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Notes on Carex—VI

KENNETH KENT MACKENZIE

CAREX TETANICA SCHK. AND ITS ALLIES

The above species, which is widely distributed in the north-eastern part of the United States, has been the source of some diversity of opinion among botanists who have given special attention to our species of *Carex*. Like many other species, it shows a considerable amount of variation, and the perigynia, moreover, seem unusually variable. Several varieties or allied species have been from time to time proposed. But all of these, with the exception of *Carex Woodii* Dewey and *Carex Meadii* Dewey, have with good reason been relegated to synonymy.

I have gone carefully over the original description of *Carex Woodii* Dewey, as well as studied some of the original specimens (almost unrecognizable scraps) collected by Dr. Wood in Jefferson County, New York, and preserved in the New York Botanical Garden. From this study it seems to me that the plant is best treated as a slim form of *Carex tetanica* Schk., and is not worthy of recognition.*

Carex Meadii Dewey, on the other hand, seems to be clearly worthy of recognition. It is undoubtedly closely related to *Carex tetanica*, but holds its distinctive features over a large area of country. The two species are, moreover, readily told apart in large collections of herbarium material, and good specimens which cannot be referred at once to the proper one of these two species are very few in number.

The curious point, however, in dealing with this group is that there are certain local plants apparently but little collected which

* Some old specimens in the Torrey Herbarium collected in Jefferson County, New York, by an unnamed collector and marked *Carex Woodii* are, however, *Carex colorata*, hereinafter described. It is possible that these represent *Carex Woodii*, but in the absence of any definite evidence I have preferred to regard the common slender form of *Carex tetanica* usually regarded as *Carex Woodii* as that plant. A good example of what I regard as *Carex Woodii* is a specimen collected June 17, 1902, by Rich, Williams & Fernald at Sudbury, Massachusetts.

are more worthy of separation than any of the plants already discussed. One of these plants from the region of the Great Lakes has long been in my collection under the name of *Carex tetanica* var. *Woodii* (Dewey) Bailey. Moreover, from the description and key it is without doubt the plant treated as *Carex tetanica* by Herr Kükenthal in the Pflanzenreich.† In that excellent work the key character used to separate *Carex livida* Wahl., and *Carex vaginata* Tausch from *Carex polymorpha* Muhl. and *Carex tetanica* Schk. (as there treated) is the following:

“Vaginae inferiores clare brunneae foliiferae”

“Vaginae inferiores purpureae aphyllae.”

This key works excellently and brings out very characteristic features when applied to all the species except the real *Carex tetanica*. Any one examining it will soon see that both it and *Carex Meadii* have the lower sheaths conspicuously leaf-bearing and do not have the sheaths strongly purplish tinged. On the other hand the plant of the Great Lake region above referred to does exactly answer this description. Not only is this true but it further differs from the real *Carex tetanica* in being loosely stoloniferous. The stolons are stout for the size of the plant, are strongly purplish-tinged, and very readily pulled up. Contrasted with this, *Carex tetanica* has very deep-seated slender white running rootstocks. Any one who has ever collected the plant will know how hard and tedious an undertaking it is to get to these rootstocks. In fact it is so hard that most herbarium specimens do not show them at all. The plant of the Great Lake region is evidently worthy of recognition and is therefore here proposed as

✓ ***Carex colorata* sp. nov.**

“*Carex tetanica* Schk.” Kükenthal, in Engler, Pflanzenreich 4²⁰: 514. 1909.

Culms arising in loose stools, slender, 3–5 dm. high, aphyllodipodic, strongly purplish-tinged at base, strongly stoloniferous, the stolons purplish-tinged and with loose sheaths, near the surface of the ground and readily pulled up, the culms usually noticeably

† After writing the above I was favored by Prof. Macoun with a loan of the specimens of this group from the herbarium of the Geological Survey of Canada, and found that the above statement is correct, Macoun's No. 33,639, the first specimen cited by Kükenthal under *C. tetanica*, not being that species but the species here described.

exceeding the leaves, roughened on the angles at least above, the sterile culms numerous. Leaves (not bracts) with well-developed blades usually two to four to a fertile culm, near the base but not bunched, the sheaths overlapping, rather loose, white- or yellowish-scarious opposite the blades, the ligule not prolonged, the blades flat, glabrate to minutely pubescent, the upper the larger, usually 2.5–4 mm. wide, 5–20 cm. long, strongly roughened; blades of sterile culm averaging much longer; terminal spike staminate, from but little to strongly peduncled, its peduncle smooth or little roughened, the spike linear, 1.5–3.5 cm. long, 2.5–4 mm. wide, the numerous closely appressed scales oblong-ovate, obtuse, purplish brown with green midrib and hyaline margins; pistillate spikes two or three, widely separate, erect on slender usually much exserted peduncles, the spikes linear, 1.5–3.5 cm. long, 3–4 mm. wide, loosely and alternately 6–15-flowered, the perigynia ascending; bracts leaflet-like, shorter than the culm, the sheaths 5–30 mm. long; scales obovate or ovate, obtuse or acutish, varying to acuminate or even cuspidate, wider than and about two thirds the length of mature perigynia, straw-colored or purplish brown with green midrib and hyaline margins; perigynia oblanceolate or fusiform, obtusely triangular, 3.5–4 mm. long, 1.5 mm. wide, lightly many-nerved, tapering to the base, tapering at apex into the minute slightly curving beak, 0.5 mm. long, the orifice oblique; achenes triangular, oblong, 2.5 mm. long, closely fitting the perigynia; stigmas three.

