

# SORGHASTRUM (POACEAE) IN FLORIDA<sup>1</sup>

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## ABSTRACT

Descriptions, habitats, ranges, frequencies, and flowering times of the four species of *Sorghastrum* indigenous to Florida are presented. Three-dimensional features of the inflorescences have proven critical in the discrimination of species. Past difficulties in identification are largely attributable to the two-dimensional aspects of the inflorescences seen in herbarium specimens. *Sorghastrum apalachicolense* D. W. Hall, endemic to Florida, is described from elevated spots in wet pine-wiregrass savannas.

*Sorghastrum* comprises thirteen to fifteen species in the warmer areas of the Americas and Africa. Four species are present in the United States and all four occur in Florida. One species, *S. nutans* (Linnaeus) Nash, is wide ranging East of the Rocky Mountains. The remaining three species are mainly confined to the southeastern United States.

In the field the four species are quite distinct. However, three of these, *S. elliotii* (Mohr) Nash, *S. nutans* (L.) Nash, and *S. secundum* (Elliott) Nash, have been very difficult to differentiate after being pressed as the distinctive aspects of the inflorescences are destroyed. Maturity of the inflorescences and the amount of dew or rain clinging to the spikelets also can alter the form. The fourth species, *S. apalachicolense*, has recently been discovered as an endemic in western Florida. The inflorescence of this newly found species is quite discrete being very open as compared to the compact nature of this in the other three species. Figure 1.

The key in Chase (1950) does not work for herbarium specimens of *S. elliotii* and *S. secundum* as the form of the panicle is usually destroyed in pressing, the color of the spikelets on both species varies from chestnut-brown to yellowish-brown, and the hairs on the ultimate branchlets of both species seem to be few and not conspicuously long-hairy toward the tip. The following descriptions expand on the data presented in the various floras of the United States (Allen, 1975; Chase, 1950; Correll and Johnson, 1970; Fernald, 1950; Gould, 1975; Hall, 1978; Long and Lakela, 1971; Radford, Ahles and Bell, 1968; Small, 1933) which deal with *Sorghastrum*. The key in this treatment should enable the identification of plants both in the field and herbarium. This treatment of the genus *Sorghastrum* is part of my dissertation, *The Grasses of Florida* (Hall, 1978), which is being revised for publication.

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## FLORISTIC TREATMENT

Perennials; culms erect, tufted, sometimes rhizomatous, sheaths auricled; spikelets 2-flowered, paired—one sessile and perfect and the other pedicelled and rudimentary or the pedicel only present; sessile spikelets—glumes equal, leathery; first lemma sterile, 0- or 2-nerved; second lemma fertile, 1-2-nerved, 2-toothed, awned from tip; palea thin when present; pedicelled spikelets—rudimentary or absent; first lemma sterile, thin; second lemma sterile or staminate; terminal spikelets with 2 sterile pedicels; disarticulation at rachis joints, sessile spikelet, pedicel or pedicels, and inter-node attached.

The form of the panicles, as stated in the key and descriptions below, is distinctive for each of the species as observed on living plants in the field; however, this distinctiveness is seldom evident on herbarium specimens.

1. Awns to 1.3 cm long, once-geniculate; plants rhizomatous; surfaces of the glumes stramineous or only faintly brown basally ..... *S. nutans*
1. Awns 1.6–4.6 cm long, twice-geniculate; plants non-rhizomatous; surfaces of the glumes brown.
  2. Axis of the panicle straight and with the branchlets declining-second; spikelets 0.8–1.2 mm wide..... *S. secundum*
  2. Axis of the panicle notably arching, broadly bowed, branchlets distributed all the way around the axis *or* axis of the panicle straight and with the branchlets distributed no more than 180 degrees around the axis; spikelets 1.1–1.8 mm wide.
    3. Axis of the panicle notably arching, broadly bowed, the branchlets distributed all the way around the axis; spikelets 1.1–1.4 mm wide ..... *S. elliottii*
    3. Axis of the panicle straight and with the branchlets distributed no more than 180 degrees around the axis; spikelets 1.3–1.8 mm wide... *S. apalachicolense*

## SORGHASTRUM apalachicolense D. W. Hall, sp. nov. Open Indiangrass.

Perenni, culmis erectis, caespitose, sine rhizomatibus; vaginis pubescentibus; laminis ad 7.3 mm latis et 43 cm longis, planis aut parum plicatis, glabris desuper, scabris infra; paniculis 23.6–32.5 mm longis et 4.7–10.5 cm latis (aristis inclusis), diffusis, *axibus rectis* et 0.7–1.3 mm latis ad locum 1–2 mm super nodum infimum, parce ramosis et cum paucis floribus, ramis longissimis 7.5–11.1 cm longis et patentibus; *spiculis* 1.3–1.8 mm latis et 5.2–7.2 mm longis, pubescentibus; aristis lemmatis 2.1–2.8 cm longis, tortis, flexis; pedicellis 4.0–5.4 cm longis.

