contiguis sessilibus, 3-4 omnino masculis, vel 3-5 basi masculis, una alterave sæpe apice vel basi vel medio mascula, inferioribus pedunculatis, reliquis 2-4 fœmineis, omnibus vel inferioribus vel infima solum basi spiculis 1-2 compositis; perigyniis plus minus margine serratis, squamis interdum submarginatis breve aristatis vel muticis, foliis bracteisque subinde latioribus. (TAB. CCII. No. 2, and TAB. CCIII.)

HAB. Kishingunga, Gugi, *Strachey et Winterbottom*, n. 106 (Tab. CCII., No. 2). Kishtwar, *Dr. Thomson*, alt. 8-10,000 ped. (Tab. CCIII.).

These specimens are young. Besides the sessile terminal spikes, the variation in the distribution of the male florets (in which they resemble *C. ustulata*), the occasional emarginate squamæ, the longer inflorescence, and broader leaves and bracts, I see no essential character separating them from the typical form. More fully mature specimens would probably exhibit a longer arista to the squamæ.

189. *C. Koestlini* (Hochstetter); spica maxima supra-decomposita (ambitu lanceolato vel oblongo) straminea vel ferruginea, e spiculis androgynis apice masculis co-

piosissimis confluentibus, in ramis decompositis sessilibus congestis vel inferioribus subdiscretis dispositis; bracteis e basi ovata dilatata pallida plus minus longe setaceo-elongatis, infima sæpe spicam superante; stigmatibus 2; perigyniis ovato-vel ovali-lanceolatis basi cuneatis compressis sensim in rostro elongato attenuatis, ore hyalino antice alte secto demum bifido (laciniis acutis), plano-convexiusculis pallide castaneis, marginibus superne alatis serrulatis pallidioribus utrinque leviter nervatis, squamam lanceolatam acuminatam acutissimam membranaccam hyalinam castaneo tinctam æquantibus.—*C. Koestlini*, *Hochst. in Un. Itin.* 1842, n. 1244; *Stuedel, Syn. Pl. Cyp.* 193 (1855). (TAB. CCIV., CCV.)

HAB. In Abyssinia, prope Demergui, inter lapides ad rivulos, alt. 10,500–11,000 ped., *Schimper, n.* 1036, 1037, 66.

Radix fibris lignosis validis, lateritiis. *Culmus* 3-pedalis, triqueter, validus, rigidus, scaber, basi foliosus. *Folia* 5 lin. lata, culmo longiora, carinata, inferne carinato-plicata, rigida, in apice longo acutissimo triquetro attenuata. *Bractea* ligulis elongatis marginalibus præditæ: basis earum ovata, pallida, nervata, ad ramos conspicua: infima sæpe pedalis. *Spica*, in speciminibus magis evolutis, maxima, 6 poll. longa, subpollicem lata, in aliis minor oblonga. *Squamæ* conformes. *Perigynium* 3–3 $\frac{2}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, postice sæpe obscure nervatum; ore e membrana interjecta primum integro, antice alte secto, demum bifido; laciniæ longæ, graciles, acutæ, parallelæ. *Achenium* $\frac{9}{10}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum, oblongum, plano-convexiusculum, basi styli crassiore apiculatum.

Var. β . *minor*; spica breviori plus minus crassa conferta vel laxa; culmo gracili; foliis angustis; perigyniis brevioribus latioribus basi spongiosis, squamis ovatis subobtusis latioribus vel lanceolatis acuminatis acutis angustioribus, subinde sordide ferrugineis concoloribus. (TAB. CCVI., CCVII.)

HAB. Prope Demerki et Debreski, ad rivulos; alt. 9000–10,500 ped., *Schimper, n.* 170.

C. Koestlini variat spicæ magnitudine et colore; culmi robore; foliorum latitudine, rigiditate; bractearum longitudine; squamis lineari-lanceolatis, acuminatis, acutissimis vel ovatis, subobtusis, pallide castaneis, læte vel sordide ferrugineis; perigynii longitudine, latitudine; et nervatione plus minus valida et copiosa; marginibusque basi acutis vel obtusis, spongiosis, turgidis; ore plus minus bifido; laciniis longis, linearibus, vel brevibus, latioribus; radix semper fibris colore lateritiis prædita.

I am indebted to M. Spach for the opportunity of examining an extensive suite of specimens of this fine species, all collected by Schimper, and am confirmed in the opinion that they are all referable to one and the same species by M. Spach, who says, in a letter to me:—"J'ai examiné *C. Koestlini* et ses variétés, en m'aidant de vos notes, et mes recherches aboutissent à me faire participer à votre propre opinion, et même à ne conserver aucun doute sur l'identité spécifique de toutes ces formes qui de prime abord sembleraient constituer des espèces distinctes. La forme type (Tab. CCV.), qui a des périgynes fort nervurés, comme la forme *minor*, mais sans fongosité, établit, il me semble, le passage entre le *major* et *minor*. Du reste, j'ai trouvé la forme des périgynes excessivement variable dans tous les échantillons, et je n'ai pas vu que la déposition de la matière fongueuse influât en rien sur cette polymorphie, car dès l'époque de la floraison et lorsque le périgyne est encore parfaitement membraneux, il offre, sauf les dimensions, la forme qu'on lui retrouve à la maturité."

The deposition of spongy matter in perigynia is not constant in

one and the same spike. It is the effect of complete maturation, and always more or less influences the form.

Richard has not included this species in his *Fl. Abyssinica*. The original specimens distributed by the Un. Itin. were like Tab. CCV., one of which I have, through the kindness of my late friend Dr. Charles Lemann.

190. *C. conferta* (Hochstetter); spica oblonga ferruginea subduplicato-composita, e spiculis 10–12 androgynis apice masculis, superioribus ovatis simplicibus sessilibus confertis, inferioribus compositis brevi-pedunculatis discretis; bractea angusta spicâ longiore vel obsoleta auriculata; stigmatibus 2; perigyniis ovatis rostratis, ore antice altius secto bidentato, plano-convexis superne margine serratis antice 3–4 postice nisi basi obsolete nervatis pallidis, squamam late ovatam acutam ferrugineam nervo viridi subæquantibus.—*C. conferta*, *Hochst. in Un. Itin.* n. 576 (1842); *Richard, Fl. Abyssin.* ii. 512. (TAB. CCVIII.)

HAB. In Abyssinia, prope Debreski, in pratis, alt. 9300 ped., *Schimper, n.* 931.

Rhizoma lignosum, longe repens. *Culmus* 2–2 $\frac{1}{2}$ -ped., acute triqueter, scaber, nudus, subdebilis, basi foliatus. *Folia* 2–3 lin. lata, culmo longiora, plana, graminea, glauca. *Bractea* auriculatæ, sæpe obsoletæ. *Auricula* subrotundæ, ferrugineæ. *Spica* 1 $\frac{1}{2}$ –2 poll. longa, 4–8 lin. lata: spiculæ ovatæ, apice parce masculæ. *Squamæ* conformes. *Perigynium* 1 $\frac{6}{10}$ – $\frac{8}{10}$ lin. longum, $\frac{7}{10}$ – $\frac{8}{10}$ lin. latum, antice medio 3–4-nervatum, pallidum, apice ferrugineum. *Achenium* $\frac{7}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, plano-convexum, stipitatum, basi styli clavata apiculatum.

A *C. vulpina* differt rhizomate repente, spiculis inferioribus pedunculatis, perigyniis brevioribus, squamis muticis.

191. *C. Bonariensis* (Desfontaines); spica oblonga flavescens-ferruginea, e spiculis pluribus androgynis, apice masculis, sublaxe glomeratis, glomerulis inferioribus longe bracteatis; stigmatibus 2; perigyniis ovatis sensim rostratis superne margine serratis, ore antice fisso bidentato, plano-convexis utrinque insigniter medio tuberculatis basi spongiosis antice ad latera gibbosis postice foveolatis leviter nervatis stipitatis, squama ovata acuta mucronata ferruginea longioribus.—*C. Bonariensis*, *Desf. in Poir. Ency. Suppl.* iii. 250 (1813); *Gay, Ann. Sc. Nat.* x. 300 (1838: *excl. syn. Schlecht. et Kunth*). *C. vulpina* (papillosa), *Nees in Hooker Journ. Bot.* ii. 398 (1840). *C. tuberculata*, *Nees in Herb. Lindley.* (TAB. CCIX.)

HAB. In America australi. Montevideo, *Commerson, Isabelle*. Buenos Ayres, *Commerson, Tweedie*. Mendoza, *Gillies (Herb. Hooker)*.

Radix fibrosa. *Culmus* 9–12-poll., gracilis, obtusangulus, lævis. *Folia* sublineam lata, culmo breviora. *Bractea* inferiores, 2–3, foliaceæ, spicam plus minus longe superantes: infima angusta, subinde 5 poll. longa. *Spica* $\frac{1}{2}$ –1 $\frac{1}{2}$ poll. longa, 3–5 lin. lata. *Squamæ* conformes, masculæ angustiores. *Stamina* 2. *Perigynium* 2–2 $\frac{3}{10}$ lin. longum, $\frac{8}{10}$ –1 $\frac{1}{10}$ lin. latum, flavide ferrugineum. *Achenium* 1 lin. longum, $\frac{8}{10}$ lin. latum, subrotundo-ovatum, plano-convexiusculum, basi styli decidua crassiore.

The singular tuberculation of the perigynia separates this species from its allies, and is entirely wanting in the plant described by Schlechtendal and Kunth, which I refer to the next species.

192. *C. involucrata* (Boott); spica ovato-subrotunda

capitata straminea involucrata, e spiculis 3-6 ovatis androgynis apice masculis arcte congestis, inferioribus 1-2 longe bracteatis; bracteis erectis; stigmatibus 2; perigyniis late ovatis vel suborbiculatis rostratis bidentatis plano-convexis marginibus acutis superne subalatis serrulatis antice obsolete vel leviter postice plerumque basi nervatis breve stipitatis stramineis rostro ferrugineo membranaceis, squama ovata acuta vel cuspidata margine scariosa paulo longioribus.—*C. involucrata*, Boott. *C. Bonariensis*, Schlecht. in *Linnaea*, x. 116; *Kunth*, 378 (non Desf.). (TAB. CCX.)

HAB. In America australi, Gillies (*Herb. Hooker*).

Culmus subpedalis, gracilis, lævis. *Folia* 1 lin. lata, culmo breviora. *Bractea* infima 1-1½-poll., altera spica paulo longior. *Spica* 6-9 lin. longa et lata. *Perigynium* 1- $\frac{6}{10}$ - $\frac{8}{10}$ lin. longum, $\frac{8}{10}$ -1 lin. latum. *Achenium* $\frac{6}{10}$ - $\frac{8}{10}$ lin. longum et latum, orbiculatum, plano-convexum, basi styli clavata.

Affinis *C. cephalophoræ*, Muhl., quæ differt culmo scabro; foliis longioribus et latioribus; bracteis setaceis, reflexis; perigyniis bifidis; squamis longe aristatis.

193. *C. Franklinii* (Boott); spicis 6-10 rubro-ferrugineis, superioribus congestis sessilibus inæqualibus, terminali ovata apice mascula, proximis linearibus masculis vel basi parce foemineis, reliquis ellipticis utrinque acutis remotis exserte pedunculatis nutantibus sæpe omnino foemineis, infima interdum composita; bracteis inferioribus angustis vaginatis culmo brevioribus; stigmatibus 3 vel 2; perigyniis ellipticis vel ovatis vel fusiformibus plano-trigonis vel compressis plus minus rostratis, ore hyalino emarginato fimbriato oblique fisso, nervatis superne scabriusculis margine serrulatis membranaceis, squama ovata acuta mucronulata vel subobtusa dorso puberula margine hyalina longioribus.—*C. Franklinii*, Boott; *Hooker. Fl. Bor. Am.* 217. t. 218. (TAB. CCXI.)

HAB. In America septentrionali. Rocky Mountains, Drummond.

Culmus 2-3-pedalis, inferne obtusangulus, lævis, superne scabriusculus, strictus, rigidus, nudus basi foliatus vaginisque ferrugineis laceratis tectus; pars spicas gerens 3-5 poll. longa. *Folia* latitudine varia, plana, lineam lata, vel involuta vel setacea, apice attenuata, firma, elongata, culmo breviora. *Bractea* inferiores angusta, vaginata, sursum obsolete. *Vagina* infima 3-4 lin. longa. *Pedunculi* 2 lin. ad 2 poll. longi, setacei, scabri. *Spica* 5-11 lin. longæ, 1-3 lin. latæ; terminalis apice mascula, ad ejus basin 1-3 sessiles, lineares, masculæ vel basi parce foemineæ; reliquæ ovatæ, apice masculæ, vel inferiores ellipticæ, foemineæ, remotæ, exserte pedunculatæ, nutantes. *Squamæ* conformes. *Perigynium* 1- $\frac{7}{10}$ -2 lin. longum, $\frac{8}{10}$ - $\frac{9}{10}$ lin. latum, ellipticum vel ovatum: vel 2½ lin. longum, $\frac{6}{10}$ - $\frac{8}{10}$ lin. latum, superne rubro-ferrugineum, scabriusculum, basi pallidum, glabrum, compressum vel plano-trigonum, nervatum, membranaceum. *Achenium* (cum stipite $\frac{2}{10}$ lin. longo) 1 lin. longum, $\frac{5}{10}$ - $\frac{6}{10}$ lin. latum, triquetrum vel plano-convexiusculum, ferrugineum, basi styli puberuli apiculatum.

I have not seen any specimens of this plant but those brought by Drummond. In the *Flora Bor. Americana* I quoted as a synonym the *C. ovata* of Dewey and Torrey. On referring, however, to their notice of that species, I find that neither of them had seen it. Dewey erroneously describes its spikes as *apice masculæ*, and this either misled me or I found the specimens of *C. Franklinii* in *Herb. Hooker* named *C. ovata* by them. Dewey has not included this species in his reports in *Silliman's Journal*. Its affinity is with the *Ferrugineæ*, with species of which group Drejer

has placed it in his first table of affinities. In that table there are some corrections to be made. The *C. asperula*, Nees, is his *C. psychrophila*; and the *C. ovata*, Rudge, and *C. Caucasica*, Stev., are perhaps only varieties of *C. atrata*, L. *C. nigritella*, Drejer, is the *C. stylosa*, Meyer; and *C. arctica*, Dewey, is *C. Parryana*, Dewey. *C. misandra*, Br., is *C. fuliginosa*, St. and Hop.

194. *C. fuliginosa* (Sternberg et Hoppe); spicis 2-5 rarius 6 obovatis vel ellipticis atro-purpureis, terminalibus 1-2 basi masculis subsessilibus, reliquis foemineis remotis exserte pedunculatis nutantibus, infima rarius radicali; bracteis superioribus squamæformibus inferioribus vaginatis brachyphyllis; stigmatibus 3-2; perigyniis lanceolatis plano-trigonis vel compressis rostratis, ore albo-hyalino oblique fisso demum bifido vel bilobato, superne margine serratis enerviis atro-purpureis basi albidis membranaceis, squama ovata obtusa vel subacuta atro-vel læte purpurea margine albida angustioribus longioribusque.—*C. fuliginosa*, Sternb. et Hopp. *Act. Soc. Bot. Ratisbon*, i. 159. t. 3; *Hopp. et Sturm, Car. Germ. Icon.*; *Kunze*, 57. t. 14; *Anderson*, 26. t. 7. f. 90; *Drejer, Rev. Crit.* 54; *Lang*, 116; *Franklin, Nar. App.* 763 (1823); *Koch*, 881; *Dewey*, xi. 152; *Tor. Mon.* 407. *C. frigida*, Wahl. *Fl. Succ.*! *C. misandra*, Brown, *Parry, Voy. Suppl.* 283, 309; *Tor. Mon.* 325. *C. fuliginosa*, β , *Lang*, 117. (TAB. CCXII.)

HAB. In Europa, Asia, et America arctica. Lapland to the alps of Germany. Behring's Straits, *Wright*. Greenland, *Vahl*. Arctic seacoast of North America, *Ross*, *Parry*, *Franklin*, *Sir John Richardson*.

Radix fibrosa. *Culmus* 3-12-poll., gracilis, lævis, apice setaceus, nutans, basi foliatus vaginisque pallide ferrugineis tectus; pars spicas gerens 1-5 poll. longa. *Folia* plana, 1 lin. lata, vel involuta; in speciminibus altioribus vix partem tertiam inferiorem culmi attingentia. *Bractea* superiores squamæformes, purpureæ: inferiores vaginatæ, pedunculo breviores; vel infima foliacea, spiculam æquans. *Vagina* infima 2-11 lin. longa: omnes plus minus purpurascens. *Pedunculi* inferiores ½-2½ poll. longi, setacei, scabri. *Spica* plerumque 3-5, obovatæ vel ellipticæ, 4-9 lin. longæ, 2-3 lin. latæ, subinde omnes basi masculæ. *Squamæ* conformes. *Perigynium* 2-2 $\frac{4}{10}$ lin. longum, ½ lin. latum, superne vacuum; ore albo-hyalino, antice altius fisso, subintegro, vel demum emarginato vel bifido vel bilobo; inferne plano-trigonum vel compressum. *Achenium* breve stipitatum, $\frac{8}{10}$ lin. longum, ½ lin. latum, oblongum vel obovatum, trigonum vel (stigmatibus 2) angulo antico obsolete: rarius racheolâ $\frac{8}{10}$ lin. longâ instructum.

A *C. frigida*, All., differt radice fibrosa, omnibus partibus gracilioribus; spicis minoribus, superioribus, rarius omnibus, basi masculis, pedunculatis; bracteis brevioribus; perigyniis ore albo hyalino; foliis brevioribus.

Anderson says of this species, "Synonyma difficillime extricanda." I have quoted only two, that of *C. misandra*, Brown, and *C. frigida*, Wahl., for both of which I have authentic specimens. I do not quote Schkuhr, C. C. fig. 47, for the figure is certainly not characteristic, and Willdenow and Reichenbach refer it to *C. frigida*, All. Nor do I quote Reichenbach's figure, for, as Anderson says, he has misapplied the names; his *C. fuliginosa*, t. 249, being *C. frigida*, All., and his *C. frigida*, t. 250, being the *C. fuliginosa*, St. and Hop., but not very good. Brown, in his original description of *C. misandra*, alludes to an umbelliferous arrangement in the inflorescence. It is observable occasionally in imperfectly developed specimens, two or three spikes apparently proceeding from one of the upper squamæform bracts. The specimens figured in Tab. CCXII. were from the seacoast of Arctic America,

collected by Sir John Richardson. Ledebour does not include this species in his *Fl. Altaica*, nor have I seen it from the Himalaya. Dr. Gray kindly sent me specimens found by Wright in Arakam-tetchene Island, in Behring's Straits. It was found by all the Arctic travellers and voyagers in America.

Lang considers *C. misandra*, Br., a var. *minor*, and he and Drejer (Rev. p. 54) describe the perigynium "ore albo, non margine albo cincto," as in the European plant, but in specimens from the Alps of Carinthia I observe both characteristics.

195. *C. laxa* (Wahlenberg); spicis 2-3 oblongis remotis ferrugineis, terminali mascula, rarius apice vel basi mascula, reliquis foemineis laxifloris exserte pedunculatis pendulis, infima subinde radicali; bracteis vaginatis, culmo multum brevioribus; stigmatibus 3; perigyniis ellipticis rostellatis, ore integro ferrugineo, obscure nervatis papillois glaucis, squama obtusa vel acuta mutica vel mucronulata ferruginea, nervo pallido angustioribus brevioribus vel subaequantibus.—*C. laxa*, *Wahl. Act.* 156; *Fl. Lap.* 237. t. 15. f. 1; *Willd.* 294; *Schk.* 79 (excl. f. A.A.A. quae *C. rariflora*); *Kunth*, 461; *Fries Summa*, 236; *Lang*, 92; *Anderson*, 36. t. 6. f. 69; *Ledebour, Fl. Ross.* iv. 297. (TAB. CCXIII.)

HAB. In Lapponia et Rossia.

Radix stolonifera, fibris glabris. *Culmus* subpedalis, gracilis, acutangulus, laevis, flaccidus vel firmus; pars spicas gerens 3-10 poll. longa. *Folia* sublineam lata, plana vel conduplicata, culmo multum breviora. *Bractea* vaginata: infima solum spicula longior. *Vagina* infima saepe pollicaris. *Pedunculi* setacei, laeves: infimus $1\frac{1}{2}$ -5 poll. longus. *Spica mascula* 5-7 lin. longa, 1 lin. lata, erecta. *Spicae foemineae* 2-7 lin. longae, 2 lin. latae, glauco-ferruginae, a se 2-6 poll. remotae: summa saepe abbreviata, pauciflora, nunc masculae contigua: infima saepe radicalis. *Squamae* conformes, masculae longiores. *Perigynium* $1\frac{3}{10}$ - $2\frac{2}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, oblongum vel ovale, saepius ellipticum, interdum erostellatum vel repente rostellatum; ore integro vel submarginato, rectum vel subexcurvum; nervis inconspicuis. *Achenium* $\frac{9}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, obovatum, triquetrum, basi styli apiculatum.

All authors admit the resemblance of this rare species to *C. limosa* and its affinity to *C. panicea*. The vaginate bracts and smooth rootlets place it in the *Paniceae*. I have only seen Lapland specimens. M. Spach informs me that in twenty-five specimens from Læstadius, in the Herb. Mus. Paris, nine had one female spike and the others two; in four the lower one was radical. There is occasionally a sterile squamæform bract intermediate between the male and the proximate female spike. Lang says, "Mirum est quod botanici nullum de pube seu tomento tenuissimo fructuum verbum faciunt, qua ratione *C. laxa* ab affinibus optime distinguitur." He alludes to the papillae or granulations which are common to the *Paniceae*. Lang places it with the *Limosae*.

196. *C. livida* (Willdenow); spicis 2-3 rarius 4 oblongis erectis, terminali mascula, foemineis 1-3, superioribus vel omnibus approximatis, inferioribus breve vaginatis infima saepe radicali longissime pedunculata; bracteis vaginatis vel amplectentibus plerumque culmo brevioribus; stigmatibus 3; perigyniis ovatis basi plus minus acutis obtuse triquetris superne vacuis brevissime vel vix rostellatis, glaucis concoloribus vel ore integro ferrugineo, plus minus nervatis, nervis saepe obscuris, granulatis, squama oblongo-ovata obtusa mutica vel mucronata purpureo-sanguinea medio pallida margine hyalina longioribus vel subaequantibus.—*C. livida*, *Willd.* 285; *Schk.* f. 211; *Wahl. Fl. Lap.* 236; *Kunth*, 460; *Fries, Sum.* 236; *An-*

derson, 34. t. 7. f. 74; *Lang*, 94; *Boott, Fl. Bor. Am.* 224; *Carey*, 520; *Tor. Mon.* 417; *Gray, Ann. Lyc. N. York*, iii. 235 (1835); *Sartwell, Exc. n.* 66. *C. limosa*, δ , livida, *Wahl. Act.* 162 (1803). *C. Grayana*, *Dewey*, xxv. 141; *Steudel*, ii. 227. (TAB. CCXIV., CCXV.)

HAB. In Europa et America septentrionali. Lapland, Sweden, Norway, Hudson's Bay, Cumberland and Carlton House, North-west Coast. New Jersey and New York, in peat-bogs.

Radix fibrosa, fibris glabris, stolonifera. *Culmus* 4-12-poll., gracilis, obtusangulus, laevis vel superne acutangulus, scabriusculus. *Folia* 1-1 $\frac{1}{2}$ lin. lata, culmo breviora, firma, stricta, glauca, basi conduplicata, carinata. *Bractea* vaginatae vel amplectentes, culmo breviores vel infima eo paulo longior. *Vagina* 2-4 lin. lata. *Pedunculus* infimus $\frac{1}{2}$ -8-10 poll. longus. *Spica mascula* 5-10 lin. longa, 1-1 $\frac{1}{2}$ lin. lata. *Spicae foemineae* 4-8 lin. longae, 2-2 $\frac{1}{2}$ lin. latae. *Squamae masculae* purpureae, margine albidae, obtusae; nervo, nisi in superioribus, infra apicem evanescente: foemineae saepe pallidiores, muticae vel mucronatae. *Perigynium* (in speciminibus Europæis et Americanis) $1\frac{7}{10}$ - $2\frac{1}{10}$ lin. longum, $\frac{7}{10}$ - $\frac{9}{10}$ lin. latum, ovatum vel ovato-ellipticum, basi plus minus acutum, semper obtuse trigonum, *latius* plus, vel *angustius* minus, turgidum, nervis concoloribus pellucidis saepe obscuris: interdum apice subexcurvum. *Achenium* $1\frac{1}{10}$ - $\frac{3}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, triquetrum, ovale, tenuissime punctulatum, basi styli crassiore apiculatum, pallidum vel castaneum.

The Lapland specimens (Tab. CCXIV.) of this species and the American ones from New Jersey (Tab. CCXV.) exhibit the extremes of its variation. Swedish specimens are like the American plant, while those from Arctic America and the Rocky Mountains resemble those from Lapland. Anderson says, "Lapponiae quum inhabitat paludes, spicas, ob squamas valde fusco-marginatas, habet discoloris, quo magis autem austrum versus Sueciae mediae loca uliginosa occupat, eo pallidior evadit planta."

The Lapland plant has often a shorter culm, though Wahlenberg, in his 'Flora Lapponica' (p. 237) describes it as "plerumque pedalis," the spikes are often approximate, with fewer and lax flowers, and the squamæ are of a darker colour. The perigynia, however, are always trigonous, not "compressa lenticularis" (*Anderson*), nor "planiuscula" (*Wahlenberg*), nor "enervia, angulis carentia" (*Flora Rossica*). The only compressed portion is the upper part above the achenium.

The New Jersey plant has generally a tall culm, which has obtuse angles at the base, the spikes longer and more remote; the male scales, always coloured, often without a mucro; the female ones generally paler; and the achenium with less distinct punctulations.

But these distinctions are not constant, and M. Spach in a note says, "Specimen Friesianum *C. livida*, in Herb. Boott, omnino congruum speciminibus Americanis." In the American plant the female spikes are occasionally abortive. Like *C. laxa*, this species belongs to the *Paniceae*.

197. *C. limosa* (L.); spicis 2-3 laete vel fusco-ferrugineis, terminali mascula erecta oblonga vel cylindrica pedunculata, foemineis 1-2 ovatis vel oblongis saepe apice masculis pendulis; bracteis angustis, culmo brevioribus, auricula ferruginea amplectente vel brevissime vaginante; stigmatibus 3; perigyniis ovatis vel ellipticis compresso-trigonis obscure nervatis glaucis papillois rostellatis, ore integro vel emarginato, squama ovata obtusa mucronata vel acuminata subaequilata fusca vel rutilante, nervo saepe concolori longioribus vel brevioribus.—*C. limosa*, *L. Sp. Pl.* (1763); *Good. Lin. Trs.* ii. 187; *Willd.* 293; *Schk.* f. 78; *Gaud. Agrost.* 157; *Wall. Fl. Lap.* 242; *Smith,*

Eng. Fl. 102; *Eng. Bot. t.* 2043; *Kunth*, 461; *Drejer, Rev.* 51; *Lang*, 91; *Anderson*, 36. *t.* 7. *f.* 73; *Reich.* 17. *t.* 238; *Dewey*, x. 41; *Schw. et Tor.* 358 (*excl. C. lenticularis, Mx.*); *Tor. Mon.* 425; *Carey*, 519; *Sartwell, Ees. n.* 60. *C. elegans, Willd. Act. Berol.* 34. *t.* 1. *f.* 4. *C. laxa, Dewey*, xxvi. 376 (*non Wahl.*). (TAB. CCXVI.)

HAB. In Europa, Asia, et America septentrionali, in limosis. Lapland to Switzerland. Arctic America to Pennsylvania. Rocky Mountains, North-west Coast.

Radix longe repens, articulata, stolonifera: fibris flavidis, lanosis. *Culmus* 1-1½-pedalis, gracilis, erectus vel obliquus, triqueter, scabriusculus, basi foliatus, rudimentisque foliorum ferrugineis tectus. *Folia* angusta, ¼-¾ lin. lata, culmo multum breviora (*sterilia* eo longiora), viridia, glaucescentia, firma, stricta, carinata. *Bractea* angustissima: summa brevi setacea; infima culmo brevior, auricula ferruginea amplectens vel brevissime vaginans. *Pedunculi* setacei, læves, subpollicares vel breviores, læves, apice clavati, triquetri. *Spica mascula* 6-13 lin. longa, 1-1½ lin. lata, arrecta: squamæ masculæ obtusiusculæ vel acutissimæ, mucronatæ, nervo viridi vel concolori: fœmineæ in speciminibus Lapponicis nunc acuminato-cuspidatæ, perigynio longiores. *Spica fœminea* 4-10 lin. longæ, 3-4 lin. latæ, sæpe apice masculæ, a se 6-13 lin. remotæ, pendulæ. *Perigynium* 1³/₁₀-1⁸/₁₀ lin. longum, 1-1⁹/₁₀ lin. latum; formâ varians, subrotundum, ovatum vel ellipticum, compresso-trigonum vel trigono-anceps, antice planum vel plus minus convexum: rostello subinde nullo vel brevissimo, cylindrico vel conico: ore integro, interdum obliquo vel acute vel obtuse emarginato. *Achenium* 1 lin. longum, 1⁶/₁₀-1⁷/₁₀ lin. latum, ovale, triquetrum, faciebus superne gibbis, inferne cavusculis, castaneum, basi styli apiculatum, sæpe ustilagine morbidum.

A *C. livida* abunde differt spicis pendulis, sæpe apice masculis; auricula ferruginea brevissime vaginante; foliis angustioribus; fibris lanatis.

A *C. Magellanica* differt spicis apice (nec basi) masculis, paucioribus, etc.

I have never seen the terminal spike androgynous with male flowers at the top, as noticed by Fries. The female spikes, as in *C. livida*, are occasionally abortive. Smith (*Eng. Fl.* p. 102) says, "Root creeping very extensively, sending forth smooth leafy runners deep into the mud, so that the flowers are rarely produced, at least in Norfolk." Lang (p. 92) says, "Spica fœminea in *C. limosa* maxima ex parte sunt 2; in *C. irrigua* 3; masculæ in *C. limosa* frequenter 2; in *C. irrigua* semper solitaria." I have never seen two male spikes in *C. limosa*, and no other author has noticed them. As to the number of spikes, I find in 119 specimens of *C. limosa*, from various localities in Europe—

3 with 1 spike (male only).
78 " 2
38 " 3
—
119

In 78 American specimens—

1 with 1 spike (male only).
46 " 2
30 " 3
1 " 4
—
78

In 76 European specimens of *C. Magellanica*, I find—

3 with 2 spikes.	51 with terminal spike male.
42 " 3	25 " " male at base.
30 " 4	
1 " 5	
—	—
76	76

In 62 American specimens of *C. Magellanica*—

1 with 2 spikes.	47 with terminal spike male.
26 " 3	15 " " male at base.
33 " 4	
2 " 5	
—	—
62	62

It would appear from the above analysis, that in 197 specimens of *C. limosa* only 68 had two female spikes, while 124 had one. In 138 specimens of *C. Magellanica*, 68 had two and 63 had three female spikes. The specimens figured of *C. limosa* are from Arctic America. The one with unusually long spikes, *C. limosa*, var. *oblonga*,* Dewey, is from New York, varying from the common American form in the length of its spikes.

198. *C. rariflora* (Smith); spicis 3 rarius 2-4 oblongis, terminali mascula erecta pedunculata fusco-ferruginea, fœmineis laxi-paucifloris pendulis piceis approximatis vel infima subremota; bractea infima culmo brevior foliacea vel subulata, auricula purpurea oblonga amplectente vel breve vaginante; stigmatibus 3; perigyniis ellipticis brevissime aut vix rostellatis glaucis, ore integro ferrugineo, subbiconvexis obscure nervatis, squama rotundato-ovata obtusa vel acuta mucronata vel mutica amplectente picea angustioribus brevioribus vel subæquantibus.—*C. rariflora, Smith, Eng. Bot. t.* 2516; *Eng. Fl.* 100; *Anderson, xxxv. t.* 6. *f.* 70; *Lang*, 93; *Drejer, Rev.* 51; *Fries, Sum.* 70. *C. limosa*, var. *rariflora, Wall. Act.* 162; *Fl. Lap.* 242; *Kunth*, 461. *C. stygia?*, var. *rariflora, Fries, Mant.* iii. 142. (TAB. CCXVII.)

HAB. In Europa et America septentrionali. Lapland to the alps of Scotland. Greenland. Canada.

Radix repens, stolonifera: fibris longis, flavidis, lanatis. *Culmus* 4-9-poll., erectus, firmus, obtusangulus, lævis, rarius acutangulus, scabriusculus, basi foliatus. *Folia* ½-1¼ lin. lata, culmo breviora, plana, carinata, firma, superne scabra. *Bractea* antice ligula elongata obtusa purpurea apice pallidiore sæpius breve vaginante vel amplectente instructæ: infima semper culmo brevior, foliacea, vel subulata, subinde brevissima. *Pedunculi* 3-12 lin. longi, læves, superne clavato-triquetri. *Spica mascula* 3-5 lin. longa, 1 lin. lata: squamis masculis imbricatis, obtusissimis, apiculatis vel acutis, mucronatis, fusco-ferrugineis, demum decoloribus. *Spica fœminea* 3-7 lin. longæ, 2-2½ lin. latæ, rarissime apice masculæ: summa subinde brevis, erecta, infima longior: omnes plerumque laxifloræ, rarius subdensifloræ. *Squamæ* fœmineæ obvolventes, piceæ: nervo nunc pallidiore. *Perigynium* 1³/₁₀-1⁷/₁₀ lin. longum, 1⁶/₁₀-1⁷/₁₀ lin. latum, basi attenuatum, spongiosum, biconvexum vel inæqualiter trigonum, obscure nervatum, vel nervis 2 marginalibus prominentibus tenuissime granulatum: *angustius* ellipticum, utrinque acutum, vix rostellatum: vel *latius* ovale vel ovatum, stipitatum, rostellatum: ore integro, purpureo. *Achenium* 1⁸/₁₀-1 lin. longum, ½ lin. latum, oblongum, inæqualiter trigonum, punctulatum, ferrugineum, basi styli apiculatum.

A *C. limosa* differt omnibus partibus (*nisi foliis*) minoribus; culmo plerumque obtusangulo, lævi; spicis pluribus angustis, pauci-laxifloris, rarissime apice masculis; squamis piceis obvolventibus, mucronulatis; foliis planiusculis, parum latioribus; ligula elongata, sæpius vaginante.

In 108 specimens I find—

11 with 2 spikes.	The female very rarely male at top.
83 " 3	In 2 the lower one was radical.
14 " 4	

I have not seen this species from the United States, and I should infer that it is not so common in Arctic America as in Europe. M. Spach says, in a note to me, "Ex speciminibus Lapponicis in

Herb. Mus. Paris, a Læstadio missis, alia culmum præbent obtusangulum, alia acutangulum, angulis scabro-serrulatis." I have observed the same variation in Scotch specimens, all in other respects having the size and character of *C. rariflora*. I am not familiar with the *C. stygia* of Fries, which he describes with an acute-angled smooth culm, and he remarks that he had received it from Finmark, under the name of *C. limosa*. In his Mantissa (iii. 142) he was inclined to consider *C. rariflora* as a var. β of *C. stygia*, but in his Summa (p. 71) he admits both as species. Anderson (p. 35), however, makes *C. stygia* a variety of *C. rariflora*. He says of them: "In *C. stygia*, sub *C. rariflora* proponenda, valde fui dubius, et fateor notas e culmo, fructibus spicisque desumptas, quibus quodammodo diversa videntur, sat esse evidentes. Quum autem non tantum habitu toto externo sed etiam characteribus primariis quibus ab affinibus differunt, valde congruant, differentias quas inter se præbent, ex indole stationis bene esse interpretandas crederem. *C. stygia* enim loca inferalpina Norvegiæ, subalpina Lapponiæ et eximie paludosa Rossia arcticæ inhabitans, staturam sibi præfert altiore, culmum sursum scabriusculum, spicas paulo majores, nec vero ita a proxima *C. limosa* (vel, si herbam adspicias, *C. irrigua*) diversas, ut rarifloras diceres, fructus denique utrinque æqualiter convexos. *C. rariflora* autem loca summa et irrigata alpium præsertim amans, colorem multo fusciorum, culmum magis obtusangulum, herbam minorem, spicasque breviores et magis rarifloras, fructusque ob eam causam subtrigono-vel rotundato-convexos, et rostro paulo evidentiori apiculatos sibi acquirunt."

199. *C. Magellanica* (Lamarck); spicis 3-4 rarissime 2-5 glauco-ferrugineis, terminali mascula oblonga basi attenuata ferruginea vel sæpe basi mascula obovata pedunculata, reliquis foemineis, sæpe ima basi masculis subrotundis vel oblongis pendulis approximatis vel infima subremota; bractea infima foliacea culmum superante, auricula elongata amplectente vel breve vaginante; stigmatibus 3; perigyniis orbiculato-obovatis compressis antice medio gibbis obtusis glaucis papillois, ore integro, utrinque plus minus nervatis stipitatis, squama ovato-lanceolata acuminata læte vel fusco-ferruginea medio trinervi sæpe concolori demum decidua latioribus brevioribus.—*C. Magellanica*, *Lam. Encycl.* iii. 385 (1789); *Willd.* 222; *Schk. f.* 51; *Kunth*, 435. *C. irrigua*, *Smith in Hoppe Caricol. Icon.* 92; *Koch*, 875; *Fries, Mant.* iii. 140; *Anderson*, 36. t. 7. f. 72; *Lang*, 90; *Drejer, Rev.* 51; *Reich.* 17. t. 238; *Eng. Bot. t.* 2895; *Carey*, 519; *Sartwell, Exs. n.* 61. *C. limosa*, β , *irrigua*, *Wahl. Act.* 161; *Kunth*, 461; *Dewey*, x. 41; *Tor. Mon.* 425. *C. limosa*, γ , *irrigata*, *Wahl. Fl. Lap.* 243. t. 15. f. 2. *C. paupercula*, *Mich.* 172. *C. lenticularis*, *Dewey, Sill.* vii. 273. (TAB. CCXVIII., CCXIX., et CCXX.)

HAB. In Europa et America septentrionali et australi. Lapland to Switzerland. Arctic America to Pennsylvania.—Var. β , Fuegia, *Commerson, Captain King, Hombron.*

a. *Radix* repens, stolonifera: fibris flavidis, lanosis. *Culmus* $\frac{1}{2}$ - $1\frac{1}{2}$ -pedalis, triquetus, lævis vel plus minus scaber. *Folia* $\frac{1}{2}$ - $1\frac{1}{2}$ lin. lata, viridia, plana, flaccida, culmo breviora. *Bractea* infima foliacea, sæpe lineam lata, culmo subinde plus duplo longior, rarius eo brevior: superiores setaceæ, auriculis sæpe pallidis. *Pedunculi* setacei, læves. *Spica* terminalis mascula, 4-8 lin. longa, 1 lin. lata, sæpe basi mascula: squamis lanceolatis, acutis, angustioribus. *Spicae foemineæ* 4-8 lin. longæ, $2\frac{1}{2}$ -4 lin. latæ: sæpius omnes vel una alterave ima basi masculæ: infima rarius subradicalis. *Perigynium* $1\frac{7}{10}$ - $\frac{8}{10}$ lin. longum, $1-1\frac{2}{10}$ lin. latum, compressum, ancipiti-trigonum: nervis sæpe apice evanidis: glaucum, demum ferrugineum, granulatum. *Achenium* $1-1\frac{1}{10}$ lin. longum, $\frac{5}{10}$ - $\frac{6}{10}$ lin. latum,

ovali-triquetrum, castaneum, angulis pallidioribus, basi styli apiculatum.

A *C. limosa* differt spicis pluribus, terminalibus vel omnibus sæpe basi masculis; foliis planis, latioribus, flaccidis; bractea infima longiore et latiore; squamis ovato-lanceolatis, acuminatis.

In all, European and American specimens, the female spikes are frequently male at base, and, as in *C. limosa*, the scales are occasionally pallid.

Hoppe ascribes the name of *C. irrigua* to Smith, but I am not aware on what authority. It is not noticed in the 'English Flora,' and did not appear in the Supplement of 'English Botany' till 1845, where Mr. Babington has noticed the existence of male florets at the base of the spikes, a character which separates it essentially from *C. limosa*, and which has not been alluded to generally by authors. Koch refers to it, and Fries, in his Mantissa, iii., alludes to the terminal spike being often "apice foemineam." He adds: "Hoc gramen œconomico respectu summopere insigne, in pratis paludosis sylvaticis Sueciæ occidentalis præstantissimum fœnum offerens, hac ratione omnes alias Carices longe antecellens."

Drejer (Rev. p. 51) remarks that "Specimina Americana majora et vegetiora sunt, quam ulla Europæa, quæ vidi." As in the case of *C. livida*, Lapland specimens (Tab. CCVIII.) contrast with those from America (Tab. CCIX.), but I see no difference as to size in some of the Swedish and English specimens.

In the var. β (Tab. CCXX.) the scales are of a deep purple colour, but I can see no character to justify its separation from *C. irrigua*, which, if priority of names be an inflexible rule, should bear that of Lamarck. M. Spach says, in a note to me, "Specimina in Herb. Mus. Paris sunt 26, quorum 5 a Commersonio lecta (1767); reliqua legit Hombron ad Portum Famine (1840)—

16 = spicis 3. 2 sp. terminali mascula.

10 = " 4. 24 " " basi mascula.

Spicæ laterales sæpe imâ basi masculæ. Differentiæ magni momenti inter hæc et *C. irriguam arcticam* sane vix ullæ statuendæ. Squamæ rigidiores, atro-sanguineæ; perigynium papillosum, ancipiti-trigonum, ut in *C. irrigua*."

In my own herbarium I have five specimens, collected in Captain King's voyage, three of which have four spikes and two have five, all "basi masculæ;" the culm scabrous, as is frequently the case in American specimens.

I have adopted the name of Lamarck, as I cannot see any specific distinction between the Fuegian and the European and American plant; but I have described the last as the typical form, as most generally known, giving a figure of the first as a var. β (Tab. CCXX.).

200. *C. monostachya* (Richard); spica simplici androgyna apice mascula fusco-ferruginea albo variegata nuda; stigmatibus 2-3; perigyniis (immaturis) ovalibus vel obovatis longe cylindrico-rostratis, rostro superne albiohyalino, ore obliquo ciliolato, marginibus superne scabris pallidis enerviis, squama lanceolata inferne fusco-ferruginea apice conspicue albo-membranacea ciliolata angustioribus brevioribusque.—*C. monostachya*, *Rich. Fl. Abyss.* ii. 512. *Uncinia digyna*, *Hochstetter in Schimper Pl. Exs. Abyss. n.* 687 (*Un. Itin.* 1842). *C. parasitica*, *Kunze, p.* 83. (TAB. CCXXI.)

HAB. In Abyssinia, in monte Simensi Silpe, ad fines et supra fines arborum et fruticum, *Un. Itin.* 1842. In turfosis montium omnium Simensium, alt. 11-13,000 ped., *Schimper*, 1845, *Herb. Mus. Paris*. "Nulla inter Abyssiniæ Carices tam alte ascendit."

Cæspitosa. *Radix* fibris crassis sublignosis, pallidis. *Culmus* sub- $1\frac{1}{2}$ -pedalis, acutangulus, firmus, scaberrimus, basi foliatus, rudimentisque foliorum lucidis fuscis rigidis tectus. *Folia* $1\frac{1}{2}$ -2 lin. lata, sub-bipedalia, plana, carinata, rigida,

longe triquetro-attenuata. *Ligula* truncata, pallide membranacea. *Spica* 1½ poll. longa, 2-4 lin. lata, apice subdimidiatim mascula. *Squamæ* acuminatæ fœmineæ; nervo longe infra apicem evanescente: infima major, amplectens, cuspidata: masculæ angustiores, acutiores, demum ad margines albob-membranaceæ. *Perigynium* 2½ lin. longum, $\frac{7}{10}$ -1 lin. latum: rostro e medio sursum albo-hyalino. *Achenium* 1½ lin. longum, $\frac{1}{2}$ lin. latum, obovatum, lenticulare vel trigonum, basi styli incrassata. *Racheola* pallida, ligulata, apice squamæ-formi, ferruginea, contorta, achenio longior. *Stigmata* 2, rarius 3. *Antheræ* longe appendiculatæ.

The largest of the *Psyllophoræ*, and in some respects allied to *C. nardina*, Fries. In some spikes, flowers with 3 stigmas are wanting, and in others they are not so frequent as those with 2. None of the specimens afford mature perigynia. Richard did not detect the racheola, though I have found it in most of the perigynia I have opened.

201. *C. glomerata* (Thunberg); spica ovata vel oblonga densiflora ferruginea, e spiculis 10-12 ovatis arcte congestis vel inferioribus subcompositis subdiscretis plus minus longe setaceo-bracteatis; stigmatibus 2; perigyniis late ovatis acuminato-rostratis bifidis plano-convexiusculis ferrugineis marginibus viridibus superne subalatis serrulatis nervatis, nervis postice sæpe superne evanidis, membranaceis divergentibus, squama ovata acuta cuspidata ferruginea latioribus longioribusque.—*C. glomerata*, *Thunb. Prod.* 14; *Fl. Cap.* i. 344; *Willd.* 232; *Kunth*, 384; *Nees in Linnæa*, vii. 534, x. 203; *non Schk. f.* 41, quæ *C. supina*; *non Host.*, quæ *C. stenophylla*. *C. vulpina*, β *glomerata*, *Wahl. Act.* 144. *C. reflexa*, *Dietr. (sec. Kunth)*. (TAB. CCXXII.)

HAB. In Africa. Cape of Good Hope, *Thunberg*, *Drège*, *Ecklon*, etc. Uitenhage, *Dr. Alexander*.

Radix repens. *Culmus* 8-lin.-1½-ped., triquetus, lævis, firmus. *Folia* 1-1½ lin. lata, culmo breviora vel subæquantia, glaucescentia. *Bracteæ* e basi ovata setaceæ, spiculis breviores vel æquantes: infima nunc spica longior. *Squamæ* omnes acutæ, cuspidatæ. *Spica* 9-12 lin. longa, 4-6 lin. lata. *Spiculae* inferiores 4 lin. longæ, 3 lin. latæ, simplices vel compositæ. *Perigynium* 1 $\frac{9}{10}$ -2 lin. longum, $\frac{9}{10}$ -1 lin. latum, compressum; membranaceum. *Achenium* $\frac{9}{10}$ lin. longum, $\frac{6}{10}$ - $\frac{7}{10}$ lin. latum, suborbiculatum, abrupte apiculatum, basi productum, basi styli clavata.

A *C. vulpina*, L., differt culmo graciliore, lævi; angulis minus argutis; foliis glaucescentibus, angustis; squamis omnibus acutis, cuspidatis; perigyniis membranaceis, compressis, rostro breviora radice repente.

202. *C. rosea* (Schkuhr); spica oblonga vel subelongata pallida, e spiculis 4-8 androgynis apice masculis stellatim rotundatis, superioribus vel omnibus contiguis vel inferioribus plus minus remotis longe setaceo-bracteatis; stigmatibus 2; perigyniis ovalibus acuminato-rostratis bidentatis plano-convexis superne marginibus inflexis acutis scabris enerviis vel rarius leviter nervatis postice basi spongiosis corrugatis pallide viridibus demum castaneis, squama late ovata obtusissima vel infima acuta mucronulata albida subduplo longioribus.—*C. rosea*, *Schk. Z. Z. Z. f.* 179; *Willd.* 237; *Muhl.* 223; *Kunth*, 386; *Ell.* 531; *Dewey*, x. 276; *Schw. and Tor.* 302; *Darlington*, 846; *Carey*, 513; *Sartwell*, *Ews. n.* 24; *Chapman*, 534. (TAB. CCXXIII., Var. β , TAB. CCXXIV., et Var. γ , TAB. CCXXV.)

HAB. In America septentrionali. Canada to Carolina. Columbia River, *Scouler*.

Radix fibrosa. *Culmus* 1-1½-pedalis, filiformis, obtusangulus, apice triquetus, scaber, sæpe demum reclinatus. *Folia* sublineam lata, culmo longiora vel breviora, graminea. *Bractea* infima setacea, plus minus elongata, sæpe spicam superans: altera spiculam æquans vel triplo longior. *Spica* 1-2½ poll. longa, 3-4 lin. lata. *Spiculae* e perigyniis divergentibus stellatim radiatæ, rotundatæ, apice parce masculis, basi flosculis fœmineis 4-12 instructæ, rarius omnes contiguæ: inferiores deorsum plus minus remotæ. *Squamæ* hyalinæ: fœmineæ plerumque obtusissimæ, muticæ. *Perigynium* 1 $\frac{6}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, sæpius enerve, vel leviter nervatum, basi demum spongiosum, corrugatum, membranaceum. *Achenium* $\frac{8}{10}$ - $\frac{9}{10}$ lin. longum, $\frac{6}{10}$ - $\frac{7}{10}$ lin. latum, ovatum, obtusum, pallidum, basi styli conico-incrassata. *Stigmata* brevia, convoluta.

Var. β . *minor*; spiculis 4-6 minoribus discretis; perigyniis magis erectis; squamis sæpius acutis longioribus; stigmatibus longioribus nec convolutis; foliis angustioribus.—*C. retroflexa*, *Muhl. Schw. (ex parte)*. (TAB. CCXXIV.)

Var. γ . *radiata* (Dewey); spiculis 3-4 remotis paucifloris erectis vel patulis; squamis acutis vel obtusis; stigmatibus brevibus convolutis; culmis brevibus capillaceis; foliis angustis.—*C. neglecta*, *Tuck. En.* 19 (*fide spec. authent.*). *C. trisperma*, *Gray, Spec. Ews. n.* 151 (*ex Utica*). (TAB. CCXXV.)

Willdenow referred the "*C. stellulata*, β *radiata*," of Wahl. Act. 147, to *C. rosea*, with a query, and he has been followed more confidently by others. Dewey (*Sill.* vii. 271) notices the position of the male florets as inferior in Wahlenberg's plant, and suggests that it may be referable to *C. scirpoides*, Schk. Probably to that plant or to *C. trisperma*, Dewey.

I suspect the var. β and γ insensibly pass into each other. Tuckerman describes his *C. neglecta* as having the male florets inferior; but I have his original specimens, which are identical with the β *radiata*, Dewey. Schweinitz, from a specimen I have of his, considered the var. β to be *C. retroflexa*; and Muhlenberg (p. 220) describes the "capsula [of *C. retroflexa*] margine glabra et subscabra," the last character being applicable only to *C. rosea* and its varieties.

203. *C. retroflexa* (Muhlenberg); spica oblonga pallide ferruginea, e spiculis 3-6 androgynis apice masculis ovatis contiguis vel inferioribus distinctis plus minus longe setaceo-bracteatis; bracteis deciduis; stigmatibus 2, longis; perigyniis late ovatis brevi-rostratis, vel oblongis longius rostratis bidentatis basi turgide spongiosis ibique nervatis, nervis superne evanidis appressis vel inferioribus retroflexis marginibus lævibus obtusis, squama ovato-lanceolata acuta vel cuspidata decidua pallide ferruginea, nervo viridi vix aut paulo longioribus.—*C. retroflexa*, *Muhl.* 219; *Willd.* 235; *Schk. K. K. K. f.* 140; *Kunth*, 386; *Schw. and Tor.* 301; *Elliott*, 528; *Dewey*, vii. 271, and x. 277; *Carey*, 513; *Sartwell*, *Ews. n.* 26; *Chapman*, 534. *C. rosea*, β et γ ?, *Tor. Mon.* 389. (TAB. CCXXVI.)

HAB. In America septentrionali. New England to Texas.

Radix fibrosa. *Culmus* $\frac{1}{2}$ -1½-pedalis, gracilis, obtusangulus, lævis vel apice scabriusculus. *Folia* $\frac{1}{2}$ - $\frac{3}{4}$ lin. lata, culmo breviora. *Bracteæ* 1-2, elongatæ, basi nervosæ: infima sæpe spica longior. *Squamæ* conformes. *Spica* 6-15 lin. longa, 2

lin. lata. *Spiculæ* ovatae, acutae: superiores vel omnes contiguae; inferiores nunc discretæ, apice sæpe subdimidiatim masculæ. *Perigynium* late ovatum, brevi-rostratum, $1\frac{2}{10}$ lin. longum, $\frac{7}{10}$ lin. latum: vel oblongum, longius rostratum, $1\frac{1}{2}$ lin. longum, $\frac{1}{2}$ lin. latum, basi spongiosum: nunc insolite turgidum: nervis superne evanidis, marginalibus postice visis: marginibus lævibus obtusis. *Achenium* $\frac{7}{10}$ — $\frac{8}{10}$ lin. longum, $\frac{5}{10}$ — $\frac{7}{10}$ lin. latum, ovatum: basi styli conico-incerassata.

The form of the perigynium in the Texan plant is narrower, more oblong, longer rostrate, resembling that of *C. rosea*. In the Rhode Island specimens, which are fully mature, with the scales and bracts often fallen, the perigynium is broadly ovate, with a shorter rostrum; and the ovate spiculæ, with frequently appressed perigynia, contrast very strongly with those of *C. rosea*. The peculiar turgid form of the perigynium is especially observable in the Rhode Island specimens, and I think Schw. and Torrey allude to it in describing the perigynium as "obscurely triangular." The essential character of *C. retroflexa* is in the smooth margins of the perigynium, and the longer acute or cuspidate scales. I suspect in this androgynous group the form of the perigynium is always apt to be modified by the deposition of spongy matter between the surfaces in the fully mature state. The Texan specimens are not as mature as those from Rhode Island, gathered by Mr. Olney.

204. *C. bromoides* (Schkuhr); spica oblonga pallida demum straminea vel ferruginea, e spiculis 4–6 vel 8 contiguis oblongis inæqualibus laxifloris monoicis fœmineis vel masculis, vel androgynis basi vel apice masculis, infima sæpe subremota bracteata; stigmatibus 2, longis gracilibus; perigyniis lineari-lanceolatis longe rostratis, ore integro vel emarginato antice alte fisso, superne marginibus scabris plano-convexis, utrinque nervatis membranaceis basi spongiosis erectis, squama ovato-lanceolata acuminata acuta vel mucronata hyalino-albida, nervo viridi demum pallide ferruginea subæquilata longioribus.—*C. bromoides*, *Schk. f.* 176; *Willd.* 258; *Kunth*, 377; *Muhl.* 219; *Dewey, Sill.* viii. 264; *Schw. et Tor.* 300; *Darlington*, 344; *Elliott*, 528; *Carey*, 539; *Sartwell, Eas. n.* 10; *Chapman*, 533. *C. festucacea*?, *Elliott*, 535. (TAB. CCXXVII.)

HAB. In America septentrionali. British America and Rocky Mountains, *Torrey*. New England to Florida.

Culmus 1–2½-pedalis, acute triquetèr, scaber, debilis, quandoque decumbens, basi foliatus. *Folia* 1 lin. lata, culmo multum breviora: radicalia eum subæquantia, graminæ, plana. *Bracteæ* squamæformes: infima setaceo-cuspidata, spicula quandoque longior, basi amplectens. *Spica* 1–2 poll. longa, 3–5 lin. lata. *Spiculæ* sæpius 4–6, inæquales; extremæ longiores, 6–9 lin. longæ, 2 lin. latæ; intermediæ minores; omnes laxifloræ: distributione staminum variabiles: omnes omnino masculæ, vel fœmineæ, vel androgynæ basi vel apice parce masculæ: sæpe infra spiculam terminalem una vel altera minor mascula: reliquæ fœmineæ. *Spica mascula* brevior, 6–9 lin. longa. *Spiculæ* semper contiguae, ebracteatae. *Squamæ* conformes. *Perigynium* $2\frac{2}{10}$ — $\frac{3}{10}$ lin. longum, $\frac{4}{10}$ — $\frac{5}{10}$ lin. latum, pallidum, demum olivaceum vel ferrugineum, basi demum spongiosum: nervis magis coloratis: ore integro, antice sæpe alte fisso. *Achenium* fere 1 lin. longum, $\frac{4}{10}$ lin. latum, oblongo-ovatum, basi productum, ferrugineum, basi styli incrassata.

The irregular distribution of the stamens in this species has given rise to some discrepancy in the descriptions of those who have noticed it. Willdenow says, "Ab omnibus distinctissima, habitu *C. elongatæ* simillima. Masculæ enim spica, non, ut in reliquis, terminalis, sed sub terminali fœmineâ inserta: valde caudata, ut in fructiferis culmis non obvia, huic faciem androgynarum

specierum dat." This male spicula however is not always present. Willdenow had not seen the entire male spike. Muhlenberg says, "Spica suprema inferne mascula, cæteris 4 et pluribus fœmineis: mediis interdum masculis." Torrey says, "Suprema superne staminifera, cæteris pistilliferis vel androgynis inferne vel superne staminiferis." And again, he says, "Sometimes the upper spikelet is sterile below, the others with sterile florets both above and below: generally there are but about two sterile florets on the summit of each spike: occasionally an entire sterile spike occurs." Carey says, "Some of the central spikes wholly fertile." Darlington says the same. Carey adds, "occasionally dioicous." Elliott (p. 536) says the male florets are sometimes on the summit of the spikes, or occupy nearly the whole of the middle spikes. My authority for both his species is Mr. Curtis.

My own observation accords rather with that of Muhlenberg, except that he does not notice the separate male spike, which I think is found on the same root with the androgynous one.

Willdenow describes the female spikes as "includere subpedunculatis." I have seen nothing to justify this remark beyond the separate spike I have figured with a foliaceous remote bract, having the rudiment of a female spike within its elongated sheathing base.

Tuckerman, I think, correctly, associates this species with *C. Deweyana*. In the form of its perigynium, and in its long gracile stigmata, it is like the *C. longicurvis* of India.

205. *C. desponsa* (Boott); spicis 5–7 cylindricis densifloris erectis rubro-ferrugineis concoloribus, terminali rarius mascula, reliquis vel omnibus apice masculis vel infima interdum omnino fœminea, summis sessilibus contiguis proximis inserte inferioribus longe exserte pedunculatis, basi attenuatis remotis; bracteis vaginatis foliaceis, inferioribus culmo brevioribus vel longioribus; stigmatibus 3; perigyniis ellipticis triquetris longe rostratis, ore bilobato demum alte fisso, marginibus acutis superne serratis utrinque nervatis lucidis glabris, squama ovata acuta vel truncata vel emarginata valide hispido-cuspidata trinervi subæquilata longioribus (TAB. CCXXVIII.)

HAB. In India Orientali, in regione temperata montium Khasiæ, alt. 5–6000 ped., *Dr. Hooker* and *Dr. Thomson*.

Culmus 2–3-pedalis, basi validus, lævis, inter spicas scaber, basi rudimentis foliorum vaginisque rubro-purpureis tectus; pars spicas gerens 9–15 poll. longa. *Folia* 2–2½ lin. lata, culmo longiora vel breviora, plana, supra tuberculato-asperata, firma. *Bracteæ* vaginatae, foliaceæ, spicis longiores: infima nunc culmo longior. *Vagina* infima 1–2 poll. longa. *Pedunculus infimus* 1½–6 poll. longus. *Spicæ* 1–2¼ poll. longæ, 3–3½ lin. latæ: infima rarius basi spicula brevi composita. *Squamæ* conformes, nisi masculæ supremæ acutæ muticæ. *Perigynium* 3 lin. longum, $\frac{9}{10}$ lin. latum: ore bilobato, obtuso, ad margines albo, hyalino. *Achenium* $1\frac{4}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, ellipticum, triquetrum, basi styli æquali (supra basin tumida) apiculatum.

Ad *C. Boryanæ* formas depauperatas accedit. Differt laciniis rostri lobatis, obtusis, intus membranaceis, nec perigyniis punctatis.

It belongs to the *Hymenochlenæ* of Drejer.

206. *C. myosurus* (Nees); spica longissima plus minus composita laxa castanea vel fusco-purpurea, e spicis partialibus pluribus, inferioribus laxissimis remotis basi ramosis longe exserte pedunculatis; spiculis elongatis gracilibus sæpe curvatis apice subdimidiatim caudato-masculis basi demum laxifloris, summis 3–5 simplicibus alternis remotis, inferioribus in ramis plus minus compositis longis insidentibus; rachi superne filiformi nutante; bracteis inferioribus latis culmo longioribus longe

vaginatibus 3; perigyniis ellipticis utrinque acutis vel obovatis triquetris rostratis bifidis leviter nervatis scabris marginibus superne serratis quadrifariis oblique adscendentibus vel subexcurvis pallidis vel fuscis, squama lanceolata acuta brevi-cuspidata dorso striata lævi vel puberula castanea vel purpurea margine superne angusta albo-hyalina longioribus.—*C. myosurus*, *Nees*, *Wight*, *Contr.* 122; *Kunth*, 507. (TAB. CCXXIX.—CCXXXIII.)

HAB. In India orientali. In Himalaya subtropica et temperata. Simla, *Edgeworth*, alt. 5–7000 ped. Kumaon, *Royle*, n. 104. Nepal, *Wallich*, n. 3382, 3384. Sikkim, et Nepal orient., alt. 5–8000 ped., *Dr. Hooker*. Bhotan, *Griffith*. Nilghiri, *Wight*, 1913, etc.

Culmus 5–6-pedalis, validus, basi vaginis ferrugineis reticulato-fissis tectus, apice gracillimus, cernuus, scaber; pars spicas gerens sæpe 4-pedalis. *Folia* 2½–6 lin. lata, longissima. *Bracteæ* summæ squamæformes: superiores setacæ, spicis longiores: inferiores latæ, culmo longiores. *Vagina* infima 4 poll. longa. *Pedunculi* inferiores sæpe pedales, longe exserti: rachis spicarum superne filiformis, cernua. *Spicæ* partiales 10–12, apice spiculis sub-4 simplicibus remotis instructæ, basi deorsum magis magisque ramosæ. *Rami* superiores 3–4, spiculiferi: inferiores elongati, 8–12-poll., cernui, plus minus compositi, laxi: ramuli e vaginulis muticis vel setaceo-cuspidatis egredientes. *Spiculæ* 8 lin. ad 2½ poll. longæ, 1½–2 lin. latæ, basi laxifloræ, rectæ vel curvatæ, omnes apice masculæ; pars staminifera subdimidiam vel partem longiorem vel breviorcm spiculæ occupans. *Squamæ* castaneæ vel fusco-purpureæ, apice ad margines albo-hyalinæ, lanceolatæ vel oblongo-ovalcs; sensim, rarius abrupte, acuminatæ; acutæ, breve hispido-cuspidatæ; dorso puberulæ, medio leviter striatæ. *Perigynium* 1 $\frac{8}{10}$ –2 $\frac{3}{10}$ lin. longum, $\frac{5}{10}$ – $\frac{6}{10}$ lin. latum. *Achenium* 1–1 $\frac{2}{10}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum, ellipticum, breve stipitatum, fuscum; angulis concoloribus, faciebus planis.

Variat colore castaneo vel fusco-purpureo; inflorescentia simplici vel decomposita, semper laxa; perigyniis pallidis vel fuscis, plerumque adscendentibus, vel subexcurvis, nunquam horizontalibus nec rubris nec purpureis lucidisve, semper triquetris, achenium arcte vel laxiuscule vestientibus.

It is impossible within the limits of a single plate to do justice to these fine paniculate species, and in Tab. CCXXIX. I have given a reduced figure of a large specimen from the Pulney Mountains, in the Peninsula of India, sent to me by Dr. Wight, identical with the Dindygul specimen in Herb. Arnott, to show the habit, the proportions being about one-fifth of the natural size; and in Tab. CCXXX. the upper portion of this specimen is represented in its natural proportions. I have since seen specimens from Bhotan, collected by Griffith, with a more diffuse composite inflorescence, the branches in the lower partial spikes being occasionally a foot in length. So variable is the development however that in one of Dr. Wight's specimens the lower spike is reduced to a solitary spicula. The species varies not only in the simple or compound inflorescence, and in the colour of the squamæ, but in the length of the male apex of the spiculæ, in the size and form of the perigynium, and in the breadth of the leaves. In the simpler forms the partial spikes have the spiculæ arranged alternately on an unbranched rachis, or the lower spikes have one or two branches at base, each bearing 1–3 spiculæ; and in the more compound forms several of the lower spikes have several long compound branches, with alternate simple spiculæ at top, and ramuli at the base. The squamæ vary from a pale or light ferruginous, to a dark-purplish colour, appearing the more membranous the paler they are, and they vary from being narrow-lanceolate, gradually acute, to being broader, shorter, obtuse, with an abrupt acumination, and the cuspidate extension of the rib is longer or shorter, rarely at times obsolete.

The pubescence on the dorsum of the squamæ is occasionally indistinct or absent. The perigynium varies from 1 $\frac{6}{10}$ to 2 $\frac{3}{10}$ of a line in length, always triquetrous, and generally closely but sometimes loosely investing the achenium. It is scabrous on the upper part, but judging from the Sikkim specimens, becomes smoother, except at the margins, by age. The erifice I believe is normally acute, but the lacinia, which are serrate, are easily injured, and then the epithet of Nees, "lacinii præmorsis," applies. The spongy base contracts by age and gives an obovate form to it. Its colour is pale or more or less ferruginous at the upper part, or, as in the Sikkim and Bhotan specimens, the entire perigynium is of a dark opaque hue. In Herb. Arnott I observe a specimen from Courtallum, with the unpublished name of *C. æquata*, Nees, which differs in no other respects than that the male apex of the spiculæ is broader than usual, from the loose imbrication of the squamæ. All Dr. Wight's specimens. Wallich's n. 3382, and one of Griffith's, are pale; Dr. Hooker's Sikkim, Mr. Edgeworth's from Simla, Royle's n. 104, Wallich's n. 3384, and Griffith's from Bhotan, are purple.

The specimens figured are,—

Tab. CCXXIX. and CCXXX. From the Pulney Mountains; the same as the Dindygul specimen, n. 1913 in Herb. Arnott (not in Herb. Wallich or Herb. Banks).

Tab. CCXXXI. Specimen from Herb. Wallich, n. 3384; the spiculæ too straight, not showing their tendency to curvature, the inflorescence simple.

Tab. CCXXXII. Specimen from the Nilghiri, n. 1291, Herb. Arnott: the spiculæ with shorter male apices, the perigynia broader, loosely investing the achenium.

Tab. CCXXXIII. Specimen from Sikkim: the inflorescence more composite, and some of the perigynia more obovate than usual.

207. *C. baccans* (Nees); inflorescentia *C. myosuri*, sed brevior densior, spicis partialibus erectis; rachi rigida; spiculis crassioribus strictis congestis plus minus apice masculis; perigyniis turgide ovalibus vel globosis sæpe gibbosis inflatis horizontaliter divergentibus basi obtusis plus minus sæpe abrupte rostratis bifidis rostro deorsum spectante costato-nervosis glabris vel superne scabris, marginibus apice serratis, olivaceis vel flavidis rubro-tinctis demum atro-purpureis lucidis, squama late ovata æquilata obtusa, dorso striato-nervosa puberula cuspidata ferrugineo-purpurea margine albo-hyalina demum decolori longioribus.—*C. baccans*, *Nees*, *Wight*, *Contr.* 122; *Kunth*, 513. *C. curvirostris*, *Kunze*, 79. t. 20. (TAB. CCXXXIV.—CCXXXIX.)

HAB. In India orientali: in regionibus tropicis et subtropicis Himalayæ orientalis ad Sikkim, alt. 2–6000 ped., *Dr. Hooker*. Khasiæ, *Griffith*, *Dr. Hooker*, *Dr. Thomson*. Nilghiri, *Dr. Wight*, n. 1912, etc. Bombay, *Mr. Scott*. Ceylon, *Walker*. Java, *Dr. Horsfield*, *Gæring*. China, *Sir Geo. Staunton* (*Herb. Banks*). Cochin China, *Gaudichaud* (*Herb. Mus. Paris*).