The type of the above species was collected by Mr. Charles K. Dodge at Port Huron, Michigan, on May 9, 1896, and is in my herbarium. A duplicate has been deposited in the herbarium of the New York Botanical Garden.

Other specimens of this species, all in the herbarium of the Geological Survey of Canada, except where otherwise stated, have been examined as follows:

ONTARIO: Guelph, *Klugh*, June 8, 1905 (K. K. M.); Sarnia, *Macoun* 33639, June 11, 1901 (referred by Kükenthal to *C. tetanica*); Wyoming, *Macoun* 33740, June 14, 1901; Galt, *Herriot* 63112, June 13, 1902; Belleville, *Macoun* 31974, June 15, 1862 (in part).

MICHIGAN: Michigan Agricultural College, *C. F. Wheeler*, June 5, 1900.

MANITOBA: Brandon, *Macoun* 16662, June, 1880; Grand Valley, Brandon, *Macoun* 77117, June 16, 1880.

NEW YORK: Jefferson Co. (Columbia Univ.).

The second plant referred to which seems worthy of separation is a plant of the mountains of North Carolina, distributed in considerable quantities in recent years by the Biltmore collectors. Like *Carex colorata* this species differs from *Carex tetanica* and *Carex Woodii* in not having the lower sheaths blade-bearing and in being strongly purplish-tinged at base. It, however, lacks the strong stolons so characteristic of *C. colorata*, but has stout, much interwoven and elongated rootstocks, like those of *Carex polymorpha*. In addition, it is a stout plant with broader leaf-blades. In fact it seems to be a local type characteristic of some of the higher country of North Carolina, and in honor of the institution which has distributed most of the specimens seen by me it is here proposed as

✓ ***Carex biltmoreana* sp. nov.**

Culms arising in close stools from stout elongated and interwoven rootstocks, erect, stout (3–4 mm. wide towards the base), 3–7 dm. high, aphyllopodic, strongly purplish-tinged and somewhat fibrillose at base, not strongly stoloniferous, exceeding the leaves, smooth or more or less roughened on the angles above. Leaves (not bracts) with well-developed blades usually three to five to a fertile culm, near the base but usually not bunched, the sheaths overlapping, loose, glabrate, white- or yellowish-scarious opposite the blades, the ligule often strongly prolonged, the blades flat, 3.5–5 mm. wide, usually 1–2 dm. long, very rough towards apex, the lower much smaller than the upper; terminal spike staminate, strongly rough-peduncled, linear, 2–3 cm. long, 4–5 mm. wide, the numerous closely appressed scales oblong-obovate, obtuse, purplish brown with light midrib and hyaline margins; pistillate spikes one to three, widely separate or uppermost occasionally approximate, erect, on slender usually much exserted peduncles, the spikes linear or linear-oblong, 1.5–3.5 cm. long, 4–8 mm. wide, loosely or somewhat closely flowered above, attenuate at base, the perigynia 6–20, ascending; bracts leaflet-like, shorter than the culm, the sheaths 5–30 mm. long; scales ovate, varying from obtuse to cuspidate, as wide as but rather shorter than the mature perigynia, straw-colored or purplish brown with green midrib and hyaline margins; perigynia obovoid, obtusely triangular, 2.5–3.5 mm. long, 1.5–2.25 mm. wide, many-nerved, tapering to a stipitate or substipitate base, abruptly rounded at apex and minutely beaked with abruptly bent beak or beakless, the orifice entire; achenes triangular with convex sides, broadly obovoid, 2.5 mm. long, closely fitting the perigynia; stigmas three.

The following specimens have been examined :

NORTH CAROLINA : Satula Mt. (near Highlands), Biltmore no. 2686, May 25, 1897 (type in herb. N. Y. Bot. Gard.); Macon County, Buckley (Columbia Univ.); Chimney Rock Mt., Rutherford County, Biltmore no. 268e, May 10, 1898 (N. Y. Bot. Gard.); Craggy Mt., Buncombe County, Biltmore no. 268a, May 18, 1898 (N. Y. Bot. Gard.).

The species discussed under this heading may be distinguished from one another by the following key :

- Culms phyllopodic, not strongly purplish-tinged at base, spreading by deep-seated slender white rootstocks.
 - Blades of fertile culm 2-3.5 mm. wide ; perigynia 2-3 mm. long ; spikes linear ; plant slender. *C. tetanica.*
 - Blades of fertile culm 3-7 mm. wide ; perigynia longer ; spikes oblong or linear-oblong ; plant stoutish. *C. Meadii.*
- Culms aphyllopodic, strongly purplish-tinged at base, loosely stoloniferous or with interwoven stout rootstocks.
 - Loosely stoloniferous ; culms slender ; larger blades 4 mm. wide. *C. colorata.*
 - Not loosely stoloniferous, but with interwoven stout rootstocks ; culms stout ; larger blades 5 mm. wide. *C. biltmoreana.*

CAREX RIPARIA AND ITS NORTH AMERICAN ALLIES

The common sedge which has of late years been treated in our text-books as specifically identical with *Carex riparia* Curtis of Europe was by many of our earlier writers treated as a distinct species under the name of *Carex lacustris* Willd. In the treatment of the genus *Carex* in the Pflanzenreich, Herr Kükenthal has adopted a middle course and made our plant a variety of the European plant. He has, however, clearly pointed out the marked differences which exist between the two. These differences hold good in a large series of American specimens and a considerable series of European specimens examined by me. The plants, too, do not have a circumboreal distribution, and, as is well known, there are very few American species of *Carex* not having a circumboreal distribution which are specifically identical with European species. There being these marked differences between the European and American plants and their ranges being so different I cannot understand how one can logically be treated as a variety of the other. It seems to me that the only proper way to do is to recognize the plants as distinct species, and this is what I shall do.