Perennial; culms erect, caespitose, not rhizomatous; sheaths pubescent; blades to 7.3 mm wide and to 43 cm long, flat or slightly folded, glabrous above, scabrous below; panicles 23.6–32.5 cm long and 4.7–10.5 cm wide including awns, diffuse, axis straight and 0.7–1.3 mm wide at a point 1–2 mm above lowest node, sparingly branched and flowered, longest branches 7.5–11.1 cm long and spreading; spikelets 1.3–1.8 mm wide, 5.2–7.2 mm long, pubescent; lemma awns 2.1–2.8 cm long, twisted, bent; pedicels 4.0–5.4 mm long. Elevated spots in wet savannas and longleaf pine-wiregrass ridges. Calhoun to Franklin County. Locally common. July-August.

This species was discovered by Robert K. Godfrey. As presently known it occurs on both sides of the Apalachicola River including parts of Liberty,



Franklin, and Calhoun Counties. Dry elevated sites, usually dominated by longleaf pine and wiregrass, are typical where this endemic may be found. Even slight rises of just a few inches above wet areas afford enough elevation for the plant to establish itself.

The branches of the inflorescence on one side curve around the axis  $180^\circ$ . This leaves one side of the inflorescence axis bare. When wet with dew or rain the branchlets and spikelets droop to one side on the axis, often causing it to arch downwards.

*Sorghastrum apalachicolense* blooms and fruits in July and August. No other *Sorghastrums* flower and fruit at this time, at least in West Florida. Fruits and often the stems of *Sorghastrum apalachicolense* will have fallen before other species of this genus start flowering.

TYPE: UNITED STATES. FLORIDA. Liberty Co.: longleaf pine-wiregrass sand ridge, at the jct of FL 12 and FL 379, between Sumatra and Bristol, 5 Aug 1978, R. K. Godfrey 76630 (HOLOTYPE: FLAS; ISOTYPES to be distributed to BH, BM, FSU, GH, ISC, MO, NCU, NY, TAES, US, USF).

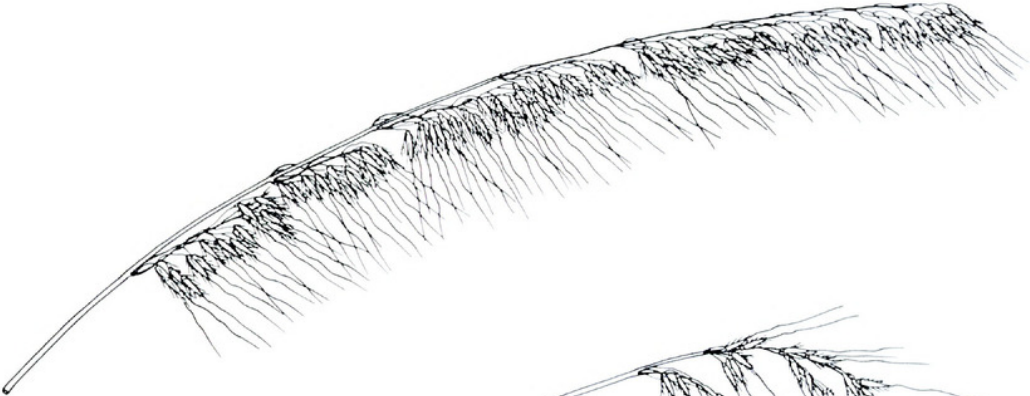
Other specimens examined: FLORIDA. Calhoun Co.: well drained longleaf pineland, S of Blountstown, by FL 71, 2.2 m S of jct with FL 275, Godfrey 76642 (FSU); well drained longleaf pineland, S of Blountstown, by FL 71, 3/4 mi S of jct with FL 73, Godfrey 76643 (FSU); well drained longleaf pineland, by FL 73, 8 mi N of Kinard and S of Carksville, Godfrey 76644 (FSU); pine flatwoods, 2.2 mi S of jct with FL 275 on FL 71, Hall 514 (FLAS); dry pine flatwoods, 3/4 mi S of jct with FL 73 on FL 71, Hall 515 (FLAS); dry ridge, 8.1 mi N of Kinard on FL 73, Hall 517 (FLAS). Franklin Co.: longleaf pine-wiregrass sand ridge, vicinity of Wright Lake, SW of Sumatra, Godfrey 76635 (FLAS, FSU). Liberty Co.: elevated place in wet pine savanna, about 4 mi NW of Sumatra, by FL 379, Godfrey 76620 (FLAS, FSU); Longleaf pine-wiregrass ridge, 7 mi S of jct of FL 12 and FL 379 by FL 379, between Sumatra and Bristol, Godfrey 76631 (FLAS, FSU); Longleaf pine-wiregrass sand ridge, 12.1 mi S of jct of FL 12 and FL 379 by FL 379, between Sumatra and Bristol, Godfrey 76633 (FLAS, FSU).

