THE CYPERACEAE OF ILLINOIS

ROBERT H. MOHLENBROCK
Southern Illinois University, Carbondale

ABSTRACT.—This is a continuation of the Cyperaceae of Illinois (Parts I - VII, Am. Midl. Nat. vols. 63, 67, 69, 70). Five species of *Eriophorum*, 7 of *Rhynchospora*, 1 of *Cladium*, and 4 of *Scleria* are treated. Keys, descriptions, and discussions are included.

This paper is a continuation of the Cyperaceae of Illinois. Other parts in this series, all in the American Midland Naturalist, have been: I. *Cyperus* 63:270-306, 1960. II. *Dulichium* 67:398, 1962. III. *Eleocharis* 67:398-423, 1962. IV. *Bulbostylis* 69:441-444, 1963. V. *Fimbristylis* 69:444-452, 1963. VI. *Lipocarpha* 69:452-455, 1963. VII. *Scirpus* 70:1-46, 1963.

Two species of *Fuirena* have been attributed to Illinois — *F. pumila* Torr. by Fernald (1950) and *F. squarrosa* Michx. from Union County by Patterson (1876). No specimens could be found.

VIII. ERIOPHORUM

Eriophorum is a Linnean genus of primarily northern, bog-inhabiting species. The first report of *Eriophorum* in Illinois was by Engelmann (1843) when he listed *E. angustifolium* and *E. gracile*.

With the exception of *E. angustifolium*, which is known from nine counties, the Illinois species of *Eriophorum* are exceedingly rare, being known only from one or two counties. All five species are confined to the northern third of the State.

MORPHOLOGY OF THE SPECIES

The species of *Eriophorum* in Illinois are slender or rather robust, usually tufted perennials, with terete or angular stems. The stems, which are glabrous or scabrous, may attain a height of about one meter in *E. virginicum*. The leaves are usually flat at the base, becoming triangular-channeled to nearly conduplicate near the subulate tip. Sometimes the leaves are channeled throughout. The margins are often scabrous.

There are 1-5 erect or spreading involucral bracts which are frequently reddish or purplish near the base. They range from 1-12 cm long.

Although species with single spikelets occur in the genus, only species with 2-30 spikelets occur in Illinois. The spikelets are borne on glabrous, scabrous, or puberulent peduncles. The acute or obtuse scales are castaneous, greenish, or lead-colored. They elongate during anthesis. There are 1-3 stamens and a 3-cleft style.

The sharply trigonous achene is 1.5-4.0 mm long and usually apiculate. The numerous, naked bristles are white or cream and greatly elongated in fruit, forming the conspicuous "cotton-heads."

SYSTEMATIC TREATMENT

Eriophorum L. Sp. Pl. 52. 1753.

Key to the Illinois Species of *Eriophorum*

1. Leaves 0.5-1.5 mm wide, channeled throughout; involucral bract 1.
   2. Culms glabrous throughout; sheath of leaf longer than blade; achene 1.5-2.0 mm long..... .....1. *E. gracile*
   2. Culms scabrous above; sheath of leaf shorter than blade; achene 2.5-3.0 mm long....2. *E. tenellum*
1. Leaves 1.5-8.0 mm wide, channeled only above the middle; involucral bracts 2-5.

3. Stamens 3; scales one-nerved.
   4. Peduncles glabrous; anthers 2.5-5.0 mm long ....3. *E. angustifolium*
   4. Peduncles puberulent; anthers 1.0-1.5 mm long..... .....4. *E. viridicarinatum*
3. Stamen 1; scales several-nerved.. .....5. *E. virginicum*

1. *Eriophorum gracile* Koch ex Roth, Cat. Bot. 2:259. 1800.

Very slender perennial with glabrous, terete culms to 60 cm tall; leaves channeled throughout, to 4 cm long, 1.5 mm broad, rounded at the apex, the uppermost sheath longer than the blade; involucral bract 1, erect, channeled throughout, 1-2 cm long, dark gray to black at base; spikelets 2-5 (-6) on slender, puberulent peduncles up to 3 cm long, the spikelets elliptic to ovoid, 7-10 mm long in flower, 12-18 mm long in fruit; scales lead-colored or blackish, obtuse or subacute; anthers 1.2-2.0 mm long; achenes 1.5-2.0 mm long; bristles numerous, white.

Habitat.—Bogs.

Range.—Labrador to Alaska, south to California, Illinois, and Delaware; Europe; Asia.

This species, because of its terete stems, its elongate leaf-sheaths, its blackish scales, and its smaller spikelets and achenes, can be separated rather easily from *E. tenellum*.

The only two records of this species' occurrence in Illinois were during the nineteenth century.

