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**RESULTS OF SURVEYS FOR SLENDER FINGER-GRASS - FERNALD  
ENVIRONMENTAL MANAGEMENT PROJECT**

**12/08/94**

**RUST  
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REPORT**

FERNALD ENVIRONMENTAL  
MANAGEMENT PROJECT

RESULTS OF SURVEYS FOR  
SLENDER FINGER-GRASS

Prepared by:

RUST Environment & Infrastructure Inc.  
Project No. 72740.000

December 8, 1994

December 8, 1994

Ms. Becky Bixby  
FERMCO  
P.O. Box 398704  
Cincinnati, Ohio 45239-8706

Regarding: Field Surveys for Slender Finger-grass at the FEMP Site  
Project No. 72740.000

Dear Ms. Bixby:

RUST Environment & Infrastructure, Inc. (RUST) has completed field surveys at the Fernald Environmental Management Project (FEMP) property in order to determine the presence or absence of Slender Finger-grass (*Digitaria filiformis*), a state endangered species. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations (Section 121), FEMP must meet the substantive requirements of the Federal Endangered Species Act of 1973, the Ohio Revised Code of 1975, the Ohio Division of Wildlife Order of 1976, and the Ohio Endangered Plant Law of 1978. The survey was conducted in accordance with our proposal number CP-3205 dated March 24, 1994.

The grass family is one of the largest in number of genera and species, and, among flowering plants, is probably the largest in the number of individuals and one of the most widely distributed (Hitchcock, 1971). When identifying a group of related variable grass species, the question arises as to whether there are several closely related but distinct species, or a few distinct species, each of which shows great variation. As a result, identification of grasses depends upon the study of abundant material both in the field and in the herbarium. Brown (1979) expressed the frustration of identifying grasses by stating, "To identify grasses with

Ms. Becky Bixby  
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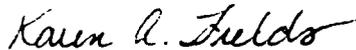
woodlands, *Digitaria filiformis* was determined not to occur in these areas.

Should you have any questions or comments regarding any of the information provided in this report, please feel free to contact the undersigned.

Respectfully submitted,

RUST Environment & Infrastructure, Inc.

Reviewed by:



Karen A. Fields  
Staff Biologist



Allan M. Hale, Ph.D.  
Senior Ecologist

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## 1.0 INTRODUCTION

Slender Finger-grass (*Digitaria filiformis*) is a state endangered species of crabgrass. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations (Section 121), the Fernald Environmental Management Project (FEMP) must meet the substantive requirements of the Federal Endangered Species Act of 1973, the Ohio Revised Code of 1975, the Ohio Division of Wildlife Order of 1976, and the Ohio Endangered Plant Law of 1978. As such, RUST Environment & Infrastructure, Inc. (RUST) has completed field surveys at the FEMP property in order to determine the presence or absence of Slender Finger-grass at the property.

Slender Finger-grass blooms from August through October in Ohio. The preferred habitat of Slender Finger-grass is in full sun, in sandy and/or sterile soils. In a 1986 botanical survey of the FEMP property conducted by Miami University, this species was reported to occur in the riparian habitats at the site. Thus, RUST conducted field surveys for this species in the riparian woodlands (along Paddys Run and in the northern woodlands) and in the Inactive Flyash Pile, since it represents a habitat with sterile, sandy soils. Surveys for Slender Finger-grass were conducted by three biologists from RUST on August 23 and 24, 1994.

## 2.0 SURVEY METHODS

Since grass species are among the most difficult plants to identify in the field and because the genus *Digitaria* in particular is composed of many distinct species all of which have highly variable identifying characteristics, each of the team members reviewed several taxonomic descriptions of Slender Finger-grass and the identifying characteristics of the species. Examples of this information are provided in Appendix I. These descriptions were carried into the field

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for use as reference material in the event that any suspect populations of Slender Finger-grass were observed.

The herbaceous ground cover stratum is the area of concern for this threatened and endangered species program; therefore, qualitative "cruise" methods were used to cover the maximum area of the facility in the most effective manner. The cruise method used is equivalent to the Point-Intercept method for measuring the relative frequency/occurrence of a species (Bonham, 1989). Using this technique, Slender Finger-grass was actively searched for by biologists from RUST who walked along pre-determined transects that traversed the preferred habitats of the species.

A total of five distinct habitats were surveyed for the presence of Slender Finger-grass: the pine plantations, northern woodlands, riparian areas along Paddys Run, the Inactive Flyash Pile, and the open areas surrounding the oval running track (Figure 1). The riparian areas along Paddys Run and the northern woodlands were surveyed because Slender Finger-grass was reported to occur in these areas in the 1986 Miami University botanical survey of the FEMP property. The clearings between the rows of the pine plantations, the Inactive Flyash Pile and the areas near the running track were surveyed because these areas all have conditions that closely resemble the preferred habitat of the species based on Ohio Department of Natural Resources (ODNR) records.

Thus, on August 23, 1994, the northern pine plantation, the northern woodland area, and the riparian areas along Paddys Run were surveyed for Slender Finger-grass in conjunction with a similar survey being conducted for Mountain Bindweed (*Polygonum cilinode*), a state endangered plant species. Along Paddys Run, each bank of the creek was examined, as well as suitable habitat adjacent to the creek (i.e., openings in the canopy cover adjacent to the creek bed). RUST observed one suspected population of Slender Finger-grass growing along the vehicle path

to groundwater monitoring wells located in the northern woodland (Figure 1). This population consisted of several hundred individuals. No other suspected populations of Slender Finger-grass were observed in any of the areas surveyed on this day. A representative sample of this suspected population of Slender Finger-grass was photographed and a specimen was collected for positive taxonomic identification.

On August 24, 1994, the Inactive Flyash Pile, the southern pine plantation, the riparian areas near the storm sewer outfall ditch, and the running track were surveyed for Slender Finger-grass. Suspected populations of Slender Finger-grass were observed in one area of the Inactive Flyash Pile and near the running track (Figure 1). Representative specimens were collected from each of these populations for positive taxonomic identification. No other suspected populations of Slender Finger-grass were observed in any of the areas surveyed.

Since several specimens from the FEMP property appeared to have the distinguishing characteristics of the species, *Digitaria filiformis*, Ms. Pat Jones with the ODNR Division of Natural Areas and Preserves, was contacted by RUST on August 25, 1994 to determine the location of voucher specimens of this state endangered species. Ms. Jones indicated that the largest voucher collection for *D. filiformis* could be found in the Ohio State University Department of Biological Diversity Herbarium. On August 29, 1994, a representative from RUST visited the herbarium curated by Dr. Richard L. Stuckey (Professor Emeritus, Botany, Ohio State University), and individually viewed all available *D. filiformis* specimens for later comparison with the FEMP samples. Based on these observations, RUST identified three different species of *Digitaria* to be growing at the site including *D. serotina*, *D. sanguinalis*, and *D. filiformis*.

RUST's specific taxonomic identification of *Digitaria filiformis* followed the morphologic

characteristics of the species as listed in Radford et. al., 1968, which include: culms in small tufts; slender and erect growth, 10 to 60 centimeters (cm.) in height; lower sheaths pilose; upper sheaths glabrous; blades erect and 5 to 15 cm. long; racemes unequal, erect and in groups of 1 to 5; spikelets 1.5 to 1.7 millimeters (mm.) long; second glume and sterile lemma pubescent with short capitellate hairs; the glume shorter than the spikelet; and the fertile lemma dark brown. All specimens collected from the FEMP property were pressed and mounted for future reference.

Since a state endangered plant species was tentatively identified as occurring at the FEMP property, the pressed specimens collected by RUST were sent to the ODNR Division of Natural Areas and Preserves for verification. Upon review of these specimens, Mr. Greg Schneider, a botanist with ODNR, determined that the specimens labeled as *Digitaria filiformis* and *Digitaria serotina* were actually *Digitaria ischaemum*, Smooth Crabgrass. His determination was based upon the fact that each of the specimens sent to ODNR had a fascicled rachis (the main axis of the inflorescence was winged), and, since *D. filiformis* is the only species of *Digitaria* that does not have a winged rachis, Mr. Schneider determined that the specimens were *D. ischaemum*.

Since ODNR's identification did not confirm RUST's initial identification, RUST met with representatives of FERMCO and the Department of Energy at which time FERMCO and RUST suggested that the specimens be sent to a third-party for validation since many of the morphologic characteristics used to identify the specimens are highly variable within the genus, *Digitaria*. As a result, the specimens were also sent to Dr. John Thieret, a grass expert from Northern Kentucky University, for identification. Dr. Thieret confirmed ODNR's determination that the specimens were actually *D. ischaemum*. Dr. Thieret based his decision on the non-erect growth of the specimens, presence of a winged rachis, and the mature spikelets being dark

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brown in color.

### 3.0 RESULTS AND CONCLUSIONS

Several populations of crabgrass were observed during the surveys conducted in August, 1994 at the FEMP property. Through verification procedures with the ODNR Division of Natural Areas and Preserves and Dr. John Thieret, a grass expert from Northern Kentucky University, these populations were determined to consist of two separate species of crabgrass, *Digitaria sanguinalis*, and *Digitaria ischaemum*, both of which are common species in Ohio. Although marginally suitable habitat (full sun with sandy/sterile soils) does exist for Slender Finger-grass near the Inactive Flyash Pile, the running track and in additional openings in the northern woodlands, *Digitaria filiformis* was determined not to occur in these areas.