*SORGHASTRUM ELLIOTTII* (Mohr) Nash, N. Amer. Fl. 17: 130. 1912. Slender Indiangrass.

*Chrysopogon elliottii* Mohr, Bull. Torrey Bot. Club 24: 21. 1897.

Perennial; culms erect to ascending, not rhizomatous, i.e. caespitose; sheaths glabrous or pubescent; blades to 9.0 mm wide and to 58 cm long, flat to folded, scabrous and rarely pubescent above, scabrous below; panicles 19.8–34.6 cm long and 3.6–6.4 cm wide including awns, diffuse, axis arching, broadly "U" or bow-shaped and 0.3–0.8 mm wide at a point 1–2 mm above lowest node, sparingly branched and flowered, longest branches to 4.5 cm long and erect to appressed; spikelets 1.1–1.4 mm wide, 5–2–6.2 mm long, pubescent; lemma awns 2.1–3.4 cm long, twisted, bent; pedicels 3.3–5.3 mm long. Old fields, barrens and mixed woodlands, usually upland pine or pine-oak communities often over a clay subsoil. Counties adjacent to Georgia,

Fig. 1. Inflorescences of *Sorghastrum*. 1. *S. secundum* X 1/3. 2. *S. elliottii* X 1/2. 3. *S. nutans* X 1/3. 4. *S. Apalachicolense* X 1/3.



1



2



3



4

1/20  
6.1.90



Apalachicola River E to Hamilton County in Florida. Infrequent. September-November. General: E Maryland, Virginia, Tennessee, Arkansas, Oklahoma, SE Coastal Plain from North Carolina to E Texas.

This species receives its common name from its distinctive habit. The culm is notably thin in relation to the other species and has a distinctive bow-shape to the inflorescence.

Normally Slender Indiangrass is found in areas where the vegetation is quite open.

Representative specimens: FLORIDA. Hamilton Co.: sandy, open woods, banks of Suwanee River, above Ellaville, *Godfrey* 53957 (FSU). Leon Co.: old field near Tallahassee, *Baggs & Henry s.n.* (FLAS); Clay banks at edge of semi-open pine-hardwood, along Orchard Pond Road, *Godfrey* 68949 (FSU). Jefferson Co.: upland, open pine-oak woodland, ca 2 mi N of Wacissa, *Godfrey* 56216 (FSU, USF). Liberty Co.: moist borders of mixed woodland, on slope, Torreya State Park, *Godfrey* 65015 (FSU). GEORGIA: Clarke Co.: field border on hilltop, agronomy farm, Whitehall, *Domby* 30 (FLAS); woods across from Biological Science Building, University of Georgia, *Banks* 1399 (USF). LOUISIANA: Quachita Parish: 12 mi SW West Monroe, frequent clumps on sandy clay loam of oak-pine forested hills, *Kral* 8013 (FSU). St. Helena Parish: longleaf pine forest ca 4 mi NE of Greensburg, *Allen* 9752 (FLAS). NORTH CAROLINA: Alexander Co.: dry open woods, 2 mi NW of Vashti, *Radford* 45149 (FLAS). Martin Co.: sandy woods, Conoho Creek, 4.5 mi NW of Williamston, *Radford* 45281 (USF). SOUTH CAROLINA: McCormick Co.: pine-oak-hickory woods, 5 mi SW of McCormick, *Duncan* 10394 (FLAS). TENNESSEE: Knox Co.: open woods on bluffs along Tennessee River, 4 mi SW of Knoxville, *Ilitis* 1622 (FLAS, FSU). TEXAS: Smith Co.: marginal thickets of pastures and open woods, Amigo, *Moore* 1041 (FLAS).

