

# A Review of the Genus *Scleria* (Cyperaceae) in Illinois

Gordon C. Tucker<sup>1</sup> and John E. Ebinger<sup>1,2</sup>

<sup>1</sup>Department of Biological Sciences, Eastern Illinois University, Charleston, IL 61920

<sup>2</sup>Illinois Natural History Survey, 1816 South Oak St., Champaign, IL 61820  
e-mail: gctucker@eiu.edu; jeebinger@eiu.edu

## ABSTRACT

Presently, five taxa of *Scleria* (nut rush, Cyperaceae) have been reported for Illinois [*S. muehlenbergii*, *S. oligantha*, *S. pauciflora* var. *pauciflora*, *S. triglomerata*, *S. verticillata*]. Of these taxa, *S. triglomerata* is common, being found scattered throughout the state, while *S. verticillata* is fairly common in northeastern Illinois and in the sand areas in the Illinois River Valley. *Scleria muehlenbergii*, in contrast, is known from a few dozen collections in the wind-blown sand deposits of Cass, Kankakee, and Lee counties, while *S. oligantha* is known from a single poor quality collection from Hardin County. *Scleria pauciflora* is relatively rare in Illinois with a few specimens from wind-blown sand deposits in the northern part of Illinois and some from dry woodlands and prairies in the extreme southern part. It is difficult to separate the two varieties (var. *pauciflora* and var. *caroliniana*), as the major character difference is the abundance and length of the hairs on the leaf surfaces. This trait is somewhat variable in the Illinois specimens examined, but at the present time we have been unable to verify the existence of *S. pauciflora* var. *caroliniana* for Illinois.

Key Words: Cyperaceae, Illinois, nut rush, *Scleria*

---

## INTRODUCTION

In 2004, while reviewing which Illinois plant species should be listed as threatened or endangered, the Endangered Species Protection Board found little information concerning the Illinois species of the genus *Scleria* (nut rush). Also, information about the distribution and habitat of the species was not very accurate, many herbarium specimens were incorrectly identified, and at that time, we could not verify the presence of one member of the genus that had been listed for the state. In addition, *Scleria* species are difficult to identify, while field identification of some taxa is tenuous at best.

*Scleria* is a genus of about 200 species widely distributed in tropical and warm-temperate regions of both hemispheres (Reznicek et al. 2002; Zhang et al. 2010). According to Kessler (1987), who synonymized some species accepted by Core (1936) and Fernald (1950), there were 14 species in North America. This treatment by Kessler (1987) was used as the basis for the "Flora of North America" by Reznicek et al. (2002). The 14 species listed are mostly restricted to the eastern half of the United States and adjacent Can-

ada with some of the species extending into the prairie and plains region, but not into, or west of the Rocky Mountain States. All 14 taxa are known from the southeastern United States.

Nut rush species are difficult to identify. First, being grass-like in general appearance, students, amateurs, and some professional taxonomists are immediately “turned-off.” Also, the flowers are small and hard to dissect. *Scleria* and *Carex* are the only members of the Cyperaceae in our flora with unisexual flowers. These imperfect flowers occur in spikelets that consist of 3-10+ scales, the lower 2-4 scales being empty, the lower fertile scales being pistillate, the upper fertile scales staminate or sometimes empty. The individual unisexual flowers lack a perianth, the pistillate flower consisting of 1 (rarely 2) pistil(s) subtended by a scale, and the staminate flower consisting of 1-3 stamens borne in a scale.

In addition to the small and rarely seen flowers, an unusual structure of the achene provides an important taxonomic characteristic. The morphology of the achene, and the commonly associated hypogynium, are probably the most important diagnostic characteristics in species identification. The hypogynium, which is derived from receptacle tissue, is a hardened disc at the base of the achene (Tucker 1987). In some species the hypogynium forms a prominent collar, while in others it is an inconspicuous ridge around the point of achene attachment. Another unusual characteristic of the genus is a structure called the contra-ligule, which is a membranous flap on the rim of the leaf sheath on the opposite side from the blade.

## METHODS

Specimens of *Scleria* were borrowed from most of the herbaria in Illinois, studied, and identified. These specimens were annotated and their distribution mapped. Also, some herbaria from surrounding states were examined for Illinois specimens. Most of the species were also observed and collected from the field. Attempts were made to relocate species that are rare, or had not recently been collected in the state, in connection with other floristic projects in which the authors and their colleagues were involved.

Listed below (alphabetically by acronym) are the locations and acronyms of the herbaria where specimens were examined: Chicago Botanic Garden, Glencoe, Illinois (CHIC); Northern Illinois University, DeKalb, Illinois (DEK); Eastern Illinois University, Charleston, Illinois (EIU); Field Museum of Natural History, Chicago, Illinois (F); USDA Forest Service, Harrisburg, Illinois (FS); University of Illinois, Urbana, Illinois (ILL); Illinois Natural History Survey, Champaign, Illinois (ILLS); Illinois State Museum, Springfield, Illinois (ISM); Illinois State University, Normal, Illinois (ISU); Missouri Botanical Garden, St. Louis, Missouri (MO); The Morton Arboretum, Lisle, Illinois (MOR); Western Illinois University, Macomb, Illinois (MWI); Purdue University Herbarium, West Lafayette, Indiana (PUL); and, Southern Illinois University, Carbondale, Illinois (SIU).