Culmus (pars spicas gerens sesquipedalis), *folia*, *bracteæ*que ut in *C. myosuro*. *Spicæ* partiales inferiores, 6–8 poll. longæ, strictæ, erectæ, pedunculis rigidis. *Spiculæ* subcrassæ, congestæ. *Perigynium* 1 $\frac{6}{10}$ –2 $\frac{2}{10}$ lin. longum, $\frac{8}{10}$ –1 $\frac{2}{10}$ lin. latum, colore formaque varians, vel olivaceum, angulatum, vel flavidum, rubro plus minus tinctum, demum atro-purpureum, inflatum, lucidum, dorso arcuatum, rostro deflexo antice sæpe gibbosum, plus minus apice ad nervos vel inter nervos scabrum, costato-nervosum, nervis demum obsolete; ore, nervis marginalibus excurrentibus, acute bifido. *Achenium* 1 $\frac{2}{10}$ – $\frac{5}{10}$ lin. longum, $\frac{5}{10}$ – $\frac{6}{10}$ lin. latum, ovale vel ellipticum, triquetrum, fuscum, faciebus concaviusculis punctulatum, oblique breve stipitatum; stylo obliquo basi incrassato.

1. Variat inflorescentia laxiore, vel spicis inferioribus elon-

gatis, laxis, ambitu lanceolatis; spiculis apice longe attenuato-masculis; perigyniis olivaceis vel atro-purpureis.—Java, E. Nepal, Khasia.

2. Inflorescentia simpliciore; perigyniis ovalibus, minus turgidis, sæpe oblique adscendentibus, rostro plus minus longo; squamis nunc lanceolatis, acutis.—Myong Valley, E. Nepal, Khasia (Hooker).

3. Inflorescentia densissima; perigyniis globosis, lutescentibus, plus minus vivide rubro-tinctis, transversim corrugatis, demum atro-purpureis.—Khasia, China.

4. Inflorescentia densissima; perigyniis oblongis, (immaturis) olivaceis, angulatis, demum atro-purpureis, inflatis, teretibus; nervis obsoletis, lucidis; spiculis sæpe apice breve masculis; ramis spicarum nunc bracteolis longis setaceis suffultis.—Khasia, Bombay, Nilghiri.

It would be evident to any one, on examining a large suite of specimens of this noble and beautiful species, that these varieties insensibly blend together, there being nothing of a fixed or determinate character in the inflorescence or in the form or colour of the perigynium. I believe the olive-colour to depend on immaturity or on locality. It may be observed on some spikes, the general hue of which is red or purple, and in all cases the eventual colour in old specimens is a dark lustrous purple. The most striking contrast is in the var. 3, the colour of which in Dr. Hooker's specimens is a bright red, or as Gaudichaud says, "d'un rouge de corail," but this colour is more or less mixed with yellow. In Griffith's specimens it is nearly all yellow, or in older ones dark-purple. Sir George Staunton's specimens from China are like Dr. Hooker's, the form of the perigynium in all being globular, with transverse corrugations; but in Gaudichaud's, which have these corrugations, the form is oblong, and the colour a dark-purple.

In Dr. Horsfield's Java specimen, Tab. CCXXXIV., the inflorescence is lax throughout, like that of *C. myosurus*, while in some of Dr. Hooker's and Griffith's this laxity is principally in the lower spikes. I have other specimens, in a young state, from Dr. Horsfield, from Java, with a very dense composite inflorescence; and M. Spach tells me that specimens from Java collected by Gœring and preserved in the Paris Herbarium, are equally dense, but the perigynia, not fully mature, are olivaceous, while Dr. Horsfield's, fully mature, are of a dark purple. In var. 2 the perigynia on some of Dr. Hooker's specimens are only subturgid, and not gibbose, but in others from the same locality, "Myong Valley, E. Nepal," they are more inflated and gibbous, often divergent, with a deflexed rostrum.

There is nothing constant in the length or breadth of the male apex of the spiculæ. In a young state it is shorter and broader from the loose imbrication of the squamæ, but it always contracts, and I suspect elongates by age. But in the same spike, even in age, it varies in length. In all the forms the colour of the squamæ is of a ferruginous purple, with broad hyaline margins, but eventually the colour entirely fades away. The form is generally broadly ovate and obtuse, rarely lanceolate and acute, with a longer or shorter cuspidation.

C. baccans is distinguished from *C. myosurus* by the inflated, coloured, horizontally divergent perigynium, with its deflexed rostrum, and in well-marked specimens by its erect, rigid, compact inflorescence.

Nees founded it on Dr. Wight's specimen n. 1912, which I have seen in Herb. Arnott. In describing the perigynium of *C. myosurus* he says, "fructu trigono gibbo." But this last character does not apply to it. *C. myosurus* was founded on a specimen of Dr. Wight's n. 1913 and Wallich's n. 3384. This last number in Herb. Wallich (Lin. Soc. Herb.) includes *a. C. myosurus*, found by Wallich in Nepal, and *b. C. baccans*, sent to Wallich by Dr. Wight from Dindygul, and I suspect some perigynia of *C. baccans* were sent with n. 3384 to Nees: for in Herb. Wallich there is a small paper packet attached to the specimens, which contains perigynia of *C. baccans* with those of *C. myosurus*. Dr. Wallich does not appear to have found *C. baccans*, and the specimen which he received from Dr. Wight he united as a var. *b.* of his *C. myosurus*.

It is evident also that Dr. Wight did not distinguish them, for while the Dindygul specimen n. 1913 in Herb. Wallich and also in Herb. Banks is *C. baccans*, in Herb. Arnott it is *C. myosurus*, identical with one I have from Dr. Wight, and which is figured in Tab. CCXXXIX. and CCXXX.

C. baccans, like *C. myosurus*, varies in the more or less composite inflorescence, as is the case in all these Indian paniculate species. I was for a long time doubtful what to consider the Java specimen, Tab. CCXXXIV., and the inflated, coloured, divergent perigynium alone led me to refer it to *C. baccans*. In more characteristic specimens, from the compactness of the inflorescence, *C. baccans* often presents a dense mass of coloured baccate fruit 10 to 12 inches in length and from 4 to 6 inches in breadth. As to the rudiment within the perigynium, noticed by Nees, I have observed it occasionally in some of Dr. Hooker's specimens, but its form is so obscure that I have had some difficulty in determining its nature. It has presented the appearance of a broad, ribbed, twisted scale, the existence of pistils alone indicating its nature.

The specimens figured are,—

Tab. CCXXXIV. The Java specimen of Dr. Horsfield, alluded to in var. 1, with the lax inflorescence and slender peduncles, the quadrifarious arrangement of the perigynia, and the long caudate male apex to the spiculæ, thus approaching in habit *C. myosurus*, but with the purple, horizontally diverging, inflated perigynia, and the broad obtuse scale, striate nerves, and broad hyaline margin of *C. baccans*. The perigynium is more or less gibbous, $\frac{8}{10}$ – $\frac{9}{10}$ lin. wide, obtuse at base, with its short oblique stipes; the achenium elliptic, $1\frac{3}{10}$ – $\frac{4}{10}$ lin. long, $\frac{6}{10}$ lin. wide, with an oblique stipes, and a style depressed at base and curved. The spiculæ issue from a spathe or ruptured proliferous perigynium, such as is figured in Tab. CCXXXVIII.

Tab. CCXXXV. Fig. 1, is the lower spike, of a lanceolate outline, of a specimen of Dr. Hooker from E. Nepal, the inflorescence more compound, the rachis stouter, and the male apices of the spiculæ shorter and broader. The perigynia are old, of a spongy texture, rough between the nerves, which are almost obliterated as well as the roughness by age, $1\frac{2}{10}$ lin. wide. The achenium $1\frac{3}{10}$ lin. long, $\frac{7}{10}$ lin. wide. The lower branch of the spike has a bracteola.

Fig. 2 is a spicula from a younger specimen from the same locality, exhibiting the shorter broader male apex. The perigynia on this specimen are of an olive colour, while in some of Griffith's this prevalent colour may be seen passing into red or purple.

Fig. 3 is a portion of a spike and a perigynium from a specimen of Dr. Hooker's from Khasia, alluded to in var. 3. The perigynium is $1\frac{7}{10}$ lin. long, $\frac{7}{10}$ –1 lin. wide, yellowish, tinged with bright red, with transverse corrugations, like the specimens of Sir G. Staunton, from the province of Chiangton, China. The achenium $1\frac{3}{10}$ lin. long, $\frac{6}{10}$ lin. wide. In Griffith's specimens from the same quarter the perigynia are yellow, or in old specimens of a dark lustrous purple, while in Gaudichaud's specimens from Cochin China, the form of the perigynium is oblong.

Tab. CCXXXVI. A specimen of Dr. Wight's from the Nilghiri, with short, comparatively simple partial spikes, and, as Nees says, "inferioribus spicarum geminatis ternatisve." The perigynium $\frac{7}{10}$ – $\frac{8}{10}$ lin. wide, angular, rough, and of an olive colour. That at *a.* young, that at *b.* seen from the posterior surface, with a membrane extending from the lacinia, and as seen from that surface, not showing the curved deflexed rostrum, visible only on a lateral view. In the young perigynia the achenium is $\frac{4}{10}$ lin. wide; but in old specimens, from the same locality, the perigynium is of a dark purple; and specimens of this age are the var. β of Nees, "fructu magis inflato et minus evidenter nervoso, rugoso, crassiusculo."

Tab. CCXXXVII. A specimen of Dr. Hooker's from Khasia, alluded to in var. 2; the perigynia $1\frac{7}{10}$ – $\frac{9}{10}$ lin. long, $\frac{8}{10}$ – $\frac{9}{10}$ lin. wide, less or more turgid and gibbous, with a larger and more gracile rostrum, often obliquely ascending or divergent, of a reddish-ferruginous colour, the orifice showing the exerted marginal nerve, which, broken off, would render it the "lacinia pramorsis" of the *C. myosurus* of Nees. The achenium is shorter, $1\frac{2}{10}$ – $\frac{3}{10}$ lin. long, $\frac{6}{10}$ – $\frac{7}{10}$ lin. wide, and the squamæ are lanceolate and

subacute. Other specimens from the same locality verge more directly into the usual character of *C. baccans*, and in all the rigid erect inflorescence is of that species.

Tab. CCXXXVIII. Is a young plant from the Edinburgh garden, showing the divergent inflated perigynium in this early stage of development. The colour of the perigynium is yellow, tinged with bright red. I have another young specimen from the Leipzig Garden, of the same kind in form and colour, sent to me by Kunze as "*C. Indica*."

Tab. CCXXXIX. exhibits the lower spikes from specimens of Dr. Hooker from Khasia, showing the dense mass of spiculæ with their baccate fruit; the branches of the spikes naked or subtended by long filiform bracteolæ; the spiculæ with longer or shorter male apices. The middle specimen exhibits the occasional depauperate state of the spikes, the lowest reduced to a single spicula. The colour of the perigynia is generally olivaceous, though occasionally tinged with red or purple, and none are fully mature.

It will be evident to any one who examines *C. baccans* and *C. myosurus* that, while they differ in the extreme forms, they occasionally unite in some characters, exhibiting, as Mr. Darwin would say, their descent through modification from a common type.

208. *C. Bengalensis* (Roxburgh); spica elongata straminea concolori, e spicis partialibus singulis (ambitu late ovato) duplicato-vel triplicato-decompositis inferioribus remotis longe exserte pedunculatis erectis; spiculis parvis oblongis numerosis androgynis apice masculis divaricatis, sæpe basi, e squamis sterilibus appressis, attenuatis; bracteis inferioribus longe vaginatis culmum superantibus; stigmatibus 3; perigyniis ovalibus obtuse trigonis subinflatis sessilibus plus minus longe rostratis rectis vel excurvis, ore integro obliquo vel bifido ciliato, valide nervosis glabris vel apice scabriusculis, marginibus superne serratis, olivaceis plerumque purpureo-maculatis demum spongiosis, squama late ovata subinde emarginata glabra vel ad basin spicularum dorso scabriuscula lineolis ferrugineis notata hispido-cuspidata æquilata patenti longioribus.—*C. Bengalensis*, *Roxb. Fl. Ind.* (TAB. CCXL., CCXLI., CCXLII., CCXLIII.)

HAB. In India orientali, in regionibus tropicis et temperatis Himalayæ, Bengalix, et Khasiæ, alt. 6000 ped. Ad Silhet et Khasia, *Wallich, Griffith, Dr. Hooker, Dr. Thomson*. Bhotan, *Booth*. Nepal, *Wallich, n.* 3400 b. (*ex parte*). Kumaon, *Blinkworth*. Simla, *Jacquemont*. Hongkong, China.

Culmus 3-pedalis, obtusangulus, validus, lævis, apice gracilis, scaber; pars spicas gerens 15–18 poll. longa. *Folia* 3–5 lin. lata. *Bractea* inferiores latæ, culmo longiores. *Spica* partiales 2–4 poll. longæ, 1–3 poll. latæ. *Rachis* angulata, scaberrima. *Spiculæ* 3–7 lin. longæ, basi 3 lin. latæ, apice plus minus longe lateque masculæ: *terminales* (sæpe aliæ) basi, e squamis vacuis appressis, steriles et quasi pedicellatæ. *Squamæ* omnes pallide stramineæ, lineolis ferrugineis notatæ: masculæ nunc plures nunc pauciores, arcte vel laxiuscule imbricatæ, mucronatæ, glabræ: fæmineæ late ovatæ, acutæ vel obtusæ, rarius emarginatæ, longius cuspidatæ, glabræ, una alterave solum ad basin spicularum dorso scabriusculæ. *Perigynium* pallide stramineum, sæpe magis conspicue intus (dempto achenio) quam extus purpureo-maculatum, plus minus longe rostratum; ore (in una eademque spica) vel integro, oblique fisso (membrana inter margines usque ad apicem extensa), vel bifido, ciliato; glabrum vel superne inter nervos scabriusculum; marginibus rostri serratis; costato-nervosum, rectum vel excurvum, papilloso-granulatum, sessile: (vix maturum) $1\frac{6}{10}$ lin. longum, plus $\frac{4}{10}$ lin. latum, acute triquetrum, achenium arcte

vestiens: (senile) $1\frac{6}{10}$ –2 lin. longum, $\frac{6}{10}$ – $\frac{8}{10}$ lin. latum, obtuse trigonum, turgidum, subinflatum, spongiosum. *Achenium* $\frac{7}{10}$ – $\frac{8}{10}$ lin. longum, $\frac{4}{10}$ lin. latum, ovale vel ellipticum, acute triquetrum, pallidum, demum atro-purpureum, faciebus concaviusculis, punctulatum; basi styli incrassata.

I have a specimen from Dr. Wallich collected by Mr. Bruce in the Juntea Hill, Khasia, the perigynia in which are not mature, and which from their acutely triquetrous form, closely investing the achenium, contrast with those in the specimens of Griffith, which are old, turgid, and subinflated. I have examined also a very extensive suite of specimens collected by Hooker and Thomson, which are intermediate in point of age, and I cannot detect any essential difference. No dependence can be placed on the greater or less number of the male florets, or on the smoothness or roughness of the perigynium, or on the character of its orifice. I believe the normal state of the orifice is entire, obliquely cut, though in the same spike you observe it distinctly bifid. The same is seen in the spathella or proliferous perigynium at the base of the spiculæ. The existence of sterile squamæ at the base of the spiculæ is not constant. When present, they give a rigid aspect to them, as if supported on short pedicels. In some of Griffith's specimens they are generally absent, and in those specimens which have the male apex of the spiculæ long and broad, the resemblance to *C. condensata*, Nees, is striking. Whether the two plants are specifically distinct I have doubts. The colour of *C. Bengalensis* is lighter; the partial spikes never geminate; the upper squamæ smooth, and the perigynium is smoother, with stronger nerves and a longer rostrum. An authentic specimen of Roxburgh is in Herb. Banks.

The specimens figured are,—

Tab. CCXL. A specimen from Dr. Hooker from East Nepal, with simpler inflorescence, the perigynium and spathella showing what I believe to be the normal state of the orifice: one of the perigynia is morbidly enlarged; the purple spots are often indistinct.

Tab. CCXLI. A specimen from Dr. Hooker from East Nepal, with the perigynium spotted. That at *b.* and *c.* is from the younger specimen from the Juntea Hill, the perigynium closely investing the achenium.

Tab. CCXLII. A specimen from Griffith from Khasia, with the inflorescence more composite, the spiculæ with more numerous male florets; the rostrum longer, sometimes smooth, and a rachæola visible.

Tab. CCXLIII. A specimen from Hongkong, China, more rigid in habit, with turgid vaginæ to the bracts, and bracteolæ to the branches of the spikes; the orifice of the perigynium oblique and entire, as is often the case in the Indian specimens. The nerves of the perigynium and the ferruginous spots, especially observable on its inner surface, and the equal base of the style, separate it from *C. Indica*, L. It is probably the *C. valida* of Nees, and perhaps *C. cruciata*, Wahl. Act. 149 (not of Nees).

209. *C. raphidocarpa* (Nees); spica elongata viridi-ferruginea, e spicis partialibus 4–5 ambitu oblongo-ovato subduplicato-pinnatis composita, inferioribus remotis longe exserte pedunculatis, mediis geminis, rachi pilosa; spiculis latis squarrosis confertis basi flosculis fæmineis pluribus; bracteis vaginatis culmo brevioribus subtus vaginisque pilosis; stigmatibus 3; perigyniis patentibus vel recurvatis ellipticis triquetris longe rostratis, ore obliquo integro demum plus minus bifido, pallidis superne ferrugineis maculatis nervatis glabris vel ad margines sparsim pilosis, squama ovata acuta brevi hispido-aristata lineolis ferrugineis notata glabra latioribus plus duplo longioribus.—*C. raphidocarpa*, *Nees, apud Wight*, 122. (TAB. CCXLIV.)

HAB. In montibus Pulney, Penins. Ind. Or., *Wight*.

Culmus $2\frac{1}{2}$ -pedalis, validus, firmus. *Folia* 3–4 lin. lata,

subtus vaginisque pilosa. *Bractea* vaginatae, culmo breviores. *Pedunculi* $\frac{1}{2}$ –4 poll. longi, pilosi. *Spicae* 2–3 poll. longae, 10–15 lin. latae. *Spiculae* 4–6 lin. longae, 4–5 lin. latae. *Squamae* conformes. *Perigynium* $2\frac{1}{2}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum: rostro $1\frac{3}{10}$ lin. longo. *Achenium* 1 lin. longum, $\frac{4}{10}$ lin. latum, inaequaliter triquetrum, pallidum, stipitatum, basi styli aequali terminatum.

Affinis *C. thyrsoflora*, Boott, et *C. Lindleyana*, N. Differt speciebus majoribus, magis apertis; rachi pilosa; perigyniis minoribus, rostro longiori, sparsim piloso; foliis bracteisque subtus vaginisque pilosis.

210. *C. fissilis* (Boott); spica elongata stramineo-pallida, e spicis partialibus 5–6 ambitu ovato duplicato-pinnatis composita, inferioribus remotis longe exserte pedunculatis, rachi scabra; spiculis oblongo-lanceolatis apice parce masculis; bracteis vaginatis culmo longioribus; stigmatibus 3; perigyniis ellipticis longe rostratis bicuspidatis, laciniis acutis scabris, nervatis excurvis glabris vel marginibus sparsim denticulatis, squama late ovata obtusa subinde emarginata vel subacuta dorso scabra nervata straminea superne albo-hyalina longe hispidaristata angustioribus subduplo longioribus. (TAB. CCXLV.)

HAB. Anuteum, New Caledonia group, *Milne* (*Herb. Hooker*).

Culmus sub-2-pedalis. *Folia* 2–3 lin. lata. *Bractea* culmo longiores. *Spicae* $1\frac{1}{2}$ –3 poll. longae, 1 – $1\frac{1}{2}$ poll. latae: spiculae 4–6 lin. longae, $1\frac{1}{2}$ lin. latae, bracteolis setaceis suffultae. *Squamae* masculae glabrae. *Perigynium* $1\frac{7}{10}$ –2 lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum, rostro $\frac{8}{10}$ lin. longo. *Achenium* $\frac{9}{10}$ lin. longum, $\frac{4}{10}$ lin. latum, ellipticum, triquetrum, fuscum, basi styli apiculatum.

A *C. cruciata*, Nees, differt inflorescentiae colore stramineo; spicis singulis; perigynio bicuspidato, margine sparsim denticulato; squamis foemineis latioribus, brevioribus.

211. *C. spatiosa* (Boott); spica elongata pallide straminea concolori, e spicis partialibus 5–6 (ambitu ovato) subduplicato pinnatim compositis, inferioribus remotis longe exserte pedunculatis; spiculis laxis apice masculis subrotundis divaricatis; bracteis inferioribus latis elongatis longe vaginatis; stigmatibus 3; perigyniis ellipticis triquetris longe rostratis, ore oblique alte fisso, superne scabris marginibus serratis crebre nervosis arcte contiguis patentibus vel subdeflexis, squama lanceolata acuta vel obtusa emarginata pallida nervosa scabra longioribus. (TAB. CCXLVI.)

HAB. In Cochin China, ad Touran, *Gaudichaud* (*Herb. Mus. Paris*).

Culmus sub-2-pedalis, triquetrum, basi foliosus; pars spicas gerens 9–18 poll. longa. *Folia* latissima, 8–10 lin. lata, $\frac{1}{2}$ –2-pedalia, plana, mollia. *Bractea* inferiores 5–8 lin. lata: infima saepe sterilis, culmum aequans: sursum breviores, demum obsoletae. *Spicae* partiales 1–2 poll. longae et latae. *Spiculae* sub-3 lin. longae et latae, saepe basi squamis vacuis appressis instructae, squamae conformes; nisi foeminae infimae subinde emarginatae. *Perigynium* (cum rostro 1 – $1\frac{4}{10}$ lin. longo) $2\frac{7}{10}$ lin. longum, $\frac{7}{10}$ lin. latum. *Achenium* $1\frac{2}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, ellipticum vel oblongo-obovatum; basi styli inerassata.

Affinis *C. cruciata*, Nees; differt foliis bracteisque latis, etc.

I am indebted to M. Spach for the knowledge of this species. He tells me that Gaudichaud remarks on the ticket to the speci-

mens in the Paris Herbarium that the rachis and inflorescence are "colore lacteo insignes."

212. *C. condensata* (Nees); spica elongata ferruginea concolori, e spicis partialibus rarius singulis saepius mediis vel inferioribus inaequalibus geminis (ambitu late ovato), inferioribus remotis longe exserte pedunculatis supradecompositis; spiculis oblongis copiosissimis apice flosculis masculis pluribus basi foemineis 1–4 vel pluribus; bracteis inferioribus longe vaginatis elongatis; stigmatibus 3; perigyniis ovalibus vel ellipticis obtuse trigonis rostratis, marginibus superne serratis, ore oblique fisso bifido, rectis vel subexcurvis plerumque scabris leviter pauci-nervatis plus minus maculatis olivaceis vel fuscis, squama late ovata acuta vel obtusa emarginata cuspidata dorso scabra striata nervosa lineolis ferrugineis notata longioribus.—*C. condensata*, Nees, *Wight, Contr.* 123; *Kunth*, 509. (TAB. CCXLVII., CCXLVIII.)

Var. β ; inflorescentia simpliori.—*C. Indica*, Nees, 123 (*non Linn.*). (TAB. CCXLIX.)

HAB. In India orientali. Kumaon, *Wallich*, 3400 *b.* (*ex parte*). Mussorie, *Royle*, n. 83–89, etc. Almora, *Strachey and Winterbottom*, n. 924. Sikkim, *Dr. Hooker*.

A *C. Bengalensi*, Roxb., differt spicis partialibus saepius geminis, polystachyis, ferrugineis; perigyniis brevius rostratis, plus minus scabris; nervis tenuioribus, paucioribus; squamis scabris.

Nees founded his *C. condensata* on Royle's n. 83 and Wallich's 3400 *b.* *ex parte*. I have figured authentic specimens of both.

Tab. CCXLVII. is a specimen, in flower, from Royle, n. 83. The "rachis sulphureo-hispidissima," as described by Nees, from the pollen diffused over it. The spiculae have 1–3 female florets. From the spathella of one of the terminal spiculae there is a pistillum with its stigmata projecting beyond the bifid apex, showing the nature of this organ as a proliferous ruptured perigynium, bearing occasionally the female organs beyond the usual floral axis.

Tab. CCXLVIII. A specimen from Royle, n. 89, more advanced, the spiculae with 3 female florets, the squamae and perigynium very rough, the nerves slight.

Tab. CCXLIX. A specimen from Wallich, n. 3400 *b.* from Kumaon, with simpler inflorescence. This is the *C. Indica*, Nees (*not Linn.*). The perigynium and squamae are from a more advanced specimen from Almora, Strachey and Winterbottom, n. 924, identical with Wallich's.

C. condensata has often a more diffuse and a less rigid habit of inflorescence than *C. Bengalensis*, and the rachis is very scabrous, and the geminate spikes common. The colour is ferruginous, the spiculae without sterile basal squamae, the female florets few, the squamae as well as the perigynium, in some specimens very scabrous. The perigynium is $1\frac{7}{10}$ – $\frac{8}{10}$ lin. long, $\frac{6}{10}$ lin. broad, unequally triquetrous, the nerves about 2 or 3 on each face, always slight. The achenium is oval-triquetrous, 1 line long, $\frac{1}{2}$ a line wide, and in the specimen of Strachey and Winterbottom it is of a pale straw-colour, faintly spotted, the apex white and somewhat cupped. In Royle's specimen it is more fully mature, of dark purple.

Though this species is common in India, the specimens, easily recognized, are generally too young to afford as satisfactory characters as those of *C. Bengalensis*. I have it thus undeveloped from Dr. Wight, from the Pulney Mountains; from Mr. Edgeworth, from "the Ulkagash range, 5–7000 feet;" Dr. Thomson, August 10, 1847, without any locality; Dr. Hooker, from Lachen. In Royle's *Herb.*, it has the numbers 83, 84, 85, and 89; and I think it is n. 2334 of Jacquemont's list.

From the specimens being generally young, and those of *C. Bengalensis* as generally old, it might be inferred that the dif-

ference between them, as we see them in herbaria, is merely that of age. That age modifies the character in *Carex* is evident, by often adding to the substance of the perigynium, affecting its roughness, frequently its form, colour, and degree of nervation, rendering it more or less turgid, and giving a rigidity to all parts of the plant; and in these puzzling paniculate species, it, and probably locality, give a greater or less luxuriance to the inflorescence, and influence the number of the female florets.

213. *C. Indica* (L.); spica longissima ferruginea, e spicis partialibus subdecem singulis, superioribus contiguis sessilibus (ambitu ovato) pinnatim, inferioribus (ambitu lanceolato) duplicato-pinnatim compositis remotis longe exserte pedunculatis stricte erectis longissime lateque bracteatis; spiculis lanceolatis subdimidiatis vel longius apice masculis basi flosculis fœmineis 2-7 instructis alternis divaricatis; stigmatibus 3; perigyniis ovalibus obtuse trigonis sæpe uno latere gibbosis rostratis, ore membranaceo integro oblique secto, æqualiter crebre valideque nervosis olivaceis glabris vel superne ad margines serratis arcte contiguis rectis vel subexcurvis, squama subrotunda obtusissima vel ovata acuta, plus minus longe aristata ferruginea margine apice albiohyalina glabra striato-nervosa longioribus (aristâ) brevioribus.—*C. Indica*, *Lin. Mant.* 574 (*non aliorum*). (TAB. CCL.—CCLIII., et Var. β , TAB. CCLIV.)

HAB. Ceylon, *Thwaites*; *Stocks* (*Herb. Hooker*). Java, *Zollinger*, n. 311, 318 (*Herb. Mus. Paris*).— β . Ile St. Georges, Archipel des Iles Salomon, *Hombroon* (*Herb. Mus. Paris*). Tenasserim, *Telfer* (*Herb. Hooker*). Feejee group, *Milne* (*Herb. Hooker*).

Culmus 3-pedalis, validus, obtusangulus, lævis, apice acutangulus, scaber, basi reliquiis foliorum fibratis, fuscis, foliisque vaginantibus tectus; pars spicas gerens fere tripedalis. *Folia* 5 lin. lata, culmum subæquantia. *Bractea* infima 5 lin. lata, $2\frac{1}{2}$ -pedalis; superiores obsoletæ; vaginæ ima basi purpureæ. *Pedunculi* inferiores 7-10 poll. longi, apice scabriusculi. *Spicæ* partiales superiores 6, contiguæ, sessiles, ebracteatae, $1\frac{1}{2}$ poll. longæ, subpollicem latæ, divaricatæ: inferiores $2\frac{1}{2}$ -3 poll. longæ, $1\frac{1}{2}$ poll. latæ: a se 5-10 poll. remotæ: infima subradicalis: erectæ, ferrugineæ, concolores, basi ramosæ: rami sessiles, 5-stachyi. *Spiculæ* 6-8 lin. longæ, basi 3 lin. latæ: omnes in spicis superioribus vel ad apicem spicarum inferiorum et in ramis pinnatim dispositæ, alternæ, divaricatæ: pars staminifera apicem dimidiam vel partem longiorem spiculæ occupans: basi flosculis fœmineis 2-7 instructæ: axis scaberrimus. *Squamæ* leviter striato-nervosæ, aliter 1-nervatæ: fœmineæ inferiores subrotundæ, obtusissimæ, longe aristatæ: superiores ovatæ, acutæ: masculæ ovato-lanceolatæ, acutæ vel mucronatæ. *Rachis* angulata, apice setose scaberrima. *Perigynium* $1\frac{9}{10}$ - $2\frac{1}{10}$ lin. longum, $\frac{7}{10}$ - $\frac{8}{10}$ lin. latum, plus minus turgidum, sæpe uno latere gibbosum; rostrum supra ejus basin tumidum. *Achenium* 1 lin. longum, vix $\frac{6}{10}$ lin. latum, ovalitriquetrum, basi productum, faciebus apice convexis basi concavis, flavidum; basi styli persistente, columnari, bulboso-incrassata. *Stigmata* longa.

Var. β , *squamis* fœmineis truncatis emarginatis.

Linnaeus has afforded no evidence whence he received his *C. Indica*. A figure of his specimen from his herbarium in the Linnaean Society is given in Tab. CCL. I was for a long time in search among the various collections from the East Indies for specimens like it, and found none, till Sir W. Hooker sent me a plant collected by Mr. Thwaites, in Ceylon, from which I have made my description of the species. I have since seen, in Sir William's herbarium specimens, found in Ceylon by Mr. Stocks,

in Tenasserim by Helfer, and the Feejee group by Milne, and have been indebted to M. Spach for one from the Salomon Archipelago, found by Hombroon (*Voy. de l'Astrolabe et de la Zélée*); and also from Java, found by Zollinger. I can see no essential difference in these plants to justify their separation from the Ceylon one. No dependence can be placed, in this paniculate group, on the number of the female florets, nor on the form of the squamæ, which in what I have considered as a variety β have a broad truncate or emarginate apex, a character more or less observable in the Ceylon plant. In the Java plant the inflorescence is of a pale straw-colour, the partial spikes rather longer, and the spiculæ of the upper spikes often, and those of the lower always, sterile. In one large entire specimen I can only detect two perigynia; the female scales are acute, and the male *muticæ*, as they are occasionally in Stock's specimens from Ceylon.

Authors have applied the name of *C. Indica* to different plants. That of Lamarck, Wahlenberg, Willdenow, and Schkuhr, was from the Island of Bourbon; that of Kunth from the Mauritius; and that of Nees from the continent of India. A reference to the description of Linnaeus will show that the character given by these authors will not apply to the true *C. Indica*. The "panicula racemis patulis, cui insident spicæ patentes" of Linnaeus, is opposed to the "spicis ramis aggregatis" of Wahlenberg, and to the "corymbis coarctato-pinnatis" of Willdenow and Schkuhr. Schkuhr figures the perigynium as bifid, and Kunth describes it "rostrato bicuspidato." I therefore should confidently refer the *C. Indica* of Lamarck, Wahlenberg, Willdenow, Schkuhr, and Kunth, to *C. Wahlenbergiana*, Boott, and that of Nees to his own *C. condensata*.

The specimens figured are,—Tab. CCL., from *Herb. Linn.*! Tab. CCLI., from Ceylon, *Thwaites*. Tab. CCLII. and CCLIII., from Java, *Zollinger*. Tab. CCLII., the lower portion, and Tab. CCLIII. (the right-hand figure), the upper portion of the same specimen. Tab. CCLIV., var. β , from the Salomon Archipelago, *Hombroon*.

214. *C. Harlandi* (Boott); spicis 2-4 ex albido pallide olivaceis contiguis cylindricis erectis, terminali mascula gracili, reliquis 1-3 fœmineis vel apice parce masculis subcrassis, inferior subremota, omnibus vaginatis inserte pedunculatis; bracteis foliaceis culmo paulo longioribus; stigmatibus 3, sublævibus; perigyniis elliptico-lanceolatis sensim rostratis, ore albo obliquo bidentato, obtuse trigonis superne marginibus oreque scabriusculis crebre striato-nervosis pallide olivaceis, squama oblonga obtusa cuspidata alba nervo viridi latioribus subduplo longioribus. (TAB. CCLV.)

HAB. Hongkong, China, *Dr. Harland* (*Herb. Hooker*).

Culmus 6-14-pollicaris, triquetus, lævis; pars spicas gerens 2-7 poll. longa. *Folia* 10-14 lin. lata, culmo duplo longiora, glauco-viridia, crebre nervosa, marginibus scabris. *Bractea* vaginata, culmo paulo longiora: infima 3 lin. lata: vel in culmis 1-2-stachyis angustæ, spiculis breviores. *Pedunculi* inserti. *Vaginæ* 3-16 lin. longæ. *Spica mascula* straminea, $2\frac{3}{4}$ poll. longa, 1- $1\frac{1}{2}$ lin. lata: subinde abbreviata, 7 lin. longa. *Spicæ fœmineæ* 1-3, quandoque apice parce masculæ, $1\frac{1}{2}$ -3 poll. longæ, 3-4 lin. latæ, masculæ arcte contiguæ, vel infima $2\frac{1}{2}$ poll. remota. *Squamæ* ciliatæ; masculæ obtusæ, muticæ; fœmineæ inferiores, longius cuspidatæ. *Perigynium* 4- $4\frac{8}{10}$ lin. longum, $\frac{9}{10}$ - $1\frac{2}{10}$ lin. latum, rostro demum medio tumente. *Achenium* stipitatum, $2\frac{8}{10}$ -3 lin. longum, 1- $1\frac{1}{10}$ lin. latum, oblongo-obovatum, compresso-trigonum, angulis indentatis, parte styli inferiore persistente ($\frac{8}{10}$ lin. longa), conspicue apiculatum: ejus apex crassior rimâ circulari basin styli deciduam bulbosam cingente. *Stigmata* 3, sublæviva.

This fine species I have named after the late lamented Dr. Harland, to whom we owe its discovery. From the remarkable form of the achenium it is allied to *C. tenebrosa*, Boott.

215. *C. tenebrosa* (Boott); spicis 3-4 fusco-olivaceis elongatis erectis remotis, terminali mascula, reliquis foemineis apice subdimidiatim masculis, inferioribus longe exserte pedunculatis; bracteis vaginatis, spiculis suis brevioribus vel subaequantibus; stigmatibus 3, laevibus; perigyniis e basi acuta ovalibus obtuse triquetris sensim longe rostratis alte bicuspidatis marginibus superne serratis crebro-nervatis glabris fusco-olivaceis, squama late ovata obtusa truncata vel submarginata apice ciliata hispido-cuspidata subduplo longioribus. (TAB. CCLVI.)

HAB. Hongkong, China. Woods in the Happy Valley, *Dr. Harland*.

Fusco-olivacea! *Radix* fibris lignosis, lanuginosis vel laevibus, validis. *Culmus* 2-4-pedalis, gracilis, firmus, laevis, triqueter, inferne foliatus; pars spicas gerens 6-20 pollices longa. *Folia* 2-3 lin. lata, plana, firma, culmo longiora, fusco-olivacea. *Bractea* vaginatae, angustae; vagina infima 1½-3 poll. longa. *Pedunculus* infimus 4-8 poll. longus, scaber. *Spica* mascula 2-3½ poll. longa, 1½ lin. lata: reliquae 1½-3½ poll. longae, basi 6 lin. latae, apice conspicue masculae, a se 3-6 poll. remotae. *Squamae* omnes conformes, fuscae, punctis minutis nigrescentibus obscuratae. *Perigynium* 4½ lin. longum, 1 lin. latum. *Achenium* 2 $\frac{2}{10}$ lin. longum, $\frac{1}{10}$ lin. latum, atro-purpureum, ovale-triquetrum; angulis infra medium incis; basi styli persistente elongata apice annulata conspicue apiculatum. *Stylus* exsertus; ejus basis decidua, clavata. *Stigmata* fusca, laevia.

A *C. Bongardi*, Boott, differt stigmatibus insigniter glabris; colore omnium partium fusco; culmo graciliori, laevi; vaginis bractearum aequalibus; bracteis brevioribus; squamis latioribus, brevioribus.

216. *C. Japonica* (Thunberg); spicis 3-7 cylindricis, terminali mascula gracili sessili, foemineis subcrassis squarrosis olivaceis contiguis divergentibus densifloris sessilibus vel inferioribus pedunculatis; bracteis foliaceis culmo longioribus evaginatibus; stigmatibus 3, longis, aurantiacis; perigyniis ovalibus subtrigonis subventricosis in rostrum saepe apice serratum attenuatis, ore obliquo ciliato bidentato demum bifido vel bilobato, divergentibus vel etiam excurvatim-arcuatis nervatis, squama ovata truncata vel lanceolata acuta hispido-cuspidata alba nervo viridi latioribus longioribusque.—*C. chlorostachys*, *Don*, *Lin. Trans.* xiv. 330; *Prod. Fl. Nip.* 43. *C. Doniana*, *Spr. Syst.* 825; *Nees*, 128; *Kunth*, 503; *Drejer, Symb.* 26. t. 13. (TAB. CCLVII.)

Var. β . *minor*; spicis brevibus oblongis; culmo breviori; foliis angustis.—*C. Japonica*, *Thunb. Fl. Jap.* 38; *Wahl. Act.* 161; *Willd.* 270; *Schk. W. W. f.* 110; *Kunth*, 517.

HAB. In Japan, *Thunberg*, *Morrow*, *Wright*; et in Himalaya centrali et orientali tropica. Nipal, *Wallich*. Sikkim, alt. 1-2000 ped., *Dr. Hooker*.

Repens. *Culmus* 1-2-pedalis, acute triqueter, scaber, rigidus, basi foliosus; pars spicas gerens 3-5 poll. longa. *Folia* 3-5 lin. lata, plana, culmo longiora. *Bractea* evaginatae, inferiores late foliaceae, culmum longe superantes. *Spica mascula* 2-2½ poll. longa, 1-2 lin. lata, demum straminea. *Spica foeminea* 1-2½ poll. longae, 3½ lin. latae, omnes sessiles vel inferiores pedunculatae, evaginatae, infima subinde paulo remota. *Squamae masculae* lanceolatae, mucronatae; *foemineae* inferiores saepe obtusae, truncatae, hispido-cuspidatae, albae, nervo viridi in superioribus excurrente, subulato. *Perigynium* 2 lin.

longum, $\frac{6}{10}$ lin. latum, glabrum vel apice scabrum; ore obliquo, demum bifido; laciniis obtusis vel acutis fimbriolatis. *Achenium* $\frac{9}{10}$ lin. longum, ½ lin. latum, ellipticum, triquetrum, basi styli saepius recta vel obliqua, apiculatum. *Stylus* papuloso-velutinus. *Stigmata* longa, aurantiaca, laxe pilosella.

I am indebted to Dr. Gray for a specimen collected by Wright in Japan, in the North Pacific Exploring Expedition, which exactly resembles the figure given by Schkuhr of *C. Japonica*, and, like that figure, in a young flowering state. I have therefore adopted the name of Thunberg. Specimens collected by Dr. Morrow, and others by Wright in Japan, are identical with those from Nipal and Sikkim. The affinity of the species is with *C. Forsteri* and *C. Pseudocyperus*.

217. *C. alopecuroides* (Don); spicis 4-6 cylindricis densifloris contiguis pallidis, terminali mascula rarius basi mascula vix spicam foemineam supremam aequante, foemineis subgracilibus erectis squarrosis, inferioribus vel omnibus breve pedunculatis, una alterave interdum basi composita, infima subinde remota breve vaginata; bracteis anguste foliaceis culmum longe superantibus; stigmatibus 3, longis; perigyniis ovatis vel ovalibus obtuse trigonis in rostrum breve attenuatis superne ad margines serratis, ore albido bidentato vel bilobato, laciniis laevibus vel ciliatis nervatis divergentibus vel subarcuatis, squama ovata acuminata acuta hispido-cuspidata alba medio viridi dorso saepe scabra latioribus longioribus vel aequantibus.—*C. alopecuroides*, *Don*, *Lin. Trans.* xiv. 332; *Prod. Fl. Nip.* 43; *Nees*, 128; *Drejer, Symb.* 26. *C. Emodorum*, *Spr. Syst.* 818; *Kunth*, 516. (TAB. CCLVIII.)

HAB. In Himalaya centrali et orientali. Nipal, *Wallich*, *Griffith*. Sikkim, alt. 1-2000 ped., *Dr. Hooker*.

Repens. *Culmus* 1-2-pedalis, acute triqueter, scaber, rigidus, basi foliosus, vaginisque pallidis laceratis tectus; pars spicas gerens 1½-4 poll. longa. *Folia* 1-2 lin. lata, culmo longiora, marginibus revolutis. *Bractea* inferiores sublineam latae, culmum longe superantes, subinde breve vaginatae, basi transversim corrugatae. *Spica mascula* 1-1½ poll. longa, sublineam lata, sessilis, rarius apice foeminea. *Spica foeminea* 1-2½ poll. longae, 2 lin. latae, pallide olivaceae. *Squamae* omnes lanceolatae, acutae, hispido-cuspidatae. *Perigynium* 1 $\frac{5}{10}$ - $\frac{6}{10}$ lin. longum, ½ lin. latum; (dempto achenio) luci subjectum, intus punctis ferrugineis maculatum, lucidum, pallidum. *Achenium* perigynio laxo tectum, $\frac{8}{10}$ lin. longum, $\frac{4}{10}$ lin. latum, ovali-triquetrum, punctulatum, ferrugineum, basi styli obliqua vel depressa crassiore apiculatum. *Stylus* laevis.

C. Japonicae arcte affinis! Differt foliis bracteisque angustioribus; spicis foemineis gracilioribus, erectis, subinde omnibus pedunculatis; squamis acutis; perigyniis minoribus nec ventricosis, ore rarius subobliquo, minus alte fisso, plerumque glabro; stylo laevi.

218. *C. Petitiana* (Richard); spicis 8 cylindricis longis crassis multi-densifloris subcomosis remotis ferrugineis, terminali basi mascula sessili, foemineis superioribus approximatis cernuis, inferioribus remotis longe exserte pedunculatis pendulis basi subattenuatis; bracteis inferioribus latis longe vaginatis culmo brevioribus; stigmatibus 3; perigyniis ovalibus vel ellipticis turgidis stipitatis sensim vel abrupte rostellatis, ore integro vel emarginato ciliato, pallidis, rostro ferrugineo, enerviis vel leviter nervatis pellucide demum undique ferrugineo-punctatis, squama lanceolata acuminata vel obtusa ab-

rupte longe valideque hispido-cuspidata ferruginea nervo viridi latoribus brevioribusque.—*C. Petitioniana*, *Rich. Fl. Abyss.* ii. 513. (TAB. CCLIX.)

HAB. In Abyssinia, in montibus provinciæ Onodgerate, *Ant. Petit.* Circa Demergui, ad rupes irriguas, alt. 11,000 ped., *Schimper, n.* 1038, *Nov.* 1852.

Radix crassa, lignosa, repens. *Culmus* 4-pedalis, validus, rigidissimus, triqueter, lævis, basi foliosus, rudimentis foliorum ferrugineis foliisque amplectentibus tectus; pars spicas gerens quandoque tripedalis. *Folia* 4–8 lin. lata, culmum subæquantia, rigidissima, plana, glauca, margine minime scabriuscula. *Bractea* inferiores 4–6 lin. latæ, spicis suis plus minus longiores, longe vaginatae: superiores angustæ, breves, demum evaginatae. *Vagina* inferiores 4–7 poll. longæ, basi ferrugineæ. *Pedunculi* inferiores 7–12 poll. longi, læves. *Spica* 2–4½ poll. longæ, 3–4 lin. latæ, terminalis (vel 3–4 superiores, *sec. Richard*) basi mascula: fœminæ superiores breviores, subsessiles, cernuæ; inferiores 7–9 poll. remotæ, pendulæ, basi subattenuatæ. *Squamæ* conformes. *Perigynium* (cum stipite $2\frac{3}{10}$ – $1\frac{3}{10}$ lin. longo) $1\frac{6}{10}$ – $2\frac{2}{10}$ lin. longum, $\frac{6}{10}$ – $\frac{9}{10}$ lin. latum, enerve vel nervis tenuibus concoloribus inconspicuis notatum. *Achenium* $\frac{9}{10}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum, ellipticum, triquetrum, stipitatum, basi styli apiculatum.

C. pendula, Hudson, maxime affinis!, et pro ejus evolutione maxima forsan habenda. Differt spicis subcomosis, crassioribus, brevioribus, nec basi longe subverticillatim laxifloris, terminali vel terminalibus basi masculis; squamis longe cuspidatis; perigyniis majoribus; foliis rigidis, glaucis.

Variat spica terminali flosculis masculis fœmineisque per totam ejus longitudinem æque dispersis.

Drejer has nowhere, to my knowledge, expressed any opinion as to the group to which *C. pendula* belongs. He has merely remarked that it and *C. strigosa* are to be excluded from his *Hymenochlenæ*. I am always glad to lean on his authority. Both *C. pendula* and *C. Petitioniana*, with several American species, may, I think, be placed in a separate group with *C. strigosa*.

219. *C. Brasiliensis* (St. Hilaire); spicis 9 cylindricis crassis densifloris erectis alternatim contiguis ferrugineis concoloribus, terminali mascula, fœmineis evaginatiss, superioribus sessilibus, inferioribus breve pedunculatis bracteatis; bractea infima foliacea culmum longe superante; stigmatibus 3–2; perigyniis ellipticis vel oblongo-ovatis rostellatis, ore subintegro vel bilobulato ciliato, compressis vel inferne subtriquetris superne vacuis utrinque leviter nervatis glabris vel marginibus dentatis granulatis lineolis ferrugineis notatis, oclusis, squama ovata obtusa vel subemarginata breve hispido-cuspidata ferruginea angustioribus brevioribusque.—*C. Brasiliensis*, *St. Hilaire, MSS.* (TAB. CCLX.)

HAB. In Brasilia australi, prov. Minaes, *St. Hilaire* (*Herb. Mus. Paris*).

Culmus 3–4-pedalis, acute triqueter, validus, superne scaber, basi vaginis rubro-ferrugineis tectus; pars spicas gerens 6 poll. longa. *Folia* 3 lin. lata, culmo breviora, glauca. *Bractea* evaginatae, superiores obsoletæ, infima subpedalis. *Pedunculus* infimus 8 lin. longus. *Spica* mascula 2 poll. longa, 3 lin. lata, breve pedunculata. *Spica* fœmineæ $\frac{1}{2}$ – $2\frac{1}{2}$ poll. longæ, 3 lin. latæ, obtusæ; *secunda* basi spiculis 2 brevioribus aucta, quasi ternata. *Squamæ* omnes conformes. *Perigynium* (vix maturum) $1\frac{6}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, compressum vel inferne subtriquetrum. *Achenium* $\frac{8}{10}$ –1 lin. longum, $\frac{1}{2}$ lin. latum, oblongo inæqualiter trigonum vel lenticulare, sæpe uno

angulo indentatum, basi styli apiculatum, pallidum. *Stylus* medio crassiusculus. *Stigmata* 3 vel 2.

C. glaucescenti, Ell., affinis. Differt perigyniis compressis, minoribus, oclusis, lineolis notatis.

I am indebted to M. Spach for the knowledge of this species, which, as far as I know, has only been found by M. St. Hilaire. It belongs to the *Æorostachyæ* of Drejer.

220. *C. glaucescens* (Elliott); spicis 4–7 cylindricis approximatis, terminali mascula ferruginea, fœmineis ima basi sæpe apice masculis evaginatiss superioribus contiguis sessilibus erectis vel infima subremota longe exserte pedunculata vel omnibus pedunculatis pendulis; bracteis angustis, infima subinde breve vaginata culmo longiore; stigmatibus 3, rarius 2; perigyniis ovatis vel ovalibus triquetris marginibus acutis, vel turgide rotundato-ovatis ventricosis, rostellatis, ore integro vel bidentato, granulatis obsolete vel leviter vel valide nervatis glaucis demum fusco-brunnescentibus glabris divergentibus, squama ovata vel oblonga emarginata vel truncata hispido-aristata rubro-ferruginea medio viridi nervata latoribus longioribus vel aristâ brevioribus.—*C. glaucescens*, *Elliott*, 553; *Dewey*, xi. 150; *Schw. et Tor.* 356; *Tor. Mon.* 425; *Kunth*, 492; *Drejer, Symb. p.* 14. t. 3; *Chapman*, 542. *C. verrucosa*, *Muhl.* 261; *Elliott*, 555; *Kunth*, 460; *Dewey*, xi. 159. *C. glandulosa*, *Elliott, Herb.* (*vide Curtis*). *C. sempervirens*, *Schw. An. Tab.* *C. inundata*, *Willd. Herb.*; *Schlechtendal, Linnea*, x. 267. *C. glauca*, *Bosc. in Herb. Vahl* (*vide Drejer*). (TAB. CCLXI.)

Var. β . androgyna, *Curtis, Sill.* xlv. 84.—*C. verrucosa*, *Dewey*, xlviii. 140; *Chapman*, 542. (TAB. CCLXII.)

Var. γ . polystachya, *Curtis, Sill.* vii. 410 (1849). (TAB. CCLXIII.)

HAB. In America septentrionali. Carolina to Florida.

Culmus 2–3-pedalis vel altior, acute triqueter, validus, superne scaber, basi foliosus, rudimentis foliorum lucidis vaginisque membranaccis ferrugineis laceratis tectus; pars spicas gerens 4–10 poll. longa. *Folia* $1\frac{1}{2}$ –3 lin. lata, clongata, apice longe setaceo-attenuata, culmo longiora vel breviora, glauca, carinata, marginibus scaberrima. *Bractea* angustæ, evaginatae: vel infima breve vaginans, culmo plerumque longior: superiores setaceæ, sursum spicis suis breviores. *Vagina* 3–7 lin. longa, intus ferruginea maculata. *Pedunculi* setacei, $\frac{1}{2}$ – $2\frac{1}{2}$ poll. longi, vel inferiores validi, rigidi, sursum obsoleti. *Spica* mascula 1– $2\frac{1}{2}$ poll. longa, 2– $3\frac{1}{2}$ lin. lata, quandoque subsessilis vel longe pedunculata: altera rarius prope sita, 4 lin. longa, sessilis. *Spica* fœmineæ 9 lin.– $2\frac{1}{2}$ poll. longæ, 2– $3\frac{1}{2}$ lin. latæ: ima basi parce masculæ, sæpe flosculis masculis apiculatæ: omnes erectæ, alternatim approximatae: superiores sessiles, vel omnes longiuscule pedunculatae, pendulæ. *Squamæ* conformes, persistentes. *Perigynium* $1\frac{6}{10}$ –2 lin. longum, $1\frac{1}{10}$ – $\frac{5}{10}$ lin. latum; formâ, nervatione oreque varians, achenium arcte vel laxissime vestiens; ore plane integro vel bidentato, dentibus apertis: nunc obscure vel leviter vel costato-nervatum; nervis sæpe pallidioribus, conspicuis: semper tenuissime granulatum, quasi pruinatum, glaucum, demum fusco-ferrugineum vel brunneum. *Achenium* $1\frac{1}{10}$ – $\frac{3}{10}$ lin. longum et latum, angulis conspicue prominentibus, faciebus concavissimis: vel ovale, $1\frac{5}{10}$ – $\frac{7}{10}$ lin. longum, $\frac{9}{10}$ –1 lin. latum, angulis minus prominentibus, faciebus concavis. In utraque forma angulis ad medium incrassatis.

We are indebted to Dr. Torey and Mr. Curtis for settling the synonymy of this very beautiful species. No author has noticed the male florets at the base of the female spikes, which I find in the

typical form and in the varieties. Mr. Curtis first noticed these variations, in Silliman's Journal, xlv. p. 84. His β *androgyna* (Tab. CCLXII.), he says, "is an autumnal variety, flowering in October, quite polymorphous. The common typical form has but one male spike; sometimes two or more, and then it is the *C. verrucosa* of Elliott." In Silliman, vii. p. 410, he describes his var. γ *polystachya* (Tab. CCLXIII.). "Spikes 8-12, small, nodding, mostly staminate at the apex. Like the var. β , it is an autumnal variety, but much smaller and less showy than the other forms, and is apparently produced by having been cropped early in the season by cattle. It grows by the margins of ponds at Society Hill, South Carolina." The modifications of form in the perigynium I have observed in all the specimens.

Drejer, I think, correctly places it in his *Æorostachya*; Tuckerman, evidently with some doubts, inserts it in his *Acutæ*, considering it allied to *C. glauca*, but he adds, "conf. *C. limosam*." The emarginate aristate squama, and the occasional occurrence of 2 stigmata, I think justify Drejer in his arrangement.

The specimens figured in Tab. CCLXI. are (7 spikes) from Alabama, and (6 spikes) from Florida; in Tab. CCLXII. and CCLXIII., from Carolina (*Curtis*).

221. *C. turgescens* (Torrey); spicis 3-4 contiguus vel distantibus, terminali mascula cylindrica gracili breve pedunculata pallida, fœmineis subrotundis vel oblongis crassis squarrosis aureis, suprema sessili, infima sæpe remota longe exserte pedunculata; bracteis culmo plus minus longioribus vel infima eo brevioribus; stigmatibus 3, aurantiacis; perigyniis ovato-lanceolatis subinflatis sensim rostratis, ore membranaceo emarginato plerumque obtuso ciliato, glabris crebre nervosis demum horizontalibus aureis concoloribus, squama late ovata acuta albida medio pallide viridi nervata plus duplo longioribus.—*C. turgescens*, *Tor. Mon.* 419 (*excl. C. folliculata*, *Ell.*); *Dewey*, iii. 356; *Sartwell*, *Ews. n.* 144; *Chapman*, 544. (TAB. CCLXIV.)

HAB. In America septentrionali. S. Carolina. Georgia and Alabama. Louisiana.

Radix fibris longissimis. *Culmus* subtripedalis, gracillimus, firmus, obtusangulus, lævis, inferne foliatus, basi vaginis foliorum pallidis tectus; pars spicas gerens 2-8 poll. longa. *Folia* 1-2 lin. lata, culmo breviora, carinata, firma. *Bractea* (nisi summa interdum abbreviata) foliaceæ, nunc culmum longe superantes, vel infima eo brevior vel subæquans, sæpe longe vaginans. *Vagina* infima 3-18 lin. longa. *Pedunculus* infimus 4 lin. ad 4 poll. longus, lævis, filiformis. *Spica mascula* $\frac{1}{2}$ -1 $\frac{1}{2}$ poll. longa, 1-2 lin. lata, utrinque acuta, nuda vel bracteata. *Squama mascula* pallidæ, obtusæ, margine membranaceæ, sæpe lineolis ferrugineis sparsis notatæ. *Spica fœminea* 6-11 lin. longæ, 5-7 lin. latæ, 6-15-floræ, summa plerumque sessilis, evaginata, vel binæ superiores breve pedunculatæ, spicæ masculæ arcte contiguæ; infima subinde 8 poll. remota, longe exserte pedunculata, cernua. *Perigynium* 4-4 $\frac{1}{2}$ lin. longum, $1\frac{2}{3}$ - $1\frac{5}{6}$ lin. latum, subcoriaceum, rostro rarius parce dentato oreque subobliquo, nervis concoloribus. *Achenium* $1\frac{5}{10}$ - $1\frac{8}{10}$ lin. longum, 1 lin. latum, ovali-triquetrum, ferrugineum, facibus concavusculis, basi styli persistente paulo crassiore apiculatum.

I am indebted to Mr. Carey for specimens of this plant, which I suspect has occasionally been confounded with *C. Elliottii*, from which it is very distinct, not only in the colour and texture of the perigynium, but in the absence of male florets on the female spikes, and the distinct vaginæ to the bracts. Mr. Carey in eighty-three specimens found three with 2 spikes, sixty-five with 3, and fifteen with 4; all with one male. Its affinity is with *C. folliculata*, L., which species, Mr. Curtis tells me, is the plant so named by Elliott. Torrey had suspected that the *C. folliculata* of Elliott might prove to be *C. turgescens*, Torrey.

222. *C. Elliottii* (Schw. et Tor.); spicis 3-4, terminali mascula cylindrica pedunculata straminea, fœmineis apice masculis subrotundis crassis squarrosis olivaceis contiguus vel approximatis sessilibus evaginatis vel infima inserte, rarius remota longe exserte, pedunculata cernua; bracteis culmo subduplo longioribus; stigmatibus 3, brevibus; perigyniis ovalibus inflatis subtriquetris sensim in rostrum breve attenuatis glabris vel superne parce dentatis, ore bifido, antice plurinerviis divergentibus olivaceis reticulato-punctulatis, squama ovata subacuta vel rotundata obtusa ciliolata albo-hyalina medio viridi nervata latioribus subduplo longioribus.—*C. Elliottii*, *Schw. et Tor.* 357; *Tor. Mon.* 418; *Dewey*, xi. 151; *Kunth*, 499; *Sartwell*, *Ews. n.* 141; *Chapman*, 544. *C. fulva?*, *Muhl.* 246. *C. castanea*, *Ell.* 546. *C. Baldwinia*, *Dewey*, 26, 107! (*fide spec. ab auctore*). (TAB. CCLXV.)

HAB. In America septentrionali. N. Carolina to Florida.

Culmus 2-pedalis, gracilis, triqueter, rigidus, apice scabriusculus, basi foliatus, rudimentisque foliorum vaginisque purpureis tectus; pars spicas gerens plerumque 2 $\frac{1}{2}$ -3 poll. longa. *Folia* 1-1 $\frac{1}{2}$ lin. lata, culmum subæquantia, linearia. *Bractea* 1 lin. latæ, erectæ, culmo longiores, nisi infima, evaginata. *Vagina* 2 lin. longa. *Spica mascula* subpollicaris, 1-2 lin. lata, breve pedunculata, nuda vel bractea lanceolata breviori suffulta. *Squama mascula* lanceolata, straminea, margine albo-hyalina, obtusæ. *Spica fœminea* 6-8 lin. longæ et latæ, apice masculæ: infima breve vaginata, inserte pedunculata, vel remota, longe exserte pedunculata, cernua (*Torrey, etc.*). *Perigynium* $3\frac{2}{3}$ lin. longum, 1 $\frac{1}{2}$ lin. latum, postice 4-5-nerviis. *Achenium* $1\frac{2}{3}$ lin. longum, $\frac{7}{10}$ lin. latum, ovali-triquetrum, punctulatum, ferrugineum, basi styli æquali apiculatum.

I have never seen specimens having the remote cernuous lower spike, as described by Torrey, Elliott, and Muhlenberg. As to its affinity, I think it is more allied to *C. intumescens* than *C. folliculata*, Lin.

223. *C. Schweinitzii* (Dewey); spicis 4-6 cylindricis approximatis densifloris demum stramineis, terminalibus 1-2 masculis vel inferiori basi vel medio et basi fœminea bracteata, fœmineis evaginatis vel inferioribus exserte pedunculatis cernuis sæpe basi compositis; bracteis inferioribus latis vaginatis culmum longe superantibus; stigmatibus 3, brevibus; perigyniis oblongo-ovatis vel ovalibus inflatis in rostrum tenue acuminatis, ore subobliquo bifido, glabris leviter parce nervatis membranaceis divergentibus pallide stramineis, squama lanceolata acuta longe hispido-aristata albida nervo viridi latioribus longioribus vel aristam subæquantibus.—*C. Schweinitzii*, *Dewey*, ix. 68; *Schw. et Tor.* 366; *Carey*, 533; *Kunth*, 518; *Sartwell*, *Ews. n.* 151. (TAB. CCLXVI.)

HAB. In America septentrionali. Canada to New Jersey.

Culmus subpedalis, triqueter, obtusangulus, superne acutangulus, scabriusculus, mollis, inferne foliatus; pars spicas gerens 4-8 poll. longa. *Folia* 2-5 lin. lata, culmo breviora, flaccida. *Bractea* inferiores 2-4 lin. latæ, plerumque plus minus vaginatæ, culmo longiores, infima nunc pedalis. *Vagina* infima 3-15 lin. longa. *Pedunculus* infimus $\frac{1}{2}$ -2 poll. longus. *Spica mascula* 15-24 lin. longa, 1-2 lin. lata, pedunculata, altera paulo remota, sessilis, 6-14 longa, sæpe basi vel medio et basi fœminea, rarius spica suprema apice et basi mascula. *Squama mascula* pallide ferrugineæ, lanceolata, acutæ vel cuspidatæ, margine albo-hyalina. *Spica fœminea*

9 lin.— $3\frac{1}{4}$ poll. longæ, 4—6 lin. latæ: inferiores pedunculatæ, cernuæ: omnes evaginatæ, vel infima vel binæ inferiores exserte pedunculatæ; infima quandoque 3 poll. remota; inferiores sæpe basi ramulis brevibus, e perigynio egredientibus, compositæ. *Perigynium* $2\frac{7}{10}$ — $3\frac{2}{10}$ lin. longum, $\frac{7}{10}$ — $\frac{9}{10}$ lin. latum. *Achenium* $\frac{8}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, ovali-triquetrum, ferrugineum, basi styli apiculatum, stylo supra contorto.

The more immediate affinity of this species, from the aristate squamæ and vaginate bracts, is with *C. tentaculata* rather than *C. vesicaria*, L. I should infer, from the few specimens I have seen, that it is not so common as several of its allies.

224. *C. rostrata* (Michaux); spicis 3—4 approximatis demum flavidis, terminali mascula elliptica inconspicua subsessili, fœmineis subrotundis contiguis squarrosis, inferioribus vaginatis, infima subinde plus minus remota exserte pedunculata erecta; bracteis angustis (nisi summa) vaginatis culmo sæpius multum longioribus; stigmatibus 3, aurantiacis; perigyniis lanceolatis obtuse triquetris basi contractis in rostrum longum lineare scabrum attenuatis, ore bifido, crebre nervosis inferioribus demum horizontaliter patentibus flavidis, squama ovata acuta vel obtusa mutica æquilata pallide ferruginea nervo viridi subduplo longioribus.—*C. rostrata*, *Mich.* ii. 173; *Dewey*, xxxix. 52. *Sartwell*, *Evs. n.* 143 (non *Muhl.*, *Hoppe*, *With.*). *C. xanthophysa*, β et γ , *Dewey*, xiv. 353 (1828). (TAB. CCLXVII.)

HAB. In America septentrionali et Asia. Canada, *Mich.* Base of the White Mountains. N. Hampshire. Lake Avalanche. New York. Kamtschatka (*Fischer*). Japan (*Wright*).

Culmus 12—15-pollicaris, gracilis, obtusangulus, lævis, inferne foliatus; pars spicas gerens 1—5 poll. longa. *Folia* sublineam lata, culmo breviora. *Bractea* angustæ. *Vagina* infima 3—12 lin. longa. *Pedunculus* infimus $\frac{1}{3}$ —2 poll. longus. *Spica mascula* 6 lin. longa, 1 lin. lata, ferruginea, spicam supremam fœmineam vix æquans. In speciminibus Japonicis nunc longior pedunculata. *Squamæ masculæ* lanceolatæ, acutæ, muticæ. *Spicæ fœmineæ* 7—8 lin. longæ et latæ, vel 2 masculæ arcte contiguæ, inferior inserte pedunculata: vel 3, infima $1\frac{1}{2}$ —3 poll. remota, plus minus longe exserte pedunculata, erecta. *Perigynium* 5— $5\frac{1}{2}$ lin. longum, $\frac{8}{10}$ lin. latum. *Achenium* $1\frac{4}{10}$ lin. longum, fere $\frac{8}{10}$ lin. latum, ovali-triquetrum, angulis obtusis, faciebus superne convexiusculis, stylo superne contorto.

This delicate species differs from its allies in its contracted inflorescence, narrow triquetrous perigynium, with its long linear rostrum and muticous scales. It is a more gracile plant than the var. β of *C. folliculata*, the spikes smaller, with fewer and more compact flowers. The perigynia in Tab. CCLXVII. that are underscored are from the original specimens of Michaux, in the *Herb. Mus. Paris.* Kunth however quotes the *C. rostrata*, *Mich.* (from an original specimen), under *C. xanthophysa*, a species not noticed in the *Fl. Bor. Americana.* I infer that he must have been misled by the general resemblance of *C. rostrata* to that plant.

225. *C. folliculata* (L.); spicis 4—5 demum flavidis remotis, terminali mascula elliptica vel oblonga pedunculata bracteata, fœmineis crassis ovatis vel subrotundis squarrosis sæpe longe distantibus, omnibus vel inferioribus exserte pedunculatis erectis; bracteis latis foliaceis vaginatis, omnibus (nisi interdum infima) culmum longe superantibus vel (nisi summa) eo brevioribus; stigmatibus 3, brevibus aurantiacis; perigyniis elongatis lanceolato-

ovatis inflatis in rostrum breve sensim acuminatis, ore bifido, marginibus superne serratis crebre nervosis subcoriaceis, inferioribus horizontaliter patentibus demum flavidis, squama ovato-lanceolata acuminata acuta longe hispido-aristata albida medio viridi nervata carina sæpe scabra longioribus vel aristam subæquantibus.—*C. folliculata*, L.; *Elliott*, 545; *Torrey*, *Mon.* 419; *Gray*, *Ann. Lyc. N. York*, iv. 235; *Carey*, 532; *Sartwell*, *Evs. n.* 142 (non *Wahl.*; *Willd.*; *Schk.*; *N.*; *Kunth*; *Dewey*, x. 32; *Schw. et Tor.*, quæ *C. intumescens*, *Rudge*). *C. folliculata*, β , *Muhl.* 244. *C. xanthophysa*, *Wahl. Act.* 152; *Kunth*, 500; *Dewey*, vii. 274 et xiv. 353; *Schw. et Tor.* 339. *C. louchicarpa*, *Willd. Herb.* (fide *Kunth*). (TAB. CCLXVIII.)

HAB. In America septentrionali. Northern and Middle States, in cedar swamps—VAR. β . Southern States. (TAB. CCLXIX.)

Culmus 2—4-pedalis, obtuse triquetrum, firmus, apice scabriusculus; pars spicas gerens 7—24 poll. longa. *Folia* 3—5 lin. lata, culmo breviora. *Bractea* vaginantes, latæ, in speciminibus inflorescentiâ elongatâ omnes nisi summa culmo breviores. *Vagina* inferiores 1—2 poll. longæ. *Pedunculi* 1—5 poll. longi, seabri. *Spica mascula* 6—11 lin. longa, 2 lin. lata, plus minus (sæpius breve) pedunculata, interdum spicam supremam fœmineam vix superans. *Spicæ fœmineæ* sub 9—12 lin. longæ et latæ, a se sæpe 3—8 poll. remotæ, suprema vel binæ superiores inserte vel omnes exserte pedunculatæ. *Squamæ* omnes hispido-aristatæ. *Perigynium* $5\frac{1}{2}$ — $6\frac{8}{10}$ lin. longum, $1\frac{2}{10}$ — $\frac{6}{10}$ lin. latum. *Achenium* $1\frac{8}{10}$ —2 lin. longum, $\frac{9}{10}$ — $1\frac{1}{10}$ lin. latum, ovali-triquetrum, angulis obtusis faciebus concaviusculis, ferrugineum, lucidum, basi styli apiculatum.