*SORGHASTRUM NUTANS* (L.) Nash, in Small, Fl. Southeast. U.S. 66. 1903.  
Yellow Indiangrass.

*Andropogon nutans* Linnaeus, Sp. Pl. 1045. 1853.

Perennial; culms erect, rhizomatous; sheaths glabrous or pubescent; blades to 11.4 mm wide and to 54 mm long, flat to folded, glabrous above and below; panicles 11.4–36.3 cm long and 2.3–4.3 cm wide, axis straight and somewhat stiffly erect, axis 0.7–2.1 mm wide at a point 1–2 mm above the lowest node, densely branched and flowered with longest branches to 8.8 cm long and erect to appressed; spikelets 1.1–1.4 mm wide, 4.6–7.1 mm long, pubescent lemma awns 6.2–12.4 mm long, twisted, bent; pedicels 2.3–4.1 mm long. Sand pine scrub, sandy oak woods, pine woods, barrens, roadsides and fields. Hillsborough County in the central peninsula northwards and through the panhandle. Infrequent, but locally common. September-November. General: East of the Rocky Mountains; Southern Canada, United States, Northern Mexico.

Yellow Indiangrass is the only North American *Sorghastrum* with rhizomes. The awns are shorter and once-geniculate versus twice-geniculate when compared with the other species of North America.



Representative specimens: ALABAMA: Mobile Co.: wet flatwoods 10.7 mi S of Theodore on AL 59, *Kral* 29729 (FLAS). ARKANSAS: Drew Co.: fallow bottoms, Monticello, *Demaree* 25511 (FSU). FLORIDA: Alachua Co.: roadside near Gulf Distributor tanks in Gainesville, *Arnold s.n.* (FLAS). Hamilton Co.: sandy loam along R.R., near FL 41, 4.1 mi SE of Genoa, *Perdue* 1826 (FSU, USF). Hernando Co.: shallow fresh water pools about 2 mi E of Weekiwachee Springs, *Ray* 9523 (FLAS, FSU, USF). Hillsborough Co.: sandhill, Temple Terrace, 46th St. about 3/4 mi S of University of South Florida, Tampa, *Lakela* 32549 (USF). Leon Co.: estate 12 mi W of Tallahassee, *Ritchey s.n.* (FLAS). Madison Co.: longleaf pine, turkey oak sand ridge, 9 mi E of Greenville, *Godfrey* 53987 (FSU). Okaloosa Co.: sandy oak woods, *Hume s.n.* (FLAS). Pasco Co.: about 2 mi S of Wilson Haven off US 41, *Ray* 10318 (USF). Putnam Co.: moist soil SW end of airport at Welaka, *Laessle s.n.* (FLAS). Walton Co.: along Laird Drive, 4 mi S of Freeport, *Davis* 15269 (FLAS). GEORGIA: Oglethorpe Co.: shaded edge of woods, Echols Mill, about 9.3 mi N of Lexington, *Montgomery* 269 (FLAS). Upson Co.: open oak woods on summit of Pine Mt., W of Thomaston, *Cronquist* 4708 (FLAS). IOWA: Fremont Co.: on top of steep loess bluff near West Mt. Olive Church, Washington Township, *Morrill* 1344 (FSU). KANSAS: Riley Co.: dark moist soil along KS 177, 8 mi S of Kansas State Univ. in Manhattan, Konza Prairie Research Natural Area, *Kooijman* 319 (FSU). MISSISSIPPI: Harrison Co.: pine open forests above Bay Saint Louis, Henderson Point, *Demaree* 36230 (USF). SOUTH CAROLINA: Bamberg Co.: sandy upland woods, NW of Govan, *Ables* 37624 (FLAS). McCormick Co.: pine-oak-hickory woods, 6 mi SW of McCormick, *Duncan* 10396 (FLAS). TENNESSEE: Polk Co.: edge of Sphagnum bog 3-4 mi E of Ducktown, TN 60, *Rogers* 31405 (USF). TEXAS: Dallas Co.: Stults Prairie, SW corner of Coit Road and Line Road, *Correll* 22582 (FSU).