## TAXONOMIC TREATMENT

As more botanical collecting occurred in Illinois the number of *Scleria* species known for the state increased. Mohlenbrock (2002) listed six taxa of *Scleria* for Illinois, five species, one with two varieties [*S. muehlenbergii*, *S. oligantha*, *S. pauciflora* (var. *pauciflora* and var. *caroliniana*), *S. triglomerata*, *S. verticillata*]. Earlier, Mohlenbrock (1986) listed the same taxa with one change, *S. muehlenbergii* was replaced by *S. reticularis*, while in 1975 Mohlenbrock listed 5 taxa, *S. oligantha* not being reported. Earlier, Jones (1971) listed only three species for Illinois (*S. pauciflora*, *S. triglomerata*, *S. verticillata*), while Jones and Fuller (1955) listed the same three taxa. The present treatment is based on Mohlenbrock (2002) which is consistent with the present treatment in the "Flora of North America" (Reznicek et al. 2002).

The sequence of species in our paper is alphabetical and not intended to convey phylogenetic relationships. However, the last species, *S. verticillata*, is quite different from the others in its spicate inflorescence and scented roots. This species, along with *S. hirtella* and a number of tropical species, has been placed in the segregate genus, *Hypoporum*.

### Cyperaceae, Tribe Scleriae Nees

**Scleria** Bergius, Kongl. Vetensk. Akad. Handl. 26: 142, pl. 4, 5, 1765. -- Nut-rush.

**Plants** perennial or rarely annual herbs, rhizomes often present. **Stems** trigonous to triquetrous, glabrous, pubescent or scabridulous. **Leaves** basal and cauline, the lowest with much reduced blades, 3-ranked; sheath present, glabrous to pubescent; blades usually well developed, linear to filiform, midvein prominent; contra-ligule usually prolonged beyond top of sheath. **Inflorescence** terminal and usually axillary, paniculate to rarely spicate; bracts 1-3, leaf-like, reduced ascending or erect; peduncles present or not, trigonous, smooth or scabridulous on the angles. **Spikelets** with 3-10+ scales, the lower 2-4 scale empty, the lower fertile scale pistillate, the remaining fertile scales staminate or empty; floral scales ovate-deltoid to ovate-lanceolate. **Flowers** usually unisexual, the plants monoecious; perianth absent; staminate flowers with 1-3 stamens; filaments capillary; anthers narrowly linear, 2-4 mm long, apex usually mucronate or awned; pistillate flowers with one pistil; styles longer than stigmas; stigmas (2) 3, capillary. **Achenes** roundly trigonous to terete, globose or ellipsoid; surface smooth, tuberculate (warty), pitted, or lobed, rarely pubescent; **hypogynium** disk-like, lobed or entire, sometimes absent.

#### Key to the species of *Scleria* in Illinois

1. Inflorescence an erect, interrupted spike of several sessile glomerules; hypogynium, a short, cylindrical disk, or absent..... 5. *S. verticillata*
1. Inflorescence of one or more terminal and lateral fascicles, paniculate; hypogynium well-developed.
  2. Achenes smooth and shining
    3. Hypogynium obscurely trigonous, with a whitish papillose crust, lacking tubercles ..... 4. *S. triglomerata*
    3. Hypogynium with 8-9 small, papillose tubercles ..... 2. *S. oligantha*
  2. Achenes tuberculate, or pitted, rarely also pubescent.

4. Achenes pitted, pubescent with tufts or lines of small hairs; hypogynium 3-lobed, the lobes oblong to lanceolate .....1. *S. muehlenbergii*  
 4. Achene tuberculate and papillate; glabrous; hypogynium with 6 globose tubercles in distinct pairs .....3. *S. pauciflora*

1. *Scleria muehlenbergii* Steudel, Nomencl. Bot. ed. 2, 2:543. 1841. -- Muhlenberg's nut-rush.

*S. reticularis* Michx. var. *pubescens* Britt.

**Plants** annual to short-lived perennial, loosely caespitose; rhizomes (in perennial plants) short, 1-2 mm thick; roots fibrous. **Stems** 20-90 (-125) cm tall, 1-3 mm wide, trigonous to subterete, often somewhat compressed, glabrous or lightly pubescent. **Leaves** with sheaths slightly winged, glabrous to pubescent; blades 10-30 cm long, 1-4 (-8) mm wide, linear, flat, glabrous; contra-ligules rotund-obtuse, 0.1-0.8 mm long, glabrous, with membranous margin. **Inflorescences** terminal and axillary, paniculate, 1.5-8 cm long; bracts 1-4 cm long, slender; peduncles (1.5-) 2-10 cm long, lowermost spreading or drooping. **Spikelets** bisexual or unisexual, 2-5 mm long, few-flowered; floral scales 3.0-4.5 mm long, 1.5-2.5 mm wide, ovate-lanceolate, keeled, green to stramineous to purplish, acuminate. **Achenes** (1.0-) 1.5-2.5 (-3.5) mm long, globose to ovoid, with obtuse, apiculate apex, conspicuously pitted, white or gray, with tufts or lines of minute, yellowish to purplish hairs; **hypogynium** distinctly 3-lobed, the lobes oblong to lanceolate, apex obtuse to subacute, appressed to achene base. **Flowering:** July, **Fruiting:** August. Damp sandy grasslands and in very shallow water; New York to Missouri south to Florida and Texas; Mexico; West Indies; northern South America.