Specimens Examined.—Peoria Co.: Peoria *Brendel s.n.* (ILL). Northern Illinois, *Vasey 18642* (ILL).

2. *Eriophorum tenellum* Nutt. Gen. Am. 2 Add. 1818.

Eriophorum gracile var. *paucinervum* Engelm. in Am. Journ. Sci. 45:105. 1846.

Eriophorum paucinervum (Engelm.) A. A. Eaton, in Bull. Torr. Club 25: 341. 1898.

Slender perennial with angled, scabrous (at least above) culms to 80 cm tall; leaves channeled throughout, to 15 cm long, 1.5 mm broad, subulate, the uppermost sheath shorter than the blade; involucral bract 1, channeled throughout, to 6 cm long, usually reddish-brown near its base; spikelets 2-7, on scrabrous peduncles to 2 cm long, the spikelets 1.2-1.7 cm long in flower, 2.0-3.0 cm long in fruit; scales greenish or reddish-brown, more or less obtuse; anthers 1-2 mm long; achenes 2.5-3.1 mm long, apiculate; bristles numerous, white.

Habitat.—Bogs.

Range.—Newfoundland to Saskatchewan, south to Minnesota, Illinois, and New Jersey.

Engelmann segregated this species as a variety of *E. gracile* with inconspicuous nerves on the scales. Eaton elevated Engelmann's variety to species rank, but the material on which it is based is identical with *E. tenellum*.

This species, which probably no longer grows in Illinois, was found a single time during the nineteenth century in a bog in Cass County. *Evers 34911* from Volo, Lake County, labeled *E. tenellum*, actually is *Rhynchospora alba*.

Specimen Examined.—Cass Co.: Beardstown, *Geyer s.n.* (ILL).

3. *Eriophorum angustifolium* Honck. Vergz. Gew. Teutschl. 153. 1782.

Eriophorum polystachion L. Sp. Pl. 52. 1753, nomen confusum.

Eriophorum angustifolium var. *majus* Schultz, Fl. Starg. Suppl. 5. 1819.

Eriophorum polystachion var. *elatius* Babington, Man. Brit. Bot. 333. 1843.

Rather robust, tufted perennial with angled, glabrous culms to 8.0 cm tall; leaves channeled in the upper half, flattened below, 3.5-7.5 mm wide, with scrabrous margins; involucral bracts 2-3, flattened below, more or less channeled above, purple near the base; spikelets 2-10, on glabrous peduncles to 5.5 cm long, the spikelets ovoid, 1-2 cm long in flower, 2.5-5.0 cm long in fruit; scales lead-colored to castaneous, acute; anthers 2.5-5.0 mm long; achenes 2.5-3.5 mm long, apiculate; bristles numerous, white.

Habitat.—Bogs.

Range.—Newfoundland to Alaska, south to Oregon, New Mexico, Illinois, and Massachusetts; Europe; Asia.

The Linnean binomial *E. polystachion*, long a source of confusion, has been rejected as a *nomen confusum*.

Our specimens, with a rather robust stature and with leaves 3.5-7.5 mm wide, have been distinguished as var. *majus*.

The glabrous peduncles, purple-based bracts, and large anthers differentiate this species from *E. viridicarinatum*.

This species, known from nine northern counties, is the only *Eriophorum* which has been collected in more than two counties.

Specimens Examined.—Boone Co.: 3 miles N. of Capron, *Fell & Fell f46339* (ILL, ISM). Cook Co.: 2 miles S. of Barrington, *Steyermark 63513* (ILL).

Kane Co.: Elgin, *Sherff 3055* (F). Lake Co.: Illinois Beach State Park, *Winterringer 10907* (ISM). Lee Co.: S. of Amboy, *V. Chase 11999* (F). McHenry Co.: McHenry, *Benke 4062* (F). Peoria Co.: Peoria, *Brendel s.n.* (ILL). Winnebago Co.: Fountaindale, *Bebb 5* (ISM). Woodford Co.: Upper Ferry, *McDonald s.n.* (ILL).

4. *Eriophorum viridicarinatum* (Engelm.) Fern. in Rhodora 7:89. 1905.

Eriophorum latifolium var. *viridicarinatum* Engelm. in Am. Journ. Sci. 46: 103. 1843.

Eriophorum polystachyon var. *latifolium* A. Gray, Man. Bot. 529. 1848.

Slender, tufted perennial with triangular, glabrous culms to 75 cm tall; leaves channeled at the apex, to 6 mm wide; involucral bracts 2-4, channeled only at the tip, green or pale brown at the base; spikelets (2-) 3-25, on puberulent peduncles to 6 cm long, the spikelets elliptic-ovoid, 6-10 mm long in flower, 15-30 mm long in fruit; scales green or occasionally lead-colored, sometimes mucronulate; anthers 1.0-1.3 mm long; achenes 2.0-3.5 mm long, apiculate; bristles numerous, cream.