Briefly stated, the European *Carex riparia* is a plant with closely bunched and very thick staminate spikes, the pistillate scales are large and very conspicuously purplish-margined, the fertile culms are phyllopodic, and the lower sheaths are neither fibrillose nor strongly purplish-tinged. On the other hand, the American *Carex lacustris* has scattered slender staminate spikes, the pistillate scales are smaller and the purplish margins generally noticeably less conspicuous, the fertile culms are aphyllopodic, and the lower sheaths are strongly fibrillose and strongly purplish-tinged.

Carex lacustris, as above defined, has a range from Maine and Vermont to Delaware, Minnesota, and Iowa. In the South and West, however, its place is taken by an allied but distinct plant of wide distribution. Although this last-mentioned plant has not in general been differentiated from *Carex lacustris*, yet many years ago it was published by S. Hart Wright as a variety of *Carex riparia* under the name *Carex riparia* var. *impressa* (Bull. Torrey Club 9: 151. 1882). It has the scattered slender staminate spikes of *Carex lacustris* and its pistillate scales are even lighter-colored and with less of a purplish tinge. On the other hand it has the phyllopodic fertile culms not tinged with purplish or but little so and not fibrillose at the base, which are characters of the European *Carex riparia*. From both these species it differs also in the perigynia, which are impressed-nerved when young, but at maturity appear nerveless at a distance or on close inspection very finely impressed-nerved, in contradistinction to the strongly nerved perigynia of the other species above discussed. This plant doubtless deserves specific rank, as the following detailed description will show:

✓ ***Carex impressa*** (S. H. Wright) Mackenzie, comb. nov.

Carex riparia impressa S. H. Wright, Bull. Torrey Club 9: 151. 1882.

Culms stout, in dense clumps, 5–8 dm. high, phyllopodic, neither fibrillose nor purplish-tinged at base, stoloniferous, exceeded by the leaves, smooth or more or less roughened on the angles above. Leaves with well-developed blades usually six to twelve to a fertile culm, mostly bunched towards the base, the blades 4–7 mm. wide, sometimes as much as 4 dm. long, flattened or folded at base, nodulose, stiff, varying from smooth on both

surfaces and on the margins (towards the base) to strongly roughened on both surfaces and to almost denticulate on the margins (towards the apex), more or less glaucous, the sheaths glabrous; terminal 2-4 spikes staminate, erect, scattered, 1-4 cm. long, 3-7 mm. wide, the upper peduncled, the others sessile or nearly so, the numerous closely appressed scales oblong-obovate, acute to aristate, from straw-colored to purplish, with hyaline margins and usually lighter midrib; pistillate spikes two to four, usually widely separated, erect, short-peduncled, stout, densely flowered, oblong-cylindric, 1-7.5 cm. long, 1 cm. wide, the very numerous perigynia closely appressed, ascending, in several-many ranks; bracts leaf-like, exceeding the culms, the lower sheaths from little to strongly developed; scales ovate, the lower aristate and often exceeding the perigynia, the others gradually shorter until those in the upper part are acute and but half the length of the perigynia, straw-colored to purplish with hyaline margins and lighter center, very variable; perigynia lanceolate-ovoid, flattened but thick, 6 mm. long, 2.5 mm. wide, impressed-nerved but appearing nearly nerveless at maturity, glabrous, the walls thick and leathery, rounded at base, tapering to the short bidentate beak, the teeth erect or slightly spreading, 0.5 mm. long; achenes triangular-obovoid, 2 mm. long, 1.25 mm. wide, not filling perigynia, tipped by the persistent slightly flexuous style; stigmas three.

The following specimens have been seen:

OHIO: Green Spring, *Beardslee*, June, 1890.

INDIANA: Wells County, *Deam*; Bluffton, *Deam*, May 28, 1899.

TENNESSEE: Jackson, *S. M. Bain* 488, May 10, 1893.

MISSOURI: Courtney, Jackson County, *Bush* 702, May 23, 1894; Jackson Co., *Mackenzie* 822, April 27, 1895; Butler County, *Bush* 2554 and 2660, May 1, 1905.

KANSAS: Quindaro, *Mackenzie*, May 30, 1897; Argentine, *Mackenzie*, April 26, 1896.

INDIAN TERRITORY: Catoosa, *Bush* 1028, May 14, 1895; Sapulpa, *Bush* 957, May 9, 1895; Arkansas, *Bush* 985, May 8, 1895.

ARKANSAS: Moark, *Bush* 2609, May 3, 1905; Miller Co., *Bush* 1394, April 21, 1902; Craighead Co., *Eggert*, May 7, 1893.

TEXAS: Grand Saline, *Reverchon* 2441, April 9, 1901; Dallas, *Reverchon* 3311*, April, May; Alvin, *S. M. Tracy* 9008, April 11, 1906.

LOUISIANA: Alexandria, *Hale*.

ALABAMA: Mobile, *C. F. Baker* 1555, April 26, 1898.

GEORGIA: Riceboro, Liberty Co., *Harper 2183*, May 2, 1904.

FLORIDA: Apalachicola, *Chapman, Biltmore no. 225a*; *Chapman*, 1850.

The three species here described may be separated by the following key:

Fertile culms aphyllopodic, strongly fibrillose and purplish-tinged at base. *C. lacustris*.
Fertile culms phyllopodic, neither fibrillose nor strongly purplish tinged at base; perigynia nerved.