### 4.0 REFERENCES

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# OHIO ENDANGERED AND THREATENED VASCULAR PLANTS

Abstracts of State-Listed Taxa

Edited by Robert M. McCance, Jr.  
James F. Burns

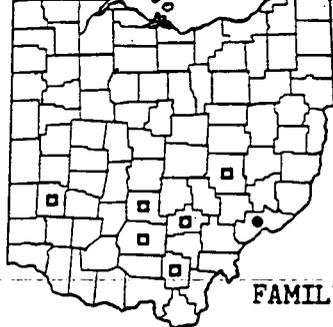
Division of Natural Areas and Preserves  
Department of Natural Resources  
Columbus, Ohio

1984



Richard F. Celeste, Governor

Lt. Gov. Myrl H. Shoemaker, Director



DIGITARIA FILIFORMIS (L.) Koel.  
Slender Finger-grass

68493

FAMILY: Gramineae (Poaceae).

HABIT: Herbaceous, erect, caespitose annual, 0.5-10 dm.; flowering August-October.

SIMILAR SPECIES: Three species of Digitaria occur in Ohio, two of which are very common. This species differs from the others by penduncle characters and its generally erect habit. This species superficially resembles members of Paspalum.

TOTAL RANGE: FL to TX and Mex., n. to s. NH, MA, NY, s. MI, IL, and IA.

STATE RANGE: There is a post-1960 record from Washington County. There are pre-1960 records from Hocking, Jackson, Montgomery, Muskingum, Pickaway, and Ross counties.

STATE STATUS: 1980-Endangered, 1982-E, 1984-E.

HABITAT: In full sun in sterile sandy soils.

HAZARDS: Grazing; overshadowing by woody species as a result of succession.

RECOVERY POTENTIAL: Unknown, but probably good due to its weedy nature.

INVENTORY GUIDELINES: Mature flowering material, with underground parts, is needed for identification. Note density of basal tufts.

COMMENTS: This species is likely more common than the records indicate, and intensive searching should find additional locations.

SELECTED REFERENCES:

Henrard, J.T. 1950. Monograph of the genus Digitaria. Universitaire Pers Leiden, Leiden. 999 p.

Hitchcock, A.S. 1951. Manual of grasses of the United States. Ed. 2, rev. by A. Chase, U.S. Dep. Agr. Misc. Publ. 200. 1051 p.

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MANUAL OF  
THE GRASSES OF THE  
UNITED STATES

A. S. Hitchcock

Second Edition  
Revised by AGNES CHASE

IN TWO VOLUMES  
VOLUME TWO

DOVER PUBLICATIONS, INC.  
NEW YORK

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2. *Trichachne californica* (Benth.) Chase. **COTTONTOP.** (Fig. 824.) Culms erect from a knotty swollen felty-pubescent base, 40 to 100 cm. tall; leaves numerous, the sheaths glabrous to sparsely pilose; blades mostly less than 12 cm. long, 3 to 5 mm. wide, from nearly glabrous to densely puberulent; panicle mostly 5 to 10 cm. long, the few racemes usually 3 to 5 cm. long, occasionally longer, erect or nearly so; spikelets approximate, excluding the hairs 3 to 4 mm. long, the white to purplish hairs much exceeding them, often spreading, the middle internerves of the sterile lemma glabrous. ♀ (*T. saccharata* Nash.)—Plains and dry open ground, Texas and Oklahoma to Colorado, Arizona, and Mexico; South America.

3. *Trichachne patens* Swallen. (Fig. 825.) Culms tufted, erect, 40 to 90 cm. tall; sheaths more or less papillose-pilose, the lowermost densely felty-pubescent; blades 5 to 15 cm. long, 1 to 4 mm. wide, scabrous; panicle 10 to 18 cm. long, the racemes stiffly ascending or spreading; spikelets remote, 4 mm. long, densely silky. the hairs exceeding the spikelet; fruit 3 mm. long, acute. ♀ —Dry fields, prairies, and roadsides, Texas.

4. *Trichachne hitchcockii* (Chase) Chase. (Fig. 826.) Culms tufted and branching at base, leafy below, slender, 30 to 50 cm. tall; sheaths and

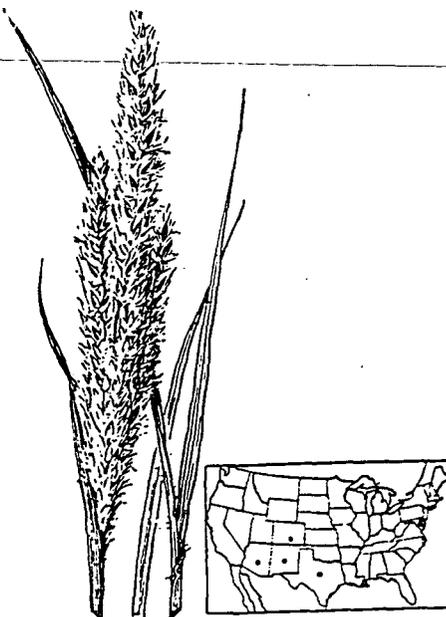


FIGURE 824.—*Trichachne californica*. X 1. (Hitchcock 13608, Tex.)

blades nearly glabrous to puberulent, sometimes densely so toward base, the blades 2 to 5 cm. long, 2 to 3 mm. wide; panicle long-exserted, 6 to 10 cm. long, the few racemes 3 to 4 cm. long, mostly rather remote and erect; spikelets 2.5 to 3 mm. long, densely silky-villous, the prominent nerves not hidden, the grayish hairs not exceeding the spikelet. ♀ —Dry plains, Texas; northern Mexico.

## 129. DIGITARIA Heister. CRABGRASS (*Syntherisma* Walt.)

Spikelets in twos or threes, rarely solitary, sessile or short-pedicelated, alternate in 2 rows on one side of a 3-angled winged or wingless rachis; spikelets lanceolate or elliptic, nearly planoconvex; first glume minute or wanting; second glume equaling the sterile lemma or shorter; fertile lemma cartilaginous, the hyaline margins pale. Annual or perennial, erect to prostrate, often weedy grasses, the slender racemes digitate or approximate on a short axis. Type species, *Digitaria sanguinalis*. Name from Latin *digitus*, finger, alluding to the digitate inflorescence of the type species.

The species are in the main good forage grasses. *Digitaria sanguinalis*, the common crabgrass, is a weed in cultivated soil. In the Southern States, where it produces an abundant growth in late summer on fields from which crops have been gathered, it is utilized for forage and is sometimes cut for hay. This species and *D. ischaemum* are common weeds in lawns. They form a fine green growth at first but start late and die in the fall.

- 1a. Rachis winged or flat-margined, the margin as wide as the central rib; plants annual, creeping at least at base.  
 Rachis bearing scattered long fine hairs (these rarely wanting); spikelets narrow, acuminate, nearly glabrous..... 2. *D. HORIZONTALIS*.  
 Rachis not bearing hairs; spikelets elliptic, acute, pubescent.  
 Plants perennial, stoloniferous..... 7. *D. LONGIFLORA*.  
 Plants annual. Culms erect or decumbent spreading.  
 Sheaths glabrous; fertile lemma brown.  
 Spikelets 2 mm. long, 1 mm. wide, the hairs or most of them capitellate.  
 3. *D. ISCHAEMUM*.  
 Spikelets 1.5 to 1.7 mm. long, about 0.6 mm. wide, the hairs not capitellate.  
 Sterile lemma with 5 distinct nerves; spikelets sparingly pubescent, 1.7 mm. long; fertile lemma light brown; racemes, if more than 2, not digitate.  
 4. *D. FLORIDANA*.  
 Sterile lemma with 3 distinct nerves; spikelets distinctly pubescent, 1.5 mm. long, fertile lemma dark brown, racemes usually all digitate.  
 5. *D. VIOLASCENS*.  
 Sheaths pilose or villous; fertile lemma pale.  
 Spikelets 1.5 to 1.7 mm. long; pedicels terete, glabrous..... 6. *D. SEROTINA*.  
 Spikelets 2.5 to 3.5 mm. long; pedicels angled, scabrous..... 1. *D. SANGUINALIS*.
- 1b. Rachis wingless or with a very narrow margin (see also *D. horizontalis*), triangular; plants not creeping (except in *D. texana*), annual or perennial.
- 2a. Fertile lemma pale or gray.  
 Plants annual, decumbent and rooting at base. Spikelets 3 mm. long, glabrous or nearly so..... 8. *D. SIMPSONI*.  
 Plants perennial.  
 Spikelets densely or sparsely villous; racemes 5 to 10.  
 Spikelets 2.8 to 3.5 mm. long, sparsely to densely villous..... 14. *D. RUNYONI*.  
 Spikelets 2 to 2.5 mm. long, rather sparsely villous..... 13. *D. TEXANA*.  
 Spikelets glabrous to obscurely appressed-pubescent on the internerves; racemes 2 to 5, some of them naked at base for 1 to 1.5 cm.  
 First glume broad, hyaline, minute but obvious; spikelets 3.2 mm. long, glabrous.  
 15. *D. PAUCIFLORA*.  
 First glume obsolete or nearly so; spikelets 2.5 to 2.8 mm. long, obscurely to obviously appressed-pubescent.  
 Racemes 2 to 4; culms ascending from a curved base; sheaths papillose-pilose.  
 16. *L. SUBCALVA*.  
 Racemes 5 to 10; culms erect; sheaths conspicuously villous.  
 17. *D. ALBICOMA*.
- 2b. Fertile lemma dark brown. Plants erect or at least not rooting at the decumbent base; annual or sometimes apparently perennial.  
 Second glume and sterile lemma glabrous (see also *D. laeviglumis* under *D. filiformis*).  
 12. *D. GRACILLIMA*.  
 Second glume and sterile lemma capitellate-pubescent.  
 Spikelets 2 to 2.5 mm. long..... 10. *D. VILLOSA*.  
 Spikelets 1.5 to 1.7 mm. long.  
 Blades folded or involute, flexuous..... 11. *D. DOLICHOPHYLLA*.  
 Blades flat..... 9. *D. FILIFORMIS*.