Habitat.—Swamps and bogs.

Range. Labrador to Alaska, south to British Columbia, Wyoming, Iowa, and New York.

The usually green scales account for the derivation of the epithet, but specimens with lead-colored scales are known. These latter greatly resemble *E. angustifolium.*

Specimens Examined.—Lake Co.: Illinois Beach State Park, *Haynie s.n.* (F). Rock Island Co.: Port Byron, *Harper s.n.* (WIS).

5. *Eriophorum virginicum* L. Sp. Pl. 52. 1753.

Slender, but firm, perennial with glabrous culms to nearly a meter tall; leaves channeled only at the tip, to 4 mm wide; involucral bracts 2-5, spreading, channeled at the tip, to 10 cm long; spikelets up to 20, crowded in a glomerule, ellipsoid, 6-10 mm long in flower, up to 20 mm long in fruit; scales stramineous or green with brownish margins, acute, several-nerved; stamen 1; anther 1.2-1.5 mm long; achene 3-4 mm long; bristles tawny or white.

Habitat.—Bogs.

Range.—Labrador to Manitoba, south to Nebraska and Florida.

The several-nerved green scales, the single stamen, and the tawny bristles characterize this species. Specimens with white bristles, such as *Hill s.n.* from Long Lake, Lake County, have been designated *f. album* (Gray) Wieg.

Specimens Examined.—Lake Co.: Grant Township, *Hill 114.1908* (ILL); Volo bog, *McDougall 283* (ILL); Lake Villa, *Gleason & Shobe 117* (F), *254* (F); E. of Antioch, *Evers 8287* (ILLS).

IX. Rhynchospora

Rhynchospora is a cyperaceous genus readily recognized by the conspicuous style persistent on the achene in the form of a beak. This accounts for the common name of beaked rush. The presence of this persistent style relates *Rhynchospora* to *Bulbostylis.*

Vahl first segregated *Rhynchospora* as a genus in 1806, transferring several species originally described in *Schoenus.*

The first report of a species of *Rhynchospora* in Illinois was by Vasey in 1860 when he attributed *R. capillacea* from Lake County. Patterson listed five species from Illinois in 1876—*R. alba, R. capillacea, R. glomerata* (= *R. capitellata*), *R. corniculata,* and *R. cymosa* (=*R. globularis*). Bailey and Swayne added a sixth species (*R. glomerata*) in 1951, and Mohlenbrock, Ozment, and Folkerts reported *R. macrostachya* in 1962.

The most comprehensive treatment of *Rhynchospora* for North America was by Gale (1944). Gale's treatment has been followed by Fernald (1950) in the Eighth Edition of Gray's Manual.

Morphology of the Genus

The species of *Rhynchospora* are slender or robust perennials with bulbous bases. The culms may attain a height of 2 meters (*R. corniculata*). The species are invariably glabrous.

The leaves may be capillary or as broad as 20 mm. Occasionally the leaves are scabrerulous along the margins.

The inflorescence, which may be a meter long, is composed of glomerules of spikelets. The spikelets are usually a dark reddish-brown, except in *R. alba* where they are whitish or light brown. The spikelets may be either sessile or pedicellate. They may be as long as 2.8 cm (*R. macrostachya*). Lowermost scales are usually sterile, while the uppermost occasionally bear imperfect flowers. There are usually three stamens.

The achene may be lenticular, globose, or flattened (in *R. macrostachya*) and is crowned by a beak which is the persistent style-base (which distinguishes this genus from *Cladium*). The achenes may be smooth and lustrous or rugulose.

The beak ranges from 0.3-5.4 mm long. It may be smooth or serrulate. The bristles, which represent the perianth, are smooth, antrorsely hairy, or retrorsely hairy. They are 3-14 in number and may be longer or shorter than the achene.

Ecology and Geograhpy

All species of *Rhynchospora* in Illinois are limited to boggy, marshy, or swampy situations. None of the seven can be considered abundant, since *R. corniculata*, the most common one, is known only from seven counties.

The two robust species, *R. corniculata* and *R. macrostachya*, basically are southern in their American distribution and, hence, are limited in Illinois to the extreme southern counties. *Rhynchospora alba*, *R. capillacea*, and *R. globularis* are distinctly northern and are known only from the northeastern counties.

Rhynchospora capitellata and *R. glomerata*, which have a range throughout eastern United States, occur at both the northern and southern extremities of Illinois, even though they are very rare.