Var. β ; culmo graciliori breviori, foliis bracteisque angustioribus; spicis longioribus, fœmineis laxi-plurifloris; perigyniis angustioribus vix inflatis laxis omnibus demum horizontaliter patentibus basi contractis glabris vel superne serratis, ore obliquo nunc subintegro; squamis ovatis acutis brevioribus muticis vel breve cuspidatis; achenio minori.—*C. folliculata*, *Elliott*, 545; *Chapman*, 544.

Drejer considers this noble species to be the full evolution of his *Spirostachya*, passing through it into *Physocarpæ*. The var. β is no doubt the *C. folliculata* of Elliott, as Mr. Curtis remarks to me that "the southern form has short scales."

226. *C. subulata* (Michaux); spicis 4—6 paucifloris pallide viridibus remotis, terminali mascula parva ovali breve pedunculata, fœmineis apice sterilibus laxis squarrosis magis latis quam longis vaginatis, inferioribus inserte vel exserte pedunculatis; bracteis vaginatis, nisi extremis culmo longioribus; stigmatibus 3, brevibus; perigyniis anguste subulatis elongatis basi contractis in rostrum longum lineare attenuatis postice alte sulcatis bicuspidatis, cuspidibus acutis deorsum reflexis, viridibus glabris nervatis horizontaliter patentibus demum deflexis punctisque ferrugineis maculatis, squama ovata acuminata acuta cuspidata alba nervo viridi æquilata subtriplo longioribus.—*C. subulata*, *Mich.* ii. 173; *Schw. et Tor.* 340. t. 26; *Carey*, 532; *Kunth*, 500; *Kunze*, 157. t. 40; *Sartwell*, *Evs. n.* 145; *Tor. Mon.* 419 et 443; *Chapman*, 543. *C. Collinsii*, *Nuttall*, 205. *C. Michauxii*, *Dewey*, x. 273. (TAB. CCLXX.)

HAB. In America septentrionali. Canada to North Carolina, in cedar swamps.

Culmus 1-2-pedalis, debilis, obtusangulus, lævis, basi vaginis foliorum rubro-purpureis tectus; pars spicas gerens 3-9 poll. longa. *Folia* 1-2½ lin. lata, culmo breviora, graminea. *Bractea* summa setacea, spicam suam vix æquans: aliæ foliaceæ. *Vagina* 3-15 lin. longæ. *Pedunculus* infimus 1-2 poll. longus. *Spica mascula* 3-5 lin. longa, vix 1 lin. lata, pallida, pedunculo 1-10 lin. longo suffulta. *Spicæ fæmineæ* 1-11-floræ, 3-6 lin. longæ, 8-10 lin. latæ: summa subinde 1-2-flora, sessilis, evaginata: vel omnes vaginatae, apice extremo steriles vel masculæ, superiores contiguæ vel omnes 1-4 poll. remotæ, inferiores plus minus longe exserte pedunculatæ, erectæ. *Squamæ* omnes acutæ, cuspidatæ. *Perigynium* 5 $\frac{5}{10}$ -7 $\frac{7}{10}$ lin. longum, $\frac{6}{10}$ latum. *Achenium* 1 $\frac{3}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, lineari-triquetrum, faciebus convexis, stylo contorto, basi ejus recta apiculatum.

This delicate species, which Torrey remarks is never of a yellow colour, is peculiar in the deep sulcus of the rostrum and the subulate reflexed lacinia of the orifice of the perigynium, a character not noticed by Richard. It was not known to Muhlenberg. Mr. Curtis has met with it in North Carolina.

227. *C. Shortiana* (Torrey); spicis 4-5 rarius 3-6 androgynis basi masculis cylindricis vel oblongis arrectis densifloris alternatim contiguis, inferioribus pedunculatis evaginatibus aurantiacis demum fusco-brunneis; bracteis inferioribus foliaceis, infima culmum subæquante; stigmatibus 3; perigyniis subrotundo-obovatis ventricosiss superne compressis abrupte rostellatis, ore integro vel emarginato, marginibus acutis glabris enerviis horizontaliter divergentibus sæpe subexcurvis transversim corrugatis stipitatis, squama ovata vel elliptica mucronulata medio viridi trinervi margine ferruginea latioribus longioribus vel subæquantibus.—*C. Shortiana*, *Torrey*, *Dewey*, 30, 60 (1836); *Drejer*, *Symb.* 12. t. 1; *Carey*, 520; *Sartwell*, *Ews. n.* 64. *C. Shortii*, *Tor. Mon.* 407 (non *Steud.*). *C. aporandra*, *Kunze*, *MSS. in Herb. Hooker.* (TAB. CCLXXI.)

HAB. In America septentrionali. Pennsylvania to Virginia, Ohio, Illinois.

Culmus 1-3-pedalis, triqueter, rigidus, scabriusculus, inferne foliatus, basi rudimentis foliorum fusco-purpureis vaginisque ferrugineis tectus; pars spicas gerens 2-6 poll. longa. *Folia* 2-4 lin. lata, superiora culmo longiora, pallide viridia, demum flavida. *Bracteæ* evaginatæ, inferiores (vel infima solum) foliaceæ, culmo longiores vel breviores: superiores setaceæ, spicis suis breviores. *Pedunculus* infimus $\frac{1}{4}$ -2½ poll. longus, scaberrimus. *Spicæ* $\frac{1}{2}$ -1½ poll. longæ, 2-2½ lin. latæ: summa sæpe basi subdimidiatim mascula, reliquæ parcius masculæ, omnes alternatim contiguæ, vel infima paulo remota quandoque cernua: obtusæ vel flosculis abortivis apiculatæ. *Squamæ* conformes, masculæ longiores, obtusæ, muticæ. *Perigynium* 1 $\frac{1}{10}$ -3 $\frac{3}{10}$ lin. longum, $\frac{9}{10}$ -1 $\frac{1}{10}$ lin. latum. *Achenium* 7 $\frac{7}{10}$ -9 $\frac{9}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, ovali-triquetrum, faciebus convexiusculis punctulatum, fusco-ferrugineum, angulis pallidioribus, basi styli brevis oblique decidua.

We are indebted to Dr. Short for this beautiful species, who discovered it in Kentucky; and it was named after him by Dr. Torrey, whose name is the more appropriate. Dewey, however, alone published it in 1836, under the name of *C. Shortiana*, Torrey. Drejer was inclined to place it in his *Melanantha*, near *C. Mertensii*, an affinity which Torrey also recognizes. If the inflorescence is alone to be considered, that affinity is evident; but I

rather incline to the opinion of M. Spach, who in a note to me remarks, that the "proxima affinitas est cum *C. glaucescente*, Elliott." The remarkable diaphanous tenuity of the perigynium in *C. Mertensii*, and its deep-coloured squamæ, separate it from *C. Shortiana*, and ally it to *C. Banksii*.

228. *C. debilis* (Michaux); spicis 4-5 rarius 6 cylindricis gracilibus pedunculatis pallidis, terminali tenui mascula vel apice extremo fæminea, reliquis fæmineis laxifloris longe setaceo exserte pedunculatis nutantibus, inferioribus remotis basi sparsifloris interdum compositis; bracteis vaginatibus culmo longioribus vel brevioribus; stigmatibus 3; perigyniis fusiformibus plus minus suburgidis utrinque acutis sessilibus rostratis, rostro apice albo-hyalino margine sæpe scabro, ore obliquo bilobo (laciniis membranaceis obtusis ciliatis), tenuiter nervatis nervis sæpe superne evanidis vel inconspicuis pellucide punctatis viridibus demum castaneis vel olivaceis ferrugineo-punctatis, squama albida vel ferrugineo-tincta oblonga obtusa mutica, nervo viridi scabro infra apicem late albo-hyalinam ciliatam evanescente, vel ovata rarius lanceolata acuta vel cuspidata latioribus plus minus longioribus.—*C. debilis*, *Mich.* l. c. ii. 172 (1803); *Tor. Mon.* 416; *Carey*, l. c. 527; *Darlington*, *Fl. Cest. ed.* 3. 352; *Chapman*, 541; *C. tenuis*, *Rudge*, *Lin. Trans.* vii. 97. t. 9. fig. 2 (1804). *C. flexuosa*, *Muhl.* 253; *Willd.* iv. 297 (1805); *Schk. f.* 124; *Kunth*, 471; *Dewey*, *Sill.* x. 40; *Schw. et Tor.* 351. (TAB. CCLXXII.)

HAB. In America septentrionali, in sylvis humidis et pratis. Norway House, *Richardson*. New England to Pennsylvania and south-westward, *Carey*. Mountains of Carolina and Georgia, *Buckley*.

Var. β ; spicis 5-7 erectis, terminali mascula vel medio vel basi vel apice et basi mascula, fæmineis linearibus angustis flosculis alternatim dispositis, inferioribus sæpe basi compositis; perigyniis brevioribus, rostro rarius scabro, squama oblongo-ovata obtusa vel acuminata acuta mutica ciliata subæquilata longioribus. (TAB. CCLXXIII.)

HAB. New York, *Sartwell*, *Ews. n.* 118. Pennsylvania, *Townsend*.

Var. γ ; spicis 4-5 ferrugineis, terminali mascula albida, reliquis fæmineis, inferioribus basi laxifloris erectis vel nutantibus; perigyniis angustioribus longioribus, rostro apice alte albo-hyalino sæpe scabro, ferrugineo-punctatis, squama lanceolata obtusa ciliata vel infima acuminata acuta rarius cuspidata albida, nervo viridi scabro plus duplo longioribus. (TAB. CCLXXIV.)

HAB. Louisiana, *Dr. Hale*. New Orleans, *Drummond*, n. 435.

Var. α . *Culmus* 1-2-pedalis, debilis, apice setaceus, scaber, basi rudimentis foliorum purpureis glabris vel puberulis tectus; pars spicas gerens 5-16 poll. longa. *Folia* 1-2 lin. lata, culmo breviora vel æquantia, supra scabra, vaginæque inferiores sæpe puberulæ. *Bracteæ* (nisi suprema) vaginatæ, omnes sæpius culmo longiores. *Vagina* infima 1-2½ poll. longa, intus sæpe (sub lente) puberula: suprema plerumque obsoleta. *Pedunculi* setacei, scabri: infimus interdum 5-6 poll. longus. *Spica* terminalis mascula, 8 lin. ad 2 poll. longa, $\frac{1}{2}$ lin. lata, basi laxiflora, pedunculata: sæpe apice extremo fæminea. *Spicæ fæmineæ* 1-2½ poll. longæ, 1-2 lin. latæ, nutantes, apice flosculis imbricatis basi alternatim remotiusculis instructæ: in-

feriores sæpe basi compositæ. *Squamæ* omnes albidæ, ferrugineo-tinctæ, obtusæ, muticæ, nervo viridi scabro infra apicem hyalinam ciliatam evanescente: vel fœmineæ inferiores rarius omnes lanceolatæ, acutæ, vel cuspidatæ. *Perigynium* $2\frac{6}{10}$ –3 lin. longum, $\frac{6}{10}$ – $\frac{8}{10}$ lin. latum; ore semper albo-hyalino, facile rupto; laciniis plerumque obtusis, ciliatis; rostro ad margines sæpe scabro. *Achenium* 1 – $1\frac{1}{10}$ lin. longum, $\frac{6}{10}$ – $\frac{7}{10}$ lin. latum, obovatum, longe stipitatum, triquetrum, castaneum, punctatum. *Stylus* flexuosus.

Var. β . *Perigynium* $2\frac{8}{10}$ lin. longum, $\frac{6}{10}$ – $\frac{7}{10}$ lin. latum. *Stylus* basi obliquus vel depressus.

Var. γ . *Perigynium* 4 – $4\frac{4}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, stipitatum. *Stylus* flexuosus.

I am not aware how far south the typical form extends. I have not seen any specimens of it south of Pennsylvania, except that of Buckley from the mountains of Carolina and Georgia; and though Elliott inserts the species in his 'Flora,' I do not quote him, as the specimen in his herbarium, under the name of *C. flexuosa*, was received from Muhlenberg, and no particular locality is given by Elliott for the species. Mr. Curtis informs me that the *C. digitalis* of Elliott's herbarium is also *C. debilis*, received from Dr. Torrey.

Between α and β there are intermediate forms, which insensibly unite them. The specimens figured (Tab. CCLXXXIII.) are from Mr. Sartwell. They approach *C. arctata*, but the scales and the sessile perigynium, with its acute base, at once distinguish them. The var. γ is in aspect different from many of the northern forms, and has a longer and narrower perigynium. It approaches *C. venusta*, especially the var. γ of that species, from which it differs in having a smooth perigynium. From the typical form of *C. venusta* it differs also in its longer rostrum, bilobed orifice, and more delicate nerves. It may, however, hereafter be judged to be rather a variety of *C. venusta* than of *C. debilis*. There are northern specimens differing from it only in having a shorter perigynium. Buckley's specimen differs only in this respect. In the typical form (Tab. CCLXXII.) the female spikes vary in length and breadth, more or less loosely flowered, erect-nutant, or the lower ones pendulous: the female scales vary in their length as compared with the perigynium, and in being more or less obtuse or acute. In the northern specimens, as compared with the var. γ , they are often acute or subacute, especially the lower ones, or lanceolate-acuminate, as long, or nearly as long, as the perigynium. The perigynium not only varies in length and breadth, but in the proportion between its body and rostrum. Two perigynia, of the same length, will thus differ in form; what in the one is added to the rostrum will be taken from the body of the perigynium, or the reverse. In some specimens the perigynium is narrower, closely applied to the achenium, assuming its triquetrous shape; or broader, tumid, and less triquetrous. The orifice is always hyaline, sometimes merely emarginate; at others, distinctly bilobed, the lobes ciliate and obtuse, especially on a lateral view of them. The lower sheaths are smooth, or more or less puberulent, the membranous portion closely beset with ferruginous spots. These spots are more distinct on the perigynia of the var. γ than on those of the more northern forms. It would be easy to select well-marked specimens of *C. debilis*, and make species of them; but I believe any one who will patiently study its variations will be convinced that all the forms are referable to one species, and I suspect a more enlarged acquaintance with the southern forms will show that they pass insensibly into those of the north, with which at present we are most familiar. We want to be better informed on the subject of *C. venusta*, and to understand more clearly its relation to *C. debilis*, or the degree of its own variableness.

229. *C. glabra* (Boott); spicis 4–5 oblongis vel cylindricis pedunculatis pallidis, terminali apice vel basi vel apice et basi rarius omnino mascula, reliquis fœmineis subdensifloris, superioribus approximatis inferioribus longe exserte pedunculatis nutantibus basi attenuatis laxifloris interdum compositis, infima remota; bracteis

vaginatibus culmum subæquantibus; stigmatibus 3; perigyniis triquetris turgidis lanceolato-ellipticis utrinque acutis vel rostellatis glabris, ore bidentato, (laciniis acutis) nervatis nervis prominentibus pellucide punctatis viridibus, squama ferruginea medio viridi nervata scabra ovato-lanceolata acuta vel mucronata rarius obtusa ciliata latioribus subduplo longioribus. (TAB. CCLXXV.)

HAB. In America septentrionali, New York, *Knieskern*.

Culmus $1\frac{1}{2}$ – $2\frac{1}{2}$ -pedalis, apice setaceus, scaber; pars spicas gerens 4–9 poll. longa. *Folia* $1\frac{1}{2}$ lin. lata, supra vaginæque inferiores scabriusculæ. *Bractea* (nisi suprema) vaginata, culmum subæquantibus, vel infima nunc eo brevior. *Vagina* infima sub 2 poll. longa, scabriuscula. *Pedunculi* setacei, scabri, 2–3 poll. longi. *Spicæ* 8–21 lin. longæ, 2 lin. latæ. *Squamæ* ferruginæ, medio viridi nervatæ, scabræ: masculæ lanceolatæ, obtusæ, muticæ, apice ciliatæ: fœmineæ acutæ vel obtusæ, mucronatæ. *Perigynium* $2\frac{7}{10}$ –3 lin. longum, $\frac{8}{10}$ – $\frac{9}{10}$ lin. latum, bidentatum, laciniis acutis (nec membranaceis), nervis usque ad apicem conspicuis. *Achenium* 1 lin. longum, $\frac{6}{10}$ lin. latum, ovali-triquetrum, stipitatum, basi styli apiculatum, flavidum.

A *C. oxylepide* differt culmo, foliis pedunculisque glabris (nec pilosis); perigyniis majoribus; squamis mucronatis; spicis inferioribus nutantibus, compositis.

A *C. formosa* differt spicis inferioribus, omnino fœmineis, etc.

A *C. debili* differt perigyniis rostellatis, ore acute bidentato nec hyalino, magis turgidis; nervis validioribus; squamis firmioribus.

I have received this species under the names of *C. formosa* and *C. debilis*. The absence of the subelongate rostrum and of the hyaline obtuse orifice separates it from *C. debilis* and its allies. It has hitherto escaped the notice of American botanists, and its value as a species must be determined by future observation. On showing it to Mr. Carey, he was of opinion that it belonged to his *Gracillimæ*, judging from the orifice of the perigynium. I have not been able to connect it with any known species of that group.

230. *C. retrorsa* (Schweinitz); spicis 5–8 cylindricis densifloris contiguis olivaceis demum flavescentibus, terminalibus 1–4 masculis sessilibus gracilibus vel summa sæpe medio vel apice fœminea, aliisque basi fœmineis, reliquis fœmineis 4–5 crassis squarrosis oblique divergentibus, superioribus sessilibus evaginatibus, omnibus contiguis vel infima plus minus vaginata exserte pedunculata distantibus sæpe basi composita; bracteis inferioribus latis longissimis, infima plus minus longè laxèque vaginata; stigmatibus 3, brevibus; perigyniis ovatis vel ovalibus inflatis sensim in rostrum tenue acuminatis, ore bifurcato, horizontaliter patentibus vel recurvis glabris nervatis membranaceis; squama lanceolata obtusiuscula vel acuta mutica vel mucronata ferruginea apice albo-hyalina medio viridi nervata latioribus longioribus.—*C. retrorsa*, Schw. An. Tab.; Schw. et Tor. 366. t. 28 (bona); Dewey, ix. 67; Carey, 533; Sartwell, Exs. n. 150; Kunth, 503 (non Nees). *C. reversa*, Sprengel. (TAB. CCLXXVI.)

HAB. In America septentrionali. Canada to Pennsylvania. Wisconsin and North-west Coast (*Douglas*).

Culmus 2-pedalis, validus, triquetrus, superne scabriusculus, inferne foliatus; pars spicas gerens $2\frac{1}{2}$ –12 poll. longa. *Folia* 2–4 lin. lata, culmo longiora, nodosa. *Bractea* inferiores latæ, longissimæ: infima quandoque bipedalis, plus minus vaginata.

Vagina 3-12 lin. longa, laxa. *Pedunculus* infimus $\frac{1}{2}$ - $2\frac{1}{2}$ poll. longus. *Spica mascula* suprema 1-3 poll. longa, $1\frac{1}{2}$ lin. lata: aliae breviores, sessiles, contiguæ: omnes sæpe flosculis fœmineis basi vel medio vel apice instructæ: inferiores plerumque e perigynio, sæpe disrupto, egredientes. *Spica fœminea* $1\frac{1}{2}$ -3 poll. longæ, 6-9 lin. latæ, plerumque arcte contiguæ vel infima $1\frac{1}{2}$ -8 poll. remota: omnes evaginatae vel infima plus minus longe vaginata, exserte pedunculata: sæpe vel binæ inferiores basi ramulis 1-2 brevibus compositæ. *Squamæ* conformes, muticæ, lanceolatae, apice albo-hyalinæ: vel fœmineæ superiores mucronatæ. *Perigynium* $3\frac{3}{10}$ - $4\frac{3}{10}$ lin. longum, $1\frac{3}{10}$ lin. latum. *Achenium* $1\frac{1}{10}$ - $\frac{3}{10}$ lin. longum, $\frac{6}{10}$ - $\frac{7}{10}$ lin. latum, ovali-triquetrum, punctulatum, late stipitatum, basi styli crassiore contorto-apiculatum.

Variat foliis angustis, 1 lin. latis.—Canada, *Bourgeau*.

In the proliferous perigynia, from which some of the male spikes and the ramuli of the female ones issue, we occasionally find not only the exserted axis bearing florets, but the usual female floral organs, showing that the racheola, so often met with within the perigynium of other species, is a rudimentary axis. This fine species belongs to the *Vesicariae*.

231. *C. tentaculata* (Muhl.); spicis 3-5 stramineis vel olivaceis approximatis, terminali mascula gracili subsessili cylindrica, fœmineis oblongis vel cylindricis crassis squarrosis obliquis vel divergentibus densifloris sessilibus evaginatæ vel inferioribus inserte vel exserte breve pedunculatis, infima sæpe subremota; bracteis foliaceis culmum longe superantibus; stigmatibus 3, brevibus; perigyniis ovalibus vel obovatis basi acutis sessilibus inflatis membranaceis in rostrum longum lineare attenuatis, ore obliquo emarginato vel bifido rarius integro, glabris vel ore rostroque scabris 8-10 nervatis, squama parva oblonga acuta vel truncata vel emarginata apice sæpe ciliata longe hispido-aristata alba medio viridi multum longioribus latioribusque.—*C. tentaculata*, *Muhl.* 239 (*excl. C. rostrata*, *Mich.*); *Schw. et Tor.* 335; *Dewey*, x. 34; *Elliott*, 543; *Carey*, 531; *Sartwell*, *Eas. n.* 137; *Chapman*, 543. *C. rostrata*, *Willd.* 282 (*non Michaux*); *Schk. H. H. H. f.* 134; *Kunth*, 496. (TAB. CCLXXVII.)

HAB. In America septentrionali et meridionali. Canada to Georgia and west to Arkansas (*Torrey*). Venezuela, *Fendler*, n. 1579 (*Herb. Gray and Hooker*). Andes of Quito. Ad ripam fl. Cosanga, 7000 ped., *Jameson*, 750 (*Herb. Hooker*).

Var. β . *gracilis*; spicis fœmineis 2 minoribus crectis; foliis angustioribus; culmo sæpe brevi.

HAB. Tennessee, *Lesquerieux*. Vermont, *Chapman*.

? Var. γ . *altior*; culmo bipedali; perigyniis $5\frac{1}{2}$ lin. longis $1\frac{7}{10}$ lin. latis basi ovatis stipitatis, nervis pluribus (16-18) quibusdam superne evanidis, ore altius bifido rostroque sæpius scabris; achenio abortivo.—*Sartwell* (*var. rostrata*, n. 138; *Schk. G. G. G. f.* 130? (TAB. CCLXXVIII.)

HAB. Penn-yan, *Sartwell*.

Culmus 12-15-pollicaris, triquetrum, rigidus, lævis vel apice scabriusculus, inferne foliatus, basi vaginis foliorum purpureis reticulato-fissis tectus; pars spicas gerens 2- $5\frac{1}{2}$ poll. longa. *Folia* 2 lin. lata, culmo longiora, firma, carinata, nodosa, vaginis laxis. *Bractea* summa setacea, spicam masculam sæpe æquans: aliae 1-2 lin. latæ: infima sæpe subpedalis, vaginata. *Vagina* 2-6, rarius 12 lin. longa. *Pedunculus* infimus 2-8 rarius 16 lin. longus, gracilis, acutangulus, scaber. *Spica*

mascula 1- $2\frac{1}{2}$ poll. longa, quandoque abbreviata, 1- $1\frac{1}{2}$ lin. lata, basi laxiflora, sæpe bractea sterili paulo remota suffulta, brevi-pedunculata, pedunculus vix unquam spicam fœmineam supremam æquans. *Spica fœminea* 8 lin.- $2\frac{1}{2}$ poll. longæ, 6-10 lin. latæ, evaginatae vel infima interdum 1-2 poll. remota inserte vel exserte pedunculata: summa rarius basi mascula. *Squamæ* inferiores longius aristatae: fœmineæ parvæ, omnino inter perigynia celatae, arista nunc perigynium æquans: masculæ majores, lanceolatae, fulvæ. *Perigynium* $3\frac{1}{2}$ -4 lin. longum, $1\frac{3}{10}$ lin. latum, nervis distantibus. *Achenium* 1- $1\frac{2}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, ellipticum, triquetrum, papilloso-asperulum, stylo basi crassiore contorto.

The oblique emarginate orifice of the perigynium and the elliptic papillose achenium distinguish this species from *C. hystericina*. I have never seen specimens from the southern states. The one in Elliott's herbarium, Mr. Curtis tells me, was from Muhlenberg. Fendler however found it in Venezuela with the orifice of the perigynium entire. I have figured a perigynium from his specimen at the lower corner of Tab. CCLXXVII. I have observed the same oblique entire orifice in some of the specimens from Dr. Barratt from Connecticut.* The var. β has the culm 4-15 inches in height, the female spikes 4-12 lines long, 3-4 lines broad. It was sent to me by Mr. Sullivant and Dr. Chapman. The other variety is possibly a hybrid between *C. tentaculata* and *C. lupulina*, for the achenia are abortive. It may be Schkuhr's *G. G. G.*, judging from the number of the nerves on the perigynium, and the absence of the achenium in the figure. It differs from *C. tentaculata* in the characters I have pointed out. It differs also from *C. Halei* and from *C. lupulina* in the squamæ; from the last also in the more divergent spikes and perigynia, narrower and shorter bracts, and narrower leaves. The absence of the achenium deprives us of the clear evidence it would afford as to the affinity. As the existence of hybrids in *Carex* is doubtless, this plant, as well as *C. Sullivantii*, is deserving of attention.

232. *C. Halei* (Carey); spicis 4 remotis pallide ferrugineis, terminali mascula cylindrica pedunculata, fœmineis orbiculatis vel oblongis crassis squarrosis remotis, inferioribus plus minus exserte pedunculatis; bracteis inferioribus vaginatis culmo paulo longioribus; stigmatibus 3, brevibus; perigyniis ovato-lanceolatis inflatis in rostrum longum tenue acuminatis, ore bifido, sessilibus glabris plurinerviis divergentibus, squama ovata acuta vel cuspidata medio late viridi nervosa margine hyalina latioribus plus duplo longioribus.—*C. Halei*, *Carey*, *MSS.*; *Chapman's Fl. S. Un. St.* 543. *C. turgescens*, *Dewey*, *Sill.* iii. 356 (1847) (*excl. C. folliculata*, *Ell.*) (*non Torrey*). (TAB. CCLXXIX.)

HAB. In America septentrionali. Florida (*Chapman*). Louisiana. Texas. Arkansas (*Carey*).

Var. β . *minor*; spica mascula 1-2-, fœmineis 5-7-flores; foliis angustis; culmo breviori graciliori.

Stolonifera. *Culmus* 1- $1\frac{1}{2}$ -pedalis, gracilis, triquetrum, lævis, inferne foliatus; pars spicas gerens 4-10 poll. longa. *Folia* 1-3 lin. lata, culmo breviora. *Bractea* $\frac{1}{2}$ -3 lin. latæ: inferiores (vel infima solum) vaginatae, culmo paulo longiores. *Vagina* infima 3-12 lin. longa. *Pedunculus* infimus 1-2 poll. longus, lævis. *Spica mascula* 1-2 poll. longa, $1\frac{1}{2}$ lin. lata, basi bractea sterili subremota suffulta. *Squamæ masculæ* inferiores, longiores, lanceolatae, acutæ, plerumque nervo infra

* In Jameson's specimens from the Andes of Quito, the orifice of the perigynium is oblique and bifid. The colour of some of the perigynia is purplish, and the lower spike in one specimen is compound at base, having two small abortive spiculæ.

apicem evanescente, margine hyalinæ. *Spicæ fœmineæ* 1-1½ poll. longæ, 12-15 lin. latæ: summa vel binæ superiores sessiles, evaginatæ, vel inferiores plus minus exserte pedunculatæ, à se 1-3½ poll. remotæ. *Perigynium* 6-6½ lin. longum, 2 lin. latum, divergens. *Achenium* 1 $\frac{7}{10}$ lin. longum, $\frac{8}{10}$ lin. latum, ellipticum, triquetrum, utrinque acutum, angulis ad medium subnodosis, lucidum, olivaceum, stylo basi crassiore contorto.

Media inter *C. intumescens* et *C. lupulinam*.

A *C. intumescens* differt spicis fœmineis 3, oblongis, plurifloris; achenio angulis subnodosis.

A *C. lupulina*, cui maxime affinis, differt culmo gracili; foliis bracteisque brevioribus, angustioribus; spicis fœmineis minoribus, remotis, magis squarrosis; squamis acutis, nec longe aristatis.

I am indebted to Mr. Carey for Florida specimens of this plant, gathered by Dr. Chapman, who then referred it, with a query, to *C. turgescens*, Tor., under which name it was published by Dewey, in 1847. The habit of the smaller forms is more that of *C. intumescens*, but its real affinity is with *C. lupulina*, and future observation must determine whether it is separable from that species. A figure of the achenium of *C. lupulina* is given, to show its resemblance to that of *C. Halei*, more correct than in Tab. CLXII., where the subnodose prominence of the middle of the angles is too exaggerated.

233. *C. squarrosa* (L.); spicis 1-5 androgynis basi masculis cylindricis ovalibus vel rotundatis approximatis erectis pedunculatis densifloris crassis echinatis flavidis demum ferrugineis, terminali majore basi cuneata mascula, reliquis basi parce masculis, infima rarius remota brevissime vaginata; bracteis foliaceis, inferioribus culmum longe superantibus; stigmatibus 3, brevibus; perigyniis confertissimis obovatis vel turbinatis inflatis abrupte longe tenuiter rostratis, rostro lævi vel scabro, ore bidentato, horizontaliter patentibus vel inferioribus recurvatis parce nervatis membranaceis, squama lanceolata subobtusa vel acuminata acuta, nervo viridi margine pallida vel ferruginea latioribus longioribus.—*C. squarrosa*, *Lin. Sp. Pl.* 973 (1753); *Willd.* 215; *Sehk. p.* 37; *Kunth*, 428; *Muhl.* 231; *Dewey*, vii. 270, et β . xi. 316; *Schw. et Tor.* 299. t. 27; *Drejer, Symb.* 29. t. 17; *Ell.* 526; *Darlington*, 354; *Carey*, 532; *Sartwell, Ews. n.* 148; *Chapman*, 537. *C. typhina*, *Mich.* 169. *C. typhinoides*, *Schw. An. tab.* (fide Dewey). (TAB. CCLXXX., CCLXXXI.)

HAB. In America septentrionali. Canada to Georgia.

Culmus 1-2-pedalis, acute triquetus, rigidus, superne scabriusculus, foliatus, basi rudimentis foliorum purpureo-ferrugineis, vaginisque foliorum facile laceratis tectus; pars spicas gerens 1-6 poll. longa. *Folia* 2-3½ lin. lata, sæpe culmo longiora. *Bracteæ* foliaceæ, inferiores 2-3 lin. latæ, culmum longe superantes, subinde steriles, angustæ: infima quandoque brevissime vaginata. *Vagina* 1-2 lin. longa, pallide ferruginea. *Pedunculus* infimus ½-2 poll. longus, scaber. *Spicæ* ½-2 poll. longæ, 4-7 lin. latæ, obtusæ vel e flosculis superioribus abortivis acutæ: infima sæpe 2-2½ poll. remota: omnes basi cuneatæ, masculæ, vel inferiores parce vel vix masculæ. *Squamæ* conformes, sæpe apice ciliolatæ, masculæ superiores, e maturatione perigyniorum, sæpe recurvatæ. *Perigynium* (e compressione distortum) 3 lin. longum, 1 $\frac{3}{10}$ lin. latum, demum (sub lente) punctis pallide ferrugineis maculatum. *Achenium* 1 $\frac{3}{10}$ - $\frac{3}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, ellipticum, utrinque acutum, triquetrum, faciebus concavis, punctulatum, basi styli apiculatum.

A *C. stenolepis* differt spicis semper basi masculis, squamis lanceolatis, muticis.

Neither Willdenow nor Schkuhr, who merely copy the description of Linnæus, were acquainted with this beautiful species, originally found by Kalm in Canada. I have never seen specimens from so northern a locality. It was not brought from the British possessions by the arctic travellers, and in describing the Carices for Sir W. J. Hooker's 'Flora Boreali-Americana' this species was consequently omitted, from a forgetfulness of Kalm's habitat. Michaux found it in Illinois. It was known only in its monostachyous form till 1817, when Muhlenberg noticed a variety with two spikes. Elliott, who had his specimen from Muhlenberg, describes it with a simple spike. Torrey, in 1824, alludes to two and three in his monograph. Drejer has beautifully figured it in his 'Symbolæ' as monostachyous, but anticipated, from the existence of the sterile bracts, that five or six spikes might be found. Dr. Barrett, I believe, first verified this conjecture, by finding specimens with five spikes. I have never seen six. Torrey, who takes no notice of *C. typhinoides*, Schw., which Dewey gives as a synonym, gives the range of this species from Canada to Georgia, remarking that it is not found in the low parts of the States. Elliott, on the authority of Muhlenberg, says it is found on the mountains of Carolina and Georgia. Chapman says, in swamps near the mountains of Georgia. Elliott's specimen was from Muhlenberg, as I am informed by Mr. Curtis. I have not seen it from the southern States. It has been distributed in its finest development, by Dr. Barrett, from the highlands of New York and the banks of the Connecticut River; and by Dr. Short from the Ohio. He speaks of it as one of the most common of the western species. It differs in the size and number of its spikes and in the breadth of the leaves and bracts. In the figures here given, the perigynia are drawn as seen in their compressed state. Drejer places it, with *C. stenolepis*, in his *Spirostachyæ*, connecting that group with *Physocarpæ*.

234. *C. stenolepis* (Torrey); spicis 5-7 cylindricis stricte erectis comosis approximatis demum brunnescente-ferrugineis, terminali mascula vel basi mascula quandoque abbreviata vel obsoleta, reliquis fœmineis, ima basi parce masculis crassis obtusis densifloris squarrosis, superioribus contiguis sessilibus, inferioribus subremotis exserte pedunculatis; bracteis inferioribus vaginatis longissimis; stigmatibus 3; perigyniis obconicis inflatis abrupte rostratis, rostro pallido bifido, nervosis densissime compactis glabris membranaceis horizontaliter patentibus, squama lineari aristæformi hispida pallida multum latioribus brevioribus.—*C. stenolepis*, *Torrey, Mon.* 420 (*non Lessing*); *Dewey*, xxx. 59; *Carey*, 533; *Drejer, Symb.* 28. t. 16; *Sartwell, Ews. n.* 149; *Chapman*, 537. *C. Frankii*, *Kunth*, 498; *Kunze*, 39. t. 9. *C. Shortii*, *Steud.* (*non Torrey*). *C. atherodes*, *Frank, Un. Itin.* (1835). (TAB. CCLXXXII.)

HAB. In America septentrionali. Pennsylvania to New Orleans and Texas. Ohio.

Culmus sub-2-pedalis, obtusangulus, firmus, stricte erectus, lævis, inter spicas genuflexus; pars spicas gerens 4-7 poll. longa. *Folia* 2-4 lin. lata, culmo longiora, nervosa. *Bracteæ* inferiores vaginatæ, latæ: infima quandoque bipedalis: summa setacea, spicâ masculâ sæpe longior. *Vagina* infima 1-1½ poll. longa. *Pedunculus* infimus 2-3 poll. longus, validus, lævis, e spathella oriens. *Spica mascula* ½-1½ poll. longa, 2 lin. lata, basi attenuata, laxiflora, subinde obsoleta. *Spicæ fœmineæ* ½-1½ poll. longæ, 4-5 lin. latæ, omnes alternatim contiguæ, vel infima 2-4 poll. remota, flavescenti-virides, demum fusco-brunnescentes, rostro squamisque pallidis variegatæ: sæpe spicæ omnes (summa conspicue, aliæ inconspicue) basi masculæ. *Squamæ* omnes conformes, inferiores latiores. *Perigynium* (e compressione distortum) obovatum vel obconicum, 2½ lin. longum, sublineam latum. *Achenium* $\frac{8}{10}$ lin. longum,

$\frac{6}{10}$ latum, obconicum, obtuse trigonum, faciebus superne convexis, basi cuneatum, punctulatum, ferrugineum; basi styli abrupte apiculatum.

Var. β ; culmo brevi graciliore, axi minus flexuoso; foliis bracteisque angustis; spicis subrotundis vel ovalibus remotis; squamis latioribus, masculis muticis subinde emarginatis ferrugineis.

HAB. New Orleans, *Teinturier*. Alabama, *Drummond*.

The male florets at the extreme base of the female spikes have been overlooked by all authors. Drejer naturally allies this beautiful species to *C. squarrosa*, considering both to belong to his *Spirostachya*, and affording a transition into his *Physocarpa*.

The var. β has a culm four inches long, and spikes three or four lines long and broad; the male spike especially with broad ferruginous squamæ, sometimes emarginate and without an arista.

235. *C. pilulifera* (L.); spicis 4-5 rarius 2-6 sessilibus congestis, terminali mascula sæpe abbreviata, fœmineis (rarius apice masculis) subglobosis, infima interdum subremota vel radicali basi attenuata longe pedunculata; bractea infima evaginata culmum sæpe superante; stigmatibus 3, rarius 2; perigyniis subglobosis rostellatis bidentatis pubescentibus enerviis spongioso-stipitatis viridibus, squama ovata acuta vel lanceolata cuspidata purpurea, nervo viridi longioribus vel brevioribus.—*C. pilulifera*, *L. Sp.*; *Good. Lin. Trs.* ii. 190; *Wahl. Act.* 160; *Willd.* iv. 259; *Act. Berol. t.* 2; *Schk. f.* 39; *Gaudin, Agros.* 135; *Kunth*, 439; *Smith, Eng. Fl.* 112; *Eng. Bot. t.* 885; *Koch*, 876; *Anderson*, 30. t. 7. f. 82; *Reich. t.* 260; *Lang*, 111; *Bertol.* 82. *C. montana*, *L. C. filiformis*, *Fl. Dan. t.* 1048. *C. decumbens*, *Ehrh.* (TAB. CCLXXXIII.)

HAB. In Europa. Norway to the north of Italy.

Radix cæspitosa. *Culmus* 4-15-pollicaris, triqueter, lævis, superne scabriusculus, sæpius incurvus, recumbens, nudus, basi foliatus, vaginisque foliorum ferrugineis tectus; pars spicas gerens 6-12 lin. longa. *Folia* 1-1½ lin. lata, culmo breviora, graminea, viridia. *Bractea* infima auriculata vel amplectens, spiculam subæquans, vel sesquipollicaris spicam superans: altera brevior, rarius conspicua. *Squamæ* conformes, plus minus purpureæ, margine albidæ, nervo viridi, late ovatæ, muticæ vel mucronatæ, vel lanceolatæ, acuminatæ, cuspidatæ: masculæ plerumque angustiores. *Spica mascula* 4-8 lin. longa, ½-1 lin. lata. *Spicæ fœmineæ* 3-4 lin. longæ, 2 lin. latæ, omnes arcte contiguæ, vel infima 3-4 lin. (rarius 3 poll.) remota, brevi-pedunculata, vel subradicalis, basi attenuata, pedunculo bipollicari suffulta: superiores vel omnes rarius apice masculæ. *Perigynium* $1\frac{1}{10}$ - $\frac{3}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, viride, rostello conico, brevi, purpureo: basi productum, spongiosum: membranaceum; nervis 2, marginalibus. *Achenium* $\frac{8}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, globoso-triquetrum, fuscum, angulis pallidioribus; basi styli decidua, clavata, supra basin persistentem æqualem abrupte deflexam sita.

A *C. varia*, Muhl., differt spicis confertis, plurifloris, subinde apice masculis, e viridi-purpureo variegatis; perigyniis enerviis, rostello semper recto brevioribus bidentatis; basi styli persistente abrupte compresso-deflexa; culmo incurvo, basi vaginis foliorum pallide ferrugineis tecto; foliis viridibus.

Drejer (Rev. 55) says, "Quo modo *C. variam* a *C. pilulifera* distinguam, neque ex descriptione neque ex specimenibus eruere possum." Treviranus (Fl. Rossica, iv. 302) says, "*C. pilulifera* nimis affinis, nec separanda nisi notis, me saltem iudice, parum firmis est *C. marginata*, Muhl., cujus synonyma, sec. Torrey, sunt *C. Pennsylvanica*, Lam., et *C. varia*, Muhl., cujusque specimen,

auctoritatem Meyeri ferens, in Kantschatka a Redowskio lectum inter plantas Ledebourianas vidi." Schlechtendal (Linnæa, x. 262) says, "*C. varia*, simillima *C. pilulifera*, et, uti nobis fere videtur, eadem." Kunth, p. 442, quotes Schlechtendal, without expressing any opinion of his own. Tuckerman, quoting Drejer, and referring to Schlechtendal's observation, quoted by Kunth, remarks of *C. varia* and *C. pilulifera*, "Species vigentes distinctæ mihi visæ sunt nostræque (*C. varia*) insignis, typus et caput gregis Americanæ propriæ."

I incline to Tuckerman's opinion. I have never seen any specimens from Kantschatka. Those from Japan, collected by Wright in the United States Pacific Expedition, are referable to *C. Emmonsii*, judging from the elliptic triquetrous form of the perigynium, differing in the deep-purple colour of the squamæ and in the slight depression of the base of the style.

Goodenough (Lin. Trs. ii. 191) has alone noticed the occasional existence of male florets on the female spikes. He says, "In spicis fœmineis flores terminales plerumque masculi. Post breve tempus hi decidui sunt, unde spicæ sæpius rotundæ evadunt." I have observed them only in a few specimens, as is the case with the inferior radical spicula, which is not noticed by any author, nor do I find any allusion to the depressed state of the style, which I find to be characteristic of *C. pilulifera*.

236. *C. Azorica* (Gay, Ann. Sc. Nat. p. 185: 1839).—Fl. Azorica, *Seubert*. (TAB. CCLXXXIV.)

HAB. In insulis Azoricis. Fayal and Pico, *Guthnick and Hochstetter*. Pico, *Dr. H. C. Watson*. St. Michael's, *T. C. Hunt, Esq.*

Habitus et inflorescentia *C. pilulifera*, L. Differt stigmatibus sæpius 2!; perigyniis ($1\frac{1}{10}$ lin. longis, $\frac{6}{10}$ lin. latis) compressis, brevius stipitatis, obovatis; spiculis 5-7, densius aggregatis, colore pallidioribus; squamis fœmineis subrotundo-ovatis, obtusis, muticis, vel sensim vel abrupte apiculatis; achenio ($\frac{6}{10}$ - $\frac{8}{10}$ lin. longo, ½ lin. lato) lenticulari, rarius planoconvexiusculo, sæpe racheola minima inserta vel exserta stipitato; basi styli persistente, recta vel depressa.

I am indebted to Dr. Watson for specimens of this plant, the aspect of which is that of *C. pilulifera*, L. I have never chanced to observe only two stigmas in *C. pilulifera*, but Gay remarks that, when they occur in it, the achenium is not compressed as in *C. Azorica*, but of an obtuse trigonous form. The racheola in *C. Azorica* is sometimes exserted, bearing a scale with a perigynium; at *f*, it is in the form of a squama only. The straight base of the style is especially visible in the lenticular achenium.

237. *C. Novæ-Angliæ* (Schweinitz); spicis 3-4 rarius 5 paucifloris e viridi purpureis, terminali mascula abbreviata sæpe inconspicua sessili, fœmineis plerumque alternis vel contiguis, inferioribus sæpe bracteis, infima remota breve (vel radicali longe) pedunculata; bracteis auriculatis læte viridibus, inferioribus vel omnibus culmo longioribus; stigmatibus 3; perigyniis obovatis vel ovalibus globosis vel obtuse subtrigonis basi longe stipitatis conico-rostratis, rostro sæpe subexcurvato, ore obliquo bifido, pubescentibus enerviis vel basi obscure nervatis, squama oblongo-ovata acuta plerumque mucronata purpurea, nervo viridi margine albo-hyalina latioribus longioribusque.—*C. Novæ-Angliæ*, *Schw. An. tab.*; *Schw. et Tor.* 328; *Dewey*, ix. 64; *Tor. Cyp.* 411; *Carey*, 525; *Kunth*, 408 (*excl. ejus descr., quæ C. Pennsylvanicam, Lam., pingit*). *C. pilulifera*, β deflexa, *Drejer, Rev.* 54. (TAB. CCLXXXV.)

HAB. In America septentrionali. Arctic America. Saddle Mountain, Massachusetts, alt. 3000 feet. Mount Marcy, New York. Greenland, *Vahl*.

Radix repens. Culmi 4–10 poll. longi, setacei, procumbentes, basi vaginis foliorum fusco-purpureis tecti; pars spicas gerens 3–12 lin. longa. Folia $\frac{1}{4}$ –1 lin. lata, læte viridia, culmo breviora vel longiora. Bractea foliaceæ, sæpe omnes culmo longiores, infima interdum 2 poll. longæ. Spica mascula 2 lin. longa, $\frac{1}{2}$ lin. lata, sessilis: fœminæ 2–3 lin. longæ, 2 lin. latæ, 3–8-floræ, sessiles, contiguæ, vel infima 3–8 lin. remota: rarius radicalis longe pedunculata. Squamæ omnes conformes. Perigynium $1\frac{1}{2}$ lin. longum, $\frac{7}{10}$ lin. latum, globosum, sæpe longe stipitatum; rostro nunc subexcurvato, basi subinde leviter nervatum. Achenium conforme, $\frac{7}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, castaneum, angulis pallidioribus, breve stipitatum, apice umbone brevissimo disciformi-depresso superatum, basi styli persistente brevissima recta abrupte apiculatum. Stylus basi plus minus elavatus.

Arcte affinis *C. pilulifera*, L. Differt culmis setaceis; foliis angustioribus; spicis minoribus, alternis, infima plerumque subremota, inferioribus vel omnibus longe bracteatis; perigyniis sæpe paulo longioribus, angustioribus, rostro interdum longiore, subexcurvato, basi sæpe obscure nervatis; squamis angustioribus; basi styli persistente, brevissime recta.

I have seen very few specimens of this plant from the States, where it seems to be confined to the highlands. Sir John Richardson brought it from Arctic America, and the specimens figured are his. They certainly approach very near *C. pilulifera*, the difference being in the very abbreviate male spike, the generally alternate, smaller, less densely flowered female spikes, the often conspicuous bracts, the straight persistent base of the style, the occasional existence of nerves, the setaceous culm, and narrow leaves. The perigynium in its globular pyriform figure and shorter rostrum contrasts with the oval, triquetrous perigynium of *C. Emmonsii*, but there is a transition from *C. pilulifera* through *C. Novæ-Angliæ* to *C. Emmonsii*, and while Drejer unites the two first, Carey unites the two last.

238. *C. Emmonsii* (Dewey); spicis 2–4 rarius 5 plerumque contiguis sessilibus pallidis, terminali mascula abbreviata, fœmineis omnibus vel superioribus congestis, infima rarius 3–4 lin. remota vel sæpe radicali laxiflora longe pedunculata; bractea infima spiculam rarius culmum æquante; stigmatibus 3; perigyniis ovali-trigonis longiuscule cylindrico-rostratis stipitatis, ore albo hyalino obliquo bifido, pallide viridibus encerviis, squama oblongo-ovata obtusa mutica vel acuminata cuspidata albida, nervo viridi demum ad latera superne purpurascente margine albo-hyalina longioribus vel æquantibus.—*C. Emmonsii*, Dewey, in *Tor. Cyp.* p. 411; *Sartwell, Ews. n.* 105. *C. alpestris*, Dewey, vii. 268; *Schw. et Tor.* 341. *C. Davisii*, Dewey, x. 279 (non Schw. et Tor.). *C. Novæ-Angliæ*, var. Carey, 525. *C. lucorum*, var. Chapman, 539. (TAB. CCLXXXVI.)

HAB. In America septentrionali. Arctic America to New Orleans.

Cæspitosa. Culmi setacei, inæquales, reclinati vel decumbentes. Folia pallide viridia, $\frac{1}{2}$ –1 lin. lata. Bractea infima plerumque solum conspicua, rarius culmum æquans vel superans. Spica mascula 2–4 lin. longa: fœminæ sessiles: infima rarius subremota vel radicalis. Squamæ conformes. Perigynium $1\frac{3}{10}$ – $\frac{4}{10}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum; rostro sæpe $\frac{1}{2}$ lin. longum. Achenium $\frac{6}{10}$ – $\frac{7}{10}$ lin. longum, $\frac{4}{10}$ – $\frac{5}{10}$ lin. latum, ovale, truncatum, basi productum, trigonum, ferrugineum, angulis pallidioribus; basi styli clavata, articulata, decidua.

Var. β . *elliptica*; spicis congestis; perigyniis longioribus ($1\frac{6}{10}$ – $\frac{8}{10}$ lin. longis, $\frac{6}{10}$ lin. latis) hirsutis squa-

mam subduplo superantibus; achenio elliptico triquetro ($1\frac{1}{10}$ lin. longo, $\frac{1}{2}$ lin. lato), basi styli decidua. (TAB. CCLXXXVII.)

HAB. Arctic America, Richardson. Providence, Olmeyer. New York, Knieskern.

This plant in habit, in some respects, closely resembles *C. Novæ-Angliæ*, but differs in habitat, growing on hills and open mounds; in the pale colour of all its parts, its short bract, its congested female spikes, the more elongated and evidently trigonous form of the perigynium and achenium, and the deciduous base of the style. It never exhibits the dark green colour of the leaves and bracts or the purplish squamæ of *C. Novæ-Angliæ*; and in those specimens, where the lower culmeal spike is distinct, it is never more than four lines remote and always sessile. I have it from Arctic America, where *C. Novæ-Angliæ* is abundant, but most copiously from the States, from Rhode Island to New Orleans, where *C. Novæ-Angliæ* (except on high mountains) is unknown. I have drawn the characters from the general habit of the plant, some of which, as in all *Carices*, admit of variation, as is the case with the bracts, which very rarely are elongated. But the trigonous form of the perigynium and achenium, the long rostrum, and the distinct articulation of the style are constant.

The var. β has a longer body to the perigynium and a longer achenium, and the pubescence is softer and longer, and the proportionate length of the perigynium to the squamæ gives a peculiar aspect to the spike. It has not been noticed by authors.

In adhering to the names given to the several preceding species by authors, I have endeavoured to point out the characters in which they differ, leaving the question of specific distinction to future observers. I have been guided by habit, the form of the perigynia and achenia, and the base of the style (which has not attracted the attention of authors), to justify my adoption of established names.

239. *C. varia* (Muhlenberg); spicis 3–5 pallidis remotis, terminali mascula abbreviata sessili vel cylindrica breve pedunculata pallide castanea, fœmineis sæpius 3, rarius apice masculis subaxifloris, superioribus globosis paucifloris sessilibus, inferioribus oblongis subremotis pedunculatis; bracteis auriculatis, superioribus emarginatis spicis suis brevioribus, infima subinde foliacea culmo longiore vaginulata vel amplectente; stigmatibus 3; perigyniis obovatis vel globosis basi productis abrupte vel sensim rostratis, rostro nunc subexcurvo, margine scabro, ore bifido, pubescentibus enerviis vel basi plus minus nervatis pallidis; squama ovata acuta vel acuminata vel obtusa sæpe emarginata mutica vel cuspidata albida concolori vel pallide castanea longioribus vel subæquantibus.—*C. varia*, β pedicellata, Dewey, xi. 163; *Sartwell, Ews. n.* 109; *Kunth*, 442. *C. Pennsylvanica*, β Muhlenbergii, Gray, Carey, 526; *Torrey, N. Am. Cyp.* 410; *Chapman*, 539. *C. collecta*, Dewey, xi. 314. (TAB. CCLXXXVIII.)

Var. β . *minor*; culmo brevior; spicis minoribus paucifloris subrotundis sessilibus subcontiguis vel alternatim remotiusculis; squamis sæpe lucide castaneis; bractea infima sæpe abbreviata.—*C. varia*, *Muhl.* 236; *Willd.* 259; *Schk. f.* 167; *Wahl. Act.* 159; *Kunth*, 442; *Elliott*, 541; *Schw. et Tor.* 329; *Dewey*, xi. 162; *Sartwell, Ews. n.* 108. *C. Pennsylvanica*, *Torrey, N. Am. Cyp.* 410 (non Lam.). (TAB. CCLXXXIX.)

HAB. In America septentrionali. Canada to Georgia.

Radix cæspitosa. Culmi 1– $1\frac{1}{2}$ -pedales, debiles, reclinati vel erecti, apice scabriusculi, basi vaginis foliorum purpureis tecti; pars spicas gerens $1\frac{1}{4}$ – $2\frac{1}{2}$ poll. longa. Folia culmea angusta, 1–3 poll. longa: *sterilia* 1–2 lin. lata, firma, culmum

subæquantia, glauco-viridia. *Bractea* infima interdum foliacea, 1 lin. lata, culmo longior. *Spica mascula* 3-10 lin. longa. *Spica feminea*, rarius apice masculæ, alternæ: superiores subglobosæ, paucifloræ, sessiles: inferiores oblongæ, pedunculatæ, 4-6 lin. longæ: infima sæpe 14 lin. remota, rarius basi composita. *Pedunculus* infimus 1-3 lin. longus. *Vagina* 1-1½ lin. longa. *Squamæ* pallidæ, vel castaneæ, margine albo-hyalinæ, obtusæ, muticæ vel acutæ, acuminatæ, cuspidatæ: fœmineæ interdum emarginatæ. *Perigynium* 1- $\frac{4}{10}$ - $\frac{7}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, rostro $\frac{2}{10}$ - $\frac{6}{10}$ lin. longo, sæpe basi plus minus nervatum. *Achenium* $\frac{8}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, trigonoglobosum, faciebus convexis, basi breve productum, ferrugineum, angulis 3 pallidioribus, abrupte basi styli persistente recta æquali apiculatum. *Stylus* supra basin clavatus. *Stigmata* 3, longa.

A *C. pilulifera* differt inflorescentia laxa; spicis plus minus remotis, laxifloris, sæpe paucifloris; perigyniis subinde nervatis, rostro nunc excurvato, bifido; basi styli persistente recta; vaginis foliorum purpureis.

A *C. Pennsylvanica* differt spicis fœmineis sæpius pluribus; perigyniis sæpe nervatis; forma bractearum; foliis latoribus, glaucescentibus; radice fibrosa.

A *C. Novæ-Angliæ* differt colore pallido, bracteis superioribus brevioribus, et

A *C. Emmonsii* differt spica infima pedicellata; perigyniis globosis, ab utraque culmo validiore; foliis latoribus; spica mascula magis conspicua, fœmineis magis remotis; perigyniis subinde nervatis.

There is no abrupt transition from what I have considered should be the typical form of *C. varia* and its variety, for I observe them on the same root. The difference no doubt depends upon locality, the larger development found in moist woods and the smaller in open, dry hills, and then having a more coloured inflorescence. I can have no doubt of the specific distinction of *C. varia* and *C. Pennsylvanica*. In 58 specimens of *C. varia* I find—

	2	with 2 spikes.
16	„	3
35	„	4
5	„	5
—		
58		

and in 159 specimens of *C. Pennsylvanica* I find—

	41	with 2 spikes.
94	„	3
24	„	4
—		
159		

In *C. Pennsylvanica* the terminal spike in 7 was female at top; in 4 the lower of 3 spikes was radical, oblong, lax-flowered on a long peduncle, and in 1 the lower of 4 spikes was 1 inch remote, with a leafy bract.

The resemblance of the var. β , with the elongated male spike, is however close. But the root of *C. Pennsylvanica* is stoloniferous, the leaves narrower, of a brighter green and softer texture, the female spikes oftener 2 or 1, and sessile; the perigynium oftener larger, variable in the length of the rostrum and lacinia, and nerveless; the bracts ovate-lanceolate, acute, more or less subfoliaceous, amplexiform at base, while those of *C. varia* are auricled, the upper emarginate, as the female scales occasionally are. The scales in *C. varia* are generally shorter than the perigynium, the rostrum sometimes oblique, the mouth less obliquely cut, and bifid, the lower spike often pedicellate. The perigynium in both when mature is suborbicular, spongy at base, as is common to the whole group. This spongy base contracts by age. There are only 2 prominent marginal nerves generally, though in *C. varia* there are occasionally nerves at base, more or less distinct, which appear translucent, when held to the light, after the achenium is removed. *C. varia* is a paler plant generally, and flowers later in the spring. I have never seen the lower spike radical in *C. varia*, nor the male spike androgynous, nor the vagina of the leaves reticulate.

240. *C. Pennsylvanica* (Lamarck); spicis 3-2 rarius 4, e viridi purpureis, terminali omnino vel basi mascula trigona sessili vel breve pedunculata, fœmineis sæpius 2 sessilibus paucifloris contiguis, vel infima subremota rarius radicali laxiflora longe pedunculata; bracteis squamæformibus acutis auriculatis amplectentibus cuspidatis spicula brevioribus, vel infima subulata rarius culmum æquante; stigmatibus 3; perigyniis globosis abrupte breve conico-rostratis, rostro recto, ore obliquo membranaceo integro vel bilobato sæpe alte fisso, pubescentibus enerviis viridi-ferrugineis, squamam oblongo-ovatum acutam vel acuminatam rarius cuspidatam purpuream margine anguste albo-hyalinam subæquantibus.—*C. Pennsylvanica*, *Lam. Ency.* iii. 388; *Torrey, Cyp.* 410; *Carey*, 526; *Darlington*, 350; *Sartwell, Eas. n.* 107; *Chapman*, 539. *C. marginata*, *Muhl.* 237; *Willd.* 261; *Schk. f.* 143; *Kunth*, 443; *Dewey*, xi. 163; *Schw. et Tor.* 332; *Elliott*, 542. (TAB. CCXC., CCXCI.)

HAB. In America septentrionali. Carlton House to Carolina and Georgia. Rocky Mountains.

Radix stolonifera. *Culmi* 6-12-pollicares, erecti, scabri, basi reliquiis foliorum fibratis vaginisque ferrugineo-purpureis reticulato-fissis foliisque brevibus teeti; pars spicas gerens 8-14 lin. longa. *Folia* ½-1 lin. lata, pallide viridia, graminea, culmo breviora vel æquantia. *Bractea* nunquam emarginatæ. *Spica mascula* 5-9 lin. longa, 1-1½ lin. lata (*sec. Muhl.*), trigona, rarius apice fœminea. *Spica feminea* 2 vel 1, rarius 3, sessiles, 3-6-floræ, contiguæ, vel infima 6-10-flora, paulo remota, rarius radicalis, laxiflora, longe pedunculata. *Squamæ* purpureæ, nervo pallido, margine albo-hyalinæ: masculæ obtusæ vel lanceolatæ, acutæ vel cuspidatæ: fœmineæ perigynio plerumque longiores et latiores. *Perigynium* 1- $\frac{8}{10}$ lin. longum, $\frac{9}{10}$ lin. latum. *Achenium* $\frac{8}{10}$ -1- $\frac{1}{10}$ lin. longum, $\frac{8}{10}$ lin. latum, globosum, basi productum, angulis 3 notatis, vel teres, angulis oblitteratis, apice basi styli persistente æquali brevissima apiculatum. *Stylus* supra basin clavatus, sæpe demum exsertus.

Whether the *C. lucorum*, Willd. (*Kunze*, 153, t. 39), is to be considered a variety of *C. Pennsylvanica* (*rostrum elongato*), must be determined by future observation. The inflorescence and habit are the same. I have a specimen from Kunze from the mountains at Broad River, North Carolina, and can see no difference except in the elongated rostrum. I have figured a small specimen and perigynium in Tab. CCXCI. from Arctic America, in which the rostrum is unusually long, the specimen from which it was taken differing in no other respect from *C. Pennsylvanica*. Dr. Gray and Mr. Carey found a carex on the Roan and other mountains of North Carolina, which in habit is the same as *C. lucorum*, except that the leaves and culm are very long. Dr. Gray remarks that it "rarely fruits." Mr. Carey (p. 525) says the plant figured by Kunze is *C. Novæ-Angliæ*, and he inserts "*C. lucorum*, Kunze, not Willd.?" as a synonym of that species, and adds:—"The mature perigynia in Kunze's figure have the elongated beak of *C. nigro-marginata*, Schw. (possibly the *C. lucorum* of Willd.)." Mr. Carey takes no notice of the plant he found on the Roan Mountain, and probably the absence of perigynia prevented his observing its affinity to Kunze's plant. Future observers must clear up the difficulty, my present impression being, with Schlechtendal (*Linnaea*, x. 262) and Kunze, that *C. lucorum* is closely allied to *C. Pennsylvanica*.

Dr. Chapman, in his valuable 'Flora of the Southern United States,' inserts *C. lucorum*, and considers *C. nigro-marginata*, *C. Floridana*, and *C. Emmonsii* as varieties of it, all growing in "dry sandy soil, Florida to North Carolina." He takes no notice of the plant found on the mountains of North Carolina.

241. *C. umbellata* (Schkuhr); spicis 2-6 ovalibus purpureis vel pallidis, terminali mascula rarius basi mascula

longe pedunculata vel sessili, fœmineis remotis subradicalibus inserte vel exserte pedunculatis æquialtis quasi umbellatis, vel superioribus 1-2 masculæ contiguis; bracteis inferioribus foliaceis vaginantibus; stigmatibus 3, rarius 2; perigyniis globosis raro plano-convexis basi spongioso-stipitatis longe conico-rostratis, rostro recto vel subexcurvo, ore obliquo emarginato vel subbifido, plus minus pubescentibus enerviis vel nervatis marginibus scabris pallidis, squama ovata subacuta vel ovato-lanceolata cuspidata pallida margine purpureo-tincta demum sæpe decolori brevioribus vel longioribus.—*C. umbellata*, *Schk. f.* 171; *Willd.* 290; *Kunth*, 443; *Muhl.* 256; *Dewey, Sill.* x. 31, et xi. 316; *Schw. et Tor.* 352; *Tor. Cyp.* 427; *Carey*, 525; *Sartwell, Ews. n.* 104. (TAB. CCXCII., CCXCIII.)

HAB. In America septentrionali. Arctic America to Pennsylvania. Rocky Mountains.—Var. β *brevirostris* (Tab. CCXCIV.). Carlton House (*Richardson*).

Dense cæspitosa, stolonifera. *Culmi* plures, 1-4 poll. longi, basi vaginis ferrugineis scabriusculis reliquisque foliorum fibratis tecti. *Folia* $\frac{1}{2}$ -1 lin. lata, culmos longe superantia, rigida, attenuata, apice callosa, truncata. *Bractea* suprema squamæformis, spicula brevior, vel setacea, culmum subæquans: inferiores vaginatæ, spicas superantes. *Spica* terminalis mascula, 4-6 lin. longa, 1 lin. lata, purpurea, subinde basi mascula: reliquæ fœmineæ, 3-4 lin. longæ, 2-3 lin. latæ: omnes subradicales inter folia latentes, sæpe sessiles, vel superiores 1 rarius 2 masculæ contiguæ, inferior breve pedunculata. *Squamæ* ovatæ, muticæ, vel lanceolatæ, acuminato-cuspidatæ: masculæ sæpius fusco-purpureæ, margine albo-hyalinæ: fœmineæ ad latera purpureæ, nervo viridi: demum omnes decolores. *Perigynium* $1\frac{8}{10}$ -2 lin. longum, $\frac{8}{10}$ lin. latum: pube, nervis, oreque varians: rostro $\frac{6}{10}$ - $\frac{7}{10}$ lin. longo; ore albo-hyalino, obliquo, integro vel emarginato vel subbifido: globosum, maturitate vix aut ne vix trigonum, rarius plano-convexum, enerve vel plus minus nervatum, pubescens vel fere glabrum, marginibus semper serrato-scabris. *Achenium* $\frac{8}{10}$ - $\frac{9}{10}$ lin. longum, $\frac{8}{10}$ lin. latum, globosum, faciebus convexis, vel rarius plano-convexum, pallidum, demum fusco-purpureum, obtusum, basi styli incrassata, articulata, decidua.

Var. β . *brevirostris*; perigyniis minoribus $1\frac{5}{10}$ - $\frac{6}{10}$ lin. longis, $\frac{6}{10}$ - $\frac{7}{10}$ lin. latis, obovatis, triquetris, rostro $\frac{2}{10}$ lin. longo, ore emarginato, squama late ovata obtusa vel acuta angustioribus brevioribus; achenio $\frac{8}{10}$ lin. longo, $\frac{1}{2}$ lin. lato, faciebus subplanis vel modice convexis. (TAB. CCXCIV.)

The var. *vicina* of Dewey, with the upper female near the male spike, is often found on the same root with the typical form, and Torrey remarks that it is a very constant character, except in the dwarf state of the plant.

It is constant in the var. β , which I have not seen from the States. The smaller and more triquetrous perigynium is like that of *C. Emmonsii*. The length of the rostrum is variable.

The specimens figured in Tab. CCXCII. are from Oriskany, New York; in Tab. CCXCIII. from the Methye Portage (the squamæ are more conspicuously cuspidate, and the perigynium smooth); and in Tab. CCXCIV. from Carlton House: the two last collected by Sir John Richardson.

The occasional occurrence of only 2 stigmata, with the accompanying modification in the form of the perigynium and achenium, had escaped my notice till after the figures had been engraved.

In Tab. CCXCIII., the figures at the bottom of the plate exhibit a terminal androgynous spicula, and a lateral one issuing from a spathella, and in the smaller figure a perigynium with its 3 stigmata, and an exserted rudimentary squama.

242. *C. Rossii* (Boott); spicis 4-5 pallidis paucifloris, terminali mascula, fœmineis flosculis 3-6 alternatim dispositis, superioribus 1-3 masculæ approximatis, inferioribus remotis inæqualiter longe exserte pedunculatis, infima radicali; bracteis superioribus (nisi summa) culmum superantibus, inferioribus vaginatis, omnibus (nisi infima) pedunculo brevioribus; stigmatibus 3; perigyniis ovalibus stipitatis longe rostratis bifidis pubescentibus enerviis, squamam ovato-lanceolatam acutam vel cuspidatam subæquantibus.—*C. Rossii*, *Boott, in Hook. Fl. Bor. Amer.* 222. (TAB. CCXCV.)

HAB. In America septentrionali. Rocky Mountains, *Drummond*; *Fendler, Pl. Nov. Mexicanæ*, n. 889.

Culmi 6-8-pollicares, gracillimi, acutanguli, scabri, basi rudimentis foliorum vaginisque nervatis scabriusculis purpureis tecti. *Folia* $\frac{1}{4}$ -1 lin. lata, culmo longiora vel breviora, attenuata, apice callosa, truncata. *Bracteæ* foliaceæ, angustæ. *Spica mascula* 3-5 lin. longa. *Spicæ fœmineæ* 4-5; flosculis 3-5, rarius 6, attenuatim dispositis: superiores 1-3 masculæ approximatae: inferiores 2-3 remotæ, inæqualiter longe pedunculatae, vaginatae, vel infima radicalis, brevius pedunculata. *Pedunculi* 1-5 poll. longi: longiores reclinati vel decumbentes. *Squamæ masculæ* oblongæ, pallidæ vel purpureo-tinctæ, infima sæpe cuspidata: fœmineæ ovato-lanceolatae, acuminatae vel cuspidatae, sæpe perigyniis longiores, plus minus pallidæ. *Perigynium* $1\frac{8}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, ovale, inæqualiter turgidum, acute bifidum, marginibus scabrum. *Achenium* $\frac{6}{10}$ -1 lin. longum, $\frac{6}{10}$ lin. latum, subtrigono-globosum, obtusum, basi styli brevissime aut vix apiculatum.

A *C. umbellata* differt culmo capillari, altiori; pedunculis elongatis; spicis pauci-laxifloris; perigyniis bifidis.

I had never met with this plant since I first described it in the *Fl. Boreali-Americana*, many years ago, from Drummond's specimens, till Dr. Gray sent it to me from Fendler's collection. Whether it be anything more than a lax variety of *C. umbellata*, growing in deep woods, future observers must determine. I have never seen any specimens of *C. umbellata* from the States like it. The alternate arrangement and elongated peduncles of the female spikes, with 3-6 alternate flowers, and the acutely bifid mouth of the perigynium, with the long capillary culm, are the prominent distinctions.