Staminate spikes slender, scattered; perigynia finely impressed-nerved or appearing nearly nerveless at maturity; pistillate scales not prominently purplish-margined. *C. impressa*.

Staminate spikes thick, closely approximate; perigynia strongly nerved at maturity; pistillate scales prominently purplish-margined. *C. riparia*.

NEW EASTERN SPECIES OF CAREX

Carex aestivaliformis sp. nov.

Carex gracillima × *aestivalis* Bailey, Bull. Torrey Club 20: 417. 1893.

Culms densely cespitose, slender, erect or ascending, 3.5–7 dm. high, glabrous or nearly so, sharply triangular and roughened on the angles above, exceeding the leaves, strongly purplish-tinged at base, aphyllopodic. Well-developed blades some four or five to a fertile culm, the sheaths (especially the lower) sparsely short-pubescent, the upper not overlapping; blades glabrous or sparsely pubescent and ciliate near base, rough, 2–3.5 mm. wide, the longer about 3 dm. long, flat, ascending; spikes three or four, widely separate or slightly approximate, narrowly linear, 1.5–6 cm. long, 3.5 mm. wide, the terminal gynaeceandrous, the lateral pistillate, nodding or weakly erect on long, slender, rough peduncles, the perigynia 20–40, appressed-ascending, closely packed in few ranks or loosely at base; lowest bract leaflet-like, short-sheathing, shorter or longer than inflorescence, the upper reduced; scales ovate, short-acuminate, acute or obtuse, several-nerved, green with hyaline margins, sometimes tinged with reddish brown, narrower than and about two thirds the length of the perigynia; perigynia oblong-ovoid, flattened-triangular in cross-section, deep green, glabrous, strongly several-nerved, 3–3.5 mm. long, 1.5 mm. wide, sessile and rounded at base, abruptly very short beaked, the beak 0.25 mm. long, minutely bidentate and hyaline-tipped; achenes triangular-obovoid, 2 mm. long, 0.75 mm. wide, not filling perigynia; style straight, slender; stigmas three.

The species above described has to my knowledge been collected in six localities, and each time the collector has had trouble

with it. The first collection was in an upland swale near Alcove, New York, on July 5, 1892, by C. L. Shear, and it was later found by him in two other localities in Greene County, New York. His collections were first doubtfully referred to *Carex Sullivantii* Boott, and later on were described by Professor Bailey (Bull. Torrey Club 20: 419. 1893) as a hybrid between *Carex gracillima* and *Carex aestivalis*. He, however, pointed out that there were two objections to so classifying the plant, the first being that it had characters possessed by neither of its supposed parents, and the second that *Carex aestivalis* was not known from the country where the present plant was found. Specimens now at hand from the other stations emphasize these two points, and show that the plant cannot be properly treated as it was by Professor Bailey.

The next collection was by me in a mountain meadow near Greenwood Lake, Passaic County, New Jersey, on June 23, 1907 (no. 2676). The plant was not common, but as I collected enough to make several specimens, I designate a specimen from this collection as the type of the species.

The plant has lately again been found in eastern Pennsylvania by Mr. S. S. Van Pelt (Wissahickon ravine, Philadelphia Co., east side, above Thorp's Lane, high up, July 17, 1909). Through him it was sent to the New York Botanical Garden with a request that he be informed whether it was *Carex aestivalis* or not.

As a matter of fact the plant is closest to *Carex aestivalis*, but is distinguished by the larger perigynium, which has a bidentate beak, that of *C. aestivalis* not being bidentate. From *Carex Sullivantii*, supposed to be a hybrid between *Carex pubescens* and *C. gracillima*, it is distinguished by the gynaeceandrous terminal spike, merely acute or short-acuminate scales, and somewhat narrower and less pubescent leaves. I do not know any hybrid it can represent, and, as it is certainly distinct enough, I here propose it as a species.

The southern *Carex oxylepis*, which is closely allied, has wider and generally more pubescent leaves and strongly acuminate or cuspidate scales.

✓ ***Carex fulvescens* sp. nov.**

Culms loosely cespitose from slender rather short rootstocks, erect, 2.5–4 dm. high, rather sharply triangular, smooth or slightly

roughened on the angles above, exceeding the leaves, phyllopodic, and slightly fibrillose at base. Well-developed blades about six to ten to a fertile culm, flat or somewhat folded at base, 2-3 mm. wide, 1.5 dm. long or less, erect or ascending, roughened towards the apex, the sheaths of the upper and of the bracts prolonged at the mouth and strongly tinged with chestnut-brown; staminate spike solitary, slender-peduncled, 1.5-2.5 cm. long, 2-3 mm. wide, the oblong-obovate scales closely appressed, obtuse or subacute, chestnut with white-hyaline margins and apex; pistillate spikes one or two, widely separate, erect, the upper on scarcely exerted peduncle, the lower on a strongly exerted peduncle, short-oblong or oblong, 12-20 mm. long, 7.5-10 mm. wide, closely flowered, the perigynia 15-35, spreading-ascending in several ranks; bracts strongly sheathing, the blades erect, much shorter than inflorescence; scales ovate, short, acute or obtuse, brownish chestnut with conspicuous white-hyaline apex and margins above, the center lighter-tinged, nearly as wide and nearly as long as body of perigynia; perigynia yellowish-green, narrowly elliptic, slightly inflated and suborbicular or obscurely triangular in cross-section, 5-6 mm. long, 1.5-2 mm. wide, strongly and rather closely about 10-nerved, rounded to a substipitate base, and contracted into a rough strongly bidentate beak 1.5 mm. long, the erect slender teeth smooth within; achenes triangular, oblong-obovoid, 2 mm. long, 1 mm. wide, long-tapering at base; style slender; stigmas three.