**Note:** *Scleria muehlenbergii* is similar to *S. reticularis*, having a similar growth habit and morphological characteristics, and both have been reported for Illinois (Mohlenbrock 1986, 2002). We have not found *S. reticularis* in Illinois, but this species is known from Indiana and Wisconsin and could logically occur here. The two taxa are easily separated since the achenes of *S. muehlenbergii* have tufts or lines of very thin hairs that are commonly yellowish or purplish in color. These hairs are lacking on the achenes of *S. reticularis*. Mohlenbrock (2002) considered *S. muehlenbergii* very rare in Illinois, occurring only in a sand pond in Cass County; he also reported it from Lee Co. (Mohlenbrock 2001). However, we have located numerous other collections.

**Specimens Examined:** ILLINOIS: **Cass Co.:** moist peaty sand, E of Beardstown, 13 Aug 1957, *R.T.Rexroat* 4158 (ILLS); edge of peaty swamp, E of Beardstown, 20 Aug 1957, *R.T.Rexroat* 4232 (ISM), 4233 (ISM), 4234 (ISM), 4235 (F, ISM), 4236 (ILLS) 4237 (ISM), 4239 (ISM); moist peaty sand W of Virginia, 1 Oct 1958, *R.T.Rexroat* 5520 (ISM), 5521 (ILLS); natural sand pond W of Virginia, 5 Sep 1958, *R.T.Rexroat* 5351 (ISM), 5352 (ISM), 5353 (ISM); sand pond SE of Beardstown, 19 Aug 1960, *R.T.Rexroat* 7074 (ISM), 7075 (ILLS), 7076 (ISM), 7077 (ISM); pond SE of Beardstown, 12 Sep 1960, *R.T.Rexroat* 7173 (ISM, SIU), 7174 (ISM); sand pond, SE of Beardstown, 7 Sep 1969, *R.T.Rexroat* 17163 (MWI), 17164 (MWI), 17165 (MWI), 17166 (MWI). **Kankakee Co.:** low area along ditch, Sweet Fern Sand Savanna, 9 Aug 2002, *P.B.Marcum* 1514 (ILLS). **Lee Co.:** interdunal pond near Amboy, 15 July 1959, *J.B.Long* 977 (ILL); interdunal pond near Amboy, 28 July 1959, *J.B.Long* 988 (ILL);

sphagnum covered depression near Amboy, 3 Aug 1959, *J.B.Long 991* (ILL); interdunal pond near Amboy, 11 Sep 1959, *J.B.Long 1012* (ILL); Amboy Township, Sec. 33, found in three locations on my farm, 27 Sep 1969, *J.B.Long s.n.* (ISM); low sandy swale, Amboy Township, Sec. 33, 16 Aug 1969, *J.B. Long s.n.* (ISM); Amboy Township, Sec. 33, this plant varies from none yearly back to abundant, 27 Jul 1991, *J.B.Long 1248* (ISM), *1249* (ISM); border of sandhill hollow, "Old Farm," 14 Aug 1990, *J.Long 1196* (ILL); moist sand barren, "The Old Farm," 22 Aug 1990, *J.Long 1201* (ILL); sandy barren shore of pond, Rocky Ford, 1 Oct 1990, *J.Long 1213* (ILL).

**2. *Scleria oligantha*** Michaux, Fl. Bor.-Amer. 2:167. – nut-rush.

**Plants** perennial, with loosely clustered stems; rhizomes 1-8 cm long, 3-5 mm thick, hard, stout, nodulose; roots fibrous. **Stems** 30-60(-75) cm tall, 1-2.5 mm wide, trigonous, glabrous to pubescent. **Leaves** with sheaths usually narrowly winged, glabrous to pubescent; blades 15-30 cm long, 2-6 mm wide, linear, flat, glabrous; contra-ligules ovate, 1.3-3 mm long, scabridulous, with conspicuous hyaline border. **Inflorescence** terminal and sometimes axillary, paniculate, 0.5-2.5 cm long; bracts 2-11 cm long, relatively slender; peduncles 1-2 cm long, erect. **Spikelets** bisexual to staminate, 3-8 mm long, few-flowered; floral scales 3-6 mm long, 1.5-3 mm wide, ovate-lanceolate, slightly keeled, green to purplish brown, apex acuminate. **Achenes** 3-4 mm long, ovoid to subglobose, with obtuse, usually apiculate apex, smooth, glossy, white; **hypogynium** base obtuse trigonous, with 8-9 small, rounded or elongated, granular tubercles. **Flowering:** June-July, **Fruiting:** July-August. Mesic to xeric woods, glades, and wet meadows; New Jersey, Ohio, Missouri south to Texas, and Florida; Mexico; Central America.

**Note:** Though reported as "scattered in moist woods" in Illinois by Mohlenbrock (2002), and listed for Illinois by Reznicek et al. (2002), we have found only one specimen (see below) that we have tentatively identified as *S. oligantha*. This specimen is immature and lacks a root system. On this specimen, we found one achene that was nearly mature. The surface of the achene was smooth and the hypogynium consisted of eight granular tubercles.