243. *C. nigro-marginata* (Schweinitz); spicis 3 rarius 4-5 purpureis viridi-pictis paucifloris sessilibus, terminali mascula sæpe inconspicua, fœmineis masculæ contiguis congestis, vel infima subremota rarius radicali exserte pedunculata; bracteis squamæformibus cuspidatis vel inferioribus subfoliaceis, infima culmum superante; stigmatibus 3; perigyniis ovalibus inæqualiter trigonis stipitatis rostratis, ore obliquo emarginato, marginibus scabris parce puberulis enerviis pallidis, squama ovata obtusa vel lanceolata acuta rarius cuspidata purpurea medio viridi angustioribus brevioribus vel subæquantibus.—*C. nigro-marginata*, *Schw. An. tab.*; *Torrey, Cyp.* 412; *Dewey*, x. 232; *Kunth*, 481. *C. lucorum*, *Sartwell, Ews. n.* 106. *C. lucorum*, var., *Chapman, Fl.* 539. (TAB. CCXCVI.)

HAB. In America septentrionali. Carolina, *Schweinitz, Mr. Curtis*.

Cæspitosa. *Culmi* 1-10-pollicares, gracillimi, superne scabri, reliquiis foliorum fibratis vaginisque scabriusculis reticulato-fissis ferrugineis tecti. *Folia* annotina $\frac{1}{2}$ - $1\frac{1}{2}$ lin. longa, culmo multum longiora, superne curvata, firma. *Bracteæ* squamæ-

formes, vel inferiores 1-2 subulato-foliaceæ. *Spicæ* concolores: maseula 3 lin. longa, sessilis: fœmineæ 2-3 lin. longæ: omnes congestæ, vel infima paulo remota, rarius radicalis, plus minus longe exserte pedunculata. *Squamæ* conformes. *Perigynium* $1\frac{5}{10}$ - $\frac{8}{10}$ lin. longum, $\frac{5}{10}$ - $\frac{6}{10}$ lin. latum, compresso-subtrigonum: angulo ut in affinibus introrso; rostro $\frac{4}{10}$ lin. longo; ore emarginato bidentato; marginibus interdum lævibus: parce puberulum. *Achenium* $\frac{8}{10}$ lin. longum, $\frac{6}{10}$ lin. latum, plano inæqualiter trigonum, castaneum; basi styli clavata, articulata, decidua.

This species is allied to *C. Emmonsii*, chiefly differing in the deep purple colour of the squamæ, and the remarkably long, curved, rigid leaves. Dewey, I know not on what authority, quotes Schweinitz for its being found in Pennsylvania. In the analytical table it is said to be a native of Carolina, and Torrey gives "Salem, North Carolina," as the habitat, on the authority of Schweinitz. Mr. Curtis found it on Society Hill, South Carolina, and though not noticed by Elliott, Mr. Curtis tells me it is in his herbarium from Schweinitz from North Carolina. I have not observed any florets with 2 stigmas. Dewey, in his character, gives 3, and in his description says they are 2. From its close affinity with *C. Floridana*, which has commonly 2, but occasionally 3 stigmas, it is more than probable that 2 will be found in *C. nigro-marginata*, especially as the perigynium occasionally exhibits a lenticular or plano-convex form.

244. *C. Floridana* (Schweinitz, An. tab.)—*Schw. et Tor.* 306. t. 28. fig. 1; *Dewey*, x. 45; *Kunth*, 408; *Torrey, Cyp.* 411. *C. lucorum*, var., *Chapman, Fl.* 539. (TAB. CCXCVII.)

HAB. In America septentrionali. Florida, *Chapman, Le Conte*.

Habitus et inflorescentia *C. nigro-marginatæ*, sed pallidior; spicis pene decoloribus, leviter tantum purpureo-tinctis; stigmatibus 2, rarius 3; perigyniis ovalibus, plano-convexis, rarius trigonis; achenio lenticulari vel triquetro.

This plant looks like an etiolated *C. nigro-marginata*. Dr. Chapman, in his notes, contends for its specific distinction on the ground that it has invariably 2 stigmas, with the corresponding plano-convex and lenticular form of the perigynium and achenium. But I have specimens of his in which 3 stigmas are discernible, and M. Spach thinks such are generally to be found on the top of the spikes. Torrey, in his Mon. 412, remarks that "it has 3 stigmas almost uniformly" in his specimens. Both he and Schweinitz had previously described only 2; and from the congested spikes and inconspicuous male spike, Schweinitz was, in his analytical index, misled, describing "the androgynous spike male in summit," an error which in his and Torrey's monograph led to the idea that it was allied to *C. Muhlenbergii*. Dewey first corrected this error, rightly associating it with *C. Nova-Angliæ*. He describes the stigmas as 2 only, and I cannot but suspect that Torrey, in his monograph, referred to other specimens sent by Chapman, which have 3 stigmas and a trigonous perigynium, and which Chapman referred with a query to "*C. Emmonsii*?" I am indebted to Mr. Carey for specimens of them. They are too young, but I think do not essentially differ from *C. Emmonsii*. They are stouter and have long foliaceous stolons, and are without the long annotinous leaves of *C. Floridana*.

Dr. Chapman, in his Flora, p. 539, has since adopted other views, and considers *C. Floridana* a variety of *C. lucorum*. He certainly errs in saying the stigmas are 3. In all the specimens I have seen they are generally 2. This zealous botanist, to whom we are so recently and largely indebted for his very valuable 'Flora of the Southern United States,' will in the future editions of his work, I hope, clear up the difficulties of this group, contrasting the plant from the mountains of North Carolina with those from the sandy plains, and the Southern forms with those of the Northern States. My object in these 'Illustrations' has been to give figures of what have been generally considered species, leaving

future observers in the fields of nature to determine their specific claims, but fully alive to the importance of carefully noting all evident variations from a typical character.

245. *C. Richardsoni* (Brown); spicis 2-4 oblongo-cylindricis subremotis erectis albido-purpureis, terminali mascula pedunculata, fœmineis inserte vel breve exserte pedunculatis; bracteis vaginæformibus aphyllis; stigmatibus 3, longis; perigyniis obovatis inæqualiter trigonis abrupte rostellatis, ore hyalino integro, pubescentibus enerviis membranaceis pallidis, squama ovato-lanceolata acuta vel obtusa purpurea margine late scariosa amplectente angustioribus brevioribusque.—*C. Richardsoni, Brown, Franklin's Nar. App.* 763 (1823); *Hooker, Fl. Bor. Am. t.* 223; *Kunth*, 519; *Schw. et Tor.* 330; *Dewey*, xi. 152; *Carey*, 526; *Sartwell, Eas. n.* 110. (TAB. CCXCVIII.)

HAB. In America septentrionali. Arctic America, *Richardson*. Rocky Mountains, *Drummond*. North-west Coast, *Douglas*. Illinois, *Mead*. (New York, *Dewey*.) Wisconsin, *Sartwell* (*vide Carey*).

Stolonifera. *Culmus* $\frac{1}{2}$ -1-pedalis, seaber, obtusangulus, erectus, basi vaginis foliiferis ferrugineis tectus; pars spicæ gerens $1\frac{1}{2}$ -3 poll. longa. *Folia* $\frac{1}{2}$ -1 lin. lata, plana, firma, culmo breviora. *Vaginæ* bractearum purpureæ, apice scariosæ, aetæ, aphyllæ, 1-4 lin. longæ. *Pedunculus* infimus 4-8 lin. longus, seaber. *Spicæ* maseula 4-12 lin. longa, 1-2 lin. lata, sæpe clavata. *Spicæ fœmineæ* plerumque breviores, æquilatæ, subdensifloræ, infima interdum basi composita. *Squamæ* conformes, demum decolores. *Perigynium* $1\frac{3}{10}$ lin. longum, $\frac{6}{10}$ lin. latum. *Achenium* 1 lin. longum, $\frac{6}{10}$ lin. latum, conforme, inæqualiter subplano-trigonum; ferrugineum basi styli inerasata.

This example of the *Dactylostachyæ* of Drejer in habit is like *C. cardiolepis*, Nees, but differs in the nerveless perigynium and squamæ. It was considered to be confined to the northern parts of the American continent till Dr. Mead discovered it in Illinois. I have not seen specimens from any other parts of the States. I observe occasionally, in some young florets, 4 stigmas, and the composition of the female spike is from proliferous perigynia, bearing on each side of the spike an exserted axis, with one or two perfect flowers. The marginal bracts terminate in an acute scarious apex.

246. *C. Tolmiei* (Boott); spicis 3-9 atro-vel ferrugineo-purpureis ovatis oblongisque, terminali mascula subsessili, fœmineis sæpe apice masculis, superioribus ovatis sessilibus arcte contiguis, inferioribus oblongis remotis longe setaceo-pedunculatis nutantibus vel pendulis evaginatis; bracteis inferioribus foliaceis, infima culmum subæquante; stigmatibus 3; perigyniis ovalibus compresso-subtriquetris cylindrico-rostellatis, ore integro obliquo, pallidis purpureo-tinctis parce nervatis, squama ovata obtusa mutica purpurea, nervo pallido margine sæpe decolori brevioribus vel longioribus.—*C. Tolmiei, Boott, Hook. Fl. Bor. Am.* 224. *C. melastoma, Fischer, in Herb. Boott*. (TAB. CCXCIX.)

HAB. North-west Coast, America. Columbia River, *Tolmie*; *Seemann, n.* 2207 (*Herb. Hooker*). Behring's Straits, *Langsdorff* (*Fischer*). Arakamtchetchene Island, Behring's Straits, *Wright, in U. S. N. Pacific Exp.* (*Herb. Gray*).

Rhizoma horizontaliter repens, fibris lanatis. *Culmus* 1-1 $\frac{1}{2}$ -

pedalis, triqueter, validus, lævis, basi foliatus, foliisque marcidis, reliquisque pallidis laceratis rudimentisque foliorum ferrugineis tectus; pars spicas gerens 3-5 poll. longa. *Folia* 1-2 lin. lata, firma, carinata, culmo breviora, apice triquetra, scabra. *Bractea* 2-3, foliaceæ, evaginatae: infima culmum subæquans: auriculæ oblongæ, ferrugineæ. *Pedunculus* infimus 1-1½ poll. longus, setaceus, subinde contortus. *Spica mascula* 6-8 lin. longa, sub lineam lata, sessilis vel brevipedunculata. *Spicæ fæmineæ* 4-8, quandoque apice parce masculæ, 3-8 lin. longæ, 2 lin. latæ: superiores breviores, ovatae, sessiles, arcte contiguæ: inferiores oblongæ, deorsum magis remotæ longeque pedunculatae: infima 1-2½ poll. remota, basi laxiflora, nutans vel pendula. *Squamæ* masculæ ferrugineo-purpureæ, vel omnes atro-purpureæ, nervo pallidiore, muticæ: fæmineæ inferiores longiores. *Perigynium* 1-1½ lin. longum, ⅙-⅗ lin. latum, utrinque leviter nervatum, (sub lente) tenuissime granulatum. *Achenium* ⅗-⅘ lin. longum, ⅙-⅘ lin. latum, inæqualiter triquetrum, pallide ferrugineum, angulis pallidioribus, tenuissime punctulatum, basi styli æquali abrupte apiculatum.

This species has much of the aspect, and in some respects the habit of *C. rigida*, Good., from which it differs in the number of its spikes, its 3 stigmas, triquetrous achenium, and nerved perigynium. The existence of 3 stigmas in *C. rigida* is very rare. In one of the florets from a specimen of Wright, I found a filiform racheola longer than the achenium. It belongs to the *Micro-rhynchæ* of Drejer.

247. *C. miliacea* (Muhlenberg); spicis 4 rarius 3-5 gracilibus cylindricis flavescenti-viridibus demum pallide ferrugineis basi attenuatis, terminali mascula vel apice rarius medio fæminea pedunculata nutante, fæmineis approximatis nutantibus vel pendulis, supremo sæpe sessili inferioribus basi verticillatim vel alternatim dissitifloris setaceo-pedunculatis, infima subremota obsolete vel breve vaginata; bractea infima foliacea, plerumque culmo longiore; stigmatibus 3; perigyniis oblongo-ovatis acuminatis tenuiter rostellatis, ore membranaceo integro vel emarginato, enerviis rarius parce nervatis superne vacuis subcontortis vel excurvis inferne trigonis flavescenti-viridibus tenuissimis glabris squama ovata vel lanceolata acuminata vel obtusa truncata rarius emarginata cuspidata albida, nervo viridi longioribus latioribusque.—*C. miliacea*, *Muhl.* 257; *Willd.* 290; *Schk.* 77. *O. O. O.*; *Ell.* 552; *Dewey*, x. 30; *Schw. et Tor.* 353; *Darlington*, 39; *Kunth*, 469; *Carey*, 526; *Sartwell*, *Ews. n.* 114; *Chapman*, 538. *C. prasina*, *Wahl. Act.* 161. (TAB. CCC.)

HAB. In America septentrionali. Canada to the mountains of Georgia.

Culmus 1½-2-pedalis, gracilis, debilis, superne scaber, basi foliatus, apice nudus; pars spicas gerens 2½-7 poll. longa. *Folia* 1½-2 lin. lata, culmo breviora, plana, graminea. *Bractea* infima plerumque culmo longior, obsolete vel breve vaginata: superiores setaceæ. *Vagina* 1-6 lin. longa, ligula membranacea oblonga amplectens, pallida. *Pedunculus* infimus ½-1½ poll. longus, setaceus, scaber. *Spica* terminalis mascula vel apice rarius medio fæminea, basi attenuata, laxiflora, 1-2 poll. longa, 1 lin. lata, nutans. *Spicæ fæmineæ* sæpius 3, infima 1-3½ poll. remota, inferiores flosculis basi verticillatim vel alternatim laxe dispositis, nutantes vel pendulæ. *Squamæ* omnes albidæ, demum pallide ferrugineæ, margine hyalinæ, nervo viridi vel ferrugineo: masculæ lanceolatae, acutæ, muticæ vel mucronulatae: fæmineæ ovatae vel lanceolatae, acuminatae: vel obtusæ, truncatae, rarius emarginatae, cuspidatae. *Perigynium* 1-1½-⅗

lin. longum, ⅙ lin. latum, basi antice angulo achenii distentum, superne vacuum; rostello tenui, albido. *Achenium* ⅘ lin. longum, ⅙ lin. latum, circumscriptione subrotundo-obovatum, triquetrum: angulis medio incrassatis, lateribus insigniter concavis: pallide castaneum; basi styli demum decidua.

No author has confidently decided on the affinity of this species. Tuckerman places it among his *Acutæ*. Carey thought it was not allied to any of the American species he had described, and for convenience placed it in his *Anomalæ*, with *C. scabrata* and *C. Sullivantii*. Both he and Dewey thought that in aspect it was like some forms of *C. crinita*. The perigynium has a general resemblance to that of *C. torta*, but the peculiar achenium, and the yellowish-green colour of its spikes, and the white scales with their green nerve and mucro, separate it from the *Melanostachyæ* of Drejer, which include the *Acutæ*. Its inflorescence is like that of *C. gracillima* and its allies. The achenium, with its concave sides and angles incrassate at the middle, is like that of *C. glaucescens* and *C. scabrata*, and I am inclined to place it with the last.

The emargination of the scales is by no means constant. Dewey remarks that it is so slight as to require nice examination. Torrey describes them as acuminate, and Carey as ovate. I have not seen any specimens south of Virginia. Elliott has none in his Herbarium, and he quotes Pursh for its locality. Chapman finds it in the mountains of Georgia.

248. *C. Wahlenbergiana* (Boott); spica elongata ferruginea rarius pallida concolori, e spicis partialibus singulis sub 8 (ambitu lanceolato) compactis, inferioribus remotis exserte pedunculatis subduplicato pinnatim compositis, basi ramosis, ramis appressis, usque ad basin spiculiferis; spiculis lanceolatis erectis congestis apice plus minus masculis; bracteis superioribus culmo longioribus; stigmatibus 3; perigyniis lanceolatis plano-triquetris rostratis bifidis glabris marginibus serratis nervatis rectis, squama late ovata acuta vel obtusa subemarginata striato-nervosa glabra aristata ferruginea margine albo-hyalina nervo viridi angustioribus longioribusque.—*C. Wahlenbergiana*, *Boott.* *C. Indica*, *Wahl. Act.* 149 (*excl. Lin.*); *Willd.* 246 (*excl. Lin. Mant.*); *Schk. f.* 206 (*excl. Lin.*); *Poiret, Ency. Suppl.* iii. 240 (1813); *Kunth (ejus descr. excl. Lin., Nees)*. (*Non Lin. Mant.*; *nec Lamarck, Ency.* iii. 385 (1783), *nec Nees*.) *C. Persoonii*, *Schk.* (TAB. CCCI.)

HAB. In insulis Bourbon et Mauritius, et in Abyssinia.

Var. β ; perigyniis squamisque scabris. (TAB. CCCII.)

Var. γ ; perigyniis omnino vel superne tantum scabris, rostro breviori. (TAB. CCCIII.)

Var. δ . *Schimperi*; culmo altiori; foliis glaucis; bracteis superioribus culmo brevioribus demum obsolete; perigyniis 3-5-7 lin. longis, ⅘ lin. latis, squamis subinde muticis, spathella vix gibbosa. (TAB. CCCIV.)

HAB. In Abyssinia, ad montem Silhe, alt. 9-10,000 ped., *Schimper*, n. 545 (1852), *Herb. Mus. Paris.*

Var. ϵ ; brevifolia. (TAB. CCCV.)

Culmus 2-pedalis, lævis. *Folia* 2-4 lin. lata, culmum subæquantia. *Bractea* inferiores vaginatae, culmum æquantes; superiores angustæ, eo longiores. *Vagina* infima 1½-2½ poll. longa. *Pedunculi* 1-3 poll. longi, scabriusculi. *Spicæ* partiales 1-3½ poll. longæ, 6-8 lin. latæ: inferiores ramis erectis coarctato-aggregatis. *Spiculæ* 5-9 lin. longæ, 2 lin. latæ, erectæ, appressæ, rarius patentæ, contiguæ. *Perigynium* 2-4 lin. longum, fere ⅙ lin. latum, bifidum, plerumque rectum; laciniis ⅘ lin. longis, acutis vel obtusiusculis, carinato-com-

plicatis, margine membranaceis; carina ciliato-scabra, rarius sublævigata; rostro plus minus longo. *Achenium* stipitatum, $1-1\frac{2}{10}$ lin. longum, $\frac{1}{2}$ lin. latum, plano-triquetrum, pallidum, basi styli æquali apiculatum. *Stylus* puberulus. *Spathella* gibbosa.

A *C. ramosa*, Schk., differt inflorescentia magis compacta, simplici; spicis singulis aggregatis; ramis ad basin spiciferis, erectis; perigyniis glabris, latioribus, bifidis, laciniis subulatis, margine membranaceis, brevioribus.

I have no hesitation in referring the *C. Indica* of the authors quoted to this species. The "spicis compositis, ramis aggregatis, capsulis depresso-triquetris" of Wahlenberg, exactly apply to it, and not to the *C. Indica* of Linnæus, to which he, Willdenow, and Schkuhr referred it. They all refer it to the island of Bourbon. Kunth gives the description of Nees, but adds one of his own from a specimen from the Mauritius, which he says is similar to the Bourbon one in Herb. Willdenow. Lamarek copies the description of Linnæus, translating into French Linnæus's observations, and afterwards alludes to a specimen he has of Commerson from Bourbon, which he says offers some particulars not expressed by Linnæus. Poiret, in the Supplement to the French Encyclopædia under *C. Indica*, quotes all the above references to Willdenow, Wahlenberg, and Schkuhr.

I have had an opportunity, through the kindness of M. Spach, of examining the specimens in the Paris collection, gathered in the isle of Bourbon by Commerson, Richard, and Boivin, and one from the Mauritius in Herb. Hooker. They differ in the pale or ferruginous colour of the inflorescence, in the smoothness or roughness of the perigynium, which is from $\frac{6}{10}$ to $\frac{8}{10}$ of a line in breadth, in the length of the rostrum, the laciniæ acute or obtuse, often unequal and more or less ciliate, and in the squamæ being more or less obtuse or emarginate. The species is well characterized by the compact spikes, the branches being erect, the spiculæ appressed, rarely patent, and the perigynia but slightly excurved.

The specimens figured are,—

Tab. CCCI. From the Isle of Bourbon, gathered by Boivin, the same as the plant from the Mauritius in Herb. Hooker.

Tab. CCCII. β . With rough perigynia and squamæ, from Bourbon, Richard.

Tab. CCCIII. γ . From Bourbon (Commerson), the perigynia broader, more or less scabrous, the rostrum short, the style very rough, and the achenium occasionally with a linear racheola.

Tab. CCCIV. From Abyssinia, Schimper (Herb. Mus. Paris).

There are no essential characters in the Abyssinian plant to justify its separation from the insular one. The perigynium is longer, and the upper bracts shorter, and the squamæ occasionally muticæ.

Tab. CCCV. Isle of Bourbon, Boivin, a solitary specimen in Herb. Mus. Paris, with short leaves, otherwise in squamæ approaching *C. crinigera*, B.

249. *C. crinigera* (Boott); spica longissima ferruginea concolori supradecomposita, e spicis partialibus sub 12 (ambitu latè ovato) laxis patulis, extremis singulis, reliquis geminis inæqualibus, superioribus sessilibus evaginatis pinnatim, inferioribus subæqualiter distantibus longe graciliter exserte pedunculatis duplicato vel deorsum ramosis subtriplicato pinnatim compositis; ramis basi nudis; spiculis lanceolatis alternis divaricatis plus minus apice masculis; stigmatibus 3, longis; perigyniis fusiformibus triquetris longe rostratis alte bicuspidatis (laciniis filiformibus) undique scaberrimis tenuiter nervatis obliquis vel subexcurvis, squama lanceolata acuta aristata striato-nervosa scaberrima ferruginea sæpe concolori angustioribus longioribusque. (TAB. CCCVI.—CCCVIII.)

Var. β ; minor. (TAB. CCCIX.)

HAB. In the Island of Bourbon (Herb. Mus. Paris).

Culmus 3-pedalis, validus, lævis, superne scaber; pars spicas gerens 2-2½-pedalis. *Folia* 3-4 lin. lata, culmum subæquantia,

rigida. *Bracteæ* inferiores 3-4 lin. latæ, longæ, vaginatæ; superiores angustæ, culmo breviores. *Vaginæ* inferiores 2-3 poll. longæ. *Pedunculi* inferiores 3-5 poll. longi, graciles, scabri. *Spicæ* partiales superiores subpollicem longæ, singulæ, sessiles, contiguæ: reliquæ geminatæ, 2-3½ poll. longæ, $1\frac{1}{2}$ - $2\frac{1}{2}$ poll. latæ, inæquales, deorsum basi magis ramosæ; ramis apertis, basi nudis; rachii scabra, sæpe flexuosa. *Rami*, ut spiculæ, e spathella egredientes, bracteolis minimis setaceis suffulti. *Spiculæ* 4-8 lin. longæ, divaricatæ. *Squamæ* conformes, scaberrimæ. *Perigynium* $2\frac{1}{2}$ lin. longum, $\frac{1}{2}$ lin. latum, nervis marginalibus magis prominentibus, alte bicuspidatum, laciniis filiformibus $\frac{1}{2}$ lin. longis undique scaberrimum. *Achenium* (cum stipite $\frac{2}{10}$ lin. longo) $1\frac{2}{10}$ lin. longum, plus quam $\frac{4}{10}$ lin. latum, triquetrum, fuscum, basi styli æquali apiculatum. *Stylus* puberulus.

C. ramosa seems to have been established by Schkuhr, on specimens from the Mauritius, as Willdenow quotes his figure, which however was not published till 1806, when he corrected Willdenow's error as to the number of stigmata. Kunth, under *C. ramosa*, quotes *C. cruciata*, Wahl., as a synonym, on the authority of Wahlenberg in his Fl. Lapponica, p. 250, and consequently gives all the habitats of Schkuhr, Wahlenberg, Willdenow, and Nees, thus making it a native of the Mauritius, China, and the East Indies. He describes it from specimens sent to him from Paris, which he says are like those of Willdenow, but does not say of which country they were native.

Nees has no *C. ramosa* in his list in Wight's 'Contributions,' but he speaks of it under *C. meiogyna*. I infer, therefore, he considered it distinct from *C. cruciata*, Wahl. Had he thought them the same, he would have quoted *C. ramosa* as a synonym to *C. cruciata*, and have contrasted his *C. meiogyna* with *C. cruciata*, which he describes, and not with *C. ramosa*. I am informed by M. Spach that there is no authentic specimen of *C. ramosa*, so named, in the Paris Herbarium, but it was probably established on specimens collected by Commerson or Petit-Thouars, as such are in the herbarium of the garden of plants found by them in the Mauritius. There is also a specimen from the same island in Herb. Hooker, from Bojer.

I have, through the kindness of M. Spach, had the opportunity of examining a suite of specimens of *C. crinigera* from the Paris collection, gathered in the island of Bourbon by Richard, Boivin, Bernier, and Gaudichaud, which differ from *C. ramosa* in geminate spikes, larger spiculæ, and a deeply bifid and highly excurved perigynium, scabrous squamæ, and a more complex inflorescence. The fig. n. 204, of Schkuhr, is the only authority I have for his *C. ramosa*, which is a native of the Mauritius. I am not aware of the date of Commerson's or Petit-Thouars's visit to that island, but I think it probable the specimens of *C. crinigera* sent to Paris by the collectors above named, from the island of Bourbon, must have been much later, and perhaps also posterior to the publication of Schkuhr's work in 1806.

The specimens figured are,—

Tab. CCCVI. The lower and

Tab. CCCVII. the upper portion of a specimen from the island of Bourbon (Richard). In Tab. CCCVII. at $v \times \times \times$ is a branch of the panicle with 3 spiculæ, the lateral ones with a solitary female floret. The separate spicula on the right is more enlarged, showing a bract, and the spathella open to the base bearing a pistil, clearly indicating the nature of the spathella, which in these paniculate species is either sterile (an axis only issuing from it), or bearing a normal floret, or a pistil, or stamens only.

Tab. CCCVIII. A partial spike much enlarged, with separate spiculæ, with one or more female florets, or entirely male, the spathellæ either sterile, or with a normal floret or a pistil only.

1. A spicula seen in a front and back view, entirely male, the spathella sterile.

2. A spicula seen in a back and front view, with a solitary female floret in the form of a pistil only issuing from the spathella.

3. The same as No. 2, the spathella removed to show the pistil.

4. A spicula with a solitary female floret, sterile spathella, and bract.

5. The same as No. 4, seen from within, removed from the axis and bract, showing, as in Nos. 1 and 2, the bicarinate spathella.

6. A lateral branch of the spike, with 3 spiculæ; terminal one normal, *without* spathella, lateral ones male, with sterile spathella.

Tab. CCCIX. *β. minor*. A specimen from the island of Bourbon (*Bernier*), with a simpler inflorescence.

The perigynia are represented as punctulate,—a character I have not observed, and I suspect the base of the setæ gave M. Maubert the idea of it. In what I consider as the true *C. ramosa* of Schkuhr, from the Mauritius, the perigynia, both in specimens from Petit-Thouars, and from Bojer in Herb. Hooker, have distinct, resinous, ferruginous spots.

In this remarkable group the general direction of the perigynium varies in the same spicula, being erect or slightly oblique at top, and gradually more and more excurved towards the base of the spicula. The excurved form, however, varies in degree in different species. It is a very striking character, from the early development of the perigynium in *C. filicina*, Nees.

250. *C. cryptostachys* (Brongniart); spica plus minus elongata lineari viridi demum olivaceo-ferruginea, e spiculis 8–10 vel pluribus oblongis linearibus apice masculis erectis exserte pedunculatis in racemis radicalibus aphyllis simplicibus vel deorsum compositis alternatim dispositis; bracteis vaginatis subulato-brachyphyllis; stigmatibus 3, brevibus; perigyniis oblongis vel oblongo-obovatis stipitatis compresso-biconvexis rostellatis, ore subobliquo bidentato, crebre striato-nervosis superne scabris marginibus ciliatis, squama subrotunda ovata obtusa mutica vel abrupte apiculata mucronata plus minus vaginato-

amplectente longioribus.—*C. cryptostachys*, *Brongn. Voy. de la Coquille, Duperry, t. 25; Kunth, 513.* (TAB. CCCX.)

HAB. In India orientali. China. Penang, *Wallich, n. 3383.* Offack, Ins. Waigiou, N. Guinea, *Durville.* Touran, Cochin China, *Gaudichaud (Herb. Mus. Paris).* Java, *Zollinger (Herb. Mus. Paris).* Hongkong, *Wright.* U. S. Pac. Exped., *Dr. Harland.*

Culmi 6–12-poll., plures ex eadem radice, aphylli, fere e basi spiculiferi, graciles. *Folia* 3–5 lin. lata, culmos longe superantia, plana, apice longe attenuata, striato-nervosa, rigida. *Bracteæ* vaginatæ, subulatæ, spiculis breviores. *Vaginæ* 3–12 lin. longæ, intus scabriuseulæ. *Spica* 6–10 poll. longa, in eadem planta simplex vel basi e ramis plus minus longis composita. *Spiculæ* 3–14 lin. longæ, 1½ lin. latæ, apice inconspicua masculæ. *Squamæ* subinde plus minus vaginantes. *Perigynium* (eum stipite $\frac{3}{10}$ lin. longo) $1\frac{8}{10}$ lin. longum, $\frac{7}{10}$ lin. latum. *Achenium* (eum stipite calloso tumido aurantiaco $\frac{2}{10}$ lin. longo) $1\frac{1}{10}$ lin. longum, $\frac{7}{10}$ lin. latum, depressionibus undique distortum, fuscum; basi styli deorsum recurvata, æquali.

This remarkable species, originally found by Dr. Wallich at Penang, was not noticed till Brongniart described and figured it among the plants collected in the voyage of the 'Coquille.' I am indebted to M. Spach for the knowledge of its having been found in Java and Cochin China, and to Dr. Gray and Mr. Bentham for its being a native of Hongkong. It belongs to the *Dactylostachyæ* of Drejer.

THE END.



C. CRUENTA.



C. CRUENTA. A & B. (2)

M.

p.



C. CRUENTA. B.

M.

2.



C. KOSTLINI.



C. KÖSTLINI.



C. KÖSTLINI. B.

M.

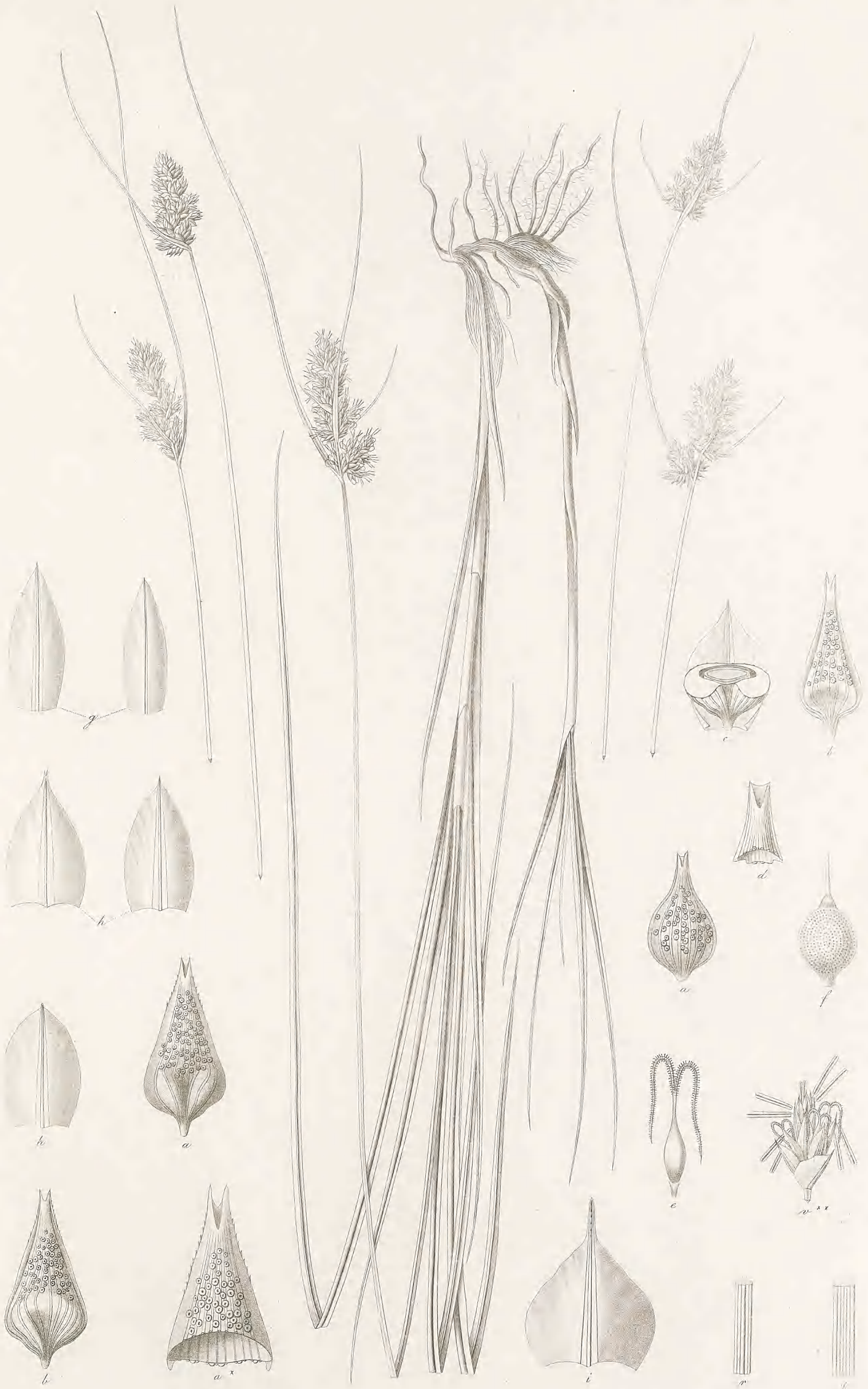
P.



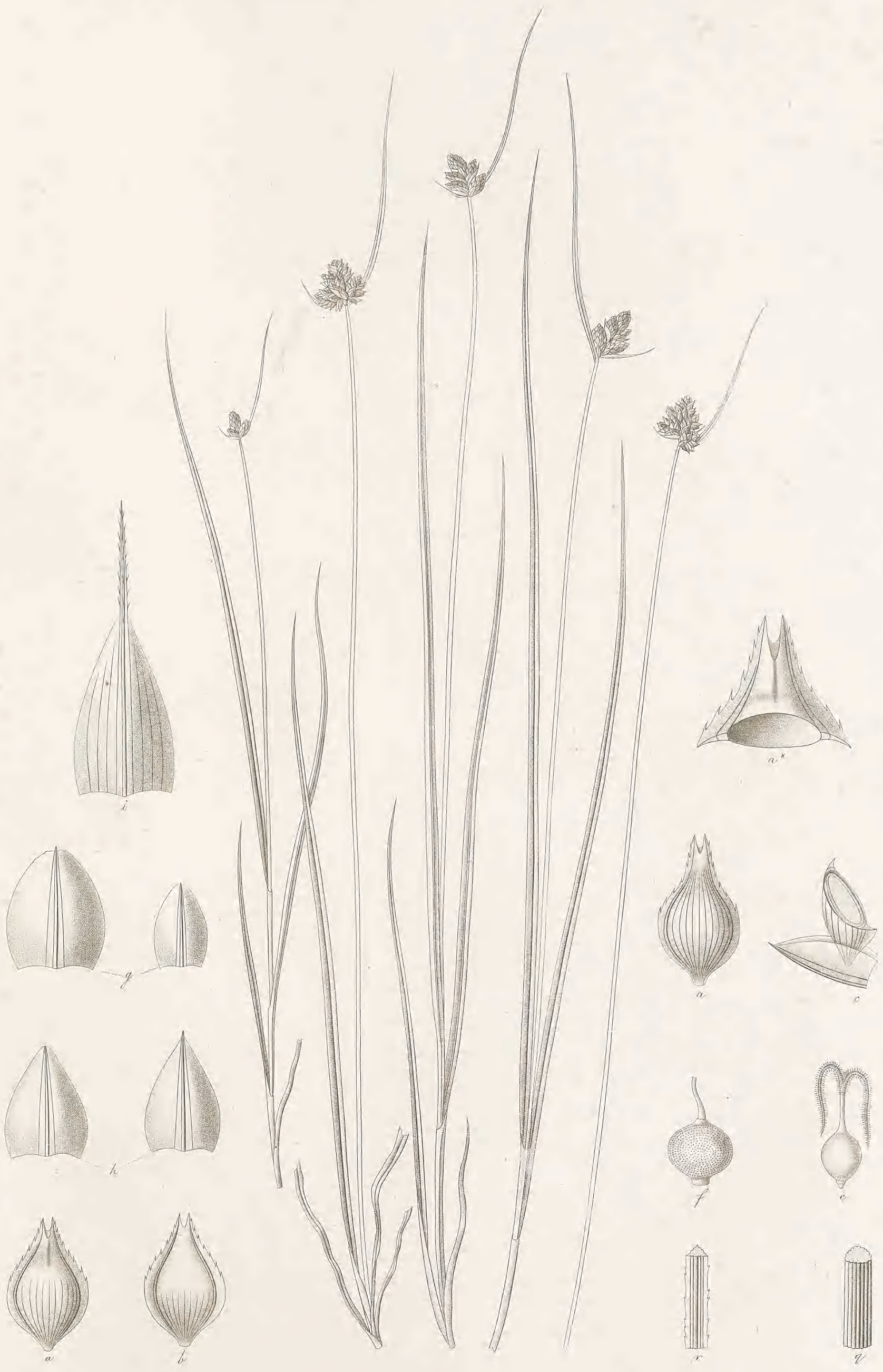
C. KÖSTLINI, B.



C. CONFERTA.



C. BONARIENSIS.



C. INVOLUCRATA.



C. FRANKLINII.

M.



C. FULIGINOSA.

M.

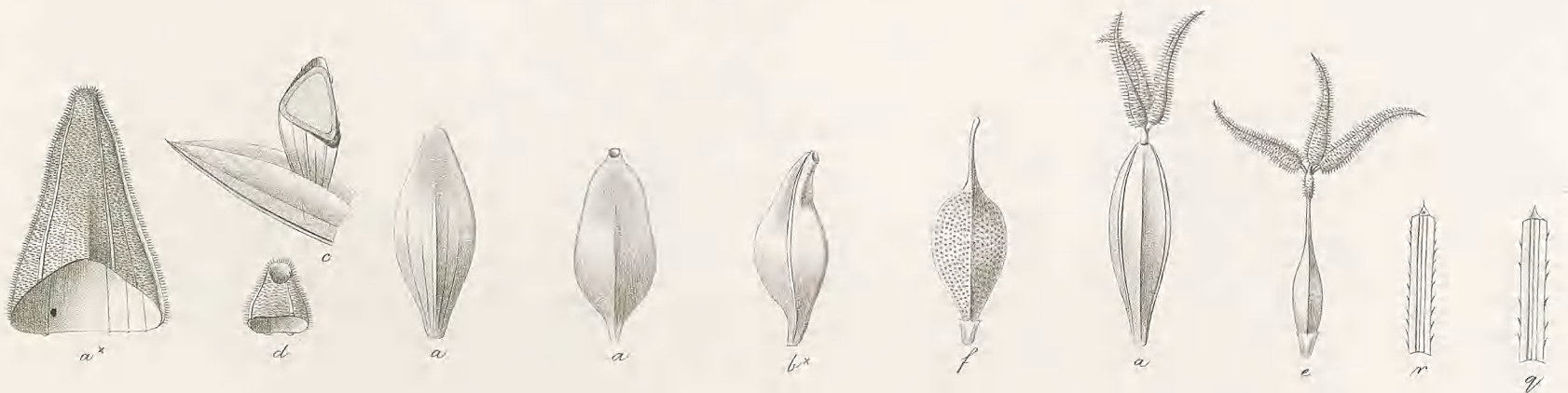
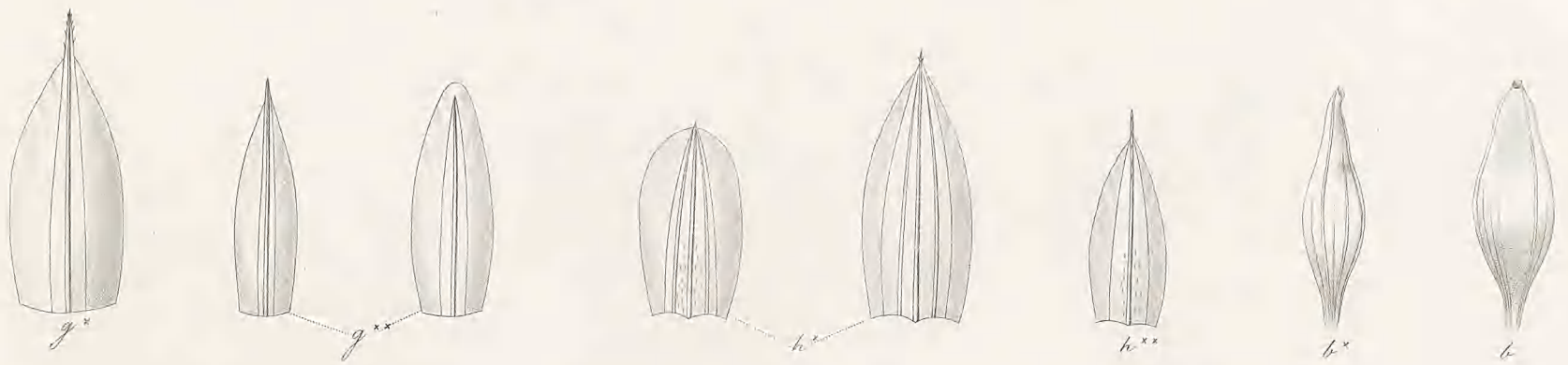
c.



C. L A X A .

Al.

β



C. LIVIDA.



C. LIVIDA.

M.

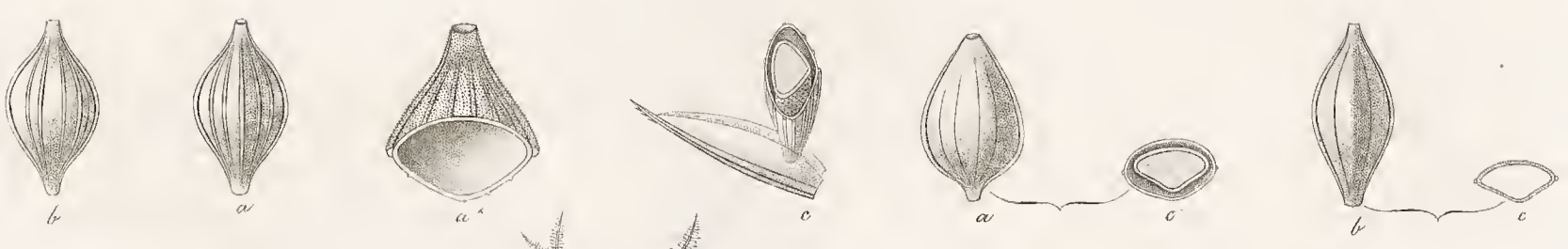
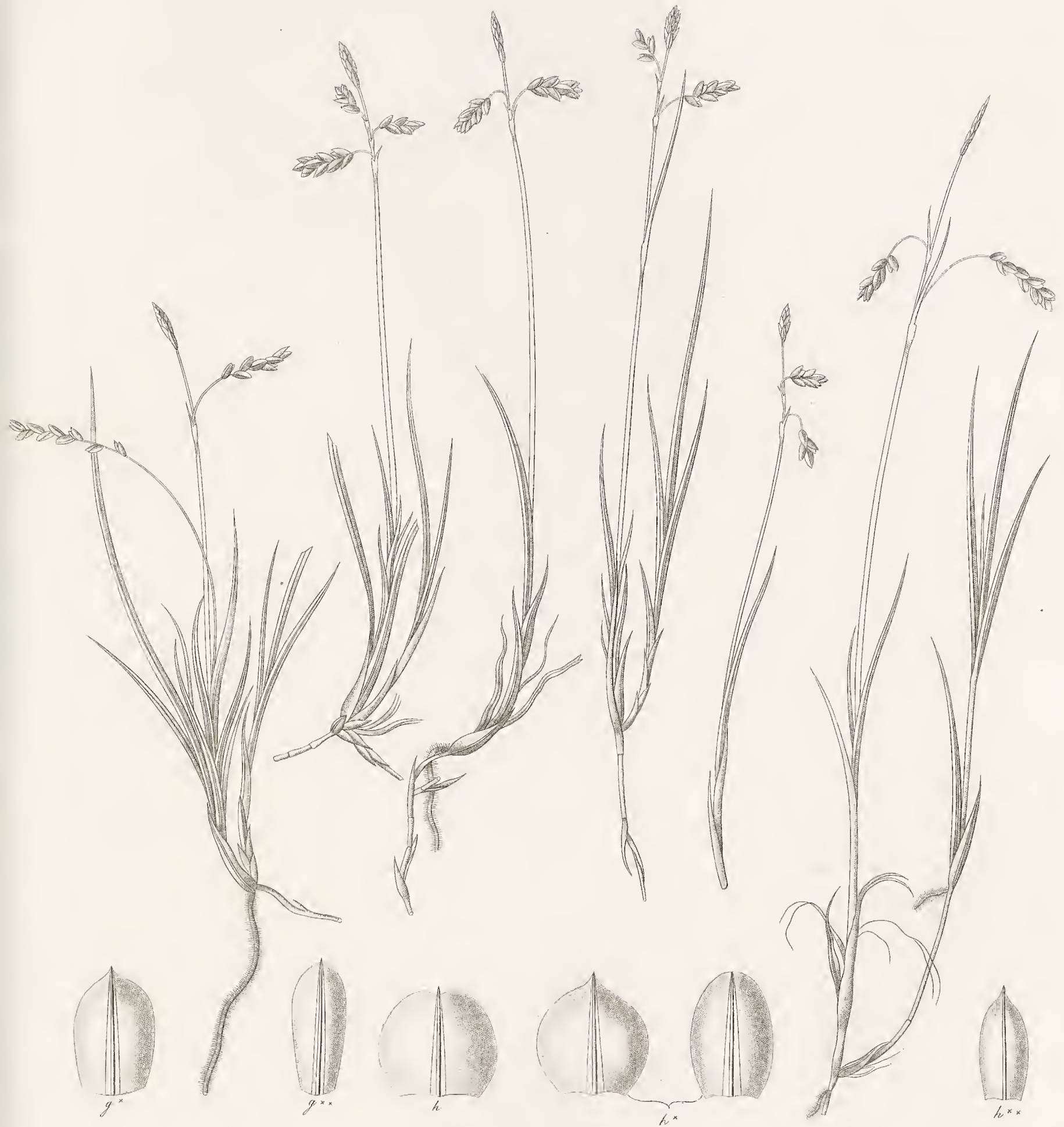
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C. LIMOSA.

ll.

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C. RARIFLORA.



C. MAGELLANICA.
(Fuegia)

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C. MAGELLANICA.
(Lapponica)



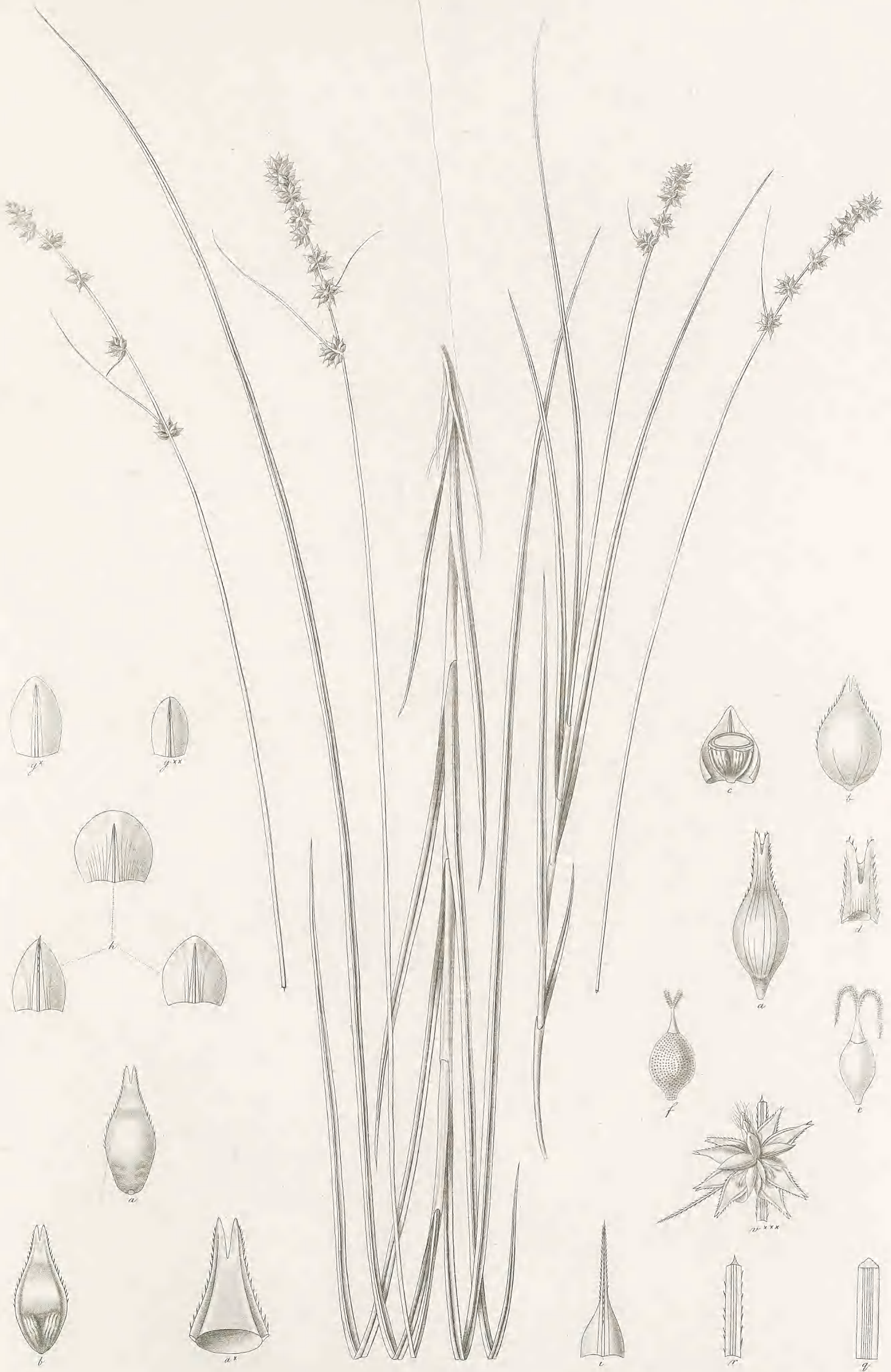
C. MAGELLANICA.
(Boreali Americana)



C. MONOSTACHYA.



C. GLOMERATA.



C. ROSEA.



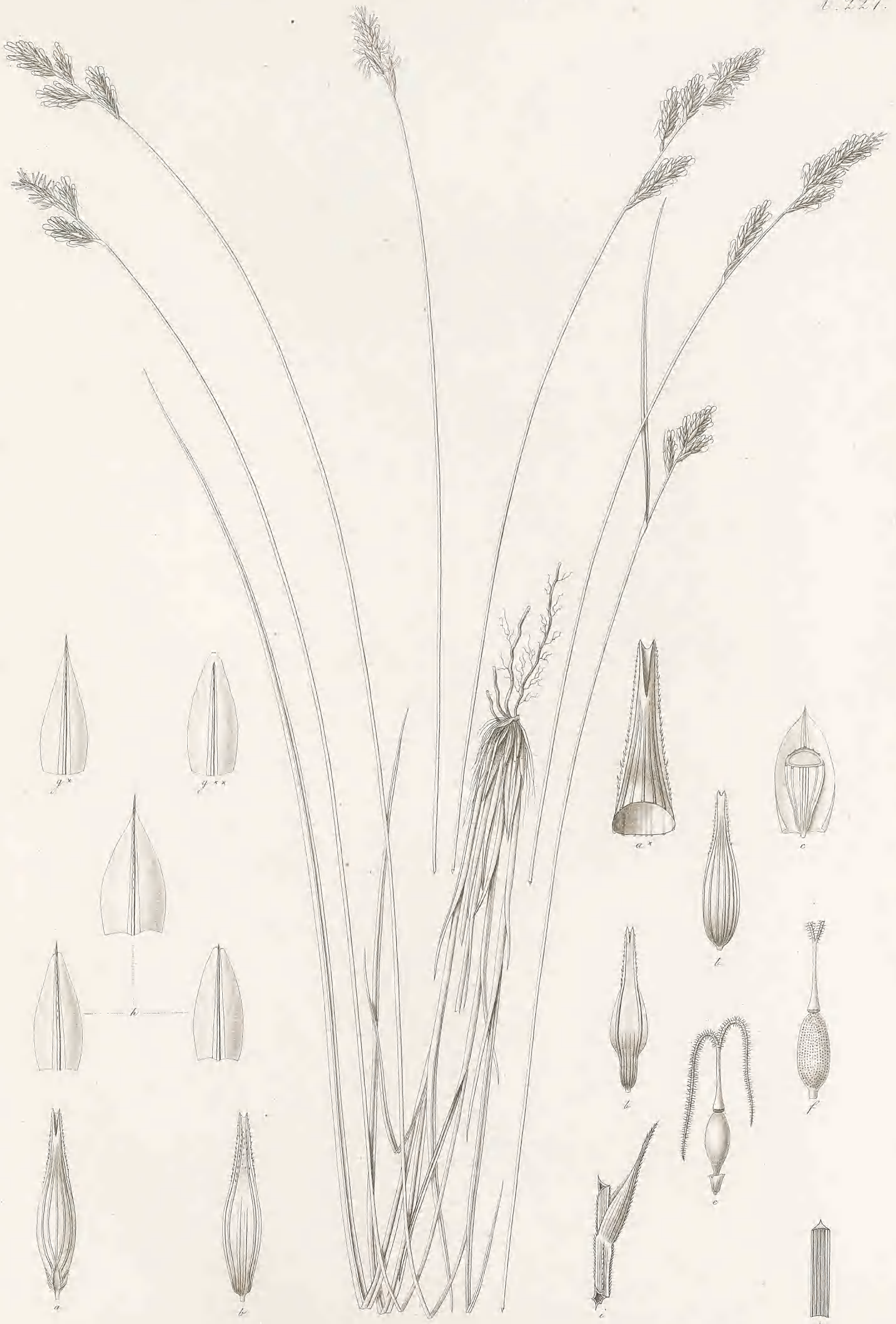
C. ROSEA B.



C. ROSEA γ.



C. RETROFLEXA.



C. BROMOIDES.



C. DESPONS A.



C. MYOSURUS.

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C. MYOSURUS.

M.

P.



C. MYOSURUS.



C. MYOSURUS.

M.

P.



C. MYOSURUS.



C. BACCANS.

M.

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C. BACCANS.

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C. BACCANS.



C. BACCANS.

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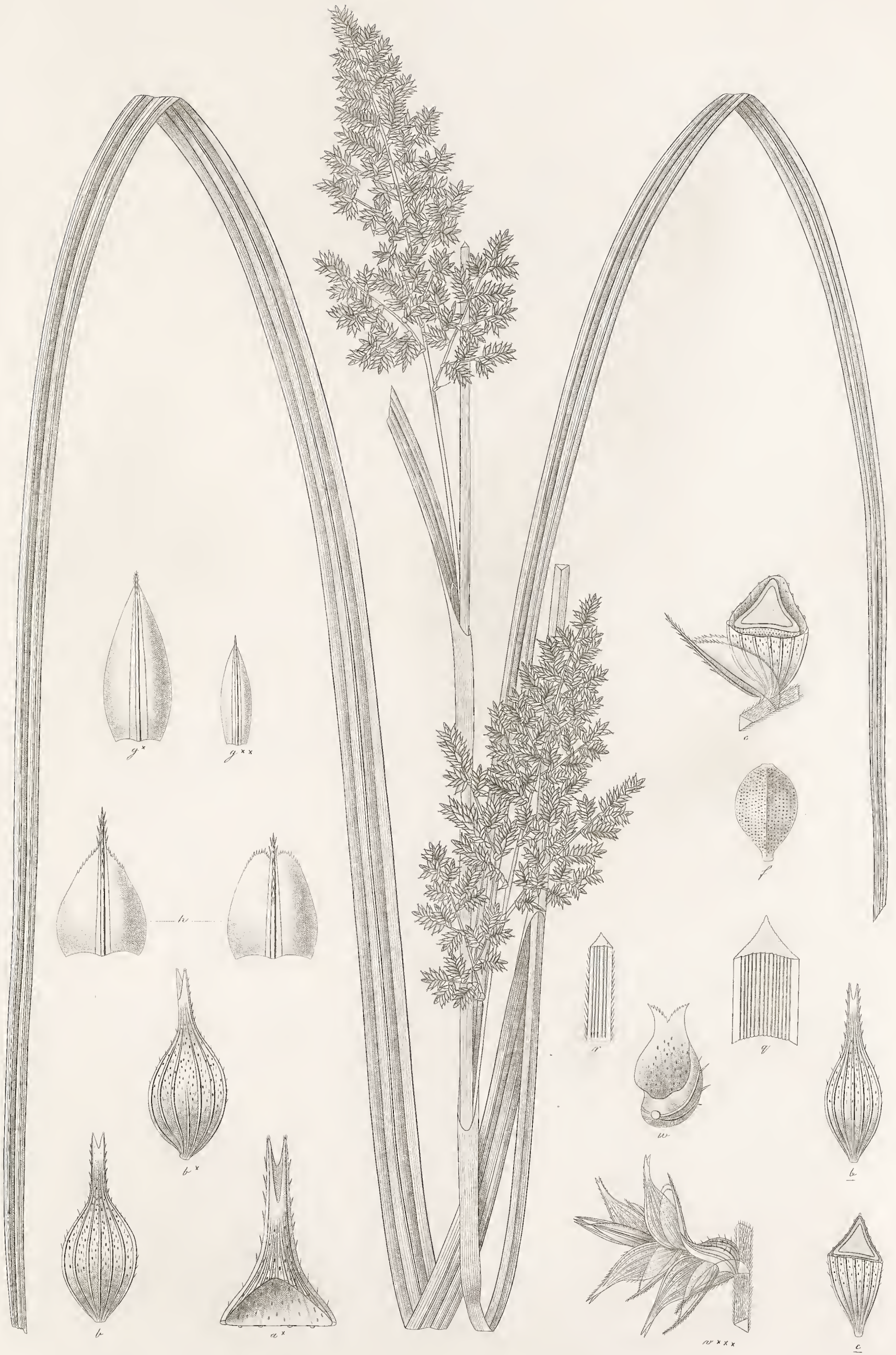


Rees del et Lith

C. baccans.



C. BENGALENSIS.



C. BENGALENSIS.



C. BENGALENSIS.



C. BENGALENSIS.

M.

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C. RAPHIDOCARPA.



C. FISSILIS.



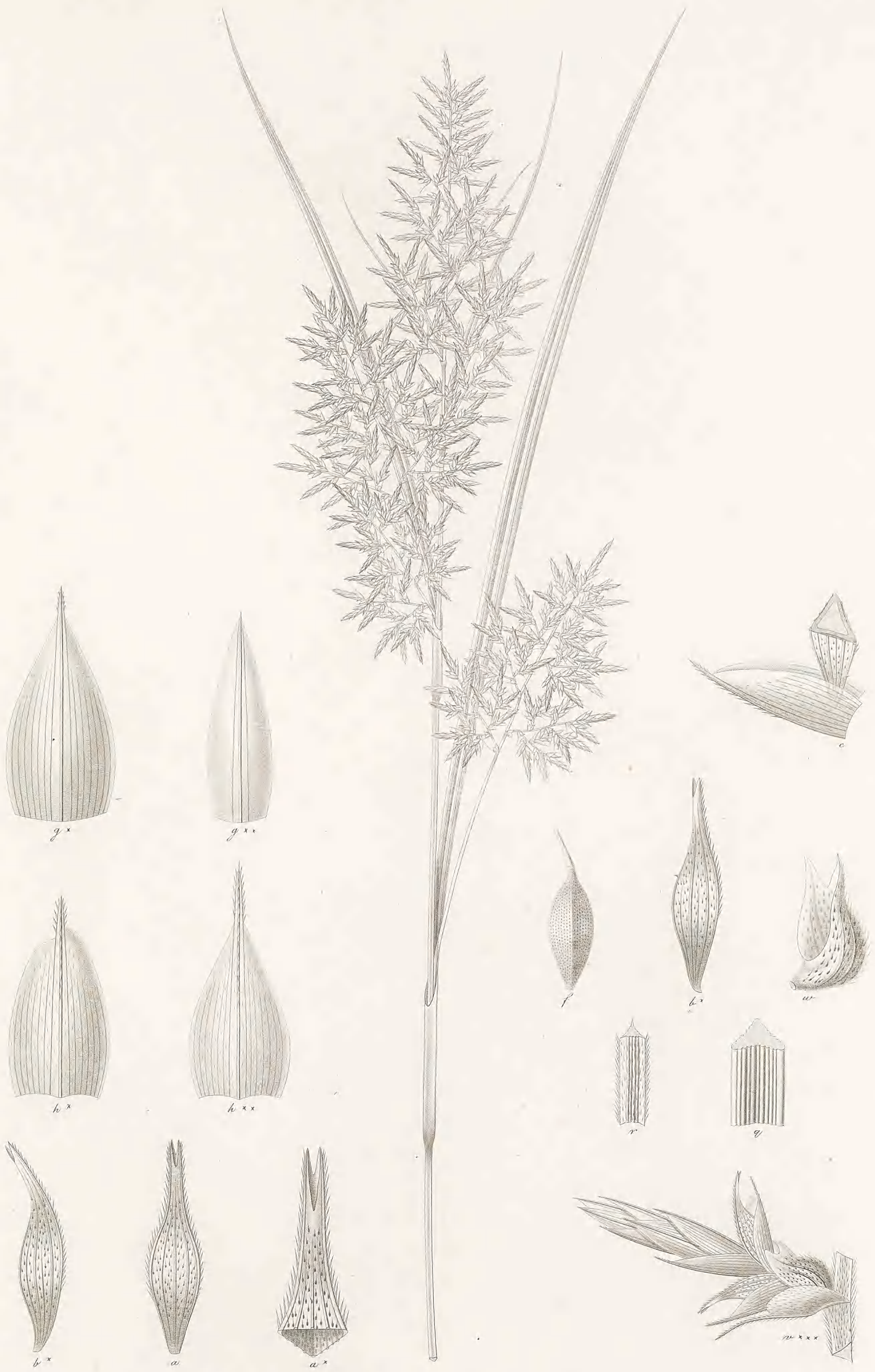
C. SPATIOSA.



C. CONDENSATA.

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C. CONDENSATA.

M.

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C. CONDENSATA B:

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C. INDICA.



C. INDICA.



C. INDICA.



C. INDICA.



C. INDICA B.



C. HARLANDI.



C. TENEBROSA.



C. JAPONICA.



C. ALOPECUROIDES.

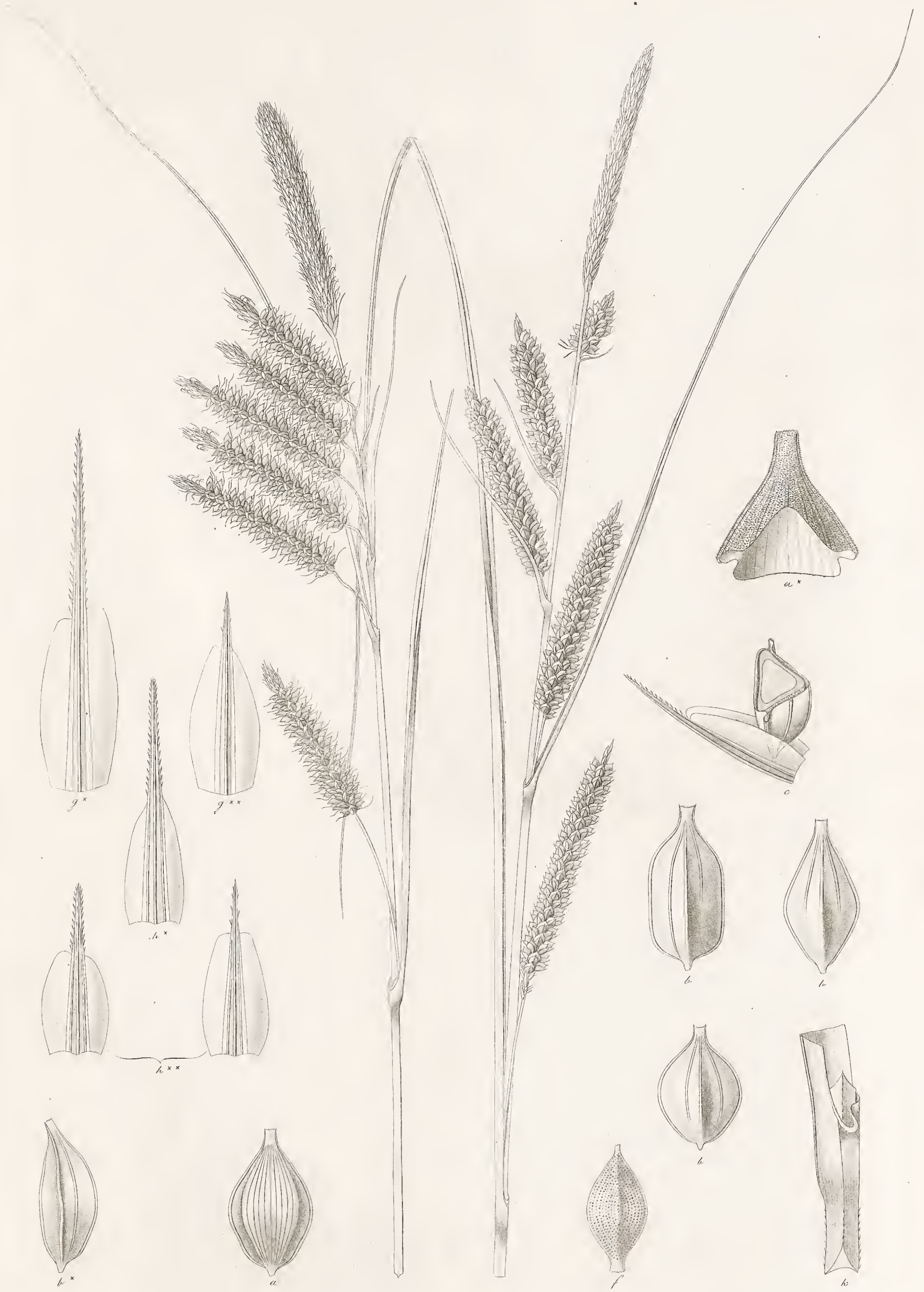




C. PETITIANA.



C. BRASILIENSIS.



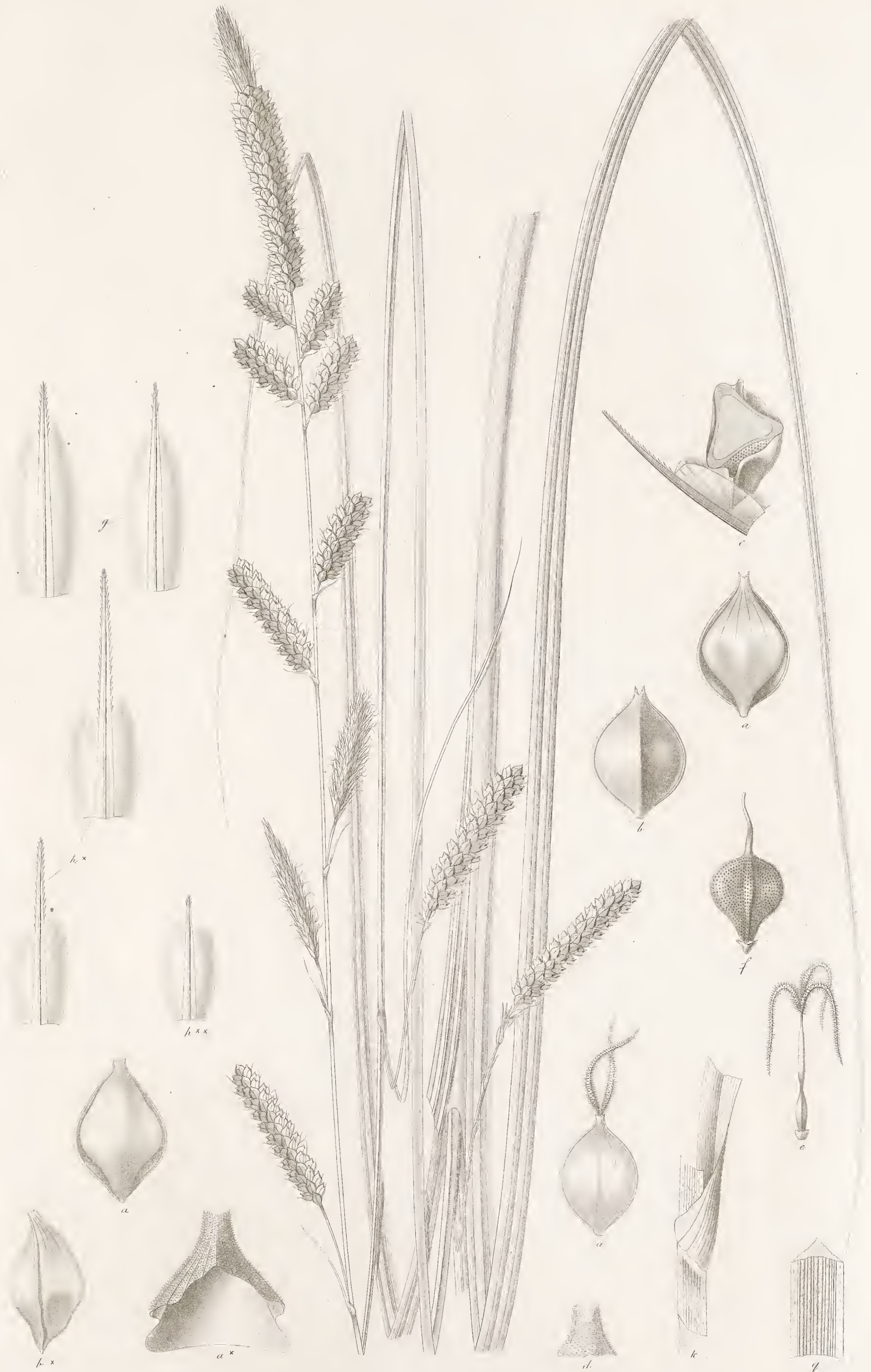
C. GLAUDESCENS.