1. *Digitaria sanguinalis* (L.) Scop.  
 CRABGRASS. (Fig. 827.) Plant branching and spreading, often purplish, rooting at the decumbent base, the culms sometimes as much as 1 m. long, the flowering shoots ascending; sheaths, at least the lower, papillose-pilose; blades 5 to 10 mm. wide, pubescent to scaberulous; racemes few to several, 5 to 15 cm. long, rarely longer, digitate, with usually 1 or 2 whorls a short distance below; spikelets about 3 mm. long; first glume minute but evident; second glume about half as long as the spikelet, nar-

row, ciliate; sterile lemma strongly nerved, the lateral internerves appressed-pubescent, the hairs sometimes spreading at maturity (*D. fimbriata* Link); fertile lemma pale. ☉  
 —Fields, gardens, and waste places, a troublesome weed in lawns and cultivated ground throughout the United States at low and medium altitudes, more common in the East and South; temperate and tropical regions of the world. Native of Europe. A specimen with nearly glabrous sheaths and inflorescences of 2 racemes collected by



FIGURE 826.—*Trichachne hitchcockii*. Plant. X 1; spikelet and floret. X 10. (Type.)

Tracy in Mississippi, said to be introduced, has been erroneously referred to *Syntherisma barbatum* (Willd.) Nash (*Digitaria barbata* Willd.).

*DIGITARIA SANGUINALIS* var. *CILIARIS* (Retz.) Parl. Sterile lemma, pectinate-ciliate, the stiff cilia 1.5 mm. long. Along railroad, Berks County, Pa. Waif from Asia.

2. *Digitaria horizontalis* Willd. (Fig. 828.) Resembling *D. sanguinalis*, the culms more slender, the racemes mostly subracemose, very slender, lax, the rachis scarcely winged, bearing scattered long fine spreading hairs (these rarely wanting); spikelets narrow, about 2 mm. long; first glume minute or obsolete; second glume half as long as the spikelet. ☉ (*Syntherisma setosum* Nash; *S. digitatum* Hitchc.)—Waste places, southern and central Florida; ballast, Mobile, Ala.; tropical regions of North America and South America.

3. *Digitaria ischaemum* (Schreb.) Schreb. ex Muhl. SMOOTH CRABGRASS.

(Fig. 829.) Erect or usually soon decumbent-spreading, resembling *D. sanguinalis* but not so coarse or tall; foliage glabrous, bluish or purplish; racemes mostly 2 to 6, 4 to 10 cm. long, the rachis with thin wings wider than the midrib; spikelets about 2 mm. long; first glume hyaline, obscure; second glume and sterile lemma as long as the dark fertile lemma, pubescent with capitellate hairs. ☉ (*Syntherisma humifusum* Rydb.)—Waste places, often a troublesome weed in lawns. Quebec to Georgia, west to Washington and California; introduced from Eurasia. The first glume is so thin as to be apparently wanting. *DIGITARIA ISCHAEMUM* var. *MISSISSIPPIENSIS* (Gattinger) Fernald. Taller, the racemes mostly 5 to 7, often 10 or even 15 cm. long; first glume often more easily seen. ☉ —Maryland, Indiana, Illinois, Virginia, Tennessee, South Carolina, and Georgia.

4. *Digitaria floridana* Hitchc. (Fig. 830.) Culms tufted, decumbent at base, 20 to 30 cm. tall; foliage glabrous except for a few long hairs around the mouth of the sheath; blades 4 to 7 cm. long, 3 to 6 mm. wide; racemes 3 or 4, rather distant on the axis, 3 to 6 cm. long, the rachis wings wider than the midrib; spikelets 1.5 to 1.7 mm. long, rather sparingly pubescent; first glume wanting; second glume and sterile lemma about as long as the light-brown fertile lemma. ☉ —Sandy pine woods, Florida (Hernando County). The inflorescence resembles that of *D. filiformis*, but the rachis is winged; the spikelets are smaller than those of *D. ischaemum*.

5. *Digitaria violascens* Link. (Fig. 831.) Annual or apparently perennial; culms numerous in a tuft, spreading at base, slender, 10 to 40 cm. tall; leaves mostly clustered near the base, the sheaths glabrous; blades flat, mostly less than 5 cm. long, 3 to 6 mm. wide, the upper culm blade distant, reduced; racemes slender, 2 to 5, usually 2 or 3, digitate or some-

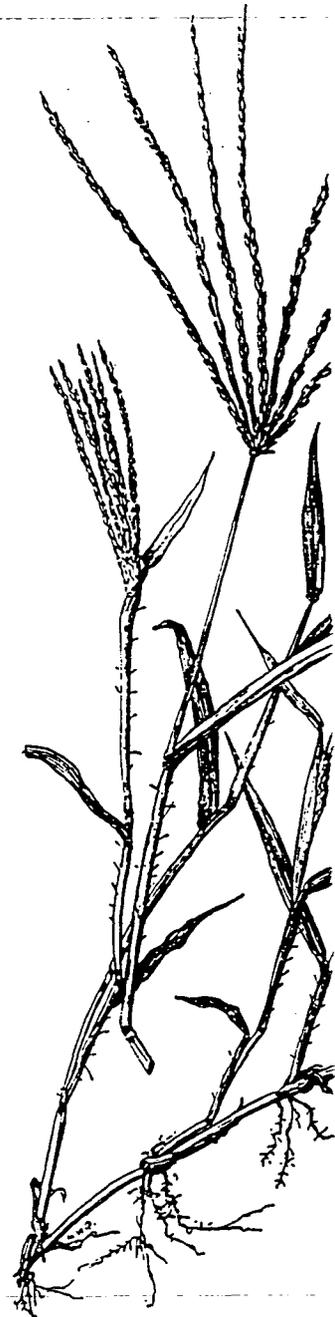


FIGURE 827.—*Digitaria sanguinalis*. Plant views of spikelet and floret. X 10. (Kana.)

CULTURE

usually soon resembling *D.* so coarse or tall; bluish or purplish; 6, 4 to 10 cm. with thin wings rib; spikelets about glume hyaline, oblong and sterile lemma, fertile lemma, serrate hairs. ☉ (*diffusum* Rydb.)— a troublesome species to Georgia, Florida and California; Eurasia. The first spikelet apparently *SCHAEMUM* var. (*lattingeri*) Fernald. spikelets mostly 5 to 7, 1.5 cm. long; first glume long, 3 to 6 mm. easily seen. ☉ (Florida, Illinois, Virginia, South Carolina,

*na Hitchc.* (Fig. 827) decumbent at base; tall; foliage glaucous; few long hairs on the sheath; first glume long, 3 to 6 mm. rather distant from the midrib; first glume wanting; sterile lemma light-brown. ☉ —Sandy pine barrens (Fernando County). Resembles that of *D.* rachis is winged; spikelets smaller than those

*ens Link.* (Fig. 828) perennial; a tuft, spreading 10 to 40 cm. tall; spikelets near the base, blades flat, 1.5 cm. long, 3 to 6 mm. long; upper culm blade slender, 2 mm. long; ligulate or some-