**Specimen Examined:** Illinois: Hardin Co.: locally common at edge of limestone glade opening now grown closed by red cedar at Barker Bluff Natural Area, center Sec. 7 T12S R10E, growing with *Ratibida pinnata*, *Manfreda virginica*, *Quercus muehlenbergii*, *Juniperus virginiana*, and *Verbesina virginica*, 8 Jul 1998, *M.A.Basinger & J.P.Shimp 11369* (FS).

**3. *Scleria pauciflora*** Muhlenberg ex Willdenow, Sp. Pl. 4: 318, 1805. -- papillose nut-rush, few-flowered whip-grass.

*Scleria pauciflora* var. *effusa* C.B. Clarke; *Scleria ciliata* Michx. var. *pauciflora* (Muhl. ex Willd.) Kükenthal

**Plants** perennial, with loosely clustered stems; rhizomes 1-10 cm long, 3-5 mm thick, hard, stout, nodulose; roots fibrous. **Stems** 20-50(-70) cm tall, 0.6-1.5 mm wide, trigonous, glabrous or sparsely to densely pubescent. **Leaves** with sheaths not winged, glabrous to densely short-pubescent; blades 10-35 cm long, 0.6-2 (-2.5) mm wide, linear, flat

to commonly plicate, glabrous or pubescent; contra-ligules obtuse to triangular, 0.2-0.7 mm long, scabridulous, with narrow hyaline border. **Inflorescences** terminal and sometimes axillary, paniculate, 0.4-2.0 cm long; bracts 1-10 cm long, very slender; peduncles 1-5 cm long, erect. **Spikelets** bisexual or staminate, 3-6 mm long, 3-6 flowered; floral scales 2-5 mm long, 2-3.3 mm wide, ovate-lanceolate, slightly keeled, green to purplish tinged, apex acuminate. **Achenes** 1.3-2.5 mm long, ovoid to globose, with obtuse, apiculate apex, irregularly transversely tuberculate and papillate, sometimes the papillae near the base elongate and spinulose; **hypogynium** narrow, somewhat trigonous, with 6 finely puberulent globose tubercles in distinct pairs. **Flowering:** July-August, **Fruiting:** August-September. Moist sandy soil of grasslands and open woods; New Hampshire to Kansas, south to Texas and Florida; West Indies (Cuba).

**Note:** Mohlenbrock and Ladd (1978) recorded this species from Henry and Union counties, but we could not confirm these distribution records.

*Scleria pauciflora* Muhl. ex Willd var. *caroliniana* A. Wood has been reported for Illinois (Mohlenbrock 1976, 2002; Reznicek et al. 2002). The two varieties have nearly identical geographic ranges but we have not been able to verify the existence of var. *caroliniana* for Illinois; no specimens of this variety have been found during our study. The two varieties differ only in the type and extent of pubescence, var. *parviflora* being glabrous to densely hairy, the hairs less than 0.4 mm long, var. *caroliniana*, in contrast, is villous-ciliate with spreading hairs 0.5-1 mm long on the stems, leaves, and bracts (Fairey 1967, 1969, Reznicek et al. 2002). Many specimens of *S. pauciflora* var. *pauciflora* that we have examined have dense pubescence, particularly on the lower leaf sheaths (some of these had been misidentified as var. *caroliniana*). The hairs of these specimens are short, mostly less than 0.3 mm long, not at all like the villous-ciliate hairs of var. *caroliniana* that exceed 0.5 mm in length. The specimen cited by Mohlenbrock (1976) from Lee Co. (Long 792, ILLS) has short hairs and we consider it var. *pauciflora*.

**Specimens Examined:** ILLINOIS: **Hardin Co.:** woodland, 2.5 miles west of Elizabethtown, 5 Jun 1952, *H.E.Ahles* 6206 (EIU, ILL, ISM); dry woodland in compartment 53, NEQ Sec 11 T12S R8E, 15 Jun 1991, *L.R.Stritch, E.L.Shimp & J.P.Shimp* 2606 (FS). **Iroquois Co.:** sand savanna, Iroquois County State Conservation Area, 25 Jul 2001, *L.R.Phillippe* 33403 (EIU, ILLS). **Johnson Co.:** no date, *F.Brendel s.n.* (ILL); dry/dry-mesic upland oak-hickory forest in compartment 34, SEQ Sec 36 T11S R4E, 7 Aug 1992, *J.P.Shimp & L.R.Stritch* 2959 (FS). **Kankakee Co.:** sandy roadside, Liebert Natural Area, 26 Jul 2002, *D.T.Busemeyer & L.R.Phillippe* 1018 (ILLS); edge of black oak sand savanna, Sweetfern Natural Area, 9 Aug 2002, *P.B.Marcum* 1524 (ILLS). **Lee Co.:** Amboy Township, Sec. 7, 27 Aug 1969, *J.B.Long s.n.* (ISM); sand barren, Sec 12 T19N R10E, 17 Jul 1958, *J.B.Long* 786 (ISM); sand barren, 17 Jul 1958, *J.B.Long* 792 (ILLS). **Massac Co.:** common in fields, NEQ of SWQ Sec 27 T14S R5E, 30 Jun 2004, *J.Schwegman s.n.* (ILLS). **Pope Co.:** prairie, Dean Cemetery Prairie, 7 Jul 1992, *M.A.Basinger* 4565 (ILLS); drainage area in dry prairie, Dean Cemetery Prairie, Sec 23 T15S R6E, 19 Jul 1991, *C.Giedeman s.n.* (SIU); dry prairie, Dean Cemetery Prairie, 19 Jul 1991, *F.Latortue s.n.* (SIU); dry restored tall grass prairie, Dean Cemetery Prairie, NEQ Sec 23 T15S R6E, 11 July 1991, *B.Middleton s.n.* (SIU); small barren remnant, Azots Field, 16 Jun 2004, *J.Schwegman s.n.* (ILLS); on Stinson Trail, barren remnant, near Azots, 9 Jul 1978, *J.Schwegman* 2937 (ISM); dry juniper-oak savanna in compart-