Many years ago B. D. Greene collected near Boston two species of *Carex*, which are now in the Torrey Herbarium. One of these was described by Dewey in 1836 as *Carex Greeniana* (Am. Journ. Sci. 30: 61). This name has by most subsequent authors been treated as a synonym of *Carex Hornschuchiana* Hoppe ("*Carex fulva* Good." of most authors). An examination of both the original specimen and the original description of Dewey shows that this course is erroneous. The specimen marked *Carex Greeniana* is a specimen of the European *Carex helodes* Link (*Carex laevigata* Smith) and has the long-acuminate or aristate scales of that species, in this agreeing with Dewey's description, which calls for a plant with cuspidate or mucronate scales.

The other specimen, which is marked "*Carex fulva* Good." is closely related to the European *C. Hornschuchiana* Hoppe and furnishes one of the chief reasons for attributing that species to North America, as has been done for years under the name of "*Carex fulva* Good." What *Carex fulva* Good. really is, has,

however, long been a favorite theme for discussion among European students of *Carex* (Pryor in Jour. Bot. **14**: 366; Kükenthal in Allgem. Bot. Zeits. **11**: 45), and while the older authors generally treat it and *Carex Hornschuchiana* as the same, later authors regard *C. fulva* as representing something else and have taken up the name *Carex Hornschuchiana* for what was formerly called *C. fulva*.

While closely resembling this European species, the Boston plant differs in the longer perigynia (5–6 mm. long), as compared to perigynia of about 3 mm. in length in the European species. (Kükenthal, Pflanzenreich **4**²⁰: 665, and numerous specimens examined by me.) In addition, the usually more obtuse scales are very noticeably more white-hyaline at the apex, the spikes are wider and heavier, and the sheath is generally more strongly prolonged opposite the blade and more strongly tinged with dark chestnut.

Besides the specimen collected near Boston (possibly introduced through wild fowls from further north), I have seen specimens from Anticosti (Ellis Bay, *John Macoun* 50, Sept. 7, 1883) and Miquelon (Valley of La Belle-Rivière, *Louis Arsene* 93, July 28, 1902). It is probable, too, that the reports of the occurrence of *Carex fulva* in Newfoundland arise from finding this species there.

✓ **Carex Bushii** sp. nov.

Carex hirsuta, var. *cuspidata* Dewey, Wood's Class Book 758. 1863.

Carex triceps, var. *longicuspis* Kükenthal, Pflanzenreich **4**²⁰: 431. 1909.

Culms erect, 3–6 dm. high, growing in medium-sized clumps, glabrate or somewhat pubescent, triangular, shorter than or exceeding the leaves, somewhat purplish-tinged at base. Well-developed blades three or four to a fertile culm, the sheaths short-pubescent, the upper not overlapping, blades short-pubescent (especially below), 1.5–3 mm. wide, the larger 2.5 dm. long, flat, erect-ascending, the uppermost leaf usually inserted shortly below and exceeding the spikes; spikes usually two or three, approximate, oblong or oblong-cylindric, 5–20 mm. long, 5–8 mm. wide (without the scales), the lower half of the uppermost staminate, the remainder pistillate, all erect, sessile or nearly so, densely many-flowered; bract of lowest spike slender, setaceous, some-

what to much exceeding the head; second bract when present much smaller; scales of pistillate flowers triangular-lanceolate, the middle and lower strongly rough-cuspidate, narrower than but exceeding the perigynia (usually strongly so), with green, about 3-nerved center and hyaline often brownish-tinged margins; perigynia obpyramidiform, nearly orbicular in cross-section, swollen and squarrose at maturity, tapering at base, somewhat tapering at the blunt or slightly pointed apex, glabrous, green or becoming brownish at maturity, rather strongly and coarsely ribbed, 2.5-3 mm. long, 1.5-2 mm. wide, the orifice entire or minutely emarginate; achenes strongly triangular, obovoid, large, sometimes 2.5 mm. long and 1.8 mm. wide; style persistent, bent; stigmas three.

The above species is based primarily on Mr. B. F. Bush's *no.* 2514, collected April 30, 1905, at Fulton, Arkansas, and preserved in my own herbarium, but it seems common enough, and from the descriptions there can be no doubt that the synonyms quoted above belong here. I first became acquainted with this plant in 1896 when botanizing on the prairie at Waldo Park, immediately south of Kansas City, Missouri, in company with Mr. Bush, and since then have gradually been accumulating a series of specimens. I am glad indeed to be able to associate Mr. Bush's name with the present plant, and as he seems to have collected more material of it than any other botanist it seems peculiarly appropriate to do so.

Study in recent years has shown that *Carex hirsuta* Willd. of the earlier botanists is undoubtedly an aggregate, and all modern students of the group have treated it either as containing more than one species, or as one species with several strongly marked varieties. The former course seems to me much the more scientific and is accordingly adopted here. The division here made of the old *Carex hirsuta* has been primarily based on the shape of the perigynium. In the plant of Willdenow this is much flattened, ascending, rounded at apex, and more nerved than ribbed. In the other group it is inflated, squarrose, suborbicular in cross-section, pointed at the apex, and strongly ribbed at least towards the apex. The first group is represented by *Carex hirsuta* Willd. and *Carex triceps* Michx., the former differing from the latter only in the more developed pubescence of the leaves, a character which a large series of specimens shows is of no value.