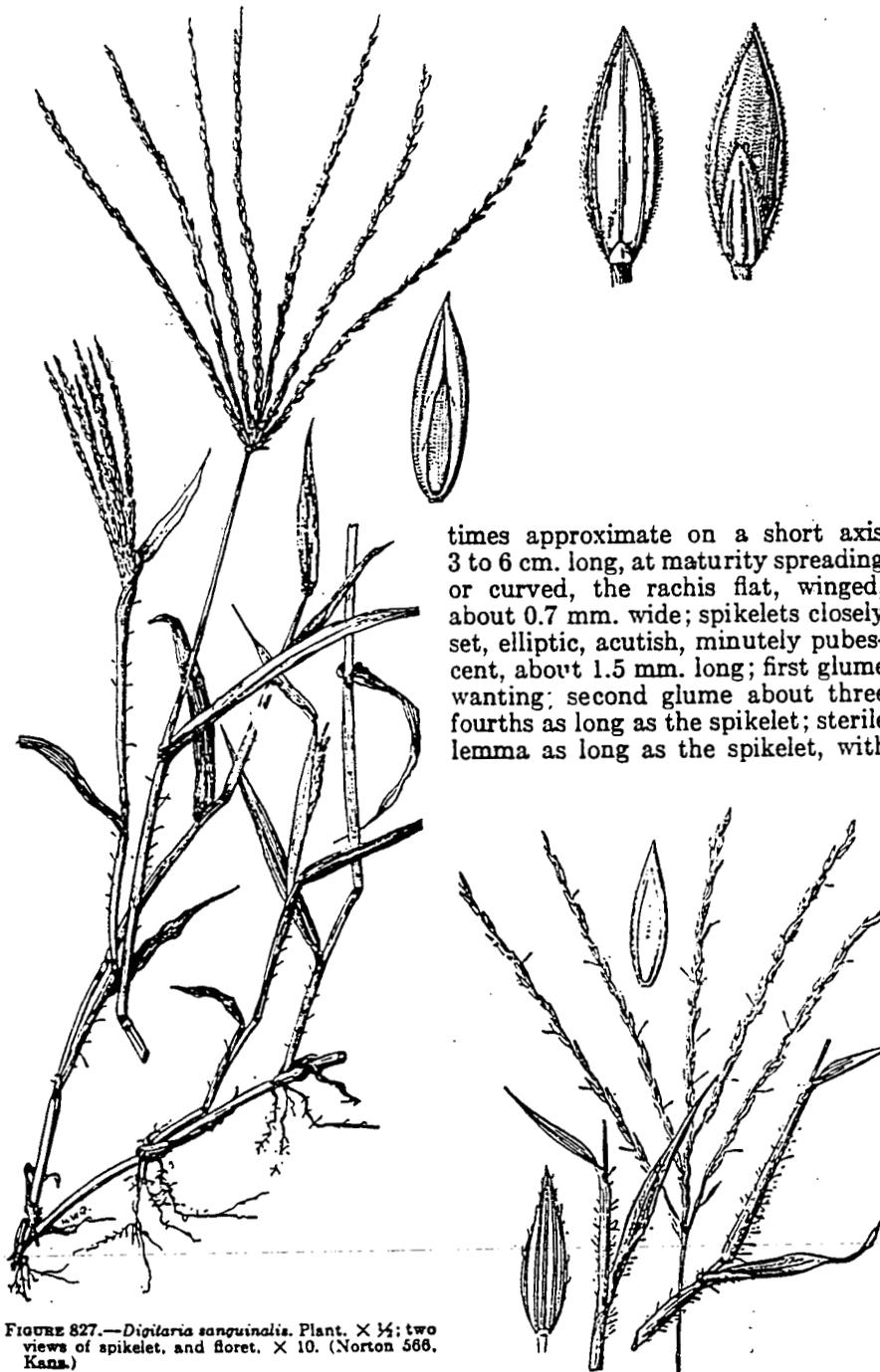


FIGURE 827.—*Digitaria sanguinalis*. Plant,  $\times \frac{1}{2}$ ; two views of spikelet, and floret,  $\times 10$ . (Norton 566, Kans.)

times approximate on a short axis 3 to 6 cm. long, at maturity spreading or curved, the rachis flat, winged, about 0.7 mm. wide; spikelets closely set, elliptic, acutish, minutely pubescent, about 1.5 mm. long; first glume wanting; second glume about three fourths as long as the spikelet; sterile lemma as long as the spikelet, with

FIGURE 828.—*Digitaria horizontalis*. Plant,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Nash 998, Fla.)



FIGURE 829.—*Digitaria ischaemum*. Plant, X 1; spikelet and floret, X 10. (Jones 1761, Vt.)

three distinct nerves and 1 or 2 obscure pairs; fertile lemma acute, dark brown at maturity. ♂ ♀ —Open pineland in sandy soil, Indiana and Kentucky; Georgia and Florida to Arkansas and Texas; tropical America; tropical Asia.

6. *Digitaria serótina* (Walt.) Michx. (Fig. 832.) Creeping, sometimes forming extensive mats; flowering culms ascending or erect, 10 to 30 cm. tall; leaves crowded on the creeping culms, the blades short; sheaths villous; blades 2 to 8 cm. long, 3 to 7 mm. wide; racemes usually 3 to 5, slender, often arcuate, 3 to 10 cm. long, the rachis with thin wings wider than the midrib; spikelets pale, about 1.7 mm. long; first glume wanting; second glume about one-third as long as the sterile lemma, both finely pubescent; fertile lemma pale. ♂ —Pastures and waste places, Coastal Plain, Pennsylvania to Florida and Louisiana; Philadelphia (ballast); Cuba.



FIGURE 830.—*Digitaria floridana*. Plant, X 1; spikelet and fertile floret, X 10. (Type.)

7. *Digitaria longiflora* (Natz.) Pers. (Fig. 833.) Stoloniferous; culms ascending, 20 to 40 cm. tall, glabrous; sheaths glabrous; ligule membranaceous, 1 mm. long; blades 1 to 4 cm. long, 3 to 5 mm. wide, flat, glabrous; racemes 2 to 4, 3 to 8 cm. long, usually curved, the rachis flat, 0.5 to 0.8 mm. wide; spikelets 1.5 mm. long, elliptic, minutely pubescent. ♀ —Ditches and sandy ground, southern Florida; tropical regions of the Old World; introduced in the American Tropics.

8. *Digitaria simpsoni* (Vasey) Fernald. (Fig. 834.) Resembling *D. sanguinalis* in habit; sheaths papillose-pilose, those of the innovations compressed-keeled; blades not more than 6 mm. wide, softly pilose; racemes 4 to 8, ascending, pale, 8 to 12 cm. long, the triangular rachis narrowly margined; spikelets about 3 mm. long; first glume hyaline, obsolete or nearly so; second glume and sterile lemma finely 7- to 9-nerved, glabrous

or very obscurely pubescent; exceeding the pale, slightly fertile lemma. ♂ —Sandy fields, Florida, rare; Isla de Pinar.

9. *Digitaria filiformis* (Fig. 835, A.) Culms in slender, usually erect, 10 tall, rarely taller, those of unequal; lower sheaths upper mostly glabrous; blades usually 5 to 15 cm. long more robust plants), 1 wide; racemes mostly 1 to erect or ascending, mostly 10 cm. long, somewhat fasciated; spikelets 1.5 to long; first glume wanting; glume and sterile lemma with short capitellate hairs; times nearly glabrous, shorter than the spikelet; lemma dark brown, slightly ♂ —Sandy fields and ground, New Hampshire and Oklahoma, south Texas, and Mexico. A



FIGURE 831.—*Digitaria violascens*. Partial views of spikelet, and floret, X 10. (Ala.)

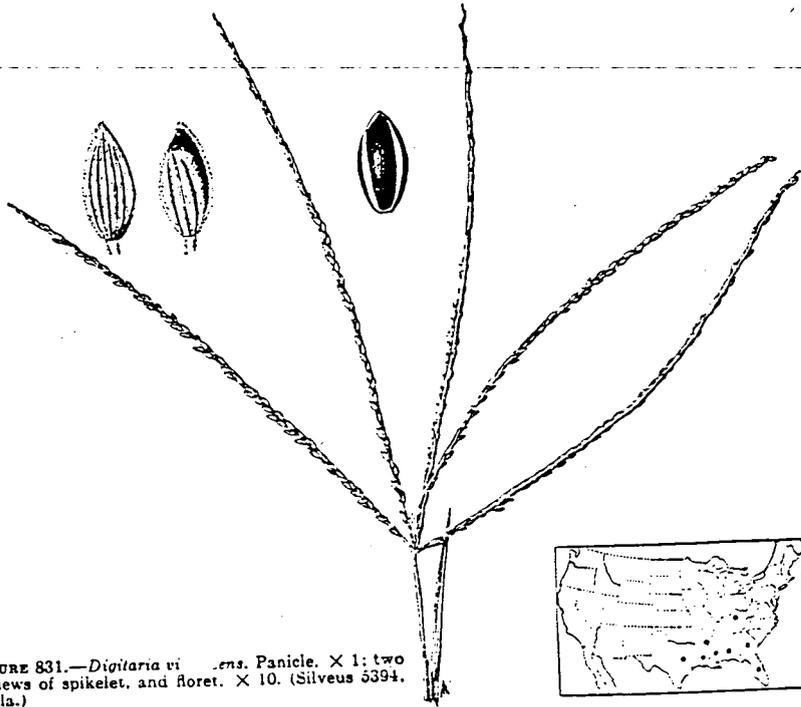


FIGURE 831.—*Digitaria villosa*. Panicle. X 1; two views of spikelet, and floret. X 10. (Silveus 5394. Ala.)

or very obscurely pubescent, barely exceeding the pale slightly apiculate fertile lemma. ○ —Sandy fields, Florida, rare; Isla de Pinos, Cuba.

9. *Digitaria filiformis* (L.) Koel. (Fig. 835, A.) Culms in small tufts, slender, usually erect, 10 to 60 cm. tall, rarely taller, those of a tuft very unequal; lower sheaths pilose, the upper mostly glabrous; blades erect, usually 5 to 15 cm. long (longer in more robust plants), 1 to 4 mm. wide; racemes mostly 1 to 5, unequal, erect or ascending, mostly less than 10 cm. long, somewhat distant, not fasciated; spikelets 1.5 to 1.7 mm. long; first glume wanting; second glume and sterile lemma pubescent with short capitate hairs, sometimes nearly glabrous, the glume shorter than the spikelet; fertile lemma dark brown, slightly apiculate.

○ —Sandy fields and sterile open ground, New Hampshire to Iowa and Oklahoma, south to Florida, Texas, and Mexico. A form with

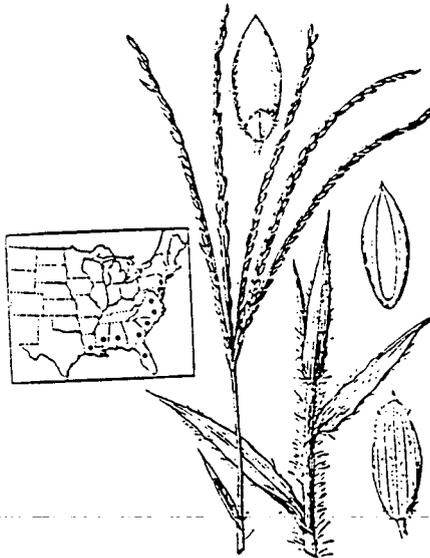


FIGURE 832.—*Digitaria serotina*. Plant. X 1; two views of spikelet, and floret. X 10. (Tracy 4653. Miss.)

long, the capitellate hairs rather stiff and appressed; fruit dark brown. 2 (Has been confused with *panicea* (Swartz) Urban.)—Moist pinelands and open ground, southern Florida; Cuba, Puerto Rico.

12. *Digitaria gracillima* (Scribn. & Fernald. (Fig. 838.) Perennial in dense tufts; culms 60 to 100 cm. tall, erect; lower sheaths appressed-villous; blades elongate, 1 to 2 mm. wide

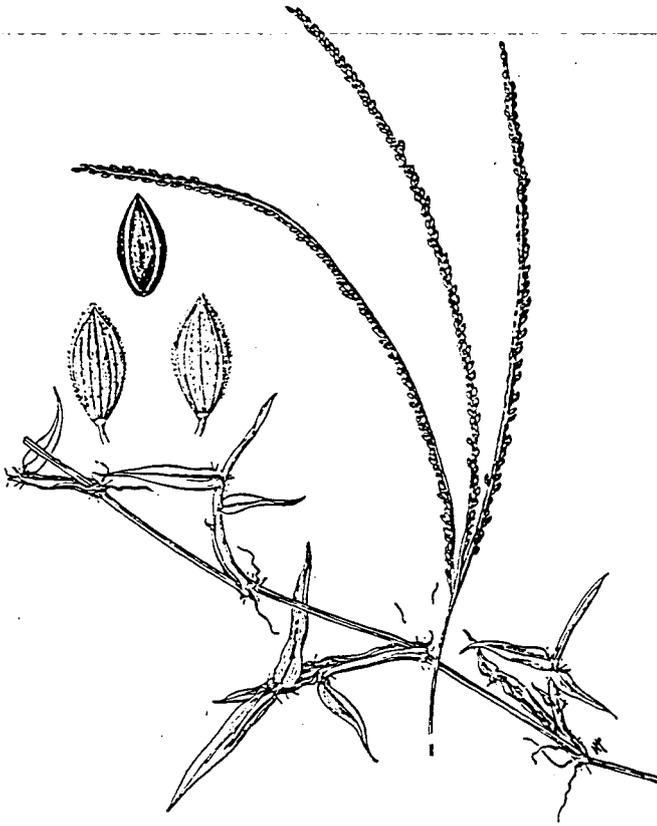


FIGURE 833.—*Digitaria longiflora*. Plant,  $\times \frac{1}{2}$ . Stolon and panicle,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Silveus 4405, Fla.)

glabrous spikelets from Manchester, N. H., has been described as *D. laeviglumis* Fernald (835, B.).

10. *Digitaria villosa* (Walt.) Pers. (Fig. 836.) Perennial at least in the Southern States, in large tufts, purplish at base; culms 0.75 to 1.5 m. tall, rarely branching; sheaths, at least the lower, grayish villous, sometimes sparsely so; blades elongate, 3 to 6 mm. wide, often flexuous, from softly pilose to nearly glabrous; racemes 2 to 7, narrowly ascending, rarely somewhat spreading, very slender, usually 15 to 25 cm. long, rather distant, often naked at base, sometimes interrupted; spikelets 2 to 2.5 mm. long, usually densely pubescent with soft capitellate hairs, the hairs longer than in *D. filiformis*, and some-

times only obscurely capitellate, the spikelets otherwise very like those of *D. filiformis*. 2 —Sandy fields and woods, Maryland to Missouri, south to Florida and Texas; Cuba, Mexico. This species and *D. filiformis* seem to intergrade to some extent. Plants from peninsular Florida with less strongly pubescent sheaths, 2 to 4 elongate racemes, and spikelets with longer hairs have been distinguished as *D. leucocoma* (Nash) Urban.

11. *Digitaria dolichophylla* Henr. (Fig. 837.) Slender wiry perennial, 50 to 115 cm. tall; blades elongate, folded or involute, flexuous, about 1 mm. wide; racemes mostly 1 to 3, erect, 5 to 20 cm. long, usually 10 to 20 cm., very slender, loosely flowered; spikelets about 1.5 mm.

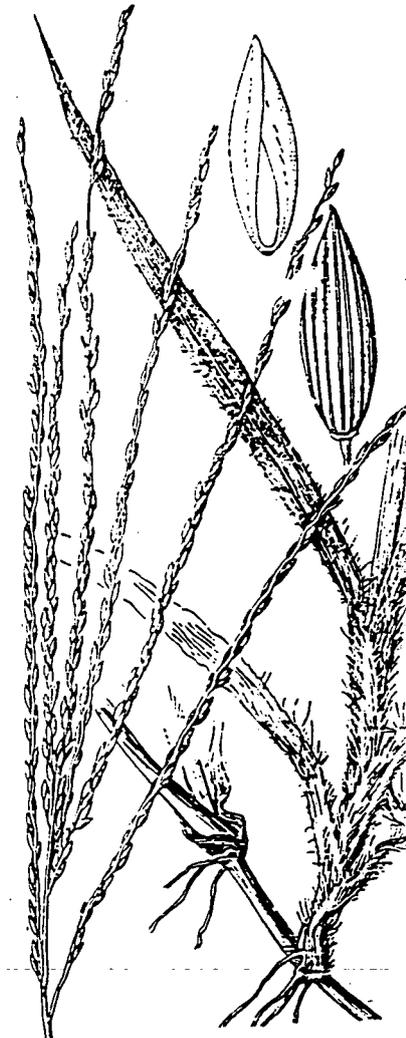


FIGURE 834.—*Digitaria simpsoni*. Plant,  $\times 1$ ; stolon and panicle,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Curtiss 6422, Fla.)

long, the capitellate hairs rather stiff and appressed; fruit dark brown. ♀ (Has been confused with *D. panicea* (Swartz) Urban.)—Moist pine barrens and open ground, southern Florida; Cuba, Puerto Rico.

12. *Digitaria gracillima* (Scribn.) Fernald. (Fig. 838.) Perennial in dense tufts; culms 60 to 100 cm. tall, erect; lower sheaths appressed-villous; blades elongate, 1 to 2 mm. wide,

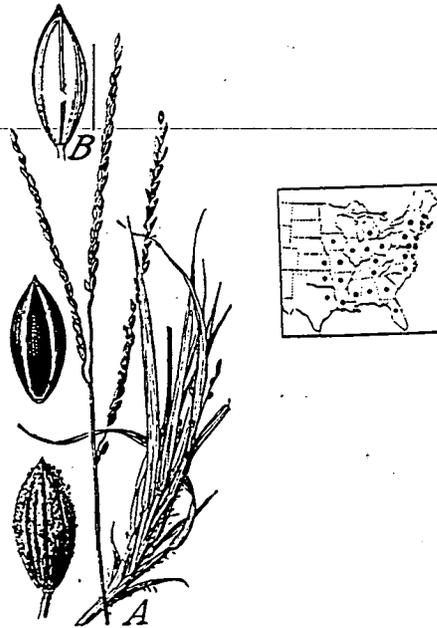


FIGURE 835.—A. *Digitaria filiformis*. Plant,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Bissell, Conn.) B. *D. laevigata*. Spikelet,  $\times 10$ . (Type coll.)

often involute, more or less flexuous; racemes mostly 2 or 3, distant (rarely as many as 5 and fairly approximate), very slender; spikelets rather remote, relatively long pediceled, about 2.3 cm. long, glabrous; first glume ob-

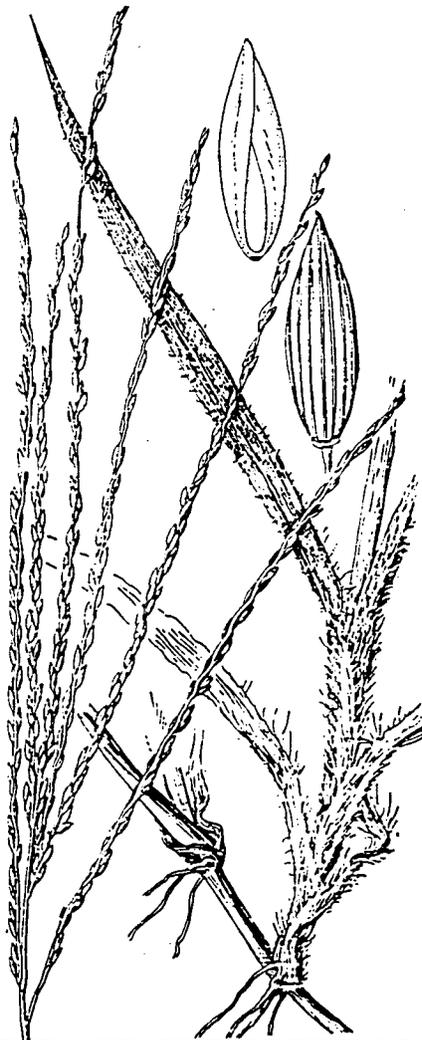


FIGURE 834.—*Digitaria simpsoni*. Plant,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Curtis 6422, Fla.)



FIGURE 836.—*Digitaria villosa*. Plant,  $\times 1$ ; spikelet and floret,  $\times 10$ . (Curtis 5300, Fla.)

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MANUAL  
OF THE  
VASCULAR FLORA  
OF THE  
CAROLINAS

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ALBERT E. RADFORD

HARRY E. AHLES

C. RITCHIE BELL



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THE UNIVERSITY OF NORTH CAROLINA-PRESS  
CHAPEL HILL.

21

long, sterile lemma 1-3 nerved, glaucous, obtuse, 3-4 mm long; fertile lemma and palea nerveless or faintly nerved, papillose, obtuse, 3-4 mm long. Grain dark red, broadly ellipsoid, 2.8 mm long. (n=60, 80) Aug.-Oct. Low woods, roadsides and fields; pied. and cp. [Va., Ga., Fla., Ala., Miss., Tenn., Ky.] Includes *P. difforme* Le Conte—S; *P. floridanum* var. *glabratum* Engelm.

#### 75. DIGITARIA Heister CRAB GRASS

Annuals; internodes glabrous. Leaves cauline; blade margins cartilaginous, scaberulous; sheath margins usually scarious; ligules membranous. Racemes racemose, ascending; rachis usually winged, scaberulous. Spikelets plano-convex, ellipsoid, acute. First glume usually absent, 2nd glume villous on nerves and margins, acute, sterile lemma 5-7 nerved, acute; fertile lemma and palea nerveless, cartilaginous, glabrous, acute; fertile lemma margins flat, hyaline. Grain whitish to brownish, ellipsoid. These plants are our worst field and garden weeds.

Rachis trigonous, not distinctly winged .....	1. <i>D. filiformis</i> .
Rachis not trigonous, distinctly winged .....	
Sheath glabrous .....	2. <i>D. ischaemum</i> .
Sheath pubescent .....	
Spikelets 2.8-3.2 mm long .....	3. <i>D. sanguinalis</i> .
Spikelets 1.5-1.8 mm long .....	4. <i>D. serotina</i> .

1. *D. filiformis* (L.) Koeler. Cespitose annual; culms 3-12 dm tall, nodes glabrous. Blades to 15 cm long, 2-4 mm wide, papillose-hirsute and scaberulous above, glabrous or occasionally pilose to hirsute beneath; sheaths papillose-hirsute; ligules erose to lacerate, 0.5-1 mm long. Racemes 2-7, ascending, 3-12 cm long; rachis trigonous, wingless, scaberulous. Spikelets 1.8-2.5 mm long; pedicels scaberulous, 0.5-3 mm long. Second glume 5-nerved, 1.2-1.5 mm long, sterile lemma margin ciliate, 1.8-2 mm long; fertile lemma and palea purple, papillose lined, 1.8-2 mm long. Grain 1-1.2 mm long. (n=18) Sept.-Oct. Sandy fields, roadsides.

1a. var. *filiformis*.\* Spikelets 1.8-2 mm long; plant 3-7.5 dm tall. Scattered throughout. [Va., Ga., Fla., Ala., Miss., Tenn., Ky.] *Syntherisma filiforme* (L.) Nash—S.

1b. var. *villosa* (Walter) Fernald. Spikelets 2-2.5 mm long; plant frequently more than 1 m tall. Pied. and cp. [Va., Ga., Fla., Ala., Miss., Tenn.] *Syntherisma villosum* Walter—S.

2. *D. ischaemum* (Schreber) Schreber ex Muhl. Cespitose to decumbent annual; culms 1.5-6 dm tall, nodes glabrous. Blades to 14 cm long, 2-7 mm wide, glabrous on both surfaces or sparsely pilose; sheaths glabrous; ligules 1-2.5 mm long. Racemes 2-6, ascending, 2-9 cm long; rachis wing scaberulous, 1 mm wide. Spikelets 1.5-2.2 mm long, in groups of 2 or 3; pedicels minutely scaberulous angled, 0.5-2 mm long. Second glume usually 3-nerved, 1.8-2.2 mm long; sterile lemma slightly villous, 1.8-2.2 mm long; fertile lemma and palea purple, papillose lined, 1.8-2.2 mm long. Grain 1.2-1.4 mm long. (n=18).

2a. var. *ischaemum*. Spikelets 1.8-2.2 mm long. July-Oct. Fields and lawns; throughout. [Va., Ga., Ala., Miss., Tenn., Ky., W.Va.] *Syntherisma ischaemum* (Schreber) Nash—S.

2b. var. *violascens* (Link) Radford. Spikelets ca. 1.5 mm long. Sept.-Oct. Sandy woods and roadsides; cp. [Ga., Fla., Ala., Miss., Ky.] *D. violascens* Link—G.

3. *D. sanguinalis* (L.) Scopoli.\* Cespitose, mat-forming annual freely rooting at the lower nodes; culms 2-7 dm tall, lower nodes pilose, upper glabrous. Blades to 16 cm long, 1-16 mm wide, pubescent or puberulent above, scaberulous beneath, occasionally papillose-hirsute basally; sheaths papillose-hirsute; ligules erose, 2-3 mm long. Racemes 3-9, ascending, 2-16 cm long; rachis wing 0.8-1 mm wide, scaberulous. Spikelets 2.8-3.2 mm long, in 2 or 4 rows; pedicels scaberulous angled, 0.5-2 mm long. First glume triangular, glabrous, acute, 0.5 mm long, 2nd glume 5-nerved, 2.8-3.2 mm long; sterile lemma margins villous, 2.8-3.2 mm long; fertile lemma and palea purplish, papillose lined, 2.8-3.2 mm long. Grain 2-2.2 mm long. (n=18, 24, 27) July-Oct. Fields, roadsides and waste places; throughout. [Va., Ga., Fla., Ala., Miss., Ky., W.Va.] *Syntherisma sanguinale* (L.) Dulac.—S.

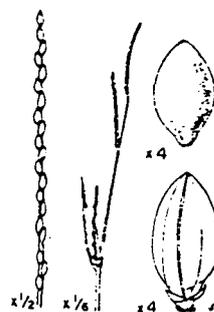
4. *D. serotina* (Walter) tall, nodes appressed pubescent. sheaths villous; ligules 1-2.5 mm scaberulous, 0.8 mm wide. Spikelet mm long. Second glume absent or villous, 1.5-1.8 mm long; fertile l. long. Oct. Sandy woodlands, rare Miss.] *Syntherisma serotinum* Wa

#### 76. BI

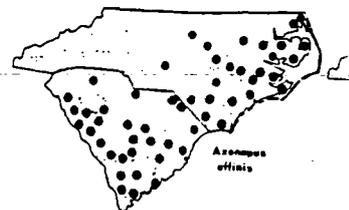
1. *B. platyphylla* (Griseb) nodes; culms 3-6 dm tall, nodes ar 5-14 mm wide, glabrous on both s papillose-pilose, margins ciliate; l ascending, 4-8 cm long; rachis w spikelet. Spikelets ovoid, not plar setose, 0.5-1 mm long. First glume 2nd glume and sterile lemma 7-sterile palea scarious; fertile lem long. Grain yellowish, broadly elli Co., N.C., Beaufort, Dillon, Richi

#### 77. AXO

Rhizomatous perennials usu low cauline; blades glabrous n bo glabrous, margins glabrous; ligule jugate; rachis trigonous, wingless.



*Brachiaria platyphylla*



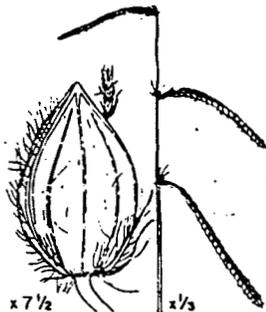
long; rachis wing scaberulous, 1 mm wide. Spikelets orbicular, 2.5-3 mm broad, in 2 rows; pedicels scaberulous, 1-1.5 mm long. Second glume 3-nerved, glabrous, 2.5-3 mm long, sterile lemma 5-nerved, glabrous, 2.5-3 mm long; fertile lemma and palea nerveless, slightly papillose, 2.5-3 mm long. Grain yellowish, suborbicular, 2 mm broad. (n=20) June-Aug. Fields, meadows and roadsides; throughout. [SE.] Includes *P. longipilum* Nash, *P. circulare* Nash—S; *P. laeve* var. *circulare* (Nash) Fernald—F.

