

THE NORTH AMERICAN SPECIES OF PASPALUM

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INTRODUCTION

BASIS AND METHODS OF WORK

The revision of *Paspalum* here offered is based primarily upon the collections in the United States National Herbarium. The collections of *Paspalum* in several of the large herbaria of this country and in Europe have also been examined. As in other groups, nearly all the early descriptions of American species of *Paspalum* were published by European authors. It has been necessary, therefore, to seek the basis of their work in European herbaria. The writer studied the collections in several of the herbaria listed in the revision of *Panicum*,¹ and visited besides Freiburg, where, at the Botanical Institute, is preserved Doell's own herbarium; Leiden, where types of Persoon and Steudel are preserved in the Rijks Herbarium; and Pisa, where Raddi's types are preserved at the University.

The Hackel Herbarium, listed in the revision of *Panicum* under Attersee, the home of Prof. Eduard Hackel, is now in the Natural History Museum in Vienna.

Dr. J. Daveau kindly lent for study the collections of *Paspalum* in the Institut Botanique, Montpellier, and Dr. René Viguiier those in the Institut Botanique at Caen.

The plants studied by Flügge, author of *Graminum Monographiae*, Part 1, *Paspalus* (Reimaria), published in 1810, have not been located. Johann Flügge was a physician of Hamburg. He appears to have used the Willdenow Herbarium, preserved in the herbarium of the Botanical Museum in Dahlem, Berlin, at least for the Humboldt and Bonpland collections. In the herbarium of the British Museum are a number of grasses from the herbarium of Ernst Ferdinand Nolte, with labels bearing names and data agreeing with those in Flügge's work, the plants themselves agreeing with the descriptions. According to Murray and Britten² the British Museum purchased a selection of plants from the Nolte Herbarium in 1875, the year of

¹ Contr. U. S. Nat. Herb. 15: 2-4. 1910.

² Hist. Coll. Nat. Hist. Brit. Mus. 1: 171. 1904.

Nolte's death. Nolte seems to have purchased a number of classic herbaria, the collections of Forskål, Cavanilles, Delile, and Allioni, being among those in his herbarium. It may be that he purchased Flügge's herbarium. Flügge's name nowhere appears on the specimens examined in the British Museum.

TYPE SPECIMENS

Like the revision of *Panicum* the work on *Paspalum* has been done on a type basis. For a discussion of this method of work the reader is referred to the revision of *Panicum* and especially to Hitchcock's revision of *Agrostis*.³ The basis of each name, valid or synonymous, is stated in each case, and also the herbarium in which the type specimen is preserved.

SPECIES, SUBSPECIES, AND FORMS

The attitude expressed in the revision of *Panicum*⁴ has been strengthened during subsequent years. Judgment concerning the taxonomic rank of groups of *Paspalum* has been based on a great amount of herbarium material and on somewhat extended field work. In some species, such as *Paspalum coryphaeum*, field work has shown that what in the herbarium appear to be fairly distinct species are not even taxonomic forms, but phases, from young simple plants to old branching ones, or habitat forms. Others, like *P. laeve* and *P. plicatulum*, might be divided into a great number of varieties and forms, but having so divided them it would still be difficult to assign many plants to any particular form, the characters failing to make constant combinations. The fact seems to be that the species actually are variable in length of leaf, pubescence, and, within narrow limits, size of spikelet. Some, such as the allies of *Paspalum setaceum*, form a network of closely related species. The entire Setacea group might be reduced to one or two species with subspecies, varieties, subvarieties, and forms, and the Laevia to another, but I do not see that greater definiteness would be gained thereby. A name is the expression of a taxonomic idea.⁵ If it were obvious which of the species involved was the parent and which the descendants, and the order of their descent, it would express a taxonomic idea to make the parent form a species with the others ranged under it, according to their descent. But the study of a vast amount of material in the field and in the herbarium does not indicate any definite descent. I surmise the parent form is long since extinct, that *P. ciliatifolium*, *P. pubescens*, and *P. stramineum* are brothers, that the others are cousins in various

³ U. S. Dept. Agr. Bur. Pl. Ind. Bull. 68: pp. 12-14. 1905.

⁴ Hitchc. & Chase, Contr. U. S. Nat. Herb. 15: 7. 1910.

⁵ Greene, Landmarks of Botanical History, 122. (Smithsonian Misc. Coll. 54: no. 1870.) 1909.

degrees removed. Darwin's diagram⁶ best expresses the case. To place *P. pubescens* as a subspecies of *P. ciliatifolium*, with *P. stramineum* and *P. supinum* under that as varieties, and *P. setaceum* as another subspecies, with *P. debile* and *P. longepedunculatum* as varieties under it, would express an exactness of relationship that the facts do not at all warrant. All we can truthfully say is that the species are closely related and appear to intergrade, whether by hybridization or by reverting to ancestral forms we do not know.

It may be, as some geneticists hold, that there are far more real species than we recognize, but if these "elementary" species can not be recognized, it seems needless to cumber bibliography with them. The descriptions are based on the great majority of plants studied, and specimens that disagree slightly with these descriptions are cited as exceptional or intermediate.

GEOGRAPHICAL DISTRIBUTION

The species of *Paspalum*, numbering probably nearly 400, are plants of the Tropics and warm temperate regions, especially of the Western Hemisphere, and are particularly abundant in Brazil. The genus extends to the northern United States, but no species are known from Canada or from the Rocky Mountains north of Colorado. Two littoral species and two tropical weedy ones are of world-wide distribution but are undoubtedly of American origin. The relatively few species not native to the Americas are mostly allies of *Paspalum scrobiculatum* L. and related to our dark-fruited species of the *Plicatula* group. The species of *Paspalum* are found in various habitats from sandy coasts, marshes, savannas, and prairies, to forested or brushy slopes, where some assume a clambering habit. In much of the high campos of Brazil *Paspalum* is the dominant genus of grasses.

TEXT FIGURES

Each species is illustrated by a text figure showing a portion of the inflorescence, only enough to suggest its general character, natural size, two views of the spikelet and one view of the fruit magnified 10 diameters. The four full page habit drawings were made by Mary Wright Gill, the other figures by the author.

ECONOMIC IMPORTANCE OF PASPALUM

Paspalum is one of the most economically important genera of *Paniceae*, the tribe to which it belongs, only *Panicum*, containing the common millet, *Chaetochloa* (*Setaria*), containing the foxtail millets, and *Pennisetum*, containing pearl millet and elephant or Napier grass, exceeding it in value.

⁶ Origin of Species, chap. 4, opposite p. 90, Amer. ed. 1887.

A large number of native perennial species of *Paspalum*, especially *P. circulare*, *P. laeve*, and related species, and *P. pubescens* and its allies furnish excellent grazing from the Middle Western States southward. They are mostly late summer and fall grasses, furnishing fresh forage when earlier pasture grasses are dry or have been consumed. *Paspalum pubiflorum* and more particularly *P. pubiflorum glabrum* are excellent drought-resistant pasture grasses in the Gulf States and northward to Kentucky and Oklahoma. They, as well as *P. laeve* and *P. circulare*, are cut for hay to a limited extent. The chief value of the native perennials, however, is for grazing. *Paspalum boscianum*, commonly called bull-grass or bull-paspalum, a succulent annual, furnishes good hay in the Southeastern States, where it makes abundant volunteer growth in fields after cultivation of the crops has ceased. It reseeds freely and is not planted. It is especially valuable for dairy cows, but is hard to cure unless dried on frames.

Paspalum dilatatum, widely known as paspalum-grass, water-paspalum, water-grass, or more commonly simply paspalum, and in recent years as Dallis grass, was introduced into the southern United States from Uruguay or Argentina about the middle of the last century and is now common throughout the Gulf States where it is considered a valuable pasture grass especially for dairy cattle, furnishing excellent late summer and autumn feed, withstanding close grazing, and not being injured by moderate frosts. It is most important in northern and central Georgia, Alabama, and Mississippi, where it is cut for hay as well as grazed. The names water-paspalum and water-grass are misleading because, though this species is naturally a plant of moist lowlands, records show that it stands extreme drought where there is a good rainfall at some time of the year. In the Hawaiian Islands, particularly on the island of Hawaii, and in Guam *Paspalum dilatatum*, introduced from the Southern States, is building up a livestock industry. In the Philippine Islands it is widely planted by dairymen and ranchers for pasture, but is not cut for hay.

Paspalum urvillei, Vasey grass, is related to *P. dilatatum* and was introduced somewhat later from Uruguay or southern Brazil. It is coarser and taller than *P. dilatatum*, and though readily grazed while young, becomes woody and unpalatable with age. In some sections of the South, particularly Arkansas and Louisiana, it is cut for hay. It was introduced into Australia and South Africa, where it is now regarded as a useful fodder grass. The early introductions of this grass into the British dominions were misidentified as *Paspalum virgatum* and that name still persists, an unfortunate error, true *P. virgatum* being one of the unpalatable group called in Spanish America "cortaderia" because of the razor-edged blades. The name *P.*

virgatum for *P. urvillei* has recently found its way into Hawaiian agricultural literature.

Paspalum notatum has been introduced as a pasture grass in the Gulf States under the name Bahia grass. It is proving of value, especially in Florida, thriving on both clayey and sandy soil and being readily grazed. It forms the main constituent of native pasture in Cuba and Porto Rico and in parts of Costa Rica, southern Brazil, Uruguay, and Argentina. It has recently been introduced into East Africa and is said to furnish excellent lowland pasture in Uganda. *Paspalum notatum* is coming into use for golf courses in the West Indies and in Panama, because it forms a tough heavy turf even on rather light sandy soil.

Less important are the native *Paspalum lividum* and *P. hartwegianum* in Texas and Mexico. The latter has recently been grown in Mississippi as a forage grass. It is sensitive to frost but is promising for pasture along the Gulf Coast.

Paspalum vaginatum is an important soil binder on low sandy coasts in the Tropics and sub-Tropics, and *P. distichum*, known as knotgrass, jointgrass, and Fort Thompson grass, is a valuable soil binder along streams subject to erosion in the Tropics and sub-Tropics. It furnishes excellent grazing in flat regions near the coast. In the West it is spreading along irrigation ditches and sometimes invades rice fields in California. In Australia it is known as water-couch and siltgrass. It is there regarded as a valuable grass on alluvial flats.

A wide-spread aquatic species, *Paspalum repens*, floating-paspalum or water-paspalum, is sometimes a water weed, making dense growth in drainage canals in the Southern States. It has recently been reported as troublesome in the Panama Canal Zone where it is choking the outlet of Pedro Miguel River and affording a breeding place for mosquitoes. This species is, however, greedily eaten by cattle wherever they have access to it, the animals wading far into the water to get it. It would seem that cattle might be utilized to hold this grass in check or to exterminate it if desirable.

Paspalum conjugatum a common widely creeping species of the Tropics and sub-Tropics, not grazed by cattle where other forage is available, makes a fairly good grass for golf grounds in southern Louisiana.

According to W. L. McAtee, of the Biological Survey, the seeds of paspalum are eaten by a large number of birds, wild ducks and bobwhites especially feeding on them extensively.

HISTORY AND LIMITATION OF THE GENUS.

The genus *Paspalum* was first known from American plants. There are but two known pre-Linnaean figures of *Paspalum*, both cited by Linnaeus under *Panicum dissectum*, the first species of

Paspalum described. Neither belongs to this species. The first, Plukenet's "Gramen paniceum, spica simplici, ad caulem intervallata, binis granorum ordinibus uno versu constante *Americanum*," plate 350, figure 2,⁷ is unidentifiable, but may be *Paspalum boscianum*. The figure seems to be meant to illustrate the American species cited by Linnaeus and also "Gramen paniceum distachyophoron s. spica gamella, binis granorum ordinibus uno versu constante Ind. Orient. Ponnevaragupille *Malabarorum*," coupled with it by Plukenet. The latter phrase name probably refers to *Paspalum scrobiculatum* and the figure may have been intended for that, though Linnaeus did not cite it when later he described *P. scrobiculatum*. The second pre-Linnaean figure, Sloane's "Gramen dactylon majus, panicula longa, spicis plurimis nudis crassis," plate 69, figure 2,⁸ is *Paspalum virgatum*, and is later cited by Linnaeus under that species.

In the *Species Plantarum* (1753) Linnaeus included the one species of *Paspalum* known to him in *Panicum*, describing the genus *Paspalum* in 1759, with four species, all still retained in the genus. The type species,⁹ the earliest described, belongs to a relatively small group, in which the rachis is foliaceous-winged.

Subsequent authors expanded the genus to include species of other groups. Lamarck¹⁰ included species of *Syntherisma* (*Digitaria*), *Axonopus*, *Eriochloa*, and *Cynodon* (*Capriola*), and was followed by Poiret.¹¹ Flügge¹² includes all these except *Cynodon*. Kunth, Trinius, and Nees, in their various works, and most subsequent authors retain species of *Axonopus* in *Paspalum*, but place *Syntherisma* in *Panicum*, mostly as section *Digitaria*, or recognize it as a genus under the name *Digitaria* Scop. or *Syntherisma* Walt. Hooker¹³ and a few other modern authors retain *Syntherisma* in *Paspalum*. *Eriochloa* H. B. K. and *Cynodon* Pers. (or *Capriola* Adans.) have been generally recognized as distinct genera. Bentham and Hooker¹⁴ and Hackel¹⁵ include *Cabrera* and *Anastrophus* as sections of *Paspalum*. Chase¹⁶ differentiates *Axonopus* Beauv., with *A. compressus* (Swartz) Beauv. as the type, on the reversed position of the sessile, solitary spikelet, with *Anastrophus* Schlecht. as a synonym and *Cabrera* Lag. (including *A. aureus*) as a section.

⁷ Plukenet, Mant. 94. pl. 350. f. 2. 1700.

⁸ Sloane, Cat. Pl. Jam. 34. 1696; Voy. Jam. 1: 112. pl. 69. f. 2. 1707.

⁹ See page 7.

¹⁰ Tabl. Encycl. 1: 175-176. 1791.

¹¹ In Lam. Encycl. 4: 28-35. 1804.

¹² Monogr. Pasp. 1810.

¹³ Fl. Brit. Ind. 7: 10-20. 1896.

¹⁴ Gen. Pl. 3: 1098. 1883.

¹⁵ In Engl. & Prantl, Pflanzenfam. 2³: 35. 1887.

¹⁶ Proc. Biol. Soc. Washington 24: 129-136. 1911.

Nash¹⁷ recognizes *Anastrophus* Schlecht. for *A. compressus* and its close allies, and *Axonopus* Beauv., taking *A. aureus* Beauv. as the type, for this species and its allies, distinguished by long stiff golden hairs on the rachis. Stapf¹⁸ recognizes *Axonopus* Beauv., including *A. compressus*, as distinct from *Paspalum*.

In the present paper *Axonopus* Beauv., including *Anastrophus* Schlecht. and *Cabrera* Lag., is excluded from *Paspalum*, and *Dimorphostachys* Fourn., once recognized as a genus by Nash¹⁹ but later²⁰ included by him in *Paspalum*, is included in this genus.²¹

One well-marked subgenus, *Ceresia*, is here recognized. This is connected with *Paspalum* proper by the group *Dissecta* (the subsection *Pseudoceresia* of Bentham and Hooker). The species are grouped and arranged to indicate their affinity, so far as possible in a lineal sequence. Some groups, such as *Setacea* and *Leavia*, are natural aggregations of closely related species; the constituents of other groups are less obviously allied. Four species having no close allies are left ungrouped.

DESCRIPTION OF THE GENUS AND SPECIES

PASPALUM L.

Paspalum L. Syst. Nat. ed. 10. 2: 855. 1759. Following a brief diagnosis four species are given: *Paspalum dimidiatum*, *P. virgatum*, *P. paniculatum*, and *P. distichum*. All agree with the diagnosis and all are to-day included in the genus. *Paspalum dimidiatum*, which is based on *Panicum dissectum* L. Sp. Pl. 57, 1753, being the earliest species described, is taken as the type. Linnaeus does not explain the change of the specific name. The sheet in the Linnaean Herbarium bears both names in his writing, "*dimidiatum*" being crossed out. In the second edition of the *Species Plantarum* the name is changed to *Paspalum dissectum*.²² The masculine form *Paspalus* was used by Flügge,²³ by Roemer & Schultes,²⁴ and by Nees.²⁵

Sabsab Adans. Fam. Pl. 2: 31, 599. 1763. No species are given. "*Paspalum* Lin." is cited as synonym.

Cleachne Roland in Rottb. Act. Lit. Univ. Hafn. 1: 285. 1778. This name is given as a synonym of *Paspalum* in a list of plants of Surinam, with three names without description.

¹⁷ In Small, Fl. Southeast. U. S. 79. 1903; N. Amer. Fl. 17: 161-164. 1912.

¹⁸ In Prain, Fl. Trop. Afr. 9: 565. 1919.

¹⁹ In Small, Fl. Southeast. U. S. 78. 1903.

²⁰ N. Amer. Fl. 17: 179-180. 1912.

²¹ For discussion of generic synonyms see pp. 7 to 9, and for further discussion of generic characters see p. 9 and Chase, Proc. Biol. Soc. Washington 24: 129-132, 137-141. 1911.

²² For further discussion of *Paspalum* and generic synonyms see Chase, Notes on Genera Paniceae IV. Proc. Biol. Soc. Washington 24: 137-141. 1911.

²³ Monogr. Pasp. 51-190. 1810.

²⁴ Syst. Veg. 2: 290-317. 1817.

²⁵ Agrost. Bras. 18-82. 1829.

Ceresia Pers. Syn. Pl. 1: 85. 1805. A brief diagnosis is given and a single species, *C. elegans* Pers., is cited. This name is based on "*Paspalum membranaceum* Lam. ill. gen. 177. t. 43. f. 2. Hab. in Peru." The generic diagnosis appears to be taken from Lamarck's specific description, but slightly rearranged. Lamarck's specimen was examined in the Paris Herbarium. The name is invalidated by *Paspalum membranaceum* Walt. 1788, and the species has been renamed *Paspalum ceresia* (Kuntze) Chase. It is related to *P. stellatum* Humb. & Bonpl., but is not known from North America.

Reimaria Flügge, Monogr. Pasp. 213. 1810. Three species are included, *R. candida* Humb. & Bonpl., *R. elegans* Humb. & Bonpl., and *R. acuta* Humb. & Bonpl. The first two are species of *Paspalum* in which both glumes are wanting; the first, *R. candida*, is taken as the type of *Reimaria*. The third species, to which the generic description less aptly applies, has been made the type species of *Reimarochloa* Hitchc.

Paspalanthium Desv. Opusc. 59. 1831. A single species, *P. stoloniferum* Desv., based on *Paspalum stoloniferum* Bosc, is included. This is the same as *Paspalum racemosum* Lam.

Moenchia Wender in Steud. Nom. Bot. ed. 2. 2: 153. 1841. Not *Moenchia* Roth. 1788. There is no description, a single nomen nudum, *M. speciosa* Wender, being given as a synonym of *Panicum saccharoides* Kunth (upon which is based *Paspalum saccharoides* Nees).

Anachyris Nees, Journ. Bot. Kew Misc. 2: 103. 1850. A single species, *A. paspaloides* Nees, "In Brasilia. Gardner, n. 4031 in herb. Lindl.," is included. This specimen is the same as *Paspalum malacophyllum* Trin. (see page 228). Steudel²⁶ spells the name *Anachyrium*.

Maizilla Schlect. Bot. Zeit. 8: 601, 605. 1850. A single species, "*M. stolonifera* Bosc. sub *Paspalo*," is included. This is the same as *Paspalum racemosum* Lam.

Cymatochloa Schlecht. Bot. Zeit. 12: 817, 821. 1854. Two names, "*C. fluitans* (*Ceresia fluitans* Ell.)," and "*C. repens* (*Paspalum repens* Berg.)," are given. Both names apply to the same species, *Paspalum repens* Berg.

Dimorphostachys Fourn. Compt. Rend. Acad. Sci. Paris 80: 441. 1875. This genus is proposed because of the presence of the first glume of the spikelet, this glume in the lower of the pair of spikelets being larger than in the upper. The author says the group contains eleven species, but four of which he mentions, *Panicum monostachyum* H. B. K., *Paspalum pilosum* Lam., *Paspalum oajacense* Steud., and *Paspalum pedunculatum* Poir. Fournier does not here actually transfer any species to *Dimorphostachys*. His first-named species, which we take as the type, was, together with the others given in his posthumous work,²⁷ published under this genus by Hemsley,²⁸ as *D. monostachya* Fourn., based on *Panicum monostachyum* H. B. K., which is the same as *Paspalum pilosum* Lam.

Wirtgenia Nees; Doell in Mart. Fl. Bras. 2²: 40. 1877. "*Wirtgenia paspaloides* Nees ab Esenb. in herb. Reg. Berolin.," a herbarium name for the species Nees published as *Anachyris paspaloides*, is here given as a synonym of *Paspalum malacophyllum* Trin.

Digitaria Heist. has been included by the writer²⁹ in the synonymy of *Paspalum*. The name is first published by Fabricius³⁰ as follows: "*Digitaria* Heist. *Dactylis* Rai. Gramen dactylon majus panicula longa, spicis pluribus nudis

²⁶ Syn. Pl. Glum. 1: 33. 1854.

²⁷ Mex. Pl. 2: 14-16. 1886. See p. 20 for discussion of date.

²⁸ Biol. Centr. Amer. Bot. 3: 499. 1885.

²⁹ Proc. Biol. Soc. Washington 24: 137. 1911.

³⁰ Pl. Hort. Helmst. 207. 1759.

crassis. Sloane." This phrase name in Sloane³¹ refers to the species described as *Paspalum virgatum* by Linnaeus, who cites the same Sloane phrase name and illustration. As shown by Hitchcock,³² however, this citation is to be regarded as an error, a misidentification, rather than the basis of the name, the plant in Helmstadt, Bavaria, to which the name was applied, being undoubtedly the common crabgrass, *Digitaria sanguinalis* (L.) Scop., or *Syntherisma sanguinalis* (L.) Dulac. The reference to Ray leads back to a group of finger-grasses including *Hyparrhenia hirta* (L.) Stapf, *Cynodon dactylon* (L.) Pers., *Syntherisma sanguinalis*, and others. The Sloane citation being rejected, the name *Digitaria* does not apply to *Paspalum*.

Syllepis Fourn. is included in the synonymy of *Paspalum* by Nash.³³ Fournier³⁴ cites "Sacchari species anomalae Kunth, Enum. 1, 475," and includes two Mexican species. The Kunth species are *Saccharum contractum* Humb. & Bonpl., *S. dubium* Humb. & Bonpl., and *S. caudatum* Meyer, all now referred to *Imperata*. The Mexican species included in *Syllepis* are *S. polystachya*, based on *Saccharum polystachyum* Swartz, therefore a typonym of *Paspalum saccharoides* Nees, and *S. ruprechtii*, without description, but with specimens cited showing it to be *Imperata brasiliensis* Trin. Under *Syllepis polystachya* Fournier cites Gouin's no. 56 from Vera Cruz, which we have not seen, and Wright "in herb. Durand" from Texas, which is probably a duplicate of *Imperata hookeri* Rupr., collected in what is now New Mexico, by Wright (no. 2101). We take *Syllepis ruprechtii* as the type of the genus, referring *Syllepis* to *Imperata* as a synonym. This is the disposition made of it by Bentham & Hooker.³⁵

DESCRIPTION

Inflorescence of 1 to numerous simple spikelike racemes along a simple common axis; spikelets plano-convex, or sometimes unequally biconvex or concavo-convex, sessile or short-pedicelled, solitary or in pairs, in two rows on one side of a narrow or winged rachis, the back of the fertile lemma (the convex side of the spikelet) toward it; first glume typically wanting, regularly present in one group and in a few other species, occasionally developed in others; second glume and sterile lemma usually similar, the glume suppressed in a relatively few species; fruit commonly obtuse, the lemma and palea chartaceous-indurate, rarely but slightly so, the margin of the lemma inrolled at maturity, a lunate line of thinner texture at the back just above the base, the radicle protruding through this at germination; stamens three, styles two, stigmas plumose.

Annual or perennial grasses, of various habit, confined to the warmer regions of both hemispheres, mostly American.

In the United States most of the species flower in late summer and autumn.

The characters of chief generic value are the strictly racemose inflorescence, the plano-convex or slightly concavo-convex spikelets in which the first glume is wanting, and the obtuse indurate fruit, the margin of the lemma inrolled, taken in combination. But in this large genus, though well marked as a whole, there are many species in which one or more of these characters fail. The suppression of the first glume, by which Linnaeus distinguished *Paspalum*, "gluma 2-valvis," from *Panicum*, "gluma uniflora trivalvis," and which has been generally accepted as the principal generic character by subsequent authors, is the least

³¹ Voy. Jam. 1: 112. pl. 69. f. 2. 1707.

³² Rhodora 29: 114-116. 1927.

³³ N. Amer. Fl. 17: 165. 1912.

³⁴ Mex. Pl. 2: 52. 1886.

³⁵ Gen. Pl. 3: 1125. 1883.

reliable. In a majority of the species an occasional spikelet may be found with the first glume developed. In *Paspalum distichum* such spikelets are common, in *P. vaginatum* frequent. In the group Decumbentes, including *Dimorphostachys* Fourn., the first glume is usually developed unequally, being small to nearly obsolete on the primary spikelet (the upper) of a pair and large on the secondary spikelet. They are exceedingly variable in size in a single raceme. The second glume also is suppressed in *Paspalum candidum* and its allies and in a few other species. This usually holds for a species, but in *P. multicaule* and in the South American *P. pallidum* H. B. K. spikelets in a single raceme are found, some with and some without the second glume. Throughout this paper the second glume refers to that organ even though the first is wholly wanting. The "third glume" or "third scale" of various authors is here called the sterile lemma.

Species of *Paspalum* have commonly been described as having spikelets in two rows or in three or four rows. The spikelets are always in two rows on one side of the rachis, but in a great many species the pedicel is actually a branch, bearing a primary spikelet at its summit and a secondary spikelet on a short branchlet or pedicel. Such spikelets crowded together appear to be in four rows; when less densely crowded, with one of each pair turned toward the center of the raceme they appear to be in three rows.

KEY TO SPECIES AND GROUPS

Rachis membranaceous or foliaceous, mostly broad and winged. (Scarcely winged in a few species with silky spikelets.)

Spikelets clothed with long silky hairs or conspicuously fringed with long hairs. (See also *Dilatata* and *Conjugata* with narrow rachis.) See SUBGENUS *Ceresia*, p. 15.

Spikelets glabrous (or minutely pubescent in *P. repens*). Rachis foliaceous, green. See *Dissecta*, p. 28.

Rachis not membranaceous, foliaceous, or winged. (Slightly winged in a few species but, if so, spikelets not silky.)

Inflorescence a large flabellate panicle of numerous racemes. Spikelets solitary.

Spikelets glabrous or minutely ciliate.....107. *P. fasciculatum*.

Spikelets obscured by their long silky hairs.....140. *P. saccharoides*.

Inflorescence not flabellate.

Racemes 2, conjugate or nearly so at the summit of the culm, rarely a third below. (Racemes 2 to 5 in *P. paucispicatum*.)

Spikelets elliptic to narrowly ovate.

Plants with creeping rhizomes or stolons. See *Disticha*, p. 41.

Plants tufted, not rhizomatous or stoloniferous.

Spikelets not transversely wrinkled.....36. *P. lineare*.

Spikelets transversely wrinkled.....87. *P. insulare*.

Spikelets suborbicular, broadly ovate or obovate.

Spikelets concavo-convex, sparsely long-silky around the margin; plant stoloniferous.

Racemes usually not more than 12 cm. long; spikelets 1.4 to 1.8 mm. long.....104. *P. conjugatum*.

Racemes usually more than 12 cm. long; spikelets mostly 2 mm. long.
104a. *P. conjugatum pubescens*.

Spikelets plano-convex (rarely biconvex), not silky margined; plants not stoloniferous.

Plants annual, small, slender; spikelets not more than 1.5 mm. long.

Spikelets orbicular, some of them beaded with globular hairs.

91. *P. multicaule*.

Spikelets obovate, glabrous or minutely pubescent.

Glume and sterile lemma narrower than the fruit, exposing it, spotted with black.....92. *P. pictum*.

Glume and sterile lemma covering the fruit, not spotted.
93. *P. clavuliferum*

Plants perennial; spikelets 1.8 to 3 mm. long.

Spikelets golden-brown, transversely marked with dark lines.
35. *P. serpentinum*.

Spikelets green, not marked. See *Notata*, p. 63.

Racemes 1 to many, racemose or fascicled on the axis, not conjugate.

Second glume wanting.

Fruit smooth and shining.....137. *P. pulchellum*.

Fruit minutely papillose.

Pedicels bearing stiff hairs as long as the spikelets; fertile lemma not ridged.....136. *P. gardnerianum*.

Pedicels without stiff hairs; fertile lemma prominently ridged.
135. *P. malacophyllum*.

Second glume developed.

First glume developed on at least one of the pair of spikelets.

Spikelets turgidly biconvex.....138. *P. bifidum*.

Spikelets plano-convex. See *Decumbentes*, p. 91.

First glume normally wanting (rarely developed on occasional spikelets).

Racemes terminal and axillary, the axillary sometimes hidden in the sheaths; terminal inflorescence of 1 to 3, rarely to 6, racemes.

Plants rooting at the lower nodes.....48. *P. nutans*.

Plants erect to widely spreading but not rooting at the nodes.

See *Setacea*, p. 73.

Racemes terminal on the primary culm or leafy branches, no truly axillary racemes. (A flowering branch, with a leaf reduced to the sheath and wholly concealed in the parent sheath, sometimes found in *P. laxum*, *P. laeve* and others, simulates an axillary raceme).

Plants annual.

Spikelets with a broad firm notched margin.

139. *P. fimbriatum*.

Spikelets not so margined.

Spikelets not more than 1.5 mm. long, elliptic; fruit pale.

Racemes 6 to 35.....96. *P. microstachyum*.

Racemes 1 to 4. See *Parviflora*, p. 148.

Spikelets 2 to 3 mm. long; fruit dark brown.

Spikelets 2.4 to 3 mm. long, commonly appressed-pubescent.

132. *P. convexum*.

Spikelets not more than 2.2 mm. long, glabrous.

Rachis scarcely 1 mm. wide...133. *P. melanospermum*.

Rachis 2 to 2.5 mm. wide.....134. *P. boscianum*.

Plants perennial.

Racemes solitary, subcylindric; spikelets solitary (sometimes paired in *P. sauguetii*).

Plants stoloniferous. Culms rarely more than 10 cm. tall.

Glume and sterile lemma not beaked or wrinkled.

97. *P. breve*.

Glume and sterile lemma beaked beyond the fruit, deeply wrinkled.....98. *P. edmondi*.

Plants not stoloniferous.

Sterile lemma wrinkled or crumpled. See *Filiformia*, p. 140.

Sterile lemma not wrinkled or crumpled.

Spikelets 3 to 3.3 mm. long, pubescent at least toward the margin and base. See *Alterniflora*, p. 138.

Spikelets not more than 1.8 mm. long.

Blades not more than 1 mm. wide, concavo-convex or subterete in cross section.

Plants delicate; blades capillary, subterete.

90. *P. capillifolium*.

Plants wiry; blades concavo-convex.

83. *P. filiforme*.

Blades or some of them 2 mm. or more wide; flat or involute.

Spikelets elliptic, glabrous..... 88. *P. rupestre*.

Spikelets oval, pubescent..... 89. *P. saugatii*.

— Racemes 2 to many.

Glume and sterile lemma conspicuously crumpled.

85. *P. lindenianum*.

Glume and sterile lemma not crumpled or but slightly so.

Plants creeping, rooting at the nodes.

Spikelets 3.5 mm. long, in pairs... 22. *P. paucispicatum*.

Spikelets not more than 2.5 mm. long (except subterranean spikelets of *P. ampicarpum*), solitary.

Plants not stoloniferous, the culms decumbent and rooting at base; fruit pale..... 67. *P. squamulatum*.

Plants stoloniferous; fruit reddish at maturity. See *Orbiculata*, p. 157.

Plants not creeping, sometimes rooting at 1 or 2 nodes of a decumbent base, if so, spikelets in pairs.

Spikelets conspicuously silky-ciliate around the margin, the hairs as long as the spikelet or longer. See *Dilatata*, p. 169.

Spikelets not conspicuously ciliate.

Fruit dark brown and shining; spikelets glabrous or minutely appressed-pubescent. See *Plicatula*, p. 213.

Fruit pale to stramineous (brown but not shining in *P. virgatum* and *P. conspersum*).

Plants robust; culms commonly more than 1 meter, often 2 meters, tall (less than 1 meter in *P. difforme*). Spikelets normally in pairs.

Culms freely branching. Racemes 10 to 45; spikelets elliptic, glandular-pubescent.

126. *P. coryphaeum*.

Culms simple or with a few simple branches.

Blades firm, with sharp-cutting edges; racemes mostly more than 15 (5 to 10 in *P. secans* with elliptic spikelets).

Sheaths, at least the lower, harshly hispid.

Rachis not ciliate..... 60. *P. affine*.

Sheaths not hispid (except in *P. nelsoni* with long-ciliate rachis). See *Virgata*, p. 196.

Blades relatively lax, the edges not cutting; racemes rarely more than 5. Spikelets orbicular or broadly obovate.

Spikelets obovate, turgidly plano-convex. See **Floridana**, p. 190.

Spikelets orbicular, depressed-lenticular. Glume and sterile lemma thin in texture. Spikelets 2.2 to 2.5 mm. (rarely to 2.8 mm.) long; foliage not conspicuously villous.

111. **P. praecox.**

Spikelets 2.7 to 3.4 mm. long; lower sheaths and blades mostly conspicuously villous, at least at base. 112. **P. lentiferum.**

Plants not robust; if more than one meter tall culms relatively slender.

Spikelets suborbicular or broadly obovate, or broadly oval.

Spikelets 2.2 to 4 mm. long, glabrous.

Spikelets turgidly plano-convex, 3.5 to 4 mm. long. 114. **P. difforme.**

Spikelets depressed plano-convex or lenticular, 2.2 to 3.4 mm. long. See **Laevia**, p. 178.

Spikelets not more than 2 mm. long.

Spikelets 2 mm. long.

Racemes thick; spikelets depressed rounded-obovate. 28. **P. mutabile.**

Racemes slender; spikelets turgidly obovate. Blades lax, velvety.

68. **P. oligostachyum.**

Blades stiff, glabrous beneath, scabrous above. 66. **P. nesiotis.**

Spikelets not more than 1.8 mm. long, hemispheric. See **Paniculata**, p. 117.

Spikelets elliptic to oval or obovate.

Blades elongate, involute, not more than 2 mm. wide. See **Alterniflora**, p. 138.

Blades not elongate and involute, or, if so, much wider.

Culms decumbent at base, rooting at the lower nodes (occasional plants in dry situations erect), branching.

Sheaths, at least the lower, harshly hispid. 59. **P. botterii.**

Sheaths not hispid, softly pubescent in some species. See **Livida**, p. 53.

Culms erect to spreading, not rooting at the nodes.

Spikelets not more than 1.8 mm. long (sometimes 2 mm. in *P. laxum*).

Spikelets in pairs. See **Caespitosa**, p. 126.

Spikelets solitary (occasionally paired in *P. saugettii*).

Racemes 3 or 4; nodes glabrous.

95. **P. standleyi.**

Racemes 1 or 2; nodes pubescent.

89. **P. saugettii.**

Spikelets 2 mm. or more long.

Blades firm, folded at base, more or less involute-margined. Plants in hard tufts.

Spikelets 3 mm. long. See *Livida*, p. 53.

Spikelets 2.1 to 2.5 mm. long.

Culms erect; rachis 1.2 to 1.5 mm. wide.....80. *P. rocanum*.

Culms stiffly ascending to spreading; rachis less than 1 mm. wide.

Blades 2 to 15 cm. long, rarely longer; spikelets 2.1 mm. long.

77. *P. bakeri*.

Blades 12 to 55 cm. long; spikelets 2.2 to 2.5 mm. long.

79. *P. pleostachyum*.

Blades relatively lax, flat.

Blades 1 to 2.5 cm. wide (sometimes slightly less in *P. coryphaeum*).

Spikelets elliptic, subacute.

Culms 1 to 4 meters tall; racemes 10 to 45.....126. *P. coryphaeum*.

Culms mostly less than 1 meter tall; racemes not more than 10.

64. *P. costaricense*.

Spikelets elliptic-obovate.

Second glume shorter than the spikelet; racemes usually fewer than 10.....59. *P. botteri*.

Second glume covering the fruit; racemes 10 to 30...60. *P. affine*.

Blades not more than 1 cm. wide (occasionally wider in *P. pubiflorum*).

Foliage velvety-pubescent throughout.....61. *P. tenellum*.

Foliage not velvety-pubescent.

Rachis more than 1 mm. wide. Racemes thick. See *Livida*, p. 53.

Rachis less than 1 mm. wide.

Second glume papillose-pubescent.....62. *P. jaliscanum*.

Second glume glabrous or very sparsely pubescent, not papillose.

Spikelets ovate, 2 mm. long.

65. *P. virletii*.

Spikelets elliptic or ovate-elliptic, 2.1 to 2.8 mm. long.

Glume and sterile lemma delicate in texture, equal.

27. *P. crinitum*.

Glume and sterile lemma not delicate, the glume shorter, exposing the fruit.

63. *P. tonduzii*.

SUBGENUS *Ceresia* (Pers.) Reichenb. Consp. Veg. 49. 1828

Erect or clambering perennials; blades firm, narrow; racemes 1 to several; rachis membranaceous, mostly broadly winged (narrowly winged to nearly wingless in *P. cymbiforme*, *P. humboldtianum* and *P. sanguineolentum*); spikelets clothed with long silky hairs or conspicuously fringed with long hairs; fruit pale. Plants of upland savannas.

Second glume broadly winged; sterile lemma fringed with long hairs.

Rachis narrower than the spikelets; glume cordate at base.

6. *P. pectinatum*.

Rachis wider than the spikelets; glume not cordate.....7. *P. contractum*

Second glume not winged; sterile lemma inconspicuously fringed.

Rachis brightly colored, the margins golden to rufous; spikelets solitary.

Culms simple; racemes solitary or paired.....1. *P. stellatum*.

Culms branching; racemes not paired, 2 to 7 on the main culm, solitary on the branches.....2. *P. heterotrichon*.

Rachis dull, greenish, purplish, or brown; spikelets paired or solitary.

Rachis 4 to 5 mm. wide; culms robust, clambering. Racemes usually more than 8.....3. *P. trachycoleon*.

Rachis not more than 3 mm. wide; culms not robust and clambering. Culms branching; rachis 2 to 3 mm. wide; spikelets fringed with spreading hairs.

Blades not ciliate, those of the primary culm not more than 7 mm. wide; fringing hairs of the spikelet rather silky, very unequal.

4. *P. cymbiforme*.

Blades papillose-ciliate, those of the primary culm mostly 8 to 12 mm. wide; fringing hairs of the spikelet stiff, about equal.

5. *P. humboldtianum*.

Culms simple; rachis 1 mm. wide; spikelets silky-villous, not stiffly fringed.....8. *P. sanguineolentum*.

1. *Paspalum stellatum* Humb. & Bonpl.

Paspalus stellatus Humb. & Bonpl. in Flüge, Monogr. Pasp. 62. 1810. "America meridionalis, Humboldt et Bonpland." Kunth²⁶ gives the locality of the Humboldt and Bonpland collection as "in radicibus Andium Novogranatensium, prope Ibague et La Palmilla," [Colombia.] Flüge states that there are two conjugate racemes, Kunth that the racemes are in pairs, rarely single. In the specimen so named in the Willdenow Herbarium labeled "Amer. merid. Humb." one culm bears one raceme, another two racemes. In the British Museum is a specimen labeled "*Paspalus stellatus* Monogr. p. 62. Amer. merid. H. & B. Willdenow 1809" which has two racemes. Both have coarsely hirsute foliage.

Paspalus stellatus var. *monostachyus* Nees, Agrost. Bras. 78. 1829. "In Brasilia australi (Sellow)." Nees divides the species into var. α *monostachyus* and var. β *distachyus*, though he states that even among the Humboldt specimens are several both *monostachyus* and *distachyus*. The Sello specimen named 'var. *monostachyus*' in Nees' script in the Berlin Herbarium has solitary racemes.

Paspalus stellatus var. *distachyus* Nees, Agrost. Bras. 78. 1829. "In apricis arenosis prope Tejuco (Langsdorff.—Vid. in Herb. Acad. Imp. Petrop. et Trin.)." The Langsdorff specimen has not been examined.

Paspalum cujabense Trin. Gram. Icon. 3: pl. 284. 1831. The figure is drawn from a Brazilian specimen, no further data given. The type specimen, in the

²⁶ H. B. K. Nov. Gen. & Sp. 1: 86. 1816.

Trinius Herbarium was collected by Langsdorff at Cuyabá. Trinius later²⁷ referred this to *P. stellatum*. As shown by an earlier plate²⁸ Trinius took *P. carinatum* Humb. & Bonpl. to be *P. stellatum*. The Langsdorff specimen is less pubescent than usual in *P. stellatum*. The name is spelled *P. cuyabense* by Doell.²⁹

Paspalum wagnerianum Schlecht. *Linnaea* 26: 133. 1853. "Sillae de Caracas (n. 396.)" Wagnener. The type has not been located, but the description applies well to Pittier 7489, from near Caracas.

Paspalum splendens var. *sphacelatum* Hack. *Oesterr. Bot. Zeitschr.* 51: 239. 1901. "Brasilia, prov. Goyaz, Glaziou nr. 22550." The specimen cited, in the

Hackel Herbarium, is named "*Paspalum splendens* Hack." in Hackel's script, but it agrees with the description, differing from *P. splendens* in having a broadly winged rachis. The foliage is much less hirsute than usual in *P. stellatum*. Some culms bear two racemes, some one only.

Paspalum stellatum forma *hirsuta* Hack. in *Stuck. Anal. Mus. Nac. Buenos Aires* 21: 28. 1911. "St[uckert] no. 18,694 * * * Resistencia, Chaco," Argentina. The form is differentiated only by hirsute leaves. The type, in the Hackel Herbarium, has densely hirsute foliage.

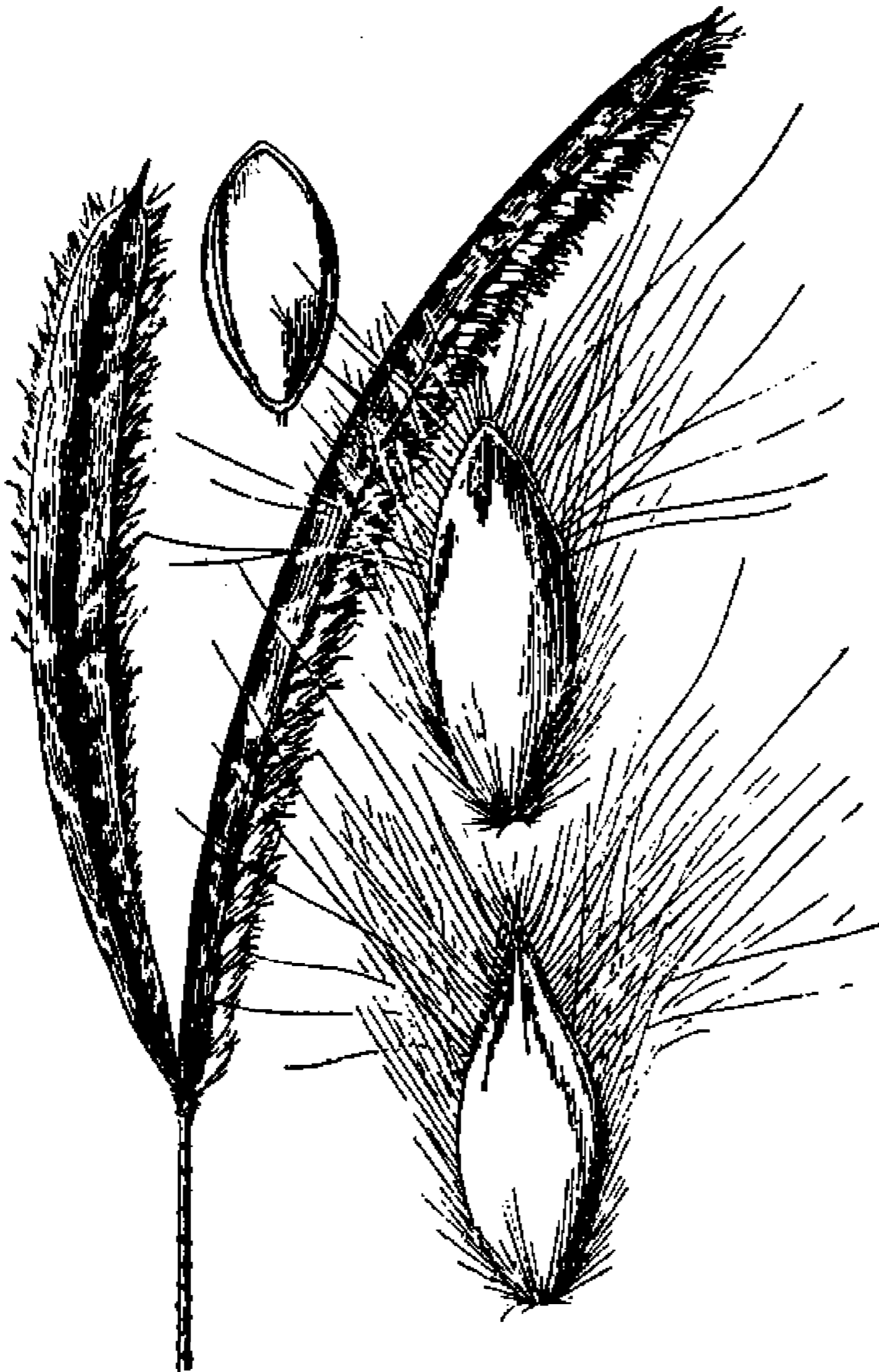


FIGURE 1.—*P. stellatum*. From Sello 5888

DESCRIPTION

A tufted perennial; culms simple, erect or the base decumbent (the outer culms of a tuft sometimes spreading), 40 to 80 cm. tall, slender and wiry, glabrous or toward the summit appressed-pubescent; nodes obscurely appressed-pubescent or glabrate; sheaths mostly overlapping,

close-fitting, the lower papillose-hirsute (or becoming papillose only) the upper glabrous or nearly so; ligule membranaceous-ciliate, about 0.5 mm. long; blades erect (the junction with the sheath inconspicuous), 8 to 25 cm. long, 2 to 3 mm. wide at base (the uppermost reduced), involute-setaceous, papillose-pilose, or the lower surface glabrous; racemes solitary or paired, ascending, more or less falcate, 2.5 to 10 cm. long (rarely longer), the second shorter, commonly reduced to a rudiment represented by a papery brown scale subtending the single

²⁷ Mem. Acad. St. Petersburg. VI. Sci. Nat. 1: 164. 1834.

²⁸ Trin. Gram. Icon. 1: pl. 119, 1828, corrected in the Corrigenda published in volume 3 of the same work, 1836.

²⁹ In Mart. Fl. Bras. 2: 94. 1877.

raceme; rachis 5 to 7 mm. wide, abruptly mucronate, glabrous or rarely sparsely pilose on the dull plum-colored keel, the papery winged margins golden-brown to purplish maroon, silvery-pubescent on the very short peduncle; spikelets solitary on minute radiately pilose pedicels, closely imbricate, the body of the spikelet almost hidden under the dense glistening white hairs, about 3 mm. long and 1.1 mm. wide, excluding the hairs, the base encircled by glistening white hairs about half as long as the spikelet; glume and sterile lemma subequal, obscurely 2 or 3 nerved (the midnerve of the lemma suppressed), fringed with glistening white hairs, those of the upper half arising from papillae and much exceeding the spikelet, the margins of the glume and lemma becoming slightly thickened and corky at maturity spreading the hairs radiately; fruit minutely stipitate, 2 mm. long, 1 mm. wide, obovate-elliptic, smooth and shining.

The name of this beautiful species refers to the radiate hairs of pedicels from which the spikelets have fallen.

DISTRIBUTION

Savannas and open rocky slopes, mostly between 500 and 1,500 meters altitude, southern Mexico and Hispaniola to Argentina.

OAXACA: Juquila, *Conzatti* 4364. Cauque, *Nelson* 3424. Teopisco, *Collins & Doyle* 124.

HONDURAS: Siguatepeque, *Standley* 55996, 56275.

EL SALVADOR: Volcán de San Salvador, *Calderón* 2272.

COSTA RICA: Boruca, *Pittier*⁴⁰ 4463.

PANAMA: Province of Coclé, *Pittier* 5020, 5064.

HAITI: St. Michel, *Leonard* 7289, 7526, 7537a. Between Morne Sala and Morne Basil, *Ekman* H 2484. Hinche, *Ekman* H 6428. Mirebalais, *Ekman* H 2302. Miragoâne, *Ekman* H 7246.

COLOMBIA: Santa Marta, *Smith* 142.

VENEZUELA: Caracas, *Bailey* 112; *Pittier* 7487, 7489. Guacara, *Pittier* 8169. Aragua, *Pittier* 11326. Galipán, *Pittier* 6201. Cojedes, *Pittier* 11998. Without locality, *Fendler* 2533.

BRAZIL: Caldas, *Regnell* III. 1344. Bello Horizonte, *Chase* 9308. Serra do Cipó, *Chase* 9100, 9253, 9295. Minas Geraes, *Claussen* 1020; *Glaziou* 17414, 20085; *Widgren* 887. Goyaz, *Gardner* 4030; *Glaziou* 22545, 22548, 22550. Pocos da Caldas, *Holway* 1708. São Paulo, *Gerdes*. Cuyabá, *Malme* 1562 E. Capão Grande, *Dusén* 4023, 8011. Without locality, *Glaziou* 22553 in part; *Riedel*; *Sello* 5656, 5686.

PARAGUAY: Río Apa, *Hassler* 11058. Trinidad, *Rojas* 2757. Cordillera de Altos, *Fiebrig* 664.

BOLIVIA: Buenavista, *Steinbach* 7103.

ARGENTINA: Posadas, *Ekman* 594, 595; *Parodi* 4515, 4664, 7070. Territorio del Formosa, *Jørgensen* 2882.

2. *Paspalum heterotrichon* Trin.

Paspalum heterotrichon Trin. Gram. Icon. 3: pl. 285. 1831. The figure is drawn from a Brazilian specimen; nothing further as to locality is given. The type specimen in the Trinius Herbarium is labeled "Brasil (absque loc.) Langsdorff 1829."

Paspalum (Ceresia) gracile Schlecht. Linnaea 10: 134. 1854. Not *P. gracile* Rudge 1805. Plantae Wagnerianae Columbicae no. 397, collected at "Sillae de

⁴⁰ Collections from Costa Rica bearing identical data and numbers have been distributed some with Pittier, some Tonduz as collector. Some are on the "Herb. Instit. physico-geogr. nat. costaricensis" label, some on Pittier & Durand label.

Caracas," Venezuela. The type has not been located. The description applies closely to *P. heterotrichon*.

Paspalum heterotrichum var. *paucispicatum* Hack. Notizbl. Bot. Gart. Berlin 1: 328. 1897. "Habitat in Haiti in montibus Furcy; *Picarda* n. 1525." Differentiated from the typical form in having but 1 or 2 racemes. The type

specimen, bearing the name in Hackel's script, in the Hackel Herbarium in Vienna, is an unusually slender plant.

DESCRIPTION

A tufted perennial; culms leafy, very slender, wiry, obscurely pubescent toward the almost filiform summit, otherwise glabrous, at first simple and erect, 50 to 90 cm. tall, later branching and leaning or clambering among other vegetation, the branches borne from the middle and upper nodes, sometimes repeatedly branching with short internodes and narrow blades, the whole forming a somewhat flabellate cluster; nodes bearded with appressed silky white hairs; sheaths mostly overlapping, close, silky pubescent along the margin, puberulent at the junction with the blade and with a fringe of white hairs 4 to 5 mm. long at the throat; blades spreading, firm, becoming involute at least toward the acuminate-setaceous apex, minutely puberulent on the upper surface, obscurely so or



FIGURE 2.—*P. heterotrichon*. From type specimen and *Malme* 1562 B

glabrous beneath; those of the primary culm 5 to 15 cm. long and 2 to 3.5 mm. wide, those of the branches 3 to 8 cm. long and about 2 mm. wide, the uppermost blades reduced to a setaceous point; racemes of the primary culm 2 to 7 (rarely 1) those of the branches usually solitary, ascending-falcate, 1 to 6 cm. long on short slender bearded pedicels, 1 to 2 cm. distant along a subfiliform slightly flexuous axis; rachis 3 to 4 mm. wide, glabrous, abruptly acuminate, the keel dull green, the thin membranaceous margins golden-ochraceous; spikelets solitary, closely imbricate, whitish, more or less obscured by the copious glistening white hairs, excluding these hairs about 2.5 mm. long, 0.8 mm. wide, elliptic, acute; glume subhyaline with 3 rather strong nerves, the marginal pair fringed with spreading white hairs from 1 to 2 mm. long, arising from papillae, a single hair from midway on each side stouter than the rest and as much as 3 mm. long, the glume also bearing just above the base a ring of hairs half as long as the spikelet, the sterile lemma narrower and slightly shorter than the glume, short-ciliate toward the apex, otherwise glabrous, 3-nerved, the midnerve lying in a sulcus extending from the base to half or two-thirds the length of the lemma; fruit but little indurate, 1.7 mm. long, 0.6 mm. wide, elliptic-lanceolate, very minutely puberulent at the apex.

DISTRIBUTION

Open grassy hillsides and savannas, at moderate altitudes, from Panama to Peru and southern Brazil; also in Haiti.

PANAMA: El Boquete, *Hitchcock* 8235, 8297. Chiriquí Volcano, *Killip* 4555.

HAITI: St. Michel, *Buch* 1091; *Leonard* 7537, 7793, 7795a. Mirebalais, *Ekman* H 2274. Ennery, *Leonard* 8957. Morne Faure, *Christ* 1800. Miragoâne, *Ekman* H 7247. Trouin, *Ekman* H 2401. Furcy, *Leonard* 4298.

COLOMBIA: Santa Marta, *Smith* 143.

VENEZUELA: Caracas, *Pittier* 7487. Tovar, *Fendler* 1698.

BRAZIL: Cuyabá, *Malme* 1562 B, 3153. Without locality, *Glaziou* 22576.

PERU: Yanano, *Macbride* 3749.

3. *Paspalum trachycoleon* Steud.

Paspalum trachycoleon Steud. Syn. Pl. Glum. 1: 28. 1854. "*Puncck* nr. 742. Venezuela." The type specimen, with the name in Steudel's script in the Paris Herbarium, consists of a culm, without the base, 1 meter long, with 7 racemes.

DESCRIPTION

A somewhat woody suberect to clambering or trailing perennial; culms 1 to 2 meters tall, sometimes rather robust, branching from the middle and upper nodes, the branches elongate, leafy; internodes glabrous, yellowish; nodes bearded, the lower sometimes retrorsely so; foliage glaucous-olivaceous, the sheaths papillose-hirsute, or the uppermost glabrous; ligule membranaceous, brown, about 2 mm. long; blades ascending or spreading, firm, 10 to 18 cm. long, 8 to 15 mm. wide (the uppermost and those of the branches smaller), slightly narrowed to the base, or the upper sometimes subcordate, long-acuminate, densely papillose-velvety on both surfaces and with long stiff hairs at the base; panicles of 5 to 14, usually 9 to 12, ascending, straight or subfalcate racemes, 3 to 6 cm. long, approximate along a slender, softly pubescent, angled axis (this sometimes winged toward the summit); rachis herbaceous, 4 to 5 mm. wide, olive-green or purplish, usually pubescent on the midnerve and long-pilose at the base; spikelets 2.2 to 2.5 mm. long, abruptly pointed, pale, silky, mostly in pairs, densely imbricate, the whole forming a silvery shining mass; glume 2 or 3 nerved, the midnerve usually suppressed, clothed with long silky hairs except near the summit, densely ciliate on the upper half of the submarginal nerves, one hair on each nerve stronger than the rest and 2 to 3 mm. long, the others about 1 mm. long, the sterile lemma slightly inflated, glabrous, 3 to 5 nerved, sulcate down the middle toward the base; fruit about 2.2 mm. long and 0.9 mm. wide, acuminate, pilose at the tip, a few white hairs on the back of the lemma.

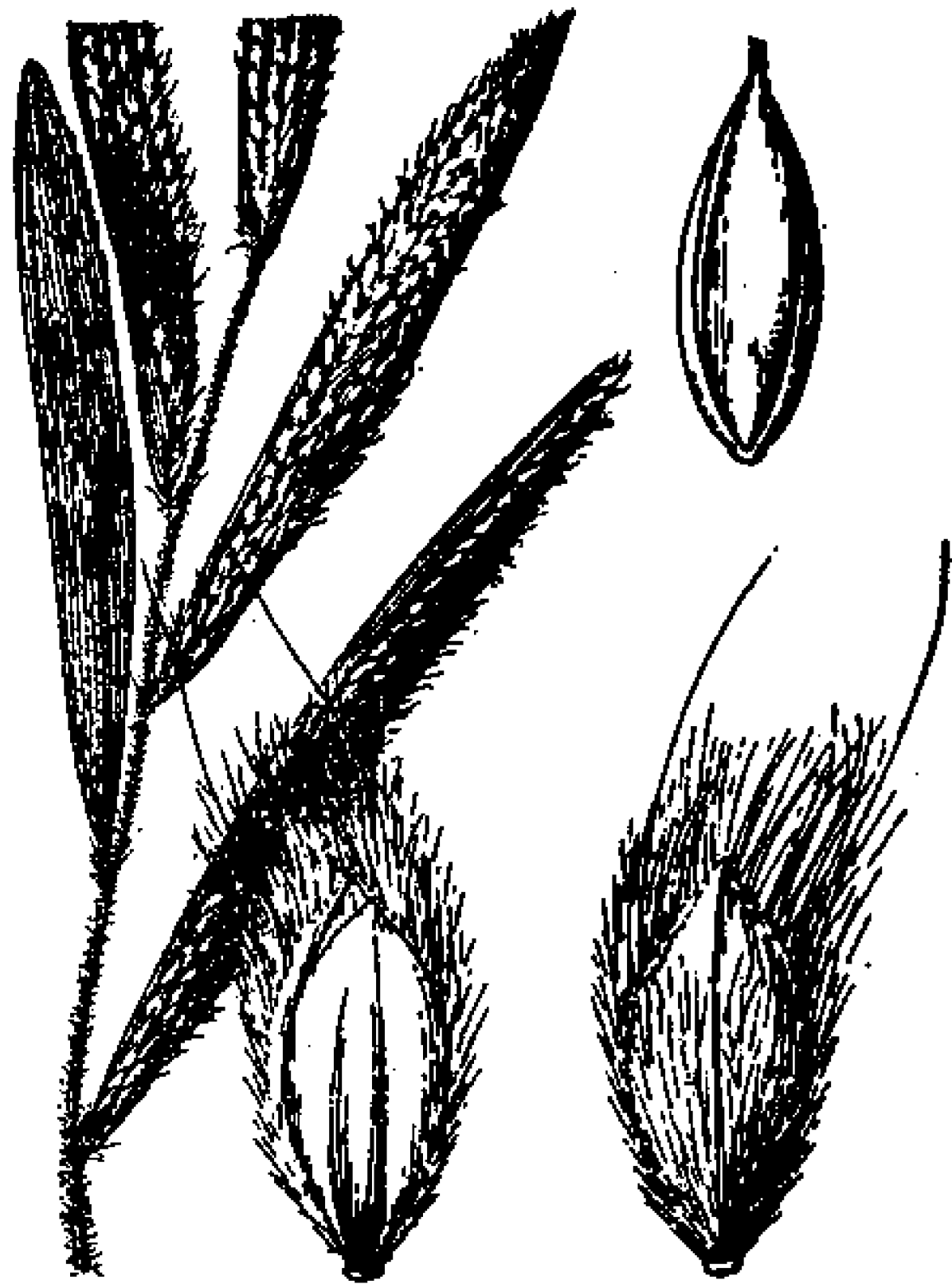


FIGURE 3.—*P. trachycoleon*. From *Linden* 1555

DISTRIBUTION

Open or brushy banks and slopes, mostly between 1,000 and 1,700 meters altitude, from Guatemala to Brazil.

GUATEMALA: Piedra Blanca de Qualán, *Pittier* 1788.

HONDURAS: Copán, *Pittier* 1832a.

EL SALVADOR: Volcano San Salvador, *Hitchcock* 8946.

COLOMBIA: Santa Marta, *Smith* 2170. Dept. Santander, *Killip & Smith* 16192, 19038. Dept. Huila, *Rusby & Pennell* 1014. "New Grenada," *Linden* 1555.

VENEZUELA: Mérida, *Moritz* 1537. Tovar, *Fendler* 1694, 1697; *Pittier* 12818. Caracas, *Pittier* 5902; *Bailey* 148, 447. Los Teques, *Pittier* 6033; *Allart* 214.

BRAZIL: Caldas, *Henschen* III. 1345x. Est. Goyaz, *Glaziou* 22577; *Gardner* 4390. Southern Brazil, *Sello*.

4. *Paspalum cymbiforme* Fourn.

Paspalum cymbiforme Fourn. Mex. Pl. 2: 5. 1886.⁴¹ "Mirador, in campis (LIEBM. n. 224); San Pablo (LIEBM. n. 226); Consoquitla (LIEBM. n. 225)." Liebmann's no. 226 in the Copenhagen Herbarium, with the name in Fournier's script, is taken as the type. It is an overmature tuft of several culms.

DESCRIPTION

A slender perennial in small hard clumps; culms 0.5 to 1 meter tall, erect, with a few erect, leafy branches from the middle nodes, minutely pubescent below the panicle, otherwise glabrous; lower nodes sometimes bearded with erect hairs; sheaths puberulent on the collar and usually long-ciliate on the margin toward the summit, otherwise glabrous; ligule membranaceous, brown, about 1 mm. long, usually a row of stiff hairs back of it; blades usually spreading, 7 to 15 cm. long, 3 to 7 mm. wide (the uppermost often nearly setaceous), firm, tapering from the base to an involute-setaceous tip, obscurely puberulent on the upper surface, glabrous beneath, with a few long hairs at the base and sometimes scattered along the margin, racemes 2 or 3, flexuous or falcate, 5 to 7 cm. long, 1.5 to 3 cm. distant on a slender flexuous often narrowly winged axis; rachis 2 to 2.5 mm. wide, the wings brownish-membranaceous, the center dull green, a tuft of white hairs at the base, otherwise glabrous; spikelets in pairs, closely imbricate, 3 mm. long, about 1 mm.

⁴¹ The date given on the title-page of this work is 1886. A set of proof sheets was supplied to Bentham in 1880 and is referred to by the latter author in his paper, Notes on Gramineae, read November 3, 1881, and published in the Journal of the Linnaean Society (Botany 19: 14-134. 1881). Fournier's names are also cited by Hemsley (Biol. Centr. Amer. Bot. 3: 1885), to which work they are referred by the Index Kewensis, but the names are there usually nomina nuda. The proof sheets mentioned above are in the library at Kew, marked, "Proof sheets of Mr. Fournier Gramineae, 1881. From Mr. Bentham." They are stamped, "Ire Epreuve 18 Mai 1880." Bentham says of these (Notes on Gramineae, p. 20), "Eugène Fournier's 'Enumeration of Mexican Gramineae' is not yet published; but being already printed off and M. Fournier having obligingly supplied me with a copy, I feel bound in so far as I am concerned, to treat it as having already taken date." The Kew copy ends with page 150 and lacks index, title-page, and plates.—Taken from The North American Species of Panicum, Hitchcock and Chase, Contr. U. S. Nat. Herb. 15: 49. 1910. In addition it may be noted that Stiles in a discussion of "What constitutes publication" (Science 67: 471-478. 1928) holds that the distribution of proof sheets does not constitute publication, since publication necessarily implies public property.

wide, elliptic, acute, tawny or purplish-tinged, partly obscured by the long glistening white hairs; glume and sterile lemma equal, slightly inflated, obscurely 3 to 5 nerved, the glume pilose on the lower half and stiffly ciliate on the marginal nerves, the hairs conspicuously unequal, the longest 3 to 3.5 mm. long, the sterile lemma glabrous or sparsely pubescent at the summit, slightly sulcate down the middle toward the base; fruit about 2.2 mm. long and 0.7 mm. wide, elliptic, smooth.

DISTRIBUTION

Rocky slopes in the uplands, Mexico and Guatemala.

MEXICO: San Pablo, *Liebmann* 226.

VERA CRUZ: Mirador, *Liebmann* 224. Consoquitla, *Liebmann* 225.

GUATEMALA: Guatemala City, *Hitchcock* 9033½. Santa Rosa, *Heyde & Luz* (*Dist. Smith*) 4298.

5. *Paspalum humboldtianum* Flüge

Paspalum humboldtianum Flüge, *Monogr. Pasp.* 67, 1810. "America meridionalis. *Humboldt et Bonpland.*" Kunth⁴ states that the specimen is from "regno Quitensi, prope Puenbo," Ecuador. Specimens of this collection are in several herbaria. Those in the Museum of Natural History in Paris, in the British Museum, and in the United States National Herbarium bear the name in Bonpland's script, that in Berlin in Kunth's script. The specimens in the Willdenow Herbarium (2 sheets) are probably those described by Flüge. In all the specimens the blades are papillose-pubescent. The secondary spikelet of the pair is developed in part of some racemes but mostly abortive as described by Kunth for *P. ciliatum*.

Paspalum distichophyllum H. B. K. *Nov. Gen. & Sp.* 1: 86. 1816. "Mesa de Cuello et Ibague," Colombia, *Humboldt and Bonpland*. The type has not been located. The description indicates a late branching phase of *P. humboldtianum*, such a plant as *Hitchcock's* no. 9033, with reduced squarrose blades and but 2 or 3 racemes.

Paspalum ciliatum H. B. K. *Nov. Gen. & Sp.* 1: 87. *pl.* 24. 1816. Not *P. ciliatum* Lam. 1791. "Prope Ibague et Valle de Caravajal, in radicibus montis

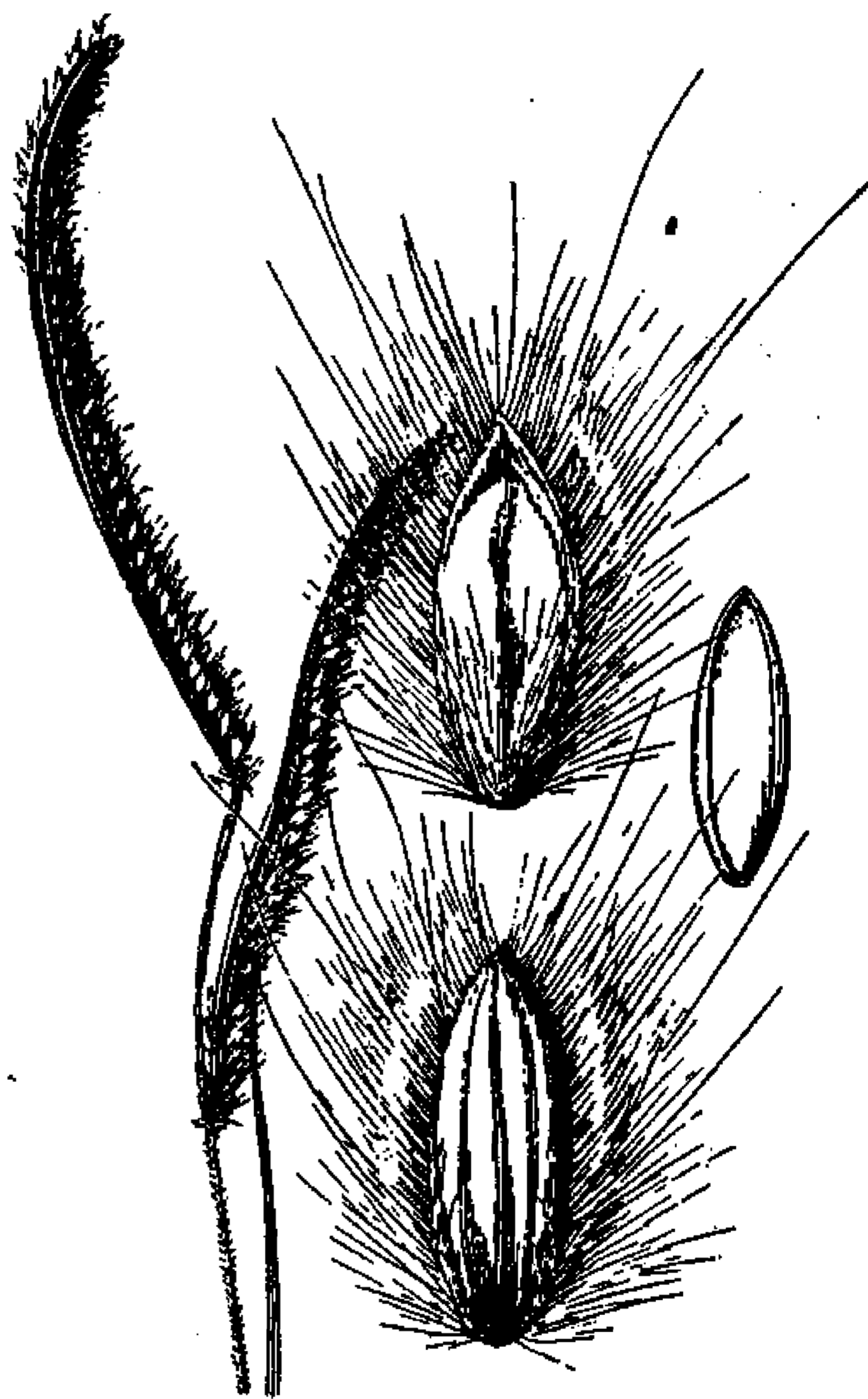


FIGURE 4.—*P. cymbiforme*. From type specimen

⁴H. B. K. *Nov. Gen. & Sp.* 1: 86. 1816.

Quindiu, in regno Novogranatensi." [Colombia.] In the Berlin Herbarium is a specimen from the Humboldt Herbarium with the name in Kunth's script. No locality is given. A specimen from the Bonpland Herbarium with the name in Kunth's script but without locality is in the Paris Herbarium. A second in the Paris Herbarium from the Bonpland Herbarium but without Kunth's writing gives the locality as cited.

Paspalum blepharophorum Roem. & Schult. Syst. Veg. 2: 292. 1817. Based on *P. ciliatum* H. B. K. Trinius⁴³ misapplied this name to a common Brazilian species, *Paspalum polyphyllum* Nees, and the name has since been generally used for the species he figured.

Panicum obtectum Presl, Rel. Haenk. 1: 301. 1830. "Hab. in Mexico." The

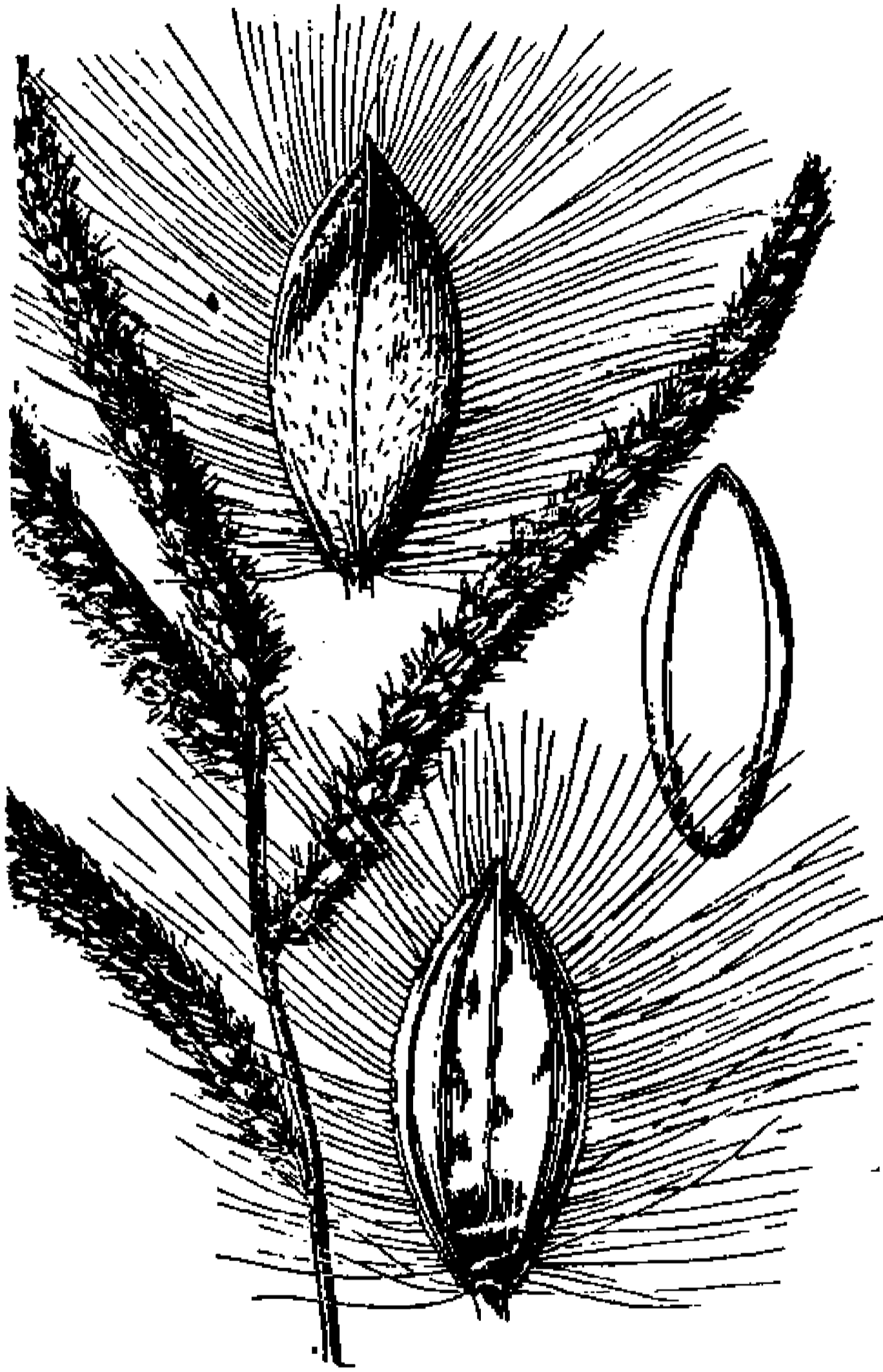


FIGURE 5.—*P. humboldtianum*. From type specimen and Pringle 1750

type specimen, collected by Haenke, in the National Museum at Prague consists of two specimens, each with but two racemes.

Tricholaena oblecta Fourn. Mex. Pl. 2: 35. 1886. Based on *Panicum obtectum* Presl. The name is earlier mentioned without citation of basis by Hemsley.⁴⁴

Panicum humboldtianum Kuntze, Rev. Gen. Pl. 3²: 361. 1898. Based on *Paspalum humboldtianum* Flügge.

In Index Kewensis *Paspalum ciliatum* Rupr. is listed. Ruprecht⁴⁵ refers Galeotti's no. 5683 to *P. ciliatum* H. B. K. (in its correct sense, with *P. blepharophorum* Roem. & Schult. as a synonym).

DESCRIPTION

A tufted perennial, erect or ascending from a woody decumbent base, and sometimes producing strong scaly rhizomes; culms 40 to 80 cm., rarely nearly 1 meter, tall, commonly branching from the lower and sometimes from the middle nodes; nodes from densely bearded with appressed white hairs to glabrate; sheaths mostly overlapping, papillose-pilose along the margin and usually toward the summit, sometimes throughout, rarely nearly glabrous; ligule membranaceous, brown, 1 to 2 mm. long; blades flat, firm, spreading, 8 to 18 cm. long, 6 to 15 mm. wide, slightly narrowed toward the base, acuminate into a stiff more or less involute point, the midnerve prominent beneath (the lower blades and those of the branches smaller, the uppermost reduced to a mere point) sparsely to rather densely pubescent to glabrate on the

⁴³ Gram. Icon 2: pl. 134. 1829.

⁴⁴ Biol. Centr. Amer. Bot. 3: 493. 1885.

⁴⁵ In Galeotti, Bull. Acad. Sci. Brux. 9: 238. 1842.

upper surface, the epidermis loosely cellular, a fringe of stiff white hairs back of the ligule, appressed-pubescent beneath with occasional long stiff hairs intermixed, the margins usually prominently papillose-ciliate; panicles consisting of 2 to 5 rarely 7 or 8, ascending to nodding, lax glistening silky racemes, 5 to 10 cm. long, about 7 mm. wide, 1 to 3 cm. distant on a slender flattened axis; rachis narrowly winged, 2 to 3 mm. wide, minutely scabrous or glabrous and with a tuft of long white hairs at the base; spikelets commonly solitary toward both ends of the raceme (the secondary spikelet undeveloped), in pairs in the middle, excluding the cilia about 3.2 mm. long, 1.1 mm. wide, elliptic, abruptly pointed; glume and sterile lemma equal, the glume 3-nerved, pubescent and edged with a fringe of glistening white hairs arising from papillae, at maturity becoming thick and corky, the hairs radiating like a corona, the lemma 3-nerved, strigulose or glabrous, papery and wrinkled toward the base; fruit about 2.8 mm. long, narrowly obovoid, smooth and shining.

In *P. humboldtianum* the amount of pubescence is exceedingly variable but otherwise the species is a well-marked one.

Arsène's no. 2813, Müller 2036, and Schaffner 136, all from Mexico, are peculiar teretological specimens with multiple glumes all fringed.

DISTRIBUTION

Stony open or brushy slopes in the highlands from Mexico to Argentina.

SONORA: Sierra de Álamos, *Rose, Standley & Russell* 12832.

SINALOA: Mazatlán, *Ortega* 4333.

COAHUILA: Jaral, *Schumann* 1737.

SAN LUIS POTOSÍ: San Luis Potosí, *Schaffner* 173. Cárdenas, *Hitchcock* 5723, 5776.

JALISCO: Guadalajara, *Hitchcock* 7297; *Palmer* 286 in 1886; *Pringle* 1750, 11757. Zapotlán, *Hitchcock* 7176.

COLIMA: Alzada, *Hitchcock* 7055.

MICHOACÁN: Uruápan, *Hitchcock* 6980. Morelia, *Arsène* 2471, 2813, 5849, 6665.

PUEBLA: Mt. Orizaba, *Seaton* 117.

VERA CRUZ: Orizaba, *Bourgeau* 2641; *Hitchcock* 6355; *Müller* 2036, 2037; *Schaffner* 136. Mirador, *Liebmann* 221. Jalapa, *Hitchcock* 6679. Zacuapan, *Purpus* 2002, 2901, 6207, 8029.

MORELOS: Cuernavaca, *Hitchcock* 6837; *Holway*⁴⁶ 3510; *Rose, Painter & Rose* 10203.

OAXACA: Sierra de San Felipe, *Conzatti & Gonzalez* 440; *Pringle* 5572. Oaxaca, *Hitchcock* 6133. Xochimilco, *Conzatti* 3641.

GUATEMALA: Cobán, *Türkheim* 3790. Alta Verapaz, *Pittier* 219. Dept. Santa Rosa, *Heyde & Lux (Dist. Smith)* 6271. San Rafael, *Holway* 64. Solala, *Holway* 129. Guatemala City, *Hitchcock* 9033. Cuyotenango, *Rojas* 105. Without locality, *Tonduz* 750; *Seler* 2442.

HONDURAS: Siguatepeque, *Standley* 56246.

EL SALVADOR: San Salvador, *Calderón* 1152; *Hitchcock* 8895. Finca San Nicolás, *Choussy* A18.

NICARAGUA: Jinotepe, *Hitchcock* 8697.

COSTA RICA: Nuestro Ami, *Jiménez* 529. San Rafael de Cartago, *Pittier* 9734.

PANAMA: El Boquete, *Hitchcock* 8186; *Killip* 4522.

⁴⁶In Mexican Grasses, *Contr. U. S. Nat. Herb.* 17: 230-240, 1913, *Holway's* collections made in 1899 were cited as *Rose's*, the labels, by a clerical error, giving *Rose* as collector.

COLOMBIA: Huila, *Pittier* 1530. Loma de Bichiquí, *Pittier* 1525. Pamplona, *Killip & Smith* 19770.

VENEZUELA: Tovar, *Pittier* 12820. Caracas, *Pittier* 6155, 7216, 7354, 9559, 9626. Galipán, *Pittier* 6202. Quebreda de Anauco, *Eggers* 13330. Without locality, *Fendler* 1699.

ECUADOR: Quito, *Harteman* 65. Ambato, *Hitchcock* 21710. Huigra, *Rose* 22639. Between Huigra and Naranjapata, *Hitchcock* 20656. Portovelo, *Hitchcock* 21306; *Rose* 24027. Pichincha, *Firmin* 255, 562.

PERU: Chosica, *Holway* 782; *Macbride & Featherstone* 517. Ollantaytambo, *Hitchcock* 22485. "Huara" (probably Huaraz) *Dombey*.

BOLIVIA: Sorata, *Rusby* 205; *Mandon* 1254. Cotaña, *Buchtien* 3125. Illimani, *Julio* 44. Cochabamba, *Hitchcock* 22795, 22830. Buena Vista, *Steinbach* 6644. Río Cuchi, *Steinbach* 6618. Without locality, *Bang* 2590.

ARGENTINA: Prov. Tucumán, *Lillo* 4284. Prov. Catamarca, *Jørgensen* 1765. Sierra Chica de Córdoba, *Stuckert* 1875. Without locality, *Lorentz & Hieronymus* 184.

6. *Paspalum pectinatum* Nees

Paspalum pectinatum Nees in Trin. Gram. Icon. 1: pl. 117. 1828. The illustration is said to be from "specimen Brasiliense." Nees, who publishes the species anew,⁴⁷ cites a specimen in the Berlin Herbarium collected by Sello in southern Brazil. The type specimen in the Trinius Herbarium is labeled "Sellow, Brazil." Both descriptions are doubtless based on the same collection.

Anastrophus pectinatus Schlecht.; Jacks. Ind. Kew. 1: 118. 1893. Listed under *Anastrophus* with reference to Schlechtendal's paper on *Anastrophus*.⁴⁸ Schlechtendal mentions *Paspalum pectinatum* Nees as very different from other species of the group, but does not make the combination.

DESCRIPTION

An erect perennial in coarse tufts, hard, smooth and reddish at the base, resembling *Fimbristylis spadicea*; culms simple, 0.3 to 1 meter tall, subcompressed, rather rigid, glabrous; lower sheaths overlapping, firm, with a thinner margin, often shredded, glabrous below, harshly villous toward the summit, often loose from the culm, ferruginous on the inside; ligule firm, about 1 mm. long, blades suberect, rather thick, 12 to 60 cm. long, 3 to 5 mm. wide, the uppermost usually reduced or obsolete, linear, densely harshly villous, sometimes becoming glabrate in age; racemes 1 to 3, usually 2, conjugate or closely approximate, suberect or ascending, often appressed to each other, 4 to 8 cm. long, about 5 mm. wide (or wider when flattened out), commonly dwindling and with abortive spikelets at the summit; rachis 1.8 to 2.3 mm. wide, dull, clothed with long hairs at the very base, otherwise glabrous, the margins slightly erose, scabrous; spikelets solitary, closely imbricate, 4.5 to 6 mm. long, about 2.5 mm. wide excluding the cilia, depressed, cordate-lanceolate; glume and sterile lemma 3-nerved, the glume nearly flat, the margins outspread, minutely ciliate, pubescent at base, otherwise glabrous; the sterile lemma narrower and shorter than the glume, sparsely clothed with stiff hairs (their bases tuberculate at maturity) on the thin internerves, ciliate on the thickened brown tuberculate margin, the stiff spreading hairs 2 to 3 mm. long; fruit 4.2 to 4.5 mm. long, about 1.7 mm. wide, lanceolate-elliptic, obtuse, the lemma and palea rather thin in texture, brownish, the lemma ascendingly ciliate along the angles and at the summit.

⁴⁷ Agrost. Bras. 34. 1829.

⁴⁸ Bot. Zeit. 8: 681. 1850.

Trinius figures a minute first glume and states that it is found on most of the spikelets. Nees does not mention such a glume and none is found in the specimens (including a fragment from Trinius' type) examined.

DISTRIBUTION

Savannas and rocky open slopes from sea level to 1,800 meters, Honduras to southern Brazil.

HONDURAS: Dept. Copán, *Blake* 7445.

COSTA RICA: Cruz de Guanacaste, *Pittier* 2695. Puntarenas, *Biolley* 2651.

PANAMA: Cerro Vaca, *Pittier* 4351. Taboga Island, *Hitchcock* 8096; *Pittier* 3584.

COLOMBIA: Popayán, *Lehmann* 979.

BRAZIL: Serro do Cipó, *Chase* 9212, 9216, 9250. Caldas, *Regnell* in 1845. Est. Minas Geraes, *Kuhlmann* 5998; *Widgren* 885. Serra do Urbano, *Glaziou* 22426. Campo de Pichoa, *Glaziou* 22427. Est. Goyaz, *Glaziou* 22429. Campinas, *Novaes* 1272. Itapetininga, *Löfgren* 267. Jaguarahyva, *Dusén* 10611, 13256. Turma, *Dusén* 15727. Ponta Grossa, *Dusén* 2844a. Est. Paraná, *Dusén* 2770.

7. *Paspalum contractum* Pilger

Paspalum contractum Pilger, Bot. Jahrb. Engler 25: 709. 1898. "Columbia: Collecta in itinere ad Los Llanos de San Martin (Coll. columb. n. 190. *Stübel*)."

The type in the Berlin Herbarium, bearing the name in Pilger's script, is a poor specimen without the base and the blades fallen.

Paspalum echinotrichum Mez, Bot. Jahrb. Engler 56: Beibl. 125: 9. 1921. "Hylaea [Brazil] (*Ule* br. n. 29 et n. 8033, 8479)." The three specimens with the name in Mez's script are in the Berlin Herbarium. The spikelets are mostly fallen from no. 29; no. 8033, being an excellent complete specimen, is taken as the type.

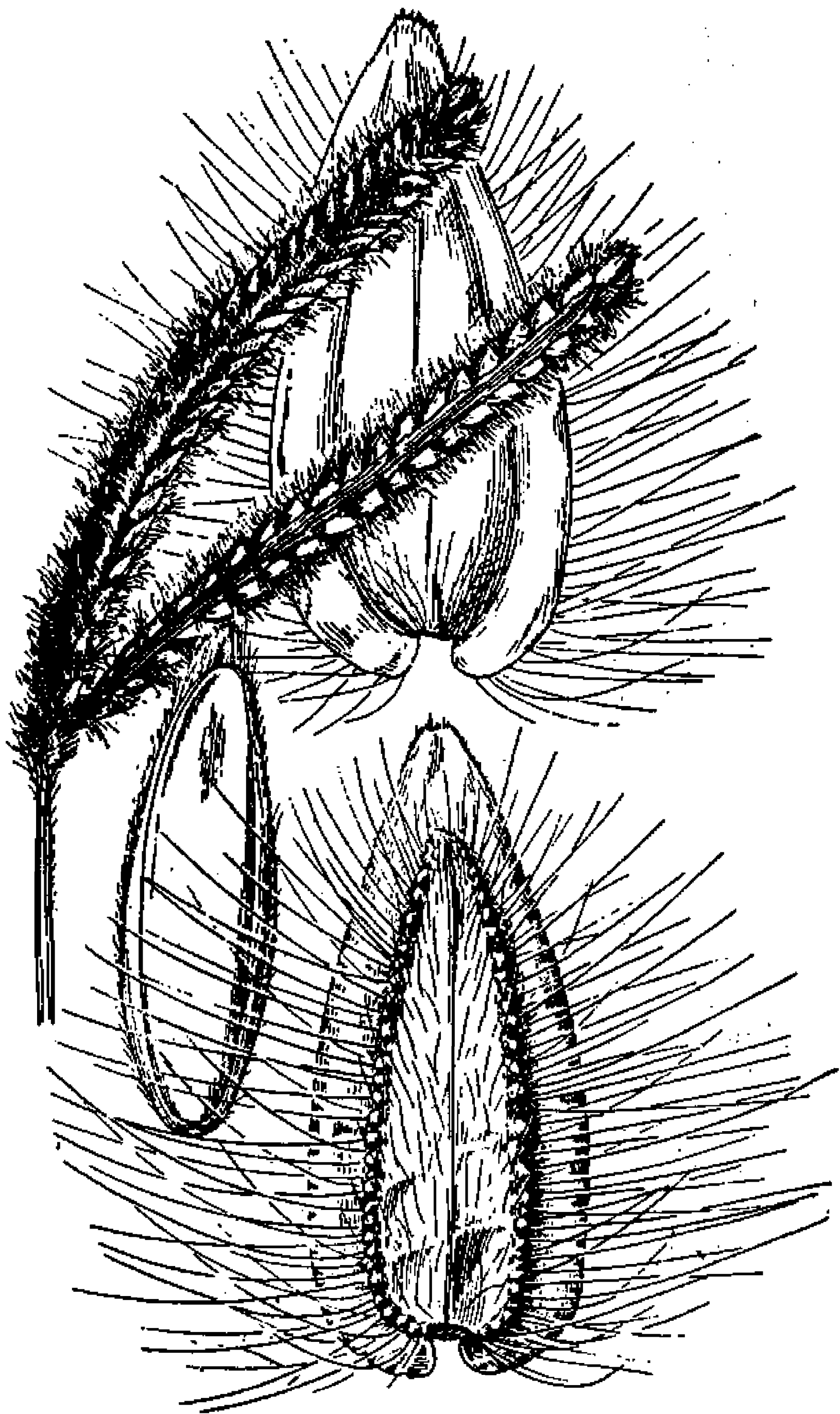


FIGURE 6.—*P. pectinatum*. From type specimen and *Pittier* 2651

DESCRIPTION

A slender tufted perennial; culms 50 to 90 cm. tall, erect, simple, glabrous, the lower and middle nodes with a band of erect white hairs; leaves aggregate on the lower half of the culms, the upper two sheaths distant, nearly bladeless, glabrous, the lower and middle sheaths long-pilose, the lowermost glabrate

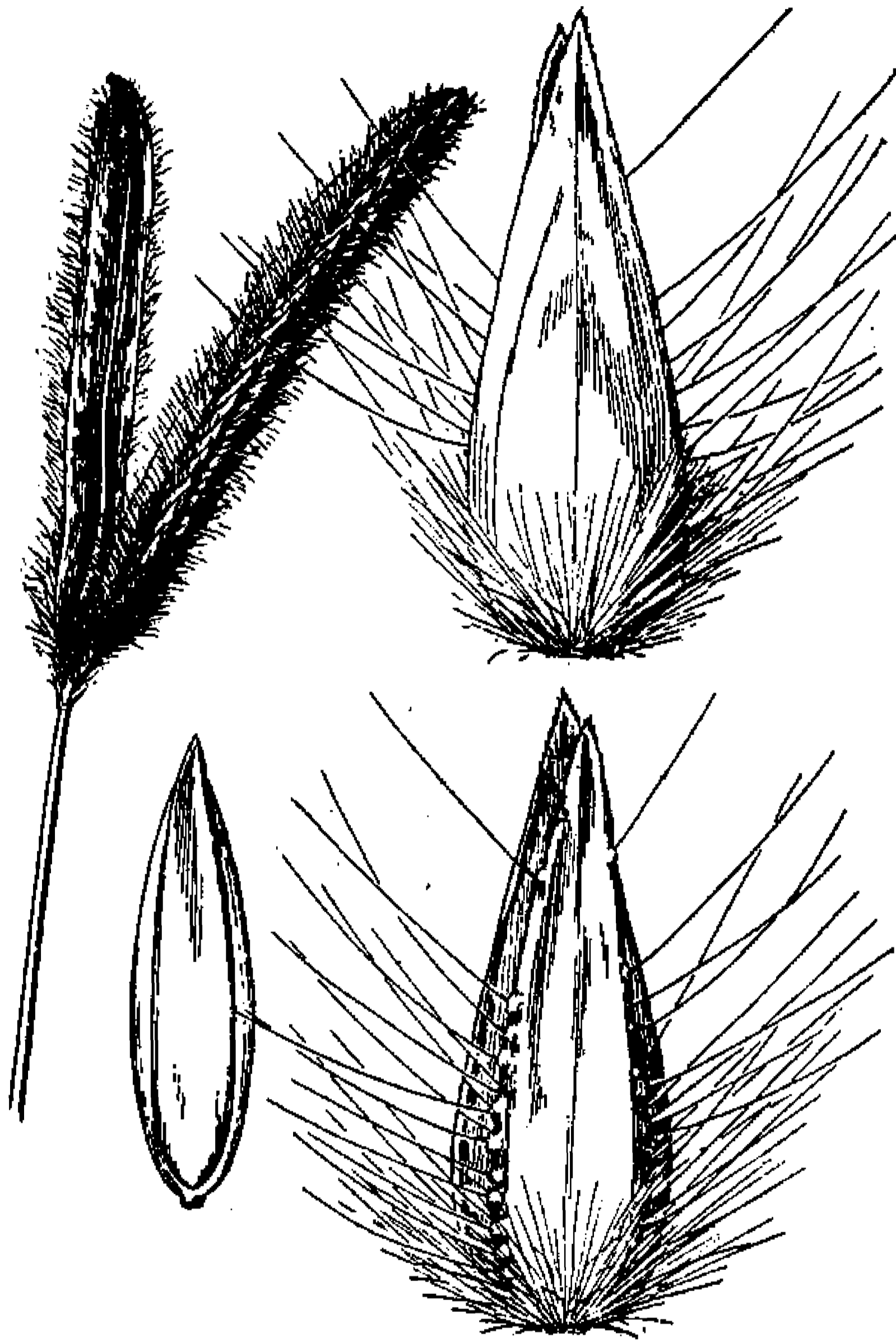


FIGURE 7.—*P. contractum*. From Pittier 5063

and somewhat shredded toward the base; ligule about 1 mm. long, firm, brown, with a ring of long white hairs back of it; blades suberect, 10 to 25 cm. long, 2 to 4 mm. wide (the upper much reduced), linear, both surfaces conspicuously pilose, the spreading hairs about 5 mm. long and, beneath the copious long hairs, densely short-pubescent, the margin and midnerve beneath strongly papillose; racemes 2 or 3, closely approximate, narrowly ascending, 3.5 to 7 cm. long, 5 to 6 mm. wide; rachis 4.5 to 5 mm. wide, clothed with long hairs at the very base, otherwise glabrous, the center pale green, the membranaceous wings light golden-brown, fading to tawny; spikelets solitary, closely imbricate, 5 to 5.5 mm. long, about 1.8 mm. wide

excluding the cilia, depressed, lanceolate, acuminate; glume and sterile lemma faintly 3-nerved, the glume slightly convex, the margins upturned, except toward the summit, but not clasping the sterile lemma, densely bearded at the base, otherwise glabrous, minutely fimbriate-ciliate at the summit; sterile lemma narrower and slightly shorter than the glume, pilose at the base and stiffly ciliate on the thickened papillose margin except at the summit, the spreading hairs 2 to 2.5 mm. long, densely pilose at the base, ciliolate at the summit, and sometimes with a few stiff tubercle-based hairs on the internerves; fruit 3.8 mm. long, 1.8 mm. wide, pale, glabrous, minutely stipitate, the palea slightly exceeding the lemma.