The second group is represented by *Carex caroliniana* Schwein. as well as by *Carex Bushii* here described. The large green

perigynia and strongly rough-cuspidate scales of the latter contrast strongly with the smaller brownish green perigynia and short scales of the former. For convenience these species may be keyed as follows :

- Perigynia much flattened, ascending, rounded at apex, nerved. *C. hirsuta.*
 Perigynia swollen, nearly orbicular in cross-section, squarrose, tapering at apex, coarsely ribbed.
 Perigynia 2 mm. long, brownish green; scales not rough-cuspidate. *C. caroliniana.*
 Perigynia longer, green; scales rough-cuspidate. *C. Bushii.*

Carex Bushii ranges from Rhode Island (*fide* Kükenthal) and New York to Kansas and Texas and eastward along the coast to northwestern Florida. I have seen the following specimens :

RHODE ISLAND : *Olney* (mixed).*

NEW YORK : Oneida Co., *Haberer* 1125, June 20, 1902; Washington County, *Burnham* 48, July 8, 1898 ("Grows with the species, but at once recognized as different"); Penn Yan, *Sartwell*.

PENNSYLVANIA : Lancaster County, *Carter*, June, 1893 ("very large; var.") and July 11, 1909; Nockamixon Rocks, Bucks County, *Britton*, May 30, 1893; West Chester, *Townsend*; Rockhill, Bucks County, *MacElwee* 382, June 2, 1899.

ILLINOIS : "Illinois" *Vasey* — "*Carex triceps* v. *cuspidata* Dewey"; Jefferson County, *Eggert*, May 16, 1898.

MISSOURI : St. Louis, *Riehl*, 1838; Montier, *Bush* 691, May 15, 1894; 2800, May 11, 1905; 2896, May 17, 1905; and 4670, May 24, 1907; Desoto, *Hasse*, May 24 1887; Courtney, *Bush* 1719, May 26, 1902; Waldo Park, Jackson Co., *Mackenzie*, June 10, 1896.

ARKANSAS : Little Rock, *Hasse*, May, 1885; Fulton, *Bush* 2514, April 30, 1905 (type, in herb. K. K. Mackenzie).

INDIAN TERRITORY : Sapulpa, *Bush* 1047, May 2, 1895.

KANSAS : Cherokee County, *Hitchcock* 871, 1896.

TEXAS : Lindale, *Bush* 2449, April 23, 1901; Alvin, *Tracy* 9009, April 11, 1906; Raleigh, *Reverchon* 3619, April 16, 1903; Galveston, *Plank*, April 10, 1892.

LOUISIANA : New Orleans, *Hooker*, 1827.

* The *Olney* distribution of *Carex* seems unfortunately to have become mixed, and it is not safe to rely on the specimens distributed by him in determining the range of any species.

MISSISSIPPI: Starkville, *Tracy* 1375, April 14, 1890.

FLORIDA: Walton County, *Curtiss*, 1885.

NOTES ON NOMENCLATURE

In applying the rules of nomenclature of the "American Code" to the species of *Carex* found in North America, it has been found that a considerable number of species have been known by names which are not tenable. For some of these species valid names exist but to others new names must be given, and for various reasons certain other necessary changes in names must also be made, as follows:

✓ ***Carex hirtifolia* nom. nov.**

Carex pubescens Muhl.; Willd. Sp. Pl. 4: 281. 1805. Not *C. pubescens* Poir. Voy. en Barb. 2: 254. 1789. Not *C. pubescens* Gilib. Exerc. Phyt. 2: 547. 1792.

✓ ***Carex camporum* nom. nov.**

Carex marcida Boott; Hook. Fl. Bor.-Am. 2: 212. pl. 213. 1840. Not *C. marcida* J. F. Gmel. 1791.

✓ ***Carex normalis* nom. nov.**

Carex mirabilis Dewey, Am. Journ. Sci. 30: 63. pl. Bb. f. 92. 1836. Not *C. mirabilis* Host. 1809.

✓ ***Carex glacialis* nom. nov.**

Carex pedata Wahl. Fl. Lapp. 239. pl. 14. 1812. Not *C. pedata* L. 1763.

✓ ***Carex Farwellii* (Britton) Mackenzie, comb. nov.**

Carex deflexa Farwellii Britton; Britton & Br. Ill. Fl. 1: 334. 1896.

✓ ***Carex abscondita* nom. nov.**

Carex ptychocarpa Steud. Synops. Cyper. 234. 1855. Not *C. ptychocarpa* Link. 1799.

✓ ***Carex debiliformis* nom. nov.**

Carex cinnamomea Olney, Proc. Am. Acad. 7: 396. 1868. Not *C. cinnamomea* Boott. 1846.

CAREX LASIOCARPA Ehrh. Hann. Mag. 9: 132. 1784.

"*Carex filiformis* L." Good. Trans. Linn. Soc. 2: 172, and of all American authors; not *Carex filiformis* L.

European writers have determined that the name *Carex filiformis* L. is not applicable to the plant which has so generally borne the name, but is properly applicable to *Carex tomentosa* L. Accordingly they now apply the name *Carex lasiocarpa* Ehrh. to the plant heretofore known as *Carex filiformis* L.—a course which is here followed. The description and locality of the plant of Linnaeus do not apply to the plant treated by authors as *Carex filiformis*, although there is a specimen of this plant in the Linnæan herbarium so named. See on this point Kükenthal, Pflanzenreich 4²⁰: 748.