Systematic Treatment

Rhynchospora Vahl, Enum. 2:229. 1806.

Key to the Illinois Species of *Rhynchospora*

1. Leaves 6-20 mm broad; achene 4.7-5.5 mm long, 2.5-3.0 mm broad; beak 12-20 mm long.
    2. At least one of the usually 6 bristles longer than the achene..... .....1. *R. macrostachya*
    2. None of the usually 3-5 bristles longer than the achene..... .....2. *R. corniculata*
1. Leaves 0.3-6.0 mm (7.0 rarely in *R. glomerata*); achene 1.2-2.6 mm long, 0.8-1.6 mm broad; beak 0.3-1.8 mm long.
    3. Bristles antrorsely hairy, rarely smooth or entirely lacking; tubercle 0.3-0.6 mm high, broadly deltoid.....3. *R. globularis*
    3. Bristles retrorsely hairy, rarely smooth; tubercle 0.6-1.8 mm long, conical.
        4. Spikelets lanceoloid; bristles 3.6-4.3 mm long; leaves capillary, at most 0.4 mm broad.....4. *R. capillacea*
        4. Spikelets ovoid to lanceovoid; bristles 2.0-3.5 mm long (occasionally to 4.0 mm long in *R. glomerata*); leaves 0.5-7.0 mm broad.
            5. Achene with a conspicuous margin, smooth.
                6. Achene 1.2-1.4 mm wide, with broad shoulders; bristles 3-4 mm long..... .....5. *R. glomerata*
                6. Achene 0.8-1.2 mm wide, pyriform; bristles 2.0-2.8 mm long.. .....6. *R. capitellata*
            5. Achene emarginate, or nearly so, slightly rugulose.....7. *R. alba*

1. *Rhynchospora macrostachya* Torr. ex A. Gray, in Ann. Lyc. N. Y. 3:206. 1835.

Robust perennial with bulbous-thickened base; culms to 1 meter tall, glabrous; leaves 0.6-1.2 cm broad, glabrous, the sheaths glabrous; inflorescence 0.6-1.0 m long, stiffly ascending, the terminal glomerules sessile or on stalks to 4 mm long; spikelets 7-45 in a glomerule, reddish-brown, 1.5-2.8 cm long; scales elliptic-lanceolate, subacute; achenes obovoid, flattened on the faces, short-stipitate, 4.7-5.4 mm long, 2.5-3.0 mm broad; beak subulate, serrulate, 1.5-2.0 cm long, 1-2 mm broad at base; bristles (4-) 6, antrorsely hairy, at least some of them 1 cm long or longer.

Habitat.—Swampy woods and ditches.

Range.—Maine to Kansas, south to Texas and Florida.

This is the most recent species of *Rhynchospora* to be added to the Illinois flora. A single, small colony occurring in a swampy roadside ditch north of Pulaski represents the only Illinois station.

Much similarity exists between *R. macrostachya* and *R. corniculata*, but the latter is more robust (up to 2 meters tall) and has bristles which never exceed the achene. These two species comprice Section Calyptrostylis.

Specimen Examined.—Pulaski Co.: N. of Pulaski, *Mohlenbrock & Voigt 5742* (SIU).

2. *Rhynchospora corniculata* (Lam.) Gray, in Ann. Lyc. N. Y. 3:205. 1835.

Schoenus corniculatus Lam. Tabl. Encycl. 1:137. 1791.

Rhynchospora corniculata var. *interior* Fern. in Rhodora 20:140. 1918.

Robust perennial with swollen base; culm stout, erect, to nearly 2 m tall; leaves several, to 20 mm broad, with smooth or scabrerulous margins; inflorescence much branched, often nearly 1 m long; glomerules with 4-10 flowers; achenes (in our area) 4.7-5.5 mm long, 2.6-3.0 mm broad; beak 12-18 mm long, the base two-thirds to nearly equalling the width of the summit of the achene; bristles 3-5, shorter than the achene or with 1 bristle longer than the achene.

Fernald maintains that plants of the Mississippi Valley, because of their smaller achenes and enlarged beak base, should be segregated as var. *interior* Fern. Complete overlapping in both the length and the width of the achenes makes it impossible to separate these taxa. The ratio of beak base width to achene summit width follows a clinal gradient from the Coastal Plain up the Mississippi Valley and offers no possible point of separation.

Habitat.—Swamps and low roadside ditches.

Range.—Delaware to Missouri, south to Texas and Florida.

In Illinois, this species has been found in seven extreme southern counties. Its northernmost station is in a low roadside ditch one mile north of Howardton in Jackson County. A report of this species from Gallatin County could not be verified.

The first mention of this species from Illinois was by Patterson in 1876.