DISTRIBUTION

Open slopes, between 500 and 1,000 meters, Panama to northern Brazil.

PANAMA: Picacho de Olá, Pittier 5063.

COLOMBIA: Llanos de San Martín, Shaw in 1927; Stübel 190 (Berlin Herb.).

BRITISH GUIANA: Mount Roraima, Im Thurn 262; Tate 157, 296 A.

BRAZIL: Hylaea, Ule 29, 8033, 8479 (all in Berlin Herb.).

8. *Paspalum sanguineolentum* Trin.

Paspalum sanguineolentum Trin. Gram. Pan. 116. 1826. "Brasil. (Langsdorff.)" The type in the Trinius Herbarium was examined by A. S. Hitchcock. It is labeled "In graminosis subhumidis, S. da Lapa, Brasil, Langsdorff." This is the original of the illustration in the Icones.⁴⁹

DESCRIPTION

A slender erect olivaceous tufted perennial; culms 1 to 1.25 meters tall, simple, compressed, sometimes loosely twisted, glabrous; nodes appressed-bearded to nearly or the upper quite glabrous; leaves aggregate near the base, sometimes reddish tinged (hence the name), the lower sheaths short, overlapping and appressed-pubescent, the pubescence dense and tawny at base, the upper elongate, bladeless or with reduced blades, sparsely pubescent to glabrous; ligule membranaceous, firm, about 1 mm. long; blades flat, ascending or spreading, 5 to 30 cm. long, 8 to 15 mm. wide, the lower tapering to the base, those of the mid-culm rounded at base, from appressed-pubescent on both surfaces to glabrous, usually with long hairs at the very base on the upper surface; panicles nodding, of 3 to 8 ascending pale silky racemes 3 to 7 cm. long, approximate or the lower somewhat distant on a slender flattened axis; rachis 0.8 to 1.2 mm. wide, long-pilose at the very base, the margin scabrous; spikelets in pairs on minute scabrous pedicels, scarcely crowded, 3.3 to 3.5 mm. long, about 1.5 mm. wide, rather turgid; glume and sterile lemma 3-nerved, the glume slightly shorter than the fruit, both pale silky-villous, the hairs arising from papillae and much exceeding the spikelet; fruit nearly as large as the spikelet, pale, smooth and shining.

The Mexican specimens cited below were referred to *Paspalum erianthum* Nees by Nash⁵⁰ and by Chase⁵¹. That species, closely allied to *P. sanguineolentum*, is much more common in Brazil but has not been found in North America. The Eriantha group does not belong in subgenus *Ceresia*, *P. sanguineolentum* being placed here for convenience.

DISTRIBUTION

Moist savannas, southern Mexico and Brazil.

OAXACA: San Juan Guichicovi, Nelson 2735, 2735a.

BRAZIL: Goyaz, Gardner 3542; Glaziou 22489 in part. Est. Rio Grande do Sul, Dutra 546 (depauperate). Without locality, Sello 3541.

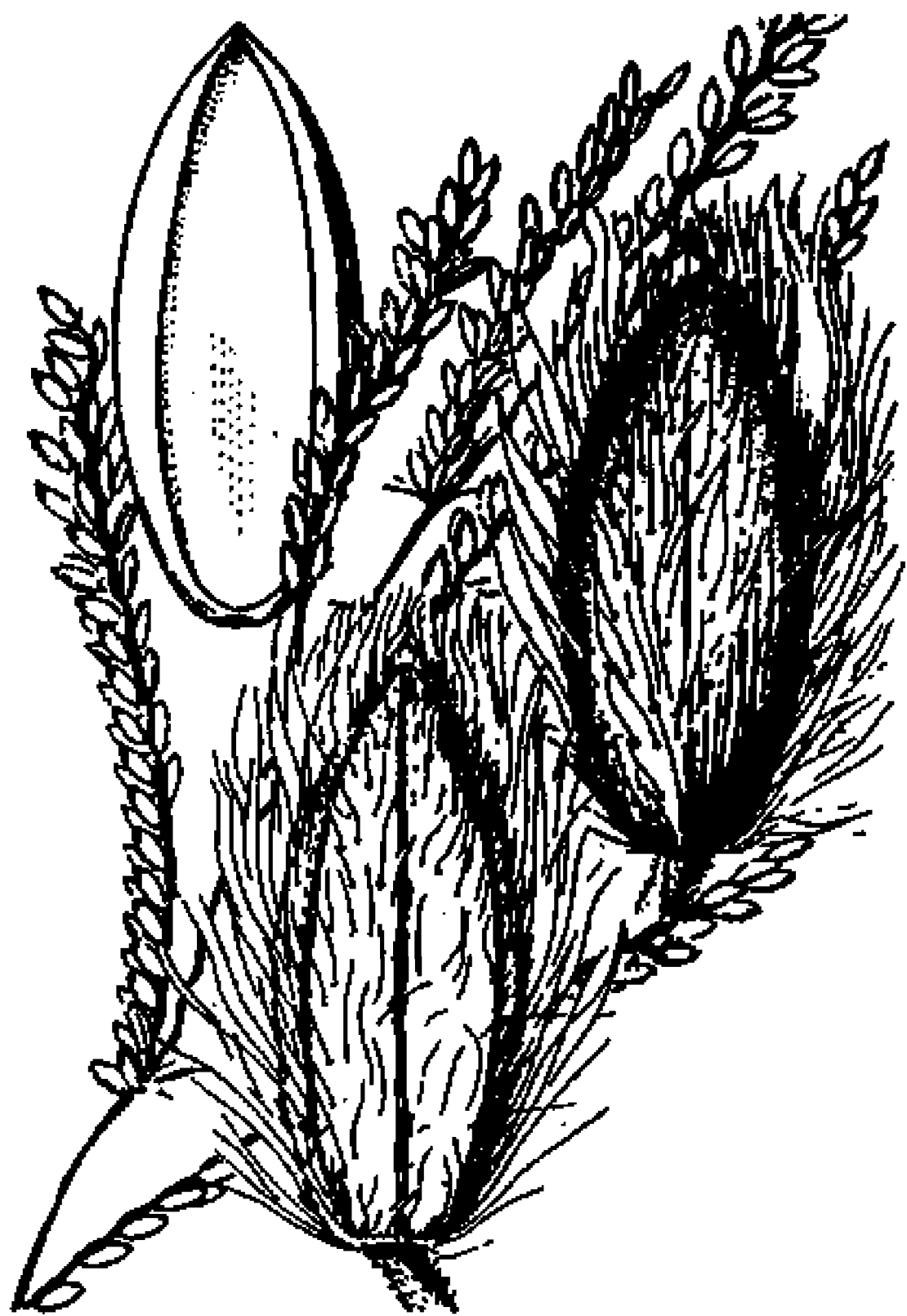


FIGURE 8.—*P. sanguineolentum*. From Nelson 2735

⁴⁹ Trin. Gram. Icon. 2: pl. 142. 1829.

⁵⁰ N. Amer. Fl. 17: 196. 1912.

⁵¹ Contr. U. S. Nat. Herb. 17: 240. 1913.

PASPALUM PROPER

Dissecta. (Subsect. *Pseudoceresia* Benth. & Hook.)⁵²—Annuals or perennials, mostly branching and straggling (*P. crassum* robust, erect); blades flat; racemes few to many; rachis foliaceous, green; spikelets glabrous (or minutely pubescent in *P. repens*); fruit pale. Mostly aquatics, subaquatics, or plants of ditch borders and moist places.

Plants perennial.

Racemes persistent on the axis; rachis with a spikelet at the apex. Second glume developed.

Spikelets 2 mm. long, obovate-oval.....9. *P. dissectum*.

Spikelets more than 3 mm. long, pointed.

Racemes 2 (rarely 1); blades mostly not more than 5 mm. wide.

10. *P. serratum*.

Racemes mostly 3 to 5 (rarely 2); blades mostly more than 8 mm. wide.

11. *P. acuminatum*.

Racemes falling from the axis; rachis extending beyond the uppermost spikelet.

Spikelets about 0.8 mm. wide, in two rows.....12. *P. repens*.

Spikelets about 1.2 mm. wide, so distant as to appear as if in a single row.

13. *P. longicuspe*.

Plants annual.

Plants robust, erect; racemes 5 to 15 cm. long, persistent...18. *P. crassum*.

Plants slender, spreading or clambering; racemes 1.5 to 5 cm. long, falling entire.

Second glume developed.

Racemes 20 to 80 or more; sterile lemma distinctly fluted, the glume slightly so.....17. *P. racemosum*.

Racemes 3 to 12; sterile lemma not fluted.....14. *P. prostratum*.

Second as well as first glume suppressed.

Plants smooth or slightly scabrous; spikelets 2.3 to 2.5 mm. long.

15. *P. candidum*.

Plants very scabrous throughout; spikelets 1.8 to 1.9 mm. long.

16. *P. scabrum*.

9. *Paspalum dissectum* (L.) L.

Panicum dissectum L. Sp. Pl. 57. 1753. Following a brief description are three citations, from Royen, Plukenet, and Sloane, and the locality, "Habitat in Indiis." None of the citations agree with Linnaeus' own description. In the Linnaean Herbarium is a specimen collected by Kalm in North America which bears the name in Linnaeus' script. No locality is given, but the plant was probably collected in Delaware. "Dactylis spicis alternis numerosis patulis, calycibus unifloris. Roy. lugdb. 56," and Plukenet's name (see p. 6) we are unable to identify. The Sloane citation applies to *Paspalum virgatum* and was later cited by Linnaeus when he described that species. The locality "in Indiis" may have been intended for Sloane's Jamaican species. Linnaeus' description "spiculis alternis; rachi lineari membranacea extrorsum imbricato florifera" so perfectly applies to the winged rachis turned up over the base of the spikelets in the Kalm specimen that that is taken as the type, the citations being rejected as erroneous.⁵³

⁵² Gen. Pl. 3: 1098. 1883.

⁵³ For full discussion see Hitchcock, Types of American Grasses, Contr. U. S. Nat. Herb. 12: 115. 1908.

Paspalum dimidiatum L. Syst. Nat. ed. 10. 2: 855. 1759. Based on "*Panicum dissectum* sp. pl. 57. n. 6" [6 being *P. dissectum*].

Paspalum dissectum L. Sp. Pl. ed. 2. 81. 1762. Based on "*Panicum dissectum* Sp. pl. 1. p. 57."

Paspalum membranaceum Walt. Fl. Carol. 75. 1788. Presumably described from South Carolina. No specimen of this genus is found in Walter's herbarium.⁵⁴ Of the species found in Walter's locality, his brief description applies only to *P. dissectum*.

Paspalum vaginatum Ell. Bot. S. C. & Ga. 1: 109. 1816. Not *P. vaginatum* Swartz, 1788. "Near Savannah—Doctor Baldwin." The type specimen in the Elliott Herbarium has been examined.

Paspalum walterianum Schult. Mant. 2: 166. 1824. Based on "*Paspalum membranaceum* Walt.," the name presumably changed because of the later *P. membranaceum* Lam. In Chapman's Flora⁵⁵ the name is given as *P. walteri* Schultes.

Paspalum tectum Steud. Syn. Pl. Glum. 1: 29. 1854. "Florida." The type, bearing the name in Steudel's script in the Paris Herbarium, consists of a single culm. It was collected by Chapman.

Paspalum drummondii C. Muell. Bot. Zeit. 19: 332. 1861. "America septentrionalis, ubi prope St. Louis legit Drummond (Coll. 1. No. 182)." The type specimen was examined in the Berlin Herbarium.

DESCRIPTION

A subaquatic, glabrous, olive-green perennial, creeping, often forming radiate mats, rooting at the nodes, freely branching, the flowering branches ascending; culms 20 to 60 cm. long, compressed, the nodes usually swollen; sheaths soft, loose, commonly divergent, often flat and bladelike, the prophyllum visible; ligule about 2 mm. long, hyaline, lacerate, extending down the sheath margin; blades flat, thin, usually spreading, 3 to 6 cm. long, rarely longer, 4 to 5 mm. wide, scarcely narrowed at base, rather abruptly acute; inflorescence terminal and axillary, short-exserted, of 2 to 4 usually erect racemes, distant half to one-third their own length, on a slender, narrowly winged axis; racemes falling entire; usually 2 to 3 cm. long, the rachis membranaceous, 2 to 3 mm. wide, abruptly pointed and terminating at the base of the uppermost spikelet, the minutely scabrous margins inflexed, covering the base of the spikelets; spikelets solitary, 2 mm. long, 1.4 mm. wide, obovate, subacute, pale; glume and sterile lemma thin, 3 to 5 nerved, slightly exceeding the fruit, in the terminal spikelet usually a little longer, forming a short point; fruit 1.8 mm. long, 1.3 mm. wide, obtuse, minutely papillose-roughened.



FIGURE 9.—*P. dissectum*. From Commons 85

DISTRIBUTION

On muddy or sandy banks of ponds and ditches or in shallow water, New Jersey and Missouri to Florida and Texas; also in Cuba.

NEW JERSEY: West Cape May, *Brown* in 1921.

ILLINOIS: Duquoin, *Eggert* in 1893.

⁵⁴ See Hitchcock, Identification of Walter's Grasses, Ann. Rep. Mo. Bot. Gard. 16: 31-56. 1905.

⁵⁵ Fl. South. U. S. 570. 1860

MISSOURI: Webb City, *Palmer* 968, 969.

DELAWARE: Ellendale, *Canby* in 1891. Townsend, *Canby* in 1863 and in 1896; *Commons* in 1863. Wilmington, *Commons* 85. Cedar Neck, *Commons* 314.

MARYLAND: Berlin, *Canby*. Without locality, *Canby*.

GEORGIA: Savannah, *Baldwin*.

FLORIDA: Jacksonville, *Curtiss* 5081 in part; *Kearney* 170. Monticello, *Combs* 351. Milton, *Chase* 4313. Apalachicola, *Chapman* (*Dist. Biltmore*) 4307a.

Econfina, *Combs* 679. Chipley, *Combs* 578. Pensacola, *Combs* 527. Waldo, *Combs* 689. Ellzey, *Combs* 833. Avondale, *Combs* 501. Without locality, *Curtiss* in 1886; *Chapman*.

TENNESSEE: Nashville, *Gattinger* in 1878, 1879, and 1882; *Gattinger* in *Curtiss* 3564.

ALABAMA: Mobile, *Kearney* 40; *Mohr* in 1884 and 1892.

MISSISSIPPI: Scranton, *Tracy* 4507. Ocean Springs, *Tracy* 128.

ARKANSAS: Fulton, *Bush* 1055.

LOUISIANA: Shreveport, *Cocks* 3512. Alexandria, *Hale*. Crowley, *Webb* in 1912. Oberlin, *Ball* 221. Without locality, *Buckley*; *Drummond*.

TEXAS: Houston, *Thurrow* in 1898. Without locality, *Drummond* 363; *Nealley* in 1886.

CUBA: Laguna Santa Maria, *Ekman* 17269. Hanábana, *Wright* 169 in 1865. Eastern Cuba, *Wright* 3440.

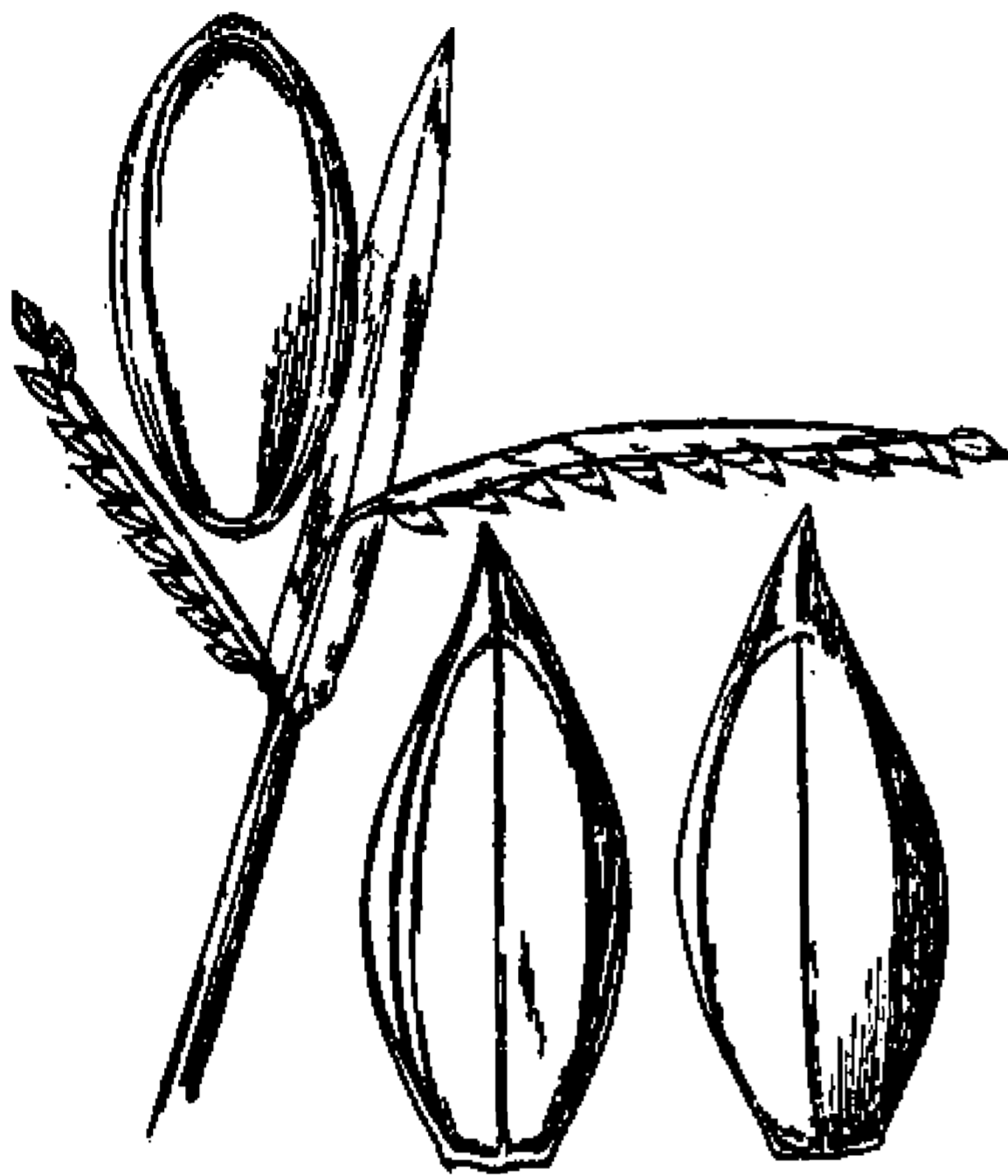


FIGURE 10.—*P. serratum*. From type specimen

10. *Paspalum serratum* Hitchc. & Chase

Paspalum serratum Hitchc. & Chase, *Contr. U. S. Nat. Herb.* 18: 306. 1917. "Type in the U. S. National Herbarium, no. 694431, collected in the water of a small pool, Troy, Jamaica, November 6, 1912, by A. S. Hitchcock (no. 9795)."

DESCRIPTION

An aquatic, glabrous perennial with rather soft elongate sparingly branching culms as much as 1.7 meters long, bearing a few rootlets at the nodes, the internodes flattened, more or less angled in drying; sheaths thin, loose, overlapping on the flowering branches; ligule 2 mm. long, hyaline, erose; blades flat, soft, thin, ascending, 3.5 to 9 cm. long, 3 to 7 mm. wide, abruptly rounded at base; racemes 2, rarely 1, 12 to 15 mm. distant, spreading, 3 to 5 cm. long, the peduncle mostly included; rachis membranaceous, green, 3 to 3.5 mm. wide, the margins inflexed over the base of the spikelets, naked at the base, terminating at the base of the uppermost spikelet; spikelets solitary, 3.2 to 3.4 mm. long, 1.4 mm. wide, elliptic, acute, the thin faintly 3-nerved glume and sterile lemma pointed beyond the fruit; fruit elliptic-obovate, obscurely papillose-roughened, the very tip bearing a few minute, thick hairs.

Paspalum serratum differs from *P. dissectum* in its sparingly branching habit, less leafy culms, and larger pointed spikelets.

DISTRIBUTION

In ponds and sluggish streams, Cuba and Jamaica.

CUBA: Jagüey Chico, *Ekman* 16990.

JAMAICA: Troy, *Hitchcock* 9795; *Harris* 12582, 12598. Inverness, *Harris* 12719. Without locality, *Alexander*.

11. *Paspalum acuminatum* Raddi

Paspalum acuminatum Raddi, Agrost. Bras. 25. 1823. "In pratis prope Rio-janeiro." The type specimen in the Raddi Herbarium at the University in Pisa consists of two culms, each with 3 racemes.

DESCRIPTION

An aquatic or subaquatic glabrous perennial with an extensively creeping base, or, in wet ground, in clumps of few to several culms decumbent at base, and erect or ascending, sparingly branching flowering culms 30 to 100 cm. long; culms rather fleshy, compressed, the nodes dark brown; sheaths soft, loose, overlapping toward the summit of the culms; ligule hyaline, 2 mm. long, slightly erose; blades flat, soft, ascending, 4 to 12 cm. long, 5 to 12 mm. wide, rounded at base, abruptly acuminate, racemes 3 to 5, rarely 2, distant about one-fourth their length along a narrowly winged axis, erect or ascending, 3.5 to 7 cm. long; rachis membranaceous, 3 to 3.5 mm. wide, the margins inflexed over the base of the spikelets, minutely hispidulous, terminating at the base of the uppermost spikelet; spikelets solitary in two rows, 3.5 mm. long, 1.6 mm. wide, elliptic, the thin glume and sterile lemma abruptly pointed beyond the fruit, faintly 3 to 5 nerved; fruit 2.9 mm. long, 1.5 mm. wide, obovate-elliptic, minutely papillose-roughened, the obtuse apex with a minute tuft of short thick hairs.

DISTRIBUTION

In shallow water or wet open ground, from southern Louisiana and Texas to Argentina.

LOUISIANA: Without locality, *Buckley* (mixed with *P. dissectum*).

TEXAS: Falfurrias, *Tharp* 3225.

MICHOACÁN: Morelia, *Arsène* 3132.

GUATEMALA: Without locality, *Bernoulli & Cairo* 938.

BRAZIL: São Miguel, Minas Geraes, *Chase* 9622.

PARAGUAY: Sierra de Amambay, *Hassler* 10784.⁵ Río Apa, *Hassler* 11930. Lacus Ypacaray, *Hassler* 12471.

ARGENTINA: Mercedes, *Parodi* 6213.

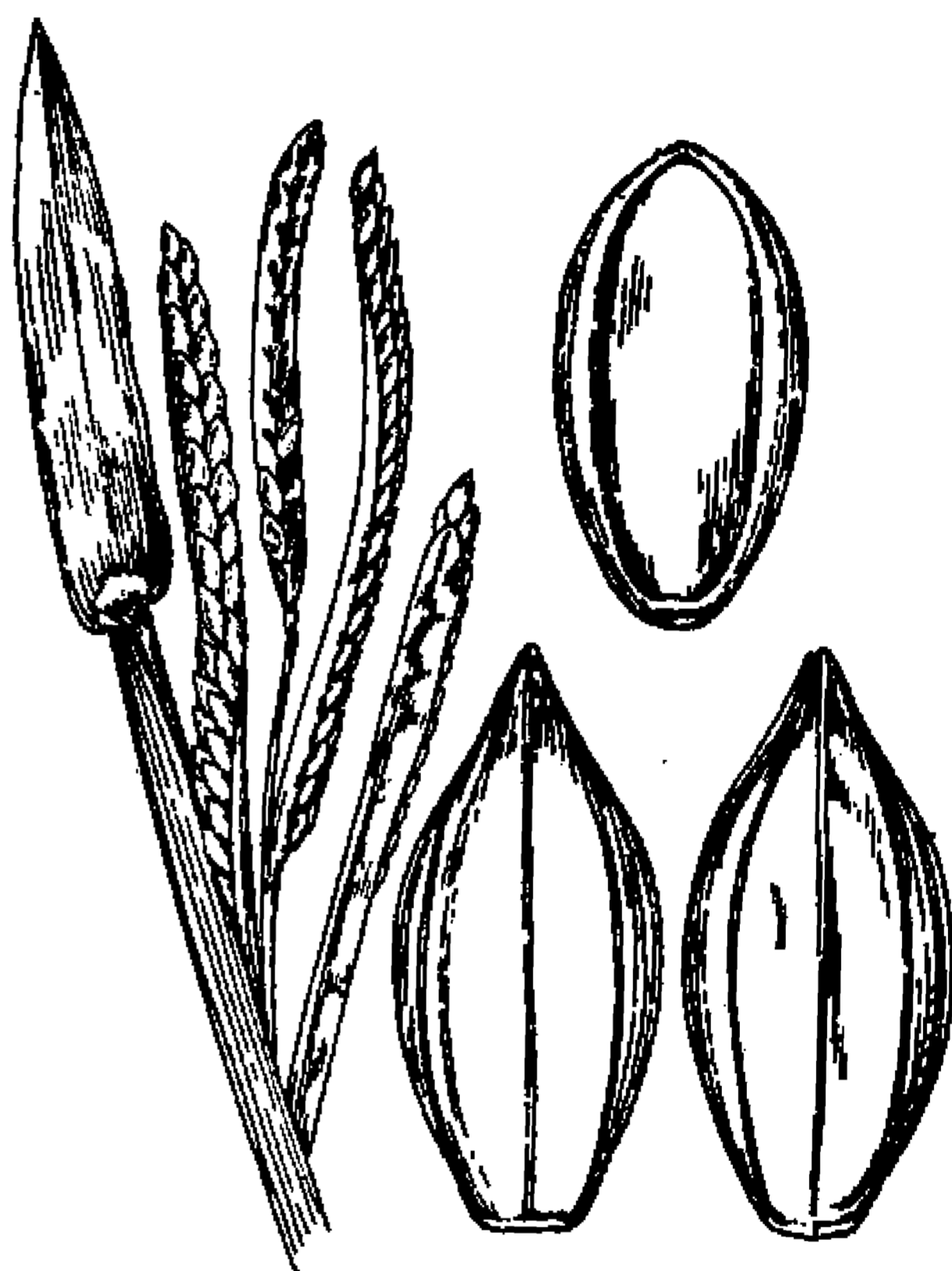


FIGURE 11.—*P. acuminatum*. From *Arsène* 3132

12. *Paspalum repens* Bergius

Paspalum repens Bergius, Act. Helv. Phys. Math. 7: 129. pl. 7. 1762. 'Habitat in Surinamo.' [Dutch Guiana.] The type specimen has not been located but Bergius' detailed description, especially the statement that the mouth of the sheath is bidentate, referring to the prominent auricles characteristic of this species, and the plate, leave no doubt as to its identity. The spikelets are not said to be pubescent so it is to be assumed those of Bergius' specimen are glabrous.

⁵Some of the collections of this series were made by Rojas, but the numbers are those of Hassler.

Paspalum gracile Rudge, Pl. Guian. 20. pl. 26. 1805. No locality is given. The type specimen in the herbarium of the British Museum is labeled "Guiana." It consists of a part of a culm with inflated sheaths and a partly included panicle 10 cm. long. The spikelets are minutely pubescent.

Paspalum mucronatum Muhl. Cat. Pl. 8. 1813. Name only, the one word "sharp-pointed" given in the column of English names being merely a translation of the name "*mucronatum*." The habitat listed is Georgia.

Ceresia fluitans Ell. Bot. S. C. & Ga. 1: 109. pl. 6. f. 4. 1816. "Grows in the river swamps. Ogechee. In rice fields." The type specimen is in the Elliott Herbarium; the spikelets are sparsely pubescent.

Paspalum mucronatum Muhl. Descr. Gram. 96. 1817. "Habitat ad ripas Mississippi, et in Georgia." The type is in the Muhlenberg Herbarium; the spikelets are sparsely pubescent.

Paspalum natans LeConte, Journ. de Phys. 91: 285. 1820. "*P. mucronatum* Muhlenberg. Habitat in Georgiae oryzaceis." There is no specimen in the herbarium of the Academy of Natural Sciences, Philadelphia,⁵⁷ bearing this name in LeConte's handwriting. There is a specimen of *P. repens* labeled "*Paspalum fluitans*" in his hand. The description and the citation of *P. mucronatum* Muhl. leave no doubt as to the species.

Paspalum fluitans Kunth, Rév. Gram. 1: 24. 1829. Based on *Ceresia fluitans* Ell.

Paspalum pyramidale Nees, Agrost. Bras. 77. 1829. "Habitat in ripae fluminis Amazonum inundatis, ad insulam Marajo et alibi provinciae Paraensis." The type specimen, collected by Martius, in the Munich Herbarium, is labeled. "Marajo, Para, ripa fl. Amazon." It consists of the upper part of a culm with an exceptionally large pyramidal panicle 20 cm. long and 15 cm. wide. The spikelets are glabrous.

Paspalum frankii Steud. Syn. Pl. Glum. 1: 19. 1854. "Frank. Hrb. un. it. 1837 * * * N. Orleans." The type specimen, with the name in Steudel's script, is in the Drake Herbarium in Paris. The sheaths are only minutely papillose.

Paspalum bistipulatum Hochst.; Steud. Syn. Pl. Glum. 1: 29. 1854. "Hrbr. Hostm. sur. nr. 707a. * * * Surinam." The type specimen, in the Drake Herbarium in Paris, has glabrous spikelets.

Cymatochloa fluitans Schlecht. Bot. Zeit. 12: 822. 1854. Based on *Ceresia fluitans* Ell.

⁵⁷ We learn from a sketch of Maj. John Eatton LeConte by Doctor Gray (Bot. Gaz. 8: 197-199. 1883) that LeConte collected in lower Georgia and Florida, that he and his brother established a botanic garden on their father's estate in Georgia, and that when he visited Paris in 1827 (seven years after the publication of his Monographie des especes du genre *Paspalum*) he took his herbarium with him, and that "his acquaintances made free use of his permission to help themselves to the duplicates." His herbarium was presented to the Academy of Natural Sciences, Philadelphia, in 1852, but as Doctor Gray says "There is reason to think, accordingly, that the remains of it which went to the Philadelphia Academy of Natural Sciences will not throw all the light which might be expected upon the species of plants which were described in his published papers." This is true in the case of LeConte's earliest publication, that on *Paspalum*. In his introductory paragraph nothing is said of specimens preserved. His specimens of *Paspalum* now in the Academy are without date or, except in a few cases, locality. They are, therefore, taken as interpretations of LeConte's descriptions, rather than as types, it being evident in several instances that at least additional material entered into the description.

Cymatochloa repens Schlecht. Bot. Zeit. 12: 822. 1854. Based on *Paspalum repens* Berg.

Cymatochloa pyramidalis Schlecht.; Doell in Mart. Fl. Bras. 2¹: 98. 1877. The name is incorrectly credited to "Schlecht. Berliner Bot. Zeit." Schlechtendal suggests that *P. pyramidalis*, *P. gracile*, and *P. bistipulatum* apparently belong in *Cymatochloa*, but he does not transfer the names.

Walter⁵⁸ misapplied the name *P. paniculatum* L. to this species.

DESCRIPTION

An aquatic, rarely terrestrial, perennial, with submerged culms, sometimes as much as 2 meters long with tufts of long roots at the nodes and numerous floating branches, the culms soft and spongy, glabrous; nodes dark, sometimes hispid; sheaths commonly overlapping on the branches, those of the floating branches inflated, flask-shaped, papery, often purple-spotted, glabrous, those of aerial branches loose, thin, glabrous (or scabrous above) to sparsely papillose-hispid, in all a prominent erect auricle on either side at the summit; ligule rather firm, erose, strigose, extending up the inner margin of the auricle; blades flat, thin, usually 10 to 20 cm. long, 12 to 15 mm.

wide, sometimes as much as 27 cm. long and 2.5 cm. wide, tapering to both ends, scabrous, often ciliate toward the base, the collar dark-colored, usually strigose; panicles short-exserted, usually 10 to 15 cm. long, 4 to 10 cm. wide, sometimes as much as 20 cm. long of numerous ascending, spreading or recurved rather lax racemes, solitary or in fascicles of 2 or 3 along a slender scabrous axis; racemes tardily falling entire, usually 3 to 5 cm. long, rarely 9 cm. long, the rachis about 1.5 mm. wide, scabrous, often flexuous, naked at the narrowed base and acuminate tip; spikelets solitary, whit-



FIGURE 12.—*P. repens*. From Hitchcock 9179

ish, 1.4 to 2 mm. long, about 0.8 mm. wide, elliptic; glume and sterile lemma very thin, more or less exceeding the fruit and pointed beyond it, 2-nerved, the nerves near the margins, the midnerve suppressed, pubescent with soft spreading hairs to glabrous, the lemma commonly with a V-shaped pinkish stain at base; fruit 1.4 to 1.7 mm. long, 0.6 mm. wide, elliptic, smooth and shining.

At maturity the numerous racemes are often curled back, the panicle suggesting an ostrich feather.

Terrestrial plants are usually much dwarfed, the base creeping, rooting at the nodes, the flowering branches 10 to 20 cm. tall.

Most of the specimens from the United States have pubescent, even glandular-pubescent, spikelets. In those of the Tropics the spikelets are either pubescent or glabrous. In a few specimens, such as *Smith* 2750, from Colombia, and *Jenman* 6020, from British Guiana, some spikelets are glabrous and others sparsely pubescent. In *Bush* 3695, a terrestrial specimen, some of the spikelets are paired.

Where accessible to cattle this species is readily eaten, the animals wading far into the water to get it. It has been reported from Arkansas as causing trouble by dense growth in drainage canals, and is becoming a troublesome water weed in the Canal Zone, where it is choking the outlet of Pedro Miguel River into Miraflores Lake, and affording a breeding place for mosquitoes.

⁵⁸ Fl. Carol. 75. 1788.

DISTRIBUTION

Floating in sluggish streams or standing water or creeping in wet places, South Carolina to Indiana and Kansas, south to Florida, Texas, the West Indies, and Paraguay.

- INDIANA: Dan's Pond, *Deam* 22201, 26591. Patoka, *Deam* 22247. Boonville, *Deam* 24346. Mt. Vernon, *Deam* 22309.
- ILLINOIS: Calhoun County, *Metcalf* 1122. Belknap, *Gleason* 2198. Mound City, *Vasey*. Oquawka, *Patterson*. St. Clair County, *Eggert* 255b. Lower Wabash Valley, *Ridgway* 2867. Richland County, *Ridgway* 3344.
- MISSOURI: Eagle Rock, *Bush* 376. Lake Side, *Bush* 5164. Butler County, *Bush* 3695. Campbell, *Bush* 6200. Oak Grove, *Bush* 9944. Allentown, *Eggert* in 1886; *Letterman* in 1900. Wicks, *Eggert* in 1887. Chandon County, *Hall* in 1869. St. Louis, *Gladfelter* in 1895. Jasper County, *Palmer* in 1908.
- KANSAS: Labette County, *Hitchcock* in 1899. Cherokee County, *Clothier & Whitford* in 1897.
- SOUTH CAROLINA: Bluffton, *Millichamp* in 1881.
- GEORGIA: Rome, *Chapman*.
- FLORIDA: Jacksonville, *Curtiss* 5081 in part. Upper St. John River, *Curtiss* 3563. Dunnellon, *Combs* 912. Old Town, *Combs* 872. Eustis, *Nash* 1699. Istachatta, *Curtiss* 5970. Bartow, *Combs* 1201. Fort Myers, *Hitchcock* 3900. Peace Creek, *Garber* in 1878.
- KENTUCKY: Wickliffe, *McFarland & Anderson* 222.
- TENNESSEE: Cumberland, *Gattinger* in 1880.
- ALABAMA: Blue Rock, Tuscaloosa County, *Harper* 116.
- MISSISSIPPI: Columbus, *Tracy* in 1895.
- ARKANSAS: Marked Tree, *Bush* 183. Du Valls Bluff, *Letterman* in 1880.
- LOUISIANA: Upper Louisiana, *Carpenter*. Natchitoches, *Ball* 159. Marksville, *McAtee* 2164. Alexandria, *Hale* in 1840. Chalmette, *Tracy* 7750. Point-a-la-Hache, *Langlois* in 1886. Jacksonville, *Drummond* in 1835. Baton Rouge, *Brown* 1353.
- OKLAHOMA: Copan, *Stevens* 2128. Arkansas, *Bush* 687. Without locality, *Stevens* 4411.
- TEXAS: Humble, *Tharp* 4254. Houston, *Fisher* 200, 2089; *Thurrow* in 1898. Columbia, *Bush* 1303. Without locality, *Nealley* in 1884.
- TABASCO: San Juan Bautista, *Rovirosa* 44.
- GUATEMALA: Without locality, *Bernoulli & Cairo* 964.
- EL SALVADOR: Lake Ilopango, *Hitchcock* 8918. Ateos, *Calderón* 1879.
- COSTA RICA: Guanacaste, *Jimenez* 726. Puntarenas, *Hitchcock* 8582.
- PANAMA: Canal Zone, *Hitchcock* 8031, 9179; *Piper* 5205; *Standley* 28482, 31464. *Curry* in 1928. Chagres River, *D. Popenoe* 36. Mindago River, *Killip* 4231. Matías Hernández, *Pittier* 6808.
- JAMAICA: Cornwall, *Harris* 12557. Shettlewood, *Harris* 11641. Westmoreland, *Harris* 11812. Middle Quarters, *Hitchcock* 9582.
- TRINIDAD: Caroni Savanna, *Hart* 4194.
- COLOMBIA: Santa Marta, *Smith* 2750. Island of Mompos, *Curran* 258. Soplaviento, *Killip & Smith* 14568. Magangué, *Pennell* 3937. Without locality, *Moritz* 1546.
- VENEZUELA: Guárico, *Grisol* 24.
- BRITISH GUIANA: Georgetown, *Hitchcock* 16526. Yarikita Police Station, *Hitchcock* 17647. Canje River, *Jenman* 1904. Lamaha, *Jenman* 3855*. Coast region, *Jenman* 4442, 6020. Barima River, *Jenman* 7109*. Without locality, *Schomburgk* 358.

FRENCH GUIANA: Without locality, *Lockhart*.

BRAZIL: Rio Branco, *Kuhlmann* 3121. Pará, *Goeldi* 120. Ega, *Pöppig* 2863.

Piauí, *Litzelburg* 5538. Joazeiro, *Chase* 7919. Guaporre, *Riedel*.

PARAGUAY: San Bernardino, *Rojas* 1014. Central Paraguay, *Morong* 282.

ECUADOR: Naranjal, *Mille* 11. Balao, *Eggers* 14632; *Jameson* 540.

ARGENTINA: Santa Fé, *Parodi* 3297. Formosa, *Kermes* (*Herb. Parodi*) 3465.

13. *Paspalum longicuspe* Nash

Paspalum longicuspe Nash, N. Amer. Fl. 17: 172. 1912. "Type collected near Guadalajara, Jalisco, Mexico, October 2, 1891, C. G. Pringle 3854 (herb. Columbia Univ.)." The type has been examined; a duplicate is in the National Herbarium.

DESCRIPTION

An aquatic perennial with submerged culms a meter or more long, with ample tufts of long roots at the nodes, and bearing floating flowering branches 20 to 30 cm. long; culms soft, fleshy, drying flat; sheaths mostly overlapping, inflated, serving as floats, often densely spotted with dull purple, scabrous toward the summit, bearing an erect pointed auricle 3 to 6 mm. long; ligule hyaline, brown, about 3 mm. long, lacerate, strigose, bordering the inner margin of the auricle; blades flat, thin, ascending, 6 to 16 cm. long, 6 to 12 mm. wide, narrowed to both ends, very scabrous on both surfaces; panicle finally short-exserted, 7 to 11 cm. long, 3 to 5 cm. wide, consisting of numerous ascending more or less fascicled racemes approximate along a slender stiff scabrous axis; racemes falling entire, 2 to 3.5 cm. long; rachis membranaceous, 2 to 2.5 mm. wide, naked for 2 to 5 mm. at the narrowed base and for about 1 cm. at the acuminate tip, very scabrous, keeled; spikelets solitary, so distant as to appear in a single row, pale, 2.4 mm. long, 1.1 mm. wide, elliptic with an acuminate tip; glume and sterile lemma subhyaline, faintly 2-nerved, the midnerve suppressed, the lemma with a reddish stain at the base; fruit 2 mm. long, 1.1 mm. wide, elliptic, obtuse, smooth and shining, the tip of the palea not included at maturity.



FIGURE 13.—*P. longicuspe*. From type collection

DISTRIBUTION

Floating in water of highland ponds, Mexico.

NAYARIT: San Blas, *Ferris* 5464. Between Mexcaltitlán and Tuxpan, *Mexia* 1022.

JALISCO: Guadalajara, *Pringle* 3854. Orozco, *Hitchcock* 7386.

MEXICO (Republic of): Hecla del Castillo, *Oliva* 31.

14. *Paspalum prostratum* Scribn. & Merr.

Paspalum prostratum Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 24: 9. 1900. "Type specimen 3343 C. G. Pringle, low lands near Pátzcuaro, State of Michoacán [Mexico], November 9, 1890." This specimen, in the National Herbarium, bears the name in Merrill's script.

Paspalum prostratum pygmaeum Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 24: 9. 1900. "Type specimen 7167 C. G. Pringle, Pedregal * * * Valley of Mexico, Federal District, September 30, 1896. In dry places by the railroad track." The type specimen, in the National Herbarium, consists of three dwarf plants more densely pilose than *Pringle* 3343.

DESCRIPTION

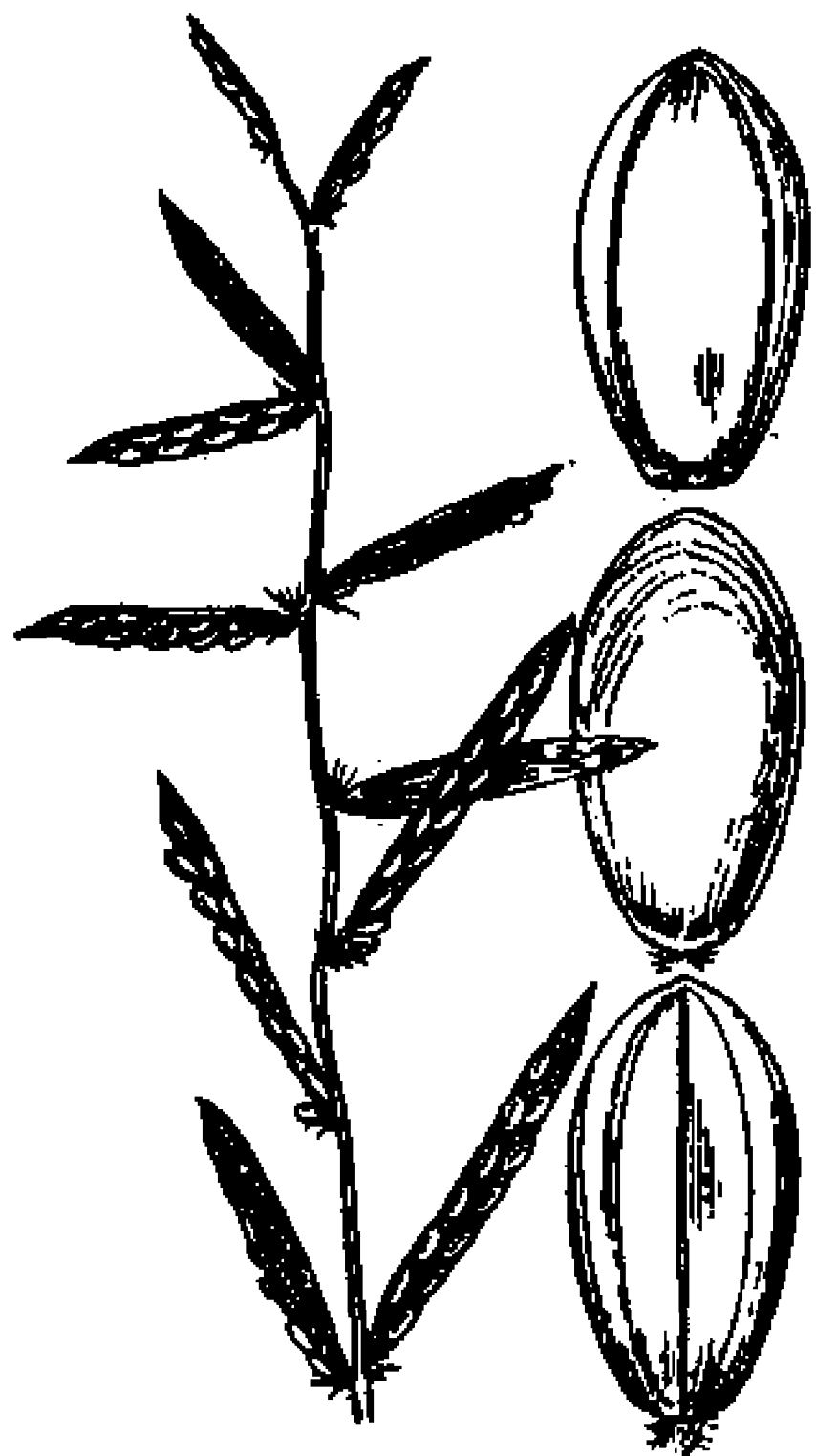


FIGURE 14.—*P. prostratum*. From type specimen

A low annual, the main culms prostrate, rooting at the nodes, bearing ascending often fascicled flowering branches, 5 to 30 cm. tall, these simple or branching from the lower nodes; culms flattened, striate, glabrous; sheaths thin, loose, compressed, from sparsely pilose along the margin and otherwise glabrous to densely pilose; ligule hyaline, scarcely 0.5 mm. long; blades flat, thin, 1.5 to 8 cm. long, 5 to 12 mm. wide, rounded to subcordate at base, abruptly acuminate, with a serrulate white cartilaginous margin, papillose-pilose on both surfaces, more densely so beneath; racemes 3 to 12, spreading, solitary or subfasciculate, the lower remote, falling entire, 1 to 3 cm. long, the common axis flattened, striate, 5 to 12 cm. long; rachis membranaceous, about 2.5 mm. wide, pilose at base and with a scabrous white cartilaginous margin, abruptly acuminate beyond the uppermost spikelet; spikelets solitary, mostly in 2 rows but sometimes so widely spaced as to appear as if one, whitish, 2.1 to 2.2 mm. long, about 1.1 mm. wide, obovate-elliptic, glabrous;

glume and sterile lemma very thin, 3-nerved, the lemma sometimes with a pair of faint intermediate nerves; fruit about the size of the spikelet, smooth and shining.

Fendler's no. 1696 from Venezuela, with narrower blades and less spreading habit, is doubtfully referred here.

DISTRIBUTION

Moist slopes at middle and higher altitudes, southern Mexico to Bolivia.

HIDALGO: Trinidad Iron Works, *Pringle* 8891.

MICHOACÁN: Morelia, *Arsène* 3129, 8684. Pátzcuaro, *Pringle* 3343.

COLOMBIA: Bogotá, *Idinael* 278. La Baja, *Killip & Smith* 18024. California, *Killip & Smith* 16936. Coconuco, *Killip* 6861. Guasca, *Ariste Joseph* A458 b, A463 a. Chiquinquirá, *Ariste Joseph* in 1909.

BOLIVIA: Sorata, *Holway* 507.

15. *Paspalum candidum* (Humb. & Bonpl.) Kunth

Reimaria candida Humb. & Bonpl.; Flüge, Monogr. Pasp. 214. 1810. "Locus natalis. Prope Puanbo [Puembo] in America meridionali," Ecuador. There are several Humboldt and Bonpland collections from Puembo, Ecuador, named *Paspalum candidum* or *Reimaria candida*. On those in the Willdenow and the Berlin herbaria and in the British Museum, the locality is misspelled "Puanbo," as in Flüge's work. The specimen in the Bonpland Herbarium in the Paris Herbarium is labeled Puembo. The specimen in the Berlin Herbarium bears both names in Kunth's script. Flüge seems to have used Willdenow's herbarium, and the specimen there, in a folder marked "*Paspalum confertum*—*Reimaria candida*," may be Flüge's type.

Paspalum candidum Kunth, Mem. Mus. Hist. Nat. 2: 68. 1815. Based on *Reimaria candida* Humb. & Bonpl. as published by Flügge.

Paspalum confertum Willd.; Steud. Nom. Bot. ed. 2, 2: 270. 1841, as synonym of *P. candidum*. This name with "*Reimaria candida*" is on the folder of *Paspalum candidum* in the Willdenow Herbarium (see above).

Paspalum uniseriatum Steud.; Lechl. Berb. Amer. Austr. 55. 1857. A name only, assigned to Lechler's no. 1862, from Peru. This collection so named in Steudel's script is in the Paris Herbarium.

DESCRIPTION

A straggling or clambering annual, ascending from a decumbent base, often rooting at the geniculate nodes, freely branching, the branches divergent; culms commonly 1 meter or more long, smooth and shining, drying compressed or grooved; nodes dark, swollen, often strigose, rarely hirsute; sheaths loose, thin, usually shorter than the internodes, ciliate toward the summit and with a few long hairs at the apex or glabrous; ligule hyaline, about 1.5 mm. long, erose; blades flat, thin, spreading, 5 to 10 cm. long, 6 to 20 mm. wide, oblong-elliptic, softly pubescent on both surfaces to glabrous; panicle usually short-exserted, 5 to 12 cm. long, of 8 to 20 ascending or arched-spreading racemes, falling entire, 2 to 4 cm. long; rachis membranaceous, 2 to 2.5 mm. wide, more or less trough-shaped, scabrous, pilose at the very base and extending 2 to 3 mm. beyond the spikelets; spikelets solitary, often so distant as to appear to be in a single row, not appressed, but somewhat spreading from the rachis, white, 2.3 to 2.5 mm. long, about 1.1 wide, oblong-elliptic; glume wanting, the sterile lemma equaling the fruit, very thin, 3-nerved, glabrous; fruit the size of the spikelet, white, smooth and shining.

DISTRIBUTION

Moist shaded banks and slopes and in recently disturbed soils, up to 1,800 meters altitude, Vera Cruz to Chile.

VERA CRUZ: Jalapa, *Pringle* 7884.

GUATEMALA: Solola, *Holway* 168. Cobán, *Johnson* 621; *Popenoe* 913. Alta Verapaz, *Johnson* 119, 831. Guatemala City, *Hitchcock* 9144. Dept. Santa Rosa, *Heyde & Lux (Dist. Smith)* 4300.

EL SALVADOR: Volcano Salvador, *Hitchcock* 8937. Ahuachapán, *Standley* 19787.

COSTA RICA: Yerba Buena, *Standley & Valerio* 50018. Cerros de Zurquí, *Standley & Valerio* 50626. Viento Fresco, *Standley & Torres* 47838.

Rio Reventado, *J. D. Smith* 4992. Cartago, *Cooper* 75; *Torres* 14. San José, *Cooper (Dist. Smith)* 5995; *Hitchcock* 8477; *Tonduz* 8492, 9854;⁵⁹ *Jiménez* 128; *Standley* 39016. San Francisco de Guadalupe, *Tonduz (Dist. Smith)* 7193. Between San Pedro Montes de Oca and Curridabat, *Standley* 32779, 41256. Santa Maria de Dota, *Standley* 41606; *Standley & Valerio* 43214. La Verbena, *Standley* 32268.



FIGURE 15.—*P. candidum*. From type specimen and *Hitchcock* 8937

⁵⁹ Many collections bear both a serial number of the "Herb. Instit. physico-geogr. nat. costaricensis," and also a serial number of the John Donnell Smith Herbarium. The Herb. Costaricense number only is here cited.

PAÑAMA: El Boquete, *Killip* 4510.

COLOMBIA: Medellín, *Toro* 675. California, *Killip & Smith* 17018. Río Paez Valley, *Pittier* 1238. Camino del Gachetá, *Ariste Joseph A* 550. "New Granada," *Triana* 258.

VENEZUELA: Silla de Caracas, *Warming* in 1891-92.

ECUADOR: Quito, *Heilborn* 539. Chillo, *Sodirol* 300. Nono, *Sodirol* in 1887. Huigra, *Rose* 22582. Las Juntas, *Rose* 23219. Cumbe, *Rose* 22957.

PERU: Obrajillo, *Wilkes Expl. Exped.* Mito, *Macbride & Featherstone* 1366. Cuzco, *Pennell* 13991. Machu Picchu, *Cook & Gilbert* 858. Muña, *Macbride* 3951. Without locality, *Lechler* 1862; *Heyne*.

BOLIVIA: San Felipe, *Hitchcock* 22597.

CHILE: Valparaiso, *Gunther* 33.

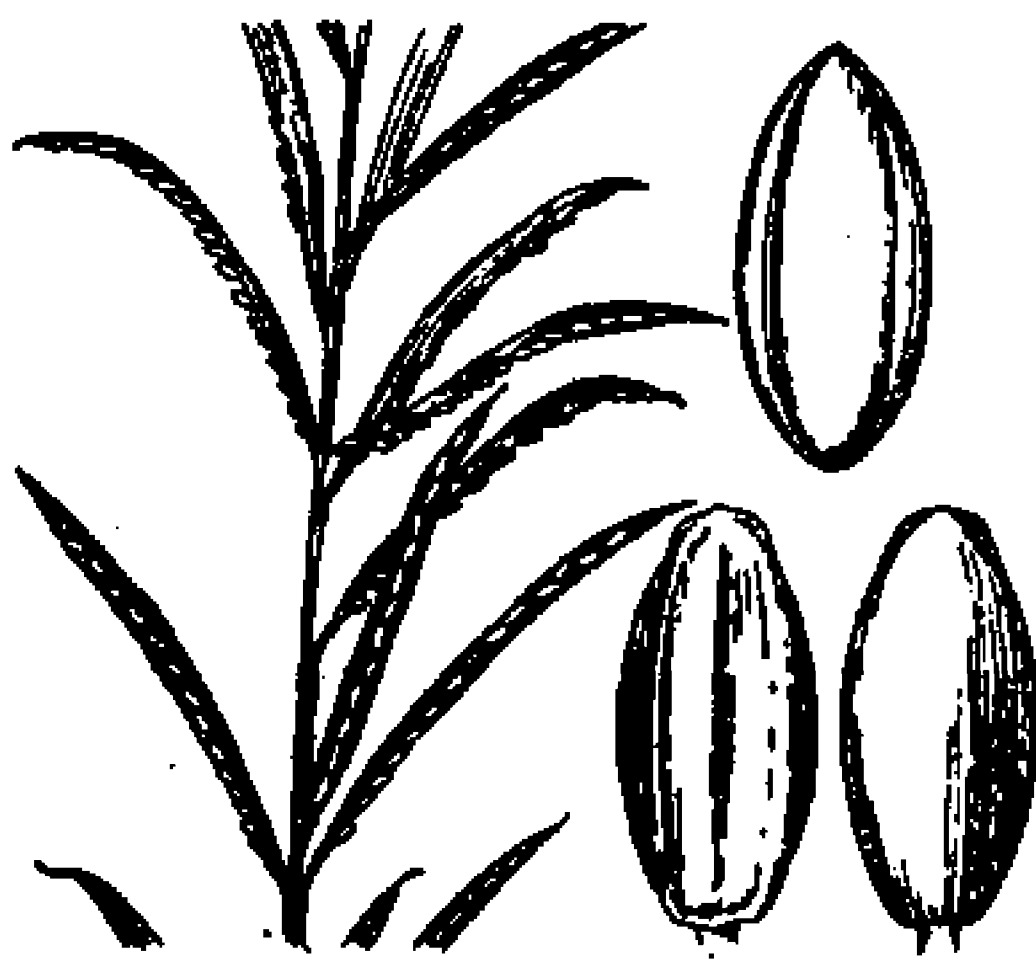


FIGURE 16.—*P. scabrum*. From type specimen

16. *Paspalum scabrum* Scribn.

Paspalum scabrum Scribn. U. S. Dept. Agr. Div. Agrost. 4: 36. pl. 3. 1897. "Guatemala, No. 3903 Heyde & Lux, 1892." The type specimen, in the United States National Herbarium, bears the name in Scribner's script. On plate 3 the specific name is erroneously given as "*scabriusculum*."

DESCRIPTION

A straggling or clambering annual, with elongate culms ascending from a decumbent base, bearing a few long divergent branches, striate, sometimes vinous purple, very scabrous, the nerves beset with minute backwardly pointed prickles; nodes retrorsely strigose; sheaths overlapping toward the summit of the branches, loose, scabrous like the culms; ligule hyaline, about 2 mm. long, lacerate; blades flat, thin, spreading or reflexed, 5 to 10 cm. long, 1 to 2.4 cm. wide, lanceolate-elliptic, papillose-pilose on both surfaces; panicles short-exserted or included at base, 11 to 20 cm. long, 4 to 5 cm. wide, of 20 to 50 spreading subfasciculate racemes along a grooved very scabrous axis, the racemes falling entire, 1.5 to 5 cm. long; rachis membranaceous, thin, with a strong midnerve, scabrous, about 2 mm. wide, the acuminate apex extending 2 to 3 mm. beyond the spikelets, pilose at base; spikelets solitary, so distant as to appear in a single row, somewhat divergent from the rachis, white, 1.8 to 1.9 mm. long, about 0.8 mm. wide, oblong-elliptic; glume wanting; sterile lemma equaling the fruit, thin, glabrous, 3-nerved; fruit the size of the spikelet, white, smooth and shining.

DISTRIBUTION

Brushy slopes, up to 2,800 meters, Guatemala to Ecuador.

GUATEMALA: Chupadero, Dept. Santa Rosa, *Heyde & Lux (Dist. Smith)* 3903.

COLOMBIA: California, *Killip & Smith* 16969, 18487. Between Piedecuesta and Las Vegas, *Killip & Smith* 15494. Chinácota, *Killip & Smith* 20810. Líbano, *Pennell* 3318.

ECUADOR: Guayaquil, *Hitchcock* 19948. Milagro, *Hitchcock* 20274.

17. *Paspalum racemosum* Lam.

Paspalum racemosum Lam. Tabl. Encycl. 1: 176. 1791. "E Peru. Com. D. boutelou." The type, bearing the name and a diagnosis in Lamarek's script, is in the Paris Herbarium. The panicle is 15 cm. long, the spikelets brown.

Paspalum stoloniferum Bosc, Trans. Linn. Soc. 2: 83. pl. 16. 1794. "H. in Perua." A specimen from "herb Bosc." in the herbarium at Padua is probably the type.

Milium latifolium Cav. Icon. Pl. 3: 37. pl. 273. 1794. "Habitat in Peru." The type specimen has not been examined, but the description and the crude plate identify the species.

Paspalum purpureum Ruiz & Pav. Fl. Peruv. Chil. 1: 47. 1798. "Habitat in Peruviae cultis." A specimen in the Berlin Herbarium labeled "*Paspalum* (mayzillo vulgo) *purpureum* Flor. Peruv. Ruiz, in Peruviae cultis" in Ruiz's script, is probably part of the type.

Paspalianthum stoloniferum Desv. Opusc. 59. 1831. Based on *Paspalum stoloniferum* Bosc.

Maizilla stolonifera Schlecht. Bot. Zeit. 8: 605. 1850. Based on *Paspalum stoloniferum* Bosc.

Paspalum biglume Steud. Syn. Pl. Glum. 1: 24. 1854. Described from a specimen cultivated in the botanic garden at Göttingen under the name *Paspalum stoloniferum* Bosc. The type specimen, bearing the name in Steudel's script, is in the Paris Herbarium.

Paspalum manabiense Mez, Repert. Sp. Nov. Fedde 15: 30. 1917. "Ecuador: Prov. Manabi, prope Hacienda El Recreo (Eggers no. 14965)." The specimens of this collection in the Berlin and the Munich herbaria bear the name in Mez's script. Both consist of small plants with small panicles of pale spikelets.

DESCRIPTION

A glabrous, widely spreading or clambering annual; culms as much as 1 meter long, rooting at the nodes, with rather numerous ascending branches; nodes dark brown; sheaths thin, loose, the upper more or less inflated; ligule 2 to 3 mm. long, erose, decurrent on the sheath as a brown hyaline margin; blades flat, thin, spreading, 4 to 12 cm. long, 1 to 2 cm. wide, acuminate, tapering to a rounded or subcordate base, often glaucous beneath, scabrous on the margin, otherwise smooth; panicles terminal, from pale tawny to ferruginous or dark purple, 10 to 20 cm. long, 1.5 to 2.5 cm. wide, of numerous (20 to 80 or more) ascending subfasciculate racemes, somewhat crowded along a slender axis, the racemes falling entire, 1 to 2 cm. long; rachis flat, pale-green, about 1 mm. wide, terminating at the base of the uppermost spikelet, short-pubescent at base, the margin scabrous; spikelets solitary on short pubescent pedicels, imbricate in 2 rows, pale tawny to ferruginous or brownish purple, about 2.7 mm. long and 1.2 mm. wide, elliptic, abruptly pointed; glume and sterile lemma thin, loose, much exceeding the fruit, ciliate at the apex, 1-nerved, the glume rugulose across the lower one-third to half, fluted or deeply wrinkled just within the margin, the internerves of the sterile lemma deeply transversely fluted at maturity, plane on the margins and down the center; fruit 1.5 mm. long, 0.6 mm. wide, narrowly obovate, pale, smooth and shining.



FIGURE 17.—*P. racemosum*. From type specimen of *P. stoloniferum*

DISTRIBUTION

In recently disturbed soils, fields, waste places, and roadsides, Ecuador and Peru; introduced as an ornamental and sparingly escaped in the West Indies, Brazil, and Peru.

CUBA: Habana, Léon 759.

DOMINICAN REPUBLIC: Poiteau.

BRAZIL: Pará, Goeldi in 1909.

ECUADOR: El Recreo, Eggers 14965. Perucho, Sodiro. Huigra, Hitchcock 20341; Holway 823; Rose 22162, 24017, 24022, 24025. Guayaquil, Anthony & Tate 79; Hitchcock 19955, 20132, 20134. Huataxi, Spruce 5959 (Kew Herb.).

PERU: Lima, Hitchcock 22338; Wilkes Expl. Exped.; Mathews 425, 426; Savatier 1188. Santa Clara, Rose 18742. "Callao et Lima," Didrichson 4387. Cerro de la Brea, Haught 108.

18. *Paspalum crassum* Chase

Paspalum crassum Chase, Contr. U. S. Nat. Herb. 17: 239. 1913. "Type in the U. S. National Herbarium, no. 691235, collected in prairie, among high grass and weeds, 450 meters altitude, at Alzada, Colima, Mexico, September 21, 1910, by A. S. Hitchcock (no. 7093)." This specimen is 2 meters tall, but immature, the margin of the fruits not yet inrolled.

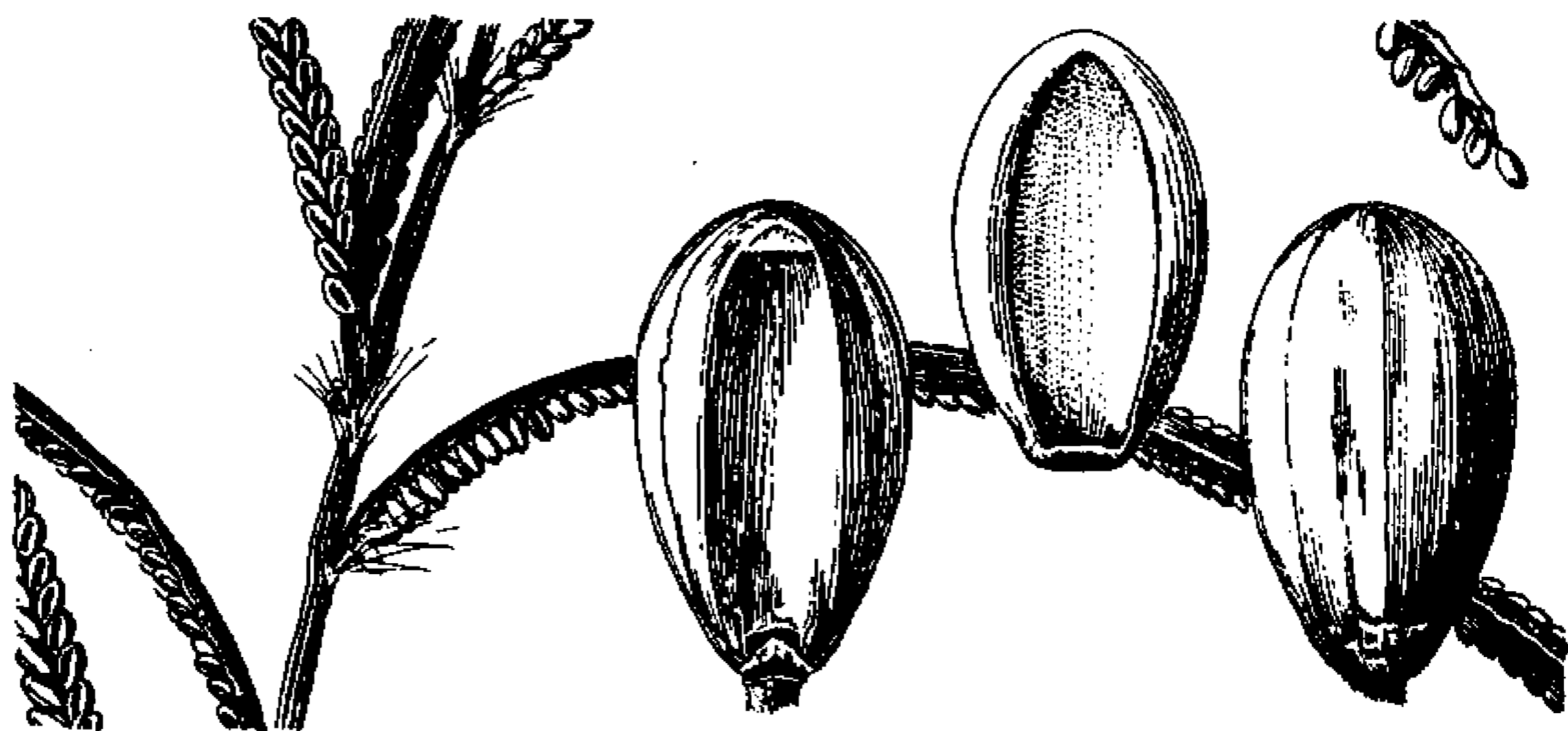


FIGURE 18.—*P. crassum*. From type specimen

DESCRIPTION

A large, coarse annual, producing prop-roots from the lower nodes; culms stout, erect, 40 cm. to 2 meters tall, simple or sparingly branching from the lower nodes, papillose-hirsute below the nodes and toward the summit; sheaths loose, longer than the internodes, coarsely papillose-hispid; ligule membranaceous, about 5 mm. long, lacerate; blades flat, 15 to 60 cm. long, 2.5 to 3 cm. wide, tapering to the base, conspicuously papillose-hispid on both surfaces, the midnerve prominent beneath; panicle 10 to 20 cm. long, the axis strongly angled; racemes 4 to 10, arched-ascending, 5 to 15 cm. long; rachis about 3 mm. wide, scabrous, pilose at the base; spikelets solitary or occasionally paired, imbricate but scarcely crowded, pale green, 3.1 to 3.3 mm. long, 1.7 to 2 mm. wide, oval, turgid, slightly concave on the face, blunt, glabrous; first glume minute or obsolete, firm; second glume and sterile lemma subchartaceous, covering the fruit, the sterile lemma inclosing a hyaline palea and a more or less developed staminate flower; fruit minutely papillose-striate, the margin of the lemma thin and flat before maturity, then inrolled.

In its coarse hispid foliage and thick prop-roots this species resembles *Echinochloa walteri* (Pursh) Heller. The only closely related species is *Paspalum tumidum* Kuhl. of Brazil. It is placed in the Dissecta group because of the winged rachis, but is not closely allied to the other species of this group.

DISTRIBUTION

Open moist grassy ground, Mexico, Venezuela, and Peru.

COLIMA: Alzada, *Hitchcock* 7093.

EL SALVADOR: Ahuachapán, *Padillo* 393.

VENEZUELA: Without locality, *Moritz* in 1865 (British Museum).

PERU: Colonia Perené, Junín, *Hitchcock* 22076.

Disticha.—Creeping perennials with wiry subcompressed culms, producing stolons or rhizomes; racemes 2, conjugate or approximate, occasionally a third below (racemes 2 to 5 in *P. paucispicatum*); spikelets somewhat pointed.

Second glume pubescent; spikelets relatively turgid.

Spikelets solitary or occasionally paired; racemes usually 2...21. *P. distichum*.

Spikelets mostly paired; racemes usually 3.....22. *P. paucispicatum*.

Second glume and sterile lemma glabrous; spikelets flattened.

Blades erect or ascending, involute-setaceous.....20. *P. distachyon*.

Blades spreading, tapering from base to apex, the margins involute.

19. *P. vaginatum*.

19. *Paspalum vaginatum* Swartz

Paspalum vaginatum Swartz, Prodr. Veg. Ind. Occ. 21. 1788. "Jamaica." In the Swartz Herbarium are two sheets of the Swartz collection, both leafy upright branches without the creeping base, the racemes mature, widely expanded or reflexed.

Paspalum littorale R. Br. Prodr. Fl. Nov. Holl. 188. 1810. "Littora Novae Hollandiae intra tropicum." The type specimen in the British Museum was collected by "R. Brown, * * * Banks of Patterson's River, Oct. 1804." Sprengel⁶⁰ misspells the name "litorale."

Digitaria foliosa Lag. Gen. & Sp. Nov. 4. 1816. "Habitat in Havana, ubi legit D. Balth. Boldo." The specimen in the Madrid Herbarium, consisting of 3 small tufts, is labeled "ex Havana, Boldo iter."

Paspalum tristachyum LeConte, Journ. de Phys. 91: 285. 1820. "Habitat in subsalsis Georgiae." The specimen in the herbarium of the Academy of Natural Sciences, Philadelphia, bearing this name in LeConte's script is a single culm of *P. vaginatum* bearing 3 racemes. It agrees well with LeConte's description and is accepted as the type. A specimen from LeConte so named by him in the Paris Herbarium has 2 racemes.

Digitaria tristachya Schult. Mant. 2: 261. 1824. Based on *Paspalum tristachyum* LeConte.

Paspalum brachiatum Trin.; Nees, Agrost. Bras. 62, 1829, as synonym of *P. vaginatum*. "Sieber Herb. Martin." This specimen in the Trinius Herbarium has three racemes.

Paspalum foliosum Kunth, Rév. Gram. 1: 25. 1829. Based on *Digitaria foliosa* Lag.

Paspalum kleineanum Presl, Rel. Haenk. 1: 209. 1830. "Hab. in Peruviae arenosis." The type specimen, collected in Peru by Haenke, is a small plant with short rhizome and crowded involute blades. Presl states that a specimen of this species from India sent by Klein is preserved in the Willdenow Herbarium. While the species is named *P. kleineanum*, the Haenke specimen is taken as the type, since that is the plant described.

⁶⁰Syst. Veg. 1: 244. 1825.

Paspalum inflatum A. Rich. in Sagra, Hist. Cuba 11: 298. 1850. "Crescit in locis sabulosis et maritimis insulae Cubae, circa Havanam." The type specimen collected by Ramon de la Sagra bearing the name in Richard's script, in the Paris Herbarium, is a mixture of *P. vaginatum* and *P. distichum*, the vegetative part being mostly *P. distichum*, the inflorescence *P. vaginatum*. The description states that the spikelets are glabrous, for which reason *Paspalum inflatum* is referred to *P. vaginatum*. A second specimen of this collection in the Drake Herbarium is entirely *P. vaginatum*.

Paspalum vaginatum var. *longipes* Lange, Naturhist. For. Kjöbenhavn Vid. Medd. 1854: 44. 1854. Described from the province of Galicia, Spain. The type, or part of it, collected by Lange and bearing the name in his script is in the Delessert Herbarium. The racemes are naked for 6 to 10 mm. at the base.

Paspalum squamatum Steud. Syn. Pl. Glum. 1: 21. 1854. "Jardin legit in Guinea." The type, bearing the name in Steudel's script, is in the Institut Botanique, Caen. A duplicate with Steudel's script is in the Paris Herbarium.

Paspalum didactylum Salzm.; Steud. Syn. Pl. Glum. 1: 20, 1854, as synonym of *P. vaginatum*. "Salzm. hrbr." The Salzmann collection from "Bahia; in maritimis," Brazil, was examined in the Montpellier, Munich, Delessert, and Kew herbaria.

Paspalum distichum var. *tristachum* Wood, Class-book 783. 1861. No specimen nor locality is cited. The description of the species indicates *P. vaginatum*, not *P. distichum*, the variety differentiated only by "spikes in 3's, closely approximate."

Paspalum distichum var. *vaginatum* Swartz; Griseb. Fl. Brit. W. Ind. 541. 1864. Based on *P. vaginatum* Swartz.

Paspalum reptans Poir.; Doell in Mart. Fl. Bras. 2²: 75, 1877, as synonym of *P. vaginatum*. "In Lamarckii herbario, ex parte."

Paspalum vaginatum var. *nanum* Doell in Mart. Fl. Bras. 2²: 75. 1877. "Prope Rio de Janeiro (Glaziou n. 4346)." The type, bearing the name in Doell's script in the Berlin Herbarium consists of two depauperate tufts with culms only 4 and 6 cm. tall and spikelets barely 3 mm. long.

Paspalum reimarioides Chapm. Fl. South. U. S. 665. 1883. Not *P. reimarioides* Brongn. 1830. "Brackish marshes along the coast, West Florida." The type specimen has not been located, but in the United States National Herbarium is a specimen sent under this name to Doctor Vasey in 1884 by Doctor Chapman. The description and this specimen serve to identify the species which is the same as that described by Chapman in the same work as *P. vaginatum* Swartz, as shown by Chapman specimens so labeled, though the Chapman specimen sent as *P. reimarioides* is an exceptionally lax plant with three racemes.

Paspalum distichum var. *littorale* F. M. Bailey, Queensland Grasses 23. 1888. Presumably based on *P. littorale* R. Br., though that name is not cited.

Paspalum vaginatum var. *reimarioides* Chapm. Fl. South. U. S. ed. 3. 577. 1897. "Saline marshes along the coast, Florida and westward." Probably based on *P. reimarioides* Chapm. The description applies to large specimens of *P. vaginatum*.

Paspalum distichum var. *nanum* Stapf in Dyer, Fl. Cap. 7: 371. 1898. Based on *P. vaginatum* var. *nanum* Doell.

Sanguinaria vaginata Bubani, Fl. Pyr. 4: 258. 1901. Based on *Paspalum vaginatum* Swartz.

Paspalum distichum var. *anpinense* Hayata, Icon. Pl. Formosa 7: 55. f. 27. 1918. "Anpin, Sept. 1913, leg. T. Soma," Formosa. The type has not been examined. The description and figure indicate a specimen of *P. vaginatum* with spikelets in which the midnerve of the glume, but not that of the sterile lemma, is suppressed.

By a typographical error this species is listed as "*P. variegatum* Swz." by Vasey.⁶¹ On the following page the name is correctly given as *P. vaginatum*.

Raddi⁶² refers a Brazilian specimen to "*Paspalus longiflorus*. P. Beauv. Fl. de Ow. II. 46. t. 85?" In Beauvois' work Willdenow is given as author of this name. Willdenow⁶³ cites "Retz. obs. 4. p. 15." That is *Digitaria longiflora* (Retz.) Pers. (*Syntherisma longiflora* Skeels). Raddi's specimen in the herbarium at Pisa consists of 5 plants of *P. vaginatum*, three with 2 racemes, one with three, and one with 5 racemes. Beauvois' plate represents *P. vaginatum*.

DESCRIPTION

An extensively creeping perennial, with horizontal rhizomes, pale, glabrous as a whole, stoloniferous, often forming extensive colonies, the stolons sometimes slender and wiry, sometimes stout and almost succulent, up to a meter or more long, the culms subcompressed, usually grooved, the short broad loose often overlapping sheaths bladeless or with short reflexed blades; branches ascending or erect, usually the greater number on any plant sterile with overlapping sheaths and conspicuously distichous, stiffly ascending blades,

the flowering shoots 8 to 60 cm. tall (the upturned end of a runner sometimes flowering), simple or branching, the branches sometimes aggregate, forming dense tufts of stiff foliage; sheaths commonly overlapping, broad, loose, often keeled, the summit with small auricles; ligule membranaceous, about 0.5 mm. long, with a ring of soft white hairs back of it, the hairs sometimes 5 mm. long; blades 2.5 to 15 cm. long, 3 to 8 mm. wide at base, narrower than the summit of the sheath, taper-

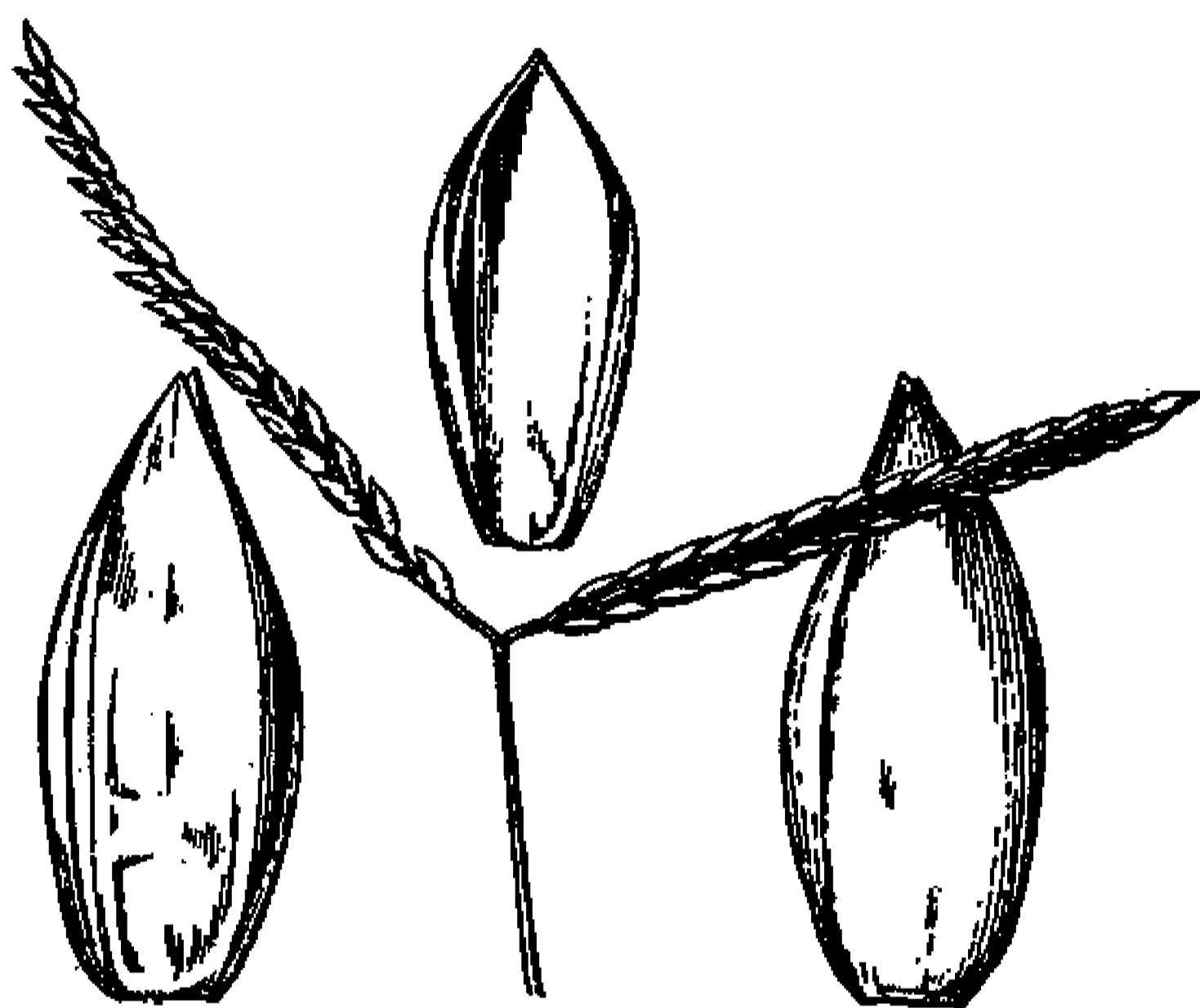


FIGURE 19.—*P. vaginatum*. From type specimen and Hitchcock 9886

ing from the abruptly contracted base to an involute apex, usually firm, sometimes subrigid, ascending commonly at a uniform angle; peduncles compressed, commonly short or included; racemes commonly 2, rarely as many as 5, conjugate or closely approximate, at first erect and appressed together, usually spreading or reflexed at maturity, often subfalcate, 1.5 to 7.5 cm. long; rachis naked at base forming slender peduncles, 1 to 2 mm. (rarely to 2.5 mm.) wide, triangular, flexuous, minutely scabrous on the margin; spikelets solitary, imbricate, except the lower ones, 3 to 4.5 mm. long (commonly 3.5 to 4 mm.), 1.2 to 1.5 mm. wide, ovate-lanceolate, acute, pale stramineous; first glume rarely developed; second glume and sterile lemma equal, thin in texture, weakly 5-nerved but the midnerve of both usually suppressed, the sterile lemma often transversely undulate, sometimes conspicuously so; fruit 2.5 to 3 mm. long, narrowly obovate, subacute, slightly concavo-convex.

⁶¹ Bot. Gaz. 9: 54. 1884.

⁶² Agrost. Bras. 24. 1823.

⁶³ Sp. Pl. 1: 332. 1797.

Rarely the upright shoots are so congested on a short-jointed, vertical rhizome as to produce a more or less tufted plant. Depauperate plants of this character are the form described as *P. vaginatum nanum* Doell. Such plants are *Ekman* 13392 and *Chase* 8221. In the latter, from a dry rocky cliff above the sea at Leblon, Rio de Janeiro, the little tufts above the surface appear quite distinct from *P. vaginatum*, but the stout horizontal underground parts are those of typical *P. vaginatum*. Plants from adjoining more favorable spots are taller, with longer racemes, and undoubtedly referable to *P. vaginatum*.

DISTRIBUTION

Seacoasts and brackish sands, often forming a pure stand, from North Carolina to Florida, Texas, Mexico, and the West Indies to Argentina, and on the Pacific coast from Lower California to Cocos Island and Chile; also found on tropical and subtropical coasts of the Eastern Hemisphere.

A good soil binder on low sandy coasts.

NORTH CAROLINA: Ocracoke Island, *Kearney* 2281.

FLORIDA: Apalachicola, *Kearney* 120. St. Vincent Island, *McAtee* 1689 A. Jacksonville, *Curtiss* 3576*; *Hitchcock* 2465. Indian River, *Curtiss* 3567* in part. Gainesville, *Combs* 765a. Cedar Key, *Combs* 766. Homosassa, *Combs* 942. Kissimmee, *Swallen* 246. Hillsborough County, *Fredholm* 6470. Braidentown, *Combs* 1293. Fort Myers, *Hitchcock* 505. Sanibel, *Hitchcock* 2466. Marco, *Hitchcock* 19787. Miami, *Garber* in 1877. Key Largo, *Chase* 3927. Key West, *Rugel* 46, 188. Without locality, *Chapman*; *Rugel* 392, 449.

ALABAMA: Mobile, *Mohr* 21 in 1878, and in 1893.

MISSISSIPPI: Deer Island, *Tracy* 66, 4623. Biloxi, *Tracy* 6466.

LOUISIANA: Point au Barree, *Wurzlów* in 1913.

TEXAS: Galveston, *Nealley* in 1892; *Ward* in 1877. Copano Bay, *Tharp* 1732. Brownsville, *Hitchcock* 2467. Without locality, *Nealley* in 1883.

LOWER CALIFORNIA: San José del Cabo, *Brandege* 2 in 1890.

TAMAULIPAS: Tampico, *Hitchcock* 5785.

SAN LUIS POTOSÍ: Hacienda de Angostura, *Pringle* 3695. Guascama, *Purpus* 5421.

VERA CRUZ: Vera Cruz, *Hitchcock* 6568.

PUEBLA: Puebla, *Nicolás* in 1908.

GUATEMALA: Izabel, *Blake* 7833. Puerto Barrios, *Standley* 25138.

EL SALVADOR: La Unión, *Hitchcock* 8780.

NICARAGUA: Managua, *Maxon* 7257, 7337. San Juan del Sur, *Hitchcock* 8603.

COSTA RICA: Port Limón, *Hitchcock* 8418; *Pittier* 12697.

PANAMA: Canal Zone, *Hitchcock* 7996, 8034, 8042; *Pittier* 4232; *Standley* 30881.

Old Panama, *Hitchcock* 8403. Punta Poitilla, *Standley* 30799. Río Indio de Fató, *Pittier* 4261.

BERMUDA: *Brown & Britton* 100.

BAHAMAS: Hog Island, *Britton & Brace* 340. Nassau, *Geogr. Soc. Baltimore* 546.

CUBA: Arroyo Mántua, *Ekman* 11003. Habana, *Curtiss* 751; *Ekman* 13392; *Léon* 811. Playa del Rosario, *Roca* 7287. Playa de Marianao, *Palmer & Riley* 848. Tunas, *Léon* 6734. Santiago de Cuba, *Léon & Voisard* 930. Western Cuba, *Wright* 947, 3854.

JAMAICA: Montego Bay, *Hitchcock* 9667. Savanna-la-Mar, *Hitchcock* 9866. Black River, *Hitchcock* 9641. Buff Bay, *Hitchcock* 9775. Gordon Town, *Hart* 860. Kingston, *Amer. Gr. Nat. Herb.* 563; *Harris* 12661.

HAITI: Cap Haitien, *Ekman* H 2756.

PORTO RICO: Mona Island, *Hess* 439. Mayaguez, *Chase* 6307; *Sintenis* 6857. Santurce, *Chase* 6343. Humacao, *Eggers* 691. Island of Vieques, *Chase* 6694.

VIRGIN ISLANDS: St. Croix, *Benson*; *Paulsen* 313.

LEEWARD ISLANDS: Antigua, *Hitchcock* 16383. Guadeloupe, *Hitchcock* 16409.

- WINDWARD ISLANDS: Martinique, *Duss* 545 in part; *Sieber* 20367. Barbados, *Bot. Station Herb.* 277.
- TRINIDAD: Port of Spain, *Hitchcock* 10050. San Fernando, *Hitchcock* 10108. Cedros, *Hitchcock* 10139.
- TOBAGO: Scarborough, *Broadway* 4655; *Hitchcock* 10287. Studley Park, *Broadway* 3045.
- COLOMBIA: Puerto Colombia, *Hitchcock* 9924. Santa Marta, *Smith* 179.
- VENEZUELA: Paraguana, *Curran & Haman* 569, 578. Paparo, *Pittier* 6317.
- BRITISH GUIANA: Coast region, *Jenman* 4391, 4395, 4522, 4523.
- BRAZIL: Pernambuco, *Chase* 7758. Maceió, *Chase* 7839. Bahia, *Capanema* 5427; *Chase* 8020; *Riedel* in 1831; *Salzmann*. Rio de Janeiro, *Chase* 8221, 8458; *Glaziou* 20122; *Lützelburg* 26; *Matos* (*Mus. Nac. Rio Jan.*) 16004; *Wilkes Expl. Exped.* Guaratuba, *Dusén* 13783. Porto Dom Pedro II., *Dusén* 13465. Rio Grande do Sul, *Capanema* 5417. Without locality, *Burchell* 1565; *Gardner* 1187; *Riedel* 968.
- URUGUAY: Montevideo, *Herter* 336; *Lombardo* 1786, 1818; *Marchesi* 1749.
- ECUADOR: Balao, *Eggers* 14602.
- PERU: "Callao et Lima," *Didrichsen* 4384.
- ARGENTINA: Buenos Aires, *Goulard* 14.
- FRANCE: Bayonne, *Le Sauvage* in 1856.
- PORTUGAL: Porto, *Buchtien* in 1891.
- FRENCH CONGO: Gabon, *Thollon* 692.
- PORTUGUESE EAST AFRICA: Beira, *Shantz* 366.
- UNION OF SOUTH AFRICA: Durban, *Rudatis* 1564.
- MAURITIUS: *Sieber* 27.
- JAPAN: Oshima, *Faurie* 4474.
- CHINA: Pakhoi, Kwantung, *Hitchcock* 19252. Island of Hainan, *Hitchcock* 19198.
- INDO-CHINA: Haiphong, *Hitchcock* 19542. Bac Ninh, *Jard. Bot. Hanoi* 38. Tourane, *Hitchcock* 19401. Islands of Palo Condor, *Harmand* in 1875-77. "Cochinchina," *Germain*; *Thorel* in 1862-1866.
- FORMOSA: Keelung, *Hitchcock* 18194. Without locality, *Henry* 1036.
- INDIA: "Dakolie," *Prain* in 1902.
- STRAITS SETTLEMENTS: Selangor, Malay Peninsula, *Hort. Bot. Singapore* 4508.
- CEYLON: Negombo, *Alsten* in 1926.
- BORNEO: Without locality, *Beccari* 3528.
- JAVA: Surabaja, *Junghuhn*. Kangean Islands, *Backer* 27676. Madoera, *Backer* 20700.
- PAPUA: Kerema, *Brass* 1229.
- ARU ISLANDS: Dobbo, *Jensen* 222.
- PHILIPPINE ISLANDS: Manila, *Hitchcock* 18034, 18105; *Loher* 1747; *Santos* 12. Pasay, *Merrill* (*Kneucker Gram.*) 805. Los Baños, *Elmer* 18140. Samar, *Merrill* 5229.
- AUSTRALIA: (Queensland) Brisbane River, *Bailey*. (New South Wales), Port Macquarie, *Herb. Bot. Gard. Sydney*.
- NEW ZEALAND: Bay of Islands, *Wilkes Expl. Exped.* Auckland, *Petrie* in 1895. Waitemata, *Kirk* 301.