ment 29, NEQ of SEQ Sec 10 T12S R5E, Hayes Creek Canyon Watershed, 26 Jul 1981, *L.R. Stritch 1760* (FS); dry-mesic barrens, Dean Cemetery East Biological Area, NEQ of NWQ Sec 23, T12S R6E, 1 Aug 1994, *E.F. Ulaszek 2418* (FS). **Randolph Co.:** dry woodland above N-side of Rockcastle Creek Canyon, 2 miles S of Steeleville, 13 Jul 2010, *R.W. Nyboer s.n.* (EIU). **Will Co.:** Braidwood Dunes and Savanna Nature Preserve, dry-mesic sand prairie, 16 June 2005, *L.R. Phillippe 37642* (ILLS) and 2 Sep 2006, *L.R. Phillippe 38029* (ILLS). **Williamson Co.:** sandstone glade, Crab Orchard National Wildlife Refuge, SWQ of SWQ Sec 34 T10S R1E, 4 Jul 1983, *E.F. Ulaszek 387* (ILLS).

**4. *Scleria triglomerata*** Michaux, Fl. Bor.-Amer. 2: 168. 1803. -- tall nut-rush, whipgrass.

*S. nitida* Muhl. ex Willd.; *Scleria minor* (Britt.) Stone; *Trachylomia triglomerata* (Michx.) Nees; *Scleria triglomerata* var. *gracilis* Britt.; *Scleria flaccida* Steud.

**Plants** perennial, with loosely clustered stems; rhizomes 1-3 cm long, 3-5 mm thick, hard, stout, nodulose; roots fibrous. **Stems** 40-100 cm tall, 1-4 mm wide, trigonous, glabrous to ciliate on the ridges. **Leaves** with sheaths not winged, glabrous to pubescent; blades 15-30 cm long, 3-9 mm wide, linear, flat, glabrous to slightly pubescent; contra-ligules ovate-deltate, 1.3-4 mm long, scabridulous, with conspicuous hyaline border. **Inflorescence** terminal and axillary, paniculate, 1.5-4.5 cm long; bracts 2-11 cm long, relatively slender; peduncles 1-2 cm long, erect. **Spikelets** bisexual to staminate, 3-9 mm long, many-flowered; floral scales 2-5 mm long, 2.1-3.2 mm wide, ovate-lanceolate, slightly keeled, green to purplish brown, apex cuspidate, 1-6 mm long. **Achenes** (1.5-) 2-3 (-3.5) mm long, ovoid to subglobose, with obtuse, usually apiculate apex, smooth, glossy, white; **hypogynium** narrow, obscurely trigonous with a whitish papillose crust. **Flowering:** June-July, **Fruiting:** July-August. Damp fields, or in dry soil, prairies, savannas, and mesic sand prairies; Massachusetts, southern Ontario, and Iowa south to Florida and Texas; Puerto Rico; Mexico.

**Note:** Mohlenbrock and Ladd (1978) recorded this species from Cass and Jo Daviess counties, but we could not confirm this.

A segregate, with hairy sheaths and larger achenes, *S. minor* was accepted by Fernald (1950) and Fairey (1967) but synonymized by Core (1936) and Kessler (1987) with slight discussion. It occurs in the eastern United States from New York south to Texas and Florida (Fernald 1950, Reznicek et al. 2002), and is entirely within the range of *S. triglomerata*. *Scleria minor* has not been reported for Illinois, and we have found no Illinois collections fitting this taxon.

**Specimens Examined:** ILLINOIS: **Adams Co.:** railroad prairie E of Fowler, 10 Jun 1965, *R.A. Evers 83699* (ILLS); E part of county, high limestone bluff, 30 Sep 1963, *R.T. Rexroat 9179* (ISM); SE part of county, high dry hill over limestone, 4 Oct 1963, *R.T. Rexroat 9206* (ISM); dry red clay hill, 13 Jul 1964, *R.T. Rexroat 9390* (ISM), *9391* (ISM), *9392* (ISM). **Carroll Co.:** mesic sand prairie, Mississippi Palisades State Park, 29 Aug 1992, *W.C. Handel 617* (ILLS). **Cass Co.:** E of Beardstown, 13 Aug 1957, *R.T. Rexroat 4159* (ISM), *4160* (ISM); E of Beardstown, 10 Sep 1957, *R.T. Rexroat 4316* (ISM); near Virginia, 13 Jul 1964, *R.T. Rexroat 9390* (SIU). **Cook Co.:** wet meadow,