Specimens Examined.—Alexander Co.: E. of Olive Branch, *Winterringer 3453* (ILL, ISM). Jackson Co.: 4 miles S. of Gorham, *Winterringer 5555* (ISM). Johnson Co.: 1 mile W. of West Vienna, *Mohlenbrock 14212* (SIU). Pulaski Co.: 4 miles S. of Ullin, *Winterringer 10722* (ISM). Massac Co.: Mermet Lake, *Mohlenbrock s.n.* (SIU). Saline Co.: Cottonwood Pond, *Bailey & Swayne 2843* (ISM, SIU). Union Co.: Near Lick Creek, *Mohlenbrock s.n.* (SIU).

3. *Rhynchospora globularis* (Chapm.) Small, Man. S. E. Fl. 184. 1933.

Rhynchospora cymosa var. *globularis* Chapm. Fl. So. U. S. 525. 1860.

Rhynchospora globularis var. *recognita* Gale, in Rhodora 46:245. 1944.

Tufted perennial with slender, glabrous culms to 50 cm tall (in Illinois); leaves 2-5 mm long, the sheaths glabrous; inflorescence cymose, the terminal glomerules 5-10 mm broad; spikelets crowded 2.5-4.0 mm long; scales suborbicular, obtuse, occasionally mucronulate; achenes obovoid to suborbicular, transversely marked, frequently rugulose, 1.3-1.6 mm long, slightly narrower; beak merely deltoid, 0.3-0.6 mm long; bristles tiny, much shorter than the achenes, antrorsely hairy.

Habitat.—Moist, sandy soil.

Range.—New Jersey to Missouri, south to Texas and Florida; California; Central America; West Indies.

This is the only slender species of *Rhynchospora* in Illinois with antrorsely hairy bristles.

The Illinois specimen has been referred to as var. *recognita*. There may be some justification in recognizing this variant from var. *globularis*. Table I summarizes the differences.

TABLE I. Summary of major differences between *R. globularis* var. *globularis* and *R. globularis* var. *recognita*.

	var. *globularis*	var. *recognita*
Leaf Width	1-2 mm	2-5 mm
Glomerule Diameter	3-8 mm	5-10 mm
Achene Length	1-1.3 mm	1.3-1.6 mm
Beak Length	0.3 mm	0.3-0.6 mm

Only a single Illinois county is known.

Specimen Examined.—Kankakee Co.: 9 miles E. of St. Anne, *Schneider 1656* (F).

4. *Rhynchospora capillacea* Torr. Fl. N. & Mid. States 55. 1823.

Rhynchospora capillacea var. *leviseta* E. J. Hill, in Am. Nat. 10:370. 1876.

Cespitose perennial with capillary culms to 40 cm tall; leaves filiform to linear, involute, to 0.4 mm wide; glomerules usually 2, the terminal with 2-10

spikelets, the lateral with 1-4 spikelets; spikelets sessile or nearly so; achenes oblong-obovoid, stipitate, 1.7-2.4 mm long, 0.9-1.4 mm broad (in our specimens); beak 0.8-1.5 mm long, the base about two-thirds as wide as the summit of the achene; bristles 6, longer than the achene, retrorsely hairy or smooth.

Habitat.—In bogs and marshes.

Range.—Newfoundland to Saskatchewan, south to Missouri and Virginia.

The slender spikelets and the capillary leaves distinguish this unusual Illinois species.

Specimens with glabrous bristles have been segregated as f. *leviseta*. These include *Swink 528* (ISM), *Bennett s.n.* (ILL), and *Hill 2925* (ILL), all from Illinois Beach State Park, Lake County.

The St. Clair County station, collected from by Brendel in the mid-nineteenth century, is probably extinct.

Specimens Examined.—Cook Co.: S. of Thornton, *Winterringer 16460* (ISM). Kane Co.: Elgin, *Fuller 9299a* (ISM). Lake Co.: Illinois Beach State Park, *Winterringer 8984* (ISM). St. Clair Co.: Without locality, *Brendel s.n.* (ILL).

5. *Rhynchospora glomerata* (L.) Vahl, Enum. 2:234. 1806.

Schoenus glomeratus L. Sp. Pl. 441. 1753.

Cespitose perennial with rather slender culms to 1.5 m tall; leaves linear to linear-lanceolate, 3-6 (-7) mm wide; spikelets subsessile, 4.5-6.5 mm long; achenes suborbicular, with broad "shoulders" and a prominent margin, lustrous, 1.5-1.8 mm long, 1.2-1.4 mm broad; beak 1.2-1.8 mm long, the base about one-half as broad as the summit of the achene; bristles usually 6, retrorsely hairy, 3-4 mm long.

Habitat.—Moist, often sandy soil.

Range.—New Jersey to Kansas, south to Texas and Florida.

Considerable difficulty exists in distinguishing this species from the scarcely separable *R. capitellata*. The characters employed in the key offer the only ways in identifying these species.

A specimen labeled *R. glomerata* from Thornton, Cook County (*Fuller 9035* [ISM], is *Cladium mariscoides*.

Only two authentic specimens of this species have been seen for Illinois.

Specimens Examined.—Kankakee Co.: Kankakee, *Hill 81.1871* (ILL). Pope Co.: Belle Smith Springs, *Swayne 1769* (ILL).

6. *Rhynchospora capitellata* (Michx.) Vahl, Enum. 2:235. 1806

Schoenus capitellatus Michx. Fl. Bor. Am. 1:36. 1803.

Cespitose perennial with slender culms rarely to 1.2 meters tall; leaves filiform to linear, 0.5-3.0 mm wide; terminal glomerule subsessile, the lateral pedunculate; spikelets 3-5 mm long; achenes pyriform, narrowly winged, 1.2-1.8 mm long, 0.8-1.2 mm broad; beak 1.0-1.5 mm long, the base about one-half as broad as the summit of the achene; bristles 5-6, retrorsely hairy or rarely glabrous, 2.0-2.8 mm long.

Habitat.—Moist soil.

Range.—Nova Scotia to Wisconsin, south to Texas and Florida; Oregon; California.

Smallness of all parts tends to distinguish this species from *R. glomerata*.

Although known from only five stations, this species is the most common of the slender *Rhynchosporas* in Illinois.

Graham 9396 (ISM), reported as *R. capitellata* by Evers and Winterringer (1960), is actually *Cladium mariscoides*.

Specimens Examined.—Cook Co.: West Pullman, *Hill 148* (F). Iroquois Co.: Near Beaverville, *Jones 18816* (ILL). Kane Co.: Elgin, *Benke 3669* (F). Kankakee Co.: W. of Kankakee, *Sherff 1656* (ILL). Pope Co.: N. of Herod, *Ahles 4686* (ISM).

7. *Rhynchospora alba* (L.) Vahl, Enum. 2:229. 1806.

Schoenus albus L. Sp. Pl. 44. 1753.

Cespitose perennial with very slender culms to 55 (-70) cm tall; leaves filiform to linear, 0.5-2.5 mm wide; glomerules whitish or light brown, the terminal one 5-15 mm broad, the lateral two somewhat smaller; spikelets sessile; achenes obovoid to pyriform, stipitate, slightly rugulose, lustrous, 1.5-2.0 mm long, the base about one-half as broad as the summit of the achene; beak elongate-triangular, 0.6-1.2 mm long, 1.2-1.8 mm broad; bristles (in our specimens) usually 10-14, 2.4-3.0 mm long, retrorsely hairy.

Habitat.—Sphagnum bogs.

Range.—Newfoundland to Alaska, south to California, Illinois, and Georgia; Puerto Rico; Europe; Asia.

Probably the only extant stations for this species in Illinois are in sphagnum bogs at Cedar Lake in Lake County and Maple Lake in Cook County. The Peoria County station known to Brendel during the latter part of the nineteenth century doubtlessly has been destroyed.

Cedar Lake is indeed a remarkable area which features a sphagnum bog

and several exceptionally rare vascular plants for Illinois. Numbered among these are *Carex trisperma, Carex viridula, Eriophorum virginicum, Nuphar variegatum, Sarracenia purpurea, Drosera rotundifolia, Sorbus aucuparia, Vaccinium myrtilloides, Aster longifolius*, and *Bidens beckii*.

Specimens Examined.—Cook Co.: Maple Lake, *Winterringer 12313* (ISM). Lake Co.: Lake Villa, *Gleason & Shobe 137* (F). Peoria Co.: Peoria, *Brendel s.n.* (ILL).

X. Cladium

Only a single species of the twig rush occurs in Illinois. It closely resembles species of *Rhynchospora*, but may be differentiated by its lack of a beak on the achene.

1. *Cladium mariscoides* (Muhl.) Torr. in Ann. Lyc. N.Y. 3:372. 1836.

Schoenus mariscoides Muhl. Gram. 4. 1817.

Stoloniferous perennial with a triangular culm to nearly 1 m tall; leaves channeled. 1-3 mm wide, scabrerulous on the margins; inflorescence paniculate, to 30 cm long; spikelets in clusters of 3-10, some pedunculate, others sessile; lowest scales sterile, the median ones staminate, the terminal one perfect; stamens 2; style usually 2-cleft; bristles 0; achene mitriform, truncate at base, apiculate at apex, 1.3-1.8 mm long.