20. *Paspalum distachyon* Poit.

Paspalum distachyon Poit.; Trin. Mém. Acad. St. Pétersb. VI. Sci., Nat. 1: 142. 1834. Described from a specimen so named by Poiteau, collected, presumably by him, in Santo Domingo. This specimen, said to be in the herbarium of the elder Mertens, now in the herbarium of the Botanical Garden of Leningrad, has not been examined. In the Paris Herbarium is a specimen named "*Paspalum distachyon locis maritimis*. St. Dominique. Poiteau," which is doubtless a duplicate; another is in the Florence Herbarium.

DESCRIPTION

An erect perennial with slender, hard, yellowish rhizomes, forming tough sods, sometimes sparingly stoloniferous; culms 12 to 40 cm. tall, slender, wiry, compressed, often 2 or 3 at a single node of the rhizome; sheaths usually longer than the internodes, keeled, bearing a few hairs on each side of the summit; ligule membranaceous, about 0.3 mm. long; blades 6 to 15 cm. long, 1 to 2 mm. wide, drying involute, mostly erect; racemes 2, 1.2 to 5 cm. long, erect, often closely appressed together, straight; rachis 0.6 to 0.7 mm. wide, triangular, flexuous, the margin scabrous, attenuate at base into a slender peduncle, sometimes with a few hairs at the very base; spikelets solitary on minute puberulent pedicels, scarcely imbricate, 2.8 to 3 mm. long, about 1.2 mm. wide, ovate-lanceolate, acute, pale, greenish; glume and sterile lemma equal, rather firm, 3 to 5 nerved (nerves sometimes strong, sometimes obscure in spikelets in the same raceme); fruit 2.1 mm. long, 1 mm. wide, elliptic, subobtuse, more turgid and firmer in texture than that of *P. vaginatum*.



FIGURE 20.—*P. distichum*. From Hitchcock 9678

DISTRIBUTION

Moist or dry, brackish or alkaline soil, mostly near the coast, in the West Indies.

CUBA: Habana, Léon 2614, 2783. Cienaga de Zapata, Léon & Loustalot 9534. Baraguá, Hitchcock 23340, 23341. Tiffin, Shafer 2874, 2905. Guantánamo, Hioram 12. Jamaica, Hioram & Baptiste 1289. Isle of Pines, Ekman 12423.

JAMAICA: Montego Bay, Hitchcock 9678. Savanna-la-Mar, Hitchcock 9864. Black River, Harris 12548; Hitchcock 9842. Inverness, Harris 11695, 12716.

HAITI: Cap Haitien, Ekman H 2749, H 2756. Port-au-Prince, Buch 1760.

LEEWARD ISLANDS: Dominica (probably Poiteau).

21. *Paspalum distichum* L.

Paspalum distichum L. Syst. Nat. ed. 10. 2: 855. 1759. No citation is given. In the Pugillus Jamaicensium Plantarum,⁶⁴ published in November of the same year, this species is described in greater detail. In the preface to this paper it is stated that the plants were collected in Jamaica

by Browne. The specimen in the Linnaean Herbarium is without data. It consists of two culms, one with two, the other with three racemes, and two sterile shoots.

Digitaria paspalodes Michx. Fl. Bor. Amer. 1: 46. 1803. "Hab. in pascuis aridis, juxta Charleston," South Carolina. The type specimen in the Paris Herbarium consists of three fertile specimens each with 2 racemes.

Paspalum digitaria Poir. in Lam. Encycl. Suppl. 4: 316. 1816. "Caroline, aux environs de Charleston (V. s. Comm. Bosc.)." *Digitaria paspalodes* Michx. is cited as synonym. The type has not been examined but the description and Poiret's citation of Michaux's name identify the species.

Milium paspalodes Ell. Bot. S. C. & Ga. 1: 104. 1818. Based on *Digitaria paspalodes* Michx., although the description applies to *Axonopus furcatus* (Flügge) Hitchc. and the figure (pl. 6. f. 2) represents that species.

⁶⁴ Amoen. Acad. 5: 391. 1759.

Milium distichum Muhl. Descr. Gram. 78. 1817. "Habitat in Carolina." No reference is made to *Paspalum distichum* L., but the description agrees with it.

Paspalum michauxianum Kunth, Rév. Gram. 1: 25. 1829. Based on *Digitaria paspalodes* Michx.

Panicum paspaliforme Presl, Rel. Haenk. 1: 296. 1830. "Hab. in Peruviae montanis huanoccensibus." Haenke. The first glume is developed in most of the spikelets of the type specimen in the National Museum at Prague.

Panicum polyrrhizum Presl, Rel. Haenk. 1: 296. 1830. "Hab. ad Monterey Californiae," Haenke. There are two sheets of this collection in the herbarium of the German University at Prague, with the locality given as California. The plants were probably collected on the coast of Lower California, not at Monterey. A minute first glume is present in many of the spikelets.

Paspalum bracteatum Dufour; Kunth, Enum. Pl. 1: 53, 1833, as synonym of *Paspalum michauxianum* Kunth. Dufour's specimen, bearing the name (with a slightly different spelling) is in the DeCandolle Herbarium. It was collected at Bordeaux in 1826 by M. L. Dufour, no. 36.

Panicum digitarioides Rasp.; Kunth, Enum. Pl. 1: 53, 1833, as synonym of *Paspalum michauxianum*. Kunth cites "Bull. de la Soc. Linn. de Bord. 197," but the name is not found in the work cited, nor is there an article by Raspail in it. There is a paper by Des Moulins⁶⁵ on "*Paspalum digitaria* (*Digitaria paspalodes* Michaux)." In a notice of this paper⁶⁶ the name "*Panicum digitariae* Raspail" appears.

Paspalum fernandezianum Colla, Mem. Acad. Sci. Torino 39: 27. pl. 59. 1836. "Vulgo Chepica dictam. * * * legit ipse Berterus in pascuis collium ins Juan Fernandez, et misit cum hac inscriptione in sched. Paspalum a conjugato diversum" (p. 26). On "Bertero 1488, Paspalum a conjugato diversum, vulgo Chepico. In pasc. coll. freq. Ins. Juan fernandez 1830 April" in the Kew Herbarium Munro has written "I have no doubt this is *P. fernandezianum* Colla, described from a plant of Bertero marked 'Paspalum conjugato diversum.'" The specimen is stoloniferous and has pubescent foliage.

Paspalum chepica Steud. Syn. Pl. Glum. 1: 21. 1854. "Paspalum nr. 511 et 1223. Bertero hrbr. Chili Ins. I. Fernand." Bertero's no. 1223, with the name in Steudel's script, is in the Paris Herbarium. The specimen has a long stolon and sparsely pilose foliage.

? *Paspalum oaxacense* Steud. Syn. Pl. Glum. 1: 21. 1854. "Franko legit in Oaxaca." The type has not been located. The description suggests a culm of *P. distichum* without the base and with the racemes approximate instead of paired, such a plant as Palmer's no. 192 in 1896. The first glume is often developed in this species. The name is spelled *P. oajacense* by Hemsley.⁶⁷

Paspalum vaginatum var. *pubescens* Doell in Mart. Fl. Bras. 2²: 75. 1877. "Prope Rio de Janeiro (Glaziou n. 3612)." Doell's specimen of the number cited was not found. This collection in the National Herbarium has spikelets more densely pubescent than usual on the glume and with a stripe of pubescence on the internerves of the sterile lemma.

? *Dimorphostachys? oajacensis* Fourn.; Hemsl. Biol. Centr. Amer. Bot. 3: 499. 1885; Mex. Pl. 2: 16. 1886. Based on *Paspalum oaxacense* Steud., the plant unknown to Fournier.

Paspalum schaffneri Griseb. in Fourn. Mex. Pl. 2: 6. 1886. This name was earlier listed by Hemsley⁶⁸ without description. "Chapultepec * * *

⁶⁵ Bull. Hist. Nat. Soc. Linn. Bordeaux 1: 45. 1826.

⁶⁶ Dierbach, Repert. Bot. 1: 69. 1831.

⁶⁷ Biol. Centr. Amer. Bot. 3: 499. 1885.

⁶⁸ Biol. Centr. Amer. Bot. 3: 482. 1885.

(SCHAFFN. n. 19a); prope San Angel (SCHAFFN. n. 19c); circa Mejico * * * prope Guadalupe, Mirador (SCHAFFN. n. 19b)." The three specimens were examined in the Paris Herbarium; 19a and 19c bear the name in Fournier's script.

Paspalum elliottii S. Wats. in A. Gray, Man. Bot. ed. 6. 629. 1890. Based on *Milium paspalodes* Ell., and like that misapplied to *Axonopus furcatus* (Flügge) Hitchc.

Paspalum paspaloides Scribn. Mem. Torrey Club 5: 29. 1894. Based on *Digitaria paspalodes* Michx., but misapplied to *Axonopus furcatus* as shown by figure 23 in a later work.⁶⁰ Scribner spelled the name "paspaloides," as did Nash under *Anastrophus* (see below).

Panicum digitaria Laterr.; Jacks. Ind. Kew. 3: 412. 1894. Error for *Paspalum digitaria* Poir., as listed in Laterr. Ami des Champs 329. 1825.

Digitaria disticha Fiori & Paoll. Icon. Fl. Ital. Illustr. 1: 16. f. 138. 1895. Presumably based on *Paspalum distichum* since "(L.)" is cited. The figure represents that species.

Anastrophus paspaloides Nash in Britton, Man. 75. 1901. Based on *Paspalum paspaloides* Scribn. but misapplied to *Axonopus furcatus* (Flügge) Nash.

Paspalum distichum var. *digitaria* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 13: 424. 1906. Based on *P. digitaria* Poir.

Paspalum distichum subsp. *paspalodes* Thell. Mem. Soc. Sci. Nat. Cherbourg 38: 77. 1912. Based on *Digitaria paspalodes* Michx.

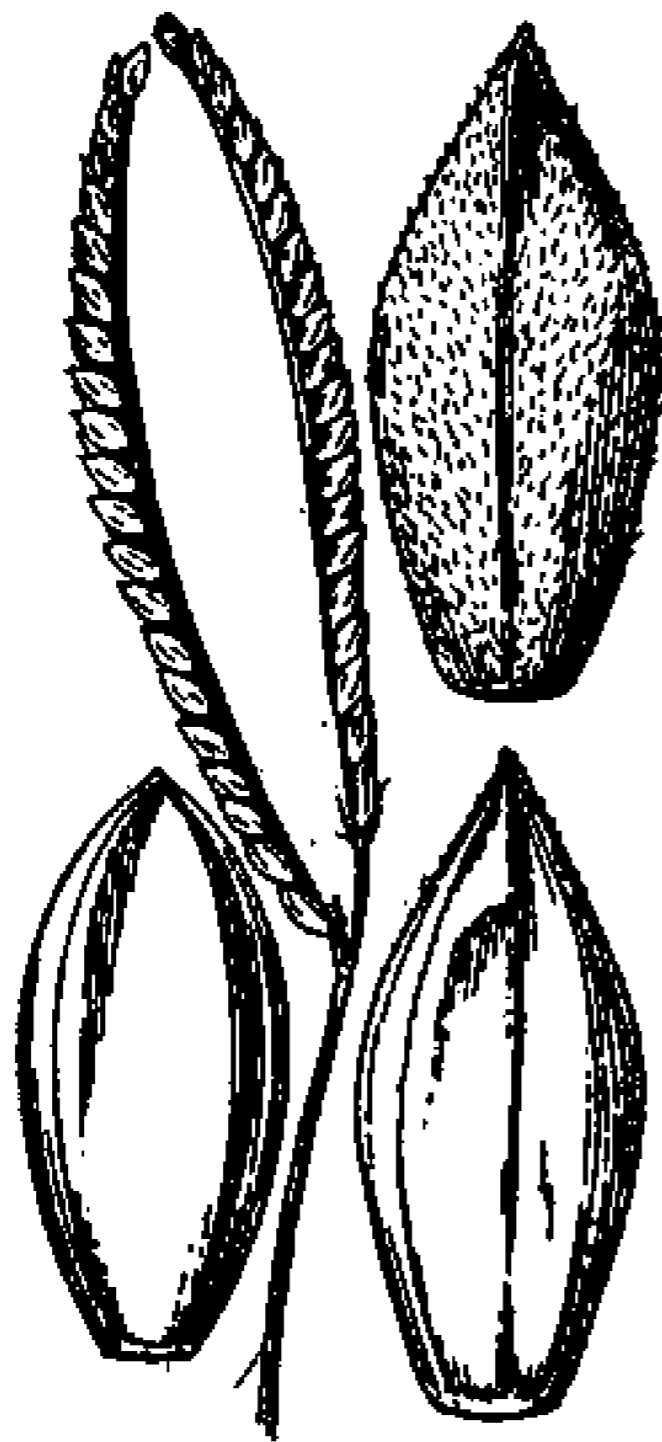


FIGURE 21.—*P. distichum*.
From photograph of type
and Hitchcock 9394

DESCRIPTION

A widely creeping perennial with slender rhizomes, extensively stoloniferous, often forming loose mats, the stolons usually slender, subcompressed, sometimes as much as 1 meter long, the sheaths on the average less loose than in *P. vaginatum*, the blades usually well developed; branches erect or ascending, most of them finally flowering, 6 to 50 cm. tall, often sparingly branching, the culms subcompressed, the dark nodes often with a few ascending hairs; sheaths loose, keeled, commonly pilose on the margin toward the summit; ligule membranaceous, about 0.5 mm. long; blades flat, ascending, 3 to 12 cm. long, 2 to 6 mm. wide at the rounded ciliate base, tapering to an acuminate sometimes involute apex, dull green, relatively soft in texture, occasionally minutely pubescent on the upper surface; peduncles commonly short, often included; racemes usually 2, rarely as many as 4, from erect to reflexed, commonly incurved, 1.5 to 7 cm. long, rarely longer; rachis slightly pedunculate in one, sometimes in both racemes, usually a few long white hairs in the axils, 1 to 1.5 mm., rarely 2 mm. wide, triangular, minutely scabrous on the margin; spikelets solitary (rarely in pairs in the middle of the raceme), imbricate, 2.5 to 3.5 mm., rarely 4 mm. long, 1.3 to 1.5 mm. wide (the variation in size sometimes found in the same plant) elliptic, abruptly acute, pale green; first glume frequently developed; second glume and sterile lemma equal, 3 to 5 nerved, the midnerve relatively prominent, the glume minutely appressed-pubescent, sometimes obscurely so; fruit 2.5 to 2.8 mm. long, about 1.2 mm. wide, elliptic.

⁶⁰ Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 7: 41. 1898.

This is the most variable of the three allied species, sometimes closely resembling *P. vaginatum* but distinguishable by the slightly more turgid spikelets, the glume and sterile lemma not papery, the midnerve evident, the glume at least obscurely pubescent.

Paspalum distichum, known as knotgrass, jointgrass, and Fort Thompson grass, is a valuable soil binder along streams subject to erosion in the Tropics and sub-Tropics. It furnishes excellent grazing in flat regions near the coast. It is sometimes a bad weed in the cotton fields of the Black Belt of Alabama. In the West it is spreading along irrigation ditches and sometimes invades rice fields in California. In Australia it is known as water-couch and siltgrass. It is there regarded as a valuable pasture grass on alluvial flats.

DISTRIBUTION

Ditches and wet, rarely brackish, places, New Jersey to Florida, Tennessee, and Arkansas, and west to California and north along the coast to Washington, south through Mexico and the West Indies to Argentina and Chile; also near warm-temperate coasts of the Eastern Hemisphere.

NEW JERSEY: Camden, *Parker* in 1879.

PENNSYLVANIA: Philadelphia, *Parker* in 1865; *Canby*.

VIRGINIA: Dismal Swamp, *McCarthy*. Virginia Beach, *Kearney* 2028.

NORTH CAROLINA: Ocracoke Island, *Kearney* 2296. Wilmington, *Hitchcock* 400; *Kearney* 279.

SOUTH CAROLINA: Aiken, *Ravenel* in 1882. Orangeburg, *Hitchcock* 18. Georgetown, *Alexander* 157. Without locality, *McCarthy* in 1888.

GEORGIA: Dalton, *Harper* 383. Rome, *Chapman*. Stone Mountain, *Hitchcock* 2431. Augusta, *Hildebrand* in 1921. Albany, *Pollard & Mazon* 527. Ruskin, *Ricker* 902.

FLORIDA: Chipley, *Combs* 539a. Marianna, *Swallen* 499. Quincy, *Combs* 420. Apalachicola, *Kearney* 110. Tallahassee, *Combs* 388. Monticello, *Combs* 317. Jefferson County, *Hitchcock Fl. Pl.* 2469. Madison, *Combs* 241. Madison County, *Hitchcock Fl. Pl.* 2467. Jacksonville, *Combs* 30, 31; *Curtiss* 3567* in part, 4021, 5078, 5741; *Kearney* 135. Baldwin, *Combs* 52. St. Augustine, *Ricker* 947. Gainesville, *Combs* 728. Waldo, *Combs* 710. Eustis, *Chase* 4089; *Hitchcock Fl. Pl.* 2468; *Nash* 1035, 1205. Indian River, *Curtiss* 3567*. Titusville, *Chase* 3961. Homosassa, *Combs* 965. Hillsborough County, *Fredholm* 6380. Bartow, *Combs* 1245. Kissimmee, *Swallen* 271. Braidentown, *Combs* 1272. Sanibel, *Hitchcock* 2432. Fort Myers, *Chase* 4160; *Hitchcock* 506. Dade County, *Small, Mosier & Small* 6893. Key West, *Curtiss* 3567. East Florida, *Palmer* in 1874.

TENNESSEE: Nashville, *Gattinger*. Cumberland River, *Gattinger*. Knoxville, *Kearney* in 1895; *Ruth* 79 and in 1895.

ALABAMA: Selma, *McCarthy* in 1888. Tuskegee, *Carver* 38. Central Alabama, *Mohr* in 1880. Mobile, *Mohr* in 1884.

MISSISSIPPI: Starkville, *Kearney* 12, 93. Agricultural College, *Pollard* 1324. Leake County, *Williams* in 1892.

ARKANSAS: Almyra, *Haskell* in 1911. Pine Bluff, *Hitchcock* 16107. McNab, *Greenman* 4387.

LOUISIANA: Shreveport, *Ball* 103; *Hitchcock* 3901. Alexandria, *Hale*. McCall, *Combs* 1434. Baton Rouge, *Joor* 17. New Orleans, *Drummond* 441; *Joor* 16. Houma, *Wurzlów* in 1913. Pointe-a-la-Hache, *Langlois* in 1884. Cameron, *Cocks* 3009. South Pass, *Tracy & Lloyd* 465.

TEXAS: El Paso, *Hitchcock* 13341; *Jones* in 1885. Western Texas, *Wright* 798. 911, 2093. Fort Davis, *Palmer* 30999. Abilene, *Tracy* 7936. Tom Green County, *Tweedy* in 1880. Fort Worth, *Hitchcock* 3902. Dallas, *Reverchon* 1067.

- Texarkana, *Letterman* in 1894. Austin, *Tharp* in 1921. Comanche Spring, *Lindheimer* 1269. San Antonio, *Ball* 941; *Havard* 6 in 1884; *Hitchcock* 5142. Kerrville, *Hitchcock* 5301. Beaumont, *Plank* 22. Jefferson County, *Plank* 16. Gonzales, *Bogusch* 1487; *Plank* 53. Pierce, *Tracy* 7388. Houston, *Hall* 808; *Thurrow* in 1898. Columbia, *Bush* 294. Rio Grande City, *Griffiths* 6467. Mercedes, *Olive* 9. Corpus Christi, *Hitchcock* 5362. Sarita, *Hitchcock* 5464, 5480. Boquillas, *Swallen* 1117.
- OKLAHOMA: Greer County, *Stevens* 1120. Norman, *Prier* 64.
- WASHINGTON: Kalama, *Leckenby* in 1900. Klickitat County, *Suksdorf* 1612.
- OREGON: Sauvies Island, *Howell* in 1885. Columbia Slough, *Piper* 4200; *Sheldon* 11305. Albina, *Suksdorf* 2981, 3213. Columbia River, *Leckenby* in 1900. Siskiyou National Forest, *Hitchcock* 23538. Sutherlin, *Lawrence* 2095.
- UTAH: St. George, *Cottam* 3388.
- NEVADA: Fallon, *Knight* in 1927.
- NEW MEXICO: Socorro, *Plank* 72; *Vasey* in 1881. Kingston, *Metcalf* 1501. Las Cruces, *Hitchcock* 3903; *Wooton* 1077. Mesilla Valley, *Wooton & Standley* in 1906. Mesilla Park, *Hitchcock* 3821. Queen, *Hitchcock* 13526. Blue Spring, *Tharp* 4147.
- ARIZONA: Fort Verde, *MacDougal* 571. Phoenix, *Peebles, Harrison & Kearney* 230. Tucson, *Griffiths* 1610; *Hitchcock* 3518; *Pringle* in 1881; *Toumey* in 1891 and 1892. Santa Rita Mountains, *Griffiths* 6015. Patagonia, *Hitchcock* 3676, 3677, 3687. San Pedro Valley, *Toumey* in 1894. San Bernardino Ranch, *Mearns* 721, 742, 789, 1979.
- CALIFORNIA: Crescent City, *Davy & Blasdale* 5937. Biggs, *McKee* in 1921. Searsville, *Baker* 1836. Stege, *Suksdorf* 423. Alviso, *Baker* 1699. Yosemite National Park, *Hitchcock* 3211. Santa Cruz, *Anderson* in 1887; *Jones* 2307. Fresno, *Griffiths* 4719. Visalia, *Coville & Funston* 1281. Los Angeles, *Grant* 1196. Westminster, *Abrams* 1762. Laguna Beach, *Crawford* 750. San Pasqual Valley, *Chandler* 5331. San Diego County, *Orcutt* 512a. Without locality, *Rothrock* 59.
- LOWER CALIFORNIA: Santa Agueda, *Palmer* 214 in 1890.
- SONORA: Santa Cruz, *Mearns* 2619. Hermosillo, *Hitchcock* 3575, 3616.
- CHIHUAHUA: Galleada, *Hartman* 659.
- COAHUILA: Saltillo, *Hitchcock* 5587, 5588, 5602; *Palmer* 259 and 391 in 1898.
- SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5743. San Luis Potosí, *Hitchcock* 5683, 5748; *Schaffner* 1073.
- ZACATECAS: Zacatecas, *Hitchcock* 7528.
- DURANGO: Torreón, *Hitchcock* 7561. Durango, *Hitchcock* 7568; *Palmer* 192 in 1896.
- JALISCO: Guadalajara, *Hitchcock* 7311. Orozco, *Hitchcock* 7378. Zapotlán, *Hitchcock* 7127.
- AGUASCALIENTES: Aguascalientes, *Hitchcock* 7481, 7487.
- GUANAJUATO: Acámbaro, *Hitchcock* 6944. Irapuato, *Hitchcock* 7415.
- QUERÉTARO: Querétaro, *Hitchcock* 5815, 5837.
- HIDALGO: Pachuca, *Hitchcock* 6768.
- VERA CRUZ: Orizaba, *Hitchcock* 6312, 6314; *Pringle* 7532. Córdoba, *Hitchcock* 6400. Jalapa, *Hitchcock* 6647, 6652. Vera Cruz, *Hitchcock* 6561.
- PUEBLA: Tehuacán, *Hitchcock* 6044, 6066. Chalchicomula, *Hitchcock* 6291. Puebla, *Arsène* 333, 1601; *Nicolas* 5410. Mt. Orizaba, *Seaton* 61.
- MEXICO: Federal District, *Arsène* 8831; *Bourgeau* 532; *Hitchcock* 5884; *Lyonnet* 49; *Pringle* 6780. Toluca, *Hitchcock* 6910.
- MORELOS: Cuernavaca, *Hitchcock* 6844.
- MICHOACÁN: Morelia, *Arsène* 3362. Rincón, *Arsène* in 1909.

- OAXACA: Tomellín, *Hitchcock* 6225. Oaxaca, *Hitchcock* 6173.
- GUATEMALA: San Marcos, *Lehmann* 1571. La Aurora, *Morales* 700.
- COSTA RICA: San José, *Hitchcock* 8495; *Jiménez* 927; *Pittier* 306. Tres Ríos, *Pittier* 4329. Tuis, *Tonduz* 11395. Alajuelita, *Tonduz* 8822.
- BERMUDA: Harrington Sound, *Brown & Britton* 826.
- BAHAMAS: New Providence, *Britton & Brace* 513. Watling Island, *Geogr. Soc. Baltimore* 479.
- CUBA: San Diego de los Baños, *Léon* 4413. Herradura, *Tracy* 9056. Western Cuba, *Wright* 1546. Habana, *Curtiss* 764; *Léon* 929, 940, 1992, 6204. Marianao, *Léon* 12457. Hoyo Colorado, *Léon* 7537. Puentes Grandes, *Ekman* 504; *Léon* 1991. Batabanó, *Ekman* 888. Santiago de las Vegas, *Baker & Wilson*, 385. Guanabacoa, *Léon* 2642. Sancti Spiritus, *Léon* 941. Without locality, *Wright* 292 in part.
- JAMAICA: Shettlewood, *Harris* 11645. Ipswich, *Hitchcock* 9593. Ewarton, *Hitchcock* 9454. Spanish Town, *Hitchcock* 9287. Castleton Gardens, *Harris* 12528; *Hitchcock* 9389, 9394. Mt. Hybla, *Harris* 11850. Gordon Town, *Hart* 865. Troy, *Harris* 12568.
- HAITI: Marmelade, *Leonard* 8416. Mirabalais, *Cook, Scofield & Doyle* 91. Pétienville, *Leonard* 5059. Jacmel, *Ekman* H 7086.
- DOMINICAN REPUBLIC: Haina, *Faris* 388. San Cristóbal, *Faris* 258.
- PORTO RICO: Maricao, *Chase* 6233. Hato Grande, *Sintenis* 2715. Canóvanas, *Stevenson* 5389. Ponce, *Chase* 6483, 6494. Fajardo, *Sintenis* 1720. Island of Vieques, *Chase* 6690.
- VIRGIN ISLANDS: St. Croix, *Hitchcock* 16326; *Ricksecker* 433; *Thompson* 23, 242. Tortola, *Fishlock* 436.
- LEEWARD ISLANDS: Antigua, *Hitchcock* 16397. Guadeloupe, *Duss* 3609.
- WINDWARD ISLANDS: Martinique, *Duss* 545; *Husnot* 74. St. Lucia, *Glasgow* 9; *Kemp* 47, 56; *Moore* 18. St. Vincent, *McRae*. Grenada, *Broadway* 1793.
- TRINIDAD: San Fernando, *Broadway* 6353. Pitch Lake, *Hitchcock* 10086.
- TOBAGO: Cullodon, *Broadway* 4513. Plymouth, *Hitchcock* 10283.
- COLOMBIA: Buenaventura, *Hitchcock* 19908. Santa Marta, *Smith* 2159.
- BRITISH GUIANA: Georgetown, *Hitchcock* 16563. Coast region, *Jenman* 3962, 4520, 4586.
- DUTCH GUIANA: Paramaribo, *Kuyper* in 1913. "Surinam," *Weigelt*.
- BRAZIL: Bello Jardim, *Chase* 7701. Bahia, *Chase* 8037. Serra de Itatiaia, *Chase* 8258. Ouro Preto, *Chase* 9333. Lavras, *Chase* 8752. Rio Pardo, *Jürgens* 49. Without locality, *Capanema* 5418.
- PARAGUAY: Ypacaray, *Hassler* 12452. Río Pilcomayo, *Rojas* 322.
- URUGUAY: Montevideo, *Arechavaleta* 201; *Lombardo* 1813. Nueva Palmira, *Herter (Herb. Osten)* 18826. Palleros, *Herter (Herb. Osten)* 18621.
- ECUADOR: Ibarra, *Sodirol* in 1888. Pomasqui, *Sodirol* in 1897.
- PERU: Chosica, *Holway* 781.
- BOLIVIA: La Paz, *Buchtien* 4518. Cotaña, *Buchtien* 3126. San José, *Hitchcock* 22730. Cochabamba, *Hitchcock* 22793. Arque, *Hitchcock* 22790. Oploca, *Hitchcock* 22882. Tarija, *Fries* 1064. Río Sutureú, *Steinbach* 6835. Without locality, *Bang* 1312.
- ARGENTINA: Prov. Catamarca, *Jørgensen* 1150. Formosa, *Jørgensen* 3298; *Parodi* 8318. Pergamino, *Parodi* 3993. General Alvear, *Parodi* 8. General Roca, *Fischer* 257.
- CHILE: Santiago, *Claude Joseph* 2270; *Hastings* 316; *Philippi* in 1888. Panguipulli, *Claude Joseph* 2640a. Rauco, *Claude Joseph* 4718. Bureo, *Claude Joseph* 4146. Termas de Chillan, *Holway* in 1919.
- HAWAIIAN ISLANDS: Honolulu, *Andersson* 8 in 1852; *Hitchcock* 13803.

FRANCE: Garonne River, *Arnaud* in 1885. Bordeaux, *Motelay* in 1870. Biarritz, *Blanchet* 230. Beziers, *Sennez* in 1891.

ITALY: Genoa, *Canepa*.

UNITED SOCIALIST SOVIET REPUBLICS: (Transcaucasia) Abchasien, *Woronow* in 1902. Suchum Kale, *Marcowicz* (*Kneucker Gram.*) 482.

UNION OF SOUTH AFRICA: Pretoria, *Nat. Herb.* 19604.

INDIA: Gwalior, *Maries* 19.

CHINA: Shanghai, *Hitchcock* 18580. Canton, *Hitchcock* 18702.

FORMOSA: Taihoku, *Sasaki* 21388.

INDO-CHINA: Hanoi, *Hitchcock* 19485, 19487. Without locality, *Petelot* 20.

AUSTRALIA: South Perth, *Carne* 117. Sydney, *Black* 33. *Hamilton* in 1909. Scone, *White* 44.

NEW ZEALAND: Wellington, *Travers* in 1909.

22. *Paspalum paucispicatum* Vasey

Paspalum paucispicatum Vasey, *Contr. U. S. Nat. Herb.* 1: 281. 1893. "Collected at Guadalajara [Mexico] by Dr. Edward Palmer (no. 243) in 1886." The type specimen in the United States National Herbarium consists of two plants, one bearing 2, the other 3, racemes. The nodes are less pubescent than usual in this species.

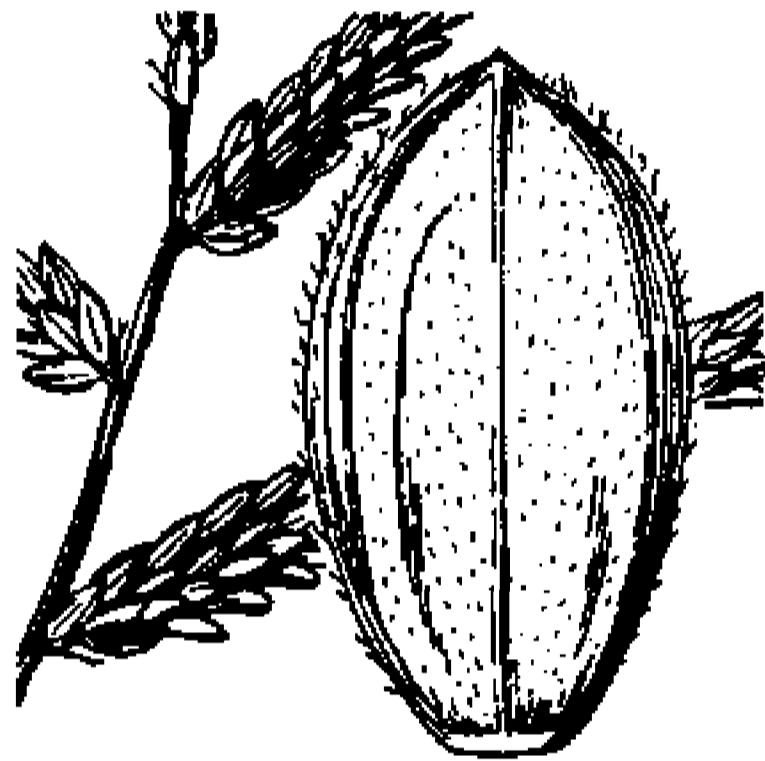


FIGURE 22.—*P. paucispicatum*.
From *Hitchcock* 3615

DESCRIPTION

Similar to vigorous specimens of *P. distichum*, the nodes usually more densely pilose, the ligule about 1 mm. long; racemes 2 to 5, mostly 3, the upper two conjugate, the others 5 to 10 mm. distant; spikelets mostly in pairs, crowded, 3 to 3.5 mm. long, the sterile lemma as well as the glume usually pubescent but minutely so.

The inflorescence of 3 to 5 thick racemes with spikelets in pairs appears very different from that of *P. distichum*, but several Mexican specimens appear to be intermediate between the two; for example, *Hitchcock* 5683, 6168, and 7311, referred to *P. distichum*, and *Arsène* 10268, *Palmer* 693 and some specimens of *Palmer* 243, the type collection of *P. paucispicatum*, referred to *P. paucispicatum*. This might perhaps better be regarded as a variety of *P. distichum*, but the resulting name would be misleading.

DISTRIBUTION

Moist sand or mud in arid regions, southern California and Mexico.

CALIFORNIA: "Southern California," *Palmer* in 1888.

SONORA: Hermosillo, *Hitchcock* 3615. Yaqui River, *Palmer* 16 in 1869. Guaymas, *Palmer* 243 in 1886.

CHIHUAHUA: Miñaca, *Hitchcock* 7735.

NUEVO LEÓN: Monterrey, *Hitchcock* 5522, 5552, 5575.

JALISCO: Guadalajara, *Palmer* 243 in 1886.

QUERETARO: Queretaro, *Arsène*⁷⁰ 10268.

OAXACA: Oaxaca, *Hitchcock* 6168.

⁷⁰ Brother Arsène has distributed occasional collections of Brother Abbon, Brother Agniel, Brother Nil, and others. The name of the collector is given on the label, often in parentheses, but the printed label and serial number are those of Brother Arsène. These specimens are therefore cited as Arsène's.

Livida.—Perennials with compressed culms; blades mostly flat; spikelets 2 to 3.1 mm. long. Scarcely a natural group.

Spikelets turgidly plano-convex, 3 to 3.2 mm. long. Culms rather stout.

Spikelets pubescent.....23. *P. pubiflorum*.

Spikelets glabrous.....23a. *P. pubiflorum glabrum*.

Spikelets depressed plano-convex or slightly concavo-convex.

Spikelets and rachis pale. Spikelets pointed, at least the glume pubescent.

Blades rather lax.....25. *P. hartwegianum*.

Blades firm, subinvolute, the margins very scabrous....26. *P. alcalinum*.

Spikelets and usually the rachis stained with lurid purple or bronze.

Panicle axis very slender, flexuous; spikelets 2 to 2.5 mm. long, usually minutely apiculate.....24. *P. lividum*.

Panicle axis slender but straight; spikelets 2.5 to 3 mm. long, not apiculate.

Spikelets elliptic, about 1.3 mm. wide. Racemes relatively slender.

27. *P. crinitum*.

Spikelets elliptic-obovate; about 1.8 mm. wide.

Spikelets 2 mm. long; culms not more than 50 cm. tall.

28. *P. mutabile*.

Spikelets 2.8 to 3.1 mm. long; culms 60 to 150 cm. tall.

Rachis 1.5 to 2 mm. wide; racemes 9 to 20; spikelets plano-convex.

29. *P. tinctum*.

Rachis 1.2 to 1.4 mm. wide; racemes 4 to 10; spikelets slightly concavo-convex.....30. *P. arsenei*

23. *Paspalum pubiflorum* Rupr.

Paspalum planifolium Fourn. Mex. Pl. 2: 10. 1886. "San Luis de Potosi (VIRL. absque n.); Orizaba (F. MÜLL.) n. 2062 in herb Petrop." The name was earlier listed without description by Hemsley.⁷¹ The Virlet specimen in the Paris Herbarium, bearing the name in Fournier's script, consists of three fragments with overmature panicles. The spikelets are very minutely pubescent. Müller's no. 2062 in Kew Herbarium is a specimen of *P. lividum*. The one in Leningrad has not been examined. Although *P. planifolium* appears on the page preceding that on which *P. pubiflorum* is published it has no priority in time, and the name is not taken up because the fragmentary type is less characteristic of the species than is the type of *P. pubiflorum* and because the latter name has come into use, while the former has not. In the only subsequent work in which *P. planifolium* appears⁷² the name is misapplied to *Paspalum botteri*.

Paspalum pubiflorum Rupr.; Fourn. Mex. Pl. 2: 11. 1886. "Tehuacan de las Granadas * * * (GAL. n. 5747)." The name was listed without description by Ruprecht⁷³ and by Hemsley.⁷⁴ The type specimen, collected by Galeotti, was examined in the Brussels Herbarium.

Paspalum pubiflorum var. *viride* Fourn. Mex. Pl. 2: 11. 1886. "San Luis de Potosi (VIRL. n. 1328)." This was listed without description by Hemsley.⁷⁵ Virlet's no. 1328 in the Brussels Herbarium is named "*Paspalum pubiflorum*" in Fournier's script. The varietal name does not appear. The plant is typical *P. pubiflorum*.

⁷¹ Biol. Centr. Amer. Bot. 3: 481. 1885.

⁷² Chase in Hitchc. Contr. U. S. Nat. Herb. 17: 234. 1913.

⁷³ Bull. Acad. Brux. 9: 237. 1842.

⁷⁴ Biol. Centr. Amer. Bot. 3: 481. 1885.

⁷⁵ Biol. Centr. Amer. Bot. 3: 481. 1885.

Paspalum hallii Vasey & Scribn. Bull. Torrey Club 13: 165, 1886, as synonym of "*P. remotum* Remy?" The description is drawn from "E. Hall, 804 Texas." This specimen, in the United States National Herbarium, is labeled "*Paspalum remotum* Remy fide Munro" and bears diagnosis and notes in Vasey's hand expressing doubt of the accuracy of the identification. The lowest raceme of one plant is 9 cm. below the next above, in the other three plants it is approximate.

Paspalum remotum var. *glaucum* Scribn. in Vasey, Bull. Torrey Club 13: 165, 1886. No specimen is cited. In the United States National Herbarium is a somewhat glaucous specimen bearing this name in Scribner's writing. It was collected by V. Havard in Grapevine Canyon, Western Texas, in September, 1883.

Paspalum pubiflorum var. *glaucum* Scribn. Contr. U. S. Nat. Herb. 3: 19, 1892. "Southwestern Texas and Mexico * * * (Dr. Havard & C. G. Pringle)." The type specimen of *P. remotum glaucum* bears the changed name in Scribner's script.

This species has been referred to *P. remotum* Remy, on the basis of an identification by Munro of Hall 804 as *P. remotum*. The type of *P. remotum* or part of it, from Bolivia,⁷⁶ with the name in Munro's script, was examined in the Oxford Herbarium. It is not known from North America.

DESCRIPTION

A glaucous to olivaceous perennial, decumbent at base, often rooting at the nodes and bearing erect flowering branches, the internodes of the decumbent part short, the nodes swollen; culms rather robust, 40 cm. to 1 meter long, ascending or erect from the decumbent base, compressed, often sulcate in drying, glabrous, the ascending part simple or bearing a few leafy shoots, rarely a flowering branch; nodes dark, at least the lower pilose;

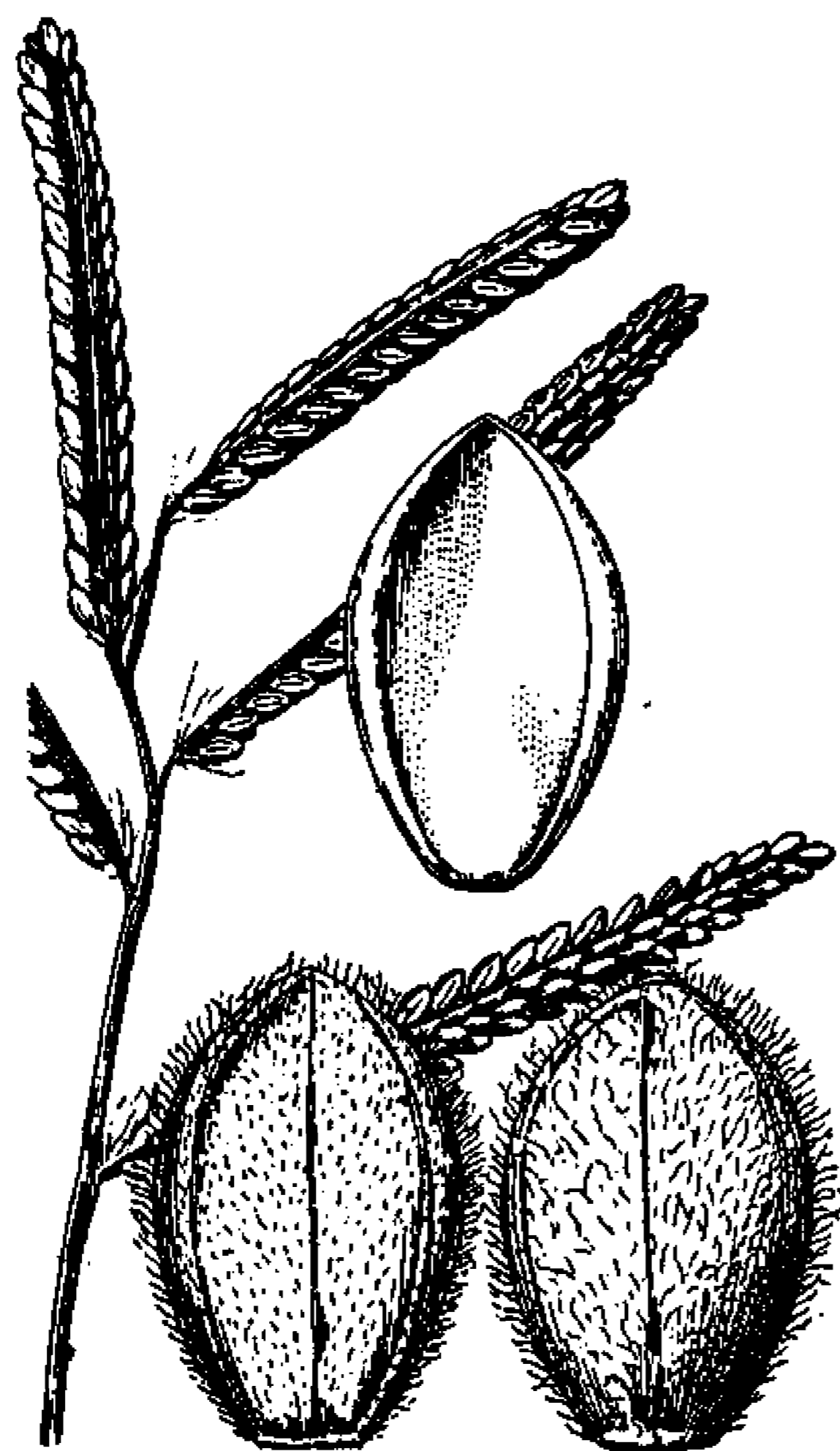


FIGURE 23.—*P. pubiflorum*. From type specimen and Hitchcock 5555

sheaths mostly shorter than the internodes, rather loose, at least the lower sparsely papillose-pilose, the margins membranaceous, brown; ligule 1 to 3 mm. long; blades flat, rather lax, 6 to 25 cm. long, commonly 10 to 15 cm. long (the uppermost reduced), 6 to 14 mm. wide, acuminate, usually with a few stiff hairs at the rounded base, otherwise glabrous, the margin scabrous, rarely ciliate toward the base; racemes 2 to 8, usually 3 to 5, the lowest sometimes distant, 2 to 10 cm. long, rather thick, from erect to horizontally spreading, a tuft of long white hairs in the axils; rachis 1.2 to 2 mm. wide, green, glabrous, scabrous on the margins, the lowest often naked at base; spikelets in pairs, rarely solitary, usually crowded, 3 to 3.2 mm. long, about 2 mm. wide, obovate, rather turgid, obtuse, yellowish green or sometimes purplish; second glume and sterile lemma

⁷⁶ See Contr. U. S. Nat. Herb. 24: 453. 1927.

subequal, 3 to 5 nerved, the glume softly pubescent with spreading hairs, the sterile lemma minutely appressed-pubescent; fruit pale, about 3 mm. long and 1.9 mm. wide, minutely striate-roughened.

Occasional plants have slightly smaller spikelets. Rarely, as in *Hitchcock* 5608, and *Holway* 3416, the blades are sparsely pilose on the lower surface. A specimen collected by Brother Arsène in Morelia, Mexico, in 1909, and *Léon* 1968 have spikelets only obscurely pubescent, as in the type of *P. planifolium* Fourn.

DISTRIBUTION

Moist open ground, banks, low woods, along streams and irrigation ditches, especially in alkaline clay soil, Louisiana and Texas, throughout Mexico, up to 2,000 meters altitude; also in western Cuba.

LOUISIANA: Alexandria, *Ball* 179, 496. Natchitoches, *Ball* 148. Without locality, *Hale*.

TEXAS: Choctaw, *Hitchcock* 2468. Fort Worth, *Hitchcock* 16141; *Ruth* 134, 300. Tarrant County, *Ruth* 761. Dallas, *Reverchon* 2217 A and in 1877. Weatherford, *Tracy* 7938. Kerrville, *Heller* 1872; *Hitchcock* 5260, 5296; *Smith* in 1897. Burnet, *Plank* 40. Brazos County, *Nealley* 92. Austin, *Hall*; *Tharp* 1293, 1294. Oak Hill, *Tharp* 2005. New Braunfels, *Hitchcock* 5198. Waller County, *Thurrow* in 1898. San Antonio, *Ball* 939; *Heller* 1699; *Hitchcock* 3904, 5146, 5254. Bexar County, *Jermy* 8. North Galveston, *Hitchcock* 2469. Rutersville, *Wright*. La Grange, *Richards* in 1883. Pierce, *Piper* in 1921; *Tracy* 7406. Port Lavaca, *Tharp* 1748. Kingsville, *Tracy* 8887. Eagle Pass, *Havard*. Del Rio, *Hitchcock* 13653, 13657. Grapevine Canyon, west of Terlingua River, *Havard* in 1883. Without locality, *Buckley* in 1883; *Drummond* 342; *Hall* 804; *Lindheimer* 567; *Nealley* in 1886 and 1889.

LOWER CALIFORNIA: Maleje, *Palmer* 45 in 1887.

SONORA: Hermosillo, *Hitchcock* 3600, 3623; *Malby* 242. Guaymas, *Palmer* 79 in 1887.

CHIHUAHUA: Chihuahua, *Kurtz* in 1885; *Pringle* 374.

COAHUILA: Saltillo, *Hitchcock* 5590, 5608. Sabinas, *Nelson* 6832. Jimuleo Springs, *Pringle* 427.

NUEVO LEÓN: Monterrey, *Hitchcock* 5549, 5555, 5563, 5572.

TAMAULIPAS: Victoria, *Palmer* 261 and 395 in 1907.

SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5735.

DURANGO: Durango, *Hitchcock* 7578; *Palmer* 871 in 1896.

JALISCO: San Nicolás, *Hitchcock* 7196, 7220, 7230. Chapala, *Holway* 3416. Colotlán, *Rose* 3602.

GUANAJUATO: Irapuato, *Hitchcock* 7414. Acámbaro, *Hitchcock* 6948, 6950.

QUERÉTARO: Querétaro, *Arsène*, 10348; *Basile* 34, 35; *Hitchcock* 5811.

PUEBLA: Tehuacán, *Hitchcock* 6059; *Pringle* 7537; *Seler* 5.

MICHOACÁN: Morelia, *Arsène* 2805.

GUERRERO: Santa Fé, *Hitchcock* 6686.

OAXACA: Valley of Oaxaca, *Conzatti & González* 350.

CUBA: Habana, *Amer. Gr. Nat. Herb.* 908. *Ekman* 10, 16800; *Léon* 1986. Cerro, *Ekman* 938.

23a. *Paspalum pubiflorum glabrum* Vasey

Paspalum remotum var. *glabrum* Vasey, *Bull. Torrey Club* 13: 166. 1886. No specimen is cited but in the National Herbarium is a specimen collected by A. B. Langlois (no. 26) in Plaquemines County, La., in 1883, which bears the name in Vasey's script. It is a tall plant without the base.

Paspalum pubiflorum glabrum Vasey; Scribn. Bull. Tenn. Exp. Sta. 7: 32. pl. 5. f. 18. 1894. "Found by the writer [Scribner] * * * at Belle Meade, near Nashville, July, 1892, and Dr. Gattinger collected it in the same region in July, 1886. Mr. S. M. Bain collected it in Lake County, near the Mississippi, June, 1893." The specimen collected by Scribner at Belle Meade, now in the National Herbarium, is the original of figure 18, hence is taken as the type. It has a

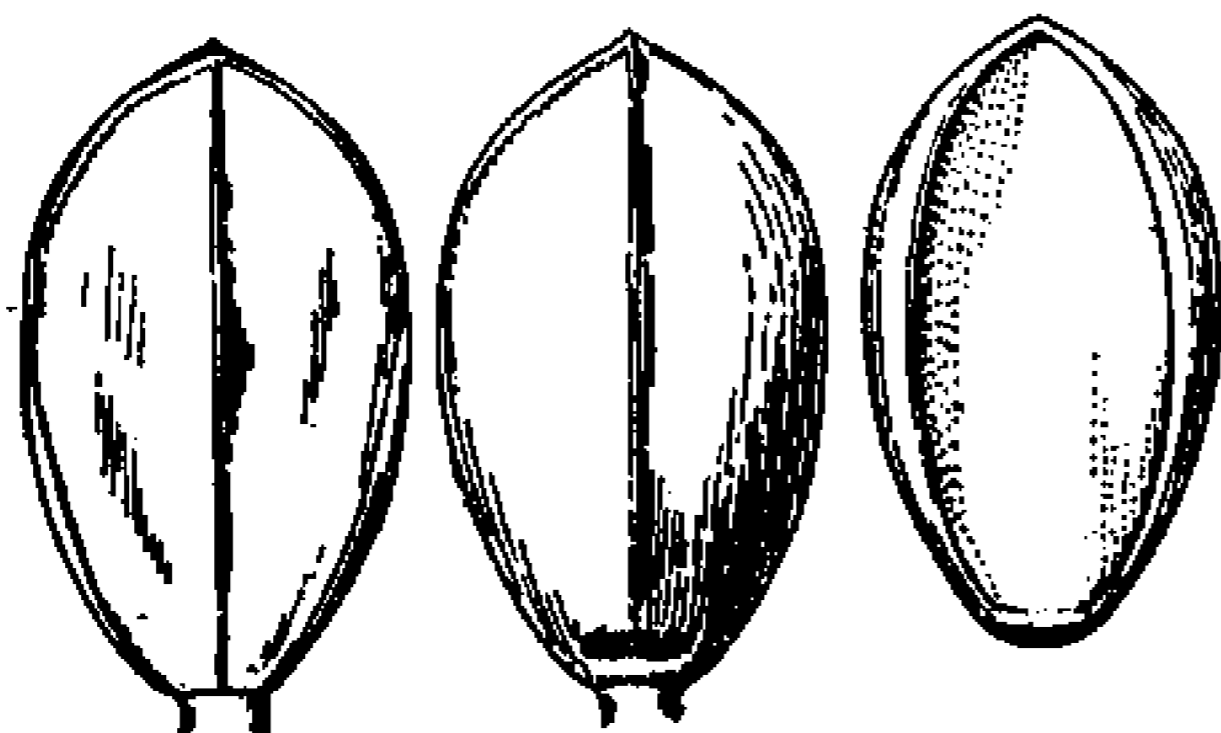


FIGURE 24.—*P. pubiflorum glabrum*. From type specimen

decumbent base, rooting at the nodes. Vasey's earlier name is not cited.

Paspalum geminum Nash, Bull. N. Y. Bot. Gard. 1: 434. 1900. "In clay soil, Florida. Type collected by the writer [G. V. Nash] at Eustis, Lake Co., May 1-15, 1894, no. 680." In this specimen, in the herbarium of the New York Botanical Garden, the culm is geniculate at base but not rooting at the nodes, the blades are rather firm and folded.

Paspalum laeviglume Scribn.; Nash in Small, Fl. Southeast. U. S. 75, 1326. 1903. Based on *P. remotum* var. *glabrum* Vasey. Not *P. glabrum* Gaud. 1811.

DESCRIPTION

Plants of the same habit as *P. pubiflorum*, on the average more robust, in rich ground the culms sometimes 2 meters long, the sheaths less pilose, the blades a little wider (occasionally to 2 cm. wide) and tapering toward the base, the racemes commonly longer and oftener more than five; spikelets glabrous.

In a few specimens the spikelets are obscurely pubescent on the glume.

Paspalum pubiflorum glabrum is a palatable pasture grass and very drought-resistant.

DISTRIBUTION

Moist low open ground, woods and ditch banks, North Carolina and Kentucky to Florida and west to Kansas and Texas.

INDIANA: Vollmer, *Deam* 32940. Mt. Vernon, *Riecken* 19.

ILLINOIS: Mound City, *Bock & Chase* 145. Cairo, *Bock & Chase* 147, 150.

MISSOURI: Carthage, *Palmer* 967, 2334. Swan, *Bush* 432, 3393. Butler County, *Bush* 3711. Dunklin County, *Eggert* 257.

KANSAS: Labette County, *Hitchcock* in 1899.

NORTH CAROLINA: Without locality, *Vasey* in 1878.

SOUTH CAROLINA: Oconee County, *Anderson* 1524, 1540. Clemson College, *House* 2863.

FLORIDA: Marianna, *Swallen* 547. Jacksonville, *Kearney* 154b. Eustis, *Nash* 680. Orange Bend, *Chase* 4093, 4108.

KENTUCKY: Wickliffe, *McFarland & Anderson* 255, 341. Camp Nelson, *McFarland* 158. Henderson, *McFarland & Anderson* 326; *Towles* in 1899.

TENNESSEE: Lake County, *Bain* 175. Nashville, *Gattinger* in 1867, 1878, 1879, and 1886. Knoxville, *Ruth* 82. West Knoxville, *Ruth* in 1895. Cocke County, *Kearney* 946.

MISSISSIPPI: Starkville, *Chase* 4440; *Kearney* 54, 85; *Tracy* 97.

ARKANSAS: Jefferson County, *Eggert* in 1896. Fulton, *Bush* 978. Fort Smith, *Bigelow*.

LOUISIANA: Alexandria, *Hale*. Shreveport, *Ball* 108. Natchitoches, *Ball* 147. Burnside, *Combs* 1405. Plaquemines County, *Langlois* in 1880. Without locality, *Hale* 25.

TEXAS: Dallas, *Reverchon* 85, 2217. Weatherford, *Tracy* 8231.

OKLAHOMA: Perkins, *Featherly* in 1925. Between Fort Cobb and Fort Arbuckle, *Palmer* 369 in 1868.

24. *Paspalum lividum* Trin.

Paspalum lividum Trin. in Schlecht. *Linnaea* 26: 383. 1854. "Ad Hacienda de la Laguna [Mexico] Jul., leg. Dr. Schiede." The type specimen, in the Trinius Herbarium, was examined by A. S. Hitchcock. The spikelets are 2 to 2.2 mm. long and dark purplish green. Other specimens of the same collection were examined by the author in the Delessert and Paris herbaria and in the British Museum. They are all small plants, like *Hitchcock* 7318, the culms 20 to 25 cm. tall. The Delessert specimen shows a decumbent base.

This species has been referred⁷⁷ to *P. denticulatum* Trin., a Brazilian species to which it is very closely related. The type specimen of *P. lividum* was referred by Trinius himself in his herbarium to *P. denticulatum*. Recent collections from Brazil show the two to be distinct.

DESCRIPTION

A glabrous perennial, the culms solitary or few in a tuft, compressed, ascending, the lower part decumbent, branching and often rooting at the nodes, sometimes creeping 1 meter or more, the ascending part 0.5 to 1 meter tall, simple or bearing a few sterile branches; sheaths keeled, rather loose, usually overlapping, the margin hyaline, sometimes pilose, especially toward the summit; ligule 1 to 2 mm. long; blades laxly ascending, usually conduplicate at base, narrower at the base than the summit of the sheath, commonly 15 to 25 cm. long, 3 to 6 mm. wide, sometimes obscurely pubescent on the upper surface; racemes 3 to 10, commonly 4 to 7, usually distant about half their own length on a very slender, flexuous axis, commonly 1.5 to 5 cm. long, mostly thick and densely flowered, usually ascending and flexuous, and with a few long delicate hairs in the axils, the lower sometimes on slender peduncles; rachis 1.5 to 2 mm. wide, dark livid purple, usually with a few long hairs scattered on the margin; spikelets normally in pairs, 2 to 2.5 mm. long, 1.3 to 1.5 mm. wide, obovate; second glume and sterile lemma equal, often minutely apiculate, delicate in texture, usually blotched with livid purple, occasionally yellowish green, 3-nerved; fruit 2 to 2.3 mm. long, about 1.2 mm. wide, elliptic, very minutely striate-roughened.

Rarely the spikelets are softly pubescent around the margin, and less rarely the sheaths are pilose, but on the whole the species is well marked. The heavy livid flexuous racemes on the almost filiform axis are particularly characteristic.

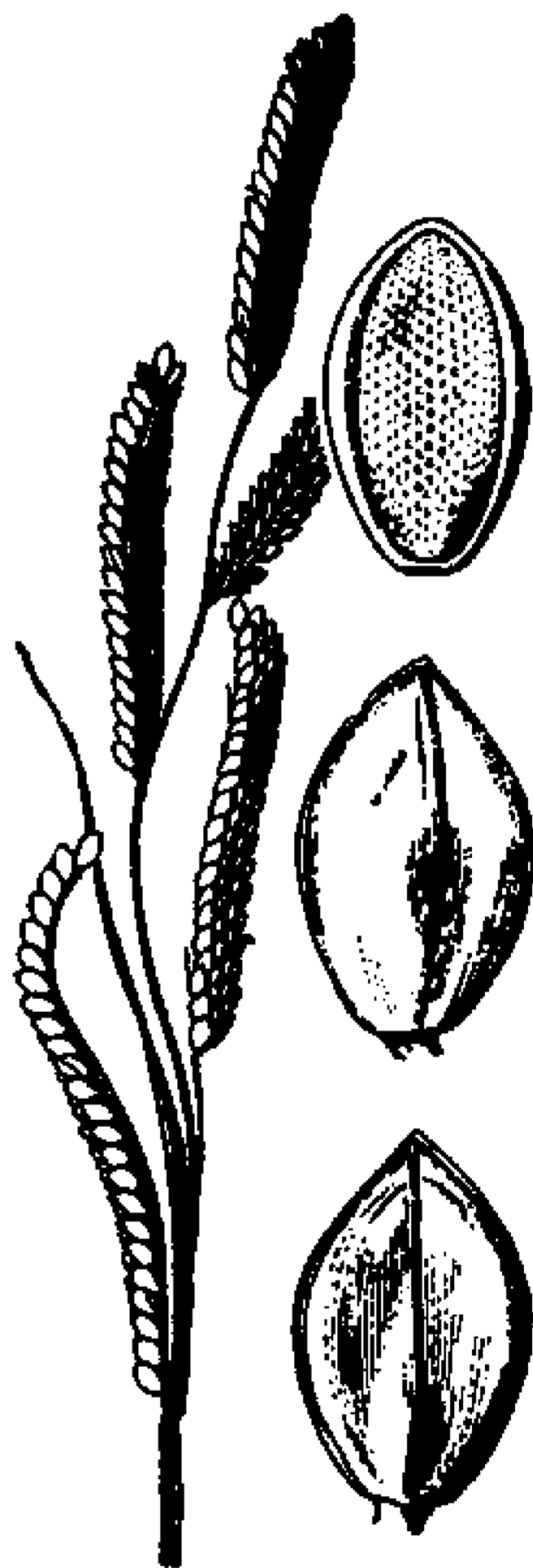


FIGURE 25.—*P. lividum*.
From type specimen and
Arsène 3176

⁷⁷ Hitchc. & Chase, *Contr. U. S. Nat. Herb.* 18: 309. 1917.

DISTRIBUTION

Low ground, wet savannas and swamps, and along streams and ditches, Alabama to Texas and Mexico and south to Argentina; also in Cuba.

ALABAMA: Perdido Bay, *Mohr* in 1893.

LOUISIANA: Cameron, *Tracy* 8395.

TEXAS: Galveston, *Hitchcock* 3867. *Pierce, Tracy* 7391, 7397. Turtle Bay Peninsula, *Tharp* 1407. Port Lavaca, *Allen* 16; *Smith* in 1923. Houston, *Fisher* 79; *Hall* 807; *Nealley* 75 in 1892; *Thurrow* in 1898. Brownsville, *Hitchcock* 5407; *Nealley* in 1889; *Pringle* 2049.

NUEVO LEÓN: *Arsène* 6301; *Hitchcock* 5565; *Pringle* 2516.

SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5740.

SINALOA: Culiacán, *Brandege* in 1904; *Palmer* 1552 in 1891.

JALISCO: Guadalajara, *Hitchcock* 7318; *Palmer* 245 in 1886. San Nicolás, *Hitchcock* 7197. Zapotlán, *Hitchcock* 7147. Tequila, *Palmer* 206 in 1886.

GUANAJUATO: Irapuato, *Hitchcock* 7388, 7409. Acámbaro, *Hitchcock* 6933.

QUERÉTARO: Querétaro, *Arsène* 10272, 10349; *Hitchcock* 5817, 5869.

HIDALGO: Ixmiquilpan, *Rose, Painter & Rose* 9059.

VERA CRUZ: Orizaba, *Botteri* 110, 566, 1286; *Bourgeau* 2544; *Hitchcock* 6313; *Mohr* 566 (probably collected with *Botteri* and same as his 566); *Müller* 2061; *Seaton* 62. Córdoba, *Hitchcock* 6451. Jalapa, *Hitchcock* 6620. Tlacotalpam, *Nelson* 523.

PUEBLA: Santa Barbara, *Arsène* 5268.

MEXICO: Federal District, *Arsène* 8277.

MORELOS: Cuernavaca, *Hitchcock* 6823, 6880, 6881.

MICHOACÁN: Morelia, *Arsène* 2384b, 3176. Uruápan, *Hitchcock* 6992.

OAXACA: Oaxaca, *Hitchcock* 6152, 6208. Santa Catarina Cañon, *Pringle & Conzatti* 272. Valley of Oaxaca, *Conzatti & González* 349.

GUATEMALA: Cobán, *Türckheim* II. 1210. Guatemala City, *Hayes* in 1860; *Popenoe* 670; *Tonduz* 702. La Aurora, *Morales* 720.

CUBA: Habana, *Baker, Tracy & Hasselbring* 3096; *Ekman* 1253, 1257; *Léon* 571, 937, 4635; *Tracy* 9119. Arroyo Apolo, *Léon* 272. Marianao, *Léon* 588. Macagua, *Ekman* 16805.

VENEZUELA: Caracas, *Pittier* 7236, 9633.

PARAGUAY: Pilcomayo River, *Morong* 1584.

URUGUAY: Montevideo, *Rural Federation of Montevideo* in 1924.

ARGENTINA: Prov. Santiago del Estero, *Venturi* 5713, 5728. Prov. Catamarca, *Venturi* 7198.

ECUADOR: La Magdalena. *Harteman* 16.

PERU: "Canruru, Andes of Peru," *Savatier* in 1876-79 (Kew Herb.).

25. *Paspalum hartwegianum* Fourn.

Paspalum hartwegianum Fourn. Mex. Pl. 2: 12. 1886. "*P. lentiferum* Lam. var. sec. cl. Munro [in Bentham] Pl. Hartw. p. 326 [error for 346]. Ad fossas prope Léon (Hartw. n. 245)." Hartweg's no. 245, bearing the name in Fournier's script, is in the Paris Herbarium. The specimen named by Munro is in the Kew Herbarium. The exact date of Fournier's publication is not known.⁷⁸ *Paspalum buckleyanum* was published in September, 1886, presumably later than *P. hartwegianum*. This name was earlier listed without description by Hemsley.⁷⁹

Paspalum buckleyanum Vasey, Bull. Torrey Club 13: 167. 1886. "Collected by Dr. Buckley in Texas." The type specimen in the National Herbarium is a

⁷⁸ See p. 20 for discussion of date of this work.

⁷⁹ Biol. Centr. Amer. Bot. 3: 479. 1885.

single culm 90 cm. long, lacking the base, the panicle with six racemes. In the Index Kewensis⁸⁰ this name is erroneously listed under *Panicum*.

DESCRIPTION

A rather wiry glabrous perennial, the culms in hard clumps or solitary, compressed, glabrous, ascending, 0.5 to 1.5 meters long, the lower part decumbent as in *P. lividum* but less commonly creeping, branching from the lower nodes, the branches rarely flowering; sheaths smooth, the lower rather papery, overlapping; ligule membranaceous, 1 to 3 mm. long; blades mostly firm, ascending, usually about as wide at the base as the summit of the sheath, 10 to 35 cm. long, 2 to 6 mm. wide, the margins very scabrous, sometimes with a few hairs at the very base, the mid-nerve prominent on the lower surface; racemes 3 to 13, commonly 4 to 7, ascending, mostly distant half to two-thirds their own length on a slender glabrous axis, pale yellowish-green, 2 to 9 cm. long, with a few long hairs in the axils; rachis 1 to 1.5 mm. wide, very minutely scabrous; spikelets in pairs, imbricate, about 3 mm. long and 1.5 mm. wide, elliptic, apiculate; second glume and sterile lemma equal, softly and often sparsely pubescent, 3 to 5 nerved; fruit 2.5 mm. long, 1.3 mm. wide, elliptic, minutely striate-roughened.

This species has recently been grown in Mississippi as a forage grass. It is sensitive to frost, but is promising for pasture along the Gulf coast.

DISTRIBUTION

Wet prairies, alkaline meadows, and along irrigation ditches, sometimes growing in the water, southern Texas and throughout Mexico.

TEXAS: Corpus Christi, *Hitchcock* 2419, 5378; *Swallen* 1053. San Diego, *Nealley* 95 in 1892. Kingsville, *Piper* in 1906. Mission, *Olive* 21. Without locality, *Buckley* in 1883; *Nealley* in 1887.

SONORA: Hermosillo, *Hitchcock* 3622.

NUEVO LEÓN: Monterrey, *Hitchcock* 5564.

SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5748½.

GUANAJUATO: Irapuato, *Hitchcock* 7400.

Acámbaro, *Hitchcock* 6938.

MORELOS: Cuernavaca, *Hitchcock* 6879.

MICHOACÁN: Valley of Zamora, *Pringle* 9599.

OAXACA: Oaxaca, *Conzatti* 3600; *Hitchcock* 6130, 6177, 6189, 6190.

26. *Paspalum alcalinum* Mez

Paspalum alcalinum Mez, *Repert. Nov. Sp. Fedde* 15: 75. 1917. "Mexico, Dept. San Luis Potosí, in pratis alcalinus prope Hacienda de Angostura * * * (Pringle no. 3764)." Specimens of *Pringle* 3764 bearing the name in Mez's script were examined in the herbarium at the University of Munich and in that of the Botanical Museum at Berlin. Duplicates are in the United States National Herbarium.



FIGURE 26.—*P. hartwegianum*. From type specimen of *P. buckleyanum*.

⁸⁰ Suppl. 1: 312. 1906.

DESCRIPTION

A glabrous perennial in tufts of 1 or 2 flowering culms and a few leafy sterile shoots, rather pale; culms 85 to 140 cm. tall, simple, or rarely branching, erect, rather robust, slightly compressed; nodes glabrous; sheaths elongate, overlapping, mostly 7 to 10 on the flowering culm, withdrawn from the culm and with involute margins toward the summit, very smooth, sometimes with a few hairs on the margin at the summit; ligule thin-membranaceous, lacerate, 5 to 6 mm. long; blades suberect, strict, 15 to 50 cm. long, 3 to 7 mm. wide (the uppermost reduced), the junction with the sheath obscure, folded at base, flat toward the middle and with a long involute setaceous and scabrous tip, scabrous on the upper surface and often stiffly ciliate at base, the margins and sometimes the midrib beneath very scabrous; panicle 15 to 18 cm. long, the common axis slender but rigid, angled, a tuft of long hairs in the axils; racemes 6 to 12, unevenly spaced, the middle mostly approximate, 4 to 7 cm. long, thick, narrowly ascending, the rachis 1.5 mm. wide, with scabrous margins; spikelets mostly in pairs (or solitary toward base and summit), imbricate, 3 mm. long, 1.5 mm. wide, elliptic, subacute; glume and sterile lemma equal, 5-nerved, pale brown to bronze or purplish, sparsely soft-pubescent; fruit 2.5 mm. long, about 1.4 mm. wide, elliptic, brownish, strongly striate-papillose, the margins of the lemma paler and nearly smooth.



FIGURE 27.—*P. alcalinum*. From type collection

Closely related to *P. hartwegianum*, distinguished chiefly by the erect habit and more numerous racemes of darker spikelets.

DISTRIBUTION

Alkaline meadows, and along irrigation ditches, Mexico, Paraguay and Argentina. Dr. Lorenzo R. Parodi writes that this species is abundant in clayey soils of the subtropical savannas of the Territory of Formosa, Argentina.

SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5743½. Hacienda de Angostura, *Pringle* 3764.

PARAGUAY: Puerto Casado, Chaco, *Rojas* 2778.

ARGENTINA: Palermo, *Parodi* 7. Roca Viejo, Chaco, *Venturi*-(*Herb. Parodi*) 1178.

27. *Paspalum crinitum* Chase

Paspalum crinitum Chase in *Hitchc. Contr. U. S. Nat. Herb.* 17: 237. 1913. "Type in the U. S. National Herbarium, no. 824361, collected in alkaline meadows, Hacienda de Angostura, State of San Luis Potosí, Mexico, July 10, 1891, by C. G. Pringle (no. 3755)." This collection has larger panicles than common and the lower sheaths are more conspicuously hairy than in most of the other specimens.

DESCRIPTION

A slender erect cespitose perennial, leafy at the base; culms simple, 0.6 to 1 meter tall, glabrous; sheaths mostly overlapping, the lower crowded, clothed with long gray hairs, the others densely and finely pubescent to glabrescent; ligule membranaceous, 2 to 5 mm. long, rather firm; blades flat, ascending, mostly

rather firm, finely pubescent on both surfaces, 10 to 25 cm. long, 4 to 8 mm. wide, the lower shorter, in age often disarticulating from the sheath, the uppermost reduced to a point of the elongate sheath; panicle 10 to 30 cm. long, the axis slender, usually bearing a tuft of long white hairs in the axils, otherwise glabrous; racemes 4 to 11, slender, finally spreading, distant, or irregularly approximate, the lower as much as 12 cm. long, occasionally compound; rachis slender, dark purple, bearing a few scattered hairs along the angles or glabrous; spikelets in pairs, loosely imbricate, light yellowish green or purple-tinged, 2.5 to 2.8 mm. long, 1.3 mm. wide, elliptic, the slender dark pedicels of the upper of the pair about 1 mm. long; second glume and sterile lemma thin, equal, 3-nerved, sparsely pilose with delicate hairs or glabrous; fruit 2.3 to 2.5 mm. long, 1.2 mm. wide, elliptic, pale.

DISTRIBUTION

Moist ground and alkaline meadows, highlands of Mexico.

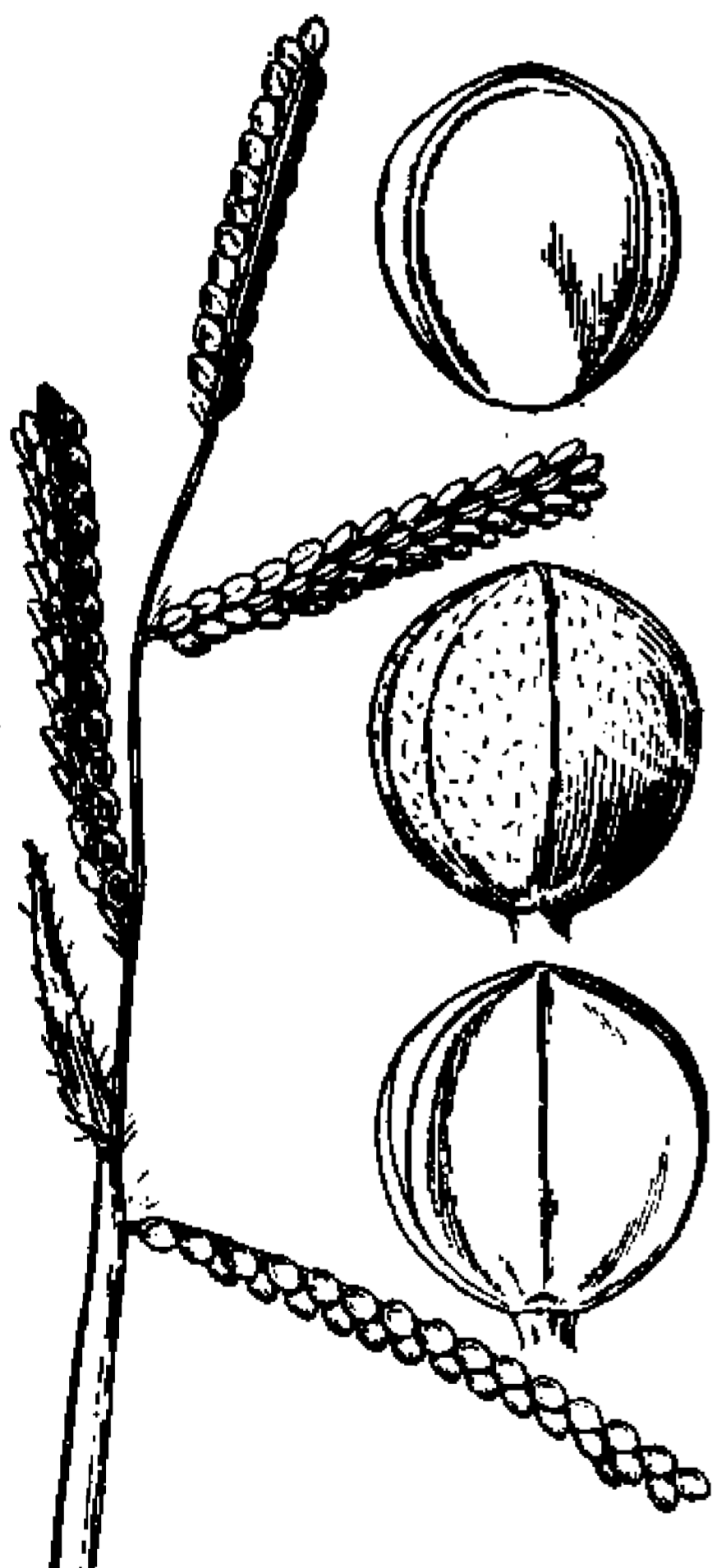


FIGURE 29.—*P. mutabile*. From type specimen



FIGURE 28.—*P. crinitum*. From type specimen

COAHUILLO: Saltillo, *Palmer* 338 in 1904.

SAN LUIS POTOSÍ: Hacienda de Angostura, *Pringle* 3755.

JALISCO: Orozco, *Hitchcock* 7382.

PUEBLA: Puebla, *Aibert* in 1911; *Arsène* 1604, 2284; *Nicolás* 131.

28. *Paspalum mutabile* Chase, sp. nov.

DESCRIPTION

A rather slender perennial, in small tufts, leafy toward the base; culms 20 to 40 cm. tall, ascending or spreading, branching at the lower nodes or simple, glabrous; nodes black, appressed-pubescent or glabrate; sheaths papillose-pilose or the upper nearly glabrous; ligule brown, about 1 mm. long; blades ascending, rather thin, flat, 5 to 15 cm. long, 5 to 10 mm. wide (the uppermost much reduced), rounded at base, sparsely papillose-pubescent on both surfaces;

racemes 3 to 6, usually 4, spreading or ascending, 1.5 to 5.5 cm. long, the common axis slender, glabrous; rachis 1 to 1.5 mm. wide, glabrous, with a few long hairs at the base; spikelets solitary or in pairs, mostly crowded, 2 mm. long, about 1.9 mm. wide, broadly obovate; glume and sterile lemma equal, 3 to 5 nerved, the glume minutely pubescent, the sterile lemma glabrous or very obscurely puberulent; fruit nearly the size of the spikelet, pale stramineous, very minutely striate-roughened.

Type in the U. S. National Herbarium, no. 928949, collected on the clay bank of the railway cut, near Cárdenas, San Luis Potosí, Mexico, July 20, 1910, by A. S. Hitchcock (no. 5773).

Two other collections from the same locality, *Hitchcock* 5730½ and 5736, are the only other specimens of this species known.

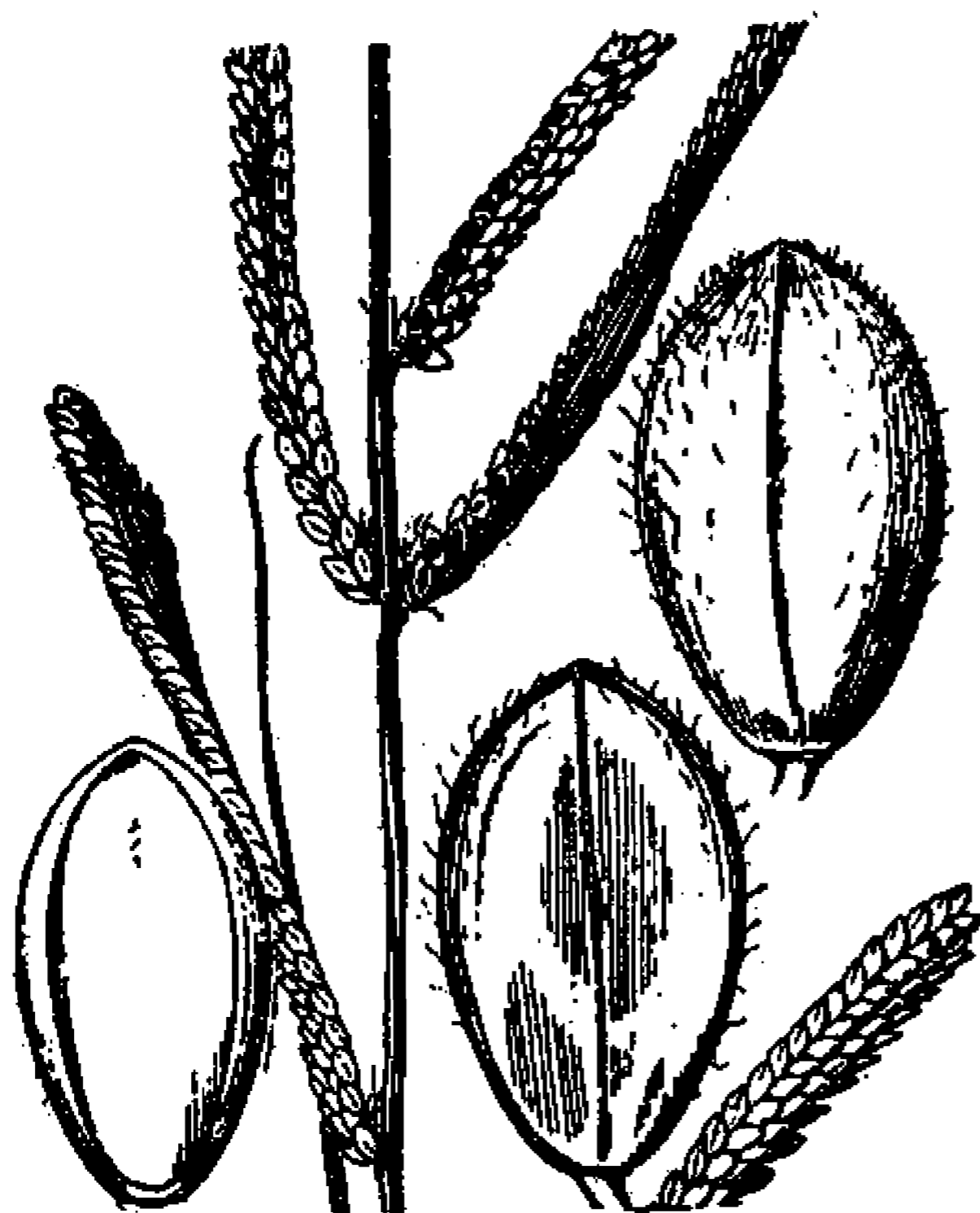


FIGURE 30.—*P. tinctum*. From type specimen

29. *Paspalum tinctum* Chase,
sp. nov.

DESCRIPTION

A rather stout perennial, in hard tufts; culms simple, 1 to 1.5 meters tall, ascending or erect from a slightly decumbent base, subcompressed, glabrous; nodes glabrous; sheaths loose, pubescent on the margin toward the summit or glabrous, the lower crowded and rather papery; ligule about 2 mm. long; blades ascending, conduplicate at base and about as wide as the summit of the sheath, flat above, 15 to 40 cm. long, 4 to 7 mm. wide (the uppermost much reduced), glabrous or sparsely pilose on the upper surface, especially at base; panicle 15 to 25 cm. long, the common axis slender but rather rigid, angled, a tuft of long hairs

in the axils; racemes 9 to 20, unevenly spaced, some distant, some subfasciculate, thick, somewhat flexuous, the lower 5 to 7 cm. long, spreading, the others gradually shorter, ascending; rachis 1.5 to 2 mm. wide, dark green or purple; spikelets in pairs, densely imbricate, 2.8 to 3 mm. long, about 1.8 mm. wide, elliptic-obovate, depressed plano-convex; glume and sterile lemma equal, 3-nerved, yellowish green variegated with purple, sparsely soft-pubescent to nearly glabrous; fruit 2.6 mm. long, 1.5 mm. wide, elliptic, smooth, pale.

Type in the U. S. National Herbarium, no. 929014, collected in moist sandy clay plain, Irapuato, Guanajuato, Mexico, at 1,900 meters altitude, October 1, 1910, by A. S. Hitchcock (no. 7404).

The type, which is the most perfect specimen, has spikelets less pubescent than have the others.

DISTRIBUTION

Open ground in the highlands of central and southern Mexico.

JALISCO: Chapala, *Holway* 3437.

GUANAJUATO: Irapuato, *Hitchcock* 7404.

MORELOS: Cuernavaca, *Hitchcock* 6882.

MICHOACÁN: Valley of Zamora, *Pringle* 9600.

30. *Paspalum arsenei* Chase, sp. nov.

DESCRIPTION

A nearly glabrous perennial, in small tufts; culms simple, or with sterile shoots from the lower nodes, 60 to 100 cm. tall, occasionally taller, ascending, sometimes decumbent at base and rooting at the lower nodes; nodes glabrous or sparsely pilose; sheaths loose, rather thin, sparsely papillose-pilose on the margin or glabrous, the lower mostly overlapping; ligule about 3 mm. long; blades flat, 8 to 30 cm., mostly 15 to 25 cm., long, 8 to 12 mm. wide, a few hairs at the rounded base, otherwise glabrous, the margins scabrous; panicle 8 to 20 cm. long, narrow, the common axis slender, angled, a few hairs in the axils; racemes 4 to 10, the lower distant, the upper approximate, 2 to 12 cm. long, ascending, or in age the lower widely spreading, the rachis 1.2 to 1.4 mm. wide, rather pale; spikelets in pairs, imbricate, or the lower solitary, sometimes distant or abortive, 2.9 to 3.1 mm. long, about 1.8 mm. wide, elliptic-obovate, plano-convex; glume and sterile lemma equal, 3 to 5 nerved, olivaceous, more or less stained with purple, sparsely and softly appressed-pubescent; fruit about 2.8 mm. long, elliptic, light brownish-stramineous, smooth and shining.

Type in the U. S. National Herbarium no. 1000431, collected at "Mayorazgo, sur l'Atoyac, alt. 2,120 meters, vicinity of Puebla, Mexico," July 18, 1907, by Brother G. Arsène (no. 1411).

In the type specimen the culms are not decumbent and the racemes are narrowly ascending. Of the other specimens one shows a decumbent base and one (overmature) lower racemes widely spreading. Arsène's no. 58 is depauperate, the panicles of 2 to 4 short racemes.

The species is named for Brother G. Arsène, whose numerous collections have contributed greatly to our knowledge of Mexican grasses.

DISTRIBUTION

Open grassland with argillaceous soil, in the highlands of Puebla and Michoacán, Mexico.

JALISCO: San Nicolás, Hitchcock 7181, 7182.

PUEBLA: Puebla, Arsène 58, 1411.

MICHOACÁN: Morelia, Arsène 2384, 2693, 8324, 8535. Loma Santa Maria, Arsène in 1909.

Notata.—Perennials with compressed culms, leafy at base; racemes 2, conjugate; spikelets solitary.

Spikelets golden brown, transversely marked with dark lines.

Spikelets green.

Rhizome stout, horizontal, forming tough sod.

Spikelets 2.5 to 3 mm. long..... 31. *P. notatum*.

Spikelets less than 2.5 mm. long..... 32. *P. minus*.

Rhizome none or short and vertical.

Plants in dense tufts, culms widely spreading to ascending; glume glabrous.

33. *P. pumilum*.

Plants in small loose tufts; glume ciliate..... 34. *P. subciliatum*.

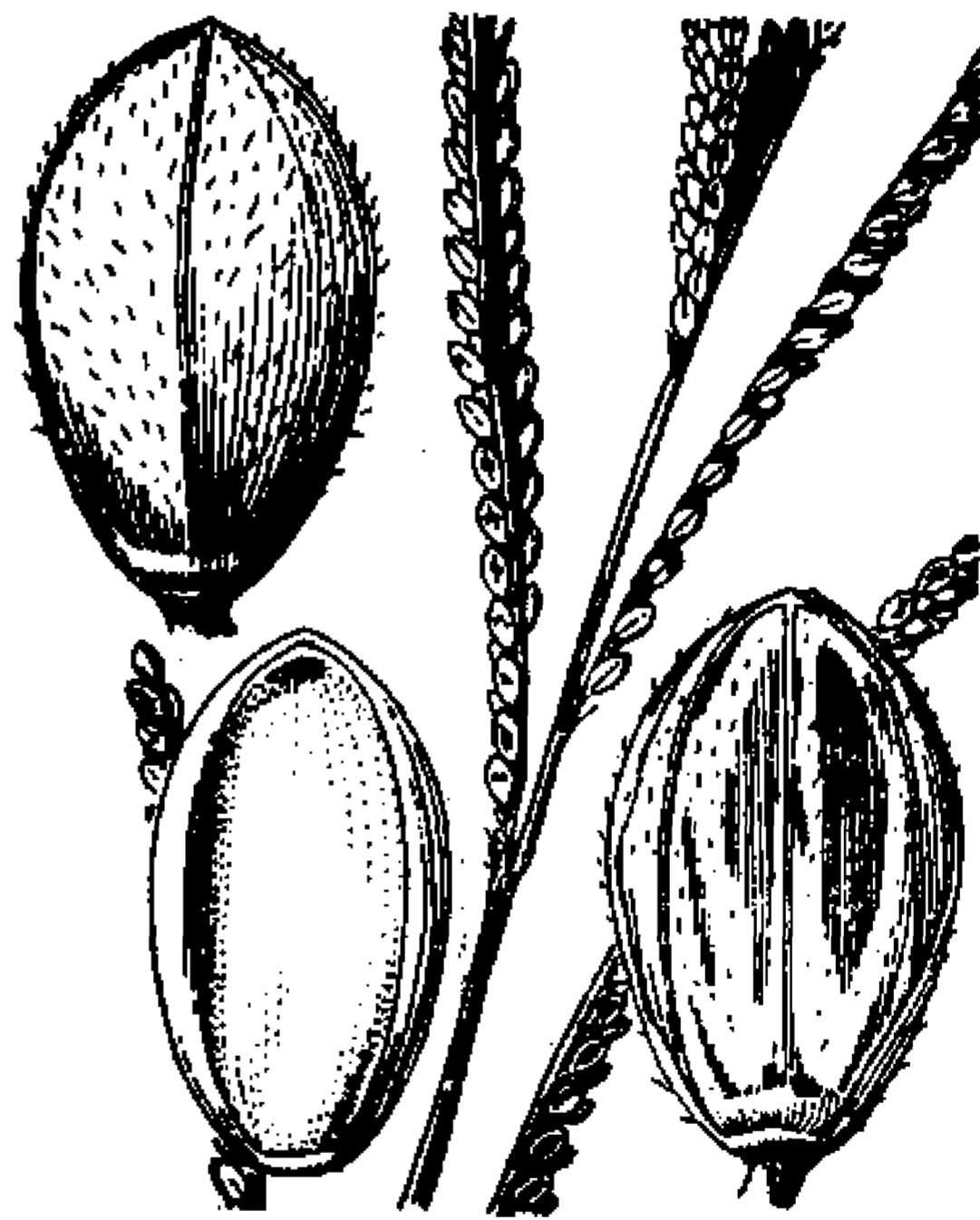


FIGURE 31.—*P. arsenei*. From type specimen.

35. *P. serpentinum*.

31. *Paspalum notatum* Flügge

Paspalus notatus Flügge, Monogr. Pasp. 106. 1810. "Insula St. Thomas. Exemplaria mecum communicaverunt Schrader et Ventenat." The type has not been located (see p. 1). A specimen in the Lamarck Herbarium in Paris, labeled "Paspalum. Ventenat. St. Thomas," and one in the British Museum "ex herb. Nolte," labeled "St. Thomas, Ventenat 1802" are the average West Indian form. This collection was not found in the Willdenow Herbarium nor elsewhere in the Berlin Herbarium.

Paspalum taphrophyllum Steud. Syn. Pl. Glum. 1: 19. 1854. "Sieber. hrbr. mixt. nr. 365. Ins. Martinica." The type in the Rijks Herbarium at Leiden is Sieber's no. 364, the number 365 cited being a misprint. Sieber's no. 364 in the United States National Herbarium is labeled Trinidad, but in the Institut Botanique, Caen, it is labeled Martinique. The spikelets are scarcely 3 mm. long.

Paspalum distachyon Willd.; Doell in Mart. Fl. Bras. 2²: 73. 1877. Not *Paspalum distachyon* Poit. 1834. A herbarium name given as synonym of *P. notatum* Flügge.