C. GLAUDESCENS. B.

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C. GLAUDESCENS. γ.



C. TURGEScENS.

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P.



C. ELLIOTTII.

M.

p.



C. SCHWEINITZII.



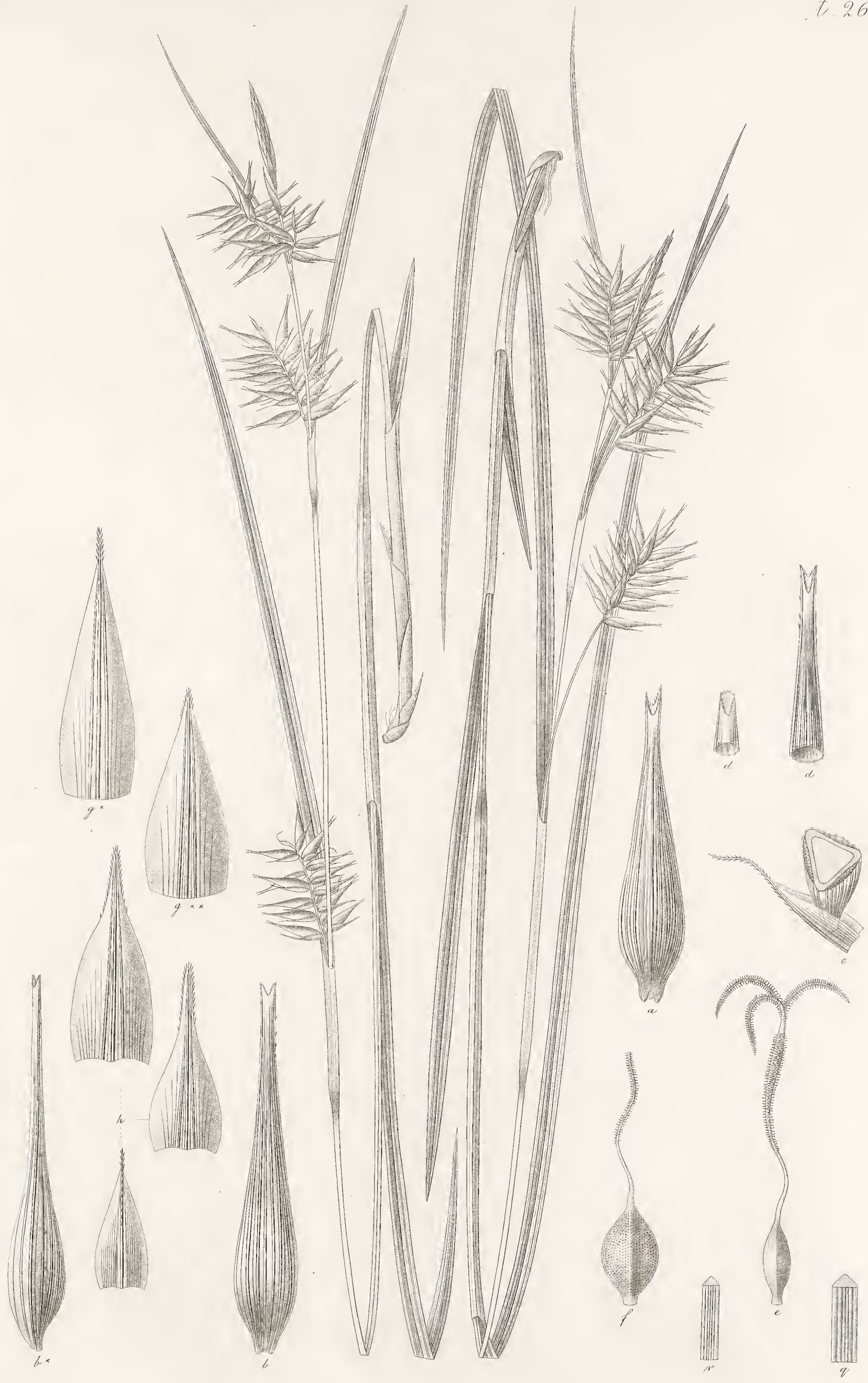
C. ROSTRATA

M.

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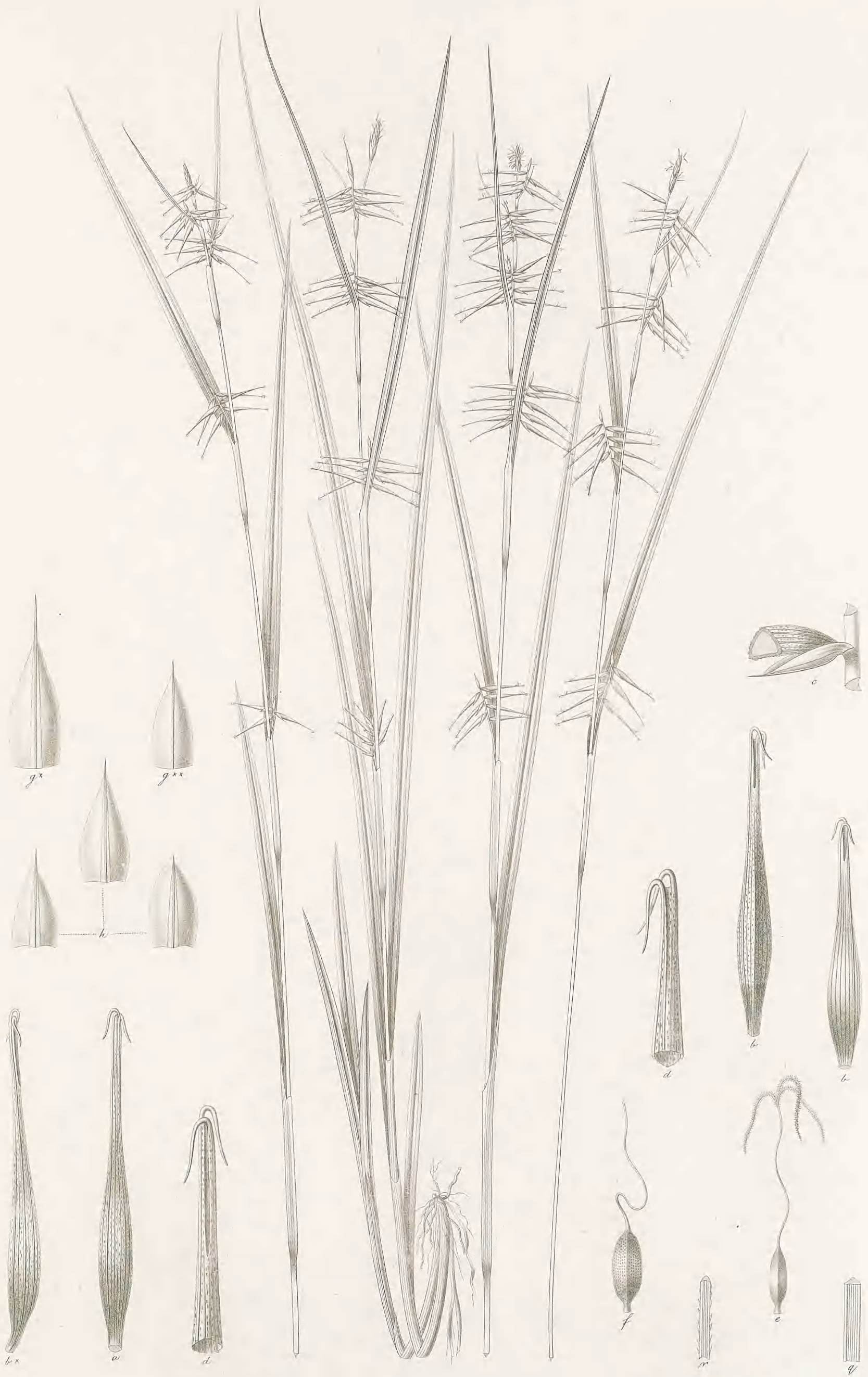
C. FOLLICULATA.



C. FOLLICULATA VAR. B.

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6.



C. SUBULATA.



C. SHORTIANA.



C. DEBILIS.



C. DEBILIS B.

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C DEBILIS γ.



C. GLABRA.



C. RETROSA.



C. TENTACULATA.

M.

C.



C. TENTACULATA VAR. γ.

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C. HALEI.

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C. SQUARROSA.



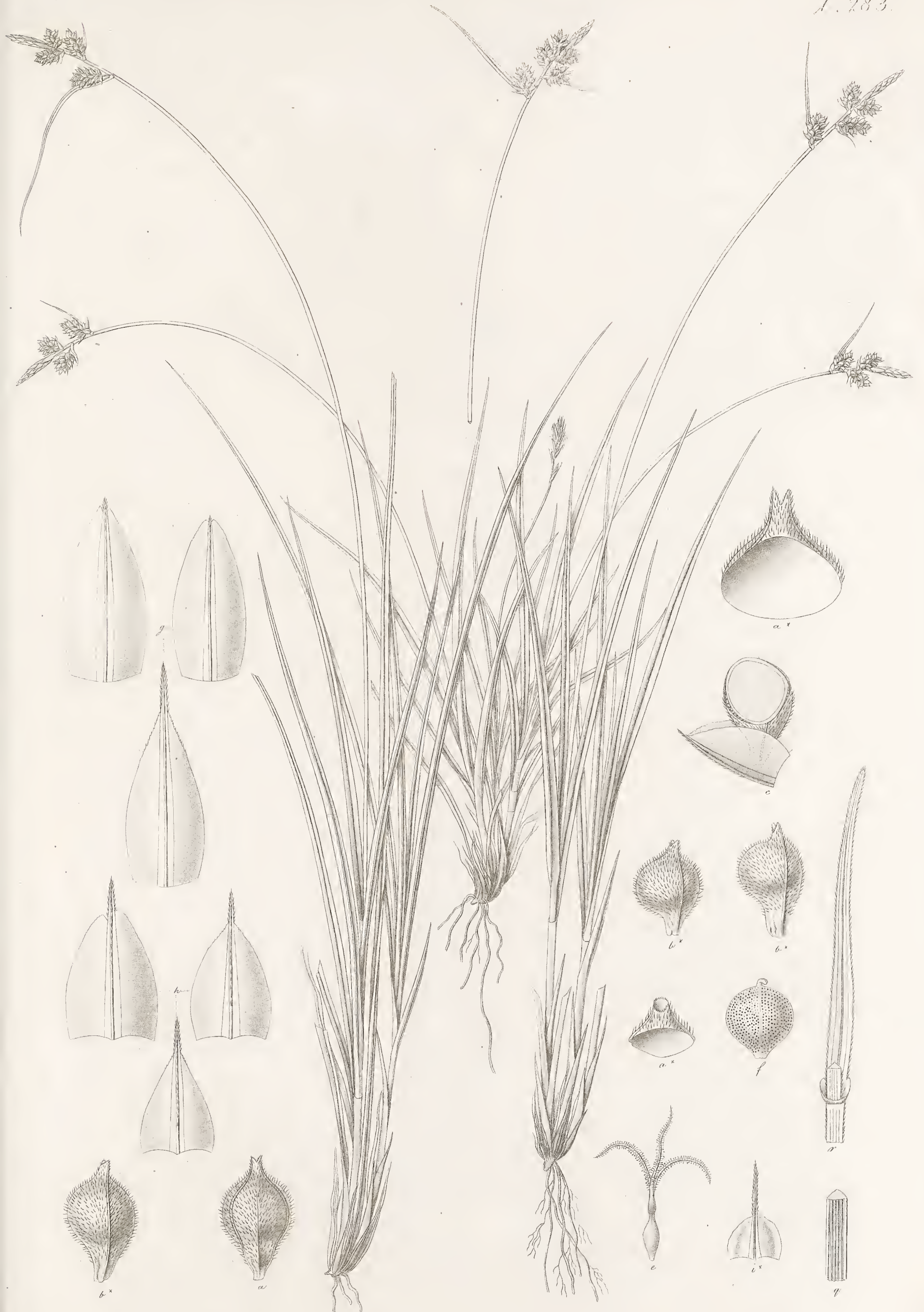
C. SQUARROSA.



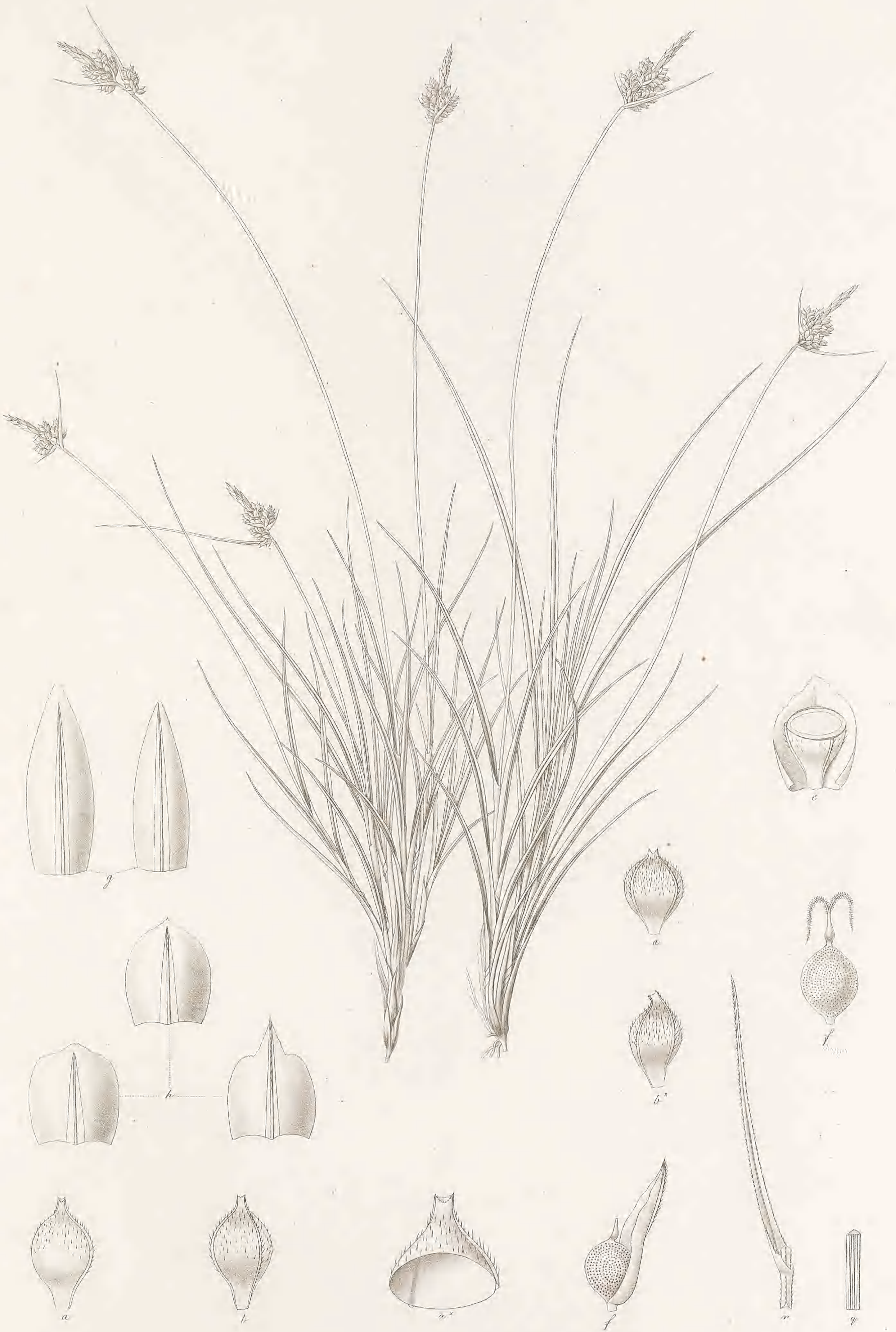
C. STENOLEPIS.

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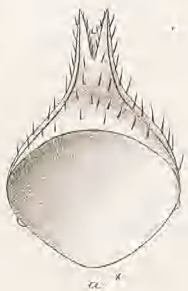
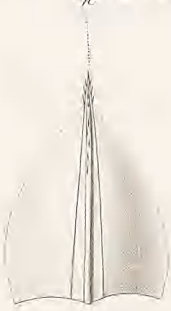
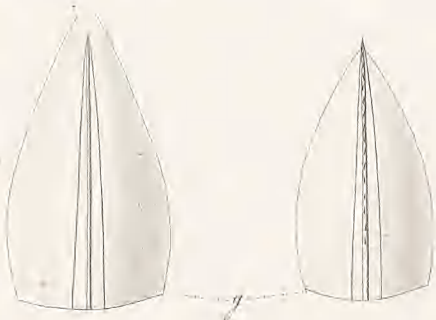
C. PILULIFERA.



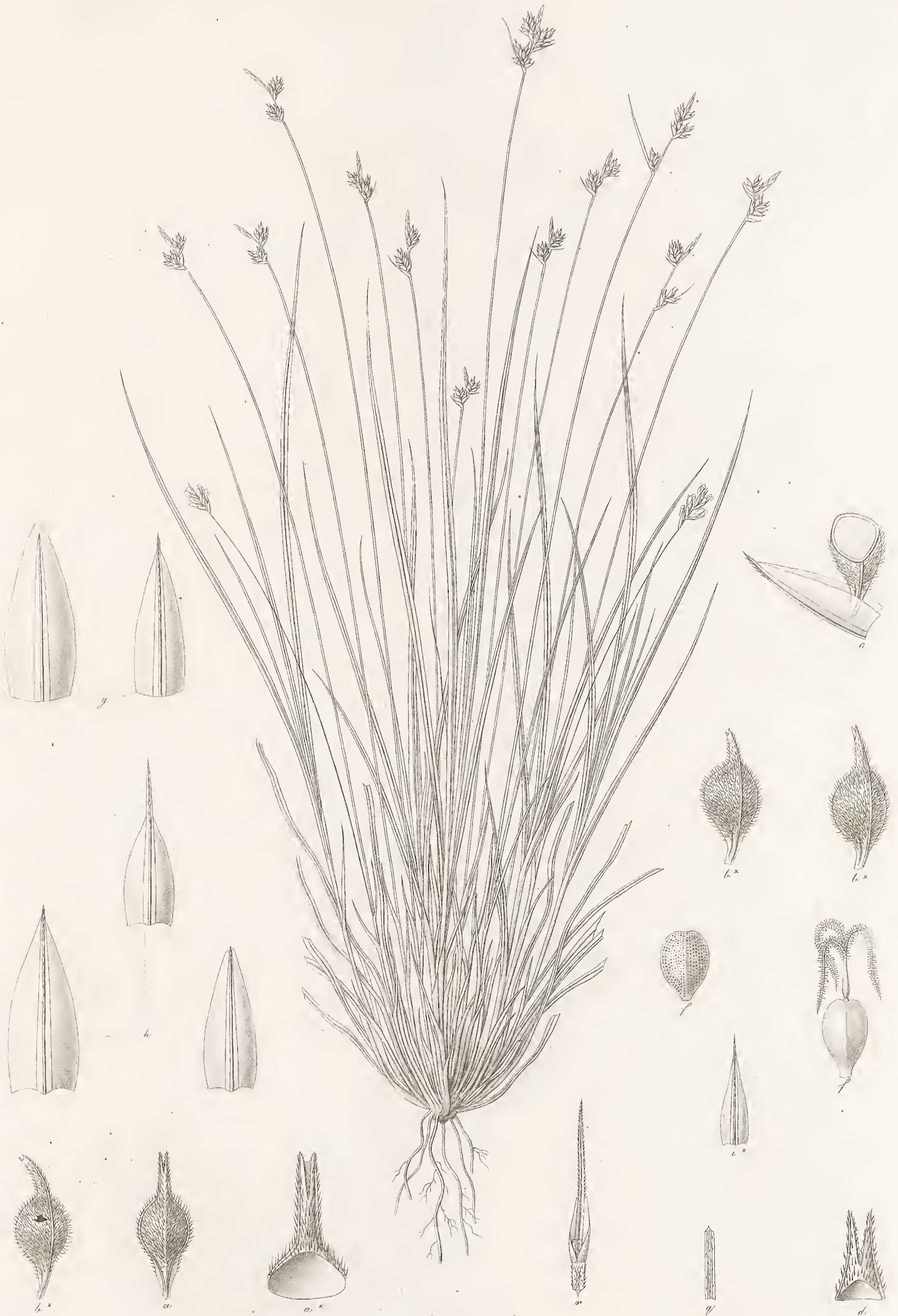
C. AZORICA.

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C. NOVAE ANGLIAE.



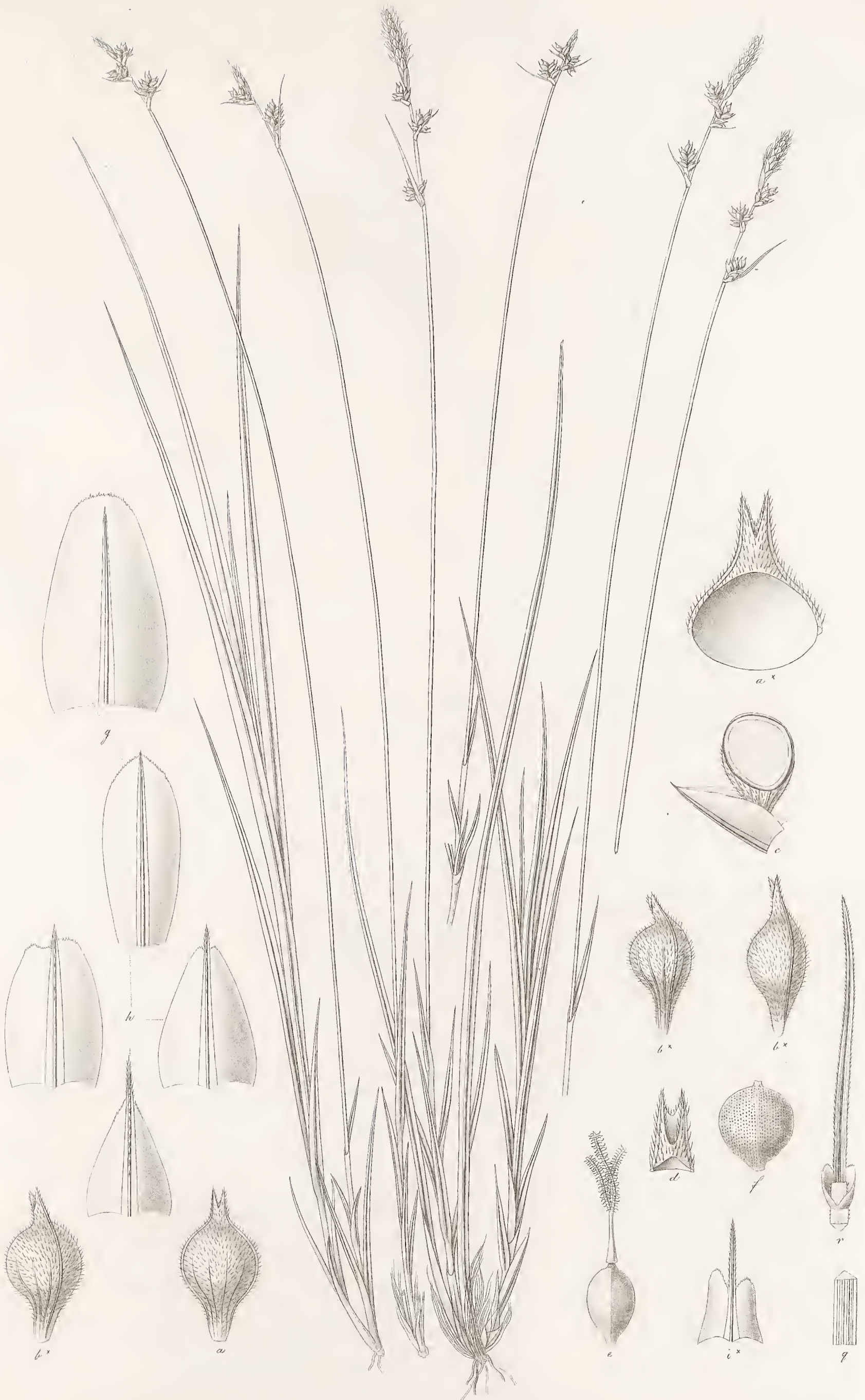
C. EMMONSII



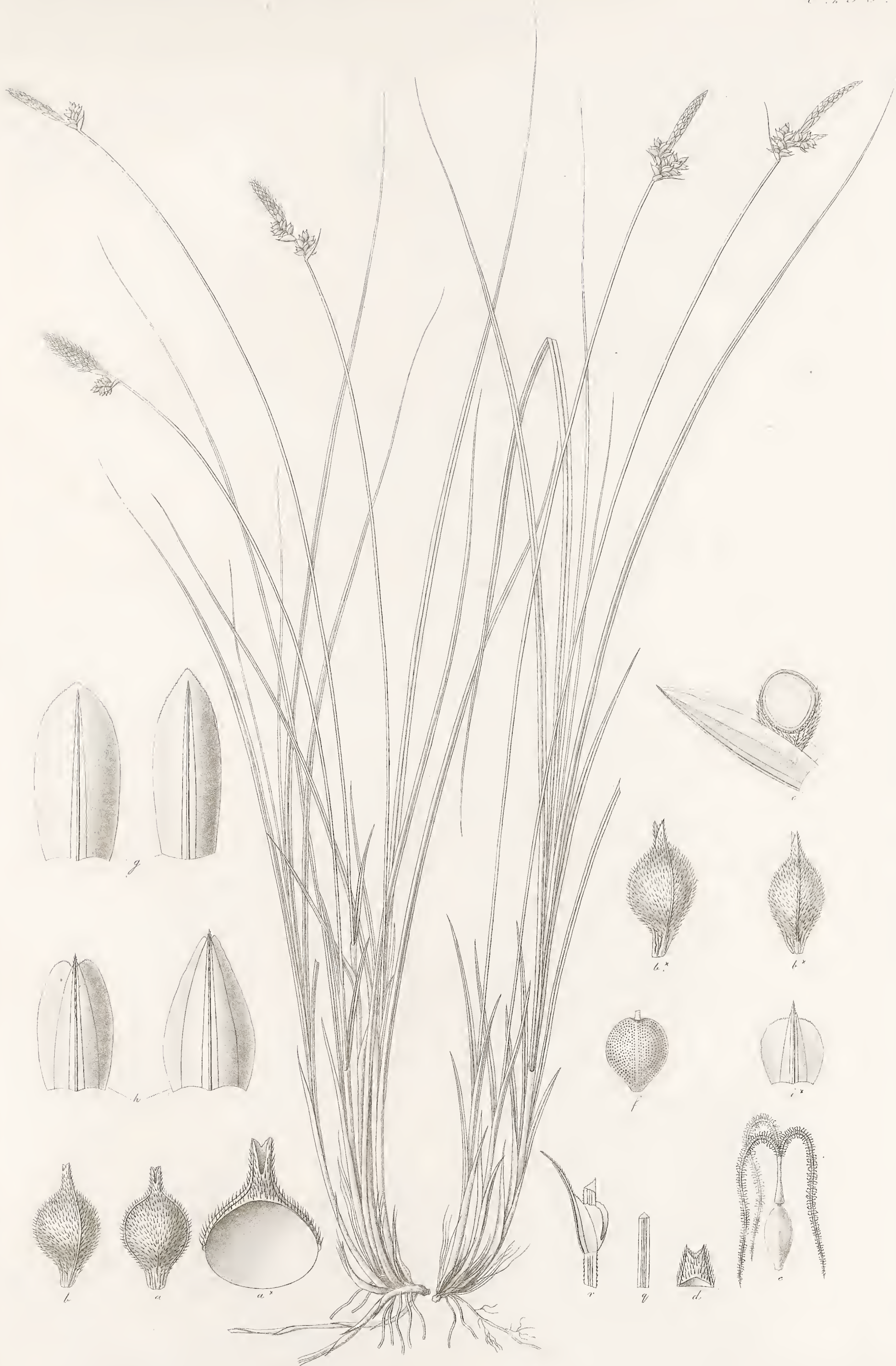
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C. VARIA



C. VARIA. B.



C. PENNSYLVANICA



C. PENNSYLVANICA.



C. UMBELLATA.



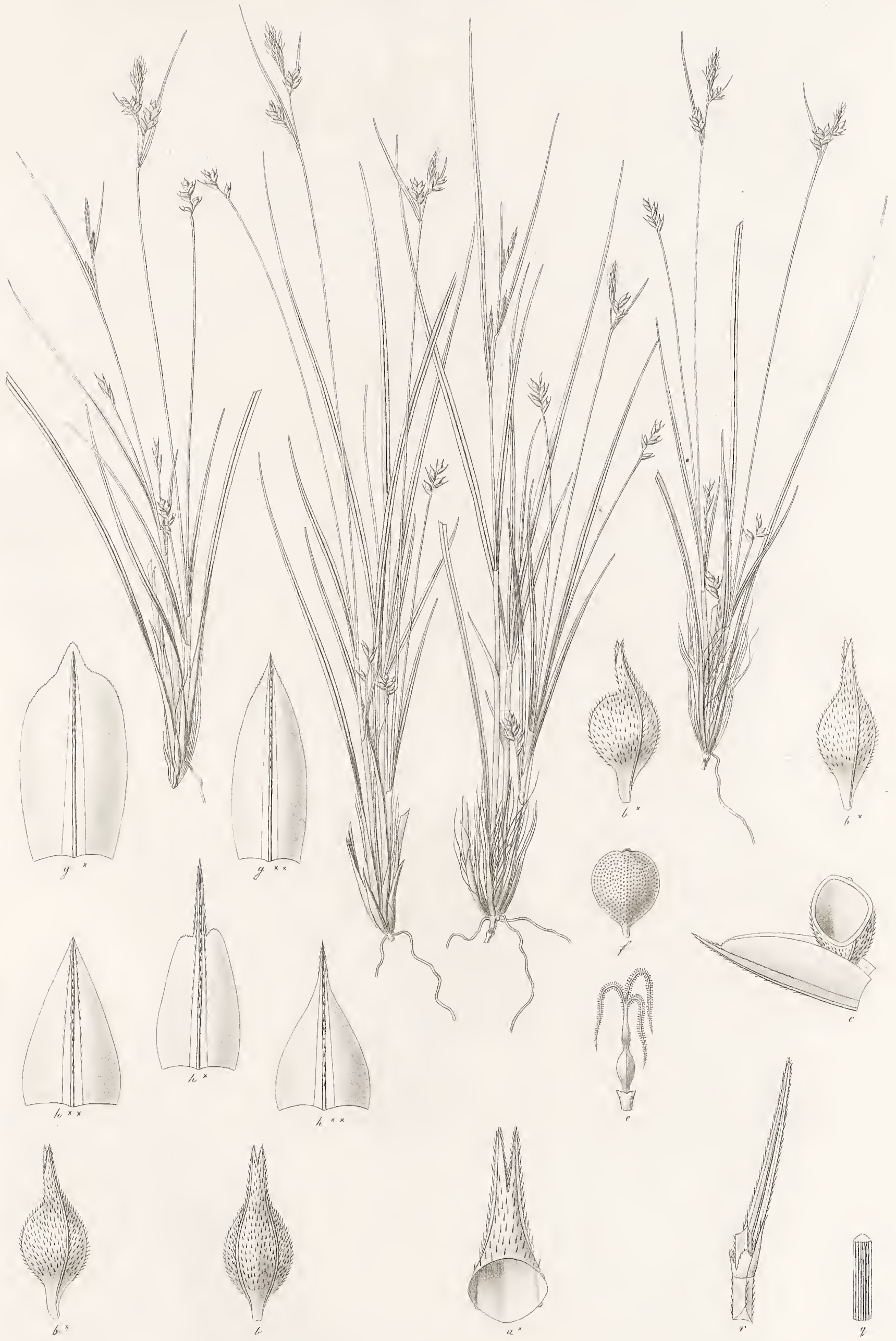
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C. UMBELLATA. B.

M.

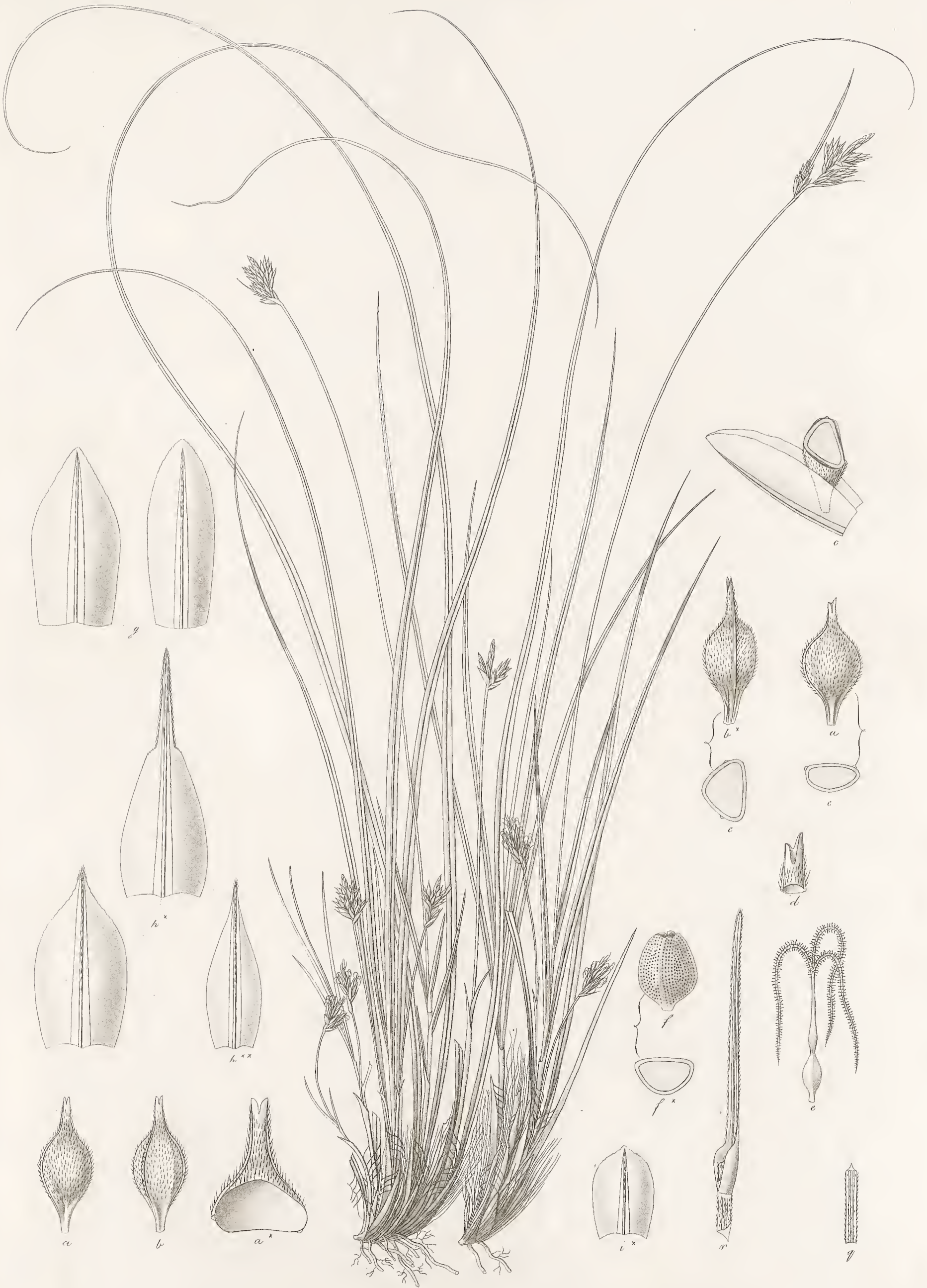
P.



C. ROSSII.

M.

P.



C. NIGRO-MARGINATA.



C. FLORIDANA.



C. RICHARDSONI.



C. TOLMIEI.



C. MILIACEA.

M.

C.



C. WAHLENBERGIANA.

M.

6.



C. WAHLENBERGIANA VAR. B.

11.

p.



C. WAHLENBERGIANA VAR. Y.



C. WAHLENBERGIANA VAR. ♂.

M.

C.



C. WAHLENBERGIANA VAR. ε.



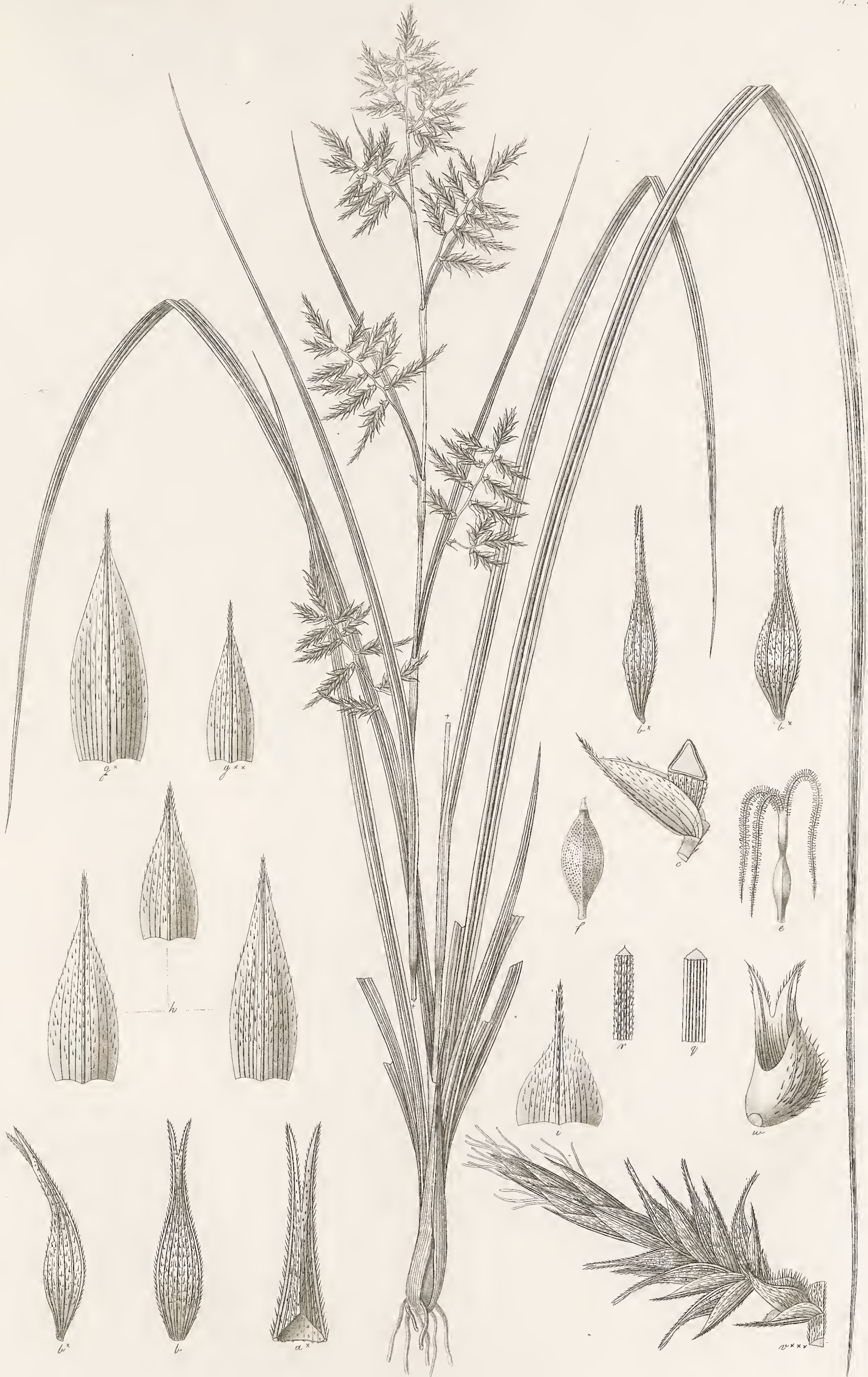
C. CRINIGERA.



C. CRINIGERA.



C. CRINIGERA.



C. CRINIGERA B.



C. CRYPTOSTACHYS.

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ILLUSTRATIONS

OF THE

GENUS CAREX.

BY

FRANCIS BOOTT, M.D.,

TREASURER OF THE LINNEAN SOCIETY.

PART THIRD.

TAB. 311-411.

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

ROSCOMMON.



LONDON :

WILLIAM PAMPLIN, 45, FRITH STREET, SOHO.

1862.

PRINTED BY  
JOHN EDWARD TAYLOR, LITTLE QUEEN STREET,  
LINCOLN'S INN FIELDS.



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## ILLUSTRATIONS

OF

## THE GENUS CAREX.

## PART III.

251. *C. filicina* (Nees); spica elongata fusco-rubra, e spicis partialibus pluribus laxis duplicato-pinnatim vel supra-decompositis rarius singulis, inferioribus plerumque geminis remotis longe inæqualiter exserte pedunculatis erectis, ramis divaricatis, ambitu triangulari; spiculis oblongis divaricatis, apice flosculis masculis 4–12 imbricatis, basi fœmineis pluribus, demum plus minus dissitis, instructis; bracteis latis foliaceis culmo brevioribus; stigmatibus 3; perigyniis ovalibus vel ellipticis triquetris, pallidis vel rarius ferrugineo-maculatis, plus minus longe subulato-rostratis divaricatis arcuatim deflexis, rostro glabro vel ad margines sæpe sparsim dentato, ore integro postice oblique secto ferrugineo membranaceo, glabris, rarius superne sparsim scabris 2–4-nervatis, squama ovata obtusiuscula mutica vel mucronata dorso scabra rubro-fusca longioribus.—*C. filicina*, Nees, *apud Wight*, p. 123. *C. meiogyna*, Nees, *l. c.*

HAB. In montibus temperatis et subtropicis Indiæ borealis et australis, 4–10,000 ped., *Wallich*, *Royle*, *etc.* In montibus Nilghiri, *Wight*. Ceylonia, *Walker*. In Java, *Horsfield*. (TAB. CCCXI.–CCCXVIII.)

*Culmus* 1½–5-pedalis, validus, lævis; pars spicas gerens 1–3 pedes longa. *Folia* 4–8 lin. lata, firma. *Spicæ* partiales singulæ, plerumque geminæ, inæquales, plus minus amplæ, 1½–6 poll. longæ, 1–2½ poll. latæ; ramis divaricatis; rachi scabra. *Spiculæ* 3–8 lin. longæ, 1½–2 lin. latæ, inferne plerumque demum laxifloræ. *Squamæ* masculæ lanceolatae, 4–12, imbricatae, muticae, glabrae: fœmineæ inferiores, scabrae, nunc mucronatae, ovatae, obtusiusculæ, vel lanceolatae, acuminatae. *Perigynium* pallidum, glabrum vel superne et ad margines rostri scabrum: superiora recta: inferiora demum plerumque dissita, divaricata, arcuatim deflexa: ore ferrugineo, membranaceo, postice alte oblique secto: 1½–2 lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum: rostro plus minus longo,  $\frac{3}{10}$ –1 lin. longo: nervis marginalibus magis prominentibus, inter margines sitis. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, conforme, basi styli persistente obliqua, apice disco circulari ampliata, basi decidua, clavata.

This is a common species, and in its fullest development is one of the most beautiful of the paniculate group, sometimes 5 feet in

height, with large lax spreading panicles of a dark chestnut colour. It varies in its inflorescence, not only from the size, but the diffuseness of its partial spikes, and the degree of compactness in the arrangement of the florets in the spiculæ, depending partly on the various stages of development in the specimens we see in herbaria, or upon locality. When the development is mature, the spiculæ generally elongate and become lax-flowered. Nees founded his *C. meiogyna* upon young specimens, “spiculis basi laxe squamosis; squamis masculis pluribus;” but I cannot find anything constant in these characters. Taken arbitrarily, with the shorter rostrum of the perigynium, they might be considered a variety, though there are intermediate forms which would not rank under it. The perigynium varies in the length of the rostrum, is often glabrous, or more or less scabrous above and at the margins of the rostrum. The female squamæ are small, not often mucronate, unless it be the lower ones, which are also often scabrous. In specimens from the Peninsula of India and Ceylon they are lanceolate and acuminate and smoother.

Should *C. meiogyna* be considered by Indian botanists hereafter as distinct, the essential characters will be found in the more lax partial spikes, the more elongate lax-flowered spiculæ, and the perigynium with a shorter rostrum. As we see the plants in our herbaria, most of them are not mature, and hence the inflorescence is more compact, and especially in those clearly referable to *C. filicina*, not one of which from Herb. Wight, on which the species was founded, is fully mature, and the spiculæ consequently have not attained their full length, nor are they so lax-flowered as they would be in maturity. I have figured several specimens, which will enable others to understand the species and its variations.

Tab. CCCXI. A specimen from Myrung, *Dr. Hooker*; with compact female florets, and the rostrum  $\frac{8}{10}$ –1 line long, the male florets few and inconspicuous. In Herb. Wight, with the same elongated rostrum, both those characters are modified, the male florets as numerous as they are said to be in *C. meiogyna*.

Tab. CCCXII. A specimen from Saureem, *Dr. Hooker*; the male florets more distinct, and a shorter rostrum. The obliquity of the permanent base of the style, I think, depends on the arched decurvation of the rostrum, not perceptible in the upper perigynia, which are straight.

Tab. CCCXIII. A specimen from Fagu, *Dr. Thomson*; with single partial spikes, scabrous squamæ, and smooth perigynium, and lax-flowered spiculæ. The base of the style is often oblique.

Tab. CCCXIV. Specimens from Mussooree, *Royle*, n. 82, on which Nees founded his *C. meiogyna*. The right-hand specimen has more male florets than the other.

Tab. CCCXV. The two lower spikes, the upper one of which is

geminate, from Annandale, *Edgeworth*. The spiculæ are more or less lax-flowered, and the rostrum varies from  $\frac{3}{10}$  to  $\frac{6}{10}$  line long.

Tab. CCCXVI. The two lower spikes of a specimen from Kathi, *Strachey and Winterbottom*; fully mature, most of the perigynia fallen. The spiculæ elongate and lax-flowered, and the perigynium scabrous. This roughness is generally limited to the upper part of the perigynium, and is very inconstant. This specimen exhibits the character of *C. meiogyna* as Tab. CCCXI. does that of *C. filicina*.

Tab. CCCXVII. A specimen from Lachen, *Dr. Hooker*; depauperate in all its parts.

Tab. CCCXVIII. Small specimens, found in "woods, Lachen, 7-9000 ft." by *Dr. Hooker*, in some respects connecting *C. filicina* with *C. cruciata*, of *Nees*. Larger specimens from "Nyrung," *Hooker*, equally pale, with yellowish etiolated leaves, have the more composite inflorescence and the squamæ of *C. filicina*; the perigynium (occasionally more obtusely triquetrous) with a longer or shorter rostrum, the direction of which is straight or arched downwards.

On a review of the specimens referable to this species, of which I have seen some hundreds, I think it may aid the observations of others by briefly alluding to the principal characters of its various forms.

*typica*; inflorescentia fusco-rubra decomposita, ramis spiculisque divaricatis; flosculis fœmineis contiguus, masculis paucioribus, rostro elongato; foliis latis.

*meiogyna*; spiculis demum elongatis; flosculis fœmineis dissitis, masculis sæpe pluribus; rostro brevior.

*pallida*; inflorescentia foliisque lutescenti-pallidis angustioribus.

*minor*; omnibus partibus depauperatis.

252. *C. cruciata* (*Nees*); spica elongata pallida decomposita, e spicis partialibus subduplicato-pinnatim compositis, superioribus congestis, inferioribus remotis longe exserte pedunculatis, mediis geminis inæqualibus, ramis oblique erectis; spiculis obliquis apice parce masculis basi laxè fœmineis, bracteis culmo longioribus, vaginis superne scabriusculis; stigmatibus 3; perigyniis ovalibus triquetris plus minus longe rostratis, ore integro plus minus obliquo nunc emarginato, vel bilobulato, pallidis glabris, rostro ferrugineo ad margines sparsim dentato, nervatis obliquis vel excurvis, squama ovata deorsum longius hispido-aristata, dorso scabra ciliata fulva lineolis ferrugineis notata longioribus latioribusque.—*C. cruciata, a, Nees, apud Wight, p. 123. (TAB. CCCXIX., CCCXX.)*

HAB. In Himalaya temperata et subtropica, 4-7000 ped. Nipal, *Wallich*. Mussooree, *Royle, n. 86, etc.* Khasia, *Griffith, Hooker*. Shaidevi in Kunawur?, *Strachey and Winterbottom*. Kursing, *Dr. Hooker*.

*Culmus* gracilis, lævis. *Folia* 4-6 lin. lata, flaccida, glabra, apice solum infraque scabriuscula. *Bractea* 2-4 lin. lata. *Vagina* superne et extus pulverulento-scabriuscula. *Pedunculi* graciles, scabri. *Spiculæ* graciles, laxæ, terminales apice flosculis masculis 3-5, basi fœmineis 7-12 alternis instructæ. *Squamæ* masculæ angustiores, mucronatæ vel superiores muticæ, laxæ: fœmineæ inferiores longe hispido-aristatæ, obtusæ vel emarginatæ: superiores longiores, acutæ. *Perigynium*  $1\frac{2}{10}$ -2 lin. longum, (rostro  $\frac{2}{10}$ - $\frac{3}{10}$  lin. longo,)  $\frac{2}{10}$  lin. latum, pallidum, rarius punctis ferrugineis notatum: ore ferrugineo, membranaceo, integro, obliquo: rostro ad margines plus minus sparsim dentato. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo)  $1\frac{2}{10}$  lin. longum, plus  $\frac{4}{10}$  lin. latum, ellipticum, fuscum, angulis pallidioribus, basi styli persistente, apice ampliata, apiculatum. *Stylus* conicus.

*Nees* described his *C. cruciata, a*, from specimens of *Wallich*, from Nipal, and of *Royle*, from Mussooree, both of which I have in my herbarium. He quotes *Wahlenberg* for the species, though *Wahlenberg's* plant was a native of Canton, and probably the *C. Bengalensis* of *Roxburgh*.

I doubt if *C. cruciata* will be found separable from *C. filicina*. It looks like a variety growing in woods, in which *Strachey and Winterbottom* found it. It is distinguished by its pale colour, laxer and less compound inflorescence; the branches of the spikes and spiculæ obliquely erect; the occasional longer arista of the lower female squamæ, which are sometimes emarginate and ciliate; the variable orifice of the perigynium, which is never arched downward; the slight roughness of the bracteal vaginæ; and the more flaccid leaves.

But I cannot say that all these characters are constant, and it must be left to future observers in India to determine how far different localities affect the plants of this very puzzling group.

The specimens figured are—

Tab. CCCXIX. A specimen from "Shadevi Woods, 6000 ft.," from *Strachey and Winterbottom*.

Tab. CCCXX. One from *Kursing*, from *Dr. Hooker*.

253. *C. amœna* (*Boott*); spica oblonga ferruginea, e spicis partialibus ovatis densis duplicato-pinnatim compositis rarius mediis geminis, superioribus congestis infima vel inferioribus breve exserte pedunculatis subremotis; spiculis brevibus densifloris apice parce masculis, bracteis angustis culmo longioribus, vaginis superne scabridis; stigmatibus 3; perigyniis ellipticis triquetris excurvis longe rostratis, ore obliquo bilobato, glabris vel rostro ad margines sparsim dentato, nervatis ferrugineis, squama lanceolata acuminata deorsum longius aristata glabra vel carina scabra ferruginea longioribus latioribusque.—*C. amœna, Boott. C. cruciata, β, Nees, l. c. p. 123. (TAB. CCCXXI.)*

HAB. Penins. Ind. orient. Nilghiris, *Wight, n. 1917. Madras, Dr. Hooker*.

*Culmus*  $\frac{1}{2}$ - $1\frac{1}{4}$ -pedalis, gracilis, lævis; pars spicas gerens 3-7 poll. longa. *Folia* 1-2 lin. lata, culmo breviora, rigida, infra scabra, marginibus revolutis. *Vagina* infima 6-10 lin. longa, superne scabrida. *Spicæ* partiales 10-12 lin. longæ, 6 lin. latæ: inferiores 2-3 poll. remotæ. *Squamæ* omnes lanceolatæ, aristatæ, masculæ laxæ. *Perigynium* 2- $2\frac{2}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum (rostro 1- $1\frac{2}{10}$  lin. longo): ore obliquo, bilobato, rarius integro. *Achenium*  $\frac{2}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, basi styli persistente et decidua æquali.—In uno flosculo achenium hexagonum, stigmatibus sex!

A *C. cruciata, a*, *Nees*, differt inflorescentia brevior, magis compacta, ferruginea; spiculis brevioribus, congestis, densifloris; squamis angustis, lanceolatis; perigyniis longius rostratis, basi styli æquali; culmo brevior; foliis rigidis, angustis, infra scabris, marginibus revolutis.

*Nees* described his *C. cruciata, β*, from an imperfect specimen of *Wight's*, exhibiting only the upper portion of the spike. I have an entire specimen from *Wight*, with which others brought from *Madras* by *Dr. Hooker* agree, and one of which I have figured; the orifice of the perigynium I suspect is normally entire, and that its bilobed character depends upon a rupture on the protrusion of the stigmata.

254. *C. ramosa* (*Schkuhr*); spica elongata glauco-ferruginea, e spicis partialibus laxis pinnatim vel duplicato-pinnatim compositis, ambitu ovato, superioribus contiguus, inferioribus remotis longe exserte pedunculatis, mediis geminis; spiculis patulis subpaucis apice flosculis masculis 3-6, basi fœmineis pluribus laxè imbricatis;

bracteis inferioribus culmo longioribus; stigmatibus 3; perigyniis ovalibus trigonis glaucis punctis ferrugineis sæpe notatis scabris nervatis rostratis demum arcuatim deflexis contiguis, ore obliquo integro vel bilobato ferrugineo membranaceo, squama ovata aristata ferruginea striato-nervosa scabra ciliata subæquilata longioribus.—*C. ramosa*, Schk. f. 204; Willd. 247; Kunth, 507. *C. cruciata*,  $\beta$ , Nees (ex parte), Herb. Arnott. *C. Mercariensis*, Hochstetter (Herb. Hooker). (TAB. CCCXXII.)

HAB. Mauritius, Schk., Bojer (Herb. Hooker). Penins. Ind. Orient., Courtallum, Wight, n. 998, 1293 (Herb. Boott). Prope Mercara (Hochst.).

*Culmus* bipedalis, gracilis, lævis; pars spicas gerens 8–16 poll. longa. *Folia* 2–3 lin. lata, linearia, culmo longiora, glauco-viridia. *Bractea* inferiores 1–3 lin. latæ, 1–1½-pedales: superiores setaceæ. *Spiculae* divaricatæ, bractcolis longis setaceis sæpe suffultæ. *Squamæ* ferrugineæ vel fulvæ, lineolis ferrugineis notatæ: masculæ lanceolatæ, acutæ, glabræ: femineæ aristatæ, scabræ, ciliatæ. *Perigynium* 1½ lin. longum, ¾ lin. latum, rostro ¼ lin. longo: ore sæpius bilobato: laciniis ferrugineis obtusis subinde ciliatis, scabrum. *Achenium* 1½ lin. longum, ¾ lin. latum, triquetrum, stipitatum, fusco-purpureum, angulis pallidioribus, basi styli æquali depresso-curvata, stipite tortuosa.

I have alluded to the *C. ramosa*, Schk., at p. 102, inferring from his figure, and from a specimen from the Mauritius (Bojer) in Herb. Hooker, that it was distinct from the *C. crinigera* of Bourbon. The specimen I have figured, Tab. CCCXXII., is from Courtallum, in the peninsula of India, sent to me by Dr. Wight. It agrees in all essential points with Bojer's plant from the Mauritius. The roughness of the perigynium, its ferruginous spots, the peculiar depressed and tortuous base of the style and stipes of the achenium, and the squamæ, are the same in both. It is evident from a specimen in Herb. Arnott, that Nees was in doubt about it, and eventually referred it to his *C. cruciata*,  $\beta$ . The specimen 1½ lin. longum, ¾ lin. latum has a ticket on which the name of "*C. filicina*" is scored out, and is followed by "*meiogyne, cruciata,  $\beta$* ." As Nees had no mature perigynia to his *C. meiogyne*, he must have referred the specimen in question, which has them, to his *C. cruciata*,  $\beta$ .

*C. ramosa* differs from *C. amœna* in longer culm, bracts, and inflorescence, broader leaves, scabrous glaucous perigynia, the arched direction of the shorter rostrum, and the tortuous base of the style and stipes of the achenium.

255. *C. vesiculosa* (Boott); spica elongata laxa ferruginea, e spicis partialibus subduplicato-pinnatim compositis remotis, ambitu lanceolatis, inferioribus longe exserte pedunculatis geminis inæqualibus nutantibus; spiculis oblongis apice flosculis masculis pluribus in ramulis 3–6 spiculiferis subsessilibus remotis insidentibus; bracteis culmum subæquantibus; stigmatibus 3; perigyniis ellipticis triquetris rostratis scabris nervatis ferrugineis rectis, ore demum bifido sæpe antice alte fisso, squamam oblongo-ovatum mucronatam glabram ferrugineam æquantibus.—*C. vesiculosa*, Boott. (TAB. CCCXXIII.)

HAB. In montibus Khasiæ, Wallich, Griffith, Hooker.

*Culmus* 2–2½-pedalis, gracilis, lævis, rigidus, basi vaginis foliorum reticulato-fissis tectus; pars spicas gerens 10–15 poll. longa. *Folia* 1–2 lin. lata, culmo breviora, rigida, carinata, supra vesiculis apiculatis sæpe attritis (basi cava circulari demum solum extante), infra punctis indentatis notata. *Spicæ* partiales 2–3 poll. longæ, 6–8 lin. latæ. *Pedunculi* inferiores inæquales, scabri, 4–6 poll. longi, filiformes. *Spiculae* 4 lin. longæ, 1 lin. latæ, contiguæ. *Squamæ* conformes. *Perigy-*

*nium* 1½ lin. longum, ½ lin. latum. *Achenium* 1½ lin. longum, ½ lin. latum, triquetrum, stipitatum, basi styli decidua bulbosa.

Variat inflorescentia magis compacta, spiculis longioribus, ramulis spicarum longius pedunculatis.

This species was first found by Gomez (Herb. Wallich), in 1829, at Chirra Pungee, a specimen being figured in Tab. CCCXXIII. It has since been sent from the Khasia Mountains by Griffith and Dr. Hooker. It is generally too young for a satisfactory character of the perigynia. In some of Wallich's specimens the inflorescence is more compact, and in some of Griffith's the spiculæ are 6–7 lines in length, with the lower rami of the spikes pedunculate. The perigynium is occasionally deeply cleft.

256. *C. Cumingiana* (Steudel); spica elongata gracili laxa olivaceo-ferruginea, e spicis partialibus parvis oligostachyis sæpius compositis singulis vel geminis, inferioribus remotis longe exserte setaceo-pedunculatis erectis; spiculis apice flosculis masculis pluribus ovatis sæpe solitariis in apicem pedunculorum contiguis sessilibus; bracteis superioribus spicis suis longioribus; stigmatibus 3; perigyniis ovalibus trigonis demum turgidis valide nervatis rostratis divergentibus superne scabris marginibus dentatis olivaceis ferrugineo-punctatis, squama ovata acuta vel obtusa emarginata hispido-aristata nervata glabra vel superne scabra ferrugineo-punctata longioribus vel subæquantibus.—*C. Cumingiana*, Steud. Synop. p. 206. *C. rhizomatosa*, Steud. l. c.

HAB. Ins. Philipp., Manilla, Cuming, n. 1795 (Herb. Hooker). Assam (Herb. Hooker), Ins. Sumbawa, Zollinger, n. 3447. Ind. Orient., in ripas fluv. Burrampooter, prope Gowhatty, Booth (ex Herb. Nuttall, Herb. Boott). (TAB. CCCXXIV., CCCXXV.)

*Radix* fibris longis lignosis. *Culmus* 1–1½-pedalis, gracilis, rigidus, lævis, basi reliquiis capillaccis nigris foliorum tectus; pars spicas gerens 4–12 poll. longa. *Folia* 1–1½ lin. lata, culmo breviora, plana. *Bractea* brevis, superiores culmum paulo superantes: infima spicâ suâ longior vel brevior. *Pedunculi* filiformes, scabri, longe exserti: infimus subinde 5-pollicaris. *Spicæ* partiales oligostachyæ, superiores congestæ, sessiles, e spiculis 3–5 compositæ: inferiores remotæ, singulæ vel geminatæ, rarius monostachyæ, plerumque 2–3-stachyæ, vel e geminis una monostachya, altera composita. *Spiculae* 4–5 lin. longæ, in apicem pedunculorum sessiles, basi flosculis femineis 3–6 patentibus, apice masculis pluribus imbricatis, instructæ. *Squamæ* omnes aristatæ, ut folia, bractea, vagina, perigynia, punctis ferrugineis notatæ. *Perigynium* 1½ lin. longum, ¾ lin. latum. *Achenium* 1½ lin. longum, ¾ lin. latum, ovale, triquetrum.

I see no essential difference in the specimens from the Philippine and Molucca Islands, and those from Assam and the banks of the Burrampooter river. The last, sent to me by the late Mr. Nuttall, collected by Mr. Booth, are the more mature, and the perigynia are more turgid, smoother, with a less deep and less acute orifice. I cannot explain the difference in the descriptions of Steudel's species. That of *C. Cumingiana* is correct. I have figured, Tab. CCCXXIV., the plant of Zollinger, from Sumbawa, from the Herb. Mus. Paris, through the kindness of M. Spach; and in Tab. CCCXXV. the plant from the Burrampooter. It has no affinity with *C. gracilis*, Br. (*C. lachnosperma*, Wallich), as Steudel asserts it has.

257. *C. impunctata* (Boott); spica elongata gracili laxa rubro-ferruginea, e spicis partialibus 4–5 ovatis pinnatim vel subduplicato-pinnatim compositis, mediis ge-

minis, inferioribus longe exserte pedunculatis; spiculis oblongis apice masculis; bracteis spicas suas subæquantibus; stigmatibus 3; perigyniis ellipticis triquetris fusco-rubris scabris impunctatis marginibus ciliatis paucinervis rectis vel excurvis plus minus longe rostratis, ore bilobato, squama ovata acuta vel obtusa mucronata fusco-rubra angustioribus longioribus.—*C. impunctata*, *Boott.* (TAB. CCCXXVI.)

HAB. In Java, *Zollinger*, n. 2563 (*Herb. Mus. Paris*).

*Rhizoma* tortum, lignosum, repens. *Culmus* subpedalis, gracilis, scaber; pars spicas gerens 7 poll. longa. *Folia* sublineam lata, culmo breviora, rigida, carinata, marginibus revolutis. *Bractea* superiores spicis breviores. *Spicae* partiales 6–8 lin. longæ, 4 lin. latæ: superiores contiguæ: mediæ geminæ: omnes simpliciter vel una alterave subduplicato-pinnatim compositæ. *Spiculae* 3–4 lin. longæ, alternatim contiguæ. *Squamæ* fœmineæ inferiores mucronatæ: masculæ acutæ, muticæ. *Perigynium* (vix maturum)  $1\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ellipticum, plus minus rostratum: rostrum nunc anguste lineare, nunc e basi latiore sensim angustatum, bilobatum: lacinia obtusæ, ad margines membranaceæ, nervis ad facies 2–3 inæqualibus, marginibus e basi setose ciliatis. *Achenium* 1 lin. longum,  $\frac{3}{10}$  lin. latum, ellipticum, stipitatum, pallidum, basi styli apiculatum.

The more complex inflorescence, the bilobed impunctate perigynium, with its few slight nerves, distinguish this species from the preceding one. The specimen figured is from the Paris Herbarium, communicated by M. Spach.

I at one time thought that this species might be the *C. rhizomatosa*, Steudel, and that some mistake had been made in the number and habitat of the specimens in Herb. Steudel and Mus. Paris; but Steudel takes no notice of the roughness of the perigynium, so marked in *C. impunctata*, and his "spiculis pluribus dense aggregatis, superioribus masculis, inferioribus fœmineis," is at variance with *C. impunctata*, as it is with *C. Cumingiana*.

258. *C. setosa* (Boott); spicis 4–5 ferrugineis concoloribus cylindricis pedunculatis remotis, terminali mascula, reliquis fœmineis basi attenuatis nutantibus longe exserte pedunculatis, infima subinde basi composita; bracteis inferioribus longe vaginatis spicas subæquantibus vel iis brevioribus; stigmatibus 3; perigyniis oblongo-ovalibus rostratis stipitatis plano-triquetris enerviis glabris vel superne scabris marginibus setis longis e basi ciliatis ferrugineis, ore oblique fisso bidentato, squama lanceolata obtusa truncata vel emarginata vel acuta mutica vel mucronata paulo longioribus.—*C. setosa*, *Boott.* (TAB. CCCXXVII.)

Var.  $\beta$ ; spicis angustioribus brevioribus erectis; squamis muticis, abrupte vel sensim apiculatis, vel obtusis emarginatis, vel nervo centrali superne hispido excurrente; perigyniis scabris. (TAB. CCCXXVIII.)

Var.  $\gamma$ ; spica mascula laxiflora; squamis inferioribus longissime valideque cuspidatis, fœmineis latis truncatis emarginatis cuspidatis. (TAB. CCCXXIX.)

HAB. In Himalaya orientali temperata. Sikkim, 8–12,000 ped., *Dr. Hooker*.