Washington Heights, 22 Aug 1902, *R.Bebb 1062* (F, MO); N Silva Bud, Chicago, 16 Aug 1904, *F.C.Gates 289* (F); along railroad, N of Jefferson Park, Chicago, 12 Jul 1893, *W.S.Moffatt s.n.* (ILL); sandy prairie E of Thornton, 27 Jul 1986, *F.Swink, Johnson & Sullivan 6826* (MOR). **Effingham Co.:** railroad, ½ mile SW of Mason on Rt. 37, 10 Aug 1980, *P.Shildneck 11464* (ISM); railroad prairie ½ miles SW of Mason, 10 Aug 1980, *P.Shildneck 12325* (ILL); Rt. 37 between Mason and Edgewood, 6 Aug 1983, *P.Shildneck 12675* (ISM); Rt. 37 between Mason and Edgewood, 25 Jul 1990, *P.Shildneck 15466* (ISM). **Fulton Co.:** N of Anderson Lake, 16 Jul 1958, *R.T.Rexroat 5211* (ISM, SIU); N of Anderson Lake, 14 Aug 1961, *R.T.Rexroat 7858* (ISM); S of Astoria, 20 Jun 1958, *R.T.Rexroat 4920* (ISM); gravelly clay, sterile moss covered hillside, 16 Jul 1958, *R.T.Rexroat 5212* (ISM, MWD). **Grundy Co.:** wet prairie, Goose Lake, SE of Morris, 1 Jul 1970, *R.A.Evers 102844* (ILLS); railroad right-of-way, in Braceville, 5 Jul 1975, *R.Schulenberg & A.Kropp 75-770* (MOR). **Henderson Co.:** prairie near Oquawka, 18 Jul 1972, *H.N.Patterson s.n.* (F); Oquawka, no date, *H.N.Patterson s.n.* (F, MO). **Henry Co.:** Munson Cemetery, 24 Jun 1982, *R.R.Clinebell 145* (MO). **Iroquois Co.:** E of Watseka, 14 Jun 1962, *R.A.Evers 74030* (ILLS, ISM); sand prairie, Iroquois County Conservation Area, 1 Jul 1970, *R.A.Evers 102869* (ILLS); near Beaverville, 18 Jul 1948, *G.N.Jones 18818* (ILL); dry-mesic savanna, Iroquois County State Conservation Area, 25 Jul 2001, *L.R.Phillippe 33401* (EIU, ILLS); dry-mesic savanna, Hooper Branch Savanna Nature Preserve, 9 Aug. 2001, *L.R.Phillippe 33492* (ILLS); sand, SEQ of SEQ Sec 24 T27N R12W, 14 Aug 1977, *R.Schulenberg & E.Hedborn 508* (MOR). **Jasper Co.:** mesic prairie, Prairie Ridge State Natural Area, 4 Jul 1996, *B.Edgin 438* (EIU). **Kankakee Co.:** sandy area, Liebert Natural Area, 26 Jul 2002, *D.T.Busemeyer & L.R.Phillippe 1019* (ILLS); sandy swamp, SE of St. Anne, 29 Jun 1944, *G.D.Fuller 8930* (ILL); E of St. Anne, 1 Jul 1944, *V.O.Graham 8930* (ISM); E of St. Anne, 1 Jul 1944, *V.O.Graham 9337* (ISM); sand prairie, Kankakee, 10 Jun 1871, *E.J.Hill s.n.* (ILL); near St. Anne, 16 Jun 1940, *G.N.Jones 11504* (ILL); sand prairie, Sweetfern Sand Savanna, 9 Aug 2002, *P.B.Marcum 1518* (ILLS); wet-mesic prairie, 9.4 miles NE of St. Anne, *L.R.Phillippe & M.A.Feist 34725* (EIU, ILLS); natural prairie, 3 miles SE of Custer Park, 24 Aug 1947, *J.A.Steyermark 64886* (F, ILL); old crescent dune area, 2 miles S of Leesville, 26 Jun 1992, *G.Wilhelm & A.Reznicek 20569* (MOR); Sweetfern Sand Savanna Land and Water Reserve, old field, 9 Aug 2002, *P.B. Marcum et al. 1518* (ILLS); IDNR property (Leesville East), about 11 miles E of St. Anne, shallow ponded area with *Quercus palustris*, 3 Jul 2002, *M.A. Feist & G. Spyreas 1712* (ILLS). **Lake Co.:** wet meadow, Camp Logan, 29 Jun 1906, *F.C.Gates 2772* (F, ILL); sedge meadow, State Beach Park, 10 Aug 1985, *U.Rowlett 1728* (F); **Lee Co.:** Bartell's Prairie, Winddrift Sanctuary 3 miles NW of West Brooklyn on Shaw Road, 16 May 1986, *P.K.Armstrong 121* (MOR); original prairie near Amboy, 4 Aug 1932, *V.H.Chase 4702* (ILL); sandhills, May Tp., 21 Jun 1951, *V.H.Chase 11997* (ILL); dry-mesic sand prairie, Foley Sand Prairie Nature Preserve, 11 Aug 2002, *J.E.Ebinger 31039* (EIU); along railroad, 8 Aug 1956, *J.B.Long 184* (ILL); moist sand prairie, 22 Jun 1958, *J.B.Long 753* (ILL); S of Amboy, 15 Jun 1988, *J.B.Long 1079* (ISM); Nichols Prairie, 18 Jun 1990, *J.B.Long 1164* (ILL); native wet prairie, Richardson Wildlife Foundation, 10 Jul 1997, *L.R.Phillippe & W.C.Handel 29017* (ILLS). **Mason Co.:** sandy soil, Sand Prairie-Scrub Oak Nature Preserve, 14 Jul 1977, *A.G.Jones 4012* (ILL); mesic sand prairie, Matanzas Prairie Nature Preserve, 14 May 1990, *M.Morris & L.R.Phillippe 357* (EIU, ILLS); ephemeral sand pond, Sand Prairie-Scrub Oak Nature Preserve, 21 Aug 2003, *L.R.Phillippe 36097* (EIU, ILLS); NEQ Sec 4 T20N R9W, 30 Aug 1982, *S.Tyson 1174*