Paspalum notatum var. *latiflorum* Doell in Mart. Fl. Bras. 2²: 73. 1877. "Brasilia meridionali et ad Montevideo (Sello)." No specimen so named by Doell has been located. A Sello specimen from Brazil, from the Berlin Herbarium, bearing the numbers 3419 and 3506, has orbiculate-elliptic spikelets in the middle of the racemes and probably represents Doell's variety.

Paspalum saltense Arech. Anal. Mus. Nac. Montevideo 1: 53. 1894. "En campos gramíneos del Departamento del Salto," Uruguay. In the United States National Herbarium is a specimen collected in Salto in 1893 and sent by Professor Aréchavaleta. The spikelets are slightly more than 3 mm. long.

DESCRIPTION

An ascending perennial with short stout woody horizontal rhizomes, forming tough but not extensive sods, the rhizome clothed with the firm persistent bases of old sheaths; culms simple, 15 to 50 cm. tall, rarely taller, glabrous, flattened, the nodes dark; leaves crowded at the base, the overlapping sheaths usually short and reaching to a common height, the blades stiffly spreading,

thus forming a rather conspicuous distichous tuft near the base of the culm; sheaths compressed, keeled, rather glossy, glabrous or ciliate toward the summit or rarely pubescent throughout; ligule a minute membrane with a dense row of white hairs about 1 mm. long back of it; blades flat, or folded at base, 2 to 30 cm. long (the uppermost reduced to a mere point), 3 to 10 mm. wide, linear, usually sparsely ciliate toward the base, sometimes almost to the summit, otherwise glabrous; racemes 2, rarely 3, subconjugate (the common axis about 5 mm. long), recurved-ascending, 2.5 to 12 cm. long (usually 4 to 7 cm.),

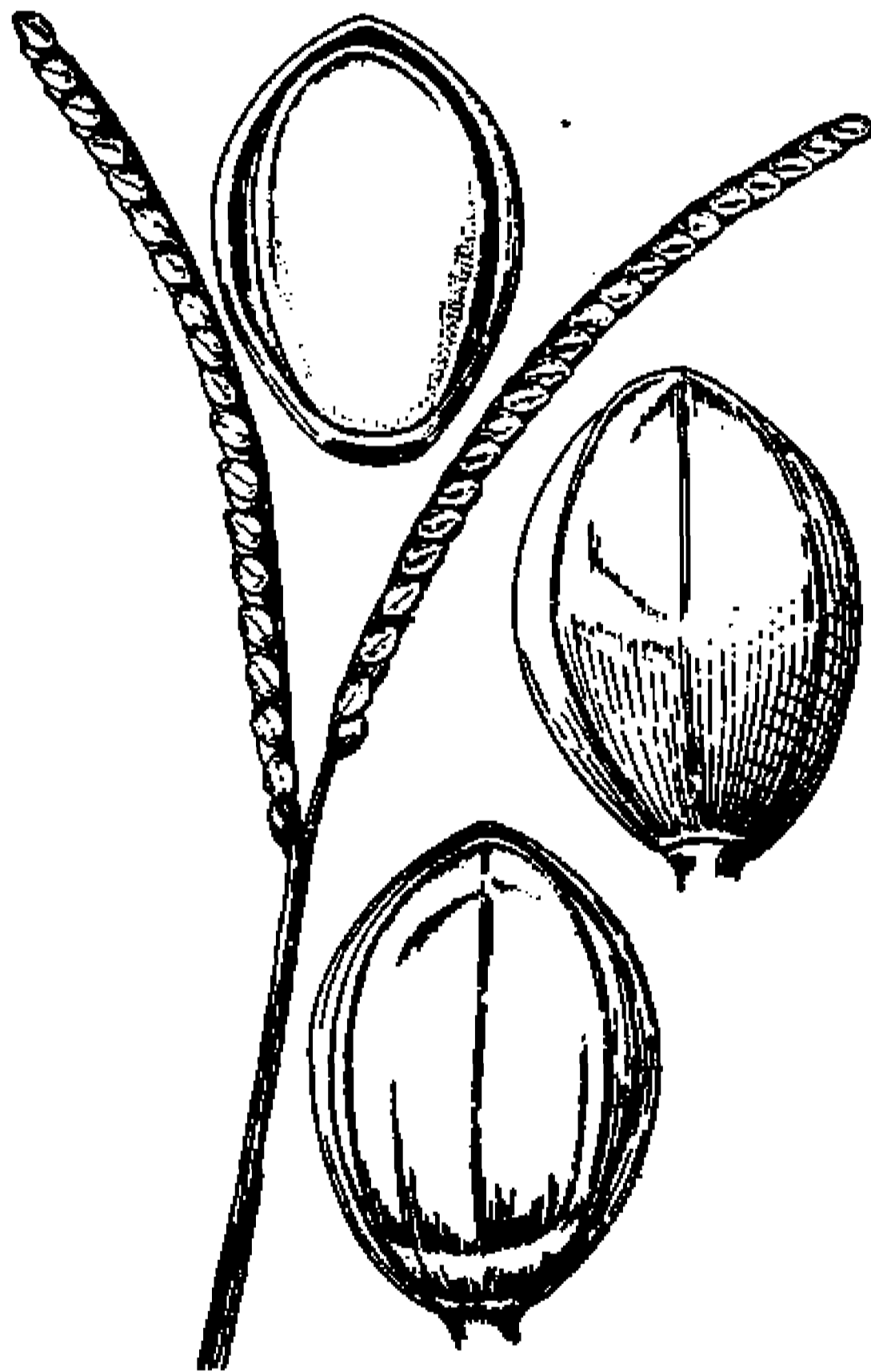


FIGURE 32.—*P. notatum*. From Chase 6639

relatively rather thick; rachis about 1 mm. wide, glabrous, usually flexuous toward the summit; spikelets solitary, 2.5 to 3.8 mm. long, 2 to 2.8 mm. wide, ovate to obovate; glume and sterile lemma equal, firm in texture, smooth and shining, 5-nerved (the intermediate nerves often obscure); fruit 2.5 to 3.5 mm. long, 1.8 to 2.5 mm. wide, oval.

In what is presumably the typical form from the West Indies the spikelets are not more than 3 mm. long (except in three collections from Havana), while in the continental specimens the spikelets are 3 to 3.8 mm., rarely 4 mm., long. The continental specimens are on the average larger than those of the West Indies and the racemes longer. Except in size the continental form, to which belongs *P. saltense* Arech., does not differ in any way from the Antillean form. The West Indian form is about half way between *P. saltense* and *P. minus*, which Fournier differentiated from the large form of Mexico. From the largest spikelets of this form to the smallest of *P. minus* there is an almost unbroken series.

The following specimens from Havana belong to the continental form: *Léon* 117b, 928½ and *Tracy* 9118. *Hitchcock* 6962 and 6984 from Uruápan, Mexico, are the Antillean form. In North American specimens the foliage is nearly glabrous. In a few specimens from Venezuela and Brazil the foliage is conspicuously pilose: *Bailey* 247; *Chase* 8360, 9092; *Pittier* 7212, 7242. *Hitchcock's* no. 5765 is exceptional in having four racemes, a short pair above the ordinary pair.

This species has been introduced as a pasture grass in the Gulf States under the name of Bahia grass. It is proving of value, thriving on both clayey and sandy soil and being readily grazed. It forms the main constituent of native pasture in Cuba and Porto Rico and in parts of Costa Rica, Brazil, Uruguay, and Argentina.

DISTRIBUTION

Open ground, savannas, and pastures from sea level to 2,000 meters, from central eastern Mexico to Argentina and throughout the West Indies; introduced in the southern United States, and rare as a ballast plant northward.

NEW JERSEY: Camden, *Scribner* in 1880.

FLORIDA: Gainesville, *Weber* 214.

LOUISIANA: St. Martinsville, *Langlois* in 1893.

NUEVO LEÓN: Monterrey, *Arsène* 6283.

SAN LUIS POTOSÍ: Cárdenas, *Hitchcock* 5727, 5778. Las Canoas, *Hitchcock* 5765; *Pringle* 3774.

NAYARIT: Tepic, *Mexía* 570.

JALISCO: Guadalajara, *Hitchcock* 7281; *Holway* 3421; *Palmer* 295 in 1886; *Pringle* 11240. La Junta, *Hitchcock* 6996. San Nicolás, *Hitchcock* 7183. Zapotlán, *Hitchcock* 7141.

VERA CRUZ: Orizaba, *Bourgeau* 2749; *Hitchcock* 6322. Córdoba, *Hitchcock* 6430. Jalapa, *Hitchcock* 6591. Vera Cruz, *Hitchcock* 6565, 6577. Mecapalco, *Liebmann* 156.

PUEBLA: Mt. Orizaba, *Seaton* 112 B.

MORELOS: Cuernavaca, *Hitchcock* 6838.

MICHOACÁN: Morelia, *Arsène* 2917. Uruápan, *Hitchcock* 6962, 6984.

COLIMA: Colima, *Palmer* 138 in 1897.

OAXACA: Oaxaca, *Buchinger* 960; *Hitchcock* 6109. Valley of Oaxaca, *Conzatti & González* 341; *Nelson* 1262. Tomellín, *Hitchcock* 6245. Las Sedas, *Smith* 933. Ixcotel, *Conzatti* 3616.

CHIAPAS: Ocuilapa, *Nelson* 3033.

MEXICO: (Republic of): La Agua Azul, *Oliva* in 1895.

- GUATEMALA: Cobán, *Johnson* 441. Guatemala City, *Hitchcock* 9020; *Rojas* 37; *Tonduz* 683. Amititlan, *Popenoe* 696. Fiscal, *Deam* 6205. La Aurora, *Morales* 722. Las Vacas, *Hayes* in 1860. Santa Rosa, *Heyde & Lux* (*Dist. Smith*) 3910; *Lehmann* 1662. Without locality, *Heyde* 734.
- HONDURAS: Tela, *Standley* 54484. Siguatepeque, *Standley* 55966.
- EL SALVADOR: San Salvador, *Renson* 353; *Standley* 23655. Finca San Nicolás, *Choussy* in 1923.
- NICARAGUA: Corinto, *Hitchcock* 8615. Masaya, *Hitchcock* 8658.
- COSTA RICA: Alajuelita, *Tonduz* 8824. San José, *Hitchcock* 8454; *Tonduz* 752. Río Torres, *Tonduz* 306. Desamparados, *Pittier* 4325. Las Cóncevas, *Lank-ester* in 1920. Turrialba, *Pittier* 16120. Río Grande, *Herb. Inst. phys.-geogr. Costaric.* 14337.
- PANAMA: David, *Hitchcock* 8367. Chepo, *Pittier* 4453. Chorrera, *Hitchcock* 8136. Canal Zone, *Hitchcock* 7998, 8009.
- CUBA: Guane, *Léon & Roca* 6989. Sierra la Guira, *Léon* 5167. San Diego de los Baños, *Léon* 4526. Herradura, *Baker* 2968; *Hitchcock* 454. San Ramón, *Ekman* 13052. Mariel, *Ekman* in *Amer. Gr. Nat. Herb.* 914. Habana, *Baker, Tracy & Hasselbring* 3097; *Ekman* 1251; *Léon* 117b, 928; *Tracy* 9118. Guanabacoa, *Hitchcock* 23224; *Léon* in 1907. La Magdalena, *Baker* 2. Placetas del Sur, *Léon* 6423. Mordazo, *Ekman* 17096. Baraguá, *Hitchcock* 23360. Isle of Pines, *Palmer & Riley* 1119. Without locality, *Wright* 3438 in part.
- JAMAICA: Troy, *Hitchcock* 9784. Claremont, *Hitchcock* 9495. Holly Mount, *Amer. Gr. Nat. Herb.* 564. New Forest, *Hitchcock* 9821. Lititz Savanna, *Harris* 12443. Bull Head Mountain, *Hitchcock* 9540. Kingston, *Hitchcock* 9471. Westphalia, *Harris* 11570. Blue Mountains, *Perkins* 1488. Cinchona, *Harris* 9497; *Hitchcock* 9696, 9711. Castleton Gardens, *Hitchcock* 9395. Hardware Gap, *Harris* 11544.
- HAITI: Port-Margot, *Ekman* H 2927. Boche à Bateau, *Ekman* H 734. Aux Cayes, *Ekman* H 863.
- DOMINICAN REPUBLIC: Samaná Peninsula, *Abbott* 152.
- PORTO RICO: Mayaguez, *Chase* 6287, 6314; *Holm* 173. Maricao, *Britton, Cowell & Brown* 4476; *Chase* 6236. Lares, *Chase* 6585. Bayamon, *Hioram* 347. Vega Beja, *Chase* 6424. San Juan, *Chase* 6344, 6401. Catano, *Chase* 6639. Río Piedras, *Chase* 6779; *Hioram* 807. El Yunque, *Chase* 6729. Colonia San Miguel, *Britton & Shafer* 1624.
- LEEWARD ISLANDS: Antigua, *Wulfschlaegel* 593. Dominica, *Hitchcock* 16421.
- WINDWARD ISLANDS: Martinique, *Duss* 558. Grenada, *Broadway* 1793½.
- COLOMBIA: Corinto, *Pittier* 993. Palmira, *Pittier* 845. Suratá, *Killip & Smith* 16496. Central Cordillera, *Dawe* 854.
- VENEZUELA: Caracas, *Bailey* 247; *Pittier* 7177, 7212, 7242, 9656, 9707. Dos Caminos, *Pittier* 6308, 7964a. "Carma," *Jahn* 315.
- BRAZIL: Bello Horizonte, *Chase* 9092. Serra Mantiqueira, *Chase* 8691. Serra de Itatiaia, *Chase* 8360. Rio de Janeiro, *Chase* 8213. Rio Capinzal, *Dusén* 17864. São Leopoldo, *Dutra* 503. Without locality, *Sello* 3417.
- PARAGUAY: San Bernardino, *Rojas* 1006. Central Paraguay, *Morong* 548.
- URUGUAY: Palmira, *Herter* (*Herb. Osten*) 18814. Colonia, *Herter* (*Herb. Osten*) 18815. Cerro Largo, *Herter* (*Herb. Osten*) 18623. Durazno, *Schroeder* (*Herb. Osten*) 18736. Montevideo, *Herter* 327; *Lombardo* 1978; *Marchesi* 1859, 3104. Without locality, *Arechavaleta* in 1881 and 1892.
- PERU: Huánuco, *Macbride* 3519.
- BOLIVIA: Buena Vista, *Steinbach* 5273, 7020. Santa Cruz, *Steinbach* (*Herb. Osten*) 14959.
- ARGENTINA: Mocovi, *Venturi* 63. Posadas, *Ekman* 578. Prov. Mendoza, *Jensen* in 1904-5. Córdoba, *Stuckert* 5977, 11048, 12664; *Stuckert* (*Kneucker Gram.*) 364. Buenos Aires, *Parodi* 144, 145. Prov. Catamarca, *Venturi* 7098.

32. *Paspalum minus* Fourn.

Paspalum minus Fourn. Mex. Pl. 2: 6. 1886. "In valle Cordovensi (BOURG. n. 2298); Paso del Correo, maio (LIEBM. n. 154)." The type, *Bourgeau* 2298, bearing the name in Fournier's script, in the Paris Herbarium, is a dense tuft. In 2 of the 9 inflorescences there are 3 racemes. The spikelets are 2.1 mm. long.

DESCRIPTION

Similar to *P. notatum*, commonly in denser mats, on the average smaller, the culms rarely more than 30 cm. long, the sheaths and blades 5 to 15 cm. long, more commonly ciliate, sometimes conspicuously so; racemes more slender, less rarely 3; spikelets 2 to 2.5 mm. long, 1.5 to 1.6 mm. wide, oval, less shining than those of *P. notatum*.

DISTRIBUTION

Open slopes and savannas from sea level to 1,500 meters, from central Mexico to Paraguay and Bolivia, and in the Greater Antilles.

FIGURE 33.—*P. minus*. From type collection

VERA CRUZ: Córdoba, *Bourgeau* 2298. Jalapa, *Hitchcock* 6590.

MEXICO (Republic of): Mecapalco, *Liebmann* 156. Paso del Correo, *Liebmann* 154.

GUATEMALA: Puerto Barrios, *Hitchcock* 9161. Izabel, *Blake* 7744. Cubilquitz, *Türckheim* (*Dist. Smith*) 7697, 8793.

NICARAGUA: San Juan del Norte, *Oersted* 14107.

COSTA RICA: Puntarenas, *Hitchcock* 8583. Guápiles, *Standley* 37288. San José, *Hitchcock* 8497. Boruca, *Tonduz* 4471. Buenos Aires, *Pittier* 3658.

PANAMA: El Boquete, *Hitchcock* 8234. Baja Boquete, *Killip* 4582. Cerra Vaca, *Pittier* 5345. Chorrera, *Hitchcock* 8123. Chepo, *Pittier* 4624. Panama, *Piper* 5293. Canal Zone, *Hitchcock* 7973, 7978; *Killip* 4027; *Standley* 26355; *Stork* 53.

CUBA: Arroyo del Sumidero, *Léon & Shafer* 13670; *Shafer & Léon* 13677. Heradura, *Hitchcock* 455, 23439; *Tracy* 9093. Cajalbana, *Léon & Charles* 4856. San Diego de los Baños, *Léon* 4468. Pinar del Río, *Hitchcock* 23284, 23305. Mordazo, *Ekman* 17093. Isle of Pines, *Britton & Wilson* 14695; *Palmer & Riley* 978. Without locality, *Wright* 3438 in part.

JAMAICA: Bull Head Mountain, *Hitchcock* 9540½.

HAITI: Las Cahobas, *Cook, Scofield & Doyle* 103.

DOMINICAN REPUBLIC: Cotuy, *Abbott* 830, 850.

PORTO RICO: Trujillo Alto, *Chase* 6368.

COLOMBIA: Buena Ventura, *Hitchcock* 19904. Cali, *Pittier* 641. Jamundí, *Pittier* 935.

VENEZUELA: Dividive, *Pittier* 10821.

PARAGUAY: Ypacaray, *Hassler* 12546. Sapucay, *Hassler* 13033.

BOLIVIA: San Carlos, *Buchtien* 79 in 1926.

33. *Paspalum pumilum* Nees

Paspalum pumilus Nees, Agrost. Bras. 52. 1829. "Habitat in sylvarum marginibus et ad vias versus Almada et Ferracas provinciae Bahiensis." The type in the Munich Herbarium, with the name in Nees script, was collected by Martius. It consists of four plants, two pubescent and two glabrous, corresponding to the two forms into which Nees divides the species, α , with glabrous foliage, and β , with softly villous foliage.

Paspalum campestre Trin. Mém. Acad. St. Pétersb. VI. 3²: 144. 1834. "V. spp. Bras." The type in the Trinius Herbarium is labeled "in campis siccis arenosis, pr Ilheos, Brasil, Langsdorf." The foliage is densely pubescent.

Panicum bicrurulum Salzm.; Steud. Nom. Bot. 2: 253. 1841. "Bahia." Name only, doubtless an error for *Paspalum bicrurulum* Salzm.

Paspalum bicrurulum Salzm.; Steud. Nom. Bot. 2: 270. 1841. "Bahia" Name only. Steud. Syn. Pl. Glum. 1: 21. 1854. "Hrbr. Bahiense." A Salzmann specimen bearing the name in his script and also a note in Steudel's script, "*Paspalum bicrurulum* Salzm. species distincta," is in the Lenormand Herbarium at Caen. This plant is geniculate below and appears to be the basis of Steudel's description. It is *P. pumilum*, as noted by Doell on the label. Three species were distributed by Salzmann bearing this name: *P. pumilum*, *P. multicaule*, and the species related to *P. pumilum* but with appressed-hispid spikelets which Doell⁸¹ describes as *P. bicrurulum* Salzm., based on Salzmann's species in part. Steudel describes the spikelets as glabrous, hence it is necessary to refer *P. bicrurulum* to *P. pumilum*. The specimen in the Delessert Herbarium and part of that in the United States National Herbarium belong to the species having appressed-hispid spikelets; all the others so named which have been examined are either *P. pumilum* or *P. multicaule*. In Salzmann's own herbarium in Montpellier is a specimen of the species with appressed-hispid spikelets, with a varietal name added by Salzmann to *Paspalum bicrurulum*. Doell suggests that *P. strigosum* would be a better name for the species with appressed-hispid

spikelets than *P. bicrurulum*, because Salzmann confused two species under that name. Since the species is without a name otherwise, *P. strigosum* Doell (Mart. Fl. Bras. 2²: 58. 1877), based on *P. bicrurulum* Salzm.; Doell, not Salzm.; Steudel, 1854, may be taken up for this apparently rare species. The only known collection, other than Salzmann's, is Chase's no. 7885 from Bahia.

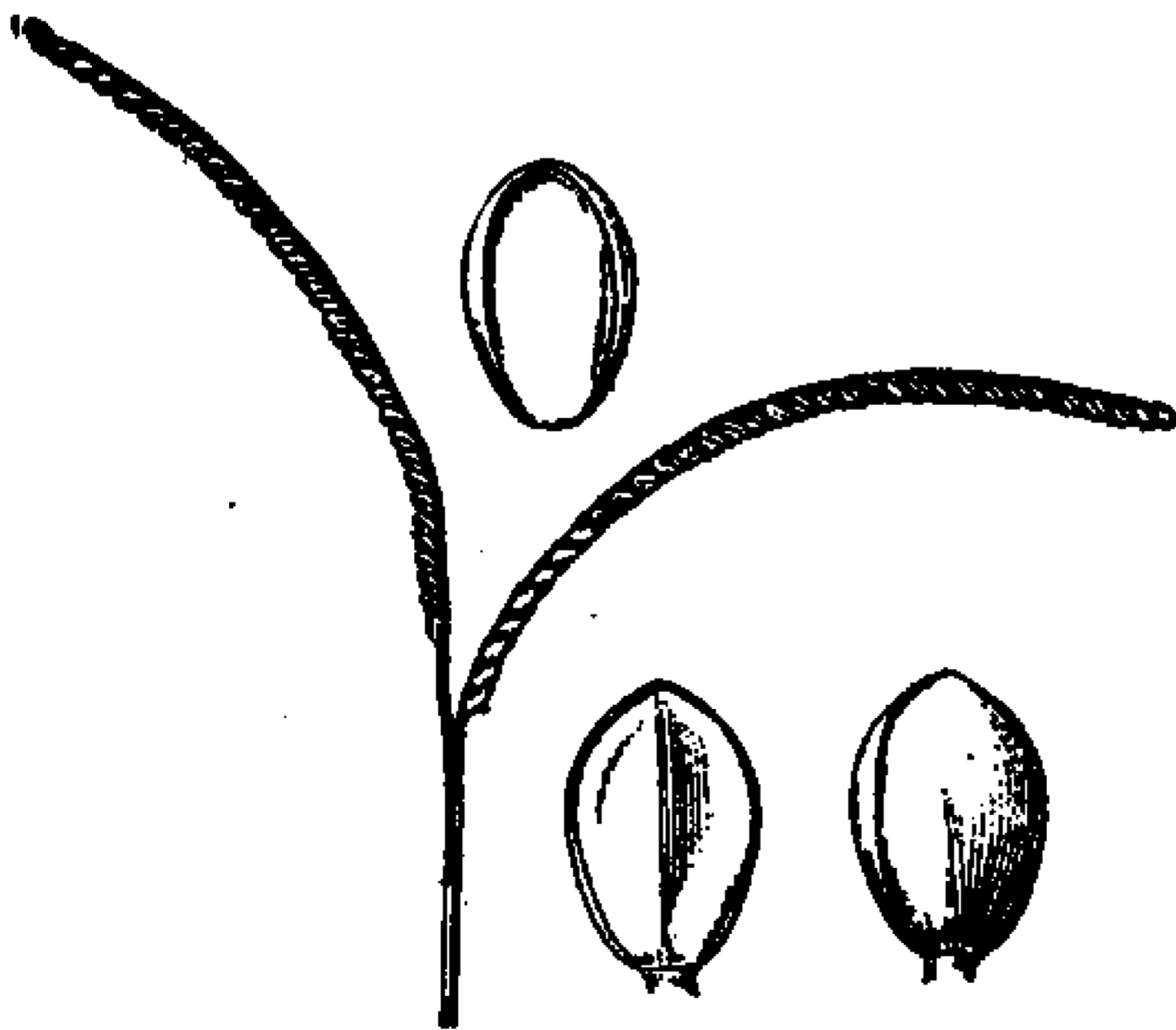


FIGURE 34.—*P. pumilum*. From type specimen and Hitchcock 10350

DESCRIPTION

A low perennial in dense tufts, the rhizomes, if any, short, slender, and nearly vertical; culms slender, simple, 12 to 60 cm. tall (usually 15 to 35 cm.), spreading to ascending, glabrous, flattened; leaves crowded at the base, from nearly glabrous to densely pubescent throughout, and grayish olivaceous or purplish, the subcompressed overlapping sheaths successively longer, pubescent at least on the

⁸¹ Mart. Fl. Bras. 2²: 57. 1877.

margin, the upper leaves with long sheaths and short or obsolete blades; ligule membranaceous, about 0.5 mm. long, with a dense row of hairs back of it; blades flat, ascending, 1.5 to 12 cm. long, 2 to 7 mm. wide, linear-elliptic to linear, less firm than in the preceding; racemes 2, subconjugate (rarely 3), recurved-ascending, 2 to 7 cm. long, slender; rachis about 0.6 mm. wide, glabrous; spikelets solitary 1.6 to 2 mm. long, 1.1 to 1.3 mm. wide, not shining, otherwise as in the preceding.

DISTRIBUTION

Sandy savannas and moist open ground mostly at low altitudes, Dominica and Trinidad to Colombia, Uruguay and Chile.

LEEWARD ISLANDS: Dominica, *Jones* 39.

TRINIDAD: Piarco Savanna, *Hitchcock* 10350; *Warming* 808. Valencia, *Broadway* 6946.

COLOMBIA: Buenaventura, *Hitchcock* 19907. Córdoba, *Pittier* 540.

BRITISH GUIANA: Lama Stop-off, *Hitchcock* 16899, 16973, 17011, 17012. Lama Dam, *Jenman* 6015. Penal Settlement, *Hitchcock* 17028. Bartica, *Hitchcock* 17260, 17269. Wismar, *Hitchcock* 17280. Akyma, *Hitchcock* 17433.

BRAZIL: Pernambuco, *Chase* 7727, 7761. Bahia, *Salzmann*. Cachoeira, *Chase* 8081. Parafuso, *Chase* 7983. Ouro Preto, *Chase* 9374. Juiz de Fôra, *Chase* 8586. Alto da Serra, *Chase* 9768. Pico de Tijuca, *Chase* 8492. Novo Friburgo, *Glaziou* 4307. Rio de Janeiro, *Chase* 8172, 8234, 8438, 8443. Campos do Jordão, *Chase* 9895. Ypiranga, *Dusén* 3986. São Leopoldo, *Dutra* 599. Without locality, *Beyrich*; *Riedel* 964.

URUGUAY: Montevideo, *Arechavaleta* 79 in 1874, 2 in 1890; *Berro* 6733; *Marsh* 51.

CHILE: Valdivia, *Buchtien* in 1898.

34. *Paspalum subciliatum* Chase

Paspalum subciliatum Chase, Journ. Washington Acad. Sci. 17: 144. *f. 1.* 1927. "Type in the U. S. National Herbarium, no. 734821, collected in a savanna, in the vicinity of Balboa, Canal Zone, September 6, 1911, by A. S. Hitchcock (no. 8017)."

DESCRIPTION

A tufted perennial, leafy below; culms erect and crowded from a short horizontal rhizome, the innovations short and subglobose, resembling bulblets at the base of flowering culms; culms simple, 15 to 45 cm. tall, slender, compressed, striate, glabrous; sheaths glabrous or with a few hairs on the margin at the summit, the lower mostly short and crowded, the upper one elongate and bladeless; ligule ciliate, about 0.5 mm. long; blades erect, folded at base and slightly wider than the sheath, flat above, drying more or less involute with attenuate tip, 10 to 20 cm. long, 2 to 3 mm. wide (or occasional lower ones 5 to 8 cm. long and 5 mm. wide), long-pilose on the upper surface toward the base, otherwise glabrous; racemes 2, conjugate (rarely a third below), narrowly ascending to spreading, 3 to 6.5 cm. long, one usually a little longer and naked at the very base: rachis slender, flexuous, with a dense tuft of short.

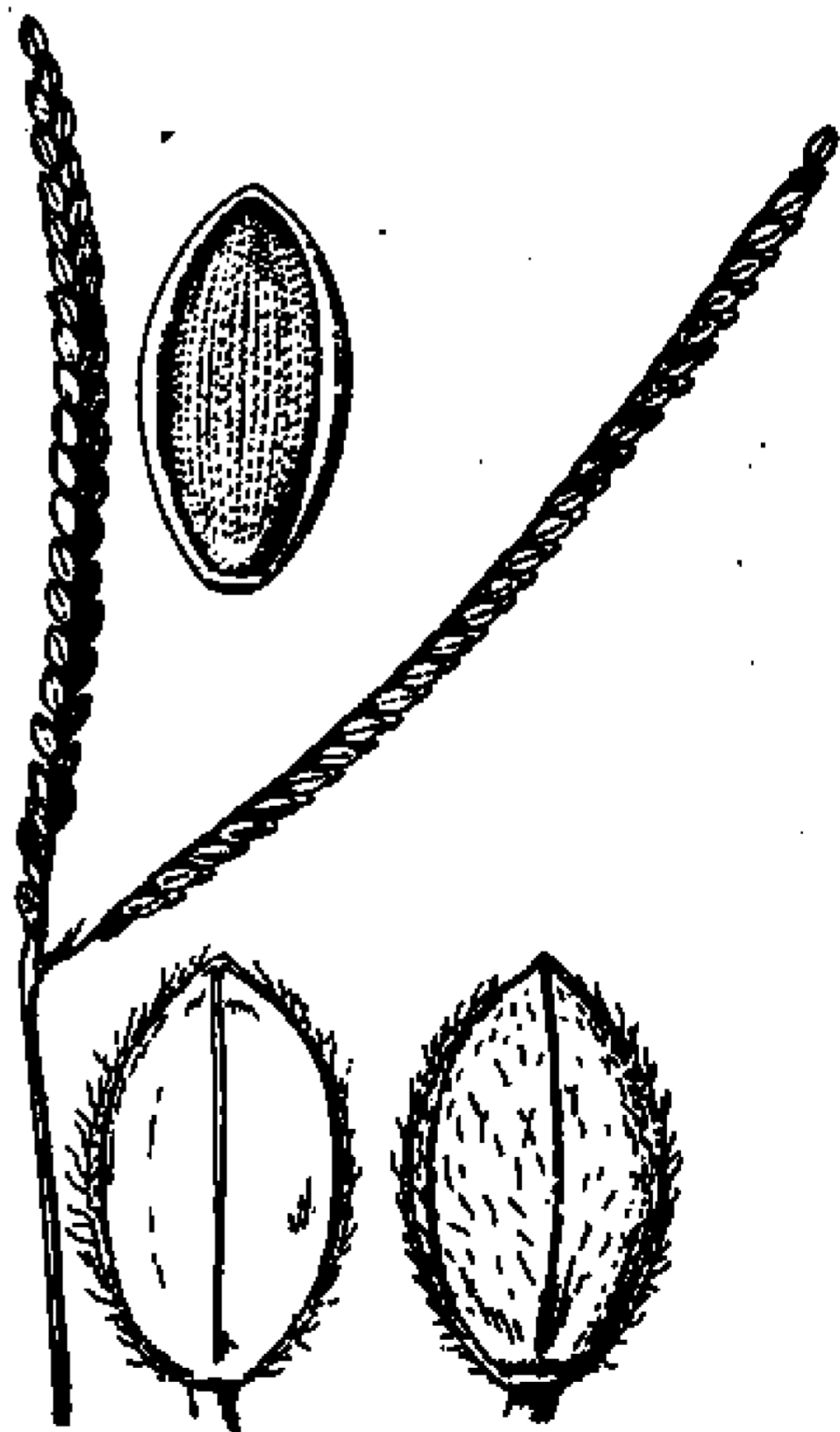


FIGURE 35.—*P. subciliatum*. From type specimen

white hairs at base, otherwise glabrous, purplish; spikelets grayish green, solitary, sessile, scarcely or not at all imbricate, elliptic, subacute, 2.2 to 2.4 mm. long, 1.2 to 1.5 mm. wide; glume and sterile lemma equal, covering the fruit, 3-nerved, the glume minutely pubescent, the hairs longer around the margin, the sterile lemma ciliate toward the summit, otherwise glabrous; fruit pale, very minutely papillose-striate.

DISTRIBUTION

Open savannas, Panama and Brazil.

PANAMA: Dolega, *Hitchcock* 8339. Canal Zone, *Hitchcock* 8017. Chepo, *Pittier* 4500.

BRAZIL: Rio Branco, Amazonas, *Kuhlmann* 3170.

35. *Paspalum serpentinum* Hochst.

Paspalum serpentinum Hochst.; Steud. Syn. Pl. Glum. 1: 22. 1854. "Hrbr. Kappler nr. 1561 * * * Surinam." This collection, from the Steudel Herbarium, is in the Drake Herbarium at Paris. Another, bearing the name in Steudel's script, is in the Lenormand Herbarium at Caen. A second specimen in the Drake Herbarium is named *Paspalum maculosum* β *rotundiflorum* in Doell's script. In these specimens the lower sheaths are conspicuously villous.

Paspalum argyrocondylon Steud. Syn. Pl. Glum. 1: 22. 1854. "Hrbr. Paris et Lenorm. Guiana." The specimen in the Lenormand Herbarium at Caen, bearing the name in Steudel's script, consists of a culm lacking the base, the sheaths pilose toward the summit. It is labeled "Guiana nr. 11," no collector's name being given.

Paspalum maculosum var. *rotundiflorum* Doell in Mart. Fl. Bras. 2³: 72. 1877. Based on *P. serpentinum* Hochst.

DESCRIPTION

A slender cespitose perennial, leafy at the base, the culms naked above; culms simple, erect, 50 to 60 cm. tall, sulcate in drying,

glabrous; nodes glabrous; lower sheaths and blades crowded, densely grayish villous, the upper sheaths glabrous, bladeless or nearly so; ligule membranaceous, brown, scarcely 0.5 mm. long; blades firm, flat or involute, erect or the lowermost spreading, 6 to 40 cm. long, 3 to 5 mm. wide, the nerves prominent on the minutely puberulent upper surface; racemes 2, subconjugate, 6 to 8 cm. long, ascending; rachis slender, flexuous, minutely puberulent, bearing a tuft of shining white hairs at base; spikelets solitary, relatively long-pediceled, 2.6 mm. long, 2.2 to 2.3 mm. wide, suborbicular, the face slightly convex with a submarginal furrow on each side, the margin flat; glume and sterile lemma equal, faintly 3-nerved, glabrous, yellowish brown, with irregular transverse markings of dark brown; fruit stramineous, 2.5 mm. long, 2 mm. wide, broadly obovate, the palea slightly convex, the lemma with a submarginal furrow.

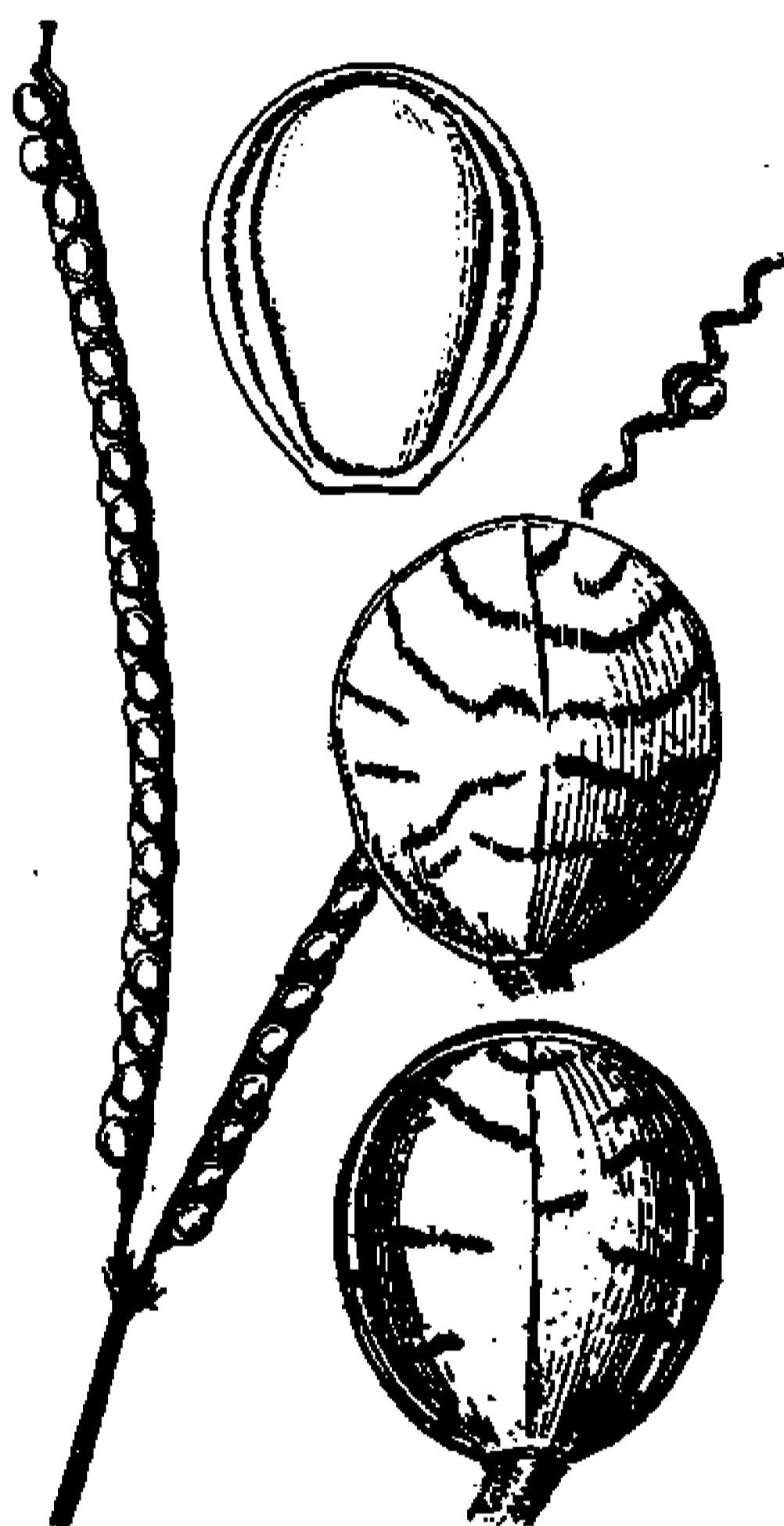


FIGURE 36.—*P. serpentinum*. From type specimen and *Hitchcock* 10337

DISTRIBUTION

Wet sandy savannas, Trinidad and the Guianas.

TRINIDAD: Piarco Savanna, *Hitchcock* 10337.

BRITISH GUIANA: Rupununi Savanna, *Melville*.

DUTCH GUIANA: "Surinam," *Kappler* 1561.

Linearia.—Perennial; culms slender tufted; blades narrow; racemes 2; spikelets narrowly elliptic. But one species in North America.

36. *Paspalum lineare* Trin.

Paspalum lineare Trin. Gram. Pan. 99. 1826. "V. spp. Brasil. (Langsdorff)."
The type specimen in the Trinius Herbarium was examined by A. S. Hitchcock. The spikelets are 4.2 to 4.4 mm. long. The first glume is developed in several of the spikelets as noted by Trinius; in one it is three-fourths as long as the spikelet. The racemes are 4 and 4.5 cm. long in the fragment of the type given to the United States National Herbarium, though Trinius' description gives the length as an inch "(pollicaribus)." The blades are glabrous as described and 0.5 mm. wide as folded. Trinius' type of *P. lineare* would seem to be one of the specimens cited by Nees as *P. angustifolium*, "Serra da Lapa dicti prov. Minarum (α Langsdorff)," α referring to the species itself not " β glumis transversum undulatis." Nees cites "*Paspalum lineare*, Trin. ined." as a synonym of his *P. angustifolium* (though Trinius' work appeared in 1826 and Nees' in 1829). Trinius applies Nees' name *P. angustifolium* "ined." to the plant with cross-wrinkled spikelets which Nees himself referred to *P. angustifolium* " β glumis transversim undulatis." That species is not known from North America. Trinius later⁸² recognized the error and states that the form he described under *P. angustifolium* Nees seems to be a distinct species. His plate 111 (an excellent figure of *P. lineare*) is entitled "*Paspalum angustifolium*," though the description is headed "*Paspalum lineare*."

Paspalus angustifolius Nees, Agrost. Bras. 64. 1829. Not *Paspalum angustifolium* LeConte 1820, nor Nees; Trin. Gram. Pan. 99. 1826. "*Paspalum lineare*, Trin. ined. * * * Chapada do Paranán dictis versus Contagem de S. Maria, et ad Flumen formosum provinciarum Goyazanae et Minarum (Martius); ad Fazenda do Borrachudo. Brasiliae (Sellow); * * * Serra da Lapa dicti prov. Minarum (α Langsdorff.) * * * V. et in Herb. Reg. Berol. et in Herb. Acad. Imp. Petrop. et Trin." In the Munich Herbarium is a specimen collected by Martius with the data "Paranan et Rio Fermoza," which is named "*Paspalus angustifolius* v. β " in Nees' script. A second sheet with the same name "v. β " in Martius' script bears the data "Chapada do Paranam * * * S. Maria & fl. formosam. Goyaz & Minarum." These specimens agree with Nees' description of *P. angustifolium* itself, not with that of var. " β glumis transversim undulatis." The name in Nees' script is on a little slip, not on the label with the locality. It seems probable that this slip was misplaced. The Martius collection of var. β as described was not found in the Munich Herbarium but was found by A. S. Hitchcock in the Trinius Herbarium marked "*Paspalum angustifolium* N. Es. in Brasilia, mis. auctor." Trinius⁸³ described this as "*Paspalum angustifolium* N. ab Es! in Mart. Fl. Bras. ined." with a note that the name should be changed because of *P. angustifolium* LeConte. The plant is the same as *P. approximatum* Doell; it is not found in North America. Because of the confusion both of Martius' collections are rejected as the type of *P. angustifolium* Nees. In the Berlin Herbarium is a specimen

⁸² Icon. Pl. 111. 1828.

⁸³ Gram. Pan. 99. 1826.

with a label in Nees' script "*Paspalus angustifoli* N. ab Es. Sellow Brasilia," with a second slip in Nees' script "*Pasp. angustifolius* v. a," written above another name which had been scratched out, and with a third slip in Kunth's script "*Pasp. angustifolius* Nees ab Esenb." This specimen agrees with Nees' description and is taken as the type. The upper part of the sheaths and lower part of the very slender blades are pilose; the spikelets are about 4.3 mm. long; a minute first glume is developed in several of them. Two of the culms bear three racemes. A second sheet of apparently the same collection bears a Sello field label "Faz. do Buraxudo 7 Dbr. 18." This bears in Nees' script the unpublished name crossed out in the label on the other sheet.

Paspalum neesii Kunth, Rév. Gram. 1: 25. 1829. "(*Paspalum angustifolium* Nees ab Esenb.)." Kunth does not specify whether it is *P. angustifolium* Nees in Trin. 1826, or of Nees himself, 1829, that he is changing. Since Kunth published the change in 1829 it would seem as if he must have had the earlier name in mind, but his writing on the Nees' specimen in Berlin (see above) shows that he knew Nees' 1829 species as *P. angustifolium*.

Panicum furcellatum S. Moore, Trans. Linn. Soc. London. Ser. 2. 4: 505. pl. 34. 14-22. 1895. "Santa Cruz * * * (N. 763)" Moore, Matto Grosso,

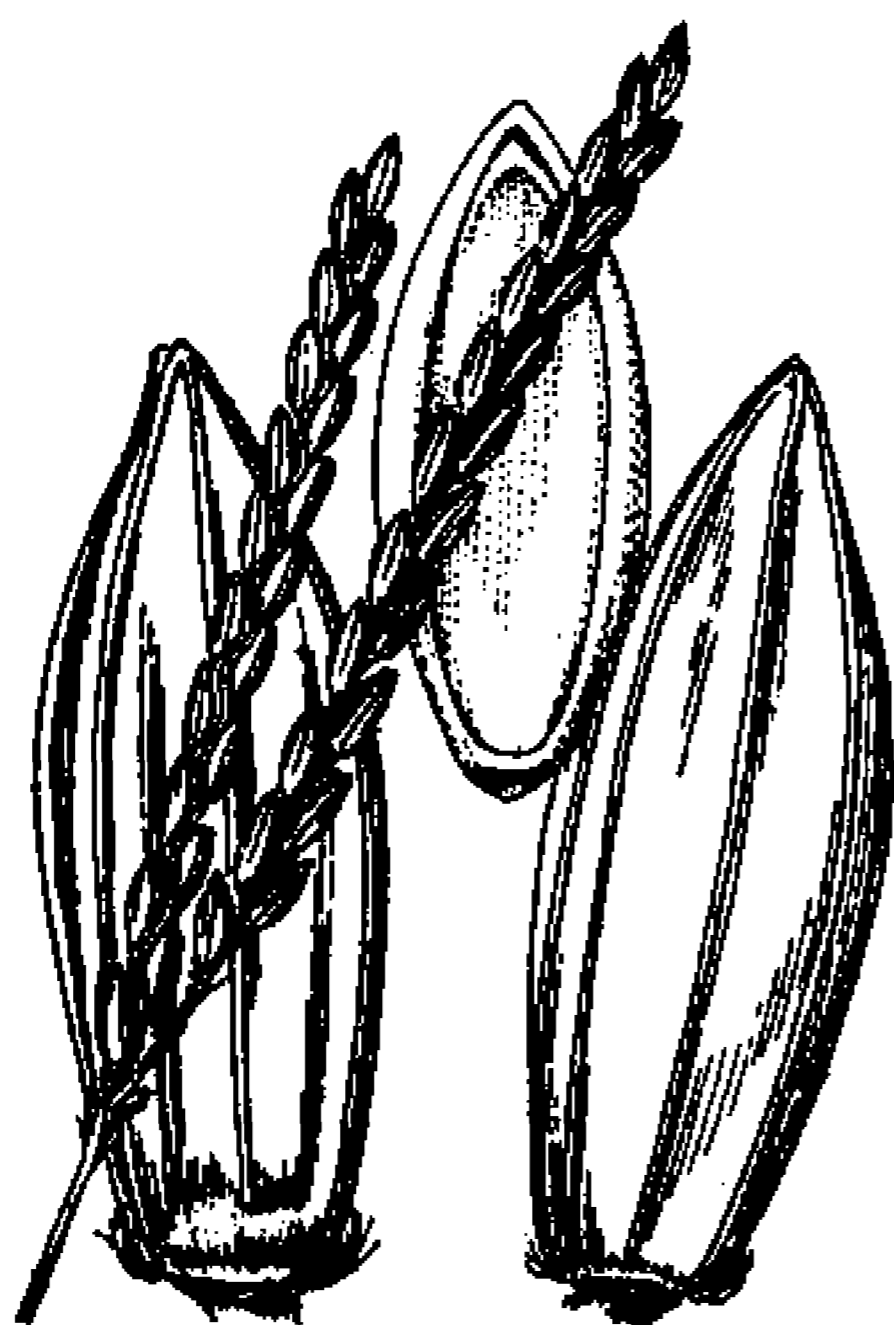


FIGURE 37.—*P. lineare*. From type specimen and Glaziou 22493

Brazil. The type specimen, collected by Moore, was examined in the herbarium of the British Museum. The sheaths are from sparsely appressed-hirsute to glabrous, hairy at the mouth, the upper almost glabrous; the blades are coarser than in the types of *P. lineare* and *P. angustifolium*, being 1.5 mm. as folded. The spikelets are 4 to 4.1 mm. long; the first glume is well developed in about one-third of the spikelets.

DESCRIPTION

A slender, densely caespitose perennial, the base usually clothed with old shredded sheaths; culms simple, stiffly erect, compressed, glabrous, 40 to 80 cm. tall; nodes densely appressed-pubescent with short white hairs; basal leaves several to many, with compressed, often somewhat equitant, overlapping sheaths 6 to 10 cm. long, pilose to subglabrous, usually conspicuously hairy at the summit, their blades conduplicate, the upper surface grown together except at the very base, as much as 50 cm. long or more, erect or nearly so, 0.5 to 1.5 mm. wide as folded, narrower at base than the summit of the sheath, densely pilose on the inner surface at base; culm leaves usually 3, the sheaths shorter than the elongate internodes, glabrate or nearly so except at the summit; ligule membranaceous, minute; blades like those of the basal leaves, 5 to 30 cm. long, the uppermost reduced to a subulate tip; inflorescence of two (rarely 3) erect or slightly spreading approximate but not conjugate racemes 3 to 5.5 cm. long, the common axis 3 to 10 mm. long; rachis slender, flexuous, rarely narrowly winged, long-pilose at the base, otherwise glabrous, that of the upper raceme often naked at base for 5 to 10 mm.; pedicels from minute to 1 mm. long; spikelets solitary, scarcely or not at all imbricate, erect, 4 to 4.5 mm. long (rarely longer) 1.5 to 1.8 mm. wide, elliptic, with a short tuft of white hairs on either side at the very base, otherwise glabrous (rarely with a few hairs along the margin of the glume); glume and

sterile lemma 5 nerved, covering the fruit and pointed beyond it; fruit pale, 3.8 to 4.3 mm. long, about 1.4 mm. wide, minutely and striately papillose-roughened.

This species is variable in the pubescence of the foliage and the size of the spikelets. In Hitchcock & Chase's Grasses of the West Indies⁸⁴ the more slender Cuban plant with spikelets not more than 4 mm. long and with subglabrous foliage was described as *Paspalum neesii* Kunth. Further study of more material shows no dividing line between the form with larger spikelets and that with usually smaller spikelets. As shown above, the types of *P. lineare* and *P. angustifolium* alike have very slender blades and spikelets more than 4 mm. long, the only difference being that in *P. angustifolium* the blades are pilose below. The Cuban specimens have coarser nearly glabrous blades and mostly spikelets not more than 4 mm. long. In Britton, Britton & Wilson 15114 the spikelets are 4 to 4.2 mm. This is the commoner form of Brazil, though specimens cited below show variation from blades 0.5 as folded to 1.5 as in Cuban specimens, and from glabrous to hirsute. The first glume is frequently developed in a few spikelets of a raceme.

The copious basal foliage is commonly burned off to a height of 10 to 15 cm. Tonduz's no. 6548 is exceptional in having spikelets 5 mm. long, the glume obscurely ciliate on the margin about halfway to the summit.

Doell⁸⁵ uses the name *P. neesii* Kunth for this species, giving *P. lineare* Trin. as a synonym followed by the note "(varietas grandiflora)."

DISTRIBUTION

Savannas, Costa Rica and Cuba to Argentina.

COSTA RICA: Cabagra, Tonduz 6548.

CUBA: Herradura, Baker 3459; Ekman 10737. Between Zarzal and Nagua, Léon 11336; Ekman 14146. Isle of Pines, Britton, Britton & Wilson 15114; Curtiss 379.

BRAZIL: Est. Minas Geraes, Glaziou 17375; Widgren 870. Capelinha de Santo Antonio, Glaziou 22493. Cabeceiras do Cantario, Kuhlmann 1698. Tamanduá, Dusén 10834. Southern Brazil, Sello. Without locality, Glaziou 15633, 22474, 22476.

PARAGUAY: Between Río Apa and Río Aquidaban, Fiebrig 4996. Sierra de Amambay, Hassler 10775, 11639.

ARGENTINA: Río Paraná, Chaco, Muello (*Herb. Parodi*) 4703.

Setacea.—Perennial from a knotted base or very short rhizomes; culms compressed; ligule a minute membrane with a dense row of long white hairs back of it; blades flat; inflorescence terminal and axillary, the racemes slender, mostly subcylindric, the spikelets in pairs (or the lower occasionally undeveloped), crowded, strongly plano-convex; fruit nearly the size and form of the spikelet, smooth and shining. The first glume is developed in occasional specimens, more frequently so than in most groups of the genus, other than Decumbentes.

Most of the species of this group are rather poorly defined and appear to intergrade. Pubescence is extremely variable in amount and position, and the spikelets vary in size and shape. Those on a single plant are nearly uniform in length but vary in width and form in a single raceme. Where several names have been reduced to synonymy, as in *Paspalum ciliatifolium*, the characters of each type are given. Those that do not agree with the writer may therefore

⁸⁴ Contr. U. S. Nat. Herb. 18: 311. 1917.

⁸⁵ Mart. Fl. Bras. 2²: 83. 1877.

apply these names to such specimens as chance to have the particular characters found in the different type specimens. Intergrading forms have been maintained as species when much the greater part of the material studied is definitely referable to one or the other.

Several of the type specimens of this difficult group are fragmentary or are mixtures of two or three species. Of mixtures that element has been chosen for type that accords with the concept that has grown up about the name in question. (See *Paspalum longepedunculatum* and *P. ciliatifolium*.)

Spikelets not more than 1.8 mm. long (or sometimes 1.9 in *P. debile* and *P. propinquum*), usually 1.5 to 1.7 mm. (See also exceptional *P. ciliatifolium*.)

Blades conspicuously ciliate, otherwise nearly glabrous.

Blades relatively short, rounded at base and recurved-ascending; foliage aggregate toward the base, the upper culm relatively naked; spikelets glabrous, mostly 1.5 to 1.6 mm. long.-----37. *P. longepedunculatum*.

Blades mostly elongate, suberect, not aggregate toward the base; spikelets pubescent, 1.7 to 1.9 mm. long-----45. *P. propinquum*.

Blades and sheaths conspicuously pubescent throughout.

Culms slender, erect or suberect; foliage not aggregate at base; blades suberect, usually not more than 5 mm. wide-----38. *P. setaceum*.

Culms stouter, mostly spreading; foliage more or less aggregate at base; blades spreading, usually more than 5 mm. wide-----39. *P. debile*.

Spikelets 2 to 2.5 mm. long (or 1.8 to 1.9 mm. in *P. ciliatifolium* and *P. propinquum*.)

Foliage, except margins, glabrous as a whole or nearly so (sparsely pubescent in exceptional *P. ciliatifolium* and lower sheaths usually pubescent in *P. rigidifolium*.)

Blades stiff, usually not more than 6 mm. wide; spikelets mostly 2.2 to 2.4 mm. long-----46. *P. rigidifolium*.

Blades from lax to rather firm, if firm more than 6 mm. wide; spikelets not more than 2.1 mm. long.

Spikelets mostly 2 mm. long, rounded at summit; blades mostly more than 8 mm. wide-----44. *P. ciliatifolium*.

Spikelets 1.8 to 1.9 mm. long, slightly pointed; blades not more than 8 mm. wide-----45. *P. propinquum*.

Foliage conspicuously pubescent (or sparsely so in exceptional specimens of *P. pubescens*).

Culms erect or nearly so.

Blades from sparsely to rather densely pilose, rather thin.

43. *P. pubescens*.

Blades puberulent on both surfaces with long hairs intermixed or the lower surface nearly or quite glabrous except for a few long hairs along midrib and margin, usually rather firm-----42. *P. stramineum*.

Culms widely spreading or prostrate.

Foliage coarsely hirsute; plants commonly relatively stout.

40. *P. supinum*.

Foliage finely puberulent; plants usually grayish olivaceous.

41. *P. psammophilum*.

37. *Paspalum longepedunculatum* LeConte

Paspalum debile Muhl. Cat. Pl. 8. 1813; Descr. Gram. 90. 1817. Not *P. debile* Michx. 1803. The type has not been examined. The description applies perfectly to *P. longepedunculatum*.

Paspalum longepedunculatum LeConte, Journ. de Phys. 91: 284. 1820. "*P. debile*, Muhlenberg, gram. Habitat in Carolina boreali." LeConte was obviously

describing his own specimens. He refers *P. debile* Michx. to *P. setaceum* and *P. debile* Muhl. to *P. longepedunculatum*. A specimen bearing the name in LeConte's handwriting but without data is in the herbarium of the Academy of Natural Sciences, Philadelphia. This consists of an entire mature plant of *P. longepedunculatum* and the upper part of a culm of *P. ciliatifolium*. A duplicate in the Drake Herbarium labeled "Am. Sept. LeConte," is *P. longepedunculatum*, while another so labeled in the Paris Herbarium is *P. ciliatifolium*. The complete plant in the herbarium of the Academy of Natural Sciences is taken as the type. This is an exceptional specimen in having three racemes on the primary culm. The spikelets are 1.8 mm. long.

Paspalum setaceum var. *longepedunculatum* Wood, Class-book 782. 1861. Based on *P. longepedunculatum* LeConte.

Paspalum kentuckiense Nash, Britton, Man. 1039. 1901. "Type collected near Poor Fork P. O., Ky., by T. H. Kearney, Jr., Aug. 1893." The type specimen, in the herbarium of the New York Botanical Garden, consists of rather small plants, the axillary peduncles not or scarcely exerted. The spikelets are 1.7 mm. long.

DESCRIPTION

A slender perennial, in tufts of few to several culms, with leafy shoots at the base, relatively naked above; culms ascending or suberect, 25 to 80 cm. tall, glabrous, the internodes finally elongate; nodes dark brown, the lower often geniculate; leaves mostly aggregate at the base, 2 above, the sheaths ciliate on the margin, sometimes obscurely pubescent on the collar, otherwise glabrous or nearly so; ligule a minute brown membrane with a row of stiff white hairs 2 to 3 mm. long back of it; blades commonly conduplicate at base, with a strong midrib, recurved-ascending, flat beyond the base, 4 to 18 cm. long, commonly to 10 cm. long, 3 to 8 mm. wide, rather firm, stiffly papillose-ciliate on the margin, the hairs 1.5 to 3 mm. long, minutely pubescent to glabrous on the upper surface, usually glabrous on the lower but sometimes sparsely pilose along the midnerve or toward the apex; racemes on very slender finally elongate peduncles, 1 or 2, rarely 3, on the primary, 1 on the axillary peduncles, the slender arching racemes 3 to 8 cm. long; rachis slender, minutely pubescent at base; spikelets in pairs on slender scabrous pedicels, crowded, 1.5 to 1.8 mm. long, 1 to 1.2 mm. wide, elliptic-obovate, becoming turgid and blunter at maturity, pale, glabrous; glume and sterile lemma equal, barely covering the fruit at maturity, rather firm, the glume 3-nerved, the lemma 2-nerved, the midnerve suppressed, the lemma and often the glume, sparsely spotted with faint minute depressions; fruit about the size and shape of the spikelet, pale and shining.

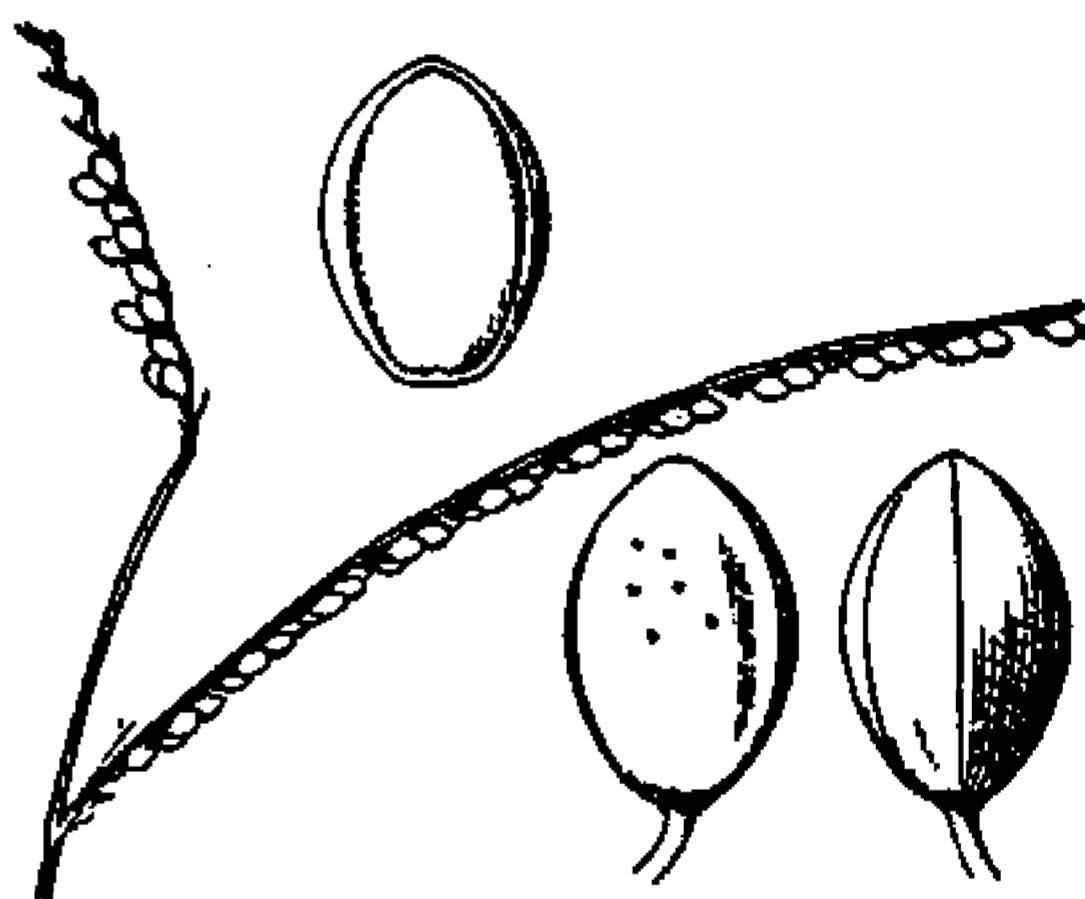


FIGURE 38.—*P. longepedunculatum*. From Nash 2074

The most characteristic form of this species, with short, rather firm, recurved-ascending blades, and spikelets 1.5 to 1.6 mm. long, is found only in Florida. The type specimen, presumably from South Carolina, approaches *P. ciliatifolium*, with which the species seems to intergrade. The type of *P. kentuckiense* is much more characteristic of the species, though the spikelets are 1.7 mm. long and the blades are short-ciliate.

DISTRIBUTION

Sandy soil, mostly in low pine land or "flatwoods," Georgia and Kentucky to Florida and Mississippi.

GEORGIA: Stone Mountain, *Hitchcock* 206, 2420.

FLORIDA: New River, *Hitchcock* 2492. Apalachicola, *Biltmore Herb.* 815c in part; *Kearney* 97. Madison, *Combs* 229. Lake City, *Combs* 76; *Combs & Rolfs* 105, 121; *Ricker* 888 A. Jacksonville, *Pieters* in 1899. Baldwin, *Combs* 56. Cedar Key, *Combs* 782. Crystal, *Combs* 1020. Eustis, *Chase* 4047, 4048, 4056; *Hitchcock* 2493; *Nash* 1417 in part, 2074. Sanford, *Chase* 4033, 4034, 4035. Titusville, *Chase* 3974, 3987. Brevard County, *Fredholm* 5743. Merritt Island, *Swallen* 177. Kissimmee, *Swallen* 259. Fellsmere, *Tracy* 9383, 9385. Braidenton, *Combs* 1318. Jensen, *Hitchcock* 753½. Fort Myers, *Chase* 4146, 4152, 4167; *Hitchcock* 508, 862; *Standley* 12940, 14830; *J. P. Standley* 180. Marco, *Hitchcock* 2422. Miami, *Chase* 3869, 3886; *Hitchcock* 2423. Homestead, *Hitchcock* 688. Without locality, *Rugel* 442.

KENTUCKY: Poor Fork, *Kearney* 26, 56.

TENNESSEE: Elizabethton, *Hitchcock* 2421.

ALABAMA: Pisgah, *Chase* 4494.

MISSISSIPPI: Moss Point, *Tracy* 4632.

38. *Paspalum setaceum* Michx.

Paspalum setaceum Michx. Fl. Bor. Amer. 1: 43. 1803. "Hab. in aridis Carolinae inferioris." The type in the Michaux Herbarium consists of four incomplete overmature culms, with solitary racemes. Only one spikelet remains, this is glabrous, 1.5 mm. long. The data read "Hab. in aridis apricis Caroline, Georgia." What appears to be a specimen of the same collection is in the herbarium of Drake from the Richard Herbarium. This consists of two better specimens of *P. setaceum* and one of *P. pubescens*.

Paspalum hirsutum Retz. misapplied by Poir. in Lam. Encycl. 5: 28. 1804. "Communiquée par Bosc * * * de la Caroline." The Bosc specimen was examined in the Delessert Herbarium.

Paspalum leptostachyum DC. Cat. Hort. Monsp. 130. 1813. Not *P. leptostachyum* Humb. & Bonpl.; Flüggé 1810. "Hab. * * *" The type specimen, bearing the name in A. P. DeCandolle's script, in the DeCandolle Herbarium, consists of 3 immature flowering culms and a sterile one.

Paspalum incertum Roem. & Schult. Syst. Veg. 2: 308. 1817. Based on *P. leptostachyum* DC., the description of which is copied. A specimen so named in the Berlin Herbarium "Hort. bot. Berol. 1835," is not like DeCandolle's plant but is *Paspalum debile* Michx.

Paspalum eriophorum Willd.; Nees, Agrost. Bras. 56. 1829. Not *P. eriophorum* Schult. 1827. "Willd. Herb.," the native country unknown. The specimen so named in the Willdenow Herbarium bears no data. It is a characteristic specimen of *P. setaceum*.

Paspalum dolichopus Trin.; Steud. Nom. Bot. ed. 2. 2: 271. 1841. Name only, with "*P. eriophorum* Willd. hrb. (non Schult.);" referred to it.

DESCRIPTION

A slender olivaceous perennial in tufts of few to several culms, with numerous leafy shoots with long suberect leaves at base; culms erect or suberect (or, in very large tufts, spreading), 25 to 65 cm., commonly 30 to 50 cm., tall, bearing 1 or 2 slender peduncles at the middle and upper nodes, glabrous; nodes glabrous; sheaths pilose, the upper often nearly glabrous except on the margin; ligule a minute membrane with a dense row of hairs 2 to 3 mm. long, back of it; blades flat, rather firm, erect or nearly so, linear, 5 to 17 cm., commonly 10 to 12 cm., long, 2 to 6 mm. wide, densely pilose on both surfaces and papillose-ciliate on the margin, the upper sometimes short-pubescent only; racemes on very slender peduncles, solitary or sometimes 2, slender, arching, 3 to 9 cm., mostly 5 to 7 cm., long, the rachis pubescent at base, sometimes obscurely so; spikelets in pairs on

slender flat pedicels, the lower of the pair slightly winged at base (the margin of the mid-angle of the rachis extending up the pedicel), crowded, 1.4 to 1.7 mm. long, about 1 mm. wide, elliptic-obovate, turgid at maturity, pale; glume and sterile lemma equal, barely covering the fruit at maturity, the glume 3-nerved, the lemma 2-nerved, or the midnerve rarely developed, both glabrous or, the glume especially, more commonly minutely pubescent, with minutely capitate hairs, often speckled with minute pale brown depressions; fruit about the size and shape of the spikelet, smooth and shining.

DISTRIBUTION

Sandy soil, mostly open woods, of the Atlantic Coastal Plain, Long Island New York, to Florida and Texas; also in Mexico.

NEW YORK: Southampton, *St. John* 2576.

NEW JERSEY: Camden, *Scribner* 25 in 1881. Wildwood, *Chase* 3494; *Pollard* in 1897. Cold Spring, *Pennell* 2155. Sea Island Junction, *Leonard* 2313.

PENNSYLVANIA: Philadelphia, *Smith*.

OHIO: Painesville, *Beardslee*.

MARYLAND: Riverdale, *Chase* 7516. Chesapeake Beach, *Chase* 6136, 7001, 7003.

DISTRICT OF COLUMBIA: Washington, *Vasey* in 1882. Mt. Hamilton, *Killip* 6315.

VIRGINIA: Colonial Beach, *Hubbard* 406. Portsmouth, *Chase* 3685. Dismal Swamp, *Chase* 3650. Virginia Beach, *Hitchcock* 2424. Bedford County, *Curtiss*.

NORTH CAROLINA: Chimney Rock, *Biltmore Herb.* 815b. Elizabethton, *Heller* 14028. Wilmington, *Chase* 7195; *Delile* in 1806; *Hitchcock* 2425. Winter Park Heights, *Chase* 7143. Wrightsville, *Chase* 3122. Craven County, *McCarthy*.

SOUTH CAROLINA: Orangeburg, *Hitchcock* 300, 2426.

GEORGIA: Stone Mountain, *Hitchcock* 2428. De Kalb

County, *Eggert* in 1897. Ruskin, *Ricker* 906. Dock Junction, *Ricker* 967.

FLORIDA: Pensacola, *Combs* 515. Milton, *Swallen* 402, 450. De Funiak Springs, *Combs* 442. Chipley, *Combs* 546, 606. Marianna, *Swallen* 506. Quincy, *Combs* 402. Tallahassee, *Combs* 377; *Kearney* 69. Monticello, *Combs* 345, 350. Madison, *Combs* 232. Suwanee County, *Hitchcock* 2488. Lake City, *Combs & Rolfs* 196; *Hitchcock* 2486. Jacksonville, *Combs* 4; *Curtiss* 5198; *Kearney* 136. Baldwin, *Combs* 64. Levy County, *Hitchcock* 2491. Floral City, *Swallen* 349. Eustis, *Chase* 4046½; *Nash* 1417 in part. Tampa, *Combs* 1374. Bartow, *Combs* 1179.

KENTUCKY: Bell County, *Kearney* 386.

TENNESSEE: Valley Forge, *Hitchcock* 2427. Cocke County, *Kearney* 945.

ALABAMA: Etowah County, *Eggert* in 1899. Auburn, *Pollard & Maxon* 71. Tuskegee, *Carver* 90. Nesheka, *Carver* 6. Tensaw, *Tracy* 8027. Spring Hill, *Bush* 225. Mobile, *Kearney* 47; *Mohr* in 1898.

MISSISSIPPI: Ocean Springs, *Pollard* 1131; *Tracy* 35, 4504. Biloxi, *Tracy* 1893, 1895.

TEXAS: Crystal City, *Tharp* 5235.

TAMAULIPAS: Tampico, *Hitchcock* 5793. Buena Vista, *Wootton* in 1919.

39. *Paspalum debile* Michx.

?*Paspalum dissectum* Walt. Fl. Carol. 75. 1788. Not *P. dissectum* L. 1762. Presumably described from South Carolina. No specimens of *Paspalum* are found in Walter's herbarium.⁸⁶ The description indicates some species of the Setacea group, possibly *P. debile* Michx.

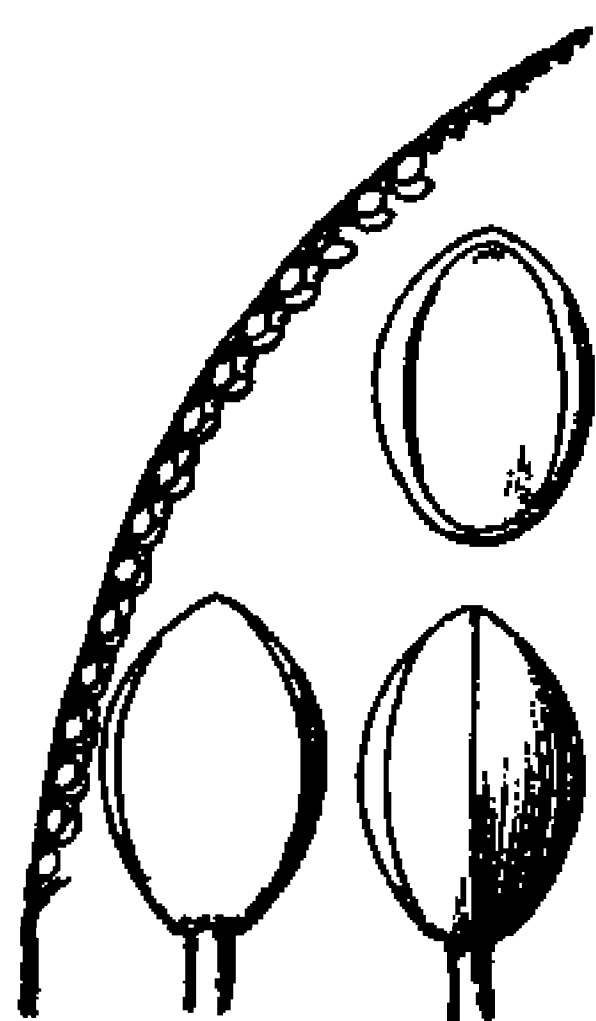


FIGURE 39.—*P. setaceum*
From *Hitchcock* 300

⁸⁶ Hitchcock, Rep. Mo. Bot. Gard. 16: 41. 1905.

Paspalum debile Michx. Fl. Bor. Amer. 1: 44. 1803. "Hab. in maritimis Carolinae et Georgiae." The type in the Michaux Herbarium bears two labels. One, with the name in Michaux's script marked "Hab. in Carolina. No. 1er.," is accompanied by parts of two culms (1) without inflorescence, sheaths and blades densely villous, the blades linear, 13 cm. long and 5.5 mm. wide; and (2) with one inflorescence of two half-included racemes, the spikelets 1.9 mm. long, with obscurely pubescent glume. A third specimen is a single culm of *P. setaceum*. On the second label is written in Michaux's script "*Paspalum debile?* Recolte ici des graines de Caroline." One fragmentary specimen with a single raceme

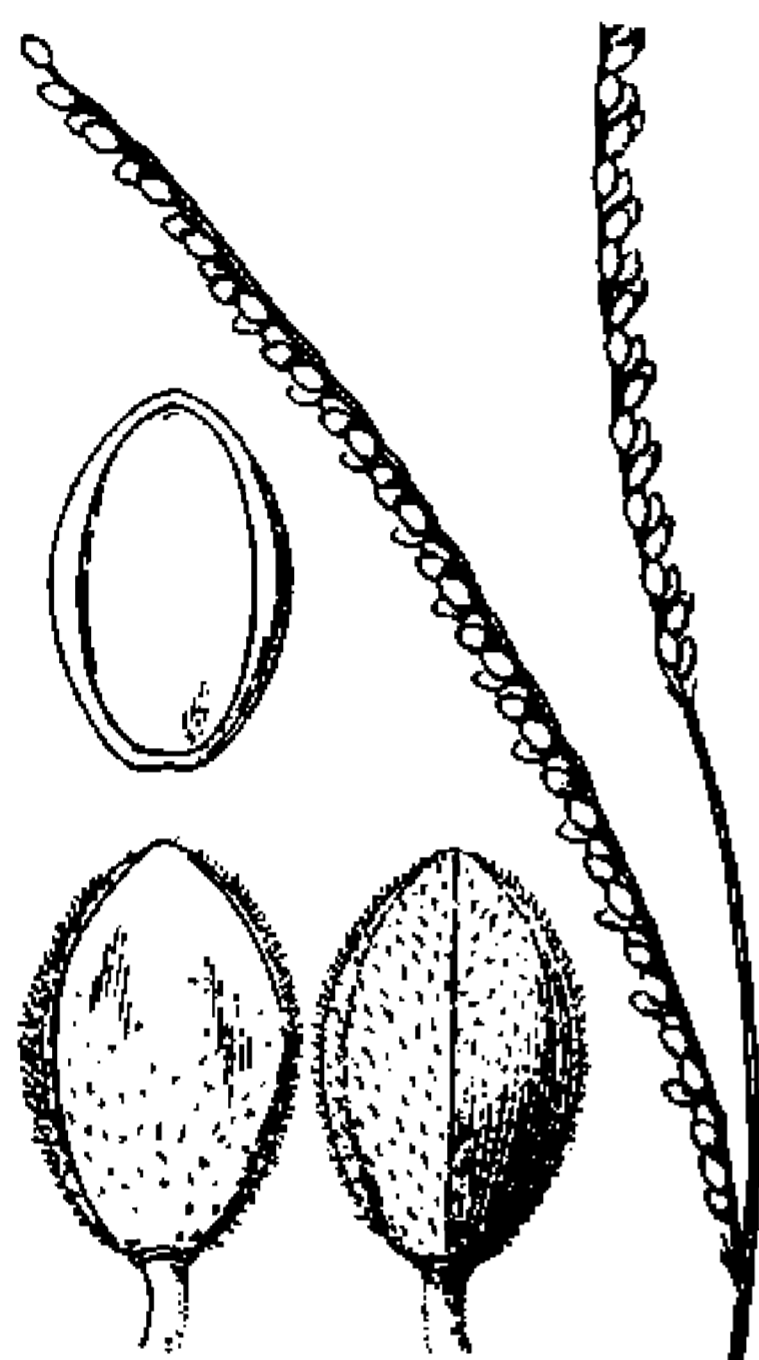


FIGURE 40.—*P. debile*. From type collection of *P. villosissimum*

and glabrous spikelets 1.6 mm. long belongs to *P. setaceum*, the second piece is without inflorescence and is the same as the sterile specimen above the first label. Judging from this second label the plants accompanying it were grown in Michaux's garden from seed from Carolina. The fragments mentioned above as (1) and (2) are taken as the type.

Paspalum dubium DC. Cat. Hort. Monsp. 130. 1813. "Hab. * * * ." The type, in the DeCandolle Herbarium bearing the name in A. P. DeCandolle's script, consists of a single culm with a terminal and 3 axillary inflorescences. There is no locality, but a ticket with "3 3142 27 aout" in what may be Bosc's script.

Paspalum infirmum Roem. & Schult. Syst. Veg. 2: 307. 1817. Based on *Paspalum debile* Michx., the name presumably changed because of *P. debile* Poir. 1804.

Paspalum villosissimum Nash, Bull. Torrey Club 24: 40. 1897. "Type collected [by G. V. Nash] at Eustis, Lake County, Fla., early in June 1894, no. 946, and distributed as *P. setaceum*." This specimen, in the herbarium of the New York Botanical Garden, is a clump with woolly foliage and spikelets 1.8 to 1.9 mm. long.

DESCRIPTION

Closely related to *P. setaceum*, the culms stouter, ascending or spreading, the foliage more aggregate at the base, densely grayish-villous, the more spreading blades as much as 9 mm., commonly 5 to 7 mm., wide; racemes more commonly 2, rarely 3, on the average somewhat longer, the pedicels nearly terete, the spikelets 1.8 to 1.9 mm. long, usually pubescent with minutely capitate hairs, speckled more plentifully than in *P. setaceum*.

Paspalum setaceum and *P. debile* are both variable and appear to intergrade. Michaux differentiates *P. debile* from *P. setaceum* by its weak (instead of erect) culms and its spikelets solitary and puberulent, instead of paired and glabrous. As in all this group the second of the pair of spikelets is sometimes undeveloped.

Several of the Texas specimens and the one from Mexico are much less villous than is typical, the plants, except for the small spikelets and olivaceous color, somewhat resembling *P. stramineum*.

DISTRIBUTION

Sandy mostly dry soil, barrens and flatwoods, Long Island, New York, to Florida and Texas; also in Mexico and Cuba.

NEW YORK: Three Mile Harbor, Latham in 1925.

NEW JERSEY: Atsion, *Commons* 88. Wildwood, *Chase* 3494½. Smithburg, *Pearce* 1884.

NORTH CAROLINA: Winter Park Heights, *Chase* 7144. Greenville, *Chase* 4574.

GEORGIA: Manor, *Tabor* 39.

FLORIDA: Lake City, *Combs & Rolfs* 146. Jacksonville, *Curtiss* 5092 in part. Gainesville, *Combs* 720. Old Town, *Combs* 852, 892. Dunnellon, *Combs* 905. Crystal, *Combs* 1019. Floral City, *Swallen* 341. Eustis, *Chase* 4069; *Nash* 946, 2019. Grasmere, *Combs & Baker* 1034. Pierson, *Dowell* 7344. Lavignes Landing, *Baker* 250. Titusville, *Chase* 3971, 4027. Brevard County, *Fredholm* 5915. Kissimmee, *Swallen* 266. Port Tampa, *Churchill* in 1923. Polk County, *Foote* in 1885. Fort Myers, *Chase* 4169, 4186; *Hitchcock* 509, 854, 2429. Jensen, *Hitchcock* 753.

ALABAMA: Mobile, *Mohr*. Spring Hill, *Langlois* 18.

MISSISSIPPI: Moss Point, *Tracy* 4632. Scranton, *Tracy* 4632a.

LOUISIANA: Covington, *Wurzlów* in 1914.

TEXAS: Gonzales County, *Bogusch* 498, 500. Encinal, *Griffiths* 6383. Torrecillas, *Griffiths* 6431. El Sordo, *Griffiths* 6447. Sarita, *Hitchcock* 2430, 5442.

"Narcoossee," *Ennis* 4 in 1899. Without locality, *Nealley* in 1887.

VERA CRUZ: Vera Cruz, *Orcutt* 2891.

CUBA: Herradura, *Hitchcock* 471. Cojimar, *Ekman* 1094. Santa Fé, *Léon* 8783.

40. *Paspalum supinum* Bosc

Paspalum supinum Bosc; Poir. in Lam. Encycl. 5: 29. 1804. "Communiquée par Bosc, qui l'a recueillie dans la Caroline." Good specimens so named by Bosc are in the Delessert Herbarium, the Willdenow Herbarium, and in the herbaria at Paris and Padua. The one in the Paris Herbarium (since the species was described by Poirét) is probably to be regarded as the type. The spikelets are 2 to 2.1 mm. long, the glume pubescent, the sterile lemma glabrous, the midnerve developed. The plants are smaller than characteristic of this species, the culms being 22 to 30 cm. long.

Paspalum dasyphyllum Ell. Bot. S. C. & Ga. 1: 106. 1816. "Common in cultivated ground," presumably about Charleston, S. C. The type was examined in the Elliott Herbarium. The spikelets are 2 mm. long, the culm about 35 cm. long.

Paspalum setaceum var. *supinum* Trin. Gram. Icon. 2: pl. 130. 1829. Based on *P. supinum* Bosc.

Paspalum ciliatifolium var. *dasyphyllum* Chapm. Fl. South. U. S. ed. 3. 578. 1897. Based on *P. dasyphyllum* Ell.

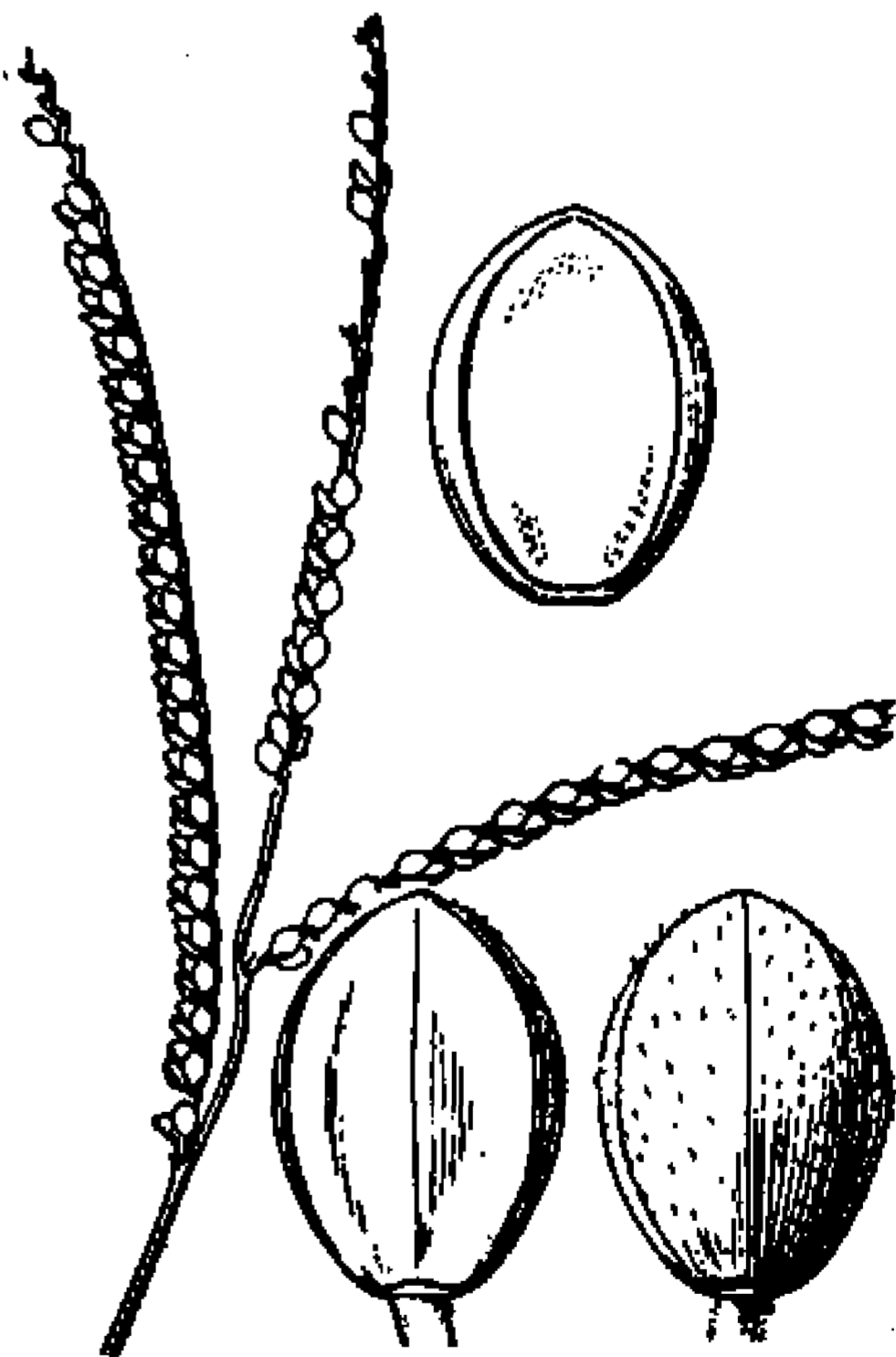


FIGURE 41.—*P. supinum*. From Chase 4572

DESCRIPTION

A spreading tufted perennial with olivaceous coarsely pubescent foliage; culms relatively stout, widely spreading, 30 to 90 cm. long, occasionally bearing leafy branches as well as axillary peduncles, glabrous; nodes glabrous; sheaths rather broad, keeled, hirsute, especially on the keel, or sometimes, especially the upper, sparsely appressed-pubescent or nearly glabrate except on the margin, the lower

overlapping; ligule, a minute membrane with a dense row of stiff white hairs about 2 mm. long back of it; blades flat, rather firm, 12 to 30 cm., commonly 15 to 25 cm., long, 8 to 15 mm. wide, scarcely narrowed to the rounded base, hirsute, commonly densely so, on both surfaces, sometimes finely pubescent beneath the long hairs, the margins papillose-ciliate; peduncles mostly less elongate than in related species; racemes commonly 2 or 3, rarely solitary, very rarely 4 to 6, straight or slightly arching, 4 to 9 cm., rarely 12 cm., long, the rachis pubescent at base, rarely with a few stiff hairs on the back, an occasional pedicel also bearing a long hair; spikelets in pairs, crowded, 2 to 2.1 mm. long, about 1.5 mm. wide, elliptic-obovate, turgid; pale; glume and sterile lemma equal, covering the fruit at maturity, 3-nerved or the lemma more commonly 2-nerved, glabrous, or the glume minutely pubescent with capitate hairs, sometimes slightly speckled, the sterile lemma very rarely also pubescent; fruit about the size and shape of the spikelet, yellowish and shining at maturity.

This is the coarsest of the *Setacea* group.

Small plants with relatively small blades may be distinguished from *Paspalum pubescens* by the dense harsh pubescence, and from *P. debile* by the larger spikelets.

DISTRIBUTION

Dry sandy open ground and old fields, North Carolina to Florida and west to Louisiana.

NORTH CAROLINA: Heiligs Mill, *Small & Heller* 199. Wilmington, *Hitchcock* 312, 2433. Masonboro, *Chase* 4572.

SOUTH CAROLINA: Orangeburg, *Hitchcock* 2434.

GEORGIA: Thomasville, *Tabor* in 1919.

FLORIDA: Florida National Forest, *Chapline (For. Serv.)* 38147. Milton, *Swallen* 423. Santa Rosa County, *Combs* 495. Marianna, *Swallen* 536. Quincy, *Combs* 404. Tallahassee, *Bitting* 833; *Kearney* 71. Monticello, *Combs* 323. Jefferson County, *Hitchcock* 2483. Madison, *Combs* 229½. Suwanee County, *Hitchcock* 2484. Lake City, *Combs & Rolfs* 123, 128, 166; *Hitchcock* 2470, 2485; *Rolfs* 266. Jacksonville, *Curtiss* 5090, 6018; *Hitchcock* 2435. Duval County, *Curtiss* 3576 in part. Gainesville, *Chase* 4197, 4231; *Combs* 719, 755; *Norton* 585b. Old Town, *Combs* 901. Ellzey, *Combs* 808. Floral City, *Swallen* 331. Crystal, *Combs* 1020½. Orange Bend, *Chase* 4117. Eustis, *Chase* 4090; *Hitchcock* 2481, 2482; *Nash* 1418 in part. Eldorado, *Chase* 4124, 4128. Orange City, *Hood* 29. Sanford, *Chase* 4042. Grasmere, *Combs & Baker* 1033. Clarcona, *Meislahn* 170a. Orange County, *Baker* in 1897. Tarpon Springs, *Churchill* in 1923. Hillsborough County, *Fredholm* 6366. Bartow, *Combs* 1175. Manatee, *Rugel* 183. Fort Myers, *Chase* 4138, 4147, 4178; *Hitchcock* 2436. Miami, *Chase* 3862. Dade County, *Small, Mosier & Small* 6458, 6519.

TENNESSEE: Madisonville, *Kefauver*. Lavergne, *Eggert* in 1897.

ALABAMA: Mobile, *Mohr* in 1883.

MISSISSIPPI: Biloxi, *Tracy* 3662. Ocean Springs, *Tracy* 121. Petit Bois Island, *Tracy* 4631.

LOUISIANA: Lake Charles, *Chase* 6075.

41. *Paspalum psammophilum* Nash

Paspalum prostratum Nash in Britton, *Man.* 74. 1901. Not *P. prostratum* Scribn. & Merr. 1901 (earlier than the preceding.) "Southeastern N. Y. to Del." The specimen marked "Type" in Nash's script, collected at Kingsbridge, N. Y., September 13, 1896, by G. V. Nash, no. 514, is in the herbarium of the New York Botanical Garden. It is a tuft of 5 culms with mature raceme.

Paspalum psammophilum Nash in Hitchc. Rhodora 8:205. 1906. Based on *P. prostratum* Nash, 1901.