*Culmus* sesquipedalis, lævis, inter spicas scaber; pars spicas gerens 7–11 poll. longa. *Folia* lineam lata, culmo breviora. *Bractea* vaginata. *Pedunculus* infimus 4–5 poll. longus, filiformis, superne scaber. *Vagina* infima bipollicaris. *Spica mascula* 16–20 lin. longa, 1–2 lin. lata: fœmineæ 16–24 lin.

longæ, 2–2½ lin. latæ, basi attenuatæ: infima basi spiculis 1–2 brevibus subinde composita. *Squamæ* masculæ longiores, nervo centrali scabro, infra rarius extra apicem excurrente. *Perigynium*  $1\frac{6}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, rostro antice interdum scabro. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, plano-subtriquetrum, stipitatum, pallidum, basi styli apiculatum.

This species belongs to the *Ferrugineæ* group, varying in the degree of roughness on the perigynium, but especially in the form of the squamæ. It is distinguished from *C. hæmatostoma* by its rostrate nerveless perigynium. All Dr. Hooker's specimens were from Lachen.

259. *C. celsa* (Boott); spicis 4 oblongo-cylindricis contiguis fusco-ferrugineis concoloribus, terminali majore androgyna basi mascula, reliquis fœmineis, superioribus sessilibus, infima breve pedunculata; bractea evaginata subulata culmo breviora; stigmatibus 3; perigyniis ovalibus triquetris sensim longiuscule rostratis, ore obliquo bifido, pallide viridibus glabris vel rostro ferrugineo superne dentato plus minus leviter nervatis membranaceis, squama ovata obtusa vel acuta fusco-ferruginea nervo pallido angustioribus longioribusque.—*C. celsa*, *Boott.* (TAB. CCCXXX.)

HAB. In Nipalia, *Herb. Wallich*, n. 3393.

*Culmus* 3-pedalis, triquetrum, gracilis, superne scaber, inferne foliatus, basi rudimentis foliorum ferrugineo-purpureis vaginisque fibrillatis tectus; pars spicas gerens subbipollicaris. *Folia* 1–1½ lin. lata, culmo breviora, plana. *Bractea* infima spiculâ ejus paulo longior vel brevior, evaginata; altera abbreviata: auriculis purpureis, amplis. *Pedunculus* 2–5 lin. longus, scaber. *Spica* terminalis 10–12 lin. longa, 2 lin. lata, basi subdimidiatim vel brevius mascula: fœmineæ minores. *Squamæ* conformes: masculæ persistentes, longiores. *Perigynium*  $1\frac{6}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale, triquetrum, punctulatum, ferrugineum. *Stylus* insertus.

Habitus et aspectus *C. parvibracteata*, Nees, quæ (affinis *C. obscura*) differt culmo breviora, foliis elongatis, spicis 5 inferioribus remotis, perigyniis erostris, ore integro, squamis obtusis ciliatis, stylo exserto.

I have only seen this species in the herbarium of Dr. Wallich. Nees takes no notice of it. It belongs to the *Melananthæ* of Drejer. The specimens of *C. parvibracteata* in Herb. Royle, are young, I suspect not separable from *C. obscura*. The erostrate perigynium, with its entire orifice, sufficiently distinguish it from *C. celsa*.

260. *C. longifolia* (Brown); spica longissima, e spiculis 10–14 pluribusve stramineis cylindricis, superioribus singulis masculis 2–3 sessilibus contiguis, vel 4 infima remota exserte pedunculata, reliquis fasciculatis binatis remotis longissime exserte pedunculatis pendulis, superioribus vel omnibus, apice vel basi, vel apice et basi masculis vel sterilibus vel omnino fœmineis; bracteis vaginatis foliaceis elongatis; stigmatibus 3, longis; perigyniis oblongo-ellipticis utrinque attenuatis plano-triquetris rostratis bifidis demum bilobis nervatis marginibus serratis (sub lente) scabridis vel glabris pallidis vel ferrugineis, squama pallide ferruginea margine late albohyalina obtusissima rotundata vel emarginata cuspidata angustioribus longioribusque.—*C. longifolia*, *Brown*, *Prod.* 242; *Kunth*, 472. *C. Brownei*, *Steud. Syn.* 209. (TAB. CCCXXXI.)

HAB. In Australia, *Brown*. In Tasmania, *Gunn*, *Archer* (*Herb. Hooker*).

*Culmus* 4-5-pedalis, obtusangulus, lævis, rigidus; pars spicas gerens nunc 3-pedalis. *Folia* 2-3 lin. lata, plana. *Bractea* longissimæ, vaginatae, spicis suis rarius culmo longiores. *Vagina* infima 2-3 poll. longa. *Pedunculi* filiformes, scabri, inæquales: inferiores quandoque 12-15 poll. longi. *Spicae* masculæ singulæ, erectæ, 1-2 poll. longæ, 1 lin. latæ, reliquæ 1-2 poll. longæ, 3-4 lin. latæ, fasciculatæ (rarius singulæ), inæquales, plerumque medio fœmineæ. *Squamæ* conformes. *Perigynium*  $2\frac{3}{10}$ - $3\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ -1 lin. latum, in specimenibus Australiæ scabridum, rubro-ferrugineum, resinopunctatum: in iis Tasmaniæ glabrum, marginibus scabris, pallidum. *Achenium*  $1\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovali-vel obovato-triquetrum, ferrugineum, angulis pallidis punctulatum, basi styli curvata apiculatum; in uno specimine (e Tasmania) racheolâ lineari  $\frac{3}{10}$  lin. longâ apice ferrugineâ instructum.

Var.  $\beta$ . *minor*; spicis 3-6 singulis brevibus, superioribus ima basi masculis; foliis abbreviatis.

HAB. In Tasmania, *Gunn*, *Archer* (*Herb. Hooker*). Coal River, Australia, *Richmond* (*Herb. Hooker*). (TAB. CCCXXII.)

I have seen but few Australian specimens of this fine species. Those from Tasmania in no other respects differ than in the smoothness and pale colour of the perigynium. The habit is the same in both.

I have no hesitation in referring the var.  $\beta$  to the typical form, especially as I see in *Herb. Hooker* specimens from the Coal River having simple spikes, with others bearing fasciculate ones; and in a more mature specimen from Tasmania, given to me by Mr. Archer, since the specimen from Gunn, Tab. CCCXXII., was engraved, I find the size of the perigynium ( $3\frac{2}{10}$  lin. long.,  $\frac{9}{10}$  lin. lat.) agrees with the typical form. We observe the same variation in simple and fascicled spikes in other species, as in *C. Cherokeeensis* and *C. elata*. In Tab. CCCXXXI. I have figured a scabrous perigynium from Australia, the specimen there figured being from Tasmania.

261. *C. Raoulii* (Boott); spicis 5-7 ovalibus vel cylindraceis densifloris approximatis e stramineo-subpurpureis, terminali longiore basi conspicue mascula, reliquis ima basi masculis sessilibus evaginatibus vel infima quandoque remota breve exserte vel inserte pedunculata; bracteis inferioribus longissimis; stigmatibus 2; perigyniis obovatis vel ovalibus late rostellatis bifidis vel bifurcatis compressis purpureis crebre pallideque nervosis inter nervos scabris marginibus ciliato-serratis subcoriaceis, squama obtusa vel emarginata longe hispido-cuspidata decolori membranacea angustioribus (cuspidate) brevioribus.—*C. Raoulii*, *Boott in Hooker, Fl. N. Zealand*, p. 283. (TAB. CCCXXXIII.)

HAB. Akaroa, New Zealand, *Raoul*, n. 208 (*Herb. Hooker et Herb. Mus. Paris*).

*Culmus* 1-2-pedalis, gracilis, firmus, apice scaber; pars spicas gerens 3-7 poll. longa. *Folia* 2 lin. lata, culmo longiora. *Bractea* nisi infima evaginatae, culmum longe superantes. *Vagina* 3-4 lin. longa. *Spica* terminalis 1-1½ poll. longa, basi subdimidiatim mascula: reliquæ ima basi masculæ, 4-12 lin. longæ, 3-4 lin. latæ. *Squamæ* conformes, stramineæ, tenues, margine hyalinæ, apice subinde ciliolatae. *Perigynium*  $1\frac{4}{10}$ - $1\frac{5}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, intus (dempto achenio) præcipue purpureum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, lenticulare, orbiculatum, basi productum.

A *C. testacea*, B., differt spicis omnibus basi masculis, perigyniis obovatis scabris, bracteis longioribus latioribus, culmo validiore.

I am indebted to M. Spach for the figures drawn from specimens in the Paris Herbarium.

262. *C. Jamesoni* (Boott); spica atro-purpurea laxa, e spicis partialibus approximatis, extremis singulis, mediis fasciculatis geminatis ternatisque, inferioribus partim compositis, inæqualiter longe pedunculatis nutantibus, infima longissime bracteata; spiculis pluribus inæqualibus apice masculis; stigmatibus 3; perigyniis lanceolatis glabris vel ovalibus cylindrico-rostratis, rostro inter margines dentato, bidentatis, ore obliquo ciliato, nervatis atro-purpureis, squama lanceolata mucronata purpurea margine albo-membranacea brevioribus angustioribus.—*C. Jamesoni*, *Boott, Lin. Tr.* 20, 124. (TAB. CCCXXXIV.-CCCXXXVII.)

HAB. In America australi. Columbia in montibus ad alt. 13,000 ped., *Jameson* (*Herb. Hooker*). Paramo de Cuchero and de Ruiz, *Purdie* (*Herb. Hooker*). Tunguragua. Escudador, 9-10,000 ped., *Spruce* (*Herb. Bentham*).

Var.  $\beta$ ; spiculis elongatis gracilibus longe pedunculatis. (TAB. CCCXXXV.)

Var.  $\gamma$ ; perigyniis ovalibus, rostro dentato. (TAB. CCCXXXVI., CCCXXXVII.)

*Culmus* 3-4-pedalis, triquetrum, validus, scaber, basi vaginis longis foliorum amplectentibus atro-purpureis reticulato-fissis tectus; pars spicas gerens 6-12 poll. longa. *Folia* 3-4 lin. lata, culmum æquantia, rigida, carinata. *Bractea* basi purpureæ: infima nunc  $2\frac{1}{2}$  pedes longa, breve vaginata, sursum demum squamæformes. *Pedunculus* infimus  $3\frac{1}{2}$  poll. longus, scaber, vel inferiores 4-6 poll. longi. *Spicae* partiales superiores, subsessiles, singulæ sæpe congestæ: proximæ geminatae, simplices: mediæ ternatæ: infima singula quæ et in quoque fasciculo una longior, spiculis minoribus 1-5 composita. *Spicula*  $\frac{1}{2}$ -3 poll. longæ, 1-4 lin. latæ: omnes apice extremo masculæ. *Squamæ* conformes. *Perigynium* lanceolatum, glabrum,  $2\frac{1}{2}$  lin. longum,  $\frac{4}{10}$  lin. latum: vel ovale,  $1\frac{6}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, rostro basi inter margines dentato. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{3}{10}$ - $\frac{4}{10}$  lin. latum, oblongum, triquetrum, pallidum, sæpe indentatum, basi styli æquali recta vel depresso-curvata. *Stigmata* 3; stylo inserto.

This species varies in the more or less lax and compound inflorescence, in the breadth of the spiculæ and form of the perigynium, but I can find nothing constant to justify a specific difference. There is a transition from the lanceolate to the oval form in the perigynium, and the roughness between the margins of the rostrum in the var.  $\gamma$  is not always observable. The achenium is the same in both forms of the perigynium, for the indentation and the depressed base of the style are accidental.

The affinity is with *C. Boryana*, Schk.

Tab. CCCXXXIV. is a specimen of Purdie's from the Paramo de Cuchero.

Tab. CCCXXXV. Var.  $\beta$ , one of Purdie's from Valleseta, on the road to the Paramo de Ruiz.

Tab. CCCXXXVI. Var.  $\gamma$ , from the same locality as the last; the base of the rostrum occasionally rough.

Tab. CCCXXXVII. Var.  $\gamma$  is a specimen of Spruce, from Tunguragua.

263. *C. Borbonica* (Lamarek); spicis 4-5 sanguineo-ferrugineis concoloribus approximatis erectis vel cernuis, terminali mascula vel basi mascula, reliquis fœmineis

oblongo-cylindricis basi attenuatis sessilibus vel brevi exserte pedunculatis; bracteis inferioribus vaginatis angustis culmum subæquantibus; stigmatibus 3; perigyniis ellipticis plano-triquetris rostratis bifurcatis superne marginibus scabris nervatis subinflatis sanguineis vel pallidis maculatis membranaceis, squama lanceolata acuta rarius emarginata cuspidata longioribus vel cuspidate brevioribus.—C. Borbonica, *Lam. Ency.* iii. 387 (1789); *Willd.* 267; *Schk.* p. 55; *Spreng.* 817; *Kunth.* 522. (TAB. CCCXXXVIII.—CCCXL.)

HAB. In Ins. Bourbon, *Commerson, Boivin* (*Herb. Mus. Paris*).

*Culmus* 1½-pedalis, triqueter, lævis, inter spicas scaber, validus, rigidus, basi foliosus, sursum foliis vaginantibus munitus; pars spicas gerens 2–3 poll. longa. *Folia* 1–3 lin. lata, culmo paulo breviora, plana, carinata, striata, erecta, rigida, acuta: basi involuta purpurea. *Bractea* angustæ, inferiores vaginatæ, culmo subinde paulo longiores, 1–2 steriles, 2–4 poll. remotæ, longius vaginatæ. *Vagina* infima 6–9 lin. longa. *Pedunculi* 3–12 lin. longi. *Spica* terminalis mascula, pollicaris, 2 lin. lata, sessilis: vel basi subdimidiatim mascula, vel basi et apice mascula vel sterilis, pedunculata, 18–21 lin. longa: reliquæ fœmineæ, 10–22 lin. longæ, 3–4 lin. latæ, acutæ: infima interdum 2 poll. remota. Infra spicam terminalem subinde adsunt flosculi fœminei 1–2 alterni, quasi rudimenta spicarum. *Squamæ* conformes, sanguineo-ferrugineæ, rarius emarginatæ. *Perigynium* 2 $\frac{7}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, achenium laxe vestiens. *Achenium* 1 $\frac{1}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, oblongo-ovatum vel ellipticum, triquetrum, fuscum, punctulatum, basi styli recta vel curvata apiculatum.

I am indebted to M. Spach for specimens of this plant, collected by Boivin in the Isle of Bourbon. Notwithstanding the evident difference in the breadth and length of the leaves and bracts, I doubt the specific distinction of the following species. The presence of sterile bracts in *C. Borbonica* would suggest the probability of spikes being occasionally developed in them, and the inflorescence would then be similar to that of *C. Simensis*. No dependence can be placed on the position of the male florets. The perigynia are alike, varying in the degree of roughness at the margins.

264. *C. Æthiopica* (Schkuhr); spicis 4–5 cylindricis e viridi castaneis, masculis 1–3, fœmineis superioribus masculæ contiguis, suprema nunc ima basi mascula, inferioribus remotis longe exserte pedunculatis cernuis; bracteis inferioribus vaginatis late foliaceis culmo longioribus; stigmatibus 3; perigyniis ellipticis plano-triquetris subinflatis rostratis bifidis nervatis pellucide demum sanguineo-maculatis pallidis glabris vel superne marginibus subscabris, squama ovata emarginata cuspidata medio late viridi nervata lateribus castanea apice ciliata longioribus vel brevioribus.—*C. Æthiopica*, *Schk. Z. fig.* 83, p. 107 (1801, *excl. pl. Retz*); *Boott, Lin. Tr.* xx. 146. *C. lævigata*, *Wahl. Act.* 153; *Willd.* 295; *Smith, Eng. Bot.* (1804); *Schk. Nachtr.* p. 74 (1806); *Smith, Eng. Fl.* 122 (1828); *Kunth.* 493; *non Smith, Lin. Tr.* v. 272 (1799). *C. iridifolia*, *Kunth.* 492 (1837). *C. Simensis*, *Hochst. Unio Itin.* 1842, n. 1180; *Richard, Fl. Abyss.* ii. 514. (TAB. CCCXLI.—CCCXLIV.)

HAB. In Africa. Cape of Good Hope, *Thunberg*. Cafferland, *Gill*. Uitenhage, *Zeyher* (*Herb. Hooker*). Georgetown, *Dr. Alexander Prior*. Ruigtevaleey, ad fluvium, *Drége*. In Abyssinia! in pratis humidis montis Bachit, supra fines arborum et fruticum, *Schimper*, 1838;

et ad montem Roahit, 11,000 ped., *Schimper*, 1851 (*Herb. Mus. Paris*).

*Culmus* 2-pedalis, lævis, apice scabriusculus, basi foliosus; pars spicas gerens 7–15 poll. longa. *Folia* 3–6 lin. lata, culmo longiora, plana, glauco-viridia. *Bractea* inferiores 4 lin. latæ, culmo longiores, vel angustiores eo breviores, vaginatæ. *Vagina* 8 lin. ad 3 poll. longæ. *Pedunculus* infimus 2–7 poll. longus. *Spica* 1–3 poll. longæ, 2–4 lin. latæ: terminales 1–3 masculæ, vel summa subdimidiatim basi mascula: aliæ 1–4 ima basi masculæ, infima fœminea: vel inferiores 3–4 fœmineæ. *Squamæ* omnes vel acutæ vel truncatæ vel emarginatæ, plus minus longe cuspidatæ. *Perigynium* 2 $\frac{4}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{9}{10}$ –1 $\frac{1}{10}$  lin. latum, laciniis marginibusque plus minus scabris, rarius glabris. *Achenium* 1–1 $\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, ellipticum, basi productum vel obovatum, triquetrum, basi styli contorta apiculatum.

Schkuhr, in his Riedgr. p. 107 (1801), had been misled in referring his *C. Æthiopica*, which he received indirectly from Thunberg, to the Isle of Bourbon, as in his Nachtr. p. 74 (1806), he says that it was from the Cape of Good Hope. Wahlenberg, Act. Holm. 1803, excluding the native habitat, appears to have first quoted *C. Æthiopica* as a synonym to *C. lævigata*, Smith, in which he was followed by Smith in Eng. Bot. 1804, and by Willdenow in 1805, and eventually, though doubtingly, by Schk. in his Nachtr. 1806; and this error, notwithstanding the observations of Schkuhr, was persisted in by Smith, Eng. Flora, iv. 122 (1828), and by Kunth, Cyp. (1837). I first met with the plant in Herb. Hooker, where specimens from the Cape, collected by Gill and Zeyher, are found, and I have since been indebted to Dr. Alexander Prior for specimens he brought from the Cape. To my late friend Dr. Charles Lemann, I am indebted for specimens of *C. Simensis* from the Unio Itin., and to M. Spach, for others sent by Schimper as late as 1853. *C. iridifolia* is in Herb. Hooker, and M. Spach has furnished me with a note on the specimen in Herb. Mus. Paris. I have no doubt of the specific identity of the three plants, and I suspect when *C. Borbonica* is more known, it will be found inseparable, judging from the identity of its perigynium with that of the others. The distribution of the male florets is variable. In *C. Simensis* the terminal spike is male or male at base, as in *C. Borbonica*. In *C. Æthiopica* and *C. iridifolia* the terminal spikes 1–3 are male. The bracts in *C. Borbonica* contrast with those of *C. Æthiopica*, and the leaves are narrower and shorter; but in *C. Simensis*, which has long and broad leaves, the bracts are like those of *C. Borbonica*.

The specimens figured are Tab. CCCXLI. and CCCXLII. *C. Æthiopica*, from Dr. Alexander Prior; one young, to show the foliage.

Tab. CCCXLIII. and CCCXLIV. are Schimper's specimens of *C. Simensis* (1853).

265. *C. Boryana* (Schkuhr); spica elongata laxa e viridi sanguineo-ferruginea; spiculis pluribus cylindricis elongatis inæqualibus, omnibus apice masculis, vel summis 1–2 masculis, superioribus sessilibus congestis, inferioribus geminatis remotis longe exserte pedunculatis, nutantibus, una ex geminis simplici, altera basi spiculis 1–5 composita; bracteis inferioribus vaginatis foliaceis, infima culmum superante; stigmatibus 3; perigyniis ovalibus vel lanceolatis plano-triquetris rostratis bicuspidatis nervatis, marginibus superne plus minus scabris, pallidis vel sanguineo-tinctis pellucide demum sanguineo-maculatis membranaceis, squama lanceolata acuta rarius emarginata longe cuspidata latioribus, brevioribus vel æquantibus.—*C. Boryana*, *Schk. fig.* 191; *Kunth.* 506; *Spr.* 814. *C. subulata*, *Wahl. Act.* 152 (fide *Wahl. Fl. Lap.* 250). (TAB. CCCXLV.—CCCXLVII.)



*β. minor!*; spica abbreviata; spiculis paucis brevibus, superioribus sæpe masculis, omnibus singulis, simplicibus vel geminatis; culmo gracili; foliis bracteisque angustis.—*C. typhoides?* *Bory, Itin.* iii. 24. *Willd. Enum. Hort. Berl.* 954 (1809); *Kunth*, 506; *Spr.* 814. (TAB. CCCXLVIII., CCCXLIX.)

HAB. In Ins. Bourbon and Mauritius. Bourbon, *Sonnerat, Boivin, Richard*. Mauritius, *Bory*. Fernando Po, *Mann*.

*Culmus* 3-4-pedalis, lævis, basi foliosus; pars spicas gerens sesquipedalis. *Folia* 3-5 lin. lata, longissima. *Bractea* inferiores sæpe culmo longiores, vaginatae, sursum decrescentes, evaginatae, setaceae, demum squamæformes. *Vagina* infima sæpe 4 poll. longa. *Spiculæ* inæquales, 1-4 poll. longæ, 3½ lin. latæ, basi attenuatæ, laxifloræ: omnes androgynæ, plus minus apice masculæ, vel summæ 1-2 masculæ, singulæ; inferiores geminatæ, quarum una simplex, altera basi spiculis 1-5 plus minus elongatis androgynis, nunc pæne omnino masculis composita. *Squamæ* conformes, sanguineo-ferrugineæ, rarius pallidæ; inferiores longius cuspidatæ. *Perigynium* 1- $\frac{8}{10}$ -3 lin. longum, rarius lanceolatum, 3½-4 lin. longum,  $\frac{6}{10}$ - $\frac{9}{10}$  lin. latum. *Achenium* obovatum,  $\frac{9}{10}$  lin. longum, vel ellipticum, 1- $\frac{3}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. latum, triquetrum, fuscum, basi styli depresso-contorta apiculatum.

*C. Boryana* differt. spiculis 5-20 vel pluribus, geminatis vel singulis, simplicibus vel ramosis, sublaxifloris vel sparsi-rarius densifloris, elongatis 4-pollicaribus multifloris, vel abbreviatis subpollicaribus paucifloris, nutantibus vel erectis, sanguineo-ferrugineis vel pallidis, omnibus apice masculis vel summa, rarius superioribus omnino vel pæne masculis; perigyniis 1- $\frac{8}{10}$ -4 lin. longis,  $\frac{6}{10}$ - $\frac{9}{10}$  lin. latis, ovalibus brevius rostratis vel lanceolatis longius rostratis plus minus alte bicuspidatis, laciniis divergentibus, ore interdum postice obliquo, glabris vel superne ad lacinias oris vel ad margines, vel ad unum marginem solum serrato-scabris, pallidis vel sanguineo-tinctis, semper (luce subjectis) pellucide demum sanguineo-punctatis; achenio obovato  $\frac{9}{10}$  lin. longo,  $\frac{7}{10}$  lin. lato; vel elliptico 1- $\frac{3}{10}$  lin. longo,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. lato; squamis acutis, plus minus cuspidatis, rarius subtruncatis vel emarginatis apiceque dentatis; culmo valido vel gracili; foliis latis rigidis vel angustis gramineis.

I am indebted to M. Spach for the opportunity of examining a large suite of specimens of *C. Boryana* from the Herb. Mus. Paris, collected by Boivin and H. Richard in the Isle of Bourbon, and as in the case of *C. Kæstlini*, I could not see any abrupt transition from the more compound to the simple forms, and I cannot but believe that the *C. typhoides*, Bory, is referable to the latter. In none was the perigynium more than 3 lines long, but in a specimen from the Mauritius in Herb. Hooker it varies from 3½ to 4 lines in length. I have figured a perigynium from that specimen in Tab. CCCXLIX.

Tab. CCCXLV. the lower part, and Tab. CCCXLVI. the upper part, of a specimen of Richard.

The others from specimens of Boivin, all from the Isle of Bourbon.

Tab. CCCXLVIII. is the form like that found by Mann on "Clarence Peak, Fernando Po, 8500 ft. Dec. 1860" (Herb. Hooker).

266. *C. insularis* (Carmichael); spicis 7-9 cylindricis crassis approximatis ferrugineis, terminalibus 1-3 masculis arcte contiguis, fœmineis deorsum longius pedunculatis, superioribus sæpe apice masculis contiguis evaginatibus, inferioribus pendulis, infima interdum remota longe exserte pedunculata; bractea infima lata vaginata, omnibus (inferioribus longe) culmum superantibus; stigmatibus 2; perigyniis ovatis breve rostratis acute bifidis,

plano-convexiusculis nervatis glabris membranaceis olivaceis, squama oblonga truncata vel acuta apice ciliata longe hispido-aristata rubro-ferruginea brevioribus.—*C. insularis*, *Carmichael, Lin. Tr.* xii. p. 508 (1818), "Carex spicis pluribus masculis fœmineis pedunculatis," *Aubert du Petit Thouars, Fl. de Trist. d'Acugna*, p. 36, in *Mélanges de Botanique*. (TAB. CCCL.)

HAB. In Ins. Tristan d'Acunha, on the plain, *Car.*, *Pet. Thouars*.

*Culmus* 2½-pedalis, acute triqueter, scaber, validus, rigidus, basi foliosus; pars spicas gerens 9-12 poll. longa. *Folia* 6 lin. lata, culmo longiora, plana, rigida. *Bractea* foliaceæ: infima vel binæ inferiores vaginatae. *Vagina* ½-2½ poll. longæ. *Pedunculi* scabri: infimus 3½-6 poll. longus. *Squamæ* conformes, longe aristatæ, masculæ majores. *Spica mascula* suprema 1½ poll. longa, 2 lin. lata; sæpe ad basin spiculis 1-2 brevibus arcte contiguis instructa. *Spica fœminea* 2-2½ poll. longæ, 4-6 lin. latæ: omnes pedunculatæ. *Perigynium* 2-2 $\frac{4}{10}$  lin. longum,  $\frac{8}{10}$ - $\frac{9}{10}$  lin. latum, subcompressum. *Achenium* 1 lin. longum,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latum, late ovale, lenticulare, castaneum, basi styli apiculatum. *Stylus* supra basin contortus.

This species has escaped the observation of authors, though described in the Transactions of the Linnean Society nineteen years previously to the publication of the 'Cyperographia' of Kunth, Steudel, in his Synopsis, has not included it. Its affinity is with *C. paludosa*, Good., which occasionally has two stigmas. The transverse section of the perigynium in the Tab. CCCL. does not accurately show the plano-convex form.

267. *C. Wahuensis* (Meyer); spicis 2-6 cylindricis approximatis pallidis vel lutescenti-vel olivaceo-ferrugineis comosis stricte erectis, terminali mascula densiflora, fœmineis subdimidiatim apice masculis crassis inserte vel exserte pedunculatis, infima subremota subinde radicali; bracteis vaginatis angustis plerumque culmo brevioribus; stigmatibus 3; perigyniis ellipticis vel obovatis obtuse inæqualiter trigonis rostratis bicuspidatis creberrime striato-nervosis, superne ad margines scabris, squama oblonga ovata obtusa emarginata longe hispido-aristata æquilata longioribus, cuspidate subduplo brevioribus.—*C. Wahuensis*, *Meyer, Cyp. Nov. Mem. Ac. St. Petersb.* i. 218. t. 10; *Kunth*, 515. (TAB. CCCLI.—CCCLIV.)

HAB. Ins. Wahu (Owhyee), *Meyer, Nuttall*; Ins. Atooi, *Nuttall (Herb. Boott)*. Sandwich Islands. Ins. Loochoo, *Wright (Herb. Gray)*. Simoda, Japan, *Wright (Herb. Gray)*. Port Hamilton, Korea, *Wilford (Herb. Hooker)*.

*Radix* fibrosa. *Culmus* 2½-24 pollices altus, rigidus, lævis vel scaber, basi foliosus, rudimentis reliquiisque fibratis foliorum atro-purpureis tectus; pars spicas gerens 2½-12 pollices longa. *Folia* ½-5 lin. lata, culmo longiora, rigida, marginibus revolutis, apice attenuata, curvata. *Bractea* vaginatae, sæpe spicas suas subæquantes, rarius culmo longiores. *Squamæ* conformes, pallidæ vel ferrugineæ. *Spica mascula* 1-3 poll. longa, 1½-3 lin. lata. *Spica fœminea* plus minus longæ, apice masculæ, 1-3 poll. longæ, 3-5 lin. latæ: infima interdum basi spicula altera brevi aucta. *Perigynium* 2- $\frac{7}{10}$ -3 lin. longum,  $\frac{8}{10}$ -1 lin. latum, pallidum vel olivaceum, demum purpureum lucidum. *Achenium* 1- $\frac{2}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, obovatum, obtuse triquetrum, angulis sæpe indentatum vel distortum, subinde abortivum, atro-purpureum, basi styli crassa depresso-

curvata. *Antheræ* (polline effuso) cineræ, spiraliter tortæ.—*Racheola* ligulata intus perigynium sæpe adest.

The specimens figured are,—

Tab. CCCLI. From Wahu or Owhyhee, from Nuttall. In one of the florets was a racheola, and the penultimate female spike has a small branch at base. These specimens contrast in size with the one figured by Meyer. I have others from the same locality  $3\frac{1}{2}$  inches high, with leaves only half a line in width.

Tab. CCCLII. A specimen from Port Hamilton, Korea, with a radical lower spike and normal achenium.

Tab. CCCLIII. From Port Hamilton, with broad leaves.

Tab. CCCLIV. From Loochoo; the bracts longer than the culm.

A *C. pumila*, Thunb. (*C. littorea*, Labill.), satis distincta, perigyniis obtuse triquetris bicuspidatis, margine scabris; squamis longe ligulato-hispido-aristatis; culmo altiore; nec vaginis foliorum culmum arctissime circumvolventibus; nec radice longe repente.

I can see nothing essentially distinct in the specimens of this species from its various remote localities. The achenium is generally more or less indented or distorted, occasionally abortive from the imperfect development of its nucleus. There is such an evident transition in the breadth of the leaves, that I have not thought it necessary to make the leaves a ground for varieties. Meyer's figure represents them as too flaccid. Steudel describes the female squamæ as *muticæ*, by an oversight.

268. *C. riparia* (Curtis); spicis sæpius 6–7 cylindricis densifloris erectis remotis, masculis 3–5 ferrugineis, foemineis 2–3 rarius 4 crassis olivaceis, superioribus sæpe apice masculis sessilibus, infima basi attenuata, nunc longe exserte pedunculata nutante; bracteis late foliaceis evaginatis, vel infima plus minus vaginata sæpe culmum superante; stigmatibus 3; perigyniis lanceolato-conicis vel obtuse trigonis rostratis bifurcatis crebre nervosis glabris olivaceis coriaceis, squama ovata cuspidata ferruginea sæpius longioribus.—*C. riparia*, Curtis, *Fl. Lond.*, etc.; *Muhl.* 259; *Elliott*, 554. *C. lacustris*, Willd. 306; *Schk. fig.* 152; *Kunth*, 489; *Schw. et Tor.* 369; *Torrey, Cyp.* 423; *Dewey*, x. 43; *Carey*, 530; *Sartwell, Exs. n.* 131. *C. exaltata*, *Peterm.*; *Steudel*, 237. *C. Chilensis*, *Brongn.*, *Kunth*, 420. *C. vacillans*, *Steudel*, 235. *C. incrassata*, *Schlecht. Linnæa*, x. 119; *Kunth*, 490; *Steudel*, 238. (TAB. CCCLV.)

HAB. In America Sept. et Merid., Canada to Florida. Chili, *D'Urville*; *Lechler*, n. 439. Montevideo, *St. Hilaire*. Brazil, *Gaudichaud*.

*Culmus* 2–3-pedalis, triqueter, validus, basi vaginis foliorum reticulato-fissis tectus; pars spicas gerens 1–18 poll. longa. *Folia* 3–5 lin. lata, reticulatim nodosa. *Bractea* infima interdum vaginata. *Spicæ masculæ*  $\frac{1}{2}$ –3 poll. longæ, extremæ longiores, 2–2 $\frac{1}{2}$  lin. latæ. *Spicæ foemineæ* 2–3 poll. longæ, 4–6 lin. latæ. *Perigynium*  $2\frac{2}{10}$ – $3\frac{1}{2}$  lin. longum,  $\frac{2}{10}$ –1 lin. latum, bifurcatum, dentibus plus minus longis. *Achenium*  $1\frac{2}{10}$ – $1\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, utrinque acutum, triquetrum, flavidum, basi styli curvata.

*C. lacustris* differs in no essential respects from the *C. riparia* of Europe and Asia. There is scarcely a single character in the one that may not be found in the other. *C. lacustris* is generally paler, with longer and narrower perigynia, the squamæ shorter and less cuspidate, and the vaginæ of the lower leaves more uniformly reticulate. But there is nothing constant in these characters in either plant.

I find, in 35 specimens of *C. riparia*, Curt.:

|                  |                |                  |
|------------------|----------------|------------------|
| 1 with 3 spikes. | 4 with 2 male. | 2 with 2 female. |
| 4 " 5 "          | 10 " 3 "       | 15 " 3 "         |
| 8 " 6 "          | 14 " 4 "       | 13 " 4 "         |
| 11 " 7 "         | 3 " 5 "        | 1 " 5 "          |
| 10 " 8 "         |                | 1 " 6 "          |
| 1 " 9 "          |                |                  |

In 1 all the spikes were female.

- 1 the terminal spike was basi mascula.
- 2 the terminal spike was basi et apice mascula.
- 10 the upper female spike was apice mascula.
- 2 the 2 upper female spikes were apice masculæ.
- 5 all the females were apice masculæ.
- 2 the lower females were basi compositæ.

1 the lower female had a peduncle 8 inches long.

The lower bract occasionally with a vagina  $\frac{1}{2}$ –2 poll. long.

The perigynium  $2\frac{2}{10}$ –3 lin. long.,  $\frac{7}{10}$ – $1\frac{2}{10}$  lin. lat.

The achenium  $1$ – $1\frac{4}{10}$  lin. long.,  $\frac{5}{10}$ – $\frac{8}{10}$  lin. lat., ellipticum vel obovatum, basi styli curvata vel contorta flavidum.

In 38 specimens of *C. lacustris*, W.:

|                  |                 |                  |
|------------------|-----------------|------------------|
| 6 with 5 spikes. | 11 with 3 male. | 1 with 1 female. |
| 12 " 6 "         | 19 " 4 "        | 17 " 2 "         |
| 15 " 7 "         | 8 " 5 "         | 15 " 3 "         |
| 3 " 8 "          |                 | 5 " 4 "          |
| 2 " 9 "          |                 |                  |

In 9 the upper female was apice mascula.

- 2 the 2 upper females were apice masculæ.
- 2 the 2 lower females were basi compositæ.
- 2 the lower female had a peduncle 8 inches long.

The lower bract occasionally with a vagina  $\frac{1}{2}$ –1 poll. long.

The perigynium  $2\frac{2}{10}$ – $3\frac{1}{2}$  lin. long.,  $\frac{8}{10}$  lin. latum.

The achenium  $1\frac{2}{10}$ – $1\frac{4}{10}$  lin. long.,  $\frac{7}{10}$  lin. latum, ellipticum, flavidum, basi styli curvata.

With relation to the reticulated vaginæ, I observe them in a Swedish specimen from Wahlenberg. Lang (Car. Germ. et Scand.) p. 140, in describing *C. riparia* says, "Vaginæ reticulato-fissæ." Ledebour (Fl. Altaica, 221) says, "Vagiæ in filamenta reticulatim connexa lacerantur." Steudel (Cyp. 237) inserts the "*C. exaltata*, Petermann," from Saxony (which is evidently *C. riparia*) and says, "Vaginæ demum reticulato-fissæ." Torrey (Cyp. 423) says, "*C. lacustris* is distinguished by its strongly-nerved fruit, with a more acutely bifid mouth." But I see no difference in the two plants in these respects; and Treviranus (in Fl. Rossica) remarks, under *C. riparia*, "Fructus valide nervosus cum rostro peracute bifido, quo *C. lacustrem* à *C. riparia* distingui vult cl. Torrey, non minus insigniter in planta Germanica observatur."

Kunth (under *C. lacustris*) says, "Nescio quomodo à *C. paludosa*, Good., distinguenda." It differs as much as *C. riparia* does. *C. paludosa* is always a smaller plant, with an ovate compressed perigynium, with an emarginate mouth, and more prominent nerves, and stigmas 3–2; more nearly approaching in aspect the *C. stricta*, Good.

I am indebted to M. Spach for the opportunity of examining the *C. Chilensis*, Brongn., which certainly has 3 stigmas; and to M. Sonder, of Hamburg, for a specimen of *C. vacillans*, Steud. I have not seen any specimen of what Dewey (Sill. 49, 1845) considers the *C. riparia* of New England, etc., but I am not surprised at his finding it in the States, since I agree with Schkuhr (p. 84) and Schlechtendal (Linnæa, 1835) in considering *C. lacustris* as inseparable from *C. riparia*.

The only authentic specimeu that I have seen of *C. incrassata*, Schlechtendal, is in Herb. Hooker, differing in no respect from the usual forms of *C. riparia*. Schlechtendal describes the male spikes occasionally to be 10, which is double the number I have ever seen.

269. *C. alpina* (Swartz); spicis 3–4 rarius 2–5 parvis confertis aurantiaco-purpureis, terminali basi mascula majore, reliquis foemineis subrotundis vel ovalibus obtusis sessilibus vel infima pedunculata sæpe remota; bractea foliacea auriculata rarius vaginulata spicam superante

subinde abbreviata; stigmatibus 3; perigyniis suborbiculatis vel obovatis abrupte rostellatis, vel ellipticis utrinque acutis trigonis, angulo introrso, ore emarginato, aurantiacis, rostro apice purpureo, granulato-asperulis superne margine serratis rarius scabris enerviis vel plus minus nervatis, squama late ovata obtusa vel acuminata atro-purpurea margine demum decolori longioribus.—*C. alpina*, Swartz; *Wahl. Act.* 160; *Fl. Lap.* 241; *Anderson*, 38. t. 6. f. 66; *Fl. Ross.* 286. *C. Vahlia*, *Schk. f.* 94 et 154; *Willd.* 254; *Kunth*, 431; *Koch*, 874; *Drejer*, *Rev.* 30; *Lang*, 87; *Reich.* 16. t. 235; *Ledeb. Fl. Alt.* 217; *Eng. Bot. t.* 2666; *Bertol.* 72; *Steudel*, 202. *C. media*, *Brown, Fr. Nar. App.* 763. *C. brachylepis*, *Turez.* (TAB. CCCLVI. et CCCLVII.)

HAB. In Europa, Asia, America septentrionali. Iceland. Lapland to Swiss Alps. Altai, Dahuria. In Himalaya temperata et alpina ad Kumaon, 10,000 ped., *Royle*, n. 123; *Strachey et Winterbottom*; et ad Sikkim, 10–12,000 ped., *J. D. Hooker*. Greenland, Arctic America, Rocky Mountains.

*Culmus* 2–24-pollicaris, rigidus, crectus, basi foliatus, apice sæpe scaber. *Folia* 1–1½ lin. lata, culmo breviora. *Bractea* foliacea, plerumque spicam superans, altera sæpe brevis: infima nonnunquam sterilis, remota. *Vagina* rarius 2 lin. longa. *Pedunculus* 2–5 lin. longus. *Spica* congesta, e spiculis sæpius 3 subsessilibus, 3–4 lin. longis, 2–3 lin. latis, vel 2–5: infima subinde 10 lin. remota, plus minus pedunculata. *Squamæ* conformes, obtusæ vel acuminatæ, muticæ, atro-vel rubropurpureæ, margine demum decolorès. *Perigynium* 1–1½ lin. longum, ¼–⅓ lin. latum, in eadem spicula forma varians. *Achenium* ⅞ lin. longum, ¼–⅓ lin. latum, ellipticum vel obovatum, triquetrum, pallidum, basi styli apiculatum.

Wahlenberg, in the *Act. Holm.*, speaks of this species as “egregie varians;” but in the European forms it is I think easily distinguishable from its allies. Lang says of the figures of Schkuhr, “si habitum spectas, minus accurate delineata,” an opinion in which I cannot concur. Wahlenberg, in his *Flora Lap.*, says, “capsulis subglobosis,” as in Schkuhr’s fig. 94, which has been most objected to, but which may often be observed with the elliptic form in the same spike. Wahlenberg also says, “capsulis subpubescentibus.” I have never seen any to confirm this observation. In the Lapland, Scotch, and Norwegian plant, the perigynium is not only rough from the protuberant granulations, but the upper surface is occasionally rough, as the margins are, as shown in Tab. CCCLVII. In some Norwegian, but especially in the Arctic American plant, the nerves are distinct and the roughness disappears. In the Altai plant the perigynium is often subexcurved. In the specimens from the Himalaya there are forms like those of Europe, others which differ in the size of the spiculæ, in the occasional cuspidation of the squamæ, and the curvature of the culm. Nees has separated this last under the name of *C. infuscata*, making no allusion to its affinity with *C. alpina*. But Drejer (*Symb.* p. 13), in contrasting it with the var.  $\beta$  of Nees (*C. Lehmanni*, Drej.), says, “*C. infuscata* multo propior est *C. Vahlia*, Schk.” With the exception of the above differences from the European type, I think it can be regarded only as an exceptional form of *C. alpina*, but, in deference to Nees, I have adopted his name, and I have done the same with the *C. parviflora* of Meyer, which in the *Fl. Rossica* is the var.  $\gamma$  of *C. alpina*.

Tab. CCCLVI. Specimens figured, No. 1, from the Clova Mountains, Scotland; No. 2, from Arctic America.

Tab. CCCLVII. Specimens: No. 1, from Norway; No. 2, from the Altai; No. 3, from Dahuria. The details from the Norwegian and Altai specimens.

Var.  $\beta$ . *infuscata*; spiculis majoribus 4–5 lin. longis

2½ lin. latis; perigyniis 1½ lin. longis, ⅔ lin. latis, ellipticis vel obovatis, obtuse subturgide trigonis, nervatis, nervis superne evanidis, squama oblongo-ovata acuminata vel cuspidata atro-purpurea brevioribus vel longioribus; culmo sæpe curvato, vaginis foliorum punctis ferrugineis maculatis; achenio ⅞ lin. longo, ⅔ lin. lato, ovali vel obovato.—*C. infuscata*, *Nees*; *Wight Contr.* 125; *Kunth*, 431; *Drejer, Symb.* 13 (sub *C. Lehmanni*); *Steudel*, 202. (TAB. CCCLVIII. et CCCLIX.)

HAB. In Himalaya temperata et alpina. Kunawur, *Royle*, n. 123; *Jaquemont*. Kishtwar, 10–14,000 ped., *Dr. Thomson*. Sikkim, *Dr. Hooker*. Tibetia occident., ad Hasora, *Winterbottom*.

Nees alludes to the truncate orifice of the perigynium, which is occasionally observable, but the usual form of it is (as in *C. alpina*) a more or less distinct emargination. Drejer says, “perigyniis lenticulari-convexis,” but this can only apply to the more turgid forms, in which the achenium fails to impress its internal angle on the perigynium.

Tab. CCCLVIII. The specimens figured are, No. 1, *Royle*, n. 123, Pungee; No. 2, from *Dr. Thomson*, 14/6/1848; No. 3, from *Strachey* and *Winterbottom*, Garais Valley; No. 4, from *Jaquemont*, Chini, Kunawur, n. 1560, Herb. Mus. Paris.

Tab. CCCLIX. No. 1, *Strachey* and *Winterbottom*; No. 2, *Dr. Hooker*, Sikkim.

The spiculæ oblong, more laxly alternate, and narrower.

Var.  $\gamma$ . *parviflora*; spiculis 4–5 lin. longis, 3 lin. latis, confertis, infima subinde composita; perigyniis majoribus, 1½–⅞ lin. longis, ⅔–⅓ lin. latis, ellipticis, bifidis, enerviis, fusco-purpureis, basi pallidis, squama ovata fusco-purpurea nervo concolori rarius extra apicem producto longioribus; culmo rigido, stricto; foliis 1–2 lin. latis, bractea reflexa, ligula amplectente oblonga; achenio ⅞ lin. longo, ⅔ lin. lato, elliptico vel obovato; stylo subinde contorto.—*C. melanocephala*, *Turez. MSS.* *C. parviflora*, *Meyer*; *Kunth*, 436. *C. alpina*,  $\gamma$ , *Fl. Rossica*, iv. 286. *C. Vahlia*, var., *Steudel*, 202. (TAB. CCCLX.)

HAB. In Alpe Urgudei. Dahuria, *Turez.* In humidis ad nives deliquescentes Alpium, Alatau ad fl. *Lepsa*, *Karelin et Kirilow*, n. 2080 (*Herb. Hooker*).

In the ‘*Flora Rossica*’ this is considered the same as the *C. alpina*,  $\beta$  *nigrescens*, *Anderson*, Cyp. Scand., but it is much larger than any of the northern European forms I have seen. The specimens figured are: No. 1, those of *Turez.*, sent to me by *M. Fischer*; and No. 2, from Dahuria, Herb. Mus. Paris.

270. *C. Lehmanni* (*Drejer*); spicis 3–5 parvis ovalibus vel oblongis e flavide-atro-purpureis subsessilibus congestis vel contiguis, terminali basi mascula sæpe majore, reliquis fœmineis, infima plus minus pedunculata remota, tamen superiores attingente nisi rarius radicali longissime exserte pedunculata, basi composita; bracteis evaginatiss, infima culmum sæpe longe superante; stigmatibus 3, brevibus; perigyniis obovatis obtuse trigonis abrupte rostellatis, ore subintegro vel emarginato, glabris obsolete nervatis flavidis, rostello purpureo, squama ovata acuta vel cuspidata atro-purpurea concolori longioribus.—*C. Lehmanni*, *Drejer, Symb.* 13. t. 2. *C. infuscata*,  $\beta$ , *microcarpa*, *Nees*, 125; *Kunth*, 431. (TAB. CCCLXI.)

HAB. In Himalaya tropica et alpina. Nipal, *Wallich*, n. 3381. Kumaon, *Strachey et Winterbottom*, 14–15,000 ped. Sikkim, *Dr. Hooker*, 12,000 ped.

*Culmus*  $\frac{1}{2}$ –2-pedalis, triquetus, apice scaber, gracilis, basi foliatus; pars spicas gerens plerumque  $\frac{1}{2}$ –3 poll. longa. *Folia* 1–3 lin. lata, elongata, culmum æquantia vel eo breviora, plana, graminea. *Bractea* evaginata: infima angusta vel  $1\frac{1}{2}$  lin. lata,  $1\frac{1}{2}$ – $5\frac{1}{2}$  poll. longa, altera spicam superans vel æquans. *Pedunculus* infimus plerumque 2 lin. ad 2 poll. longus: vel radicalis pedalis, bractea æquilonga suffulta. *Spicæ* omnes congestæ, parvæ, subæquales, sessiles: vel oblongæ, 3–6 lin. longæ, 2 lin. latæ, contiguæ: infima plus minus remota, tamen semper alias attingens, nisi rarius radicalis, remota, basi subinde spiculis 2 brevibus basi composita. *Squamæ* conformes. *Perigynium* 1– $1\frac{1}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, pallide flavescens, apice purpureo tinctum. *Achenium* conforme,  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, obovatum, obtuse triquetrum, olivaceum.

Allied to *C. alpina*, but evidently distinct in inflorescence and form of perigynium. Drejer considered it to be allied to *C. Shortiana* from the form of the perigynium. "Mihi videtur," he says, "quasi immediate à *C. Shortiana* ad *melananthas* ducere, intimamque affinitatem clarius ostendere."

271. *C. atrata* (Linn.); spicis 3–5 rarissime 6 ovalibus vel oblongo-cylindraceis rubro- vel demum atro-purpureis contiguis; superioribus sessilibus vel omnibus (deorsum longius) pedunculatis terminali basi mascula; reliquis fœmineis rarius omnibus vel una alterave ima basi parce masculis erectis vel cernuis; bractea evaginata, auriculata, culmo paulo longiore vel æquante, superioribus squamæformibus, infima rarius remota sterili vaginata; stigmatibus 3; perigyniis late vel subrotundo-ovalibus compresso-ventricosis abrupte vel sensim rostellatis, ore emarginato vel bidentato, flavidis ferrugineo tinctis glabris tenuiter granulatis enerviis sessilibus, squama ovata obtusa vel acuta æquilata vel ad apicem spicarum lanceolata acuminata angustiore rubro-ferruginea vel atro-purpurea brevioribus vel longioribus.—*C. atrata*, *Lin.*; *Good. Lin. Trs.* ii. 189; *Willd.* 221; *Schk.* x. f. 77; *Wahl. Act.* 106; *Fl. Lap.* 242; *Gaud. Agrost.* 114; *Kunth*, 433; *Koch*, 875; *Eric. Mant.* iii. 137; *Anderson*, 37. t. 6. f. 67; *Drejer, Rev.* 31; *Lang.* 89; *Lcd. Fl. Alt.* 214; *Fl. Rossica*, 287; *Reich.* 16. t. 237; *Bertol.* 74; *Light*, 555; *Smith, Eng. Fl.* 103; *Eng. Bot. t.* 2044; *Schw. et Tor.* 320; *Torrey, Cyp.* 406; *Carey*, 520; *Dewey*, x. 271; *Sartwell, Eas. n.* 63. *C. aterrima*, *Hoppe, Icon.*; *Koch*, 874; *Reich. t.* 236; *Kunth*, 434. *C. atrata*,  $\beta$ , *Gaud. Agrost.* 115; *Fl. Rossica*, 287. *C. nigra*, *All. Ped.* 267; *Bellard. App.* 44; *Willd.* 266; *Schk. f.* 115; *Kunth*, 435; *Koch*, 874; *Reich.* 16. t. 236; *Bertol.* 73. *C. atrata*,  $\gamma$ , *Gaud.* *C. saxatilis*, *Scop. Carn.* 221. *C. æthostachya*, *Schk. f.* 196. *C. distachya*, *W. Schk. f.* 33. *C. ovata*, *Rudge, Lin. Trs.* vii. 96. t. 9. f. 1. *C. Caucasica*, *Stev. Biebst.* iii. 613. *Kunth*, 433. *C. atrata*, *Fl. Rossica*, 287. (TAB. CCCLXII.–CCCLXV.)

HAB. In Europa. Islandia usque ad Alp. Germaniæ et Helvetiæ. In Asia, Caucasus, Altai, Himalaya orient. temp. et alpina, Sikkim, alt. 12–17,000 ped. In America, Grœnlandia, Am. Arctica, Mont. Alb. et Sax.

*Radix* fibrosa. *Culmus*  $\frac{1}{2}$ – $2\frac{1}{2}$ -pedalis, triquetus, lævis vel apice scabriusculus. *Folia*  $1\frac{1}{2}$ –4 lin. lata, culmo breviora. *Bractea* infima rarius infra spicas sita, sterilis, remota, vaginata, plerumque auriculata: auriculis sæpe concretis. *Spicæ*

6–12 lin. longæ, 2–3 lin. latæ, erectæ vel cernuæ, ovals, latiores; vel cylindraceæ, angustiores, deorsum longius pedunculatæ. *Perigynium*  $1\frac{4}{10}$ – $2\frac{3}{10}$  lin. longum,  $\frac{7}{10}$ – $1\frac{5}{10}$  lin. latum, viride, demum fulvum vel ferrugineum vel (in *C. aterrima*) atropurpureum; rostello cylindrico purpureo. *Achenium*  $\frac{8}{10}$ – $1\frac{2}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, inæqualiter triquetrum, ellipticum. *Stamina* 3 vel 2. *Flosculi* rarius hermaphroditici!

*C. atrata*, L., variat culmo plus minus alto, lævi vel scaberimo; longitudine et latitudine foliorum; spicis ovalibus vel obovatis vel cylindricis, plus minus latis, omnibus rarius, vel una alterave, basi masculis: erectis vel cernuis, inferioribus nunc basi compositis, infima subinde subradicali longe exserte pedunculata; squamis rubris vel atro-purpureis, concoloribus vel margine albidis, latoribus obtusis perigynio brevioribus, vel angustioribus acuminatis acutis eo longioribus; perigyniis latoribus ovalibus vel obovatis, vel angustioribus ellipticis, plus minus ventricosis abrupte cylindrico- vel sensim rostellatis vel erostibus, ore emarginato vel bidentato rarius integro; flavidis demum fulvis plus minus purpureo tinctis vel atropurpureis, plus minus grosse granulatis vel ad margines raro dentatis, enerviis vel obsolete tenuiter nervatis.

I have taken the description of this species from European specimens, noticing above the variations it undergoes in other countries. It is not possible to describe its varieties without attributing to one characters that are more or less to be found in the others.

The following may give a general idea of them:—

*C. atrata*, L.; spiculis ovalibus; perigyniis fulvis enerviis, squamis superioribus sæpe lanceolatis acutis.

Var. *aterrima* (*C. aterrima*, Hoppe, etc.); spiculis oblongis perigyniisque atro-purpureis foliis latoribus.

Var. *ovata* (*C. ovata*, Rudge, etc.); spiculis ovalibus rubro-ferrugineis. (TAB. CCCLXII.)

Var. *nigra* (*C. nigra*, All., etc.); spiculis ovalibus plerumque sessilibus congestis, terminali subinde mascula; stigmatibus 3 et 2; perigyniis atro-purpureis, marginibus pallidis sæpe dentatis, squamis obtusis. (TAB. CCCLXIII.)

Var. *Caucasica* (*C. Caucasica*, Stev.); spiculis cylindraceis vel clavatis; perigyniis tenuiter nervatis, squamis abrupte acuminatis; foliis elongatis.

Var. *pullata*; spiculis cylindraceis; perigyniis oblongis, ore sæpe integro, nervatis minime ventricosis, squamis lanceolatis acuminatis acutis. (TAB. CCCLXIV.)

Var. *glacialis*; spiculis ovalibus; perigyniis achenium arcte vestientibus, ore subinde subbifido, squamis lanceolatis acuminatis acutis. (TAB. CCCLXV.)

*C. aterrima*, Hoppe, as Kunth and especially Ledebour remark, is not distinguishable from *C. atrata*, L., the dark purple colour of the perigynia and breadth of the leaf affording no constant character. In *C. atrata* the colour of the perigynium is fulvous, more or less spotted or tinged, sometimes entirely with a ferruginous hue. Ledebour says, "perigynia (fructu maturascente) sensim sensimque nigrescunt et demum sæpissime atro-purpurea evadunt."

Beyond the rufous colour of the spikes in *C. ovata*, I know nothing that is observable distinguishing it from the usual character of *C. atrata*, and this colour, as well as the occasional narrow cylindrical spikes, are found in European specimens, and in those from the White Mountains of New Hampshire.

The variety *nigra* (*C. nigra*, All.) appears to be confined to the Alps of Germany and Switzerland. It is, from its alpine habitat, more contracted in all its parts, the terminal spike occasionally male, and the stigmas at times only 2, with a corresponding lenticular achenium. The perigynium varies in width, and consequently is more or less ventricose; the upper margins at first pale and often dentate, but the colour eventually is more or less dark purple, as in *C. aterrima*, except at base. In *C. atrata* and

its varieties the angle of the achenium is posterior, and hence Koch describes the perigynia as "dorso obtuse carinata."

Spicis 3-5 ovalibus fuliginosis quasi capitatis, terminali basi rarius omnino mascula, reliquis plerumque fœmineis, superioribus vel omnibus sessilibus; bractea sæpe spicam superante; stigmatibus 3, rarius 2; perigyniis ovalibus vel obovatis vel ellipticis brevissime vel vix rostellatis, ore emarginato, granulato-asperulis sanguineo-demum atro-purpureis basi marginibusque superne pallidis sæpe dentatis subinde obscure nervatis, squama ovata obtusiuscula vel abrupte apiculata atro-purpurea nervo rarius extra apicem producto paulo longioribus.

*Culmus* 4-8-pollicaris, lævis. *Folia* 1-2 lin. lata. *Perigynium*  $1\frac{1}{2}$  lin. longum,  $\frac{4}{10}$  lin. latum, vel  $1\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, inæqualiter triquetrum, vel lenticulare. (TAB. CCCLXIII.) *C. atrata (nigra)*.

This variety in its development is like the var. *glacialis* of the Himalaya, but the lanceolate squamæ and acutely bifid orifice of the perigynium of the last are peculiar to it. Wahlenberg (Fl. Lap. 242) says of *C. atrata*, "capsulæ in summis alpebus fuscae occurrunt adeo ut de differentia *C. nigra*, All., adhuc dubito." Tuckerman, when at Upsala, had a specimen of *C. nigra* from Germany given to him by Wahlenberg, and on the ticket he has added these words, "nicht gut (dicente Wahlenbergio)." I observe male florets occasionally at the top of the spikes, as in the *C. distachya*, Willd.

Tab. CCCLXIII are specimens of *C. nigra* from the Alps of Germany.

I have never seen authentic specimens of *C. Caucasica*, Stevens, but M. Spach has sent me those cultivated in the Paris Garden from seeds sent from St. Petersburg, which I think are not specifically different from *C. atrata* :—

Spicis 4-5 cylindricis vel clavatis (10 lin. longis, 2-3 lin. latis) erectis; perigyniis ( $1\frac{8}{10}$  lin. longis,  $\frac{8}{10}$  lin. latis) ellipticis rostellatis, ore bidentato, tenuiter nervatis flavidis ventricosis, squama ovata subabrupte acuminata vel cuspidata ferrugineo-purpurea margine albida paulo brevioribus angustioribus; culmo  $1\frac{1}{2}$ -pedali scabriusculo; foliis  $1\frac{1}{2}$ -2 lin. latis, culmo longioribus.

Stevens says, "fructibus squamam longitudine æquantibus triplo latioribus." In the Paris plant the squamæ are longer than the perigynium, and it is only the narrowing apex of them which, as it lies over the perigynium, gives the appearance of the perigynium being "triplo latioribus." The base of the squamæ is rather broader than the perigynium.

The length of the leaves in *C. atrata* varies. I have a specimen from Glen Dole, Scotland:—Culmo 2-pedali; foliis 3 lin. latis, superioribus culmum fere æquantibus; spiculis 5, cylindraceis, summa mascula vel sterili, inferioribus 3 basi masculis compositis, ramulis 2-3 fœmineis remotiusculis ad basin sitis.

In one from Russia, sent by Fischer, the spiculæ are 15 lines long,  $2\frac{1}{2}$  lines wide, approaching in aspect to *C. Mertensii*, Pres.

The specimens from the Himalaya vary and exhibit characters belonging to *C. atrata*, *aterrima*, and *Caucasica*. Some from Lachen, from an elevation of 11,000 feet, are in no respect different from the European forms of *C. atrata*, with obtuse squamæ. Others from the same locality, with one or all the spikes male at base, have lanceolate-acuminate squamæ, longer or shorter and often narrower than the perigynium, which in a fully mature specimen has the dark-purple perigynium, with the very short abrupt rostellum of *C. aterrima*, the orifice sometimes entire, and without the white membranous margin generally observable.

In Tab. CCCLXIV. I have figured specimens from Lachen and Yeumtung, 12-15,000 feet, from Dr. Hooker:—

Spicis 3-5 oblongis vel cylindraceis erectis, summa vel omnibus ima basi masculis; perigyniis oblongis vel ellipticis erostribus vel brevissime rostellatis, ore subinde integro, atro-purpureis interdum leviter 2-3-nervatis apice ad margines nunc parce dentatis plus minus ventricosis, squama lanceolata acuminata acuta brevioribus.

*Culmus*  $1\frac{1}{2}$ -pedalis, gracilis, scaberrimus, vel validior, lævis. *Spicæ* 10-12 lin. longæ, 2-4 lin. latæ, vel 3-4 subsessiles æquialtæ, bracteis brevibus, vel 5 inferiores pedunculatæ, bracteis foliaceis. *Squamæ* atro-purpureæ, acumine sæpe scabro. *Perigynium*  $1\frac{2}{10}$ -

$\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{6}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. latum, ovale, flavidum.—*C. atrata (pullata)*.

In Tab. CCCLXV., specimens from the Himalaya, 15-17,000 feet, Dr. Hooker.—*C. atrata (glacialis)*.

Spicis 3-4 ovalibus atro-purpureis, infima pedunculata una alterave basi mascula; bracteis brevibus; perigyniis ovalibus erostribus vel obovatis rostratis, ore emarginato vel subbifido (achenium arcte vestientibus), enerviis fulvis superne ferrugineo-purpureis, squama lanceolata acuminata acuta atro-purpurea æquilata subduplo brevioribus; stigmatibus 3.

*Culmus* 2-8 pollices altus, lævis. *Folia* 1-2 lin. lata, culmo breviora. *Spicæ* 4-6 lin. longæ,  $2\frac{1}{2}$ -3 lin. latæ. *Perigynium*  $1\frac{2}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum. *Achenium* conforme,  $\frac{6}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, fulvum.

In Tab. CCCLXII., specimens from the Rocky Mountains, like those of *C. ovata*, Rudge, from Newfoundland. In one perigynium were 2 achenia, each with 3 stigmas as shown in the figure.

272. *C. atropicta* (Steudel); spicis 2-3 ovalibus arcte contiguis ima basi masculis subsessilibus atro-purpureis; bractea evaginata amplectente culmum vix æquante; stigmatibus 2; perigyniis elliptico-obovatis rostellatis, ore emarginato scabro compressis atro-purpureis marginibus superne pallidis acutis subalatis e medio sursum aculeatis obscure leviter nervatis membranaceis stipitatis, squama ovato-lanceolata acuta vel mucronata atro-purpurea nervo concolori scabro latioribus paulo longioribus.—*C. atropicta*, Steudel, *Syn.* 204. (TAB. CCCLXVI.)

HAB. In pratis uliginosis prope Sandy Point. Fuegia, Lechler, *Pl. Magellan.*; Steudel, *n.* 1188.

*Culmus* sesquipedalis, basi foliatus, superne angulis acutissimis scabris. *Folia* 2 lin. lata, rigida, marginibus revolutis, culmo breviora. *Spicæ* 7-9 lin. longæ, 4-5 lin. latæ, omnes basi parce masculæ. *Squamæ* conformes. *Perigynium*  $2\frac{3}{10}$ - $\frac{6}{10}$  lin. longum,  $1-1\frac{2}{10}$  lin. latum. *Achenium* (cum stipite  $\frac{1}{2}$  lin. longo)  $1\frac{1}{2}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, lenticulare, punctulatum, basi styli æquali apiculatum.

Allied to *C. atrata*, var. *nigra* (*C. nigra*, All.), which has the upper margins of the perigynium equally pale and occasionally 2 stigmas.—Differs in the compressed perigynium with aculeate margins, and the long stipes of the achenium and tall culm. The specimen figured was communicated by M. Spach from the Herb. Mus. Paris. I have since, through the kindness of M. Sonder, of Hamburg, received one with 3 spiculæ.

273. *C. Bonplandii* (Kunth); spiculis 8-12 basi masculis congestis ferrugineis vel castaneis, inferioribus plus minus longe bracteatis; perigyniis ovatis vel ovato-lanceolatis sensim in rostrum attenuatis, ore integro antice secto, inalatis marginibus plus minus serrato-scabris nervatis plano-convexis, squamam ovatam subacutam æquantibus.—*C. Bonplandii*, Kunth, 380. *C. Purdiei*, Boott, *Illustr. t.* 67. (TAB. CCCLXVII.)

Var.  $\beta$ . *angustifolia*.—*C. Tatanara*, Steudel, *n.* 2560, 2603.

HAB. In America meridionali. South America, *Bonpland*. Columbia, Jameson, *n.* 172. Andes of Quito, *Couthouy*. Condorasto, Escudor, in pratis alpinis, *n.* 5901 a, et Tunguragua, in saxosis, *n.* 5901, Spruce (*Herb. Hooker*). Chicapayos, Peru, Mathews.—Var.  $\beta$ . *Tatanara*, Peru, in uliginosis, Lechler, *n.* 2560. Sachapata, Lechler, *n.* 2603.

I have, through the kindness of M. Klotsch, had the opportunity of examining the specimen in the Berlin Herbarium, from

which Kunth drew his description of this species, and M. Spach subsequently sent me one of Bonpland's for examination from the Herb. Mus. Paris. The spikes of the Berlin specimen, and the entire specimen of Bonpland, are figured in Tab. CCCLXVII. I owe to my late friend Dr. Charles Lemann the specimens from Jameson and Mathews; to Dr. Gray for Couthouy's; to Mr. Bentham for a sight of Spruce's; and to M. Sonder, of Hamburg, for those of Lechler. I have no hesitation in referring Purdie's plant, described at p. 26 and figured in Tab. LXVII. of these Illustrations to that of Kunth. The spiculæ in the specimens of Bonpland are male at base, though Kunth described them "spiculis mere fœmineis." As usual, the species varies in the size and colour of the spike, the number of the spikelets, 6-12, the lower ones occasionally distinct, the number and length of the bracts, 2-5, the longer or shorter rostrum and the degree of its marginal roughness. The perigynium varies from  $1\frac{6}{10}$  to  $2\frac{1}{10}$  lin. long,  $\frac{5}{10}$ - $\frac{7}{10}$  lin. wide, and the achenium  $\frac{8}{10}$  lin. long,  $\frac{4}{10}$ - $\frac{5}{10}$  lin. wide, in its mature state oblong-ovate, pointed at base. The stem is from 1 to 3 feet in height, and the spike 10 to 20 lines in length. Lechler's specimens have a slender weak culm and narrow leaves and a small spike, but do not differ in the perigynium.

Its nearest ally is *C. elongata*, L.

Tab. CCCLXVII. No. 1, the spikes of the authentic specimens from Berlin; No. 2, the specimen of Bonpland, from Paris.

#### 274. *C. scoparia*, etc.

The claims of this plant and its allied forms to specific distinction have given rise to much difference of opinion. Torrey, in his monograph (1836), confining his view to the perigynium, thought specimens might be found so as to exhibit "a gradation from the narrow fruit of *C. scoparia* to the almost orbicular and broadly winged fruit of *C. straminea*;" and he might have added *C. alata*. His arrangement was—

1. *C. scoparia*.  
*C. arida*.  
*C. lagopodioides*.
2. *C. festucacea*.  
*C. mirabilis*.
3. *C. cristata*.
4. *C. straminea*.  
*C. tenera*.  
*C. fœnea*.
5. *C. alata*.

Tuckerman, in his 'Enumeratio Methodica' (1843), admitted but two species—

1. *C. scoparia*.  
*C. arida*.  
*C. lagopodioides*.
2. *C. straminea*.  
*C. fœnea*.  
*C. tenera*.  
*C. festucacea*.  
*C. mirabilis*.  
*C. cristata*.  
*C. alata*?

Carey, in the second edition of Gray's 'Manual' (1856), omitting his *C. adusta*, which is not the plant of the Fl. Bor. Amer., has six species,—

1. *C. arida*.
2. *C. scoparia*.
3. *C. lagopodioides*.  
*C. cristata*.
4. *C. festucacea*.  
*C. tenera*.  
*C. mirabilis*.
5. *C. fœnea*.
6. *C. straminea*.

*C. alata*, then supposed to be confined to the Southern States, did not come within the limits of the 'Manual.' *C. arida*, which I have previously noticed (Tab. LIV.), is admitted now on all hands to be distinct; and *C. Liddoni* (Tab. LIII.), a single speci-

men of which I have, through the kindness of Dr. Torrey, lately seen from Santa Rita del Cobra, New Mexico (*Dr. Bigelow*), must still be left to future observation, though I think it distinct from *C. arida*.