(ISM). **McDonough Co.:** dry bluff top, Argyle Lake State Park, 6 Aug 1984, *R.D.Henry & A.R.Scott 4311* (MWI), *4312* (MWI), *4313* (MWI). **McHenry Co.:** Ringwood, *G.Vasey s.n.* (ILL). **McLean Co.:** 1 Jul 1858, F.Brendel Herbarium (ILL). **Ogle Co.:** Pine Rock Natural Area, 4 miles E of Oregon, 22 Aug 1969, *D.R.Wade & D.E.Wade C-2156* (ISM). **Peoria Co.:** dry wooded hillside near Princeville, 29 Aug 1906, *V.H.Chase 1252* (ILLS); hilltop prairie, Limestone Twp., 16 Jul 1960, *V.H.Chase 16126* (ILL, ISM, MOR); sandy banks above Rocky Glen near Peoria, Jul 1891, *F.E.McDonald s.n.* (ILL). **Pope Co.:** prairie, 5 miles S of Bay City, 12 Jun 1968, *R.A.Evers 95172* (ILLS); old field SW of Bay City, 23 Jul 1970, *R.A.Evers 103102* (ILLS); tall grass prairie, Dean Cemetery Prairie, 11 Jul 1991, *B.Middleton s.n.* (SIU); dry field, ½ miles WSW of Azotus Church, 6 Jul 1967, *J.Schwegman 1222* (SIU); dry-mesic barrens, Dean Cemetery East Ecological Area, 23 Jun 1994, *E.F.Ulaszek 2091* (FS). **Warren Co.:** mesic prairie, 3.5 miles E of Berwick, 10 Jul 1973, *R.A.Evers 110724* (ILLS). **Will Co.:** dry-mesic sand prairie, Braidwood Dunes and Savanna Nature Preserve, 16 Jun 2005, *L.R.Phillippe 37644* (EIU, ILLS) and *37645* (ILLS); wet meadows E of Braidwood, 16 Jul 1935, *R.A.Schneider 9715* (ILLS); wet sand prairie near Braidwood, 16 Jun 1973, *R.Schulenberg, M.Madeny & G.Dewey s.n.* (MOR); disturbed dry-mesic sand prairie, 13 Aug 2007, *L.R. Phillippe & P.B. Marcum 40037* (ILLS); mesic prairie, Wilmington Shrub Prairie Nature Preserve, 3 miles E of Braidwood, 28 Jun 2007, *L.R. Phillippe 39812* (ILLS). **Winnebago Co.:** Fountaindale, 1868, *M.S.Bebb s.n.* (F); bog, Beloit, 1 Aug 1947, *E.W.Fell & G.B.Fell 47-148* (ISM, MWI); bog, Beloit, 8 Aug 1947, *E.W.Fell & G.B.Fell 47-171* (ISM).

**5. *Scleria verticillata*** Muhlenberg ex Willdenow, Sp. Pl. 4: 317. 1805. -- low nut-rush, whorled nut grass.

*Hypoporum verticillatum* (Willd.) Nees

**Plants** annual, loosely tufted; rhizomes none; roots fibrous, with citrus-like scent when fresh. **Stems** 10-60 cm tall, 0.3-0.8 mm wide, trigonous, glabrous. **Leaves** with sheaths pilose; blades 5-30 cm long, 0.5-1.5 mm wide, filiform, flat, glabrous; contra-ligules scarcely prolonged, 0.1-0.3 mm long, with few stiff straight hairs to 0.3 mm long. **Inflorescences** of 2-8 erect to oblique sessile glomerules, well spaced on a rachis 4-15 cm long; bracts 3-8 mm long, slender; peduncles absent or nearly so. **Spikelets** bisexual, 2-3 (-4) mm long, few-flowered; floral scales 2-4.5 mm long, 0.7-1.5 mm wide, oblong-lanceolate, keeled, reddish-brown, acuminate, with bristle-like tip. **Achenes** 1-1.5 mm long, broadly ovoid to subglobose, with obtuse, usually apiculate apex, irregularly reticulate or tuberculate (reticulations transverse), white; **hypogynium** a small brownish ridge at the base of the achene, or absent. **Flowering:** July, **Fruiting:** August. Damp grasslands, marl flats, interdunal swales, fens; Connecticut, New York, extreme southern Ontario, Michigan, and Minnesota, south to Florida and Texas; Mexico; West Indies.