CAREX LEERSII Willd. Prodr. Fl. Berol. 28. 1787

Carex stellulata Good. Trans. Linn. Soc. 2: 144. 1794.

Carex sterilis Willd. Sp. Pl. 4: 208 (in greater part). 1805.

CAREX SPRENGELII Dew.; Spreng. Syst. 3: 827. 1826

Carex longirostris Torr.; Schwein. Ann. Lyc. N. Y. 1: 71. 1824.

Not *C. longirostris* Krock. 1814.

CAREX BARRATTII Schw. & Torr. Ann. Lyc. N. Y. 1: 361.
1825

Carex littoralis Schwein. Ann. Lyc. N. Y. 1: 70. 1824. Not *C. littoralis* Krock. 1814.

✓ **Carex Howeii** nom. nov.

Carex interior, var. *capillacea* Bailey, Bull. Torrey Club 20: 426. 1893.

Carex delicatula Bicknell, Bull. Torrey Club 35: 495. 3 N 1908.

Not *C. delicatula* C. B. Clarke, Kew Bull. Misc. Inf. Add. Ser. 8: 79. 18 Au 1908.

Named in honor of the late Dr. E. C. Howe, a careful student of the difficult group to which this species belongs.

CAREX ATHERODES Spreng. Syst. 3: 828. 1826

Carex aristata R. Br. in Frankl. Narr. Journ. Bot. App. 36. 1823. Not *C. aristata* Honck. 1792. Not *C. aristata* Clairv. 1811.

✓ **Carex rhomalea** (Fernald) Mackenzie, comb. nov.

Carex saxatilis, var. *rhomalea* Fernald, *Rhodora* 3: 50. 1901.

CAREX LACHENALII Schk. Riedgr. 51. *pl. y. f.* 79. 1801.

Carex lagopina Wahl. Kongl. Vet.-Acad. Handl. 24: 145. 1803.

✓ **Carex mesochorea** nom. nov.

Carex mediterranea Mackenzie, Bull. Torrey Club 33: 441. 1906.

Not *C. mediterranea* C. B. Clarke. 1896.

✓ **Carex aggregata** nom. nov.

Carex agglomerata Mackenzie, Bull. Torrey Club 33: 442. 1906.

Not *C. agglomerata* C. B. Clarke. 1903.

✓ **Carex amphigena** (Fernald) Mackenzie, comb. nov.

Carex glareosa, var. *amphigena* Fernald, *Rhodora* 8: 47. 1906.

CAREX ANNECTENS Bicknell, Bull. Torrey Club 35: 492. 1908.

Carex xanthocarpa Bicknell, Bull. Torrey Club 23: 22. 1896.

Not *C. xanthocarpa* Degl. 1807.

Carex xanthocarpa annectens Bicknell, Bull. Torrey Club 23: 22. 1896.

✓ **Carex Swanii** (Fernald) Mackenzie, comb. nov.

Carex virescens, var. *minima* Barratt; Bailey, Mem. Torrey Club 1: 77. 1889. Not *Carex minima* Boullu. 1878).

Carex virescens, var. *Swanii* Fernald, *Rhodora* 8: 183. 1906.

"*Carex virescens* Muhl." Britton & Br. Ill. Fl. 1: 316. *f.* 743. 1896, and of other recent writers.

Common in the northeastern part of the United States are two closely related sedges, one or the other of which has been treated as *Carex virescens* Muhl. by authors who have had occasion to deal with them. Unfortunately, there has been considerable diversity of opinion as to which plant should bear the name, and the facts on which the question must be decided seem somewhat contradictory. So much is this so that Professor Fernald (*Rhodora* 8: 182, 183) and Mr. Bicknell (Bull. Torrey Club 35: 488, 489) have reached opposite conclusions.

Before taking up the literature on the subject, it is necessary to obtain a clear idea of the two species, and this is all the more requisite because there are certain distinctions between them, not always emphasized, which help materially to clear up the difficulty.

The first of the species referred to is a tall slender plant strongly reddened at base, generally 4–7 dm. high with the culms much exceeding the leaves. The uppermost stem leaf is usually inserted 2–3 dm. below the spikes, but occasionally at a less distance. The lowest bract is leaflet-like, 0.5–2 mm. wide, and somewhat exceeding the spikes. The spikes themselves are two to four in number, linear-cylindric, 12–35 mm. long, and 2.5–4 mm. wide. The perigynia are oblong-elliptic, round-tapering at apex, and generally strongly costate. This last character is, however, variable and the ribs at times are even less prominent than in the other plant. The perigynia too, especially towards the base of the terminal spike, are apt to become broadly obovoid and rounded at apex.

The second plant is also slender but much lower (2–5 dm. high). The reddening at base is rarely much developed, and the culms are exceeded by the leaves. The uppermost stem-leaf is usually inserted 3 cm. below the spikes, but occasionally as much as 12 cm. The lowest bract is very narrow (0.5 mm. wide) and about twice exceeds the uppermost spike. The spikes are oblong-cylindric, 5–20 mm. long and 3–5 mm. wide. The perigynia are broadly obovoid, rounded at apex and from little to markedly costate.

These two plants are perfectly distinct and I have been able to discover little warrant for the statement that there are “numerous transitional specimens.” Undeveloped specimens are at times hard to place but this is true in all groups of critical species.