Those at present under view may, from the prevailing form of the perigynium, be arranged as follows:—

Perigyniis ovali- vel ovato-lanceolatis:—

1. *C. scoparia*.
2. *C. lagopodioides*.
3. *C. cristata*.

Var. *mirabilis*.

Perigyniis ovatis orbiculatis vel obovatis:—

4. *C. fœnea*.
5. *C. alata*.
6. *C. adusta*.
7. *C. straminea*.

Var. *tenera*.

- „ *aperta*.  
„ *festucacea*.  
„ *typica*.  
„ *Crawei*.  
„ *Meadii*.

274. *C. scoparia* (Schkuhr); spicis 5-7 rarius 3-10, ovalibus utrinque acutis demum apice obtusis apertis alternatim approximatis vel coarctatis fulvis nudis vel inferioribus setaceo-bracteatis; perigyniis elliptico-lanceolatis attenuato-rostratis bidentatis plus minus alatis utrinque nervatis imbricatis, squama lanceolata acuminate acutissima superne pallide fulva longioribus.—*C. scoparia*, *Schk. f.* 175; *Willd.* 230; *Kunth*, 396; *Schw. et Torrey*, 313; *Torrey, Cyp.* 394; *Dewey*, viii. 94; *Carey*, 515; *Sartwell, Eas. n.* 41; *Chap.* 535. (TAB. CCCLXVIII.)

HAB. In America sept. Arctic America to South Carolina.

*Culmus* sæpe 2-pedalis, gracilis, apice acute triqueter, scaber. *Folia*  $\frac{3}{4}$ - $1\frac{1}{4}$  lin. lata, culmo breviora. *Spica* 10 lin. ad 2 pollices longa, 3-5 lin. lata. *Squamæ* masculæ latiores, obtusæ, fulvæ, margine albo-hyalinæ. *Perigynium*  $2\frac{5}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, attenuato-rostratum. *Achenium*  $\frac{6}{10}$  lin. longum, plus  $\frac{3}{10}$  lin. latum, ovale, lenticulare, stipitatum.

Var. *minor*!; spicis ferrugineis concoloribus contiguis vel capitatis; bracteis 2-3, spica longioribus; perigyniis minoribus ( $1\frac{5}{10}$ - $\frac{7}{10}$  lin. longis,  $\frac{4}{10}$  lin. latis), postice subinde enerviis. (TAB. CCCLXIX.)

HAB. Arctic America, New Hampshire.

*Culmus*  $\frac{8}{10}$ -pollicaris. *Spica* 6-7 lin. longa.

A. *C. lagopodioides* differt culmo gracili; foliis angustioribus; vaginis arete vestientibus; spicis fulvis ovalibus utrinque acutis; perigyniis longioribus latioribus, rostro attenuato, imbricatis, demum superioribus apertis; squamis fœmineis acutissimis.

In only one specimen out of very many the lower spike was compound.

The specimens figured are,—

Tab. CCCLXVIII. Penn Yan, from Herb. Tuckerman, exhibiting his var. *moniliformis*.

Tab. CCCLXIX. The var. *minor*, from pastures at the base of the White Mountains, *Tuckerman*.

275. *C. lagopodioides* (Schkuhr); spicis 10-15 vel pluribus ovalibus vel obovatis obtusis in capitulum oblongum coarctatis pallide viridibus demum brunneis con-

coloribus, inferioribus subinde discretis compositisque, infima nunc anguste longiuscule bracteata; perigyniis ellipticis vel lanceolatis sensim plus minus rostratis utrinque nervatis anguste alatis ciliolatis, squama ovata subacuta vel acuminata longioribus.—*C. lagopodioides*, *Schk. f.* 177; *Willd.* 230; *Kunth*, 398; *Dewey*, viii. 95; *Schw. et Tor.* 313; *Carey*, 515; *Sartwell*, *Ews. n.* 42. *C. scoparia*,  $\beta$ , *Tor. Mon.* 394;  $\delta$ , *Tuck. Enum. Chap.* 535. *C. tribuloides*, *Wahl. Act.* 145. (TAB. CCCLXX.)

HAB. America septentrionali. Canada to S. Carolina. California, *Thurber*.

*Culmus* 2–2½-pedalis, validus, scaber. *Folia* 1½–3 lin. lata, apice attenuata, elongata; vaginis triquetris, laxis, apice ampliatis. *Spica* 14 lin. ad 2 pollices longa, 6–8 lin. lata. *Bractea* subinde foliacea. *Perigynium* 1 $\frac{8}{10}$ –2 $\frac{4}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum.

It varies in a shorter, broader, elliptic perigynium, or a longer, narrower, lanceolate one, with a more attenuated rostrum.

A *C. scoparia* dignoscitur culmo validiore; foliis latioribus, longioribus, apice attenuatis, vaginisque triquetris laxis; spica majore, pluristachya, pallide viridi; perigyniis minoribus, angustioribus, sæpe minus attenuato-rostratis, magis apertis; squamis minoribus.—Variat spica angustiore; spiculis basi conica masculis, inferioribus 4–6 alternatim discretis; culmo elatiore, flaccido. (TAB. CCCLXXI. No. 1.)

The variety is found "in moist shady borders of the forest," *Tuckerman*. In a poor soil the spike is abbreviated, with fewer spiculæ. It resembles *C. festucacea* and *C. mirabilis*.

The specimens figured are,—

Tab. CCCLXX. From *Sartwell*; and in one the lower spicula is remote on a long exerted peduncle! showing, in these androgynous species, the same tendency in the upper vaginæ of leaves to produce spiculæ, as is so often seen in the higher groups of the genus.

Tab. CCCLXXI. 1. Specimens from *Tuckerman*: the variety with the narrow spike and lower subremote spiculæ. 2. Specimens from *Drummond*, Texas, of *C. straminea*, var.; the *C. hyalina*, *Boott*, *Boston Journ. Nat. Hist.* v. (1845).

276. *C. cristata* (*Schweinitz*); spicis 8–12 pluribusve rigidis squarrosis rotundis arcte congestis obtusis pallide viridibus subinde infima foliaceo-bracteata; perigyniis oblongo-ovalibus vel ovatis rostratis anguste alatis ciliolatis sursum serratis utrinque nervatis apertis vel subrecurvis, squama lanceolata obtusa mutica longioribus.—*C. cristata*, *Schweinitz, An. Tab.*; *Schw. et Tor.* 315. t. 25. f. 1; *Dewey*, x. 44; *Sartwell*, *Ews. n.* 43. *C. lagopodioides*, var., *Carey*. *C. straminea*,  $\zeta$ , *Tuck.* *C. remotiuscula*, *Wahl. Act.* 147? (TAB. CCCLXXII., CCCLXXIII.)

HAB. America septentrionali. Arctic America to Pennsylvania. Oregon, *Lyall*. Siberia, *Wahl.*

*Culmus* 2–2½-pedalis, rigidus, sæpe validus, acute triquetris, scaberrimus. *Folia* 1–3 lin. lata, elongata, apice attenuata; vaginis triquetris, laxis. *Bractea* infima nunc foliacea, spicam duplo superante. *Spica* 10 lin. ad 1½ pollicem longa, 4–6 lin. lata. *Squamæ* obtusæ. *Perigynium* 1 $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, utrinque crebre nervosum, anguste alatum, ad margines basi ciliolatum, sursum serratum, divergens vel recurvatum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, obovatum, ferrugineum.

Ad *C. lagopodioidem* propius accedit quoad culmum, folia,

vaginas, et inflorescentiam. Differt spiculis minoribus rotundis rigidis, perigyniis ovatis recurvatis.

I have a specimen from M. Fischer, of Moscow, with a ticket, "*C. festucacea*, Heming legit." Heming travelled to the south of the river Don, and I infer that the specimen is from that locality, and probably is the *C. remotiuscula* of Wahlenberg, *Act. Holm.* 147, which is referred to Siberia, and by Sprengel also to North America. It is not included in the 'Flora Rossica,' where it is merely alluded to as possibly a form of *C. remota*, L. I have the same plant from the garden of my late friend Edward Forster, Esq., under the name of *C. festucacea*, and he received it from Mr. Borrer, who thought the seeds came from the north of Europe. In Tab. CCCLXXIII. are specimens figured from the Paris Garden, exactly agreeing with those from M. Fischer and Mr. Forster, and differing only from the American *C. cristata* in having a narrower spike with smaller and more alternating spiculæ, such in fact as are occasionally observable in American specimens.

I am indebted to M. Spach for the following detailed description of the plant, as growing in the Hort. Mus. Paris, which is valuable as showing its affinity to *C. lagopodioides*—

"Planta dense cæspitosa, fasciculorum sterilium loco, agens culmos steriles creberrimos, culmis spicigeris inordinatim intermixtos, simulque cum istis ortos, ½–1½-pedales, ad apicem usque foliosos, ubique foliorum vaginis obtectos, gemma foliari indefinite exerescente terminatos. Folia rigidula, infima brevia, sequentia gradatim longiora: fasciculorum sterilium superiora 4–5 in fasciculum approximata. Vaginæ foliorum insigniter carinato-triquetræ, laxæ, sursum sensim ampliata, dorso carinata. Culmi spicigeri acute triquetri, secus apicem fere tripteri, faciebus planis, plerumque carinato-costatis: angulis scabris: pars foliosa obtusa trigona. Spica plus minus tortuosa, imoque fractiflora (eo manifestius quo laxius), speciminibus gracilioribus cernua, oblique porrecta. Spiculæ nunc laxæ remotæ, nunc plus minus confertæ, tristiche alternæ (ita ut plerumque spicula quarta spiculæ infimæ superpositur), volumine vario; forma ludentes, ab exacte sphaeroidea ad ovoideam et ovalem vel turbinatam, basi nunc angustata, nunc rotundata. Spicula terminalis plerumque clavata. Perigynia sæpissime jam juvenilia patentia, excepto summa haud raro minus divergentia vel interdum suberecta; accedente maturitate plus minusve recurva, infima haud raro subdeflexa. Rarius observantur spiculæ etiam maturitate perfecta, perigyniis omnibus vel saltem plerisque vix aut ne vix divergentibus, vel perigyniis inferioribus erectis, superioribus plus minusve divergentibus."

M. Spach adds the further evidence that *C. cristata* is allied to *C. lagopodioides*, as *Carey* thought, rather than to *C. straminea*. He says:—"Culmi steriles *C. cristatæ*, eodem modo ut *C. lagopodioidis*, omni evolutionis statu facillime à *C. straminea* distinguunt; vaginæque *C. stramineæ* nec triquetrae nec laxæ et sursum ampliores, ita ut specimen vivum imo juvenile hujus speciei cum *C. cristata* confundere non licet. *C. lagopodioides* autem quoad culmum, folia eorumque vaginas, et perigyniorum directionem eodem modo se habet ac *C. cristata*—nam spiculæ, perigyniis omnibus erectis vel parum divergentibus, plus minus squarrosæ, frequentius in *C. lagopodioides* occurrunt."

As future researches into the intricacies of this puzzling group can alone satisfactorily fix its limits, I leave the question of specific claims to those who can study it in its varied native haunts, feeling at the same time that its transitions from one form or habit to another, whether considered as varieties or species, are equally interesting and important.

The specimens figured are,—

Tab. CCCLXXII. From Ohio, *Sullivant*.

Tab. CCCLXXIII. From the Paris Garden; like the *C. festucacea*, Fischer, from *Heming*, and *Hort. Borrer*, and *Forster*.

In Tab. CCCLXXIV. are specimens of *C. mirabilis*, *Dewey*, No. 1, from *Dewey*; 2, per *Dr. Barrett*; 3, Ohio, *Sullivant*; and, 4, New Jersey, *Kneiskern*.

Spicis 5–12 pallide viridibus subrotundis basi parce masculis coarctatis vel inferioribus vel omnibus discretis nudis vel setaceo-bracteatis; perigyniis ovatis vel suborbiculatis sensim plus minus attenuato-rostratis anguste alatis apertis, squama acuta longiori-

bus.—*C. mirabilis*, Dewey, *Sill.* xxx. 63; *Sartwell*, *Evs.* n. 46. *C. straminea*, var., *Tuckerman*. *C. festucacea*, var., *Carey*. (TAB. CCCLXXIV.)

HAB. Massachusetts to Ohio; along fences in pastures. Columbia River.

*Culmus*  $1\frac{1}{2}$ –3-pedalis. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata; superiora elongata. *Perigynium*  $1\frac{6}{10}$ –2 lin. longum,  $\frac{6}{10}$ – $\frac{9}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum.

An intermediate form, in colour like *C. lagopodioides* and *C. cristata*, differing from the first in its ovate sometimes suborbicular perigynium, and from the last in its less rigid spiculæ; and from *C. straminea* (*festucacea*) in its subrotund spiculæ, which, from the absence of numerous male squamæ, are of a prevalent green colour.

277. *C. fœnea* (Willdenow); spiculis 3–8 argenteo-viridibus demum stramineis ovalibus, plerumque contiguus, terminali subinde basi magis conspicue conico-mascula, infima plus minus setaceo- vel subfoliaceo-bracteata; perigyniis late ovalibus orbiculatis vel obovatis breve rostratis late alatis appressis, transversim corrugatis, squama ovata obtusiuscula vel lanceolata acuta paulo longioribus.—*C. fœnea*, *Willd. Enum.* 957 (1809); *Kunth*, 397; *Muhl.* 227; *Elliott*, 533; *Dewey*, x. 284 et xxv. 142; *Schw. et Tor.* 315; *Carey*, 516; *Chapman*, 535; *Sartwell*, *Evs.* n. 47. *C. straminea*,  $\beta$ , *Gay*, *Ann. Sc. Nat.* x. 362. *C. straminea*,  $\gamma$ , *Tor. Mon.* 395. (TAB. CCCLXXV.)

HAB. In America septentrionali et occidentali. New England to Florida. New Orleans, *Drummond*, n. 433. Mexico, *Scheide*, *Berlandier* (*Herb. Mus. Paris*). New Granada, *Purdie* (*Herb. Hooker*).

*Culmus* 1– $2\frac{1}{2}$ -pedalis, sæpe validus, lævis vel apice scabriusculus. *Folia* plana, carinata, culmo breviora. *Spiculæ* ovales, sæpius basi apiceque acutæ. *Perigynium*  $1\frac{6}{10}$ – $\frac{7}{10}$  lin. longum,  $1$ – $1\frac{1}{10}$  lin. latum, vel  $2$ – $2\frac{1}{10}$  lin. longum,  $1\frac{2}{10}$ – $\frac{4}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, ovale, ferrugineum.

Willdenow founded his *C. fœnea* on a specimen from the Berlin Garden; and Kunth says of it, "Nil nisi forma hortensis *C. Scopariæ*." Dewey thought it intermediate between *C. straminea* and *C. scoparia*. Schw. and Torrey say it is nearly related to *C. lagopodioides*, though Torrey eventually, in his monograph, and Gay, in the *Annales*, consider it a variety of *C. straminea*. Carey thinks it differs principally from *C. festucacea* in the colour of the spikes, the constantly erect and more broadly margined perigynia. No dependence can be placed on the stoutness or smoothness of the culm. The perigynium is oval, subacute at base, or suborbicular, rounded at base and generally with a short abrupt rostrum. Olney finds it on the sandy banks of ponds and on the rocky seashore of Rhode Island; and Tuckerman on rocks near ponds at Stoneham, Massachusetts. The Mexican specimens have larger elliptic spiculæ, acute at both ends, as seen in some of the New Jersey specimens. The pale oval spiculæ with the appressed perigynia are the more apparent distinctions between *C. fœnea* and *C. straminea*.

Var.  $\beta$ ; spiculis 1–5 vivide ferrugineis ovalibus acutis vel ovatis contiguus nudis vel infima setaceo-bracteata; perigyniis ovalibus vel suborbiculato-ovatis sensim sæpe longiuscule rostratis basi subacutis rarius rotundatis, squama lanceolata acuta vel mucronata longioribus. (TAB. CCCLXXVI.)

HAB. Ohio, *Sullivant*, *Lesquereux*.

*Perigynium*  $2\frac{2}{10}$ – $\frac{6}{10}$  lin. longum,  $\frac{2}{10}$ – $1\frac{2}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum, vix  $\frac{5}{10}$  lin. latum, ovale.

This variety, which in several respects is like *C. fœnea*, differs in the bright ferruginous colour of the spiculæ, and the larger rostrum. It resembles *C. scoparia*, and shows a transition between *C. fœnea* and *C. straminea*, under the last-named of which I have it from Mr. Carey. I have only seen it from Ohio. It is however not very different from the "*C. tenera*" of Olney, from Rhode Island.

Var.  $\gamma$ ; spiculis 2–10 pallidis demum stramineis plerumque alternatim remotiusculis omnibus (terminali sæpe magis conspicue) basi conico-masculis, nudis, infima subinde composita; perigyniis ovalibus vel orbiculatis e basi late alatis brevi plerumque sensim rostratis compressis appressis, plus minus plurinerviis, squama lanceolata acuminata acuta latioribus paulo longioribus vel æquantibus.—*C. adusta*, *Carey*, *Tuckerman* (*non Fl. Bor. Amer.*). *C. festucacea*, *Sartwell*, *Evs.* n. 44 (*ex parte*), *Dewey*, *Olney*. *C. straminea*, var., *Sartwell*, *Evs.* n. 49. (TAB. CCCLXXVII.)

HAB. Warwick, Rhode Island, *Olney*. Chelsea, seabeach and rocky seashores. Maine, *Tuckerman*. Ipswich, in sand, *Oakes*. New York, *Sartwell*.

*Culmus* 1– $1\frac{1}{2}$ -pedalis, obtusangulus, lævis vel apice triqueter, scaber. *Folia* 1 lin. lata, rigida, basi involuta. *Bracteæ* lanceolatae, squamæformes, spiculis breviores. *Spiculæ* extremæ basi magis conico-masculæ: intermediæ ovatae, parcius masculæ: omnes plerumque discretæ vel remotiusculæ. *Perigynium*  $2$ – $2\frac{3}{10}$  lin. longum,  $1\frac{2}{10}$ – $\frac{3}{10}$  lin. latum, appressum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, ferrugineum.

I have this variety under the name of "*C. straminea* with narrow fruit," from Mr. Oakes. Olney has sent it under the name of *C. straminea* and *C. festucacea*. Tuckerman included it in his *C. straminea*, var. *moniliformis*, and believed it to be *C. adusta*, from which it differs in inflorescence and compressed appressed perigynia. It is near the typical form, but differs in colour, and in the alternate spiculæ, and often nutant spikes, and involute leaves.

In Tab. CCCLXXV. are figured specimens,—

1. From New Jersey, *Torrey*.

2. New Orleans, *Drummond*, n. 433.

3. Rhode Island, *Olney*.

4. Florida, *Chapman*.

5. New Granada, *Purdie*. The spiculæ elongated, the lower remote, stalked, a *lusus* occasionally observable in other androgynous species.

In Tab. CCCLXXVI. specimens from Sullivant.

In Tab. CCCLXXVII. No. 1, specimens from Oakes; No. 2 from Olney.

278. *C. alata* (Torrey); spiculis 3–10 pallidis demum ferrugineis ovatis vel subrotundis contiguus, inferioribus subinde majoribus, suprema plus minus basi conico-mascula, infima vel inferioribus brevi setaceo-bracteatis; perigyniis orbiculato-obovatis vel obcordatis vel late ovalibus basi subacutis vel cordatis basi rotundatis abrupte vel sensim plus minus longe rostratis bifidis, late alatis ad latera late spongiosis transversim corrugatis, apertis, squama lanceolata vel ovata acuta vel hispido-mucronata longioribus triplo latioribus.—*C. alata*, *Torrey*, *Mon.* 396; *Sartwell*, *Evs.* n. 77. *C. straminea*, *Sartwell*, *Evs.* n. 48. *C. fœnea*, *Chapman*, 535. (TAB. CCCLXXVIII.)

HAB. New York to Florida. Rio Brazos, Texas, *Drummond*. Western Texas, *Wright*.

*Culmus*  $1\frac{1}{2}$ –3-pedalis, sæpe validus, apice nutans. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{2}$  lin. lata, culmo breviora. *Spiculæ* omnes rotundatæ,



minores (5 lin. longæ, 3 lin. latæ), vel inferiores majores (9 lin. longæ, 5 lin. latæ), sæpe omnes basi parce vel subconico-masculæ. Squamæ plus minus longe mucronatæ. Perigynium 2 lin. longum,  $1\frac{6}{10}$  lin. latum, vel  $3\frac{2}{10}$  lin. longum,  $2\frac{3}{10}$  lin. latum. Achenium  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ — $\frac{8}{10}$  lin. latum, ovale, stipite subinde  $\frac{2}{10}$  lin. longo.

Torrey founded his *C. alata* on specimens from North Carolina and Georgia. Its range has since been extended from New York to Mexico, or Western Texas. The size of the spiculæ varies, often not much larger than those of *C. straminea*, and the mucro of the squamæ varies in length or is absent. The stipes of the achenium is not peculiar, as one longer or shorter is observable in other forms. It seems to me to be a fuller development of the *fænea* group, connecting it with the typical form of *C. straminea*. The broad obovate outline of the perigynium is perhaps the prevailing form, though the orbicular cordate form, as seen in the fully mature perigynium from Wright's specimen from Texas, is observable in northern specimens. Tuckerman, from the description of the plant, was inclined to refer it to his *C. straminea*, *a*. I have a specimen, given to me forty years ago in Paris, by M. Delisle, as the "*C. leporina*, Michaux, oryzetis Carolinæ Sept.," and I infer from the observations of Gay in the Ann. Sc. Nat. x. 362, where he remarks that Michaux's plant was *C. straminea* (*ex parte*) and from his quoting the specimen of Drummond from the Rio Brazos under *C. straminea*, var. *intermedia*, that he referred the present one to that variety, as Drummond's specimen from that locality in my own herbarium is clearly *C. alata*. Michaux included *C. scoparia* under his *C. leporina*.

In Tab. CCCLXXVIII. I have figured,—

No. 1. Specimens from Florida, *Chapman*.

No. 2. One from New York, the n. 48 of Sartwell, Car. Exs., and a perigynium and squama from Wright's specimen from Western Texas, in which the squama is without the mucro, and the perigynium  $3\frac{2}{10}$  lin. longum, and  $2\frac{3}{10}$  lin. broad.

279. *C. adusta* (Boott); spiculis 4–10 subrotundis vel basi conico-masculis pallidis vel stramineis, inferioribus remotiusculis subinde compositis bracteatibus; perigyniis ovatis, orbiculatis vel ovalibus plerumque sensim rostratis bidentatis, superne anguste alatis, demum plano-convexis turgidis pallidis dorso plurinerviis, squamam lanceolatam acutam subæquantibus.—*C. adusta*, *Boott*, in *Hook. Fl. Bor. Am.* ii. 215. *C. argyrantha*, *Tuckerman*.  $\beta$ . minor, var. *angustifolia*, *Boott*, *Fl. Bor. Am.* *C. pratensis*, *Drejer*, *Rev. Crit. Car. Bor.* p. 24. (TAB. CCCLXXIX.—CCCLXXXIII.)

HAB. In America septentrionali. Arctic America to New Jersey. Carlton House, Methye Portage, etc., *Sir John Richardson*. North-west coast, in "dry shady open woods," *Douglas*, *Scouler*. Rocky Mountains, *Drummond*. Massachusetts, *Oakes*. New Hampshire, *Tuckerman*, "on rocks in woods." Rhode Island, *Olney*. New Jersey, *Knieskern*.—VAR.  $\beta$ . Greenland, *Vahl*. Carlton House, *Sir John Richardson*.

*Culmus*  $1\frac{1}{2}$ -pedalis, gracilis, obtusangulus, lævis vel apice scabriusculus. *Folia* 1–2 lin. lata, plana, culmo breviora. *Bracteæ* inferiores 1–2 subfoliaceæ, superiores squamæformes acutæ. *Spiculæ* rotundatæ, vel extremæ majores clavatæ: omnes simplices vel inferiores compositæ, subinde e spiculis 3–4 in spicam brevem dispositis. *Squamæ* lanceolatæ, pallide ferruginæ vel stramineæ vel argenteo-albidæ, perigynium longitudine et latitudine subæquantibus. *Perigynium* 2 lin. longum, 1 lin. latum, pallidum, antice 10–12-nerviis, superne anguste alatum, marginibus basi obtusis. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{1}{10}$  lin. latum, suborbiculatum, biconvexum, sessile, ferrugineum.

In Tab. CCCLXXIX. are figured the specimens from Cumberland House, on which the species was originally founded many years ago in the Flora Bor. Americana. They are fully mature, and with others less mature had been variously named by Dewey and Torrey in Herb. Hooker; the younger ones as *C. bromoides*, *C. leporina*, *C. straminea*, and *C. festucacea*, and the mature ones as *C. Muhlenbergii*. The specimens from the States, as is usual with *Carex*, vary in size.

In Tab. CCCLXXX. are less mature specimens from the Methye Portage, from *Sir John Richardson*.

In Tab. CCCLXXXI. a specimen from Derby County, Massachusetts, from *Mr. Oakes*, who had named it "*C. straminea*, var. *fænea*;" spiculis 12, argenteo-viridibus, inferioribus compositis; perigyniis squama lanceolata acutissima latioribus paulo brevioribus.—*Culmus*  $3\frac{1}{2}$ -pedalis, apice triqueter, scaber. *Perigynium*  $1\frac{7}{10}$ — $\frac{8}{10}$  lin. longum,  $1\frac{2}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum.

In Tab. CCCLXXXII. No. 1, a specimen from Rhode Island, *Olney*. *Perigynium*  $1\frac{9}{10}$  lin. longum,  $1\frac{2}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ — $\frac{7}{10}$  lin. latum. No. 2, the *C. argyrantha*, from *Tuckerman*, from Amherst, found on rocks in woods; a more delicate form. *Perigynium*  $1\frac{5}{10}$ — $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ — $1\frac{1}{10}$  lin. latum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$ — $\frac{6}{10}$  lin. latum.

In Tab. CCCLXXXIII. small specimens too young for details. No. 1, from Carlton House, *Richardson*; the "var. *angustifolia*," Fl. Bor. Americana. No. 2, specimen from Greenland, sent to me by *Vahl* as the "*C. pratensis*, *Drejer*," *Rev. Crit. Car. Bor.* p. 24.

*C. adusta* has not been clearly understood in the United States, nor was I fully aware till lately, that it had been several times found in them. *Oakes* referred his specimen to *C. fænea*. *Tuckerman* included it in *C. straminea*, and *Carey* mistook what I have figured in Tab. CCCLXXXII. as a form of *C. fænea* for it. In 1859 *Tuckerman* described a delicate form, found on rocks in woods at Amherst, under the name of *C. argyrantha*, which, without any allusion to *C. adusta*, he thought had affinity in squamæ, etc., with *C. Deweyana*, and in fruit with *C. remota*, L. In Tab. CCCLXXIX. I have figured the original specimens from Arctic America, on which the species was founded, the turgid perigynium, with its narrow wing and many nerves, and the large orbicular achenium, leading me to consider it distinct from its allies. The figures I have given will, I hope, make it sufficiently known in its different forms, and when these are more carefully contrasted with *C. straminea* and *C. fænea*, its admitted distinction or its merging into the one or the other will be determined.

The wing of the perigynium is more or less extended downward, sometimes rather abruptly terminating below the middle of the achenium, or reaching much narrowed to the base. The nerves are generally prominent, but in the Arctic specimen with mature fruit, they would seem to become more or less obliterated, and in those perigynia with the large orbicular achenium this organ seems to encroach on the wings and lessen their breadth. In the Arctic specimens the squamæ are of the same silvery whiteness as those from the States, or are of a light chestnut or fulvous colour, white and hyaline at the margins, or eventually of a straw-colour, a difference depending on locality or age. The achenium varies in form and size, oval and narrower, or suborbicular and broader; those in *Olney's* specimen approaching the larger form of the Arctic specimens.

280. *C. straminea* (Schkuhr); spiculis 2–12 ovatis subrotundis ovalibus obovatis vel clavatis aggregatis vel approximatis vel subremotis, inferioribus rarius compositis stramineo-albo-vel glauco-viridibus, demum ferrugineis, terminali vel omnibus basi plus minus conico-vel parce masculis, nudis vel infima vel inferioribus setaceo-raro subfoliaceo-bracteatibus; perigyniis compressis orbiculatis ovatis obovatis vel ovalibus basi rotundatis cordatis, vel subacutis abrupte brevi vel sensim longius rostratis, ore subintegro bidentato vel bifido antice subinde

alte secto, ad latera sæpe spongiosis corrugatis marginibus anguste vel late alatis tenuissime serrulatis utrinque plus minus nervatis appressis vel apertis, squama ovata obtusiuscula vel lanceolata acuta vel acutissima sæpe mucronulata vel aristata albo-hyalina vel superne vel omnino straminea longioribus vel subæquantibus sæpe duplo vel subtriplo latioribus.

Before alluding to the varieties of this species, I think it best to give the description of it by M. Spach, as observed by him in the Paris Garden; a large suite of specimens from which accompanied his note.

"*C. straminea* (*Hort. Paris.*) densos, e culmis numerosis (2-300) omnibus spicigeris, cæspites efformat: fasciculis sterilibus, per ætatem saltem, nullis intermixtis. Desunt omnino etiam culmi steriles, quales constanter agunt *C. lagopodioides* ejusque var. *C. cristata*, et ? *C. mirabilis*, necnon *C. arida*."

"*Culmus* obtusangulus, fructifer haud raro elegantissime reclinatus. *Folia* profunde viridia, planiuscula, substricta. *Vaginæ* arctæ, obtuse vel obsolete trigonæ; ore haud ampliato. —Facillime hoc caractere distinguitur in vivo culmus imo juvenilis *C. stramineæ* à *C. lagopodioides* et *C. cristata*, quarum vaginæ sunt sursum ampliatae, laxæ, et conspicue carinato-triquetræ. In eodem rhizomate variat, spicis strictis densis vel plus minusve laxis, rachi flexuosa, haud raro cernua; spiculis longius vel brevius clavatis, aut (præsertim in spicis densioribus) ovoideis vel ovalibus, basi vix aut ne vix angustata, et parce masculiflora. Spiculas etiam vidi rarius ex toto foemineas. Culmis aliis strictioribus et validioribus, aliis debilioribus gracilibus diffusis, plerisque foliis conspicue longioribus: paucioribus folia parum superantibus, paucissimis folia haud æquantibus. Perigynia, quoad figuram et amplitudinem polymorpha ovata, orbiculata, ovalia, obovata, abrupte brevi vel sensim longius rostrata, late vel anguste alata, modo squama vix latiora, modo squamam plus minusve superantia, nunc imo perfectissima maturitate (planta in viva) adpressa, nunc jam juventute quam scrius plus minusve divergentia, haud raro stellatim patentia. Plerumque cito brunescunt, et etiam observari haud pauca, quamvis submatura, colore viridi aut pallide stramineo adhucdum gaudentia."

In the general character I have given above of this species, I have enumerated the variations observable in it, and now proceed to notice the principal forms it assumes. It will be found that no dependence can be placed on any one single character; and if we look at specimens from various localities, we shall find the difference supposed to exist between the several recorded species to elude us. I have figured these and some others from my herbarium, which contains a large suite of specimens, and I believe that any one patiently studying the group from equally ample materials, will be obliged to admit that it is impossible to discover exclusive characters on which any satisfactory specific distinctions can be founded.

*C. straminea*, var. *tenera*; spiculis 3-6 parvis ovalibus vel obovatis contiguis vel plus minus approximatis ferrugineis nudis vel bracteatis, rachi sæpe flexuosa; perigyniis ovatis vel orbiculatis sensim brevi lateque conico-rostratis plus minus alatis pallidis, squama ovata obtusiuscula vel acuta fulva paulo latioribus longioribus. — *C. tenera*, *Dewey*, viii. 97; *Sartwell*, *Exs.* n. 45. *C. straminea*, var. *minor*, *Dewey*, xi. 318; *Tor. Cyp.* 395. *C. festucacea*, var. *tenera*, *Carey*. (TAB. CCCLXXXIV.)

HAB. Arctic America to New York.

*Culmus*  $1\frac{1}{2}$ -pedalis, gracillimus, scaber, nutans. *Folia*  $\frac{1}{2}$ -1 lin. lata. *Perigynium*  $1\frac{3}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum.

*Achenium*  $\frac{6}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, sæpe suborbiculatum. *Squama*  $1\frac{3}{10}$  lin. longa,  $\frac{3}{10}$  lin. lata.

Dewey describes the perigynium both in his *C. tenera* and his *C. straminea*, var. *minor*, as ovate, the "oblong-lanceolate" scale in *C. tenera* being about two-thirds the length of the perigynium, and in *C. straminea minor* as "ovate acute" about equal to it. This, the smallest form of the group, is clearly through the preceding variety insensibly connected with the var. *festucacea* and the typical form, and I think that gradations will be found hereafter equally connecting *C. fœnea* and *C. alata* with them.

In Tab. CCCLXXXIV. the specimens figured are from Dewey. No. 1, his "*C. tenera*," No. 2, his "*C. straminea minor*" (with perigynia and a squama from Olney's "*C. tenera*," which is referable, from the longer acuminate squama, to the following variety).

*C. straminea*, var. *aperta*; spiculis 4-8 ferrugineis omnibus plus minus (terminali sæpe conspicue) basi conico-masculis nudis; perigyniis late ovalibus vel suborbiculatis longe conico-rostratis, ore bidentato antice alte secto, divergentibus ad latera spongiosis corrugatis, squama lanceolata acuminata acutissima longioribus triplo latioribus. — *C. festucacea*, *Sartwell*, *Exs.* n. 44 (*ex parte*). *C. tenera*, *Olney*. (TAB. CCCLXXXV.)

HAB. America septentrionali. New England to New Jersey.

*Culmus* 2-pedalis, apice gracillimus, nutans. *Folia* lineam lata. *Squamæ* omnes lanceolatae, acutissimæ. *Perigynium*  $2-2\frac{3}{10}$  lin. longum,  $\frac{3}{10}$ - $1\frac{2}{10}$  lin. latum (rostro  $\frac{3}{10}$  lin. longo). *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale.

I have figured these specimens to show how one form passes into others. They are intermediate between the typical form, the var. *festucacea* and *tenera* differing from *festucacea* in the gracile nutant culm, larger conical rostrum, and acuminate squamæ; and from *tenera* in the larger, more numerous spiculæ, longer acuminate squamæ, and the larger perigynium, which has a more marked divergence than in either of the above. In aspect they resemble *C. adusta*, but differ in the colour of the spiculæ, fewer nerves on the perigynium, and in the narrow oval achenium.

I have specimens from Nuttall (Cambridge), marked with a star, which was usual with him when he thought the species was new; and from Tuckerman, who found it in "wet ground by a pond, in Amherst," and who includes it in his "*C. straminea (moniliformis)*." I have two copies of Sartwell's 'Carices Exsiccatæ,' in one of which, under n. 44, he has distributed this plant as *C. festucacea*, and in the other, under the same number and name, the form I have referred in Tab. CCCLXXVII. to *C. fœnea*. The specimens from Rhode Island, sent as *C. tenera* by Olney (two perigynia and a squama of which I had figured in Tab. CCCLXXXIV. before I had received the larger form from Nuttall on the sale of his herbarium last year), merely differ in their smaller size, the squama equalling the perigynium.

In Tab. CCCLXXXV. the smaller specimen figured is the n. 44 (*ex parte*) Sartwell, *Exs.*; and the larger one from Nuttall.

*C. straminea*, var. *festucacea*; spicis 5-8 ferrugineis vel albo-viridibus, omnibus plus minus clavatis alternatim approximatis nudis, vel infima brevi setaceo-bracteatis; perigyniis ovalibus ovatis orbiculatis basi rotundatis vel subcordatis vel subacutis sensim longiuscule vel subabrupte brevius rostratis sæpe anguste alatis apertis, squama acuta vel mucronata longioribus. — *C. festucacea*, *Schkuhr*, f. 173; *Willd.* 242; *Kunth*, 401; *Dewey*, viii. 96; *Schw. et Tor.* 316; *Tor. Cyp.* 394; *Darlington*, 347; *Carey*, 516. *C. straminea*, var., *Gay*, *Tuckerman*, *Chapman*. *C. albo-lutescens*, *Schweinitz*. (TAB. CCCLXXXVI.)

HAB. Massachusetts to Pennsylvania, "in meadows and open woodlands," *Darlington*.

*Culmus* 1-4-pedalis, triqueter, scaber. *Folia* 1-2 lin. lata. *Perigynium*  $1\frac{4}{10}$ - $2\frac{2}{10}$  lin. longum,  $\frac{9}{10}$ -1 lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, stipitatum.

The most characteristic specimens of this form which I have are from Westchester, Pennsylvania, from Mr. Townsend, the spiculæ all conspicuously clavate, the lower half with closely imbricate male squamæ of a ferruginous colour, as in the figure of Schkuhr, but in specimens from Connecticut, from Dr. Barratt, they are white, and the upper portion of the spiculæ smaller and round. Dr. Darlington, in his 'Flora Cestrica,' describes the culm as occasionally four feet in length and decumbent. Specimens in no respect different are found with others like *C. straminea* on the same root. The specimens figured are from Westchester.

*C. straminea*, Schk. (typica); spicis 3-6 stramineis, subrotundis, omnibus basi parce masculis vel ovatis, summa vel omnibus brevi conico-masculis plus minus approximatis coarctatis vel discretis sæpe nudis; perigyniis orbiculatis abrupte brevi vel ovatis vel ovalibus sensim longius rostratis basi plerumque rotundatis late alatis apertis, squama ovata obtusiuscula vel acuta vel mucronata subduplo latioribus paulo longioribus.—*C. straminea*, Schk. f. 34 et 174; Willd. 242; Kunth, 398; Wahl. 145; Schw. et Tor. 314; Dewey, vii. 276 et xi. 157; Tuck. 17; Carey, 516; Chapman, 535; Darlington, 347; Gay, Ann. Sc. Nat. x. 362; Tor. Mon. 395; Sartwell, Exs. n. 76. (TAB. CCCLXXXVII.)

HAB. In America septentrionali.

*Culmus* 1-2-pedalis, triqueter, scaber, firmus. *Folia* 1-1½ lin. lata, culmo breviora. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $1\frac{5}{10}$  lin. latum (rostrum  $\frac{3}{10}$ - $\frac{4}{10}$  lin. longo), vel  $2\frac{2}{10}$  lin. longum,  $1\frac{1}{10}$ - $\frac{5}{10}$  lin. latum (rostrum  $\frac{6}{10}$  lin. longo), ad latera sæpe spongiosum corrugatum. *Achenium*  $\frac{8}{10}$  lin. longum et latum, ferrugineum.

I have described above as the typical form mature specimens sent to me by Dr. Barratt from Connecticut, and which are figured in Tab. CCCLXXXVII. Among them were spikes having the character of *C. festucacea*. The inflorescence is at times coarctate or with the spiculæ alternate, more or less approximate, and with bractæ more or less setaceous, characters equally variable in all the forms. The prevalent form of the perigynium is orbicular, with a short abrupt rostrum, but it is occasionally oval or broadly ovate, with a rounded or subcordate or more or less subattenuated base, and with a longer conical rostrum.

*C. straminea*, var. *Crawei*; spiculis 6, majoribus basi conico-masculis pallidis contiguis nudis; perigyniis ovalibus ovatis vel suborbiculatis sensim longe rostratis ad latera spongiosis corrugatis late alatis, squama ovata acuta vel obtusa mutica subduplo longioribus. (TAB. CCCLXXXVIII.)

HAB. Michigan, *Crawe*. Wisconsin Prairies, *Lapham*. Darby Plains, Ohio, *Sullivant*. Connecticut, *Barratt*.

*Culmus* sub-3-pedalis, validus. *Folia* 2-3 lin. lata. *Spiculæ* 9-10 lin. longæ, 4 lin. latæ, omnes basi conico-masculæ. *Squamæ* sæpius obtusæ, muticæ. *Perigynium*  $3\frac{1}{2}$  lin. longum,  $1\frac{8}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum.

The specimen figured is from Michigan, and *Crawe* had marked it "*C. alata*?" but it differs in the form of the perigynium and squamæ from that variety. Mr. Carey had named the Ohio speci-

mens as *C. straminea*. The pale fulvous ovate squamæ, as contrasted with the pale green of the perigynia, is striking, and while the habit is that of *C. festucacea*, the large perigynia with their broad wings and long rostrum are marked distinctions from that variety.

To this form I refer, as a small variety, the Texas plant which I published in 1845 as *C. hyalina*, the pale uniform glaucous colour of the spiculæ of which, with the undulate wings of the perigynium, led me, when I was less familiar with the variations of the group, to consider it distinct. Scheele has so considered it since, but there are no specific characters about it.

*C. hyalina*, Boott, *Boston Journ. Nat. Hist.* 1845. *C. tetra-stachys*, Scheele, *Steudel*, 198. (TAB. CCCLXXI, No. 2.)

*Culmus* flaccidus. *Folia* angusta. *Spiculæ* 2-4. *Perigynium*  $2\frac{3}{10}$ - $\frac{7}{10}$  lin. longum,  $\frac{9}{10}$ - $1\frac{3}{10}$  lin. latum, late alatum. *Achenium*  $1-1\frac{1}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-obovatum. *Squamæ* muticæ.

HAB. Texas, *Drummond*. Labady Prairies, Texas, *Schlottmann*.

I am indebted to M. Sonder for Scheele's plant, and I have the same from Chapman, without a habitat or name.

*C. straminea*, var. *Meadii*; spiculis 5-6, subrotundis contiguis pallidis basi parce masculis nudis; perigyniis ovalibus orbiculatis vel cordatis longe rostratis apertis, squama longe acuminata vel subhispido cuspidata latioribus longioribus. (TAB. CCCLXXXIX.)

HAB. Illinois, *Dr. Short*, *Dr. Mead*.

*Culmus* 2-pedalis, subvalidus. *Squamæ* masculæ pallide stramineæ, marginibus late albo-hyalinæ. *Perigynium*  $2\frac{3}{10}$ -3 lin. longum,  $1\frac{2}{10}$ - $\frac{4}{10}$  lin. latum, nec ad latera spongiosum. *Achenium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, ovale.

The long cuspidation of the squamæ, with their broad hyaline margins, give a peculiar aspect to this form. I have it from Dr. Short, and from Mr. Carey from Dr. Mead, under the name of *C. straminea*. Mr. Carey remarks that "the broad chestnut-coloured wing and hyaline margins of the squamæ render the spiculæ less rigid." I have only seen it from Illinois. It differs from the preceding variety in the long cuspidation of the squamæ. The specimen figured is from Dr. Mead.

281. *C. stipata* (Muhlenberg); spica cylindrica vel oblongo-ovata vel hastata sæpe maxima crassa densiflora pallide olivacea demum flavida decomposita, e spiculis numerosis squarrosis congestis, inferioribus vel fere omnibus compositis nudis vel brevi setaceo-bracteatis; stigmatibus 2, brevibus; perigyniis e basi turgida truncata ovatis sensim in rostrum longum lineare attenuatis bifidis, marginibus superne acutis serratis, utrinque plurinervatis stipitatis membranaceis ima basi insigniter spongiosis divergentibus, squama ovato-lanceolata acuta vel cuspidata albida nervo viridi longioribus.—*C. stipata*, *Muhl.* 220; *Schk. f.* 132; *Willd.* 233; *Kunth*, 382; *Ell.* 529; *Schw. et Tor.* 304; *Carey*, 512; *Dewey Sill.* vii. 271 et x. 277; *Chap.* 533; *Sartwell, Exs. n.* 18. *C. vulpinoidea*, *Tor. Mon.* 390 (non *Michaux*). (TAB. CCCXC. et CCCXCI.: var. maxima, *Chapman*.)

HAB. In America septentrionali et Japan. Arctic America to Florida, Columbia River; Hakodadi, Japan, *Wright (U. St. Exp. Exped., Ringgold et Rogers)*.

*Culmus* 1-3-pedalis, latus, angulis acutissimis, faciebus concavis, flaccidus, apice scaber. *Folia* 2-9 lin. lata, culmo breviora vel æquantia. *Vaginæ* sæpe transversim corrugatæ. *Bractæ* setacæ, spiculis vix, nisi infima, longiores. *Squamæ*

conformes. *Spica* 1-4 poll. longa, 5-18 lin. lata. *Perigynium*  $2\frac{7}{10}$ -3 lin. longum, basi  $\frac{8}{10}$  lin. latum, supra basin turgidam spongiosam transversim sulcatum. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, ovatum, basi abrupte productum, lucidum, castaneum, ima basi styli clavata.

This species, as Dr. Chapman remarks to me, "attains a large size in Florida, and is very handsome." Carey describes the base of the style as "not tumid." It is clavate, and in the Florida plant subbulbous. I have observed what I have termed a spathe, or modified perigynium, giving origin to the spiculæ, as in the Indian paniculate group.

Tab. CCCXC. Specimens from Florida, *Chapman*.

Tab. CCCXCI. From the Apalachicola, Florida, *Chapman*, his "var. *maxima*."

282. *C. conjuncta* (Boott); spica lanceolata acuta pallida, e spiculis 6-12 superioribus parvis simplicibus, inferioribus laxè contignis compositis brevi setacco-bracteatis; perigyniis subcordato-ovatis sensim breviuscule conico-rostratis bidentatis membranaceis basi spongiosis utrinque 5-7-nervatis, antice nervis centralibus magis prominentibus, aliis, et postice sursum evanidis, stipitatis, squama ovata acuta vel acuminata latioribus longioribus.—*C. conjuncta*, *Boott*. *C. vulpina*, *Carey*, 512; *Dewey*, vi. 348, 2nd ser. (*non L.*) (TAB. CCCXCII.)

HAB. In America septentrionali. New York, *Torrey*. Kentucky, *Short* ("C. stipata"). Ohio, *Sullivant*. Illinois, *Mead*.

*Culmus* sæpe  $3\frac{1}{2}$ -pedalis, latus, flaccidus, angulis acutissimis, scaber, inferne foliatus. *Folia* 3-4 lin. lata, plana, glaucoviridia; vaginis membranaceis transversim corrugatis. *Spica* 2-2 $\frac{1}{2}$  poll. longa, basi 6, apicè 3 lin. lata, pallida. *Spiculæ* superiores parvæ, semper simplices; inferiores laxè contiguæ, compositæ. *Perigynium*  $1\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $1-1\frac{2}{10}$  lin. latum, marginibus acutis scabris. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, orbiculatum, basi styli bulbosa.

A *C. vulpina*, *L.*, differt culmo flaccido; vaginis foliorum transversim corrugatis; spica laxiore pallida acuta; squamis acutis; perigynio membranaceo bidentato, rostro breviorè; achenio orbiculato, basi styli bulbosa.

The wide, very acute-angled, flaccid culm, the transverse corrugation of the vaginæ of the leaves, the pallid colour of the inflorescence, and the general aspect of the plant, would have induced me to refer it to *C. stipata*, as Dr. Torrey and Dr. Short have done, were it not for the marked difference in the form, nervation, and less prominently turgid base of the perigynium. Carey referred it to *C. vulpina*, *L.*, but I have alluded to the points in which it differs from that species.

Dewey, in Wood's Botany, refers the Nebraska plant to *C. vulpina*, but the specimen sent to me by Mr. Sartwell from that Territory, has a nerveless perigynium, and is the same as Sartwell's Exs. n. 75, "*C. cephaloidea*, Dewey." This name has been a source of confusion. I have from Dewey two distinct plants so named by himself, *C. sparganioides*, var. *minor*, and the large form of *C. cephalophora*; and Sartwell has distributed another under the same name. This last, which is the *C. sparganioides*, var. *cephaloidea*, of Carey, and which he tells me he had received from Dewey as his *C. cephaloidea*, had better retain this name, though the description in Wood's Botany is really not applicable to it, for it is there described as having an "obtusish perigynium, twice as long as the short ovate obtusish glume," characters which certainly do not apply to Sartwell's n. 75.

Tab. CCCXCII. The specimens figured are from Columbus, Ohio, *Sullivant*.

283. *C. vulpina* (*L.*); spica oblonga vel subelongata crassa obtusa densiflora decomposita demum fusco-ferru-

ginea, e spiculis pluribus squarrosis multifloris congestis, omnibus vel inferioribus compositis plus minus longe setaceo-bracteatis; stigmatibus 2; perigyniis ovatis vel ovato-vel subcordato-lanceolatis acuminato-rostratis bifidis plano-convexis, marginibus scabris plus minus sæpe obsolete nervatis, nervis 5-7, rarius pluribus, superne plerumque evanidis, stipitatis coriaceis, inferne spongiosis divergentibus ferrugineis, squama ovata acuta rarius obtusa cuspidata latioribus longioribus.—*C. vulpina*, *L.*; *Good. Lin. Trs.* ii. 161; *Schk. f.* 10; *Reichenb. t.* 217; *Kunth*, 383; *Koch*, 866; *Fries, Sum.* 73; *Anders.* 66. t. 3. f. 17; *Lang*, 34, etc. etc. *C. nemorosa*, *Rebent.*; *Schk. f.* 186; *Fries, Sum.* 73. *C. vulpina*,  $\beta$ , *Reichenb. t.* 216; *Koch*, 866. (TAB. CCCXCIII.)

HAB. In Europa, Asia, Africa.

*Radix* valide fibrosa. *Culmus* 2-3-pedalis, triquetus, angulis acutissimis, validus, scaberrimus, "rachi spica multo auctior" (*Good.*), tamen subinde gracilior, angulis minus argutis. *Folia* 2-4 lin. lata, culmo breviora. *Bracteæ* setacæ, breves vel plus minus (sæpe conspicue) elongatæ: infima subinde foliacea. *Spica* 1-2 $\frac{1}{2}$  poll. longa (nunc abbreviata), 5-8 etiam basi 10 lin. lata, obtusa, usque ad apicem æquilata. *Spiculæ* congestæ: omnes vel inferiores (quasi lobatæ vel ramosæ) compositæ: infima rarius subdiscreta. *Perigynium* 2-2 $\frac{1}{2}$  etiam  $2\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ - $1\frac{1}{10}$  lin. latum, coriaceum, inferne spongiosum; nervis utrinque 5-7, superne evanidis, sæpe subobsoletis, rarius 10-12, mediis antice sursum conspicuis. *Achenium*  $1-1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$ - $\frac{8}{10}$  lin. latum, ovatum, ferrugineum, basi styli subæquali.

This species is widely diffused, and I suspect hereafter will be considered as the typical form to which, as in the case of *C. divisa*, many recorded species are to be referred. It is the var. *crassior* of Anderson (No. 1 and 2 of Tab. CCCXCIII.). His var. *nemorosa* is represented by No. 6 and 10, and his var. *elongata* by No. 3, the last having a simpler, narrower, but not longer, spike. He says these forms are analogous to those of *C. muricata*, but in none can I think there is an affinity with *C. paniculata* or *C. disticha*. The variety *nemorosa*, with its long bracts, is described as paler and with a laxer spike. Koch remarks that it is found "in umbra sylvarum;" but Lang correctly says, "interdum ad fossas apricas." I have found it in Battersea Fields, near London, in open ditches. No dependence can be placed upon the bracts or form of the spike.

I have figured spikes from various localities. In specimens from Pisa and Lisbon the nerves on the perigynium are most numerous. In those from Lisbon the perigynium is sometimes  $2\frac{8}{10}$  lines long. I have not given all the references to authors or to the synonyms of this common plant, as they can be obtained by a reference to the Floras of Europe, my chief object having been to contrast it with the American plant which Carey had referred to *C. vulpina*, *L.*

In Tab. CCCXCIII. the spikes figured are,—No. 1. From Germany, *Reichenbach*; 2. Scotland, *Dickie*, the typical form; 3. Upsal, *Fries*, his "spica elongata;" 4. Lisbon, *Sharpe*; 5. Pisa, *Parlatore*; 6. Battersea Fields, *Boott*, var. *nemorosa*; 7. Canaries, *Watson*; 8. ditto, *Bourgeau*; 9. ditto, *Webb*; 10. Sicily, *Parlatore*. The details are of No. 1, 4, 5, and 6.

284. *C. sparganioides* (Muhlenberg); spica elongata cylindrica pallida interrupta e spiculis 6-12 apice masculis densifloris, omnibus vel superioribus rotundis contiguis nudis simplicibus, inferioribus deorsum remotioribus oblongis compositis, infima nunc subfoliaceo-bracteata; stigmatibus 2; perigyniis late ovatis acuminato-rostratis vel suborbiculatis, rostro breviorè bidentatis superne e medio marginibus acutis vel subalatis serrulatis

enerviis usque ad basin membranaceis pallidis demum aureis lucidis divergentibus, squama albida ovata acuta mutica vel subinde acuminata cuspidata sæpe duplo longioribus latoribusque.—*C. sparganioides*, *Muhl.* 223; *Schk. f.* 142; *Willd.* 237; *Kunth*, 381; *Dewey, Sill.* viii. 265; *Schw. et Tor.* 305; *Elliott*, 531; *Carey*, 513; *Darlington*, 345; *Chapman*, 534; *Sartwell, Exs. n.* 20. (TAB. CCCXCIV. No. 1.)

HAB. In America septentrionali. New England to Georgia.

*Culmus*  $1\frac{1}{2}$ – $2\frac{1}{2}$ -pedalis, acutangulus, scaberrimus, strictus, firmus, gracilis, basi foliosus. *Folia* 3–4 lin. lata, flaccida, culmum subæquantia. *Vaginæ* inferiores subinde plus minus transversim corrugatæ. *Bracteæ* setaceæ, spiculis plerumque breviores, vel longiores: infima rarius foliacea,  $2\frac{1}{2}$ –4 poll. longa. *Squamæ* superiores, sæpe muticæ: inferiores cuspidatæ. *Spica* 2–4 poll. longa. *Spiculæ* inferiores, sæpe compositæ, 6–8 lin. longæ, subremotæ. *Perigynium*  $1\frac{6}{10}$ – $2\frac{2}{10}$  lin. longum, 1 lin. latum. *Achenium*  $\frac{8}{10}$ – $1\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovato-orbiculatum, basi abrupte productum, basi styli decidua plus minus clavata.

Var.  $\beta$ . *minor*; spica abbreviata; spiculis paucioribus contiguis; squamis muticis; foliis angustioribus; culmo brevior; perigyniis membranaceis.—*C. cephalophora*,  $\beta$ , *Tor. N. Am. Cyp.* 389. *C. cephaloidea*, *Dewey (ex parte)*. *C. muricata*,  $\beta$  *cephaloidea*, *Dewey, Sill.* ii. 307. (TAB. CCCXCIV. No. 2.)

The var.  $\beta$  is simply a reduced form. It resembles what I have figured (Tab. CCCXCV.) as the *C. cephaloidea* of Dewey, but differs in its membranous perigynium and squamæ.

Tab. CCCXCIV. The specimens figured are,—No. 1. N. York, *Sartwell's Exs. n.* 20. 2. Var. *minor*, Michigan, from *Dewey*, sent to *Carey* as "*C. cephaloidea*, Dewey."

285. *C. cephaloidea* (*Dewey*); spica pallida demum straminea oblonga, e spiculis 5–6 ovatis contiguis bracteatis apice masculis; stigmatibus 2; perigyniis ovatis vel orbiculato-ovatis rostratis acute bifidis marginibus superne subalatis scabris enerviis basi spongiosis pallidis, squama lanceolata acuminata cuspidata brevioribus vel subæquantibus.—*C. cephaloidea*, *Dewey (ex parte)*; *Sartwell, Exs. n.* 75. *C. sparganioides v. cephaloidea*, *Carey*, 513. (TAB. CCCXCV.)

HAB. In America septentrionali. Illinois, *Vasey*. Nebraska, *Heyden (e Sartwell, Herb. Boott)*.

*Culmus*  $1\frac{1}{2}$ – $3\frac{1}{2}$ -pedalis, gracilis, scaber, inferne foliatus. *Folia*  $1\frac{1}{2}$ –3 lin. lata, culmo breviora. *Bracteæ* setaceæ: inferiores spiculis longiores. *Spica* 9–16 lin. longa, 4 lin. lata. *Squamæ* inferiores longius cuspidatæ. *Perigynium*  $1\frac{8}{10}$ –2 lin. longum,  $\frac{8}{10}$ – $1\frac{2}{10}$  lin. latum, membranaceum, divergens, rostro subinde brevi. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, orbiculatum, basi styli decidua bulbosa.

In habit and aspect like *C. sparganioides*, var. *minor*, but differs in the lanceolate cuspidate squamæ, in the spongy base of the perigynium, which is winged at the margins and acutely bifid, and in the bulbous base of the deciduous style. All the spiculæ are occasionally furnished with setaceous bracteæ. The vaginæ of the leaves not corrugate.

I am not aware that Dewey has anywhere described his *C. cephaloidea*, except in Wood's Botany; and the description, as I have remarked under *C. conjuncta*, does not apply to the present plant. I have ventured to give the name to it, as Dewey has included it under the name of *C. cephaloidea*. I have pointed out in what re-

spects it differs from the small form of *C. sparganioides*, with which it has been confounded. Future observers will, I have no doubt, diminish the number of species of this androgynous group; but before they can do so satisfactorily, they must have clear notions of the forms that have been described as species by different authors.

Tab. CCCXCV. The specimens figured are from Illinois, *Vasey*.

286. *C. cephalophora* (*Muhlenberg*); spica parva rotunda ovata vel suboblonga capitata pallida concolori, e spiculis 3–6 parvis simplicibus plerumque arctissime congestis, inferioribus setaceo-bracteatis; bracteis sæpius reflexis; stigmatibus 2; perigyniis ovatis ovalibus vel suborbiculatis acuminato-rostratis bifidis marginibus subalatis serrulatis enerviis vel dorso 3–4-nervatis membranaceis patentibus vel reflexis, squama ovata acuta vel obtusa plus minus cuspidata alba nervo viridi latoribus longioribus vel (cuspidate) brevioribus.—*C. cephalophora*, *Muhl.* 218; *Schk. f.* 133; *Willd.* 220; *Kunth*, 387; *Dewey, Sill.* x. 268; *Schw. et Tor.* 300; *Tor. Mon.* 389; *Ell.* 526; *Darlington*, 345; *Carey*, 513; *Chap.* 534; *Sartwell, Exs. n.* 22 et n. 21, "*C. cephaloidea*." *C. cephaloidea*, *Dewey (ex parte)*. (TAB. CCCXCVI., CCCXCVII.)

HAB. In America septentrionali. Canada to Florida, "on grassy hillsides and shady river-banks, often in very dry situations, seldom twenty inches high, or four to five feet, decumbent among bushes," *Schw. et Tor.*

Var.  $\beta$ . *angustifolia*; minor.—*C. Leavenworthii*, *Dewey, Sill.* ii. 246, 2nd ser.; *Sartwell, Exs. n.* 73. (TAB. CCCXCVIII.)

HAB. Louisiana, Texas, N. Mexico, *Wright*. Guiana (*Herb. Hook.*). Rocky Mountains, *Nuttall (Herb. Boott)*.

*Culmus* 9-pollicaris, erectus, vel 4–5-pedalis, decumbens, obtusangulus, apice acute triqueter, scaber, firmus, basi foliatus. *Folia* 1– $2\frac{1}{2}$  lin. lata, elongata, plana, culmo longiora vel breviora. *Bracteæ* setaceæ, spiculis sæpe longiores, infima subinde spica longior, patentibus vel reflexis. *Spica* parva, rotundata vel ovata, densa, capitata vel suboblonga, 4–9 lin. longa, 3–5 lin. lata. *Spiculæ* congestæ: inferiores vix unquam discretæ. *Squamæ* acutæ vel obtusæ; inferiores longius cuspidatæ: masculæ sæpe muticæ. *Perigynium*  $1\frac{4}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{7}{10}$ –1 lin. latum; nervis antice 3–4 sæpius obsoletis vel carentibus; membranaceum, pallidum, demum flavidum vel purpureum, marginibus pallidis. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum et latum, orbiculatum vel ovatum, basi styli plus minus bulboso-castaneum.

This species is allied to *C. Muhlenbergii*, to the small form of *C. sparganioides*, and to what I have considered as the *C. cephaloidea* of Dewey. It differs from *C. Muhlenbergii*, in its soft, membranous, and generally nerveless perigynium, and its longer plane leaves; from *C. sparganioides*,  $\beta$ , in its smaller spike, cuspidate squamæ, and occasionally nerved perigynium; and from *C. cephaloidea* in the smaller, ovate, often obtuse squama, and smaller perigynium, which in the typical form is not spongy at base. In its most characteristic form it is distinguishable from all by its small capitulate spike. If this should be considered merely as a depauperate form, then I think that, with *C. cephaloidea*, it must merge into *C. sparganioides*, from the texture of the perigynium.

I can see nothing to justify the separation of *C. Leavenworthii*. Specimens from Illinois from Dr. Mead show the transition from the one to the other. The perigynium of *C. cephalophora* is generally membranous to the base, but in some specimens, as in *C. Leavenworthii*, it is spongy at base or at the lower margins,—a character in some cases the result of a deposition of spongy matter

as the fruit ripens. Muhlenberg describes the perigynium of *C. cephalophora* as "flavescens, demum atra." I observe this dark colour in a specimen from New Mexico from *Wright*, and in others from the Rocky Mountains from *Nuttall*.

The specimens figured are,—

Tab. CCCXCVI. No. 1. Pennsylvania, *Schweinitz*. 2. Dexter, New York, *Vasey*.

Tab. CCCXCVII. Auburn, New York, *Carey*. These specimens represent the "*C. cephaloidea*," Sartwell, n. 21, and I suspect are those described under that name by Dewey in Wood's Botany.

Tab. CCCXCVIII. are the "*C. Leavenworthii*," Sartwell, Exs. n. 73, from Louisiana, *Hale*.

287. *C. Muhlenbergii* (Schkuhr); spica ovata vel oblongo-cylindracea pallida, e spiculis 3-9 ovatis, superioribus vel omnibus simplicibus congestis vel inferioribus subdiscretis longiuscule setaceo-bracteatis, infima rarius composita: stigmatibus 2; perigyniis orbiculatis ovalibus vel ovatis brevi lateque rostratis alte bifidis utrinque crebre valideque nervosis, superne anguste alatis serratis, imbricatis demum patentibus subcoriaceis pallidis, squama lanceolato-ovata acuta vel obtusa plus minus longe cuspidata albida nervo viridi latioribus brevioribus vel longioribus.—*C. Muhlenbergii*, *Schk. f.* 178; *Willd.* 231; *Kunth*, 381 (*excl. descript. ejus*); *Muhl.* 221; *Schw. et Tor.* 304; *Dewey, Sill.* viii. 265; *Ell.* 529; *Carey*, 513; *Darlington*, 346; *Chap.* 534; *Sartwell, Exs.* n. 23. *C. piniaria*, *Bose*. *C. pinetorum*, *Willd. Herb. Schlecht. Linnæa*, x. 265. (TAB. CCCXCIX.)

Var.  $\beta$ . *enervis*; squamis sæpe muticis; perigyniis obsolete vel prorsus enerviis. (TAB. CCCC.)

HAB. In America septentrionali. Dry fields and hillsides, in sand and gravel. Hudson's Bay to Texas.

*a. Culmus* 1-2-pedalis, gracilis, striatus, rigidus, scaber. *Folia* 1-2 lin. lata, rigida, carinata, plus minus conduplicata, culmo breviora vel æquantia. *Bractea* setacea, spiculis plerumque longiores: ad aspectum (cum squamis longiuscule cuspidatis) comosum, spicæ præbentes; infima subinde 4-polliearis. *Squama* plus minus cuspidata, rarius muticæ. *Spica* 6-18 lin. longa, 3-5 lin. lata, abbreviata, ovata, vel oblonga, cylindracea. *Perigynium* orbiculatum, vel ovatum, basi rotundatum; vel ovale, basi acutum,  $1\frac{7}{10}$ -2 lin. longum,  $\frac{7}{10}$ - $1\frac{2}{10}$  lin. latum, breve lateque rostratum, rostro (in formâ ovali) paulo longiore: *typice* plurinervium, rarius nervis plus minus obsolete, subcoriaceum (nec basi spongiosum), marginibus recurvis. *Achenium*  $\frac{9}{10}$ - $1\frac{2}{10}$  lin. longum,  $\frac{8}{10}$ -1 lin. latum, orbiculatum; vel oblongum, basi productum, demum ferrugineum. *Stylus* perbrevis, basi decidua, clavata vel bulbosa, sessili.

Var.  $\beta$ ; spiculis ebracteatis; squamis breve cuspidatis, etiam muticis; perigyniis subcoriaceis, nervis minus distinctis, antice ad latera obsolete, postice (vel utrinque) carentibus.

This species, in its typical form, with orbicular strongly-nerved perigynia, long bracts, and aristate squamæ, is sufficiently distinct. But it varies in the form and degree of nervation of the perigynia, in the length of the bracts, and arista of the squamæ. Still, in all its forms it is recognizable by the rigid culm and leaves, and the firm, not membranous texture of the perigynium, which in *a* and *\beta* is not spongy at base. The base of the very short style is sessile on the body of the achenium, varying in thickness, and Schkuhr's beautiful figure in this respect is an exception to what I have observed. In the nerveless form of the perigynium, the resemblance is great to *C. cephaloidea*, but the broader flexible leaves and the thin membranous perigynium, which is spongy at base, of that plant, afford marks of distinction.

The specimens figured are,—

Tab. CCCXCIX. From Connecticut, *Dr. Barratt*.

Tab. CCCC. Highlands, Hudson River, *Mr. Russell*.

288. *C. Brongniartii* (Kunth); spica ovata oblonga vel cylindracea densiflora demum ferruginea, e spiculis pluribus multifloris apice masculis congestis, inferioribus compositis subinde discretis bracteatis; stigmatibus 2; perigyniis ovatis vel suborbiculatis rostratis bidentatis compressis nervatis marginibus acutis scabris appressis fusco-ferrugineis basi spongiosis, squama rotundata obtusa vel ovata acuta cuspidata latioribus longioribus.—*C. Brongniartii*, *Kunth*, 380; *Desv. Fl. Chil.* vi. 208. *C. Muhlenbergii*, *Brongn. (Duperry, It. Bot.)* 151. *C. muricata*, *Schlecht. Linnæa*, vi. 29 (*fide Kunth*). *C. Xalapensis*, *Kunth*, 350. *C. hypoxanthus*, *Steud. Syn.* 193. (TAB. CCCCI.-CCCIII.)

HAB. In Mexico, California, Chili, Xalappa, *Kunth*. Valdivia, *Gay*. Napa Valley, San Francisco, Mariposa, *Thurber*. Arigua, *Lechler*, n. 738. Concepcion, *D'Urville*.

*Radix* lignosa, valide fibrosa. *Culmus* 1-2-pedalis, gracilis, triquetus, apice scabriusculus, inferne foliatus. *Folia* 2 lin. lata, firma, plana, culmo breviora, demum flavida. *Bractea* infima subsetacea, spica brevior, vel plures, subfoliaceæ, longiores. *Spica* abbreviata, vix 1- vel  $1\frac{1}{2}$ -pollicaris, 6 lin. lata. *Squama* pallidæ, lateribus ferrugineis. *Perigynium*  $1\frac{5}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{8}{10}$ -1 lin. latum (rostro  $\frac{5}{10}$  lin. longo), nervis antice 7-9 postice 4-5 sursum conspicuis. *Achenium*  $\frac{8}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, late ovatum, basi productum. *Stylus* bulbosus, ima basi constrictus.

A *C. vulpina*, L., differt perigyniis sæpe orbiculatis, appressis, magis compressis; rostro brevioribus; basi styli bulbosa; culmo gracili.

A *C. Muhlenbergii*, Schk., differt perigyniis basi spongiosis appressis fusco-ferrugineis, rostro longiore, ima basi styli constricta; spica majore multiflora.

Kunth, as *Gay* remarks (*Ann. Sc. Nat.* x. 356, 1838), does not seem to have had a clear conception of *C. Muhlenbergii*, Schk., for he has given Willdenow's character with a reference to *Schkuhr's figure*, 178, but has appended the description of a specimen from Jacquemont, which he had received under the name of *C. vulpinoidea*, and which, as *Gay* has shown, was the true plant of Michaux. The "spicæ propriæ complures: utriculi enerviî stramineo-flavidi" apply to it and do not to *C. Muhlenbergii*.