**Note:** This species resembles the pantropic *S. hirtella* Sw., a perennial with pilose floral scales.

**Specimens Examined:** ILLINOIS: **Cook Co.:** springy and marshy ground, SE of Elgin City limits, 2 Sep 1919, *H.C.Benke 3674* (F); marl flats, fen immediately S of Bluff City Cemetery, 5 Oct 1983, *E.Evert 6425a* (MOR); sandbar along creek in fen, 1 Aug 1984,

*N.Stoyhoff* 545 (MOR); marly fen, SE edge of Elgin, S of Bluff City Cemetery, 3 Oct 1977, *G.Wilhelm, W.Hess & M.Grintz* 4162 (MOR); edge of tufa flat, SE edge of Elgin, S of Bluff City Cemetery, NEQ of NEQ of NWQ Sec 30 T41N R9E, 25 Aug 1977, *G.Wilhelm, D.Young, R.Moran & M.Madany* 4045 (MOR); **Kane Co.:** Nelson Lake, 16 Sep 1984, *D.Young s.n.* (MOR). **Lake Co.:** sand swale, Illinois Beach Nature Preserve, 2 Sep 1988, *M.Bowles* 842 (MOR); marshland, 2.5 miles S of Wauconda, 21 Sep 1961, *R.A.Evers* 71702 (ILLS); beach, *Liatris spicata* prairie, 24 Aug 1909, *F.C.Gates* 3210 (F); Illinois Beach State Park, 27 Aug 1983, *U.Rowlett* 1365 (F); alkaline marshy ground. 6 miles N of Barrington, W of Tower Lake and N of Kelsey Road, property of Dr. Wm. Holmes, 15 Sep 1956, *J.A.Steyermark* 82628 (ILL); near Dead River, Illinois Beach State Park north of Waukegan, 15 Aug 1953, *F.A.Swink* 2551 (F). **Mason Co.:** moist peaty sand, SE of Havana, 18 Aug 1957, *R.T.Rexroat* 4216 (ISM), 4217 (ISM), 4218 (EIU), 4219 (ILLS), 4220 (ISM), 4221 (ISM). **McHenry Co.:** Spring Hill Farm, SWQ of NWQ Sec 21 T44N R8E, 16 Aug 1976, *R.C.Moran s.n.* (MOR). **Peoria Co.:** Peoria, no date, *F.E.McDonald s.n.* (ILL). **Will Co.:** wet peaty soil on boggy hillside, Troy, 15 Sep 1911, *E.J.Hill* 30.1911 (ILL). **Woodford Co.:** cold bogs in Illinois River bottom one mile beyond upper ferry, Aug 1887, *F.E.McDonald s.n.* (ILL); Sep 1887, *F.E.McDonald s.n.* (ILL).

### LITERATURE CITED

- Core, E.L. 1936. The American species of *Scleria*. *Brittonia* 2:1-105.
- Fairey, J.E. 1967. The genus *Scleria* in the southeastern United States. *Castanea* 32:37-71.
- Fairey, J.E. 1969. *Scleria pauciflora* Muhl. and its varieties in North America. *Castanea* 34: 78-90.
- Fernald, M.L. 1950. Gray's Manual of Botany. Eighth Edition. American Book Company, New York. lxiv + 1632pp.
- Jones, G.N. 1971. Flora of Illinois. Third edition. American Midland Naturalist Monograph No. 7: vi + 401.
- Jones, G.N. and G.D. Fuller. 1955. Vascular plants of Illinois. University of Illinois Press, Urbana, and the Illinois State Museum, Springfield, Illinois. Museum Scientific Series, Vol VI: xii + 593.
- Kessler, J.W. 1987. A treatment of *Scleria* (Cyperaceae) for North America north of Mexico. *Sida* 12:391-407.
- Mohlenbrock, R.H. 1975. Guide to the vascular flora of Illinois. Southern Illinois University Press, Carbondale and Edwardsville. ix+494 pp.
- Mohlenbrock, R.H. 1976. The illustrated flora of Illinois: sedges, *Cyperus* to *Scleria*. Southern Illinois University Press, Carbondale and Edwardsville. xiii+192 pp.
- Mohlenbrock, R.H. 1986. Guide to the vascular flora of Illinois. Revised and enlarged edition. Southern Illinois University Press, Carbondale and Edwardsville. viii + 507 pp.
- Mohlenbrock, R.H. 2001. The Illustrated flora of Illinois. Sedges: *Cyperus* to *Scleria*. Southern Illinois University Press, Carbondale, Illinois. 223 pp.
- Mohlenbrock, R.H. 2002. Vascular flora of Illinois. Southern Illinois University Press, Carbondale and Edwardsville. x + 490 pp.
- Mohlenbrock, R.H. and D.M. Ladd. 1978. Distribution of Illinois Vascular Plants. Illinois University Press, Carbondale and Edwardsville. vii + 282 pp.
- Reznicek, A.A., J.E. Fairey III, & A.T. Whittemore. 2002. *Scleria* (Cyperaceae). Pp. 242-251 in Flora of North America Editorial Committee (eds.), Flora of North America north of Mexico, vol. 23.
- Tucker, G.C. 1987. The genera of Cyperaceae in the southeastern United States. *Journal of the Arnold Arboretum* 68:361-455.
- Zhang, S.R., G.C. Tucker, and D.A. Simpson. 2010. *Scleria* P.J. Bergius. In: Wu, C. Y., et al. (eds.), Flora of China 23: 260—268. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis.