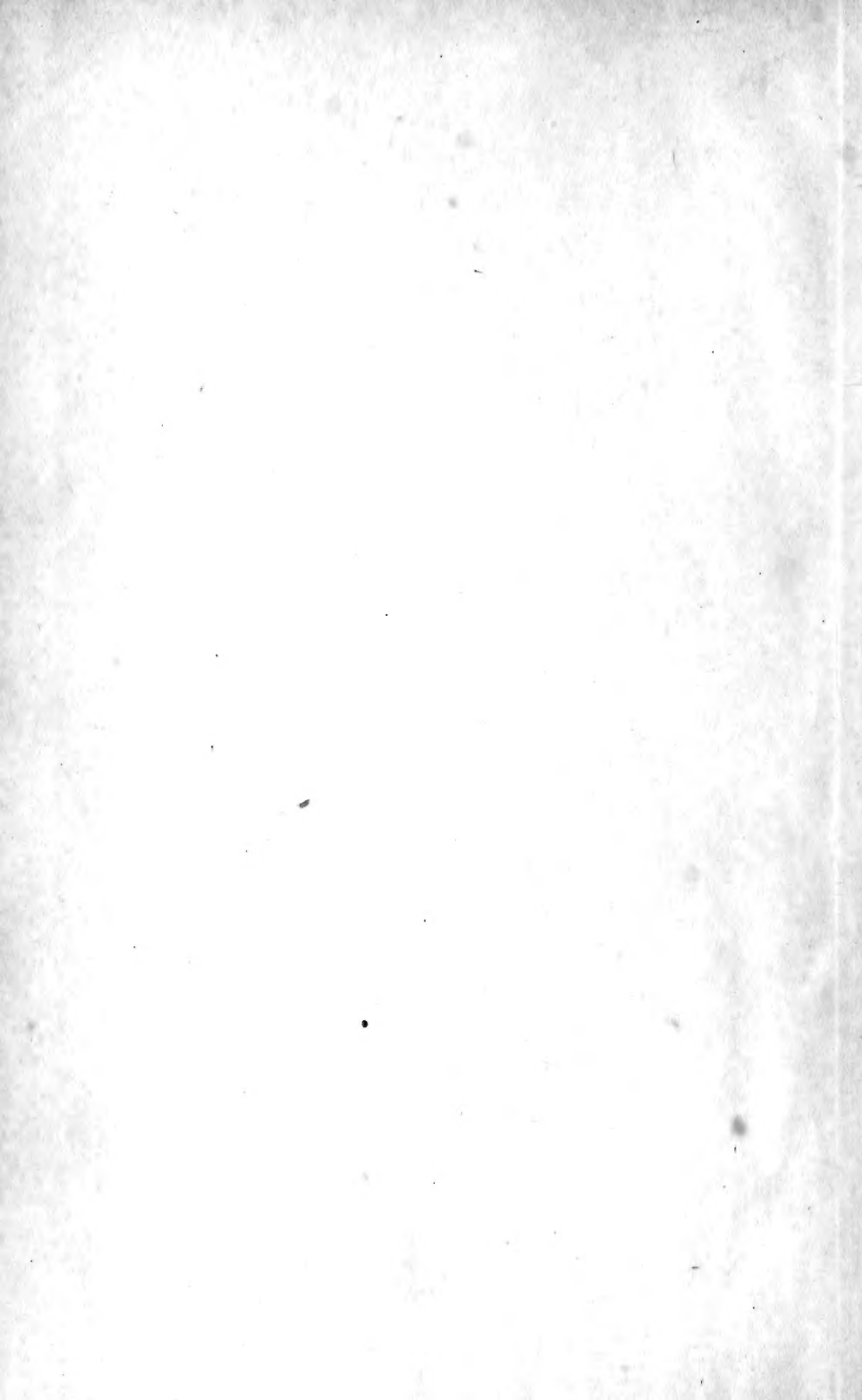




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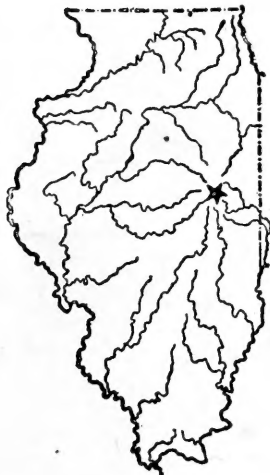
UNIVERSITY OF ILLINOIS

Agricultural Experiment Station

BULLETIN No. 205

THE GRASSES OF ILLINOIS

BY EDNA MOSHER



URBANA, ILLINOIS, MARCH, 1918

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FOREWORD

Dr. Mosher's monograph of the grasses of Illinois represents a type of work that is needed for every natural or economic group of Illinois plants. It is not a compilation or a perfunctory systematic account of plants known or thought to occur in Illinois; but it is based on personal examination of scattered earlier records and a critical verification of the meaning of the entries in them where specimens exist for such verification. The thoroughness with which all available materials have been scanned is evident from the fact that of the two hundred and four species admitted by Dr. Mosher over one-fifth are now recorded for the first time as occurring in Illinois. That the nomenclature of the paper does not entirely conform to that of the latest general floras marks an added point of excellence, for it rests on the later and maturer judgment of Mrs. Agnes Chase (whose large personal herbarium was presented to the University several years ago) and Professor A. S. Hitchcock, who are admittedly the American authorities on grasses today, and whose aid has been given freely as the study progressed.

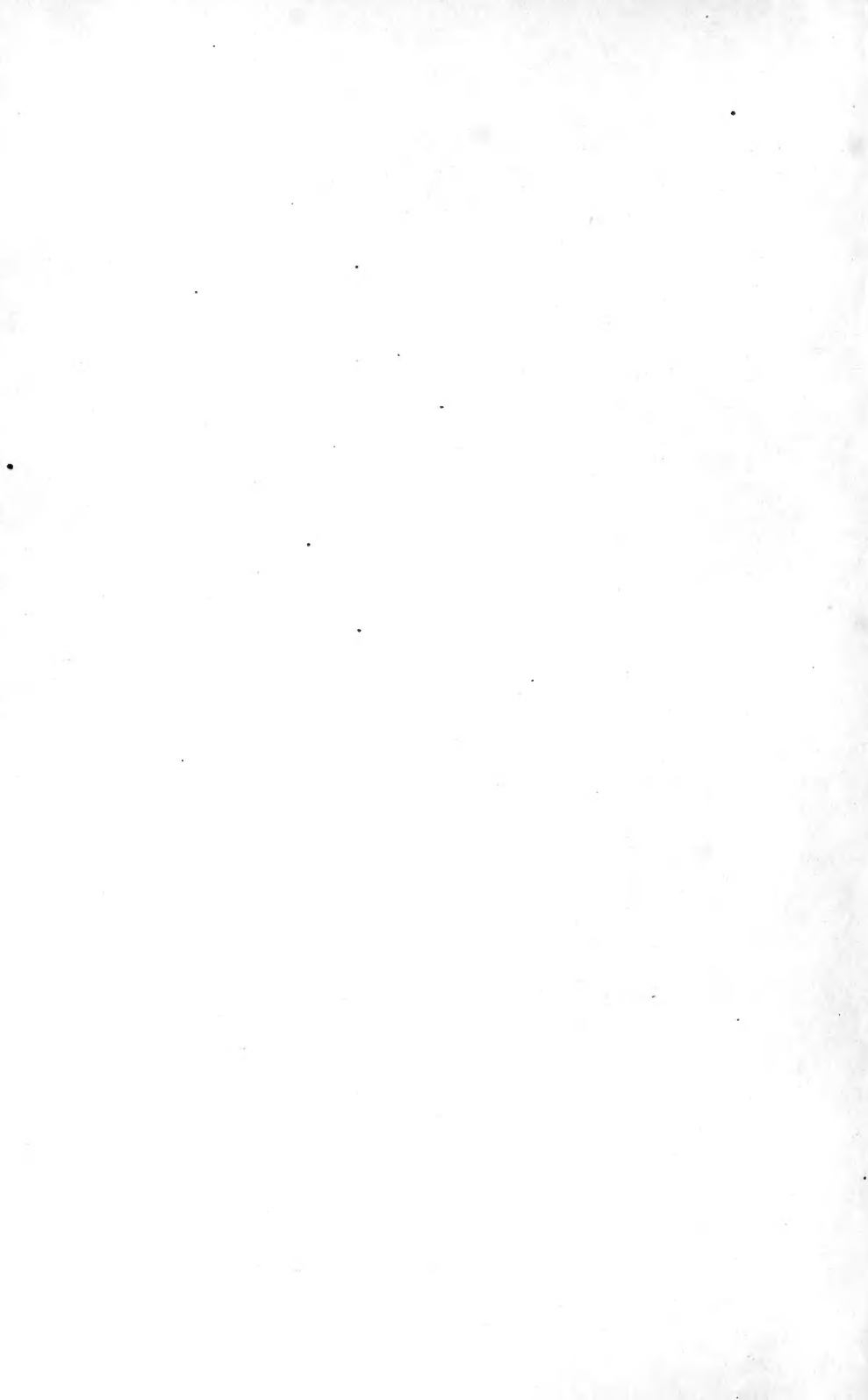
William Trelease

Urbana, March 20, 1918



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THE GRASSES OF ILLINOIS

BY EDNA MOSHER¹

INTRODUCTION

According to the earlier botanists who studied the flora of Illinois, about two hundred species of plants were found on the original prairie and more than half of these were grasses. The grasses were probably the most characteristic plants of the prairie, the shorter and less conspicuous species forming a dense sod; the taller species usually forming large clumps from three to six feet tall, which were visible for a considerable distance. The original prairie is fast disappearing from the state of Illinois, and with it many of the species of grasses once included in its flora. The majority of the species which were abundant there are still found within the state, altho some of them are extremely rare. A number of the species have not been collected in Illinois in recent years and may not occur in the state at the present time. The grasses, however, still remain a prominent feature of the landscape, as anyone who has seen our great cornfields will testify. From an economic standpoint they are the most important plants of Illinois today, as the cultivated grasses called grains form a large percentage of the crops of the state. In addition there are the cultivated grasses of our pastures and meadows, many of which are introduced species, and all of which add to the wealth of the state. There are also many species of grasses that are weeds in lawns and cultivated fields, but the extent of their damage never has been, and probably never will be, correctly estimated.

The known species of grasses of the state have been listed by a number of authors, but the only paper devoted entirely to them was published by I. A. Lapham in 1857. Since then the number of species known to the state has increased nearly fifty percent. Some of these have been included in lists published since that time, but there are forty-three species which have not been listed before as occurring in the state. Some of these species have been introduced from Europe and Asia. Altogether two hundred and four species, representing sixty-three genera, have been listed in this publication.

¹This work was begun as a second minor under the direction of Professor William Trelease of the Department of Botany while the writer was working for the degree of doctor of philosophy in the University of Illinois. Professor Trelease urged the completion and publication of the work and has given every aid and encouragement during its progress. Mrs. Agnes Chase has also given valuable assistance, especially as regards questions of synonymy.

It has been the aim in this investigation to list all species of grasses which are known to have been collected in the state. Practically all specimens cited here have been seen by the author, and considerable pains have been taken to verify the determinations of the earlier botanists whose lists are cited in the bibliography.

In the preparation of this publication the grasses in the following herbaria have been studied:

University of Illinois Herbarium.—The collections in this herbarium have furnished the basis for the work. This herbarium includes partial collections of the earlier botanists Hall, Wolf, Vasey, M. S. Bebb, Mead, and Lapham, with the entire collections of Brendel, Schneck, Hill, Welsch, and Andrews. The collections of Dr. Welsch were not dated, but are known to have been made between 1862 and 1871. Mrs. Agnes Chase has presented a set of duplicates of her Illinois collections to the University, in addition to many other specimens. There are also duplicates of most of the species collected by Mr. V. H. Chase of Wady Petra, Illinois, which form an important part of the collection. With a very few exceptions the collections not mentioned in connection with other herbaria belong to the University of Illinois.

United States National Herbarium.—It was impossible during a brief visit to this herbarium to list all the Illinois specimens there, but only a few of the commoner species were omitted. All the specimens cited as collected by Skeels, Wilcox, and Hill are from this herbarium. There are duplicates of some of these in the Field Museum.

Field Museum Herbarium.—This herbarium contains a large number of Illinois specimens, and includes the herbarium of H. N. Patterson of Oquawka, besides smaller collections made by Sherff, De Selm, and others.

Northwestern University Herbarium.—The entire collection of H. H. Babcock belongs to this herbarium, together with specimens collected by Umbach, Shipman, and Smith.

Mr. Charles Robertson of Carlinville, Mr. Hallock Shearer of Mt. Carmel, Dr. H. S. Pepoon of Chicago, and Dr. G. H. French of Carbondale very kindly loaned Illinois specimens for examination, which have aided materially in this work. Some of the species furnished were not found in any of the herbaria examined.

This work would be quite incomplete without an expression of appreciation for the uniform kindness and many courtesies extended by the curators of these various herbaria. Special thanks are also due Professor William Trelease and Mrs. Agnes Chase for help in the solution of many puzzling problems.

The accompanying illustrations are all made from original drawings and are designed to show the most typical structure or structures of each species so that its identification will be as easy as possible. Spike-

acts in the same genus have been drawn, in nearly all cases, to the same scale; hence their relative size will be apparent from the figures.

The genera are arranged as in Gray's Manual, but the species under each genus are arranged alphabetically. The nomenclature follows the American code.

The bibliography includes only those works in which the grasses of the state are mentioned. For general information on grasses the reader is referred to "A Text-book of Grasses" by A. S. Hitchcock (Macmillan, 1914), which also contains an excellent bibliography. A recent publication of the Nebraska Experiment Station, "A Handbook of Nebraska Grasses," Bulletin 148, also contains a very complete bibliography.

The discussion of each species contains references to the articles or books cited in the bibliography. Thus, under *Sorghastrum nutans* (page 280), are given the synonyms to which the species was referred by earlier writers. "*Andropogon avenaceum*, Michaux '03, 58," then, refers us to "Flora Boreali-Americana," page 58, where this species was listed as *Andropogon avenaceum*.

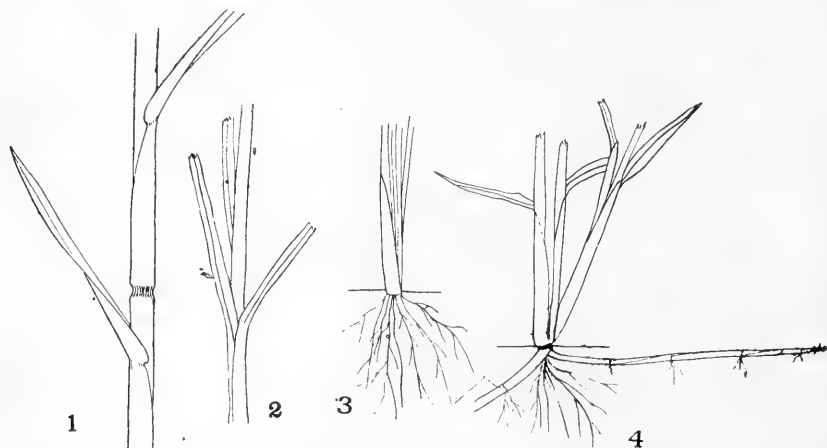
THE STRUCTURE OF GRASSES

Grasses belong to the family Poaceae, or Gramineae, which includes between three and four hundred genera. Sixty-three genera, exclusive of the cultivated grasses called grains, are found in Illinois. These genera include the two hundred and four species known to occur in the state.

There are few plants likely to be mistaken for grasses. The sedges resemble them most but are easily distinguished by their three-ranked leaves and solid stems (Fig. 2). Grasses have two-ranked leaves and usually hollow stems (except in Maydeae and Andropogoneae, of which *Tripsacum* and *Andropogon* are typical genera) (Fig. 1).

According to their length of life, grasses are classed as follows:

Annual Grasses.—Many species of grasses live but one year. The seeds of the preceding year germinate in spring or early summer and ripen seed in the summer and fall. Common crab grass, *Syntherisma sanguinalis*, old witch grass, *Panicum capillare*, and Indian corn, *Zea mays*, are well known examples of annual grasses.



Figs. 1-4.—1, Portion of grass culm showing 2-ranked leaves; 2, Portion of sedge culm showing 3-ranked leaves; 3, Portion of grass plant showing fibrous roots; 4, Portion of grass plant showing rootstocks

Winter Annuals.—In our latitude the seeds of certain annual grasses may germinate in the fall and live over winter in small tufts, sending up their flower stalks in early spring. These are known as winter annuals. Low spear grass, *Poa annua*, little barley, *Hordeum pusillum*, and the varieties of winter wheat are common examples of winter annuals.

Perennial Grasses.—These grasses are propagated both by seeds and by rootstocks. There are two types of perennial grasses in Illinois. In one (Fig. 3), the stem dies back to the base each winter and

a new shoot comes up the next spring from a bud formed within the old sheath. These grasses have fibrous roots and form bunches or tufts, and for that reason are often called bunch grasses. Timothy, *Phleum pratense*, and orchard grass, *Dactylis glomerata*, are common examples of this type. In the other type (Fig. 4), the stem dies back to the base, but there are long, creeping rootstocks, or rhizomes, really underground stems, just below the surface of the soil, and the new shoots come from these. Such grasses usually form a compact sod, and hence many species are valuable for lawn grasses, as Kentucky blue grass, *Poa pratensis*. Other common grasses with creeping rootstocks are redtop, *Agrostis alba*, and couch grass, *Agropyron repens*. Besides these we have a single species of bamboo, the cane *Arundinaria macrosperma*, with woody, perennial culms.

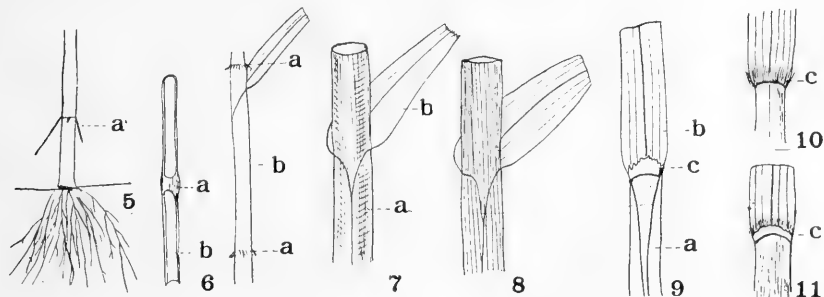
THE GRASS PLANT

The grass plant consists of root, stem, and leaves. The last two of these are modified to form the inflorescence.

Root.—The grass plant has slender, fibrous roots which are usually very numerous at the base of the plant (Fig. 3). In the corn plant and occasionally in other grasses, roots are developed from the lower nodes and act as prop, or brace roots (Fig. 5a).

Stem.—The stem of the grass plant is called a culm. In all but very young plants the culm is usually hollow except at the more or less swollen nodes (Fig. 6a). In maize and sorghum the stems are filled with pith. The parts of the culm between the nodes are called internodes (Fig. 6b). The culms are nearly always cylindrical, as in the corn stalk (Fig. 7), but they may be flattened, as in Canada blue grass, *Poa compressa* (Fig. 8). They are never three-angled, as in the sedges.

Leaf.—The leaves are borne at the nodes and consist of two parts, the sheath and the blade. The sheath (Figs. 7a and 9a) is wrapped



Figs. 5-11.—5, Lower portion of grass culm with brace roots; 6, Culm split to show (a) the solid node, (b) the internode; 7, Cylindrical culm; 8, Flattened culm; 9, Portion of leaf showing (a) sheath, (b) blade, (c) ligule; 10, Ligule a ring of hairs; 11, Ligule membranous, fringed with hairs

round the culm above the node; the blade (Figs. 7b and 9b) is the flat portion which extends free from the stalk and is often called the leaf. On the inner side of the joining of the blade and sheath is an appendage called the ligule (Fig. 9c). This is usually thin and membranous (Fig. 9c) but sometimes consists of a row of fine hairs (Fig. 10c), or it may be a thin membrane fringed with hairs (Fig. 11c).

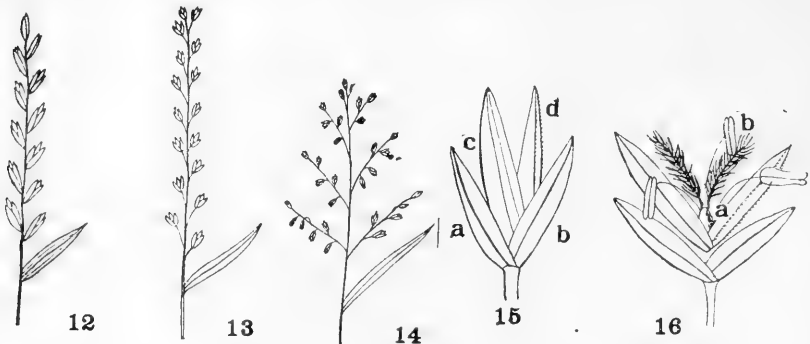
The edges of the sheath are grown together in most species of *Bromus* and *Festuca*, and in some other genera. Sometimes the sheaths become very much inflated and inclose the inflorescence, as in *Andropogon virginicus* (Fig. 24). Some species of water grasses have inflated sheaths which act as floats, as in *Paspalum repens* (Fig. 36).

The blades are usually linear and very much longer than they are wide (Fig. 37), but in *Panicum boscii* (Fig. 91) and some other species, the blades are quite broad as compared with the length. The blade has a strong midrib and several nerves, or veins, on each side, which are parallel to the midrib except in the broad-leaved species. There are short appendages called auricles at the base of the blade in some grasses. These are prominent on the leaves of wheat and barley. They are also found in *Hordeum* and *Agropyron*, and other genera closely related to these.

THE INFLORESCENCE, OR FLOWER CLUSTER

The flowers of grasses are small and inconspicuous but are closely grouped together and borne on shoots that are easily distinguished from the leaves. The various bracts which make up the flower are modified leaves. In some species of grasses the perfect flowers, from which the seeds are formed, are hidden by the sheaths, as in the case of some species of *Panicum* and in certain other genera.

There are three common forms of inflorescence—the spike, the raceme, and the panicle. The inflorescence is made up of spikelets,



Figs. 12-16.—12, Spike; 13, Raceme; 14, Panicle; 15, Spikelet, (a) first glume, (b) second glume, (c) lemma, (d) palea; 16, Spikelet opened to show (a) pistil, (b) stamens

which are single flowers or groups of flowers subtended by a pair of bracts (Figs. 15a and b) called glumes.

The Spike.—The spike has a long, unbranched axis, with the spikelets sessile, or without stalks (Fig. 12). Wheat, *Triticum vulgare*, and couch grass, *Agropyron repens*, are common examples of this type.

The Raceme.—This type of inflorescence (Fig. 13) differs from the spike in having stalked, or pediceled spikelets. A typical example is the simple form of meadow fescue, *Festuca elatior*. Often the pedicels of the spikelets are very short and the inflorescence has the general appearance of a spike and is called a spike-like raceme. *Syntherisma* (Fig. 29), *Paspalum* (Fig. 37), and *Andropogon* (Fig. 21) are examples of spike-like racemes.

The Panicle.—In the panicle (Fig. 14) the main axis of the inflorescence is branched and rebranched, and the spikelets are pediceled. The common oat, *Avena sativa*, and Kentucky blue grass, *Poa pratensis*, are good examples of this type of inflorescence. Sometimes the branches of a panicle are so short that they are hidden by the spikelets and the inflorescence appears to be a spike. *Heleochoa schoenoides* (Fig. 148) and canary grass, *Phalaris arundinacea* (Fig. 117), are familiar examples. The axis of an inflorescence is usually known as a rachis. In some grasses, as, for example, squirrel-tail grass, *Hordeum jubatum*, the axis disjoints at the nodes at maturity.

A perfect flower contains both stamens and pistils. Most grasses bear perfect flowers, but following are a few exceptions to the rule:

Dioecious Plants.—There are some species of grasses in which the pistillate spikelets are on one plant and the staminate on another. A few examples of this type of inflorescence are found among Illinois grasses. *Eragrostis hypnoides* is one of these, the lemmas of the pistillate spikelets being slightly narrower and more pointed than those of the staminate spikelets.

Monoecious Plants.—In these plants the staminate and pistillate spikelets are on different parts of the same inflorescence, or on different parts of the plant. In wild rice, *Zizania palustris* (Fig. 107), the staminate flowers are on the lower branches of the panicle and the pistillate spikelets on the upper. *Tripsacum dactyloides* (Fig. 17) has the staminate spikelets at the end of the spikes and the pistillate spikelets embedded in the basal portion. In the corn plant the ear is the pistillate inflorescence and is borne on a different part of the plant from the tassel, which is the staminate inflorescence.

In *Andropogon*, *Sorghastrum*, and other genera closely related there are staminate, pistillate, or sometimes sterile spikelets, as well as perfect flowers in the same inflorescence. The first three types are often referred to merely as imperfect spikelets. These spikelets have a definite arrangement (Figs. 22 and 28). Sterile spikelets have neither stamens nor pistils and are often very much reduced so that only the stalk, or pedicel, remains (Fig. 27).

THE SPIKELET

The spikelet may consist of a single flower or of a number of flowers. As the classification of grasses is based primarily on the characters of the spikelet, it is essential to know something of its structure.

The stalk of the spikelet is known as the pedicel. The spikelet consists of a short axis, called the rachilla, which bears one or more flowers. The rachilla may be jointed to the pedicel either above or below the glumes.

The Glumes.—At the base of the spikelet are two empty bracts, which are called glumes. They are designated as the first, or outer glume (Fig. 15a), and the second, or inner glume (Fig. 15b). They are usually easily distinguished from the other parts of the spikelet by the difference in shape, texture, number of nerves, amount of hairs present, etc. Sometimes the first glume is very small, as in *Syntherisma sanguinalis* (Fig. 32), or it may be wanting, as in the species of *Paspalum* (Fig. 41). Both glumes are absent in *Homalocenchrus* (Fig. 108). Sometimes the glumes are awned, as in *Elymus canadensis* (Fig. 280).

The Lemmas.—The lemmas are the bracts of the spikelet found within and above the glumes (Fig. 15c). Their number varies with the number of flowers found in the spikelet. There is usually a flower at the base of each lemma; if the flower is sterile, the lemma is called a sterile lemma. The lemma often differs from the glumes in texture, being sometimes much thinner, and sometimes, as in *Panicum*, much hardened. It is often awned (Fig. 147); the awns are sometimes spirally twisted or bent (Figs. 124 to 133).

The Palea.—The palea (Fig. 15d) together with the lemma serves to inclose the stamens and pistil. It is usually two-nerved and like its lemma in texture.

The Stamens.—There are usually three stamens (Fig. 16b), but the number varies from one to six.

The Pistil.—In our species there is a single pistil (Fig. 16a), which has a one-celled ovary, two styles (rarely one), and two feathery stigmas.

The Fruit.—The grass seed, so-called, is in reality a fruit (a caryopsis), the seed being inclosed in the ripened ovary.

KEY TO THE GENERA OF ILLINOIS GRASSES

- a. Inflorescence in a single terminal symmetrical (not one-sided) spike, the spikelets 2- to several-flowered, sessile on the main axis, single or 2 or 3 at each joint (as in wheat, barley, or rye).
- b. Axis disjointing with spikelets attached; spikelets 3 together at each joint, the lateral ones sterile and reduced to awns (barley). 60. *Hordeum*
- bb. Axis not disjointing; spikelets 1 to 3 at each joint, all alike.
- c. Spikelets 2 or 3 at each joint of the axis; glumes in front of the spikelet, awl-shaped, not keeled. 61. *Elymus*
- cc. Spikelets 1 at each joint of the axis; glumes at the sides of the spikelets.
- d. Spikelets placed edgewise on the axis, the inner glume wanting except on the terminal spikelet. 58. *Lolium*
- dd. Spikelets placed flat against the axis.
- e. Glumes obsolete or rudimentary; spikelets horizontally spreading at maturity. 62. *Hystrix*
- ee. Glumes well developed; spikelets appressed to the axis.
- f. Glumes broadly ovate, abruptly awned or pointed, sometimes toothed; plants annual (wheat). *Triticum*
- ff. Glumes lanceolate, or narrower, awned or awnless, not toothed.
- g. Lemmas prickly-hispid on the keel; glumes 1-nerved, narrow; plants annual (rye). *Secale*
- gg. Lemmas smooth on the keel; glumes several-nerved; plants perennial. 59. *Agropyron*
- aa. Inflorescence a panicle, raceme, or aggregation of spikes; panicle may be open, as in oats, or contracted, as in timothy; racemes usually appear like spikes, but some of the spikelets are pediceled, as *Paspalum* (Fig. 37), *Andropogon* (Fig. 23), and crab grass (Fig. 29); the spikes are one-sided and aggregate, as in Bermuda grass (Fig. 193).
- b. Fruit a bur with barbed spines. 12. *Cenchrus*
- bb. Fruit not a bur.
- c. Spikelets unisexual, the staminate and pistillate in different parts of the same inflorescence or in different inflorescences.
- d. Pistillate spikelets in ears in the axils of the leaves; staminate spikelets in a terminal tassel (corn). *Zea*
- dd. Pistillate and staminate spikelets in different parts of the same inflorescence.
- e. Inflorescence consisting of 1 to 4 stout spikes, the lower part thick and hard, readily disjointing, the pistillate spikelets embedded in the joints, the staminate spikelets in pairs along the narrow axis of the upper part. 1. *Tripsacum*
- ce. Inflorescence a large terminal panicle, the pistillate spikelets erect on the ascending upper branches of the panicle, the staminate pendulous on the spreading lower branches. 13. *Zizania*
- cc. Spikelets perfect; or perfect and staminate, or sterile, arranged in pairs (unisexual in *Eragrostis hypnoides*, but the spikelets alike in appearance).
- d. Spikelets in pairs, one perfect and sessile, the other pediceled and staminate (rarely perfect) or sterile (apparently two pediceled spikelets in *Holcus* and *Sorghastrum*), on a jointed axis, readily disjointing with the spikelets attached; glumes hardened; spikelets dorsally compressed, the sessile spikelets awned.
- e. Inflorescence of slender racemes, these single or 2 or 3 together, not panicle. 3. *Andropogon*
- ee. Inflorescence an open or contracted panicle.
- f. Panicle densely wooly, of slender, many-flowered racemes; spikelets all perfect. 2. *Erianthus*

- ff. Panicle not wooly, joints more or less short pubescent; racemes of 1 to 5 joints, pediceled spikelet staminate or reduced to the pedicel.
 - g. Pediceled spikelets staminate; panicle open; awns deciduous. 5. *Holcus*
 - gg. Pediceled spikelets reduced to a hairy pedicel; panicle narrow; awns persistent. 4. *Sorghastrum*
- dd. Spikelets not in pairs, or if so, the two alike; axis not disjoining.
- e. Spikelets sessile in 1-sided spikes, these digitate or racemose on a common axis (as in Bermuda grass, Fig. 193).
 - f. Spikes digitate (Fig. 201).
 - g. Spikes slender; spikelets 1-flowered; plants perennial. 40. *Capriola*
 - gg. Spikes stout; spikelets 3- or 4-flowered; plants annual.
 - h. Rachis of spike prolonged into a point beyond the spikelets; lower lemmas awn-tipped. 43. *Dactyloctenium*
 - hh. Rachis of spike not prolonged beyond the spikelets; lemmas awnless. 44. *Eleusine*
 - ff. Spikes racemose (Figs. 194, 195, 196).
 - g. Spikes very slender; spikelets remote, closely appressed; plants annual. 41. *Schedonnardus*
 - gg. Spikes thick; spikelets densely imbricated.
 - h. Plants robust, 4 to 6 feet tall; spikelets 1-flowered; first glume exceeding the floret, stiffly ciliate on the keel; spikelets falling entire. 39. *Spartina*
 - hh. Plants not robust, not over 3 feet tall; spikelets with 1 perfect floret and 1 or 2 sterile lemmas; first glume shorter than the floret, persistent after the fall of the floret. 42. *Bouteloua*
- ee. Spikelets pediceled, in open (Fig. 118) or spike-like (Fig. 117) panicles, or in racemes (Fig. 29).
 - f. Spikelets 1-flowered or with 1 perfect terminal floret and 1 or 2 sterile or staminate florets below it.
 - g. Spikelets without staminate or rudimentary florets below the perfect one; spikelets laterally compressed, glumes keeled.
 - h. Glumes wanting; spikelets strongly flattened, imbricate on the slender branches of an open panicle; lemmas awnless. 14. *Homalocenchrus*
 - hh. Glumes present, if minute the lemmas awned.
 - i. Lemmas more or less indurate, at least firmer than the glumes, terete or subterete, not keeled.
 - j. Lemma not sharp-pointed, strongly indurate; panicle branches spreading or drooping. 17. *Milium*
 - jj. Lemma sharp-pointed or awned; panicle branches ascending or erect.
 - k. Awn 3-parted; lemma with a sharp-pointed callus at base. 20. *Aristida*
 - kk. Awn simple.
 - l. Awn 4 to 8 inches long, twisted and bent; lemma with a needle-pointed callus. 19. *Stipa*
 - ll. Awn not over 2 inches long; callus not sharp-pointed.
 - m. Awn deciduous, bent; lemma broad, elliptical or ovate. 18. *Oryzopsis*

- mm. Awn, if present, persistent; lemmas lanceolate.
- n. Glumes minute or obsolete; rachilla prolonged beyond the base of the palea; floret stipitate.
 - 22. *Brachyelytrum*
- nn. Glumes usually at least half as long as the spikelet (minute in *M. schreberi*); rachilla not prolonged; floret not stipitate.
 - 21. *Muhlenbergia*
- ii. Lemmas not indurate, at least not firmer than the glumes, or if somewhat firmer, strongly compressed and keeled.
 - j. Panicle compact, cylindrical; spikelets strongly flattened and keeled.
 - k. Spikelets about 1 cm. long; floret conspicuously hairy at base; robust perennial with stout, scaly rootstocks.
 - 30. *Ammophila*
 - kk. Spikelets not over 4 mm. long; lemma not hairy at base; plants without rootstocks.
 - 1. Panicle partly included in a broad subtending sheath; glumes shorter than the lemma.
 - 23. *Helcochloa*
 - 11. Panicle not included in a subtending sheath; glumes not shorter than the lemma.
 - m. Glumes abruptly aristate, stiffly ciliate on the keel; lemmas awnless (timothy).
 - 24. *Phleum*
 - mm. Glumes not pointed nor ciliate on the keel; lemma with a slender awn from the back.
 - 25. *Alopecurus*
 - jj. Panicle open or contracted; spikelets not strongly flattened.
 - k. Floret conspicuously hairy at base.
 - 1. Lemma with a delicate dorsal awn; rachilla prolonged beyond the base of the palea.
 - 29. *Calamagrostis*
 - 11. Lemma awnless; rachilla not prolonged.
 - 28. *Calamovilfa*
 - kk. Floret not hairy at base.
 - 1. Lemma shorter than the glumes; palea usually wanting.
 - 27. *Agrostis*
 - 11. Lemma longer than the glumes or as long; palea present.
 - m. Florets stipitate; lemma with a minute awn; panicle drooping.
 - 31. *Cinna*

- mm. Florets not stipitate; lemma awnless; panicle not drooping.
26. *Sporobolus*
- gg. Spikelets with 1 or 2 staminate or rudimentary florets below the perfect one (first glume wanting in *Paspalum* and in some species of *Syntherisma*, the sterile lemma simulating a second glume).
- h. Spikelets laterally compressed; glumes strongly keeled; sterile florets falling attached to the perfect floret.
- i. Plants grayish-velvety throughout; one floret below the perfect one, staminate; perfect floret with a hooked awn on the back.
32. *Notholcus*
- ii. Plants glabrous throughout; two florets below the perfect one.
- j. Panicle open; lower florets staminate; plants fragrant. 16. *Torrestia*
- jj. Panicle contracted or spike-like; lower florets reduced to minute scales.
15. *Phalaris*
- hh. Spikelets dorsally depressed; glumes not keeled; spikelets falling entire; fertile floret indurate.
- i. Spikelets subtended by 1 to several slender bristles, in a narrow spike-like panicle.
11. *Chaetochloa*
- ii. Spikelets not subtended by bristles.
- j. Spikelets sessile along one side of a slender axis; first glume obsolete or minute.
- k. Racemes subdigitate; fruit subindurate with a flat, white, hyaline margin; spikelets compressed, biconvex; annuals. 6. *Syntherisma*
- kk. Racemes solitary or racemose; fruit indurate, the firm margin inrolled; spikelets plano-convex; first glume obsolete; perennials. 8. *Paspalum*
- jj. Spikelets in open or compact panicles.
- k. Floret subindurate; margins of lemma hyaline, flat. 7. *Leptoloma*.
- kk. Floret strongly indurate; margins of lemma firm, inrolled, at least at base.
- l. Sterile lemma awned or strongly mucronate; fruit pointed; spikelets short-pedicel in clusters; coarse annuals.
10. *Echinochloa*
- ll. Sterile lemma awnless; fruit not pointed; spikelets usually long-pedicel. 9. *Panicum*
- ff. Spikelets 2- to many-flowered; sterile florets, if any, above the perfect ones (except in *Uniola*, Fig. 227).
- g. Glumes exceeding or equaling the florets (except in *Sphenopholis* and *Koeleria*; in these at least the second glume is usually longer than first floret), usually papery and shining.
- h. Spikelets at least 8 mm. long.
- i. Florets 2 to 4, awned from the back (awn rudimentary in cultivated oats).

- j. Panicle narrowly pyramidal; spikelets 8 to 10 mm. long, not pendulous.
37. *Arrhenatherum*
- jj. Panicle about as broad as long; spikelets 2 cm. long or more, pendulous (oats). 36. *Avena*
- ii. Florets 7 to 12, awned from between the teeth of a bidentate apex. 38. *Danthonia*
- hh. Spikelets not over 5 mm. long.
 - i. Lemmas bearing delicate dorsal awns; panicle branches capillary, flexuous.
35. *Deschampsia*
 - ii. Lemmas awnless, or obscurely awn-tipped.
 - j. Glumes dissimilar, the second broadly wedge-shaped or obovate; spikelets falling entire. 33. *Sphenopholis*
 - jj. Glumes similar, acute, persistent after the fall of the florets. 34. *Koeleria*
- gg. Glumes shorter than the lowest floret.
 - h. Culms woody perennial; plants shrubby; blades narrowed into a short petiole above the sheath.
63. *Arundinaria*
 - hh. Culms herbaceous; plants not shrubby; blades sessile on the sheath.
 - i. Plants usually 6 to 12 feet tall, the culms strong, reed-like, with stout, creeping rootstocks; panicle large, feathery at maturity.
46. *Phragmites*
 - ii. Plants rarely 5 feet tall, the culms not reed-like; panicle not feathery.
 - j. Lemmas 3-nerved.
 - k. Spikelets short-pedicled along one side of a slender rachis, forming elongate racemes, these arranged in a rather open panicle.
45. *Leptochloa*
 - kk. Spikelets not in 1-sided racemes.
 - l. Lemmas glabrous, not lobed; nerves not excurrent.
49. *Eragrostis*
 - ll. Lemmas hairy on the nerves below, lobed at the apex; mid-nerve excurrent.
 - m. Panicle usually large, spreading; lateral nerves of the lemmas excurrent; palea not fringed.
47. *Tridens*
 - mm. Panicle small, few-flowered; lateral nerves of the lemmas not excurrent; palea conspicuously fringed. 48. *Triplasis*
 - jj. Lemmas 5- to many-nerved (the intermediate obscure in *Poa alsodes*).
 - k. Upper floret unlike the lower, folded together forming a club-shaped mass; spikelets pendulous, falling entire. 50. *Melica*
 - kk. Upper florets like the lower; spikelets sometimes drooping, not pendulous.

1. Lemmas firm, somewhat hardened, faintly many-nerved, acuminate.

m. Lower florets empty but like the upper in appearance; spikelets strongly flattened; lemmas not polished; panicle drooping.

52. *Uniola*

mm. Lower florets perfect; spikelets not flattened, florets turgid, polished; grain at maturity beaked, expanding the lemma and palea.

51. *Diarina*

11. Lemmas herbaceous, 5- to 9-nerved, the nerves usually strong.

m. Spikelets strongly flattened, densely crowded in 1-sided clusters at the ends of the stiff, naked panicle branches.

53. *Dactylis*

mm. Spikelets not flattened, nor in 1-sided clusters.

n. Lemmas keeled, and usually with a tuft of cobwebby, white hairs at base (blue-grass).

54. *Poa*

nn. Lemmas not keeled, rounded on the back, not cobwebby at base.

o. Lemmas obtuse, usually scarious at the tip; nerves parallel, usually prominent.

55. *Panicularia*

oo. Lemmas acute or awned; nerves approaching at the apex.

p. Lemmas not toothed, awned from the tip or awnless; spikelets not over 15 mm. long, usually less.

56. *Festuca*

pp. Lemmas minutely 2-toothed, usually awned from just below the apex; spikelets rarely less than 2 cm. long.

57. *Bromus*

DESCRIPTIONS AND DISTRIBUTION OF ILLINOIS GRASSES

1. **TRIPSACUM** L.

This is a subtropical genus of which one species is found in southern Illinois. It includes tall, coarse perennials with creeping rootstocks. The inflorescence consists of solitary or clustered spikes borne at the ends of the culms or their branches. There are two kinds of spikelets in each spike, the pistillate spikelets borne singly, sunken in the thickened axis of the lower part, and the staminate in pairs on the slender upper part. The lower part of the axis is very hard and woody, and separates readily into joints. In each of these joints is embedded a pistillate spikelet, which has a very hard outer glume. The upper part of the stalk is slender, not woody, and does not separate into joints, but falls off entire.

***Tripsacum dactyloides* L.**

Gama Grass. Sesame Grass (Fig. 17)

Michaux '03, 60; Lapham '57, 548, 598; Patterson '76, 52; Flagg '78, 284; Brendel '87, 89.

Entire plant smooth and glabrous; culms 3 to 7 feet tall; leaves 3 dm. or more long, 1 to 3.5 cm. wide; ligule a fringe of hairs less than 1 mm. long; spikelets 8 mm. long.

This is one of the largest grasses found in the state. It prefers moist soil in swamps or along ditches and streams. It is an excellent forage grass.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. CHRISTIAN CO., Taylorville, *Andrews*. HANCOCK CO. Without locality, *Mead* in 1843. MACOUPIN CO. Macoupin, *Robertson*, July, 1884. MARION CO. Without locality, *M. S. Bebb*, 1860. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality *Schneck*, July, 1890; without locality, *Shearer*.

2. **ERIANTHUS** Michx.

Woolly Beard Grass

This genus is found in both temperate and tropical regions. The plants are tall, reed-like perennial grasses with thick, creeping rootstocks. One species is cultivated for ornament, and is commonly known as plume grass, wool grass, or hardy pampas grass. The inflorescence is a large, compact panicle clothed with long, silky hairs, which are borne on the panicle branches and in a tuft at the base of each spikelet. The spikelets are in pairs, one pedicled, the other sessile, but both are perfect, of equal size, and bear long awns.

***Erianthus divaricatus* (L.) Hitchc.**

Spiral-awned Plume Grass (Figs. 18 and 19)

Erianthus alopecuroides, Lapham '57, 548, 599; Patterson '76, 52; Flagg '78, 285. *E. saccharoides*, Brendel '87, 89.

Culms 3 to 8 feet tall, with appressed hairs at the nodes and on the upper portion near the inflorescence; leaves long, one-half inch to one inch wide; panicle loose, with soft, silky hairs.

This grass was probably once found in the southern part of the state, but it is doubtful if it occurs in the state at the present time.

JACKSON CO. Without locality, *French*, Sept., 1878.

Erianthus contortus Baldwin.—This species is described by Lap- ham among the plants of Illinois; but no citations are given. As it is not mentioned by any other author, and no specimens have been seen, it is extremely doubtful if it has ever been collected in Illinois.



Figs. 17-19.—17, *T. dactyloides*, part of inflorescence: (a) pistillate spikelet, (b) and (c) staminate spikelets; 18, *E. divaricatus*, inflorescence; 19, *E. divaricatus*, pair of spikelets: (a) pediceled spikelet, (b) sessile spikelet

3. ANDROPOGON L.

Beard Grass

These grasses are tall, often coarse, tufted perennials, found in both temperate and tropical climates. The inflorescence is of lateral and terminal spikes, with paired spikelets. One spikelet is sessile and perfect, usually bearing a twisted awn; the other is pediceled, imperfect, either bearing stamens or reduced to a single glume, which is often minute or entirely lacking. The rachis joints and pedicels often bear long, silky hairs. The leaves are long and narrow, the ligules short and membranous, with fringed edges. The culms in some of the species show a conspicuous bluish bloom, particularly in the region of the nodes, hence the common name bluestem.

- a. Inflorescence protruding from a very prominent spathe, which is shorter than, or equaling the inflorescence; awns straight, usually three times the length of the sessile spikelets; pediceled spikelets reduced to a minute scale or wanting; rachis joints very slender. *A. virginicus*
- aa. Inflorescence not protruding from a prominent spathe; awns more or less bent, usually less than twice the length of the sessile spikelet; pediceled spikelets always present and distinct; rachis joints thickened, clavate.
- b. Inflorescence of paired or digitate spikes; pediceled spikelet nearly as long as the sessile, the pedicel thickened and somewhat clavate. *A. furcatus*
- bb. Inflorescence of solitary spikes; pediceled spikelet very much shorter than the sessile, the pedicel thin and straplike. *A. scoparius*

Andropogon furcatus Muhl.

Forked Beard Grass. Big Bluestem (Figs. 20 and 21)

Lapham '57, 548, 599 (Plate 4, Fig. 6); Patterson '76, 52; Flagg '78, 285; Brendel '87, 64; Higley and Raddin '91, 140; Huett '98, 129; Gleason '07, 181; Gleason '10, 147; Gleason, '12, 48; Gates '12, 354.

Culms smooth, 3.5 to 6 feet tall; sheaths smooth, blades rough on the margins; spikes stout, usually purplish; pediceled spikelet usually staminate, 6 to 7 mm. long; sessile spikelet 8 to 9 mm. long, the awn 10 to 14 mm. long, spirally twisted and usually bent.

A common grass in Illinois, characteristic of the prairie, but found in many other situations. It furnishes good pasture when young, but the stems soon become hard.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Without locality, along railroad track, *Gibbs*, Oct., 1878; Without locality, *Percival*, Oct., 1876; Champaign, *Mosher*, Sept., 1913; Savoy, *Gibbs*, Sept., 1898; Seymour, *Tsou*, Oct., 1913; Rantoul, *Gates*, Oct., 1907. CHRISTIAN CO. Taylorville, *Andrews* in 1898. COOK CO. Chicago, *Sherff*, Sept., 1912; Mayfair, Chicago, *Gates*, Sept., 1905; South Chicago, *Schneck*, Aug., 1893. FORD CO. Near Roberts, *Wilcox*, July, 1902. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon* 443. LAKE CO. Beach area near Waukegan, *Gates* in 1908; Waukegan, *Gleason* and *Shobe* 323. MCHENRY CO. Algonquin, *Nason*, July, 1878. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1882. MENARD CO. Athens, *Hall*, 1861. OGLE CO. Oregon, *Waite*, Aug., 1885. PEORIA CO. Peoria, *McDonald*, Aug., 1894; Peoria, *Brendel*; Glasford, *Wilcox*, July, 1902. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase*, Sept., 1897. WABASH CO. Without locality, *Schneck*, Nov., 1900; without locality, *Shearer*; Shannon's swamp, *Schneck*, Oct., 1882; Hanging Rock, *Schneck*, Sept., 1878; Lucas farm, *Schneck*, Aug., 1900. WILL CO. Joliet, *Skeels*, Aug., 1904.

Andropogon scoparius Michx.

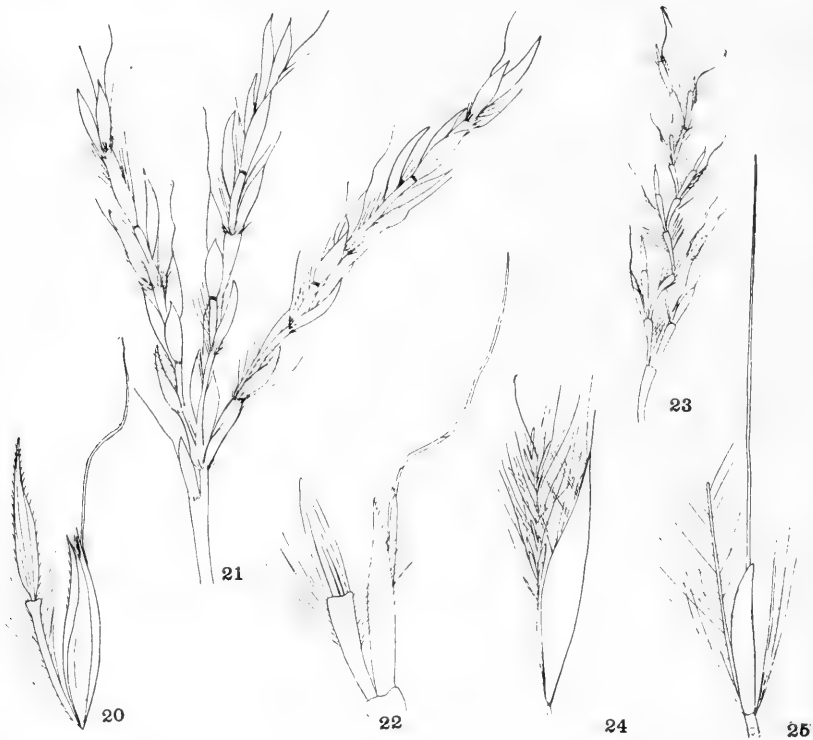
Broom Beard Grass. Little Bluestem (Figs. 22 and 23)

Engelmann '44, 104; Lapham '57, 549, 599; Patterson '76, 52; Flagg '78, 285; Brendel '87, 64; Higley and Raddin '91, 140; Huett '97, 129; Gleason '07, 181; Gleason '10, 147; Gates '12, 354.

Culms smooth or slightly pubescent, 1 to 4 feet tall; leaves slightly rough; spikes slender; pediceled spikelet a single, small, awn-pointed glume; sessile spikelets 6 to 7 mm. long, the awn spirally twisted and bent.

A common prairie grass, easily distinguished from *A. furcatus* by its habit of growing in closer bunches. It is also much shorter and

more slender, and has a tendency to grow more on hills or ridges, while *A. furcatus* likes more level, richer soil. These two species of



Figs. 20-25.—20, *A. furcatus*, pair of spikelets; 21, *A. furcatus*, inflorescence; 22, *A. scoparius*, pair of spikelets; 23, *A. scoparius*, inflorescence; 24, *A. virginicus*, inflorescence; 25, *A. virginicus*, pair of spikelets

Andropogon were found in abundance on the original prairie. This species usually turns purple early in the season. When young it is relished by stock.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Without locality, along railway track, *Gibbs*, Oct., 1898; Champaign, *Clinton*, Oct., 1895. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Constance, Chicago, *A. Chase*, Aug., 1900; Englewood, *Hill*, Sept., 1875; Chicago, *Sherff*, Aug., 1912; Thornton, *Hill*, July, 1865. FULTON CO. Without locality, *Pepoon*. JACKSON CO. Makanda, *Seymour*, Aug., 1880. JO DAVIESS CO. Without locality, *Pepoon* 443; Hanover, *Gleason* and *Gates* 2528. KANKAKEE CO. Altorf, *Hill*, Aug., 1872; Waldron, *Hill*, Aug., 1873; Kankakee, *De Selm*, Sept., 1913. LAKE CO. Beach area north of Waukegan, *Gates* 2921; Waukegan, *Gleason* and *Shobe* 319. MCHENRY CO. Ringwood, *Vasey*. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1894. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 126. WABASH CO. Without locality, *Shearer*; Walter's farm, *Schneck*, Sept., 1900; Mt. Carmel, *Schneck*, Oct., 1876; Old Palmyra, *Schneck*, Sept., 1900; Hanging Rock, *Schneck*, Sept., 1904.



Figs. 26-27.—26, *S. nutans*, inflorescence;
27, *S. nutans*, group of spikelets

Andropogon virginicus L.

Virginia Beard Grass. Broom Sedge (Figs. 24 and 25)

Andropogon virginicus, Lapham '57, 549, 599; Patterson '76, 53; Flagg '78, 285. *A. dissitiflorus*, Brendel '87, 89. *A. virginicus*, Higley and Raddin '91, 140.

Culms smooth or sparsely pubescent, 1.5 to 4 feet tall; leaves usually smooth; spikes slender, 2, 3, or more inclosed in a prominent spathe; pediceled spikelets reduced to a minute scale, or only the pedicel present; sessile spikelets 3 to 4 mm. long, the awns very long and straight.

This grass grows best in rather sterile soil. It is often looked upon as a weed because it forces more valuable plants from permanent pastures, tho it furnishes fairly good grazing early in the season.

COOK CO. Evanston, *Shipman*, Sept., 1875. FULTON CO. Without locality, *Pepoon*. ST. CLAIR CO. Without locality, *Brendel*, 1850; Mascoutah, *Welsch*. WABASH CO. Without locality, *Schneck*; without locality, *Shearer*; Mt. Carmel, *Schneck*, Oct., 1876; Walter's farm, *Schneck*, Oct., 1900; Simond's farm, *Schneck*, Oct., 1897.

4. SORGHASTRUM Nash

This genus is closely related to *Andropogon*, but has the spikelets in panicles. It is found in both tropical and temperate climates. The spikelets are in pairs or in threes at the ends of the panicle branches and are of two kinds, a sessile perfect spikelet with one or two slender, hairy pedicels, the sterile spikelet obsolete.

***Sorghastrum nutans* (L.) Nash**

Indian Grass. Wood Grass. Wild Sorghum (Figs. 26 and 27)

Andropogon avenacum, Michaux '03, 58. *Sorghum nutans*, Lapham '57, 549, 601 (Plate 4, Fig. 7); Patterson '76, 53; Flagg '78, 285. *Chrysopogon nutans*, Brendel '87, 64; Higley and Raddin '91, 141; Huett '97, 129. *Sorghastrum avenacum*, Gleason '07, 181. *Sorghastrum nutans*, Gleason '10, 147; Gleason '12, 48; Gates '12, 354.

Culms smooth, 3 to 6 feet tall; leaves long and narrow, the blades slightly rough; ligule membranous, 3 to 5 mm. long, the edge slightly fringed; spikelets 6 to 8 mm. long, pubescent, especially at base, the awn loosely twisted, 12 to 15 mm. long.

This grass is perennial by long, creeping rootstocks. It was one of the grasses of the original prairie and was found over practically the same area as *Andropogon furcatus*. When in bloom it is one of the most beautiful of our native grasses, with its graceful bronze-colored panicles and bright yellow anthers.

ILLINOIS SPECIMENS: Without locality, Vasey. CHAMPAIGN CO. Without locality, *Searle*, Oct., 1876; Urbana, *Clinton*, Aug., 1895; Champaign, *Gibbs*, Oct., 1898; Champaign, *Clinton*, Aug., 1898. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *A. Chase*, Aug., 1901. DU PAGE CO. Hinsdale, *Smith*, Oct., 1902. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. E. of Warren, *Pepoon* 562. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. LAKE

CO. Beach area north of Waukegan, *Gates* 2966; Waukegan, *Glason* and *Shobe* 325. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* 1591. PEORIA CO. Peoria, *McDonald*; Peoria, *Brendel*. ST. CLAIR CO. Maseoutah, *Welsch*. VERMILION CO. Muncie, *Mosher*, Oct., 1915. WABASH CO. Without locality, *Schneck*, Oct., 1900; without locality, *Shearer*; Old Palmyra, *Schneck*, Sept., 1879. WILL CO. Joliet, *A. H. Skceles*, Sept., 1904. WINNEBAGO CO. Fountaindale, *M. S. Bebb*.

5. *HOLCUS* L.

These grasses belong to tropical and warm temperate climates and are natives of the Old World. The various cultivated sorghums belong to this genus, also kaffir corn and broom corn. One species, *H. halapensis*, is naturalized in America and has been found as a weed in Illinois. The inflorescence consists of a large open panicle, the pediceled spikelets staminate.

Holcus halapensis L.

Johnson Grass (Fig. 28)

Sorghum halapense, Gray's Manual, 7th ed., Britton '07.

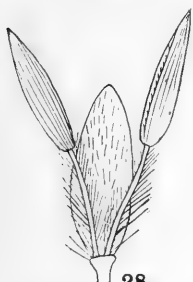


Fig. 28.—*H. halapensis*, group of spikelets

Culms 3 to 5 feet tall, usually smooth; leaves almost smooth, somewhat rough on the margins; ligule membranous, 2 mm. long, the upper half fringed; spikelets in twos or threes; perfect spikelets about 5 mm. long, with appressed hairs, awn 10 to 16 mm. long; pediceled spikelets slightly longer than the sessile.

This grass is perennial by long, stout, creeping rootstocks and is very difficult to eradicate where it once becomes established. It is much liked by stock, but under certain conditions is poisonous thru the production of hydrocyanic acid.

CHAMPAIGN CO. Urbana, *Mosher*, Oct., 1914. Experiment Station grounds, Clinton, Oct., 1897. CHRISTIAN CO. Taylorville, *Andrews*, Aug., 1898. COOK CO. Glencoe, *Gates* 1686.2. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, July, 1894.

6. *SYNTHERISMA* Walt.

Finger Grass. Crab Grass

Our species of this genus are annuals. One species, *Syntherisma filiformis*, appears to be a native of Illinois; the other two species are known to have been introduced within the last century. The inflorescence consists of digitate, spike-like racemes, hence the common name, finger grass. The spikelets are arranged in groups of two or three, one subsessile or on a very short pedicel, the others on pedicels as long as the spikelets or longer. The leaves are usually thin and lax, the ligules short and membranous.

Rachis with the lateral angles winged; culms spreading, often rooting at the lower nodes.

Pedicels sharply 3-angled; first glume present; sheaths densely pubescent.

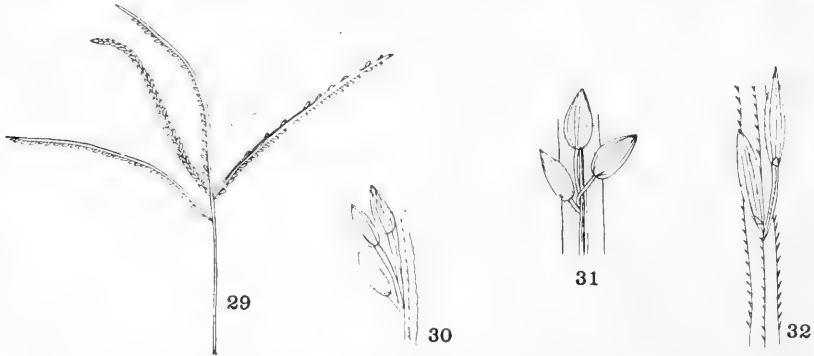
S. sanguinalis

Pedicels rounded; first glume wanting; sheaths smooth.

S. ischaemum

Rachis with wingless angles; culms erect, never spreading and rooting at the lower nodes.

S. filiformis



Figs. 29-32.—29, *S. ischaemum*, inflorescence; 30, *S. filiformis*, group of spikelets; 31, *S. ischaemum*, group of spikelets; 32, *S. sanguinalis*, group of spikelets

Syntherisma filiformis (L.) Nash

Slender Finger Grass (Fig. 30)

Digitaria filiformis, Engelmann '44, 103. *Panicum filiforme*, Lapham '57, 548, 593; Patterson '76, 52; Flagg '78, 284; Brendel '87, 88. *Syntherisma filiformis*, Gleason '07, 181. *Digitaria filiformis*, Gleason '10, 147.

Culms 6 to 28 inches long, erect; leaves short, grouped at the base of the plant; at least the lower sheaths pubescent; racemes 2 to 5, generally erect; spikelets pubescent, 1.7 to 1.8 mm. long, mostly in threes.

This grass is found in dry, sandy soil, usually along roadsides and in waste places. It is not abundant in Illinois.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb* in 1860. CHRISTIAN CO. Taylorville, *Andrews*, July, 1898. MENARD CO. Without locality, *Hall*; Athens, *Hall*, Sept., 1866. ST. CLAIR CO. Without locality, *Brendel* in 1850; Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*.

Syntherisma ischaemum (Schreb.) Nash

Small Crab Grass. Smooth Crab Grass (Figs. 29 and 31)

Panicum glabrum, Lapham '57, 548, 593; Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Higley and Raddin '91, 139; Huett '97, 128. *Syntherisma linearis*, Britton '07, 77. *Digitaria humifusa*, Gray's Manual, 7th ed., p. 95.

Culms 6 to 24 inches long, spreading over the ground, often rooting at the lower nodes and forming large mats; sheaths and blades smooth and glabrous; racemes 2 to 5, usually 3; spikelets glandular pubescent between the nerves, 2 to 2.2 mm. long, usually in threes, on rounded pedicels; first glume wanting.

A grass of the same habit as *Syntherisma sanguinalis* and probably often confused with it. It is found as a weed in gardens and cultivated places but is not so common as the above-mentioned species.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1899; Urbana, *Seymour*, Sept., 1888. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon*. PEORIA CO. Peoria, *Brendel*. STARK CO. Wady Petra, *V. H. Chase* 131. WILL CO. Mokena, *A. Chase* 2014.

Syntherisma sanguinalis (L.) Dulac

Common Crab Grass. Large Crab Grass (Fig. 32.)

Panicum sanguinale, Lapham '57, 548, 593; Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Huett '91, 128. *Digitaria sanguinalis*, Gates '12, 354.

Culms 1 to 3 feet long, much branched, spreading, rooting at the lower nodes and forming large mats; sheaths densely hairy; blades more or less pubescent on both surfaces; nodes frequently bearded with reflexed hairs; racemes 3 to 12; spikelets appressed pubescent, 2.5 to 3.5 mm. long, usually in pairs on sharply angled pedicels, first glume minute.

This grass is one of our most troublesome weeds in Illinois, being found in lawns, gardens, and among cultivated crops. It is also found along roadsides and in waste places. Being an annual, it should not be allowed to produce seed. When among crops it is generally destroyed by cultivation, altho its habit of rooting at the lower nodes makes eradication somewhat more difficult than in the case of grasses without this habit. It is most serious, however, as a lawn pest. On account of its habit of growth, it is difficult to cut with the lawn mower, and here it produces seed so close to the ground that it entirely escapes the mower. Hence it comes up from seed year after year, and often, especially in newly-made lawns, entirely crowds out the bluegrass.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb* in 1861; without locality, *Hall*. CHAMPAIGN CO. Urbana, *Seymour*, June, 1880; Seymour, *Tsou*, Oct., 1913; Urbana, *Gibbs*, Sept., 1898; Urbana, *Clinton*, Aug., 1895; Urbana, *Mosher*, Oct., 1913. CHRISTIAN CO. Taylorville, *Andrews*, July 1, 1898. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Warren, *Pepoon* 479. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. PEORIA CO. Peoria, *McDonald*, Aug., 1887; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality, *Shcarer*.

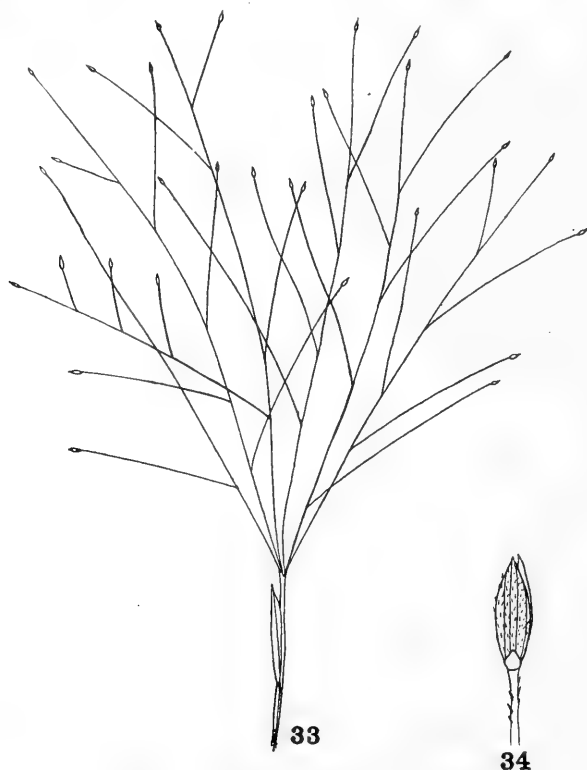
7. LEPTOLOMA Chase

This genus is represented in North America by a single species. The plants are perennial with large, open panicles at the ends of brittle culms, the panicles breaking off when the plant is mature and forming tumbleweeds. The spikelets are one-flowered, with a minute first glume. The lemma and palea are thick and leathery. The blades are rather firm with short, membranous ligules.

Leptoloma cognatum (Schult.) Chase
Fall Witch Grass (Figs. 33 and 34)

Panicum autumnale, Lapham '57, 548, 594; Flagg '78, 284; Brendel '87, 64; Huett '97, 128; McDonald '00, 103. *Panicum cognatum*, Gleason '07, 181. *Leptoloma cognatum*, Gleason '10, 147.

Culms erect, or spreading at base, much branched, 1 to 2.5 feet long, roughened with short, stiff hairs; lower sheaths sometimes



Figs. 33-34.—33, *L. cognatum*, inflorescence; 34, *L. cognatum*, spikelet

slightly pubescent, the upper smooth; blades 1 to 3 inches long, 4 to 6 mm. wide, smooth except for slightly roughened edges; panicle spreading, hairy in the axils; spikelets appressed pubescent, 2.7 to 3 mm. long, single on the ends of long pedicels.

This grass is not abundant in Illinois. It occurs mainly in the sand areas thruout the state.

ILLINOIS SPECIMENS: Without locality, *Vasey*. FULTON CO. Without locality, *Pepoon*. HENDERSON CO. Sandy banks of the Mississippi near Oquawka, *Patterson*, Sept., 1873; Oquawka, *Patterson*, Sept., 1881. JO DAVIESS CO.

Without locality, *Pepoon* 182. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913; Altorf, *Hill*, July, 1873. MACON CO. Decatur, *Clokey*, Sept., 1898. MASON CO. Without locality, *M. S. Bebb* in 1861. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1889. ST. CLAIR CO. Mascoutah, *Welsch*.

8. PASPALUM L.

This genus includes a large number of species, most of which are found in warm climates. None of the species are abundant in the state; for the most part they are found in the southern half. The inflorescence consists of spike-like racemes which are racemose along the main axis. The spikelets are flat on one side and strongly convex on the other, many of them almost hemispherical. They are frequently arranged in pairs on the rachis. These grasses are of no economic importance in the state, as they grow mostly in wet or sandy soil and are not common. The leaves are long and narrow, and often pubescent. The amount of pubescence present is quite variable on all parts of the plant.

- a. Rachis thin and leaf-like, more than 2 mm. broad.
 - b. Spikelets pubescent, 1.5 mm. long, elliptical; blades 1 to 6 inches long, 6 to 14 mm. broad. *P. repens*
 - bb. Spikelets smooth, 2 mm. long; leaf-blades 2 inches or less long, 2 to 6 mm. broad. *P. dissectum*
- aa. Rachis never thin and leaf-like, less than 1 mm. broad.
 - b. Spikelets pubescent, arranged in pairs.
 - c. Spikelets less than 2 mm. long, usually 1.5 mm., usually glandular spotted; blades densely pilose. *P. setaceum*
 - cc. Spikelets 2 mm. or more long, not glandular spotted; leaves velvety, the whole plant grayish. *P. bushii*
 - bb. Spikelets smooth.
 - c. Blades ciliate on the margin, the surfaces of the blade either smooth or pubescent; spikelets in pairs.
 - d. Surfaces of blades smooth or with a few very fine hairs.
 - e. Spikelets about 2 mm. long, always more than 1.7 mm.
 - f. Spikelets green; culms erect; blades usually smooth; spikelets averaging 2 mm. in length. *P. ciliatifolium*
 - ff. Spikelets yellowish or straw color; culms always spreading; blades usually with a few fine hairs on the upper surface; spikelets usually more than 2 mm. long. *P. stramineum*
 - ce. Spikelets 1.5 to 1.7 mm. long; leaves usually ciliate on the midnerve. *P. longepedunculatum*
 - dd. Surfaces of blades, both upper and under, densely pubescent; plants erect; spikelets 2 to 2.5 mm. long. *P. muhlenbergii*
 - cc. Blades not ciliate on the margin; spikelets usually arranged singly.
 - d. Blades conspicuously pubescent.
 - e. Spikelets about 2 mm. long, arranged in pairs; culms spreading or prostrate. *P. supinum*
 - ce. Spikelets 2.5 to 2.8 mm. long, arranged singly; sheaths and blades long pilose; culms erect. *P. longipilum*
 - dd. Blades smooth or slightly pubescent; spikelets arranged singly.
 - e. Spikelets 3 to 3.2 mm. long; leaf-blades and lower sheaths with a few hairs; blades reaching the base of the panicle or exceeding it. *P. circulare*
 - ee. Spikelets 2.5 to 2.9 mm. long; plants smooth; panicle much exceeding the blades. *P. laeve*

Paspalum bushii Nash

(Fig. 39)

Culms erect, 2.5 to 3.5 feet long, smooth; leaves gray-green; lower sheaths finely pubescent, the upper sheaths ciliate on the margin; blades long, usually 8 to 10 mm. wide, ciliate on the margins, densely velvety on both surfaces, and with a few long hairs intermixed; racemes 2 or 3; spikelets in pairs, 2 to 2.2 mm. long, pale yellowish, oval, densely pubescent.

This species is found in dry soil and is probably rare in Illinois.

CASS CO. Chandlerville, *Scymour*, Aug., 1886. HENDERSON CO. Oquawka, *Patterson*.



Figs. 35-38.—35, *P. dissectum*, inflorescence; 36, *P. repens*, inflorescence, (a) inflated sheath; 37, *P. longepedunculatum*, inflorescence; 38, *P. stramineum*, leaf

Paspalum ciliatifolium Michx.

(Fig. 40)

Culms erect, 16 to 32 inches long, smooth; sheaths smooth; blades long, thin, 6 to 15 mm. wide, smooth and glabrous on both surfaces or occasionally with a few hairs along the midnerve on the under side, long ciliate on the margins; racemes single or in pairs; spikelets in pairs, oval or round, 1.8 to 2.2 mm. long, usually smooth and glabrous, but sometimes with short, appressed hairs.

HENDERSON CO. Oquawka, *Patterson*, Aug., 1874. MARION CO. Without locality, *Brendel*. PEORIA CO. Peoria, *McDonald*, Sept., 1900. WABASH CO. Mt. Carmel, *Waite*, Aug., 1887.

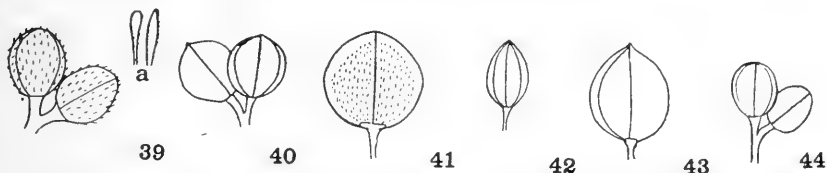
Paspalum circulare Nash

Round-flowered Paspalum (Fig. 41)

Culms erect or slightly reclining, 1 to 2.5 feet long, smooth; sheaths flattened, the lower ones densely pubescent; blades long, narrow, 5 to 8 mm. wide, with long hairs on the upper surface near the base, usually smooth and glabrous on the under surface, but sometimes with a few long hairs; racemes 1 to 4, usually 2 or 3; spikelets arranged singly, smooth, circular in outline, 3 to 3.2 mm. long.

This species is usually found in moist places. It resembles *P. laeve*, from which it may be distinguished by the pubescent sheaths and larger spikelets.

CLINTON CO. Shattuck, *Waite*, Aug., 1887. ST. CLAIR CO. Without locality, *Brendel*. WABASH CO. Mt. Carmel, *Patterson*, Sept., 1877.



Figs. 39-44.—39, *P. bushii*, spikelets, (a) glandular hairs; 40, *P. ciliatifolium*, spikelets; 41, *P. circulare*, spikelet; 42, *P. dissectum*, spikelet; 43, *P. laeve*, spikelet; 44, *P. longepedunculatum*, spikelets

Paspalum dissectum L.

Walter's Paspalum (Figs. 35 and 42)

Paspalum walterianum, *Patterson* '76, 52; *Flagg* '78, 284; *Brendel* '87, 88.

Culms much branched, usually spreading along the ground at the base and often rooting at the lower nodes, 1 to 2 feet long, the flowering culms erect or ascending; sheaths somewhat inflated, smooth; blades always less than 3 inches in length, usually much shorter, smooth; racemes 3 to 7, alternate, about an inch in length, usually partly included in the upper sheath, rachis flattened, green and membranous, 2 to 3 mm. wide; spikelets arranged in two rows, smooth, oval, 2 to 2.2 mm. long.

This species is found in damp or wet places along ditches and streams.

PERRY CO. Du Quoin, *Eggert* in 1893. PULASKI CO. Mound City, *Brendel*, Aug., 1853. ST. CLAIR CO. Without locality, *Brendel* in 1850; without locality, *Brendel*, Aug., 1851; Mascoutah, *Welsch*.

Paspalum laeve Michx.

Field Paspalum. Smooth Paspalum (Fig. 43)

Paspalum laeve, *Lapham* '57, 548, 592 (Plate 4, Fig. 3); *Patterson* '76, 52; *Flagg* '78, 284; *Brendel* '87, 88.

• Culms sometimes erect but oftener spreading, or even lying flat

on the ground, 1 to 3 feet long; sheaths smooth and glabrous, sometimes ciliate on the margins, but never pubescent; blades long, but seldom more than 8 inches, 4 to 8 mm. wide, smooth; racemes 2 to 6, commonly 2 or 3, hairy in the axils, not over 3.5 inches long; spikelets arranged singly in two rows, smooth, 2.5 to 2.9 mm. long.

This is one of the commonest species of *Paspalum* in localities where this genus is found. There are two varieties, *P. laeve australe*, which has blades pilose above and sometimes towards the base beneath, and *P. laeve angustifolium*, which has much longer blades, usually over 8 inches, commonly folded, with a few hairs on the upper surface, and racemes which are usually four inches in length. These varieties are usually found in the same localities as the species, but none have, as yet, been seen from Illinois. This species is usually found in moist fields and meadows.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. HENDERSON CO. Onwawka, *Patterson*, Sept., 1877. MARION CO. Without locality, *M. S. Bebb* in 1860. PEORIA CO. Peoria, *Brendel* in 1853. FERRY CO. Du Quoin, *Seymour*, Aug., 1880. ST. CLAIR CO. Mascoutah, *Welsh*. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Patterson*, Sept., 1877.

Paspalum longepedunculatum Le Conte Long-stalked *Paspalum* (Figs. 37 and 44)

Culms usually spreading or reclining, slender, smooth, 12 to 20 inches long; leaves mostly clustered at the base of the plant; sheaths smooth; blades long-ciliate on the margins, usually smooth on both surfaces, but sometimes pubescent on the upper surface; blades usually not over four inches long, 4 to 6 mm. wide; racemes 1 or 2 on a very long, slender peduncle; spikelets in pairs, smooth, 1.5 to 1.7 mm. long.

This species is found in dry or sandy soil in about the same situations as *P. muhlenbergii*.

PEORIA CO. Peoria, *McDonald*, Sept., 1900. ROCK ISLAND CO. Rock Island, banks of the Mississippi river, *McDonald*, Aug., 1900.

Paspalum longipilum Nash Long-haired *Paspalum* (Fig. 45)

Paspalum plenipilum, Gray's Manual, 7th ed., Britton '07.

Culms erect, 1 to 3 feet long, smooth; sheaths flattened, with hairs about equal to the sheath in width, more numerous along the margin and midnerve; blades usually erect, often folded, densely pubescent on the upper surface, the hairs longer near the base, less densely pubescent on the lower surface; racemes 2 to 6, usually 3, on a long peduncle, densely hairy in the axils; spikelets oval, smooth, arranged singly, 2.5 to 2.8 mm. long.

This species somewhat resembles *P. laeve*, but is distinguished by the pubescent sheaths. The hairs on sheaths and blades are much longer than in either variety of *P. laeve*.

RICHLAND CO. Olney, *Ridgway*, in 1914. WABASH CO. Without locality, *Shearer*.

Paspalum muhlenbergii Nash

(Fig. 46)

Culms usually erect, but often spreading or reclining, 16 to 32 inches long, smooth; sheaths usually pubescent; blades long and narrow, 5 to 10 mm. wide, usually wider near the middle, ciliate on the margins, appressed pubescent on both surfaces; racemes 1 or 2; spikelets in pairs, smooth, 2 to 2.5 mm. long.

This species is generally found in sandy soil, along roadsides, in vacant lots, and other uncultivated places.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHRISTIAN CO. Taylorville, *Andrews*. JACKSON CO. Without locality, *French*, July, 1878. MACOUPIN CO. Carlinville, Robertson in 1881. MARION CO. Without locality, *Brendel* in 1860. PEORIA CO. Peoria, *Brendel* in 1859. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*.

Paspalum repens Berg.

Water Paspalum (Figs. 36 and 47)

Paspalum fluitans, Lapham '57, 548, 592; Patterson '76, 52; Flagg '78, 284; Brendel '87, 88. *Paspalum mucronatum*, Britton '07, 73.

Culms ascending, 6 to 36 inches long, much branched, the branches spreading out at the base; sheaths inflated, very loose, either smooth or slightly pubescent; blades 2 to 8 inches long, 6 to 25 mm. wide, very thin, slightly rough; racemes 10 to 40, the rachis flattened and membranous; spikelets arranged in two rows, slightly pubescent, 1 to 1.5 mm. long.

This species is usually found in water, with the stems floating, the inflated sheaths serving as floats. It is found sometimes in wet, muddy places.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*; without locality, southern Illinois, *Forbes*. HENDERSON CO. Oquawka, *Patterson*, Sept., 1877. JERSEY CO. Bottom lands, *Grafton*, *Seymour*, Oct., 1882. JOHNSON CO. Belknap, *Gleason*, Aug., 1902. PULASKI CO. Mound City, *Vasey*. ST. CLAIR CO. Without locality, *Brendel*, Aug., 1850; Mascoutah, *Welsch*.

Paspalum setaceum Michx.

(Fig. 48)

Lapham '57, 592; Patterson '76, 52; Flagg '78, 284; Brendel '87, 88; McDonald '00, 103; Gleason '07, 181; Gleason '10, 147.

Culms usually erect, 1 to 2 feet long, smooth and slender; lower sheaths and blades densely pubescent; racemes usually single, occasionally 2, on a long, slender peduncle; spikelets in pairs, almost circular, 1.5 mm. long, usually pubescent and glandular spotted, but sometimes smooth and glabrous.

This species has been confused with *P. muhlenbergii*, which has much larger spikelets. Many of the herbarium specimens of *P. muhlenbergii* examined were labeled *P. setaceum*, so it is quite possible that the citations above refer to both species.

LEE CO. Dixon, *Vasey*. MASON CO. Without locality, *Wolf*; without locality, *Hall*; Devil's Hole, Havana, *Gates* 3439.

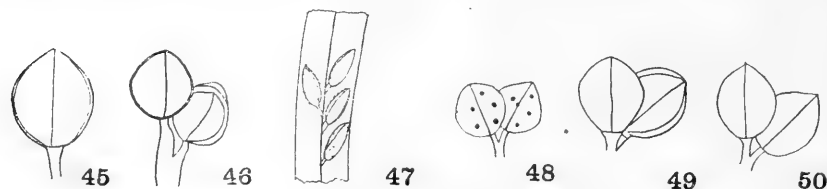
Paspalum stramineum Nash

Straw-colored Paspalum (Figs. 38 and 49)

Culms often spreading or almost flat on the ground, smooth, 8 to 24 inches long; leaves yellowish green or straw color; sheaths smooth and glabrous except on the margin, where there is a fringe of short hairs; blades rather firm, ciliate on the margin, at least 10 mm. wide, some very fine hairs on the upper surface, smooth and glabrous on the under surface; spikelets in pairs, yellow or almost white, usually smooth, almost circular, very thick, 2 to 2.2 mm. long.

This species is found in sandy places and is easily distinguished by the pale color of leaves and spikelets.

CASS CO. Beardstown, *McDonald* in 1900. JO DAVIESS CO. Sandy prairie near Mississippi river, *Pocheon* 399. KANKAKEE CO. Kankakee, *Hill*, Aug., 1872; *Altorf*, *Hill*, Aug., 1872. WABASH CO. Mt. Carmel, *Waite*, Aug., 1887.



Figs. 45-50.—45, *P. longipilum*, spikelet; 46, *P. muhlenbergii*, spikelets, 47, *P. repens*, spikelets; 48, *P. setaceum*, spikelets; 49, *P. stramineum*, spikelets; 50, *P. supinum*, spikelets

Paspalum supinum Bosc.

(Fig. 50)

Culms spreading or lying flat on the ground, 2 to 3 feet long, smooth; sheaths and blades conspicuously pubescent; blades long, usually 1 foot or more, 5 to 15 mm. wide; spikelets in pairs, smooth, oval, about 2 mm. long.

This species closely resembles *P. bushii* in the "fuzzy" appearance of the leaves, but is distinguished by the glabrous spikelets. In *P. bushii* the culms are erect, but never in *P. supinum*.

MASON CO. Manito, *Wilcox* 56. UNION CO. Anna, *Seymour*, Aug., 1880. WABASH CO. Mt. Carmel, *Patterson* in 1877.

9. PANICUM L.

This genus belongs typically to warm climates and includes a very large number of species, of which thirty-six have been found in Illinois. A few of these are weeds, but the majority of them are of no economic importance. Most of the species are perennials, but a few are annuals, and among the annuals are found the species which are common weeds. The inflorescence usually consists of many-flowered panicles. The spikelets have two glumes and a sterile lemma, which

are usually strongly nerved, and a very hard, shiny, fertile lemma and palea inclosing the fruit, which are never nerved. This genus was recently revised by Hitchcock and Chase (Contributions from the U. S. Nat. Herb., Vol. 15, 1910). The Illinois species have been arranged in groups following their classification, then arranged alphabetically under the different groups.

a. Spikelets smooth and glabrous.

b. Plants never forming a winter rosette of leaves at the base of the culm, the leaves all similar.

c. Plants annual, without creeping rootstocks.

d. First glume not over one-fourth the length of the spikelet, and usually broadly rounded at the apex, never sharp-pointed; plants generally smooth thruout. *P. dichotomiflorum*

dd. First glume always one-half the length of the spikelet, or more; plants typically very pubescent, the sheaths usually papillose-hirsute; panicles many-flowered, usually large, with fine capillary branches.

e. Spikelets 4.5 to 5 mm. long, panicles often drooping.

P. miliaceum

ee. Spikelets always less than 4 mm. long; panicles never drooping, numerous, one-third the entire height of the plant or more.

f. Spikelets 2.5 or more long, usually at least 3 mm.; blades sparsely pubescent.

g. Panicles as broad as long, leaves usually crowded at the base of the plant. *P. barbipulvinatum*

gg. Panicles narrow, usually less than half as broad as long. *P. flexile*

ff. Spikelets only rarely exceeding 2.2 mm. long; blades generally densely pubescent.

g. Culms slender; the panicles delicate, relatively few-flowered; spikelets less than 2 mm. long, usually in pairs at the ends of the naked panicle branches.

P. philadelphicum

gg. Culms stout; panicles diffuse, many-flowered; spikelets 2 mm. or more long.

h. Panicles as broad as long, usually more than half the length of the entire plant, mostly terminal only. *P. capillare*

hh. Panicles oval, seldom as broad as long, normally one-third the length of the entire plant, or less, produced from all the nodes. *P. gattingeri*

cc. Plants perennial, with or without creeping rootstocks.

d. Panicles open, the spikelets long pediceled; culms from long, creeping rootstocks, not flattened. *P. virgatum*

dd. Panicles somewhat contracted and resembling those of common redtop, (*Agrostis alba*); culms flattened, sheaths keeled.

e. Long, scaly rootstocks present; spikelets 3.4 to 3.8 mm. long. *P. anceps*

ee. Rootstocks never present; spikelets 1.8 to 2 mm. long.

P. agrostoides

bb. Plants forming a winter rosette at the base of the culm, these much shorter and broader than the culm leaves.

c. Spikelets over 3 mm. long.

d. Spikelets pointed or beaked; blades very long and narrow, usually stiff and erect from the base of the plant; panicle narrow and few-flowered. *P. depauperatum*

dd. Spikelets blunt; blades short and rather broad, distributed along the culm; panicle nearly as broad as long, but not densely flowered. *P. scribnerianum*

- cc. Spikelets less than 3 mm. long.
 - d. Blades very long and narrow, not over 5 mm. wide, usually all erect from the base of the plant and usually longer than the panicle until it is mature; spikelets 2.2 to 2.7 mm. long; sheaths pilose. *P. linearifolium*
 - dd. Blades not elongated, not in a tuft at the base of the plant, the panicle always considerably above the leaves; sheaths smooth, or the lowermost sometimes puberulent.
 - e. Spikelets more than 2 mm. long, pointed; sheaths with pale glandular spots. *P. yadkinense*
 - cc. Spikelets 2 mm. or less long, not pointed.
 - f. Nodes bearded.
 - g. Ligule not present; spikelets 1.5 to 1.6 mm. long. *P. microcarpon*
 - gg. Ligule present; spikelets 2 mm. long; at least the lower nodes bearded; fruit always covered by the second glume and sterile lemma. *P. barbuiatum*
 - ff. Nodes not bearded; spikelets 2 mm. long; the fruit exposed at tip, never quite covered by the second glume and sterile lemma. *P. dichotomum*
- aa. Spikelets more or less pubescent.
 - b. Blades broad, usually more than 1.5 cm. wide, cordate at base; culms stout, usually two feet or more high; spikelets over 2.5 mm. long.
 - c. Sheaths, at least the lower ones, hispid, the hairs arising from prominent papillae; spikelets 2.7 to 3 mm. long. *P. clandestinum*
 - cc. Sheaths smooth, or with a few soft hairs.
 - d. Nodes smooth; spikelets less than 4 mm. long. *P. latifolium*
 - dd. Nodes bearded; spikelets 4 to 4.5 mm. long. *P. boscii*
 - bb. Blades narrow, at least not over 1.5 cm. wide, usually not cordate at base; culms never as stout, rarely as tall, as in the preceding species.
 - c. Spikelets 2 mm. or more long.
 - d. Blades much elongated, the length usually more than fifteen times the breadth, less than 5 mm. wide, the leaves growing mostly erect from the base and forming tufts.
 - e. Spikelets about 3.5 mm. long, pointed or beaked. *P. depauperatum*
 - cc. Spikelets 3 mm. long or less, not pointed or beaked.
 - f. Culms in small tufts; spikelets 2.7 to 3.2 mm. long, almost as broad as long. *P. perlongum*
 - ff. Culms in large tufts; spikelets 2.2 to 2.7 mm. long, distinctly longer than broad. *P. linearifolium*
 - dd. Blades usually not elongated, generally over 5 mm. wide; leaves not all clustered at the base of the plant, but distributed along the culm.
 - e. Spikelets more than 3 mm. long; culms stout, erect, with stiff blades, and usually pubescent sheaths.
 - f. Plants densely pubescent thruout, the hairs arising from small papillae, those on the sheaths spreading; panicle narrow, always longer than wide. *P. leibergii*
 - ff. Plants not densely pubescent thruout, usually with few hairs on the blades, the upper surface normally smooth; panicle about as wide as long.
 - g. Spikelets distinctly longer than broad, somewhat pointed, usually pubescent; plants olivaceous, pubescence appressed. *P. oligosanthos*
 - gg. Spikelets nearly as broad as long, blunt, usually nearly smooth; plants always bright green or yellowish green, pubescence not appressed. *P. scribnerianum*
 - cc. Spikelets less than 3 mm. long.
 - f. Leaves densely pubescent on both surfaces, the entire plant pubescent; spikelets 2.2 to 2.4 mm. long.

- g. Hairs on the culms and sheaths spreading horizontally. *P. villosissimum*
- gg. Hairs on the culms and sheaths not spreading horizontally, but appressed or ascending. *P. pseudopubescens*
- ff. Leaves not densely pubescent on both surfaces, the entire plant not noticeably pubescent.
 - g. Blades ciliate, otherwise glabrous, or with a few fine hairs; spikelets 2 mm. long; sheaths retrorsely pilose; blades very soft. *P. xalapense*
 - gg. Blades broad, sometimes ciliate around the cordate base; spikelets 2.5 to 3 mm. long; sheaths smooth; blades firm. *P. commutatum*
- cc. Spikelets less than 2 mm. long.
 - d. Culms and sheaths densely and usually conspicuously pubescent; ligules densely hairy, 2 to 5 mm. long.
 - e. Spikelets more than 1.5 mm. long.
 - f. Culms conspicuously pubescent with long, soft, horizontally spreading hairs; blades pubescent, the hairs nearly as long as the width of the blade; spikelets 1.8 to 1.9 mm. long. *P. praecocius*
 - ff. Culms and blades pubescent, with short, appressed hairs.
 - g. Upper surface of blades smooth, or with only a few hairs near base; blades with a thin, white margin; spikelets 1.6 to 1.7 mm. long. *P. tennesseense*
 - gg. Upper surface of blades pubescent; blades never with a thin, white margin; spikelets 1.6 to 1.8 mm. long. *P. huachucae*
 - cc. Spikelets 1.5 mm. or less long.
 - f. Summit of the culm with long hairs, panicle branches tangled. *P. implicatum*
 - ff. Summit of the culm without hairs; panicle branches not tangled. *P. meridionale*
 - g. Culms and sheaths not conspicuously pubescent, either smooth or with short, appressed hairs; ligules (except in *P. lindheimeri*) generally very short, not over 1.5 mm. long.
 - h. Spikelets not spherical, longer than broad; ligules always visible; blades narrow.
 - i. Sheaths ciliate, otherwise glabrous or the lower sparsely pilose, about half the length of the internode; ligule densely hairy, 3 to 5 mm. long. *P. lindheimeri*
 - ii. Sheaths appressed pubescent, very little shorter than the internodes; ligules about 1 mm. long. *P. tsugetorum*
 - hh. Spikelets spherical or nearly so; ligules obsolete or nearly so; blades broad.
 - i. Panicle nearly as broad as long; blades not distinctly nerved. *P. sphaerocarpon*
 - ii. Panicle about two-thirds as broad as long; blades distinctly nerved. *P. polyanthes*

DICHOTOMIFLORA

Only one species of this group is found in Illinois. These are annual plants, typically smooth thruout, with large, spreading panicles 4 to 16 inches long. The leaves are long and narrow, the ligules 1 to 3 mm. long, membranous, edged with a fringe of long hairs. The first glume is very short, one-fourth or less the length of the spikelet.

***Panicum dichotomiflorum* Michx.**

Sprouting Crab Grass (Fig. 51)

Panicum proliferum, Lapham '57, 548, 549; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64. *Panicum dichotomiflorum*, Hitchcock and Chase '10, 51.

Entire plant usually smooth and glabrous; culms 1 to 4 feet long, somewhat flattened, usually spreading at the base, but sometimes erect, geniculate at the nodes, the nodes often considerably swollen; sheaths loose, very often purplish; blades 4 to 20 inches long, 3 to 20 mm. broad; spikelets smooth, 2 to 3 mm. long, usually 2.5 mm.

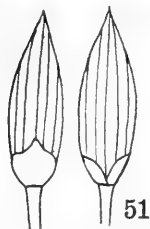


Fig. 51.—*P. dichotomiflorum*, spikelet

This species is usually found in moist ground and along ditches and streams, and generally produces a very rank growth. It also occurs as a weed in waste places and cultivated soil, often forming a rank growth after crops have been removed. In such situations it must be regarded as a weed, but it is not usually very troublesome as it is an annual and can be easily controlled if thoro cultivation is

given the soil and no seed is allowed to form.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Gibbs*, Oct., 1886; Champaign, *Mosher*, Oct., 1914; Urbana, *Gibbs*, Sept., 1898; Urbana, *Seymour*, Aug., 1880; Urbana, *Mosher*, Sept., 1914. CHRISTIAN CO. Taylorville, *Andrews*, Aug., 1898. COOK CO. Chicago, *Umbach* in 1896; Chicago, *Moffatt* 374. FULTON CO. Without locality, *Pepoon* 485; Canton, *Wolf*. HANCOCK CO. Without locality, *Mead* in 1842. JACKSON CO. Makanda, *Seymour*, Aug., 1880. JO DAVIESS CO. Warren, *Pepoon* 485. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald* 71. PIATT CO. White Heath, *Mosher*, Oct., 1914. ST. CLAIR CO. Without locality, *Eggert* 110; Mascoutah, *Welsch*. WABASH CO. Without locality, *Schneck* in 1904; without locality, *Shearer*; Mt. Carmel, *Schneck* in 1888.

CAPILLARIA

The plants in this group are all annuals. They are very pubescent, usually on both culms and leaves, but at least on the leaves. The hairs arise from small, rounded papillae. The ligules are about 3 mm. long and are fringed with hairs. The panicles are of the type shown in Fig. 33, usually large, from 4 to 18 inches long, and at maturity they often break away from the plant and become tumble-weeds. The spikelets are smooth and the first glume is always at least one-third the length of the spikelet. Six species of this group are found in Illinois.

***Panicum barbipulvinatum* Nash**

(Fig. 52)

Hitchcock and Chase '10, 63.

Culms erect, 6 inches to 3 feet long, pubescent below the nodes; sheaths very pubescent; blades sparsely pubescent on both surfaces,

1.5 to 6 inches long, 3 to 12 mm. wide; panicles broad and spreading, often almost half the length of the plant, few-flowered; spikelets smooth, 3 to 3.3 mm. long, usually about 3 mm.

This species very closely resembles *P. capillare*; at first sight the two might be considered identical. *P. barbipulvinatum*, however, has a much thinner and more spreading panicle, its blades are not so hairy and its spikelets are larger.

HENDERSON CO. Vicinity of Oquawka, *Patterson*.

***Panicum capillare* L.**

Witch Grass. Tumble-weed. Old Witch Grass. Tickle Grass

(Fig. 53)

Michaux '03, 47; Lapham '57, 548, 594; Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 139; Huett '97, 128; Hitchcock and Chase '10, 60; Gates '12, 354; Sherff '13, 594.

Culms usually erect, 8 inches to 4 feet long, pubescent, especially at the nodes; sheaths densely pubescent, the hairs nearly as long as the sheath is wide; blades 4 to 10 inches long, 5 to 15 mm. wide, the midrib prominent, both surfaces thickly covered with short, appressed pubescence; panicle many-flowered, included in the sheath till maturity, then very large and spreading, sometimes half the length of the plant, nearly circular in outline, finally breaking away from the plant and acting as a tumble-weed; spikelets 2 to 2.5 mm. long.

This is a very common species in Illinois, by far the most common of this group. It is a weed in cornfields and among other cultivated crops. It is also found along ditches and in other moist places. It is easily eradicated by cultivation if care is taken to destroy the plants before the seed forms.

CHAMPAIGN CO. Urbana, *Gibbs*, Sept., 1898; Urbana, *Mosher*, Oct., 1913; Urbana, *Clinton*, Aug., 1895; Seymour, *Tsou*, Oct., 1913. COOK CO. Chicago, *Robert Bebb* 2917; Chicago, *Babcock*, Sept., 1874. DU PAGE CO. Naperville, *Umbach* in 1898. FORD CO. Roberts, *Wilcox* 109. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon* 478. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. LAKE CO. Lake Forest, *Jensen*, Aug., 1895. MCHENRY CO. Algonquin, *Nason*, Aug., 1879. PEORIA CO. Peoria, *McDonald*, Sept., 1904. PIATT CO. White Heath, *Mosher*, Oct., 1914. ST. CLAIR CO. Cahokia, *Eggert*, Sept., 1875; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* in 1897. WABASH CO. Without locality, *Shearer*, Sept., 1899; Mt. Carmel, *Schneck*, Sept., 1876. WILL CO. Mokena, *A. Chase* 2008.

***Panicum flexile* (Gattinger) Scribn.**

(Fig. 54)

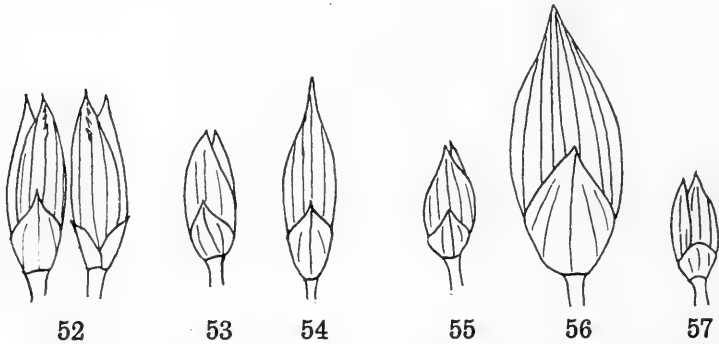
Hitchcock and Chase '10, 55.

Culms erect, 8 to 20 inches long, almost smooth except at the nodes; sheaths pubescent, the hairs about half as long as the width of the sheath, but not very conspicuous; blades sparsely pubescent or smooth, 4 to 12 inches long, 2 to 6 mm. wide; panicles narrow, few-flowered,

seldom half the length of the plant; spikelets smooth, 3 to 3.5 mm. long.

This is not a common species in Illinois. It is found in sandy soil, usually where it is moist. It is readily distinguished from *P. capillare* by its slender habit of growth, less dense pubescence on the sheaths, smaller, narrower panicles, narrower leaves, and larger, more pointed spikelets. Its habit of growth is more like that of *P. philadelphicum*, from which it is distinguished by its narrower panicle, and longer, pointed spikelets.

COOK CO. Chicago, *A. Chase* 1474, 1479, 1729, 2006; Chicago, *Hill* in 1901; Irondale, Chicago, *A. Chase* 1473; Grand Crossing, *Robert Bebb* 2928; Grand Crossing, *McDonald*, Sept., 1893. LAKE CO. Beach, *Umbach* 2543. ST. CLAIR CO. Without locality, *Eggert* 241. WABASH CO. Without locality, *Shearer*, Oct., 1915; Mt. Carmel, *Schneck*, Sept., 1879.



Figs. 52-57.—Spikelets: 52, *P. barbipulvinatum*; 53, *P. capillare*; 54, *P. flexile*; 55, *P. gattingeri*; 56, *P. miliaceum*; 57, *P. philadelphicum*

***Panicum gattingeri* Nash**

(Fig. 55)

Hitchcock and Chase '10, 57.

Culms 8 inches to 3 feet long, erect at first, but soon spreading and rooting at the lower nodes; culms, nodes, and sheaths densely pubescent, the hairs almost as long as the width of the culm; blades 4 to 8 inches long, 6 to 10 mm. wide, sparsely pubescent or smooth; panicles numerous, oval in outline, never as much as half the length of the plant; spikelets usually 2 mm. long.

This species is very closely related to *P. capillare* but differs in the spreading habit, the more oval outline of the panicle and the shorter, broader spikelets. It is usually a weed and is found in the same situations as *P. capillare*. It may easily be eradicated by cultivation, which prevents the formation of seed.

CHAMPAIGN CO. Urbana, *Seymour*, Oct., 1880. FULTON CO. Canton, *Wolf* in 1882. PEORIA CO. Peoria, *Brendel*. STARK CO. Wady Petra, *V. H. Chase*, Sept., 1900; 124 in 1897. VERMILION CO. Catlin, *Lansing*, Sept., 1912. WABASH CO. Without locality, *Shearer*, Aug., 1915.

Panicum miliaceum L.

Broom-corn Millet. Hog Millet (Fig. 56)

Hitchcock and Chase '10, 69.

Culms stout, usually erect, 8 inches to 3 feet high, pubescent below the nodes, which are densely, softly pubescent; sheaths loose, densely pubescent, the hairs not more than half the width of the sheath; blades 4 to 12 inches long and 8 to 20 mm. broad, sparsely long pubescent on both surfaces, sometimes almost smooth; panicles relatively small, rather compact, many-flowered, and usually drooping; spikelets 4.5 to 5 mm. long.

This plant frequently escapes from cultivation and is found in waste places.

COOK CO. Chicago, *A. Chase* 1633; Woodlawn, Chicago, *Millsbaugh* 389. LAKE CO. Beach Area, *Gates*. VERMILION CO. Hastings, *S. Gray* in 1905.

Panicum philadelphicum Bernh.

(Fig. 57)

Culms erect and slender, 6 to 20 inches long, usually pubescent but sometimes smooth and glabrous; sheaths densely pubescent, the hairs as long as the width of the sheath and usually perpendicular to it; blades short and narrow, 1 to 4 inches long and 2 to 6 mm. wide, sparsely pubescent; panicles oval in outline, few-flowered, the spikelets mostly in twos, 1.7 to 2 mm. long.

This plant is usually yellowish green and is much smaller and more slender than *P. capillare*. The panicles are very much smaller, never more than one-third the length of the plant, and the spikelets are usually smaller. This species is found in rather dry soil, by roadsides and in waste places. It is rare in Illinois.

ILLINOIS SPECIMENS: Without locality, *Vasey*.

VIRGATA

This group includes plants which are perennial by stout, creeping rootstocks. They are not densely pubescent plants like the *Capillaria*, the only species in Illinois being practically smooth thruout. The ligules are 2 to 4 mm. long, membranous, and fringed with hairs. The spikelets are large and contain a staminate flower in addition to the perfect one. The first glume is always more than half the length of the spikelet, and the second glume is longer than the sterile lemma.

Panicum virgatum L.

Switch Grass (Fig. 58)

Michaux '03, 48; Engelmann '44, 103; Lapham '57, 548, 594; Babeock '73, 97; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 139; Huett '97, 128; Gleason '07, 181; Gleason '10, 147; Hitchcock and Chase '10, 87; Gates '12, 354.



Fig. 58.—*P. virgatum*, spikelet

Culms erect, 3 to 6 feet tall, smooth; sheaths usually smooth, sometimes ciliate on the margin or with a few hairs at the throat; blades 4 inches to 2 feet long, 4 to 15 mm. wide, usually smooth except for the rough edges; panicles large and spreading; spikelets 3.5 to 5 mm. long.

This is a species belonging to the prairie. It is usually found in moist places, where it grows in large bunches. When young, it furnishes some grazing for stock, but when the plant is old the stems are very hard.

ILLINOIS SPECIMENS: Without locality, *Hall* in 1870. COOK CO. Chicago, *A. Chase* 1178, 1636; Chicago, *Babcock*, July, 1874. CHAMPAIGN CO. Without locality, *Percival*, Oct., 1876; Champaign, *Clinton*, Sept., 1897; Champaign, *Seymour*, July, 1880; Savoy, *Gibbs*, Sept., 1898. FULTON CO. Without locality, *Pepon*. IROQUOIS CO. Thawville, *Wilcox* 100. JO DAVIESS CO. Without locality, *Pepon* 411. LAKE CO. Waukegan, *Gleason* and *Shobe* 326; Winthrop Harbor, *Gates*. LEE CO. Dixon, *Scymour*, Sept., 1882. MACON CO. Decatur, *Clokey* in 1898. MENARD CO. Athens, *Hall* in 1870. OGLE CO. Without locality, *M. S. Bebb* in 1858; Oregon, *Waite* in 1885. PEORIA CO. Princeville, *V. H. Chase* 818; Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1903. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* in 1897. WABASH CO. Without locality, *Shearer*; Old Palmyra, *Schneck*, Sept., 1897; Mt. Carmel, *Schneck*, Oct., 1876. WILL CO. Joliet, *Skeels* 470.

AGROSTOIDEA

These plants are perennials, growing in bunches, some species with scaly rootstocks. The sheaths are often keeled. The ligule is never over a millimeter long, membranous, and sometimes fringed with hairs. The panicles in our species are many-flowered, the spikelets short-pedicelled, mostly crowded on the ascending branches. The spikelets are smooth and have a keeled first glume.

Panicum agrostoides Spreng.

Munro Grass (Fig. 60)

Lapham '57, 548, 594; Patterson '76, 52; Flagg '78, 284; Huett '97, 128; Hitchcock and Chase '10, 100.

Culms erect, smooth, 1.5 to 3 feet long, many short leaves clustered at the base of the plant with some very long ones on the culm; sheaths keeled, usually smooth; blades folded at the base, flat above, 8 to 20 inches long, 5 to 10 mm. wide, slightly rough on both surfaces but not pubescent; panicles narrowly oval in outline, much the size and shape of common redtop, *Agrostis alba*; spikelets 1.8 to 2 mm. long.

This species is usually found in damp places, often forming a dense stand over considerable areas that are low and somewhat boggy.

It also grows along the banks of streams and ponds. It furnishes very good fodder if present in sufficient quantities.

ILLINOIS SPECIMENS: Without locality, Southern Illinois, *Vasey* in 1860. CLINTON CO. Shattuck, *Waite*. HANCOCK CO. Augusta, *Mead*. JACKSON CO. Makanda, *Seymour*, Aug., 1880. KANKAKEE CO. Kankakee, *De Selm*, Aug., 1913. MADISON CO. Madison, *Eggert* 227. PEORIA CO. Peoria, *Brendel* in 1859. PULASKI CO. Mound City, *Vasey*. ST. CLAIR CO. Without locality, *Brendel* in 1850; Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*, Sept., 1898.

Panicum anceps Michx.

(Fig. 59)

Brendel '59, 585; *Vasey* '61, 671; *Patterson* '76, 52; *Flagg* '78, 284; *Brendel* '87, 64; *Hitchcock and Chase* '10, 107.

Culms erect from stout, scaly rootstocks, smooth, 1.5 to 3 feet long; sheaths finely pubescent or smooth and glabrous; blades often folded together at base, usually slightly rough and glabrous, sometimes a few hairs near the base, 8 to 20 inches long, 4 to 10 mm. wide; panicles stiffly erect, the long slender branches not close together, bearing short, appressed branchlets, mostly along the lower side; spikelets 3 to 3.8 mm. long, usually about 3.5.

This species is found in moist, sandy soil, often in open woods.



59



60

Figs. 59-60.—Spikelets: 59, *P. anceps*;
60, *P. agrostoides*

It is of no economic importance.

ILLINOIS SPECIMENS: Without locality, *Vasey*. HENDERSON CO. Without locality, *Patterson*. PEORIA CO. Peoria, *Brendel*. POPE CO. Herod, *Clinton*, July, 1898. PULASKI CO. Mound City, *Vasey*. ST. CLAIR CO. Mascoutah, *Welsch*. UNION CO. Anna, *Seymour*, Aug., 1880. WABASH CO. Mt. Carmel, *Waite* in 1887; Paton Station, *Schneck*, Aug., 1881.

Subgenus *DICHANTHELIUM* Hitchcock and Chase

The remaining groups of *Panicum* are included in this subgenus. In these plants there is a more or less well-marked winter rosette of leaves at the base of the plant, which are broader and shorter than the other leaves (Fig. 67). This rosette is formed in midsummer or fall, and lives over until spring. In the spring simple culms (Fig. 73) are produced, bearing terminal panicles with numerous spikelets, which seldom produce seed (Fig. 67b). After these panicles are mature, the culms branch and the winter rosette is formed. This changes the appearance of the plant completely in most cases (Fig. 67), and some of these autumnal forms have been described as new species. A second lot of panicles, often hidden by the sheaths, are produced on the branches, the spikelets on these producing seed.

DEPAUPERATA

This group includes plants with simple culms, 4 to 16 inches tall with long, narrow leaves clustered at the base. The ligule is a ring of very short hairs. The panicles are small, very narrow, and in summer are borne well above the leaves. In autumn the panicles are smaller and more or less hidden by the leaves. The species are extremely variable both as to size of spikelet and amount of hairs present.

***Panicum depauperatum* Muhl.**

(Figs. 61 and 64)

Lapham '57, 548, 596; Babcock '73, 250; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 139; Huett '97, 128; Hitchcock and Chase '10, 151.

Culms slender and stiff, variable as to amount of pubescence present, sometimes smooth and glabrous; sheaths usually finely papillose-pubescent; blades 3 to 9 inches long, 2 to 5 mm. wide, the smaller leaves at the base of the plant; panicles narrow, few-flowered; spikelets beaked, the second glume and sterile lemma extending beyond the fruit, 3 to 4 mm. long, usually about 3.5 mm., sometimes with a few short hairs.

There is little difference between the plant in spring and in autumn. It grows in poor soil, generally in open woods. *Panicum depauperatum* as mentioned by the earlier authors probably included *P. perlongum*, as that species has only recently been segregated from *P. depauperatum*.

ILLINOIS SPECIMENS: Lansing, *A. Chase* 867. JACKSON CO. Makanda, *Gleason*, June, 1903.



Fig. 61.—*P. depauperatum*

***Panicum perlongum* Nash**

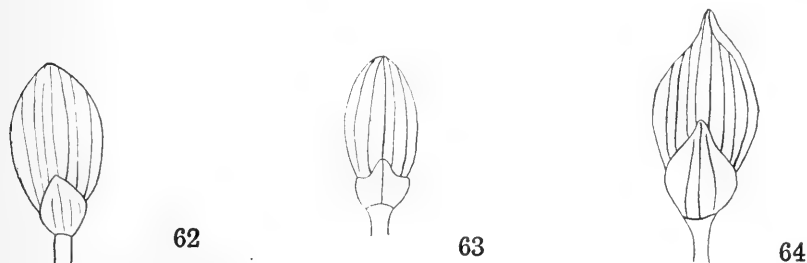
(Fig. 62)

Gleason '10, 148; Hitchcock and Chase '10, 153.

Culms as in the preceding species; sheaths usually densely pubescent, very seldom smooth; blades 2 to 10 inches long, 2 to 4 mm. wide; panicles very small, but appearing densely flowered; spikelets blunt, or if appearing beaked, the points of the second glume and sterile lemma not extending beyond the fruit, 2.7 to 3.3 mm. long, often pubescent.

This species closely resembles *P. depauperatum*, but the spikelets do not have a beak prolonged beyond the fruit, and the leaves are longer and narrower. *P. depauperatum* has very few panicles in the autumn, while *P. perlongum* has a great many. It is a prairie species and grows in dry soil.

ILLINOIS SPECIMENS: Without locality, *Babcock*; without locality, *Wolf*. CHAMPAIGN CO. Urbana, *Seymour*, May, 1880. HENDERSON CO. Oquawka, *Patterson*. JO DAVIESS CO. Hanover, *Gleason* and *Gates* 2530. LAKE CO. Beach, *Gates* 2454; Waukegan, *Gates* 2472. PEORIA CO. Peoria, *McDonald*. STARK CO. Wady Petra, *V. H. Chase* 460, 1456, 1511. WILL CO. Joliet, *Hill*, June, 1907; Joliet, *Skeels*, June, 1904.



Figs. 62-64.—Spikelets: 62, *P. perlongum*; 63, *P. linearifolium*; 64, *P. depauperatum*

***Panicum linearifolium* Scribn.**

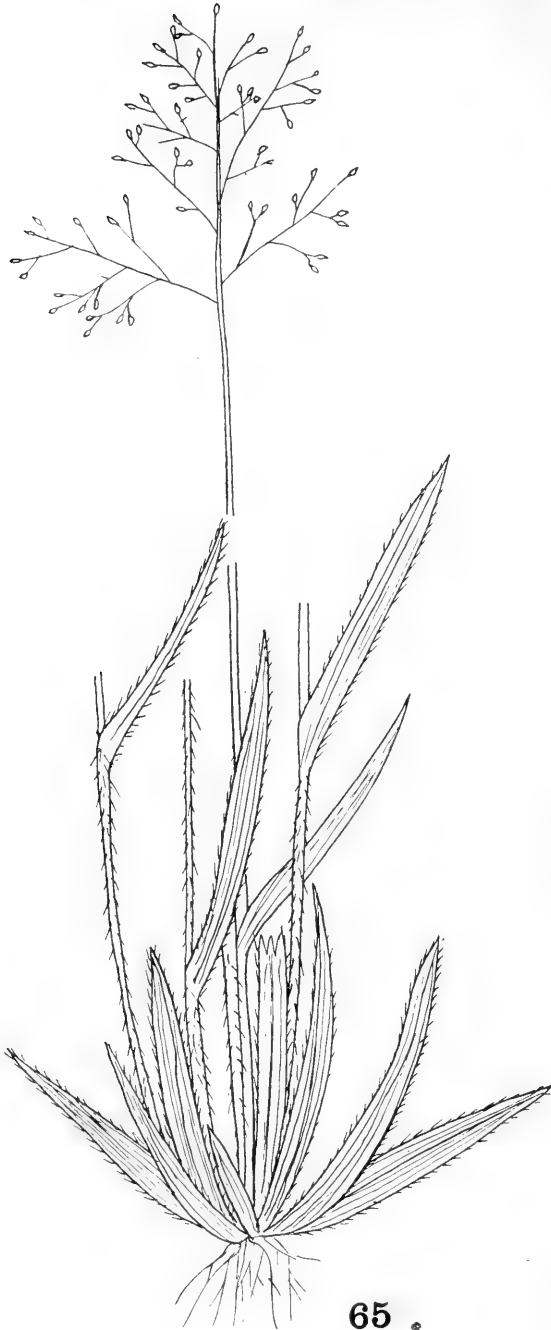
(Fig. 63)

Hitchcock and Chase '10, 155.

Culms 8 to 18 inches long, very slender, seldom pubescent; sheaths usually densely pubescent; blades 4 to 15 inches long, often longer than the panicles, 2 to 4 mm. wide; panicles larger than in the two preceding species; spikelets 2.2 to 2.7 mm. long, often with a few soft hairs.

This species is best distinguished by its smaller, narrower spikelets, but the leaves are typically much longer and narrower and not so stiff as in the preceding species. It grows in dry woods.

COOK CO. Glencoe, *Gates*, June, 1907. DU PAGE CO. Wheaton, *Moffatt*, July, 1893. JACKSON CO. Makanda, *Gleason*, June, 1903. ST. CLAIR CO. Mascoutah, *Welsh*. UNION CO. Cobden, *Waite*, June, 1885.



65 .

Fig. 65.—*P. xalapense*

LAXIFLORA

The species belonging to this group are characterized by their soft, pale green foliage. The blades in the Illinois species are edged with rather long hairs or cilia and are usually pubescent on both surfaces.

The leaves in summer are always clustered at the base of the plant and are shorter here than on the culm. This cluster of leaves persists in the autumn, but does not form a true rosette such as is found in the next group, *Dichotoma*. The ligules are very short and inconspicuous. The panicles in summer are borne far above the leaves; in autumn they are smaller and often hidden by them. The spikelets are small, always less than 2.5 mm. in length.

***Panicum xalapense* H. B. K.**

(Figs. 65 and 66)

Hitchcock and Chase '10, 160.

Plants in spring and early summer with smooth, slender culms 8 to 24 inches long; sheaths densely, retrorsely pubescent with long, soft hairs arising from small papillae; blades 4 to 8 inches long, 7 to 12 mm. broad, sparsely pubescent on both surfaces, the edges ciliate, with hairs usually as long as those on the sheaths; panicles few-flowered; spikelets pubescent, about 2 mm. long, sometimes slightly shorter. Plants in autumn more branched at the base, forming denser tufts than in the spring.



66

Fig. 66.—*P. xalapense*, spikelet

This species is most abundant in the southern states. It has been collected only a few times in Illinois.

JACKSON CO. Without locality, *French* in 1905. ST. CLAIR CO. *Mascoutah*, *Welsch*. UNION CO. *Anna*, *Seymour*, Aug., 1880.

DICHOTOMA

The plants belonging to this group are strikingly different in spring or early summer, and in autumn. The spring or vernal form has several simple culms in a tuft. The panicles are few-flowered, not very large, and their spikelets rarely perfect seed. In the autumn a small, flat rosette is formed at the base, and the culms branch freely, often resembling miniature trees. These culms often become too heavy to stand erect and are found bent over or lying prostrate on the ground. The dead leaves of the winter rosette are always found at the base of the culms of the vernal form, if care is taken in collecting the plants. The panicles borne in autumn are very much smaller than those of the vernal form, and are usually included in the leaf sheaths, often scarcely visible. Their spikelets always produce seed. The leaves

and culms in this group are never conspicuously pubescent, and the ligules are very short, less than 1 mm. in length, and fringed. The spikelets are never over 2.5 mm. in length.

***Panicum barbulatorum* Michx.**

(Fig. 68)

Vernal culms 1 to 2.5 feet tall, the lower nodes bearded; sheaths shorter than the internodes, but usually more than half as long, sometimes with a few soft hairs; blades 2.5 to 4 inches long, 6 to 10 mm. wide; panicles borne well above the leaves; spikelets 2 mm. long, smooth, the second glume always covering the ripe fruit. Autumnal culms branched rather more than in *P. dichotomum* and usually reclining, being too top-heavy to stand erect.

This species is found in sterile soil, usually in the woods. In its vernal phase it closely resembles *P. dichotomum*, but it always has bearded nodes.

JACKSON CO. Makanda, *Seymour*, Aug., 1880. PEORIA CO. Peoria, *Brendel*.
WABASH CO. Belmont, *Schneck*, Oct., 1900.

***Panicum dichotomum* L.**

(Figs. 67 and 69)

Lapham '57, 596 (Plate 4, Fig. 4); Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Higley and Raddin '91, 139; Huett '97, 128; Hitchcock and Chase '10, 190.

Vernal culms 1 to 2 feet long, smooth and glabrous, the nodes not bearded, but sometimes, especially the lower ones, with a few hairs; sheaths less than half as long as the internodes, smooth or sparsely pubescent, leaves 2 to 4 inches long, 4 to 8 mm. wide, usually smooth but sometimes with a few long hairs along the edges; panicles borne well above the leaves, small and few-flowered; spikelets 2 mm. long, smooth, the second glume always shorter than the fruit when ripe. Autumnal culms much branched from about the middle, the lower portion usually unbranched, making the plant look like a small tree; blades much smaller than in the vernal form.

This species is often purplish in both vernal and autumnal forms. The vernal form closely resembles *P. barbulatorum*, but this species has bearded nodes and the fruit is always covered by the second glume. The species described and figured by Lapham was evidently not *P. dichotomum* as it was densely pubescent, while this species is smooth.

ST. CLAIR CO. Mascoutah, *Welsh*. UNION CO. Cobden, *Waite* in 1885.

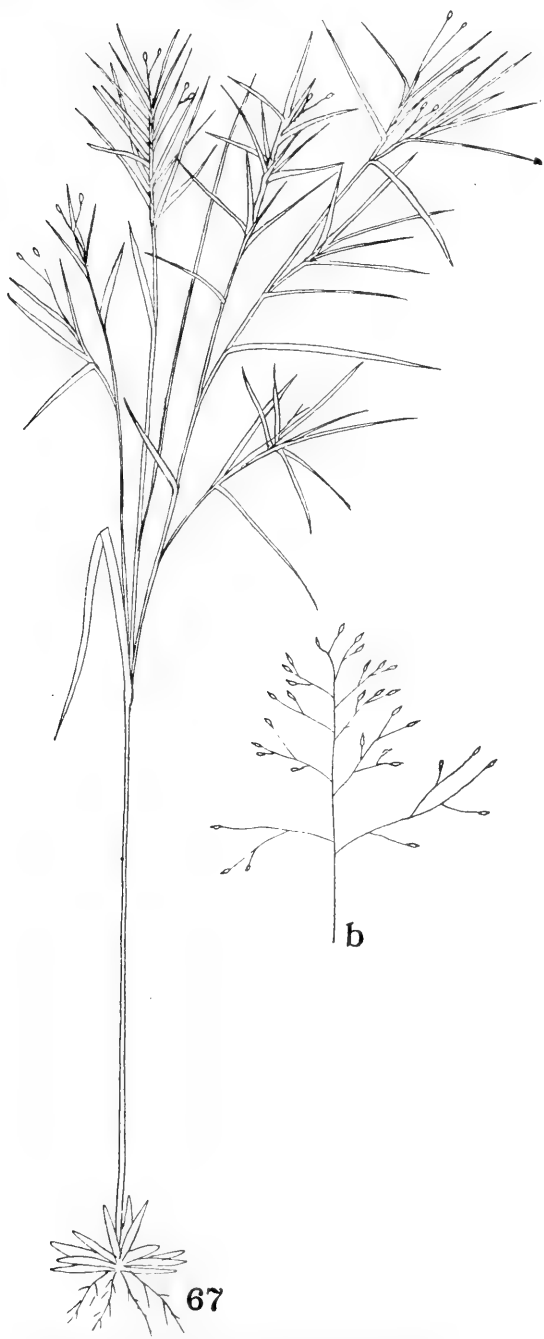


Fig. 67.—*P. dichotomum*, autumnal form, (b) panicle of vernal form

Panicum microcarpon Muhl.

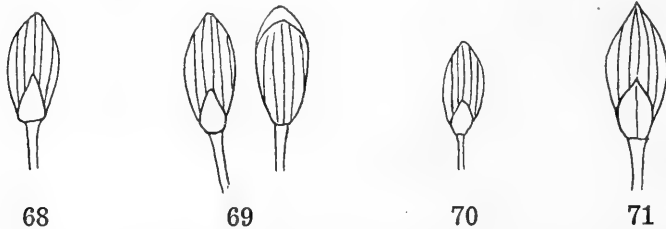
(Fig. 70)

Lapham '57, 548, 595; Patterson '76, 52; Flagg '78, 284; Brendel '87, 89; Hitchcock and Chase '10, 181.

Spring form growing in tufts or large clumps; culms generally erect, sometimes bent at base, 1 to 2 feet long, the nodes bearded with reflexed hairs; sheaths smooth, except sometimes the lower ones, ciliate along the margin; blades thin, 4 to 5 inches long, 8 to 15 mm. wide, smooth and glabrous except sometimes for a few hairs near the base; panicles many-flowered, oval in outline; spikelets 1.5 to 1.6 mm. long, glabrous. Autumnal form much branched, especially at the top, and bent over from the weight of the branches; blades much smaller, 1 to 2.5 inches long, the panicle smaller and few-flowered.

This species grows in wet woods and swampy places. The species described by Lapham was probably not *P. microcarpon*, as he says it resembles *P. latifolium*. His description is not complete enough to determine certainly what the species was, but it was probably *P. polyanthes*.

ILLINOIS SPECIMENS: Without locality, *Vasey*. PEORIA CO. Peoria, *Brendel*, POPE CO. Herod, *Clinton*, July, 1898. WABASH CO. Without locality, *Shearer*, Aug., 1899; Mt. Carmel, *Schneck* in 1880; Mt. Carmel, *Waite*, Aug., 1887; near Mt. Carmel, *Schneck*, June, 1900; Shannon's swamp, *Schneck*, June, 1884.



Figs. 68-71.—Spikelets: 68, *P. barbdatum*; 69, *P. dichotomum*; 70, *P. microcarpon*; 71, *P. yadkinense*

Panicum yadkinense Ashe

(Fig. 71)

Hitchcock and Chase '10, 195.

Vernal culms 2 to 3 feet tall; smooth, the nodes not bearded; sheaths smooth, with pale, almost white, glandular spots; blades smooth, 3 to 5 inches long, 8 to 11 mm. broad; panicles larger than in *P. dichotomum*; spikelets 2.3 to 2.5 mm. long, smooth. Autumnal form considerably branched but never tree-like as in *P. dichotomum*, the leaves smaller but not much reduced.

This is a considerably larger species than either *P. dichotomum* or *P. barbdatum* and is easily recognized by its pointed spikelets. The

leaves are much broader than in either of these species, and the white spots between the veining of the sheaths is quite distinctive.

JACKSON CO. Makanda, *Gleason* in 1903. JOHNSON CO. Without locality, *Schneck* in 1902; Tunnel Hill, *Schneck*, May, 1902.

SPRETA

The plants belonging to this group are rather stiff and have short, narrow leaves not over 8 mm. wide. They resemble the plant shown in Fig. 73. The ligule is a ring of long hairs, usually 5 to 6 mm. long. The plants are seldom pubescent, but the spikelets usually are short pubescent. The autumnal form does not differ very widely from the spring form, the extra branches being short and closely appressed to the plant.

Panicum lindheimeri Nash

(Fig. 72)

Hitchcock and Chase '10, 203.

Vernal culms erect, rather stiff, 1 to 3 feet high, smooth or sometimes finely pubescent on the lower part; lower sheaths usually with fine pubescence, the upper smooth and usually about half the length of the internodes; ligules often 4 to 5 mm. long; blades smooth on both surfaces; spikelets 1.4 to 1.6 mm. long, densely pubescent. Autumnal culms spreading, or often lying on the ground, branching at the nodes, the branches short and appressed to the culm, the leaves much smaller than the vernal form, and pointed.



72

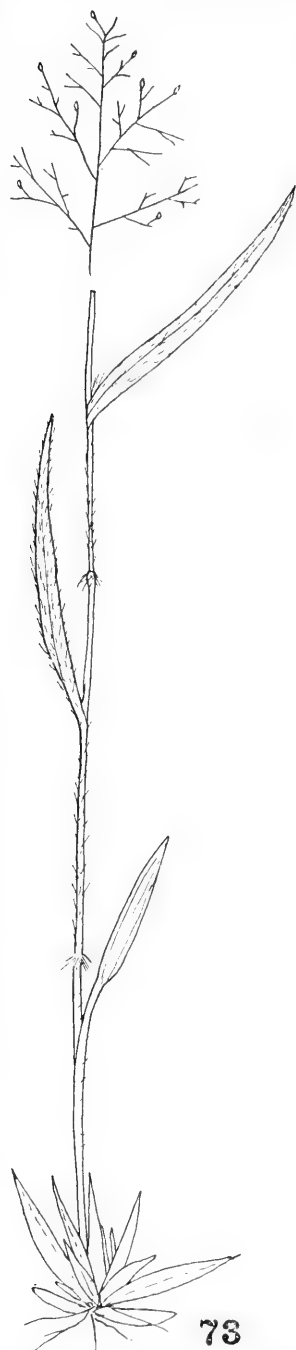
Fig. 72.—*P. lindheimeri*, spikelet

This species is very variable as to the kind and amount of pubescence present. The plants are usually smooth thruout but often pubescent near the base. The species has the general appearance of *P. dichotomum* in the vernal form, but is usually taller. It also resembles a narrow-leaved plant of *P. huachucae silvicola*.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Seymour*, June, 1880. COOK CO. Chicago, *Nelson* in 1899; Irondale, Chicago, *Hill*, July, 1913. JACKSON CO. Without locality, *French* in 1871. LAKE CO. Beach, *Umbach* 2242. ST. CLAIR CO. Without locality, *Egbert* 237.

LANGUINOSA

In this group the plants are usually conspicuously pubescent. The blades are not over 10 mm. wide and are usually narrower. The ligules are densely hairy, from 2 to 5 mm. long. The spikelets are pubescent and never more than 3 mm. long. The autumnal form is much branched and quite different from the spring form. The leaves and panicles are considerably smaller. The species now included in

Fig. 73.—*P. huachucae*

this group were incorrectly referred by the earlier American authors to *P. pubescens* Lam. or Michx. (that name being a synonym of *P. scoparium* Lam.). *P. pubescens*, Engelmann ('44, p. 103) is cited, but it is impossible to determine which species he collected.

***Panicum huachucae* Ashe**

(Figs. 73 and 74)

Hitchcock and Chase '10, 214; Gates '12, 354.

Culms 8 to 24 inches tall, erect and stiff; culms and leaves densely papillose-pubescent; nodes bearded with spreading hairs; sheaths shorter than the internodes; blades 1.5 to 2.5 inches long, 6 to 8 mm. wide; ligules 3 to 4 mm. long; panicle axis and branches covered with long hairs nearly to the end; spikelets 1.6 to 1.8 mm. long, densely pubescent.

This species is usually light olive green but generally tinged with purple, and the spikelets are often purplish. The plant is very stiff and harsh to the touch from the abundance of hairs. The autumnal form is much the same, tho the culms are branched and the leaves much shorter; usually not much over an inch in length. The panicles are very small and almost hidden by the leaves. There is considerable variation in the amount of pubescence present. The species intergrades with the subspecies *P. huachucae silvicola*, which is apparently more abundant in Illinois.

CHRISTIAN CO. Taylorville, *Andrews*, Aug., 1898. COOK CO. East Side, Chicago, *Hill*, July, 1905; Palos Park, *Umbach*, June, 1909; Lansing, *A. Chase*, June, 1898; Beverly Hills, *A. Chase*, June, 1902; Washington Heights, *Robert Bebb*, June, 1902; Chicago, *Somes*, Aug., 1907; Chicago, *Hill* in 1905. FORD CO. Kempton, *Wilcox*, July, 1902. HENDERSON CO. Oquawka, *Patterson*. KNOX CO. Williamsfield, *V. H. Chase* 1858. LAKE CO. Beach, *Umbach* 2237, 2244; Wauconda, *Hill* in 1898; Rockefeller, *Gates*, July, 1907; area north of Waukegan, *Gates*; Waukegan, *Gleason* and *Shobe*, Aug., 1906. MACON CO. Elm Ridge, *Clokey* 2435.

PEORIA CO. Princeville, *V. H. Chase*, Aug., 1906. RICHLAND CO. Near Olney, *Ridgway*. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*.

***Panicum huachcae silvicola* Hitchc. and Chase**

Hitchcock and Chase '10, 218.

This subspecies differs from the species in being taller, more slender, and not so pubescent. It is also a softer, grayer green than the species and does not look or feel so harsh. The nodes are bearded with reflexed hairs. The leaves are softer and thinner and less pubescent.

CHAMPAIGN CO. Mahomet, *Gleason* 1033; Urbana, *Gates*, Sept., 1907; Urbana, *Seymour* and *Waite* 1024; Urbana, *Mosher*, June, 1914. COOK CO. Orland, *Umbach*, Aug., 1909; Palos Park, *Umbach*, Sept., 1909; La Grange, *Hill*, July, 1907; Riverside, *Hill*, July, 1907; Englewood, *Derr*, May, 1885. DU PAGE CO. Downer's Grove, *Umbach* 1820. JACKSON CO. Makanda, *Gleason* 1028, 1030; Grand Tower, *Gleason* 1031. JO DAVIESS CO. Without locality, *Pepoon* 580 and .01. KNOX CO. Williamsfield, *V. H. Chase*, 1851. LA SALLE CO. Starved Rock, *A. Chase*, July, 1901. MACON CO. C. H. & D. Bridge, *Clokey* 2437, 2449; Decatur, *Clokey*, Aug., 1897. MCLEAN CO. Normal, *Somes* 138. MARSHALL CO. Lawn Ridge, *V. H. Chase* 1477, 1491. MENARD CO. Without locality, *Hall* in 1861; Athens, *Hall* in 1861. OGLE CO. Oregon, *Waite* in 1885; Pine Rock, *Waite*, June, 1885. PEORIA CO. Peoria, *McDonald*, Aug., 1900; Peoria, *Robert Bebb*, June, 1905; Glasford, *Wilcox* 42; Peoria, *Brendel*; Princeville, *V. H. Chase* 81. PIATT CO. White Heath, *Mosher*, July and Oct., 1914. RICHLAND CO. Parkersburg, *Ridgway*, June, 1902. ST. CLAIR CO. Mascoutah, *Welsch*. VERMILION CO. Muncie, *Mosher*, Oct., 1914. WABASH CO. Without locality, *Schneck*, July, 1897; without locality, *Shearer*, June, 1899; Hanging Rock, *Ashe* and *Schneck*, July, 1899; Mt. Carmel, *Schneck*, July, 1888; Patton, *Schneck*, June, 1879.

***Panicum implicatum* Scribn.**

(Fig. 75)

Hitchcock and Chase '10, 213.

Vernal form with slender culms, 8 to 20 inches tall; culms and sheaths papillose-pubescent; sheaths shorter than the internodes; ligules 4 to 5 mm. long; blades 1 to 2.5 inches long, 3 to 6 mm. wide, with long, spreading pubescence, 3 to 4 mm. long, on the upper surface and shorter pubescence on the lower; panicles small, the axis with long, soft hairs, the branches usually tangled; spikelets 1.5 mm. long, densely pubescent. Autumnal form much branched from the nodes, forming small tufts of leaves, which partially conceal the much reduced panicles; culm leaves seldom over an inch long and 2 to 4 mm. in width.

This species is found in wet meadows, bogs, and swamps. It is a northern species and so far has been found only in the northern half of the state. It closely resembles *P. huachucae* as to general appearance and habit of growth.

COOK CO. Chicago, *Nelson* 66. IROQUOIS CO. Chebanse, *Hill*, July, 1870. MASON CO. Manito, *Wilcox* 57. OGLE CO. Without locality, *Waite* in 1885. ROCK ISLAND CO. Near Rock Island, *McDonald*, Sept., 1901.

Panicum meridionale Ashe

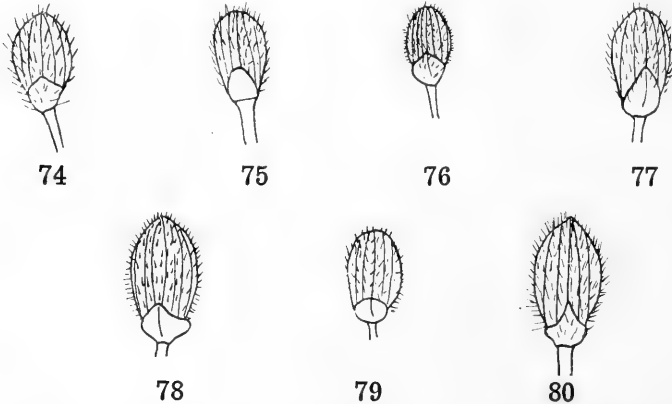
(Fig. 76)

Hitchcock and Chase '10, 210.

Vernal form with slender culms 6 to 15 inches tall; culms and sheaths pilose; nodes bearded; sheaths shorter than the internodes; blades .5 to 1.5 inches long, 2 to 4 mm. wide, sparsely long pubescent on the upper surface and short pubescent on the lower; panicle small, the axis smooth or short pubescent; spikelets 1.3 to 1.4 mm. long, densely pubescent. Autumnal form much branched from all the nodes, the branches forming small tufts; leaves and panicles not very much reduced; panicles hidden by the leaves.

This species is found in sandy woods or shady places, in sterile soil in the woods, or in peat soil on the prairie. It closely resembles *P. implicatum* but the culms are shorter and more slender and the plants less pubescent.

COOK CO. Chicago, *Hill* 145. Kensington, *Hill*, July, 1890; Irondale, Chicago, *Hill*, July, 1913. KANKAKEE CO. South of Kankakee, *Hill*, July, 1913.



Figs. 74–80.—Spikelets: 74, *P. huachucae*; 75, *P. implicatum*; 76, *P. meridionale*; 77, *P. praecocius*; 78, *P. pseudopubesens*; 79, *P. tennesseense*; 80, *P. villosissimum*

Panicum praecocius Hitchc. and Chase

(Fig. 77)

Hitchcock and Chase '10, 226.

Vernal form with rather stout culms, 6 to 24 inches tall, often forming spreading tufts; culms and sheaths densely long pubescent; sheaths much shorter than the internodes; ligules 3 to 4 mm. long; blades 2 to 4 inches long, 4 to 6 mm. wide, long pubescent on both surfaces, the hairs nearly equal to the width of the blade; spikelets 1.8

to 1.9 mm. long, densely pubescent. Autumnal form much branched at the nodes, the branches closely appressed to the stem; leaves only slightly smaller than in the spring form, and partially concealing the much reduced panicles.

This species is found on dry prairie and in clearings. It has been found only in the middle western states. The type locality for the species is Wady Petra in Stark county.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Waite*, June, 1886; Urbana, *Seymour*, May, 1880. JO DAVIESS CO. Hanover, *Gleason* and *Gates*, June, 1908; without locality, *Pepoon* .02 and .04. KNOX CO. Williamsfield, *V. H. Chase* 1850. LAKE CO. Winthrop Harbor, *Gates* 2778; Wankegan, *Gates* 2469. LA SALLE CO. Starved Rock, *A. Chase* 1605. MARSHALL CO. Without locality, *V. H. Chase*, 1791. MASON CO. Havana, *Gleason* 1034. STARK CO. Wady Petra, *V. H. Chase* 472, 649, 1212, 1214, 1218. WILL CO. Joliet, *Hill* in 1907.

Panicum pseudopubesces Nash

(Fig. 78)

Panicum sp., Gleason '07, 181. *P. pseudopubesces*, Gleason '10, 147; Hitchcock and Chase '10, 235.

Vernal form with stiff culms 8 to 20 inches tall; culms and sheaths densely pubescent, the hairs usually as long as the width of the culm; nodes densely bearded with spreading hairs; sheaths shorter than the internodes; ligule about 2 to 3 mm. long; blades 2 to 4 inches long, 5 to 10 mm. wide, the upper surface long pubescent near the edge, smooth in the center, occasionally smooth all over, the lower surface with short, fine pubescence; spikelets 2.2 to 2.4 mm. long, densely pubescent. Autumnal form usually with spreading culms, sometimes flat on the ground, with a few branches at each node; leaf blades considerably reduced and usually smooth.

This species is usually light olive green in color. It is found in sandy soil, often in open woods. Gleason found it very abundant in the sand areas which he studied. There it formed one of the characteristic bunch grasses where the sand was being continually blown away from the roots of the plants.

JO DAVIESS CO. Hanover, *Gleason* and *Gates* 2535, 2539, 2575. LA SALLE CO. Starved Rock, *A. Chase* 1605; Starved Rock, *Skeels*, May, 1905.

Panicum tennesseense Ashe

(Fig. 79)

Hitchcock and Chase '10, 218.

Vernal form 10 to 25 inches tall, stiffly erect or slightly spreading; culms and sheaths with short hairs, sometimes nearly smooth; ligules 4 to 5 mm. long; nodes bearded; sheaths shorter than the internodes; blades 2 to 3.5 inches long, 5 to 8 mm. wide, with a very narrow white margin, upper surface with a few long hairs near the base, the

lower surface short appressed pubescent; spikelets 1.6 to 1.7 mm. long, densely pubescent. Autumnal form usually spreading, the culms much branched at the nodes, forming tufts of leaves, often bending the plant to the ground; leaves much reduced and concealing the very small panicles.

This species is usually found in moist places. In general appearance it is much like *P. huachucae* and its subspecies, but in *P. tennesseense* the upper surface of the leaves is not pubescent. Hitchcock and Chase cite some intergrading specimens in which a few hairs occur on the upper blade surface. The plants often have a purplish tinge.

CHRISTIAN CO. Taylorville, *Andrews*, June, 1899. LAKE CO. Zion City, *Hill*, Aug., 1905; Waukegan, *Gates*, June, 1908; Beach, *Umbach*, July, 1909. ROCK ISLAND CO. Banks of Mississippi near Rock Island, *McDonald*, Sept., 1900.

***Panicum villosissimum* Nash**

(Fig. 80)

Hitchcock and Chase '10, 233.

Culms in large tufts 10 to 20 inches tall, rather slender; culms and sheaths very densely long pubescent, giving them a soft, fuzzy appearance; nodes bearded; sheaths shorter than the internodes; ligule 4 to 5 mm. long; blades 2 to 4 inches long, 5 to 10 mm. wide, densely soft, appressed pubescent on both surfaces; spikelets 2.2 to 2.3 mm. long, the pubescence spreading. Autumnal form usually much branched, especially at the lower nodes, the leaves closely appressed to the stem, the plants often prostrate; blades not much reduced, usually with a few long hairs on the upper surface.

This species is found in dry, usually sandy soil, in open woods or on hillsides. The vernal form is light olive green; the autumnal form is often tinged with purple.

LA SALLE CO. Starved Rock, *A. Chase* 1606. MADISON CO. Without locality, *Eggert* 293.

COLUMBIANA

The species of Columbiana differ mainly from those of Languinosa in the absence of long, spreading hairs on culms and sheaths, the pubescence being short and appressed. The ligule is short, usually not over 1 mm. long. The blades are firm and always less than 1 cm. wide, rarely with long hairs on the upper surface. The autumnal form is freely branched. The spikelets are always covered with short pubescence.

***Panicum tsugetorum* Nash**

(Fig. 81)

Hitchcock and Chase '10, 245.

Vernal culms 12 to 18 inches tall, usually ascending but often bent over near the base; densely pubescent with very fine, soft hairs, closely

appressed; sheaths usually as long as the internodes, less pubescent than the culms, ciliate on the margin; ligules 1 to 1.5 mm. long; blades with a thin, white margin, 1.5 to 3 inches long, 4 to 7 mm. wide, usually smooth above, sometimes with a few long hairs near the base; spikelets pubescent, 1.8 to 1.9 mm. long.



81

Fig. 81.—*P. tsugetorum*, spikelet

Autumnal form spreading on the ground and branching from the lower and middle nodes, the branches growing erect or ascending, not closely appressed to the culm; blades only slightly reduced, sometimes sparsely covered with long hairs.

This species is found in dry, sandy soil, usually in the woods. The type specimen was collected in a hemlock grove. The plants in spring are bluish green; later they often acquire a purplish tinge. The spikelets are usually dark colored. The general appearance of this species is like that of *P. huachucae silvicola*.

LA SALLE CO. Starved Rock, *A. Chase* 1604; Starved Rock, *Greenman, Lansing, and Dixon* 155. OGLE CO. Oregon, *Hill* in 1905.

SPHAEROCARPA

The species belonging to this group are usually found in small tufts and are practically smooth thruout. The ligules are obsolete or nearly so. The blades are rather stiff with strong margins, which are usually very rough. The panicles are usually about the length of the leaves, and are borne well above them in the spring form. This group is so named on account of the shape of the spikelets, which are almost spherical.

Panicum polyanthes Schult.

(Figs. 82 and 83)

Hitchcock and Chase '10, 254.

Vernal form with culms in a tuft 1 to 3 feet tall; culms stout, erect, smooth, scarcely ever with hairs on the nodes; sheaths as long as the internodes, smooth, ciliate on the margin; ligules too small to be distinguished; blades 5 to 10 inches long, 15 to 25 mm. wide, rough on the upper surface and smooth on the lower, except for a few hairs along the margin near the base; panicles much longer than broad; spikelets 1.5 to 1.6 mm. long, nearly spherical, short pubescent. Autumnal form much like the vernal except that a few branches with smaller blades and panicles are produced from the lower nodes.

The species listed as *P. microcarpon* by Lapham ('57, 548, 595) was probably *P. polyanthes*. The name *P. microcarpon* Muhl. 1817, not Muhl.; Ell. 1816, was then applied to the species now known as *P. polyanthes* (Hitchcock and Chase '10, 255). This species is found in damp places, usually in or near the woods. It is much taller than

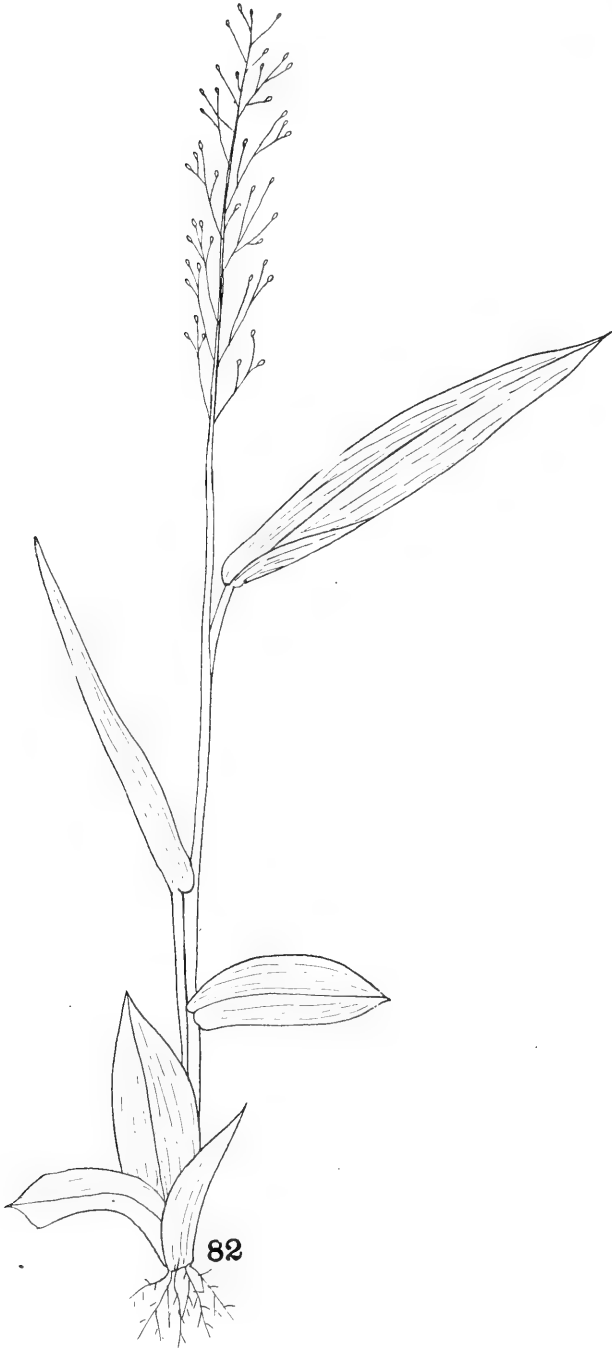


Fig. 82.—*P. polyanthes*

P. sphaerocarpon and has larger leaves. The plants are light green in color.

ILLINOIS SPECIMENS: Without locality, *French* in 1905. JACKSON CO. Grand Tower, *Gleason*, July, 1902. PEORIA CO. Peoria, *Brendel*. UNION CO. Cobden, *Earle* in 1886.

Panicum sphaerocarpon Ell.

(Fig. 84)

Hitchcock and Chase '10, 251.

Vernal form with culms 8 to 20 inches tall, seldom erect, the tuft usually spreading, not pubescent except on the nodes; sheaths almost as long as the internodes, slightly ciliate on the margin, otherwise smooth; ligules too small to be distinguished; blades 2 to 4 inches long, 7 to 14 mm. wide, rough but not pubescent on the upper surface except along the margin near base, smooth below; panicles about as wide as long; spikelets short pubescent, 1.6 to 1.8 mm. long, almost spherical. Autumnal form spreading on the ground, branching from the lower and middle nodes; blades and panicles not greatly reduced.



83



84

Figs. 83-84. — Spikelets: 83, *P. polyanthus*; 84, *P. sphaerocarpon*

This species is usually found in sandy soil. It is not common in Illinois. The plants are usually light green with purplish spikelets.

CHRISTIAN CO. Taylorville, *Andrews*, Aug., 1898. JACKSON CO. Without locality, *French*, June, 1878, and May, 1905.

OLIGOSANTHIA

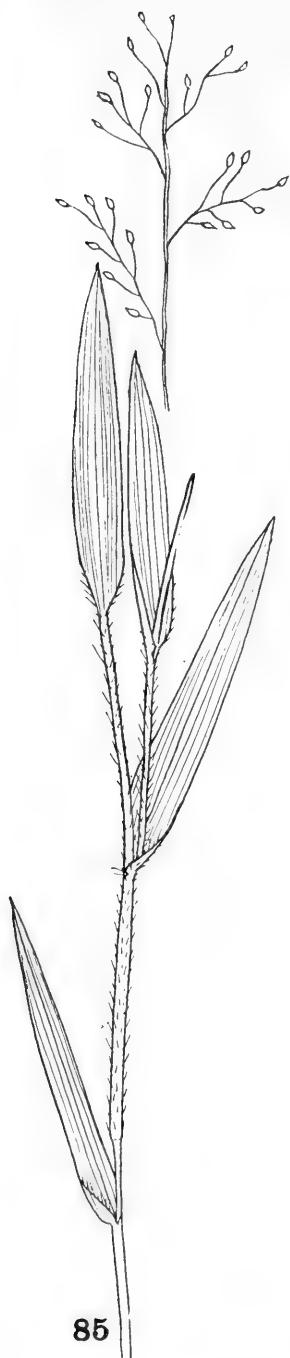
The species belonging to this group are as a rule stout, erect plants with stiff leaves and large spikelets. The sheaths are usually hairy, the ligules never more than 1 mm. long and the spikelets 3 to 4 mm. long. In the autumnal form the culms branch near the top.

Panicum leibergii (Vasey) Scribn.

(Figs. 85 and 86)

Hitchcock and Chase '10, 289.

Vernal form with erect, slender culms in small tufts; culms 1 to 3 feet tall, usually pubescent; sheaths shorter than the internodes, conspicuously papillose-pubescent, the hairs spreading; ligules not visible; blades 2 to 6 inches long, 7 to 15 mm. wide, short, appressed papillose-



85
Fig. 85.—*P. leibergii*,
culm

pubescent on both surfaces, tho sometimes only on the basal part; panicles few-flowered, the length about twice the width; spikelets 3.7 to 4 mm. long, long pubescent. Autumnal form not very different, the culms usually leaning over, a few branches from the middle and lower nodes, the blades very little reduced, usually concealing the panicles.

This is another of the prairie species. It is found thruout the state.

CHAMPAIGN CO. Champaign, *Waite* in 1888; Champaign, *Seymour*, June, 1884. CHRISTIAN CO. Taylorville, *Andrews*, June, 1899. DU PAGE CO. Naperville, *Umbach* 1669. JO DAVIESS CO. Warren, *Pepoon* 12 and 729. KNOX CO. Without locality, *V. H. Chase* 1701. LIVINGSTON CO. Emington, *Wilcox*, July, 1902. MACON CO. Decatur, *Clokey*, May, 1889. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* July, 1907. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *McDonald*, June, 1903. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 461, 1466. WILL CO. Joliet, *Skeels* 334.

Panicum oligosanthos Schult.

(Fig. 87)

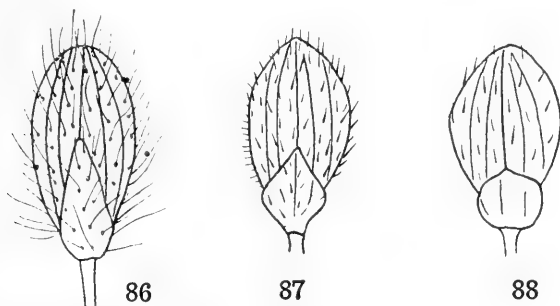
P. pauciflorum, *Patterson* '76, 52; *Flagg* '78, 284. *P. oligosanthos*, *Lapham* '57, 595; *Hitchcock and Chase* '10, 285.

Vernal form with culms in small tufts 1 to 2.5 feet tall, usually erect and finely pubescent; nodes bearded; sheaths shorter than the lower internodes, sometimes longer than the upper ones and covered with soft pubescence; ligule 1 to 2 mm. long; blades 2.5 to 5.5 inches long, 5 to 8 mm. wide, smooth except for a few hairs on the upper

surface near the base; spikelets with long pedicels, 3.5 to 4 mm. long, sparsely pubescent. Autumnal form branching mostly from the upper nodes, often becoming top-heavy and lying on the ground; leaves much smaller and panicles reduced to a few spikelets.

This species is found in sandy soil usually in moist situations. The plants are olive green, very often deeply tinged with purple.

ILLINOIS SPECIMENS: Without locality, *Schneck*.



Figs. 86-88.—Spikelets: 86, *P. leibergii*; 87, *P. oligoanthos*; 88, *P. scribnerianum*

***Panicum scribnerianum* Nash**

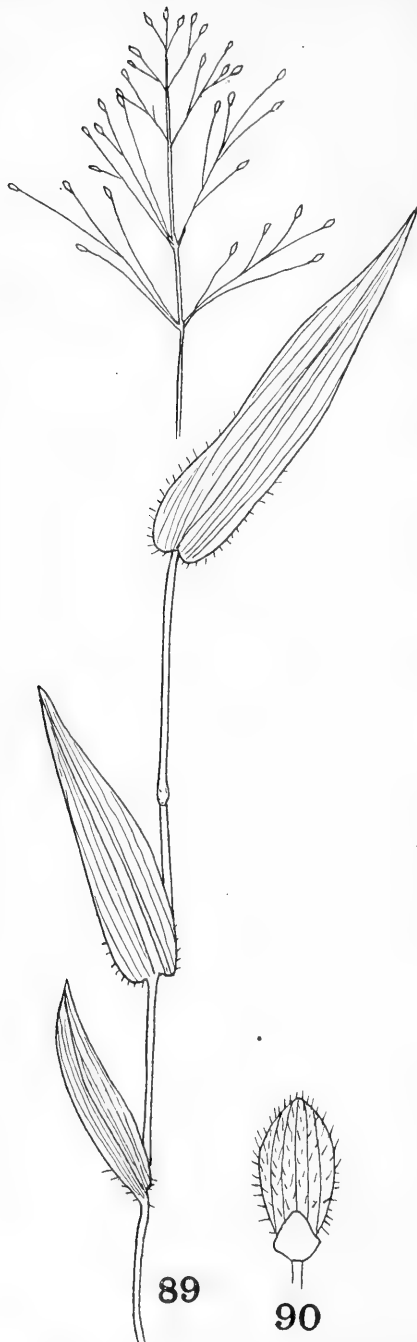
(Fig. 88)

Gleason '10, 148; Hitchcock and Chase '10, 283; Gleason '12, 48; Gates '12, 354.

Vernal form with the culms in fairly large tufts, usually somewhat spreading, 8 to 20 inches tall, generally smooth; nodes not bearded; sheaths papillose-pubescent; ligules about 1 mm. long; blades 2 to 4 inches long, 6 to 12 mm. wide, usually ciliate on the margin, sometimes with a few short hairs on the under surface, otherwise smooth; panicles small, the length and breadth about equal; spikelets 3.2 to 3.3 mm. long, sparsely pubescent or almost smooth. Autumnal form branching from the middle and upper nodes, the leaves slightly reduced, partially concealing the small panicles.

This is a typical prairie species found in dry or sandy soil. It is probably one of the commonest species of perennial *Panicum* found in Illinois.

CHRISTIAN CO. Taylorville, *Andrews*, June, 1899. COOK CO. Chicago, *A. Chase* 1607; Chicago, *Greenman*, *Lansing*, and *Dixon* 156. HENRY CO. Galva, *V. H. Chase* 1749. JO DAVIESS CO. Without locality, *Pepoon* 185; Hanover, *Gleason* and *Gates* 2598. LAKE CO. Beach, *Umbach* 2365; Waukegan, *Gates* in 1909. MACON CO. Near Decatur, *Clokey* 2438. MARSHALL CO. Without locality, *V. H. Chase* 1792. PEORIA CO. Peoria, *McDonald*, June, 1890. STARK CO. Wady Petra, *V. H. Chase* 922. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*.



Figs. 89-90.—89, *P. commutatum*, culm; 90, *P. commutatum*, spikelet

COMMUTATA

The species of this group are rather stout, usually with smooth culms. The blades are generally more than 1 cm. wide, smooth, and ciliate at the base. The ligule is practically wanting. The spikelets are finely pubescent, from 2.5 to 3 mm. long.

Panicum commutatum Schult.

(Figs. 89 and 90)

Hitchcock and Chase '10, 303.

Vernal form with culms in tufts, 1 to 2.5 feet high, the culms smooth; nodes occasionally with minute hairs; sheaths shorter than the internodes, usually smooth except for the ciliate margin; ligules not visible; blades short and broad, 2 to 7 inches long, 12 to 25 mm. broad, smooth on both surfaces, the margin ciliate at the base; spikelets 2.6 to 2.8 mm. long, pubescent. Autumnal form branching from the middle of the culm; the leaves little reduced; panicles very small.

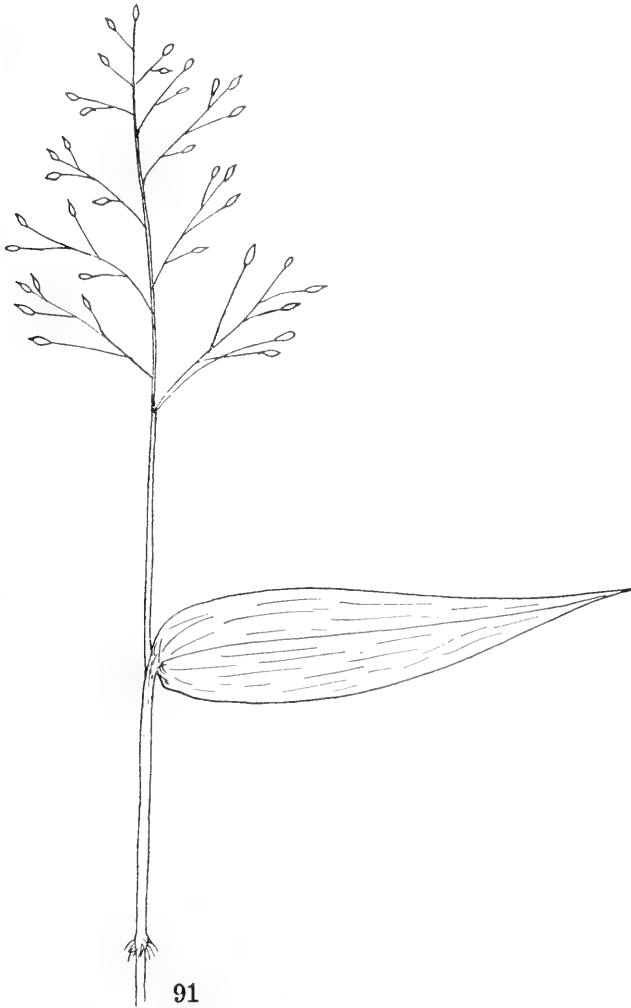
This species is found mostly in woods and shady places. It is dull, grayish green, usually tinged with purple.

ILLINOIS SPECIMENS: Without locality, *Schneck* in 1879.

LATIFOLIA

The species belonging to this group are readily distinguished by their very tall culms and broad, thin leaves, which are

usually more than 1.5 cm. wide. The ligules are never over 1 mm. long. The spikelets are from 2.5 to 4.5 mm. long, short pubescent. The species are all found in shady places.



91
Fig. 91.—*P. boscii*, leaf and panicle

***Panicum boscii* Poir.**

(Figs. 91 and 93)

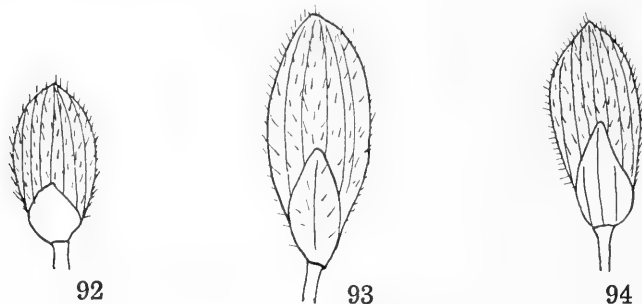
Hitchcock and Chase '10, 317.

Vernal form with the culms in large clumps 1.5 to 2.5 feet tall, usually smooth, very rarely pubescent; nodes retrorsely bearded;

sheaths a little more than half the length of the internodes, ciliate on the margin, otherwise smooth, rarely with fine pubescence; ligule about 1 mm. long; blades 2.5 to 5 inches long, 1.5 to 3 cm. wide, usually smooth on both surfaces but sometimes with a few fine, short hairs on the upper surface, ciliate on the margin at base; spikelets 4 to 4.5 mm. long, covered with fine hairs. Autumnal form as in *P. clandestinum*, sometimes branched enough to be top-heavy.

This species is found in woods and other shady places. It is closely related to *P. latifolium* and has been mistaken for that species by many of the earlier writers, who seem to have included all the species of *Latifolia* under that name.

CHRISTIAN CO. Taylorville, *Andrews*, May, 1899. JACKSON CO. Without locality, *French* in 1905. JOHNSON CO. Tunnel Hill, *Ridgway* in 1902. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality, *Schneck*, May, 1906; without locality, *Shearer*, Aug., 1899; Hanging Rock, *Schneck*, Sept., 1904; Key's Hill, *Schneck*, June, 1905.



Figs. 92-94.—Spikelets: 92, *P. clandestinum*; 93, *P. boscii*; 94, *P. latifolium*

***Panicum boscii molle* (Vasey) Hitchc. and Chase**

This differs from the species in the soft pubescence of culms and sheaths, which gives them a velvety appearance. The blades are velvety on the under surface and have slightly longer hairs on the upper surface. It is usually not so tall as the species, but there are intergrading forms.

UNION CO. Without locality, *French* in 1872. WABASH CO. Without locality, *Shearer*, Aug., 1899; Leopold's farm, *Schneck*, May, 1906; Mt. Carmel, *Schneck*, May, 1904.

***Panicum clandestinum* L.**

(Fig. 92)

Engelmann '44, 103; Lapham '57, 548, 595; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64; Hligley and Raddin '91, 139; Huett '97, 128; Hitchcock and Chase '10, 312.

Vernal form with the culms in large clumps, the culms 2.5 to 5 feet tall, usually papillose-pubescent; sheaths as long as the internodes, with long hairs like the culm, at least on the lower sheaths, or on the

branches; blades 4 to 8 inches long, from 1.5 to 3 cm. broad, rough on both surfaces but not pubescent, ciliate on the margin at base; spikelets 2.7 to 3 mm. long, short pubescent. Autumnal form not very different except for the branching from the middle and upper nodes, and the much reduced panicles almost completely hidden in the sheaths.

This species is found in sandy soil, usually in moist situations.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1882. CHRISTIAN CO. Taylorville, *Andrews*, May, 1898. FULTON CO. Canton, *Wolf*. JO DAVIESS CO. Along the Mississippi river, *Pepoon* 580. KANKAKEE CO. Mt. Langham, near Kankakee, *De Selm*, Sept., 1913. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1902 and 1903. UNION CO. Anna, *Seymour*, Aug., 1880. VERMILION CO. Stony Crest, *Butts* and *Seymour*. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, June, 1885; Hanging Rock, *Schneck*, May, 1906; Belmont, *Schneck*, Oct., 1900.

Panicum latifolium L.

(Fig. 93)

Lapham '57, 548, 595; Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Higley and Radlin '91, 139; Huett '97, 128; Hitchcock and Chase '10, 314.

Vernal form with a clump of stout culms 1.5 to 3.5 feet tall, smooth; the nodes not bearded, rarely with a few hairs; sheaths shorter than the internodes, ciliate on the margin, otherwise smooth, or with a few short, soft hairs on the lower sheaths; ligule not visible; blades 3 to 5 inches long, 1.5 to 4 cm. wide, usually smooth, but occasionally with a few short hairs on one or both surfaces; spikelets 3.4 to 3.7 mm. long, sparsely pubescent. Autumnal form as in *P. clandestinum*.

This species is usually found in shady places. The plants are typically smooth, but some specimens are found with short hairs on culms and sheaths.

ILLINOIS SPECIMENS: Without locality, *Vasey*; without locality, *M. S. Bebb* in 1861. CHAMPAIGN CO. Urbana, *Waite* in 1886; Urbana, *Butts* and *Seymour*, June, 1880. CHRISTIAN CO. Taylorville, *Andrews*, May, 1894. COOK CO. Beverly Hills, *Robert Bebb* 882; Edgewater, Chicago, *Gates*, July, 1906; Hyde Park, Chicago, *Babcock*, July, 1873. JO DAVIESS CO. Without locality, *Pepoon*, Aug., 1908. LAKE CO. Antioch, *Gleason* and *Shobe* 268. MCHENRY CO. Algonquin, *Nason*. MACON CO. East of Fishing Club, *Clokey* 2436. MARSHALL CO. Lawn Ridge, *V. H. Chase*, July, 1907. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*; Glasford, *Wilcox* 22, 41; Mossville, *A. Chase* 889; Peoria, *McDonald* 33. ST. CLAIR CO. Without locality, *Eggert* 239; Mascoutah, *Welsch*. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Schneck* in 1879; Key's Hill, *Schneck*, June, 1905; Mt. Carmel, *Schneck* in 1878 and Aug., 1900; Hanging Rock, *Schneck* in 1879.

The following species cited as having been found in Illinois have not been seen:

Panicum laxiflorum Lam.—This name is listed by Higley and Radlin ('91, 139) and Huett ('97, 128). It probably refers to *P. dichotomum*, while the name *P. dichotomum* was applied to the species of *Languinosa*.

Panicum nitidum Lam.—This name is listed by Huett ('97, 128) as occurring in Illinois. According to Hitchcock and Chase this species is not found so far north. The name may refer to *P. sphaerocarpon*.

Panicum pubescens Lam.—This is cited by Engelmann ('44, 103) and refers to the group *Languinosa*, the name *P. pubescens* having been applied to these species in common.

Panicum scoparium.—Engelmann ('44, 103) cites *P. scoparium* Lam., while Lapham ('57, 548) cites *P. scoparium* Michx. The species they referred to is probably *P. scribnerianum*.

Panicum xanthophysum A. Gray.—Lapham ('57, 548, 595) and Flagg ('78, 284) cite this as an Illinois species. The name was probably misapplied to *P. leibergii*.

10. ECHINOCHLOA Beauv.

This genus is closely related to *Panicum*. It has the same type of spikelets, but the sterile lemma is awned or awn-pointed, and sometimes the second glume. The spikelets have stiff, bristly hairs on the nerves. The plants are coarse, rank annuals with long, broad leaves. The ligule is obsolete. The inflorescence is of panicles with short raceme-like branches, the spikelets crowded.

Sheaths smooth; awns seldom an inch in length, usually much shorter.

Spikelets nearly always awned, the second glume with a short awn or awn-pointed; spines on the nerves stout and strong; panicle usually spreading, never compact, usually more than an inch in width. *E. crus-galli*

Spikelets with a very short awn or awn point, second glume not awned or awn-pointed; spines on the nerves delicate; panicle never spreading, very compact, an inch or less in width. *E. frumentacea*

Sheaths, at least the lower, papillose-hispid; awns usually about two inches in length. *E. walteri*

Echinochloa crus-galli (L.) Beauv.

Barnyard Grass. Cockspur Grass (Figs. 98 and 99)

Panicum crus-galli, Lapham '57, 548, 596; Babeock '73, 97; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 139; Huett '97, 128. *Echinochloa crus-galli*, Gates '12, 354; Sherff '13, 594.

Stems branching from the base, often spreading over the ground, 1 to 6 feet long; sheaths and blades smooth, the blades 6 to 24 inches long, 6 to 25 mm. wide; panicle 4 to 12 inches long, usually spreading; spikelets about 3 mm. long.

This species was introduced from Europe and is found all over the state. It is one of the commonest weeds of the farm and garden, preferring damp, rich soil, and hence it is usually abundant in barnyards. The panicles vary in color from green to purple. It can be eradicated by a thorough cultivation, which prevents the formation of seed.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1895; Urbana, *Seymour*, June, 1880; Urbana, *Mosher*, Oct., 1913. COOK CO. Bowmanvil, Chicago, *Gates*, July, 1906; Chicago, *Babeock*, Aug., 1874. FULTON CO. Canton, *Wolf*. KANKAKEE CO. Kankakee, *De Selm*, Aug., 1913. LAKE CO. Libertyville, *Sherff*, Sept., 1912; Waukegan, *Gleason and Shobe* 320. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. MACON CO. Decatur, *Clokey*, Aug., 1897. PEORIA CO. Peoria, *McDonald*; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Without locality, *V. H. Chase* 95. WINNEBAGO CO. Fountaindale, *M. S. Bebb*.

Echinochloa frumentacea (Roxb.) Link

Japanese Barnyard Millet. Billion Dollar Grass (Figs. 95 and 96)

This species was introduced into the United States some years ago, in the hope that it would prove to be a valuable forage plant. As its value was not so great as was expected, little of it is now cultivated. It has frequently been found as an escape from cultivation. It closely resembles the short-awned forms of *E. crus-galli*, but has a narrower, more compact panicle.

VERMILION CO. Bank of Butler Branch creek, Catlin, Lansing, Sept., 1912.

Echinochloa walteri (Pursh) Nash

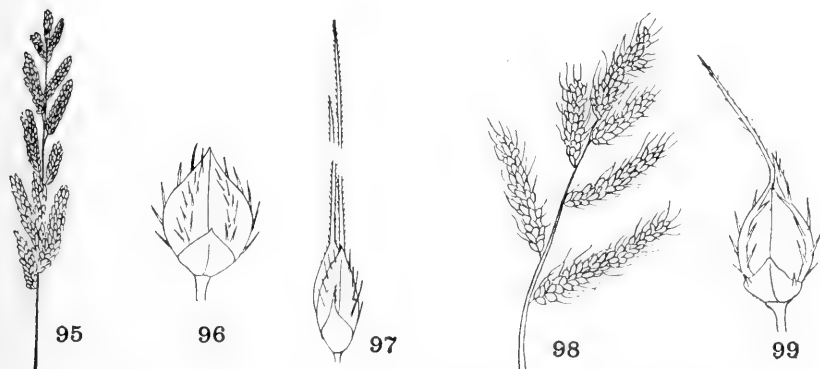
Salt-marsh Cockspur Grass (Fig. 97)

Panicum hispidum, Lapham '57, 548. *Panicum crus-galli* var. *hispidum*, Patterson '76, 52; Flagg '78, 284; Higley and Raddin '91, 139; Huett, '97, 128.

Culms branching from the base and often spreading, 1 to 6 feet long; sheaths, at least the lower, densely papillose-hirsute; blades usually roughened but not pubescent, a foot or more long, 12 to 25 mm. wide; panicle nodding, the branches usually ascending; spikelets about 3 mm. long, the first glume with a short awn, the second glume and sterile lemma with awns 2 inches or more long.

This is the only native species of the genus found in Illinois. It likes wet places, such as marshes, and is usually found near salt water.

COOK CO. Shores of Calumet lake, Chicago, A. Chase 1426; shores of Calumet lake, Chicago, Sherff, Sept., 1912; Pullman, Hill, Aug., 1900. FULTON CO. Canton, Wolf. LAKE CO. Antioch, Gleason and Shobe 259; Fox lake, Aug., 1908. PEORIA CO. Peoria, Brendel. ST. CLAIR CO. Without locality, Eggert, Sept., 1879; Mascoutah, Welsh; East St. Louis, Eggert, June, 1878. TAZEWELL CO. East Peoria, McDonald, Aug., 1889.



Figs. 95-99.—95, *E. frumentacea*, inflorescence; 96, *E. frumentacea*, spikelet; 97, *E. walteri*, spikelet; 98, *E. crus-galli*, inflorescence; 99, *E. crus-galli*, spikelet

11. **CHAETOCHELOA** Scribn.

This is another genus closely related to *Panicum* and with the same type of spikelets, but these have a cluster of one to several bristle-like branchlets on the short pedicel just below the spikelet (Fig. 101). The inflorescence is of spike-like panicles; the blades are long and flat. The ligule is a ring of hairs 1 to 2 mm. in length. The Illinois species are all annuals and were all introduced from Europe.

Spikelets at least 3 mm. long.

Lemmas deeply transversely rugose, very convex; bristles 5 or more, yellow or yellowish brown; panicle 1 cm. or less thick; spikelets usually exceeding 3 mm. in length. *C. lutescens*

Lemmas faintly transversely rugose, moderately convex; bristles 1 to 3, usually purple, but sometimes yellow; inflorescence generally more than 1 cm. thick. *C. italica*

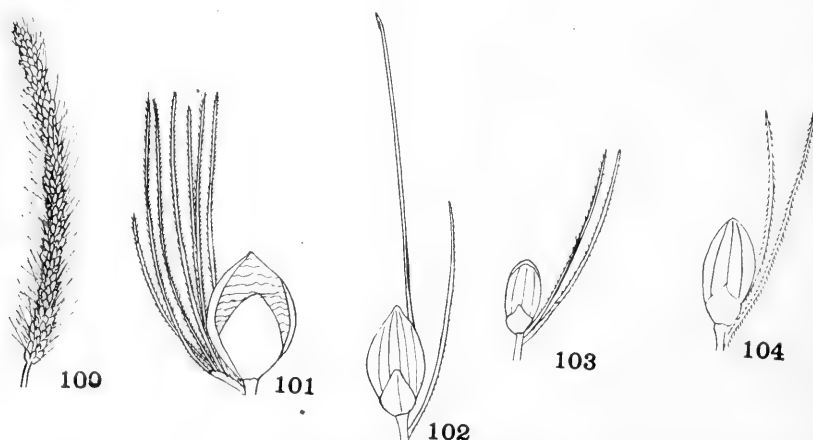
Spikelets about 2 mm. long.

Bristles downwardly barbed.

Bristles upwardly barbed.

C. verticillata

C. viridis



Figs. 100-104.—100, *C. lutescens*, inflorescence; 101, *C. lutescens*, spikelet; 102, *C. italica*, spikelet; 103, *C. viridis*, spikelet; 104, *C. verticillata*, spikelet

Chaetochloa italica (L.) Scribn.

Millet. Hungarian Grass. Italian Millet. Foxtail Millet (Fig. 102)

Setaria italica, Flagg '78, 284; Higley and Raddin '91, 140; Huett '97, 129.

(Stems generally erect, 2 to 6 feet tall; sheaths and blades generally roughened but not pubescent; blades 6 to 12 inches in length, 6 to 36 mm. wide; panicle 1.25 to 5 cm. thick, usually compound; spikelets about 3 mm. long, bristles 2 or 3, usually purplish.)

This grass is extensively cultivated for forage. There are many varieties. Hungarian grass is a form with small purple heads. The common millet with a large compound inflorescence is more generally cultivated.

CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1895; Urbana, *Seymour*, July, 1880; Urbana, *Mosher* in 1914. COOK CO. Chicago, *A. Chase* 1198. KANKAKEE CO. Kankakee, *Reeher*, July, 1908; Kankakee, *Hill*, Aug., 1870. LAKE CO. Channel lake, *Haynes*, Aug., 1905. PEORIA CO. Peoria, *McDonald*, July, 1900; Peoria, *Brendel*. WABASH CO. Mt. Carmel, *Schneck*, July, 1905.

***Chaetochloa lutescens* (Wieg.) Stuntz**

Yellow Foxtail. Pigeon Grass (Figs. 100 and 101)

Setaria glauca, Lapham '57, 548, 597 (Plate 4, Fig. 5); Patterson '76, 52; Flagg '78, 284; Higley and Raddin '91, 140; Huett '97, 129; Gleason '10, 148. *Chaetochloa glauca*, Britton '07, 89.

Culms branching at the base, usually erect, or often spreading, 1 to 4 feet long; sheaths and blades smooth, the blades 2 to 6 inches long, 5 to 15 mm. wide; panicle 1 to 3.5 inches long, 1 cm. or less wide; spikelets 3 mm. or more in length, bristles 5 or more, tawny yellow, upwardly barbed.

Yellow foxtail is one of the worst weeds of the cornfield, or in fact of most grain fields. It comes up in the field after cultivation has been discontinued and produces enormous quantities of seed, which effectively seed the field for spring. If the field is plowed in the fall before the seed ripens, and thoroly cultivated the next year, a great deal of it will be destroyed. It blooms almost thruout the season and can be eradicated only by frequent cultivation. Not all the seed sprouts the first year; the soil is often so full of it that it takes several years to eradicate it.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb* in 1868. CHAMPAIGN CO. Without locality, *Percival*, Nov., 1876; Urbana, *Gibbs*, Sept., 1898; Urbana, *Clinton*, Aug., 1895; Urbana, *Seymour*, July, 1881; Urbana, *Burrill*, Aug., 1880; Seymour, *Tsou*, Oct., 1913; Urbana, *Mosher*, Oct., 1913. COOK CO. Chicago, *Lansing*, Aug., 1897; Chicago, *Hill*, July, 1895. LAKE CO. Channel lake, *Haynes*, Aug., 1905. MACOUPIN CO. Carlinville, *Robertson* in 1881. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase*.

***Chaetochloa verticillata* (L.) Scribn.**

Bristly Foxtail (Fig. 104)

Setaria verticillata, Patterson '76, 52; Higley and Raddin '91, 140.

Culms erect or spreading, 1 to 3 feet long; sheaths smooth; blades thin, roughened on the upper surface but not hairy; panicles much like those of *C. lutescens* as to shape and size, green; spikelets 2 to 2.5 mm. in length, bristles 1 to 3, stout, and downwardly barbed.

This species is a weed in waste places and around dwellings, but it is not very common in Illinois.

HENDERSON CO. Oquawka, *Patterson*, Sept., 1873. PEORIA CO. Peoria, *Brendel*. ROCK ISLAND CO. Moline, *Seymour*, Aug., 1884. STARK CO. *V. H. Chase*, Aug., 1897.

Chaetochloa viridis (L.) Scribn.

Green Foxtail. Bottle Grass (Fig. 103)

Setaria viridis, Vasey '61, 671; Patterson '76, 52; Flagg '78, 284; Higley and Raddin '91, 140; Huett '97, 129; Gleason '07, 181.

Culms branching at the base, erect or spreading, 1 to 3 feet tall; sheaths and blades smooth, the blades 3 to 10 inches long, 4 to 12 mm. wide; panicles less than 1 cm. broad; spikelets about 2 mm. long, bristles 1 to 3, green, upwardly barbed.

Green foxtail is found in the same places as yellow foxtail, *C. lutescens*, and may be exterminated in the same way.

CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1895; Champaign, *Gibbs*, Oct., 1898; Urbana, *Seymour*, June, 1880; Urbana, *Mosher*, Oct., 1913. CHRISTIAN CO. Taylorville, *De Motte*. COOK CO. Hyde Park, Chicago, *A. Chase*, July, 1901; Landers, Chicago, *Hill*, July, 1895. KANKAKEE CO. Waldron, *Hill*, July, 1873. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1882. PEORIA CO. Peoria, *McDonald*; Peoria, *Brendel*. STARK CO. Wady Petra, *V. H. Chase*, Aug., 1897. WABASH CO. Without locality, *Schnceck*, May, 1896.

12. **CENCHRUS** L.

Because of the peculiar burs which inclose the spikelets, the plants belonging to this genus will never be confused with any other species of grass. These burs are borne in a spike and are armed with stout spines which are retrorsely barbed and often inflict painful wounds. They are easily detached from the culm when they are mature and are carried around by animals. Each bur contains from 2 to 6 spikelets which always remain and germinate inside the bur. The sheaths are rather loose and the blades are short and narrow. The ligule is a ring of short hairs less than 1 mm. in length. The plants are found in waste places, usually where there is sandy soil. The only species in Illinois is an annual.

Cenchrus carolinianus Walt.

Sandbur. Bur Grass. Hedgehog Grass (Figs. 105 and 106)

Cenchrus tribuloides, Lapham '57, 548, 597; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 140; Huett '97, 129; McDonald '00, 103. *Cenchrus carolinianus*, Gleason '10, 148; Gates '12, 354.

Culms flattened, 8 to 30 inches long, branched at nearly all the nodes, usually spreading on the ground, the branches ascending, and forming large mats; sheaths loose, flattened, smooth; blades smooth, sometimes folded, 2 to 5 inches long, 5 to 10 mm. broad; burs about 8 mm. thick, the surface pubescent between the spines.

This species is a troublesome weed in some situations, but it may be eradicated by thoro cultivation.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CARROLL CO. Near Mississippi river, *Pepoon*, Aug., 1879. CHAMPAIGN CO. Champaign, *Gibbs*, Oct., 1898; Champaign, *Seymour*, Sept., 1880. COOK CO. Chicago, *Lansing*; Chicago, *Babcock*, July, 1874; Ravenswood, *Reynolds*. KANKAKEE CO. Altorf, *Hill*, July, 1873.

LAKE CO. Waukegan, *Gates* 2980. MCHENRY CO. Ringwood, *Vasey*. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1881. MASON CO. Without locality, *M. S. Bebb* in 1861. MENARD CO. Without locality, *Hall*; Athens, *Hall*, Aug., 1864. PEORIA CO. Peoria, *McDonald*, Aug., 1885; Peoria, *Brendel*, Aug., 1852. STARK CO. Wady Petra, *V. H. Chase* 1929. VERMILION CO. Muncie, *Mosher*, Oct., 1915. WINNEBAGO CO. Fountindale, *M. S. Bebb*. WABASH CO. Banks of Wabash river, *Schneck*, July, 1904.



Figs. 105-107.—105, *C. carolinianus*; 106, *C. carolinianus*, spikelet; 107, *Z. palustris*, inflorescence

13. ZIZANIA L.

These annual grasses are usually found growing in the water along the edges of ponds and streams. The plants are tall, with broad leaves and large, open panicles. The erect, awned, pistillate spikelets are borne on the ascending upper branches of the panicle, the pendulous, staminate spikelets on the spreading lower branches. The spikelets are all one-flowered.

Zizania palustris L.

Wild Rice. Water Oats. Indian Rice (Fig. 107)

Zizania aquatica, Lapham '57, 544, 561 (Plate 1, Fig. 2); Babcock '73, 96; Patterson '76, 49; Flagg '78, 279; Brendel '87, 63; Higley and Raddin '91, 140; Huett '97, 129; Cowles '00, 155.

Culms erect, 3 to 10 feet tall; sheaths loose, smooth; ligule membranous, 5 to 6 mm. long; blades 1 to 3 feet long, 1.5 to 4 cm. wide, smooth; panicles 1 to 2 feet long; pistillate spikelets 8 to 24 mm. long, awned; staminate, 6 to 12 mm. long, not awned.

This species was once very abundant in Illinois but is now rare. Patterson '76 describes it as being very common along the margins of ponds and sloughs. Mr. R. E. Richardson of the Illinois State Laboratory of Natural History, who is stationed at Havana, says that from inquiries he has made there seems to be no doubt that prior to 1900 wild rice was abundant along the Illinois river as far north as the head of Peoria lake. In that year the permanent increase in water levels caused by the addition of water from Lake Michigan probably led to its extermination in many situations, tho it is reported to be still found along Rice lake and Beebe lake. Mr. Elmer Caldwell, formerly a member of the State Fish Commission, has reported it from his land around Slim lake and Moulden lake, which are not far from West Matanzas lake. One of the old residents of Havana reports that in the '90's a Mr. Thomas High used to cut it regularly for hay on his land about Duck lake.

COOK CO. Chicago, *Babcock*, Aug., 1874; Desplains river, Lyons, *A. Chase*, Aug., 1901; Thornton, *Hill*, Sept., 1866. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902. FULTON CO. Canton, *Wolf*; Breeds, *Clinton*, Aug., 1897. KANKAKEE CO. In Kankakee river, *Hill*, Aug., 1870. LAKE CO. Fourth lake, *Walcott*, Aug., 1911. MCHENRY CO. Ringwood, *Vasey*. PEORIA CO. Peoria, *Brendel*. UNION CO. Bluff lake, *Seymour*. WILL CO. Joliet, *Skeels*, Aug., 1904.

14. HOMALOCENCHRUS Mieg.

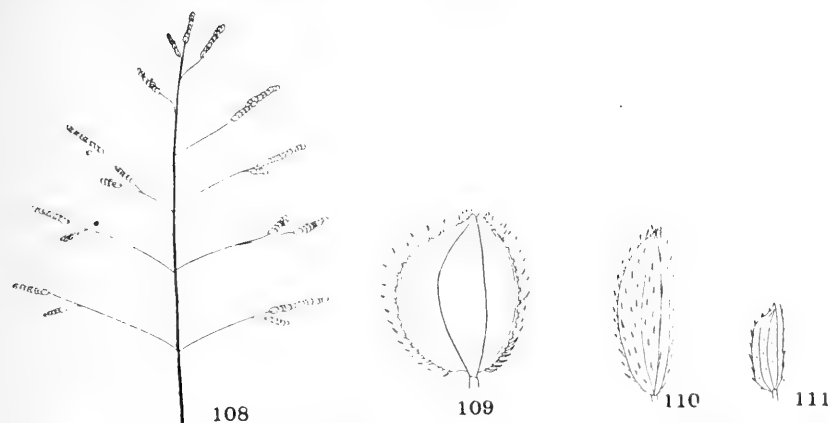
These grasses are found in wet, usually marshy places and are easily distinguished by their panicles of laterally flattened spikelets, their narrow, rough leaves, and very short membranous ligules. The spikelets are perfect, the glumes obsolete. There are two kinds of panicles, however,—a broad, spreading one, in which the spikelets are usually sterile, and a small, narrow, hidden one inclosed by the sheath, in which the spikelets ripen seed. The species are all native to Illinois.

Spikelets longer than broad, with bristly hairs on the margins and veins, the surface pubescent.

Spikelets 2.5 to 3.5 mm. long, sparsely covered with short, stiff hairs all of the same length; branches single. *H. virginicus*

Spikelets 4 to 5 mm. long, with longer, stiffer hairs around the margin; branches fasciated. *H. oryzoides*

Spikelets about as broad as long, with strong, bristly hairs on margins and veins, the surface smooth and glabrous. *H. lenticularis*



Figs. 108-111.—108, *H. lenticularis*, inflorescence; 109, *H. lenticularis*, spikelet; 110, *H. oryzoides*, spikelet; 111, *H. virginicus*, spikelet

Homalocenchrus lenticularis Michx.

Catch-fly Grass (Figs. 108 and 109)

Leersia lenticularis, Michaux '03, 39; Lapham '57, 544, 560; Patterson '76, 49; Flagg '78, 279; Brendel '87, 63.

Culms 2 to 4 feet tall, smooth, usually not branched, the nodes pubescent; sheaths rough, blades slightly rough, 4 to 12 inches long, 8 to 20 mm. wide; panicle 4 to 10 inches long; spikelets very flat, closely overlapping and nearly covering each other, 5 mm. in length.

This species was reported by Patterson '76 as abundant along the river banks from Peoria and Henderson counties southward. In 1904 it was reported by F. E. McDonald as rare.

ILLINOIS SPECIMENS: Without locality, *Hall*. COOK CO. Wolf lake, Chicago, *Hill*, Sept., 1892. HANCOCK CO. Without locality, *Ehinger* in 1881. HENDERSON CO. Mississippi river near Oquawka, *Patterson*, Sept., 1873. KANKAKEE CO. Kankakee, *Hill*, Aug., 1870. MACON CO. Decatur, *Clokey*, Sept., 1898. MARION CO. Without locality, *M. S. Bebb*. MASON CO. Havana, *Seymour*, Aug., 1886. MENARD CO. Without locality, *Hall* in 1861; *Athens*, *Hall* in 1861. PEORIA CO. Near Illinois river, *McDonald* in 1904; Peoria, *McDonald*, Sept., 1901; Peoria, *Brendel*. ST. CLAIR CO. Fayetteville, *Brendel*; Mascoutah, *Welsch*. WILL CO. Homer, *Hill*, Aug., 1911. WOODFORD CO. Near Upper Ferry, *McDonald*, Aug., 1889.

Homalocenchrus oryzoides (L.) Sw.

Cut Grass. White Grass. False Rice. Rice Cut Grass (Fig. 110)

Leersia oryzoides, Lapham '57, 544, 560; Babcock '73, 96; Patterson '76, 49; Flagg '78, 279; Brendel '87, 63; Higley and Raddin '91, 140; Huett '97, 129; Gates '12, 354; Gleason '12, 44; Sherff '13, 594.

Culms 1 to 3 feet long, usually branched, smooth, the nodes pubescent; sheaths and blades usually quite rough, the blades 3 to 10 inches long and 4 to 10 mm. wide; spikelets 4 to 5 mm. long.

This species is usually found in the water or in very damp soil. It gets its common name from the roughness of the leaves, which often cut the hands if one attempts to pull up the plant.

ILLINOIS SPECIMENS: Without locality, *Vasey*; northern Illinois, *M. S. Bebb*. CHAMPAIGN CO. Urbana, *Seymour*, Oct., 1880; Crystal lake, Urbana, *Clinton*, Sept., 1899; Mahomet, *Gibbs* and *Clinton*, Oct., 1898. COOK CO. Evanston, *Shipman*, Sept., 1875; Chicago, *Lansing*, Sept., 1898; Palos Park, *Umbach*, Sept., 1909. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902. FORD CO. Paxton, *Moffatt*, Sept., 1897. FULTON CO. Canton, *Wolf*. JACKSON CO. Makanda, *Seymour*, Aug., 1880. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. LAKE CO. South of Lake Villa, *Gleason* and *Shobe* 228; Libertyville, *Sherff*, Sept., 1912. LIVINGSTON CO. Chatsworth, *Wilcox*, July, 1902. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MARSHALL CO. Near Henry, *Meek*, Sept., 1906. MENARD CO. Athens, *Hall*, Sept., 1864. OGLE CO. Oregon, *Waite*, Aug., 1884. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1896, and 1904. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase*, 1910. VERMILION CO. Butler Branch creek, Catlin, *Lansing*, Sept., 1912. WABASH CO. Hanging Rock, *Schneck*; Mt. Carmel, *Schneck*, Oct., 1876; Greathouse creek, *Schneck*, Sept., 1880. Shannon's swamp, *Schneck*, Sept., 1879. WILL CO. Without locality, *Moffatt*, Sept., 1891; Joliet, *Skeels*, Aug., 1904. WINNEBAGO CO. Fountaindale, *M. S. Bebb*.

Homalocenchrus virginicus Willd.

White Grass (Fig. 111)

Leersia virginica, Lapham '57, 544, 560 (Plate 1, Fig. 1); Babcock '73, 96; Patterson '76, 49; Flagg '78, 279; Brendel '87, 63; Higley and Raddin '91, 140; Huett '97, 129.

Culms slender, branched, 1 to 3 feet tall, smooth, the nodes pubescent and sometimes the culm for a short distance below the node; sheaths smooth, blades thin, slightly rough on both surfaces, 2 to 6 inches long, 2 to 6 mm. wide; spikelets 2.5 to 3 mm. long.

This species is often found in damp woods as well as along the margins of streams and ponds.

ILLINOIS SPECIMENS: Without locality, *Hall*; without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, Sept., 1899; Urbana, *Waite*, Aug., 1887. COOK CO. Palos Park, *Umbach*, Sept., 1909; Beverly Hills, *Robert Bebb*, Aug., 1904; Bowmanvil, Chicago, *Gates*. DU PAGE CO. Hinsdale, *Smith*, Aug., 1902. JACKSON CO. Without locality, *French*, Aug., 1905. KANKAKEE CO. Baker creek, Kankakee, *De Selm*, Sept., 1913. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. MACON CO. Decatur, *Clokey*, Sept., 1898. MENARD CO. Without locality, *Hall*; Athens, *Hall* in 1864. PEORIA CO. Glasford, *Wilcox*, July, 1902; Peoria, *McDonald*, Aug., 1895; Peoria, *Brendel*; Princeville, *V. H. Chase*, Aug., 1900. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. WABASH CO. Mt. Carmel, *Waite*, Aug., 1887; Mt. Carmel, *Schneck*, Aug., 1900; Hanging Rock, *Schneck*, Sept., 1879.

15. PHALARIS L.

These grasses are either annual or perennial and have laterally flattened, apparently one-flowered spikelets in which the glumes are long, exceeding the hardened lemma and palea. There are two small scales at the base of the floret which represent sterile lemmas. The leaves are flat, the ligule thin, membranous, 3 to 5 mm. long. The inflorescence is of spike-like, or very narrow panicles.

Inflorescence a contracted panicle 8 to 12 cm. long, usually about 1 cm. broad; spikelets 5 to 6 mm. long, the glumes not winged.

Leaves green; axis of the panicle rarely visible. *P. arundinacea*

Leaves striped green and white; axis of the panicle often visible, especially at the base. *P. arundinacea picta*

Inflorescence an ovate, spike-like panicle, 2 to 5 cm. long, always more than 1 cm. broad; spikelets 6 to 8 mm. long; the glumes winged. *P. canariensis*

Phalaris arundinacea L.

Reed Canary Grass (Figs. 116 and 117)

Lapham '57, 548, 591 (Plate 4, Fig. 2); Babcock '73, 97; Patterson '76, 52; Flagg '78, 284; Brendel '87, 64; Higley and Raddin '91, 141; Sherff '12, 419; Sherff '13, 594.

Culms erect, smooth, 2 to 5 feet tall; sheaths smooth; blades slightly rough, 3 to 6 inches long, 6 to 16 mm. wide; spikelets 5 to 6 mm. long.

ILLINOIS SPECIMENS: Without locality, *Vasey*. COOK CO. Chicago, *Babcock*, June, 1870 and 1873; south of Chicago, *McDonald*, June, 1890; Beverly Hills, *A. Chase*, June, 1903. DU PAGE CO. Naperville, *Umbach*, June, 1897. FULTON CO. Canton, *Wolf*. HENDERSON CO. Oquawka, *Patterson*, June, 1872. MCHENRY CO. Ringwood, *Vasey*. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Near Wady Petra, *V. H. Chase* 615. WABASH CO. Mt. Carmel, *Schneck*, May, 1900.

Phalaris arundinacea picta L.

Ribbon Grass. Painted Grass

This variety, a common garden form introduced from the Old World, is probably more familiar to many Illinois people than the native species. The leaves are striped with white, and the panicle is usually more open. It frequently escapes from cultivation.

CHAMPAIGN CO. Urbana, *Pillsbury*, June, 1889. ST. CLAIR CO. Mascoutah, *Welsch*.

Phalaris canariensis L.

Canary Grass (Figs. 114 and 115)

Lapham '57, 591; Babcock '73, 97; Flagg '78, 284; Higley and Raddin '91, 141; Huett '97, 129.

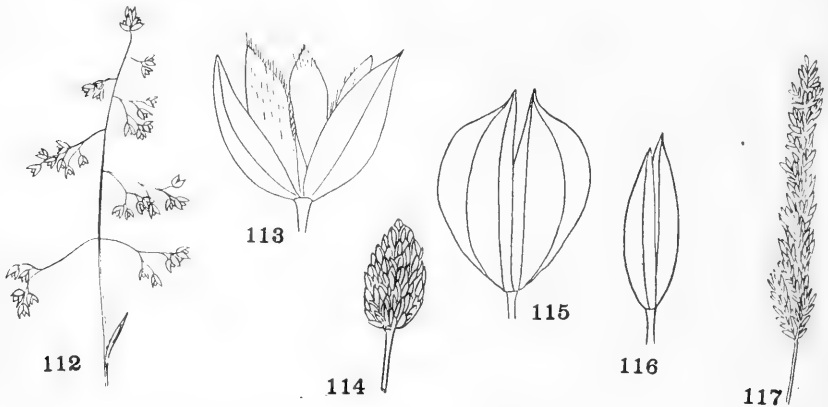
Culms erect, smooth, 1 to 3 feet tall; sheaths slightly roughened, blades very rough, 2 to 6 inches long, panicles spike-like, the length 2 or 3 times the width; spikelets 6 to 8 mm. long, white or pale yellow, the nerves green.

This species is an annual introduced from Europe. It is found in waste places and along roadsides. The seeds are used as food for canaries.

CHAMPAIGN CO. Urbana, *Seymour*, June, 1880; Champaign, *McCluer*, July, 1893. COOK CO. Chicago, *Warne*; Jackson park, Chicago, *Clark*, July, 1902. MCHENRY CO. Algonquin, *Nason*, July, 1878. MACOUPIN CO. Carlinville, *Robertson*, July, 1883. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1896. ST. CLAIR CO. Mascoutah, *Welsch*.

16. **TORRESIA** Ruiz and Pav.

The grasses belonging to this genus are perennials with long, creeping rootstocks and fragrant leaves. The spikelets are three-flowered, the terminal floret perfect, the lower ones staminate, the three falling together. The leaves are flat, the lower ones very long and narrow, the upper ones very short. The ligules are thin and membranous, 3 to 4 mm. long. The inflorescence is an open panicle and the spikelets are brown and shining. Only one species of the genus is found in Illinois.



Figs. 112-117.—112, *T. odorata*, panicle; 113, *T. odorata*, spikelet; 114, *P. canariensis*, inflorescence; 115, *P. canariensis*, spikelet; 116, *P. arundinacea*, spikelet; 117, *P. arundinacea*, inflorescence

Torresia odorata (L.) Hitchc.

Holy Grass. Vanilla Grass (Figs. 112 and 113)

Hierochloa borealis, Vasey '61, 671; Patterson '76, 52; Flagg '78, 284; Brendel '87, 88; Higley and Raddin '91, 141; Huett '97, 129. *Hierochloë odorata*, Gates '12, 355. *Savastana odorata*, Britton '07, 93.

Culms erect, smooth, 2 to 3 feet tall; sheaths smooth; blades smooth, 2 to 6 mm. wide, those at the base 4 to 8 inches long, those on the culm 1 to 2 inches long; spikelets 4 to 6 mm. long, shining brown, when fresh usually with a purplish tinge.

This grass is called Holy grass in Europe, where it is strewn before churches on saints' days. In this country the long leaves have been used by the Indians in weaving baskets, mats, etc., tho the grass which is now most used by them for this purpose is *Anthoxanthum odoratum*, or sweet vernal grass, which retains its fragrance much better. No Illinois specimens of this grass have been seen by the writer.

ILLINOIS SPECIMENS: Without locality, northern Illinois, *Brendel*. COOK CO. Without locality, *Shipman*, May, 1876; Beverly Hills, *A. Chase* 2074; *Dunning*, *Gates*, May, 1906; *Dunning*, *Umbach*, May, 1901; Chicago, *Moffatt*, May, 1895;

Chicago, *Babcock*, May, 1874; Washington Heights, *Hill*, May, 1882; South park, Chicago, *Clark*, May, 1902. DU PAGE CO. Naperville, *Umbach*, May, 1895. GRUNDY CO. Without locality, *Brendel*. LAKE CO. Beach, *Gates* 1651. MCHENRY CO. Without locality, *Vasey*; Ringwood, *Vasey* in 1853. WINNEBAGO CO. Without locality, *M. S. Bebb*.

17. MILIUM (Tourn.) L.

These grasses are distinguished by the narrow, one-flowered spikelets in which the glumes are equal and exceed the hard, shiny lemma and palea, which resemble those of species of *Panicum*. The leaves are thin and flat and the ligule thin and membranous, 3 to 4 mm. long. The panicle is large and open. There is one species in Illinois, which is perennial from creeping rootstocks.

Milium effusum L.

Wild Millet. Tall Millet Grass (Figs. 118 and 119)

Patterson '76, 52; Flagg '78, 284; Brendel '87, 88.

Culms erect but weak, smooth, 2 to 6 feet tall; leaves smooth throughout, the blades 3 to 9 inches long, 6 to 15 mm. wide; panicles 6 to 20 inches long, the drooping branches usually roughened with short, stiff hairs; spikelets 3 to 3.5 mm. long, the surface of the glumes rough.

This species is usually found in rich, moist woods. It is native to the northern part of America and is also found in the north of Europe and Asia.

KANE CO. Elgin, *Vasey*. TAZEWELL CO. Without locality, *Brendel*.

18. ORYZOPSIS Michx.

These perennial grasses are not abundant in Illinois. The spikelets are one-flowered, the glumes long, the lemma rather hard, pubescent, and terminated by a slender, deciduous awn. The leaves are often involute; the ligule is membranous and very short, almost wanting. The inflorescence is of very narrow panicles borne well above the leaves.

Blades narrow, involute; spikelets, excluding awn, less than 5 mm. long.

Blades broad, flat; spikelets, excluding awn, always more than 5 mm. long.

Leaves mostly crowded at the base of the plant; blades rough on the upper surface but not pubescent. *O. pungens*

Leaves distributed along the culm; blades densely pubescent on the upper surface. *O. asperifolia*
O. racemosa

Oryzopsis asperifolia Michx.

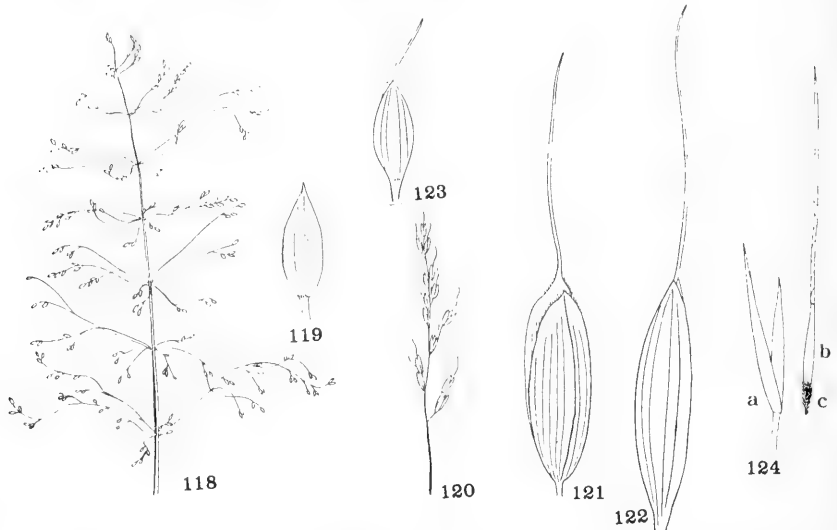
White-grained Mountain Rice (Figs. 120 and 121)

Culms usually erect, tufted, 1 to 2 feet tall, the leaves crowded at the base; sheaths smooth; basal blades very long, often longer than the culm, generally covered with whitish bloom, rough on the upper sur-

face but not pubescent, 4 to 8 mm. wide; culm blades, if present, less than an inch long; spikelets 6 to 8 mm. long, the awn 5 to 10 mm. long; lemma not turning black when the fruit is ripe.

This species is found on wooded hillsides or in pastures, especially in damp situations. After the fruit is ripe, the leaves usually spread out flat on the ground, while the culms remain erect.

COOK CO. Without locality, *Shipman* in 1877.



Figs. 118-124.—118, *M. effusum*, panicle; 119, *M. effusum*, spikelet; 120, *O. asperifolia*, inflorescence; 121, *O. asperifolia*, spikelet; 122, *O. racemosa*, spikelet; 123, *O. pungens*, spikelet; 124, *S. spartea*, spikelet, (a) glume, (b) lemma, (c) callus

Oryzopsis pungens (Torr.) Hitchc.

Slender Mountain Rice (Fig. 123)

Oryzopsis canadensis, Lapham '57, 545; Flagg '78, 280.

Culms in thick tufts, 6 to 30 inches tall; the leaves crowded at the base and nearly as long as the culm; sheaths usually smooth; blades narrow and involute; culm leaves, if any, very short; spikelets 3 to 4 mm. long, the awn very short or wanting.

This species is found in dry, usually rocky soil.

ILLINOIS SPECIMENS: Without locality, *Hall*. ST. CLAIR CO. Mascoutah, *Welsch*.

Oryzopsis racemosa (Sm.) Ricker

Black-fruited Mountain Rice (Fig. 122)

Oryzopsis melanocarpa, Patterson '76, 50; Flagg '78, 280; Brendel '87, 63.

Culms erect, simple, 2 to 4 feet tall, the leaves not crowded at the base; sheaths usually smooth, blades flat, 4 to 12 inches long, 4 to 15

mm. wide, rough beneath, densely pubescent above; spikelets 7 to 9 mm. long, the awn 15 to 25 mm. long; lemma black at maturity.

Usually found in rocky woods. It is quite different in appearance from either of the other species. Usually it is not found in such large tufts.

COOK CO. Glencoe, *Johnson*, Sept., 1890. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*.

19. STIPA L.

These species are readily recognized by the long-awned spikelets. The glumes are membranous, narrow, and acuminate. The floret terminates in a strong awn twisted at base and usually bent once or twice; at the base of the floret is a sharp-pointed callus covered with backward-pointing hairs. The lemma is hardened, convolute, and incloses the palea. The inflorescence is a panicle. The leaves are long, narrow, and involute. The ligule is rather thick and membranous, 1 to 2 mm. long. It is probable that three species may have been found in Illinois, but authentic specimens of only one species have been seen by the writer. The species are all perennials.

Stipa spartea Trin.

Porcupine Grass (Fig. 124)

Lapham '57, 545, 569; Babcock '73, 97; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 141; Huett '97, 129; Gleason '07, 182; Gleason '10, 148; Gates '12, 355.

Culms erect, not branched, 2 to 9 feet tall, the leaves mostly crowded at the base; sheaths smooth, the upper sheaths often rather loose and sometimes inclosing the base of the panicle; blades long and narrow, usually involute, not over 4 mm. wide; glumes 2.5 to 3.5 cm. long, a little longer than the dark brown lemma; awn 4 to 8 inches long; callus with a needle-like point.

This is one of the species of prairie grasses. It is found all over the state.

ILLINOIS SPECIMENS: Without locality, prairies, *Vasey*; without locality, *Mead*. CHAMPAIGN CO. Champaign, *Waite*, June, 1886; Urbana, *Seymour*, June, 1880; Champaign, *Gleason*, May, 1902. COOK CO. West of Chicago, *Moffatt*, June, 1893. DU PAGE CO. Naperville, *Umbach*, May, 1899; Hinsdale, *Smith*. HENDERSON CO. Oquawka, *Patterson*, June, 1872. HENRY CO. Galva, *V. H. Chase* 1750. JO DAVIESS CO. Hanover, *Gleason* and *Gates* 2602. KANKAKEE CO. Kankakee, *Hill*, June, 1873. LAKE CO. Beach, *Gates* 2464. MCHENRY CO. Ringwood, *Vasey*. MACON CO. Decatur, *Clokey*, May, 1899. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, June, 1887. ST. CLAIR CO. Without locality, *Eggert*, May, 1877; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1206. WILL CO. Joliet, *Skels*, June, 1904. WINNEBAGO CO. Fountaingdale, *M. S. Bebb*.

Stipa avenacea L.—This species, commonly called black oat grass, appears to have been found in Illinois some time ago. Lapham ('57, 545, 569) describes it as occurring in the state and figures it (Plate 2, Fig. 1). From his description and figure it seems that the identifica-

tion was correct. He describes it as occurring in dry, sandy places in timbered land and openings. It is also mentioned by Flagg ('78, p. 280). This species is distinguished from *Stipa spartea* by its smaller spikelets in which the glumes are 8 to 10 mm. long and the awn 1.5 to 3 inches long.

Stipa viridula Trin.—This species, commonly called green Stipa, is a native of the western states. In the Field Museum, Chicago, there is a specimen collected by E. Hall, Athens, 1862. Hall brought many seeds of western grasses back with him and planted them in Athens, and many specimens preserved by him were obtained in this manner. However, most of these seem to have been labeled "raised from seed," and as no other record has been made of the occurrence of this species in Illinois it seems best to place it on the doubtful list at present. It has a narrow panicle and still smaller spikelets than *S. avenacea*, the glumes being 6 to 8 mm. long and the awn less than 1.5 inches long.

20. ARISTIDA L.

Triple-awned Grass. Needle Grass

These grasses were found in abundance on the original prairie, and many species are still found in Illinois. They usually grow in large tufts, or bunches, and are readily distinguished by the three-parted awn of the lemma. The glumes are long and narrow and sometimes awn-tipped. The one-flowered spikelets are borne in narrow panicles. Like *Stipa*, the lemmas have a sharp-pointed callus. The leaves are long and narrow, usually involute. The ligule is very short, never over 2 mm. in length, and is fringed with hairs. The species are of no value for grazing and often are very annoying to grazing animals because of the awns and the sharp-pointed callus which penetrate the skin. There are both annual and perennial species.

- a. Awns jointed to the lemma, and of nearly equal length.
 - b. Awns united into a conspicuous spiral column 6 mm. or more long.
 - A. tuberculosa*
 - bb. Awns not united into a spiral column, reflexed and somewhat coiled at base.
 - A. desmantha*
- aa. Awns not jointed to the lemma.
 - b. Central awn much longer than the lateral awns, the lateral awns erect.
 - c. Central awn forming a distinct spiral at base; second glume not awned.
 - d. Glumes almost equal, awn-pointed, usually 7 to 9 mm. long; lateral awns erect, about 2 mm. long.
 - A. dichotoma*
 - dd. Glumes unequal, pointed, the first about two-thirds as long as the second, which is 12 to 14 mm. long; lateral awns spreading, one-third to one-half the length of the central awn.
 - A. basiramea*
 - cc. Central awn not forming a distinct spiral, rarely a loose one, the awn either horizontal or reflexed, glumes awned, unequal, the second glume equaling the lemma.
 - d. Central awn always horizontal; lemma 5 to 7 mm. long.
 - A. gracilis*

- dd. Central awn forming a loose spiral or strongly reflexed and hook-like; lemma 20 to 30 mm. long. *A. ramossissima*
- bb. Central awn differing slightly in length from the lateral ones, the latter more or less horizontal; glumes almost equal in length.
- c. Awns not over 3 cm. long, glumes 9 to 12 mm. long.
- d. Leaf-blades smooth, not hairy; first glume longer than the second. *A. purpurascens*
- dd. Leaf-blades with long hairs near the base; first glume usually equal to, but sometimes longer than the second. *A. stricta*
- cc. Awns 4 to 7 cm. long; glumes 20 to 30 mm. long. *A. oligantha*

***Aristida basiramea* Engelm.**

Forked *Aristida*. Tufted Triple-awn (Fig. 131)

Gleason '10, 148.

Culms branched, 8 to 24 inches tall; sheaths smooth, blades 1 to 6 inches long, 1 to 2 mm. wide; panicles usually less than 6 inches long, narrow, often partly included in the upper sheaths; glumes pointed, unequal, the first 8 to 12 mm., the second 12 to 14 mm.; lemma about 10 mm. long, the middle awn 1 to 2 cm. long, the lateral awns 2 to 7 mm.

This species is an annual growing in dry, sandy soil, and sandy barrens.

CHAMPAIGN CO. Urbana, *Waite*, Sept., 1888. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson* 232; Oquawka, *Tracy* in 1887. OGLE CO. Oregon, *Waite*, Sept., 1888. ROCK ISLAND CO. Barstow, *McDonald*, Aug., 1903; Osborn, *Seymour*, Sept., 1884. ST. CLAIR CO. Without locality, *Brendel* in 1850.

***Aristida desmantha* Trin. and Rupr.**

Western *Aristida* (Fig. 126)

Culms branched, 1 to 2 feet tall; sheaths loose, smooth; blades 4 to 8 inches long, 1 to 2 mm. wide, roughened only on the upper surface; panicle 4 to 8 inches long, about half as wide, the branches ascending; glumes shiny brown, about equal, 15 to 20 mm. long; lemma shorter, the awns about equal, jointed to the lemma, reflexed and somewhat coiled at base but not forming a spiral column.

This species belongs to the southwestern part of the United States. It is found in dry soil.

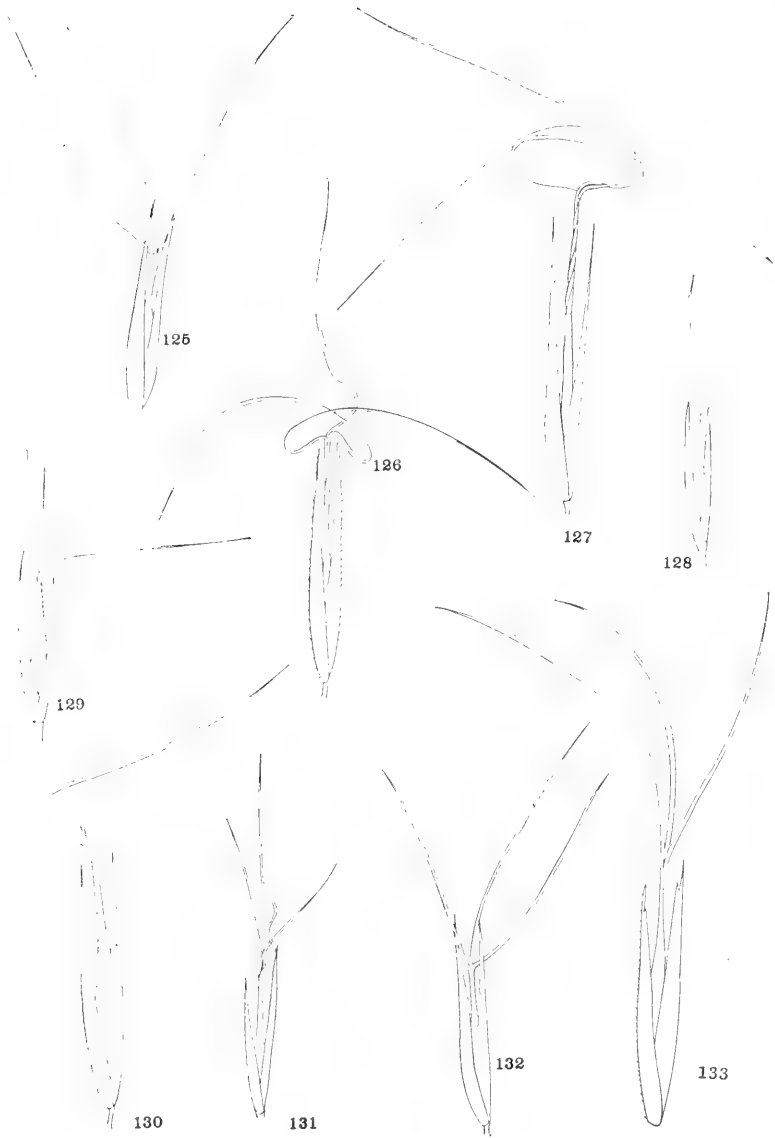
ILLINOIS SPECIMENS: Without locality, *Vasey*. MASON CO. Without locality, *M. S. Bebb* in 1861.

***Aristida dichotoma* Michx.**

Poverty Grass (Fig. 128)

Lapham '57, 545, 569 (Plate 2, Fig. 2); Patterson '76, 50; Flagg '78, 280; Brendel '87, 88.

Culms slender, much branched, usually branching at every node, 4 to 24 inches tall; sheaths loose, smooth; blades 1 to 3 inches long, 1 to 2 mm. wide, involute; panicles spike-like, 2 to 6 inches long; glumes almost equal, 7 to 8 mm. long, sharp-pointed; lemma shorter,



Figs. 125-133.—Spikelets: 125, *A. stricta*; 126, *A. dcsmantha*; 127, *A. tuberculosa*; 128, *A. dichotoma*; 129, *A. gracilis*; 130, *A. ramossissima*; 131, *A. basiramca*; 132, *A. purpurascens*; 133, *A. oligantha*

the lateral awns much reduced, the middle awn 3 to 6 mm. long, finally coiled at the base.

These plants are found in dry, sandy or gravelly soil. They usually grow in quite large tufts.

ILLINOIS SPECIMENS: Without locality, *Hall* in 1861; southern Illinois, *Vasey*. JO DAVIESS CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead* in 1842. MACOUPIN CO. Carlinville, *Robertson*, July, 1882. MENARD CO. Athens, *Hall* in 1861. PERRY CO. Du Quoin, *Vasey*. ST. CLAIR CO. Mascoutah, *Welsch*.

Aristida gracilis Ell.

Slender *Aristida*. Slender Beard Grass (Fig. 129)

Lapham '57, 545, 571; Patterson '76, 50; Flagg '78, 281; Brendel '87, 88.

Culms slender, branched at the base, 6 to 20 inches tall; sheaths smooth, blades 1 to 4 inches long, 1 to 2 mm. wide, usually drying involute; inflorescence a slender raceme or spike-like panicle, 2 to 6 inches long; glumes unequal, the second equaling the lemma, which is about 6 mm. long; lateral awns erect, 2 to 6 mm. long, median awn spreading, usually about 10 mm. long.

This species is seldom found in very large tufts; often the plants occur singly. They are found in dry, usually sandy soil.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. FULTON CO. Without locality, *Brendel*. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MENARD CO. Athens, *Hall* in 1867. ST. CLAIR CO. Mascoutah, *Welsch*. UNION CO. Without locality, *French*, Sept., 1878; without locality, *Wolf*; Anna, *Seymour*, Aug., 1880. WABASH CO. Without locality, *Shearer*.

Aristida oligantha Michx.

Few-flowered *Aristida* (Fig. 133)

Michaux '03, 41; Lapham '57, 545, 571; Patterson '76, 50; Flagg '78, 281; Brendel '87, 88.

Culms much branched, 1 to 2 feet tall; sheaths loose, smooth; blades 1 to 6 inches long, 1 to 2 mm. wide, smooth, usually involute; inflorescence a raceme or spike-like panicle; glumes unequal and awned; lemmas 20 to 30 mm. long; awns nearly equal, 4 to 7 cm. long.

This species was first found on the prairies of Illinois by Michaux. It grows in dry soil, and was probably the commonest species of *Aristida* on the original prairies of the state.

ILLINOIS SPECIMENS: Without locality, *Mead*. CHAMPAIGN CO. Near Champaign, *Clinton*, Oct., 1898. CLINTON CO. Carlyle, *Mead*; Shattuck, *Waite*, Aug., 1897. COOK CO. Lyons, *Hill*, Aug., 1898. HANCOCK CO. Augusta, *Mead*. HENDERSON CO. Near Oquawka, *Patterson*, Sept., 1881. JACKSON CO. Without locality, *French*, Aug., 1905. MACOUPIN CO. Brighton, *McDonald*, Sept., 1894; Medora, *McDonald*; Carlinville, *Robertson*, Aug., 1882. MARION CO. Odin, *Vasey* in 1862. MENARD CO. Athens, *Hall*. PEORIA CO. Princeville, *V. H. Chase* 1248. ROCK ISLAND CO. Barstow, *McDonald*, Sept., 1904. ST. CLAIR CO. Mascoutah, *Welsch*. UNION CO. Cobden, *Seymour*, Aug., 1880; Anna, *Seymour*, Aug., 1880. WABASH CO. Without locality, *Shearer*. WASHINGTON CO. Irvington, *French*, Sept., 1872.

Aristida purpurascens Poir.

Purplish Aristida (Fig. 132)

Aristida geyeriana, Lapham '57, 545, 571. *Aristida purpurascens*, Lapham '57, 545, 571; Patterson '76, 50; Flagg '78, 281; Brendel '87, 88.

Culms 1 to 2.5 feet tall, smooth, not much branched; sheaths smooth; blades 4 to 8 inches long, 1 to 2 mm. wide, smooth, sometimes flat but usually involute; panicle spike-like, purplish, 4 to 10 inches long; glumes unequal, pointed, 10 to 12 mm. long; awns 1.5 to 3 cm. long, the middle one slightly longer than the lateral.

This species is a perennial. It may usually be distinguished by its purplish inflorescence. It usually grows in sandy or gravelly soil.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb*. LAKE CO. Beach, *Gates* 3260. MASON CO. Without locality, *Vasey*. MENARD CO. Athens, *Hall*, 1861. ST. CLAIR CO. Without locality, *Brendel* in 1850.

Aristida ramosissima Engelm.

Branched Aristida (Fig. 130)

Lapham '57, 545, 569; Patterson '76, 50; Flagg '78, 280; Brendel '87, 88.

Culms 6 to 24 inches tall, much branched, the branches spreading; sheaths loose, smooth; blades roughened above, usually involute, 1 to 3 inches long, 1 to 2 mm. wide; glumes unequal, 15 to 20 mm. long, lateral awns very small and erect, the central awn 15 to 20 mm. long with a semicircular or S-shaped bend at the base.

This species is found in dry soil. It is a middle western species.

ILLINOIS SPECIMENS: Without locality, *Beal* in 1862; without locality, *Vasey*. MARION CO. Odin, *Vasey*. MACOUPIN CO. Carlinville, *Robertson*. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. UNION CO. Jonesboro, *Seymour*, Aug., 1880. WABASH CO. Without locality, *Schneck*, July, 1879; without locality, *Shearer*; Mt. Carmel, *Schneck*, Sept., 1877 and Aug., 1898; Lick Prairie, *Schneck*, Aug., 1878.

Aristida stricta Michx.

Erect Aristida (Fig. 125)

Engelmann '44, 103; Lapham '57, 545, 571; Patterson '76, 50; Flagg '78, 281; Brendel '87, 88.

Culms 2 to 4 feet tall; sheaths smooth; blades 8 to 12 inches long, densely pubescent, almost woolly on the upper surface near the base, usually involute; panicle spike-like, 6 to 24 inches long; glumes about equal or the first longer than the second, awn-pointed; lateral awns usually shorter than the central one, which is 1 to 2 cm. long.

This species is found in dry soil. It is a southern species closely resembling *A. purpurascens*, but is taller and lacks the purplish color.

MASON CO. Without locality, *Mead*, Aug., 1845.

Aristida tuberculosa Nutt.Sea-beach *Aristida* (Fig. 127)

Aristida tuberculata, Lapham '57, 545, 571. *A. tuberculosa*, Patterson '76, 50; Flagg '78, 281; Higley and Raddin '91, 141; Huett '97, 129; McDonald '00, 103; Gleason '07, 182; Gleason '10, 148.

Culms 6 to 20 inches tall, branched at the base, somewhat swollen at the nodes; sheaths loose, smooth; blades 5 to 10 inches long, about 2 mm. wide, rough above; panicle open; glumes 2.5 cm. long, with pointed tips; awns jointed to the lemma and twisted at base into a slender column nearly as long as the lemma.

This species is most commonly found along the southern part of the Atlantic coast. It is also found along the Great Lakes and in the interior wherever there are sandy areas.

ILLINOIS SPECIMENS: Without locality, *Mead*. COOK CO. Chicago, *Babcock*, July, 1870. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, Sept., 1872. LEE CO. Dixon, *Seymour*, Sept., 1882. MASON CO. Without locality, *M. S. Cobb* in 1861; without locality, *Hall* in 1861 and Sept., 1876. UNION CO. Cobden, *Waite*, Sept., 1884.

21. MUHLENBERGIA Schreb.

This genus has one-flowered spikelets which in Illinois species are, with one exception, borne in very narrow panicles. The glumes are thin and usually sharp-pointed or awned. The lemma is also pointed or awned and incloses the grain, thus differing from the nearly related genus *Sporobolus*, in which the grain is free. The awns are variable even in the same individual and do not afford good characters for the separation of species. There is a short, usually hairy callus at the base of the lemma. Many of the species have long, scaly rootstocks. All Illinois species are perennial. The leaves are mostly long and narrow and the ligule is short and membranous.

The species of *Muhlenbergia* are of little economic importance. It is said that the species which inhabit damp ground are useful for hay if cut before the stems become hard, but most of the species grow in waste places and are usually looked upon as weeds. The long rootstocks make them somewhat difficult to destroy; thoro cultivation is the only method of eradication recommended. *M. mexicana*, *foliosa*, and *racemosa* are the only species likely to cause trouble in this state.

- a. Glumes minute, always less than one-fourth the length of the spikelet, the first glume often wanting. *M. schreberi*
- aa. Glumes always more than one-fourth the length of the spikelet.
 - b. Plants never from long, scaly rootstocks; leaves elongate and very narrow, usually involute.
 - c. Panicle open, with long, spreading branches; spikelets on long, capillary pedicels; glumes about one-half the length of the lemma. *M. capillaris*
 - cc. Panicle narrow and spike-like; spikelets nearly sessile; glumes nearly as long as the lemma, at least two-thirds its length. *M. cuspidata*
- bb. Plants always from long, scaly rootstocks; leaves not elongate, seldom becoming involute.

- c. Glumes awned, always considerably longer than the lemma, sometimes nearly twice its length; panicle usually compact, resembling an interrupted spike. *M. racemosa*
- cc. Glumes seldom awned, usually not longer than the lemma, but sometimes slightly longer; panicles usually slender.
 - d. Glumes always shorter than the lemma, never more than three-fourths its length, broad at base; leaf-blades spreading.
 - e. Lemma awnless or short-awned; spikelets 1.5 to 2 mm. long; nodes not pubescent; culms not densely short pubescent. *M. sobolifera*
 - ce. Lemma long-awned; spikelets 3 to 4 mm. long; nodes pubescent; culms densely short pubescent. *M. tenuiflora*
 - dd. Glumes about equal in length to the lemma, sometimes longer, very narrow at the base; leaf-blades erect, or nearly so.
 - e. Culms smooth and shiny below the nodes, never covered with fine hairs. *M. mexicana*
 - ee. Culms with very short, fine hairs for an inch or two below the nodes.
 - f. Callus without hairs. *M. glabriflora*
 - ff. Callus with hairs one-third to one-half the length of the lemma.
 - g. Panicles few-flowered; lemma usually long-awned. *M. umbrosa*
 - gg. Panicles densely flowered; lemma not awned. *M. foliosa*

Muhlenbergia capillaris (Lam.) Trin.

Long-awned Hair Grass (Fig. 136)

Culms growing in tufts, 1.5 to 3 feet tall, usually smooth; sheaths smooth, short at the base of the plant, and often overlapping, but longer near the summit; blades 4 to 12 inches long, about 2 mm. wide, usually involute; panicle spreading, with long, capillary branches, spikelets, excluding the awn, 3.5 to 4 mm. long, on long, capillary pedicels, which are thickened near the base of the spikelet; glumes about half as long as the awned lemma; awn 5 to 18 mm. long; callus hairs very short.

This species is found in dry soil. So far only one specimen has been seen from Illinois. The panicle is usually purple.

UNION CO. Without locality, *Seymour* in 1881.

Muhlenbergia cuspidata (Torr.) Rydb.

(Fig. 137)

Culms in tufts, 1 to 2 feet tall, very slender, smooth; sheaths and blades smooth; blades 4 to 10 inches long, very narrow, usually involute; panicle very slender, few-flowered; spikelets 3 to 4 mm. long, the glumes with a cusp or short awn about two-thirds as long as the lemma; callus hairs wanting.

This species is described in Gray's Manual (seventh edition) as *Sporobolus brevifolius* (Nutt.) Scribn. It is found in dry places. The

only Illinois specimens seen were collected on dry, gravelly hills, or on limestone rocks on a river bank.

WILL CO. Joliet, *Hill* 185 in 1906; bank of Du Page river, Bird's Bridge, *Hill* 36 in 1912.

Muhlenbergia foliosa Trin.

(Fig. 138)

Culms 2 to 3 feet long, often bent near the base and lying on the ground, branched above the base, the branches erect, one or two inches of surface below the nodes covered with very fine, short hairs; sheaths smooth; blades rough to the touch, 1.5 to 6 inches long, 2 to 5 mm. wide; panicles well beyond the uppermost sheath, usually rather thick, compactly flowered; spikelets 2.5 to 3 mm. long, the glumes nearly or quite equal to the lemma; callus covered with soft hairs nearly half as long as the spikelet.

This species closely resembles *M. mexicana* in general appearance and habit. *M. foliosa* can be readily distinguished by the minute hairs on the culm just below the nodes. The panicles vary greatly in width. The narrower panicles resemble those of *M. umbrosa*, which has long-awned lemmas. There is an awned form of *M. foliosa*; but no specimens of it were found among the Illinois collections. The plants are usually found in damp meadows and swamps. Most of the herbarium specimens were labeled *M. mexicana filiformis*.

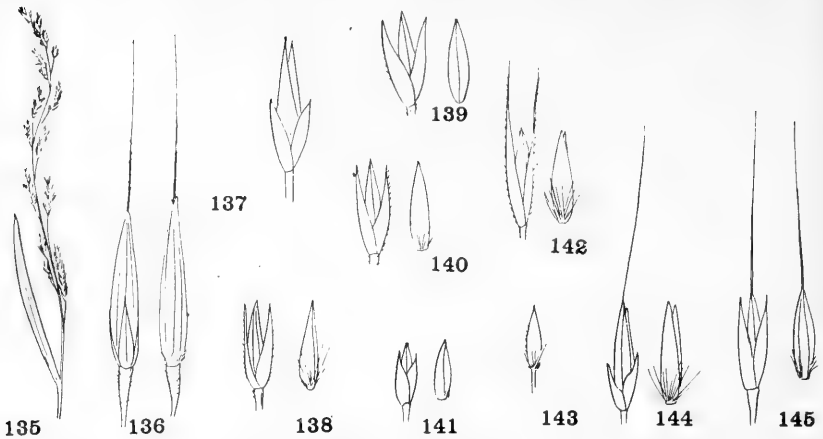
ILLINOIS SPECIMENS: Without locality, *Ball*. CHAMPAIGN CO. Without locality, *Burrill*, Oct., 1877; Champaign, *Clinton*, Oct., 1895. FULTON CO. Without locality, *Wolf* in 1881. JO DAVIESS CO. Bluffs of Apple river, *Pepoon* 611. KANKAKEE CO. Waldron, *Hill*, Sept., 1873. MCHENRY CO. Algonquin, *Nason*, Aug., 1879. PEORIA CO. Peoria, *Brendel*. PIATT CO. White Heath, *Mosher*, Oct., 1914. STARK CO. Wady Petra, *V. H. Chase* 1268. WILL CO. Joliet, *Skeels*, Sept., 1904. WINNEBAGO CO. Fountaindale, *M. S. Bebb*.

Muhlenbergia glabriflora Scribn.

(Fig. 139)

This species is very much like *M. foliosa* in general appearance. The culms are simple for nearly half their length, then branch profusely and bear numerous panicles, often partially included in the upper sheaths, more typically cylindrical than in *M. foliosa*. The spikelets are of about the same size, but the callus bears no hairs, making it very easy to distinguish the species. The leaf blades are generally shorter than in *M. foliosa*. The plants are found in woods and other shady places.

ILLINOIS SPECIMENS: Without locality, *Wolf*. CHRISTIAN CO. Taylorville, *Andrews*, Sept., 1898. MENARD CO. Athens, *Hall* in 1868. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*, Aug., 1898 and 1899.



Figs. 135-145.—135, *M. mexicana*, inflorescence; 136, *M. capillaris*, spikelet; 137, *M. cuspidata*, spikelet; 138, *M. foliosa*, spikelet; 139, *M. glabriflora*, spikelet; 140, *M. mexicana*, spikelet; 141, *M. sobolifera*, spikelet; 142, *M. racemosa*; 143, *M. schreberi*, spikelet; 144, *M. tenuiflora*, spikelet; 145, *M. umbrosa*, spikelet

***Muhlenbergia mexicana* (L.) Trin.**

Meadow Muhlenbergia. Mexican Drop-seed (Figs. 135 and 140)

Agrostis lateriflora, Michaux '03, 53. *Muhlenbergia mexicana*, Lapham '57, 545, 566; Babcock '73, 97; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 141; Huett '97, 129.

Culms 2 to 4 feet long, often branching at the base, lying on the ground and rooting at the lower nodes, the remainder erect, always smooth; blades rough to the touch, 2 to 6 inches long, 2 to 6 mm. wide; panicles numerous, usually narrowed toward the tip, often partially inclosed in the upper sheath; spikelets 2.5 to 3 mm. long; glumes awn-pointed or with a short awn, about as long as the lemma.

This species is common in fields, gardens, and in waste places. It is a troublesome weed in some places. It is recommended that the areas containing this weed be thoroly cultivated and the rootstocks exposed to the sun.

ILLINOIS SPECIMENS: Without locality, *Brendel* in 1873; without locality, *Mead*; without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Gates*, Oct., 1907; Urbana, *Gibbs*, Sept., 1898; Champaign, *Mosher*, Sept., 1914; Urbana, *Mosher*, Sept., 1914. COOK CO. Wolf lake, *Hill*, Sept., 1892. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Bluffs of Apple river, *Pepoon*. KANKAKEE CO. Kankakee, *Crampton*, Sept., 1913. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1900. ST. CLAIR CO. Mascoutah, *Welsch*. SANGAMON CO. Springfield, *M. S. Bebb* in 1861. STARK CO. Wady Petra, *V. H. Chase*, Aug., 1893. WILL CO. Joliet, *Skeels*, Sept., 1904. WABASH CO. Without locality, *Schneck*, Sept., 1880; Mt. Carmel, *Schneck*, Sept., 1897.

Muhlenbergia racemosa (Michx.) B. S. P.

Marsh Muhlenbergia. Wild Timothy (Fig. 142)

Agrostis racemosa, Michaux '03, 53. *Muhlenbergia glomerata*, Lapham '57, 545, 566; Babcock '73, 97; Patterson '76, 49; Flagg '78, 280; Patterson '87, 63; Higley and Raddin '91, 141.

Culms smooth, often much branched, 1 to 3 feet tall, erect, with fine short pubescence below the nodes; sheaths smooth, blades usually rough to the touch, 2 to 5 inches long, 2 to 6 mm. wide; panicles dense and spike-like; spikelets 4 to 6 mm. long, the glumes always awned and considerably longer than the lemma, sometimes almost twice as long.

This species is found in wet places, such as swamps and bogs.

CHAMPAIGN CO. Champaign, *Clinton*, Oct., 1895. HANCOCK CO. Augusta, *Mead*. HENDERSON CO. Oquawka, *Patterson*, Sept., 1872. KANE CO. Elgin, *Sherff* 1946. LAKE CO. Cedar lake, Lake Villa, *Gleason* and *Shobe* 128; Sun lake, Lake Villa, *Gleason* and *Shobe* 200. MCHENRY CO. Ringwood, *Vasey*. MADISON CO. East Alton, *McDonald*, Sept., 1900. MENARD CO. Athens, *Hall* in 1866. OGLE CO. Oregon, *Waite*, Sept., 1885. PEORIA CO. Peoria, *Brendel*; Princeville, *V. H. Chase* 940. STARK CO. Wady Petra, *V. H. Chase* 1943. WINNEBAGO CO. Fountaindale, *M. S. Bebb* in 1873.

Muhlenbergia schreberi J. F. Gmel.

Dropseed. Nimble Will (Fig. 143)

Dilepyrum minutiflorum, Michaux '03, 40. *Muhlenbergia diffusa*, Lapham '57, 545, 567; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Huett '97, 129. *Muhlenbergia schreberi*, Gleason '12, 41.

Culm smooth, much branched, the basal part usually lying on the ground and often rooting at the nodes, the ends erect; sheaths loose, smooth; blades rough, 1.5 to 3.5 inches long, 1 to 4 mm. wide; panicles numerous, slender, densely flowered; spikelets, excluding the awn about 2 mm. long, the first glume nearly obsolete, the second very small, the lemma awned.

This species grows in dry places.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Gibbs*; Urbana, *Clinton*, Oct., 1895; Champaign, *Percival*, Oct., 1876; Urbana, *Gates*, Sept., 1907. COOK CO. Evanston, *Shipman*, Sept., 1875; Chicago Heights, *A. Chase*, Sept., 1897; Palos Park, *Umbach*, Sept., 1909. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902; Naperville, *Umbach*, Sept., 1898. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, Sept., 1873. LAKE CO. River Forest, *Hill*, Aug., 1890. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1882. OGLE CO. Oregon, *Waite*, Aug., 1884. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1900. RANDOLPH CO. Bremen, *Hill*, Aug., 1892. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1270, 1165, 1277. WABASH CO. Without locality, *Schneck*, July, 1900; without locality, *Shearer*; Mt. Carmel, *Schneck*, Sept., 1904. WILL CO. Mokena, *Chase*; Joliet, *Skeels*, Sept., 1904.

Muhlenbergia sobolifera (Muhl.) Trin.

Rock Muhlenbergia (Fig. 141)

Lapham '57, 545, 566; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 141.

Culms smooth, erect or nearly so, 1 to 3 feet tall; sheaths smooth; blades rough, shorter on the culm, 1 to 6 inches long, 2 to 6 mm. wide; panicles long and very slender; spikelets 1.5 to 2.5 mm. long, the glumes sharp-pointed and one-half to two-thirds as long as the lemma.

This species is usually found in rocky woods.

FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1882. MENARD CO. Athens, *Hall* in 1869. PEORIA CO. Peoria, *Brendel*. WABASH CO. Without locality, *Schneck*, Oct., 1881; Mt. Carmel, *Schneck*, Sept., 1897.

Muhlenbergia tenuiflora (Willd.) B. S. P.

Slender Muhlenbergia (Fig. 144)

Muhlenbergia willdenowii, Lapham '57, 545, 566 (Plate 1, Fig. 9); Babcock '73, 97; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 141.

Culms simple or very sparingly branched, covered with fine, short hairs which point downwards; nodes pubescent; sheaths generally with a few very fine hairs at least near the edges, usually shorter than the internodes; blades rough, 2.5 to 8 inches long, 2 to 8 mm. wide; panicles long and slender but rather densely flowered; spikelets 3 to 4 mm. long, glumes unequal, one-half to two-thirds the length of the lemma, which bears an awn 2 to 4 times the length of the body.

This species has the broadest leaves of any of the genus found in Illinois. They are usually horizontally spreading. It resembles *M. sobolifera* more than any other species, but the larger spikelets and hairy culms easily distinguish it. The plants grow in rocky woods and other shady places.

CHAMPAIGN CO. Urbana, *Seymour* and *Waite*, July, 1886. COOK CO. Palos Park, *Umbach*, Aug., 1909. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. KANE CO. Elgin, *Vasey*. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Sept., 1902; Glasford, *Wilcox*, Aug., 1902. WABASH CO. Mt. Carmel, *Schneck* in 1879; Hanging Rock, *Schneck*, Sept., 1904.

Muhlenbergia umbrosa Scribn.

Wood Muhlenbergia (Fig. 145)

Muhlenbergia sylvatica, Lapham '57, 545, 566; Babcock '73, 97; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 141; Huett '97, 129.

Culms usually much branched, 1 to 3 feet tall, with very fine, short hairs below the nodes; sheaths smooth; blades rough, 2 to 7 inches long, 2 to 6 mm. wide; panicles long and very narrow, few-flowered; spikelets, excluding the awn, 2.5 to 3 mm. long, glumes awn-pointed

or slightly awned, shorter than the lemma, which bears an awn usually 6 to 12 mm. long.

This species is found in moist woods. It is much like *M. foliosa* and *M. glabriflora* in general appearance, but may be distinguished by the slender, few-flowered panicle and by a long-awned lemma. In rare instances a short-awned form was found among Illinois specimens.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1882. CARROLL CO. Mt. Carroll, *Shimer*, Oct., 1891. DU PAGE CO. Wheaton, *Moffatt*, Sept., 1892. FULTON CO. Canton, *Wolf*. KANKAKEE CO. Kankakee, *De Selm*, Sept., and Oct., 1913. MENARD CO. Without locality, *Hall*; Athens, *Hall* in 1874. PEORIA CO. Peoria, *Brendel*; Princeville, *V. H. Chase*, Oct., 1900. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Near Wady Petra, *V. H. Chase*, Sept., 1906. WABASH CO. Without locality, *Shearer*; Hanging Rock, *Schneck*, Sept., 1900.

22. BRACHYELYTRUM Beauv.

This genus includes a single species in which the plants are perennial from short rootstocks. The culms are tall and slender and the blades rather short and broad. The ligules are membranous, from 1 to 2 mm. long, the margin irregular. The inflorescence is a very narrow, few-flowered panicle. The spikelets are one-flowered, the glumes very minute or obsolete, and the lemma is awned.

Brachyelytrum erectum (Schreb.) Beauv.

Bearded Short Husk (Figs. 146 and 147)

Brachyelytrum aristatum, Lapham '57, 545, 567 (Plate 1, Fig. 10); Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 142.

Culms erect, unbranched, densely pubescent at and near the nodes; sheaths with a few hairs, shorter than the internodes; blades 3 to 5 inches long, 6 to 18 mm. wide, rough to the touch; spikelets, excluding the awns, 10 mm. long, rough, and slightly pubescent.

This grass is found in shady places, usually in damp, rocky woods.

ILLINOIS SPECIMENS: Without locality, *Mead*; without locality, *Vasey*; southern Illinois, *Brendel*. CHAMPAIGN CO. Urbana, *Butts* and *Seymour*, June, 1880. COOK CO. Palos Park, *Umbach*, Aug., 1909; Glencoe, *Johnson*, Sept., 1890. FULTON CO. Canton, *Wolf*. JO DAVIESS CO. Along Apple river, *Pepoon* 691. HENDERSON CO. Oquawka, *Patterson*, Aug., 1872. LA SALLE CO. Near Starved Rock, *A. Chase*, July, 1901; Starved Rock, *Hill* 138 in 1901. PEORIA CO. Glasford, *Wilcox*, July, 1902; Peoria, *Brendel*; Springdale, Peoria, *McDonald*, July, 1890. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Mascoutah, *Welsch*. VERMILION CO. Danville, *Waite*, June, 1886. WABASH CO. Without locality, *Schneck*, July, 1905; Mt. Carmel, *Schneck*, Sept., 1886; Hanging Rock, *Schneck*, Sept., 1904 and Aug., 1879.

23. HELEOCHLOA Host

This grass, which has been sparingly introduced into this country, is a native of Europe and Asia. It grows in small bunches. The spike-like panicles have the general appearance of *Phleum pratense*, our common timothy or herd's grass. The panicles are partially included in the enlarged upper sheaths. The spikelets are one-flowered, the

glumes, lemma, and palea are all of the same texture. The glumes are flattened and keeled, with a row of stout hairs along the keel. The blades are short and narrow; the ligule is composed of a ring of short hairs.



Figs. 146-150.—146, *B. erectum*, inflorescence; 147, *B. erectum*, spikelet; 148, *H. schoenoides*, inflorescence; 149, *H. schoenoides*, spikelet; 150, *P. pratense*, spikelet

Heleocholea schoenoides (L.) Host

Rush Cat-tail Grass (Figs. 148 and 149)

Culms smooth, 4 to 18 inches tall, sheaths much shorter than the internodes, the upper sheaths enlarged; blades 1 to 3 inches long, sharp-pointed, rather rough on the upper surface; panicle 1 to 1.5 inches long; spikelets about 2.5 mm. long.

This grass has not been reported from many localities in Illinois. It is found in waste places.

COOK CO. Blue Island, *Robert Bebb*, Aug., 1902 and 1903; Chicago, *Somes*, Aug., 1909. ST. CLAIR CO. East St. Louis, *Eggert*, Aug., 1893.

24. *PHLEUM* L.

Cat-tail Grass

The native species of this genus (*P. alpinum*) does not occur in Illinois, being found only on high mountains or in the arctic regions

of the continent. The introduced species, *P. pratense*, is cultivated everywhere in the state for hay. It is a perennial grass, growing in tufts, with long, cylindrical, spike-like panicles. The spikelets are one-flowered, flattened, and closely crowded. The lemma is thinner than the glumes and transparent. The leaves are long and flat, the ligules membranous, from 2 to 3 mm. long.

Phleum pratense L.

Timothy. Herd's Grass (Fig. 150)

Culms 1.5 to 3.5 feet tall, erect, smooth, enlarged, and bulbous at base; sheaths smooth; blades 3 to 12 inches long, 4 to 6 mm. wide; spikelets 2 to 5 mm. long, usually 3 mm.; glumes keeled and about twice as long as the lemma, the midnerve produced into a short awn 1 to 2 mm. long.

This species grows in meadows all over the state.

25. ALOPECURUS L.

Foxtail Grass

This genus includes plants with the inflorescence in spike-like panicles which somewhat resemble timothy, or herd's grass, *Phleum pratense*. The spikelets are one-flowered, flattened, with keeled glumes. The lemma is thin and transparent and bears an awn near the base. There are two species commonly found in Illinois. A third species, *A. pratensis*, is mentioned by Lapham, Patterson, Flagg, and Huett as having been cultivated in Illinois. No Illinois specimens have been seen, however, except from the University experimental plots. It is included in the key, so that if any specimens are found, they may be identified.

Spikelets 4 to 6 mm. in length.

A. pratensis

Spikelets never more than 3 mm. in length.

Awn scarcely exceeding the spikelet and not extending over 1 mm. beyond it; spikelets 2.5 to 3 mm. long.

A. aristulatus

Awn exceeding the spikelet by the length of the glume or more; spikelets 2 mm. long.

A. geniculatus

Alopecurus aristulatus Michx.

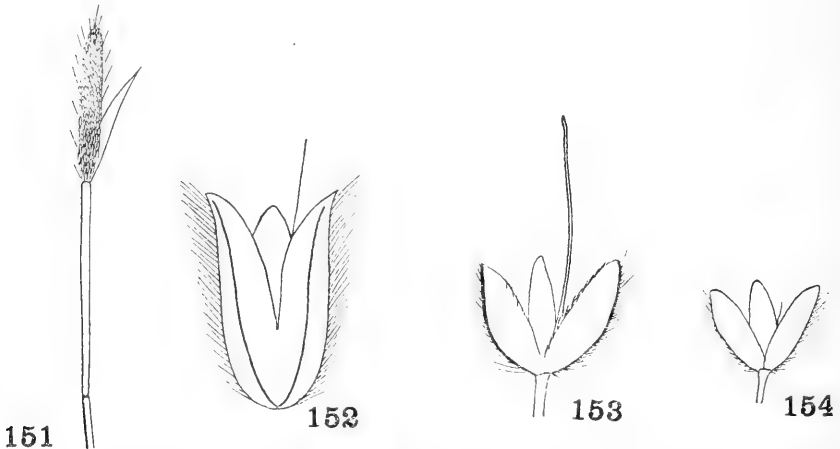
Wild Water Foxtail. Floating Foxtail (Fig. 154)

Alopecurus aristulatus, Lapham '57, 544, 562 (Plate 1, Fig. 3); Flagg '78, 280. *Alopecurus geniculatus* var. *aristulatus*, Brendel '87, 63; Higley and Raddin '91, 142; Huett '97, 129.

Culms slender, smooth, 6 inches to 2 feet tall, usually erect; sheaths smooth; blades roughened, 1 to 6 inches long, 1 to 4 mm. wide; spikelets about 2 mm. long, the awn very short, not extending beyond the panicle.

This species is described by earlier writers as being native to Illinois, and there seems to be no doubt on this point. It grows in the water along the edges of ponds and streams or in very wet soil.

ILLINOIS SPECIMENS: Without locality, *Vasey*; lakes in Illinois, *Eggert*, July, 1878. COOK CO. Winnetka, *Johnson*, May, 1889; Engelwood, *Umbach*, July, 1898. DU PAGE CO. Glen Ellyn, *Moffatt*, May, 1894. FULTON CO. Canton, *Wolf*. LAKE CO. Gilmer, *Gates*, July, 1907. MCHENRY CO. Without locality, *Brendel*. MENARD CO. Athens, *Hall*, June, 1865. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*.



Figs. 151-154.—151, *A. geniculatus*, inflorescence; 152, *A. pratensis*, spikelet; 153, *A. geniculatus*, spikelet; 154, *A. aristulatus*, spikelet

Alopecurus geniculatus L.

Marsh Foxtail (Figs. 151 and 153)

Lapham '57, 544, 562; Patterson '76, 49; Flagg '78, 280; Sherff '13, 594.

- Culms 6 inches to 2 feet tall, slender, smooth, the base usually lying along the ground, the ends erect; sheaths smooth; blades roughened, 1 to 6 inches long, 1 to 4 mm. wide; panicles with a somewhat furry appearance due to the slender awns; spikelets 2.5 to 3 mm. long, the awn slightly bent, usually about twice the length of the spikelet.

This species was introduced from Europe. It is found in wet soil, especially in marshes and along the banks of ponds and streams.

COOK CO. Englewood, *Umbach*, July, 1898. DU PAGE CO. Glen Ellyn, *Hill*, May, 1894. EFFINGHAM CO. Edgewood, *Holden*, May, 1898. HENDERSON CO. Oquawka, *Patterson*. LAKE CO. Lake Forest, *Jensen*, May, 1895; Lake Zurich, *Hill*, June, 1899. MACOUPIN CO. Carlinville, *Robertson*, May, 1884. MCLEAN CO. Bloomington, *Burrill*, May, 1894. MARION CO. Without locality, *Lapham*; Salem, *M. S. Bebb* in 1860; Salem, *Hall*. MENARD CO. Athens, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, June, 1890. PULASKI CO. Beechwood, *Spencer*, May, 1900. ST. CLAIR CO. East St. Louis, *Eggert*, June, 1887; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 471.

26. **SPOROBOLUS** R. Br.

Dropsced. Rush Grass

The species of this genus found in Illinois are all native to the state and include both annuals and perennials. They all grow in dry soil and nearly all have narrow, involute, pointed leaves. The ligules are membranous, from 1 to 3 mm. long. The spikelets are one-flowered and the fruit is not inclosed by the lemma, but is free and usually falls out as soon as ripe.

- a. Panicle diffuse, branches capillary. *S. asperifolius*
- aa. Panicle not diffuse, branches slender but not capillary.
 - b. Glumes very unequal; panicle branches ascending or spreading, panicle not spike-like (except secondary panicles in autumn).
 - c. Sheaths not bearded at the summit; spikelets 4 to 6 mm. long.
 - S. heterolepis*
 - cc. Sheaths conspicuously bearded at the summit; spikelets 2.5 to 3 mm. long.
 - S. cryptandrus*
- bb. Glumes nearly equal; panicle contracted, more or less spike-like.
 - c. Sheaths much enlarged and always inclosing the lateral panicles, sometimes the terminal ones; blades short, scarcely longer than the sheaths.
 - d. Spikelets 2.5 to 3 mm. long; lemma not pubescent. *S. neglectus*
 - dd. Spikelets 3.5 to 4 mm. long; lemma pubescent. *S. vaginaeflorus*
 - cc. Sheaths never enlarged, except the upper which often partially incloses the panicle; blades long, very much longer than the sheaths, always very narrow and involute; plants perennial.
 - d. Spikelets 5 mm. or more long; panicles densely flowered and usually included in the enlarged upper sheaths.
 - e. Lemma and palea pubescent at the base.
 - f. Palea with a long sharp point; lemma about two-thirds the length of the palea. *S. clandestinus*
 - ff. Palea acute but not with a long sharp point, and only slightly longer than the lemma. *S. canovirens*
 - ce. Lemma and palea never pubescent at base, but always smooth and polished. *S. asper*
 - dd. Spikelets never more than 4 mm. long; panicles loosely flowered and not included in the upper sheath. *S. drummondii*

Sporobolus asper (Michx.) Kunth

Long-leaved Rush Grass (Fig. 155)

Sporobolus longifolius, Britton '07, 105.

Culms 1.5 to 4 feet tall, smooth; sheaths smooth; blades 4 to 18 inches long, 2 to 4 mm. wide, flat at base but soon becoming involute, smooth on the under surface, rough on the upper, and with long hairs near the base; panicle partially included in the upper sheath, 3 to 9 inches long, about half an inch wide; spikelets 5 to 6 mm. long.

This species is found in dry, usually sandy soil. *S. drummondii* closely resembles this species, but it has smaller spikelets, narrower and less dense panicles which are usually not inclosed in the sheath.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1882. CHAMPAIGN CO. Without locality, *Seymour*, Oct., 1880; St. Joseph, *Clinton*, Oct., 1895; Champaign, *Clinton*, Oct., 1895; Urbana, *Gates*, Oct., 1907. COOK CO. Chicago, *Umbach*, Sept.,

1898. HENDERSON CO. Oquawka, *Patterson*. MACOUPIN CO. Carlinville, *Robertson*, Sept., 1882. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *McDonald*, Sept., 1900 and 1901; Peoria, *Brendel*; Princeville, *V. H. Chase* 1180. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. STARK CO. *V. H. Chase* 820. WABASH CO. Hanging Rock, *Schneck*, Sept., 1878. WILL CO. Joliet, *Skeels*, Sept., 1904.



Figs. 155-164.—155, *S. asper*, spikelet; 156, *S. asperifolius*, spikelet; 157, *S. canovirens*, spikelet; 158, *S. clandestinus*, spikelet; 159, *S. cryptandrus*, spikelet; 160, *S. drummondii*, inflorescence; 161, *S. drummondii*, spikelet; 162, *S. heterolepis*, spikelet; 163, *S. neglectus*, spikelet; 164, *S. vaginaeflorus*, spikelet

***Sporobolus asperifolius* (Nees & Meyen) Thurb.**

Rough-leaved Dropseed (Fig. 156)

Culms 6 to 18 inches tall, smooth, erect from a long rootstock; sheaths short, smooth; blades flat, short, and pointed, very numerous near the base of the plant, 1 to 3 inches long, 2 to 3 mm. wide, very rough on the upper surface, smooth beneath; panicle spreading, 3 to 7 inches long and about half as wide, the spikelets 1.5 mm. long, on long, capillary pedicels, rarely 2- or 3-flowered.

This is a western species and has been reported only once from Illinois. It is found in dry soil.

KANE CO. Elgin, along railway track, *Sherff*, Aug., 1912.

***Sporobolus canovirens* Nash**

(Fig. 157)

Culms 1 to 3 feet tall, smooth; sheaths smooth; blades narrow and involute except at base, 4 to 18 inches long, 2 to 4 mm. wide, with long hairs at the base; panicle 2 to 4 inches long, less than half an inch wide, partially included in the upper sheath; spikelets about 6 mm. long, lemma and palea slightly pubescent at base.

This species is found in sandy soil. In general appearance it resembles both *S. clandestinus* and *S. asper*.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1882. FULTON CO. Canton, *Wolf*. HENDERSON CO. Oquawka, *Patterson*.

Sporobolus clandestinus (Spreng.) Hitchc.

Rough Rush Grass (Fig. 158)

Agrostis aspera, Michaux '03, 52. *Vilfa aspera*, Lapham '57, 544, 563; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63. *Sporobolus asper*, Huett '97, 129; McDonald '00, 103.

Culms 2 to 5 feet tall, smooth; sheaths smooth; blades long, narrow, involute except at the base, 3 to 15 inches long, 2 to 4 mm. wide; panicle 2 to 6 inches long, 2 to 4 mm. wide; spikelets 6 to 8 mm. long, the lemma pubescent near the base.

This species is found in dry and sandy soil. It is distinguished by the exceedingly long, pointed palea.

COOK CO. Leydon, *Gates*. PEORIA CO. Peoria, *McDonald*, Sept., 1900 and 1901.

Sporobolus cryptandrus (Torr.) Gray

Sand Dropseed (Fig. 159)

Lapham '57, 545, 564; Patterson '76, 49; Flagg '78, 280; Brendel '87, 88; Higley and Raddin '91, 142; Huett '97, 129; Gleason '07, 182; Gleason '10, 148; Gates '12, 355.

Culms smooth, 1 to 2 feet tall; sheaths short, smooth, with conspicuous long hairs at the throat; blades short, flat, rough on the upper surface, mostly crowded at the base of the plant, 2 to 5 inches long, 3 to 5 mm. wide; panicle open, somewhat resembling that of common redtop, in autumn contracted and partly included in the sheath; spikelets usually dark colored, 2 to 2.5 mm. long.

This species is very common along the shores of Lake Michigan and throuth the sand areas of the state.

ILLINOIS SPECIMENS: Without locality, *Vasey*; Canteen lake, *Eggert*, Sept., 1886. CASS CO. Beardstown, *McDonald*, Sept., 1900. COOK CO. Chicago, *Vasey*; Chicago, *Babcock*, Oct., 1874; Evanston, *Johnston*, Sept., 1886; Chicago, *Lansing* 371; Lake View, Chicago, *Umbach*, Sept., 1898; Hyde Park, Chicago, *A. Chase*, Aug., 1899; Evanston, *Sherff*, July, 1911. HENDERSON CO. Oquawka, *Patterson* in 1881. LAKE CO. Beach Area, *Gates* 3255. LA SALLE CO. Ottawa, *Seymour*. MASON CO. Manito, *Wilcox*, July, 1902; Havana, *Gleason*, Aug., 1903. OGLE CO. Oregon, *Waite*, Sept., 1880. ST. CLAIR CO. *Eggert*, Oct., 1886.

Sporobolus drummondii (Trin.) Vasey

(Figs. 160 and 161)

Culms 1 to 2.5 feet tall, smooth; sheaths smooth; blades long and narrow, flat at base, involute at tip, 3 to 15 inches long, upper surface rough, sometimes pubescent near the base, but usually smooth; panicle seldom included in an inflated upper sheath, 3 to 6 inches long, very slender, loosely flowered, always less than half an inch wide; spikelets 4 mm. long.

This species is considerably smaller than *S. asper*, which it closely resembles.

ST. CLAIR CO. Mascoutah, *Welsch*. WILL CO. Gougar's Prairie, Joliet, *Skeels*, Sept., 1904.

Sporobolus heterolepis Gray
Northern Dropseed (Fig. 162)

Lapham '57, 545, 563 (Plate 1, Fig. 6); Babcock '73, 96; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 142; Huett '97, 129; Gleason '10, 148; Gates '12, 355.

Culms 1 to 3 feet tall, smooth, erect; sheaths smooth; blades long and narrow, rough on the upper surface; panicles 3 to 10 inches long, the branches often spreading, but sometimes erect; spikelets 4 to 6 mm. long, the first glume very much shorter and narrower than the long-pointed second glume.

This species is very distinct and hence is not likely to be mistaken for any other. It is found in dry soil. On the original prairies of the state it was abundant.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb* in 1859 and 1868; without locality, *Vasey*; without locality, *Mead*; without locality, *Hall* in 1875. CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1895; Champaign, *Clinton*, Oct., 1895. COOK CO. Englewood, *Hill*, Sept., 1875. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902. FULTON CO. Canton, *Wolf*; Canton, *McDonald*, Aug., 1889. JO DAVIESS CO. Warren, *Pepoon* 596. HANCOCK CO. Augusta, *Mead* in 1845. HENDERSON CO. Oquawka, *Pratt*, Oct., 1872. KANKAKEE CO. Altorf, *Hill* 199 in 1872. LAKE CO. Beach Area, *Gates* 3223. MCHENRY CO. Union, *Seymour*, Sept., 1881; Ringwood, *Vasey*. PEORIA CO. Without locality, *Brendel*; near Princeville, *V. H. Chase* 819; Peoria, *McDonald*, Sept., 1900. WABASH CO. Mt. Carmel, *Schneck*, Oct., 1876; Old Palmyra, *Schneck*, Sept., 1904. WILL CO. Joliet, *Hill* 195 in 1907. WINNEBAGO CO. Fountaindale, *M. S. Bebb* in 1868.

Sporobolus neglectus Nash
Small Rush Grass (Fig. 163)

Culms smooth, 6 to 24 inches tall, forming small bunches; sheaths inflated, broader than the blades, smooth; blades slightly longer than the sheaths, about 2 mm. wide, rough on the upper surface, usually pubescent near the base, usually involute when dry; panicles 1 to 2.5 inches long, all except the terminal panicles completely inclosed in the inflated sheaths; spikelets 2.5 to 3 mm. long, glumes, lemma, and palea all of the same texture, all white and shining.

This species has been confused with *S. vaginaeflorus*, which it resembles in general habit of growth and in the size and shape of the panicles which are inclosed in the inflated upper sheaths. *S. neglectus* is usually a smaller plant and is distinguishable by its smooth, white spikelets, those in *S. vaginaeflorus* having pubescent lemmas and not white, shiny spikelets as in *S. neglectus*.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb*; without locality, *Wolf*; without locality, *Vasey*; Lake Zurich, *Hill*, Sept., 1898; Otto, *De Selm*, Sept., 1913. CHAMPAIGN CO. Urbana, *Waite*, Sept., 1888; Urbana, *Seymour*, Oct., 1880; St. Joseph, *Clinton*, Oct., 1895. COOK CO. Chicago, *Babcock*, Oct., 1874; Evanston, *Shipman*, Oct., 1875. DU PAGE CO. Naperville, *Umbach*, Aug., 1898. FULTON CO. Without locality, *Pepoon*; Canton, *Brendel*. HANCOCK CO. Augusta, *Mead*. HENDERSON CO. Oquawka, *Patterson*. LAKE CO. Lake Zurich, *Hill*, Sept., 1898. MENARD CO. Without locality, *Hall* in 1861 and 1864; Athens, *Hall* in 1864.

OGLE CO. Without locality, *M. S. Bebb*; Oregon, *Waite*, Sept., 1888. PEORIA CO. *McDonald*, Oct., 1904; Peoria, *Brendel*. STARK CO. Duncan, *V. H. Chase*, Sept., 1906. WILL CO. Marley, *Hill*, Sept., 1895.

***Sporobolus vaginaeflorus* (Torr.) Wood**
Sheathed Rush Grass (Fig. 164)

Vilfa vaginaeflora, Lapham '57, 544, 563 (Plate 1, Fig. 5); Babcock '73, 96; Flagg '78, 280; Brendel '87, 63. *Sporobolus vaginaeflorus*, Higley and Raddin '91, 142; Huett '97, 219.

Culms 8 to 24 inches tall, smooth; sheaths usually all inflated, smooth; blades a little longer than the sheaths, very narrow, usually involute, rough on the upper surface and pubescent near the base; lateral panicles usually inclosed in the inflated sheaths, the terminal ones usually free; spikelets 3.5 to 4 mm. long, the glumes usually white, the lemma dark colored and always pubescent.

This species resembles *S. neglectus*, but is usually larger and is easily recognized by the spikelets. It grows in dry, sandy soil.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1882; without locality, *Mead* in 1844. CHAMPAIGN CO. Urbana, *Grimes*, Sept., 1916. COOK CO. Lyons, *Hill*, Aug., 1898; Morgan Park, Chicago, *Hill*, Sept., 1898; Eggleston, *Hill* 309 in 1898. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead* in 1843. HENDERSON CO. Oquawka, *Patterson*. LAKE CO. Lake Zurich, *Hill*, Sept., 1898. MENARD CO. Without locality, *Hall*. PEORIA CO. Peoria, *McDonald*, Sept., 1900. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1209 and 1266. WABASH CO. Mt. Carmel, *Schneck*, Sept., 1876 and Oct., 1887.

Two other species have been reported from Illinois, *S. junceus* (Higley and Raddin '91, p. 42) and *S. virginica* (*Vilfa virginica*, Patterson '76, 49; Flagg '78, 280; Brendel '87, 88). No specimens of either of these have been seen. The latter, as understood at present, is a seashore rush grass with long, stout rootstocks, and is not found inland.

27. AGROSTIS L.

Bent Grass

This genus includes both annual and perennial species. They are distinguished by the small one-flowered spikelets in which both glumes and lemma are thin, the glumes considerably the longer. The palea is minute or wanting in all Illinois species but *A. alba*. The inflorescence is always paniculate. The leaves are narrow, with conspicuous membranous ligules. *A. alba* is the only species of economic importance.

Lemma with a long awn; spikelets less than 2 mm. long. *A. elliotiana*

Lemma awnless; spikelets more than 2 mm. long.

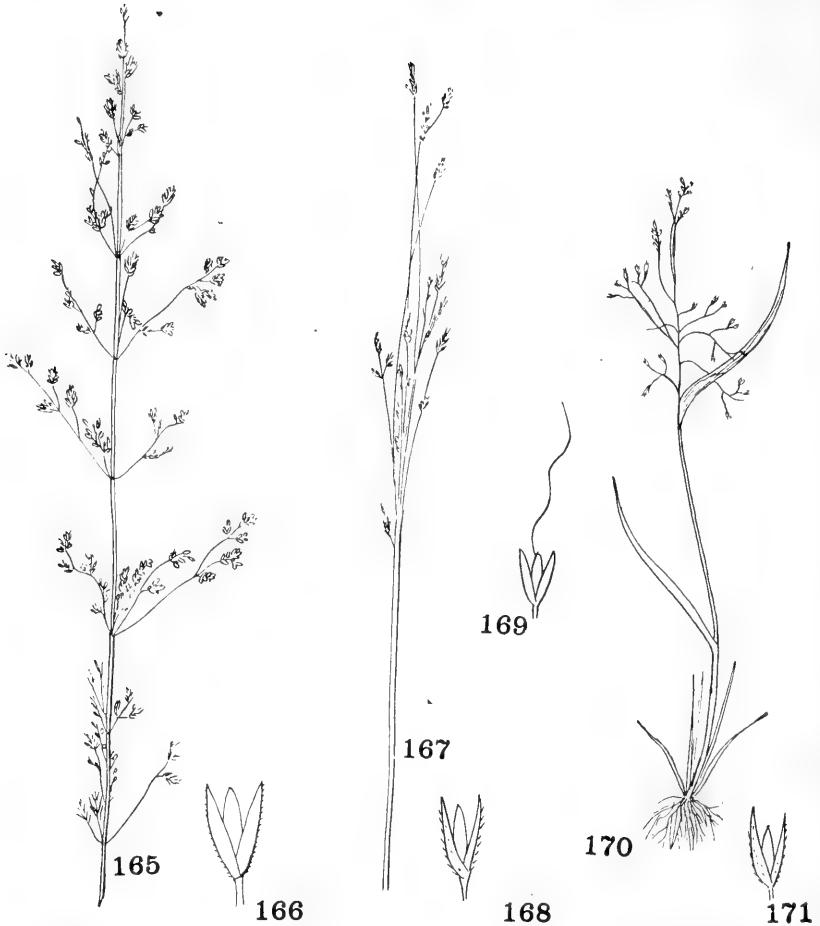
Palea at least half as long as the lemma.

A. alba

Palea minute or wanting.

Panicle branches spreading, usually whorled, the branches long and capillary, very rough, spikelet-bearing at the tips. *A. hyemalis*

Panicle branches ascending or spreading, but not whorled, nearly smooth, the spikelets not clustered at the tips of the branches. *A. perennans*



Figs. 165-171.—165, *A. alba*, inflorescence; 166, *A. alba*, spikelet; 167, *A. hymenalis*, inflorescence, immature; 168, *A. hymenalis*, spikelet; 169, *A. eliottiana*, spikelet; 170, *A. perennans*; 171, *A. perennans*, spikelet

Agrostis alba L.

Fiorin. White Bent. Redtop (Fig. 165)

Lapham '57, 545, 565; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Huett '97, 130; Gates '12, 355; Sherff '12, 420; Sherff '13, 594.

Culms 1 to 4 feet tall from creeping rootstocks; sheaths smooth, blades 2 to 8 inches long, 2 to 6 mm. wide, slightly rough; ligule membranous, usually 4 to 5 mm. long; panicle spreading, contracted after flowering; spikelets 2 to 2.5 mm. long, palea present, usually half as long as the lemma.

The earlier botanists of the state assert that this species is native here, and that it is found in moist situations in prairies, fields, roadsides, ditch banks, etc. It is one of the common pasture grasses and is also cultivated for hay. A low variety is cultivated as a lawn grass under the name of creeping bent.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Mosher*, June, 1913; Urbana, *Seymour*, July, 1878; Urbana, *Clinton* in 1893; Urbana, *Mosher*, June, 1913. COOK CO. Without locality, *Gates*, June, 1906; Evanston, *Shipman*, July, 1875. FULTON CO. Without locality, *Pepoon*; Canton, *Brendel*. JACKSON CO. Without locality, *Lapham*. JO DAVIESS CO. Warren, *Pepoon* 24. MACOUPIN CO. Carlinville, *Robertson*, May, 1881. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*; East St. Louis, *Eggert*, June, 1879. STARK CO. Wady Petra, *V. H. Chase* 56. WABASH CO. Without locality, *Schneck*, June, 1900; without locality, *Shearer*; Mt. Carmel, *Schneck*, June, 1892, 1900, 1904.

Agrostis alba vulgaris Thurb.

Agrostis vulgaris, Lapham '57, 545, 566; Babcock '73, 96; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63. *Agrostis alba* var *vulgaris*, Higley and Raddin '91, 142; Huett '97, 130; Cowles '00, 106.

This variety, on account of the many intergrading forms, is not easily distinguished from the species. It is usually found in dryer situations and is not so tall, from 9 to 18 inches being the average height. The panicle is smaller and usually more open and spreading. The leaves are smaller and the ligule is generally much shorter.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. CHAMPAIGN CO. Champaign, *Clinton* in 1888; Urbana, *Seymour*, June, 1880. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1889.

Agrostis elliottiana Schultes

Elliott's Bent Grass (Fig. 169)

Plants annual; culms slender, 5 to 12 inches tall, smooth; sheaths smooth; blades rough, .5 to 5 inches long, not over 2 mm. wide; ligule about 2 mm. long; panicle narrow, somewhat open, the branches delicate; spikelets about 1.5 mm. long, the lemma bearing a slender awn about 5 mm. long.

This is a southeastern species and rare in Illinois. It grows in dry soil. So far as known it is the only awned species of *Agrostis* in the state.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Shimer*, May, 1893. JOHNSON CO. Tunnel Hill, *Evelyn Ridgway*, May, 1900. ST. CLAIR CO. Mascoutah, *Welsch*.

Agrostis hyemalis (Walt.) B. S. P.

Hair Grass (Figs. 167 and 168)

Agrostis scabra, Lapham '57, 545, 564; Babcock '73, 96; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 143; Huett '97, 130.

Culms slender, smooth, 1 to 2 feet tall; leaves not numerous, mostly clustered at the base of the plant, sheaths smooth, the blades rough, 2

to 5 inches long, 1 to 3 mm. wide; panicle usually purplish, with spreading, capillary, whorled, very scabrous branches spikelet-bearing at the tips; spikelets 1.5 to 2 mm. long.

This species was very abundant on the prairies, especially in the poorer kinds of soil. It prefers dry soil and is usually found now in uncultivated fields, pastures, and woodland. The panicles are usually very large, somewhat resembling those of *Panicum capillare* and like them break off at maturity and roll before the wind.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Seymour*, July, 1880. COOK CO. Chicago, *Babcock*, July, 1873; Chicago, *Hill* 23 in 1891. JO DAVIESS CO. Without locality, *Pepoon* 177. JOHNSON CO. Tunnel Hill, *Schneck*, May, 1902. KANKAKEE CO. *Hill*, May, 1870. MCHENRY CO. Ringwood, *Vasey*. MACOUPIN CO. Carlinville, *Robertson*, June, 1882. MARION CO. Without locality, *Lapham*; Salem, *M. S. Bebb* in 1860. MARSHALL CO. Steuben township, *V. H. Chase* 1785. PEORIA CO. Peoria, *McDonald*; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 56, 1200, 1442. WABASH CO. Without locality, *Schneck*, June, 1901; without locality, *Shearer*; Mt. Carmel, *Schneck*, June, 1904; vicinity of Mt. Carmel, *Schneck* in 1879, 1881, and 1890.

***Agrostis perennans* (Walt.) Tuckerm.**

Thin Grass (Figs. 170 and 171)

Brendel '59, 585; *Vasey* '61, 671; *Babcock* '73, 96; *Patterson* '76, 49; *Flagg* '78, 280; *Brendel* '87, 63; *Higley and Raddin* '91, 142; *Sherff* '12, 49; *Sherff* '13, 594.

Culms usually very slender, erect or ascending from a decumbent base; sheaths smooth, blades rough, 2 to 6 inches long, 2 to 6 mm. wide, numerous, mostly erect; panicle variable, usually narrow and not spreading, pale green or sometimes purplish; the branches usually not whorled and not having the spikelets clustered at the ends, capillary and slightly roughened; spikelets 2 to 3 mm. long.

This species is exceedingly variable in its habit of growth, so that it is difficult to state definitely the differences between this species and *A. hyemalis*. In general, however, they are very easily distinguished. *A. perennans* grows in shady places and blooms mostly from August to October, while *A. hyemalis* blooms from May to July.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Gleason*, Sept., 1898; Urbana, *Clinton*, Sept., 1899 and Oct., 1895. COOK CO. Evanston, *Shipman*, Sept., 1875; Winnetka, *Sherff* 1915. FULTON CO. Canton, *Wolf*; Canton, *Brendel*. PEORIA CO. Princeville, *V. H. Chase* 1186; Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1899. ST. CLAIR CO. Mascoutah, *Welsch*. UNION CO. Cobden, *Seymour*, Aug., 1880. WABASH CO. Without locality, *Shearer*, Oct., 1901; Hanging Rock, *Schneck*; Crayfish creek, *Schneck*, Oct., 1897; Mt. Carmel, *Schneck*, Sept., 1877.

28. CALAMOVILFA Haek.

These are tall, reed-like grasses which have long, stout rootstocks. They are found mostly on the sandy shores of lakes and streams. The large, spreading panicles are composed of one-flowered spikelets with firm glumes, lemma, and palea, the callus densely bearded.

Calamovilfa longifolia (Hook.) Hack.

Long-leaved Reed Grass (Fig. 172)

Calamagrostis longifolia, Vasey '61, 671; Babcock '73, 97; Patterson '76, 50; Flagg '78, 250; Higley and Raddin '91, 143; Huett '97, 130; McDonald '00, 103. *Calamovilfa longifolia*, Gleason '07, 182; Gleason '10, 148; Gates '12, 355.

Culms single, not branched, smooth and stout, 1 to 6 feet tall; sheaths pubescent, at least near the base and on the margin; ligule a short fringe of hairs; blades 9 to 18 inches long, involute, pointed at the end; panicle 6 to 18 inches long; spikelets 6 to 7 mm. long.

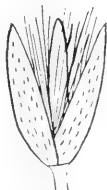
This grass is found in loose sands and is abundant along the shores of Lake Michigan, where it acts as a sand binder.

The typical form of the species, described from Saskatchewan, is a less robust plant having a narrow, strict panicle. Eggert's St. Clair collection is this typical form. The Oquawka and Lake Michigan specimens are the robust form with large, open panicles which have been distinguished as var. *magna* Scribn. and Merr.

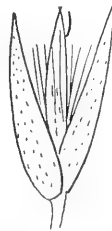
COOK CO. Without locality, along lake shore, Vasey; Evanston, Shipman, July, 1875; Chicago, Vasey; Chicago, Lansing, July, 1898; Chicago, Babcock, August, 1874. HENDERSON CO. Near Oquawka, Patterson. LAKE CO. Waukegan, Gleason and Shobe 322; north of Waukegan, Gates, 2920; Waukegan, Sherff. MASON CO. Without locality, M. S. Bebb. ST. CLAIR CO. Without locality, Eggert in 1882.



172



173



174



175

Figs. 172-175.—Spikelets: 172, *C. longifolia*; 173, *C. canadensis*; 174, *C. inezpansa*; 175, *A. arenaria*

29. CALAMAGROSTIS Adans.

Reed Bent Grass

These grasses are tall, with long, running rootstocks and panicles which resemble those of *Agrostis*, especially *A. alba*. The spikelets are one-flowered, the lemma and palea are thinner than the glumes, the lemma awned on the back and surrounded with long hairs from the short callus at its base. The leaves are long and narrow, the ligule membranous with ragged edges.

Panicle generally open; spikelets 3 to 3.5 mm. long; lemma smooth, the callus hairs about as long as the lemma. *C. canadensis*

Panicle narrow, constricted; spikelets 4 to 4.5 mm. long; lemma rough, callus hairs about three-fourths as long as the lemma. *C. inexpansa*

Calamagrostis canadensis (Michx.) Beauv.

Blue-joint Grass (Fig. 173)

Lapham '57, 545, 568 (Plate 1, Fig. 11); Babeock '73, 97; Patterson '76, 50; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 130; Huett '97, 130; Gates '12, 355; Sherff '12, 419; Sherff '13, 594.

Culms 2 to 5 feet tall, smooth or slightly rough; sheaths smooth; blades 6 to 18 inches long, 2 to 8 mm. wide, rough; panicle usually widely spreading, but sometimes with the branches erect; spikelets 3 to 3.5 mm. long, the lemma smooth with an inconspicuous awn, the callus hairs almost equaling and concealing the lemma.

This species is found in wet soil, such as swamps and bogs. It is said to make excellent hay.

ILLINOIS SPECIMENS: Without locality, *Mead*; Maynard, *A. Chase*, June, 1898. CHAMPAIGN CO. Champaign, *Seymour*, June, 1884; Champaign, *Waite*, June, 1886. COOK CO. Bryn Mawr, *Meyers*, 1910; Beverly Hills, *Robert Bebb*, Aug., 1904; Chicago, *Babeock*, Aug., 1872. JO DAVIESS CO. Without locality, *Pepoon* 48. HANCOCK CO. Augusta, *Mead* in 1843. HENDERSON CO. Oquawka, *Patterson*. KANKAKEE CO. Kankakee, *Hill*, June, 1870. LAKE CO. Lake Villa, *Gleason* and *Shobe* 116, 146, 224. LIVINGSTON CO. Emington, *Wilcox*, July, 1902. MCHENRY CO. Ringwood, *Vasey*. MACOUPIN CO. Carlinville, *Robertson*, July, 1883 and 1884. MENARD CO. Athens, *Hall*, June, 1866. OGLE CO. Oregon, *Waite*, July, 1885. PEORIA CO. Princeville, *V. H. Chase*, 1897; Peoria, *Brendel*; Akron, *V. H. Chase*, June, 1897. ST. CLAIR CO. Mascoutah, *Welsch*. WHITE CO. Carmi, *Schneck*, June, 1897. WINNEBAGO CO. Without locality, *M. S. Bebb*; Fountaindale, *M. S. Bebb*.

Calamagrostis inexpansa Gray

Bog Reed Grass (Fig. 174)

Culms slender, 2 to 4 feet tall; sheaths smooth; blades rough, 8 to 12 inches long, 4 mm. wide or less; panicle narrow but not very densely flowered; spikelets 4 mm. long, awns short, lemma rough, callus hairs about two-thirds the length of the lemma.

This species is found in low, wet places.

COOK CO. Hyde Park, Chicago, *Babeock*, July, 1873.

Calamagrostis cinnoides.—This species has been reported by Lapham (*C. coarctata*, '57, 545, 568) and by Flagg (*C. nuttalliana*, 78, 280). No specimens of this have been seen by the writer.

30. AMMOPHILA Host

The only species in this genus is a stout perennial with strong, creeping rootstocks. It is found along the shores of Lake Michigan, where it acts as a sand binder. This grass is able to push up to the surface again after being covered by shifting sand. The inflorescence

is a long, densely flowered, spike-like panicle, with one-flowered spikelets. The glumes, lemma, and palea are firm in texture, and the callus bears a ring of short hairs.

Ammophila arenaria (L.) Link

Sea Sand Grass. Psamma. Marram. Beach Grass (Fig. 175)

Calamagrostis arenaria, Vasey, '61, 671; Babcock '73, 97; Patterson '76, 50; Flagg '78, 280. *Ammophila arundinacea*, Higley and Raddin, '91, 143; Cowles, '00, 171. *Ammophila arenaria*, Gates '12, 355.

Culms smooth, 2 to 4 feet tall; sheaths smooth; blades 6 to 12 inches long, rough on the upper surface, narrowed and involute, ending in a sharp point; spikelets flattened and rough, 10 to 15 mm. long.

COOK CO. Shores of Lake Michigan, *Vasey*; shores of Lake Michigan, *Scammon*, Sept., 1860; Chicago, *Babcock*, July, 1874; Evanston, *Shipman*, July, 1879.

31. CINNA L.

Wood Reed Grass

These grasses are tall and slender, the culms growing singly or a few together. The inflorescence is of many-flowered panicles. The spikelets are one-flowered, flattened, and keeled, the glumes narrow; the lemma bears a minute awn just below the apex, but there are no hairs at the base. The palea is one-nerved or the two nerves are so close together as to appear one. The leaves are flat, the ligules brown, membranous, almost transparent, 5 to 6 mm. long.

Spikelets 3 to 4 mm. long; awn 1 to 2 mm. long; first and second glumes about equal.

Spikelets 5 to 6 mm. long; awn about .5 mm. long; first glume much shorter than the second.

C. latifolia

C. arundinacea

Cinna arundinacea L.

Indian Reed (Figs. 176 and 177)

Lapham '57, 545, 565; Babcock '73, 96; Patterson '76, 49; Flagg '78, 280; Brendel '87, 63; Higley and Raddin '91, 143.

Culms 2 to 5 feet tall, smooth; sheaths smooth; blades 6 to 12 inches long, 4 to 15 mm. wide, slightly roughened; panicle usually densely flowered, the numerous branches ascending, the ends nodding; spikelets 5 to 6 mm. long, the glumes unequal, rough, the lemma with a minute awn or awnless.

This grass is found in moist, shady situations, especially in the woods. It is said to furnish excellent hay where it grows abundantly along the borders of streams.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, Clinton, Sept., 1899; Urbana, *Seymour*, July, 1880; Urbana, *Seymour* and *Waite*, July, 1886. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. River Forest, *A. Chase*, Sept., 1900; Evanston, *Shipman*, Aug., 1875; Chicago, *Moffatt*, Aug., 1892. FULTON CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*. JACKSON CO. Without locality, *French* in 1878; without locality, *Lapham* in 1857.

JO DAVIESS CO. Without locality, *Pepoon* 48 and 462. KANE CO. Elgin, *Sherff*, Oct., 1909. MCHENRY CO. Algonquin, *Nason*, Aug., 1879. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MENARD CO. Athens, *Hall*, Sept., 1864. PEORIA CO. Glasford, *Wilcox*, Aug., 1902; Princeville, *V. H. Chase*, Sept., 1906; Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1894. WABASH CO. Without locality, *Schneck*, Sept., 1876; without locality, *Shearer*; Hanging Rock, *Schneck*, Sept., 1879; Mt. Carmel, *Schneck*, Sept., 1877.



Figs. 176-180.—176, *C. arundinacea*, inflorescence; 177, *C. arundinacea*, spikelet; 178, *C. latifolia*, inflorescence; 179, *C. latifolia*, spikelet; 180, *N. lanatus*, spikelet

Cinna latifolia (Trev.) Griseb.

Slender Wood Reed Grass (Figs. 178 and 179)

Cinna arundinacea var. *pendula*, Patterson '76, 49; Flagg '78, 280.

Culms 2 to 5 feet tall, smooth; sheaths smooth; blades 6 to 12 inches long, 10 to 15 mm. wide; panicle spreading, the slender branches often drooping; spikelets 3 to 4 mm. long; glumes nearly equal, rough; lemma with a short awn.

This species is found in damp woods. It is not so abundant as *C. arundinacea*.

KANE CO. Elgin, *Vasey*. LAKE CO. Beach, *Gates*, July, 1909.

32. NOTHOLCUS Nash

This grass was introduced from Europe and is fairly common in the eastern United States and on the Pacific coast. The spikelets are

two-flowered, the lower flower perfect, the upper staminate. The glumes and lemmas are thick, the palea very thin. The inflorescence is in dense panicles shaped something like those of *Agrostis*. The entire plant is covered with short, soft pubescence, hence the name velvet grass.

***Notholcus lanatus* (L.) Nash**

Velvet Grass. Meadow Soft Grass (Fig. 180)

Holcus lanatus, Gray's Manual, 7th ed.; Britton '07, 115.

Entire plants light green and velvety; culms 1 to 3 feet tall; sheaths shorter than the internodes; blades 1 to 6 inches long, 4 to 12 mm. wide, ligule membranous, 2 to 3 mm. long; spikelets flattened, about 4 mm. long, pubescent, the glumes longer than the lemmas.

This grass is perennial. It grows best in moist places, and will thrive in very poor soil. It is a rather pretty species, with its pale green foliage and pink-tinted panicles but it is not regarded as a valuable forage grass in most places where it has been introduced. In some parts of the West, however, it is much liked.

CHAMPAIGN CO. Urbana, *Burrill*, June, 1891.

33. SPHENOPHOLIS Scribn.

These grasses are tall, slender, tufted perennials with narrow panicles. The leaves are flat, usually very narrow; the ligule is membranous, fringed with fine hairs, and from 2 to 4 mm. long. The species are most easily determined by the shape of the glumes, the first being very narrow and pointed, the second much broader, obovate or wedge-shaped. The spikelets are 2- to 3-flowered, and longer than the glumes.

Second glume almost as broad as long, broadly obtuse or truncate at the apex, nearly equal in length to the first.

Second glume not nearly so broad as long, acute or narrowly obtuse at the end, longer than the first.

S. obtusata
S. pallens

***Sphenopholis obtusata* (Michx.) Scribn.**

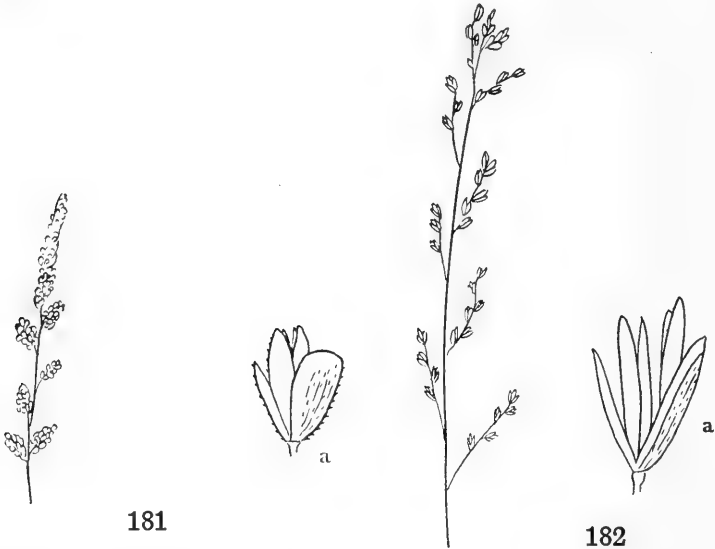
Blunt-scaled Sphenopholis (Fig. 181)

Eatonia obtusata, Lapham '57, 546, 575 (Plate 2, Fig. 10); Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 143; Huett '97, 130.

Culms 1 to 3 feet tall, smooth; leaves mostly clustered at the base of the plant, sheaths rough, often pubescent; blades 1.5 to 6 inches long, 2 to 6 mm. wide, slightly rough; panicle densely flowered, 2 to 6 inches long, often so narrow as to appear spike-like; spikelets 2.5 to 3 mm. long, the glumes strongly nerved and rough except on the smooth, shiny margin; lemmas similar in texture to the glumes; palea thin and transparent.

This species is found in dry soil. It was one of the species of the original prairie and is still found in many places in the state.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, Clinton, June, 1900; Champaign, *Gleason* 1006. COOK CO. Chicago, *Lansing* 272; Woodlawn, Chicago, *Lansing*, June, 1898; Englewood, *Hill*, July, 1875; South Chicago, *A. Chase*, July, 1901. CHRISTIAN CO. Taylorville, *Andrews*. FULTON CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead*, June, 1848. JO DAVIESS CO. East of Warren, *Pepoon* 8. KANKAKEE CO. Bourbonnais, *Hill* 83 in 1874. MACOUPIN CO. Carlinville, *Robertson*, May, 1884. MARION CO. Without locality, *M. S. Bebb* in 1860. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1156 and 1460. TAZEWELL CO. Without locality. *McDonald*, July, 1889. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Old Palmyra, *Schneck*, May, 1880; Mt. Carmel, *Schneck*, June, 1904.



Figs. 181-182.—181, *S. obtusata*, inflorescence, (a) spikelet; 182, *S. pallens*, inflorescence, (a) spikelet

***Sphenopholis pallens* (Spreng.) Scribn.**

(Fig. 182)

Eatonia pennsylvanica, Lapham '57, 546, 576; Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 143. *Sphenopholis pallens*, Sherff '12, 419; Sherff '13, 594.

Culms smooth, 1 to 3.5 feet tall; sheaths rough, sometimes pubescent; blades 2 to 7 inches long, 4 to 6 mm. wide, rough and sometimes with a few hairs; panicles loosely flowered, narrow, 3 to 7 inches long; spikelets 3 to 4 mm. long, glumes strongly nerved and rough except the margins; lemma firm; palea membranous, transparent.

This species was also found on the original prairie but in moist situations.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Burrill*, *Waite*, and *Seymour*, June, 1884; Champaign, *Waite*, June, 1886. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Glencoe, *Sherff*, June, 1911. HENDER-

SON CO. Oquawka, *Patterson*. MCHENRY CO. Algonquin, *Nason*, June, 1878. KANKAKEE CO. Kankakee, *Hill*, June, 1873. MACOUPIN CO. Carlinville, *Robertson*, June, 1884. MENARD CO. Without locality, *Hall* in 1874; Athens, *Hall* in 1864. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1889. STARK CO. Wady Petra, *V. H. Chase* 589. WABASH CO. Without locality, *Schneck*, May, 1879; without locality, *Shearer*; Patton, *Schneck*, June, 1900; Mt. Carmel, *Schneck*, June, 1881, 1900, 1904 and 1906; Old Palmyra, *Schneck*, June, 1900. WILL CO. Joliet, *Skeels*, June, 1904.

Sphenopholis pennsylvanica (L.) Hitchc.—This species is described as *Trisetum pennsylvanicum* in Britton's Manual (1907), where it is reported from Illinois. It was also reported from Illinois by several of the earlier authors as *Trisetum palustre*: Lapham '57, 548, 589; Patterson '76, 52; Flagg '78, 284 and Brendel '87, 88. It is also reported from Illinois in Gray's Manual (7th ed.) under the name *S. palustris* (Michx.) Scribn. No Illinois specimens are contained in the herbaria examined, nor are there any in the herbarium of the New York Botanical Garden or in the Gray Herbarium.

34. KOELERIA Pers.

This genus includes a single species which was found in dry places on the western prairies. It grows in large bunches, with narrow leaves and shining, spike-like panicles which are about the length of those of timothy, but are thicker, interrupted, and not quite cylindrical. The spikelets are 2- to 4-flowered, the glumes slightly shorter than the florets.

Koeleria cristata (L.) Pers.

(Fig. 184)

Lapham '57, 546, 575; Babcock '73, 97; Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 143; Gleason '10, 148; Gates '12, 355.

Culms 1 to 2.5 feet tall, densely short pubescent just below the panicle, otherwise smooth; leaves mostly clustered at the base; sheaths pubescent; ligules inconspicuous or lacking; blades 1 to 12 inches long, 1 to 5 mm. wide, generally rough and more or less pubescent, becoming involute when dry; panicle pale green and shining; spikelets rough, 4 to 5 mm. long.

ILLINOIS SPECIMENS: Without locality, *Vasey*; without locality, *Hall*; southern Illinois, *Lapham* in 1857. CHAMPAIGN CO. Champaign, *Waite*, June, 1886; Champaign, *Seymour*, June, 1884. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Rogers Park, *Johnson*, July, 1890. FULTON CO. Without locality, *Pepoon*. JACKSON CO. Makanda, *Gleason*, June, 1903. JO DAVIESS CO. Without locality, *Pepoon*, July, 1908; Hanover, *Gleason* and *Gates* 2533. KANKAKEE CO. Kankakee, *Hill*, 47 in 1871. KNOX CO. Williamsfield, *V. H. Chase* 1842. LAKE CO. Waukegan, *Gates* 2467; Beach, *Gates* 2763; Rockefeller, *Gates* 1740. MCHENRY CO. Algonquin, *Nason*, June, 1878. MACOUPIN CO. Carlinville, *Robertson*, June, 1884. MARION CO. Without locality, *M. S. Bebb* in 1860. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* 1382. PEORIA CO. Peoria, *McDonald*, June, 1890; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. East of Wady Petra, *V. H. Chase* 28; Wady Petra, *V. H. Chase* 1382 and 1496. WABASH CO. Without locality, *Shearer*.

35. *DESCHAMPSIA* Beauv.

This genus belongs to cold climates; only one species has been found in Illinois. The plants are perennial with short, very narrow or involute leaves clustered at the base, and, borne far above them, a loose, open panicle with shining spikelets, which are brown, tinged with purple. The spikelets are mostly 2- rarely 3-flowered, the glumes and lemmas thin, the lemma bearing an awn from near its base.

Deschampsia caespitosa (L.) Beauv.

Tufted Hair Grass (Figs. 183 and 185)

Aira caespitosa, Vasey '61, 671; Flagg '78, 284.

Culms in tufts 2 to 4 feet tall, smooth; sheaths smooth; ligule membranous, transparent, 3 to 5 mm. long; blades usually flat, becoming involute when dry, rough on the upper surface, 1 to 6 inches long, 2 to 3 mm. wide; panicle 4 to 8 inches long, usually half as wide, the branches not numerous, slender, rough and spikelet-bearing at the ends; spikelets 3.5 to 4 mm. long, the glumes usually as long as the lemma, the awn extending slightly beyond the glumes. This species is found in moist soil, usually along streams.

ILLINOIS SPECIMENS: Without locality, *Vasey* in 1861; northern Illinois, *Vasey*. KANE CO. Elgin, *Vasey*.

36. *AVENA* (Tourn.) L.

Oat

Two species of oat, both annuals, may be found in Illinois—the wild and the cultivated. The latter often escapes from cultivation and may be found in waste places, but it seldom establishes itself. The genus is distinguished by its large, open panicles with spikelets from half an inch to an inch long. The spikelets are 2- to 4-flowered, the many-nerved glumes longer than the lemmas, which usually bear a dorsal awn. The leaves are long and flat, the ligule membranous, 1 to 4 mm. long.

Lemmas pubescent; awn well developed, twisted at the base.
Lemmas smooth; awn, if present, small, usually straight.

A. fatua
A. sativa

Avena fatua L.

Wild Oat (Fig. 186)

Culms stout, 1 to 4 feet tall, smooth; sheaths usually smooth, sometimes slightly roughened near the blade, occasionally hairy; blades slightly roughened, 3 to 12 inches long, 4 to 14 mm. wide; panicle 4 to 12 inches long, usually narrow, the branches ascending; spikelets 22 to 25 mm. long, excluding the awns, the lemmas sparsely covered with long brown hairs, which are more numerous near the base; awn arising from near the middle of the lemma, twisted at base.

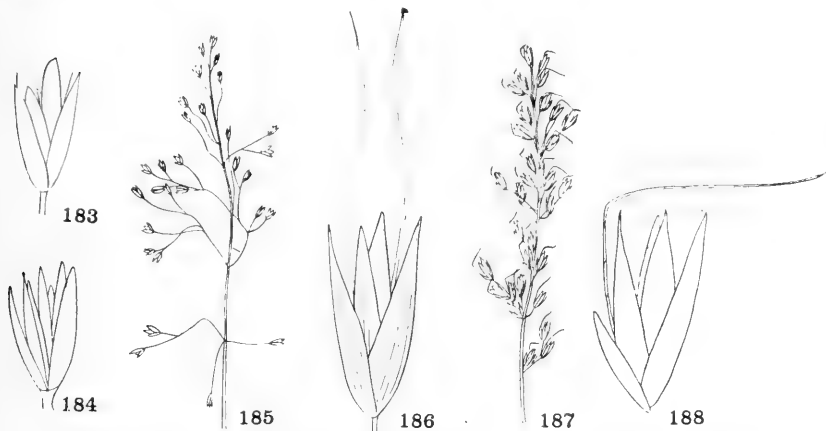
This species is a common weed in the West, but it has been reported from only one locality in Illinois.

DU PAGE CO. Naperville, *Umbach*, July, 1896 and 1898; Naperville, *Moffatt*, Aug., 1894.

Avena sativa L.

This species is too well known to need description. Under cultivation the awn is obsolete, but in specimens found in waste places, it is often fairly well developed. Such specimens may be distinguished from *A. fatua* by the nearly glabrous lemma.

CHAMPAIGN CO. Champaign, *Clinton*, July, 1900; Champaign, *Seymour*, July, 1880. COOK CO. Chicago, *Lansing*, July, 1898. LAKE CO. Channel lake, *Haynes*, Aug., 1905. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*.



Figs. 183-188.—183, *D. caespitosa*, spikelet; 184, *K. cristata*, spikelet; 185, *D. caespitosa*, inflorescence; 186, *A. fatua*, spikelet; 187, *A. elatius*, inflorescence; 188, *A. elatius*, spikelet

37. *ARRHENATHERUM* Beauv.

Oat Grass

This genus is commonly called oat-grass on account of its spikelets, which closely resemble those of the oat but are considerably smaller. The plants are perennial with long, flat leaves and narrow panicles. The spikelets are 2-flowered, one floret perfect, awnless or with a short awn, the other staminate, awned, the awn bent, twisted near the base.

Arrhenatherum elatius (L.) Beauv.

Tall Oat Grass. Randall Grass (Figs. 187 and 188)

Culms smooth, 3 to 4 feet tall; sheaths smooth; blades rough, 2 to 12 inches long, 2 to 8 mm. wide; ligule membranous, about 1 mm. long, panicle 4 to 12 inches long, narrow, the branches ascending; spikelets 7 to 8 mm. long, the lemma rough, its awn about twice as long.

This species was introduced from Europe as a meadow grass. It often escapes from cultivation. So far as known it has never been extensively cultivated in Illinois.

CHAMPAIGN CO. Urbana, *Burrill*, July 1878. COOK CO. Hyde Park, *Hill* 217 in 1894. PEORIA CO. Peoria, *McDonald*, July, 1903.

38. DANTHONIA DC.

This genus is distinguished by its narrow, spike-like panicles which consist of very few spikelets. The leaves are mostly clustered at the base, very short, narrow, and usually involute. The spikelets are 3- to 8-flowered, the florets usually all perfect. The glumes are much longer than the lemmas, usually extending beyond all the florets. The lemmas are toothed at the end with a flat, twisted awn between the teeth. Only one species is found in Illinois.

Danthonia spicata (L.) Beauv.

Wild Oat Grass (Figs. 191 and 192)

Lapham '57, 547, 589 (Plate 4, Fig. 1); Patterson '76, 52; Flagg '78, 283; Brendel '87, 64; Higley and Raddin '91, 143; Huett '97, 130; Sherff '12, 420; Sherff '13, 595.

Culms smooth, 8 to 28 inches tall; sheaths usually pubescent especially at the throat; ligule very short, mostly a fringe of hairs, 1 to 2 mm. long; blades narrow, somewhat curled, usually involute, 1 to 6 inches long, 1 to 2 mm. wide; spikelets 10 to 12 mm. long, 3- to 8-flowered, the glumes smooth, the lemmas pubescent, 4 to 5 mm. long; awn longer than the lemma.

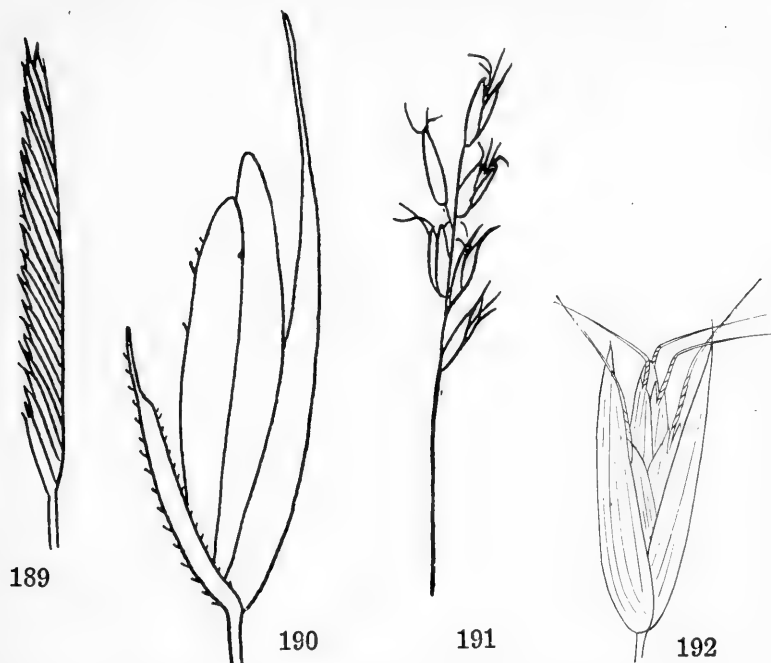
This species grows in small tufts. It is found in dry, usually sterile soil.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Seymour* and *Waite*, July, 1886. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. West Chicago, *Umbach*, June, 1897; Evanston, *Gates*, June, 1900; Beverly Hills, *R. Bebb*, June, 1902. FULTON CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead* in 1845. JACKSON CO. Without locality, *French*, May, 1905; Mankanda, *Gleason*, June, 1903. JO DAVIESS CO. Without locality, *Pepoon*. MACOUPIN CO. Carlinville, *Robertson* in 1881. MARION CO. Without locality, *M. S. Bebb* in 1860. MARSHALL CO. Steuben township, *V. H. Chase* 1789. PEORIA CO. Peoria, *McDonald* 28; Peoria, *McDonald*, June, 1887; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. UNION CO. Cobden, *Waite*, June, 1885. VERMILION CO. Muncie, *Mosher*, Sept., 1914. WILL CO. Joliet, *Skeels*, July, 1904, Mokena, *A. Chase*, June, 1897.

39. SPARTINA Schreb.

Cord or Marsh Grass

These grasses are tall, coarse perennials with stout, creeping rootstocks, found in marshes and sloughs and along the borders of streams and lakes. The inflorescence consists of spikes formed of 1-flowered, flattened spikelets which closely overlap each other on one side of the rachis.



Figs. 189-192.—189, *S. michauxiana*, inflorescence; 190, *S. michauxiana*, spikelet; 191, *D. spicata*, inflorescence; 192, *D. spicata*, spikelet

Spartina michauxiana Hitchc.

Slough Grass. Fresh Water Cord Grass (Figs. 189 and 190)

Spartina cynosuroides, Lapham '57, 545, 571 (Plate 2, Fig. 3); Babcock '73, 97; Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 138; Huett '97, 128; Gleason '07, 182. *Spartina michauxiana*, Gleason '10, 148; Gates '12, 355; Gleason '12, 45; Sherff '13, 595.

Culms smooth, 3 to 6 feet tall; sheaths smooth; ligule mostly a fringe of hairs 2 to 3 mm. long; blades sharp-pointed, 2 to 4 feet long, 6 to 15 mm. wide, rough along the edges and usually involute when dry; spikes 1 to 4 inches long; spikelets 7 to 9 mm. long, the first glume about half as long as the awned second glume.

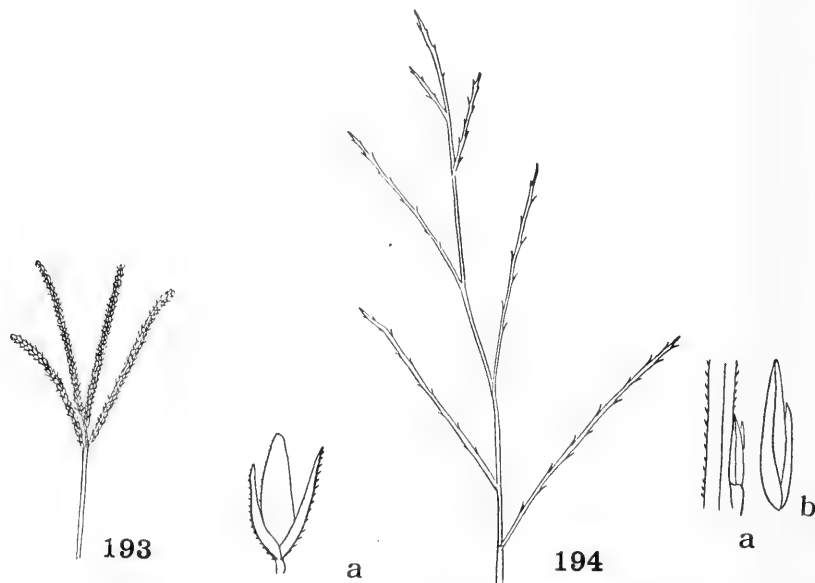
This is one of the native grasses that appear to be almost as abundant today as when the country was first settled. If cut early it makes fairly good hay. Its rootstocks make it valuable also as a sand binder.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Without locality, *Percival*; Savoy, *Gibbs*, Sept., 1898; near Mahomet, *Burrill* and *Seymour*, Aug., 1880. COOK CO. Hyde Park, Chicago, *Babcock*, July, 1874; Thornton, *Hill*, July, 1865. CHRISTIAN CO. Taylorville, *Andrews*. DU PAGE CO. Wheatland, *Umbach*, July, 1909. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *De Selm*, Aug., 1913; Kankakee, *Hill*, July, 1873. LAKE CO. Beach, *Umbach*, July, 1909; Lake

Villa, *Gleason* and *Shobe* 226; beach area near Waukegan, *Gates* 2913. MENARD CO. Athens, *Hall* in 1861. OGLE CO. Oregon, *Waite*, Aug., 1888. PEORIA CO. Peoria, *McDonald*; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 708. WABASH CO. Without locality, *Shearer*; Keensburg, *Schneck*, Aug., 1880; Mt. Carmel, *Schneck*, Oct., 1906. WILL CO. Joliet, *Skeels*, Aug., 1904.

40. CAPRIOLA Adans.

This genus belongs to the Old World; one species has been introduced into the southern states, where it is now very common. It does not grow very tall. The inflorescence, much like that of crab grass, consists of several digitate spikes. It spreads by creeping rootstocks under the surface or by runners on top, and in soft, mellow soil it grows very large and coarse, making a troublesome weed. In firm soil it is fine and makes a good lawn or pasture grass. The spikelets are one-flowered, flattened, the glumes shorter than the lemma.



Figs. 193-194.—193, *C. dactylon*, inflorescence, (a) spikelet; 194, *S. paniculatus*, inflorescence, (a) portion of rachis and spikelet, (b) spikelet

Capriola dactylon (L.) Kuntze

Bermuda Grass. Scutch Grass (Fig. 193)

Cynodon dactylon, Huett '97, 130.

Culms 4 to 24 inches high, smooth; sheaths smooth or sometimes pubescent; ligule very short, mostly a fringe of hairs; blades short, pointed, 1 to 4 inches long, 2 to 4 mm. wide, more or less roughened; inflorescence in spikes, 3 to 6, spread out finger-like, the spikelets sessile

along one side of a slender, flat rachis; spikelets 2 to 2.5 mm. long, the lemmas hairy on the keel.

This grass may be easily identified by its pale, gray-green foliage and its creeping habit. It does not seem to be very extensively introduced into Illinois. Mr. R. Pike of St. Jacob, who sent some to the University for identification, reports that it started a very few years ago in that locality and has spread at a very rapid rate. Care should be taken not to allow it to obtain a foothold in cultivated fields.

COOK CO. Chicago, *Moffat*, Sept., 1895. MADISON CO. St. Jacob, *Pike*, May, 1915. WABASH CO. Mt. Carmel, *Schneck*, July, 1898.

41. *SCHEDONNARDUS* Steud.

In this genus the inflorescence consists of long, narrow spikes arranged alternately along an angled axis, the rachis hollowed out on the sides, the one-flowered, narrow, sessile spikelets appressed in the hollows. The leaves are short and narrow and usually clustered at the base. The plants are annuals.

Schedonnardus paniculatus (Nutt.) Trel.

(Fig. 194)

Lepturus paniculatus, Lapham '57, 547, 585 (Plate 3, Fig. 6); Patterson '76, 51; Flagg '78, 282; Brendel '87, 88.

Culms in tufts, rough, 8 to 18 inches tall; sheaths flattened, smooth or slightly rough; ligule membranous, pointed; blades flat, rough, 1 to 4 inches long, 1 to 2 mm. wide; spikes arranged alternately, the axis and rachises sharply angled; spikelets 3 to 4.5 mm. long, rough.

It is extremely improbable that this species is now found in Illinois. It was found on the original prairie, especially around salt licks.

ILLINOIS SPECIMENS: Without locality, *Vasey*. HANCOCK CO. Augusta, *Mead*; Deer Lick, Augusta, *Mead*, Aug., 1845.

42. *BOUTELOUA* Lag.

Mesquite Grass. Grama Grass

These grasses are perennial and on the original prairie were important grazing grasses. The inflorescence consists of small, one-sided spikes composed of spikelets sessile on a narrow rachis, which is sometimes prolonged beyond the spikelets. The spikelets are usually 2-flowered but only the lower floret is perfect. The glumes are unequal, keeled, and usually shorter than the lemmas. The leaves are short and narrow, often involute. The ligules are very short and inconspicuous.

Inflorescence of numerous short spikes arranged on each side of the axis, drooping on slender peduncles.

B. curtispindula

Inflorescence of 1 to 3 spikes usually on one side of the stem, ascending.

Rachis of the spike projecting beyond the spikelets in a prominent point; keel of the second glume pubescent, the hairs from prominent black papillae; the sterile lemma not with a tuft of hairs at the base. *B. hirsuta*
 Rachis of the spike not projecting beyond the spikelets; keel of the second glume glabrous or with few hairs, these not from papillae; sterile lemma with a tuft of hairs at the base. *B. gracilis*



Figs. 195-199.—195, *B. curtipendula*, inflorescence; 196, *B. hirsuta*, inflorescence; 197, *B. gracilis*, spikelet; 198, *B. hirsuta*, spikelet; 199, *B. curtipendula*, spikelet

***Bouteloua curtipendula* (Michx.) Torr.**

Tall Grama Grass, Mesquite Grass. Side-oat. Grama
 (Figs. 195 and 199)

Chloris curtipendula, Michaux '03, 59. *Atheropogon apludioides*, Engelmann '44, 104; Lapham '57, 546, 572. *Bouteloua curtipendula*, Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Huett '97, 130. *Atheropogon curtipendulus*, Gleason '07, 182. *Bouteloua curtipendula*, Gleason '10, 148.

Culms 1 to 3 feet tall, smooth; sheaths smooth, hairy at the throat; blades slightly rough, sometimes pubescent at base, 2 to 12 inches long, 2 to 4 mm. wide; spikes short, numerous, arranged on either side of the axis, each consisting of from 5 to 8 spikelets; spikelets 7 to 10 mm. long.

This was one of the important grasses of the prairie and it is still found thruout the state. It is an excellent forage grass.

CASS CO. Chandlerville, *Seymour*, Aug., 1886. CARROLL CO. Savanna, *A. Chase* 1886. CHAMPAIGN CO. Experiment Station, Urbana, *Clinton*, Oct., 1897. COOK CO. Summit, *Umbach*, July, 1901; Palatine, *Gates* 1895.2. DU PAGE CO. Without locality, by railroad track, *Moffatt*, Aug., 1891. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*, Aug., 1908; HENDERSON CO. Oquawka, *Patterson*. KANKAKEE CO. Kankakee, *De Selm*, Oct., 1913; Kankakee, *Hill*, July, 1874. MCHENRY CO. Algonquin, *Nason*, Aug., 1878. MASON CO. Manito, *Wilcox*, July, 1902; Havana, *Gleason*, Aug., 1903. MENARD CO. Athens, *Hall* in 1862 and 1864. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1887; Princeville, *V. H. Chase* 1875. OGLE CO. Oregon, *Waite*, Sept., 1887. ST. CLAIR CO. Mascoutah, *Welsch*. WILL CO. Troy township, *Hill*, Sept., 1906; Joliet, *Skeels*, Sept., 1904. WINNEBAGO CO. Fountaindale, *M. S. Bebb*. WOODFORD CO. Kappa, *Seymour*, Sept., 1879.

***Bouteloua gracilis* H. B. K.**

(Fig. 197)

Bouteloua oligostachya, *Patterson* '76, 50; *Flagg* '78, 281; *Brendel* '87, 88; *Gleason* '10, 149.

Culms erect, 6 to 20 inches tall; sheaths smooth; blades smooth, 1 to 5 inches long, about 2 mm. wide, often involute; spikes 1 to 3, 2 to 5 cm. long; spikelets 5 to 6 mm. long; glumes narrow, the first about half as long as the second, which is glabrous or has a few long hairs on the keel; fertile lemma split up into three points at the summit, each of these with a short awn; sterile lemma with two lobes at the end and three short awns, with a tuft of long hairs at the base.

This species has the general appearance of *B. hirsuta*. It is a prairie species found in the same situations as the other species of the genus, tho it is much less common.

JO DAVIESS CO. Without locality, *Pepoon* 173.

***Bouteloua hirsuta* Lag.**

Hairy Mesquite. Black Grama (Figs. 196 and 198)

Atheropogon papillus, *Engelmann* '44, 104. *Chondrosium hirtum*, *Lapham* '57, 571 (Plate 2, Fig. 4). *Bouteloua hirsuta*, *Vasey* '61; *Patterson* '76, 50; *Flagg* '78, 281; *Brendel* '87, 88; *McDonald* '00, 103; *Gleason* '10, 148.

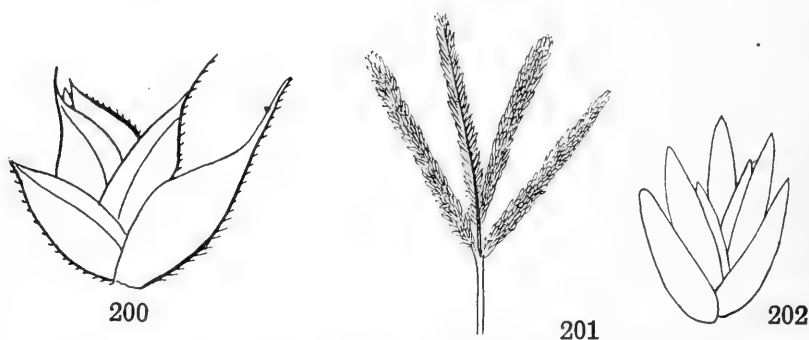
Culms 8 to 20 inches tall, the leaves crowded at the base; sheaths usually smooth, sometimes prominently papillose-pubescent; blades 1 to 5 inches long, 2 to 3 mm. wide, sparsely ciliate on the margins, usually involute when dry; spikes single or at most 2 or 3, 1 to 2 inches long, the rachis extending as a prominent point beyond the spikelets; spikelets 5 to 6 mm. long, the glumes with prominent, usually black papillae, bearing long hairs, the lemma split up into three awn-like points, the sterile floret bearing three awns.

This species is found on sandy prairie ground, tho it does not extend as far north as *B. curtipendula*. Like that species it is a good forage grass.

ILLINOIS SPECIMENS: Without locality, *Vasey*; without locality, *Mead* in 1845; along the Mississippi river, *Wilcox*. CASS CO. Beardstown, *Geyer*, Aug., 1862. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon* 160. HENDERSON CO. Without locality, *Patterson*, Aug., 1871; Oquawka, *Patterson*, Sept., 1872. MASON CO. Without locality, *Bebb* in 1861; without locality, *Hall* in 1861; Manito, *Wilcox*, July, 1902; Havana, *Gleason*, Aug., 1903. MENARD CO. Athens, *Hall* in 1860. OGLE CO. Oregon, *Waite*, Aug., 1884.

43. DACTYLOCTENIUM Willd.

One species of this genus was introduced from the warmer parts of the Old World and is found in the southern part of the state. Both in habit and in general appearance it is somewhat like *Eleusine indica*, having spikes arranged in the same manner (Fig. 201). It may readily be distinguished by the prolonged rachis which forms a point beyond the spikelets. The spikelets are flattened, 3- to 5-flowered, sessile. The glumes are broad and keeled, the lemmas sharply pointd. The leaves are flat and narrow.



Figs. 200-202.—200, *D. aegypticum*, spikelet; 201, *E. indica*, inflorescence; 202, *E. indica*, spikelet

Dactyloctenium aegypticum (L.) Willd.

Egyptian Grass. Crowfoot Grass (Fig. 200)

Lapham '57, 546, 572; Patterson '76, 50; Flagg, '78, 281.

Culms 6 inches to 2 feet tall, usually spreading and rooting at the lower nodes; sheaths very loose, smooth; blades 3 to 6 inches long, 2 to 6 mm. wide, usually pubescent near the base, especially along the edge; spikelets 3 to 4 mm. long.

This grass is an annual and is found mostly in waste places. It has been reported from several localities, altho but a single specimen has been seen by the writer.

ST. CLAIR CO. Along railway track, *Eggert*, Aug., 1876.

44. **ELEUSINE** Gaertn.

Grasses belonging to this genus are not native to America, and only one species has been introduced into Illinois. It has an inflorescence of spikes, spreading out finger-like at the top of the culm, as have common crab grass and Bermuda grass (Figs. 29 and 193). The spikelets each have several flowers, arranged in two rows on each side of the stem. The glumes are flattened and keeled and shorter than the spikelet. The leaves are flat, the ligules practically wanting.

Eleusine indica (L.) Gaertn.

Wire Grass. Goose Grass. Yard Grass. Crow's Foot
(Figs. 201 and 202)

Lapham '57, 546, 573 (Plate 2, Fig. 5); Patterson '76, 50; Flagg '78, 281.

Culms 6 inches to 2 feet tall, in large tufts, often spreading; sheaths loose, hairy at the throat; blades 3 to 12 inches long, 2 to 6 mm. wide, usually smooth; spikes 1 to 3 inches long; spikelets 3- to 6-flowered, 4 to 5 mm. long.

This grass is found as a weed in dooryards and waste places, where it often spreads and forms a dense mat on the surface which is extremely hard to cut. The plants are annuals, introduced from the warmer countries of the Old World. They may be eradicated by the same method used for crab grass, *Syntherisma sanguinalis*. Dr. Brendel collected it in 1873 in Peoria. His record was the first for that locality.

CHAMPAIGN CO. Champaign, *Seymour*, July, 1880; Urbana, *Mosher*, July, 1914; Urbana, *Gibbs*, Oct., 1898; Urbana, *Gates*, Oct., 1907; Urbana, *Burrill*, Sept., 1878. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *Umbach*, Aug., 1898. EDWARDS CO. Albion, *Waite*, Aug., 1887. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, Aug., 1877. KANKAKEE CO. Kankakee, *De Selm*, Sept., 1913. MACOUPIN CO. Carlinville, *Robertson* in 1881. MARION CO. Without locality, *M. S. Bebb* in 1860. PEORIA CO. Without locality, *Brendel*; Peoria, *McDonald*, Aug., 1885 and 1900. POPE CO. Herod, *Clinton*, Aug., 1898. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, Aug., 1879; Hurd's Ferry, *Schneck*, June, 1904; Mt. Carmel, *Patterson*, Sept., 1877.

45. **LEPTOCHLOA** Beauv.

The species of *Leptochloa* may be recognized by their peculiar inflorescence consisting of a large, open panicle formed of numerous very slender spikes. The spikelets are several-flowered, flattened, with keeled glumes and lemmas. The leaves are flat, the ligules membranous, 3 to 4 mm. long, irregular on the edge, and fringed. Two species, both annuals, were found on the original prairie in Illinois, but they are probably rare in the state at present.

Sheaths pubescent; spikelets minute, usually 1.5 to 2 mm. long; the first floret not longer than the second glume. *L. filiformis*

Sheaths smooth, spikelets 2.5 to 8 mm. long; first floret always longer than the second glume, which is about 3 mm. *L. fascicularis*

Leptochloa fascicularis (Lam.) Gray

(Fig. 205)

Festuca polystachya, Michaux '03, 66. *Leptochloa fascicularis*, Lapham '57, 546, 573; Patterson '76, 50; Flagg '78, 281. *Diplachne fascicularis*, Brendel '87, 88.

Culms in tufts, smooth, 8 to 24 inches tall, occasionally taller; sheaths smooth; blades 3 to 10 inches long, 2 to 10 mm. wide; spikes 3 to 5 inches long, the whole inflorescence 6 to 20 inches long; spikelets 7- to 11-flowered, with very short stalks, glumes unequal, the second about 3 mm. long; lemmas short awned, about 4 mm. long, ciliate on the margin near the base.

Michaux first found this plant in Illinois. It grows on wet prairie soil, along ditches, and in damp meadows.

ILLINOIS SPECIMENS: Southern Illinois, *Brendel*; ponds in Illinois near St. Louis, *Smith*; near Cahokia Mound, *Ward*, Aug., 1878. MACOUPIN CO. Carlinville, *Robertson*, July, 1882. ST. CLAIR CO. Without locality, *Brendel* in 1850; Mascoutah, *Welsch*. WABASH CO. Without locality, *Schneck*, July, 1880; near L. E. and St. L. railway, *Schneck*, June, 1900.



Figs. 203-207.—203, *L. filiformis*, inflorescence; 204, *L. filiformis*, spikelet; 205, *L. fascicularis*, spikelet; 206, *P. communis*, inflorescence; 207, *P. communis*, spikelet

Leptochloa filiformis (Lam.) Beauv.

(Figs. 203 and 204)

Leptochloa mucronata, Lapham '57, 546, 573; Patterson '76, 50; Flagg '78, 281.

Culms smooth, 16 inches to 4 feet tall; sheaths papillose-pubescent; blades smooth or slightly pubescent underneath, 4 to 10 inches long, 2 to 10 mm. broad; spikes 2 to 4 inches long, the whole inflorescence 4 to 12 inches long; spikelets small, 1 to 2.5 mm. long; glumes subequal, as long as the first floret, lemma awnless.

This species occurs in drier places than does *L. fascicularis*. It is usually found in fields.

ILLINOIS SPECIMENS: Without locality, *Hall*; wet places in Illinois, *Eggert*, Sept., 1877; southern Illinois, *Brendel*. MENARD CO. Athens, *Hall* in 1873. PULASKI CO. Mound City, *Vasey*. WABASH CO. Without locality, *Schneck*, July, 1880.

46. **PHRAGMITES** Trin.

These tall reed-like perennials rarely perfect seed, but spread by rootstocks which run for many feet underground. The inflorescence is of large panicles of 3- to 7-flowered spikelets, the rachilla joints densely covered with long, white, silky hairs. The leaves are rather broad and thick, narrowed to a sharp point. The ligules are short and thick, edged with a fringe of short hairs sparsely interspersed with long ones.

Phragmites communis Trin.

Reed (Figs. 206 and 207)

Lapham '57, 547, 584 (Plate 3, Fig. 4); Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 143; Huett '97, 130; Cowles '00, 155; Sherff '12, 418; Gates '12, 355; Sherff, '12, 418.

Plants smooth thruout; culms stout, 4 to 12 feet tall; sheaths overlapping, blades 6 to 12 inches long, 1 to 5 cm. wide; panicle 6 to 12 inches long, yellowish brown; spikelets 12 to 15 mm. long; first floret usually staminate, its lemma longer than that of the other florets.

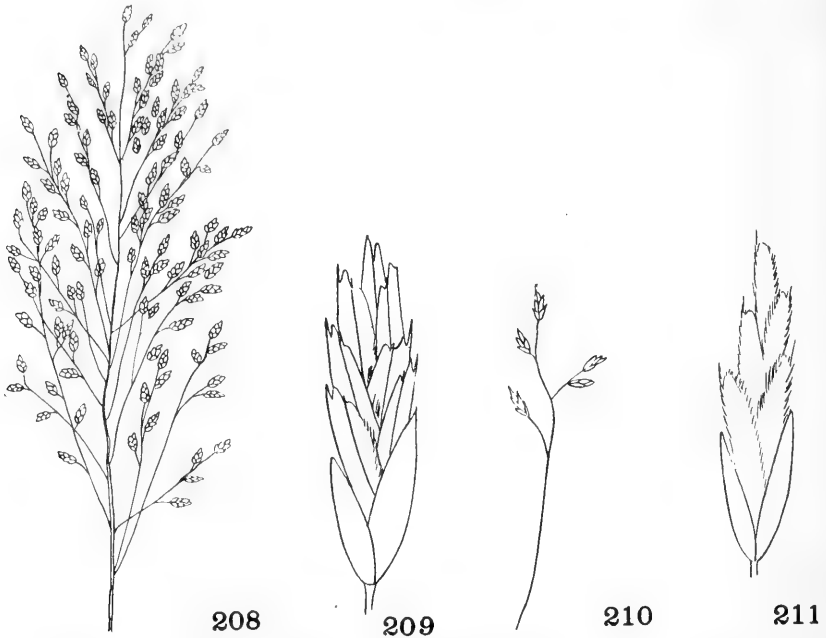
The plants are found in wet places, along the edges of ditches, ponds, etc., and in swamps.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Rantoul, *Clinton*, Sept., 1897. COOK CO. Chicago, *Babcock*, Sept., 1874; Evanston, *Shipman* in 1875; Colehour, *Hill*, Sept., 1876. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. LAKE CO. Beach, *Gates*, 3166; Fox lake, *Waite*, Sept., 1887; Lake Villa, *Gleason* and *Shobe*, Aug., 1906. LIVINGSTON CO. Emington, *Wilcox*, July, 1902. MCHENRY CO. Algonquin, *Nason*. OGLE CO. Oregon, *Waite*, Sept., 1886. PEORIA CO. Peoria, *McDonald*, Sept., 1890; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*; French Village, *Eggert*, Sept., 1892.

47. **TRIDENS** Roem. and Schult.

In this genus the spikelets are 5- to 8-flowered, with nearly all the florets perfect. The lemmas have a short awn at the apex with a sharp

tooth on each side, and the midnerve and lateral nerves are densely hairy for about half their length. The leaves are flat, long, and narrow; the ligule is a fringe of short hairs.



Figs. 208-211.—208, *T. flavus*, inflorescence; 209, *T. flavus*, spikelet; 210, *T. purpurea*, inflorescence; 211, *T. purpurea*, spikelet

***Tridens flavus* (L.) Hitchc.**

Tall Redtop (Figs. 208 and 209)

Poa seslerioides, Michaux '03, 68. *Tricuspis seslerioides*, Lapham '57, 546, 574 (Plate 2, Fig. 7); Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Gleason '07, 182. *Tridens flavus*, Gleason '10, 149.

Culms slightly flattened, smooth, 3 to 6 feet tall; sheaths hairy at the throat; blades rough, 4 to 12 inches long, 6 to 12 mm. wide, narrowed to a sharp point at tip; panicle 6 to 18 inches long, the long branches drooping, usually deep purple, sometimes reddish; spikelets 7 to 8 mm. long.

This species is very striking and handsome with its large purple panicles. It has a yellow form, but no Illinois specimens of this have been seen. When in bloom, the panicle, axis, and branches are covered with a viscid, oily substance, which makes them very sticky. This species was one of the grasses of the original prairie, and is still quite abundant thruout the state.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. ADAMS CO. Quincy, *Bebb*, July, 1860. CASS CO. Chandlerville, *Scymour*, Aug., 1886. CHRISTIAN CO. Taylorville, *Andrews*. HENDERSON CO. Oquawka, *Patterson*. JACKSON CO. Carbondale, *Scymour*, Aug., 1880. JERSEY CO. Grafton, *Scymour*. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1895 and Sept., 1903. ST. CLAIR CO. Without locality, *Eggert*, Sept., 1886; Mascoutah, *Welsch*. UNION CO. Cobden, *Scymour*, Aug., 1880. WABASH CO. Without locality, *Shearer*.

48. *TRIPLISIS* Beauv.

These grasses are perennials with small panicles of 2- to 6-flowered spikelets which have the three nerves of the lemma, as well as the palea, densely hairy. The glumes are unequal and keeled, the lemmas are toothed at the end, somewhat like *Tridens*. The leaves are long, very narrow, and usually involute. The ligule is a fringe of hairs 1 to 2 mm. long.

Triplasis purpurea (Walt.) Champ.

Sand Grass (Figs. 210 and 211)

Tricuspis purpurea, Patterson '76, 50; Flagg '78, 281. *Triplasis purpurea*, Brendel '87, 88. *Tricuspis purpurea*, Gleason '10, 149.

Culms in tufts 1 to 2 feet high, smooth; sheaths loose, shorter than the internodes; blades small, rough on the upper surface, 1 to 3 inches long, not over 3 mm. wide, usually involute; panicles 1 to 3 inches long, usually purplish, late in the season inclosed in the upper sheaths; spikelets 5 to 8 mm. long, the awn of the lemma very short.

This grass is most abundant in sandy places, being first reported in Illinois from sandy prairies and barrens.

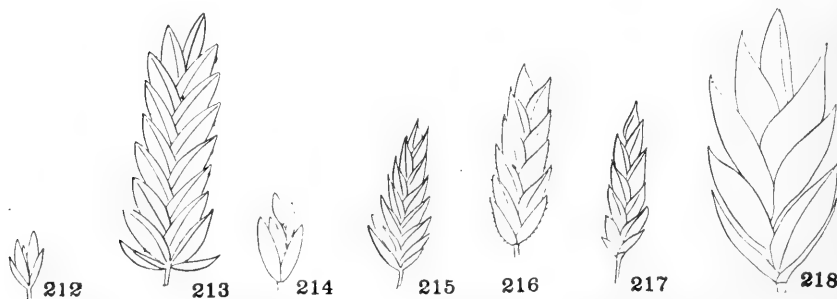
ILLINOIS SPECIMENS: Without locality, *Vasey*. CASS CO. Beardstown, *McDonald*, Sept., 1901. HENDERSON CO. Oquawka, *Patterson*, Sept., 1872. MASON CO. Without locality, *Wolf*. WABASH CO. Hanging Rock, *Schneck*, Oct., 1900; Mt. Carmel, *Schneck*, Oct., 1876.

49. *ERAGROSTIS* Beauv.

These grasses vary considerably in habit. There are both annual and perennial species. The panicles are composed of 2- to many-flowered spikelets. The glumes are keeled and shorter than the florets. The leaves are generally flat and narrow; the ligule is composed of a row of hairs. Owing to the great variation in the number of florets in a spikelet, the same species may present a very different appearance under different conditions and at different seasons of the year. *Eragrostis hypnoides* is dioecious; the lemmas of the pistillate flowers are always slightly narrower and more pointed than those of the staminate. The lemmas of many species fall with the grain when it is ripe, leaving the paleas attached to the rachilla.

- a. Culms erect or ascending, not creeping along the ground and rooting at the nodes.
- b. Spikelets usually less than 5-flowered, 2 to 3 mm. long.

- c. Spikelets on capillary pedicels which are at least 5 mm. long; plants branched at the base; length and breadth of the panicle approximately equal. *E. capillaris*
- cc. Spikelets borne on stiff pedicels which are less than 5 mm. long; plants branched from above the base; panicles much longer than broad. *E. frankii*
- bb. Spikelets usually more than 5-flowered, 5 to 16 mm. long.
 - c. Plants usually less than 18 inches tall, in dense tufts, often spreading; panicles small, densely flowered, with short branches; annuals, usually gray-green in color.
 - d. Spikelets 1.5 mm. or less in width, without glandular spots; throat of sheath and bases of lower panicle branches densely pubescent. *E. pilosa*
 - dd. Spikelets 2 to 3 mm. wide, the keels of the glumes and lemmas and their pedicels with glandular spots; throat of sheath and bases of lower panicle branches not densely pubescent. *E. cilianensis*
 - cc. Plants usually more than 18 inches tall; panicles large, loosely flowered, purplish or yellowish; perennials.
 - d. Panicles purplish, a conspicuous tuft of hairs in the axils; lemmas 1.5 to 2 mm. long. *E. pectinacea*
 - dd. Panicles yellowish, often tinged with purple; axils naked; lemmas 2.5 to 3 mm. long. *E. trichodes*
- aa. Culms creeping along the ground, rooting at the nodes; an annual of wet places. *E. hypnoides*



Figs. 212-218.—Spikelets: 212, *E. capillaris*; 213, *E. cilianensis*; 214, *E. frankii*; 215, *E. hypnoides*; 216, *E. pectinacea*; 217, *E. pilosa*; 218, *E. trichodes*

***Eragrostis capillaris* (L.) Nees**

(Fig. 212)

Lapham '57, 581; Patterson '76, 51; Flagg '78, 281; Brendel '87, 64; Huett '97, 130.

Culms branched at the base, simple above, growing in tufts, 6 to 24 inches tall; sheaths smooth or sparsely pubescent; blades 3 to 10 inches long, 2 to 4 mm. wide, with a few hairs near the base; ligule a fringe of hairs, 1 to 2 mm. long; panicle usually nearly the whole length of the plant, always more than half, diffuse, the branches capillary, the pedicels mostly over 5 mm. long; spikelets 2- to 4-flowered, 2 to 3 mm. long.

This delicate species is native to Illinois. It resembles *E. frankii* more than any other species, but its panicle is always longer. It is found in dry sandy soil.

ILLINOIS SPECIMENS: Without locality, *Hall*; Spoon river, *Brendel* in 1859; Carson, *Eggert* in 1878. CHRISTIAN CO. Taylorville, *Andrews*. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead* in 1843. LAKE CO. Channel lake, *Haynes*, Aug., 1905. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1882. PEORIA CO. Peoria, *McDonald*, Aug., 1892 and 1897; Peoria, *Brendel*. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*; Hanging Rock, *Schneck*, Sept., 1904; Mt. Carmel, *Schneck*, July, 1900.

Eragrostis cilianensis (All.) Link

Candy Grass. Stink Grass. Snake Grass (Fig. 213)

Eragrostis megastachya, Lapham '57, 547, 580. *E. poaeoides* var. *megastachya*, Babcock '73, 97; Patterson '76, 51; Flagg '78, 281; Higley and Raddin '91, 144. *Eragrostis major*, Huett '97, 130.

Culms 8 to 24 inches tall, usually spreading; sheaths shorter than the internodes, hairy at the throat; blades rough on the upper surface, 2 to 6 inches long; ligule a ring of hairs 1 to 3 mm. long; panicle dark gray-green, 2 to 6 inches long; spikelets 5 to 25 mm. long, 10- to 40-flowered; lemmas 2 to 2.5 mm. long; pedicels and keels of the glumes and lemmas glandular.

This grass is abundant everywhere in the state. It was introduced into the United States from Europe and is a well-known weed in gardens and waste places. It is easily controlled by thoro cultivation. The glands on the spikelets give out a strong and rather disagreeable odor.

COOK CO. Hyde Park, Chicago, *A. Chase* 1182; Rogers Park, *Johnson*, July, 1890; Chicago, *A. Chase*, Aug., 1899; Chicago, *Babcock*, Aug., 1874; Evanston, *Johnson*, Sept., 1888; Chicago, *Lansing* in 1897; Hyde Park, Chicago, *Lansing*, July, 1898. CHAMPAIGN CO. Without locality, *Percival*, Nov., 1876; Urbana, *Seymour*, June, 1880; Urbana, *Mosher*, Sept., 1913; Urbana, *Clinton*, Aug., 1895; Urbana, *Gibbs*, Sept., 1898; Champaign, *Mosher*, Aug., 1913. CHRISTIAN CO. Taylorville, *De Motte*; Taylorville, *Andrews*. DU PAGE CO. Hinsdale, *Smith*, Aug., 1902. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson* in 1871. KANE CO. Elgin, *Sherff* 1790. KANKAKEE CO. Kankakee, *Reecher*, Aug., 1899. LAKE CO. Channel lake, *Haynes*, Aug., 1905. MCHENRY CO. Algonquin, *Nason*, Aug., 1878; Ringwood, *Vasey*. MASON CO. Havana, *Burrill* and *Clinton*, June, 1894. PEORIA CO. Peoria, *McDonald*, Aug., 1904; Peoria, *Brendel*; Peoria, *V. H. Chase* 125. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, Oct., 1902.

Eragrostis frankii (Fisch. Mey. and Lall.) Steud.

(Fig. 214)

Lapham '57, 547, 580; Babcock '73, 97; Patterson '76, 51; Flagg '78, 281; Brendel '87, 64; Higley and Raddin '91, 144; Huett '97, 130; Sherff '13, 595.

Culms sometimes erect, but often spreading and forming a dense

tuft, 6 to 16 inches tall; sheaths smooth; ligule a ring of short hairs with longer hairs at the margin; blades 2 to 5 inches long, 2 to 4 mm. wide, rough on the upper surface; panicle spreading, usually dark gray-green, the pedicels less than 5 mm. long, giving the panicle a denser appearance than in *E. capillaris*; spikelets 3- to 5-flowered, 2 to 3 mm. long, lemmas about 1.5 mm. long.

These plants are generally much smaller than those of *E. capillaris*, which it resembles considerably. It is also a darker green with denser panicles and grows in rather damp places, altho it is found along roadsides and various waste places.

ILLINOIS SPECIMENS: Without locality, *Vasey*; Cahokia, *Eggert*, Sept., 1878. CHAMPAIGN CO. Mahomet, *Burrill* and *Seymour*, Aug., 1880; Urbana, *Clinton*, Sept., 1895; Urbana, *Gibbs*, Sept., 1898. COOK CO. Grand Crossing, *A. Chase*, Sept., 1902; Evanston, *Johnson*, Sept., 1886. FULTON CO. Canton, *Wolf*. MCHENRY CO. Ringwood, *Vasey*; Algonquin, *Nason*, Aug., 1879. MACON CO. Decatur, *Clokey*, Aug., 1897. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MENARD CO. Without locality, *Hall*. PEORIA CO. Peoria, *McDonald*, Aug., 1897 and 1899; Peoria, *Brendel*. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1260. WABASH CO. Without locality, *Shearer*, July, 1900; Mt. Carmel, *Schneck*, Oct., 1900. WINNEBAGO CO. Fountaingdale, *M. S. Bebb*.

Eragrostis hypnoides (Lam.) B. S. P.

Creeping *Eragrostis* (Fig. 215)

Poa reptans, Michaux '03, 69. *Eragrostis reptans*, Lapham '57, 547, 580 (Plate 2, Fig. 13); Babcock '73, 97; Patterson '76, 51; Brendel '87, 64; Higley and Raddin '91, 144; Huett '97, 130. *Eragrostis hypnoides*, Gleason '12, 44; Sherff '13, 595.

Culms creeping along the ground and rooting at the nodes, 8 to 20 inches long; sheaths hairy at the throat; blades 1 to 2 inches long, 1 to 2 mm. wide, rough above; spikelets smooth or sparsely pubescent, 10- to 35-flowered, 5 to 15 mm. long, lemmas about 2.5 mm. long, the nerves very prominent.

This grass is found in wet places, generally along the margins of ditches, rivers, lakes, etc. It prefers sandy soil.

ILLINOIS SPECIMENS: Northern Illinois, *M. S. Bebb* in 1858; Eagle I., Mississippi bottoms, *Patterson* in 1871; Cahokia Mound, *Ward*, Aug., 1878. CHAMPAIGN CO. Urbana, *Waite*, Sept., 1884; Urbana, *Clinton*, Sept., 1895. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Palos Park, *Umbach*, Sept., 1909. DU PAGE CO. Naperville, *Umbach*, Sept., 1899. FULTON CO. Without locality, *Pepoon*. JO DAVIES CO. Without locality, *Pepoon*, Aug., 1908. HENDERSON CO. Banks of Mississippi near Oquawka, *Patterson*, Sept., 1871. KANE CO. Elgin, banks of Fox river, *Umbach*, July, 1895. LAKE CO. Skokie marsh near Waukegan, *Sherff*, Aug., 1911; Channel lake, *Haynes*, Aug., 1905. MCHENRY CO. Ringwood, *Vasey*. MADISON CO. Without locality, *Eggert*, Sept., 1886. PEORIA CO. Peoria, *McDonald*, Sept., 1900; Peoria, *Brendel*. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Near Wady Petra, *V. H. Chase*, Aug., 1897. WABASH CO. Without locality, *Shearer*, Aug., 1899; Banks of Wabash at Hurd's Ferry, *Schneck*, Oct., 1888; banks of Wabash river at Grand Rapids, *Schneck*, Oct., 1880; Mt. Carmel, *Schneck*, Oct., 1900; Mt. Carmel, *Waite*, Aug., 1887.

Eragrostis pectinacea (Michx.) Nees

Purple Eragrostis (Fig. 216)

Poa pectinacea, Michaux '03, 69; Engelmann '44, 104. *Eragrostis spectabilis*, Lapham '57, 547, 581; Patterson '76, 51. *Eragrostis pectinacea*, Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 144; Huett '97, 130; Gleason '07, 182; Gleason '10, 149.

Culms 1 to 3 feet tall, simple; sheaths usually sparsely pubescent but often smooth, bearded at the throat; blades 4 to 12 inches long, 4 to 8 mm. wide, rough above, pubescent near the base; panicles purple, large and spreading, with a conspicuous tuft of hairs in the axils, sometimes partially included in the upper sheaths; spikelets on long, stiff pedicels, 5- to 15-flowered, 3 to 8 mm. long; lemmas 1.5 to 2 mm. long.

This grass is very conspicuous in the autumn, with its large purple panicles. These often break off and blow before the wind like tumbleweeds. It prefers dry soil.

ILLINOIS SPECIMENS: Without locality, *Hall*; without locality, *Vasey*. CASS CO. Chandlerville, *Scymour*, Aug., 1886. CHAMPAIGN CO. Urbana, *Clinton*, Aug., 1895; Urbana, *Mosher*, Oct., 1912. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon* 413. HENDERSON CO. Oquawka, *Patterson* in 1872. MACOUPIN CO. Carlinville, *Robertson*. MASON CO. Sand hills, *Wolf*; Manito, *Wilcox*, July, 1902. MENARD CO. Athens, *Hall*, Sept., 1861 and 1864. OGLE CO. Oregon, *Waite*, Aug., 1884. PEORIA CO. Peoria, *McDonald*, Aug., 1887, 1900 and 1905; Peoria, *Brendel*; Princeville, *V. H. Chase* 757. UNION CO. Cobden, *Scymour*, Oct., 1881. WABASH CO. Without locality, *Schneck*, Aug., 1880; without locality, *Shearer*; Mt. Carmel, *Schneck*, Aug., 1880.

Eragrostis pilosa (L.) Beauv.

(Fig. 217)

Lapham '57, 547, 580; Babcock '73, 97; Patterson '76, 51; Flagg '78, 281; Higley and Raddin '91, 144; Huett '97, 130.

Culms erect, branched at the base, 6 to 18 inches tall; sheaths with long hairs at the throat, otherwise smooth; blades 1 to 5 inches long, 2 to 3 mm. wide; panicle open but rather narrow, usually a tuft of long hairs at the base of the lower branches; spikelets narrow, 5- to 18-flowered, 4 to 9 mm. long; lower lemmas 1.5 mm. long.

This is the commonest species of *Eragrostis* in Illinois; it is found in waste places everywhere.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CASS CO. Chandlerville, *Hall*, Aug., 1880. CHAMPAIGN CO. Urbana, *Clinton*, Sept., 1895; Urbana, *Mosher*, Oct., 1913; Champaign, *Clinton*, Sept., 1899; Champaign, *Scymour*, July, 1880. COOK CO. Riverside, *Moffatt*, Aug., 1891; Evanston, *Johnston*, Aug., 1889; Ravenswood, Chicago, *Gates*, Aug., 1906; Hyde Park, Chicago, *A. Chase*, Aug., 1899; Chicago, *Babcock*, Sept., 1874. JO DAVIESS CO. Without locality, *Pepoon* 927. KANE CO. Elgin, *Sherff* 1791. KANKAKEE CO. Kankakee, *De Selm*, Aug., 1913. MCHENRY CO. Ringwood, *Vasey*; Algonquin, *Nason*, Aug., 1879. MACON CO. Decatur, *Clokey*, Aug., 1897. MACOUPIN CO. Carlinville, *Robertson*, July, 1879. MENARD CO. Athens, *Hall* in 1862 and 1864. PEORIA CO. Peoria, *Brendel* in 1859; Peoria, *McDonald*, Aug., 1887. PIATT CO. Deland, *Scymour*, Sept., 1889. ROCK ISLAND CO. Rock Island, *McDonald*, July, 1893. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. *V. H. Chase* 124 and 1544. UNION CO. Cobden, *Scymour*,

Aug., 1880; Anna, *Seymour*, Aug., 1880. WABASH CO. Without locality, *Shearer*, Aug., 1897; Hurd's Ferry, *Schneck*, July, 1871; Mt. Carmel, *Schneck*, Sept., 1879; Belmont, *Schneck*, Aug., 1889.

***Eragrostis trichodes* (Nutt.) Nash**

(Fig. 218)

Eragrostis tenuis, Lapham '57, 547, 581; Patterson '76, 51; Flagg '78, 281; Brendel '87, 88; Higley and Raddin '91, 144; McDonald '00, 103. *Eragrostis trichodes*, Gleason '07, 182; Gleason '10, 149.

Culms erect, 2 to 5 feet tall; sheaths long, overlapping one another, smooth, hairy at the throat; blades 4 to 30 inches long, 2 to 6 mm. wide, slightly rough on the upper surface, stiff and pointed at the tip; panicles much longer than wide, spreading and open, the spikelets borne on long, hair-like pedicels; spikelets usually yellowish, 3- to 10-flowered, lemmas 2.5 to 3 mm. long.

This species is found abundantly in the dry, sandy areas thruout the state.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Brendel* in 1861; Carson, *Eggert*, May, 1878. CASS CO. Beardstown, *McDonald*, Aug., 1892; Chandlerville, *Seymour*, Aug., 1886. CHRISTIAN CO. Taylorville, *Andrews*. HENDERSON CO. Without locality, *Patterson*; near Oquawka, *Patterson*, Sept., 1871. LA SALLE CO. Starved Rock, *Waite*, Aug., 1884. MADISON CO. Without locality, *Eggert*, Aug., 1878. MASON CO. Without locality, *Wolf*; Havana, *Trelcase* in 1914. MENARD CO. Athens, *Hall* in 1861.

Engelmann ('44, p. 104) cites *Poa hirsuta*, now *E. hirsuta*, as occurring in the state, but no specimens of this have been seen, and it is doubtful whether the species was correctly determined. Higley and Raddin ('91, p. 144) cite *Eragrostis minor*, a European species but sparingly introduced into this country. Out of many specimens labeled *E. minor* in collections which were examined, not one proved to be correctly determined; all were small specimens of *E. cilianensis*.

50. MELICA L.

Melic Grass

These grasses are perennials with paniculate inflorescence. The spikelets are large, from 7 to 12 mm. long. The glumes and lemmas are thin and papery, with a broad, transparent margin which is considerably roughened. The spikelets are 2- to several-flowered, the upper sterile lemmas reduced to club-shaped or hood-like rudiments (Fig. 222). The leaf sheaths are closed and the blades are long and narrow with long membranous ligules.

Glumes nearly equal in length and almost or quite as long as the 2-flowered spikelet; panicle simple or but little branched. *M. mutica*

Glumes unequal and considerably shorter than the spikelet, which is usually 3-flowered; panicle compound, the branches spreading. *M. nitens*

Melica mutica Walt.

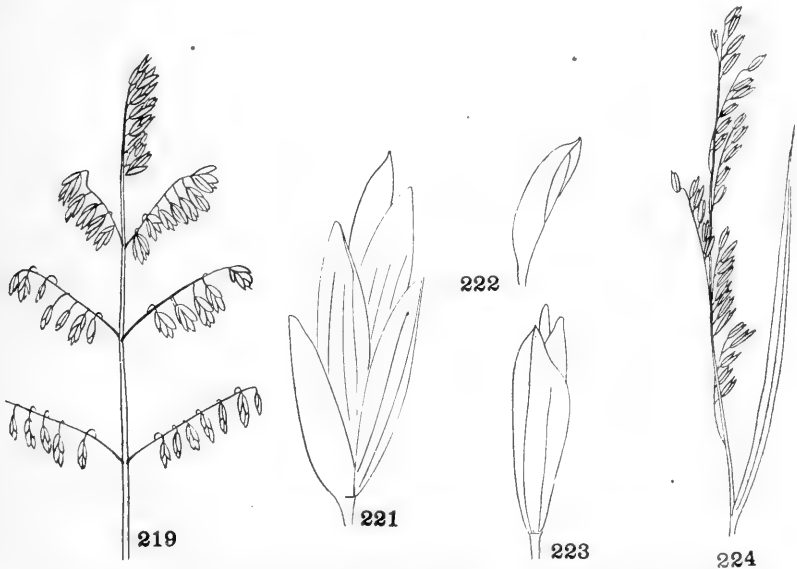
Narrow Melic Grass (Figs. 223 and 224)

Melica speciosa, Engelman '44, 103. *M. mutica*, Lapham '57, 576; Flagg '78, 281; Brendel '87, 63; Huett '97, 130.

Culms erect, 2 to 3 feet tall, slender; sheaths usually overlapping; blades rough, 4 to 8 inches long, 2 to 10 mm. wide; panicles narrow with short, ascending branches, or reduced to a raceme; spikelets 7 to 10 mm. long, rough, nodding; lemmas 6 to 8 mm. long; both glumes and lemmas with thin, whitish margins; glumes nearly equal, almost or quite as long as the floret.

This species is usually found in open woods.

HENDERSON CO. Oquawka, *Patterson*. MACOUPIN CO. Without locality, *Robertson*. MARION CO. Without locality, *Lapham*. PEORIA CO. Peoria, *Brendel*.



Figs. 219-224.—219, *M. nitens*, inflorescence; 221, *M. nitens*, spikelet; 222, *M. nitens*, sterile lemma; 223, *M. mutica*, spikelet; 224, *M. mutica*, inflorescence

Melica nitens Nutt.

Tall Melic Grass (Figs. 219, 221, and 222)

Culms 2.5 to 4 feet tall, rather stout; sheaths smooth, blades 4 to 8 inches long, 4 to 8 mm. wide; panicle usually spreading, with numerous spikelets; spikelets 10 to 12 mm. long, usually 3-flowered; lemmas 7 to 9 mm. long, rough with thin, transparent border; glumes unequal and the first glume shorter than the second, both considerably shorter than the spikelet.

This species is much more abundant than *M. mutica* in Illinois. It is probable that the two species have been confused. *M. mutica* is a smaller and more delicate plant, but the species are most readily distinguished by the spikelet characters.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Lemont, *Hill*, June, 1899. JOHNSON CO. Tunnel Hill, *Schneck*, May, 1902. KANKAKEE CO. Kankakee, *Hill* 27 in 1872. MACON CO. Decatur, *Clokey*, May, 1899. OGLE CO. Oregon, *Waite*, June, 1885. PEORIA CO. Peoria, *McDonald*, June, 1885, and 1894; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. SANGAMON CO. Springfield, *M. S. Bebb*. STARK CO. Near Wady Petra, *V. H. Chase* 1092. VERMILION CO. Muncie, *Mosher*, June, 1914. WABASH CO. Without locality, *Schneck*, June, 1895 and 1901; without locality, *Shearer*, June, 1895. WILL CO. Joliet, *Hill* 11 in 1907.

51. DIARINA Raf.

This genus is easily distinguished by its large spikelets with large, hardened, shiny lemmas. The plants are perennial with long, creeping rootstocks and simple culms. The leaves are stiff, rather broad, and nearly as long as the culm. The ligule is membranous and very short. The spikelets are 3- to 5-flowered, but the upper florets bear no seed.

Diarina festucoides Raf.

(Figs. 225 and 226)

Diarrhena americana, Engelmann '44, 103. *Diarrhena diandra*, Lapham '57, 546, 574 (Plate 2, Fig. 8). *Diarrhena americana*, Babcock '73, 97; Patterson '76, 50; Flagg '78, 281; Brendel '81, 63; Higley and Raddin '91, 144; Huett '97, 130.

Culms erect, 3 to 4 feet tall; sheaths smooth; blades usually roughened, 8 to 30 inches long, 10 to 18 mm. wide; panicles narrow, few-flowered, 4 to 10 inches long; spikelets 10 to 16 mm. long, lemmas usually brown.

This species is found in rich, damp woods.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, Oct., 1895. CHRISTIAN CO. Taylorville, *Andrews*. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. MENARD CO. Without locality, *Hall*, Aug., 1868. JO DAVIESS CO. Without locality, *Pepoon*. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Along Spoon river, *V. H. Chase* 1539. TAZEWELL CO. Without locality, *McDonald*, July, 1889. VERMILION CO. Muncie, *Mosher*, May, 1814. WABASH CO. Banks of the Wabash river, *Schneck*, July, 1904; Mt. Carmel, *Schneck*, Sept., 1880; Mt. Carmel, *Patterson*, Sept., 1877.

52. UNIOLA L.

Spike Grass

This typically southern genus is represented by a single species in Illinois. The plants are very striking, with broad leaves and an open, drooping panicle of large flattened spikelets. The spikelets are 6- to 12-flowered, 1 to 4 of the lower lemmas being empty. This species is found in shaded woods and thickets. It is most distinctive and perhaps the most beautiful grass found in Illinois.

Uniola latifolia Michx.

Broad-leaved Spike Grass (Fig. 227)

Lapham '57, 547, 583 (Plate 3, Fig. 3); Patterson '76, 51; Flagg '78, 282; Brendel '87, 88.

Culms erect, smooth, 2 to 5 feet tall; sheaths smooth, shorter than the internodes; ligule membranous, the edges erose, about 1 mm. long; blades 4 to 10 inches long, 5 to 20 mm. wide, sharply pointed at the apex, the edges rough and often ciliate near the base; panicle branches slender, drooping with the weight of the large spikelets; spikelets 15 to 30 mm. long, the lemmas 9 to 12 mm. long, keeled, ciliate on the keel.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*. CHRISTIAN CO. Taylorville, *Andrews*. JACKSON CO. Makanda, *Seymour*, Aug., 1880. KANKAKEE CO. Kankakee, *Hill*, June, 1870. MACON CO. Decatur, *Clokey*, Aug., 1896. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. MENARD CO. Athens, *Hall* in 1868. POPE CO. Herod, *Clinton*, July, 1898. PULASKI CO. Mound City, *Brendel*. ST. CLAIR CO. Without locality, *Brendel*, Aug., 1850; Mascoutah, *Welsch*. UNION CO. Cobden, *Seymour* 37. WABASH CO. Without locality, *Shearer*; Old Palmyra, *Schneck*, Aug., 1904; Hanging Rock, *Schneck*, Oct., 1900; Mt. Carmel, *Schneck*, July, 1879.



Figs. 225-229.—225, *D. diandra*, inflorescence; 226, *D. diandra*, spikelet; 227, *U. latifolia*, inflorescence; 228, *D. glomerata*, spikelet; 229, *D. glomerata*, inflorescence

53. DACTYLIS L.

This European genus is represented in Illinois by a single species, *D. glomerata*. It is distinguished by the peculiar form of the panicle which is composed of one-sided clusters of densely crowded spikelets at the ends of the stiff, naked branches. The branches spread at flowering, but contract at maturity. The spikelets are 2- to 5-flowered, flattened; the lemmas are ciliate and awn-pointed. The leaves are long and narrow, the ligule thin and membranous, 1 to 5 mm. long.

Dactylis glomerata L.

Orchard Grass. Cock's-foot (Figs. 228 and 229)

Lapham '57, 546, 575 (Plate 2, Fig. 9); Babcock '73, 97; Patterson '76, 50; Flagg '78, 281; Higley and Raddin '91, 144; Huett '97, 130.

Culms rough, 2 to 4 feet tall, in large tufts; sheaths rough, somewhat flattened and keeled; blades flat, usually rough on both surfaces, 3 to 9 inches long, 1 to 6 mm. wide; panicles 3 to 6 inches long, branches stiff, the spikelets clustered at the ends; spikelets 3- to 4-flowered; lemmas 4 to 6 mm. long, rough, ciliate on the keel.

This grass is cultivated extensively as a forage grass. It grows well in shady places. It is a perennial grass which soon becomes permanently established, being found in waste places thruout the state.

CHAMPAIGN CO. Urbana, *Burrill*, June, 1878; Urbana, *Clinton*, June, 1897. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Evanston, *Shipman*; Winnetka, *Sherff* 1924. DU PAGE CO. Naperville, *Umbach*, May, 1896. FULTON CO. Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Reecher*, July, 1908; Kankakee, *De Selm*, June, 1913. LAKE CO. Ravinia, *Gates* 1698.1. MACON CO. Decatur, *Clokey*, May, 1899. MACOUPIN CO. Carlinville, *Robertson*, May, 1883. PEORIA CO. Peoria, *McDonald*, June, 1896; Peoria, *Brendel*. ST. CLAIR CO. Without locality, *Brendel*; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 57. WABASH CO. Mt. Carmel, *Schneck*, July, 1888. WILL CO. Joliet, *Skeels*, June, 1904.

54. POA L.

This genus includes a large number of species in the cooler parts of the country. The plants are mostly perennials, but two of our common species are annuals. The spikelets are 2- to 6-flowered, usually in open panicles like those of the well-known Kentucky blue grass. Nearly all our species have a tuft of cobwebby hairs at the base of the lemma. The leaves are narrow, and have a boat-shaped tip; the ligules are membranous, sometimes 4 or 5 mm. long.

- a. Culms less than a foot tall, low, tufted, winter annuals.
 - b. Lemmas webbed at the base, apparently 3-nerved, the intermediate nerves obscure. *P. chapmaniana*
 - bb. Lemmas not webbed at the base, distinctly 5-nerved, the nerves all prominent. *P. annua*
- aa. Culms normally much over a foot tall; perennial grasses.
 - b. Lemmas with all the nerves smooth. *P. debilis*
 - bb. Lemmas with some of the nerves pubescent.
 - c. Intermediate nerves of the lemma prominent.
 - d. Midnerve pubescent for its whole length or nearly so; the second glume two-thirds the length of the spikelet. *P. sylvestris*
 - dd. Midnerve never pubescent for its whole length; second glume never two-thirds the length of the spikelet.
 - e. Plants with long, creeping rootstocks; spikelets usually less than 5 mm. long; panicle branches spikelet-bearing below the middle. *P. pratensis*
 - ee. Plants without rootstocks; spikelets 5 or 6 mm. long; panicle branches spikelet-bearing at the ends only. *P. wolfii*
 - cc. Intermediate nerves of the lemma obscure.
 - f. Marginal nerves smooth; glumes narrow. *P. alsodes*

ff. Marginal nerves pubescent; glumes broad.

g. Stems strongly flattened; plants with long, creeping rootstocks; nerves of lemma with short pubescence near base; panicle usually narrow. *P. compressa*

gg. Stems not flattened; plants without creeping rootstocks; nerves of lemma with long pubescence near base; panicle spreading. *P. palustris*



Figs. 230-233.—Spikelets; 230, *P. alsodes*; 231, *P. annua*; 232, *P. chapmaniana*; 233, *P. compressa*

***Poa alsodes* Gray**

Grove Meadow Grass (Fig. 230)

Patterson '76, 51; Flagg '78, 281; Brendel '87, 88.

Culms 1 to 2 feet tall; sheaths smooth; the upper often inclosing the base of the panicle; blades 6 to 12 inches long, 2 to 5 mm. wide; panicle branches in whorls; spikelets 2- to 3-flowered, about 5 mm. long, the lemmas faintly nerved, the midnerve long pubescent near the base, the marginal and intermediate nerves smooth.

This species is apparently rare in Illinois. It grows in shady places in woods and groves.

CHAMPAIGN CO. Brownfield Woods near Urbana, *Pease*, May, 1909.

***Poa annua* L.**

Annual Meadow Grass. Low Spear Grass (Fig. 231)

Lapham '57, 546, 578; Babeock '73, 97; Patterson '76, 51; Flagg '78, 281; Brendel '87, 64; Higley and Raddin, '91, 144.

Culms 2 to 12 inches tall, somewhat flattened, forming dense tufts, often decumbent, and rooting at the lower nodes; sheaths loose, smooth; blades 1 to 4 inches long, soft and smooth; panicle open; spikelets 3- to 6-flowered, 3 to 5 mm. long, usually 4 mm.; lemmas not webby at the base, distinctly 5-nerved, the nerves pubescent at the base.

This species was naturalized from Europe and is much less common than our native species, *P. chapmaniana*, with which it has been confused. It is a winter annual found in both cultivated and waste ground. It dies out in summer, leaving brown patches in lawns and fields where it has been growing.

CHRISTIAN CO. Taylorville, *Andrews*. CLARK CO. Cosey, *Price*, May, 1916. COOK CO. West Pullman, *Umbach*, May, 1898. DU PAGE CO. Naperville, *Umbach*,

May, 1898; West Chicago, *Umbach*, July, 1898. JACKSON CO. Without locality, *Lapham*. MCHENRY CO. Without locality, *Brendel*. MARION CO. Without locality, *M. S. Bebb* in 1860. WABASH CO. Without locality, *Shearer*, Apr., 1895; Mt. Carmel, *Trelease* and *Schneck*, May, 1888. WINNEBAGO CO. Without locality, *M. S. Bebb*, May, 1859.

Poa chapmaniana Scribn.

Chapman's Spear Grass (Fig. 232)

Culms in tufts, 2 to 12 inches tall, cylindrical, erect; sheaths close, smooth; blades 1 to 4 inches long, smooth; spikelets 3- to 7-flowered, 3 to 5 mm. long; lemmas webbed at the base, 5-nerved, the intermediate nerves obscure, the others sometimes pubescent near base.

This species was not distinguished from *P. annua* by the earlier botanists of the state. *Brendel* seems first to have noticed the difference, stating it was an annual like *P. annua* with a spikelet like that of *P. pratensis*. *Schneck* spoke of it as a variety of *P. annua* that preferred dry soil in worn-out fields. It is a very distinct species, easily separated from *P. annua*. It also is a winter annual.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Clinton*, May, 1899; Urbana, *Burrill*, June, 1880. CHRISTIAN CO. Taylorville, *Andrews*, May, 1894 and 1899. EFFINGHAM CO. Edgewood, *Holden*, May, 1898. MARION CO. Without locality, *M. S. Bebb* in 1861; Salem, *M. S. Bebb*; *Odin*, *Greene* in 1908. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*, June, 1859 and 1860. ST. CLAIR CO. Without locality, *Brendel*; *Mascoutah*, *Welsch*. WABASH CO. Without locality, *Schneck*, May, 1897; without locality, *Shearer*; Mt. Carmel, *Schneck*, May, 1904; Mt. Carmel, *Trelease* and *Schneck*, May, 1888.

Poa compressa L.

Canada Blue Grass. Wire Grass (Fig. 233)

Lapham '57, 546, 579; Patterson '76, 51; Flagg '78, 281; *Brendel* '87, 64; Higley and Raddin '91, 144; Huett '97, 130; Cowles '00, 91, 158, 176; Gleason '10, 149; Gates '12, 355; Sheriff '13, 595.

Culms strongly flattened, usually bent at the base and arising from long, running rootstocks; sheaths loose, smooth; blades 1 to 4 inches long, rough above; panicles narrow, densely flowered; spikelets variable as to size, 3- to 9-flowered, 4 to 6 mm. long, usually with a bronze tinge; lemmas webbed at base, 2 to 2.5 mm. long, obscurely nerved, the midnerve usually pubescent about to the middle, the others only at the base.

Poa compressa is one of our most common grasses, altho it was introduced from Europe. It has made its way into all the patches of original prairie examined, and seems to be found thruout the state. When growing, it is easily recognized by the flat stem and long rootstocks. It makes a close, dense sod and is often used as a lawn grass, especially where there is competition with the crab grasses, etc., which often drive out the Kentucky blue grass, more commonly used in lawns. It is also a valuable pasture grass.

ILLINOIS SPECIMENS: Without locality, *M. S. Bebb* in 1860; without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, June, 1897; Urbana, *Seymour* in 1880; *Seymour*, *Tsou*, Oct., 1913; Champaign, *Waite*, June, 1886; *Seymour*, *Chien* in 1914. CHRISTIAN CO. Taylorville, *Andrews*, June, 1899. COOK CO. Tracy, *E. Bebb*, July, 1912; Hyde Park, Chicago, *A. Chase*, Aug., 1903; Evanston, *Shipman*, Sept., 1875. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, June, 1872. LAKE CO. Beach, *Gates*, July, 1908; near Waukegan, *Gates* 2860. MCHENRY CO. Algonquin, *Nason*, June, 1878. MARION CO. Without locality, *M. S. Bebb* in 1860; Salem, *M. S. Bebb* in 1860. MENARD CO. Athens, *E. Hall*, July, 1864. PEORIA CO. Peoria, *Brendel* in 1859. PIATT CO. White Heath, *Mosher*, May, 1914. SALINE CO. Harrisburg, *Gibbs*, Oct., 1908. STARK CO. Wady Petra, *V. H. Chase* 1462. VERMILION CO. Muncie, *Mosher*, June, 1914. WABASH CO. Without locality, *Schneck*, June, 1904; without locality, *Shearer*; Connor, *Schneck*, Sept., 1899; Old Palmyra, *Schneck*, June, 1900. WILL CO. Joliet, *Keels*, June, 1904.

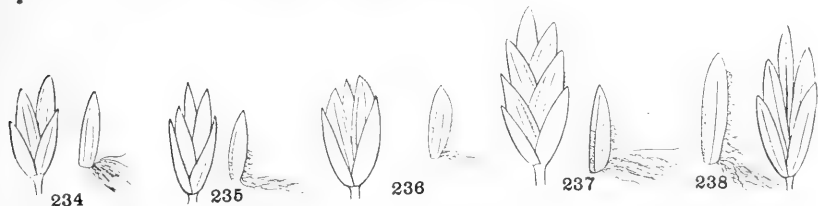
Poa debilis Torr.

Weak Spear Grass (Fig. 234)

Culms weak and slender; sheaths smooth, much shorter than the internodes; blades 1 to 5 inches long, about 2 mm. wide, smooth; panicle few-flowered, the branches slender, drooping; spikelets 2- to 4-flowered, 3 to 4 mm. long; lemmas smooth, webbed at the base.

A rare species in Illinois, found only in damp woods.

ILLINOIS SPECIMENS: Without locality, *Hill*. COOK CO. Glencoe, *Hill*, June, 1913. JO DAVIESS CO. Without locality, *Pepoon* '05.



Figs. 234-238.—Spikelets: 234, *P. debilis*; 235, *P. palustris*; 236, *P. sylvestris*; 237, *P. pratensis*; 238, *P. wolfii*

Poa palustris L.

Fowl Meadow Grass. False Redtop (Fig. 235)

Poa serotina, Lapham '57, 578; *Vasey* '61, 671; *Babcock* '73, 97; *Patterson* '76, 51; *Flagg* '78, 281; *Brendel* '87, 64; *Higley and Raddin* '91, 144. *Poa triflora*, *Sherff* '12, 419; *Sherff* '13, 595. *Poa flava*, *Britton* '07, 139.

Culms 1 to 5 feet tall; sheaths rather loose, smooth; ligule 3 to 5 mm. long; blades 3 to 6 inches long, 2 to 4 mm. wide; panicles oblong, often purplish, rather loosely flowered and delicate; spikelets 2- to 4-flowered, 3 to 4 mm. long; lemmas 2.5 to 3 mm. long, copiously webbed at base; the intermediate nerves obscure, the others long, silky pubescent for about half their length.

This grass is a native to the state, usually found in damp meadows or swamps. It is a very good forage grass, resembling somewhat

P. nemoralis, a European species introduced into many parts of this country.

ILLINOIS SPECIMENS: Without locality, *Vasey*; northern Illinois, *M. S. Bebb*. COOK CO. Skokie Marsh, Glencoe, *Sherff*, June, 1911; Hyde Park, Chicago, *Babcock* in 1873. DU PAGE CO. Hinsdale, *Smith*, May, 1903; Naperville, *Umbach*, June, 1895. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Hill* 244 in 1873. MCHENRY CO. Without locality, *Brendel*; Ringwood, *Vasey*. PEORIA CO. Peoria, *Brendel* in 1859. STARK CO. Wady Petra, *V. H. Chase* 1459, 1517, 1881.

Poa pratensis L.

Meadow Grass. Spear Grass. June Grass. Kentucky Blue Grass
(Fig. 237)

Lapham '57, 546, 579; Babcock '73, 97; Patterson '76, 51; Flagg '78, 281; Brendel '87, 64; Higley and Raddin '91, 145; Huett '97, 130; Cowles '00, 106, 158; Gleason '07, 182; Gleason '10, 149; Gates '12, 355; Sherff '12, 420; Sherff '13, 595.

Culms cylindrical, from long, running rootstocks; sheaths smooth, the lower overlapping, the upper often shorter than the internodes; ligule about 1.5 mm. long; blades longest at the base, from 1 to 8 inches long, the basal blades longest, 1 to 6 mm. wide; panicle densely flowered; spikelets 3- to 5-flowered, 4 to 6 mm. long; lemmas distinctly 5-nerved, 3 mm. long, copiously webbed at base, the marginal and midnerves pubescent, the others smooth.

This species is native to Illinois and is found all over the state in fields and meadows. It is a popular pasture and lawn grass all over the country.

ILLINOIS SPECIMENS: Without locality, *Lapham*. CHAMPAIGN CO. Urbana, *Clinton*, May, 1897 and 1900; Urbana, *Seymour*, May, 1880; Seymour, *Chien*, May, 1914; Champaign, *Mosher*, Oct., 1913. COOK CO. Ravenswood, *Gates*, June 1906; Hyde Park, Chicago, *Gates*, June, 1906; Chicago, *Lansing*, 216; Evanston, *Shipman*. DU PAGE CO. Naperville, *Umbach*, May, 1898. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, May, 1872. HENRY CO. Galva, *V. H. Chase* 1741. KANE CO. Elgin, *Vasey*. LAKE CO. Beach, *Gates*, June, 1909; north of Waukegan, *Gates*, 3037. MCHENRY CO. Without locality, *Brendel*; Algonquin, *Nason*. PEORIA CO. Peoria, *McDonald*, June, 1901; Peoria, *Brendel*. PIATT CO. White Heath, *Mosher*, May, 1914. ST. CLAIR CO. East St. Louis, *Eggert*, May, 1878; Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase*, May, 1898. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Key's Hill, *Schneck*, June, 1905; Mt. Carmel, May, 1880. WOODFORD CO. Without locality, *McDonald*, June, 1889.

Poa sylvestris Gray

(Fig. 236)

Patterson '76, 51; Flagg '78, 281; Brendel '87, 64; Huett '97, 130.

Culms 1 to 3 feet tall; sheaths smooth, shorter than the internodes; ligule 1 mm. long or less; blades 1 to 8 inches long, 2 to 6 mm. wide, the basal ones always longer; panicle open, somewhat oblong, not densely flowered; spikelets 2- to 4-flowered, 2.5 to 4 mm. long, nearly as broad; lemmas about 2.5 mm. long, webbed at base, the nerves all prominent, the midnerve pubescent to the top.

This native species is found in woods and shady places. It is easily distinguished from *P. palustris* by its broader spikelets and short ligule.

ILLINOIS SPECIMENS: Without locality, *Vasey*; southern Illinois, *Lapham*. CHAMPAIGN CO. Urbana, *Clinton*, May, 1900; Urbana, *Gleason*, June, 1900. DU PAGE CO. Hinsdale, *Smith*, June, 1903. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. MACON CO. Without locality, *Clokey* 2444. MARSHALL CO. Steuben township, *V. H. Chase* 1796. JO DAVIESS CO. Without locality, *Pepoon*. MENARD CO. Athens, *Hall*, June, 1864. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, June, 1900. PIATT CO. White Heath, *Mosher*, May, 1915. STARK CO. Wady Petra, *V. H. Chase* 1429. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, May, 1880; Hanging Rock, *Schneck*, May, 1905; Hurd's Ferry, *Schneck*, July, 1900.

Poa wolffi Scribn.

(Fig. 238)

Culms slender, smooth, 1 to 3 feet tall; sheaths smooth; blades mostly clustered at the base, 1 to 8 inches long, 2 mm. or less in width; panicle open, branches very slender, usually ascending; spikelets 2- to 4-flowered, 5 to 6 mm. long; lemmas 4 mm. long, copiously webbed at base, nerves all prominent, the lateral and midnerves pubescent for more than half their length, the intermediate nerves smooth.

Illinois is the type locality for this species, which was named after one of its earlier collectors, *J. Wolf*. The plant is comparatively rare.

ILLINOIS SPECIMENS: Without locality, *Wolf* in 1883. FULTON CO. Without locality, *Brendel* in 1860; Copperas Creek, *Wolf*, June, 1883. HENDERSON CO. Oquawka, *Patterson*. PEORIA CO. Peoria, *Brendel*.

The following species of *Poa* have been reported from Illinois, but no authentic specimens have been found as yet.

Poa brachyphylla Schult.—This was reported as *P. brevifolia* by *Lapham* ('57, 546, 578), *Flagg* ('78, 281), and *Higley and Raddin* ('91, 145).

Poa nemoralis L.—This species was reported by *Lapham* ('57, 546, 579; Plate 2, Fig. 12), who says it is a native both of this country and Europe. It seems probable that he did not have the species as it is understood at present.

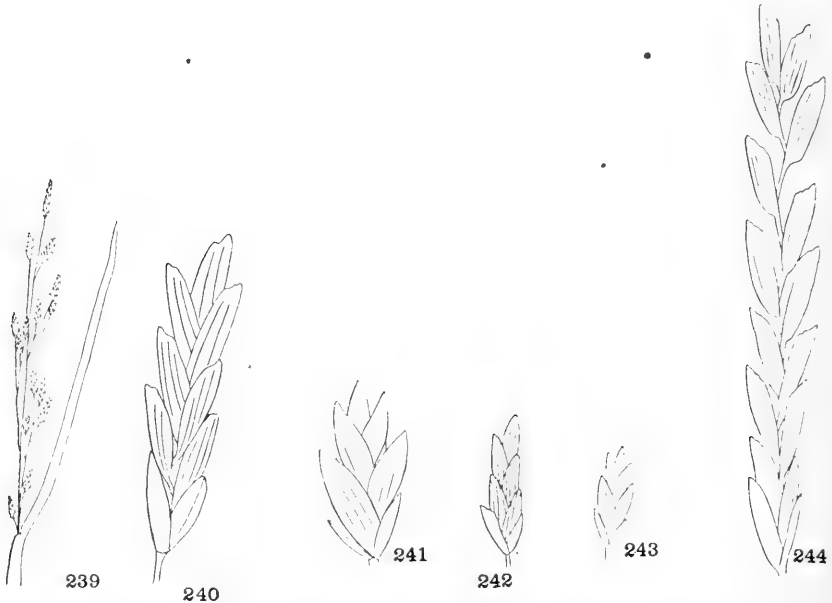
Poa trivialis L.—*Flagg* ('78, 281) cites this as occurring in Illinois, having been introduced from Europe. It is probable that it was cultivated here for only a short time.

55. PANICULARIA Fabr.

Manna Grass

These grasses are all found in moist situations. They are perennials with flat leaves and terminal panicles. The ligules are membranous. The spikelets are 3- to 15-flowered; the lemmas usually very prominently nerved, with a narrow, transparent margin. The glumes are unequal and much shorter than the spikelets.

- a. Spikelets 2 to 8 mm. long, the length never three times the width; panicles open and spreading.
- b. Spikelets 3 to 4 mm. wide; nerves on the lemmas not prominent. *P. canadensis*
- bb. Spikelets 1 to 2.5 mm. wide; nerves on the lemmas very prominent and with deep furrows between.
- c. Spikelets 3 to 4 mm. long, the lemmas 1.5 mm. long, glumes short and rounded. *P. nervata*
- cc. Spikelets 4 to 6 mm. long, the lemmas 2 mm. long, glumes oblong. *P. grandis*
- aa. Spikelets 10 to 25 mm. long, the length always more than three times the width; panicle narrow, the branches erect.
- b. Spikelets nearly sessile; 15 to 20 mm. long; lemmas firm, hispidulous; 4 to 4.5 mm. long. *P. septentrionalis*
- bb. Spikelets slender pediceled; 10 to 15 mm. long; lemmas thin, rough only on the nerves, 3.5 to 4 mm. long. *P. borealis*



Figs. 239-244.—239, *P. borealis*, inflorescence; 240, *P. borealis*, spikelet; 241, *P. canadensis*, spikelet; 242, *P. grandis*, spikelet; 243, *P. nervata*, spikelet; 244, *P. septentrionalis*, spikelet

***Panicularia borealis* Nash**

Slender Manna Grass. (Figs. 239 and 240)

Culms bent at base and rooting at the nodes, 2 to 5 feet tall; sheaths overlapping, usually smooth, the upper one inclosing the base of the panicle; blades narrow, 4 to 20 inches long, 2 to 10 mm. broad, usually folded, ending in a sharp point; panicle very narrow, with the branches erect or appressed; spikelets 10 to 15 mm. long, the pedicels one-third to two-thirds the length of the spikelets, 7- to 13-flowered: lemmas thin, 3.5 to 5 mm. long, the nerves rough.

This is a northern species, rare in Illinois. It closely resembles *P. septentrionalis*, from which it is most easily separated by its pediceled spikelets. It is found in shallow water, or in moist soil along the edges of streams and ponds.

JO DAVIESS CO. Margin of ponds near E. Dubuque, *Pepoon* 426. STARK CO. Pond northeast of Wady Petra, *V. H. Chase* 100.

***Panicularia canadensis* (Michx.) Kuntze**

Rattlesnake Grass. (Fig. 241)

Glyceria canadensis, Lapham '57, 546, 576; Babcock '73, 97; Patterson '76, 50; Flagg '78, 281; Brendel '87, 88; Higley and Raddin '91, 145; Huett '97, 130.

Culms erect, 2 to 3 feet tall; sheaths considerably shorter than the internodes, except at the base of the culm, where they overlap; blades rough, 6 to 18 inches long, 4 to 8 mm. wide; panicle 6 to 10 inches long, nearly as broad, the branches very slender, usually drooping; spikelets 5- to 12-flowered, 5 to 8 mm. long, flattened; lemmas broad 3 to 4 mm. long, faintly nerved.

This grass is one of the most beautiful of the grasses found in the state. It is also a northern species. It is found in wet places.

ILLINOIS SPECIMENS: Northern Illinois, *Brendel*. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. PEORIA CO. Peoria, *Brendel*.

***Panicularia grandis* (Wats.) Nash**

Reed Meadow Grass (Fig. 242)

Culms erect, stout, soft and spongy, 3 to 5 feet tall; sheaths loose, usually smooth; blades usually smooth beneath, rough above, 8 to 12 inches long, 6 to 16 mm. wide; panicle 8 to 16 inches long, nearly as broad, the branches drooping; spikelets numerous, 4- to 7-flowered, 4 to 6 mm. long; florets purple, the lemmas about 2 mm. long, distinctly 7-nerved; glumes whitish, 1-nerved.

This species resembles *P. nervata* in habit but is a larger, more robust species. The panicle of *P. nervata* is much smaller and usually green, while that of *P. grandis* is very large and nearly always purple; the leaves of *P. grandis* are usually much broader. This species is found only in the extreme northern part of the state, while *P. nervata* is found over the entire state.

JO DAVIESS CO. Warren, *Umbach*, July, 1896.

***Panicularia nervata* (Willd.) Kuntze**

Nerved Manna Grass. Fowl Meadow Grass (Fig. 243)

Glyceria nervata, Lapham '57, 546, 577 (Plate 2, Fig. 2); Patterson '76, 50; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 145; Huett '97, 130; Gates '12, 355; Gleason '12, 44; Sherff '12, 419; Sherff '13, 595.

Culms slender, erect, often in large bunches, 1 to 3 feet tall; sheaths usually smooth, overlapping at the base of the culm, the upper sheaths

usually partially closed; blades 6 to 12 inches long, 4 to 10 mm. wide, rough above, smooth beneath; panicle 4 to 8 inches long, often purple, the branches usually drooping, spikelets 3- to 7-flowered, 3 to 4 mm. long; lemmas distinctly 7-nerved, about 1.5 mm. long.

This is one of the native grasses much liked by stock and could be introduced into damp pasture lands. The office of Poisonous Plant Investigations, U. S. Dept. of Agriculture, has found it to contain a small quantity of hydrocyanic acid, enough to be poisonous if a quantity of the grass is eaten. It is common in Illinois in most situations.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Waite*, June, 1888; Mahomet, *Clinton*, Oct., 1898; Champaign, *Waite*, June, 1886; Urbana, *Clinton*, Sept., 1899; Urbana, *Seymour* and *Butts*, June, 1880. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *Babcock*, July, 1869; Evans-ton, *Shipman*, Sept., 1875; Lake Forest, *Jensen*, June, 1895; near Chicago, *McDonald*, June, 1891. JO DAVIESS CO. Without locality, *Pepoon* 683. KANKAKEE CO. Kankakee, *Hill*, May, 1870. HENDERSON CO. Oquawka, *Patterson*, June, 1872. LAKE CO. Beach Area, *Gates* 2810. MCHENRY CO. Algonquin, *Nason*, MACOUPIN CO. Carlinville, *Robertson*, June, 1882. MADISON CO. Venice, *Eggert*, July, 1877. MARION CO. Without locality, *Lapham*. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, Aug., 1896. ST. CLAIR CO. Mascoutah, *Welsch*. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Schneck*, July, 1888; without locality, *Shearer*; Paton, *Schneck*, July, 1879.

***Panicularia septentrionalis* Hitchc.**

Floating Manna Grass (Fig. 244)

Glyceria fluitans, Lapham '57, 546, 577; Babcock '73, 97; Patterson '76, 51; Flagg '78, 281; Brendel '87, 63; Higley and Raddin '91, 145; Huett '97, 130. *Glyceria septentrionalis*, Sherff '12, 417; Sherff '13, 595.

Culms erect, 3 to 6 feet tall, usually large, soft, and spongy; lower sheaths overlapping, the upper closed nearly to the summit; ligule 5 or 6 mm. long; blades 4 to 9 inches long, 6 to 8 mm. wide; slightly rough; panicles very narrow, the branches erect or appressed, sometimes spreading in flower; spikelets 7- to 12-flowered, 20 to 25 mm. long, nearly sessile; lemmas rough all over, 4 to 4.5 mm. long.

This species is found in shallow water with the leaves floating, or where there is very wet soil. It is an excellent grass for swampy meadows. Cattle are very fond of it.

ILLINOIS SPECIMENS: Without locality, *Vasey*; northern Illinois, *Vasey*; southern Illinois, *Lapham*. CHAMPAIGN CO. Rantoul, *Clinton*, Sept., 1897. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *Moffatt*, July, 1891; Evans-ton, *Shipman*, Sept., 1875; Chicago, *Scammon*, July, 1859. DU PAGE CO. Without locality, along ditches, *Moffatt*, July, 1891. HENDERSON CO. Oquawka, *Patterson*, July, 1872. KANKAKEE CO. Bourbonnais, *Hill*, July, 1873. LAKE CO. Gilmer, *Gates* 1712; Lake Zurich, *Hill*, June, 1899. MCHENRY CO. Ringwood, *Vasey*. MACOUPIN CO. Macoupin, *Robertson*, July, 1883. MENARD CO. Without locality, *Hall* in 1861. PEORIA CO. Peoria, *Brendel*. PIATT CO. Monticello, *Seymour* and *Waite*, July, 1880. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase*, July, 1898. WABASH CO. Without locality, *Schneck*, July, 1900; without locality, *Shearer*; Mt. Carmel, *Schneck*, July, 1879. WILL CO. Joliet, *Skeels*, June, 1904.

Panicularia pallida (Torr.) Kuntze (*Glyceria pallida* Trin.).—This was reported by Vasey ('61, 671) and Flagg ('78, 281) from Illinois. The specimens in the University herbarium labeled *Glyceria pallida* are a species of *Poa* which it strongly resembles. No other specimens have been seen and its occurrence in Illinois is doubtful.

56. FESTUCA L.

Fescue Grass

The species of *Festuca* have 2- to many-flowered spikelets arranged in open or contracted panicles. The glumes are narrow, keeled, and pointed. The lemmas are firm, not keeled but rounded on the back, often awned or awn-pointed. The leaves are narrow, in some species involute, and the ligule is very short and membranous. There are both annual and perennial species.

- a. Lemmas awnless or very rarely awn pointed; leaves flat.
 - b. Panicle narrow, erect, branches short; lemmas 5 to 7 mm. long. *F. elatior*
 - bb. Panicle open, rarely erect, branches long; lemmas 4 to 4.5 mm. long.
 - c. Spikelets broad, short pediceled, aggregated at the ends of the rather short panicle branches. *F. shortii*
 - cc. Spikelets narrow, long pediceled, scattered in an open panicle with long, slender branches.
- aa. Lemmas awned, leaves involute. *F. obtusa*
 - b. Stamens 1 or 2; lemmas rough; annual. *F. octoflora*
 - bb. Stamens 3; lemmas smooth; perennial. *F. ovina*

Festuca elatior L.

Tall or Meadow Fescue (Fig. 245)

Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Higley and Raddin '91, 145; Huett '97, 130.

Culms erect, in loose bunches, 1.5 to 5 feet tall, smooth; sheaths smooth, or slightly rough at the top; blades 4 to 16 inches long, 4 to 8 mm. wide, flat, rough on the upper surface, auricle well-developed; panicle 4 to 8 inches long, narrow, rather loose-flowered; spikelets 5- to 9-flowered, 9 to 11 mm. long; lemma 5 to 7 mm. long, faintly nerved.

This perennial species was introduced from Europe, but is now naturalized thruout the state. It is an excellent forage grass and much cultivated for hay.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Champaign, *Waite*, June, 1881 and 1886; Urbana, *Seymour*, June, 1880. FULTON CO. Canton, *Wolf*. KANKAKEE CO. Kankakee, *Hill*, July, 1874. PEORIA CO. Peoria, *Brendel*, July, 1883; Peoria, *McDonald*, July, 1903. PIATT CO. White Heath, *Mosher*, May, 1913. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 58. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, July, 1878. WILL CO. Troy township, *Hill* 32 in 1907; Mokena, *Hill* 14 in 1910.

Festuca obtusa Spreng.

Nodding Fescue (Figs. 246 and 247)

Festuca nutans, Engelman '44, 103; Lapham '57, 547, 582 (Plate 3, Fig. 1); Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 145.

Culms single or a few together, 1 to 3 feet tall; sheaths often slightly pubescent; blades rough above, 4 to 12 inches long, 4 to 7 mm. wide; panicle usually nodding, the branches bearing spikelets near the ends; spikelets 3- to 5-flowered, typically 3-flowered, 5 to 7 mm. long, always much longer than broad; lemmas about 4 mm. long with a thin white or transparent margin; second glume 3 mm. long.

This is a native species which is found in damp or shady woods and thickets.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Waite*, June, 1886; Urbana, *Clinton*, May, 1898; Mahomet, *Wright*, June, 1898; Mahomet, *Clinton*, May, 1900. CHRISTIAN CO. Taylorville, *Andrews*. DU PAGE CO. Hinsdale, *Smith*, June, 1903; Wheatland, *Umbach*, July, 1898; Naperville, *Umbach*, July, 1898. JACKSON CO. Without locality, *Lapham* in 1857. JO DAVIESS CO. Without locality, *Pepoon*. HENDERSON CO. Oquawka, *Patterson*, June, 1874. LA SALLE CO. Near Starved Rock, *A. Chase*, July, 1901. MCHENRY CO. Algonquin, *Nason*. MACOUPIN CO. Carlinville, *Robertson* in 1898. MARION CO. Without locality, *M. S. Bebb* in 1860. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* 1493. MASON CO. Without locality, *Clokey*. PEORIA CO. Princeville, *V. H. Chase*, June, 1897; Peoria, *McDonald*, June, 1890; Peoria, *Brendel*. PIATT CO. White Heath, *Mosher*, May, 1914. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Woods along Spoon river, *V. H. Chase* 1448. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*. WILL CO. Joliet, *Skeels*, June, 1904.



Figs. 245-251.—245, *F. elatior*, spikelet; 246, *F. nutans*, inflorescence; 247, *F. nutans*, spikelet; 248, *F. ovina*, spikelet; 249, *F. octoflora*, spikelet; 250, *F. octoflora*, inflorescence; 251, *F. shortii*, spikelet

Festuca octoflora Walt.

Slender Fescue (Fig. 249)

Festuca tenella, Lapham '57, 547, 581; Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 145; Huett '97, 130. *Festuca octoflora*, Gleason '10, 149; Gates, '12, 355.

Culms slender, often tufted, 2 to 16 inches tall; sheaths smooth, shorter than the internodes; blades very short, 1.5 to 4 inches long, involute; panicle narrow, contracted, spike-like, 1 to 5 inches long; spikelets 6- to 13-flowered, 5 to 12 mm. long; lemmas rough 3 to 5 mm. long, the awn about the same length.

This annual species is found in dry, open country, usually where the soil is very poor.

ILLINOIS SPECIMENS: Without locality, *Vasey*; southern Illinois, *Lapham* in 1857. CHAMPAIGN CO. Champaign, *Seymour* and *Waite*, June, 1884; Champaign, *Seymour*, June, 1884. COOK CO. Evanston, *Johnston* in 1891. HANCOCK CO. Warsaw, *Mead*, July, 1842. JACKSON CO. Makanda, *Gleason*, June, 1903. JO DAVIESS CO. Without locality, *Pepoon* 145; Hanover, *Gleason* and *Gates* 2571 KANKAKEE CO. Kankakee, *Hill* 33 in 1872. LAKE CO. Waukegan, *Gates* 2468. LA SALLE CO. Starved Rock, *Gates* 3191. MACON CO. Decatur, *Clokey*, June, 1899. MACOUPIN CO. Carlinville, *Robertson*, May, 1883. MARION CO. Without locality, *M. S. Bebb* in 1860. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* 1494. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, June, 1889. PIATT CO. White Heath, *Mosher*, May, 1914. POPE CO. Herod, *Clinton*, July, 1898. ST. CLAIR CO. Without locality, *Eggert*, Aug., 1874; Mascoutah, *Welsch*. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Schneck*, June, 1900; Old Palmyra, *Schneck*, May, 1883; Keensburg, *Schneck*, June, 1898.

***Festuca ovina* L.**

Sheep's Fescue (Fig. 248)

Culms erect in close bunches, 6 inches to 2 feet tall; sheaths usually smooth; blades pale green, involute, 2 to 5 inches long, the lower ones longest; panicle slender and spike-like, 2 to 4 inches long; spikelets 5 to 7.5 mm. long; lemmas smooth, 3 to 3.5 mm. long.

There is a native form of this species and also one introduced from Europe in seed mixtures for pastures and parks. A variety, *F. ovina duriuscula*, also introduced from Europe, is taller and has lemmas about 6 mm. long.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Crystal Lake Park, Urbana, *Trelease*, May, 1914; Urbana, *Lantz*, 1914; Urbana, *Waggoner*, May, 1914.

***Festuca shortii* Kunth**

(Figs. 250 and 251)

Culms in small bunches or single, 1 to 4 feet tall; sheaths usually smooth, shorter than the internodes; blades 4 to 12 inches long, 2 to 4 mm. wide, often involute in drying; panicle open, the naked branches bearing few- to several-clustered, short-pedicled spikelets near the ends; spikelets usually 5- to 9-flowered, typically more than 3-flowered, 5 to 7 mm. long; when mature the length and breadth nearly equal; lemmas 4.5 mm. long; second glume 4 to 5 mm. long.

This species is much more distinct than perhaps the description would lead one to believe. It was formerly included with *Festuca obtusa*, but is easily distinguished by the panicle. That of *Festuca*

obtusa is slender, graceful, and few-flowered, while in *Festuca shortii* it is broader, and thick and heavy in appearance. It is found in woods, but also in open damp places.

ILLINOIS SPECIMENS: Without locality, *Mead*; without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Burrill*, *Scymour* and *Waite* in 1884; Urbana, *Scymour*, June, 1880. FRANKLIN CO. Benton, *Patterson*, June, 1872. FULTON CO. Without locality, *Wolf*. HENDERSON CO. Oquawka, *Patterson*. MARION CO. Without locality, *M. S. Bebb* in 1860; Salem, *M. S. Bebb*. MENARD CO. Without locality, *Hall*. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. East of Wady Petra, *V. H. Chase*, 1228. WABASH CO. Without locality, *Shearer*.



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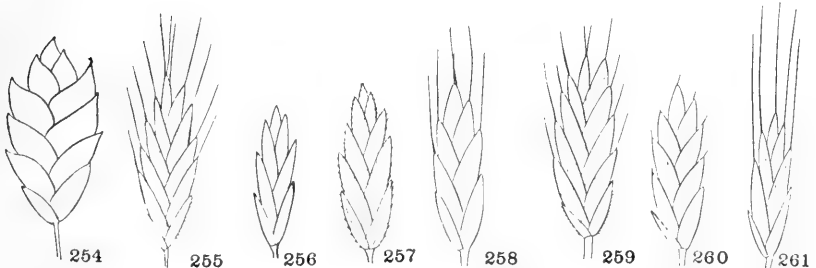
253

Figs. 252-253.—Inflorescences: 252, *B. inermis*; 253, *B. tectorum*

57. BROMUS L.

The annual species of this genus have been introduced from Europe and are more or less serious pests. The native species are perennials mostly confined to woods and shady places and are of no economic importance. The spikelets are large, usually many-flowered; the lemmas are two-toothed at the apex and often bear an awn from between the teeth; the glumes are unequal, the second larger. The inflorescence is of panicles, the spikelets either erect or drooping. The leaves are flat, the ligules membranous, seldom over 1 or 2 mm. in length. The species are exceedingly variable, and therefore difficult to classify correctly.

- a. Lemmas smooth or scabrous, not pubescent.
 - b. Second glume 3-nerved.
 - c. Lemmas awnless or awn-pointed; plants generally smooth thruout; perennial by long, running rootstocks. *B. inermis*
 - cc. Lemmas with long, scabrous awns; sheaths pilose-pubescent; annuals. *B. villosus*
 - bb. Second glume 5- to 9-nerved; plants without running rootstocks.
 - c. Spikelets with the width more than half the length; lemmas very broad, awnless or awn-pointed. *B. brizaeformis*
 - cc. Spikelets with the width always less than half the length; lemmas narrow or ovate, with an awn at least 3 mm. long.
 - d. Lemmas thick, the margin inrolled at maturity, the awn slender and weak, 3 to 5 mm. long; sheaths glabrous. *B. secalinus*
 - dd. Lemmas thin, with a transparent edge, not inrolled at maturity, the awn strong, 5 to 8 mm. long; sheaths pubescent. *B. pratensis*
- aa. Lemmas pubescent, either along the margin or over the entire surface.
 - b. Awn as long or longer than the lemma; annual species with the panicle branches drooping. *B. tectorum*
 - bb. Awn considerably shorter than the lemma.
 - c. Lemmas pubescent along the margin and sometimes at the base. *B. ciliatus*
 - cc. Lemmas evenly pubescent over the entire surface.
 - d. Lemmas densely long, silky pubescent; lemma 8 to 10 mm. long, the awn 2 to 3 mm. *B. kalmii*
 - dd. Lemmas sparsely short, appressed pubescent, 10 to 12 mm. long, the awn 4 to 8 mm. *B. purgans*



Figs. 254-261.—Spikelets: 254, *B. brizaeformis*; 255, *B. ciliatus*; 256, *B. inermis*; 257, *B. kalmii*; 258, *B. pratensis*; 259, *B. purgans*; 260, *B. secalinus*; 261, *B. tectorum*

***Bromus brizaeformis* Fisch. and Mey.**

(Fig. 254)

Culms 6 inches to 2 feet tall, smooth, slightly pubescent at the nodes; sheaths pubescent, shorter than the internodes; blades 4 to 8 inches long, 1 to 4 mm. wide; panicle open, drooping; spikelets 10 to 20 mm. long and 9 to 13 mm. wide, lemmas awnless, smooth, 8 to 10 mm. long.

This annual species was introduced from Europe and is rare in America.

RICHLAND CO. Parkersburg, *Ridgeway*, June, 1902.

Bromus ciliatus L.

Fringed Brome Grass (Fig. 255)

Lapham '57, 547, 583 (Plate 3, Fig. 2); Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 146; Huett '97, 131.

Culms slender, 2 to 4 feet tall; sheaths retrorsely pubescent; blades 8 to 15 inches long, 4 to 12 mm. wide, rough and slightly pubescent; panicle spreading, often nearly as broad as long, usually drooping; spikelets 5- to 9-flowered, 15 to 25 mm. long; glumes smooth; lemmas 10 to 12 mm. long, pubescent along the edge and sometimes near the base, but smooth on the remainder of the surface; awn 3 to 5 mm. long.

Bromus ciliatus is one of the native perennial species. It grows in damp places, usually in the woods.

ILLINOIS SPECIMENS: Without locality, *Vasey*; without locality, *Bebb* in 1860. CHAMPAIGN CO. Mahomet, *Wright*, June, 1898; Mahomet, *Burrill* and *Scymour*, Aug., 1888. COOK CO. Chicago, *Babcock*, July, 1873; Evanston, *Shipman*. FULTON CO. Without locality, *Pepoon*. JACKSON CO. Without locality, *Lapham*. JO DAVIESS CO. Without locality, *Moffatt*; without locality, *Pepoon*, Aug., 1912. KANKAKEE CO. Kankakee, *Hill*, July, 1873. MACOUPIN CO. Carlinville, *Robertson*, June, 1882. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, June, 1896; Mossville, *A. Chase* 883. POPE CO. Herod, *Clinton*, Aug., 1898. ST. CLAIR CO. Maseoutah, *Welsch*. WABASH CO. Near Paton, *Schneck*, June, 1879.

Bromus inermis Leyss.

Hungarian Brome Grass (Figs. 252 and 256)

Culms in tufts from creeping rootstocks, smooth, 1 to 4 feet tall; sheaths smooth; blades 6 to 10 inches long, 4 to 6 mm. wide, smooth; panicle narrow, the branches ascending; spikelets 6- to 10-flowered, smooth; lemmas 10 to 12 mm. long; awnless or awn-pointed, second glume 3-nerved.

This species, also known as smooth brome grass, makes rank growth, and is gradually spreading over the whole United States. It was introduced as a forage grass, but lately has been considered of little value.

JO DAVIESS CO. Without locality, *Pepoon* .06. LAKE CO. Leithton, *Gates* 1729.1; Ravinia, *Gates* 1678.2. LIVINGSTON CO. Emington, *Wilcox*. STARK CO. Wady Petra, *V. H. Chase*, 1454, also July, 1907. VERMILION CO. Muncie, *Mosher*, May, 1914.

Bromus kalmii A. Gray

Wild Chess (Fig. 257)

Lapham '57, 547, 582; Babcock '73, 97; Patterson '76, 51; Brendel '87, 64; Higley and Raddin '91, 146; Huett '97, 130; Gates '12, 355.

Culms 1.5 to 3 feet tall; sheaths softly pubescent; blades 1 to 8 inches long, 2 to 8 mm. wide, usually softly pubescent on both surfaces; the hairs often long and conspicuous; panicle small, open, branches usually wavy; spikelets 6- to 10-flowered, densely covered with soft, silky pubescence; lemmas 8 to 10 mm. long, the awn 2 to 3 mm. long; second glume 5- to 7-nerved.

This is a native perennial species usually found in dry, waste places, sometimes in woods and shady places. It is distinguished from all other Illinois species by the copious silky pubescence of foliage and spikelets.

ILLINOIS SPECIMENS: Without locality, *Vasey*. DU PAGE CO. Wheatland, *Umbach*, July, 1898. JACKSON CO. Without locality, *Lapham* in 1857. JO DAVIESS CO. Without locality, northern part, *Pepoon* 51. LAKE CO. Beach, *Gates* 2762; marsh near Rockefeller, *Gates* 1741; between Winthrop Harbor and Beach, *Gates*, June, 1908. MCHEENRY CO. Algonquin, *Nason*, July, 1878. MENARD CO. Athens, *Hall*. PEORIA CO. Peoria, *Brendel* in 1857.

***Bromus pratensis* Lam.**

(Fig. 258)

Culms 6 inches to 2 feet tall, smooth or slightly pubescent; lower sheaths overlapping and the upper shorter than the internodes, pubescent; blades 4 to 10 inches long, 4 to 7 mm. wide, pubescent on both surfaces; panicle erect, rather narrow; spikelets 6- to 10-flowered; lemma 9 to 10 mm. long, short pubescent, scabrous; awn 5 to 8 mm. long; second glume 5- to 7-nerved.

An annual species introduced from Europe, but only occasionally found in the Middle West.

VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Near Mt. Carmel, *Shearer*.

***Bromus purgans* L.**

(Fig. 259)

Bromus ciliatus var. *purgans*, Higley and Raddin '91, 146. *Bromus incanus*, *Gates* '12, 355.

Culms fairly stout, 2 to 5 feet tall; sheaths retrorsely pubescent; blades 6 to 12 inches long, 5 to 15 mm. wide, usually short pubescent on the upper surface; panicle spreading, usually large and nodding; spikelets 7- to 11-flowered; glumes sparsely pubescent, the second 3-nerved; lemmas 10 to 12 mm. long, pubescent over entire surface, the awn 4 to 6 mm. long.

This species is a native of the state. It is usually found in damp shaded places.

CHAMPAIGN CO. Urbana, *Mosher*, May, 1915. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Beverly Hills, *R. Bebb*, Sept., 1903; Bowmanvil Woods, Chicago, *Gates*, June, 1908; River Grove, *Hill* 68 in 1897. FULTON CO. Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon* .07. KNOX CO. Williamsfield, *V. H. Chase* 1839. LA SALLE CO. Starved Rock, *A. Chase*, July, 1901. MACOUPIN CO. Without locality, *Robertson*, Aug., 1883. MARSHALL CO. Near Lawn Ridge, *V. H. Chase* 1487. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1904. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Near Wady Petra, *V. H. Chase* 640, 1538. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Shearer*, May, 1899. Hanging Rock, *Schneck*, July, 1905; Grand Rapids, *Schneck*, Aug., 1900.

Bromus purgans incanus Shear.—This variety differs from the species in having densely pubescent or velvety sheaths.

ILLINOIS SPECIMENS: Without locality, *Wolf*, Sept., 1882. FULTON CO. Canton, *Wolf*. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1904. WABASH CO. Without locality, *Shearer*, July, 1896; near Mt. Carmel, *Shearer*, July, 1896.

Bromus purgans latiglumis (*B. altissimus* Pursh).—This variety has overlapping sheaths and an unusually large number of leaves. The sheaths are usually smooth except for a ring of hairs where they join the blades.

JO DAVIESS CO. Warren, *Pepoon* 489. KANE CO. Elgin, *Sherff* 1789. STARK CO. Wady Petra, *V. H. Chase* 1265. WABASH CO. Mt. Carmel, *Schneck* in 1879; Hanging Rock, *Schneck*.

Bromus secalinus L.

Cheat, or Chess (Fig. 260)

Lapham '57, 547, 582; Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Higley and Raddin '91, 146; Huett '97, 130.

Culms 1 to 3 feet tall; sheaths typically smooth, strongly nerved; blades 2 to 8 inches long, 2 to 6 mm. wide, usually smooth, sometimes slightly pubescent; panicle open, branches usually drooping; spikelets 5- to 15-flowered, smooth; lemma 8 to 11 mm. long, thick, the margins inrolled at maturity, awns short and slender, generally 3 to 5 mm. long.

This species was introduced from Europe and has now spread all thru the temperate part of North America. It becomes a serious pest in grain fields. As it is an annual, it should be prevented from ripening seed. All plants should be destroyed when first discovered in order to prevent its spread into new localities.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Clinton*, June, 1888; Urbana, *Seymour*, July, 1878; Champaign, *Scymour*, July, 1878. CHRISTIAN CO. Taylorville, *Andrews*; Taylorville, *De Motte*. COOK CO. Woodlawn, Chicago, *Millspaugh*, June, 1898. DU PAGE CO. Wheaton, *Moffatt*, June, 1892. JO DAVIESS CO. Without locality, *Pepoon*. MACON CO. Decatur, *Clokey* 2586. MACOUPIN CO. Carlinville, *Robertson*, June, 1882. MARION CO. Without locality, *Lapham* in 1857; without locality, *M. S. Bebb* in 1860. PEORIA CO. Peoria, *Brendel* in 1860; Peoria, *McDonald*, July, 1889. ST. CLAIR CO. Mascoutah, *Welsch*; East St. Louis, *Lichenbauer*, May, 1914. STARK CO. Wady Petra, *V. H. Chase* 1453. UNION CO. Cobden, *Earle*, July, 1886. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Without locality, *Schneck*, June, 1904. Mt. Carmel, *Schneck*, June, 1897; Timberville, *Schneck*, June, 1879; Old Palmyra, *Schneck*, May, 1881.

Bromus tectorum L.

Downy Brome Grass (Figs. 252 and 261)

Gates '12, 355.

Culms in tufts, slender; sheaths and blades pubescent, the latter 1 to 4 inches long, 2 to 4 mm. wide; panicle densely flowered, drooping; spikelets on slender pedicels, 5- to 8-flowered, pubescent; lemmas 8 to 12 mm. long, awn 12 to 16 mm. long; glumes pubescent, the second glume 3-nerved.

This European species was first observed in Illinois in 1903, and has spread very rapidly since that time. Four years ago, only a few

plants were observed within a thirty-mile radius of Urbana; now this species can be found along all railway tracks, around elevators, and in waste places generally. As it is likely to become a serious pest in the state, some pains should be taken to eradicate it when first observed. It is an annual species, and should be easily controlled.

CHAMPAIGN CO. St. Joseph, *Mosher*, June, 1914 and 1915; Champaign, *Mosher*, May, 1913; Urbana, *Mosher*, May, 1915; Urbana, *Trelease*, May, 1914. Seymour, *Mosher*, June, 1914. COOK CO. Hyde Park, Chicago, *A. Chase*, June, 1903. EDGAR CO. Scotland, *Dawson*, May, 1914. JO DAVIESS CO. Without locality, *Pepoon*. PIATT CO. White Heath, *Mosher*, May, 1914. STARK CO. North of Wady Petra, *V. H. Chase* 1203. TAZEWELL CO. Hilton, *McDonald*, June, 1889. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Mt. Carmel, *Schneck*, May, 1906; between Mt. Carmel and Paris, *Schneck*, June, 1906.

Bromus villosus Forsk.

Culms 1 to 3 feet tall, smooth; sheaths softly pilose-pubescent; ligule 3 to 4 mm. long; blades pilose. 8 to 10 inches long, 3 to 5 mm. broad; panicle erect or somewhat drooping, rather narrow at first but open in flower; spikelets 3.5 to 5 cm. long; drooping; glumes smooth; lemma scabrous, 25 to 30 mm. long exclusive of the awn; awn stout, scabrous, 3.5 to 5 mm. long. The plants are annuals, easily distinguished by the long, scabrous awns.

This is a Mediterranean species which is now abundant in California, and has recently appeared in Maryland. It is one of the worst weeds which has been introduced into the United States. Not only does it spread rapidly, but the long, stiff, scabrous awns of the fallen florets injure the lining of the mouth and nostrils of grazing cattle. Every precaution should be taken to prevent this species from becoming established in Illinois.

COOK CO. In one vacant lot, Cuyler, Chicago, *Gates*, June, 1905.

58. **LOLIUM** L.

Rye Grass. Darnel

This genus includes both annuals and perennials introduced from the Old World. The perennial species are cultivated, but frequently escape and establish themselves in certain localities. The inflorescence consists of long spikes. The spikelets are several-flowered and are placed edgewise to the axis. The glume next the axis is wanting, except in the terminal spikelet. The leaves are long and narrow, often showing small projections, called auricles, at the base. The ligules are membranous.

First glume shorter than the spikelet.

Lemmas awned.

Lemmas awnless.

First glume as long as, or longer than the spikelet.

L. multiflorum

L. perenne

L. temulentum



Figs. 262-265.—262, *L. multiflorum*, inflorescence; 263, *L. multiflorum*, spikelet; 264, *L. perenne*, spikelet; 265, *L. temulentum*, spikelet

***Lolium multiflorum* Lam.**

Italian Rye Grass. Awned Ray Grass (Figs. 262 and 263)

Lolium italicum, Flagg '78, 282.

Culms tufted, erect, 2 to 3 feet tall, the upper part rough; sheaths and leaves smooth, the latter 4 to 8 in. long, 3 to 7 mm. wide; spikelets 10- to 20-flowered, 15 to 20 mm. long; lemmas 7 to 8 mm. long, and awned.

This species is a perennial and a very rapid grower. It forms a dense turf, succeeding best in moist situations. It was introduced for hay, but has been used in making lawns in some parts of the country. The seed is an ingredient of most lawn mixtures.

MACON CO. Deatur, *Clokey* in 1898. PEORIA CO. Peoria, *McDonald*, July, 1903. WABASH CO. Without locality, *Shcarer*, July, 1915.

***Lolium perenne* L.**

Perennial Rye Grass (Fig. 264)

Culms tufted, erect, smooth, 1 to 3 feet tall; sheaths smooth; ligule less than 1 mm. long; blades flat, 2 to 5 inches long, 2 to 4 mm. wide, sometimes rough; spikelets 5- to 10-flowered, 8 to 12 mm. long; lemmas awnless.

This species is a perennial, closely related to *L. multiflorum*, and is also used in lawns, meadows, and pastures. The auricles on the leaves are usually pronounced.

CHAMPAIGN CO. Without locality, *Burrill*, June, 1878; Urbana, *Seymour*, July, 1880. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *Miller*, June, 1914. PEORIA CO. Peoria, *Brendel*.

Lolium temulentum L.

Darnel (Fig. 265)

Culms 2 to 4 feet tall, smooth; sheaths smooth; blades 4 to 10 inches long, 2 to 6 mm. wide, rough on the upper surface; spikelets 4- to 8-flowered, 10 to 18 mm. long, the glumes longer than the spikelets; lemmas sometimes awned.

This species is found in waste places and often becomes a troublesome weed. It was formerly supposed to be poisonous. Now it is said that the poison is due to the presence of a fungus in the fruit.

CHAMPAIGN CO. Urbana, *Seymour*, June, 1878. MENARD CO. Athens, *Hall* in 1861.

59. AGROPYRON Gaertn.

Wheat Grass

These grasses are characterized by the spiked type of inflorescence, as in *Lolium*, from which they differ in having the spikelets placed flat against the axis. The spikelets are 3- to many-flowered. The leaves are usually flat with short, thick ligules. Most of the species have long, running rootstocks. All the species are perennials, and all but one, *A. repens*, are native to this country.

- a. Lemmas densely hairy. *A. dasystachyum*
- aa. Lemmas not hairy.
 - b. Glumes scabrous on the nerves and margins; leaves rough on both surfaces, never pubescent; creeping rootstocks wanting.
 - c. Lemmas awned, the awns about twice the length of the lemmas; leaves flat, usually not more than 4 mm. wide; spike very narrow and slender, spikelets not crowded. *A. caninum*
 - cc. Lemmas awnless; leaves less than 4 mm. broad and usually rolled; spike rather broad, spikelets crowded. *A. tenerum*
 - bb. Glumes smooth, except on the midnerve; leaves never rough on both surfaces; creeping rootstocks present.
 - c. Glumes strongly nerved; leaves broad, flat, finely nerved, pubescent on the nerves above, smooth beneath. *A. repens*
 - cc. Glumes faintly nerved; leaves narrow, involute, very coarsely nerved, rough above, smooth beneath. *A. smithii*

Agropyron caninum (L.) Beauv.

Awned Wheat Grass (Fig. 266)

Triticum caninum, Vasey '61, 671; Patterson '76, 51; Flagg '78, 282; Brendel '87, 88. *Agropyron caninum*, Higley and Raddin '91, 147; Sherff '12, 420; Sherff '13, 595.

Culms erect, 1 to 3.5 feet tall; sheaths smooth; blades flat, rather thin, rough; spike slightly nodding; spikelets 3- to 6-flowered, 12 to 15 mm. long, exclusive of awns; lemmas 8 to 10 mm. long.



Figs. 266-272.—266, *A. caninum*, spikelet; 267, *A. dasystachyum*, spikelet; 268, *A. repens*, inflorescence; 269, *A. repens*, spikelet; 270, *A. smithii*, inflorescence; 271, *A. smithii*, spikelet; 272, *A. tenerum*, spikelet

This species is found in cultivated ground and meadows. It appears to be rare in Illinois.

ILLINOIS SPECIMENS: Without locality, *Vasey*. MCHENRY CO. Ringwood, *Vasey*.

***Agropyron dasystachyum* (Hook.) Scribn.**

Northern Wheat Grass (Fig. 267)

Culms erect, smooth, 1 to 4 feet tall; sheaths smooth; blades narrow, usually involute; spikelets 4- to 8-flowered, 10 to 20 mm. long; lemmas 9 to 12 mm. long, densely pubescent.

This species is found in sandy places. It belongs to the northern flora but may be found on the shores of Lake Michigan and northward.

DU PAGE CO. C. and N. W. Railway west of Turner, *Moffatt*, June, 1897.

***Agropyron repens* (L.) Beauv.**

Couch Grass. Quitch Grass. Quick Grass (Figs. 268 and 269)

Triticum repens, Lapham '57, 586 (Plate 3, Fig. 3); *Vasey* '01, 671; Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Brendel '87, 88. *Agropyron repens*, Higley and Raddin '91, 146; Huett '97, 131.

Culms erect, 1 to 4 feet tall, smooth; sheaths smooth, the lower sometimes pubescent; blades usually flat, rough, and usually sparsely pubescent above; spikelets about 5-flowered, 10 to 15 mm. long; lemmas about 10 mm. long, strongly nerved, often rough, usually terminating in a short awn.

This grass is exceedingly common in fields, especially among cultivated crops, along roadsides, and in waste places. The internodes of the creeping rootstock are bright greenish yellow. Joints of the rootstock will start new plants, making the species an exceedingly hard one to eradicate amongst cultivated crops. It may be destroyed by thoro and persistent cultivation, exposing the rootstocks to the sun. It may also be destroyed by plowing it under in the fall, if it is covered by a depth of six or seven inches of soil.

ILLINOIS SPECIMENS: Without locality, *Vasey*. CHAMPAIGN CO. Urbana, *Seymour*, June, 1880; Urbana, *Clinton*, June, 1897; Urbana, *Waite*, July, 1886. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Chicago, *Babcock*, June, 1874; Evanston, *Shipman*, July, 1875; Woodlawn, Chicago, *Lansing*, June, 1898. DU PAGE CO. Naperville, *Umbach*, June, 1898. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Reecher*, July, 1908. MCHENRY CO. Ringwood, *Vasey*. PEORIA CO. Peoria, *McDonald*, July, 1897. Princeville, *V. H. Chase* 1463. STARK CO. Wady Petra, *V. H. Chase*, June, 1907. WABASH CO. Mt. Carmel, *Schneck*, July, 1895.

***Agropyron smithii* Rydb.**

Blue-joint. Western Wheat Grass (Figs. 270 and 271)

Culms stiff, erect, smooth, 1 to 5 feet tall; sheaths smooth; blades bluish green, rough, becoming involute, 4 to 8 mm. long, 4 to 6 mm. wide; spikelets 7- to 13-flowered, 12 to 20 mm. long; lemmas awn-pointed, faintly nerved.

This species is found on the western prairies in alkali soil and is rather common here along railway tracks. It is not a weed like *A. repens*. It can be distinguished from that species by its blue-green color and more densely flowered spikelets.

ILLINOIS SPECIMENS: Without locality, northern Illinois, *Brendel*; Romeo, *Umbach*, June, 1898. JO DAVIESS CO. Hanover, *Gleason* and *Gates* 2599. PEORIA CO. Peoria, *McDonald*, July, 1901 and 1903. STARK CO. Wady Petra, *V. H. Chase* 653, 1518. WILL CO. Joliet, *Skeels* 323; Mokena, *Hill* 15 in 1910.

Agropyron smithii molle (S. and S.) Jones.—This variety is softly pubescent, thus differing from the species.

DU PAGE CO. West Chicago, *Umbach*, June, 1897.

***Agropyron tenerum* Vasey**

Slender Wheat Grass (Fig. 272)

Culms erect, stiff, smooth, 1.5 to 3 feet tall; sheaths smooth; blades flat or involute when dry, rough, 3 to 10 inches long, 2 to 4 mm. wide; spikelets 3- to 5-flowered; lemmas 10 to 12 mm. long, awned or awn-pointed, rough on the margin and toward the top.

This species has no running rootstocks. It is found mostly in dry soil, where it grows in large bunches.

COOK CO. Chicago, *A. Chase* 1132. STARK CO. South of Wady Petra, *V. H. Chase*, 1161.

Agropyron violaceum.—This species is reported by Huett ('97, 131), but no specimens have been seen.

60. HORDEUM L.

Barley

In this genus the inflorescence consists of terminal spikes, the spikelets in groups of three at each joint of the axis. The axis of the spike disjoints with the spikelets attached to the joints. The central spikelet of the group bears perfect florets, but the two lateral ones may be reduced to awns. In cultivated barley we have the two-rowed variety when only the middle spikelet of each group is perfect, and the six-rowed when all are perfect. The glumes are often reduced to awns and together with the sterile lateral spikelets form a cluster of awns below the spikelet. The leaves are flat, usually with well-developed membranous ligules. Besides the cultivated barley, *H. vulgare*, four other species are found in the state, two of which are pernicious weeds.

Spikes slender, not over 3 inches long, the awns of the spikelets not over 15 mm. long.

Glumes modified into slender awns.

H. nodosum

Glumes narrow, broadened in the middle, awn-pointed.

H. pusillum

Spikes rather stout, with awns 20 to 60 mm. long.

Awns 30 to 60 mm. long, making a spike about as wide as long; spikelets 1-flowered.

H. jubatum

Awns 20 to 35 mm. long, the width of the spike less than one-third its length; spikelets 2-flowered, with often a rudiment of a third.

H. pammeli

Hordeum jubatum L.

Squirrel-tail Grass (Figs. 273 and 275)

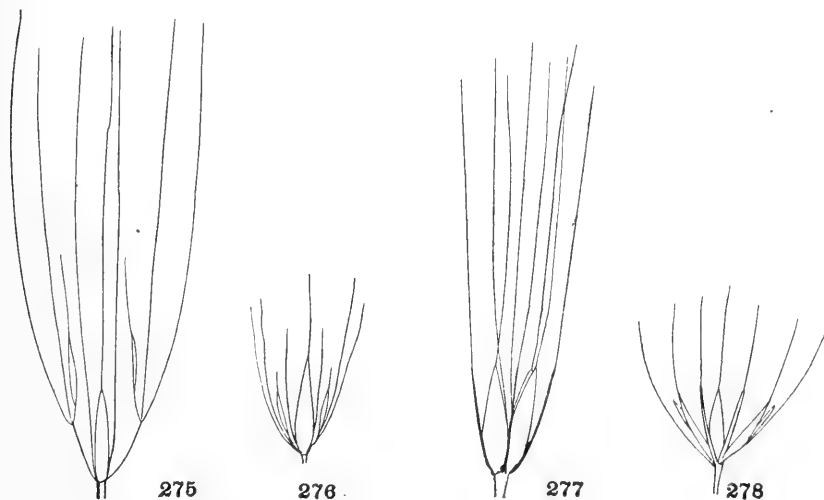
Lapham '57, 547, 586 (Plate 3, Fig. 9); Babcock '73, 97; Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Higley and Raddin '91, 147; Huett '97, 131; Sheriff '13, 595.

Culms in large bunches, 6 inches to 2 feet tall, usually erect, sometimes bent at base, the spikes nodding; sheaths smooth; blades 1 to 5 inches long, 2 to 4 mm. wide, rough; spike 2 to 4 inches long; spikelets in threes, the lateral ones imperfect and reduced to 1 to 3 spreading awns; glumes of the perfect spikelets awn-like, and spreading; lemmas 6 to 8 mm. long, awned; awns of the spikelets all long, slender, and rough.

This species is a biennial and in Illinois often a winter annual. It is one of the worst weeds of the state, not only because it crowds out useful plants, but because the awns are very troublesome to live stock. Any scheme of cultivation that prevents its ripening seed will control it. It is, however, more apt to come up in pastures and waste places which cannot well be cultivated, and as it ripens a large number of seeds, it may spread very rapidly.



Figs. 273-274.—Inflorescences: 273, *H. jubatum*; 274, *H. pusillum*



Figs. 275-278.—Groups of spikelets; 275, *H. jubatum*; 276, *H. nodosum*; 277, *H. pammeli*; 278, *H. pusillum*

CHAMPAIGN CO. Champaign, *Gibbs*, Oct., 1898; Champaign, *Clinton*, Sept., 1895; Urbana, *Seymour*, June, 1880. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Woodlawn, Chicago, *Lansing*, June, 1898; Jackson Park, Chicago, *Clark*, June, 1903; Willow Springs, *Grassley*, July, 1876; Lake Forest, *Jensen* in 1895; Evanston, *Shipman*; Evanston, *Johnson*, Sept., 1886; Chicago, *Vasey*; Chicago, *Holton*, Aug., 1850. DU PAGE CO. Hinsdale, *Smith*, Sept., 1902; Naperville, *Umbach*, June, 1898. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon* 25. KANE CO. Elgin, *Sherff*, 1799. KANKAKEE CO. Kankakee, *De Selm*, June, 1913. LAKE CO. Rockefeller, *Gates*, July, 1907. PEORIA CO. Peoria, *McDonald*. STARK CO. Wady Petra, *V. H. Chase* 72. VERMILION CO. Muncie, *Mosher*, May, 1914. WINNEBAGO CO. Fountaindale, *M. S. Bebb*.

Hordeum nodosum L.

Meadow Barley (Fig. 276)

Hordeum pratense, Patterson '76, 51; Flagg '78, 282; Brendel '87, 64; Huett '97, 131.

Culms sometimes decumbent, 6 inches to 2 feet tall; sheaths smooth; blades rough, 1 to 5 inches long, 1 to 4 mm. wide; spikes 1 to 3 inches long; spikelets mostly in threes and all of the glumes reduced to awns; lemma of the perfect spikelet 6 to 8 mm. long, the awns from 6 to 12 mm. long.

This species is often confused with *H. pusillum* by collectors, as it has the same general appearance altho it is usually a little taller. The character of the glumes is sufficient to separate them. *H. nodosum* is apparently rare in Illinois. It is found in meadows and waste places.

CHRISTIAN CO. Taylorville, *Andrews*. HENDERSON CO. Oquawka, *Patterson*, June, 1872. LA SALLE CO. Utica, *Umbach*, May, 1906.

Hordeum pammeli Scribn. and Ball

(Fig. 277)

Culms erect, or bent at base, 2 to 3.5 feet tall; sheaths smooth; blades 6 to 8 inches long, 5 to 8 mm. wide, rough, acuminate; spikes nodding, 3 to 7 inches long; spikelets in threes, all perfect, the middle spikelet 2-flowered; lemmas 7 to 8 mm. long; glumes modified into slender awns.

This species closely resembles cultivated barley. It is a perennial found on damp prairie soil or along roadsides.

STARK CO. Near Wady Petra, *V. H. Chase* 1467, 1525, 1529.

Hordeum pusillum Nutt.

Little Barley (Figs. 274 and 278)

Engelmann '44, 104; Lapham '57, 547, 587; Gleason '10, 149.

Culms erect, in small tufts, 4 to 16 inches tall; sheaths smooth; blades 1 to 2.5 inches long, 1 to 3 mm. wide, rough; spikes .5 to 3 inches long; spikelets in threes, the lateral ones imperfect; glumes of

all spikelets narrow and produced into slender awns; lemma of perfect spikelet 6 to 8 mm. long, awned.

This species is usually a winter annual in Illinois and is becoming increasingly abundant over nearly all parts of the state. It is spreading rapidly along the railroad tracks and other waste places, growing in soil in which other plants grow with difficulty. Among cultivated crops it is easily controlled, as it is an annual and may be destroyed by preventing the formation of seed. In pastures and along roadsides its increase is alarming, as it drives out the better grasses.

ILLINOIS SPECIMENS: Without locality, *Vasey*; Bear Creek, *Mead*, June, 1842. CHAMPAIGN CO. Urbana, *Seymour*, May, 1880; Champaign, *Mosher*, May, 1914. Glover, *Gates* 1546. COOK CO. Englewood, *Derr*, May, 1905. EFFINGHAM CO. Edgewood, *Bartley*, June, 1898. HENDERSON CO. Oquawka, *Patterson* 778. MARION CO. Without locality, *Lapham* in 1857; without locality, *Bebb* in 1860. MENARD CO. Athens, *Hall*, June, 1864. PEORIA CO. Peoria, *McDonald*, June, 1888; Peoria, *Brendel*. PIATT CO. White Heath, *Mosher*, May, 1914. ST. CLAIR CO. Maseoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 588, 1441. VERMILION CO. Muncie, *Mosher*, May, 1914. WABASH CO. Lucas Prairie, *Schneck*, May, 1880; Mt. Carmel, *Schneck*, June, 1879. WILL CO. Joliet, *Hill*, June, 1907; Joliet, *Skceles*, June, 1904.

61. ELYMUS L.

Wild Rye

These grasses have dense terminal spikes, which are usually slightly nodding, and flat leaves. The spikelets are 2- to 6-flowered and are usually in pairs in alternate notches of the axis. The lemmas are awned or awn-tipped. The glumes are usually narrow, sometimes reduced to awns. The spikelets are placed flat against the stalk, and both glumes are at the front of the spikelet. The species are all native.

- a. Glumes reduced to short, weak awns, the lemmas much longer. *E. äiversiglumis*
- aa. Glumes not reduced to awns, nearly or quite as long as the lemmas.
 - b. Lemmas awned.
 - c. Glumes narrow, 1 mm. or less wide, spikelets usually covered with long, fine hairs. *E. striatus*
 - cc. Glumes always 2 mm. or more in width.
 - d. Glumes strongly bowed out at the base, hardened and yellow for about 2 mm.; spikes usually included in the inflated upper sheaths. *E. virginicus*
 - dd. Glumes not strongly bowed out at the base, occasionally hardened and pale; spikes not included in the inflated upper sheaths.
 - e. Glumes hardened at base; yellowish for 1 or 2 mm.; spikes stiff and erect. *E. australis*
 - ee. Glumes not hardened at base and of the same color thruout; spikes nodding. *E. canadensis*
 - bb. Lemmas awnless. *E. arenarius*

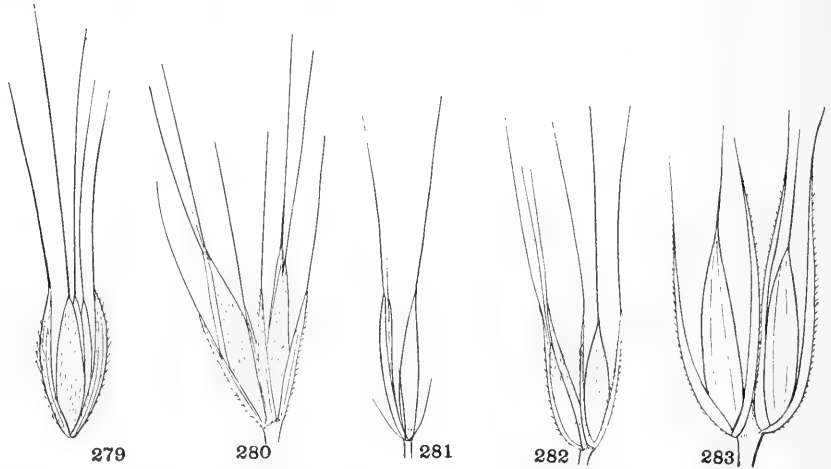
Elymus arenarius L.

Culms stout, 2 to 4 feet tall, from long, creeping rootstocks; leaves glabrous; blades involute at tip, the lower 8 to 12 inches long and crowded at the base, the upper shorter; spike stiff, 4 to 6 inches long,

densely flowered; spikelets 3- to 7-flowered, 25 to 30 mm. long; glumes and lemmas pointed, covered with short, soft pubescence, sometimes glaucous.

The plants of this species are reed-like. They are found in sandy places along the northern Atlantic coast and the shores of the Great Lakes. The only specimen seen by the writer was found too late to include a figure of the spikelet, but it is very easily recognized and not likely to be confused with any of the other species.

COOK CO. Wilmette, Killip, June, 1916.



Figs. 279-283.—279, *E. australis*, spikelet; 280, *E. canadensis*, two spikelets; 281, *E. diversiglumis*, two spikelets; 282, *E. striatus*, two spikelets; 283, *E. virginicus*, two spikelets

***Elymus australis* Scribn. and Ball**

Southern Wild Rye (Fig. 279)

Culms stout, 3 to 5 feet tall; sheaths coarsely hairy; blades 8 to 12 in. long, 10 to 15 mm. wide, rough on both surfaces, sometimes pubescent above; spike 4 to 6 inches long; glumes spreading slightly at base; somewhat thickened, usually pubescent, about 15 mm. long, bearing an awn about as long; lemmas 8 to 10 mm. long, long pubescent, the awns 2.5 to 3 cm. long.

This species is found both in woods and prairies. It differs from *E. canadensis* in having the bases of the glumes thickened, and from *E. virginicus hirsutiglumis* in having a broader, heavier spike and longer awns.

ILLINOIS SPECIMENS: Without locality, Wolf in 1882. STARK CO. Original prairie east of Wady Petra, V. H. Chase 1238, 1239½ and 1244.

***Elymus canadensis* L.**

Nodding Wild Rye (Fig. 280)

Lapham '57, 547, 588 (Plate 3, Fig. 10); Babcock '73, 97; Patterson '76, 51; Flagg '78, 283; Brendel '87, 64; Higley and Raddin '91, 147; Huett '97, 131; Gleason '10, 149; Gates '12, 355.

Culms stout, 2 to 5 feet tall; sheaths smooth; blades 4 to 12 inches long, 2 to 20 mm. wide, rough; spike 2 to 8 inches long, usually thick and densely flowered; glumes about parallel at base, not hardened; lemmas from almost smooth to very pubescent, 8 to 14 mm. long, the awn 2 to 5 cm. in length.

This is one of the species of the original prairie and is still found abundantly in the state. It prefers sandy soil. The plants are usually glaucous.

ILLINOIS SPECIMENS: Without locality, *Vasey*; Romeo, *Umbach*, July, 1898. CHAMPAIGN CO. Champaign, *Waite*; Seymour, *Tsou*, Oct., 1913. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Evanston, *Shipman*, Sept., 1886; Western Springs, *Smith*, Sept., 1902; Salt Springs, Des Plaines region, *Smith*, Sept., 1902. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon* 74 and 1190. HANCOCK CO. Augusta, *Mead* in 1842. LAKE CO. Beach, *Gates* 2879, 2880; Waukegan, *Gleason* and *Shobe* 327. MENARD CO. Without locality, *Hall*. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1896. STARK CO. Wady Petra, *V. H. Chase* 1241, 1243, 1550. WABASH CO. Without locality, *Shearer*; Mt. Carmel, *Schneck*, July, 1888; Hanging Rock, *Schneck*, Sept., 1904.

Elymus robustus Scribn. and Smith.—A form of *E. canadensis* with thick, dense, erect spikes not interrupted at base is recognized by some as a distinct species under this name. There are, however, so many intergrading specimens between this form and typical *E. canadensis* that it is difficult to define the two. The following specimens are probably typical of the form:

COOK CO. Chicago, *Babcock*. FULTON CO. Canton, *Wolf*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1235. WILL CO. Joliet, *Skeels* 441.

Elymus canadensis glaucifolius (Willd.) Torr.—This name is sometimes given to those specimens covered with a whitish or bluish bloom, but these are really typical *E. canadensis*. It has been mentioned by Patterson ('76, 51), Higley and Raddin ('91, 147), and Huett ('97, 147). The following specimens are typical:

COOK CO. Thornton, *Hill* in 1865. LAKE CO. Beach Area, *Gates* 2880. PEORIA CO. Peoria, *Brendel*; Peoria, *McDonald*, July, 1896. STARK CO. Wady Petra, *V. H. Chase* 1241.1. WABASH CO. Grand Rapids, *Schneck*, July, 1904.

***Elymus diversiglumis* Scribn. and Ball**

(Fig. 281)

Culms 3 to 4 feet high; sheaths smooth; blades 6 to 9 inches long, 6 to 12 mm. wide, rough, ending in a long sharp point; spike 3 to 6 inches long, loosely flowered; lemmas 8 to 10 mm. long, pubescent; the awn 2 to 3 cm. long; glumes reduced to short feeble awns.

This species closely approaches *Hystrix hystrix*, in which the glumes are very minute awns; it does not have pediceled divergent spikelets as in *Hystrix*.

PEORIA CO. Peoria, *Brendel*.

***Elymus striatus* Willd.**

Slender Wild Rye (Fig. 282)

Lapham '57, 547, 548; Babcock '73, 97; Patterson '76, 51; Flagg '78, 283. *E. striatus* var. *villosus*, *Brendel* '87, 64. *Elymus striatus*, *Higley* and *Raddin* '91, 147; *Huett* '97, 131; *Gleason* '10, 49. *Elymus striatus villosus*, *Lapham* '57, 547, 588; *Huett* '97, 131. *Elymus propinquus*, *Lapham* '57, 547.

Culms slender, 1 to 3 feet tall, sheaths smooth or with a few fine, soft hairs; blades 6 to 8 inches long, 4 to 10 mm. wide, rough beneath, slightly pubescent above; spikes 3 to 4 inches long; glumes slightly bowed at base, very narrow, parallel for the greater part of their length; lemma 6 mm. long with an awn 2 to 3 cm. long.

This species is usually found in woods and shady places. It is a more slender, graceful species than either *E. canadensis* or *E. virginicus*.

ILLINOIS SPECIMENS: Without locality, *Vasey*; Hills Grove, *Holton*. CHAMPAIGN CO. Urbana, *Gibbs*, Oct., 1898; Mahomet, *Scymour*, July, 1884. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Without locality, *Lapham*. FULTON CO. Without locality, *Pepoon*. HANCOCK CO. Augusta, *Mead* in 1842. JACKSON CO. Without locality, *Lapham*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Hill* 159 in 1873. MCHENRY CO. Algonquin, *Nason*, July, 1878. PEORIA CO. Peoria, *McDonald*, Aug., 1890 and 1900; Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 128 and 1507. WABASH CO. Without locality, *Schneck*, July, 1900; without locality, *Shcarer*; Mt. Carmel, *Schneck*, June, 1877 and 1879; near Timberville, *Schneck*, June, 1879.

Elymus striatus arkansanus (Scribn. and Ball) Hitchc.—This variety differs from the species in having smooth or slightly roughened glumes and lemmas.

STARK CO. Near Wady Petra, *V. H. Chase*, June, 1897.

***Elymus virginicus* L.**

Virginia Wild Rye. Terrell Grass. Lyme Grass (Fig. 283)

Lapham '57, 547, 587; *Babcock* '73, 97; *Patterson* '76, 51; *Flagg* '78, 283; *Brendel* '87, 64; *Higley* and *Raddin* '91, 147; *Huett* '97, 131; *Gleason* '10, 149; *Sherff* '13, 595.

Culms stout, 2 to 4 feet tall; sheaths usually smooth, sometimes the upper inflated and inclosing the base of the spike; blades 6 to 12 inches long, 4 to 8 mm. wide, rough; spikes 1.5 to 5 inches long, stiff; glumes smooth, considerably curved or bowed out at base, hardened and yellow for 1 to 2 mm.; lemmas smooth; awn 4 to 18 mm. long.

This species is very common in moist places, particularly along the edges of woods.

ILLINOIS SPECIMENS: Without locality, river banks, *Vasey*. CHAMPAIGN CO. Urbana, *Seymour*, Aug., 1880; Urbana, *Mosher*, Oct., 1915; Mahomet, *Gibbs* and *Clinton*, Oct., 1898. CHRISTIAN CO. Taylorville, *Andrews*. COOK CO. Evanston, *Shipman*, Oct., 1875; Chicago, *Lansing*, July, 1898. FULTON CO. Without locality, *Pepoon*; Canton, *Wolf*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Hill* 318 in 1873. MCHENRY CO. Ringwood, *Vasey*. MACON CO. Decatur, *Clokey* in 1898. PEORIA CO. Peoria, *Brendel*; between Laura and Monica, *V. H. Chase* 1824. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1549. TAZEWELL CO. Without locality, *McDonald*, July, 1889. WABASH CO. Without locality, *Schneck*, July, 1879 and 1904; without locality, *Shearer*; Mt. Carmel, *Schneck*, June, 1879 and July, 1900.

Elymus virginicus hirsutiglumis. (Scribn.) Hitchc.—This variety differs from the species in having hairy glumes and lemmas.

ILLINOIS SPECIMENS: Without locality, prairies in northern Illinois, *M. S. Bebb* in 1859. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1231, 1541.

Elymus virginicus submuticus Hook.—In this variety the glumes and lemmas are awnless or awn-pointed and slightly roughened.

ST. CLAIR CO. Mascoutah, *Welsch*.

62. HYSTRIX Moench.

This grass has much the general appearance of *Elymus*, but the spikelets, which are in groups of two or three, have a very short pedicel and at maturity stand horizontally from the stem. The glumes are reduced to short awns and one or both may be wanting. The spikelets are 2- to 4-flowered with long-awned lemmas. The plants are perennial with rather broad, flat leaves and very short thick ligules. A single species is found in Illinois.

Hystrix hystrix (L.) Millsp.

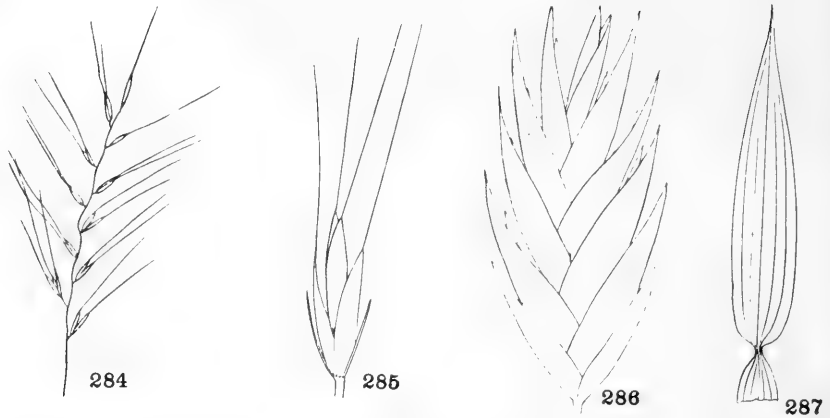
Bottle-brush Grass (Figs. 284 and 285)

Gymnostichum hystrix, Lapham '57, 547, 588 (Plate 3, Fig. 11); Babcock '73, 97; Patterson '76, 51; Flagg '78, 283; Brendel '87, 64. *Asprella hystrix*, Higley and Raddin '91, 147; Huett '97, 131. *Hystrix patula*, Gray's Manual, 7th ed.

Culms unbranched, 2 to 4 feet tall; sheaths smooth; blades rough, 4 to 12 inches long, 8 to 15 mm. wide; spike often included in the upper sheath, 2 to 6 inches long, loosely flowered; spikelets 10 to 15 mm. long, excluding the awns; lemmas often pubescent, their awns 1.5 to 4 cm. long.

This grass is found in moist woods.

CHAMPAIGN CO. Urbana, *Seymour* and *Waite*, July, 1886; Urbana, *Seymour*, June, 1880. COOK CO. Without locality, *Lapham*; Evanston, *Shipman*, Oct., 1875. CHRISTIAN CO. Taylorville, *Andrews*. FULTON CO. Without locality, *Pepoon*. JO DAVIESS CO. Without locality, *Pepoon*. KANKAKEE CO. Kankakee, *Hill* 216 in 1873. KNOX CO. Williamsfield, *V. H. Chase* 1840. LAKE CO. Channel lake, Antioch, *Gleason* and *Shobe*, Aug., 1906; Lake Forest, *Jensen* in 1895. MCHENRY CO. Algonquin, *Nason*, July, 1878. MACOUPIN CO. Carlinville, *Robertson*, Aug., 1880. PEORIA CO. Peoria, *Brendel*. ST. CLAIR CO. Mascoutah, *Welsch*. STARK CO. Wady Petra, *V. H. Chase* 1506; near Spoon river, *V. H. Chase* 622. WABASH CO. Without locality, *Schneck*, July, 1900; without locality, *Shearer*.



Figs. 284-287.—284, *H. hystrix*, inflorescence; 285, *H. hystrix*, spikelet; 286, *A. macrosperma*, spikelet; 287, *A. macrosperma*, leaf showing attachment of blade to sheath

63. ARUNDINARIA Michx.

Cane

These woody grasses of the southern swamps are found along the banks of the rivers in the southern part of the state. The genus is characterized by the perennial, woody culms, also by the blades narrowed into a short petiole at the junction with the sheath. The spikelets are large, flattened, many-flowered, with the lemmas keeled and ending in a sharp point. The plants do not flower every year. The leaves are broad compared with the width and very firm. There are two species of *Arundinaria* in the country and both have been reported from Illinois. These are *A. macrosperma* and *A. tecta*, known as giant cane and small cane. These are distinct species, but only one, *A. macrosperma*, occurs in Illinois, the other being confined to the Atlantic coast. Lapham reports that the culms of *A. macrosperma* reach a height of thirty or forty feet in southern Illinois, yet recent specimens of that species collected there are less than two feet tall. Similar small specimens of *A. macrosperma* have doubtless been incorrectly referred to *A. tecta*.

Arundinaria macrosperma Michx.

Large Cane. Giant Cane (Figs. 286 and 287)

Michaux '03, 74; Lapham '57, 547, 584, (Plate 3, Fig. 5); Patterson '76, 51; Flagg '78, 282. *A. tecta*, Patterson '76, 51; Flagg '78, 282.

Culms woody, 1.5 to 40 feet tall, branched near the top; sheaths ciliate on the margins, otherwise glabrous; leaves lanceolate, sometimes rough, 3 to 12 inches long, the largest 20 to 30 mm. wide; inflorescence on the old wood; spikelets 35 to 60 mm. long.

This species is still found in large masses in some of the swamps of the southern states, where they are known as cane-brakes.

ILLINOIS SPECIMENS: Without locality, southern Illinois, *Vasey*; without locality, *Lapham*. JACKSON CO. Makanda, *Seymour*, Aug., 1880. ST. CLAIR CO. Mascoutah, *Welsch*. WABASH CO. Banks of Wabash river, *Schneck* in 1879, June, 1905; July, 1904; Mt. Carmel, *Patterson*, Sept., 1877; Mt. Carmel, *Schneck*, June, 1900.

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