Following Professor Bailey, the second plant above described has of late years been treated as *Carex virescens*. His treatment was based on the fact that in studying the types of *Carex* in European herbaria he had occasion to look up the plant under discussion in the Willdenow herbarium. He says of the specimen found there: “a slender and short-spiked form. *C. triceps* var. *hirsuta* Bailey is also on the same sheet, but the description applies to *C. virescens*” (Mem. Torrey Club 1:60, also 76, 77, and 78). In

other words, there has evidently been some confusion of specimens in this case as in others, and one is not justified in accepting the sheet in the Willdenow herbarium as containing the type of *Carex virescens* unless the specimen there accords with the description.

Turning to the description it will certainly be admitted that a short-spiked form does not answer to a description which calls as in the present case for a linear spike, and, this being so, our only safe course is to study the original description and ignore the plant in the Willdenow herbarium.

Like a number of other Carices described by Muhlenberg, *Carex virescens* was published first in Willdenow's *Species Plantarum* (4: 251) in 1805, and secondly in Schkuhr's *Riedgraser Nachtr.* (45) in 1806. The descriptions are practically identical, but the second is accompanied by a plate (*Mmm. f. 147*). The description reads:

"C. spica androgyna lineari pedunculata inferne mascula, femineis subapproximatis binis subpedunculatis linearibus, fructibus globoso-triquetris obtusis pubescentibus. . . . Capsula[e] maturae virides subnervosae pubescentes."

The plate shows a young plant with the uppermost stem-leaf inserted much below the spikes and a broad (comparatively) lower bract somewhat exceeding the spikes. A more mature specimen is also shown with the same kind of lower bract and *strongly costate* perigynia round-tapering at apex. The spikes in both cases are shown to be linear-cylindric. Both these figures seem to me to represent the larger of the two plants under discussion. There are also figured separately obovoid perigynia without ribs on one-half but ribbed on the other half. The draftsman apparently here attempted to give a side view so as to show the nerveless inner surface of the perigynia and the nerved outer surface at the same time. The result is an uncharacteristic drawing, but there is nothing about it inconsistent with the same reference as the rest of the plate.

The plate and the description calling for a linear spike both answer then to our larger plant, and I feel justified in following Professor Fernald in so treating it. I do not, however, think that the identity of the smaller plant should be obscured by treating it as a variety. Accordingly, I have here used Professor Fernald's

varietal name as a specific one, the earlier varietal name of Barratt having already been used for a species.

CAREX RECTA Boott, Hook. Fl. Bor.-Am. 2: 220.

pl. 222. 1840

Carex salina, var. *kattgatensis* (Fries) Alm. in Hartm. Handb. Scand. Fl. 466. 1879. [ed. 11.]

"*Carex cuspidata* Wahl." Britton & Br. Ill. Fl. 1: 311. 1896.

"*Carex salina*, var. *cuspidata* Wahl." Gray's Manual 230. 1908. [ed. 7.]

In dealing with the various closely allied plants which by some authors have been treated as species and by others as varieties of *Carex salina* Wahl., the latest author to study the group (Kükenthal, Pflanzenreich 4²⁰: 361-363) has pointed out that the name *Carex cuspidata* Wahl. is not applicable to the plant found on the northeastern coast of this continent. The name to be taken up for this plant is *Carex recta* Boott, or if one prefers a varietal name the pleasant-sounding name given in the synonymy above is open to him.

In this connection it may be pointed out that *Carex lanceata* Dewey (Am. Journ. Sci. 29: 249), referred by Kükenthal, following Boott, to *Carex salina* as a variety, is probably a mixture of *Carex livida* (Wahl.) Willd. and *Carex salina* Wahl. The original collection in the Torrey herbarium is mixed and contains both species, and the description applies in part to both species, while Dewey compares the species to his *Carex Grayana* (a synonym of *Carex livida*). The plate (a poor one) is of *Carex salina*, but it does not agree with the description.

CAREX ATLANTICA Bailey, Bull. Torrey Club 20: 425. 1893

In Professor Fernald's very able paper on the Northeastern Carices of the Section Hyparrhenae (Proc. Am. Acad. 38: 447 *et seq.*) there is very little to which one can take exception, but on the contrary a careful study of the group treated leaves one very largely in accord with the treatment given. However, in identifying *Carex sterilis* Willd. with *C. atlantica* Bailey it seems to the present writer that a mistake was made. The grounds for this view are the following:

(1) Both Willdenow and Schkuhr in their descriptions lay particular stress on the dioecious character of the spikes of the plant described by them, and in fact the name is taken from this character. *Carex atlantica* never to my knowledge shows this character, while on the other hand forms of *Carex Leersii* (*Carex stellulata*) do.

(2) *Carex atlantica* is a species of the coastal plain and is very rarely found inland. *Carex sterilis* was collected in Pennsylvania, probably near Lancaster, in a region where forms of *Carex Leersii* are very abundant.

The reason advanced by Professor Fernald for identifying *Carex sterilis* with *Carex atlantica* is chiefly that some of the original material has a broad and short-beaked perigynium as compared with the narrower and long-beaked perigynium of *Carex Leersii*. In this, however, this material agrees also with the recently described *Carex incompta* Bicknell — a plant which, undoubtedly, is found around Lancaster, Pennsylvania, as it is not confined to the coastal plain.

Schkuhr's figure is based partly on young plants showing the dioecious character from which the name is taken and which should therefore be regarded as the type of the species, and partly on more mature plants showing broad short-beaked perigynia. The former seem to me to answer only to *Carex Leersii*, while the latter seem to me more probably referable to *C. incompta* than to *C. atlantica*. Under the circumstances I would treat *Carex sterilis*, as a synonym of *Carex Leersii*, and maintain *Carex atlantica* and *C. incompta* as valid species.