Habitat.—Swamps and bogs.

Range.—Newfoundland to Saskatchewan, south to Minnesota, Illinois, and Florida.

There is a striking resemblance between this species and *Rhynchospora glomerata*. This latter species, however, has a beaked achene and bristles.

The first record of this species in Illinois is a collection from Chicago, Cook County, in 1860, by Scammon.

Specimens Examined. — Cook Co.: Thornton, *Fuller 9035* (ISM). Lake Co.: Illinois Beach State Park, *Winterringer 15183* (ISM). McHenry Co.: Ringwood, *Vasey s. n.* (ILLS).

XI. Scleria

This distinctive genus was named by Bergius in 1765. The first Illinois record was by Mead (1846) from Hancock County. *Scleria* stands well-apart from other cyperaceous genera because of its unisexual flowers, the disk-supported achene, and the white, bony achene.

Core's magnificent work (1936) on this genus has made the identification of the species relatively simple.

Morphology of the Genus

The Illinois species of *Scleria* are small annuals or slender to coarse perennials from rhizomes. The triangular culms may attain a height of nearly one meter. They are glabrous or scabrous.

The flat leaves range from 1-9 mm wide. They and their sheaths are glabrous or variously pubescent.

The inflorescence is terminal and axillary, pedunculate or sessile. The involucral bracts, which generally exceed the inflorescence, are glabrous or pubescent. Both staminate and pistillate spikelets occur. The 1-flowered pistillate spikelets are usually distributed among clusters of staminate spikelets. The lowermost scales are sterile. Perianth bristles are absent. There are 1-3 stamens. The style is 3-cleft.

The lustrous, white, bony achene, which is the most conspicuous feature of the genus, is smooth, papillose, pitted, or wrinkled. It is situated upon an hypogynium, or the hypogynium may be obsolete (*S. verticellata*). The hypogynium is pebbled or bears tubercles. The characters of the achene and hypogynium are important in distinguishing species.

Systematic Treatment

Scleria Berg. in Kongl. Acad. Sv. Handl. 26:142. 1765.

Key to the Illinois Species of *Scleria*

1. Achene smooth; tubercles of hypogynium none; coarse perennial .. ..1. *S. triglomerata*
1. Achene papillose, pitted, or wrinkled; tubercles of hypogynium 0, 6, or 9; slender perennial or annual.
   2. Achene papillose; tubercles of hypogynium 6 or 9; perennial ....2. *S. pauciflora*
   2. Achene pitted or wrinkled; tubercles none; annual.

3. Achene pitted; hypogynium 3-lobed; inflorescence closely paniculate; achene 1.8-2.2 mm long .....3. *S. reticularis*
3. Achene wrinkled; hypogynium absent; inflorescence verticillate; achene 1.5 mm long .. ..4. *S. verticillata*

1. *Scleria triglomerata* Michx. Fl. Bor. Am. 2:168. 1803.

Rather coarse perennial from an elongated rhizome; culms triangular, glabrous, sometimes nearly 1 m tall; leaves 4-9 mm broad, glabrous or puberulent on the nerves below, scabrous, the sheaths and ligules glabrous or puberulent; inflorescences usually terminal and lateral, the bracts elongate; achenes subglobose to ovoid, smooth, lustrous, white, 2.0-2.5 mm high and broad; hypogynium shallowly 3-lobed, minutely pebbled, without tubercles.

Habitat.—Moist or dry open woods.

Range.—Vermont to Minnesota, south to Texas and Florida.

This is the largest as well as the most common species of *Scleria* in Illinois, although it is restricted to the northern half of the State. It is our only species with a smooth achene.

Two other species with smooth achenes which have been collected in neighboring states may eventually be found in Illinois. *Scleria nitida*, which lacks tubercles but has an achene longer than broad, is a species of dry, upland woods of Kentucky and Missouri. *Scleria oligantha*, with 8 or 9 tubercles between the achene and the hypogynium, is a species of rich hardwood forests of Indiana, Kentucky, and Missouri.

Specimens Examined.—Cass Co.: E. of Beardstown, *Rexroat 4159* (ISM). Cook Co.: N. of Jefferson Park, *Moffatt s.n.* (ILL). Fulton Co.: N. of Anderson Lake, *Rexroat 5211* (ISM). Henderson Co.: Oquawka, *Patterson s.n.* (F). Iroquois Co.: Near Beaverville, *Jones 18818* (ILL). Kankakee Co.: SE. of St. Anne, *Fuller 8930* (ILL, ISM). Lake Co.: N. of Waukegan, *Gates 2772* (ILL). Lee Co.: Without locality, *Long 753* (ILL). McHenry Co.: Ringwood, *Vasey s.n.* (ILL). McLean Co.: Without locality, *Brendel s.n.* (ILL). Peoria Co.: Near Princeville, *V. Chase 1252* (ILL). Will Co.: E. of Braidwood, *Schneider s.n.* (ILLS). Winnebago Co.: 2 miles W. of South Beloit, *Fell & Fell F47-148* (ISM).