DESCRIPTION

A spreading perennial in tufts with prostrate culms forming dense mats, grayish olivaceous; culms 25 to 100 cm. long, glabrous; nodes appressed-pubescent or the upper nearly glabrous; sheaths rather broad, softly appressed-pubescent or the upper nearly glabrous except along the margin; ligule almost obsolete, the dense row of hairs back of it about 2 mm. long; blades flat, rather firm, 4 to 16 cm. long, 4 to 11 mm. wide, rounded at base, softly and densely appressed-pubescent on both surfaces, occasionally with a few long hairs as well, the margins usually sparsely papillose-ciliate; racemes 1 to 3, commonly 2, slightly arching, 4 to 9 cm. long, the terminal exerted on a slender peduncle, the axillary on short peduncles, wholly or partly included in the sheaths, often 2 to a sheath, the peduncle of the terminal, and sometimes the internodes of the culm, often looped near their base out of the sheath (evidently confined in the sheath during growth); rachis 1 mm. wide, slightly winged, short-pubescent at base; spikelets in pairs, crowded on flat pedicels, the lower often winged at base, 2 mm. long, about 1.7 mm. wide, suborbicular, the glume slightly shorter than the sterile

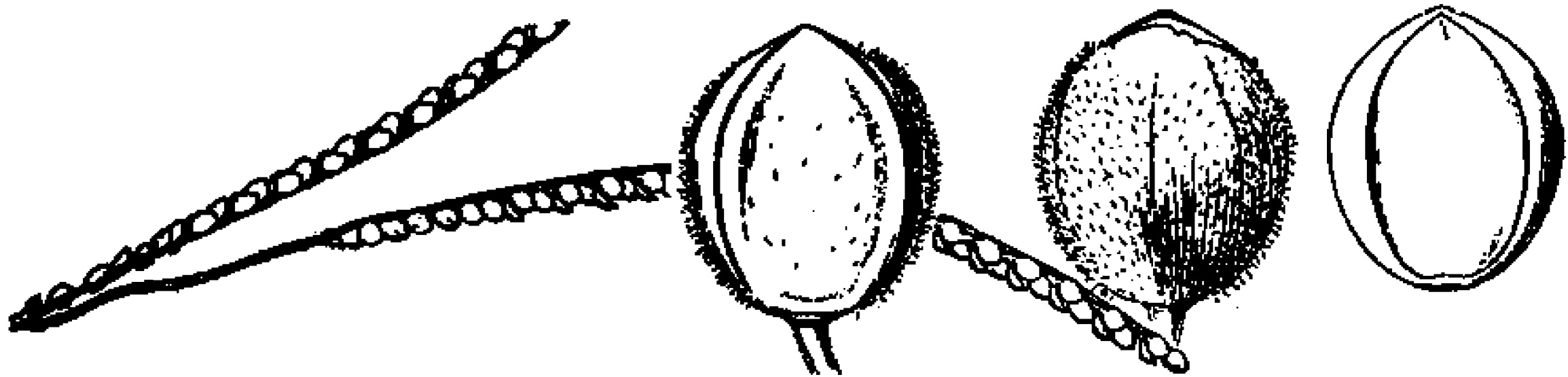


FIGURE 42.—*P. psammophilum*. From type specimen and Graves, New York, in 1898

lemma, 3 to 5 nerved, densely short-pubescent (the hairs scarcely capitate) or glabrous at the hyaline, somewhat erose summit; sterile lemma commonly, 2-nerved, very sparsely pubescent; fruit about the size and form of the spikelet yellowish, smooth and shining.

The spikelets of the axillary racemes are cleistogamous.

DISTRIBUTION

Dry sandy soil, mostly near the coast, Massachusetts to New Jersey.

MASSACHUSETTS: West Barnstable, *Knowlton* in 1911. Marthas Vineyard, *Flynn* in 1899.

RHODE ISLAND: Warwick, *Spalding* in 1916. Block Island, *Fernald & Long* 8498. Without locality, *Congdon*.

CONNECTICUT: Stamford, *White* in 1919. Sprague, *Graves* 240, 255; *Woodward* in 1913. Old Saybrook, *Bissell* in 1904.

NEW YORK: Bay View, *Latham* 3520. Shinnecock Hills, *House* 9750. Fishers Island, *Graves* in 1898. Gardiners Island, *Dobbin* 15.

NEW JERSEY: Stockton, *Fisher* in 1897. Atco, *Commons* 232. Atsion, *Chase* 3568. Camden, *Scribner* in 1882

42. *Paspalum stramineum* Nash

Paspalum stramineum Nash in Britton, Man. 74. 1901. "Neb., Kans. and Ind. Terr." The specimen marked "Type" in Nash's script, collected on Middle Loup River, near Mullen, Hooker County, Nebr., July 19, 1893, by P. A. Rydberg, no. 1582, in the herbarium of the New York Botanical Garden, is a mature

plant with blades glabrous or nearly so beneath, puberulent and sparsely pilose above, and spikelets glabrous or obscurely pubescent. The upper of the axillary racemes is partly exserted, the lower included in the sheath.

Paspalum bushii Nash in Britton, Man. 74. 1901. "In dry soil, Mo." The specimen marked "Type" in Nash's script, collected at Bernie, Mo., August 2, 1895, by B. F. Bush, no. 730, in the herbarium of the New York Botanical Garden, consists of two tall plants with blades densely puberulent on both surfaces and sparsely long-pilose as well on the upper, and terminal racemes of pubescent spikelets. The axillary racemes are wholly inclosed in the sheaths.

Paspalum stramineum and *P. bushii* are published on the same page, the first above. "Priority of position" has little weight, since it is not priority in time;

but the larger number of collections are the less pubescent form like the type of *P. stramineum*, the type of *P. bushii* being an extremely pubescent form relatively infrequent.

DESCRIPTION

A slender yellowish-green perennial, in tufts of few to several culms, erect or nearly so, or rarely spreading; culms 40 to 100 cm. tall, glabrous; nodes obscurely appressed-pubescent or glabrous; sheaths rather broad, often about as long as the internodes, pubescent along the margin, especially toward the summit, the lower often puberulent on the surface; ligule nearly 1 mm. long, the white hairs back of it about 2 mm. long; blades flat, ascending to spreading, rather firm, 6 to 20 cm., rarely to 30 cm., long, 6 to 10 mm., rarely to 15 mm., wide, rounded at the base, puberulent on both surfaces, rarely obscurely so, and sparsely pilose as well, or the lower surface nearly or quite glabrous except for a few long hairs mostly along the mid nerve, the margins commonly papillose-ciliate; racemes 2 or 3 (when 3 the terminal frequently reduced), 6 to 14 cm. long, arching,

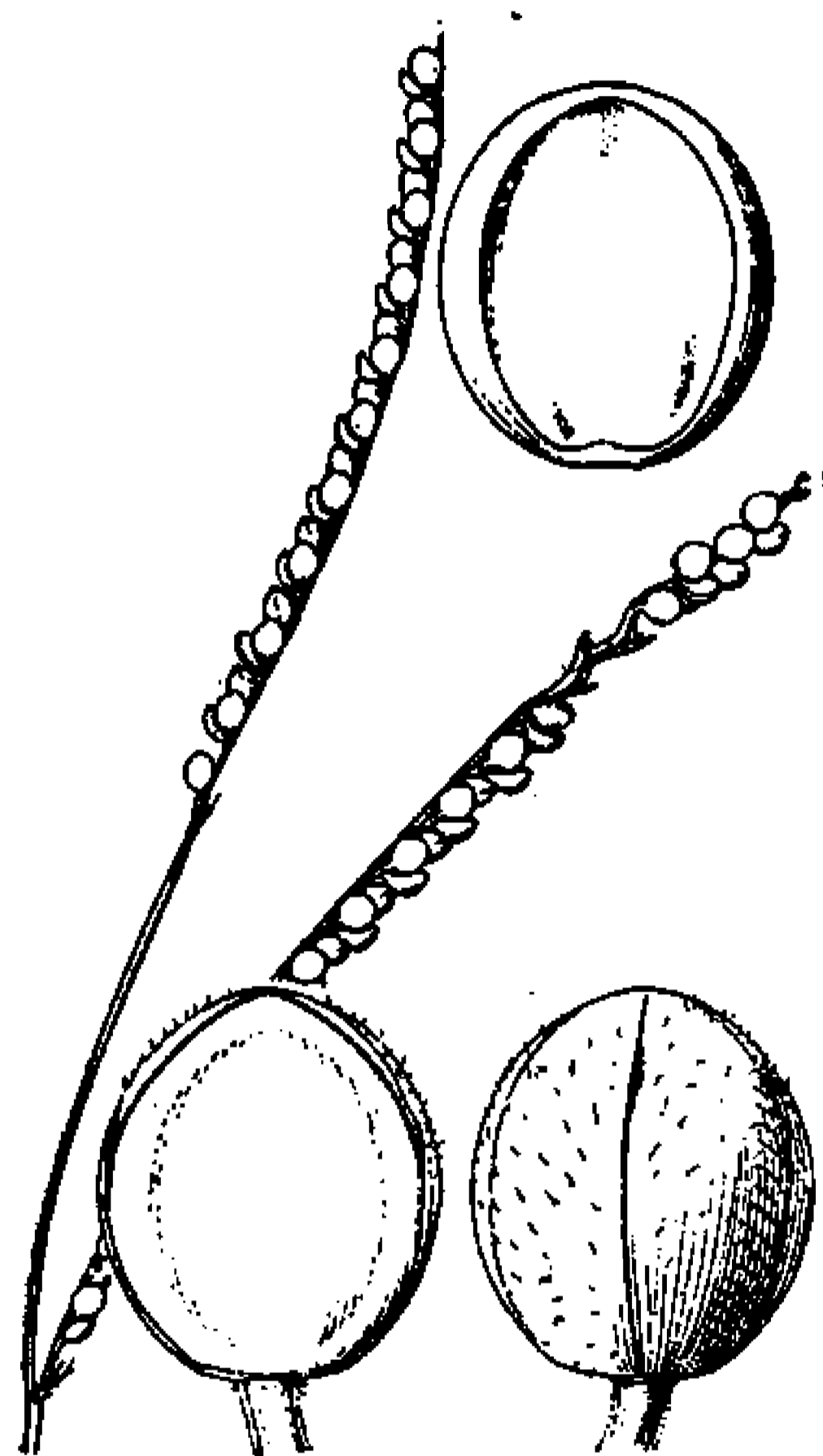


FIGURE 43.—*P. stramineum*. From type collection

the terminal exserted on a slender peduncle, the axillary on short peduncles, often wholly or partly included in the sheaths or one short-exserted, the second included, short racemes commonly borne in basal sheaths; rachis about 1 mm. wide, slightly winged, with a few long hairs at base; spikelets in pairs, crowded or relatively loose on flat pedicels, 2.1 to 2.2 mm. long, nearly 2 mm. wide, sub-orbicular, pale or whitish, the glume 3-nerved, sparsely to rather densely pubescent or sometimes glabrous, the sterile lemma 2-nerved, the mid nerve rarely developed, glabrous; fruit about the size and form of the spikelet, yellowish, smooth and shining.

The spikelets of the axillary racemes are cleistogamous.

DISTRIBUTION

Sandy soil, in open ground or open woods, Indiana to Minnesota, Texas, New Mexico, and northwestern Mexico.

INDIANA: Millers, *Umbach* 4178; *Umbach* (*Kneucker Gram.*) 807. Michigan City, *Deam* 39689. Buffalo, *Deam* 39372.

- ILLINOIS: Oquawka, *Patterson*. Alton, *Hill* 201 in 1872. Manito, *Wilcox* 56. Beardstown, *Bock & Chase* 206; *McDonald* in 1900. Mt. Carmel, *Waite* in 1887. Anna, *Seymour* in 1880.
- WISCONSIN: Trempealeau, *Fassett* 5164. Qualaska, *Fassett* 5165. La Crosse, *Pammel* 619.
- MINNESOTA: Weaver, *Fassett & Hotchkiss* 2894, 2905. Kellogg, *Fassett & Hotchkiss* 2895.
- IOWA: Iowa City, *Somes* 223, 3606, 3631.
- NEBRASKA: Mullen, *Rydberg* 1582. Halsey, *Hitchcock* 11064. Holt County, *Clements* 2817.
- MISSOURI: Kansas City, *Bush* 6501, 8156, 8165. Sibley, *Bush* 4818. Grandview, *Bush* 1771. Graydon Springs, *Standley* 9936. Allenton, *Letterman* in 1883 and 1894. Campbell, *Bush* 6329. Carruthersville, *Hitchcock* 2437.
- KANSAS: Bow Creek, *Popenoe* in 1875. Manhattan, *Hitchcock* 2381, 2534, 10414; *Kellerman* 8, 30. Riley County, *Norton* 563. Topeka, *Popenoe* in 1878. Lawrence, *Stevens* 21. Wichita, *Smyth* 232.
- TEXAS: Texline, *Griffiths* 5649. Magenta, *Ball* 1655. Littlefield, *Tharp* 4142. Chillicothe, *Ball* 1155. Denison, *Bebb* 1431, 2673. Weatherford, *Tracy* 7937. Handley, *Ruth* 479, 490. Dallas, *Bush* 1163; *Reverchon* 1068, 2832 A. Terrell, *Warburton* 9. Llano, *Plank* 16; *Smith* in 1897. Marsh, *Tharp* 3928. Rockport, *Chase* 6044, 6047, 6064. Brazos County, *Nealley* in 1882. Copano Bay, *Tharp* 1768. Sarita, *Hitchcock* 5488. Ringgold, *Swallen* 980. Without locality, *Hall* 802; *Reverchon* 87.
- OKLAHOMA: Longdale, *Stevens* 814. Alva, *Stevens* 1669. Stillwater, *Hitchcock* 2438. Wichita National Forest, *Rose (For. Serv.)* 42802. False Washita, *Palmer* 368 in 1868.
- COLORADO: Colorado Springs, *Chase* 5293.
- NEW MEXICO: Nara Visa, *Fisher* 34. San Andreas Mountains, *Wooton* in 1914. Roswell, *Griffiths* 5684, 5734. Hagermans, *Wooton* in 1914.
- ARIZONA: Patagonia Mountains, *Peebles & Harrison* 4745.
- SONORA: Between Nogales and Cocospora Ranch, *Griffiths* 6805.
- CHIHUAHUA: Paso del Norte, *Pringle* 1123.

43. *Paspalum pubescens* Muhl.

Paspalum pubescens Muhl. in Willd. Enum. Pl. 89. 1809. "Muhlenberg in litt. * * * Habitat in Carolina." The racemes are described as "subternis," the spikelets glabrous. Three racemes are infrequent in *P. pubescens*, but otherwise the brief description applies well to the specimen so named in the Muhlenberg Herbarium in the Academy of Natural Sciences, Philadelphia. This is like the type of *P. muhlenbergii* Nash. Willdenow cites *P. ciliatifolium* Michx. as a synonym. As shown (p. 86) the type specimen of *P. ciliatifolium* Michx. includes a specimen of *P. pubescens*.

Paspalum muhlenbergii Nash in Britton, Man. 75. 1901. "Mass. to Mo. and Ind. Terr., south to S. Car., Ga., and Miss." The specimen marked "Type" in Nash's script was collected at Vault Hill, near Van Cortlandt Park, N. Y., August 2, 1896, by E. P. Bicknell. In this specimen, now in the herbarium of the New York Botanical Garden, the culms are glabrous below the solitary racemes, the blades are 6 to 7 mm. wide, and the spikelets are glabrous, 2.1 mm. long.

Paspalum pubescens var. *muhlenbergii* House, N. Y. State Mus. Bull. 243-244: 39. 1923. Based on *Paspalum muhlenbergii* Nash.

The species described as *P. ciliatifolium* Michx. by LeConte⁸⁷ is *P. pubescens*, the description possibly drawn from the specimen of *P. pubescens* in the Paris Herbarium included in *P. ciliatifolium*. LeConte cites only "Georgia. Michaux."

⁸⁷ Journ. de Phys. 91: 284 1820.

Trinius⁸⁶ refers "*P. ciliatifolium* Michx. et Ell." to *P. setaceum*. This is catalogued in Index Kewensis as "*P. ciliatifolium* Trin." *P. pubescens* is the species intended.

DESCRIPTION

A slender perennial in dense tufts, rather yellowish-green to olivaceous; culms slender, ascending to spreading, 45 to 90 cm. tall, strongly compressed, glabrous; nodes glabrous; sheaths keeled, pilose toward the summit or at least on the keel and along the margin, sometimes throughout, or the lower, rarely all, glabrous except along the margin; ligule a minute membrane with a dense row of white hairs 3 to 4 mm. long back of it; blades flat, 8 to 20 cm., rarely to 30 cm., long, 2 to 10 mm., rarely to 15 mm., wide, mostly linear, slightly narrowed to a base scarcely wider than the sheath or the upper rounded at base (in the wider-leaved

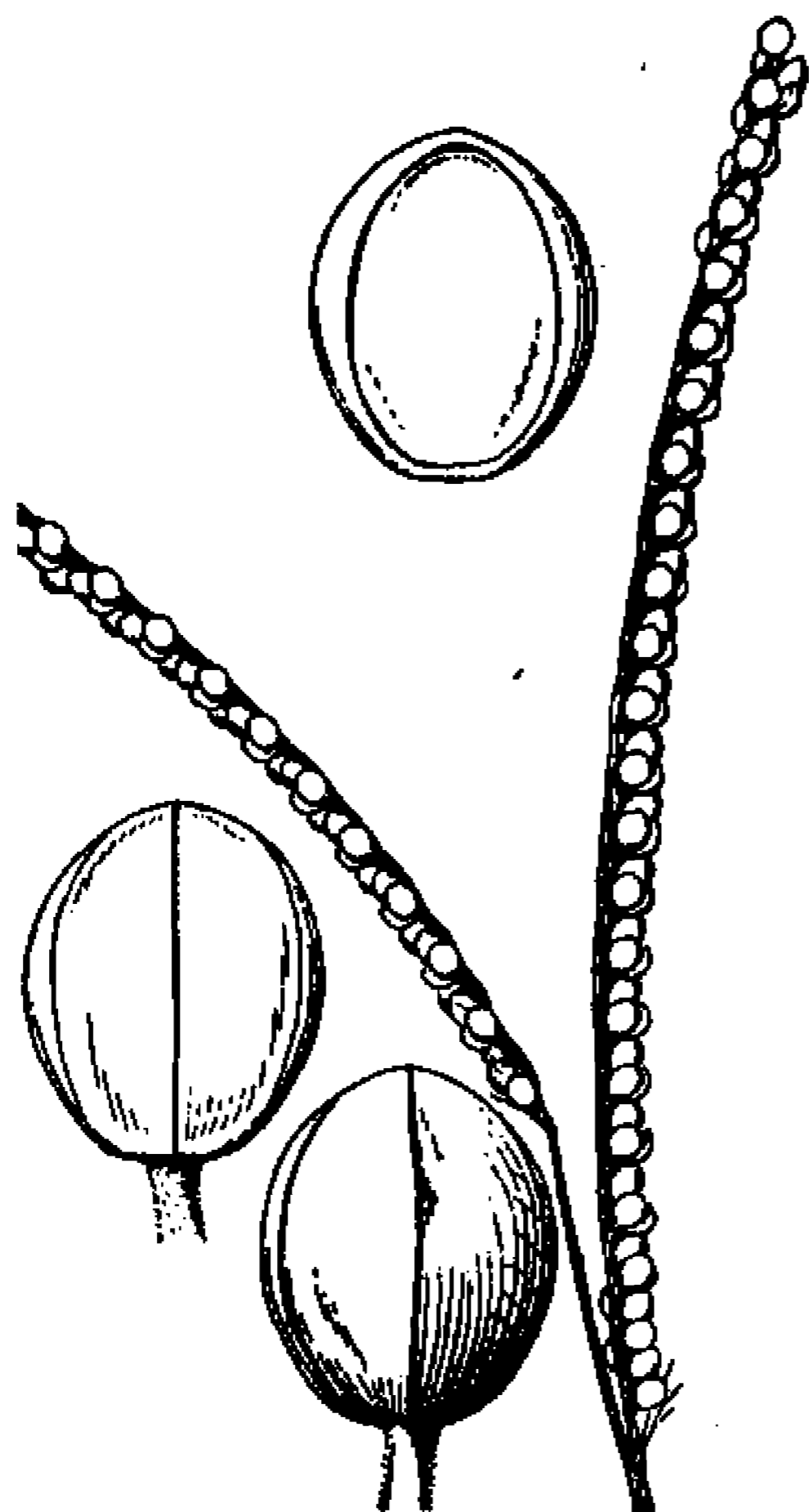


FIGURE 44.—*P. pubescens*. From Hitchcock
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specimens all more or less rounded), from sparsely to conspicuously pilose on both surfaces, sometimes minutely puberulent beneath the long hairs on the upper surface; peduncles slender, flat, finally elongate, often pilose toward the summit, the axillary 1 or 2 from upper and middle nodes; racemes 1 to 3, more commonly solitary, mostly arching, 4 to 15 cm., rarely to 17 cm., long, the rachis long-pilose at base, the common axis occasionally pilose; spikelets in pairs, crowded on short pedicels, the lower often winged at base, 1.9 to 2.1 mm. long, 1.7 to 1.9 mm. wide, suborbicular to broadly obovate, the glume and sterile lemma subequal, 3-nerved, or the glume rarely 4 or 5 nerved, or the mid nerve of the lemma suppressed, glabrous, the glume rarely sparsely pubescent; fruit about the size and shape of the spikelet.

This species varies in the amount of pubescence. The spikelets are more uniform in shape and size than in most species of this group. Plants with very narrow blades resemble *P. setaceum* but the spikelets are larger. *Paspalum pubescens* is common in pastures and old fields and is reported to be of considerable forage value in Indiana, Tennessee, Alabama, and Florida.

The following specimens have foliage less pubescent than characteristic, approaching the sparsely pubescent plants of *P. ciliatifolium*: Chase 3008, 3011, 4046, 4399, 6052; Curtiss 3576 (a coarse plant with much the habit of *P. supinum*); Deam 42561; Grimes 869; Hitchcock 2439, 2446 (spikelets only 1.8 mm. long); Hubbard 507; Ricker 912; Tracy 7937.

DISTRIBUTION

Dry or moist open ground or open woods, more common in sandy regions, Vermont and Massachusetts to Florida, and west to Michigan, Oklahoma, and Texas.

⁸⁶ Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 340. 1834.

- VERMONT: Vernon, *Grout* in 1895.
- MASSACHUSETTS: Worcester, *Eaton* in 1878. Dedham, *Mohr & Faxon* in 1895. Berlin, *Hubbard* 507. Sherborn, *Loomis* 1666. Winchester, *Boott* in 1857. Plymouth, *Oakes*. Carver, *Fernald, Hunnewell & Long* 8505. Sandwich, *Fernald & Long* 17891. West Barnstable, *Knowlton* in 1911. West Tisbury, *Seymour* 1041. Nantucket, *Flynn* in 1899.
- CONNECTICUT: Salisbury, *Bissell* in 1906. Stratford, *Eames* in 1895. Huntington, *Harger* 5741. East Hartford, *Weatherby* in 1922. South Glastonbury, *Wilson* 5. Windham County, *Round* in 1900. East Lyme, *Graves* 241. Grotton, *Graves* 245, 246.
- RHODE ISLAND: Westerly, *Weatherby & Collins* in 1919. Block Island, *Fernald, Hunnewell & Long* 8499; *Fernald, Long & Torrey* 8502.
- NEW YORK: Lake Waccabuc, *Pollard* in 1894. East Marion, *Latham* 258, 263. Orient, *Latham* 321 and in 1915.
- NEW JERSEY: Clifton, *Kearney* in 1894. Atsion, *Chase* 3491.
- PENNSYLVANIA: Penryn, *Heller* 764. Conewago, *Heller* in 1901. Smithville Swamp, *Small* in 1889. Easton, *Porter* in 1895. Tullytown, *Pollard* in 1897. Philadelphia, *Scribner* in 1878.
- OHIO: Sandusky, *Kellerman* 6807. Perkins, *Mosely* in 1898.
- INDIANA: Kewanna, *Deam* 42159. Lake Village, *Deam* 39775 A. Centerville *Deam* 13590. Mansfield, *Deam* 35003. Ferndale, *Deam* 42473. Russellville, *Grimes* 907. Greencastle, *Grimes* 869. Morton, *Deam* 37824. Brazil, *Deam* 42484. Quincy, *Deam* 41829 A. Coal City, *Deam* 35006. Merom, *Deam* 7302. Grayville, *Deam* 18229. Bloomington, *Deam* 26068. Mt. Carmel, *Deam* 41745, 42561. Washington, *Deam* 35068. Cedar Cliffs, *Deam* 17161. Between Paoli and Orleans, *Deam* 26231. Clark County, *Deam* 27992. Princeton, *Deam* 32994. Marengo, *Deam* 33404. St. Croix, *Deam* 41593. Central, *Deam* 41540. Wadesville, *Deam* 42581.
- ILLINOIS: Marshall, *Bock & Chase* 18. Lawrenceville, *Bock & Chase* 40. Maude, *Bock & Chase* 51. Mt. Carmel, *Patterson* in 1877. Browns, *Bock & Chase* 54. Albion, *Bock & Chase* 58. Carmi, *Bock & Chase* 59. Harrisburg, *Bock & Chase* 68. Brownsville, *Bock & Chase* 73. Eichorn, *Bock & Chase* 79. Golconda, *Bock & Chase* 100. Metropolis, *Bock & Chase* 104. Grand Chain, *Bock & Chase* 143. Cairo, *Bock & Chase* 151. Unity, *Bock & Chase* 163. Carbondale, *Bock & Chase* 177. Ruma, *Bock & Chase* 191. Red Bud, *Bock & Chase* 193. Hardin, *Bock & Chase* 198. Beardstown, *Bock & Chase* 203.
- MICHIGAN: Detroit, *Farwell* 1435, 1781.
- MISSOURI: Paw Paw Junction, *Bush* 336. Aberdeen, *Bush* 943. Sibley, *Bush* 4823. Atherton, *Bush* 1763. Columbia, *Hitchcock* 2340. St. Louis, *Ball & Brodie* in 1903; *Eggert* in 1875. Allenton, *Kellogg* 39. Jefferson County, *Eggert* in 1896. Webb City, *Palmer* 3066. Springfield, *Hoover* in 1897; *Standley* 8424. Eagle Rock, *Bush* 3128, 3129. Carruthersville, *Hitchcock* 2341.
- DELAWARE: Greenbank, *Commons* 87. Stanton, *Commons* 313.
- MARYLAND: Great Falls, *Chase* 5872, 7007, 7008. Chevy Chase, *Chase* 2586, 3003. Leonardtown, *Hitchcock* 7858. Berwyn, *Chase* 9948.
- DISTRICT OF COLUMBIA: Chevy Chase, *Chase* 9938; *Dewey* 125. Takoma Park, *Chase* 2575. Bennings, *Hitchcock* 2417; *Pollard* in 1897. Washington, *Ball* in 1899; *Pollard* 611; *Steele* in 1896; *Ward* in 1876.
- VIRGINIA: Luray, *Chase* 9964. Chain Bridge, *Hitchcock* 2439. Fourmile Run, *Chase* 3008, 3011, 3018; *Dewey* 323. Burkes, *Ball* in 1902. Williamsburg, *Grimes* 3022. Ewell, *Grimes* 4480. Dismal Swamp, *Chase* 3649. Lynn Haven, *Chase* 2941. Cape Henry, *Kearney* 1856. Virginia Beach, *Britton* in 1895; *Williams* 3093.
- WEST VIRGINIA: Morgantown, *Berkley* in 1928.

- NORTH CAROLINA: Biltmore, *Hitchcock* 299, 2342. Wilmington, *Hitchcock* 2446.
- SOUTH CAROLINA: Orangeburg, *Hitchcock* 2343. Floyd, *Norton* 358a. Ebenezer, *Barlett* 2838. Isle of Palms, *Norton* 367b.
- GEORGIA: Stone Mountain, *Hitchcock* 298. Savannah, *Kearney* 198. Waycross, *Ricker* 912. Dock Junction, *Ricker* 969.
- FLORIDA: Pensacola, *Combs* 518. Chipley, *Combs* 629. Lake City, *Combs & Rolfs* 175; *Rolfs* 983. Waldo, *Combs* 699. Gainesville, *Chase* 4236. Hillsborough County, *Fredholm* 6387. Bartow, *Combs* 1176. Without locality, *Curtiss* 3576 in part.
- KENTUCKY: Frankfort, *Terrill* in 1892. Hawesville, *Garman* in 1898.
- TENNESSEE: Knoxville, *Scribner* in 1889 and 1893. Lookout Mountain, *Ruth* 81.
- ALABAMA: Pisgah, *Chase* 4480. Tuskegee, *Carver* 16.
- MISSISSIPPI: Panola County, *Eggert* in 1896. Waynesboro, *Kearney* 162. Nicholson, *Kearney* 350, 355. Biloxi, *Chase* 4345; *Kearney* 219; *Tracy & Ball* 33. Ocean Springs, *Kearney* 297; *Tracy* 113, 147. Scranton, *Tracy* 4632.
- ARKANSAS: Pine Bluff, *Hitchcock* 16118. Benton County, *Plank* 6. Without locality, *Harvey* in 1884.
- LOUISIANA: Calhoun, *Ball* 47. Rayville, *Ball* 12. Coushatta, *Ball* 113. Alexandria, *Ball* 170. Covington, *Arsène* 11260. Lake Charles, *Chase* 4399, 4402, 4417; *Hitchcock* 2444. Oberlin, *Ball* 187.
- TEXAS: Handley, *Ruth* 576. Texarkana, *Heller* 4244. Waller County, *Thurrow* in 1898. Houston, *Thurrow* in 1898. Rockport, *Chase* 6052.
- OKLAHOMA: Wister, *Hitchcock* 2445. Guthrie, *Stevens* 3217. Wichita Mountains, *Swallen* 994. Without locality, *Stevens* 1310.

44. *Paspalum ciliatifolium* Michx.

Paspalum ciliatifolium Michx. Fl. Bor. Amer. 1: 44. 1803. "Hab. in Carolina." The type, bearing the name in Michaux's script, is in the Paris Herbarium, labeled "Hab. in Carolina, Georgia." This consists of three specimens: (1) A single entire culm with linear, sparsely pilose blades, 3 to 4 mm. wide, and one raceme, the spikelets all fallen. This is not identifiable with certainty, but is probably *P. setaceum*. (2) A piece of culm 50 cm. long, with lower sheath and both surfaces of the blades loosely pilose, the upper sheath ciliate only, and two racemes with glabrous spikelets 2 mm. long. This is the less pubescent form of *P. pubescens*, described as *P. muhlenbergii*. (3) A piece of culm 30 cm. long the blades ciliate, otherwise glabrous, the solitary raceme with minutely pubescent spikelets, 2 mm. long and 1.7 mm. wide. A much better specimen agreeing exactly with this bears the name in Richard's script. The description, "foliis latiusculis, pubescentibus, serrulato-ciliatis * * * glumis * * * glabris" covers both the second and third specimens, assuming the pubescence on the spikelets of the third to have been overlooked. The third is taken as the type because it is what has come to be regarded as "true" *P. ciliatifolium*.

Paspalum spathaceum Desv.; Poir. in Lam. Encycl. Suppl. 4: 314. 1816. "Cette plante croît dans l'Amérique (V. s. in herb. Desv.)" The type has not been located. (A specimen of *P. propinquum* named *P. spathaceum* in the Berlin Herbarium, collected by C. Ehrenberg in St. Thomas, can not be the type, since Ehrenberg visited America about 1836.) The description indicates a specimen of *P. ciliatifolium* in which the upper blade had been split, as in Herb. Fla. Agr. College no. 1182.

Paspalum latifolium LeConte, Journ. de Phys. 91: 284. 1820. "Habitat in Carolina australi prope Columbianam." The type, in the herbarium of the Academy of Natural Sciences, Philadelphia, is part of a luxuriant specimen with

blades 17 to 25 cm. long and 2 to 2.5 cm. wide, glabrous on both surfaces and sparingly ciliate on the margin. The spikelets are mostly glabrous, but some are obscurely pubescent on the second glume.

Paspalum ciliatifolium var. *brevifolium* Vasey, Proc. Acad. Phila. 1886: 285. 1886. "In Herb. Scribner * * * collected by Mr. Isaac Burk on the ballast grounds of Philadelphia." This specimen, now in the National Herbarium, is a lax plant with blades 7 to 14 mm. long.

Paspalum setaceum var. *ciliatifolium* Vasey, Contr. U. S. Nat. Herb. 3: 17. 1892. Based on *P. ciliatifolium* Michx.

Paspalum chapmani Nash, Bull. N. Y. Bot. Gard. 1: 290. 1899. "Collected by Dr. A. W. Chapman in Florida." The type, in the herbarium of Columbia University, has pubescent suborbicular spikelets 2.1 mm. long and 1.8 mm. wide.

Paspalum eggertii Nash, Bull. N. Y. Bot. Gard. 1: 434. 1900. "On sandy river banks, Arkansas. Type in the herbarium of Columbia University, collected by Mr. H. Eggert near Pine Bluffs, Jefferson Co., Sept. 4, 1896." In this specimen the lower sheaths are softly pubescent; the blades are mostly wholly glabrous, with a few cilia toward the base; a few are minutely puberulent on the lower surface or on the upper surface at the base. The sparsely pubescent spikelets are 2.1 mm. long.

Paspalum blepharophyllum Nash in Small, Fl. Southeast. U. S. 71, 1326. 1903. "Type, Nash, Pl. Cent. Penins. Fla. no. 1426, in Herb. Nash." This specimen, now in the herbarium of the New York Botanical Garden, agrees perfectly, as subsequently written on the sheet by Nash, with the right-hand plant of the Michaux specimen, referred to above as (3), except that the spikelets of the Michaux plant are a little more pubescent.

Paspalum epile Nash in Small, Fl. Southeast. U. S. 72, 1326. 1903. "Type, Key West, Blodgett, in Herb. C. U." This specimen, in the herbarium of Columbia University, is an overmature robust plant, with rather firm glabrous blades and broad spikelets 2 mm. long, as in the type of *P. ciliatifolium*, but glabrous.

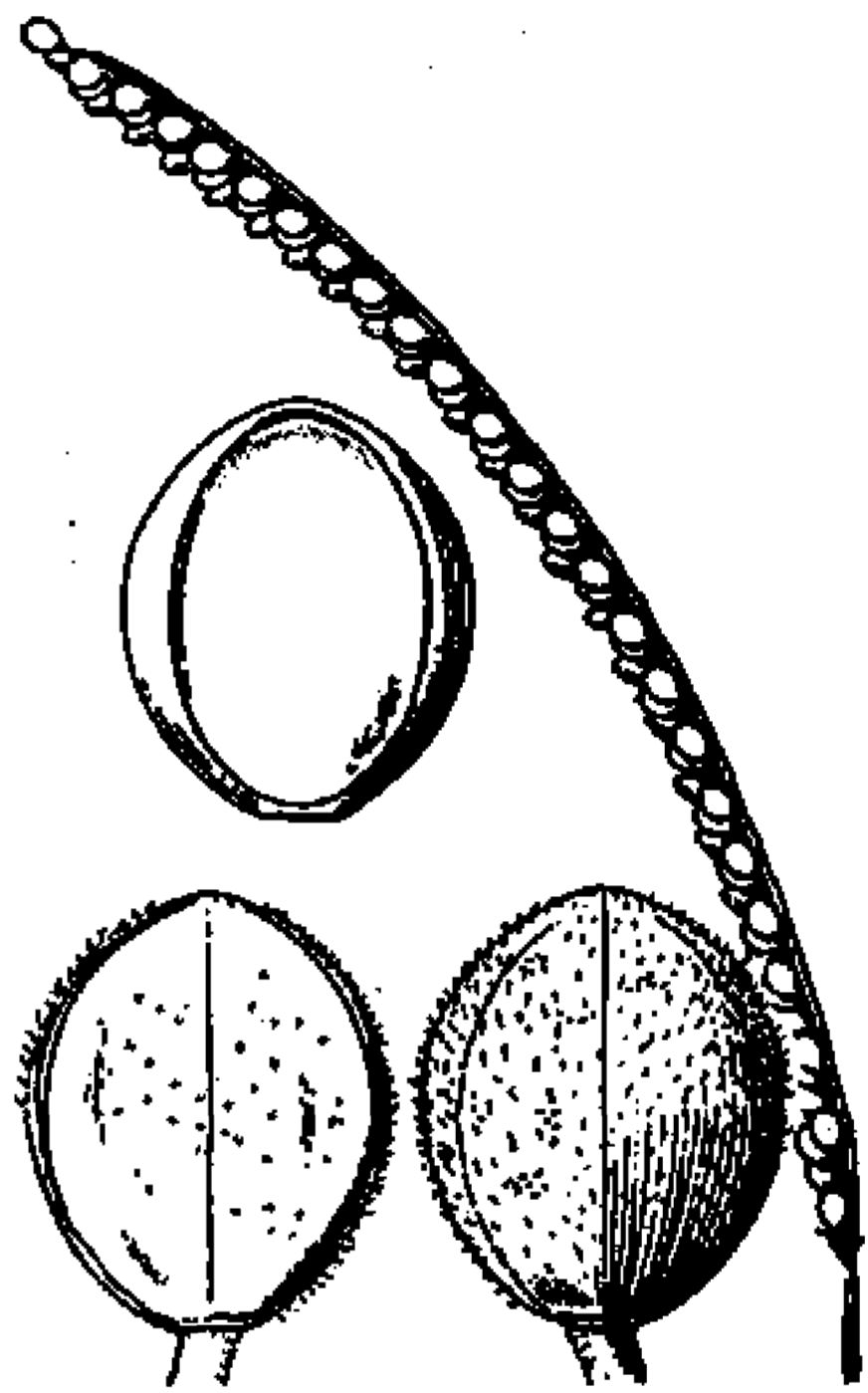


FIGURE 45.—*P. ciliatifolium*. From type specimen and Nash 1426

DESCRIPTION

A slender perennial in rather open tufts, purplish brown toward the base; culms erect to spreading, 35 to 90 cm. tall, glabrous; nodes glabrous; sheaths keeled, rather broad, glabrous or pubescent along the margin, or the lower from puberulent to appressed-pubescent; ligule minute, membranaceous, with a dense row of hairs 2 to 3 mm. long back of it, commonly produced into an erect auricle 0.5 to 1 mm. long on one or both margins; blades flat, from lax to rather firm, ascending to spreading, 10 to 35 cm. long, 7 to 20 mm. wide (rarely as much as 48 cm. long and 25 mm. wide), rounded to subcordate at base or narrowed to the width of the sheath, typically strongly ciliate along a minutely undulate cartilaginous margin, but sometimes ciliate toward the base only, very rarely not at all ciliate, otherwise glabrous or pilose along the mid nerve below or minutely pubescent toward the apex, rarely throughout; racemes 1 to 3, rarely 4, slender, arching, 4 to 15 cm., commonly 7 to 10 cm., long, the slender rachis with a tuft of hairs at base; spikelets in pairs, crowded, 1.9 to 2.1 mm. long, 1.3 to 1.7 mm.

wide, from elliptic-obovate to suborbicular, strongly plano-convex, the glume slightly shorter than the sterile lemma exposing the summit of the fruit at maturity, both 3-nerved, or the midnerve of the lemma suppressed, glabrous, or, especially the glume, minutely pubescent with obscurely capitate hairs, commonly minutely speckled; fruit about the size and shape of the spikelet, pale, smooth and shining.

Paspalum ciliatifolium is a polymorphic species. Study of a great amount of material has made it impossible to recognize as distinct the groups segregated by Nash. Pubescence on foliage and spikelets varies in a single plant. Rather stout, somewhat paler seacoast plants, with firmer blades scarcely ciliate, are the form described as *P. epile*. Plants with softly pubescent lower sheaths, and blades but slightly ciliate, are the form described as *P. eggertii*. The shape of the spikelet varies in a single raceme from elliptic-obovate to suborbicular. The spikelets tend to become rounder at maturity, but both mature and immature are found of both shapes. The spikelet shown in figure 45 was drawn in the Paris Herbarium from the Michaux specimen. In the majority of specimens the spikelets are less rounded than this.

Besides the above variations there are a number of specimens, otherwise typical or fairly typical *P. ciliatifolium*, in which the spikelets are only 1.7 to 1.9 mm. long. These and the specimens of *P. longepedunculatum* with unusually large spikelets approach, but the blades in those referred to *P. ciliatifolium* are larger and not aggregate toward the base.

The most characteristic form is greener than the other species of this group and less leafy at base, the lower blades reduced.

In the following specimens the spikelets are 1.8 to 1.9 mm. long: *Chase* 3988, 3993, 4049, 4054, 4145, 4275, 4367; *Combs* 243, 257, 357; *Eaton* 69; *Hitchcock* 631; *Norton* 367c; *Standley* 18906; *Thomas* 31.

In the following the foliage is sparsely pubescent, approaching the less pubescent specimens of *P. pubescens*: *Chase* 4046; *Hitchcock* 2448; *Norton* 340; *Plank* 61; *Rolfs* 800; *Tracy* 3679, 3688. Some of these also have spikelets 1.8 to 1.9 mm. long.

DISTRIBUTION

Open ground or open woods, mostly sandy, New Jersey to Florida, Tennessee, Arkansas, and Texas; also in Honduras and the West Indies.

NEW JERSEY: Without locality, *Torrey* (?) 24.

MISSOURI: Webb City, *Palmer* 31679.

DISTRICT OF COLUMBIA: Washington, *Chickering* in 1873; *Vasey* in 1882.

VIRGINIA: Natural Bridge, *J. Ball* in 1884. Luray, *Chase* 9963. Arlington, *Ball* in 1903. Fort Monroe, *Vasey* in 1879.

NORTH CAROLINA: Biltmore, *Biltmore Herb.* 4302a. Wilmington, *Hitchcock* 2449; *Kearney* 277.

SOUTH CAROLINA: Aiken, *Ravenel* in 1869 and 1882. Orangeburg, *Hitchcock* 2450, 2451. Isle of Palms, *Chase* 4546, 4547, 4552; *Hitchcock* 2452; *Norton* 367c. Beaufort, *Chase* 7113.

GEORGIA: Stone Mountain, *Chase* 4511; *Eggert* in 1897; *Hitchcock* 206½; *Norton* 340. Albany, *Tracy* 3680. Brunswick, *Chase* 7096.

FLORIDA: Pensacola, *Combs* 519. Milton, *Chase* 4311; *Swallen* 461. De Funiak Springs, *Combs* 459. Chipley, *Combs* 543. Bay Head, *Combs* 639. Marianna, *Swallen* 561. Apalachicola, *Chapman*; *Kearney* 98. Quincy, *Combs* 405. Tallahassee, *Combs* 357, 359; *Kearney* 70; *Nash* 2359a. Monticello, *Combs* 304. Madison, *Combs* 236, 243, 257. Lake City, *Bitting* 831, 1007; *Chase* 4275; *Hitchcock* 2474, 2475; *Rolfs* 800. Jacksonville, *Curtiss* 5079, 6017. Palm Beach, *Hitchcock* 2471, 2477, 2479. Pablo Beach, *Chase* 7030. Duval County,

- Fredholm* 135. St. Augustine, *Chase* 7017. Gainesville, *Chase* 4223, 4237; *Combs* 735, 736; *Norton* 385a. Gulf Hammock, *Garber* in 1876. Cedar Key, *Combs* 770, 800. Dunnellon, *Combs* 917. Homosassa, *Combs* 925. Floral City, *Swallen* 340. Orange Bend, *Chase* 4107, 4111. Eustis, *Chase* 4046, 4049, 4054, 4084; *Hitchcock* 2473, 2476; *Nash* 209, 600, 1001, 1418, 1426. Tavares, *Hitchcock* 816. McDonald, *Baker* 60. Grasmere, *Combs & Baker* 1032. Orange City, *Hood* in 1911. Spruce Creek, *Baker* 248. Titusville, *Chase* 3975, 3976, 3988, 3993, 4003, 4010; *Swallen* 142. Merritt Island, *Swallen* 172. Fellsmere, *Tracy* 9306. Jensen, *Hitchcock* 742. Kissimmee, *Swallen* 249. Lakeland, *Hitchcock* 832. Hillsborough County, *Fredholm* 6383. Braidenton, *Combs* 1285, 1318½, 1329. Manatee, *Rugel* 384. Palma Sola, *Tracy* 6728. Fort Myers, *Chase* 4145½, 4168; *Hitchcock* 507; *Standley* 18906. Punta Rassa, *Hitchcock* 2453; *Standley* 12663. Pine Island, *Tracy* 7201. Sanibel, *Hitchcock* 2454. Marco, *Hitchcock* 2455, 19781. Caxambas, *Hitchcock* 19784. Fort Lauderdale, *Small & Carter* 1227. Little River, *Eaton* 483. Miami, *Chase* 3849, 3853, 3951; *Eaton* 69; *Hitchcock* 628, 631; *Small* 5470; *Small & Carter* in 1903. Cape Florida, *Chase* 3960. Dade County, *Eaton* 1207. Key West, *Curtiss* in 1884.
- TENNESSEE: Ducktown, *Chambliss* 84. White Cliff Springs, *Scribner* in 1890.
- ALABAMA: Washington County, *Mohr* in 1882. Cullman County, *Eggert* in 1897. Selma, *Kearney* 9. Etowah County, *Eggert* in 1897. Mentone, *Mohr* in 1898. Auburn, *Tracy* 3741. Tuskegee, *Carver* 14. Spring Hill, *Bush* 209. Mobile, *Hitchcock* 2456; *Mohr* in 1878.
- MISSISSIPPI: Starkville, *Chase* 4441; *Kearney* 96; *Tracy* in 1892. Biloxi, *Chase* 4367; *Kearney* 338; *Tracy* 1891, 3679, 4501. Ocean Springs, *Kearney* 292; *Tracy* 21. Cat Island, *Tracy* 438a. Point St. Martin, *Tracy* 4503. Deer Island, *Tracy* 2870. Scranton, *Tracy* 4628.
- ARKANSAS: Fulton, *Bush* 969. Without locality, *Harvey*.
- LOUISIANA: Shreveport, *Tracy* 3688. Alexandria, *Ball* 555. Rapides County, *Hale*. Calhoun, *Ball* 47a. Rayville, *Ball* 12a. Burnside, *Combs* 1408. New Orleans, *Drummond* 446. Covington, *Arsène* 11285. Lake Charles, *Chase* 4435, 4436, 6087.
- TEXAS: Dallas, *Reverchon* 2832. Corsicana, *Reverchon* 3468. Palestine, *Plank* 61. Hempstead, *Hall* in 1872. Industry, *Wurzlöw* in 1892. Galveston, *Bebb* 1093, 1108; *Hitchcock* 2448. Corpus Christi Bay, *Heller* 1546. Sarita, *Hitchcock* 2457. Austin, *Swallen* 1033.
- HONDURAS: Tela, *Standley* 53039.
- BERMUDA: Hillcrest, *Collins* 155 in part.
- CUBA: Western Cuba, *Wright* 3442. Marianao, *Léon* 779. Baraguá, *Hitchcock* 23342.
- HAITI: Aux-Cayes, *Ekman* H 66.

45. *Paspalum propinquum* Nash

Paspalum propinquum Nash, Bull. N. Y. Bot. Gard. 1: 291. 1899. "Collected by the writer [Nash] in sandy soil at Eustis, Lake County, Florida, on July 25, 1894, no. 1427." The type, in the herbarium of the New York Botanical Garden, is a tall specimen with racemes 9 to 11 cm. long, and pubescent spikelets 1.8 to 1.9 mm. long, most of them somewhat apiculate.

DESCRIPTION

Closely related to *P. ciliatifolium*, the rhizome commonly more developed than usual in that, the blades rather firmer and rarely more than 8 mm. wide; spikelets 1.7 to 1.9 mm. long, elliptic-obovate, slightly pointed, more strongly spotted than usual in *P. ciliatifolium*.

This is a tropical form reaching into peninsular Florida. It differs chiefly in the pointed spikelets, though very few specimens have spikelets as noticeably pointed as in the type. In a few the spikelets are not more pointed than in many of *P. ciliatifolium*. *P. propinquum* is recognized here as a species because the tropical material as a whole is distinguishable from *P. ciliatifolium*. In tropical specimens the blades are often minutely pubescent beneath, or bear a few long hairs on either surface.

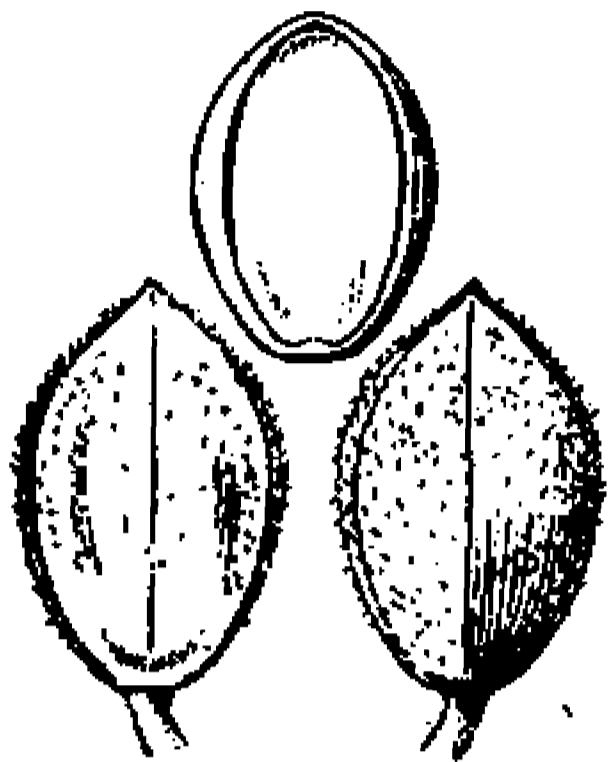


FIGURE 46.—*P. propinquum*. From type specimen

DISTRIBUTION

Sandy savannas and sand barrens overlying limestone, peninsular Florida, the West Indies, and Vera Cruz, to Panama.

FLORIDA: Eustis, *Chase* 4075; *Nash* 1427. Arcadia, *Hitchcock* 857. Miami, *Hitchcock* 2458.

VERA CRUZ: Vera Cruz, *Gouin* 27 (Paris Herb.); *Hitchcock* 6549.

MEXICO (Republic of): Zapopán, *Oliva* 80.

HONDURAS: Tela, *Kenyon* 3, 13, 15; *Standley* 53464, 53796, 54231.

EL SALVADOR: San Salvador, *Hitchcock* 8960. Santa Ana, *Hitchcock* 8854.

NICARAGUA: Jinotepe, *Hitchcock* 8684. Corinto, *Hitchcock* 8761.

COSTA RICA: Puntarenas, *Hitchcock* 8587.

PANAMA: Canal Zone, *Hitchcock* 8099, 8165.

BERMUDA: Hillcrest, *Collins* 155 in part. Hamilton, *Brown & Britton* 56.

BAHAMAS: Inagua, *Hitchcock* in 1890.

CUBA: Arroyo Mántua, *Ekman* 10960, 11021. Savanna de Chirigota, *Léon & Roca* 7455. Habana, *Léon* 2738, 3478, 7521. Cojimar, *Léon & Hioram* 5604. Isle of Pines, *Ekman* 11652; *Britton & Wilson* 15665. Without locality, *Wright* 3845.

JAMAICA: Claremont, *Hitchcock* 9520. Appleton, *Hitchcock* 9654. Ipswich, *Hitchcock* 9598.

HAITI: Vallière, *Ekman* H 4501. Bayeux, *Ekman* H 2601.

DOMINICAN REPUBLIC: Haina, *Paris* 11.

PORTO RICO: Mayaguez, *Chase* 6282. Quebradillas, *Chase* 6572. Barcelonita, *Chase* 6439. Campo Alegre, *Chase* 6433, 6613. Vega Baja, *Britton, Britton & Brown* 6950. San Juan, *Chase* 6634½. Playa de Fajardo, *Chase* 6661.

LEEWARD ISLANDS: Antigua, *Wullschlaegel* 697.

WINDWARD ISLANDS: Barbados, *Hitchcock* 16500.

46. *Paspalum rigidifolium* Nash

Paspalum rigidifolium Nash, Bull. N. Y. Bot. Gard. 1: 292. 1899. "In dry sandy soil, high pine land, peninsular Florida. Type collected by the writer [G. V. Nash] at Eustis, Lake Co., [Florida] May 1-15, 1894, no. 629." This is in the herbarium of the New York Botanical Garden, a duplicate being in the United States National Herbarium.

DESCRIPTION

A slender relatively stiff perennial, often purplish, in tufts from short scaly rhizomes; culms erect to somewhat spreading, 25 to 75 cm. tall, glabrous; sheaths close, the lower usually softly grayish-pubescent, short and overlapping, the upper pubescent along the margin, otherwise glabrous; ligule a minute membrane with a dense row of white hairs 3 to 4 mm. long back of it; blades flat, firm, erect or ascending, linear, 7 to 22 cm., commonly 10 to 15 cm., long, 2 to

5 mm., rarely to 8 mm., wide, usually not wider at base than the summit of the sheath, the scabrous margins usually sparsely ciliate toward the base, otherwise glabrous or minutely puberulent on one or both surfaces; racemes on very slender peduncles, solitary or 2, straight or arching, 7 to 14 cm. long, the rachis with a few long hairs at base; spikelets in pairs on minute nearly glabrous pedicels, crowded, 2 to 2.5 mm., commonly 2.2 to 2.4 mm. long, 1.5 to 1.8 mm. wide, obovate-elliptic, pale or purplish, the glume and sterile lemma subequal, scarcely covering the fruit at maturity, 3-nerved, or the glume sometimes 5-nerved, both glabrous or the glume obscurely pubescent, sometimes minutely speckled; fruit about the size and shape of the spikelet, pale, shining.

This species is distinguished by its stiff habit and large spikelets.

DISTRIBUTION

Sand barrens and high pine land, peninsular Florida to Texas.

FLORIDA: Old Town, *Combs* 844, 896. Crystal, *Combs* 993. Dunnellon, *Combs* 911. Eustis, *Chase* 4071; *Hitchcock* 2489; *Nash* 629. Grasmere, *Combs & Baker* 1029, 1107. Orange City, *Hood* 66. Titusville, *Swallen* 152. Bartow, *Combs* 1223. Winter Haven, *Curtiss* 6666. Tampa, *Combs* 1375. Fort Myers, *Chase* 4184. Miami, *Chase* 3950; *Hitchcock* 643, 684; *Westgate* in 1904. Cutler, *Eaton* 238. Ross Hammock, *Small, Mosier & Small* 6516.

ALABAMA: Chehaw, *Hitchcock* 2447.

MISSISSIPPI: Biloxi, *Chase* 4327, 4354½; *Tracy & Ball* 37.

TEXAS: Waller County, *Thurrow* in 1898.

Decumbentes. (*Harpostachys* Trin.⁸⁹ as section, *Dimorphostachys* Fourn. as a genus).—Perennial, mostly branching, and with axillary inflorescences; racemes 1 to several (as many as 15 in *P. botteri*); rachis mostly about 1 mm. wide; spikelets in pairs on short pedicels; first glume commonly developed in at least one of the pair (usually obsolete in *P. nutans* and *P. culiacanum*), that of the primary spikelet (the upper one of a pair) in most species minute or obsolete, that of the secondary spikelet (the lower of a pair) well-developed, long-pointed and turned to one side of the spikelet; fruit papillose-striate. The development of the first glume is exceedingly variable in all the species except *P. decumbens*. The extremes of size are commonly found in single racemes. The large glume on the secondary spikelet is inconspicuous in most species, because in this spikelet, being seen from the side, the midnerve of the glume coincides with the marginal nerve of the sterile lemma. In several of the original descriptions this glume has been overlooked.

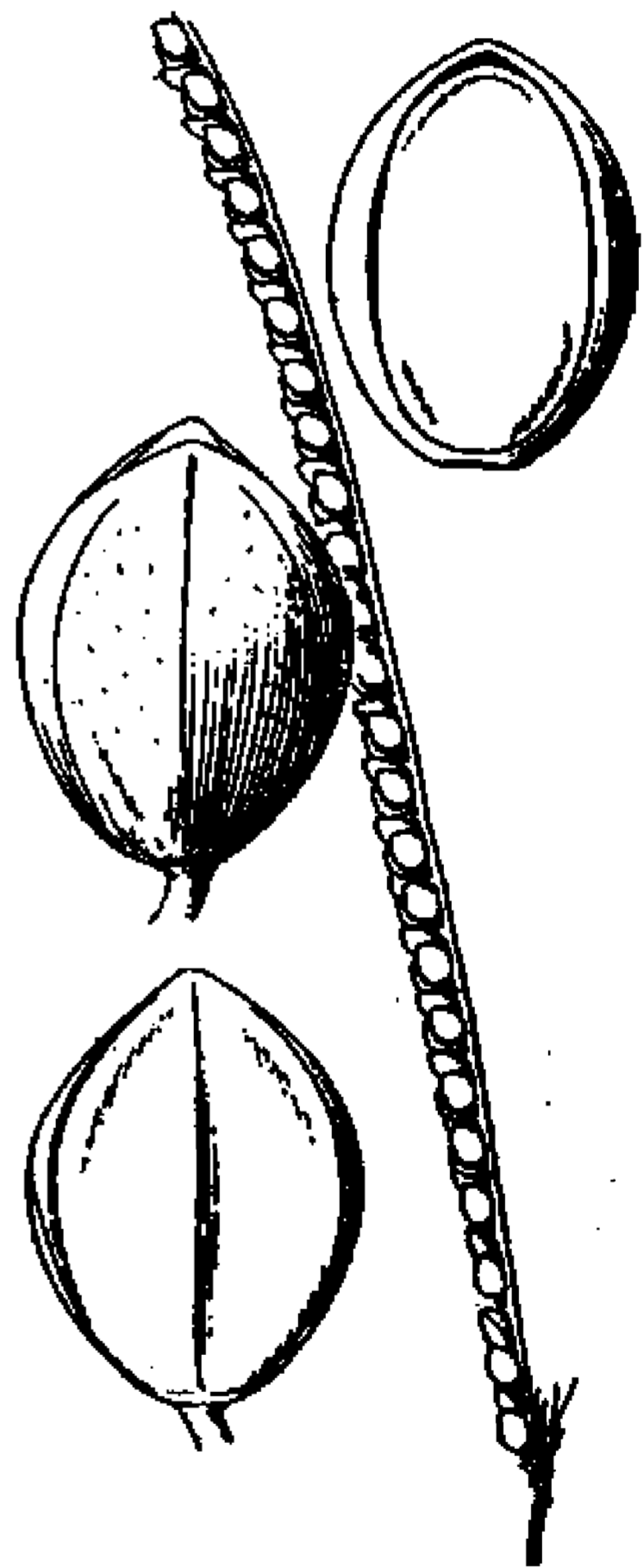


FIGURE 47.—*P. rigidifolium*.
From type specimen

Plants with stout scaly rhizomes, the culms mostly solitary. Spikelets glabrous, first glume often obsolete.

Blades flat, 8 to 15 mm. wide.....52. *P. unispicatum*.

Blades folded at base, the margins adnate above, not more than 2 mm. wide.....53. *P. monostachyum*.

⁸⁹ Mém. Acad. St. Pétersb. VI. Sci. Nat. 3^e: 227. 1834.

Plants without rhizomes, culms more or less tufted.

Spikelets not more than 2 mm. long.

Plants decumbent, creeping.

First glumes small, about equally developed on all spikelets.

47. *P. decumbens*.

First glumes obsolete or only occasionally developed.....48. *P. nutans*.

Plants erect or ascending, not creeping. First glume of secondary spikelet elongate.....49. *P. dispar*.

Spikelets more than 2 mm. long. Plants not decumbent.

Spikelets glabrous (sometimes obscurely pubescent in *P. adoperiens*).

Nodes, at least the lower, pubescent; sterile lemma subindurate, minutely papillose; first glume commonly well-developed. Spikelets glabrous.

Racemes 2 or 3.....50. *P. peckii*.

Racemes solitary.....51. *P. pilosum*.

Nodes glabrous; sterile lemma not subindurate nor papillose; first glume commonly rudimentary or obsolete or occasionally developed. Racemes few to several, rarely solitary.

Blades harshly pilose to glabrescent; spikelets broadly obovate, elliptic to suborbicular.....54. *P. adoperiens*.

Blades glabrous except for a few hairs at the very base; spikelets obovate-elliptic, not suborbicular.....55. *P. culiacanum*.

Spikelets pubescent, at least on the second glume.

First glume developed in both spikelets, rarely wanting in the primary spikelet. Spikelets glandular-speckled.

Spikelets sparsely pubescent, 2.2 to 2.6 mm. (rarely to 2.8 mm.) long; first glume of secondary spikelet small.....56. *P. langei*.

Spikelets densely pubescent, at least on the second glume, 2.9 to 3.2 mm. long; first glume of secondary spikelets $\frac{1}{5}$ to $\frac{2}{3}$ as long as the spikelet.

57. *P. variabile*.

First glume obsolete or nearly so on the primary spikelet, often or commonly obsolete on the secondary.

Racemes 1 to 3; blades less than 1 cm. wide.....58. *P. palmeri*.

Racemes 4 to 15; blades 1 to 2.4 cm. wide.....59. *P. botteri*.

47. *Paspalum decumbens* Swartz

Paspalum decumbens Swartz, Prodr. Veg. Ind. Occ. 22. 1788. "Jamaica." Specimens of Swartz's collection so named from Jamaica were examined in the Delessert Herbarium and in the Munich and Berlin herbaria. The specimens are immature with but 1 or 2 peduncles. *Paspalum decumbens* Rottb. Act. Lit. Univ. Hafn. 1: 285, 1778, is not valid publication, but merely the mention of a decumbent species of *Paspalum* eaten by sheep in Dutch Guiana.

Paspalum pedunculatum Poir. in Lam. Encycl. Suppl. 4: 315. 1816. "Cette plante croît à Cayenne. (V. s. in herb. Desfont.)" The type, bearing the name in Poiret's script, was examined in the Florence Herbarium.

Panicum decumbens Roem. & Schult. Syst. Veg. 2: 429. 1817. Based on *Paspalum decumbens* Swartz.

Paspalum vaginiflorum Steud. Syn. Pl. Glum. 1: 19. 1854. "Ex Hrbo. Paris et Lenormand. Guiana." The type, bearing the name in Steudel's script, was examined in the Paris Herbarium. It is a mature plant with several axillary peduncles. The specimen in the Lenormand Herbarium at Caen agrees with this.

Dimorphostachys pedunculata Fourn. Mex. Pl. 2: 15. 1886. Based on *Paspalum redunculatum* Poir.

DESCRIPTION

A low perennial, freely branching, the culms spreading or creeping with ascending ends, rooting at the lower nodes, often forming mats; culms 10 to 70 cm. long, the internodes short, compressed, glabrous or pubescent below the nodes; nodes pubescent or glabrescent; sheaths keeled, sparsely to rather densely papillose-pubescent, or nearly glabrous except for the finely ciliate margin; ligule membranaceous, about 0.5 mm. long; blades flat, spreading, 2 to 15 cm., commonly 5 to 10 cm., long, 6 to 12 mm. wide, rounded at base, contracted at the junction with the sheath, from velvety to sparsely pubescent on both surfaces, commonly more densely pubescent beneath, finely ciliate on the margin, the pale midnerve prominent beneath; peduncles 2 to 8 from the uppermost sheath, or in luxuriant plants from several upper sheaths (solitary in young plants), very slender, usually pubescent toward the summit; racemes solitary (very rarely 2), 1 to 3.5 cm. long, arcuate, the rachis commonly sparsely pubescent on the back toward the base; spikelets in pairs on minute puberulent pedicels, crowded, 1.7 mm. long, about 1.3 mm. wide, obovate, strongly plano-convex, glabrous, the first glume developed, small and nerveless on the primary spikelet, often larger and pointed on the secondary; second glume about half as long as the spikelet, 3-nerved, the sterile lemma equaling the fruit, 3-nerved, the lateral nerves strong, forming a narrow rim about the spikelet; fruit about the size and form of the spikelet, pale, minutely papillose-striate.

DISTRIBUTION

Open or partly shaded slopes mostly on clay soil, up to 1600 meters, often a weed in waste ground, Guatemala and the West Indies to Brazil and Bolivia.

GUATEMALA: Cubilquitz, *Türckheim* II. 951, II. 1452;

Türckheim (*Dist. Smith*) 7794, 8798. Secanquím, *Pittier* 207. Quebradas, *Pittier* 8581. Quiriguá, *Standley* 23862, 23905, 24187. Izabal, *Blake* 7812, 7834. Puerto Barrios, *Hitchcock* 9157; *Standley* 24726.

COSTA RICA: Pejivalle, *Standley & Valerio* 46755. Hacienda de Guacimo, *Tonduz* 15. Las Vueltas, *Tonduz* 12992. Port Limon, *Hitchcock* 8431. Buenos Aires, *Tonduz* 3649, 3686. General, *Pittier* 3375 in part. Cocos Island, *Pittier* 16269. Without locality, *Pittier* 3655; *Tonduz* 4880.

PANAMA: David, *Hitchcock* 8361. San Felix, *Pittier* 5185, 5752. Laguna de Chiriquí, *Hart* 180. Chorrera, *Hitchcock* 8141. Canal Zone, *Hitchcock* 7939, 7960, 7962, 7990, 8115; *Kenoyer* 128; *Standley* 29299, 30274, 31662. Taboga Island, *Hitchcock* 8088.

CUBA: Pinar del Río, *Wright* 3851. San Diego de los Baños, *Léon* 4569. Sierra de los Órganos, *Ekman* 12966. Isle of Pines, *Curtiss* 327.

JAMAICA: Bull Head Mountain, *Amer. Gr. Nat. Herb.* 573. Upper Clarendon, *Harris* 12255. Ram's Horn Range, *Hitchcock* 9562. Hardware Gap, *Harris* 11545. Castleton, *Harris* 11606. Seamens Valley, *Maxon & Killip* 58. Claverty Cottage, *Harris* 11522. Mattis River, *Maxon & Killip* 190; *Perkins* 1485.

HAITI: Port-de-Paix, *Ekman* H 3693. Plaisance, *Leonard* 9336. Pérodin, *Ekman* H 3483. Kalacroix, *Leonard* 7840, 7855.

PORTO RICO: Mayaguez, *Chase* 6170, 6176, 6186; *Holm* 88. Rosario, *Chase* 6264. Monte Alegriillo, *Chase* 6235. Monte Montoso, *Britton & Cowell* 4118. Yauco, *Britton & Britton* 7225. Adjuntas, *Britton & Shafer* 2135; *Chase* 6473; *Heller* 6354. San Juan, *Chase* 6399, 6648. Trujillo Alto, *Chase* 6361. Las Cruces,

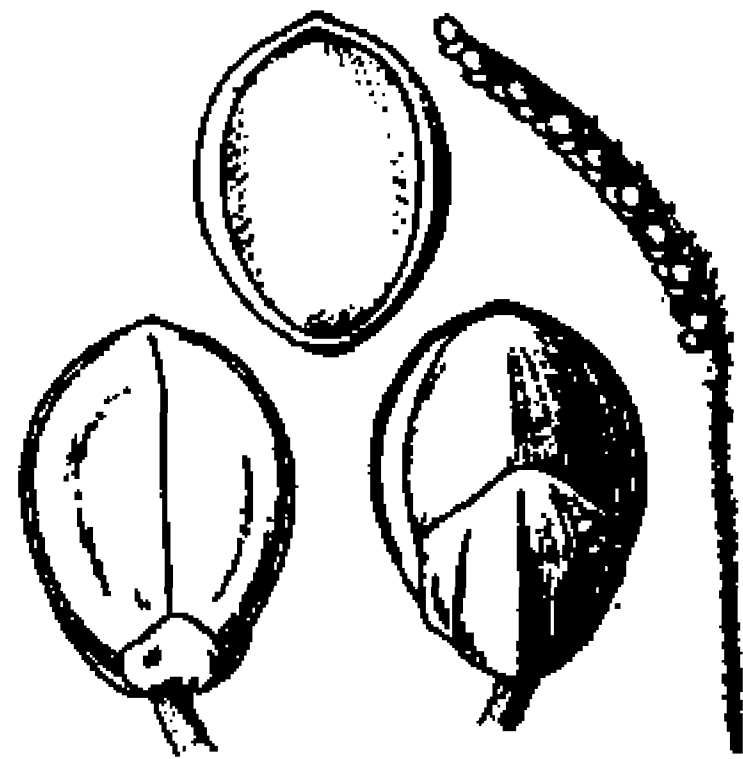


FIGURE 48.—*P. decumbens*.
From *Hitchcock* 9562

- Britton & Britton* 9068. *Cayey, Chase* 6340. Rio Grande, *Chase* 6718. *Mameyes, Cowgill* 627. *Fajardo, Britton & Shafer* 1680.
- TRINIDAD: St. Ann, *Britton & Hazen* 1688. Port of Spain, *Hitchcock* 9957½. St. Joseph, *Hitchcock* 10175. Arima, *Hitchcock* 10308. Piarco Savanna, *Hitchcock* 10353. O'Meara Savanna, *Britton & Hazen* 1582. Masacas, *Broadway* in 1925. Cedros, *Hitchcock* 10135. Without locality, *Finlay* 39; *Bot. Gard. Herb.* 2271.
- COLOMBIA: Santa Marta, *Smith* 2157, 2259. La Cumbre, *Killip* 6002. Between Santa Rosa and Cisneros, *Killip* 5342. Córdoba, *Pittier* 535, 538.
- VENEZUELA: Tovar, *Fendler* 2535. Lora River, *Pittier* 10928. Los Teques, *Pittier* 6101.
- BRITISH GUIANA: Wanama River, *Gleason* 3868. Bartica, *Hitchcock* 17195. Wismar, *Hitchcock* 17278. Akyma, *Hitchcock* 17421. Mackenzie, *Hitchcock* 17465. Mazaruni River, *Ward* 159. Upper Demerara River, *Jenman* 4073. Potaro River, *Abraham* 346.
- FRENCH GUIANA: Cayenne, *Broadway* 426, 468. Without locality, *Leprieur* 81.
- BRAZIL: Pará, *Goeldi* 29. Bahia, *Riedel* in 1831. Viçosa, *Bailey* 1181, 1218; *Chase* 9510. Lagoa Santa, *Chase* 8999. Pico da Tijuca, *Chase* 8483½. Monte Serrat, *Chase* 8351.
- ECUADOR: Teresita, *Hitchcock* 20413. Between La Chorita and Portovelo, *Hitchcock* 21210.
- PERU: Colonia Perené, *Hitchcock* 22061, 22066.
- BOLIVIA: Mapiri, *Rusby* 211. San Carlos, *Buchtien* 47, 48 in 1926. Hacienda Simaco, *Buchtien* 5314. Hacienda Casana, *Buchtien* 7105, 7106. Coroico, *Buchtien* 6445; *Hitchcock* 22718.

48. *Paspalum nutans* Lam.

Paspalum nutans Lam. Tabl. Encycl. 1: 175. 1791. "Ex America merid. Communic. D. Richard." The type, bearing the name in Lamarck's script "ex D. Richard," in the Paris Herbarium, is a single culm without the base and a single terminal raceme, no axillary ones showing. The blades are puberulent.

Paspalus curvistachyus Raddi, Agrost. Bras. 26. 1823. "In sylvestribus non procul ab urbe Rio janeiro." There are two sheets of this, one with a ticket with the name in Raddi's script and two plants, the other with three plants. Both sheets contain two species. One, the left-hand plant on the first sheet and the left and middle plants on the second sheet, is the same as *Paspalum nutans* Lam. The description was evidently drawn up from both species, but two characters given, "glumis calycinis corolla brevioribus" (glume and sterile lemma shorter than the fruit), and "nodes rooting" apply to the specimens of *P. nutans* and not to the right-hand plant on each sheet. The left-hand plant of the second sheet, being the best specimen, is selected as the type. This specimen has four racemes in the terminal inflorescence and one on each of two branches. It is well matched by Hitchcock's no. 10301 from Trinidad, with three racemes in the terminal inflorescence. The right-hand specimens on each sheet are over-mature single plants of *Paspalum arenarium* Schrad. *P. curvistachyus* was erroneously given as "*Paspalum eriostachyum* Raddi" by Dietrich.⁹⁰

Paspalum protensum Trin. Gram. Pan. 108. 1826. "(Sieber hb. Maur. II. no. 29.)" Three specimens of this collection are in the Delessert Herbarium. All have axillary racemes.

Paspalus singularis Link, Hort. Berol. 1: 48. 1827. "Hab. in Brasilia." In the type specimen, bearing the name in Link's script, in the Berlin Herbarium,

⁹⁰Syn. Pl. 1: 254. 1839.

there is a single raceme on each of two plants with an axillary raceme in the upper sheath of one. The blades are pubescent.

Paspalum heteropodium Steud. Syn. Pl. 1: 19. 1854. "*P. supinum* Sieber Hrb. Maurt. nr. 29. Ins. Maurit." This specimen, with 4 racemes in the terminal inflorescence, and bearing the name in Steudel's script, was examined in the Steudel Herbarium in the Paris Herbarium. It is the same collection as the type of *P. protensum* Trin.

Paspalum supinum Sieb.; Steud. Syn. Pl. Glum. 1: 19, 1854, as synonym of *P. heteropodium* Steud. Not *P. supinum* Bosc. 1804.

Paspalum boivini Steud. Syn. Pl. Glum. 1: 416. 1854. "Boivin legit in Ins. Mauritii." In this specimen, bearing the name in Steudel's script, in the Paris Herbarium, there is a single raceme from the upper sheath, the terminal inflorescence probably fallen.

Paspalum lloydii Nash, N. Amer. Fl. 17: 178. 1912. "Type collected at Montpelier, Dominica, 1903, Francis E. Lloyd 590 (herb. N. Y. Bot. Gard.)." The type is a single plant with two branching culms, one with a single raceme, the other with two.

DESCRIPTION

A low perennial, branching, radiate-spreading or creeping with ascending ends or, in shade, suberect from a decumbent base; culms 25 to 90 cm. long, compressed, glabrous; nodes glabrous or sparsely pubescent, occasionally densely bearded; sheaths keeled, softly pilose along the margin and often across the collar, otherwise glabrous; ligule about 1.5 mm. long; blades flat, spreading, 4 to 16 cm. long, 5 to 15 mm. wide, commonly unsymmetrically narrowed to a rounded base, or the lower tapering to a narrow base, mostly rather finely papillose-pubescent on both surfaces, sometimes glabrous or nearly so; peduncles 1 to 4 from the terminal sheaths only, very slender, finally elongate, glabrous or minutely pubescent, the primary peduncle often with 2 to 4 racemes, the others with a single one only; racemes 2 to 6 cm. long, usually arcuate at maturity, the rachis glabrous or with a few long hairs at base; spikelets in pairs, crowded, 1.8 to 2 mm. long, 1.2 to 1.3 mm. wide, obovate-elliptic, strongly plano-convex, nearly glabrous, the first glume obsolete or occasionally developed especially on the secondary spikelet, the second glume about three-fourths as long as the spikelet, 5-nerved, usually obscurely ciliate on the margin at least toward the base, the sterile lemma equaling the fruit, 5-nerved, the lateral nerves approximate; fruit about the size and shape of the spikelet, pale, papillose-striate.

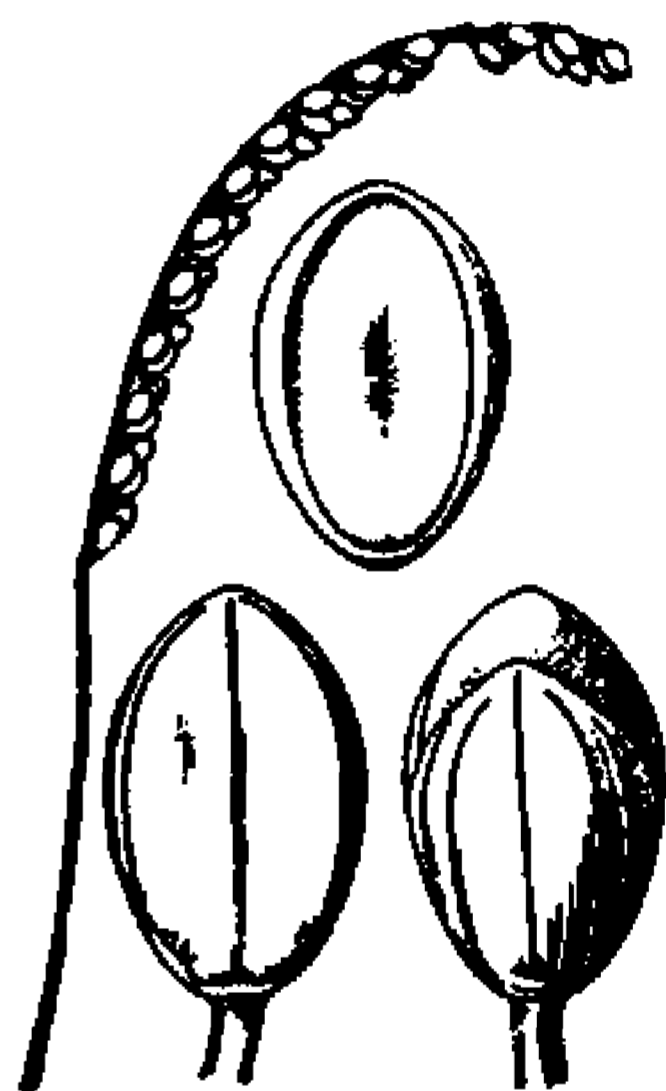


FIGURE 49.—*P. nutans*.
From type specimen of *P. curvistachyum*

DISTRIBUTION

Partly shaded slopes and banks and mossy cliffs, to 1,000 meters altitude, Honduras, and the Leeward Islands to Brazil; also in the island of Mauritius.

HONDURAS: Siguatepeque, *Standley* 56028.

EL SALVADOR: Volcano San Salvador, *Hitchcock* 8936.

COSTA RICA: Pejivalle, *Standley & Torres* 47709. San José, *Hitchcock* 8472.

General, *Pittier* 3375 in part.

PANAMA: San Felix, *Pittier* 5753. El Boquete, *Hitchcock* 8230. Chepo, *Pittier* 4719. Canal Zone, *Hitchcock* 8047; *Killip* 4125; *Pittier* 2381; *Standley* 25445, 26049.

LEeward ISLANDS: St. Christopher, *Hitchcock* 16351. Guadeloupe, *Duss* 4059. Dominica, *Bryant* 5.

WINDWARD ISLANDS: "Martinique et Guadeloupe," *Husnot* 77. Grenada, *Broadway* 1729.

TRINIDAD: St. Ann, *Broadway* 4914, 5331. Port of Spain, *Chase* 9930; *Hitchcock* 9957, 9982, 10040, 10200. St. Joseph, *Hitchcock* 10015. Mt. Tucuche, *Britton, Hazen & Mendelson* 1249. Arima, *Hitchcock* 10299, 10301. Belmont, *Broadway* 2811.

COLOMBIA: Santa Marta, *Smith* 2156.

VENEZUELA: Cristóbal Colón, *Broadway* 261. Sacupana, *Rusby & Squires* 348.

BRITISH GUIANA: Penal Settlement, *Hitchcock* 17034, 17083.

FRENCH GUIANA: Cayenne, *Broadway* 876. Without locality, *Leprieur* 91.

BRAZIL: Pará, *Goeldi* 40. Pernambuco, *Chase* 7731. Caparaó, *Chase* 9636. Serra da Gramma, *Chase* 9614. Viçosa, *Chase* 9448, 9512. Serra do Cipó, *Chase* 9120, 9199. Juiz de Fóra, *Chase* 8562, 8567. Pico da Tijuca, *Chase* 8479, 8483. Corcovado, *Chase* 7638, 8189, 8199. Monte Serrat, *Chase* 8259. Serra de Itatiaia, *Chase* 8341. Ribeira, *Brade* 6179.

AFRICA: Mauritius, *Bowin* 1498; *Sieber* II. 29.

49. *Paspalum dispar* Chase, sp. nov.

DESCRIPTION

A slender perennial, in tufts of few to several very unequal erect or ascending culms, 12 to 35 cm. tall, simple except for axillary peduncles, sparsely pilose below the raceme, otherwise glabrous; nodes spreading-pilose; sheaths keeled, finely papillose-pilose at least along the margin, the lower short, overlapping, ligule membranaceous, about 1.5 mm. long; blades flat, ascending, 4 to 15 cm. long, 3 to 5 mm. wide, the base about as wide as the summit of the sheath, the junction obscure, finely pubescent on both surfaces, more sparsely so above, finely ciliate on the margin, the pale mid nerve prominent beneath; peduncles 2 or 3 from the upper sheath, the axillary ones concealed until the primary one approaches maturity, filiform, sparsely pilose; racemes solitary, 1.5 to 4.5 cm. long, arcuate, the rachis obscurely pubescent at base; spikelets in pairs on minute puberulent pedicels, rather crowded, 1.9 mm. long, about 1.2 mm. wide, elliptic-obovate, strongly plano-convex, glabrous, the first

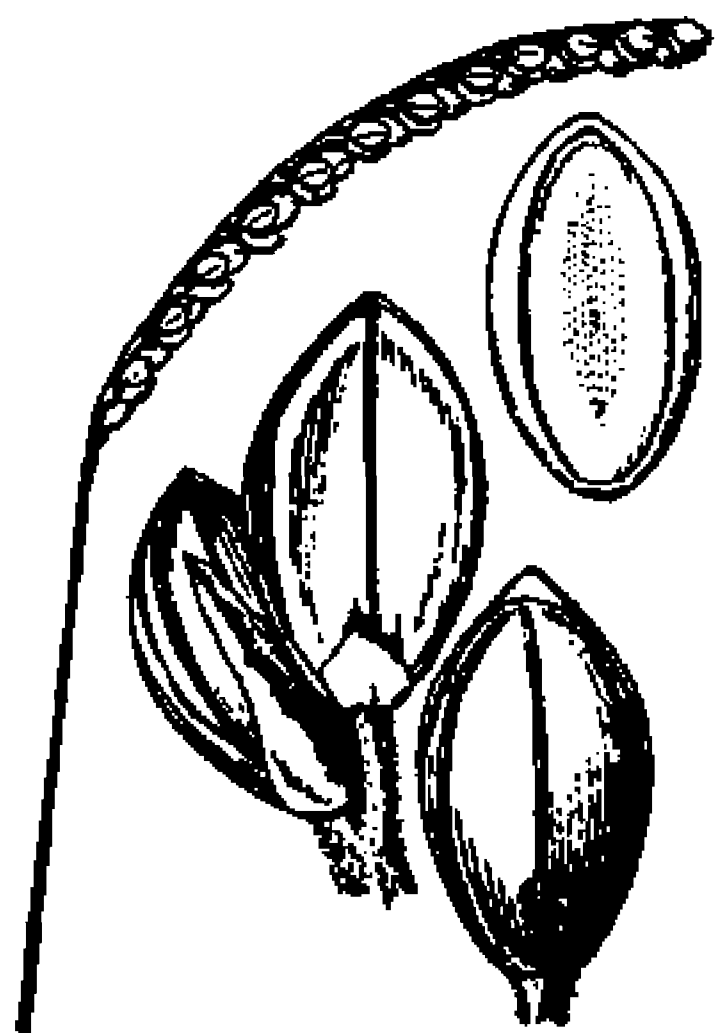


FIGURE 50.—*P. dispar*. From type specimen

glume small and nerveless on the primary spikelet, 1-nerved, pointed, and mostly from two-thirds to three-fourths as long as the spikelet on the secondary; second glume and sterile lemma 3-nerved, the glume a little shorter than the fruit, the palea of the sterile lemma usually developed, from rudimentary to nearly as long as the lemma; fruit nearly the size of the spikelet, pale, minutely papillose-striate.

Type in the U. S National Herbarium no. 1299915, collected on hillside among shrubs north of Restauración, Province of Monte-Cristi, in the Cordillera Central, Dominican Republic, altitude 700 meters, June 4, 1926, by Dr. E. L. Ekman (no. H 6248). Known only from the type collection.

50. *Paspalum peckii* Hubbard

Paspalum peckii Hubbard, Proc. Amer. Acad. 49: 495. 1913. "Type (in the Gray Herb.) and only specimen seen, pine ridge near Manatee Lagoon [British Honduras], July 18, 1905, M. E. Peck, no. 71." This specimen is a complete plant with overmature inflorescence.

DESCRIPTION

A densely tufted leafy perennial; culms erect, 72 to 82 cm. tall, glabrous; nodes sparsely short-pubescent; sheaths overlapping, the lower strongly keeled, pilose along the margin and on the collar, otherwise glabrous; ligule membranaceous, 2 to 3 mm. long; blades erect, folded at base, flat or loosely folded above, 14 to 30 cm. long, 5 to 8 mm. wide (the uppermost reduced), sublinear, long-acuminate, rather firm, sparsely puberulent on both surfaces and with long hairs back of the ligule, the mid nerve prominent beneath; peduncles slender, elongate, glabrous or sparsely pubescent, 1 or 2 from the upper sheath; racemes 2 or 3, 1.2 to 3.5 cm. distant, 6 to 13 cm. long, slightly falcate, the rachis channeled, narrowly winged, scarcely 2 mm. wide, pubescent in the axils, the margin scabrous and with a few scattered long hairs; spikelets in pairs, scarcely crowded, 2.7 mm. long, 1.2 mm. wide, elliptic-obovate, rather turgid, glabrous, the unequal pedicels pubescent; first glume obsolete or rudimentary on the primary spikelet, from rudimentary to half the length of the spikelet, pointed and eccentric on the secondary; second glume and sterile lemma 5-nerved, the glume shorter than the fruit, the lemma concave down the middle, the mid nerve depressed, inclosing a palea of equal length, thin in the middle and firm on the two keels, and sometimes a staminate flower; fruit 2.2 mm. long, finely papillose-striate.



FIGURE 51.—*P. peckii*. From type specimen

This species has the habit of *P. pilosum*, but the foliage is only obscurely pubescent. It differs chiefly in having 2 or 3 racemes, with slightly wider rachis, and in the texture of the sterile lemma, not subindurate and papillose as in *P. pilosum*.

Known only from the type specimen.

51. *Paspalum pilosum* Lam.

Paspalum pilosum Lam. Tabl. Encycl. 1: 175. 1791. "Ex America calidiore. Comm. D. Richard." The type, bearing the name in Lamarck's script, in the Paris Herbarium, consists of part of a culm with two leaves and a terminal raceme and a single axillary one from the upper sheath.

Panicum monostachyum H. B. K. Nov. Gen. & Sp. 1: 96. 1816. "Crescit in sylvis Orinocensibus, juxta Fernando de Atabapo, rupem Aricagua et Raudal de Atures," on the boundary between Venezuela and Colombia. In the Paris Herbarium is a specimen with the name and "In sylvis orinocensibus prope Fernando de Atabapo" in Bonpland's script, and apparently a duplicate in the Berlin Herbarium from Kunth's herbarium, "Orinoco, ex herb. Humb." Both are complete specimens. In both the first glume on the secondary spikelet is large and eccentric, though it is not mentioned in the original nor in the later

fuller, description⁹¹. In the plate only the primary spikelet with the minute glume is shown. The Paris specimen is taken as the type.

Paspalum monostachyum Willd.; Steud. Nom. Bot. ed. 2, 2: 260, 272, 1841, as synonym of *Panicum monobotrys* Trin., a nomen nudum. The name is not based on *Panicum monostachyum* H. B. K., that name being listed as a different species, with *P. cultratum* Trin. as a synonym. (See next paragraph.)

Panicum monobotrys Trin.; Steud. Syn. Pl. 2: 55. 1854. "*P. monostachyum* Salzm. Hrbr. Bahia." A duplicate of the type is in the United States National Herbarium. It is a small plant of *Paspalum pilosum* with sheaths pubescent along the margin and at the summit only. The first glume is described as minute but in our specimen, as in most racemes in this species, the first glume on the secondary spikelet is minute in some spikelets and large and acuminate in others. This was differentiated from *P. monostachyum* H. B. K. under the impression that that species was the same as *Panicum cultratum* Trin.⁹² Trinius later⁹³ referred *P. cultratum* figured in his Icones,⁹⁴ to *P. monostachyum* H. B. K. The plate, which agrees with the type in the Trinius Herbarium in Leningrad, does not represent *P. monostachyum* H. B. K. but a very different plant, *Thrasya cultrata* (Trin.) Nees.⁹⁵ *Panicum monobotrys* Trin. was earlier listed⁹⁶ without description.

Panicum monostachyum var. *minus* Kunth; Doell in Mart. Fl. Bras. 2³: 182. 1877. The name is credited to "Kunth l. c.," but it does not appear in either of the works cited by Doell nor in any other of Kunth's works. Doell describes the two forms of the first glume and refers Kunth's plate 104, which shows only a minute glume, to var. β .

Dimorphostachys monostachya Fourn. Mex. Pl. 2: 14. 1886. Based on *Panicum monostachyum* H. B. K., though the one specimen cited (Liebmann's no. 220) is *Paspalum unispicatum*.

Dimorphostachys pilosa Fourn. Mex. Pl. 2: 14. 1886. Based on *Paspalum pilosum* Lam.

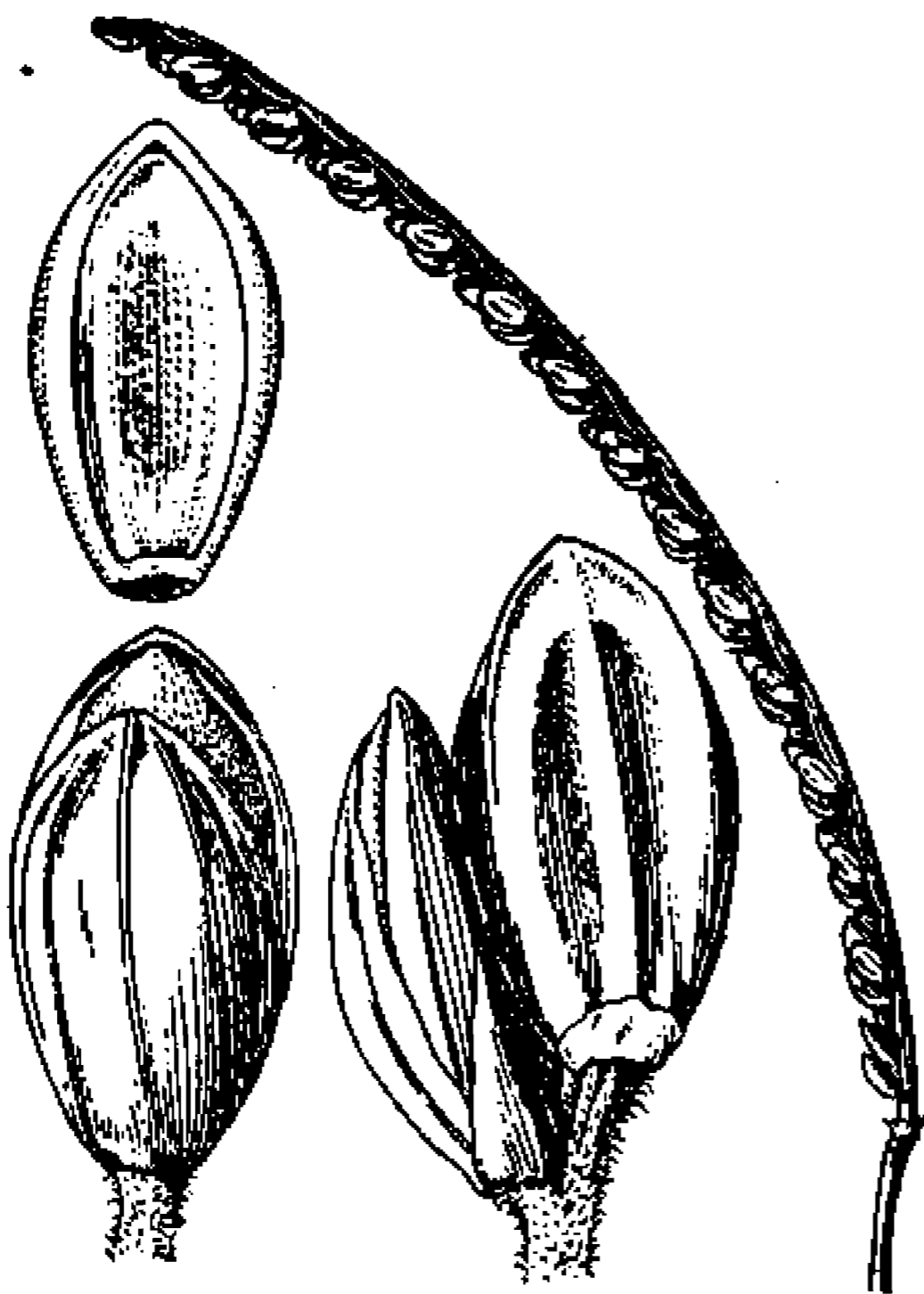


FIGURE 52.—*P. pilosum*. From Hitchcock 8130

DESCRIPTION

An olivaceous tufted perennial; culms ascending or spreading, sometimes decumbent at base, 40 to 115 cm. tall, commonly bearing slightly divergent branches from the middle nodes, subcompressed, glabrous or sparsely pubescent below the nodes; nodes densely short-pubescent to glabrous; sheaths shorter than the internodes, keeled, papillose-pubescent throughout or along the margins and at the summit only; ligule membranaceous, 1 to 1.5 mm. long; blades somewhat spreading, flat or the margins revolute, 10 to 40 cm. long, 3 to 8 (rarely to 10) mm. wide, sublinear, rather stiff, harshly pubescent on both

⁹¹ Kunth, Rév. Gram. 2: 381. pl. 104. 1830.