14. *P. praecox* Walter. Erect perennial from short rhizomes; culms 6-9 dm tall, nodes and internodes glabrous. Blades to 20 cm long, 1.5-4 mm wide, glabrous or villous on both surfaces, occasionally pilose basally above; sheaths glabrous, villous or sparsely papillose above, margins smooth; ligules 2-2.5 mm long. Racemes 3-5, racemose, ascending, 2-6 cm long; rachis wing scaberulous, 1-1.2 mm wide. Spikelets broadly obovoid to suborbicular, flattish, 2.2-3.2 mm long, in 4 rows, 2 rows rudimentary; pedicels scaberulous angled, 0.1-1 mm long. Second glume and sterile lemma 3-nerved, yellowish green, margins scarious, obtuse, 2.2-3.2 mm long; fertile lemma and palea nerveless, papillose, obtuse, 2.2-3.2 mm long. Grain brownish, broadly ellipsoid, flat, 2 mm long. (n=10, 20) Savannahs and low pinelands; cp.

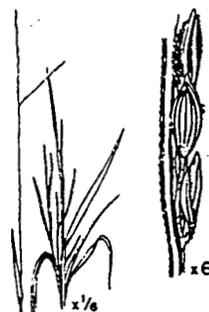
14a. var. *praecox*. Sheaths and blades glabrous or sparsely papillose. May-July. [Va., Ga., Fla., Ala., Miss.]

14b. var. *curtisianum* (Steudel) Vasey. Sheaths and blades villous or hirsute. June-Oct. Savannahs and low pinelands; cp. [Va., Ga., Fla., Ala., Miss., Tenn., Ky.] *P. lentiferum* Lam.—S.

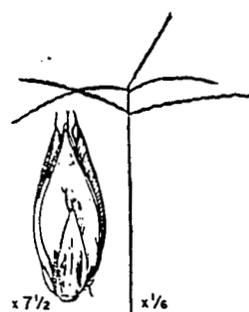
15. *P. floridanum* Michaux. Coarse perennial from stout rhizome; culms 5-15 dm tall, nodes and internodes glabrous. Blades to 40 cm long, 1-15 mm wide, glabrous on both surfaces; sheaths glabrous, occasionally pubescent apically, margins glabrous; ligules membranous, 1-2 mm long. Racemes 2-7, racemose, ascending, 3 cm long; rachis scaberulous, 1-2 mm wide. Spikelets suborbicular or broadly ellipsoid, 3-4 mm long, in 4 rows or by abortion 3 or 2; pedicels scaberulous, 1-2 mm long. Second glume 5-7 nerved, glaucous, obtuse, 3-4 mm



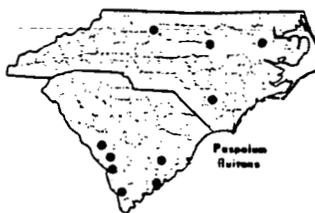
*Paspalum dilatatum*



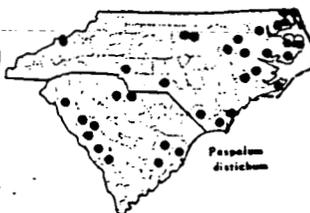
*Digitaria filiformis*



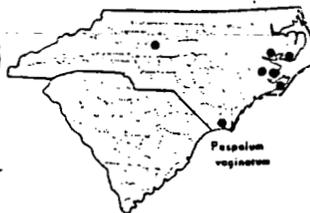
*Digitaria sanguinalis*



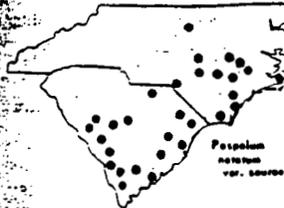
*Paspalum fluitans*



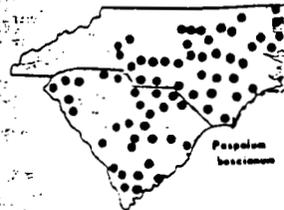
*Paspalum distichum*



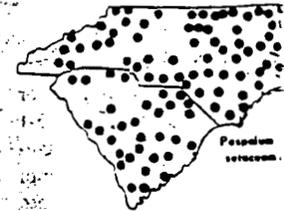
*Paspalum virginorum*



*Paspalum notatum var. sacro*



*Paspalum baseman*



*Paspalum tetracom*



*Digitaria filiformis*



A DESCRIPTIVE KEY TO THE GRASSES OF OHIO  
BASED ON VEGETATIVE CHARACTERS

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5. Culms submersed or floating or prostrate on wet soil and rooting at nodes, short or as much as 1 m long; ligule and auricles 1-3 (5) mm long; sheaths of floating branches inflated, glabrous or hairy; blades usually not more than 1 cm wide and 10 cm long but sometimes considerably wider and longer; annual. *Paspalum fluitans* (Ell.) Kunth

Four counties along the Ohio River; panicle 1-1.5 dm long, of many bladelike branches that are wider than the 2 rows of attached spikelets; spikelets about 1.8 mm long, minutely hairy; first glume absent, the second as long as the spikelet; August-October.

5. Growing in dry or moist open places, not in water or very wet soil; culms ascending or rarely erect, or ascending from a decumbent base, sometimes prostrate, sometimes rooting at lower nodes.

6. Perennial, not weedy; culms short to moderately tall, much branched, leafy, ascending from a knotty decumbent base, the base often with feltlike pubescence; internodes short, the lower often 2-3 cm long, the upper somewhat longer; whole plant often a rather large bunch; lower sheaths often pubescent; blades 2-6 mm wide, mostly less than 1 dm long, the bases often asymmetric; ligule and vertical auricles 1-1.5 mm long, usually higher on one side than on the other and extending horizontally farther on one side than on the other. *Leptoloma cognatum* (Schult.) Chase, fall witchgrass.

Open sandy soil, dry fields; 8 northern and 6 south-central counties; panicle diffuse, one-third the height of the plant or more, at maturity breaking away as a tumbleweed; spikelets 2.5-3 mm long, narrow, solitary at ends of capillary branchlets, each with 1 perfect floret and an additional lemma; sterile lemma and second glume minutely hairy, the first glume absent or very small; hyaline margins of lemma of perfect floret enclosing the palea; July-October.

6. Annual, weedy; culms spreading or ascending from a decumbent base, sometimes, especially when crowded, erect or nearly so, sometimes prostrate, usually rooting at lower nodes; internodes several to many, usually short; foliage often tinged with blue or purple; sheaths loose or inflated, mostly shorter than internodes, with pale longitudinal lines (visible when sheath is removed and held to light); blades 2-8 (10) mm wide, often with pale or purple edge; ligule 1-3 mm long. Species of *Digitaria*, crabgrass.

Waste places, lawns, cultivated fields, and gardens; general and abundant; inflorescence a panicle of spikelike racemes clustered at or near summit of peduncle, sometimes all or most of them in one or two whorls; spikelets 2-3 mm long, each with 1 perfect floret and an additional lemma; first glume minute or sometimes absent.

7. Nodes, sheaths, and blades more or less hairy, the hairs, at least some of them, papilla-based; blades 4-8 (10) mm wide, 4-15 cm long; culms sometimes to 1 m long, especially when prostrate, but often much shorter. *Digitaria sanguinalis* (L.) Scop., crabgrass.

Second glume half as long as the pale or green lemma; first glume minute; June-frost.

7. Plants glabrous or with a few straggling hairs, the hairs not papilla-based; blades 2-4 (6) mm wide, 2-10 cm long; culms usually short. *Digitaria ischaemum* (L.) Scop., smooth crabgrass.

Second glume as long as the dark lemma; first glume sometimes absent or vestigial; July-frost.

7. Blades 1-4 mm wide, sometimes pubescent near base; ligule 1-1.5 mm long, minutely toothed; sheaths, at least the lower, with papilla-based hairs that are sometimes prominent; culms slender to very slender, short to moderately tall, in small tufts, sometimes branched at base or lower nodes, usually erect, those of a tuft unequal in length; foliage and panicle not red; annual. *Digitaria filiformis* (L.) Koel.

Sandy or sterile open ground; 9 counties, mostly southern; inflorescence of 1 to several spikelike racemes attached along a rachis, not fascicled; spikelets 1.5-2 mm long, with 1 perfect floret plus an additional lemma, often in 3's on the axis of the raceme; first glume absent; second glume and slightly longer sterile lemma short-pubescent; fertile lemma and palea dark, elliptic; hyaline margins of lemma overlapping the palea; August-October.

7. Blades 3-10 mm wide; ligule 1-3 mm long, either lacinate-toothed, the teeth ending in hairs, OR entire and often brown.
8. Blades acuminate to aristate at tip; ligule 1-2 mm long, lacinate-toothed, the teeth ending in hairs; sheaths papillose-pubescent, often sparsely so, the hairs slender and sometimes deciduous, the small papillae remaining; culms short to tall, erect or sometimes bent and branched below; foliage and panicle usually red or purple; annual. *Leptochloa filiformis* (Lam.) Beauv., red sprangletop.

Open or shaded areas, sometimes a weed in states farther south; Adams and Gallia counties; apparently rare in Ohio; panicle half the height of the plant, lance-ovoid, of many spikelike branches attached along the rachis; spikelets small, few-flowered; lemma 1-1.5 mm long, pubescent on nerves; July-October.