2. *Scleria pauciflora* Muhl. ex Willd. Sp. Pl. 4:318. 1805.

Slender perennial from forking rhizome; culms triangular, scabrous on the angles, glabrous or pilose; inflorescence of mostly small terminal fascicles or sometimes pedunculate axillary fascicles; bracts much longer than the inflorescence; achene globose, white, papillose, 1.5-2.0 mm high and broad; hypogynium with 6 or 9 tubercles.

Two usually separable varieties may be recognized in Illinois.

a. Culms and leaves glabrous or sparsely hirtellous ....2a. *S. pauciflora var. pauciflora*
a. Culms and leaves densely pilose ....2b. *S. pauciflora var. caroliniana*

2a. *Scleria pauciflora* Muhl. ex Willd. var. *pauciflora*

Habitat.—Dry soil, in woods or on bluffs.

Range.—New Jersey to Kansas, south to Texas and Florida; West Indies.

The typical variety is more common than var. *caroliniana* in Illinois. At Giant City State Park, where it is locally abundant, it occurs on exposed sandstone ledges with *Isanthus brachiatus*, *Cunila origanoides*, *Agrostis elliottiana*, *Hypericum drummondii*, and others.

Specimens Examined.—Hardin Co.: 2½ miles W. of Elizabethtown, *Ahles 6266* (ILL, ISM). Henry Co.: Rock River Hills, *Dobbs s.n.* (ILLS). Johnson Co.: Without locality, *Brendel s.n.* (ILL). Union Co.: Giant City State Park, *Mohlenbrock 9214* (SIU).

2b. *Scleria pauciflora* Muhl. ex Willd. var. *caroliniana* (Willd.) Wood, Am. Bot. & Florist 368. 1871.

Scleria caroliniana Willd. Sp. Pl. 4:318. 1805.

This uncommon variety has a more eastern range in the United States than var. *pauciflora*. Only a single specimen is known from Illinois.

Specimen Examined.—Lee Co.: Without locality, *Long 792* (ILL).

3. *Scleria reticularis* Michx. Fl. Bor. Am. 2:167. 1803.

Small annual with slender, erect, glabrous culms to 50 cm tall; leaves 1-4 mm wide, glabrous; inflorescence composed of a crowded terminal panicle up to 3 cm long and lateral fascicles of spikelets on very short peduncles; bracts exceeding the inflorescence; achenes mostly obovoid, occasionally globose, 1.8-2.2 mm long, about as broad, olive-brown, glabrous with a regular pattern of shallow pits running transversely.

Habitat.—Sandy shore of pond.

Range.—Massachusetts to Delaware; South Carolina to Florida; Illinois; Indiana; Mexico.

The olive-brown achenes, annual habit with paniculate inflorescence, and transverse rows of pits on the achene serve to distinguish this species.

This is the latest species of *Scleria* to be added to the Illinois flora, having been found by Rexroat in 1959. Core has determined our material.

Aside from the Illinois station and a station in northwestern Indiana, this species is found only along the eastern seaboard and in Mexico.

Specimen Examined.—Cass Co.: W. of Virginia, *Rexroat 5351* (ISM).

4. *Scleria verticillata* Muhl. ex Willd. Sp. Pl. 4:317. 1805.

Sma'l annual with very slender, glabrous, triangular culms to 50 cm tall; leaves up to 2 mm wide, the sheaths glabrous or pilose; inflorescence fascicled in the axils of small bracts, composed of several sessile spikelets; achenes g'obose, apiculate, 1.5 mm long and broad, white, transversely ridged; hypogynium none.

Habitat.—Bogs and marshes.

Range.—Massachusetts to Minnesota, south to Texas and Florida.

This is the only species of *Scleria* in Illinois with a verticillate inflorescence and without a hypogynium.

Only the Mason County specimen cited below has been collected in the last quarter of a century.

Specimens Examined.—Kane Co.: Elgin, *Benke 3674* (F). Lake Co.: Illinois Beach State Park, *Gates 3210* (F). Mason Co.: SE. of Havana, *Rexroat 4220* (ISM). Peoria Co.: Peoria, *McDonald s.n.* (ILL). Will Co.: Troy, *Hill 30.-1911* (ILL). Woodford Co.: Beyond upper ferry, *McDonald s.n.* (ILL).

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