⁹² Gram. Pan. 126. 1826. "Brasil (Langsdorff.)"

⁹³ Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 228. 1834.

⁹⁴ Gram. Icon. 2: pl. 145. 1829.

⁹⁵ Agrost. Bras. 95. 1829.

⁹⁶ Steud. Nom. Bot. ed. 2, 2: 260, 272. 1841.

surfaces, rarely sparsely so, and with long stiff hairs at the very base, the pale midvein prominent beneath; peduncles slender, elongate, 1 to 4 from the upper and middle sheaths, sparsely pubescent; racemes solitary, mostly arcuate, 6 to 17 cm. long, the rachis channeled and very narrowly winged with a dense ring of short hairs at the base, the margins from rather sparsely long-ciliate to glabrous, usually with a few scattered hairs; spikelets in pairs, scarcely crowded, 2.6 to 3 mm. long, 1.5 to 1.7 mm. wide, elliptic, rather turgid, glabrous (rarely with a few obscure hairs at the base), the unequal pedicels pubescent; first glume usually minute on the primary spikelet, small to half the length of the spikelet, pointed and eccentric on the secondary, occasionally obsolete on one or both; second glume and sterile lemma 5-nerved, firm in texture, the glume shorter than the fruit, the lemma, especially of the lower spikelet, concave down each side of the mid nerve, the mid nerve often obscure, subindurate and minutely papillose under a lens, inclosing a palea of nearly equal length, thin in the middle and firm on the two keels, and infrequently a staminate flower; fruit about 2.5 mm. long, papillose-striate.

Many of the South American specimens are less pubescent than the typical form. In *Chase* 8534 one of the 5 peduncles bears 2 contiguous racemes.

DISTRIBUTION

Open or sparsely wooded slopes and brushy savannas, mostly in rather moist soil, lowlands, and up to 1,500 meters, Costa Rica to Bolivia and southern Brazil.

COSTA RICA: Nuestro Amo, *Jiménez* 534. San José, *Hitchcock* 8462. Las Con-cavas, *Lankester*. Turrialba, *Pittier* 9055.

PANAMA: David, *Hitchcock* 8365. Baja Boquete, *Killip* 4558. El Boquete, *Hitchcock* 8192, 8298. Cerro Vaca, *Pittier* 5325, 5364. Chorrera, *Hitchcock* 8130. Canal Zone, *Hitchcock* 7988; *Killip* 4011; *Standley* 25205.

TRINIDAD: Port of Spain, *Hitchcock* 9987. St. Joseph, *Hitchcock* 10189. Aripo Savanna, *Hitchcock* 10075. Pitch Lake, *Broadway* 2603; *Hitchcock* 10088. La Brea, *Broadway* 4969.

COLOMBIA: Buenaventura, *Hitchcock* 19909. Mesa de los Santos, *Killip & Smith* 15112. Jamundí, *Pittier* 1539. Cali, *Pittier* 659. Popayan, *Pennell & Killip* 8164.

FRENCH GUIANA: Without locality, *Leprieur* 82.

BRAZIL: Barra do Rio Negro, *Spruce* 22. Alagoinhas, *Chase* 8126. Parafuso, *Chase* 7971. Cachoeira, *Chase* 8083. Bahia, *Chase* 7860, 7890, 8025; *Salzmann*. Viçosa, *Bailey* 1205, 1222. Serra do Cipó, *Chase* 9121. Bello Horizonte, *Chase* 8944. Juiz de Fóra, *Chase* 8531, 8534. Franklin Sampaio, *Dorsett & Popenoe* 215c. Est. Minas Geraes, *Widgren* 871. Chapadinha, *Glaziou* 22579. Est. Goyaz, *Gardner* 3496. Serra de Itatiaia, *Chase* 8346. São Paulo, *Edwall* 3035. Poa, *Holway* 1624. São João, *Holway* 1657. Taipas, *Holway* 1948. Guarulhos, *Holway* 1510. São Caetano, *Holway* 1584. Mogy das Cruzes, *Glaziou* 17909. Jaguarihyva, *Dusén* 17984. Without locality, *Pohl*; *Riedel*.

ECUADOR: Portovelo, *Hitchcock* 21269.

BOLIVIA: Hacienda Casana, *Buchtien* 7108. San Carlos, *Buchtien* 14 and 15 in 1927.

52. *Paspalum unispicatum* (Scribn. & Merr.) Nash

Panicum (*Dimorphostachys*) *unispicatum* Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 24: 14. 1901. "Type specimen 6717 C. G. Pringle, Valley of Oaxaca, State of Oaxaca, July 13, 1897." The type in the United States National Herbarium with the name in Merrill's script is a complete plant with solitary racemes.

Paspalum unispicatum Nash, N. Amer. Fl. 17: 193. 1912. Based on *Panicum unispicatum* Scribn. & Merr.

DESCRIPTION

A leafy rather pale perennial with horizontal scaly rhizomes; culms 1 to few together, erect or ascending, 50 to 80 cm. (occasionally scarcely 20 cm.) tall,

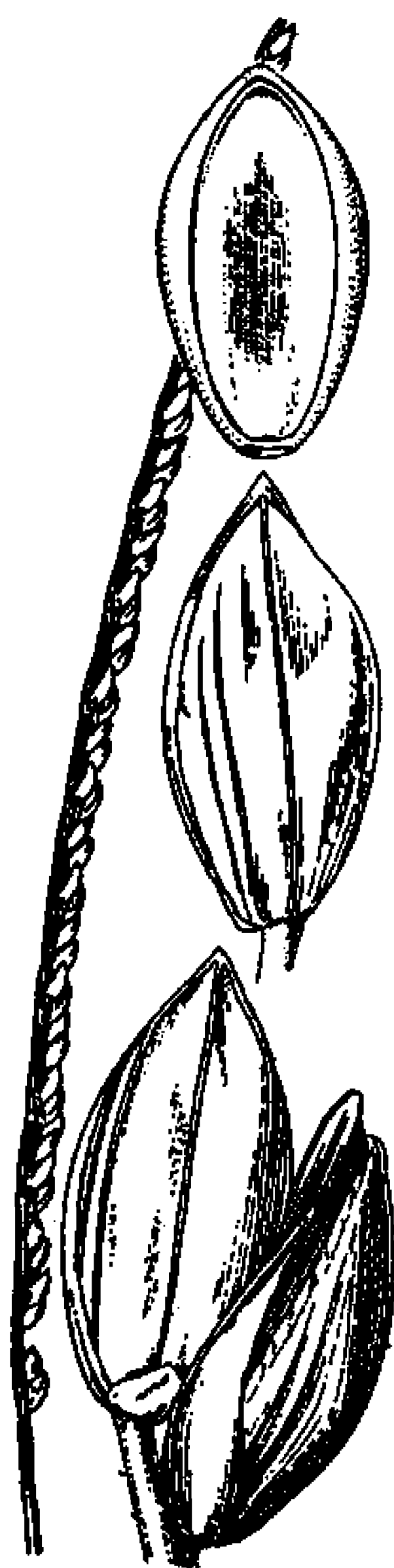


FIGURE 53.—*P. unispicatum*. From type specimen

simple or with a single erect leafy branch from the lower nodes, terete to subcompressed, glabrous; nodes glabrous; sheaths mostly overlapping, papillose-hirsute along the margin, otherwise very sparsely so to glabrous, commonly with a narrow lacerate membranaceous fringe on the collar; ligule membranaceous, 2 to 3 mm. long, with a ring of long hairs back of it; blades flat, suberect to spreading, rather stiff, 10 to 33 cm. long, 8 to 15 mm. wide, rounded at base, attenuate at apex, the uppermost reduced and commonly slender, stiffly papillose-ciliate on the margin, very sparsely (rarely rather copiously) papillose-hirsute on both surfaces to glabrescent or scaberulous only, the midvein deeply impressed, the large cells of the upper epidermis easily visible under a lens; peduncles slender, commonly 2 from the upper sheath, the secondary one often wholly or partly included (no axillary racemes found in other sheaths); racemes 1 or 2, usually 1, rather stiffly suberect to slightly arcuate, 6 to 21 cm. long, the nearly straight rachis sometimes with a few long stiff hairs at base, otherwise glabrous; spikelets in pairs, rather crowded, 3 to 3.5 mm. (mostly 3.2 mm.) long, about 1.6 mm. wide, elliptic, somewhat unsymmetrical, especially the lower of the pair, pale, glabrous, the first glume commonly minute and nerveless on the primary spikelet, eccentric, 1-nerved, keeled, acuminate and half to three-fourths as long as the spikelet on the secondary, but exceedingly variable in both, sometimes obsolete; second glume and sterile lemma 5-nerved (occasionally 7-nerved), rather firm in texture, the glume, especially in the lower spikelet, a little shorter than the sterile lemma, the lemma inclosing a palea of nearly equal length, hyaline in the middle and firm on the 2 keels, and often a well-developed staminate flower, rarely a perfect but infertile one; fruit about 2.8 mm. long, pale, minutely papillose-striate.

The extreme variability of the first glume is well shown in *Hitchcock* 5561, where in a single raceme the glume varies from obsolete to more than half the length of the spikelet on the primary spikelet and from minute and nerveless to three-fourths as long as the spikelet on the secondary.

This species is frequently affected by a fungus that distorts the inflorescence

DISTRIBUTION

Meadows, savannas, open slopes and banks, from low altitudes to about 1,500 meters, southern Texas to Venezuela and Argentina; also in Cuba.

TEXAS: Kingsville, *Piper* in 1906.

NUEVO LEÓN: Monterrey, *Hitchcock* 5561.

PUEBLA: Acatzinco, *Nicolas* in 1909.

OAXACA: Oaxaca, *Hitchcock* 6098, 6099. Valley of Oaxaca, *Liebmann* 220; *Pringle* 6717. Cerro de Soledad, *Seler* 1359a (Berlin Herb.).

CUBA: Guane, *Ekman* 11093. Habana, *Léon* 2401. Zaza de Tunas, *Léon* 947. Sancti Spíritus, *Clements* 2427; *Léon* 4099, 5582; *Sergius* 2411, 2682.

VENEZUELA: La Guayra, *Curran & Haman* 889. Caracas, *Bailey* 263; *Pittier* 5924, 6164, 6457, 7228, 7235. San Lázaro, *Pittier* 9743. Macarao, *Pittier* 11553. Gamboa, *Pittier* 9616. Laguna del Espino, *Pittier* 9642.

PARAGUAY: San Salvador, *Rojas* 2743. Puerto Casado, *Rojas* 2313.

ARGENTINA: Corrientes, *Llamas* (*Herb. Parodi*) 3046. Dept. Medinas, *Flora Tucumana* 524. Prov. Tucumán, *Venturi* 2313, 2322, 2395. Córdoba, *Stuckert* 37, (in *Kneucker Gram.*) 367. Prov. Catamarca, *Venturi* 7226. Prov. Santiago del Estero, *Venturi* 5717.

53. *Paspalum monostachyum* Vasey

Paspalum monostachyum Vasey; *Chapm. Fl. South U. S.* ed. 2. 665. 1883. "South Florida (Garber)." The type, in the United States National Herbarium, bearing the name and notes in Vasey's script, was collected by A. P. Garber (no. 224) at Miami, July, 1877. It consists of two flowering culms, the rhizomes wanting. In one raceme the first glume is developed in one of the pair of spikelets in about half the pairs, in the other raceme it is wanting. The glume is not mentioned in the description, but it is in Vasey's notes on the sheet. There is nothing in the notes to suggest that Vasey had *Panicum monostachyum* H. B. K. in mind.

Paspalum rectum var. *longispicatum* Vasey, *Bot. Gaz.* 9: 54, 55. 1884. "(*P. monostachyum* Vasey) * * * collected by Dr. Garber, at Miami, Florida." The type of *P. monostachyum* bears a note "*Paspalum rectum* Nees fide Munro," and another "var. *spicii longiori* Munro in *Herb. Gr.*"

Paspalum solitarium Nash in *Small, Fl. Southeast. U. S.* 77, 1326, 1903. "*Paspalum monostachyum* Vasey, not Walp." In *Walpers Annals*⁹⁷ following *Panicum pseudopaspalus* Nees is the note "Affine *P. monostachyo* Hmbt. et Knth.—*Paspalum monostachyum* Hort." This may better be regarded as incidental mention of a garden name than as publication of a transfer of *Panicum monostachyum* H. B. K. In his later work⁹⁸ Nash himself took this view, reducing *P. solitarium* to a synonym of *Paspalum monostachyum* Vasey. "*Paspalum monostachyum* Willd. hrb." is mentioned without description as synonym of *Panicum monobotrys* Trin.⁹⁹

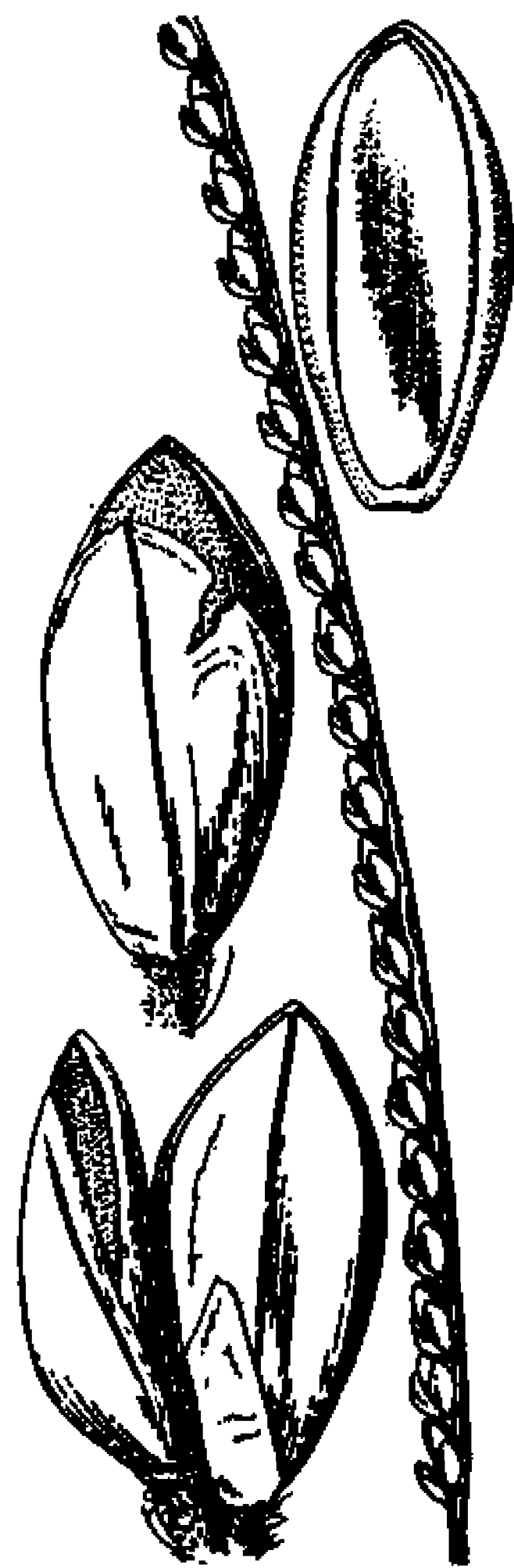


FIGURE 54.—*P. monostachyum*. From type specimen

DESCRIPTION

A slender erect glabrous perennial with horizontal scaly rhizomes, the culms 1 to 4, commonly forming open colonies, 50 to 120 cm. tall, simple, subterete; sheaths about equaling the internodes or longer, sometimes with a few hairs at the slightly auricled summit; ligule membranaceous, about 2 mm. long; blades

⁹⁷ 3:714. 1853.

⁹⁸ N. Amer. Fl. 17: 192. 1912.

⁹⁹ Steud. Nom. Bot. ed. 2. 2: 260, 272. 1841.

folded and erect at base, the junction with the sheath obscure, the margins grown together above, firm, 15 to 65 cm. long, 1 to 2 mm. wide as folded, usually with a few long hairs back of the ligule; peduncles slender, elongate, mostly 1, sometimes 2, the secondary one from the uppermost sheath only, none inclosed; racemes 1 or 2 (usually 1, rarely 3), stiffly erect to slightly arcuate, 10 to 30 cm. long, rarely shorter, the slender nearly straight rachis usually short-ciliate on the margin, commonly with a few hairs at the base; spikelets in pairs, or solitary toward the summit, scarcely crowded, 3 to 3.5 mm. long, about 1.5 mm. wide, subovate-elliptic, pale, glabrous, on nearly equal pubescent pedicels; first glume often developed in a few of the primary spikelets in each raceme, but more commonly wanting or rudimentary; second glume and sterile lemma 3-nerved, rather thin in texture, the glume shorter than the fruit; fruit 2.8 to 3 mm. long, pale, minutely papillose-striate.

In this species the first glume, when developed, is found on the primary spikelet of the pair (the one that is in other species the longer pedicelled) instead of on the secondary spikelets as in the others. It varies from a minute rudiment to a triangular scale two-thirds as long as the spikelet. Besides the type there are 3 duplicates of *Garber 224*. In two the glume is wanting or rudimentary, in the other there are many unusually large glumes. In 39 per cent of all specimens examined the first glume is developed in some of the spikelets.

DISTRIBUTION

Moist places in flatwoods, or coastal dunes, southern Florida and Texas.

FLORIDA: *Homosassa*, *Combs 956*. *Fellsmere*, *Tracy 9390*. *Palm Beach*, *Piper* in 1921. *Fort Myers*, *Hitchcock 2459*; *J. P. Standley 248*. *Alva*, *Francis 4*. *Miami*, *Chase 3883*; *Eaton 172*; *Garber 224*; *Tracy 9054*. *Homestead*, *Tracy 9319*. *Larkins*, *Small, Mosier & Small 6982*. *Paradise Key*, *Mosier 250*.

TEXAS: *Texarkana*, *Tharp 4765*. *Harris County*, *Thurrow* in 1891. *Cypress*, *Thurrow* in 1898. *Chambers County*, *Tharp 3112*. *Galveston*, *Fisher 251*; *Hitchcock 2460*; *Tracy 7395*. *Tarpon Beach*, *Hitchcock 5434*. Without locality, *Drummond 364*; *Nealley* in 1886.

54. *Paspalum adoperiens* (Fourn.) Chase

Dimorphostachys adoperiens Fourn. *Mex. Pl. 2: 15. 1886*. "Orizaba, * * * (SCHAFFN. n. 271 in herb. FRANQ.)." The type specimen, now in the Drake Herbarium, consists of a tuft, leafy at base. The blades, described as glabrous, are pubescent to glabrescent on both surfaces. No axillary racemes could be felt in the sheaths, but the specimen is immature.

Paspalum guatemalense Bartlett, *Proc. Amer. Acad. 43: 49. 1907*. "A swamp at Gualan, Department of Zacapa, Guatemala, January 20, 1905, C. C. Deam, no. 427 (type, in hb.

Gray)." The duplicate type in the Deam Herbarium has 3 culms 60 to 95 cm. tall, with axillary peduncles from the upper or upper two sheaths. The second glume of a few of the spikelets is slightly pubescent and very obscurely speckled.

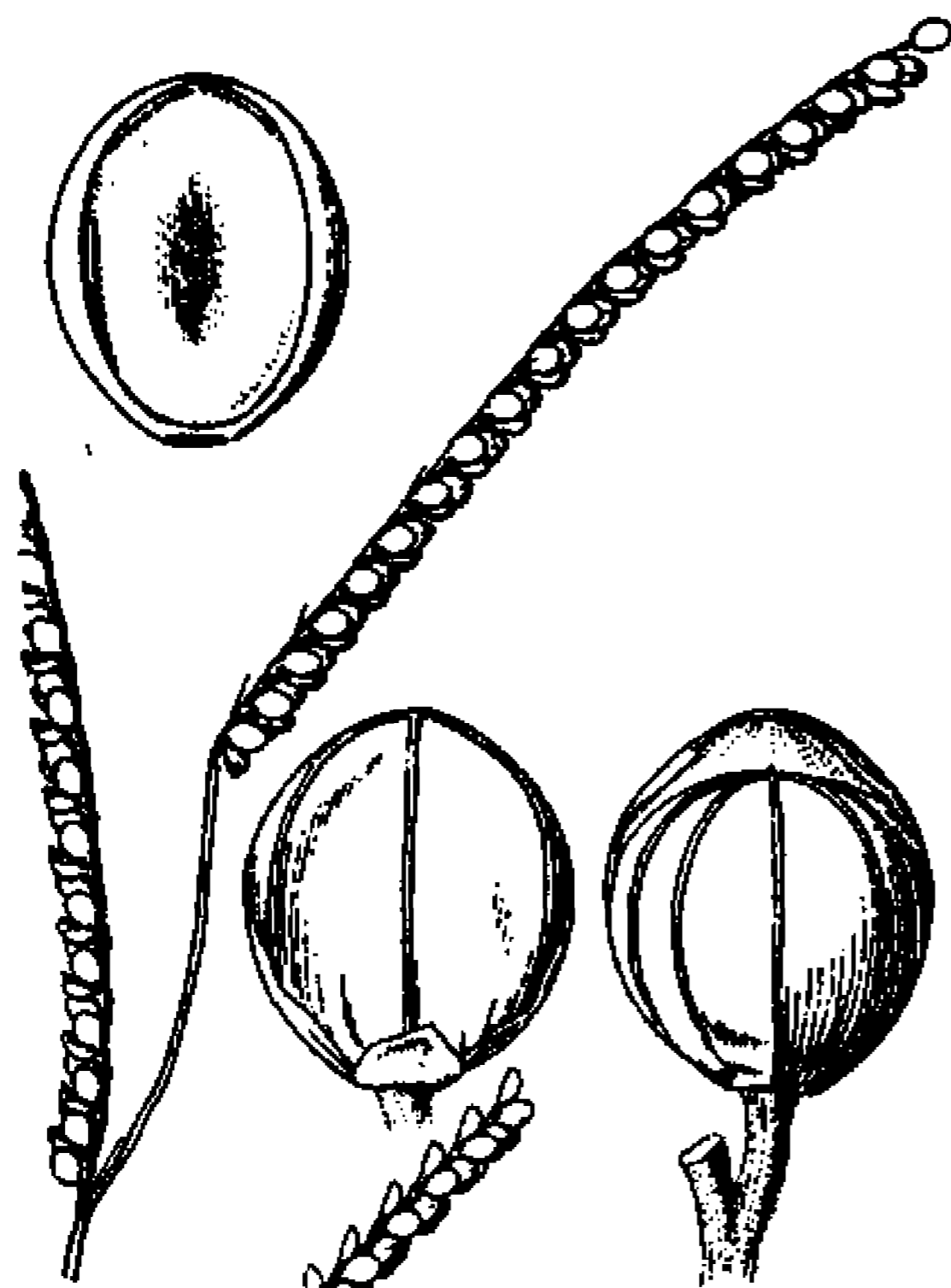


FIGURE 55.—*P. adoperiens*. From type specimen of *P. guatemalense*

DESCRIPTION

A tufted perennial; culms few to several, ascending, 35 to 95 cm. tall, sparingly branching, compressed, strongly ridged, glabrous; nodes glabrous; sheaths sparsely papillose-pilose to nearly glabrous except along the margin; ligule membranaceous, 2 to 3 mm. long; blades flat, ascending, rather firm, 5 to 22 cm., mostly 8 to 12 cm. long, 8 to 16 mm. wide, slightly narrowed to a rounded base, from densely and harshly papillose-pilose on both surfaces to very sparsely pilose or glabrescent; racemes 2 to 4, on axillary peduncles, sometimes solitary, ascending, relatively thick, 3 to 7.5 cm. long, 1.2 to 3.5 cm. distant on a slender channeled common axis (sometimes bearing minute auricles below the racemes as in *P. culiacanum*), the rachis about 0.8 mm. wide, usually with a few hairs at base and occasionally on the margin; spikelets in pairs, crowded, 2.1 to 2.5 mm. long, 1.7 to 1.8 mm. wide, broadly obovate-elliptic to suborbicular, mostly glabrous, pale or tawny, the first glume on both spikelets usually minute, broad and obtuse, occasionally obsolete on the primary spikelet or one-fourth to half as long as the spikelet and pointed on the secondary; second glume and sterile lemma 5-nerved, the glume slightly shorter, sometimes minutely pubescent down the middle or around the margin; fruit slightly smaller than the spikelet, pale, minutely papillose-striate.

In this species the first glumes on the pair of spikelets are scarcely different, that on the secondary usually being only slightly larger, though a few spikelets in an occasional raceme may have well-developed pointed glumes on the secondary spikelet.

DISTRIBUTION

Moist, mostly sandy ground up to 1,500 meters, southern Mexico, Guatemala, and El Salvador.

VERA CRUZ: Zacuapan, *Purpus* 8026.

MEXICO (Republic of): Without locality, *Schaffner* 166.

GUATEMALA: Guatemala City, *Hitchcock* 9079. San Pablo, *Salas* 7. San Felipe, *Mazon & Hay* 3527. Mazatenango, *Kellerman* 5803.

EL SALVADOR: San Salvador, *Calderón* 944; *Standley* 22441, 23271, 23285, 23559, 23596.

55 *Paspalum culiacanum* Vasey

Paspalum culiacanum Vasey, *Contr. U. S. Nat. Herb.* 1: 281. 1893. "Collected by Dr. Edward Palmer in the mountains of Culiacan (No. 1647) in 1891." The type, bearing the name in Vasey's script, is in the United States National Herbarium. It is labeled "In large bunches around a water hole in the mountains, Lodiago on the Culiacan River," Sinaloa, Mexico.

DESCRIPTION

A tufted perennial in large bunches; culms ascending, 60 to 85 cm. tall, sparingly branching, compressed, strongly ridged, glabrous; nodes glabrous; sheaths sparsely ciliate toward the summit, otherwise glabrous; ligule membranaceous, about 1.5 mm. long; blades flat, ascending, rather firm, 10 to 23 cm. long, 6 to 9 mm. wide, the uppermost reduced, rounded at base, scabrous

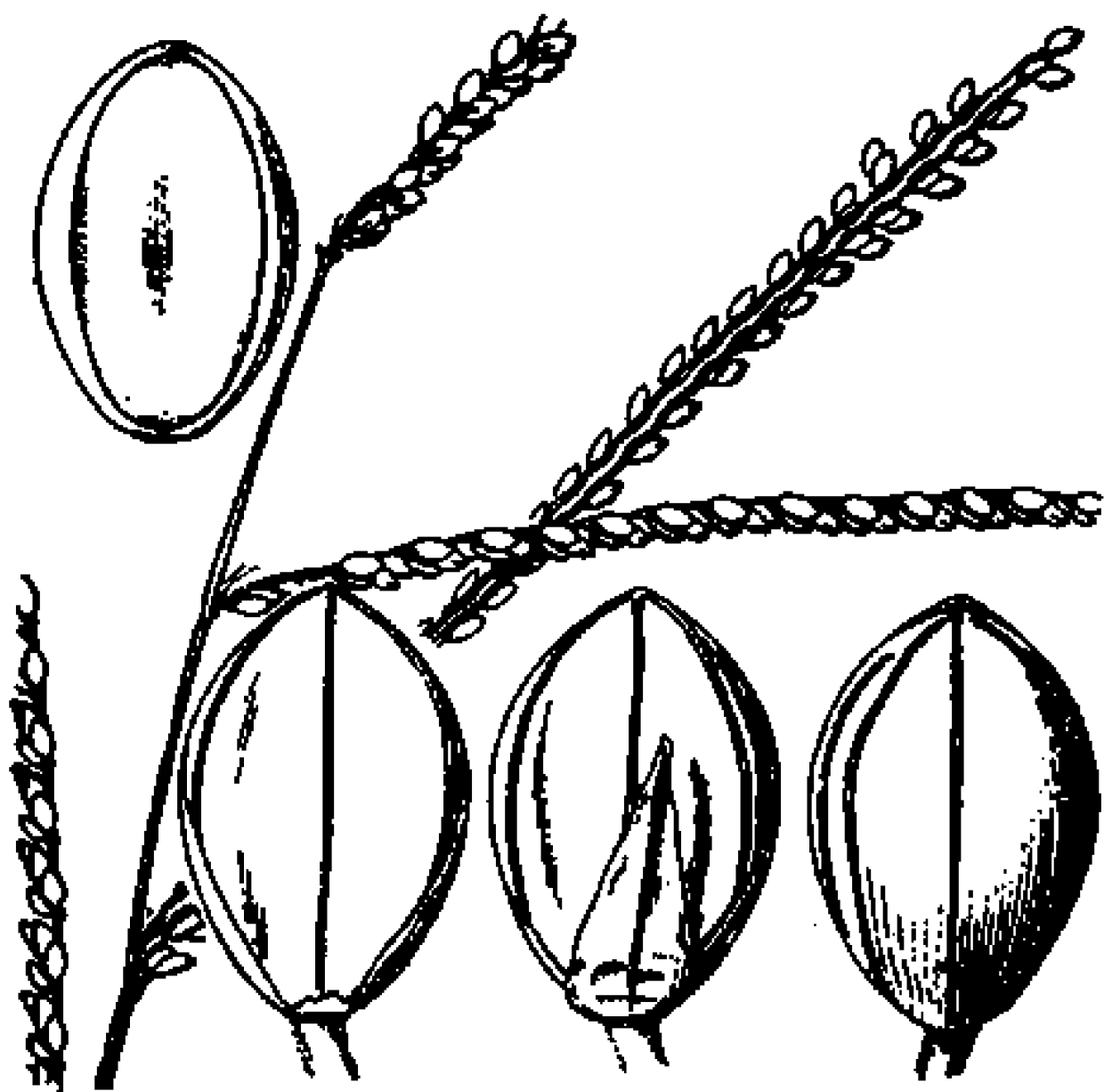


FIGURE 55—*P. culiacanum*. From type specimen

on the margin and with a few long hairs at the very base, otherwise glabrous; racemes 3 to 8, spreading, 4.5 to 7.5 cm. long, the slender common axis, 3.5 to 7 cm. long, channeled on one side and with a minute auricle on the angles just below the base of the rachises, the angles scabrous, the rachises about 1 mm. wide, with a few hairs at base and rarely a few long hairs on the scabrous margins; spikelets in pairs, scarcely crowded, 2.3 mm. long, 1.5 mm. wide, obovate-elliptic, glabrous, pale or purple-tinged, the first glume minute or obsolete on the primary spikelet, half to two-thirds as long as the spikelet on the secondary, acuminate, 1-nerved; second glume and sterile lemma subequal, barely covering the fruit, 5-nerved; fruit slightly smaller than the spikelet, pale, minutely papillose-striate, the tip obscurely papillose.

Known only from the type collection. In one sheath of one of the two plants there is a wholly included raceme. Possibly this is an exceptional specimen of *P. adoperiens* with nearly glabrous foliage and narrower spikelets.

56. *Paspalum langei* (Fourn.) Nash

Paspalum abbreviatum Trin.; Fourn. Mex. Pl. 2: 10. 1886. "Msc. in herb. Petrop: * * * Absque loco (SCHIEDE n. 888)." Schiede's no. 888, named "*Paspalum abbreviatum* S. & D." [Schiede & Deppe], in the herbarium of the Botanical Garden in Leningrad, evidently the one referred to, is the same as Liebmann's 192 (see below). The description of the plant applies fairly well to this; that of the spikelets does not, but rather to the specimens named *P. abbreviatum* in Trinius' script in the Academy of Natural Sciences (Leningrad) and in the Berlin Herbarium. These are Schiede's no. 885 and "Schiede, Jalapa [distributed by Hahn] 1836." These belong to *P. squamulatum* Fourn. It seems probable that Fournier saw both species named *P. abbreviatum* by Trinius and did not distinguish between them, and that he cited a number he had taken down. The description of the plant applies better to Schiede's no. 888, but as a whole is too uncertain to be taken up in place of *P. langei*. *P. abbreviatum* Trin. was earlier mentioned by Schlechtendal¹ as a new species from Mexico, without description or specimen cited.

In the Trinius Herbarium is a specimen of *P. langei* collected by Schiede, "Mexico Hacienda de la Laguna, 1836," with spikelets scarcely more than 2 mm. long, named *P. senescens* by Trinius. This name was also mentioned without description by Schlechtendal in the note mentioned above.

Paspalum lineare Fourn. Mex. Pl. 2: 12. 1886. Not *P. lineare* Trin. 1826. "Absque loco (LIEBM. n. 192); Chinantla (LIEBM. n. 187)." Liebmann's no. 192 in the Copenhagen Herbarium bears the name in Fournier's script, and is taken as the type. In this specimen the first glume is nearly obsolete in all but the terminal spikelets. The spikelets are 2.2 mm. long.

Dimorphostachys drummondii Fourn. Mex. Pl. 2: 15. 1886. Not *Paspalum drummondii* C. Muell. 1861. Several specimens are cited, the last "Texas (DRUMM.)," because of the name, is taken as the type. On the label of Drummond's no. 350 in the Paris Herbarium "*Paspalum abbreviatum* Trin." and two unpublished names are crossed out and "*Dimorphostachys Drummondii* n. sp." is added, all in Fournier's script. There are 2 plants, each with 2 racemes; the spikelets nearly 2.5 mm. long.

Panicum squamatum Fourn. Mex. Pl. 2: 18. 1886. Not *Paspalum squamatum* Steud. 1854. "Mundo Nuevo (KARW. n. 982)." This specimen is also cited by Fournier under *Dimorphostachys drummondii*. Fournier differentiates *P. squamatum* from *Dimorphostachys* because the first glumes are alike on both spikelets.

¹ *Linnaea* 26: 383. 1854.

Karwinsky's no. 982 in the herbarium of the Botanical Garden, Leningrad, is named *D. drummondii* by Fournier, but the first glumes are alike in both spikelets of the pair. Doubtless Fournier later described *P. squamatum* and failed to take out the citation under *D. drummondii*.

Dimorphostachys langei Fourn. Mex. Pl. 2: 14. 1886. "Hacienda de Jovo (LIEBM. n. 186); Mecapalco, maio (LIEBM. n. 179 part)." Liebmann's no. 186 in the Copenhagen Herbarium, bearing the name in Fournier's script, consists of 3 fragments with overmature inflorescences, most of the spikelets fallen. The one in which a few spikelets remain is not the form for which the name *P. langei* has come into use, but appears to be the same as that described by Fournier as *Dimorphostachys adoperiens* on the following page. The other two fragments may be the form that has recently been called *P. langei*. The description was evidently drawn up from both Liebmann's collections, nos. 186 and 179 in part. The description of the spikelets as "ovato-orbicularibus" does not apply to no. 179 in part, but to those of the fragmentary no. 186, while "spiculis pubescentibus" in the key (p. 14) applies to Liebmann's no. 179. The specimen of Liebmann's 179 in the Copenhagen Herbarium, named *D. langei* by Fournier, is selected as the type because it is the form to which Nash applied the name and which has since been known as *P. langei*. *Paspalum variable* was also distributed by Liebmann under no. 179.

Paspalum drummondii Vasey, Contr. U. S. Nat. Herb. 3: 18. 1892. Not *P. drummondii* C. Muell. 1861. Based on *Dimorphostachys drummondii* Fourn. In Index Kewensis² this name is erroneously listed as *Panicum drummondii* Vasey, the citation referring to *Paspalum drummondii* Vasey, Contr. U. S. Nat. Herb. 2: 499. 1894.

Paspalum oricola Millsp. & Chase, Field. Mus. Bot. 3: 28. f. 28, 29. 1903 (February). "Island of Cozumel, Millspaugh Pl. Utowanæ 1480." The type, in the Field Museum of Natural History, is much like the type of *D. drummondii* Fourn.; that is, the shorter-leaved, nearly glabrous form.

Dimorphostachys ciliifera Nash in Small, Fl. Southeast. U. S. 78, 1327. 1903 (July). "Type, Manatee, Fla., Simpson, no. 97, 1890, in Herb. U. S. Dept. Agric." This specimen, now in the National Herbarium, is a single complete plant 1.1 meter tall and unusually robust, with sparsely papillose-pubescent sheaths and blades, the blades 11 to 28 cm. long, 4 racemes, and spikelets 2.7 to 2.8 mm. long. The original description reads "racemes 2 or 3, * * * second and third scales (second glume and sterile lemma) 5-nerved, the former glabrous, the latter sparingly pubescent with short appressed hairs." In the type there are 4 racemes on the primary peduncle (the axillary one hidden in the sheath), and the second glumes are pubescent. The description was obviously drawn in part from other specimens.

Paspalum ciliiferum Hitchc. Contr. U. S. Nat. Herb. 12: 201. 1909. Based on *Dimorphostachys ciliifera* Nash.

Paspalum langei Nash, N. Amer. Fl. 17: 179. 1912. Based on *Dimorphostachys langei* Fourn.

DESCRIPTION

A rather slender olivaceous perennial in tufts of few to several culms; culms ascending, 30 to 100 cm. tall, mostly simple, but occasionally with a single leafy branch, compressed, glabrous; nodes glabrous; sheaths keeled, pubescent along the margin and often on the collar, otherwise glabrous to sparsely papillose-

²Suppl. 1: 312. 1906.

pubescent; ligule membranaceous, about 1 mm. long; blades flat, ascending, usually rather thin, 10 to 40 cm. long, 6 to 15 mm. wide, tapering to a narrow base or, especially the upper, rounded at base, scabrous and often sparsely ascending-ciliate on the margin, and with long hairs on the upper surface at the very base, otherwise from glabrous to appressed papillose-pubescent on the upper surface and sparsely pubescent below (more commonly nearly glabrous); peduncles slender, 1 to 3 rather short-exserted from the upper sheath, the axillary ones usually appearing late, the racemes often partly included, axillary racemes also often borne in the middle sheaths, mostly partly or wholly included; racemes 2 to 5 (rarely to 7), arcuate or subflexuous, ascending to spreading, 3.5 to 11 cm. long, mostly rather distant on a slender channeled axis 7 to 14 cm. long, the rachis with a few long hairs at the base and occasionally along the margin; spikelets in

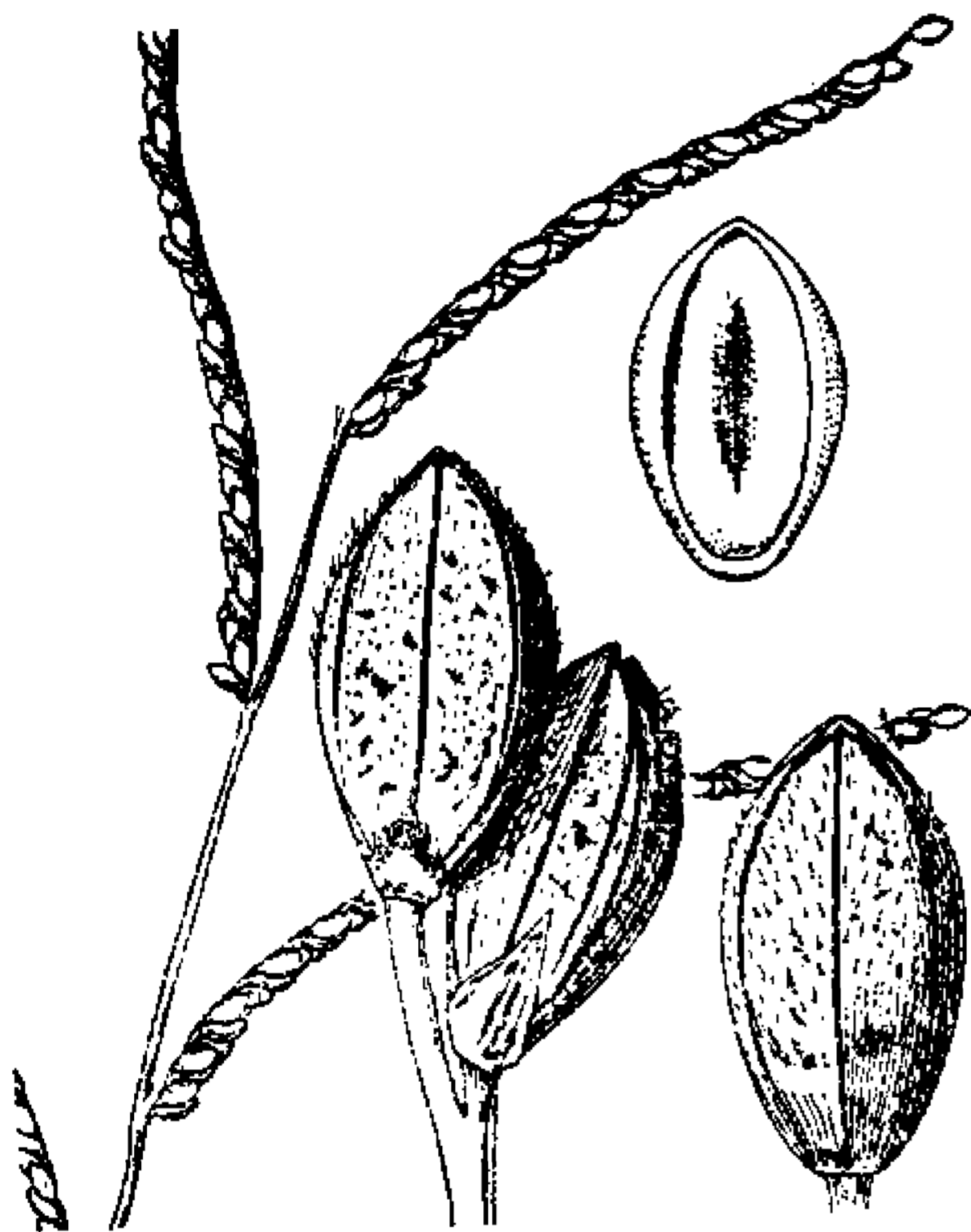


FIGURE 57.—*P. lanzei*. From Pringle 3991

pairs, not crowded, 2.2 to 2.6 mm. long (rarely only 2 mm. or as much as 2.8 mm.), 1.3 to 1.4 mm. wide, elliptic-ovoid, olive-green, turning brown at maturity and in drying, the first glume minute (rarely nearly obsolete) on the primary spikelet, with a ciliate brownish hyaline margin, usually acuminate and one-fourth to one-third as long as the spikelet on the secondary, occasionally alike on both spikelets; second glume and sterile lemma 5-nerved, finely pubescent and sparsely to copiously speckled with brown glandular spots, the glume slightly shorter than the sterile lemma, the summit of the fruit exposed at maturity; fruit 2.1 to 2.3 mm. long, pale, minutely papillose-striate.

This species varies from the relatively small, nearly glabrous form with shorter blades, like the type specimens of *Dimorphostachys drummondii* and *Paspalum oricola*, to the tall, long-leaved, pubescent form, like the type of *Dimorphostachys ciliifera*, but no two characters separating these extremes remain coupled. Only two specimens with glabrous sterile lemmas, given by Nash³ as a character of *P. lanzei*, have been seen, *Seaton* 112a and *Hitchcock* 9078. The latter has pubescent blades, more than 40 cm. long (characters assigned to *P. ciliiferum*). No specimens have been seen with spikelets having glabrous second glumes.

Hitchcock's nos. 8630, 8681, 8686, and 8744, all from Nicaragua, are coarse, rather robust plants resembling *Paspalum botterii*.

DISTRIBUTION

Moist woods and shaded slopes and banks, occasionally in open ground, mostly at low altitudes, Florida, Texas, and the Greater Antilles to Venezuela.

FLORIDA: Orange Bend, *Chase* 4092, 4096. Grasmere, *Combs & Baker* 1151. Madatee, *Simpson* 97.

LOUISIANA: Lake Charles, *Chase* 4398, 4415; *Langlois* in 1893. Cameron, *Cocks* 3010.

³ N. Amer. Fl. 17: 179. 1912.

TEXAS: Tom Green County, *Tweedy* in 1879. San Antonio, *Hitchcock* 2461, 5251. Industry, *Wurzlów* 1894. Pierce, *Tracy* 7369. Hempstead, *Hall* 803. Houston, *Fisher* 116, 260, 2012; *Nealley* in 1884; *Reverchon* 4174, *Tharp* 2024. Sheldon, *Reverchon* 4176. Lavaca River, *Plank* 87. Columbia, *Bush* 264, 963. San Jacinto River, *Tharp* 4259. Trinity Bay, *Joor* in 1884. Brownsville, *Hanson* 499. Without locality, *Drummond* 350; *Nealley* in 1884, 1885, and 1888.

NUEVO LEÓN: Monterrey, *Hitchcock* 5562, 5573.

TAMAULIPAS: Chamal Hacienda, *Wooton* in 1919. Without locality, *Runyon & Tharp* 4028.

SAN LUIS POTOSÍ: Las Canoas, *Pringle* 3991. Sierra de Guascama, *Purpus* 5423. San Luis Potosí, *Virelet* 1323 (Paris Herb.).

VERA CRUZ: Hacienda de Jovo, *Liebmann* 188 (6329). Jalapa, *Hitchcock* 6644½. Córdoba, *Hitchcock* 6417. Pital, *Liebmann* 184. Colipa, *Liebmann* 185.

PUEBLA: Orizaba, *Seaton* 112a.

GUERRERO: Iguala, *Rose, Painter & Rose* 9383.

HONDURAS: La Ceiba, *Standley* 56737.

EL SALVADOR: Colina de Santa Tecla, *Calderón* 1744. Volcano San Salvador, *Hitchcock* 8956. Dept. Ahuachapán, *Padilla* 594.

NICARAGUA: Corinto, *Hitchcock* 8744. Masaya, *Hitchcock* 8630. Jinotepe, *Hitchcock* 8681, 8686, 8724. San Juan del Sur, *Hitchcock* 8606.

CUBA: Mariel, *Ekman* 11497, in *Amer. Gr. Nat. Herb.* 934. Habana, *Léon* 934. Guatao, *Léon* 6321. Tapaste, *Léon* 4183. Arroyo Naranjo, *Léon* 587. Marianao, *Léon* 1511. Río Bacuranao, *Wilson & Léon* 11602. Matanzas, *Britton & Wilson* 148.

HAITI: Morne Cap-Rouge, *Ekman* H 5948. Trouin, *Ekman* H 2376.

VENEZUELA: Caracas, *Sydow* 6.

57. *Paspalum variable* (Fourn.) Nash

?*Panicum* (*Harpostachys*) *pseudopaspalus* Nees, *Linnaea* 24: 236. 1851. Described from a specimen grown in a greenhouse, Breslau, the native country not given. The type has not been found. The description applies well to *Paspalum variable*, but is scarcely detailed enough for certainty. It is said to be "affine *P[anicum] monostachyum* Humb. et Kth.," which is the same as *Paspalum pilosum* Lam. In any case the specific name would be an unfortunate one under *Paspalum*. The name appeared earlier without description in a seed list⁴ from the botanical garden of Breslau.

?*Paspalum haenkeanum* Nees, *Linnaea* 24: 236, 1851, as synonym of *Panicum pseudopaspalus* Nees. Not *Paspalum haenkeanum* Presl, 1830. The name is also given in the Breslau seed list mentioned above under *P. pseudopaspalus*.

Dimorphostachys schaffneri Fourn. *Mex. Pl.* 2: 15. 1886. Not *Paspalum schaffneri* Griseb. 1886. Several collections are cited, of which the one Schaffner collection, without number from Mirador, is taken as the type. This specimen, in the Fournier Herbarium in the Paris Herbarium, is named, "*Panicum Schaffneri* Griseb. ms. ipse." It consists of a single plant with nearly mature inflorescence.

Panicum schaffneri Griseb.; Fourn. *Mex. Pl.* 2: 15. 1886, as synonym of *Dimorphostachys schaffneri* Fourn.

Dimorphostachys schaffneri var. *remotispicula* Fourn. *Mex. Pl.* 2: 15. 1886. No specimen is cited and none has been found so named by Fournier. The variety is differentiated by "Spicis brevioribus, spiculis laxis."

⁴Delect. Sem. Hort. Vrat. 1850. We have been unable to verify this reference. The new species from this and other seed lists were described in *Linnaea* the following year (see above).

Dimorphostachys variabilis Fourn. Mex. Pl. 2: 15. 1886. "Absque loco (GHIESBREGHT in herb. Mus. Par.); Orizaba (BOTT. in meo herb.)." The Ghiesbreght specimen in the Paris Herbarium without locality other than Mexico, bearing the name in Fournier's script, is taken as the type. This is a dense clump, the inflorescences nearly mature.

Brachiaria grossaria Griseb.; Fourn. Mex. Pl. 2: 15, 1886, as synonym of *Dimorphostachys variabilis*. No specimen so named by Grisebach has been found.

Dimorphostachys ghiesbreghtii Fourn. Mex. Pl. 2: 16. 1886. "Absque loco (GHIESBR. in herb. Mus. Paris)." This specimen from Mexico, bearing the name in Fournier's script, consists of a tuft with a single flowering culm and several leafy shoots.

Paspalum schaffneri Scribn. Field Mus. Bot. 2: 24. 1900. Not *P. schaffneri* Griseb. 1886. Based on *Dimorphostachys schaffneri* Fourn. Plate 56, referred to in the text, was not published until later⁵ and represents *Paspalum oricola*, now referred to *P. langei*.

Paspalum variabile Nash, N. Amer. Fl. 17: 180. 1912. Based on *Dimorphostachys variabilis* Fourn.



FIGURE 58.—*P. variabile*. From type of *P. ghiesbreghtii* and Hitchcock 6645

DESCRIPTION

A leafy perennial in tufts of few to several culms, occasionally in dense tufts; culms erect or ascending, 70 to 100 cm. tall, mostly simple, occasionally with a single leafy branch, compressed, glabrous; nodes glabrous; sheaths keeled, pubescent along the margin and sparsely so on the collar, otherwise glabrous; ligule membranaceous, 2 to 3 mm. long; blades flat, ascending, relatively firm, 10 to 30 cm. long, 7 to 18 mm. wide, tapering to a rounded base, the upper reduced and broadest at the base, usually ciliate on the scabrous margin, pilose back of the ligule and commonly sparsely appressed-pubescent toward the apex on both surfaces, otherwise glabrous or nearly so; peduncles slender, 1 to 3 from the upper sheath, the axillary mostly solitary, commonly borne in all but the lower sheaths but often hidden; racemes 2 to 4, rarely 1, on the primary peduncle, usually 1 on the axillary, relatively thick, ascending, 4 to 9 cm. long, rather distant on a slender angled axis, the rachis sometimes with a few hairs at base; spikelets in pairs, scarcely crowded, 2.9 to 3.2 mm. long, about 1.7 mm. wide, elliptic-obovate, olive brown toward maturity, the first glume well developed on both of the pair of spikelets and usually increasing in size toward the end of the raceme, that of the primary spikelet with a brownish hyaline margin, mostly 2-nerved, one-fifth to two-thirds the length of the spikelet, pubescent and sometimes glandular spotted near the margin, mostly subglabrous otherwise, that of the secondary spikelet eccentric, long-pointed and strongly keeled toward the apex, 1 to 3 nerved, half to three-fourths as long as the spikelet, the hyaline margin very narrow, obscure; second glume and sterile lemma subequal, 5-nerved, pubescent, the glume at maturity copiously speckled with brown glandular spots except

⁵ Ibid 3: 29. 1903, no plate number being given.

at the base, barely covering the fruit, the apex of the lemma minutely pointed; fruit about 2.7 mm. long, pale, minutely papillose-striate.

Fournier differentiates *Dimorphostachys schaffneri*, *D. variabilis*, and *D. ghiesbreghtii*, mostly on the width of the blades, but almost the entire range of variation is found in a single plant, as in Hitchcock's no. 6439.

DISTRIBUTION

Open or brushy slopes, mostly in rich soil, at middle altitudes, Mexico and Costa Rica.

VERA CRUZ: Jalapa, *Hitchcock* 6608, 6644, 6645; *Schiede* 885. Córdoba, *Bourgeau* 1658; *Hitchcock* 6411, 6439; *Kerber* 24. Huitamalco, *Liebmann* 177. Mirador, *Liebmann* 178. Mecapalco, *Liebmann* 179 in part. Orizaba, *Bourgeau* 2598; *Hitchcock* 6323. Chinantla, *Liebmann* 168.

MORELOS: Cuernavaca, *Hitchcock* 6833.

COSTA RICA: Guanacaste, *Jiménez* 387.

58. *Paspalum palmeri* Chase, sp. nov.

Paspalum setaceum Michx. var. *pubiflorum* Vasey, Contr. U. S. Nat. Herb. 1: 114. 1891. Not *Paspalum pubiflorum* Rupr. 1886. "Grew in a swampy place, many plants together, Alamos [Mexico], September 16 to 30. No. 704," Palmer. The type specimen in the United States National Herbarium and 3 duplicates seen all consist of the upper parts of flowering culms with 2 leaves each.

DESCRIPTION

A slender olivaceous perennial, culms probably 70 cm. or more tall, compressed, glabrous; nodes glabrous; sheaths keeled, pubescent along the margin, otherwise glabrous; ligule membranaceous, 1 to 2 mm. long; blades flat, ascending to spreading, rather firm, 8 to 15 cm. long, 7 to 8 mm. wide, tapering from a rounded base to an attenuate apex, scabrous and somewhat appressed-hispid on the margin, sparsely appressed-pubescent on both surfaces toward the apex and with long stiff hairs back of the ligule; peduncles slender, 1 or 2 from the upper sheath; axillary racemes also borne in the middle sheaths, mostly partly included; racemes 1 to 3, commonly 2, ascending to spreading, 3.5 to 8 cm. long, the slender angled common axis 1.5 to 3 cm. long, the rachis usually without long hairs in the axils; spikelets in pairs, somewhat crowded, 2.8 mm. long, 1.5 mm. wide, elliptic-obovate, pale greenish brown, the first glume obsolete or nearly so on the primary spikelet, from small nerveless and obscure to strongly nerved, acuminate and half the length of the spikelet on the secondary, glabrous; second glume and sterile lemma equal, 5 (rarely 7) nerved, softly pubescent and speckled with pale glandular spots; fruit about 2.5 mm. long, pale, minutely papillose-striate.

The spikelets of *Palmer* 704 are immature. They probably turn brown and become more glandular at maturity.

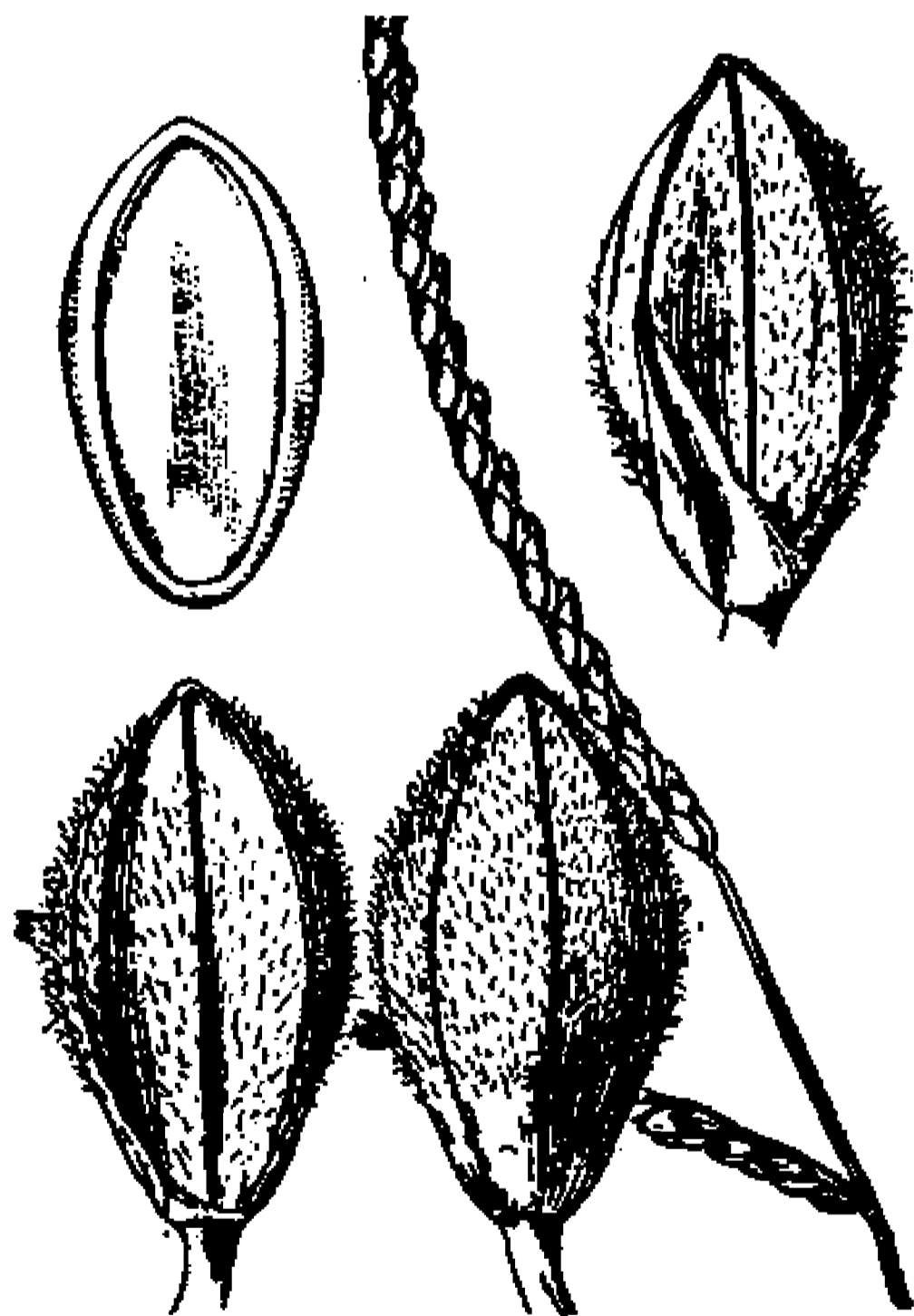


FIGURE 59.—*P. palmeri*. From type specimen

Type in the U. S. National Herbarium, no. 951577 (the type of *P. setaceum* var. *pubiflorum* Vasey) collected "from a swampy place, many plants seen but a short grower" at Alamos, Sonora, Mexico, September 16-30, 1890, by Edward Palmer (no. 704).

Known only from the type collection.

59. *Paspalum botterii* (Fourn.) Chase

Paspalum macrophyllum var. *piliferum* Fourn. Mex. Pl. 2: 11. 1886. "Orizaba (BOTT. n. 117, julio); Consoquitla (LIEBM. n. 117, agosto); Santa Maria Tlatella (LIEBM. n. 168, junio)." Specimens of Botteri's no. 117 were examined in the Paris Herbarium and in the herbaria of the British Museum and of Henslow Museum, Cambridge. In all the first glume of the secondary spikelet varies from nearly obsolete to more than half the length of the spikelet. The specimen in the Paris Herbarium is named "*Paspalum varians*" in Fournier's script (see below). Liebmann's no. 167 (erroneously cited as 117) and 168 were examined in the Copenhagen Herbarium. The first is named "*Paspalum macrophyllum* H. B. K." in Fournier's script, with "*Paspalum varians* Fourn." written below in his script; the second is named "*Paspalum varians* Fourn." in his script. In these the first glume is large and pointed in most of the secondary spikelets.

Paspalum varians Rich.; Fourn. Mex. Pl. 2: 11. 1886. Mentioned without description in comparison with *P. abbreviatum* Trin. Botteri's no. 117 in the Paris Herbarium is named "*Paspalum varians* n. sp." in Fournier's script, as well as the two Liebmann collections mentioned above.

Dimorphostachys botterii Fourn. Mex. Pl. 2: 14. 1886. "Prope Orizaba, agosto (BOTT. n. 118)." The type, bearing the name in Fournier's script, in the Paris Herbarium, consists of part of a culm with two leaves and a panicle of 10 racemes.

Dimorphostachys paspaloides Fourn. Mex. Pl. 2: 14. 1886. "Vera Cruz (GOUIN n. 32 et 33)." A specimen of Gouin's no. 32, with the name in Fournier's script and with detailed notes by Gouin, in the Paris Herbarium, is taken as the type. This is a tall plant without the base, bearing 6 racemes.

Paspalum botterii Chase, Journ. Washington Acad. Sci. 13: 436. 1923. Based on *Dimorphostachys botterii* Fourn.

Nash⁶ refers this species to *Paspalum macrophyllum* H. B. K. An examination of the type of that, however, shows it to be a species not known from North America.

DESCRIPTION

A leafy perennial in tufts of few to several culms; culms ascending, 60 to 130 cm. tall, sometimes sparingly branching, compressed, glabrous; nodes glabrous; sheaths often overlapping, keeled toward the summit, from glabrous to papillose-hirsute, especially toward the summit; ligule membranaceous, about 3 mm. long, mostly lacerate; blades flat, ascending, usually relatively firm, but sometimes thin, 14 to 40 cm. long (commonly 20 to 30 cm.), 1 to 2.4 cm. wide (usually 1.5 to 1.8 cm.), the lower often long-tapering to a narrow base, the upper rounded to subcordate, scabrous on the margin, and with a ring of stiff hairs back of the ligule, otherwise from glabrous to harshly papillose-pubescent on both surfaces; terminal panicles short-exserted until maturity, of 4 to 15 arcuate-spreading racemes, the common axis slender, glabrous, the racemes distant or, when several, the upper approximate; axillary inflorescences infrequently developed, of 1 to 3 racemes usually wholly or partly included in the sheaths; racemes 6 to 14 cm. long, the slender rachis usually with a few hairs at base; spikelets in pairs,

⁶N. Amer. Fl. 17: 179. 1909.

mbriate, 2.3 to 2.6 mm. long, about 1.4 mm. wide, elliptic-obovate, rather turgid, light brownish, turning olive-brown, the first glume obsolete on the primary spikelets, commonly developed on most of the secondary, but in some specimens only on a few, strongly eccentric and mostly more than half the length of the spikelet, 1-nerved, pointed, closely appressed and often obscure even when well developed; second glume and sterile lemma 5-nerved, the glume slightly shorter than the fruit, appressed-pubescent with very fine hairs, the lemma glabrous to sparsely pubescent; fruit about 2 mm. long, pale, minutely papillose-striate.

DISTRIBUTION

Banks of streams and ditches and moist open or partly wooded slopes at middle altitudes, Mexico and Guatemala.

SAN LUIS POTOSÍ: Las Canoas, *Hitchcock* 5760; *Pringle* 3779.

SINALOA: Rancho del Burro, *Ortega* 4102.

JALISCO: Tequila, *Palmer* 144 in 1886.

VERA CRUZ: Jalapa, *Hitchcock* 6603.

Orizaba, *Botteri* 659; *Hitchcock* 6328, 6347, 6377. Córdoba, *Hitchcock* 6416.

PUEBLA: Mt. Orizaba, *Seaton* 112a.

MORELOS: Cuernavaca, *Hitchcock* 6826.

COLIMA: Alzada, *Hitchcock* 7074.

OAXACA: Tomellín, *Hitchcock* 6209.

Oaxaca, *Conzatti & González* 1160; *Hitchcock* 6153, 6182, 6185.

GUATEMALA: Guatemala City, *Hitchcock* 9078. Secanquím, *Goll* 80.



FIGURE 60.—*P. botterii*. From *Botteri* 118 and 659

Corcovadensia.—Tufted perennials with relatively large flat lax blades and several to many racemes. Grouped with the Brazilian *Paspalum corcovadense* Raddi, but hardly a natural aggregation.

Spikelets broadly ovate or obovate, glabrous or nearly so.....65. *P. virletii*.
Spikelets elliptic or narrowly obovate.

Foliage velvety throughout.....61. *P. tenellum*.

Foliage not velvety.

Racemes mostly more than 15, arcuate.....60. *P. affine*.

Racemes not more than 12, straight.

Blades 1 to 2.5 cm. wide.....64. *P. costaricense*.

Blades not more than 1 cm. wide.

Glume papillose-pubescent.....62. *P. jaliscanum*.

Glume obscurely finely pubescent.....63. *P. tonduzii*.

60. *Paspalum affine* Steud.

Paspalum affine Steud. Syn. Pl. 1: 24. 1854. "Oaxaca." The type, bearing the name in Steudel's script, is in the Lenormand Herbarium in the Institut de Botanique at Caen. It consists of part of a culm and a detached panicle with 15 arcuate-spreading racemes.

This is the species to which Fournier,⁷ Nash,⁸ and Chase⁹ misapplied the name *P. conspersum* Schrad. The type of that was examined later in the Berlin Herbarium; it is a species of the *Virgata* group.

DESCRIPTION

A rather stout leafy, olivaceous perennial; culms ascending, commonly geniculate at base, sometimes decumbent at base and rooting at the lower nodes, simple or sparingly branching from the middle nodes, 1 to 2 meters tall, strongly compressed, glabrous; nodes sparsely hispid; sheaths overlapping, slightly keeled, coarsely and sparsely tuberculate-hispid, or the lower glabrate; ligule firm-membranaceous, about 2 mm. long; blades flat, ascending to spreading, 15 to 50 cm. long, 1.2 to 2.3 cm. wide (the uppermost reduced), rounded at base, acuminate, bearing long stiff tawny hairs on the upper surface at the very base, otherwise glabrous or very sparsely tuberculate-hispid near the mid nerve on the upper surface, the margin sharply scabrous; panicle nodding, of 10 to 31

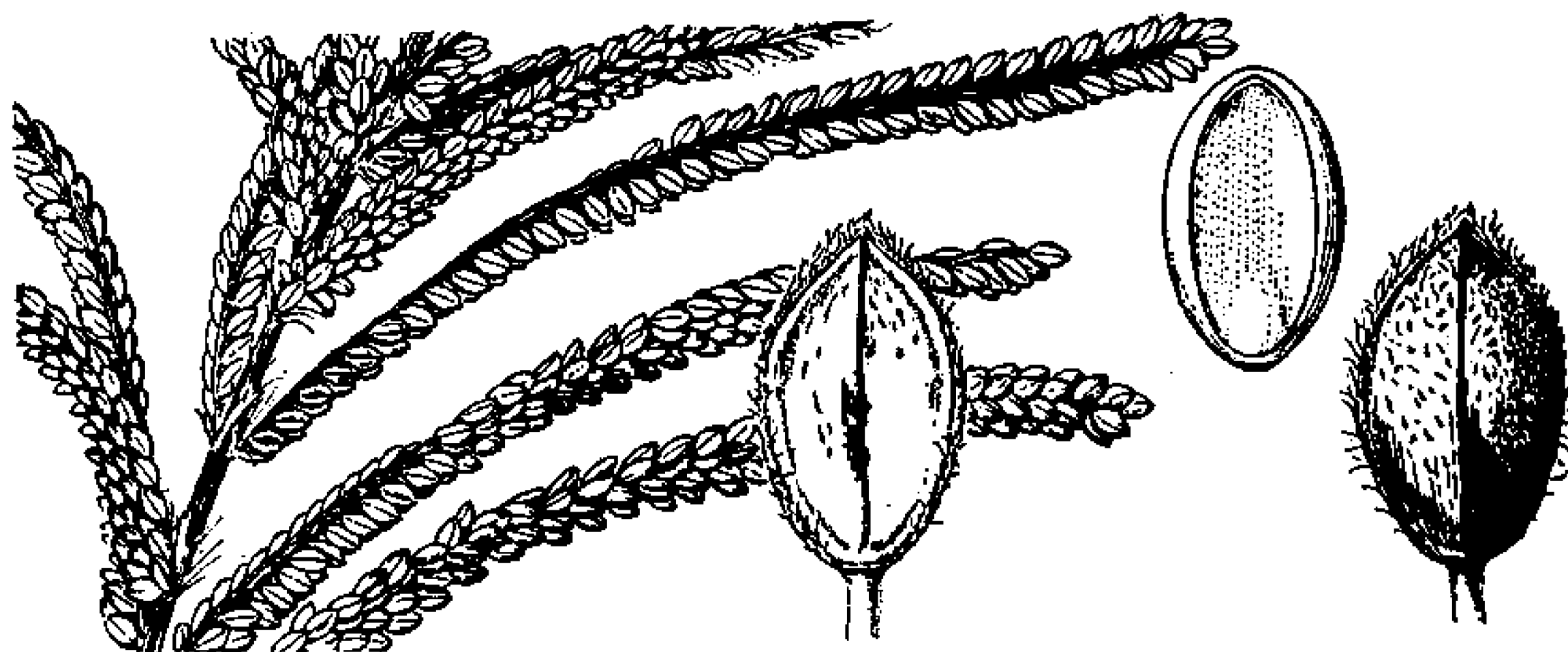


FIGURE 61.—*P. affine*. From type specimen and Hitchcock 6613

ascending to drooping racemes, the lower 7 to 11 cm. long, the upper gradually shorter, aggregate on a strongly angled common axis 8 to 18 cm. long; rachis 0.5 to 0.7 mm. wide, with copious long hairs at the very base; spikelets in pairs on minute pedicels, crowded, 2 to 2.3 mm. long, about 1.5 mm. wide, obovate-elliptic, commonly obscurely apiculate; glume and sterile lemma equal, covering the fruit, 3-nerved, the glume silky-pubescent near the margin, sparsely so to nearly glabrous otherwise, the lemma glabrous, both tan-olivaceous, speckled or blotched with purple or brown; fruit 2 mm. long, pale, smooth and shining.

DISTRIBUTION

In swamps and rich moist open or brushy ground, up to 1,300 meters altitude, Mexico and Guatemala.

VERA CRUZ: Jalapa, Hitchcock 6613, 6617; Pringle 9211. Mirador, Liebmann 169.

Orizaba, Botteri in 1857. Zacuapan, Purpus 5981.

GUATEMALA: Puerto Barrios, Hitchcock 9154. Without locality, Türckheim 161.

61. *Paspalum tenellum* Willd.

Paspalum tenellum Willd. Enum. Pl. 89. 1809. Described from a specimen in the Berlin Botanic Garden, the native country unknown. The type was examined in the Willdenow Herbarium in Berlin.

⁷ Mex. Pl. 2: 239. 1886.

⁸ N. Amer. Fl. 17: 190. 1912.

⁹ In Hitchc. Contr. U. S. Nat. Herb. 17: 239. 1913.

Paspalus elegans Flüge, Monogr. Pasp. 183. 1810. Flüge states that the seed of this grass was sent to Montpellier by Cavanilles and later to other gardens; that his specimen was given him by Rohde and Willdenow. Flüge's own herbarium has not been located.¹⁰ In the Willdenow Herbarium are two specimens so named, one *P. tenellum*; the other, bearing also an unpublished name of Willdenow's, is a different species. Flüge cites Willdenow's diagnosis of *P. tenellum*, saying that if it be the same, the name "tenellum" is misleading, the plant being rather robust.

Paspalum pubescens Lag. Gen. & Sp. Nov. 2. 1816. Not *P. pubescens* Muhl. 1809. "H[abitat] in Havana. Introd. ann. 1804 ex seminibus per D. Sessé et Mar. Espinosa missis." The type specimen, in the herbarium at the Jardin Botánico at Madrid, was grown in that garden. A duplicate sent by Lagasca is in the Munich Herbarium. Sessé collected in Mexico, whence the seed distributed by Cavanilles probably came originally.

Paspalum lagascae Roem. & Schult. Syst. Veg. 2: 317. 1817. Based on *P. pubescens* Lag. This name has been widely misapplied to the South American *P. ferrugineum* Trin. and allied species.

Paspalum robustum Link; Steud. Nom. Bot. ed. 2. 2: 273, 1841, as synonym of *P. elegans* Flüge.

Paspalum liebmanni Fourn. Mex. Pl. 2: 11. 1886. The name was earlier listed by Hemsley without description.¹¹ "Paso de Ovejo (LIEBM. n. 189, agosto)." Dr. Carl Christensen, of the University Botanical Museum, Copenhagen, writes that the specimen can not be found in that herbarium. The description appears to indicate a specimen of *P. tenellum* with approximate racemes.

Paspalum tenellum β *bourgaei* Fourn. Mex. Pl. 2: 12. 1886. The name was earlier listed by Hemsley without description.¹² "Tizapan in valle Mexicensi * * * (BOURG. n. 1150); Pedregal * * * (BOURG. n. 452)" are the only Bourgeau specimens cited. Both are in the Paris Herbarium; no. 1150, bearing the name in Fournier's script, is taken as the type.

DESCRIPTION

A softly pubescent perennial in clumps of few to several culms from a knotted base of very short rhizomes; culms suberect to ascending, 30 to 150 cm. tall, simple or branching from the lower nodes after the maturity of the primary panicle, compressed, angled, glabrous; nodes short-pubescent or glabrous; sheaths mostly shorter than the elongate internodes, densely to sparsely velvety papillose-pubescent, or glabrous toward the base, rarely throughout, the summit with a minute auricle on each side; ligule about 3 mm. long; blades flat or in age reflected (the under surface folded together), 8 to 25 cm. long, 8 to 21 mm. wide (the uppermost reduced), rounded at base or somewhat narrowed, densely velvety pubescent to sparsely soft-pubescent on both surfaces; panicle long-exserted, of 3 to 17, commonly 5 to 10, spreading to ascending rather thick racemes, the lower 2 to 8 cm. long, the others gradually shorter, the common axis flattened,

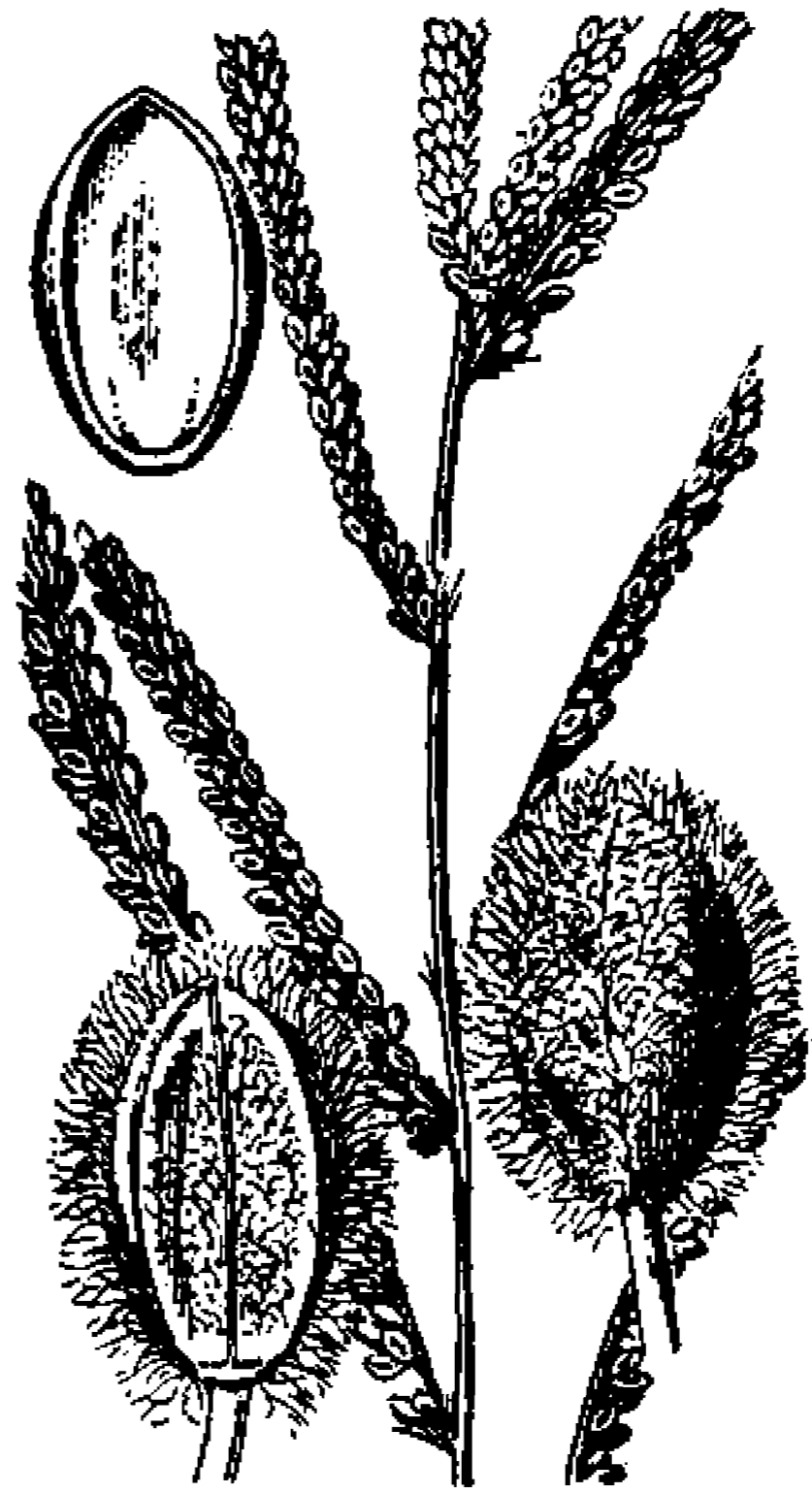


FIGURE 62.—*P. tenellum*. From type collection in Munich Herbarium and Hitchcock 6922

¹⁰ See p. 1.

¹¹ Biol. Centr. Amer. Bot. 3: 479. 1885.

¹² Biol. Centr. Amer. Bot. 3: 482. 1885.

strongly angled, glabrous; rachis 1 mm. wide, with a few long hairs at the base, otherwise glabrous; spikelets in pairs on slender glabrous pedicels, crowded, 1.9 to 2.1 mm. long, about 1.2 mm. wide, obovate-elliptic, turgid; glume and sterile lemma equal, covering the fruit, 5-nerved, the glume densely papillose-villous, the lemma pubescent with shorter hairs, the margins commonly glabrous, both at first yellowish green, toward maturity speckled or blotched with brownish purple; fruit about 1.8 mm. long, stramineous, smooth and shining.

DISTRIBUTION

Open, mostly moist ground, depressions in rocky slopes, and along ditches and roadsides, between 700 and 2,500 meters altitude, Mexico and Central America; also in Ecuador and Brazil.

SONORA: La Colorado, *Clokey* 1928.

JALISCO: Guadalajara, *Pringle* 11239. Zapotlán, *Hitchcock* 7121, 7133. San Nicolás, *Hitchcock* 7208. Ciudad Guzmán, *Collins* in 1921.

MEXICO: Federal District, Valley of Mexico, *Bourgeau* 1150; *Hitchcock* 5955; *Pringle* 6474; *Rose, Painter & Rose* 9455. City of Mexico, *Holway* 3065. Mixcoac, *Arsène* 8272.

MORELOS: Cuernavaca, *Hitchcock* 6883.

MICHOACÁN: Maravalia, *Hitchcock* 6922. Jacuaro, *Hitchcock* 6955. Morelia, *Arsène* 2377, 2644, and in 1909.

GUATEMALA: Guatemala City, *Hitchcock* 9093, 9099; *Tonduz* 685. La Aurora *Morales* 715.

EL SALVADOR: Volcano San Salvador, *Hitchcock* 8934, 8935, 8958.

BRAZIL: Bahia, *Salzmann*.

ECUADOR: Between Loja and San Lucas, *Hitchcock* 21464.

62. *Paspalum jaliscanum* Chase

Paspalum jaliscanum Chase in *Hitchc. Contr. U. S. Nat. Herb.* 17: 240. 1913. "Type in the U. S. National Herbarium, no. 691236, collected in the lower forest region, at about 2,300 meters altitude, Zapotlán to Nevada de Colima, Jalisco, Mexico, September 23, 1910, by A. S. Hitchcock (no. 7153)." In this specimen the racemes are shorter and more crowded than in other specimens seen.

DESCRIPTION

A slender suberect perennial, the culms solitary or few in a loose clump from a stout rhizome with harsh-pubescent scales, the leaves somewhat aggregate toward the base; culms simple, about 1 meter tall, compressed, glabrous; nodes sparsely appressed-hirsute to nearly glabrous; sheaths sparsely papillose-hirsute along the margin and toward the summit, overlapping on the short lower internodes; ligule 3 mm. long; blades flat or the margins loosely revolute, 12 to 20 cm. long, 12 to 15 mm. wide (the elongate upper sheath bladeless or nearly so), tapering to the base, or those of the mid culm rounded, pilose with long stiff hairs on the upper surface at base and sparsely pilose to glabrous otherwise, rather glossy, the large cells of the epidermis plainly visible under a lens, the lower surface glabrous or nearly so, the mid nerve prominent beneath, the margin inconspicuously stiffly ciliate; panicle long-exserted, 8 to 10 cm. long, of 5 to 12 ascending to spreading rather thick racemes, the lower sometimes with short branchlets at base, 4 to 7 cm. long, the others gradually shorter, the main axis slender but stiff, angled, glabrous; rachis 0.6 to 0.7 mm. wide, with a few long hairs at base, otherwise glabrous; spikelets in pairs on slender glabrous pedicels, irregularly crowded, 2.2 to 2.3 mm. long, about 1.3 mm. wide, elliptic, the flat side slightly depressed down the middle; glume and sterile

lemma subequal, barely or scarcely covering the fruit, 3-nerved, the glume papillose-pubescent and speckled or blotched with brownish purple, the lemma glabrous or papillose-pubescent down the middle, usually with purplish blotches; fruit about 2.2 mm. long, often slightly unsymmetrical, smooth and shining, stramineous.

DISTRIBUTION

Wooded slopes, southern Mexico, between 1,500 and 2,300 meters altitude.

JALISCO: Zapotlán, Mt. Nevada, *Hitchcock* 7153, 7240.

VERA CRUZ: Chinantla, *Liebmann* 199. Without locality, *Liebmann* 196.

63. *Paspalum tonduzii* Mez

Paspalum tonduzii Mez, *Repert. Sp. Nov. Fedde* 15: 72. 1917. "Costarica, in *Maydis culturis* ad Sta. Rosa du Copey, alt. 1800 m. * * * (Herb. inst. phys.-geogr. no. 11767)." This specimen, in the Berlin Herbarium, bearing the name in Mez's script and collected by Tonduz, consists of two plants without base. The right-hand plant agrees much better with the description and is taken as the type. The left-hand plant is *P. costaricense*. The spikelets of *P. tonduzii* are described as "glaberrimae," but the second glume is obscurely pubescent toward the summit.

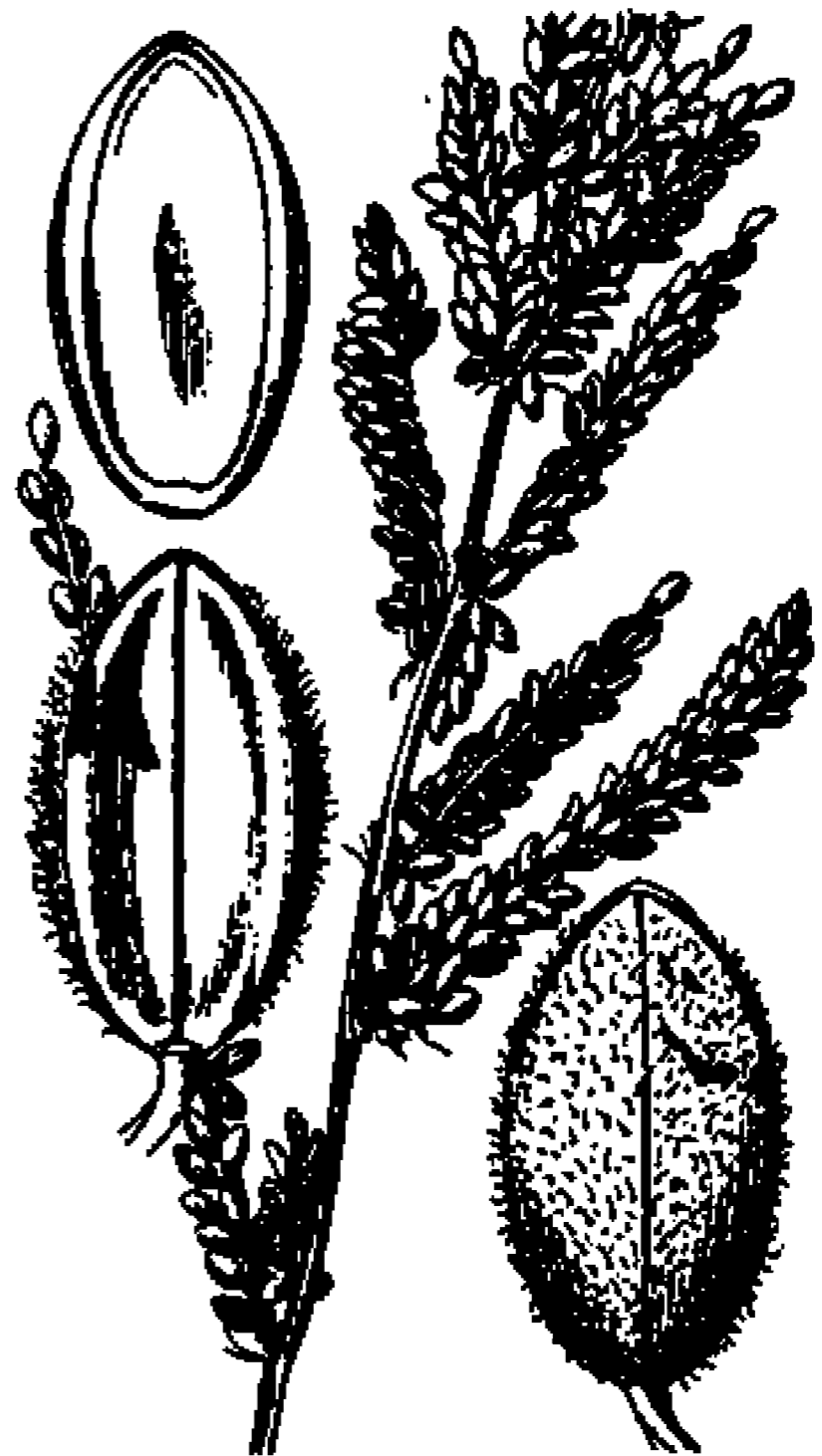


FIGURE 63.—*P. jaliscanum*. From type specimen

DESCRIPTION

Similar to *P. jaliscanum*, but the leaves not aggregate toward the base, the sheaths and blades coarsely papillose-pilose throughout; panicle short-exserted from the bladeless upper sheath, 9 to 11 cm. long, of 8 racemes, the axis and rachises dark purple; spikelets in pairs, irregularly crowded except toward base of the raceme, there the secondary of the pair of spikelets often rudimentary, 2.1 mm. long, 1.1 mm. wide, obovate-elliptic; second glume and sterile lemma 3-nerved, bronze-brown mottled with dull purple, the glume slightly shorter than the fruit, obscurely pubescent with fine appressed hairs toward the summit, the lemma glabrous; fruit 2 mm. long, stramineous, smooth and shining.



FIGURE 64.—*P. tonduzii*. From type collection

This species is known from a single collection. Besides the type only two specimens of this collection have been seen, one in the Brussels Herbarium, the other in the United States National Herbarium. It is very closely related to *P. jaliscanum*, which is known from only four collections. Further material may show the two to be extremes of a single species. In *Tonduz* 11767 in the United States National Herbarium one of the racemes bears a short branch at the base, and another has an abortive branch with rudimentary spikelets.

64. *Paspalum costaricense* Mez

Paspalum costaricense Mez, Repert. Sp. Nov. Fedde 15: 72. 1917. "Costa Rica, ad San José (Herb. inst. phys.-geogr. Cost. no. 8038,)" is the only collection cited from Costa Rica. The specimen, collected by Tonduz, in the Berlin Herbarium, bearing the name in Mez's script, is taken as the type.

DESCRIPTION

A leafy perennial in dense clumps, drying olivaceous or brown; culms ascending or erect from a spreading base, 25 to 85 cm. tall, simple, compressed, glabrous; nodes blackish, glabrous; sheaths rather broad and loose, keeled, the lower minutely pubescent with pilose margins, the upper ciliate only, or rarely very sparsely pubescent; ligule rather firm, about 3 mm. long; blades flat, spreading, thin, 6 to 22 cm. long, 1 to 2.5 cm. wide, narrowed to a rounded base, ciliate on the margin, otherwise glabrous or, less frequently, sparingly pilose; racemes 3 to 10, commonly 5 to 7, 2 to 6 cm. long, on a slender angled axis 3 to 10 cm. long, ascending to spreading, commonly arching, the lower distant; rachis purple, 1 mm. wide, with a few long hairs at base; spikelets in pairs on slender pedicels, densely crowded, 2.1 to 2.2 mm. long, about 1.2 mm. wide, elliptic, subacute, olivaceous to dull brown; glume and sterile lemma thin, equal, covering the fruit at maturity, 3-nerved, or the glume faintly 5-nerved, the nerves blackish, the glume minutely appressed-pubescent, the lemma glabrous or obscurely appressed-pubescent; fruit about the size and shape of the spikelet, pale.

The specimen collected by Gollmer, near La Guayra, Venezuela, cited by Doctor Mez was examined in the Berlin Herbarium. This is not *P. costaricense*, but a species of the Decumbentes group. *Paspalum costaricense* is remarkable for its large blades. It resembles *P. mandiocanum* Trin. of Brazil, but in that species the culms are branching and the spikelets much broader for their length.

DISTRIBUTION

Humid wood borders, thickets or partly shaded grassland, sometimes a weed in coffee plantations, at middle altitudes, Guatemala and El Salvador to Costa Rica.

GUATEMALA: El Quetzal, *Salas* 380. Chaculá, *Seler* 2707. Cobán, *Türckheim* 440, (*Dist. Smith*) 658. La Aurora, *Morales* 728a. Without locality, *Tonduz* 769.

EL SALVADOR: Volcán San Salvador, *Calderón* 486; *Hitchcock* 8957, 8959; *Standley* 22824, 22874. Volcán San Vicente, *Standley* 21482, 21493.

COSTA RICA: San José, *Hitchcock* 8489; *Tonduz* 3017, 8038. Between San Pedro de Montes de Oca and Curridabat, *Standley* 32865, 41278. Copey, *Tonduz* 11767 in part. San Francisco de Guadalupe, *Pittier* 16119; *Jiménez* in 1910.

65. *Paspalum virletii* Fourn.

Paspalum virletii Fourn. Mex. Pl. 2: 12. 1886. "San Luis de Potosi (VIRLET, n. 1329)." The Virlet specimen in the Fournier Herbarium in the Paris Herbarium, bearing the name in Fournier's script, is no. 1319, not 1329. It consists of a single culm with two sterile shoots at the base.