*SORGHASTRUM SECUNDUM* (Elliott) Nash, in Small, Fl. Southeast. U.S. 67. 1903. Lopsided Indiangrass.

*Andropogon secundus* Elliott, Bot. S.C. and Ga. 1: 580. 1891.

Perennial; culms erect to ascending, not rhizomatous, i.e. caespitose; sheaths glabrous or pubescent; blades to 8.1 mm wide and to 42 cm long, flat to folded, scabrous above and below; panicles 14.8–47.4 cm long and 3.6–6.7 cm wide including awns, 1-sided, axis straight and 0.5–1.4 mm wide at a point 1–2 mm above lowest node, moderately to densely branched and flowered with longest branches to 7.5 cm long and spreading to appressed along one side; spikelets 0.8–1.2 mm wide; 5.3–7.4 mm long, pubescent; lemma awns 1.65–4.3 cm long, twisted, bent; pedicels 3.5–6.3 mm long. Turkey oak-longleaf pine woods, scrub oak sand ridges, flatwoods, mixed woodlands, hammocks, savannas, beaches, roadsides and rocky pinelands. Throughout Florida. Common. July–November. General: SW South Carolina, Georgia, Florida, Alabama, Mississippi.

Mostly occurring in thinly wooded areas, the one-sided inflorescence renders this species visible from some distance. The straight inflorescence axis with the spikelets all positioned to one side is especially distinctive.

In South Florida the species begins blooming in July while from Central Florida northwards flowering does not start till September.



Representative specimens: ALABAMA: Escambia Co.: longleaf-pine, Hill Forest Experimental Forest, S of Brewton and W of AL 93, *Ford* 5204 (FLAS). FLORIDA: Alachua Co.: rich, dry, sandy soil, Devil's Millhopper, Gainesville, *Weatherwax s.n.* (FLAS). Bay Co.: pine flatwoods, 10 mi E of Panama City, *Ford* 5316 (FLAS). Broward Co.: 5 mi W of Cocoa, slash pine-saw palmetto flatwoods, *Kral* 5270 (FSU). Charlotte Co.: flatwoods, *Frye s.n.* (FLAS). Collier Co.: pineland, N of schoolhouse, Marco Island, *Lakela* 31188 (USF). Dade Co.: dry, rocky pineland 6 mi W of Naranja, *Sargent* 6644 (FLAS). Duval Co.: pine barrens near Jacksonville, *Curtiss* 6252 (FLAS). Escambia Co.: longleaf pine-scrub oak ridge, Warrington, *Godfrey* 74558 (FSU). Flagler Co.: ditch in pine flatwoods along S side of FL 100, 3.4 mi W of Bunnell, *Hansen* 6671 (USF). Glades Co.: Serenoa prairie E of Nash, Palmdale, *Davis s.n.* (FLAS). Hernando Co.: grassy roadside along US 41, 4 mi N of Brooksville, *Ray* 9487 (USF). Hillsborough Co.: Tampa, *Garber s.n.* (FLAS). Levy Co.: across from section 16, S side of highway, Bronson, *Swallen s.n.* (FLAS). Liberty Co.: longleaf pine-scrub oak ridge, FL 12, 2 mi NW of junction with FL 65, *Godfrey* 76668 (FLAS). Monroe Co.: rocky pinelands, Big Pine Key, *Brass* 28982 (FLAS). St. Johns Co.: moist soil, N side Hastings, *Ward* 2304 (FLAS). Walton Co.: Longleaf pine-scrub oak, junction of FL 217 and FL 219, *Tyson* 442 (USF). GEORGIA: Chatham Co.: sandy roadside, 7 mi W on GA 204, *Swank* 327 (USF). Long Co.: open pine-palmetto area, 5 mi SW of Ludowice, *Duncan* 7869 (FLAS). Richmond Co.: sandhills, Augusta, *Cuthbert s.n.* (FLAS). MISSISSIPPI: Lamar Co.: 15.5 mi W of Hattiesburg, near Little Black Creek, *Jones* 2460 (FSU). SOUTH CAROLINA: Beaufort Co.: dry woodland, St. Helena Island, *Cuthbert s.n.* (FLAS). Jasper Co.: Tillman Ridge, 7.4 mi NW of Tillman on County Route 119, *Leonard* 2764 (FLAS).

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