I have adopted Kunth's name for Brongniart's plant, thus separating it from *C. Muhlenbergii*, to which Brongniart had referred it, and have united with it *C. Xalapensis*, Kunth, and *C. hypoxanthus*, Steudel, a specimen of which I owe to the kindness of M. Sonder of Hamburg, who procured for me several of the plants of Lechler.

The specimens figured are,—

Tab. CCCCI. No. 1. The authentic specimen of *C. Brongniartii* of Kunth, from the Berlin Herbarium, sent to me for examination. 2. A specimen from Valdivia, *Gay*.

Tab. CCCCII. Specimens from California, *Bigelow*, in Whipple's Exploration to the Pacific (from *Herb. Hooker*), like a rough outline of *C. Xalapensis*, which I have from the Berlin Herbarium.

Tab. CCCCIII. Specimens of the *C. hypoxanthus*, Steudel, from *Lechler*, n. 738, procured for me by M. Sonder.

289. *C. vulpinoidea* (Michaux); spica composita vel decomposita oblonga vel elongata conglomerata sæpe basi interrupta pallida demum straminea vel ferruginea, e spiculis numerosis androgynis apice parce masculis densifloris deorsum in ramis sessilibus compositis insi-

dentibus plus minus setaceo-bracteatis; stigmatibus 2 perigyniis ovatis sensim acuminato-rostratis compressis membranaceis vel suborbiculatis abrupte brevius rostratis plano-convexis bifidis lateribus demum spongiosis, marginibus superne acutis serratis antice medio 3-4 leviter nervatis, postice enerviis, arcte imbricatis demum divergentibus, squama ovata acuta vel obtusa pallide ferruginea nervo viridi cuspidata latioribus (cuspidate) brevioribus vel subæquantibus.—*C. vulpinoidea*, *Mich.* ii. 169; *Gay, Ann. Sc. Nat. tome x. 356. 2nd ser. 1838; Carey, l. c. 512; Darlington, l. c. 345; Sartwell, Eas. n. 16; Chap. 533.* *C. microsperma*, *Wahl. Act. Holm. 144 (Fl. Lap. 250).* *C. multiflora*, *Muhl. 222; Willd. 243; Schk. f. 144; Kunth, 387; Elliot, 530; Schw. et Tor. 306; Tor. Mon. 390; Dewey, ix. 60, et xi. 316.* *C. polymorpha*, *Schw. Ann. Tab. C. bracteosa*, *Schw. Ann. Tab.* ("quam nusquam inveni," *Kunth*). *C. Muhlenbergii*, *Kunth, 381 (descript. ejus), non Schk.* *C. setacea*, *Dewey, ix. 61; Tor. et Schw. 307; Tor. Mon. 390.* *C. scabrior*, *Sartwell, Eas. n. 72; Dewey, vi. (2 ser.) 349.* *C. vulpinæformis*, *Tuck. En. 9.* (TAB. CCCCIV.—CCCCIX.)

HAB. In America septentrionali et meridionali, et regione Caucasica! Arctic America, *Richardson.* Texas, *Drummond.* Louisiana, *Hale.* Paramo de Cuchero, New Granada, *Purdie, Herb. Hooker.* Caucasus, *Fischer.* "*C. nemorosa*" (*Herb. Boott*).

*Culmus* 1-2½-pedalis, triquetus, plus minus validus, scaber, inferne foliatus. *Folia* ½-2 lin. lata, plerumque culmo longiora, firma. *Vaginæ* intus membranae, demum transverse corrugatae, sæpe punctis resinosis ferrugineis conspersæ. *Bracteæ* plerumque setaceæ, admodum variabiles: infima quandoque subpedalis, inferiores sæpe clongatae, vel omnes abbreviatae vel inconspicuae. *Spica* ½-3 etiam 5½ poll. longa, 3 vel basi 6-10 lin. lata, coarctata, vel basi ramis ovatis lobatis vel oblongis sessilibus magis compositis distinctis interrupta. *Spiculæ* ovatae, dense aggregatae, apice parve masculæ, densifloræ. *Squamæ* conformes, acutæ vel obtusissimæ: masculæ brevius cuspidatæ: fœminæ plus minus cuspidatæ, rarius cuspidate perigynium subæquante vel eo brevior. *Perigynium* 1- $\frac{2}{10}$ - $\frac{6}{10}$  lin. longum,  $\frac{1}{10}$ - $1\frac{1}{10}$  lin. latum: *immaturum* pallidum, membranaceum: *maturum* aurantiacum, demum, præcipue ad latera, spongiosum, achenio duplo vel triplo latius, quandoque enervium, plerumque antice medio 3-4 leviter nervatum, postice enerve, rarius 2-3-nervatum, rostro plus minus longo. In speciminibus e *Louisiana* et *Texas* perigynium latius ( $1\frac{1}{10}$  lin. latum) utrinque nervatum, fusco-ferrugineum, punctis resinosis conspersum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, subrotundum, basi productum, abrupte apiculatum, basi styli clavata vel bulboso-incrassata, ferruginea.

This species, which is very common in the United States, extending from the British possessions to Texas, varies exceedingly in all its parts, but so insensibly that I know not how any one form, unless arbitrarily, can be distinguished even as a variety. The apparent distinction is in the size of the spike, the presence of several long, or the absence of, bracts, the length of the cuspid of the scales, and the form and texture of the perigynium. This variation in the perigynium is certainly very striking, depending on its form, the length and more or less abruptness of the rostrum, and the membranous or almost subcoriaceous character of its substance. I think the substance and the form in some degree depend on the deposition of spongy matter, as it ripens, especially at the sides, but also throughout the whole body of the perigynium. It is owing to this deposition that the early ovate shape

becomes more subrotund, and changes from a compressed to a distinctly plano-convex form, and the rostrum, which on one and the same specimen varies in length, ultimately from the lateral distention of the body of the perigynium, becomes more abrupt. This deposition however of spongy matter would seem to be greater in some specimens than others, and the perigynia, where it is less, to preserve more of the membranous texture even to maturity. The *C. setacea*, Dewey, and *C. scabrior*, which are undistinguishable, were founded on immature specimens. No dependence can be placed on the degree of roughness either on the margins of the perigynium or of the culm, on the length of the bracts, or scales, or rostrum. The figure of Schk. was taken from too young a specimen, and Wahlenberg must have had as young a one, as his name of *C. microsperma* would imply. He refers his plant to Schkuhr's figure and makes *C. cephalophora* a variety of it. What Dewey means by his var. *microsperma* I know not, for neither his specimens nor his description differ from his specimens of *C. multiflora*, all in a young state. I observe in many specimens small resinous spots on the membranous portion of the foliaceous vaginæ: and these occur even on the perigynia of the specimens from Louisiana and Texas. This last character I have not noticed in the more northern plant. In Tab. CCCCIV. I have figured the spike of the specimen from the Caucasus, sent to me several years ago by the late M. Fischer of Moscow, under the name of *C. nemorosa*, W. Mr. Purdie has found this species in New Granada.

Gay (*Ann. Sc. Nat. x. 356; 1838*), remarks,—“Non *C. Muhlenbergii* nec *C. vulpinoidea*, Kunthio satis cognita fuisse videtur, qui Caricem, nomine *vulpinoidea*, à *Jaquemontio* acceptam ad *C. Muhlenbergii* retulit. Quæ *vulpinoidea* (inscripta in *Herb. Jaquemont*) reapse ad *C. vulpinoideam veram* pertinet.”

The specimens figured are,—

Tab. CCCCIV. No. 1. From Massachusetts, from Mr. Lowell, No. 2, a spike from Dewey. No. 3, one from Barratt; his “var. *glomerata*,” from Middletown Meadows, Connecticut.

Tab. CCCCIV. No. 1. Specimens from Ohio, *Sullivant*, with the vaginæ transversely corrugate, as is often the case. No. 2. A spike from the “*C. nemorosa*,” Fischer, from the Caucasus.

Tab. CCCCIV. Specimens from Connecticut, the “var. *ambigua*,” Barratt, the perigynia differing in form, occasionally orbicular, with a short rostrum, like those from Texas and Louisiana, but without resinous spots.

Tab. CCCCIV. Specimens from Arctic America, *Richardson*, the perigynia with a cordate base.

Tab. CCCCIV. Specimens of Sartwell's Exs. n. 72, “*C. scabrior*,” the vaginæ occasionally spotted. No. 2. Perigynia and squamæ of “*C. setacea*,” Dewey.

Tab. CCCCIX. Specimens from Ohio, *Sullivant*, his “*C. setacea*?” No. 2. Perigynia and achenium of specimens from Texas, *Drummond*; the form “*platycarpa brevirostris*” of Gay, *Ann. Sc. Nat.* (1838) p. 357.

290. *C. disticha* (Hudson); spica oblonga vel subelongata pallide vel fusco-ferruginea, e spiculis pluribus polygamis contiguis vel inferioribus discretis, extremis plerumque subfœmineis apice masculis, intermediis submasculis, vel rarius inferioribus vel omnibus fœmineis vel apice masculis; bracteis squamæformibus cuspidatis, infima sæpe elongata; stigmatibus 2; perigyniis ovatis vel ovalibus plus minus rostratis, ore antice secto demum bifido plano, convexis utrinque nervatis marginibus superne acutis vel anguste alatis scabris stipitatis membranaceis, squama ovata acuta ferruginea margine hyalina longioribus.—*C. disticha*, *Huds.; Koch, 865; Anderson, 60. t. 3. f. 15; Lang, 31; Sartwell, Eas. n. 71.* *C. intermedia*, *Good. Lin. Trs. ii. 154; Willd. 244; Kunth, 376; Schk. f. 7; Fl. Brit. 972; Eng. Bot. t. 2042; Wahl. Act. 144; Reichenb. t. 210; Ledebour, 210; Dewey, Sill. iv. 343 (1847); Fl. Ross. 273.* *C.*

spicata, *Pall. Lam.* *C. arenaria*, *Leers, t. 14. f. 2.* *C. multiformis*, *Thwill.* *C. pseudo-arenaria*, *Pers.* *C. modesta*, *Gay, Ann. Sc. Nat. x. 304 (1838).* *C. Sartwellii*, *Dewey, Sill. xliii. 90; Sartwell, Ews. n. 12; Carey, 511.* *β. repens*, *Reich. t. 210. n. 553.* *C. repens*, *Bellard, Schk. f. 135.* (TAB. CCCCX.)

HAB. In Europe, Norway to Italy. Asia, Altai, Baikal, Davuria. N. America, Carlton House, *Richardson.* Saskatchewan Prairies, *Bourgeau.* New York, *Sartwell.* Wisconsin, *Lapham.* Illinois, *Vasey.*

*Rhizoma* profunde repens, squamis lanceolatis obtectum, fasciculos foliorum culmosque spicigeros ad intervalla proferens. *Culmus* 1-2-pedalis, acute triqueter, scaber, basi rudimentis vaginisque foliorum clausus. *Folia* 1-2 lin. lata, culmo breviora, plana, læte viridia. *Bractea* e basi ovato-lanceolata cuspidata: inferiores spiculis sæpe longiores, vel infima spicam subæquans. *Squamæ* ovatae, acutæ, ferrugineæ vel pallidæ. *Spica* 1-3 poll. longa, 3-8 lin. lata, forma varians, oblongo-ovata vel lineari-elongata, vel lanceolata, vel ad mediam partem contracta. *Spiculæ* distributione staminum æque variabiles: *terminalis* et *mediæ* masculæ vel apice masculæ: *intermediæ* masculæ vel fere omnino masculæ: *inferiores* fœminæ: rarius *omnes* fœminæ vel apice masculæ, ovatae, ellipticæ, vel subrotundæ, congestæ, vel inferiores discretæ. *Perigynium*  $1\frac{1}{2}$ - $2\frac{1}{2}$  lin. longum,  $\frac{7}{10}$ - $\frac{8}{10}$  lin. latum, plus minus longe rostratum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovatum, ferrugineum, basi styli æquali.

I see no characters to distinguish *C. Sartwellii* from the European *C. disticha*. It is often of a paler colour, more slender, and with smaller spiculæ, as if growing in a drier clime, but I have specimens from France and Germany entirely agreeing with it. In the distribution of the stamens there is the same variableness, the general character in both being "spiculis apice masculis," though there is a tendency in some spiculæ to a predominance of the male or female florets, some being entirely male or female. Goodenough says,—“Spiculis 8-20 infimis et terminali subfœmineis; in fœmineis scilicet sæpius flos unus aut alter masculus, et in masculis fœmineus conspiciendus est; flores fœminei semper inferiores.”

The perigynium in the European plant varies in length ( $1\frac{1}{2}$ - $2\frac{1}{2}$  lines long); in the American it is smaller ( $8\frac{1}{2}$ -2 lines long). I believe in both the orifice is normally entire. The margin is sometimes simply acute, or there is a narrow wing extending nearly to the base.

Smith, in the Eng. Fl., refers the *C. repens*, Bellard, to *C. arenaria*. Reichenbach considers it as a variety of his *C. intermedia*, and, I think, correctly.

Bentham (Handbook, 561) considers *C. disticha* as “an inland variety, growing in marshy ground and wet meadows, of *C. arenaria*, L.”—certainly a very variable plant. The chief distinctions are, that *C. arenaria* is found in the deep sand of the sea-

coast, with a much more diffused rhizome, shorter, often fasciated culms, rigid canaliculate leaves ending in an attenuate curved apex, a broader spike, the spiculæ occasionally male at base (which has never been observed in *C. disticha*), cuspidate squamæ, perigynium spongy at the sides and base, with generally a broader wing, which is often obliquely truncate at base.

Tab. CCCCX. The specimens figured are from Illinois, *Vasey*, with perigynia and achenia (No. 2) from a specimen from France, showing the difference of their form and size in the European plant.

291. *C. Gayana* (Desvaux); spica (subinde dioica!) ovata capitata fusco-ferruginea, e spiculis apice masculis (*Gay*), vel masculis vel fœmineis pluribus arcte congestis, inferioribus compositis; bracteis setaceis spica brevioribus; stigmatibus 2; perigyniis suborbiculatis brevi conico-rostellatis, ore minimo hyalino antice alte secto, superne ad margines scabris nitidis crasse spongiosis castaneis, squama ovata acuminata cuspidata fusco-ferruginea apice albo-hyalina angustioribus brevioribus.—*C. Gayana*, *Desv. Fl. Chil.* p. 205 (*fide spec. in Herb. Mus. Paris*). (TAB. CCCCXI.)

“Spicis crebris, apice masculis, fere in uno eodemque culmo totis masculis vel fœmineis in paniculam spicæformam ovatam dense congestis, saturate fuscis; utriculo  $1-1\frac{1}{4}$  lin. longo nervio nitido ovato-rotundato, rostro fere nullo, superne angulis denticulato-scabris, ore truncato scarioso bidentato; achenio obovato-rotundato.”—*Fl. Chil.*

HAB. In Chili, *Gay.* Nov. Mexico, *Fendler, n. 881.* Base of the Rocky Mountains, *Bourgeau (Herb. Hooker).*

*Rhizoma* repens. *Culmus* subpedalis, triqueter, scaber. *Folia* 1 lin. lata, culmo breviora, pallide viridia. *Spica* 8-10 lin. longa, 6-7 lin. lata. *Perigynium*  $1-1\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum; ore antice secto, una margine albo-hyalina supra alteram jacentæ, ad mediam partem antice quasi sulcatum, ibique 2-3 nervis notatum, lateribus convexis, postice enerve. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{5}{10}$  lin. latum, orbiculatum, basi productum.

*C. decompositæ*, *Dewey*, proxima; differt et ab affinibus spica congesta capitata.

In Fendler's and Bourgeau's specimens I could not discover any male florets. Willdenow remarks their occasional absence in *C. paradoxa*, one of the group to which *C. Gayana* belongs. With Gay's specimen in the Herb. Mus. Paris, which I examined, there was one, about 3 or 4 inches high, with lax male spiculæ; and not having then seen the 'Flora Chilensis,' in which the dioicous character of the species is mentioned, I did not suppose that it belonged to it, and thus failed to figure it.

Tab. CCCCXI. The specimens figured are from the base of the Rocky Mountains, *Bourgeau (Herb. Hooker).*

THE END.





C. FILICINA.γ.





C. FILICINA.





C. FILICINA.





C. FILICINA (MEIOGYNE)







C. FILICINA.

M





C. FILICINA.

M.





C. FILICINA. (MINOR)





C. FILICINA. (MINOR)







C. CRUCIATA.





C. CRUCIATA.





C. A M O E N A.

57











C. VESICULOSA.

M.

p.





C. CUMINGIANA.





C. CUMINGIANA.





C IMPUNCTATA.











C. SETOSA B.





C. SETOSA γ.





C . C E L S A .



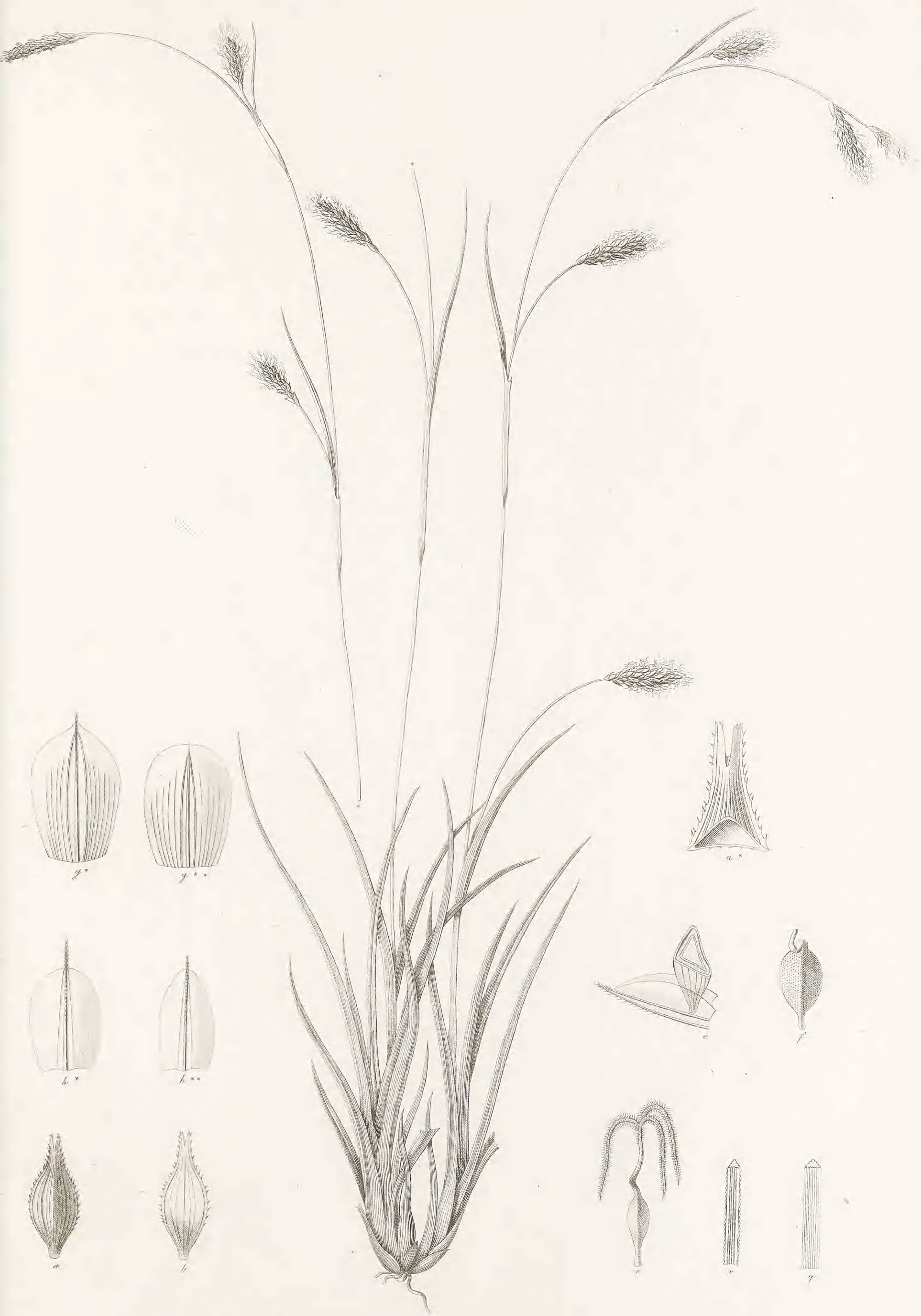




C. LONGIFOLIA

M.





C. LONGIFOLIA B.





C. RAOU LII.





C. JAMESONI.







C. JAMESONI VAR B





C JAMESONI VAR. y

11.





C. JAMESONI  $\gamma$ .





C BORBONICA.







C. BORBONICA.





C. BORBONICA.





C. CETHIOPICA.

M





C. CETHIOPICA.

h

p







C. CETHIOPICA.

M.

F.





C. CEPHALOPICA.

M.





C. BORYANA.





C. BORYANA.

M

P.







C B O R Y A N A





C. BORYANA VAR. MINOR.





C. BORYANA VAR. MINOR

Herb. B. Slav.





C. INSULARIS.







C. WAHUENSIS.





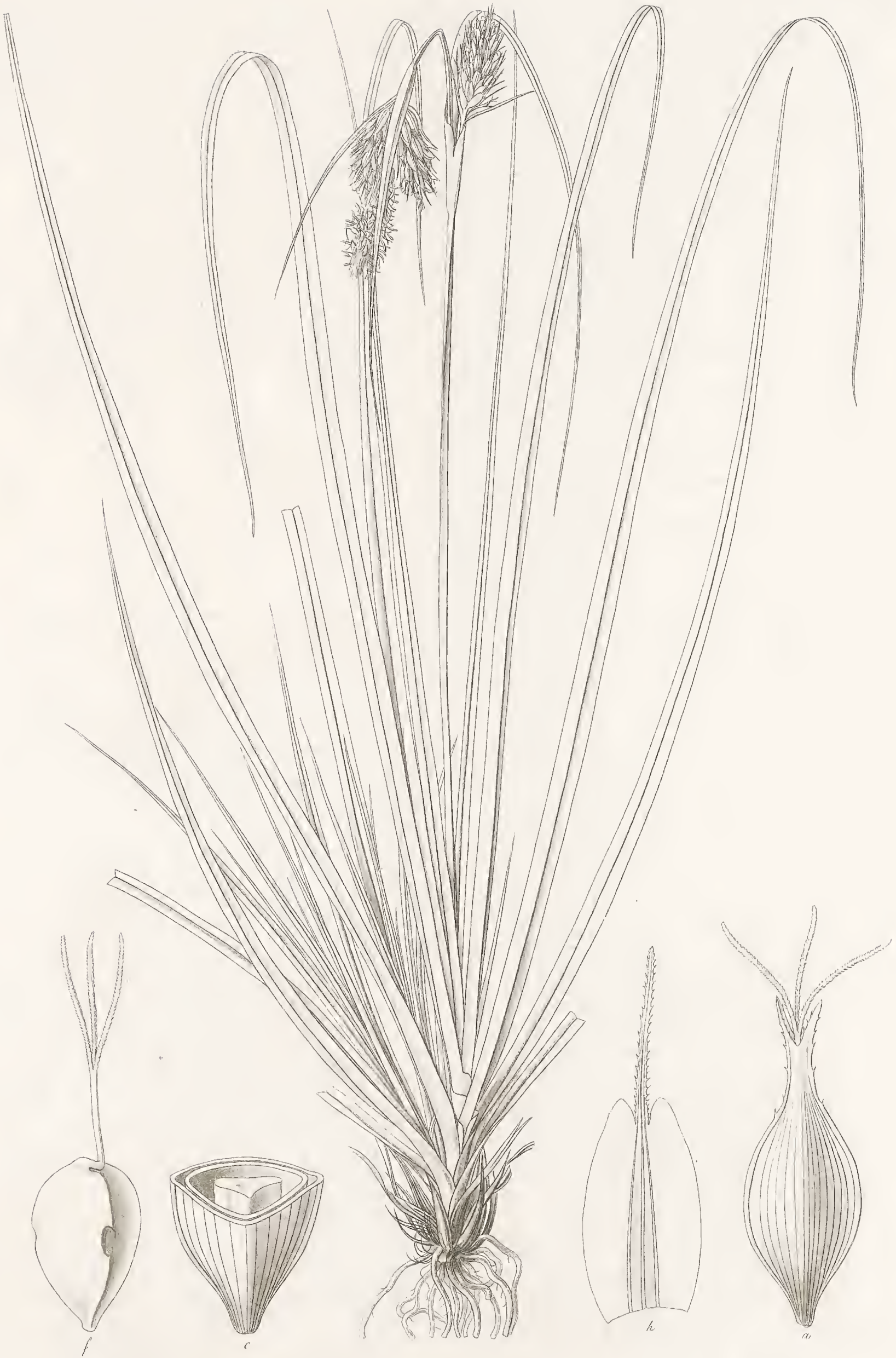
C. WAHLENSIS.





C. WARUENSIS





C. WAHUENSIS.







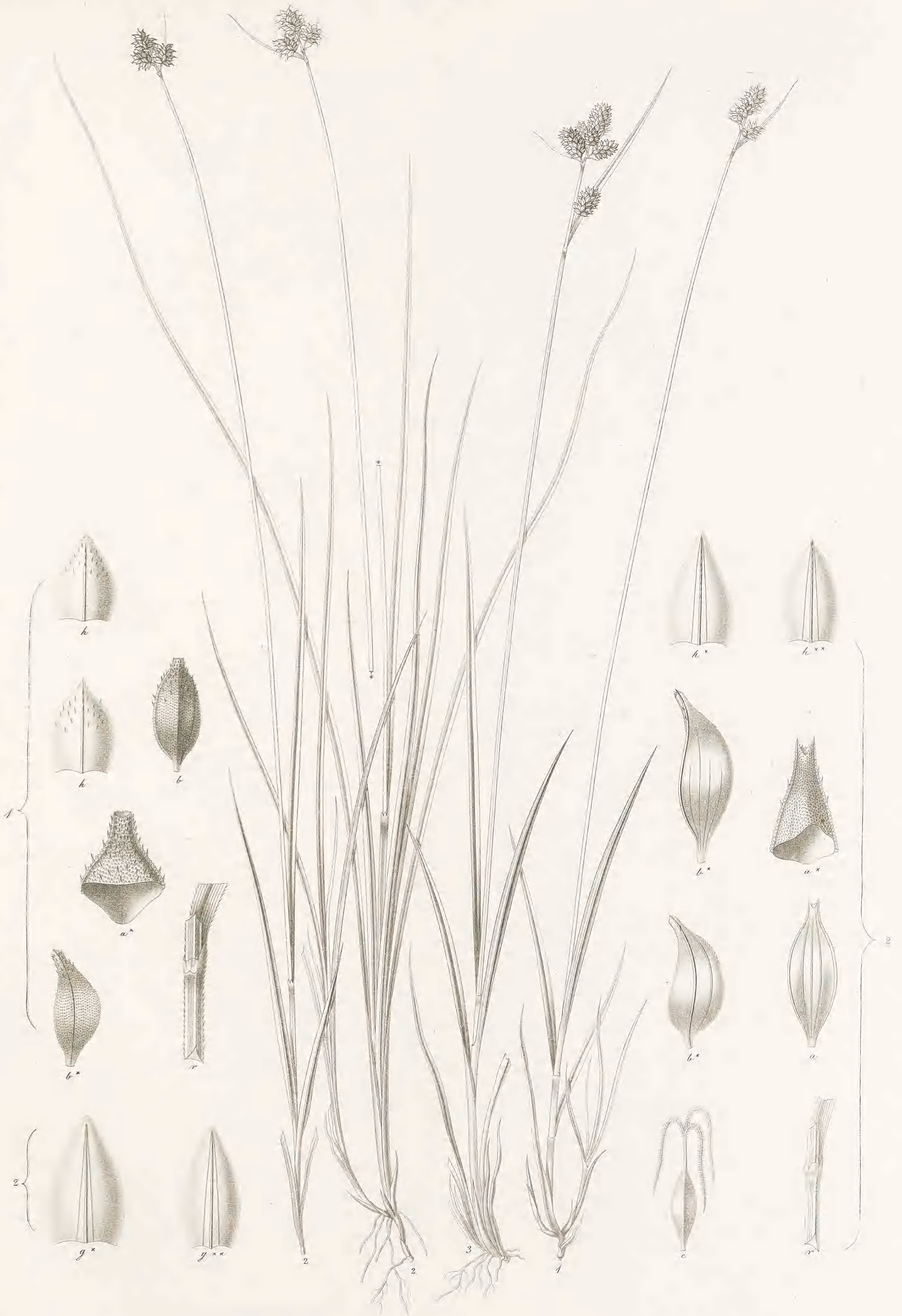
C. RIPARIA (LACUSTRIS)





C. ALPINA.





CALPINA.

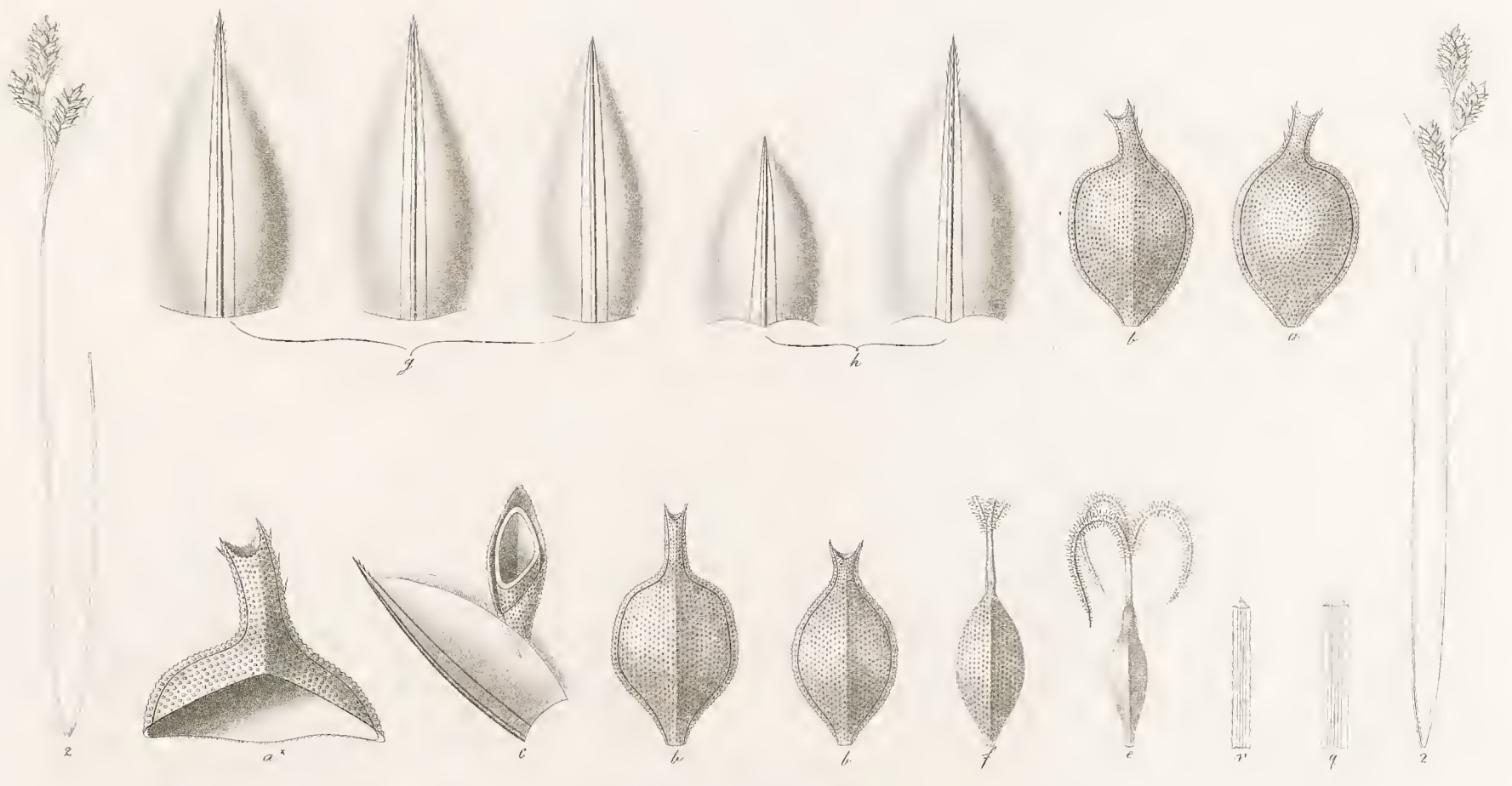




C. ALPINA VAR. B.







C. ALPINA B.





C. ALPINA VAR.  $\gamma$ .

at









C. ATRATA (OVATA)







C. ATRATA (NIGRA)





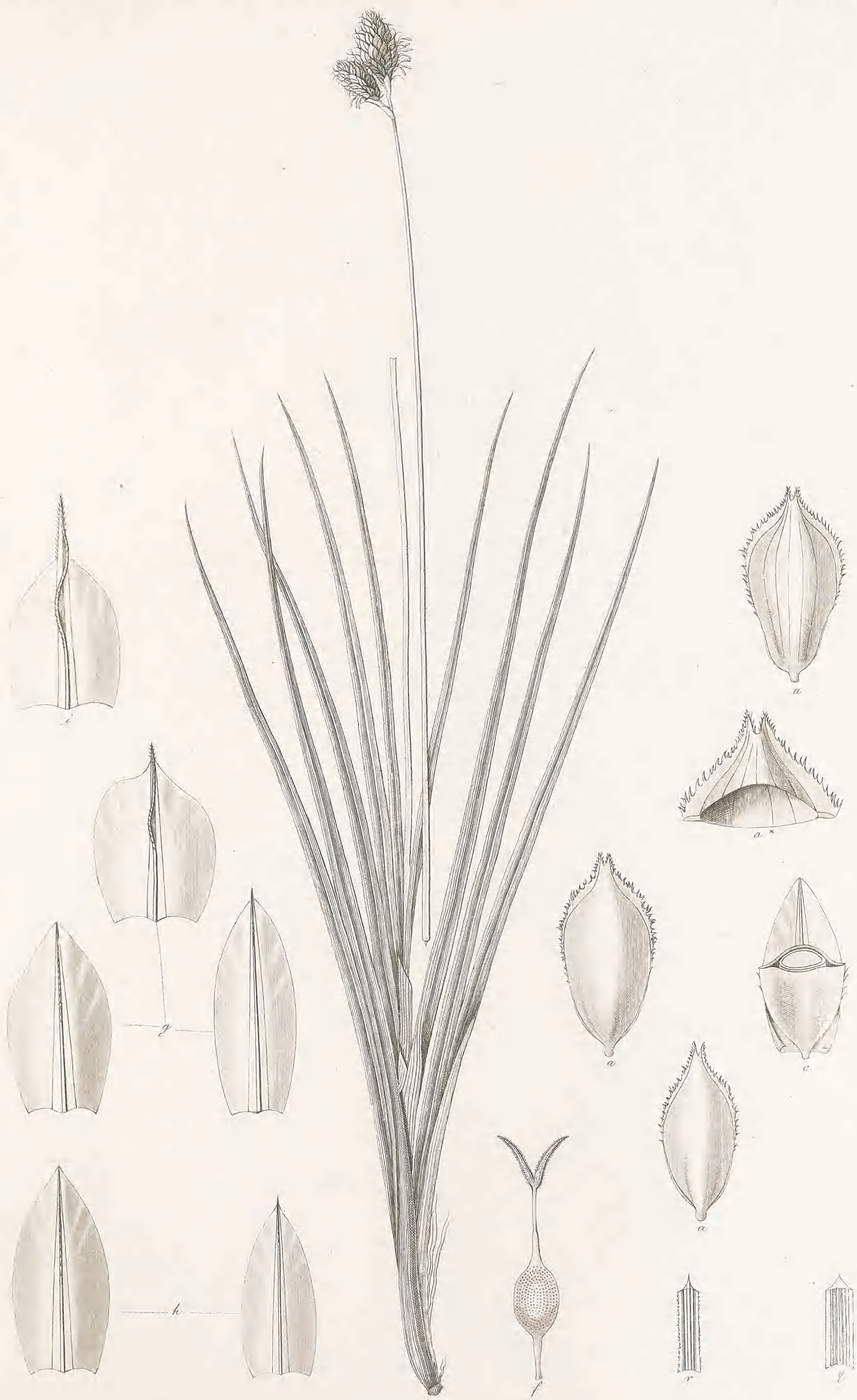
CAREX (PULLATA)





C. ATRATA. (GLACIALIS)





C. ATROPICTA.







C. BONPLANDII.





SCOPARIA.





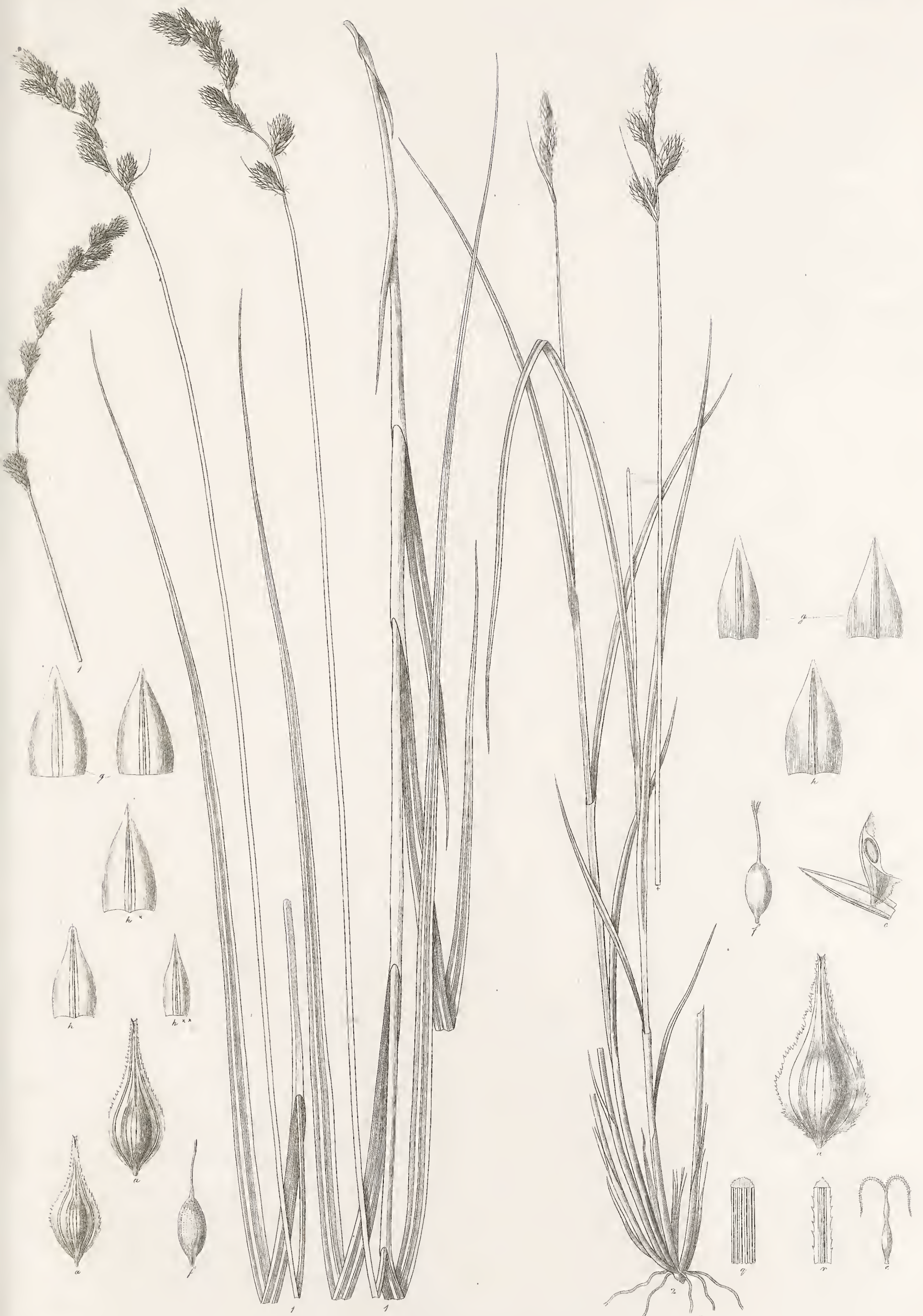
C. SCOPARIA (VAR. MINOR)





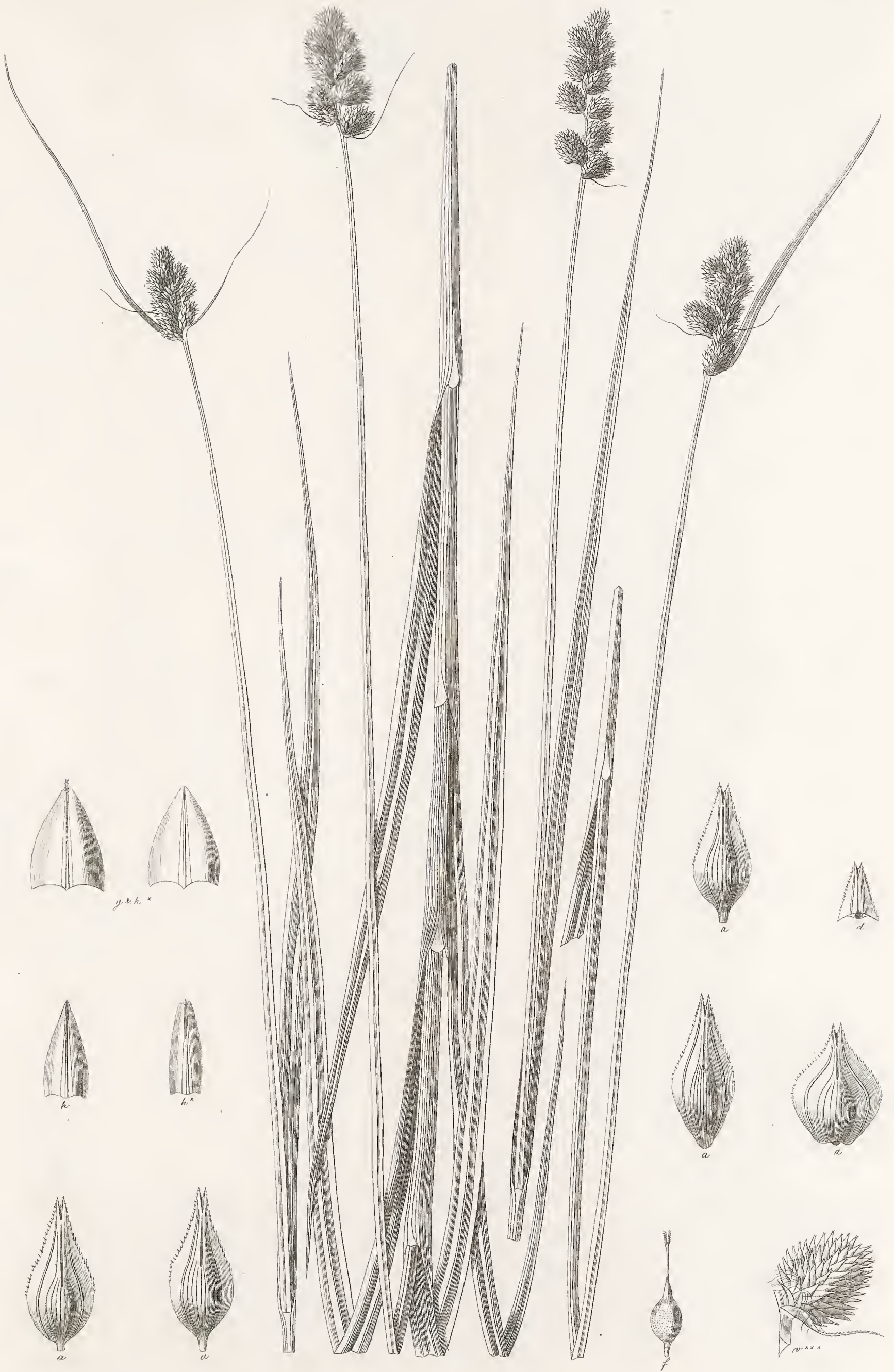






1. C. LAGOPODIODES VAR.  
 2. C. STRAMINEA (HYALINA)





C. CRISTATA.





C. CRISTATA.





C. CRISTATA (MIRABILIS)

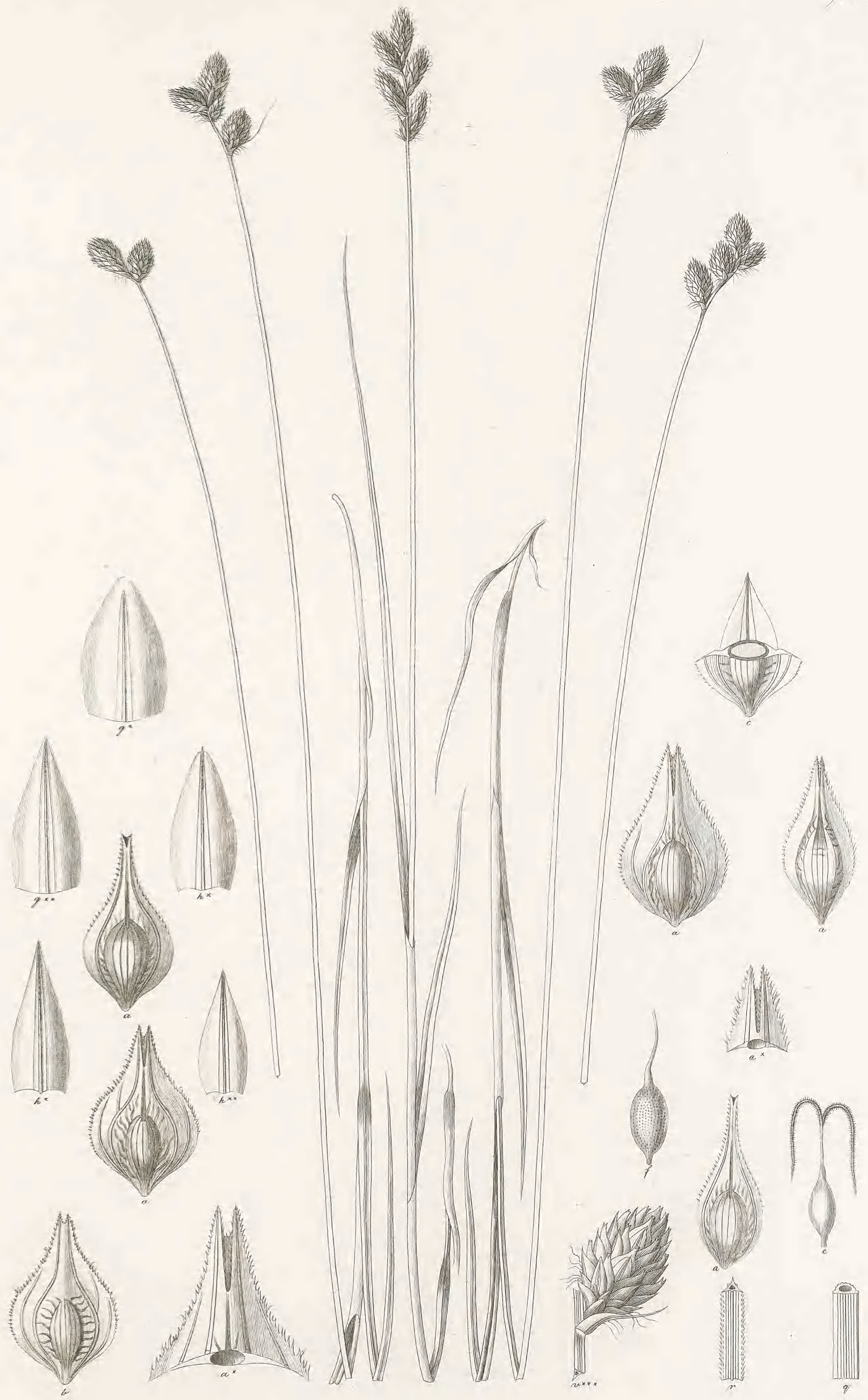






C. FOENEA.





C. FOENEA B

M.

Ca.





C. FOENEA γ





C. ALATA.







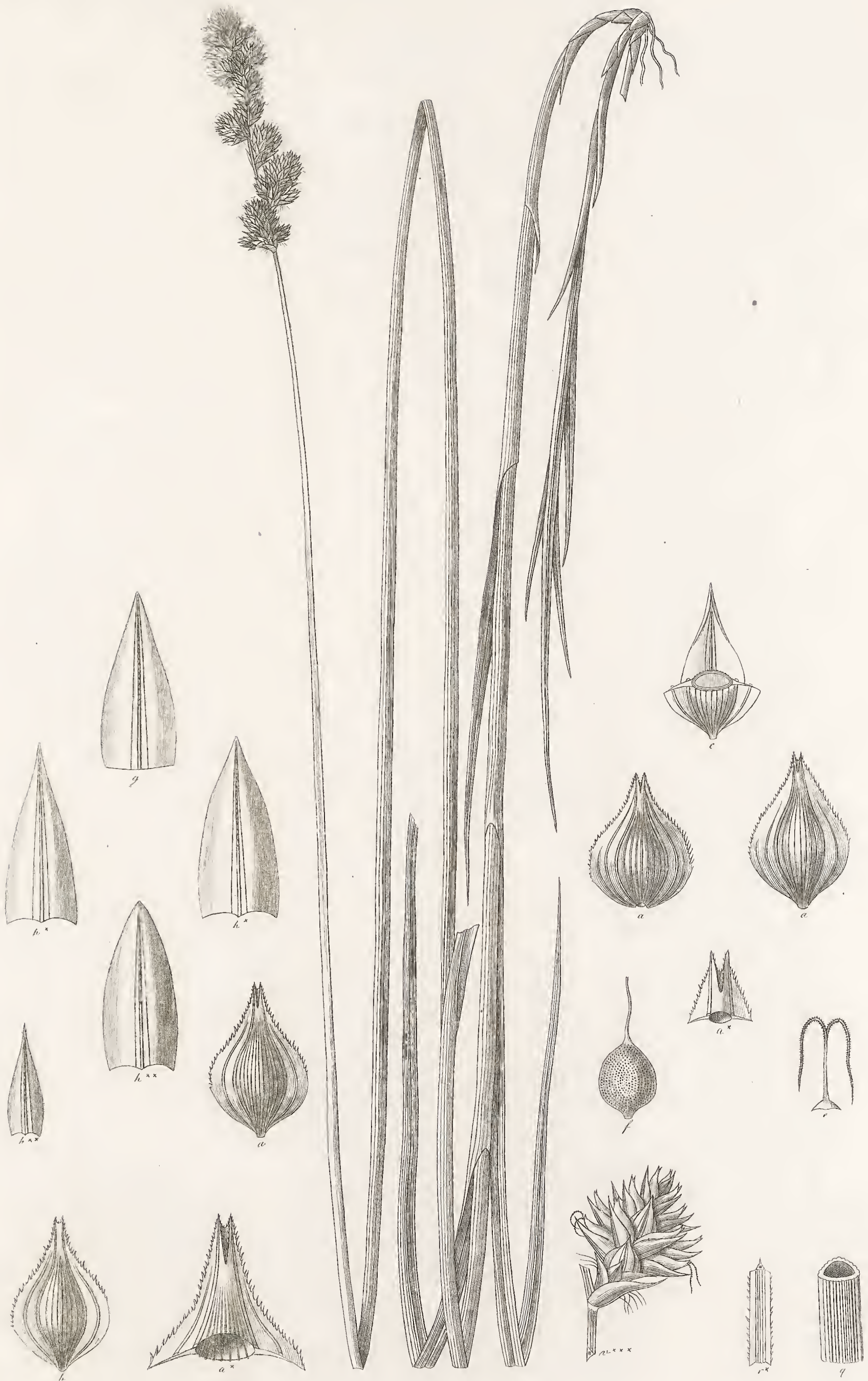
POA DISTA





*POGONUM*





C. A. D. O. T. A.





CLADUSA.





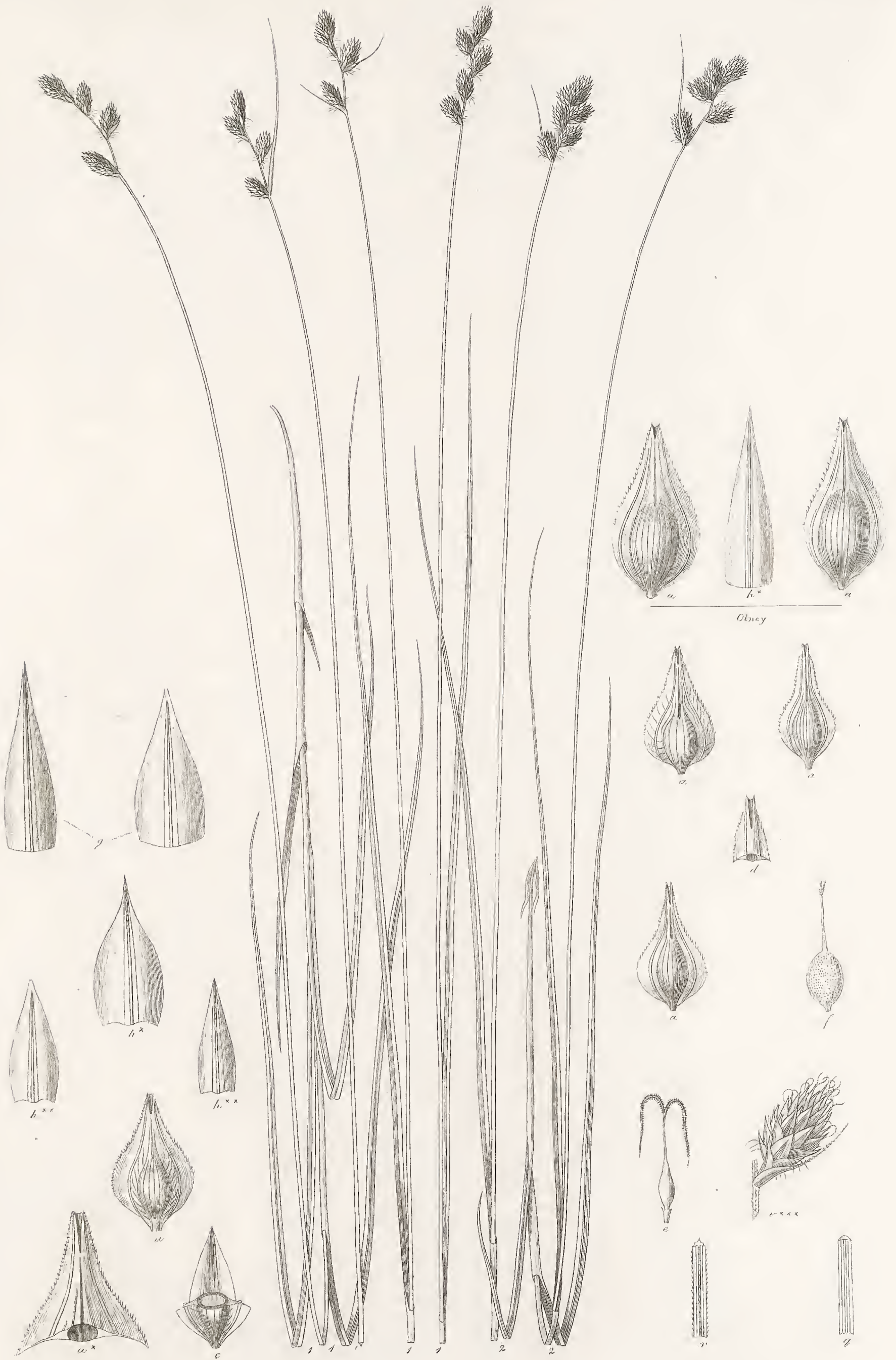


C. ADUSTA V. MINOR.

32.

10.





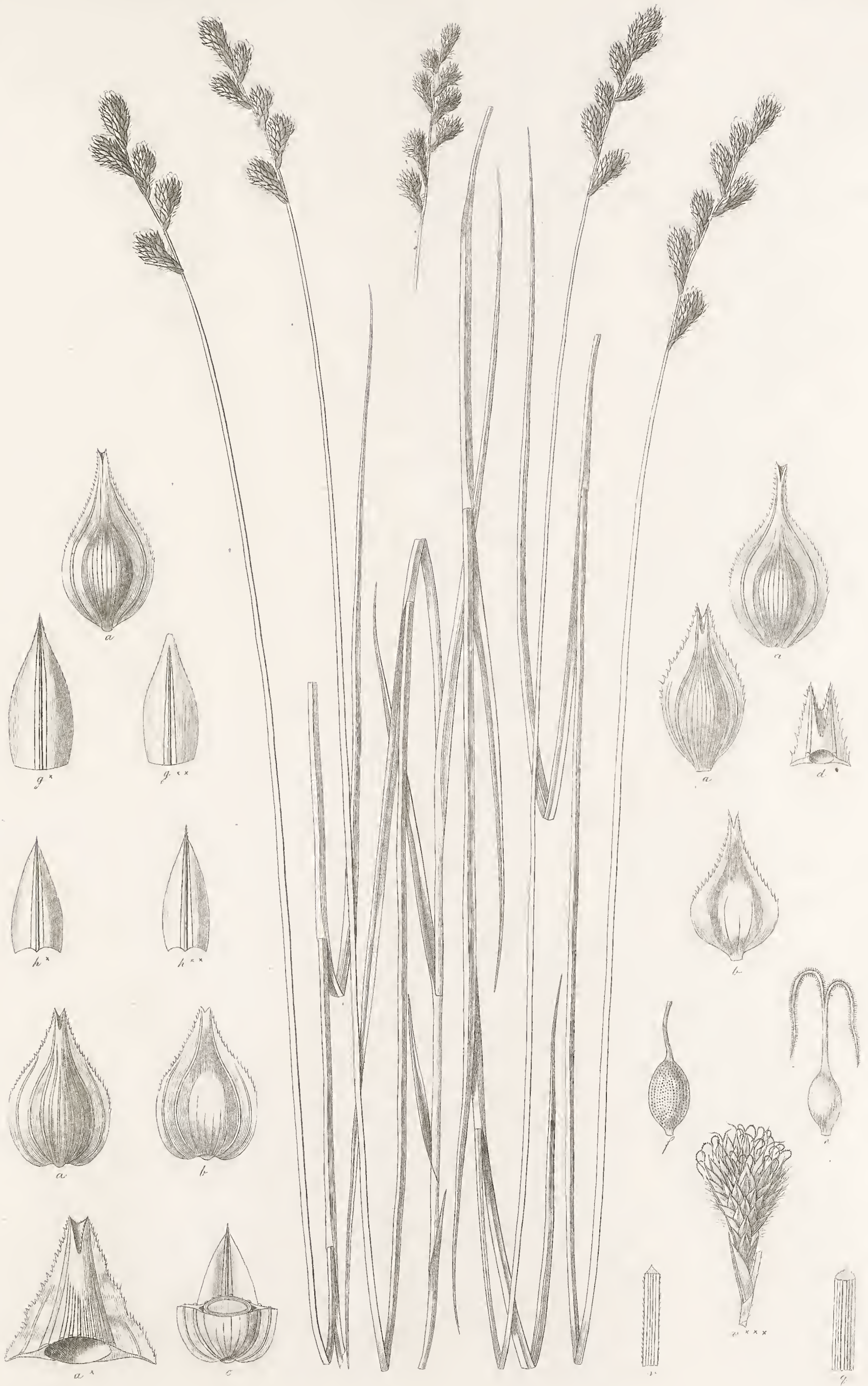
C. STRAMINEA. (TENERA)





C. STRAMINEA (APERTA)





C. STRAMINEA (FESTUCACEA)



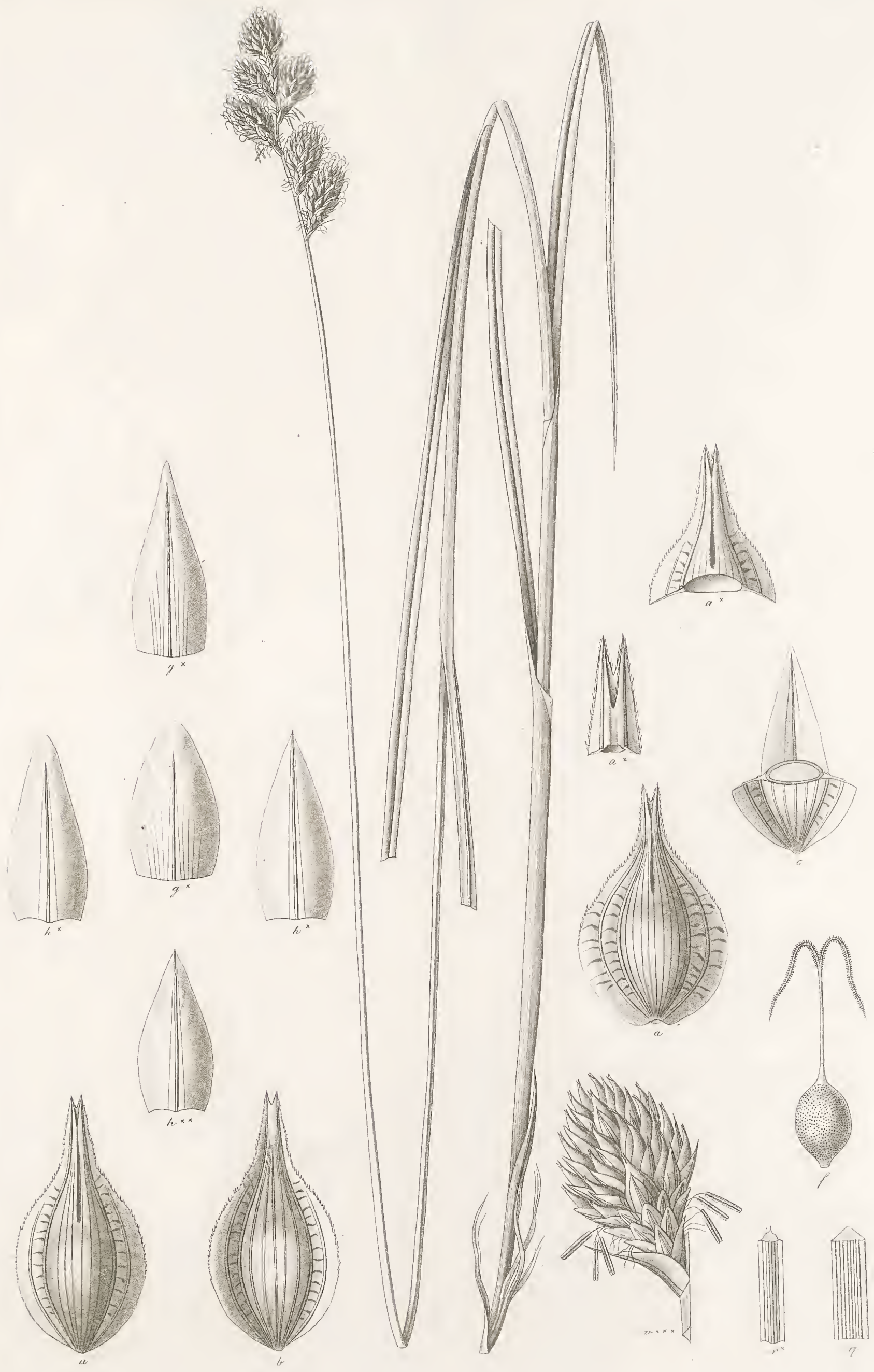




C. STRAMINEA (TYPICA)

11





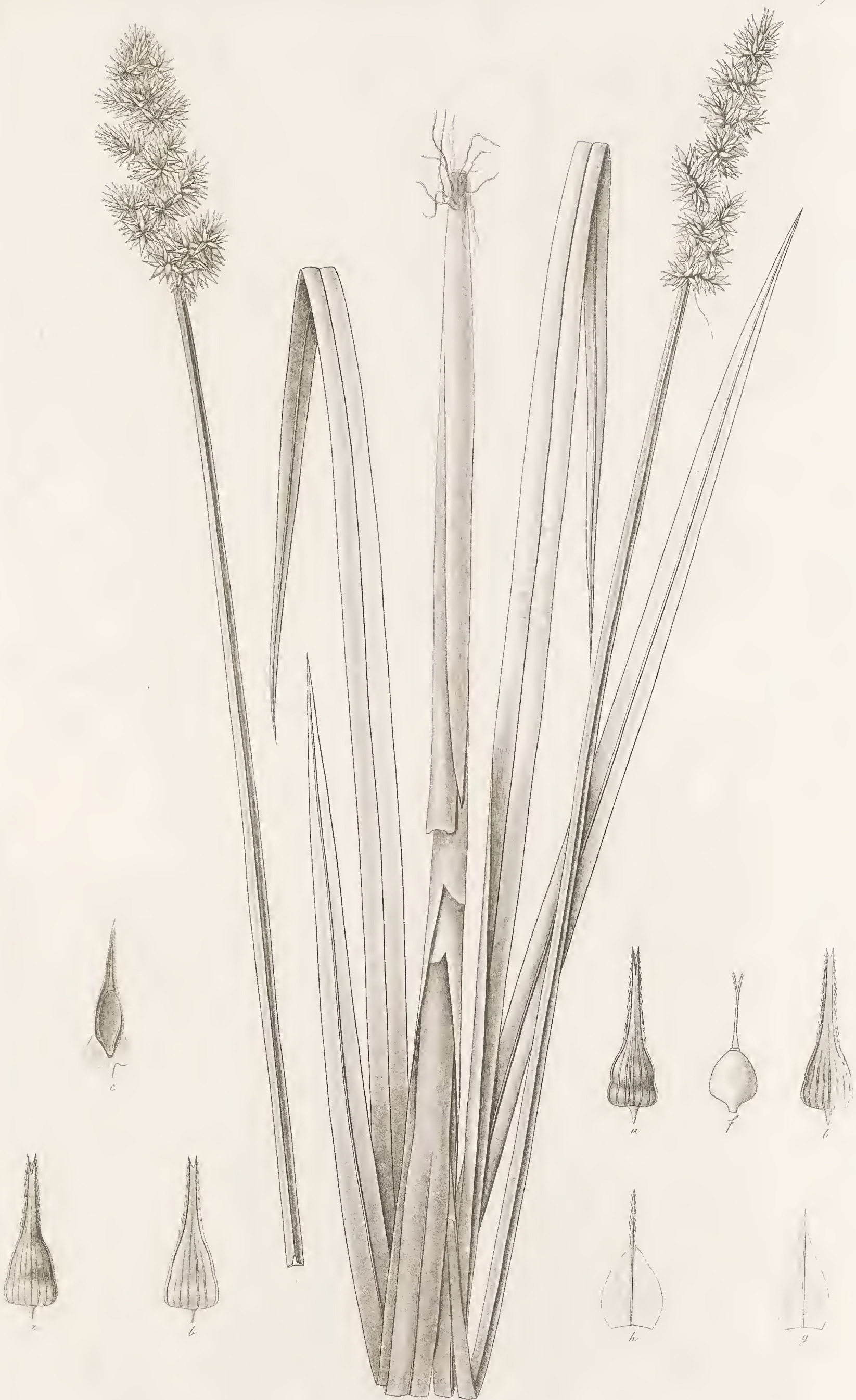
C. STRAMINEA (C. WE)





C. STRAMINEA (MEADII)





C. STIPATA







C. STIPATA V MAXIMA.

h





C. CONJUNCTA

u.





C. VULPINA.





*C. SPARGANIODES.*  
*VAR. MINOR*







C. CEPHALOIDEA.

12.





C. CEPHALOPHORA.





C. CEPHALOPHORA.





C. CEPHALOPHORA B.







C. MUHLENBERGII.





C. MUHLENBERGII B.









C. BRONGNIARTII.

F







C. BRONGNIARTII.





C. VULPINOIDEA.

11





C. VULPINOIDEA.





C. VULPINOIDEA.







*C. VULPINOIDEA.*





PULPINOIDEA.





C. VULPINOIDEA.





C. DISTICHA.







C G A Y A N A .

1  
P  
1683 (H)











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