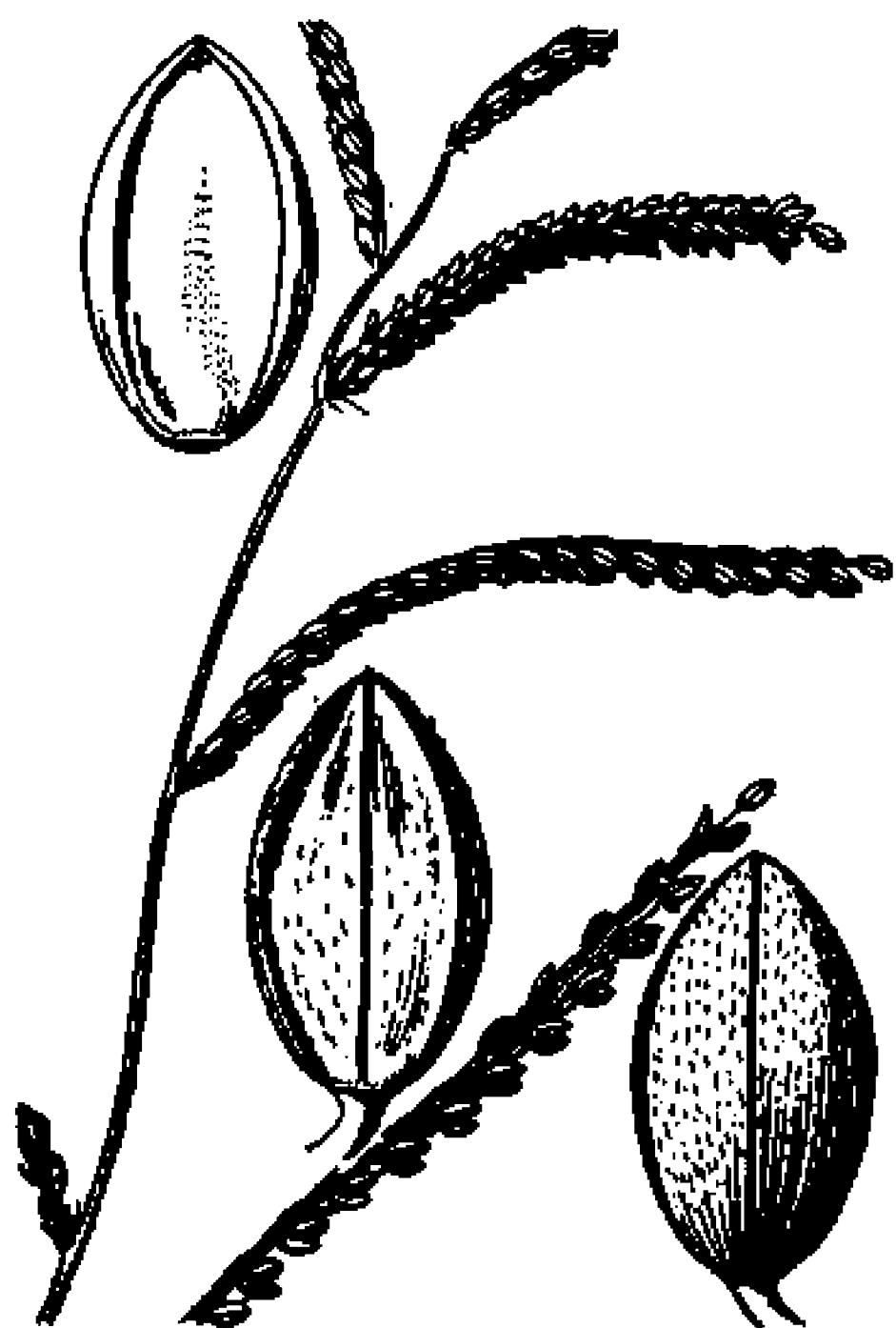


FIGURE 65.—*P. costaricense*. From type collection

DESCRIPTION

A slender perennial; culm ascending, the lower node geniculate, simple, 40 cm. tall, glabrous; nodes, sheaths and blades softly pilose, the ligule 1.5 mm. long, the blades flat, lax, 10 to 14 cm. long, 6 to 8 mm. wide, slightly narrowed to a rounded base; racemes 5, spreading, 4 to 5.7 cm. long, on a slender axis 5.5 cm. long; rachis slender, with a few long hairs at the base; spikelets in pairs on minute 3-angled pedicels, imbricate, 2 mm. long, 1.5 mm. wide, broadly ovate, strongly plano-convex stramineous, the glume and sterile lemma equal, barely covering the fruit, thin, 3-nerved, the glume very minutely pubescent, the lemma glabrous; fruit nearly the size and shape of the spikelet, pale stramineous.

The above description is based on notes on the type, the only specimen seen, and the drawing is made from a photograph of the type and a sketch made in the Paris Herbarium. The inflorescence is overmature, many of the spikelets fallen. As mounted, the second raceme is pressed up against the axis but is drawn in what is assumed to be a natural position. No data are on the label other than those given above.

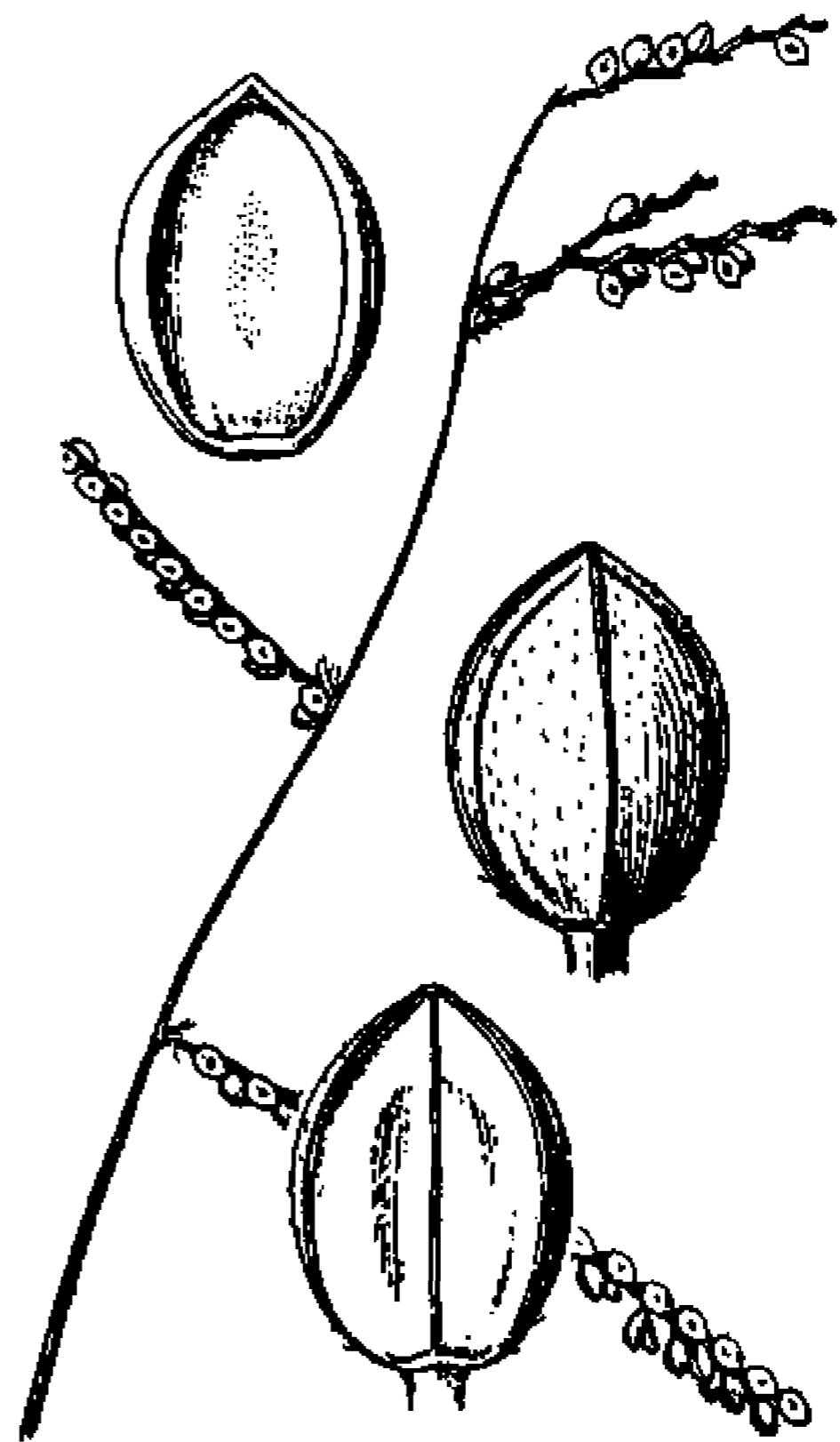


FIGURE 66.—*P. virletii*. From type specimen

Paniculata.—Tufted perennials with flat mostly pubescent blades, several to many slender racemes (or few in *P. squamulatum*) and small hemispheric or broadly obovate turgid spikelets.

Spikelets glabrous.

Blades stiff, elongate.....66. *P. nesiotus*.

Blades lax, not more than 15 cm. long.....67. *P. squamulatum*.

Spikelets pubescent.

Spikelets subangular-obovate.....68. *P. oligostachyum*.

Spikelets hemispheric.

Spikelets 1.7 to 1.9 mm. long, not densely crowded.....69. *P. lentiginosum*.

Spikelets not more than 1.5 mm. long, usually less, crowded.

Pubescence of spikelets gland-tipped.....70. *P. yucatanum*.

Pubescence of spikelets not gland-tipped.....71. *P. paniculatum*.

66. *Paspalum nesiotus* Chase, sp. nov.

DESCRIPTION

An erect slender nearly glabrous perennial; culms 45 to 120 cm. tall, compressed, bearing simple flowering branches from the middle nodes after the maturity of the primary panicle; sheaths, except the lowermost, elongate, keeled toward the summit, glabrous; ligule 2 to 3 mm. long; blades flat from a keeled base, or folded or subinvolute toward the apex, 25 to 50 cm. long, 6 to 11 mm. wide, nearly linear, the base equal in width to the summit of the sheath, the junction inconspicuous, glabrous on the lower surface, scabrous to minutely hispidulous on the upper, the margin very scabrous; panicles finally long-exserted, of 5 to 14 ascending to arching racemes, these 4 to 10 cm. long, irregularly spaced on

a slender angled axis; rachis about 0.8 mm. wide usually with a few hairs at the base; spikelets in pairs on slender scabrous pedicels, loosely and irregularly crowded, 1.9 to 2 mm. long, about 1.5 mm. wide, rounded-obovate, glabrous, pale-tawny or faintly tinged with purple; glume and sterile lemma equal, barely or scarcely covering the fruit, 3-nerved; fruit nearly the size of the spikelet, often slightly unsymmetrical, pale, very minutely papillose-roughened.

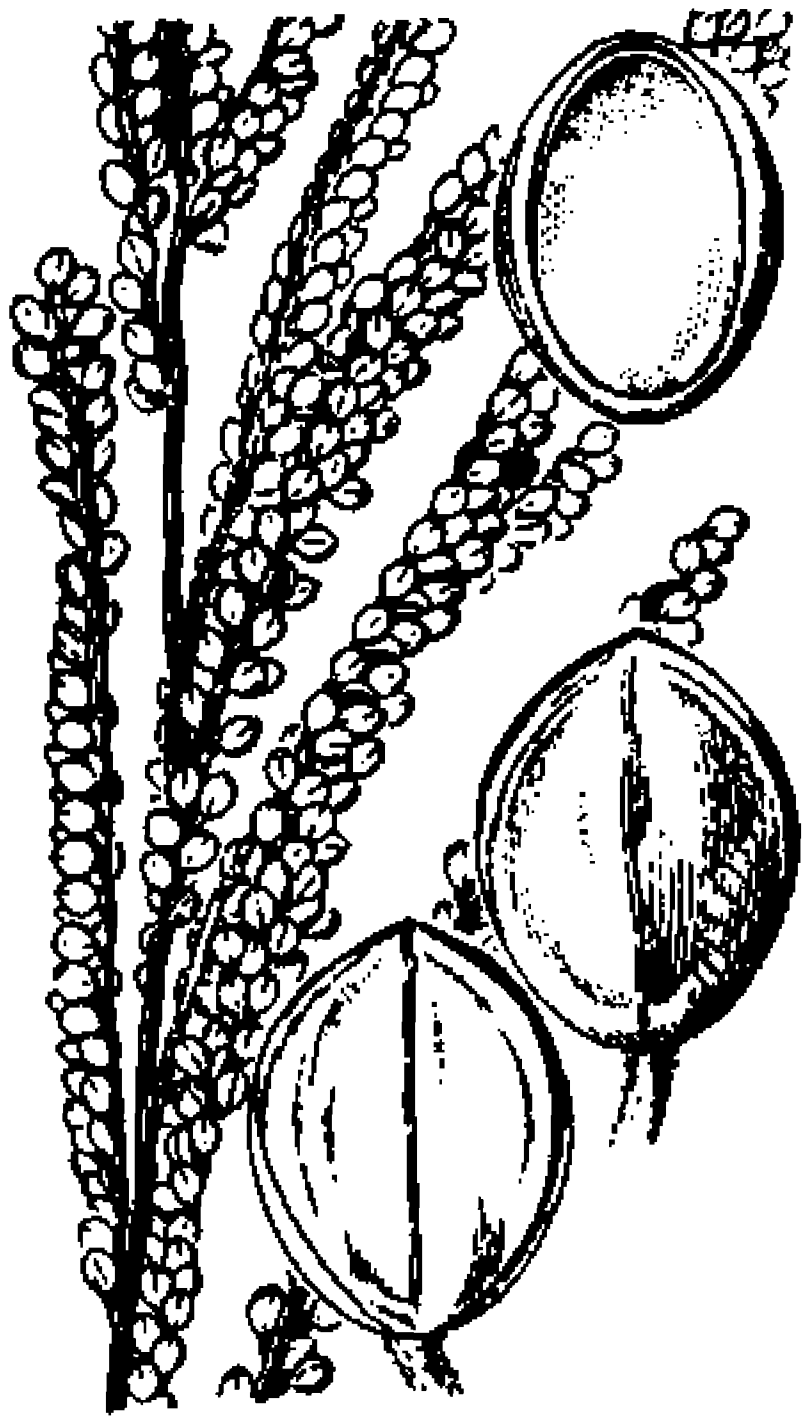


FIGURE 67.—*P. nesiotis*. From type specimen

Type in the U. S. National Herbarium, no. 1060118, collected near the Governor's residence, St. Lucia, Windward Islands, October 18, 1919, by A. S. Hitchcock (no. 16471). In this the primary panicle has fallen, leaving 2 panicle-bearing branches. The only other specimen seen is one collected in Martinique by Père Duss, in 1879, mixed with his no. 548, *Paspalum plicatulum*. This is a much smaller plant with a primary panicle only.

67. *Paspalum squamulatum* Fourn.

Paspalum squamulatum Fourn. Mex. Pl. 2: 11. 1886. "In graminosis prope Chinantla, 1000' (LIEBM. n. 198); Huitamalco, Tinzutlan, * * * LIEBM. n. 197); Orizaba, * * * (BOURG. n. 2640, BOTT. n. 115)." All the collections cited have

been examined. Bourgeau's no. 2640, in the Paris Herbarium, bearing the name in Fournier's script, is taken as the type. In a previous paper¹³ the first specimen cited, which had been examined in the Copenhagen Herbarium was chosen as the type, but Bourgeau 2640, studied in Paris in 1922, better agrees with Fournier's description, the blades being more auriculate. The sheaths are ciliate on the margin and pubescent on the collar; the blades are sparsely ciliate toward the base and some of them have a few hairs on the upper surface. The rachises bear a few scattered hairs. The spikelets are 1.6 to 1.7 mm. long. The other specimens cited agree with this.

Paspalum sumichrasti Fourn. Mex. Pl. 2: 11. 1886. "San Luis de Potosí (VIRL. n. 1301); Orizaba (BOTT. et SUM. n. 115, BOURG. absque n.)." The type, Botteri & Sumichrast 115, in the Paris Herbarium, bears the name in Fournier's script. Fournier differentiates this from *P. squamulatum* by blades not auriculate. They are rounded, scarcely auriculate, in the specimens cited as *P. squamulatum*. In Botteri & Sumichrast 115, consisting of 4 culms without base, the blades are somewhat narrowed toward the base, or the uppermost rounded. The foliage is nearly glabrous. The spikelets are 1.9 mm. long.

DESCRIPTION

A straggling perennial, the culms few to several in a tuft, decumbent and often rooting at the nodes below, the ends ascending, 25 to 90 cm. long, compressed, glabrous, the lower internodes often vinaceous, leafy throughout, branching at the lower nodes, the branches finally divergent; nodes blackish, glabrous, sheaths shorter than full grown internodes, rather loose, softly ciliate on the margin and usually pubescent on the collar, otherwise glabrous; ligule brown, 3 to 3.5 mm. long; blades flat, spreading, 5 to 15 cm. long, 3 to 15 mm. wide, commonly 7 to 10

¹³ Contr. U. S. Nat. Herb. 17: 234. 1913.

cm. long and 6 to 10 mm. wide, slightly narrowed to a rounded or subauriculate base, ciliate on the margin and commonly with a few hairs on the upper surface and glabrous beneath, sometimes softly and densely pubescent on the upper surface and glabrous or sparsely pubescent beneath, or softly pubescent on both surfaces, the variations found in single individuals; racemes 3 to 13, commonly 5 or 6, 1.5 to 6 cm. long, on a slender angled axis 2.5 to 8 cm. long, ascending to spreading, the lower distant, the upper approximate; rachis slender, angled, scabrous on the margin, and with a few hairs at the base, otherwise glabrous or sometimes with a few scattered hairs; spikelets in pairs on very short slender pedicels, densely crowded, 1.6 to 1.9 mm. long, 1.2 to 1.4 mm. wide, broadly elliptic-obovate, pale green, glabrous; second glume and sterile lemma rather firm, 3-nerved, the glume shorter than the lemma exposing the fruit at maturity; fruit nearly the size and shape of the spikelet, pale, smooth and shining.

This species varies in pubescence as noted above. In *Miller & Griscom* 143 and 144 the spikelets are 1.9 mm. long as in the type of *P. sumichrasti* and most of the blades taper to a narrow base as in that type, but the uppermost blades are rounded at base, one being quite as auriculate as any in *P. squamulatum*. In Hitchcock's no. 6961 the spikelets are 1.9 mm. long, but the blades are not narrowed at base.

DISTRIBUTION

Brushy slopes, pine woods, and partly shaded places in uplands, at 500 to 1,700 meters altitude, Mexico to Costa Rica.

LOWER CALIFORNIA: San José del Cabo, *Brandege* 40.

SINALOA: Culiacán, *Rose, Standley & Russell* 14859.

JALISCO: Zapotlán, *Hitchcock* 7246.

VERA CRUZ: Jalapa, *Hitchcock* 6638, 6654; *Smith* in 1894. Orizaba, *Hitchcock* 6387.

MICHOACÁN: Uruápan, *Hitchcock* 6961, 6978.

OAXACA: Totontepec, *Nelson* 727.

CHIAPAS: Hacienda Monserrate, *Purpus* 9200. Fenia, *Purpus* 443.

GUATEMALA: Cuyatenango, *Rojas* 104. Guatemala City, *Hitchcock* 9055.

NICARAGUA: San Rafael del Norte, *Miller & Griscom* 143, 144.

COSTA RICA: Yerba Buena, *Standley & Valerio* 50012. Cerro de La Carpintera, *Standley* 34211. Cartago, *Tonduz* 2851. La Palma, *Standley* 33187; *Tonduz* 12623. Cerro de Piedra Blanca, *Standley* 32599. San José, *Standley* 33292. Santa María de Dota, *Standley* 41583. San Francisco de Guadalupe, *Jiménez* 160.

68. *Paspalum oligostachyum* Salzm.

Paspalum oligostachyum Salzm.; Steud. Syn. Pl. Glum. 1: 23. 1854. "Salzm. hrbr. Bahia." Steudel's specimen has not been located, but in Salzmänn's own herbarium, in the Institut de Botanique of Montpellier, is a specimen bearing the name in his writing collected by him in "Bahia; in umbrosis," which agrees with Steudel's description, and which is accepted as the type.

Paspalum salzmanni Doell in Mart. Fl. Bras. 2^o: 49. 1877. "*Paspalum oligostachyum molle* Salzm. in herbario Bahiensi n. 670; Steudel Syn. 23. n. 93." In

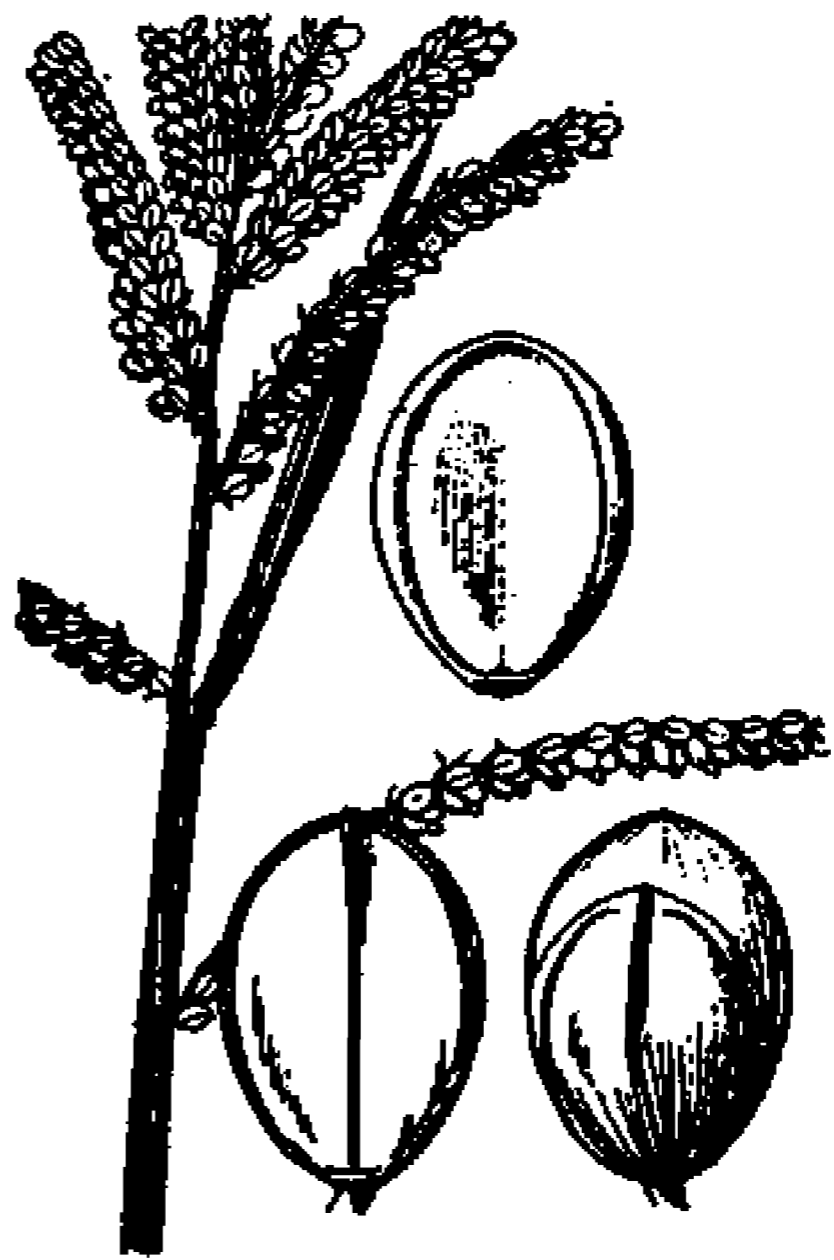


FIGURE 68.—*P. squamulatum*. From type collection

the DeCandolle Herbarium and in the Drake Herbarium in Paris are specimens of Salzmänn's 670 with the name in Doell's script. A duplicate is in the United States National Herbarium. Doell's citation of Steudel (p. 23, no. 93) refers to *P. oligostachyum*. Doell states that Salzmänn had two species, one *P. oligostachyum molle* (no. 670), the other *P. oligostachyum pilosum* (no. 671), the latter the same as *P. plicatulum* var. *subrotundum* Doell; but why he discarded *P. oligostachyum* Salzm., published by Steudel, is not apparent.

Paspalum oligostachyum molle Salzm.; Doell in Mart. Fl. Bras. 2²: 49, 1877, as synonym of *P. salzmanni*. Specimens collected in "Bahia; in umbrosis," so named by Salzmänn, are in the Institut Botanique of Montpellier. They agree with the specimens mentioned above and with the type of *P. oligostachyum*.

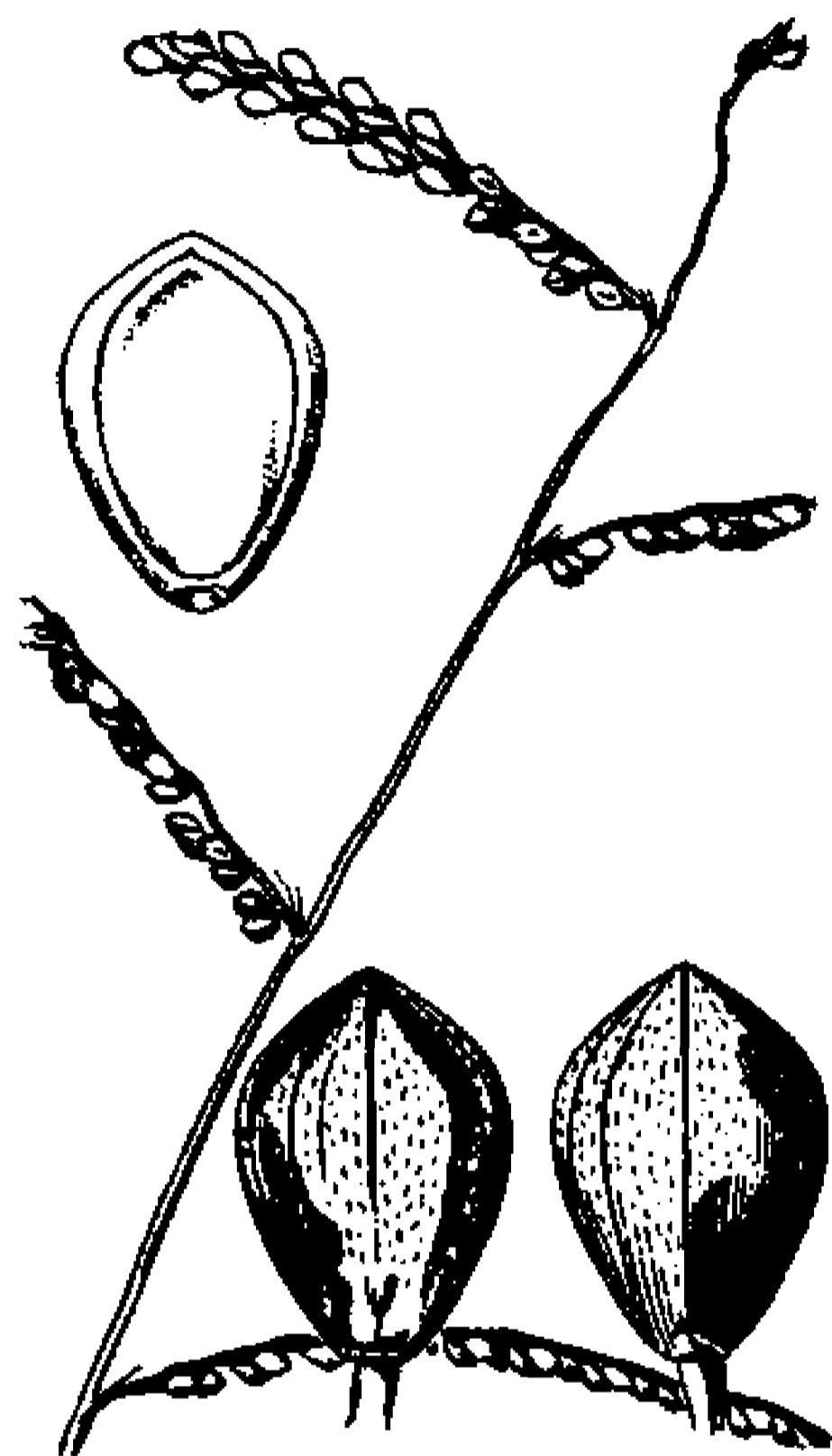


FIGURE 69.—*P. oligostachyum*. From type collection

DESCRIPTION

A leafy olivaceous perennial with dense short erect knotty rhizomes forming a tough clump; culms ascending to spreading, 25 to 75 cm. tall, simple, compressed, glabrous; nodes glabrous; sheaths mostly longer than the internodes, keeled, softly pubescent with spreading hairs, denser and longer at the summit, occasionally glabrescent; ligule about 0.5 mm. long; blades flat, ascending, densely velvety pubescent on both surfaces, and with copious long hairs on the upper surface at base, those of the mid culm 8 to 25 cm., rarely to 30 cm., long, 7 to 13 mm. wide, tapering to a narrow or sometimes slightly rounded base, the upper and lower much smaller; panicles long-exserted, of 2 to 7, commonly 3 to 5, spreading racemes, 3 to 10 cm. long, the common axis 2 to 10 cm. long, slender, angled, glabrous or very minutely puberulent; rachis very slender, flexuous, with a few long white hairs at the base; spikelets in pairs on slender pedicels, loosely imbricate, 2 mm. long, 1.4 mm. wide, subangular-obovate,

bronze-green, mottled with purplish brown; glume and sterile lemma equal, covering the fruit, rather faintly 5 to 7-nerved, obscurely appressed-pubescent with fine hairs; fruit nearly the size of the spikelet, pale, smooth and shining.

DISTRIBUTION

Wooded slopes and clay banks, Trinidad to eastern Brazil.

TRINIDAD: MONOS, *Broadway* 7437.

FRENCH GUIANA: Without locality, *Leprieur* 90.

BRAZIL: Pernambuco, *Chase* 7730; *Pickel* 1346, 1618. Bahia, *Chase* 7859, 7863, 8047½; *Salzmänn*.

69. *Paspalum lentiginosum* Presl

Paspalum lentiginosum Presl, Rel. Haenk. 1: 218. 1830. "Mexico." The type specimen, collected by Haenke, in the National Museum at Prague, consists of two plants, one with 4, the other with 5 racemes. The spikelets are 1.9 mm. long.

DESCRIPTION

A leafy glabrous perennial in tufts of few to several erect or ascending culms; culms 75 to 140 cm. tall, sparingly branching, compressed; sheaths mostly overlapping, rather loose, sparsely pilose on the margin at the summit and commonly on the collar, the lowermost, especially on young shoots, papillose-pubescent, slightly auricled; ligule 2 to 4 mm. long; blades flat, or the margins revolute in age, spreading, 12 to 25 cm. long, 8 to 14 mm. wide (the uppermost reduced), rounded at base, with a few long hairs back of the ligule, the margins scabrous; panicle finally long-exserted, of 4 to 17, mostly 5 to 13, spreading to ascending racemes, the lower 3 to 7 cm. long, the others gradually shorter, the common axis 4.5 to 11 cm. long, slender, strongly angled, sometimes with a few hairs on the angles; rachis very slender, with a few long white hairs at the base, mostly naked for 2 to 8 mm. below, the spikelets undeveloped; spikelets in pairs on slender pedicels, loosely imbricate, 1.7 to 1.9 mm. long, 1.4 mm. wide, subhemispheric; glume and sterile lemma equal, covering the fruit, 5-nerved (the lateral nerves obscure), the glume finely papillose-pubescent, the lemma glabrous or nearly so, both speckled with purplish brown, the glume often copiously so, except at the base, the lemma less so and with the margins unspotted; fruit nearly the size of the spikelet, yellowish, smooth and shining.

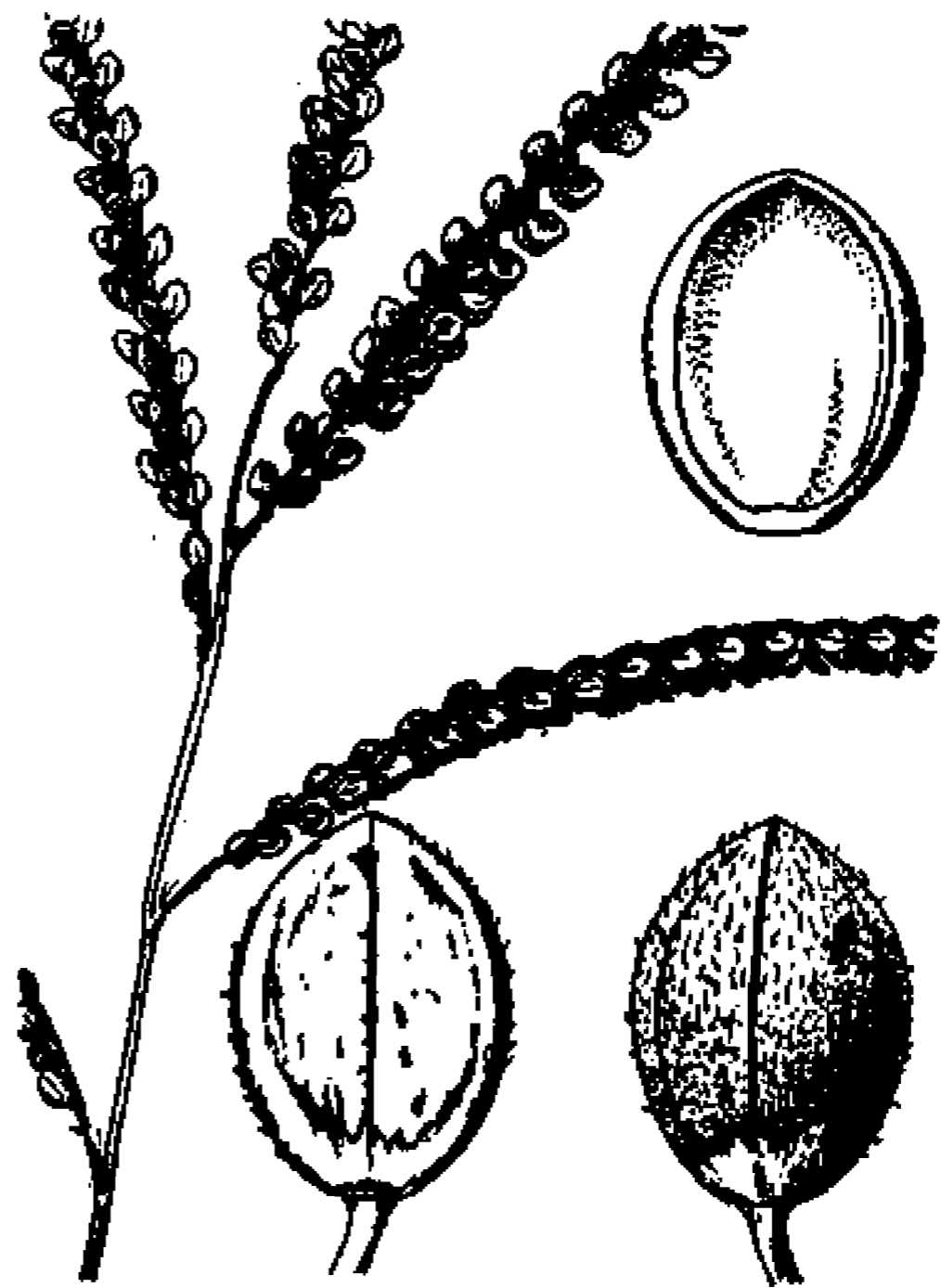


FIGURE 70.—*P. lentiginosum*. From type specimen and Hitchcock 7098

This species, especially specimens with the more numerous racemes, resembles *P. paniculatum*, but may be distinguished by the nearly glabrous foliage and larger spikelets not crowded in the racemes.

Hitchcock's no. 6874, *Holway* 3514, and *Türkheim* 3773 are large plants with foliage nearly as pubescent as in *P. paniculatum*. The spikelets are 1.7 to 1.8 mm. long and loosely arranged, for which reason the specimens are referred to *P. lentiginosum*.

DISTRIBUTION

Open, mostly moist ground, mainly at low altitudes, western Mexico and Guatemala.

SONORA: Hermosilla, *Hitchcock* 3601, 3621.

SINALOA: Culiacán, *Palmer* 1556 in 1891.

MORELOS: Cuernavaca, *Hitchcock* 6874; *Holway* 3514.

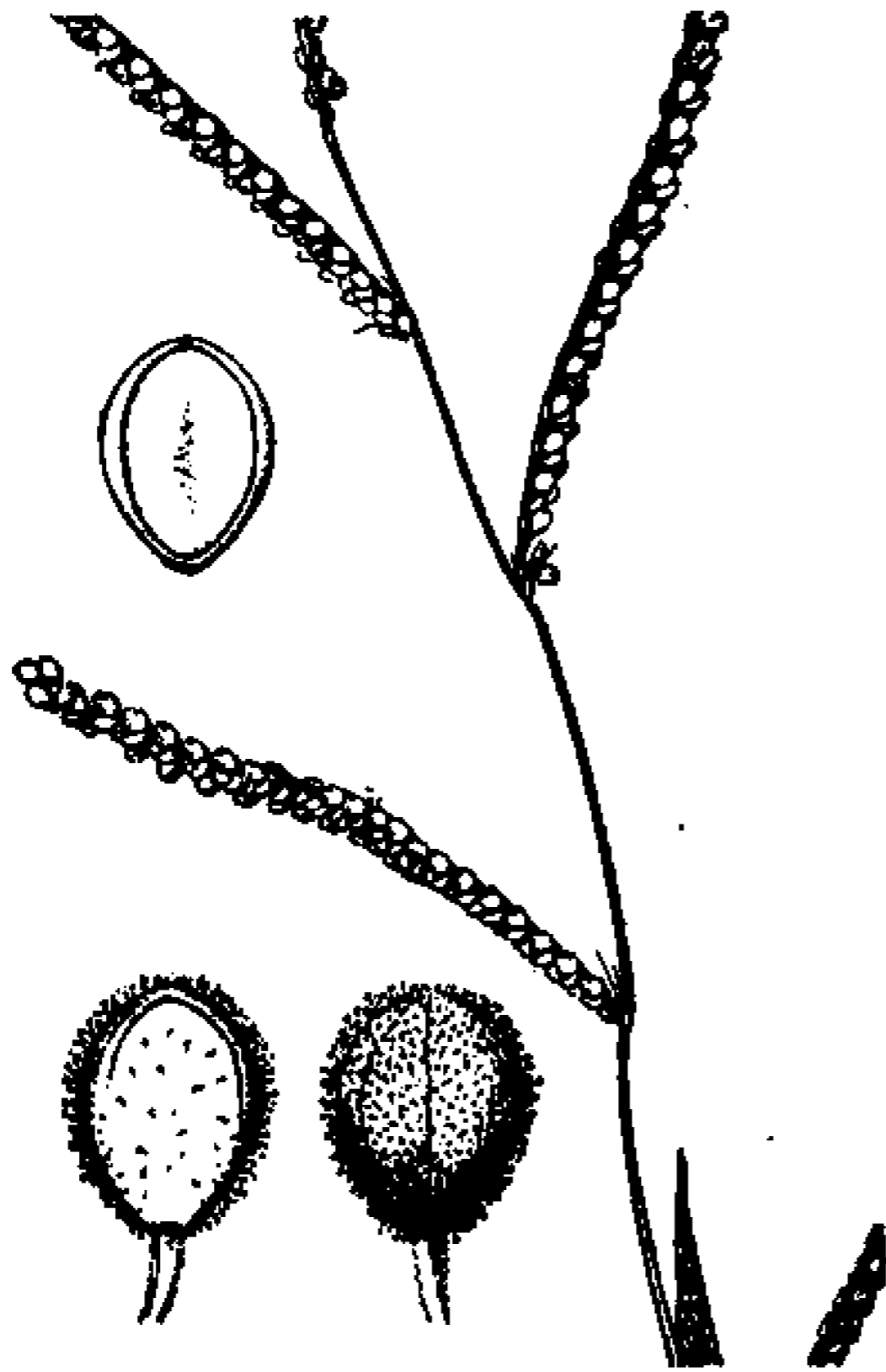
COLIMA: Alzada, *Hitchcock* 7098.

GUATEMALA: Cobán, *Türkheim* 3773. Guatemala City, *Hitchcock* 9094.

70. *Paspalum yucatanum* Chase, sp. nov.

An ascending perennial, leafy toward the base, in small tufts; culms 40 to 60 cm. tall, simple, compressed, glabrous; nodes appressed-pubescent to glabrous; sheaths mostly overlapping, appressed-pubescent except toward the base, the lower sheaths commonly villous; ligule scarcely 0.5 mm. long; blades flat, ascending, 8 to 15 cm. long, 8 to 12 mm. wide, rarely larger, rounded or slightly narrowed at base, usually finely appressed-pubescent on both surfaces and with

long white hairs at the very base, the cartilaginous margin finely undulate, short-ciliate; panicle rather short-exserted, of 4 to 9, rarely 12, spreading to ascending racemes, 3 to 5.5 cm. long, the common axis 5.5 to 12 cm. long, slender, angled, glabrous, with long hairs in the axils and occasionally a few on the angles; rachis slender, the margin scabrous; spikelets in pairs on slender angled pedicels,



rather crowded, 1.3 to 1.4, rarely to 1.5, mm. long, about 1.2 mm. wide, subhemispheric; glume and sterile lemma equal, barely covering the fruit, 5-nerved, or the midnerve of the lemma suppressed, the glume densely covered with spreading gland-tipped hairs, the lemma sparsely so; fruit nearly the size of the spikelet, stramineous, smooth and shining.

Type in the U. S. National Herbarium, no. 951629, collected at Mérida, Yucatán, July 11, 1865, by Arthur Schott (no. 597).

This species approaches *Paspalum blodgettii* of the Caespitosá group, somewhat resembling robust plants of that species with blades shorter and broader than common.

Gaumer's no. 2464 is a larger plant than the other specimens, and has nearly glabrous foliage, the blades 16 to 25 cm. long and 12 to 18 mm. wide; the panicle has 12 racemes with spikelets 1.5 mm. long.

DISTRIBUTION

Open ground, Yucatán peninsula.

FIGURE 71.—*P. yucatanum*. From type specimen

YUCATÁN: Mérida, Schott 597. Izamal, Gaumer 852.

QUINTANA ROO: Chichankanab, Gaumer 2464.

71. *Paspalum paniculatum* L.

Paspalum paniculatum L. Syst. Nat. ed. 10. 2: 855. 1759. No locality is cited. The very brief diagnosis agrees with the type specimen in the Linnaean Herbarium, where it was examined by A. S. Hitchcock. It consists of part of a culm with two leaves and a mature panicle, and was collected by Browne in Jamaica. Following his diagnosis Linnaeus cites "Sloan. jam. t. 72, f. 2." This plate represents *Panicum fasciculatum* Swartz. The Systema Naturae is a very condensed work, but in the following edition of the Species Plantarum¹⁴ Linnaeus says "Habitat in Jamaica" and gives a fuller description. He cites the Sloane phrase name and plate 72, f. 2, as before. But since Linnaeus had a specimen, to which his diagnosis applies while Sloane's does not, Linnaeus' own specimen is taken as the type.¹⁵

Paspalum hemisphericum Poir. Encycl. 5: 31. 1804. "Ledru. * * * de Porto-Ricco. (V. s. in herb. Lam.)" This specimen, with the name in Poirét's script, was examined in the Lamarck Herbarium in Paris. It is the upper part of a plant with a panicle and single leaf.

¹⁴L. Sp. Pl. ed. 2. 81. 1762.

¹⁵See Hitchcock, Contr. U. S. Nat. Herb. 12: 116. 1908.

Paspalum strictum Pers. Syn. Pl. 1: 86. 1805. "Hab. in Insul. Antill. et ad St. Domingo." The specimen, in the Paris Herbarium, from Santo Domingo, taken as the type, consists of a panicle and upper sheath only.

Paspalus compressicaulis Raddi, Agrost. Bras. 29. 1823. "Prope Rio-Inhumirim" in the vicinity of Rio de Janeiro, Brazil. The type, in the University of Pisa, is a complete plant with the name in Raddi's script.

Paspalum supinum Rupr.; Galeotti, Bull. Acad. Sci. Brux. 9: 237. 1842. Not *P. supinum* Bosc. A name without description given to Galeotti 5727.

Paspalum multispica Steud. Syn. Pl. Glum. 1: 18. 1854. "*P. guineense* Steud. in Hrbo. Lenormand. Guinea." The type, in the Lenormand Herbarium in the Institut Botanique of Caen, named "*Paspalum guineense* Steud." in Steudel's script, is Jardin's no. 23, "Côte de Guinée, Gabon," Africa.

Paspalum guineense Steud. Syn. Pl. Glum. 1: 18, 1854, as synonym of *P. multispica*.

Paspalum polystachium Salzm.; Steud. Syn. Pl. Glum. 1: 18, 1854, as synonym of *P. multispica*. "Bahia." Salzmänn collections so named are in the Montpellier, Delessert, Cambridge University, and United States National Herbaria.

Paspalum affine Bello, Anal. Soc. Españ. Hist. Nat. 12: 125. 1883. Not *P. affine* Steud. 1854. "Porto Rico." The type has not been located. There is no description, the species being differentiated from *P. paniculatum* by the pilose-ciliate base of the blade only.

Paspalum paniculatum β *rigidum* Schlecht.; Fourn. Mex. Pl. 2: 9. 1886. "Absque loco (SCHIEDE); Mirador * * * (LIEBM. n. 164); Tuzpango (BOURG. n. 2379); * * * Cordova (SCHAFFN. n. 283 in hb. Franq.); Oajaca (GHIESBR.)." The Schiede specimen and Bourgeau's no. 2379 were examined in the Paris Herbarium, and Liebmann's 164 in the Copenhagen Herbarium.

Paspalum cordovense Fourn. Mex. Pl. 2: 9. 1886. This name was earlier listed by Hemsley,¹⁶ without description. "In valle Cordovensi (BOURG. n. 2161)." The type, bearing the name in Fournier's script, was examined in the Paris Herbarium. The culm bears roots at a node 20 cm. distant from the base.

Paspalum galmarra F. M. Bailey, Dept. Agr. Brisbane Bot. Bull. 9: 12. 1894. Without description. "Along Harvey's creek, a tributary of the Russell River," Bellenden-Ker Expedition, 1889. Referred by White and by Stapf to *P. paniculatum*.

Paspalum paniculatum var. *minor* Moore, Trans. Linn. Soc. Bot. II. 4: 503. 1895. "Serra da Chapada, prope Santa Anna da Chapada, (n. 134)," Brazil. The type, collected by Spencer Moore, in the British Museum, is only 30 cm. tall.

Panicum paniculatum Kuntze, Rev. Gen. Pl. 3²: 363. 1898. Based on *Paspalum paniculatum* L.

Paspalum paniculatum *minor* Scribn. Field Mus. Bot. 2: 24. 1900. (Published as new without reference to Moore, 1895.) "Near Port Antonio, Jamaica (983), * * * Georgetown, Grand Cayman (1406)." Millspaugh's no. 983, with the name in Scribner's writing, in the United States National Herbarium, is taken as the type. This, lacking the base, is 40 cm. tall.

DESCRIPTION

A coarse leafy perennial in tough clumps with densely hirsute innovations at base; culms suberect or ascending, sometimes decumbent at base and rooting at the lower nodes, 0.3 to 2.15 meters, commonly 0.45 to 1 meter, tall, at first simple, usually branching at about the maturity of the primary panicle, compressed, strongly ridged, glabrous; nodes from conspicuously tawny-bearded with ascending stiff hairs to glabrous, commonly appressed-hispid with short hairs; sheaths

¹⁶ Biol. Centr. Amer. Bot. 3: 477. 1885.

mostly longer than the internodes but often loose and exposing them, keeled, from coarsely papillose-hispid throughout to hispid along the margin and on the collar only, the lowermost densely hispid, loose and orange-brown within; ligule 2 to 3 mm. long; blades flat, or the margins revolute in age, spreading, 9 to 50 cm. long, 6 to 25 mm. wide, commonly 12 to 25 cm. long and 10 to 20 mm. wide, rounded at base or, in long blades, narrowed below, from coarsely hispid on both surfaces and with a long tuft of tawny hairs at the base to scabrous or sometimes glabrous except at base and along the margin, the midnerve prominent beneath; panicle 5 to 30 cm., commonly 8 to 20 cm., long, of several to many (7 to 60) arched-spreading somewhat fascicled racemes, the lower 4 to 12 cm.



FIGURE 72.—*P. paniculatum*. From type specimen of *P. hemisphericum* and Duss 549

long, occasionally compound, relatively distant, the upper gradually shorter and aggregate, the common axis slender but stiff, angled, scabrous; rachis very slender, with long hairs at the base and often with few to several on the margin; spikelets in pairs on slender pedicels, densely crowded, or loosely so in lower racemes, 1.3 to 1.4, rarely 1.5, mm. long, about 1 mm. wide, subhemispheric, the flat face slightly concave, the second glume and sterile lemma equal, barely covering the fruit, 5-nerved, the lateral pair contiguous, the glume loosely pubescent with delicate hairs, the lemma with like pubescence along the margin, sometimes throughout, both blotched or speckled with purplish brown; fruit nearly the size of the spikelet, stramineous, smooth and shining.

This widespread weedy species varies greatly in size and amount of pubescence. Dwarf plants with but 4 or 5 short racemes are found in the mountains or in dry situations. The foliage is rarely nearly glabrous.

DISTRIBUTION¹⁷

Moist open ground and brushy slopes along ditches, and a weed in cultivated and waste places, mostly at low altitudes but reaching 2,100 meters. Mexico and the West Indies to Argentina; also in west Africa, in the Society Islands, and in Queensland, Australia.

SINALOA: Culiacán, *Palmer* 1555 in 1891. Rosario, *Rose* 1543.

NAYARIT (TEPIC): Acaponeta, *Rose, Standley & Russell* 14229. Tepic, *Palmer* 1924 in 1892.

JALISCO: Guadalajara, *Hitchcock* 7316; *Pringle* 2042. Río Blanco, *Palmer* 144 in 1886. San Sebastián, *Mexia* 1830.

VERA CRUZ: Mirador, *Liebmann* 164. Pital, *Liebmann* 163. Córdoba, *Finck* 17½; *Hitchcock* 6397. Orizaba, *Bourgeau* 2642; *Hitchcock* 6346, 6374. Sanborn, *Orcutt* 3246. Coatzacoalcos, *Smith* 1053.

COLIMA: Colima, *Hitchcock* 7036; *Palmer* 18 in 1897, 1265 in 1891.

GUATEMALA: Nerton, *Seler* 2715. Cobán, *Popenoe* 906; *Türckheim* (*Dist. Smith*) 116 (in the herbarium of the Academy of Natural Sciences, Philadelphia, 116 is *P. affine*). Cubilquitz, *Türckheim* (*Dist. Smith*) 7793. Finca Chamá,

¹⁷ In this common species only numbered specimens are cited.

- Popenoe* 894. Sepacuité, *Collins & Goll* 06. Secanquím, *Goll* 79; *Pittier* 249. Los Andes, *Kellerman* 5118. Morales, *Kellerman* 6260. Quiriguá, *Blake* 7702; *Standley* 23840, 23963, 23978, 24617, 24649. Cristina, *Blake* 7627. Puerto Barrios, *Deam* 80; *Kellerman* 5761; *Standley* 24789. San Pablo, *Salas* 5. Monte Grande, *Salas* 6. Santa Rosa, *Heyde & Luz (Dist. Smith)* 3558.
- HONDURAS: Tela, *Standley* 53748. Lancetilla Valley, *Standley* 52831. San Pedro Sula, *Thieme* 5594.
- EL SALVADOR: San Miguel, *Standley* 21067. Armenia, *Standley* 23516. Santa Emilia, *Standley* 22077, 22242. Ateos, *Standley* 23395. San Salvador, *Calderón* 645; *Standley* 20495, 22442, 23090, 23568, 23649; *Velasco* 5. San Marcos, *Standley* 22793. San Martín, *Standley* 22487. Santo Domingo, *Calderón* 1333. San Vicente, *Standley* 21716.
- NICARAGUA: Ameyá, *Maxon* 7143. Corinto, *Hitchcock* 8613. San Juan del Sur, *Hitchcock* 8594.
- COSTA RICA: Tilarán, *Standley & Valerio* 45024, 46554. Puntarenas, *Hitchcock* 8559. La Verbena, *Standley* 32267; *Tonduz* 8821. San José, *Hitchcock* 8468; *Standley* 32876, 33289, 39018; *Tonduz* 6946. Hacienda de Zent, *Tonduz* 267. Siquirres, *Tonduz* 4197. La Colombiana Farm, *Standley* 36702, 37003. Port Limón, *Hitchcock* 8416. Las Cóncevas, *Lankester* 203.
- PANAMA: David, *Hitchcock* 8349. El Boquete, *Hitchcock* 8272; *Pittier* 3041. Bocos del Toro, *Carleton* 182; *Hart* 65, 88. Canal Zone, *Hitchcock* 7907, 8055; *Killip* 4112, 4329; *Macbride & Featherstone* 43; *Piper* 5201, 5203, 5204, 5207, 5208; *Pittier* 3722, 4231, 6767; *Rose* 22075; *Standley* 25462, 25519, 25813, 25997, 26114, 26471, 26966, 27314, 27328, 28354, 28617, 28783, 30062, 31202, 31508, 31529, 40953. Marroganti, *Williams* 1034. Lower Changuinola River, *Stork* 279. Panamá, *Standley* 26820. Taboga, *Hitchcock* 8071; *Standley* 27953.
- CUBA: Guanajay, *Ekman* 13018. Sumidero, *Shafer & Léon* 13539. San Diego de los Baños, *Palmer & Riley* 544. El Guama, *Palmer & Riley* 179a. Corrientes Bay, *Britton & Cowell* 9872. Guines, *Léon* 579. Guayabal, *Ekman* 685, in *Amer. Gr. Nat. Herb.* 940; *Léon* 933. Jagüey, *Eggers* 5317. Sabana del Guaní, *Fernando* 430. Yayabo River, *Léon* 3978. Palmarita, *Léon* 3781. Eastern Cuba, *Wright* 766.
- JAMAICA: Troy, *Harris* 12610; *Hitchcock* 9790. Linstead, *Hitchcock* 9416. Ipswich, *Hitchcock* 9602. Savoy, *Harris* 11616. Newcastle, *Hitchcock* 9334. Claremont, *Hitchcock* 9494. Temple Hall, *Harris* 11287. Abbey Green, *Hitchcock* 9359. Blue Mountains, *Harris* 11534, 11561; *Perkins* 1487. Mt. Hybla, *Perkins* 1078. Cinchona, *Harris* 11278; *Hart* 677, 745. Content, *Harris* 11379. Windsor, *Maxon & Killip* 268. St. Margaret's Bay, *Millsbaugh* 1907.
- HAITI: Plaisance, *Leonard* 9289. Marmelade, *Leonard* 8078, 8080. Ennery, *Leonard* 9098. Port-au-Prince Mountain, *Cook, Scofield & Doyle* 59. Gauthier, *Ekman* H 8129. Minerve, *Buch* 1929. Fond Varettes, *Leonard* 3626.
- DOMINICAN REPUBLIC: San Pedro de Macoris, *Rose, Fitch & Russell* 4169. Haina, *Faris* 414. Sánchez, *Abbott* 68, 195, 513, 1119. Without locality, *Wright, Parry & Brummel* 630.
- PORTO RICO: Mayaguez, *Britton* 2368; *Chase* 6154; *Heller* 4399; *Holm* 199. Maricao, *Chase* 6239. Monte Montosa, *Britton & Cowell* 4149. Utuado, *Britton & Cowell* 476, 1013; *Chase* 6459. Adjuntas, *Britton & Brown* 5391; *Chase* 6478. Alta de Piedra, *Britton & Brown* 6230; 6402. Coamo Springs, *Chase* 6553. Bayamon, *Chase* 6390. Rio Piedras, *Barrett* 73; *Johnston* 375. Juncos, *Sintenis* 2509. Ponce, *Heller* 6227. Rio Grande, *Chase* 6727. Sierra de Naquabo, *Britton, Britton & Cowell* 2103.
- VIRGIN ISLANDS: St. Croix, *Thompson* 382.
- LEeward ISLANDS: Guadeloupe, *Duss* 2677; *Hitchcock* 16403. Dominica, *Eggers* 795, 1057; *Jones* 35.

- WINDWARD ISLANDS: Martinique, *Duss* 549; *Hitchcock* 16456; "Antilles," *Husnot* 79; *Sieber* 143. Grenada, *Broadway* 131.
- TRINIDAD: St. Ann, *Hitchcock* 10036. Port of Spain, *Hitchcock* 9960, 9993.
- TOBAGO: Adelphi, *Broadway* 4685. Botanic Station, *Broadway* 2996. Spey Side, *Hitchcock* 10249.
- COLOMBIA: Santa Marta, *Smith* 215. Río Frío, *Pittier* 1586. Mesa de los Santos, *Killip & Smith* 15025. Between Piedecuesta and Las Vegas, *Killip & Smith* 15573. Popayan, *Lehmann* 973; *Pennell & Killip* 8120. La Cumbre, *Killip & Hazen* 11127; *Pennell* 5021; *Pennell & Killip* 5950.
- VENEZUELA: Mene Grande, *Pittier* 10622. Tovar, *Fendler* 1714; *Pittier* 9301. Petare, *Pittier* 7720. Pico de Naiguatá, *Pittier* 6223.
- BRITISH GUIANA: Bartica, *Hitchcock* 17190. Wismar, *Hitchcock* 17460.
- BRAZIL: Pará, *Goeldi* 21, 310. Pernambuco, *Pickel* 1619. Bahia, *Chase* 7868. Caparaó, *Chase* 9632. Viçosa, *Bailey* 1162, 1169, 1189; *Chase* 9504. Serra do Cipó, *Chase* 9263. Lagoa Santa, *Chase* 8984. Barbacena, *Chase* 8650. Juiz de Fóra, *Chase* 8519, 8600, 8612. Lavras, *Chase* 8735. Franklin Sampaio, *Dorsett* 265b. Caldas, *Mosén* 4569; *Regnell* III. 1341. Serra de Itatiaia, *Chase* 8348; *Sampaio* 4098. Campos, *Sampaio* 2794. Therezopolis, *Bailey* 1228. Rio de Janeiro, *Chase* 8240; *Dusén* 130; *Glaziou* 17353. Nova Friburgo, *Holway* 1464. Campos do Jordão, *Chase* 9864; *Holway* 1776, 1781, 1793. Rio Claro, *Löfgren* 503. Poa, *Holway* 1731. São João, *Holway* 1650. Lapa, *Holway* 1675½. Villa Augusta, *Holway* 1597. Arthur Anfim, *Holway* 1630. Riberao Pires, *Holway* 1679. Cantareira, *Holway* 1568. Tremembe, *Holway* 1612. São Manoel de Botocatin, *Gerdes* 64. Goyaz, *Gardner* 3501. Chapada, *Malme* 2395. Serrinha, *Dusén* 13625. Blumenau, *Ule* 973. Silveira Martins, *Lindman* A 1347.
- PARAGUAY: Río Apa, *Hassler* 11649. Sierra de Amambay, *Hassler* 10134, 10738. Central Paraguay, *Morong* 553.
- ECUADOR: Milagro, *Hitchcock* 20180. "Reg. subtrop.," *Sodiolo* 299.
- PERU: Colonia Perené, *Hitchcock* 22072. La Merced, *Hitchcock* 22132. "Andes," *Pöppig* 957.
- BOLIVIA: Mapiri, *Rusby* 198; *Buchtien* 1164, 33 in 1926. Hacienda Simaco, *Buchtien* 5323. Coroico, *Buchtien* 6435; *Hitchcock* 22722. Hacienda Anacuri, *Holway* 726. Milluhuaya, *Buchtien* 4196, 4269. Sirupaya, *Buchtien* 415. La Florida, *Holway* 680; *Hitchcock* 22624, 22627. Antahuacana, *Buchtien* 6436. Yungas, *Bang* 308.
- ARGENTINA: San Ignacio, *Ekman* 573.
- AFRICA: Kamerun, *Bipinde*, *Zenker* 4026. Island of San Thomé, *Macquerys* 17; *Moller* 130. Island of Mauritius, *Vaughan* A6.
- SOCIETY ISLANDS: Tahiti, *Setchell & Parks* 50, 370. "Society Islands," *Moore* 237.
- AUSTRALIA: Yungaburra, *White* in 1918.

Caespitosa.—Perennial; culms tufted, simple or occasionally with a single branch, its leaf sometimes hidden in the parent sheath, its inflorescence appearing to be axillary; racemes few to several; spikelets mostly elliptic.

Spikelets about 1.3 mm. long, glandular-pubescent..... 72. *P. blodgettii*.
Spikelets 1.5 mm. long or longer.

Primary pedicel nearly as long as its spikelet, the spikelets not crowded.

Spikelets about 1.7 mm. long; blades glabrous on the lower surface.

74. *P. molle*.

Spikelets 2 to 2.1 mm. long; blades appressed-pubescent on the lower

surface..... 75. *P. umbratile*.

Primary pedicel much shorter than its spikelet, the spikelets crowded.

Nodes or some of them appressed-pilose; spikelets green or purplish.

Ligule obsolete or minute.....73. *P. caespitosum*.

Ligule 1.5 to 2 mm. long.....76. *P. acutifolium*.

Nodes glabrous; spikelets pale, stramineous or brownish.

Spikelets 1.7 to 2 mm. long; racemes slender, arcuate----78. *P. laxum*.

Spikelets 2.1 to 2.5 mm. long; racemes rigid.

Blades 2 to 15 cm. long, rarely longer; spikelets 2.1 mm. long.

77. *P. bakeri*.

Blades 12 to 55 cm. long; spikelets 2.2 to 2.5 mm. long.

79. *P. pleostachyum*.

72. *Paspalum blodgettii* Chapm.

Paspalum dissectum Swartz; Roem. & Schult. Syst. Veg. 2: 308, 1817, as synonym of *P. caespitosum* Flügge, with reference to a note by Swartz¹⁸ on a form of *P. filiforme* found in fertile soil bearing 3 or 4 racemes which, he says, agrees with the diagnosis of *P. dissectum* [L. undoubtedly intended] except as to prostrate habit, linear blades and in other ways. In the Swartz Herbarium in Stockholm is a specimen of *P. blodgettii*, collected by Swartz in Jamaica and named *Paspalum dissectum*. Flügge¹⁹ refers *P. dissectum* as used by Swartz to *P. caespitosum* Flügge.

Paspalum blodgettii Chapm. Fl. South. U. S. 571. 1860. "Key West, Dr. Blodgett." The type has not been located. The brief description points to a small specimen of the species later described as *P. simpsoni*. "Spikelets minute ($\frac{1}{8}$ " long) * * * minutely pubescent and granular" applies better to *P. simpsoni*, with glandular-pubescent spikelets about 1.3 mm. long, than to *P. caespitosum*, to which Chapman later²⁰ referred it, with spikelets 1.5 to 1.8 mm. long, not at all glandular. Chapman probably did not distinguish the two forms, *P. caespitosum* not being in the earlier editions. The only collection by Blodgett at Key West that has been seen is the type of *P. gracillimum* (see below).

Paspalum simpsoni Nash, Bull. Torrey Club 24: 39. 1897. "Collected by J. H. Simpson on No Name Key, Florida, in May, 1891, no. 184." The type was examined in the herbarium of the New York Botanical Garden. A duplicate is in the United States National Herbarium. In these specimens the glandular tips of the hairs on the spikelets are particularly prominent.

Paspalum gracillimum Nash in Small, Fl. Southeast. U. S. 73, 1326. 1903. "Type, Key West, Blodgett, in Herb. C. U." This specimen was examined in the herbarium of Columbia University. It consists of the upper part of two culms and an additional panicle. The specimen is marked in Vasey's hand "*Paspalum caespitosum* Flügge, *P. Blodgettii* Chapm."

DESCRIPTION

A caespitose perennial with tough base, the innovations and culm bases commonly somewhat swollen and bulblike, the scales densely pubescent; culms erect, slender, compressed, glabrous, commonly 40 cm. to 1 meter tall, simple or occasionally with a single axillary inflorescence; nodes dark, constricted, glabrous or obscurely pubescent; lower leaves crowded, the upper two distant, their sheaths elongate; sheaths keeled toward the summit and often with a minute auricle, the lower pubescent, especially at the summit, the upper pubescent toward the summit or nearly glabrous throughout; ligule minute with a ring of

¹⁸ Fl. Ind. Occ. 1: 137. 1797.

¹⁹ Monogr. Pasp. 209. 1810.

²⁰ Fl. South. U. S. ed. 3. 578. 1897.

hairs back of it; blades flat, ascending, or the lower spreading, 5 to 25 cm. long, 3 to 14 mm., commonly 5 to 10 mm., wide, rounded at the base or the lower narrowed, sparsely papillose-ciliate toward the base, rarely nearly throughout, otherwise glabrous or occasionally obscurely pubescent on either surface; racemes 2 to 12, commonly 3 to 8, slender, remote, or the upper approximate, arcuate-spreading, 2 to 8 cm. long, the common axis slender but stiff; rachis narrow, scarcely flexuous, with a few long hairs at the base, otherwise glabrous; spikelets in pairs, on slender pedicels, crowded, tinged with brown or purple, 1.3 to 1.4 mm. long, about 0.9 mm. wide, obovate, blunt, strongly plano-convex; glume and sterile lemma equal, barely covering the fruit, 3 to 5-nerved, the glume pubescent

with gland-tipped hairs, the sterile lemma glabrous or sometimes pubescent; fruit very blunt, smooth and shining.

The blades of this species vary from elongate and narrow to relatively short and broad (8 to 10 cm. long and 8 to 10 mm. wide). The specimens with elongate foliage are probably parts of crowded large tufts. Exceptionally short specimens with short spreading blades somewhat resemble *Paspalum longepedunculatum*, but the smaller spikelets, with glandular pubescence, and the more numerous racemes distinguish it.

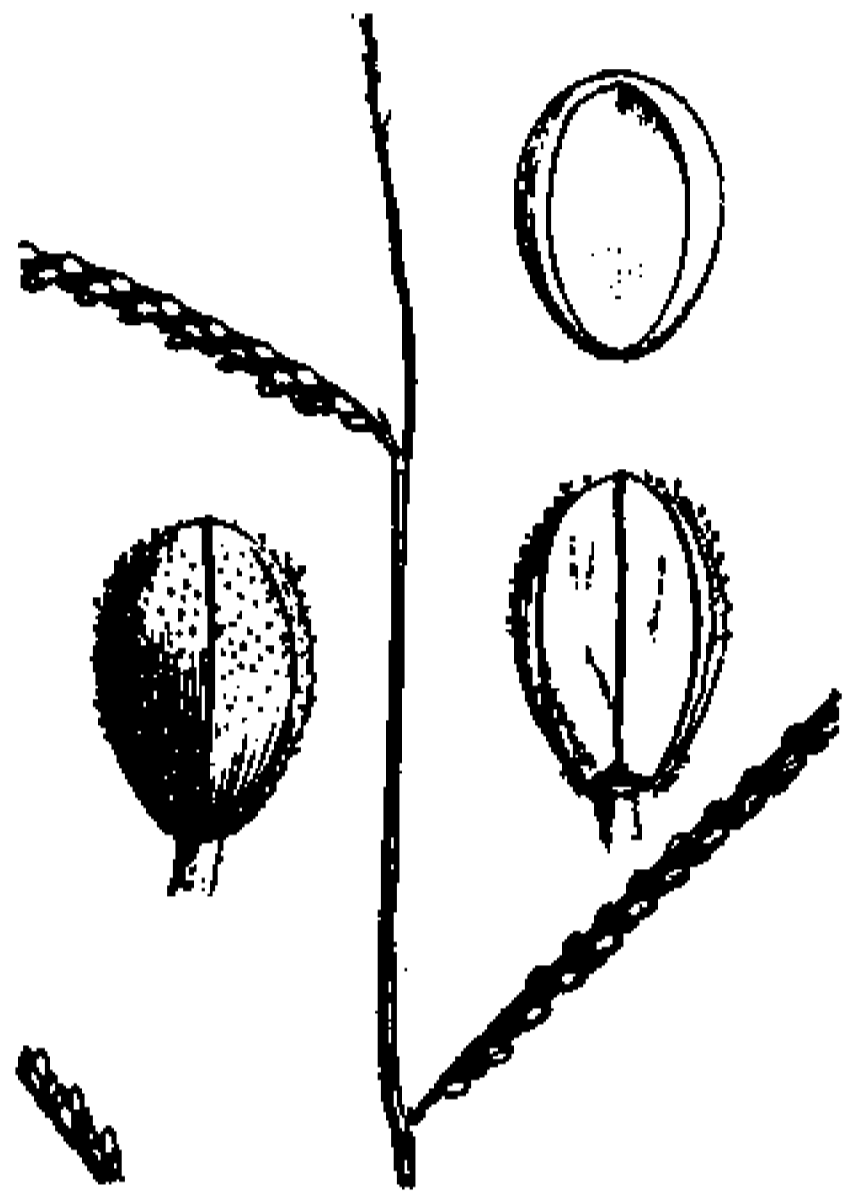


FIGURE 73.—*P. blodgettii*. From type collection of *P. simpsoni*

DISTRIBUTION

Open or brushy calcareous soil; southern Florida, Honduras, Bahamas, and the Greater Antilles.

FLORIDA: Miami, *Chase* 3840, 3861; *Garber* in 1877; *Hitchcock* 626, 2462; *Tracy* 9056; *Westgate* 3122. Homestead, *Hitchcock* 689; *Weatherwax* 834. Royal Palm Hammock, *Small & Small* 5429. Hattie Bauer Hammock, *Small, Mosier & Small* 6477. Coconut Grove, *Hitchcock* 2502; *Small & Carter* 611. Ross Hammock, *Small, Mosier & Small* 6485. Cutler, *Eaton* 246. Black Point Creek, *Small, Mosier & Small* 6740. Long Key, *Small & Carter* 2870. Paradise Key, *Mosier* 178. No Name Key, *Curtiss* 5440; *Pollard, Collins & Morris* 124; *Simpson* 184. Key West, *Curtiss* in 1884; *Hitchcock* 607.

HONDURAS: Copán, *Pittier* 1847.

BAHAMAS: Nassau, *Curtiss* 165; *Hitchcock* in 1890.

CUBA: Madruga, *Léon* 6354. Batabanó, *Ekman* 12604; *Hitchcock* 470. Motembo *Léon* 8628. Sabana de San Marcos, *Léon* 9182. Baraguá, *Hitchcock* 23346. Santiago de Cuba, *Léon* 954. Jauco, *Léon* 11690, 11719. Isle of Pines, *Britton, Britton & Wilson* 15359; *Britton, Wilson & Léon* 15790; *Millsbaugh* 1408. Eastern Cuba, *Wright* 3443 in part.

JAMAICA: Montego Bay, *Hitchcock* 9668. Savanna-la-Mar, *Hitchcock* 9874. Troy, *Harris* 12620; *Hitchcock* 9816. Ipswich, *Hitchcock* 9599½, 9624; *Maxon & Killip* 1519. Black River, *Harris* 12546. New Forest, *Hitchcock* 9833. Between Ewarton and Linstead, *Hitchcock* 9417, 9464. Bog Walk, *Harris* 12560. Between Bog Walk and Spanish Town, *Amer. Gr. Nat. Herb.* 571. Claremont, *Hitchcock* 9476, 9480. Buff Bay, *Hitchcock* 9766. Stony Hill, *Harris* 12703. Mt. Diablo, *Maxon & Killip* 459; *Ridley* 3. Kingston, *Hitchcock* 9470.

HAITI: Aux Cayes, *Ekman* H 42.

PORTO RICO: Joyuda, *Britton, Stevens & Hess* 2398. Aguadilla, *Chase* 6579, 6580, 6605.

73. *Paspalum caespitosum* Flügge

Paspalus caespitosus Flügge, Monogr. Pasp. 161. 1810. "Insula Hispaniola. Poiteau et Turpin.—Essequibo. Domina van de Moer. (Herbar. Mertens.) Specimen mecum communicaverunt Poiteau et Willdenow." In the British Museum is a specimen named "*Paspalus caespitosus*" with reference to Flügge's work, and labeled "Sto. Domingo. Poiteau, 1803." This has flat blades and 4 racemes, and is very characteristic of *P. caespitosum* as commonly understood. Another which appears to be of the same collection is in the Paris Herbarium. In the Trinius Herbarium is a specimen labeled "*Paspalum caespitosum* Fl. ab ipso cel. auctor acceptam comm. Cl. Mertens.," which is doubtless part of the Essequibo collection cited by Flügge. It is *P. molle* Poir. and does not agree with Flügge's description as well as does the Poiteau plant.

Paspalum gracile Poir. in Lam. Encycl. Suppl. 4: 313. 1816. Not *P. gracile* Rudge, 1805. "Cette plante croît a Saint-Domingue. (V. s. in herb. Desfont.)" The type, with the name in Poiret's script, was examined in the Florence Herbarium. A better specimen of the same collection is in the Richard Herbarium at Paris. Both are characteristic specimens of *P. caespitosum*, the foliage involute, as frequently found in dry ground specimens.

Paspalum heterophyllum Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816. "Cette plante croît à Saint-Domingue (V. s. in herb. Desv.)." The type was examined in the Florence Herbarium. The plant is without the base, the culm with 5 racemes. Desvaux²¹ gives Poiret as author of *P. heterophyllum* and states that the name ought to be changed because there was inadvertently a second species with different leaves mixed with the specimen. This he had named *P. parviflorum*, but that name was preoccupied, hence he renames it *P. lanceaefolium*. In the Florence Herbarium is a specimen without inflorescence labeled *Paspalum* "*lanceaefolium* Desv. in Ham. prod. *heterophyllum* Poiret. enc. supp." Attached to the plant is a partly illegible ticket; "St. Domingi," "*P. caespitosum*," and "*heterophylla*" were all I could make out. The plant is probably *Sporobolus indicus* (L.) R. Br.; it is not a species of *Paspalum*.

Paspalum poiretii Roem. & Schult. Syst. Veg. 2: 878. 1817. Based on *P. gracile* Poir., the name presumably changed because of *P. gracile* Rudge, 1805.

Paspalum lineare Fourn. Mex. Pl. 2: 12. 1886. Not *P. lineare* Trin. 1826. "Absque loco (LIEBM. n. 192); Chinantla (LIEBM. n. 187)." The two specimens cited are in the Copenhagen Herbarium, both bearing the name in Fournier's script. Liebmann's no. 192 is the same as *P. langei*; no. 187 is *P. caespitosum*. The description "spicis 5 remotis" applies to the latter specimen, which is therefore taken as the type.

Paspalum caespitosum var. *longifolium* Vasey, Bull. Torrey Club 13: 164. 1886. No specimen or locality is cited, and there is no specimen in the United States National Herbarium so named by Vasey. A collection by Garber from Florida in 1877 with elongate, narrow, nearly glabrous blades, which is named in Vasey's script, "*P. caespitosum* Flügge fide Munro," appears to be the plant described.

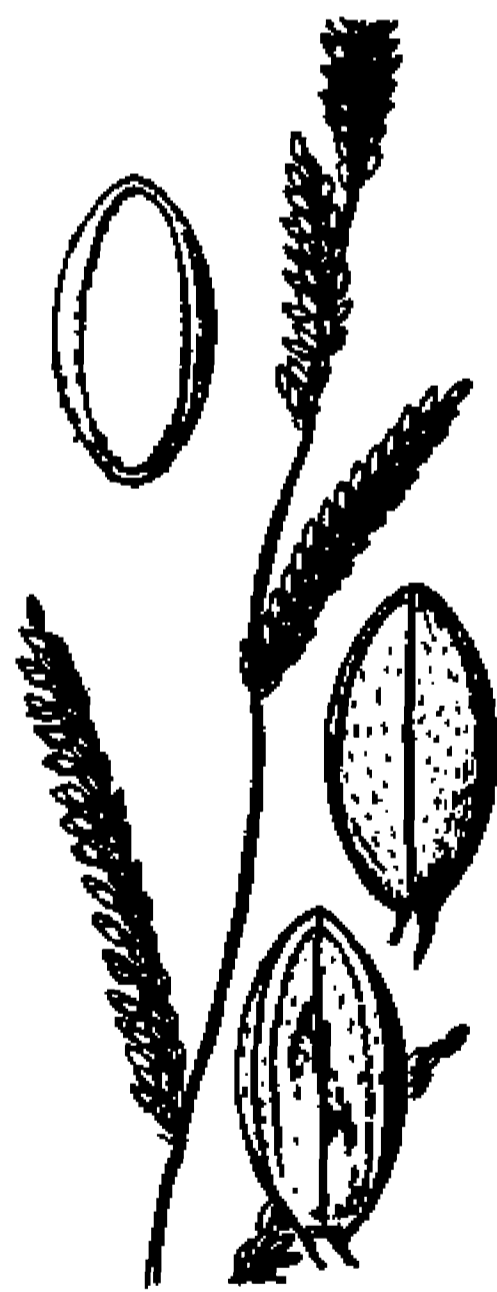


FIGURE 74.—*P. caespitosum*. From type specimen and Poiteau, Santo Domingo.

DESCRIPTION

A densely caespitose perennial, bluish green, drying paler, the long lower sheaths commonly brownish; culms erect, slender, rather wiry, the base hard and slightly enlarged, compressed, glabrous, 20 to 90 cm., commonly 30 to 60 cm.,

²¹ Opusc. 58. 1831.

tall, simple; nodes appressed-pilose to glabrescent; sheaths narrow, usually pubescent on the collar, otherwise glabrous or the lower sparsely pilose, usually minutely auricled at the summit; ligule obsolete or very minute; blades flat in sheltered situations, commonly more or less folded or involute in exposed situations, rather firm, ascending, 5 to 20 cm., rarely 25 cm. long, 4 to 10 mm. wide, narrowed to the base, usually with a few long hairs on the upper surface and margin at the base, sometimes nearly glabrous or, less frequently, ciliate or pilose on the upper surface or both, to the middle; racemes 2 to 6, commonly 3 to 5, relatively thick, remote, ascending, or somewhat spreading, mostly straight, 1.5 to 6 cm. long, usually not more than 4 cm. long, the common axis slender, angled; rachis narrow, with a few long hairs at base, otherwise glabrous; spikelets in pairs on slender pedicels one-third to half the length of the spikelet, crowded, light green tinged with brown and with dark nerves, 1.5 to 1.8 mm. long, 0.8 to 0.9 mm. wide, elliptic; glume and sterile lemma subequal, the glume barely or scarcely covering the fruit, 3 to 5 nerved, sparsely appressed-pubescent with fine hairs, or, especially the sterile lemma, nearly glabrous; fruit about the size and shape of the spikelet, smooth and shining.

Eaton's nos. 237, 269, and 481, from southern Florida, are rather depauperate plants with racemes solitary or 2, somewhat resembling *Paspalum saugeti* of Cuba.

DISTRIBUTION

Mostly in partly shaded humus in limestone soil, or rock, sometimes in sandy pinelands; southern Florida, Central America, and the West Indies.

FLORIDA: St. Augustine, *Rugel* 15. Homosassa, *Combs* 922. Tampa Bay, *Simpson* in 1890. Sarasota, *Garber* in 1876. Perico Island, *Tracy* 7032. Longboat Key, *Tracy* 6718. Sneys Island, *Tracy* 6454. Manatee, *Simpson* in 1890. Palmetto, *Nash* 2445. Palm Beach, *Hitchcock* 2503. Little River, *Eaton* 481. Lemon City, *Tracy* 7192. Miami, *Eaton* 85, 269; *Garber* in 1877; *Hitchcock* 637, 2464; *Tracy* 8851. Royal Palm Hammock, *Peattie* 1903. Cutler, *Eaton* 237. Key Largo, *Chase* 3928; *Curtiss* 3601 and in 1882; *Hitchcock* 2463. Hattie Bauer Hammock, *Small & Mosier* 6460. Goodburn Hammock, *Small & Mosier* 5916. Pumpkin Key, *Small & Mosier* 5677. Big Pine Key, *Small & Mosier* 6059. Sugar Loaf Key, *Pollard, Collins & Morris* 74. Key West, *Curtiss* 3575; *Hitchcock* 607½; *Rugel* 49.

GUATEMALA: Secanquím, *Pittier* 258. Between Los Amates and Izabal, *Blake* 7799, 7815.

BAHAMAS: Andros, *Brace* 5258; *Small & Carter* 8658, 8823. Great Exuma, *Britton & Millspaugh* 3089.

CUBA: Habana, *Ekman* 176; *Léon* 768, 2381, 3701, 7501, 8981. Río Almendares, *Ekman* 331. Columbia, *Léon* 268, 935, 936. Cojimar, *Hitchcock* 464, 465. Tapaste, *Léon* 3676. Tricornia, *Hitchcock* 467; *Tracy* 9087. Batabanó, *Hitchcock* 466. Sagua de Grande, *Léon* 9469. Caya Paloma, *Shafer* 2578. Guaro, *Hitchcock* 23419. Santiago de Cuba, *Léon* 953. Guantánamo, *Britton* 2175; *Ekman* 2890. Jauco, *Léon* 11713, 12314. Isle of Pines, *Britton & Wilson* 14890. Without locality, *Wright* 769, 3443 in part.

JAMAICA: Montego Bay, *Maxon & Killip* 1609. Lititz, *Harris* 12699. Walderston, *Harris* 12758. New Forest, *Amer. Gr. Nat. Herb.* 568. Inverness, *Harris* 12726, 12748. Cane River Valley, *Harris* 11408, 12317. Mt. Diablo, *Maxon & Killip* 504.

HAITI: St. Michel de l'Atalaye, *Leonard* 7186, 7418. St. Marc, *Leonard* 2911, 2915. Morne-à-Cabrits, *Ekman* H 1017. Gonave Island, *Leonard* 5126. Port-au-Prince, *Hitchcock* 19885; *Leonard* 2827. Etang Saumatre, *Leonard* 4216.

DOMINICAN REPUBLIC: Haina, *Faris* 4, 109. Without locality, *Poiteau*.

PORTO RICO: Mona Island, *Britton, Cowell & Hess* 1656, 1839; *Hess* 435, 436. Quebradillas, *Amer. Gr. Nat. Herb.* 569. Penuelas, *Chase* 6489. Vega Baja, *Chase* 6427.

74. *Paspalum molle* Poir.

Paspalum molle Poir. in *Lam. Encycl.* 5: 34. 1804. "À l'île Saint-Thomas * * * recueillie par le citoyen Ledru. (V. s. in herb. Lam.)." The type, in the Lamarck Herbarium, bears the name in Poiret's script. It consists of 2 overmature culms about 30 cm. tall, one with 3, the other with 2 racemes.

Paspalum sciaphilum Steud. *Syn. Pl. Glum.* 1: 18. 1854. "*P. umbrosum*. *Salzm. herb. non Trin. Bahia.*" Salzmänn specimens so named by him were examined in the Delessert, Drake, and Kew herbaria. The culms are 22 to 29 cm. tall.

Paspalum umbrosum Salzm.; Steud. *Syn. Pl. Glum.* 1: 18. 1854, as synonym of *P. sciaphilum*.

Paspalum portoricense Nash, *Bull. Torrey Club* 30: 377. 1903. "Type collected between Aibonito and Cayey [Porto Rico,] February 8, 1899, by Heller, no. 524." The type in the herbarium of the New York Botanical Garden consists of 4 small plants, the immature culms 8.5 to 10 cm. tall.

DESCRIPTION

A caespitose perennial forming small tough clumps, mostly olivaceous; culms slender, spreading, 10 to 50 cm. tall, rarely taller, simple, compressed, glabrous; nodes glabrous; leaves mostly somewhat crowded at the base, the sheaths slightly keeled, glabrous or sparsely appressed-pubescent near the margin toward the summit; ligule hyaline, about 0.5 mm. long; blades mostly flat, but involute in exposed situations, thin, ascending to spreading, 3 to 18 cm., mostly 6 to 12 cm., long, 2 to 7 mm. wide, scarcely narrowed to a rounded base, sparsely pilose on the upper surface toward the base, sparingly ciliate on the margins; racemes 1 to 5, commonly 2 or 3, slender, distant, ascending to arcuate-spreading, 1.5 to 7 cm. long, the common axis and rachises very slender, mostly with a few long hairs in the axils; spikelets in pairs on slender pedicels from half as long as the spikelet to about as long, loosely arranged, mostly purple-tinged, about 1.7 mm. long and 0.8 mm. wide, elliptic, subacute; second glume and sterile lemma subequal, covering the fruit or, at maturity, the glume very slightly shorter, 3 to 5 nerved, sparsely appressed-pubescent with very fine hairs, or the sterile lemma glabrous except near the margin; fruit about the size and shape of the spikelet, smooth and shining.

Paspalum molle with its slender loose racemes has a general resemblance to species of *Syntherisma*.

DISTRIBUTION

Open but humid slopes, mostly in red clay, West Indies to Brazil.

BAHAMAS: Crooked Island, *Brace* 4805.

PORTO RICO: Mayaguez, *Chase* 6262, 6322, 6820. Monte Alegriillo, *Amer. Gr. Nat. Herb.* 570. Aguadilla, *Chase* 6607, 6608. Vega Baja, *Chase* 6428. Between Aibonito and Cayey, *Chase* 6338; *Heller* 524. Cayey, *Chase* 6741; *Sintenis* 2451.

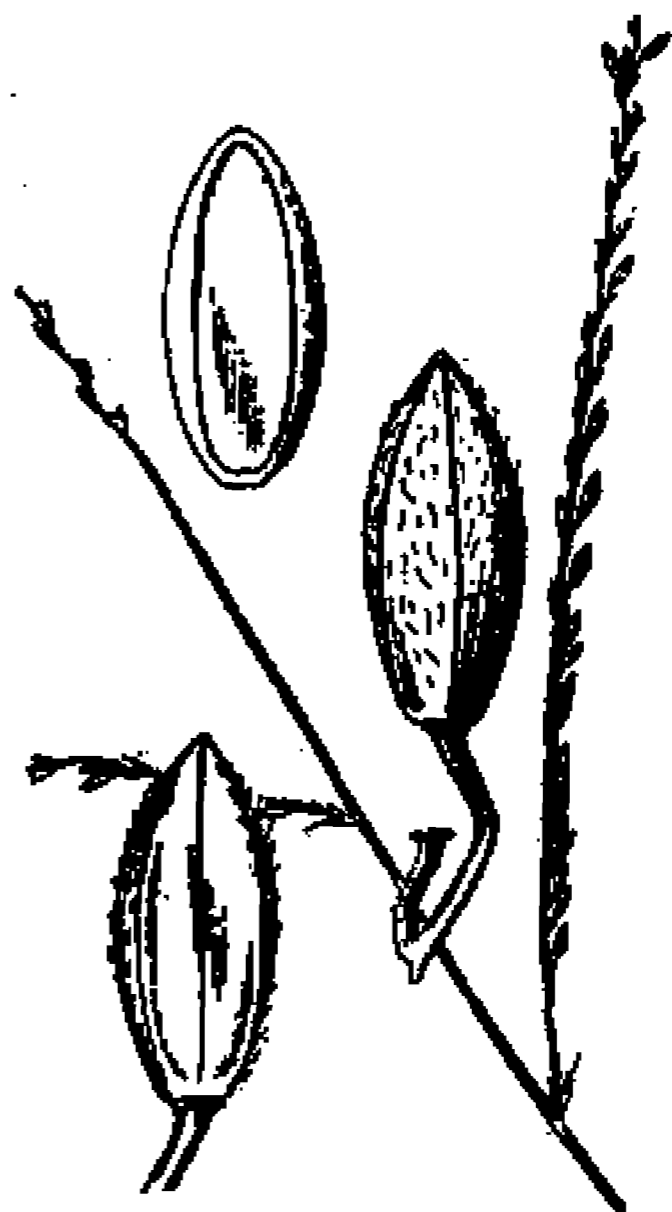


FIGURE 75.—*P. molle*. From *Amer. Gr. Nat. Herb.* 570

VENEZUELA: Curucuti, *Pittier* 10218. Carayaca, *Jahn* 301.

BRAZIL: Pernambuco, *Pickel* 1583. Itumerim, *Chase* 7963. Cachoeira, *Chase* 8095. Bahia, *Chase* 7865, 7874, 8050; *Salzmann*.

75. *Paspalum umbratile* Chase, sp. nov.

DESCRIPTION

A slender perennial in small clumps with a knotted base, the young shoots densely villous; culms few to several, ascending to widely spreading, 30 to 55 cm. tall, simple, compressed, glabrous; nodes glabrous; sheaths, except the lower, much shorter than the internodes, keeled, villous on the margin, otherwise gla-

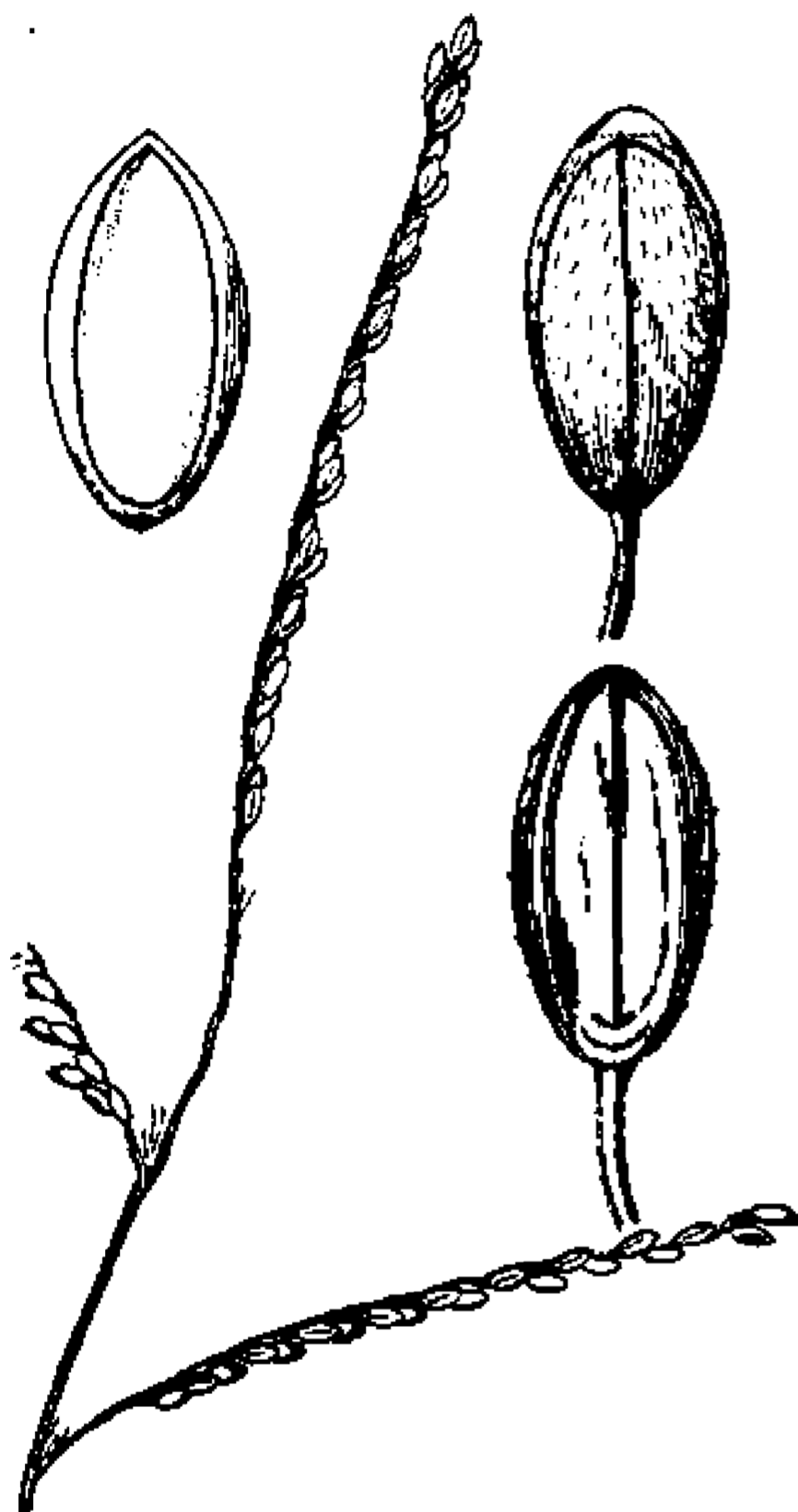


FIGURE 76.—*P. umbratile*. From type specimen

brous, the short lowermost ones villous throughout; ligule about 0.7 mm. long; blades flat, rather firm, ascending, 7 to 15 cm. long, 6 to 10 mm. wide, the lower tapering to a narrow base, the upper rounded, sparsely long-pilose on both surfaces at the base and sparsely appressed-pubescent throughout on the lower surface, the margins irregularly ciliate; racemes 2 or 3, slender, 1 to 1.5 cm. distant on a very slender axis, ascending to spreading, 4 to 6.5 cm. long, the slender rachis naked for 2 to 10 mm. and with a few delicate hairs at the base; spikelets in pairs on slender pedicels, from nearly half as long as the spikelet to about as long, loosely arranged, greenish olivaceous, 2 to 2.1 mm. long, 1 mm. wide, elliptic; second glume and sterile lemma 5-nerved, the glume slightly shorter than the fruit, sparsely appressed-pubescent with fine hairs, the lemma glabrous or obscurely pubescent along the margin; fruit about the size and shape of the spikelet, smooth and shining.