8. Blades acuminate; ligule 1-3 mm long, entire, often brown; sheaths keeled, the uppermost sometimes inflated; sheaths and blades glabrous to pubescent on surface and margin, the hairs sometimes papilla-based; foliage green; perennial. *Paspalum laeve* Michx. (Incl. *P. longipilum* Nash and *P. circulare* Nash) (See p. 62).
4. Culms without cormlike bases; plants glabrous or more or less pubescent but without velvety or papillose pubescence.
5. Blades prow-shaped at tip, the tip often so slender that its shape may not be noticeable without magnification; blades 1-3 (4) mm wide; perennial.

6. Basal tufts present; culms usually slender, short to moderately tall, pubescent or puberulent, sometimes only below the nodes and below the panicle; sheaths, at least the lower ones, pubescent or puberulent; blades pubescent, puberulent or glabrous, sometimes folded or rolled in drying; ligule 0.5-2 mm long, truncate. *Koeleria cristata* (L.) Pers., junegrass.

*Koeleria cristata* is an illegitimate name. Names used by authors in recent years have included *K. macrantha* (Ledeb.) Schultes, *K. nitida* Nutt., and *K. pyramidata* (Lam.) Beauv.

Dry prairies, open woods, sandy soil; 3 counties along western Lake Erie and Greene County; panicle shining, narrow and spike-like, silvery green, the rachis pubescent; spikelets 4-5 mm long; June-August.

6. Culms in small tufts, mostly short and slender, erect or bent at base; plants glabrous; blades sometimes rolled, the tips slender;

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Manual of Vascular Plants of  
Northeastern United States and  
Adjacent Canada

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78. DIGITARIA Heist. Crab grass. Spikelets 1-fld, single or in clusters of 2 or 3 on unequal pedicels on one side of an elongate rachis; first glume minute or lacking; second glume a third to half as long as the spikelet, conspicuously 5-7-nerved; fertile lemma cartilaginous with hyaline margins, acute, often shining, usually faintly marked with longitudinal rows of minute pits; ours annual, branched from the base, with few-several terminal, digitate or approximate, spike-like, one-sided racemes. (Syntherisma.) (B&B I, 203.)

Culms rooting at the lower nodes; rachis 0.5-1 mm wide, broadly winged, the wings as wide as or wider than the central rib.

Second glume a third to half as long as the white to stramineous or pale brown fertile lemma.

Spikelets 2.4-3 mm; pedicels triquetrous, scabrous. .... 1. *D. sanguinalis*.

Spikelets 1.5-1.7 mm; pedicels terete, glabrous. .... 2. *D. serotina*.

Second glume three-fourths to fully as long as the dark brown or purple-black fertile lemma.

Second glume as long as the spikelet; hairs of the spikelet capitate. .... 3. *D. ischaemum*.

Second glume three-fourths as long as the spikelet; hairs not capitate. .... 4. *D. violascens*.

Culms erect or ascending; rachis slender, triquetrous, very narrowly winged. .... 5. *D. filiformis*

1. *Digitaria sanguinalis* (L.) Scop. Decumbent or prostrate, much branched, rooting at the nodes, usually 3-6 dm; blades 4-10 cm x 5-10 mm, pilose; racemes 3-6 in each of 1-3 whorls, 5-15 cm; rachis 1 mm wide, broadly winged, scabrous on the margins; pedicels triquetrous, scabrous; spikelets 2.4-3 mm; first glume minute, often deciduous, the second half as long as the spikelet; sterile lemma usually scabrous on the 5 strong nerves; fertile lemma greenish-brown. Native of Europe, now cosmopolitan and established as a weed of fields, gardens, lawns, and waste ground throughout the U.S.

2. *Digitaria serotina* (Walt.) Mich. Much like No. 1; lvs densely pilose; racemes 2-6, slender, often curved, 4-8 cm; pedicels terete, glabrous; spikelets 1.5-1.7 mm, villous with minute crooked hairs; first glume lacking, the second a third to half as long as the spikelet; sterile lemma 5-nerved; fertile lemma stramineous to nearly white, or brown-tinged. Waste ground; coastal plain from Fla. and La. (and Cuba) to se. Va., and rarely adventive northward.

3. *Digitaria ischaemum* (Schreb.) Muhl. Much like No. 1; lvs glabrous; racemes 2-5 (8), 4-10 (15) cm; spikelets elliptic or somewhat obovate, 7-2.1 mm, often purple; first glume lacking or minute and hyaline; second glume and sterile lemma equal and about as long as the spikelet, both = pubescent or subtomentose with capitate hairs, especially in stripes between the nerves; fertile lemma purple-black. Native of Eurasia, now established as a weed over much of the U.S., and throughout our range, but less abundant than No. 1. (*D. humifusa*.)

4. *Digitaria violascens* Link. Distinguished from No. 3 by the somewhat smaller (ca 1.5 mm), less pubescent spikelets, the hairs not capitate. Pantropical, extending into our range in Ky. and s. Ind.

5. *Digitaria filiformis* (L.) Koeler. Branched from the base, 3-10 dm, erect or ascending; lower sheaths usually = pilose, the upper sparsely so; glabrous; racemes 2-6, erect or ascending, often distinctly separated at base; rachis triquetrous, narrowly winged; spikelets in pairs or threes, well separated and scarcely overlapping; first glume lacking, the second three-fifths to four-fifths as long as the spikelet, usually pubescent and erose-ciliate with capitate hairs; fertile lemma brown or dark purple. Fields and open ground, often a troublesome weed southward. Forms with glabrous spikelets occur in both vars. (*D. laevigulmis*).

var. *filiformis*. Culms 5-10 dm; upper sheaths glabrous, the lower glabrous to sparsely pilose; spikelets 1.7-2.2 mm. N.H. to Mich. and Kans., s. to Fla. and Mex.

var. *villosa* (Walt.) Fern. Culms 8-15 dm; upper sheaths glabrous or pilose, the lower densely pilose; racemes mostly 10-15 cm; spikelets 2-2.6 mm. Coastal plain from Va. to Fla. and Tex., and n. in the interior to Ill. (*D. villosa*.)

79. LEPTOLOMA Chase. Fall witch-grass. Spikelets fusiform, 1-fld, solitary on long slender pedicels; first glume minute or obsolete; second glume nearly as long as the spikelet, strongly 5-7-nerved; fertile lemma minutely rugulose, cartilaginous, with hyaline margins; perennial, often in large bunches, the culms ± decumbent at base; panicle very diffuse, eventually breaking away from the culm and rolling before the wind. (B&B I, 204.)

1. *Leptoloma cognatum* (Schult.) Chase. Culms tufted, 4-7 dm; lower sheaths villous to papillose-hirsute; blades 5-8 cm, narrow; panicle often a third to half the height of the plant, diffusely branched, purplish, villous in the axils; pedicels 1-4 cm, 3-angled, scabrous; spikelets acute, 2.5-3 mm, subglabrous on the second glume and sterile lemma. Dry, especially sandy soil; s. Mich. and Minn. to Va., Fla., Neb., Ariz. and n. Mex., and at scattered stations ne. to N.H.

80. ERIOCHLOA HBK. Spikelets racemose, short-pedicel in 2 rows on one side of the rachis, lance-ovoid; lower rachilla-joint thickened, forming a ring-like

callus below the second glume, the glume and sterile lemma subequal; fertile lemma indurate, finely rugulose, v branched from the base, with terminal racemes (B&B I, 204.)

1. *Eriochloa contracta* Hitchc. Culm flat, 4-7 mm wide, hairy; panicle 10-15 several, overlapping, 1-2 cm, the racemes purple-margined; spikelets lance-ovoid aristate, appressed-villous; fertile lemma and Ariz., also intr. in Mo., s. Ill. and

81. AXONOPUS Beauv. Spindle-winged rachis, forming a slender equaling the sterile lemma; fertile lemma inrolled margins, its back turned long, terminal (or also axillary), with other racemes below the summit

1. *Axonopus furcatus* (Fluegge) F. compressed, 4-8 dm; lvs to 10 mm below, often with another from the sterile lemma obscure, the other 2.5-3 mm. Damp or wet soil of the Md. (*Anastrophus f.*)

82. PASPALUM L. Spikelets plano-convex or somewhat biconvex, 2-rowed or 4-rowed, usually spiculate; rachis; first glume usually none; fertile lemma of about equal length, smooth or minutely papillose, terminal (except *P. Boscianum*), usually soft lvs and a terminal inflorescence with additional racemes on axillary

Rachis of the racemes broad, foliaceous, the rachis narrow or winged; Racemes regularly 2, approximate or Racemes 1 and terminal, or 2-several Racemes loosely fld, the spikelets in pairs of a pair barely reaching the Racemes spike-like, with numerous, Spikelets long-villous, especially a Racemes 3-6; spikelets 2.9-3.8 Racemes 8-30; spikelets 2.2-2.3 Spikelets glabrous or minutely hairy Fertile lemma dark brown at tip Sterile lemma stramineous or reddish submarginal, or the lemma Spikelets solitary; Spikelets all or mostly paired Spikelets 3.8-4.3 mm; first Spikelets 2.8-3.1 mm; first Sterile lemma 3-nerved, the of the midnerve. Spikelets flattened on both Spikelets plano-convex, a Racemes 5-10; spikelets

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