Type in the U. S. National Herbarium, no. 1,406,058, collected on a wet shaded bank, vicinity of Siguatepeque, Department of Comayagua, Honduras, altitude 1,080 to 1,400 meters, February 14–27, 1928, by Paul C. Standley (no. 56212).

The foliage of the type and only specimen seen has evidently been grazed, none of the larger blades being complete. They are probably longer than the measurement given above. This species resembles *Paspalum molle*, but is less delicate; the young basal shoots are densely villous, and the spikelets larger.

76. *Paspalum acutifolium* Léon

Paspalum acutifolium Léon in Britton, Mem. Torrey Club 16: 58. 1920. "Palm barren, sabana de Motembo, Santa Clara (*Léon & Roca* 8164) [Cuba]. The type specimen is preserved in the Colegio de la Salle Herbarium, Vedado, Havana." Specimens of this collection were sent to the United States National Herbarium by Brother Léon.

DESCRIPTION

A caespitose perennial, leafy at the base; culms less slender than in *P. caespitosum*, erect or ascending, simple, geniculate below, 20 to 48 cm. tall, compressed, glabrous; nodes appressed-pilose, the hairs white, 4 to 5 mm. long; sheaths keeled, sparsely papillose-pilose toward the summit and along the margin, the lower short and crowded; ligule 1.5 to 2 mm. long; blades firm, flat from a folded base, sometimes subinvolute toward the tip, ascending, 6 to 17 cm. long (the

uppermost reduced and narrow) 4 to 8 mm. wide, nearly linear, sparsely papillose-pilose on both surfaces or becoming glabrescent; racemes 2 to 4, ascending to arcuate-spreading, 2 to 8 cm. long, the common axis 1 to 3.5 cm. long, flattened; rachis about 0.7 mm. wide, with a few long hairs at the base; spikelets in pairs, imbricate, tinged with brownish purple, about 1.8 mm. long, 0.9 to 1 mm. wide, oblong-elliptic, rather turgid; glume and sterile lemma equal, covering the fruit, 3-nerved, obscurely pubescent near the margin or glabrous, the lemma slightly depressed with raised border; fruit slightly shorter than the spikelet, pale, the palea minutely papillose-striate.

DISTRIBUTION

Sandy or gravelly siliceous soil, palm barrens, and savannas, Cuba.

CUBA: Cauasí, *Léon* 13079, 13119. La Cumbre, *Ekman* 18980. Sabana de Motembo (Placetas del Sur), *Léon & Roca* 8164.

77. *Paspalum bakeri* Hack.

Paspalum bakeri Hack. Inf. Est. Centr. Agron. Cuba 1: 410. 1906. "Prope Habana, leg. C. F. Baker (nr. 1824)." The type was examined in the Hackel Herbarium.

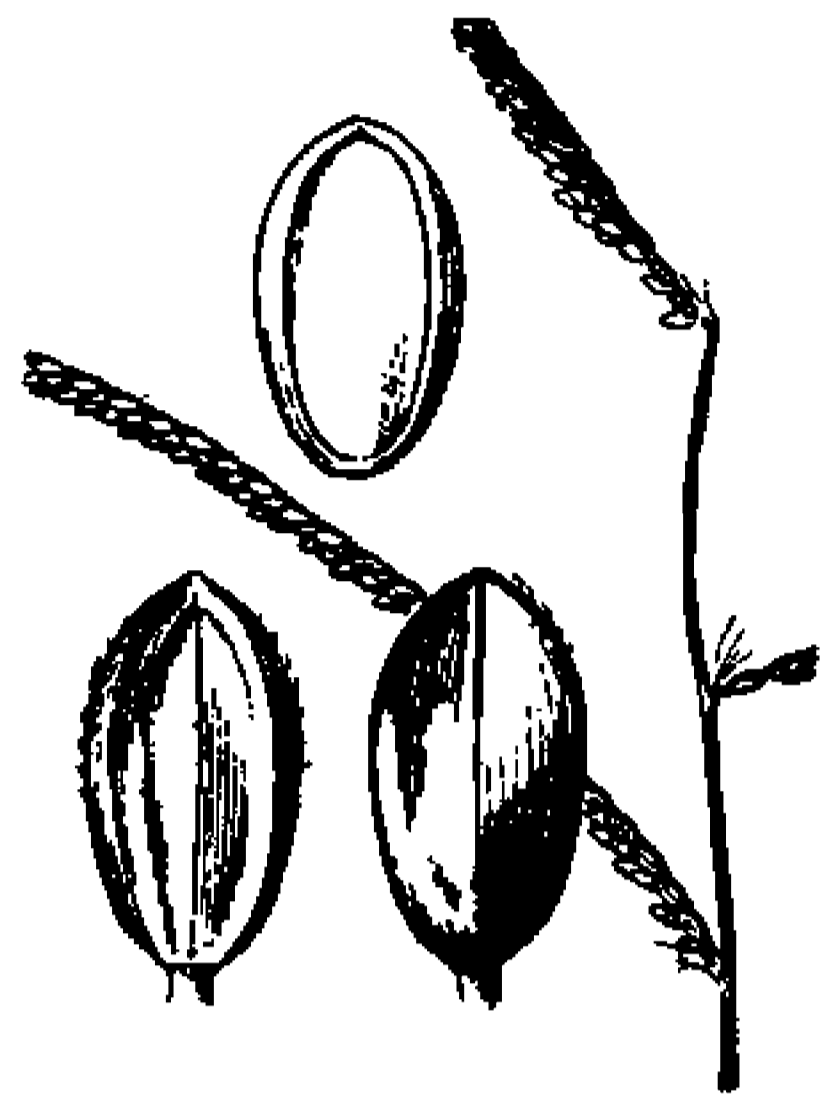


FIGURE 77.—*P. acutifolium*. From duplicate type

DESCRIPTION

A glabrous perennial forming small tough clumps, leafy at base; culms relatively rather stout, widely spreading, strongly flattened, 20 to 55 cm. long, usually with a single flowering branch from the upper node after the maturity of the primary inflorescence, the branch bearing a leaf, but this commonly reduced and hidden in the sheath of the main culm; nodes glabrous; sheaths strongly keeled with a membranaceous auricle and commonly a few hairs at the summit, the lower short and crowded; ligule about 1 mm. long; blades folded at base, commonly flat above, rather stiffly spreading or ascending, 2 to 15, mostly 2 to 10 cm., rarely to 20 cm., long, 2 to 4 mm. wide, sometimes with a few hairs on the back at base and with a ring of hairs back of the ligule; racemes 2 to 4, stiffly ascending, 2.5 to 7 cm. long, the common axis 1 to 5 cm. long, flattened; rachis flexuous, nearly 1 mm. wide, sparsely pilose at base; spikelets in pairs, mostly loosely arranged toward the ends and somewhat crowded in the middle, pale-stramineous, 2.1 mm. long, 1.1 mm. wide, obovate-elliptic; glume and sterile lemma equal, barely covering the fruit at maturity, 3-nerved, very smooth; fruit nearly the size of the spikelet, smooth and shining.

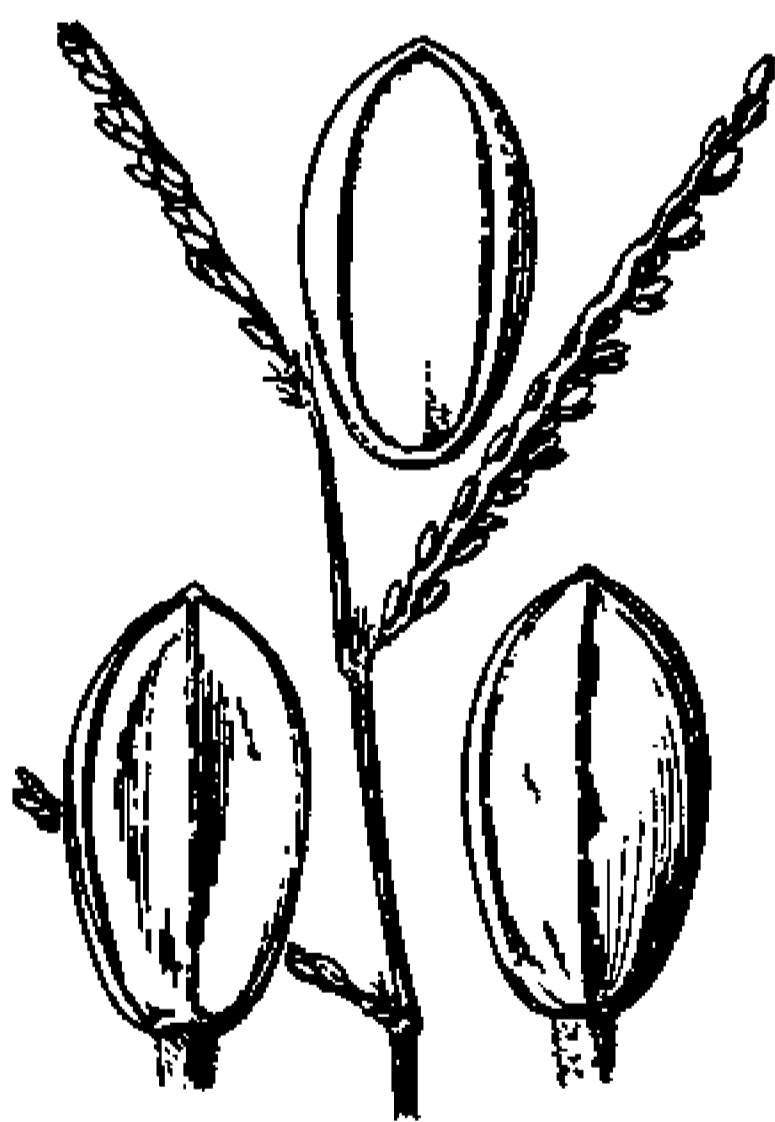


FIGURE 78.—*P. bakeri*. From type specimen

DISTRIBUTION

Sandy seashores and coral reefs, Bahamas, western Cuba, and Isle of Pines.

BAHAMAS: Inagua, *Nash & Taylor* 1353.

CUBA: Mariel, *Ekman* 12838, in *Amer. Gr. Nat. Herb.* 942. Habana, *Léon* 956, 2625. Between Morro and Cojimar, *Ekman* 798. Tricornia, *Hitchcock* 475. Yumury Mountains, *Rugel* 869. Matanzas, *Ekman* 17207. Palma Sola, *Wright* 298. Isle of Pines, *Britton, Britton & Wilson* 14939; *Britton, Wilson & Léon* 15294, 15337.

78. *Paspalum laxum* Lam.

Paspalum laxum Lam. Tabl. Encycl. 1: 176. 1791. "Ex America merid. Comm. D. Richard." The type, in the Lamarck Herbarium, bearing the name in Lamarck's script, is without data. In Richard's "Herbarium Guyanensi-Antillarum" in the Paris Herbarium is another specimen, presumably of the same collection. This bears the name and notes in Richard's script and a series of excellent drawings of the spikelet. The label reads "in fruticetis montosi sub-maritimus Sta. Croix." Both plants bear a slender flowering branch and spikelets 1.8 mm. long, the glume very obscurely pubescent. Lamarck adds to his very brief diagnosis the remark "an *P. virgatum* L. excluso sloani synonymo," which indicates that he had an incorrect concept of *P. virgatum*. This remark led to a misconception of his own species. The name *P. laxum* Lam. appeared in various works²² with the original description quoted, but seems not to have been associated with any plant until taken up by Doell²³ for *Paspalum corcovadense* Raddi (*P. plantagineum* Nees). Doell says he saw an authentic specimen of *P. laxum*, but his own description applies to *P. corcovadense* (which has a laxer inflorescence than has *P. laxum*).

Paspalum glabrum Poir. in Lam. Encycl. 5: 30. 1804. "Porto-Ricco * * * apportée par le citoyen Ledru." The type, with the name in Poiret's script, was examined in the Florence Herbarium. The spikelets are 1.8 mm. long, the glume rather densely pubescent, the sterile lemma very obscurely so or glabrous. Specimens of the same collection were examined in the herbaria of Paris, Delessert, and the British Museum. There are no branches in these specimens. The tuft of hairs at the mouth of the sheath is rather scant.

Paspalum milioides Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816. "Cette plante croît à Porto-Ricco. (V. s. in herb. Desv.)" The type has not been located. The description indicates a rather large plant of *P. laxum* with involute blades.

Paspalum miliare Spreng. Syst. Veg. 1: 247. 1825. Based on *P. milioides* Desv.

Paspalum ischnocaulon Trin. Gram. Icon. 2: pl. 126. 1828. "Figura ad specimen ex India orientali." In the Corrigenda to the Icones this plate is referred to *Paspalum glabrum* Poir. The type has not been examined, but the description and plate identify the species. "India orientali" is undoubtedly an error for India occidentali.

? *Paspalum sinuosum* Desv. Opusc. 57. 1831. "Habitat in Antillis." The type has not been located. The description applies well to *P. laxum*, but Desvaux adds that the species is related to *P. glabrum* but has much smaller spikelets.

Paspalum floribundum Desv. Opusc. 58. 1831. "Habitat in Antillis?" The type, bearing the name in Desvaux's script, in the Paris Herbarium, is a small immature plant, but 27 cm. tall, the spikelets 1.7 mm. long, nearly glabrous.

Paspalum richardii Steud. Syn. Pl. Glum. 1: 17. 1854. "*P. laxum* Rich. in Hrbo. Mougeot non Lam. Ins. Antillae." The specimen in the Mougeot Herbarium has not been located. As noted above, the specimen in the Paris Herbarium named *P. laxum* by Richard agrees with Lamarck's type. In the Drake Herbarium, however, is a specimen of *P. plicatulum* from Richard's herbarium named "*Paspalum laxum*" in his script. This is labeled, "in arenosis littoralibus Sta Crucis." Steudel's description is very vague but applies better to *P. laxum* Lam. than to *P. plicatulum*.

²² Poir. in Lam. Encycl. 5: 29. 1804; Flügge, Monogr. Pasp. 202. 1810 (among species unknown to the author); Roem. & Schult. Syst. Veg. 2: 315, 1817; Kunth, Enum. Pl. 1: 61, 1833; Steud. Syn. Pl. Glum. 1: 33, 1854.

²³ In Mart. Fl. Bras. 2^a: 85. 1877.

Paspalum laxum Rich.; Steud. Syn. Pl. Glum. 1: 17, 1854, as synonym of *P. richardii* Steud.

Paspalum rhizomatosum Steud. Syn. Pl. Glum. 1: 17. 1854. "Duchaissing legit in Guadaloupe." The type, in the Paris Herbarium, bearing the name in Steudel's script, is a tuft of two culms, one a very immature flowering culm, the other sterile. There is no true rhizome.

Paspalum koleopodum Steud. Syn. Pl. Glum. 1: 18. 1854. "Duchaissing legit in Guadaloupe." The type, bearing the name in Steudel's script, in the Paris Herbarium, consists of the upper part of a culm with 1 leaf and 2 peduncles, one with 3, the other with 2, racemes. The spikelets are 1.8 mm. long, the glume obscurely pubescent.

Paspalum laxum var. *lamarckianum* Doell in Mart. Fl. Bras. 2²: 86. 1877. Based on *P. laxum* Lam. itself, but misapplied by Doell to *P. corcovadense* Raddi.

Paspalum helleri Nash, Bull. Torrey Club 30: 376. 1903. "Type collected at Santurce [Porto Rico], Jan. 9, 1899, by Heller, no. 10." The type was examined in the herbarium of the New York Botanical Garden. The specimen is immature. The spikelets are 1.9 to 2 mm. long, the second glume sparsely pubescent.

Paspalum tenacissimum Mez, Bot. Jahrb. Engler 56: Beibl. 125: 10. 1921. "Portorico (Hioram n. 804)." This collection in the United States National Herbarium is a plant 45 cm. tall with long involute blades, the spikelets 1.8 mm. long, the glume rather densely pubescent as in the type of *P. glabrum*. Doctor Mez's specimen has not been located.

DESCRIPTION

A slender perennial in tufts of few to several culms, glabrous as a whole; culms ascending to nearly erect or sometimes, especially in small plants, spreading, simple or with a single flowering branch, 30 to 110 cm., commonly 50 to 75 cm., tall, compressed and rigid; nodes dark; sheaths narrow, ciliate at the obscurely auricled summit and pilose in the throat, sometimes conspicuously so, very smooth, the lower often purple-tinged, sometimes involute toward the summit and slightly diverging from the culm; ligule 1 to 1.5 mm. long; blades commonly more or less involute or flat in rainy seasons or in sheltered situations, firm, usually ascending, mostly elongate, sometimes as much as 50 cm. long, commonly 20 to



FIGURE 79.—*P. laxum*. From Richard's specimen in the Paris Herbarium

30 cm. long, 3 to 8 mm. wide, narrowed to the base, rarely minutely pubescent on the upper surface, the margin scabrous; racemes 2 to 14, commonly 3 to 5, slender, mostly remote (somewhat approximate in panicles of several racemes), usually arcuate-spreading, 3 to 10 cm., rarely to 14 cm., long, the common axis slender, angled; rachis slender, pubescent and usually with a few long hairs at base, the margin scabrous; spikelets in pairs on short pubescent pedicels, imbricate, 1.7 to 2 mm. long, about 1 mm. wide, elliptic-obovate; glume and sterile lemma equal, covering the fruit, 3 to 5 nerved, the glume speckled with brown and obscurely to rather densely pubescent with slightly glandular hairs, the

lemma greenish stramineous, glabrous or very rarely obscurely pubescent; fruit 1.6 to 1.7 mm. long, pale, smooth and shining or sometimes, as in the type of *P. laxum*, under a lens obscurely appressed-pubescent at the tip.

This species is variable in habit. Its most characteristic habitat is coconut groves in sand overlying limestone. In such places, depending apparently on available moisture, the blades may be flat or closely involute, but the plants are commonly tall with ascending to erect culms and elongate blades. In exposed places on the strand or on limestone cliffs the tufts are often short and spreading, with spreading blades 10 to 15 cm. long or less.

The following specimens are very slender plants with narrow firm blades minutely pubescent on the upper surface, 1 or 2 racemes, and spikelets about 1.7 mm. long. They may represent a distinct species but probably are habitat forms, all being from exposed situations: *Britton & Shafer* 1041, 3027; *Ekman* H 4156.

DISTRIBUTION

Sandy and limestone soils, Key West and the West Indies.

FLORIDA: Key West, *Blodgett* (N. Y. Bot. Gard.).

BAHAMAS: New Providence, *Britton & Brace* 404; *Curtiss* 156; *Geogr. Soc. Baltimore* 267. Andros, *Geogr. Soc. Baltimore* 197. Fortune Island, *Hitchcock* in 1890.

CUBA: Between Carabela Grande and Carabela Chica, *Roig* 3204. Habana, *Léon* 3446. Cayo Paloma, *Shafer* 2569. Guaro, *Hitchcock* 23418. Preston, *Ekman* 3475. Santiago de Cuba, *Léon* 951. Guantánamo, *Britton* 1902. Jauco, *Léon* 12305, 12313.

JAMAICA: Montego Bay, *Hitchcock* 9674.

HAITI: Ile de la Tortue, *Ekman* H 4156. Port-de-Paix, *Ekman* H 3593, H 3624. Bayeux, *Ekman* H 2555. Aux Cayes, *Ekman* H 43. Gonave Island, *Ekman* H 8837; *Leonard* 3339. Morne-a-Bateau, *Ekman* H 8043.

DOMINICAN REPUBLIC: Haina, *Faris* 105. Jovero, *Abbott* 2880a. Cape Samaná, *Abbott* 1172. Without locality, *Wright, Parry & Brummel* 607, 617, 618.

PORTO RICO: Mono Island, *Hess* 434. Desecheo, *Hess* 425. Aguadilla, *Chase* 6605½. Aguada, *Chase* 6601. Mayaguez, *Chase* 6182, 6279, 6300, 6313. Joyuda, *Amer. Gr. Nat. Herb.* 572; *Britton, Stevens & Hess* 2395. Boqueron, *Britton, Cowell & Brown* 4636, 4639; *Chase* 6499. Punta Aguila, *Britton, Cowell & Brown* 4686, 4690. Morillos de Cabo Rojo, *Britton, Cowell & Brown* 4717. Quebradillas, *Chase* 6573, 6575. Larcs, *Chase* 6584, 6591. Arecibo, *Chase* 6446. Campo Alegre, *Chase* 6437, 6618, 6625. Maniti, *Chase* 6609. Guanica, *Britton, Cowell & Brown* 4909. Condado, *Britton, Britton & Brown* 6630. Vega Baja, *Chase* 6423. Catano, *Chase* 6635. Santurce, *Chase* 6346; *Heller* 10, 164; *Hioram* 804. Cangrejos, *Stevenson* 2292. Bayamon, *Chase* 6408. Pueblo Viejo, *Chase* 6402; *Hioram* 111, 2717. Rio Piedras, *Chase* 6759. Trujillo Alto, *Chase* 6367, 6369. Cayo Muertos, *Britton, Cowell & Brown* 5041. Salinas, *Chase* 6756. Between Rio Grande and Fajardo, *Britton, Britton & Brown* 7038. Playa de Fajardo, *Chase* 6658. Playa de Humacao, *Eggers* in 1881. Culebra Island, *Britton & Wheeler* 190. Island of Vieques, *Chase* 6678, 6697.

VIRGIN ISLANDS: St. Thomas, *Eggers* in 1876, 1880, 1881, 1882; *Friedrichsthal* 183; *Hitchcock* 16313. St. Croix, *Hitchcock* 16336; *Ricksecker* 410; *Thompson* 449, 463. Angada, *Britton & Fishlock* 986, 1041. Virgin Gorda, *Fishlock* 108. Tortola, *Britton & Shafer* 694, 880. St. Jan, *Britton & Shafer* 257, 292, 506.

LEeward ISLANDS: Antigua, *Hitchcock* 16378. Dominica, *Jones* 47.

WINDWARD ISLANDS: Martinique, *Duss* 551. Barbados, *Dash* 584; *Freeman* 5026. Grenada, *Broadway* in 1905.

CURACAO: Santa Cruz, *Britton & Shafer* 3027.

79. *Paspalum pleostachyum* Doell

Paspalum pleostachyum Doell in Mart. Fl. Bras. 2²: 58. 1877. "*Paspalus ambiguus* Salzmänn n. 665 non Poiret. In collibus apricis prope Bahia (Salzmänn, herb. Bahiense [Brazil] n. 665, in herbario Candolleano obvium)." The type, bearing the Salzmänn name, was examined in the DeCandolle Herbarium. A duplicate, from Montpellier, is in the United States National Herbarium.

Paspalum ambiguum Salzm.; Doell in Mart. Fl. Bras. 2²: 59, 1877, as synonym of *P. pleostachyum*. "Salzmänn n. 665."

Paspalum anemotum Ridley, Journ. Linn. Soc. 27: 68. 1890. "Abundant in open ground behind Fort San Antonio, in the low ground near Tangle Rock and at Morro branco," Fernando Noronha, Brazil. The type, in the British Museum, bearing the name in Ridley's script, was collected by Ridley, Lea, and Ramage, no. 167. It is labeled "Morro branco, Fernando Noronha." The plant is about 90 cm. tall.

Paspalum phonoliticum Ridley, Journ. Linn. Soc. 27: 68. pl. 4. 1890. "On the altered phonolite of Morro branco, growing in clefts of the rock and on the slopes," Fernando Noronha, Brazil. The type, in the British Museum, bearing the name in Ridley's script, is Ridley, Lea, and Ramage's no. 166, and is labeled "on the altered phonolite." This is a larger clump than no. 167, the less mature culms 30 to 40 cm. tall.

DESCRIPTION

A rather rigid perennial, the culms few to many in a tough clump; culms ascending to spreading, simple, or rarely with a single branch, glabrous, or scabrous below the panicle, subcompressed, 40 to 100 cm. tall; nodes dark, glabrous; leaves rather numerous, the sheaths mostly overlapping, densely ciliate on the margin and commonly villous across the collar, conspicuously hairy in the throat, otherwise glabrous or sparsely pilose toward the summit, the lower sheaths often nodulose in drying; ligule about 1 mm. long; blades flat from a folded base, often drying folded or subinvolute, firm, rather stiffly ascending, 12 to 55 cm., commonly 15 to 25 cm., long, 4 to 8 mm. wide, about as wide at the base as the summit of the sheath or slightly narrower, stiffly ciliate on the margin below, usually puberulent on the strongly nerved coarsely cellular upper surface, sometimes pubescent on both surfaces, scabrous on both surfaces toward the apex; racemes 3 to 15, commonly 4 to 8, at length stiffly spreading, 7 to 14 cm. long (the upper one or two often reduced) on a stiff scabrous axis 4 to 11 cm. long; rachis slender, scabrous on the margin, puberulent at the very base and with a few long hairs in the axils; spikelets in pairs on short pubescent pedicels, rather irregularly and loosely crowded, 2.2 to 2.5 mm. long, about 1.2 mm. wide, elliptic-obovate, pale-stramineous; glume and sterile lemma rather firm, glabrous, 3-nerved, or the midnerve of the lemma suppressed, the glume slightly shorter than the lemma; fruit 2.1 mm. long, about 1 mm. wide, elliptic, under a lens minutely papillose-striate.

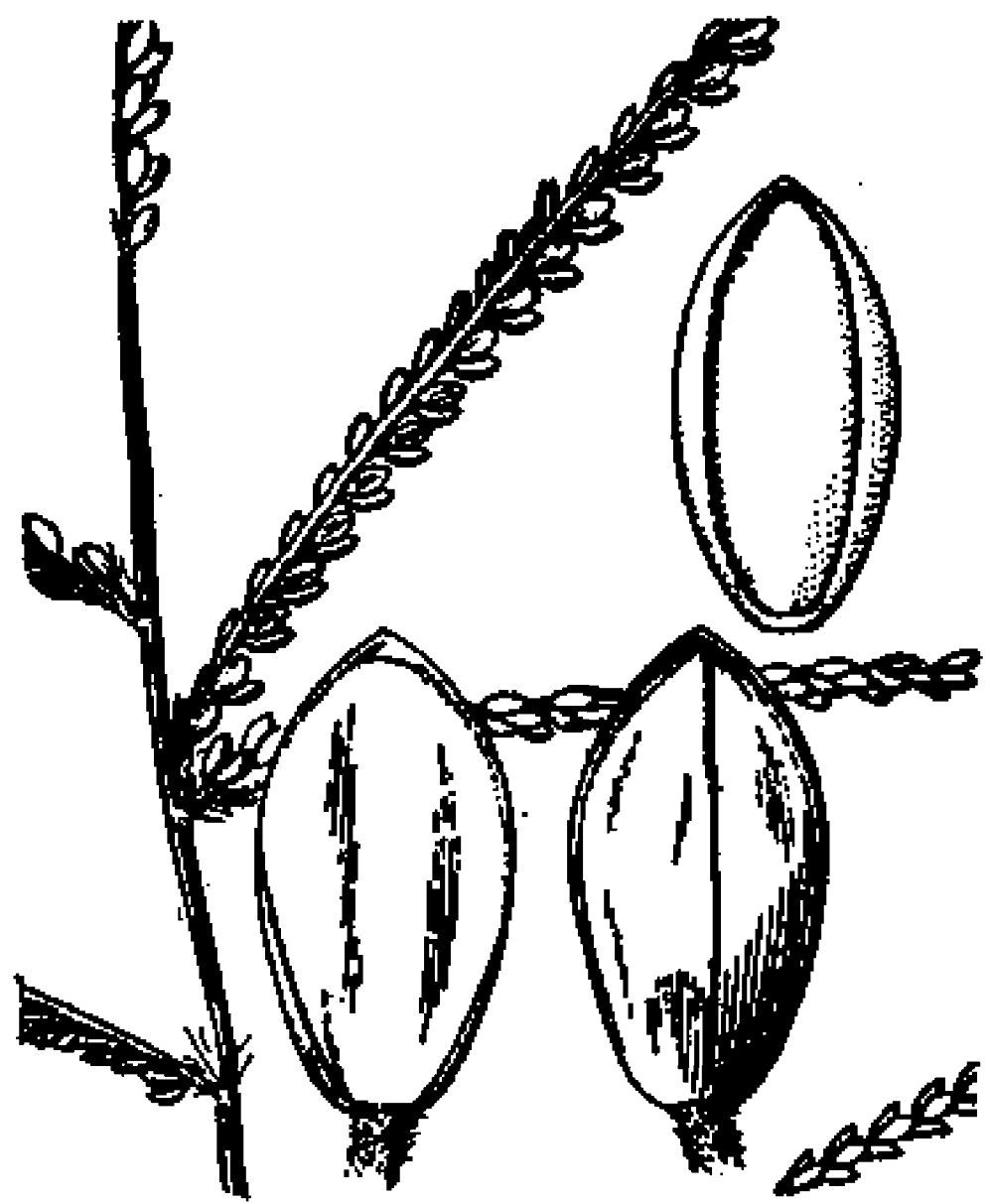


FIGURE 80.—*P. pleostachyum*. From Ekman 15758

This species is variable in the amount of pubescence. In Chase 8045 the foliage is pubescent throughout. In a collection by Broadway, Grenada, in 1905,

the plants are less robust than usual in *Paspalum pleostachyum* and resemble *P. laxum*. The spikelets are 2.3 mm. long.

DISTRIBUTION

On rocks or in sand or clay, seacoast, Cuba to Brazil.

CUBA: Guantánamo, *Ekman* 15756.

HAITI: Ile de la Tortue, *Ekman* H 4132.

WINDWARD ISLANDS: Grenada, *Broadway* in 1905.

BRAZIL: Pernambuco, *Chase* 7656, 7769. Bahia, *Chase* 7903, 8045, 8047; *Salzmann*.

Alterniflora.—Tufted rather wiry perennials, with narrow blades and 1 to few racemes. Confined to the West Indies.

Spikelets glabrous, in pairs.....80. *P. rocanum*.

Spikelets pubescent, solitary.

Blades elongate, glabrous.....81. *P. alterniflorum*.

Blades less than 20 cm. long, conspicuously pilose...82. *P. rottboellioides*.

80. *Paspalum rocanum* Léon

Paspalum rocanum Léon in Britton, Mem. Torrey Club 16: 57. 1920. "Palm barren, sabana de Motembo, Santa Clara (*Léon & Roca* 8233) is the type, preserved in Colegio De La Salle Herbarium, Vedado, Havana." A duplicate type was deposited in the United States National Herbarium by Brother Léon.

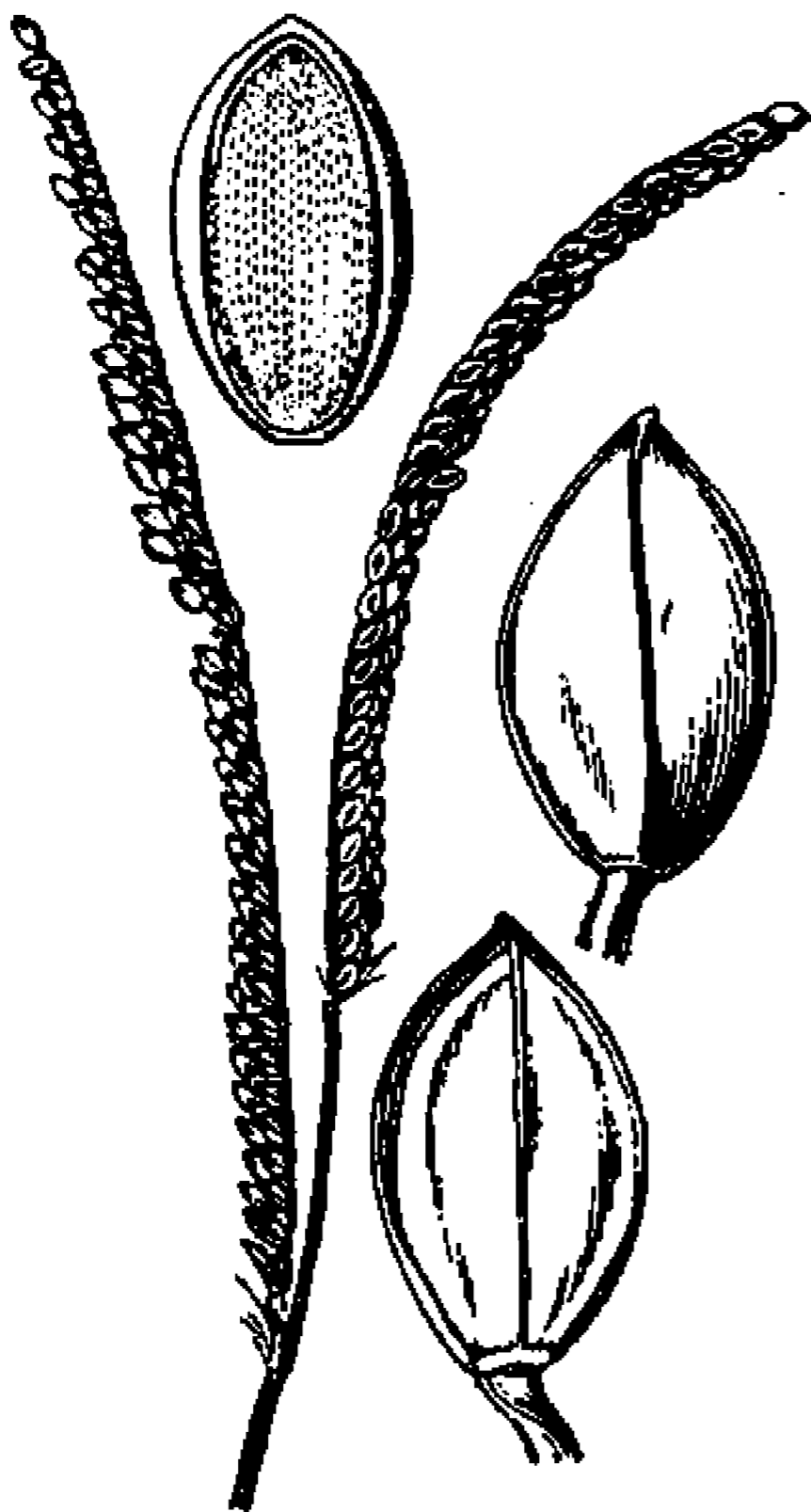


FIGURE 81.—*P. rocanum*. From duplicate type

DESCRIPTION

A slender erect perennial, glabrous as a whole, in small tough clumps with numerous sterile shoots forming a leafy tuft at base; culms simple, 40 to 75 cm. tall, compressed; nodes appressed-pubescent to nearly glabrous; sheaths keeled, sparsely papillose-pilose along the membranaceous margin, the lower and those of the leafy shoots short and overlapping, the upper elongate, their blades reduced or obsolete; ligule 2 to 2.5 mm. long; blades commonly conduplicate, sometimes flat in moist situations or in age, firm, more or less tortuous from an erect base as wide as the summit of the sheath, 10 to 30 cm. long, 3 to 7 mm. wide (flattened out), papillose-ciliate toward the base or glabrous throughout; racemes 2 to 4, from narrowly arcuate-ascending to spreading, 2.5 to 9 cm. long, 1 to 2 cm. distant on a slender common axis; rachis 1.2 to 1.5 mm. wide, scaberulous on the back and with a few long hairs at the base; spikelets in pairs on rather stout pedicels, evenly crowded, 2.1 to 2.5 mm. long, 1.3 to 1.5 mm. wide, depressed plano-

convex, mostly unsymmetrically elliptic, minutely pointed, yellowish green, turning brownish toward maturity, glabrous; glume and sterile lemma subequal, slightly pointed beyond the fruit, 3-nerved, both under a lens sprinkled toward the center with minute golden globular papillae, these drying into minute rusty spots toward maturity; fruit 2 to 2.2 mm. long, pale, minutely papillose-striate.

This species is not closely related to any other known. It seems to be most nearly allied to the Brazilian *P. flaccidum* Nees, with filiform blades and larger spikelets with firmer glume and sterile lemma, the glume smaller, exposing the fruit. *Paspalum rocanum* is placed in *Alterniflora* for convenience.

DISTRIBUTION

Palm barrens, sometimes in moist places, and brush: savannas, Provinces of Santa Clara and Matanzas, Cuba.

CUBA: Sabana de Motembo, *Léon & Roca* 8233; *Léon & Loustalot* 9382, 11337; *Ekman* 16819; *Amer. Gr. Nat. Herb.* 943. Baños de Santa Rosalia, *Léon & Loustalot* 9392. San Miguel de los Baños, Prov. Matanzas, *Léon & Roca* 8871.

81. *Paspalum alterniflorum* A. Rich.

Paspalum alterniflorum A. Rich. in Sagra, *Hist. Cuba* 11: 299. 1850. "Insulae Cubae." The type, collected by Ramon de la Sagra, was examined in the Paris Herbarium.

Paspalum dolichophyllum Hack. *Inf. Est. Centr. Agron. Cuba* 1: 409. 1906. "Prov. de Habana: Calabazar, leg. Baker et Zarragoitia (nr. 4545)." The type, in the Hackel Herbarium with the name in Hackel's script, is labeled "no. 4545 Baker & O'Donovan." The same names are given on a duplicate in the United States National Herbarium. The name of the second collector was doubtless changed by Baker, to whom Professor Hackel must have sent the manuscript. The specimens are overmature.

DESCRIPTION

Plants perennial in large dense clumps, glabrous except as noted; culms 30 to 100 cm. tall, terete, leafy, erect and simple or some of the outer culms of a clump spreading and bearing erect branches from the lower 1 to 4 nodes, the branches like the simple culms; sheaths not keeled, much overlapping, with a tuft of long hairs at the auriculate or truncate summit, or glabrate, the lower sheaths withdrawn from the culm and involute, often purplish; ligule rather firm, 1 to 2 mm. long; blades erect at base, elongate, nearly equaling the culm, mostly 1.5 to 3 mm. wide, involute, or flat but drying involute, puberulent on the upper surface; racemes 1 to 5, commonly 2 or 3, suberect or ascending, 1 to 3 cm. distant on a plano-convex slender common axis; rachis triangular, 1 to 1.5 mm. wide, with a few white hairs at base; spikelets solitary, sessile, appressed, those of a row slightly or scarcely imbricate, 3 mm. long, about 1.2 mm. wide, subcompressed, pale, ovate-oblong, subacute or blunt; glume and sterile lemma much exceeding the fruit, 5-nerved, the lateral pairs of nerves close together, the glume sparsely silky-pubescent especially on the brownish hyaline margin except the upper one-third, the lemma with like pubescence toward the base, sometimes slightly wrinkled below; fruit pale, 1.8 mm. long, 1 mm. wide, obovoid, very minutely striately roughened.

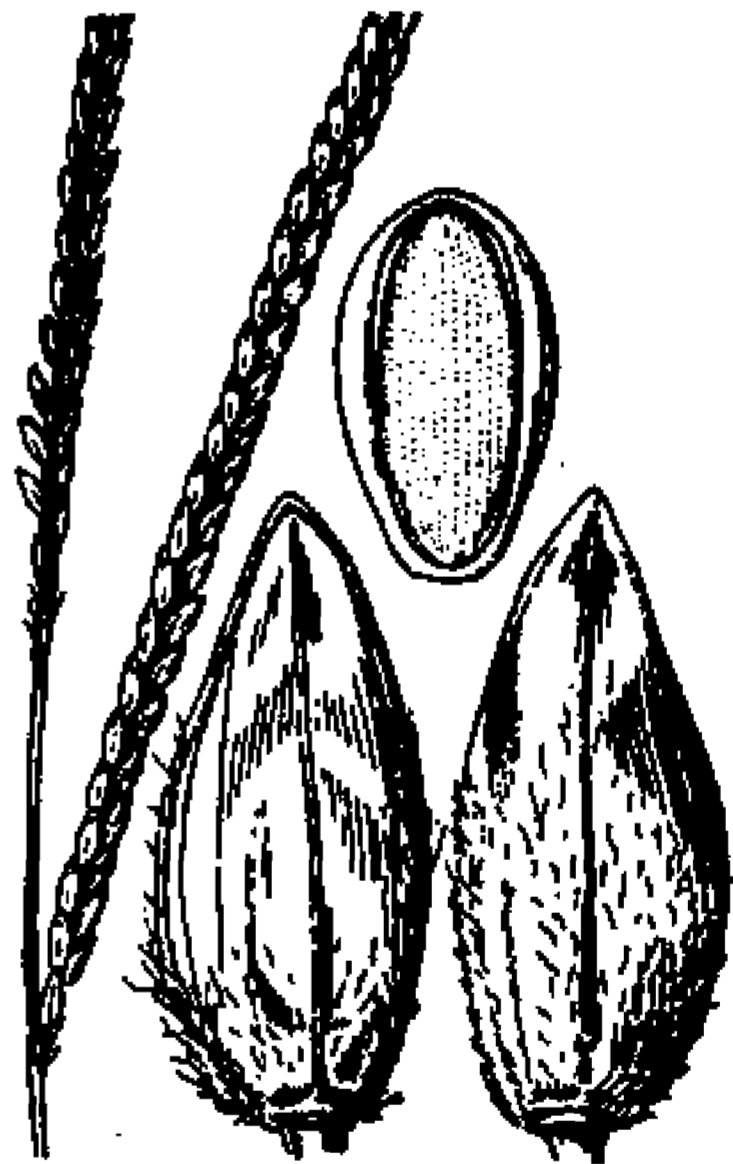


FIGURE 82.—*P. alterniflorum*.
From Baker, Tracy & Hasselbring, Cuba

DISTRIBUTION

Open ground, pastures and savannas, Cuba, common in the western part, rare eastward, and in Haiti. In the Copenhagen Herbarium is a specimen of *Paspalum alterniflorum* bearing a label of Oersted's Central American plants, no. 14109, field no. 91. The species is not known from the continent and the specimen is presumably from the West Indies.

CUBA: Mariel, *Ekman* in *Amer. Gr. Nat. Herb.* 944. Habana, *Baker, Tracy & Hasselbring* in 1907; *Léon* 2556, 3473; *Tracy* 9105. Marianao, *Léon* 581. Arroyo Apolo, *Léon* 564, 585. Vibora, *Baker* 2587; *Léon* 943, 945. Guanabacoa, *Ekman* 594; *Léon* 2561. Calabazar, *Baker & Zarragoitia* 4545. Hanábana, *Wright* 167 in 1865. Caibarien, *Fernando* 36. Manatí, *Léon* 5680. Cupey, *Ekman* 6294. Without locality, *Liebmann* 194, 201; *Rugel* 753a; *Wright* 3841.

HAITI: St. Michel, *Ekman* H 8351; *Nash & Taylor* 1445. Between Anse-à-Veau and Petit Trou des Nippes, *Ekman* H 5401.

82. *Paspalum rottboellioides* Wright

Paspalum rottboellioides Wright, *Anal. Acad. Cienc. Habana* 8: 204. 1871. "[3864] * * * En las sabanas arenosas de la Vuelto-abajo," Cuba, collected by Wright. The type was examined by A. S. Hitchcock in the Gray Herbarium.

Two duplicates are in the United States National Herbarium. These plants are mature, most of the spikelets fallen. The sterile lemmas are glabrous or nearly so.

DESCRIPTION

Plants perennial, cespitose, the dense tuft of basal leaves less than half the length of the culms; culms simple, 20 to 75 cm. tall, slender, compressed, yellowish, glabrous, with 2 nodes above the base; nodes glabrous or sparsely appressed-pilose; lower sheaths short, crowded and papillose-pilose, the upper elongate, sparsely pilose toward the summit or glabrate; ligule 0.5 to 1 mm. long; blades spreading, 5 to 18 cm. long (the uppermost reduced), 1 to 1.5 mm. wide, mostly involute, conspicuously papillose-pilose; racemes 1 or 2, ascending or spreading, straight or nearly so, 4 to 12 cm. long, the common axis slender, 1 to 2 cm. long;

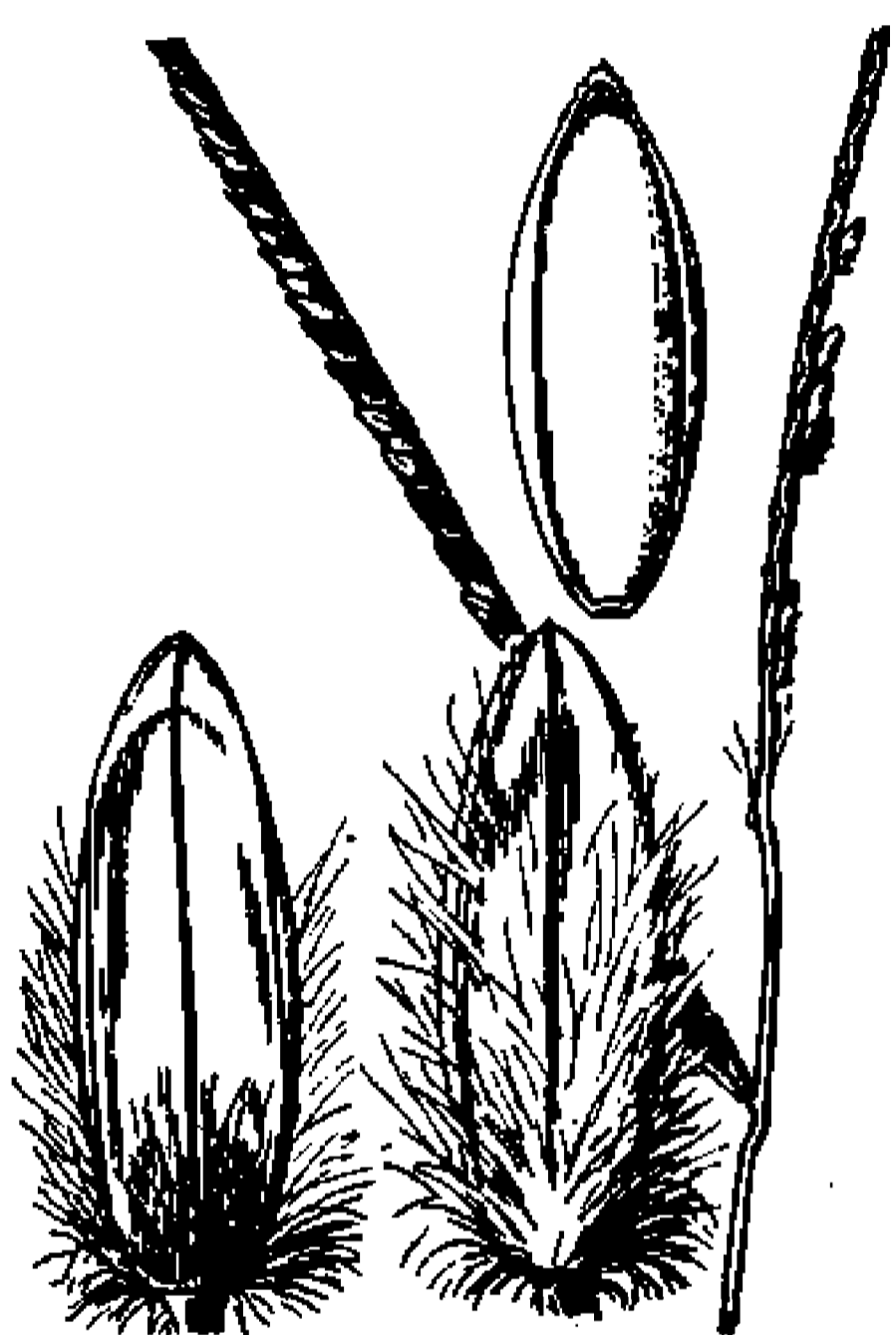


FIGURE 83.—*P. rottboellioides*. From duplicate type

rachis 1.5 mm. wide with a thick midrib and narrow membranaceous wings, the margins erose, a few white hairs at the base; spikelets solitary, subsessile, from appressed to rather loose, slightly imbricate, 3 to 3.3 mm. long, about 1 mm. wide, depressed, oblong-elliptic, more or less blotched with dark red or purple, commonly several to many spikelets in a raceme maroon-colored; glume and sterile lemma exceeding the fruit, 5-nerved, the lateral pairs of nerves close together, the glume long-villous except at the summit or throughout, the lemma villous at the base, sometimes glabrous; fruit pale, 2.3 to 2.5 mm. long, about 0.9 mm. wide, elliptic, minutely pubescent at the apex, otherwise smooth and shining.

DISTRIBUTION

Sandy pinelands, and savannas, eastern Cuba and Isle of Pines.

CUBA: Herradura, *Ekman* in *Amer. Gr. Nat. Herb.* 945. Vuelto-abajo, *Wright* 3864. Isle of Pines, *Britton & Wilson* 14697; *Curtiss* 375; *Ekman* 12219; *Taylor* 41.

Filiformia.—Tufted perennials, with slender simple culms, narrow blades and cylindric or subcylindric, usually solitary racemes. (Racemes 1 or 2, rarely to 4 in *Paspalum insulare* and *P. lindenianum*.) Confined to the West Indies.

Foliage conspicuously pubescent, flat or subinvolute.

Racemes rather flat, scarcely cylindric; rachis flexuous.....87. *P. insulare*.

Racemes cylindric; rachis straight.....86. *P. nanum*.

Foliage glabrous or nearly so, concavo-convex in cross section.

Glume and sterile lemma not crumpled.....83. *P. filiforme*.

Glume and sterile lemma inflated and crumpled.

Spikelets 2 mm. long; glume and sterile lemma not pointed beyond the fruit.

84. *P. distortum*.

Spikelets 2.7 to 3 mm. long; glume and sterile lemma pointed beyond the fruit.....85. *P. lindenianum*.

83. *Paspalum filiforme* Swartz

Paspalum filiforme Swartz, Prodr. Veg. Ind. Occ. 22. 1788. "Jamaica." The type specimen, with the name in Swartz's script, is in the herbarium of the Riksmuseet, Stockholm. A raceme from it was kindly lent for examination, and a duplicate, not labeled in Swartz's script, was deposited in the United States National Herbarium. This is not the species with distorted wrinkled spikelets to which the name has been applied by recent authors,²⁴ but the comparatively rare species described by Nash as *P. leptocaulon*. Grisebach²⁵ does not describe the spikelets as wrinkled, but specimens cited by him and examined in his herbarium show that he included *P. lindenianum* and *P. distortum* in *P. filiforme*. When Doctor Hitchcock visited European herbaria in 1907, the Swartz grasses had been lent to Doctor Mez, then at Halle. The specimen of *P. filiforme* could not be found either at Stockholm or Halle, but it was subsequently returned to Stockholm.

Paspalus swartzianus Flügge, Monogr. Pasp. 96. 1810. Based on "*Paspalum (filiforme) * * * Swartz. Prodr. p. 22.*" Flügge, having transferred *Panicum filiforme* L. [*Syntherisma filiforme* (L.) Nash] to *Paspalum*, renamed Swartz's species.

Paspalum lineare Swartz; Steud. Nom. Bot. ed. 2. 2: 272, 1841, as synonym of *P. swartzianum*. Not *P. lineare* Trin. 1826.

Paspalum leptocaulon Nash, N. Amer. Fl. 17: 181. 1912. "Type collected at Lacovia, Jamaica * * * N. L. Britton 1475 (herb. N. Y. Bot. Gard.)." This specimen is a small tuft with three flowering culms.

DESCRIPTION

A very slender glabrous perennial, in large dense tussocks of relatively few flowering culms and numerous leafy shoots, all reclining; culms simple, 20 to 70 cm. long (but flowering culms only 2 to 3 cm. long sometimes found at the base of tall tufts), with but 2 nodes above the base, compressed; sheaths crowded at the base, the lowermost 1 to 2 cm. long, explanate and truncate, the others increasingly longer up to 10 or 12 cm., keeled (the uppermost longer and bladeless or nearly so), ciliate toward the summit; ligule minute; blades mostly 20 to 50 cm. long, the lowermost shorter, about 1 mm. wide, plano-convex, sometimes loosely twisted, ciliate at the base; raceme solitary, arcuate, 3 to 8 cm. long; rachis very slender, plano-convex with a few hairs at base; spikelets solitary, those of a row scarcely



FIGURE 84.—*P. filiforme*. From type specimen

²⁴ Hitchcock, Contr. U. S. Nat. Herb. 12: 202. 1909; Nash, Fl. N. Amer. 17: 180. 1912; Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 312. 1917.

²⁵ Fl. Brit. W. Ind. 542. 1864.

imbricate, subsessile, or the lower on pedicels nearly 1 mm. long, appressed, 1.6 to 1.8 mm. long, 0.7 to 0.8 mm. wide, ovate-elliptic, rather obtuse; glume and sterile lemma firm in texture, 5-nerved, slightly exceeding the fruit, sometimes obscurely angled or wrinkled; fruit pale, 1.4 to 1.5 mm. long, about 0.7 mm. wide, minutely striately roughened.

DISTRIBUTION

Savannas, open or wooded slopes, Cuba, Jamaica, and Hispaniola.

CUBA: Guane, *Ekman* 11095. Remates, *Ekman* 11197. Sabana de Chirigota, *Leon & Roca* 7452. Mariel, *Ekman* in *Amer. Gr. Nat. Herb.* 946. San Miguel de Casanova, *Leon* 12472, 12558. Sabana de Motembo, *Leon & Loustalot* 9346. Manatí, *Leon* 6009. Without locality, *Wright* 3848.

JAMAICA: Savanna-la-Mar, *Hitchcock* 9885. Troy, *Amer. Gr. Nat. Herb.* 566. Lacovia, *Britton* 1475.

HAITI: "Hispaniola," *Swartz*.

84. *Paspalum distortum* Chase, sp. nov.

DESCRIPTION

A glabrous wiry perennial in dense tufts with numerous leafy shoots, suberect to recurved-spreading, the culms and leaves about equal and more or less tortuous, glabrous except as noted; culms simple, with 2 or 3 nodes above the base, 15 to 50 cm. tall, often with short ones intermixed in the tuft, slender, compressed; sheaths crowded at the base, the lowermost short, often explanate or deciduous, showing membranaceous prophylla 1 to 3 cm. long, ciliate at the tapering summit,

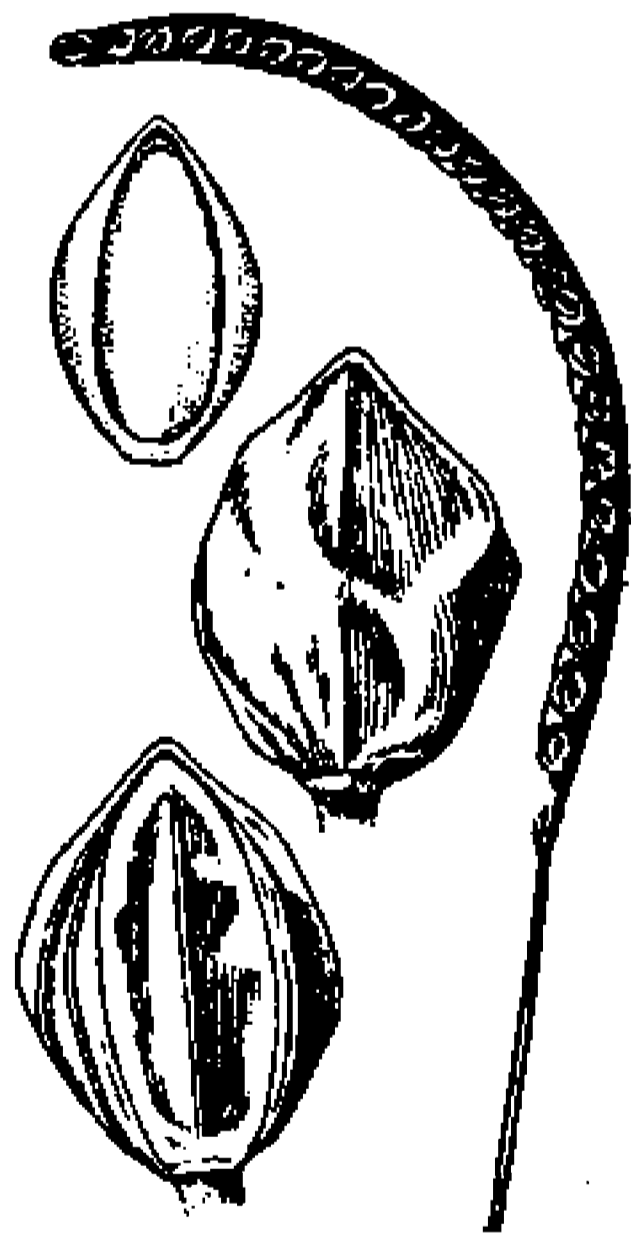


FIGURE 85.—*P. distortum*.
From type specimen

the upper increasingly longer, more or less keeled; ligule minute; blades mostly 15 to 40 cm. long, 1 to 1.5 mm. wide, involute or subinvolute, commonly somewhat tortuous, ciliate toward the base; raceme solitary (rarely 2, scarcely 1 cm. apart), arcuate, 2.5 to 6 cm. long; rachis very slender, plano-convex, with a few hairs at base; spikelets solitary, appressed, those of a row not imbricate, 2 mm. long, about 1.7 mm. wide, ovate to somewhat rhomboid, the firm-textured broad inflated glume and the narrower sterile lemma irregularly crumpled, the glume 7-nerved, the sterile lemma 5-nerved; fruit pale yellow, about 1.6 mm. long, 1 mm. wide, minutely striately roughened.

Type in the U. S. National Herbarium, no. 1010224, collected "in dense tussocks, in hillside pasture," Troy, Jamaica, altitude about 600 meters, October 16, 1917, by William Harris (no. 12569).

This species, called wiregrass in Jamaica, is the one referred to as *P. filiforme* Swartz in recent works on Cuba and Jamaica. It is more variable in length of culms and foliage and in width of blade than are true *P. filiforme* and *P. lindenianum*. It is closely allied to *P. lindenianum*, distinguished from it by its usually smaller size, shorter racemes, and smaller spikelets.

DISTRIBUTION

Open hillsides, especially on serpentine rocks, Cuba, Haiti and Jamaica.

CUBA: Cajalbana, *Leon & Charles* 4857. Habana, *Leon* 946. Guanabacoa, *Leon* 7057. San Miguel de Casanova, *Leon* 12473. Sabana del Tibisial, *Leon & Clement* 6661. Manajanabo, *Leon* 5273. Banao Mountains, *Leon & Roca* 8042.

Baraguá, *Walker* in 1925. Sierra Maestra, *Ekman* 14691. El Yunque, *Shafer* 7732. Baracoa, *Ekman* 3597. Isle of Pines, *Curtiss* 374.

JAMAICA: Troy, *Harris* 12564, 12569; *Hitchcock* 9789. Cockpit Country, *Britton* 465. Bull Head Mountain, *Hitchcock* 9544. Claremont, *Hitchcock* 9518. Between Ewarton and Linstead, *Hitchcock* 9438½.

HAITI: Aux Cayes, *Ekman* H 7.

85. *Paspalum lindenianum* A. Rich.

Paspalum lindenianum A. Rich. in Sagra, Hist. Cuba 11: 299. 1850. "Crescit in pratis montosis prope Saltadera, in provincia Santiago de Cuba. (Linden n. 1813.)" The type, labeled "Santiago de Cuba, Linden 1813" is in the Paris Herbarium. It consists of a clump with leaves overtopping the culms and inflorescences of one and of two racemes.

Paspalum longifolium Steud. Syn. Pl. Glum. 1: 21. 1854. Not *P. longifolium* Roxb. 1820. "Linden 1813. Cuba." The type specimen is in the Paris Herbarium, with the name in Steudel's script and the data "Santiago de Cuba, Linden 1813." There is a single inflorescence of two racemes.

Paspalum megaphyllum Steud. Syn. Pl. Glum. 1: 464. 1854. Based on *P. longifolium* Steud.

This species was erroneously included by Doell,²⁶ with the citation of Wright's no. 769 from Cuba, in *P. approximatum* Doell, but his type from Brazil, though it has cross-wrinkled spikelets, is a different species, not known from North America.

DESCRIPTION

A wiry perennial in dense tussocks, the leaves of the numerous sterile shoots usually about equaling the culms, all erect or suberect, 30 to 80 cm., mostly 40 to 70 cm., tall, short culms rarely intermixed, glabrous except as noted; culms with 2 nodes above the base, slender, but relatively stiff, compressed; sheaths crowded below, the lower rather broad and loose, the margins ciliate at the tapering summit; ligule minute; blades mostly 20 to 50 cm. long, about 1 mm. wide, plano-convex or subinvolute, ciliate toward the base; racemes 1 or 2, rarely 3 or 4, arcuate or nearly straight, 3 to 14 cm. long, mostly 6 to 10 cm., the common axis 5 to 20 mm. long; rachis slender, plano-convex, obscurely hairy at the base; spikelets solitary, appressed, those of a row not or scarcely imbricate, 2.5 to 2.8 mm. long, 1.7 to 1.8 mm. wide, irregularly ovate-rhomboid, the firm-textured broad inflated glume and the narrower sterile lemma deeply irregularly crumpled, the glume 7-nerved, the sterile lemma 5-nerved; fruit pale yellow, about 2 mm. long, 1.4 mm. wide, minutely striately roughened.

Linden's no. 1813, the type collection of all the names published for this species, is widely distributed in herbaria. Most of the specimens have inflorescences with two racemes. The one in the Delessert Herbarium has a short culm with a solitary raceme and three tall culms with 2, 3, and 4 racemes, respectively. None of the specimens of Linden's no. 1813 has mature spikelets. Solitary racemes are much more common for the species than are two. The

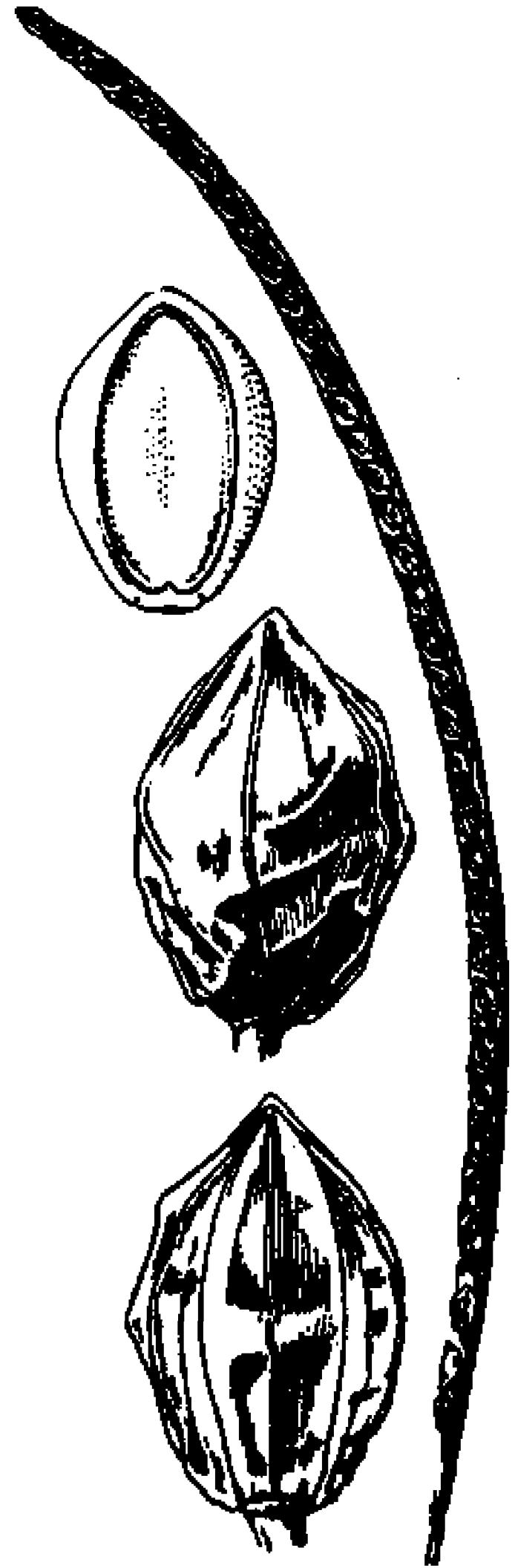


FIGURE 86.—*P. lindenianum*.
From *Hitchcock* 9873

²⁶In Mart. Fl. Bras. 2²: 82. 1877.

first glume is developed in most of the spikelets in *Léon* 7346, and in a few in *Wright* 769, *Curtiss* 523, *Léon* 945b, 5272, *Harris* 12551, and *Hitchcock* 9438.

DISTRIBUTION

Open or brushy places, mostly on limestone hills, Cuba, Jamaica, and Haiti.

CUBA: Mariel, *Ekman* 12908, in *Amer. Gr. Nat. Herb.* 947. Playa de Marianao, *Léon* 5272. Habana, *Léon* in 1909. Guanabacoa, *Ekman* 264; *Hitchcock* 463, 23242; *Léon* 944, 7346. Madruga, *Léon* 3457. Calvario, *Léon* 945b. San Miguel de Casanova, *Léon* 12471. Hanábana, *Wright* 769. Saltadura, *Linden* 1813. Baraguá, *Hitchcock* 23348, 23363. Soledad, *Hitchcock* 23326. Isle of Pines, *Curtiss* 523; *Palmer & Riley* 949.

JAMAICA: Montego Bay, *Hitchcock* 9663. Savanna-la-Mar, *Hitchcock* 9873. Cornwall, *Harris* 12551. Between Ewarton and Linstead, *Hitchcock* 9438.

Between Bog Walk and Spanish Town, *Hitchcock* 9294. Lucea, *Harris* 12559.

HAITI: Marmelade, *Leonard* 8434. Mirabalais, *Cook, Scofield & Doyle* 87. Pétionville, *Leonard* 4830. Between Décalette and Dupréné, *Ekman* H 2045.

86. *Paspalum nanum* Wright

Paspalum nanum Wright; Griseb. Cat. Pl. Cuba 230. 1866. "Cuba occ., in savanis pr. Hanábana (Wr. a 1865)." The type, Wright's no. 176, "Bushy savannas, Hanábana, June 1," 1865, was examined by A. S. Hitchcock in the Grisebach Herbarium. The culms are 8.5, 13, 15, and 22 cm. tall, much exceeding the leaves.

Paspalum caudicatum Wright, Anal. Acad. Cienc. Habana 8: 205. 1871. "[3866] En sabanas arenosas de la Vuelta-abajo." The type is in the Gray Herbarium and a duplicate in the United States National Herbarium. In this collection the culms are mostly shorter than the leaves.

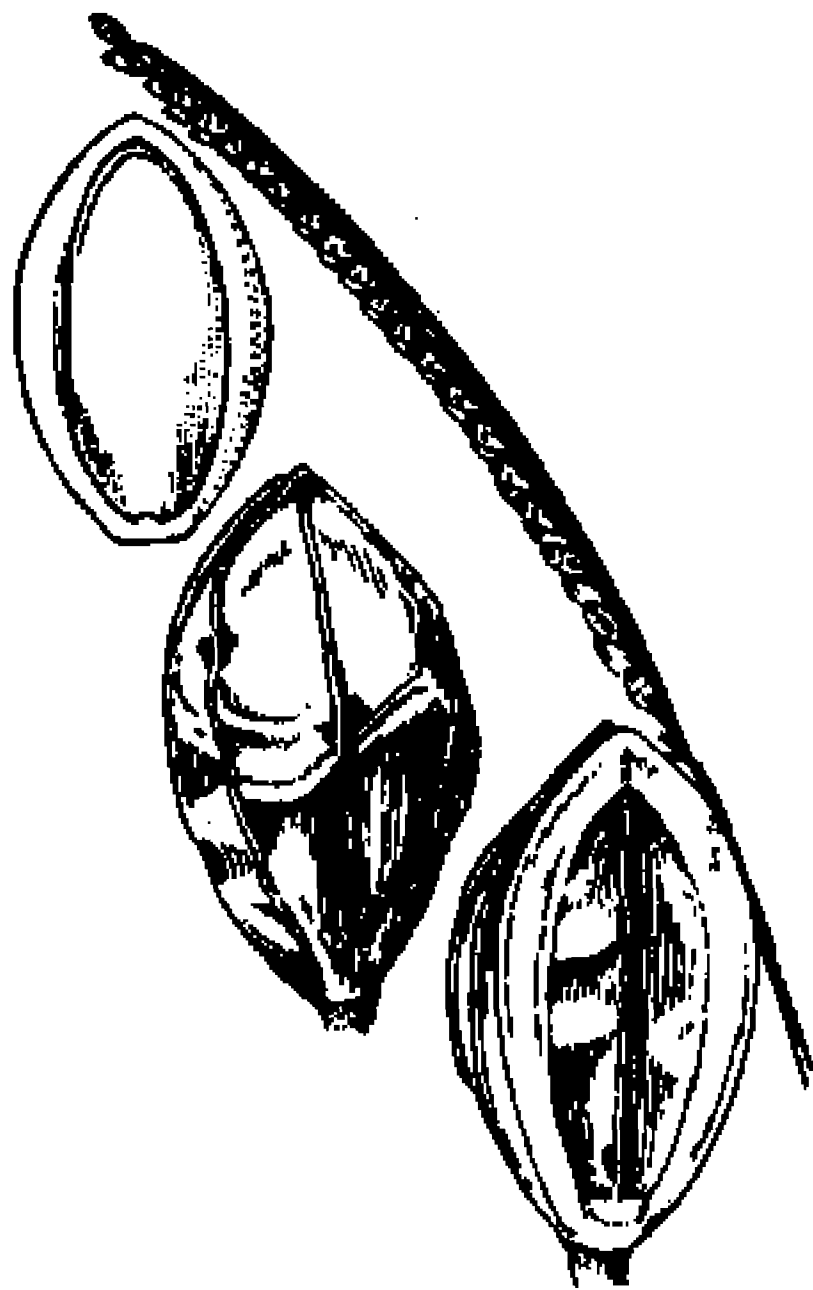


FIGURE 87.—*P. nanum*. From *Wright* 3842

DESCRIPTION

A slender perennial, cespitose from a knotted crown; culms erect or ascending, 15 to 40 cm., rarely more than 25 cm., tall, slender, compressed; nodes pubescent, occasionally glabrate; sheaths densely velvety papillose-pubescent; ligule about 1 mm. long; blades spreading, 3 to 13 cm. long, 3 to 4.5 mm. wide, flat or drying involute, the lower surface velvety like the sheaths, the upper densely to sparsely pilose; raceme solitary, arcuate or nearly straight, 1.5 to 4 cm. long; rachis slender, plano-convex, obscurely to conspicuously hairy at the base; spikelets solitary, appressed, those of a row not imbricate, 2.4 to 2.8 mm. long, 1.4 to 1.8 mm. wide, oval-elliptic, the glume and sterile lemma less firm in texture than in *P. lindenianum*,

the lemma less inflated and crumpled, the glume from slightly to conspicuously cross-wrinkled; fruit yellowish, about 2 mm. long, 1.2 mm. wide, minutely striately roughened.

This species is apparently rare.

DISTRIBUTION

Low sandy pinelands and brushy savannas, central and western Cuba and Isle of Pines.

CUBA: Santiago de los Baños, *Léon* 4570. Herradura, *Ekman* 10784, 14093, 14104, in *Amer. Gr. Nat. Herb.* 948; *Hitchcock* 462. Vuelta-abajo, *Wright* 3866. Hanábana, *Wright* 176. Isle of Pines, *Ekman* 12190. Without locality, *Wright* 3842.

87. *Paspalum insulare* Ekman, sp. nov.

DESCRIPTION

A slender tufted olivaceous perennial; culms solitary or few together with numerous erect leafy basal shoots, simple, erect or ascending, 40 to 55 cm. tall, compressed, glabrous; nodes densely appressed-pubescent; sheaths shorter than the internodes, densely papillose-pilose; ligule about 1 mm. long; blades flat, erect or ascending, 6 to 16 cm. long, 3 to 5 mm. wide (the uppermost rudimentary), papillose-pilose on both surfaces, the pale mid nerve prominent beneath;

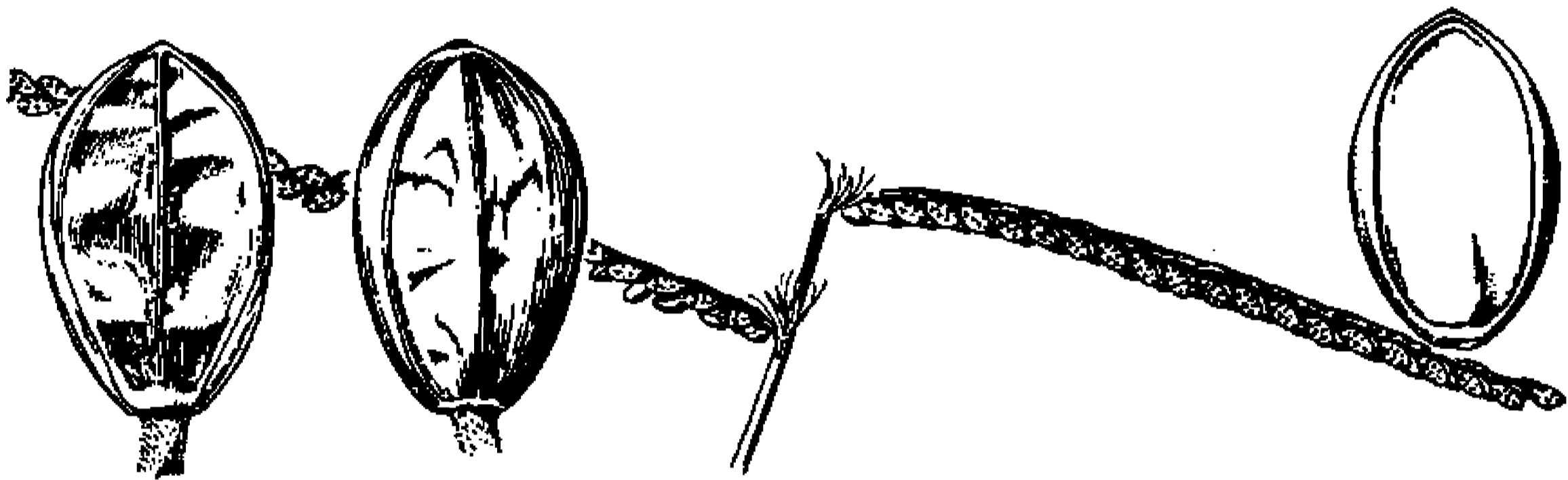


FIGURE 88.—*P. insulare*. From type specimen

racemes 1 or 2, approximate, arcuate to horizontally spreading, 3 to 6.5 cm. long; rachis nearly flat, about 1.5 mm. wide, flexuous with a dense tuft of white hairs at base; spikelets solitary, 2.5 to 2.6 mm. long, 1.5 to 1.6 mm. wide, obovate-elliptic, greenish stramineous; glume and sterile lemma equal, 5-nerved, both, especially the lemma, loose and cross wrinkled; glabrous; fruit pale stramineous, about 2.3 mm. long, very minutely striate-roughened.

Type in the U. S. National Herbarium, no. 1298149, collected in moist places between Santa Ana and Santa Barbara, Isle of Pines, October 29, 1920, by Dr. E. L. Ekman (no. 11957).

This species differs from the others of this group in the scarcely cylindrical usually paired racemes.

DISTRIBUTION

Sandy savannas, pinelands and moist places, Isle of Pines.

CUBA: Isle of Pines, Santa Barbara, *Ekman* 11957, 12220; *Taylor* 40.

Rupestria.—Densely tufted perennials with slender or filiform culms and narrow blades; ligule about 0.5 mm. long; racemes slender, solitary (sometimes 2 in *Paspalum sauetii*); spikelets minute. Confined to the West Indies.

- Blades filiform, subterete.....90. *P. capillifolium*.
- Blades not filiform, flat, folded or involute.
- Spikelets elliptic, glabrous.....88. *P. rupestre*.
- Spikelets oval, pubescent.....89. *P. sauetii*.

88. *Paspalum rupestre* Trin.

Paspalum rupestre Trin. *Linnaea* 10: 293. 1836. "Cuba, in rupibus aridis," the specimen collected by Pöppig. The type, in the Trinius Herbarium at Leningrad, is a depauperate plant, the blades folded or involute, the racemes 15 to 18 mm. long, the spikelets 1.2 mm. long.

Paspalum leoninum Chase in Hitchc. Bot. Gaz. 51: 300. 1911. "Type in U. S. National Herbarium, no. 618 754; collected August 30, 1909, on 'Obispo Hill, near Sancti Spiritus,' by Brother Léon (no. 950)." This specimen has flexuous culms 15 to 25 cm. long, racemes 20 to 35 mm. long, and spikelets 1.4 to 1.5 mm. long.

DESCRIPTION

A slender cespitose perennial, in favorable situations forming cushions; culms from suberect to radiate-reclining, simple or branching at the lower node, the branch similar to the main culm or a long-peduncled raceme only, filiform, compressed, often sinuous, 10 to 40 cm. long, glabrous; node 1 above the basal foliage, appressed-pubescent; leaves crowded at the base, the short overlapping

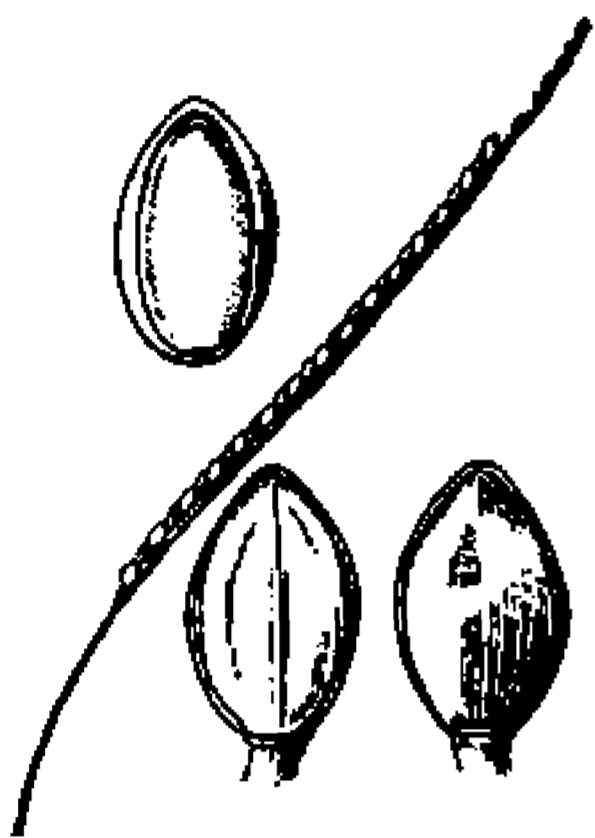


FIGURE 89.—*P. rupestre*.
From type specimen of
P. leoninum

sheaths compressed-keeled, pilose at least along the margin, and with a few stiff hairs on the minute auricles, the edges thin, the sheath of the midculm sparsely pilose on the margin, bladeless; blades folded at base and as wide as the sheaths, flat above, or in dry situations folded or subinvolute and more or less tortuous, 3 to 12 cm. long, 1.5 to 4 mm. wide, glabrous on both surfaces or obscurely puberulent on the upper, a few stiff hairs on the margins and occasionally on the upper surface; raceme solitary, straight or falcate, 1.2 to 4.5 cm. long, sometimes purplish; rachis slender, minutely puberulent and with a few white hairs at the base; spikelets solitary, appressed, 1 to 1.5 mm., mostly 1.2 to 1.3 mm., long, 0.8 to 0.9 mm. wide, elliptic, usually slightly unsymmetrical, glabrous, the pedicels flat, usually scabrous; glume and sterile lemma equal, covering the fruit, 2 or 3 nerved, the mid nerve of the glume commonly suppressed; fruit nearly the size and shape of the fruit, light brownish-stramineous.

Plants growing in rich humus form dense cushions with waxy-green foliage, which, however, dries dull green. In exposed dry stony places the plants form small tufts with fine tortuous olivaceous foliage.

Grisebach²⁷ referred Wright 3445, a specimen of *P. rupestre*, to *P. lindenianum* Rich., "ex descr." Wright²⁸ referred his no. 3445 to *Paspalum rupestre*, but gave Nees as author. The Wright specimens distributed under no. 3445 consist of both *P. rupestre* and *P. sauetii*.

In Hitchcock's no. 23424 and Chase 6315 a few of the culms bear two racemes.

DISTRIBUTION

Open rocky slopes, mostly serpentine, Cuba and Porto Rico.

CUBA: San Claudio, Ekman 12998. Guanabacoa, Hitchcock 23234; Léon 949, 2691; Léon & Arsène 11010. San Miguel de Casanova, Léon 12470. Campo Florido, Léon 3482. Amaro, Léon 9142. Ciénaga de Zapata, Roig & Cremata 2116. Sancti Spiritus, Léon 950. Guaro, Hitchcock 23417, 23419½, 23424. Baraguá, Hitchcock 23355. Sierra de Nipe, Ekman in Amer. Gr. Nat. Herb. 949. El Yunque, Shafer 7729. Jauco, Léon 12302. Baracoa, Wright 3445 in part.

HAITI: Gros Morne, Ekman H 4919.

PORTO RICO: Mayaguez, Amer. Gr. Nat. Herb. 567; Chase 6259, 6274, 6275, 6299, 6312, 6315, 6323, 6811, 6813; Holm 152. Maricao, Chase 6220, 6246.

²⁷ Cat. Pl. Cub. 230. 1866.

²⁸ Anal. Acad. Cienc. Habana 8: 202, 1871; Wright & Sauv. Fl. Cubana 194-1873.

89. *Paspalum sauetii* Chase, sp. nov.

DESCRIPTION

A caespitose perennial with tough matted roots; culms usually 15 to 40 cm. tall, simple or rarely branching, very slender but wiry, leaning or spreading, flattened, more or less twisted and tortuous, glabrous; nodes appressed-pubescent; leaves mostly crowded toward the base, the lower sheaths overlapping, the upper sheath remote, bladeless or nearly so; sheaths hirsute along the margin and at the summit, sometimes sparingly so throughout; blades rather thick, usually flat when fresh, folded or involute in drying, more or less tortuous, sometimes conspicuously so, 3 to 15 cm. long, 3 to 7 mm. wide, a few hairs above the ligule, otherwise glabrous, or sometimes sparsely pilose; racemes commonly solitary, sometimes a second, 1 to 1.5 cm. distant, 2 to 4 cm. long, erect or falcate; rachis 1 mm. wide, glabrous or minutely strigose, bearing a few long hairs at the base, spikelets solitary (the second spikelet of the pair undeveloped) or paired; pedicels about 0.8 mm. long, flattened, glabrous or nearly so; spikelets 1.3 to 1.6 mm. long, 1 to 1.1 mm. wide, oval, blunt; glume and sterile lemma covering the fruit, 3-nerved, appressed-pubescent or the lemma sometimes glabrous; fruit pale.

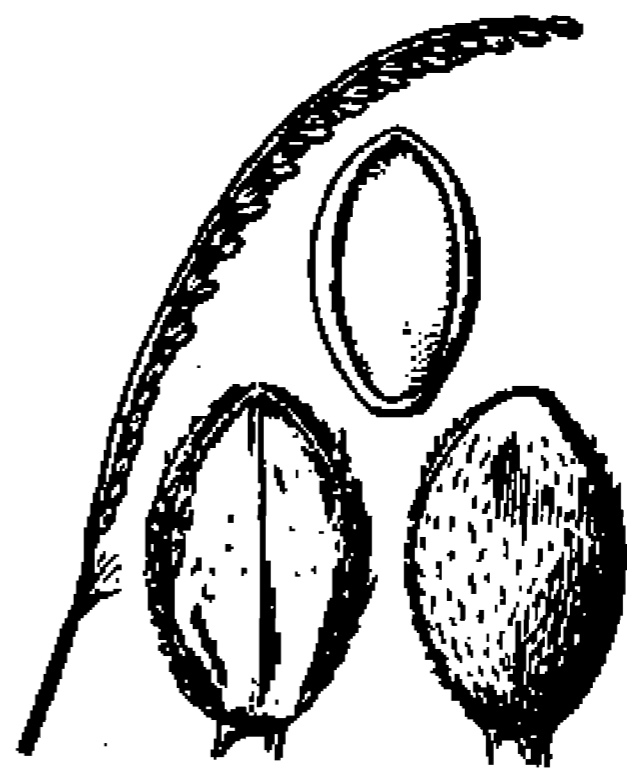


FIGURE 90.—*P. sauetii*.
From type specimen

Type in the U. S. National Herbarium, no. 1,060,707, collected on open hillside near Havana, Cuba, October 9, 1919, by Brother Léon (no. 8982).

This species has been confused with *Paspalum rupestre* Trin., from which it differs in its less delicate habit and longer foliage, and in the larger pubescent spikelets. It is named for Brother Léon, Dr. Joseph Sylvestre Sauget. When *P. leoninum* was described it was differentiated from this species, which was supposed to be *P. rupestre* Trin. In the Grasses of the West Indies²⁹ this was tentatively referred to *P. poiretii* Roem. & Schult., but that proves to be the same as *P. caespitosum*.

The culms usually have only one node above the basal foliage, but rather frequently the one below this is apparent above the tuft. In Hitchcock's no. 9482 the long delicate culms have 2 nodes and the foliage is soft and, especially the sheaths, minutely sparsely pilose. Ekman's no. 690 is a stout immature plant with blades as much as 9 mm. wide, paired racemes, and paired spikelets.

DISTRIBUTION

Rocky, mostly limestone soil in the Greater Antilles.

CUBA: Between Cape San Antonio and Morro de Piedras, Roig 3255. Habana, Ekman 697; Léon 286, 948, 1527, 3694, 4664, 7499, 8982. Cojimar, Baker & O'Donovan 4417; Ekman 16904, in Amer. Gr. Nat. Herb. 950, Hitchcock 459, 461; Léon & Hioram 5602. Tricornia, Hitchcock 458. Puentes Grandes, Léon 935b. Banao Hills, Léon 3980. Cupey, Ekman 6337. Guantánamo, Hioram 2633. Jauco, Léon 12450. Baracoa, Shafer 3951; Wright 3444 in part, 3445 in part. JAMAICA: Troy, Harris 12620a. Ipswich, Hitchcock 9599. New Forest, Hitchcock 9832. Bull Head Mountain, Hitchcock 9533. Between Ewarton and Moneague, Hitchcock 9442. Between Ewarton and Linstead, Hitchcock 9465. Claremont, Hitchcock 9482, 9516. Yardley Chase, Harris 9674. Constant Spring, Hitchcock 9275. Buff Bay, Hitchcock 9765.

²⁹ Contr. U. S. Nat. Herb. 18: 313. 1917.

HAITI: Ile de la Tortue, *Ekman* H 4228. Ennery, *Leonard* 8810, 10030. Port-au-Prince, *Ekman* H 2210; *Hitchcock* 19886, 19890. Mission, *Leonard* 3627. Fond Parisien, *Leonard* 4075. Etang Pénète, *Ekman* H 334. Morne à Cabrits, *Ekman* H 1018. Morne Rouge, *Ekman* H 690. Aux Cayes, *Ekman* H 61. DOMINICAN REPUBLIC: Haina, *Paris* 89, 107. Azua, *Rose, Fitch & Russell* 4079. PORTO RICO: Aguada, *Chase* 6598. Lares, *Chase* 6588. Between Aguadilla and San Sebastian, *Chase* 6597.

90. *Paspalum capillifolium* Nash

Paspalum capillifolium Nash, N. Amer. Fl. 17: 181. 1912. "Type collected in palm barren, Santa Clara, Cuba, March 29-31, 1910, Britton & Wilson 6116 (herb. N. Y. Bot. Gard.)." The type consists of two tufts with immature flowering culms 5 to 12 cm. long.

DESCRIPTION

A slender cespitose perennial, with a few delicate culms rising from a mass of filiform curled foliage; culms reclining, 10 to 35 cm. long, compressed, sometimes loosely twisted and sinuous, simple, with a single node above the basal foliage, the culm and node glabrous; leaves crowded at the base, the short overlapping sheaths brown with thin margins, glabrous; blades folded and curled, 3 to 15 cm. long, about 0.3 mm. wide as folded, sometimes with a few hairs on the upper surface at base, the blade of the midculm reduced or wanting; raceme solitary, straight, 2 to 4 cm. long, very slender, mostly cylindrical; rachis slender, scaberulous on the margin, obscurely pubescent at the very base; spikelets solitary, appressed, 1.7 mm. long, about 0.7 mm. wide, elliptic, the narrow blunt apex folded into a minute point at maturity, mostly slightly unsymmetrical, glabrous; glume and sterile lemma subequal, covering the fruit, 3-nerved, thin in texture and often obscurely wrinkled; fruit pale.

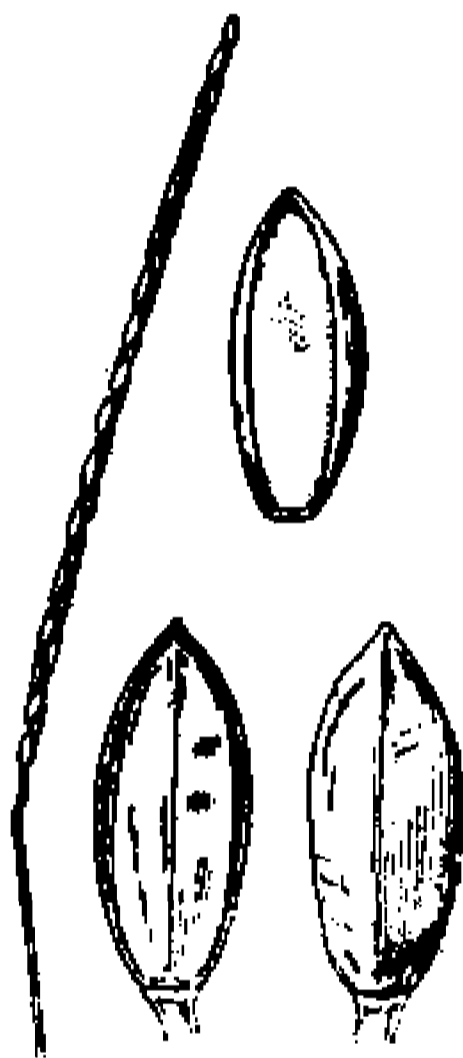


FIGURE 91.—*P. capillifolium*. From *Léon & Loustalot* 9376

DISTRIBUTION

Palm barrens and savannas, Cuba.

CUBA: Santa Clara, *Britton & Wilson* 6116. Sabana de Motembo, *Léon & Roca* 8223. Baños de Santa Rosalia, *Léon & Loustalot* 9376. Santayana, *Ekman* 19046. Holguin, *Ekman* 7565.

Parviflora.—Small slender annuals (one perennial) branching at the base, the culms of different lengths in the tuft; racemes 1 to 4, slender; spikelets minute. (*Paspalum microstachyum*, a weak annual with several to many racemes and wide blades, is placed in this group for convenience.)

- Plants perennial..... 95. *P. standleyi*.
 Plants annual.
 Blades 6 to 20 mm. wide; racemes 6 to 35..... 96. *P. microstachyum*.
 Blades not more than 2.5 mm. wide; racemes not more than 4.
 Spikelets solitary.
 Spikelets orbicular, usually beaded with globular hairs..... 91. *P. multicaule*.
 Spikelets elliptic, not beaded..... 94. *P. parviflorum*.
 Spikelets in pairs.
 Glume and sterile lemma covering the fruit..... 93. *P. clavuliferum*.
 Glume and sterile lemma narrower than the fruit, exposing it on the sides.
 92. *P. pictum*.

91. *Paspalum multicaule* Poir.

Paspalum multicaule Poir. in Lam. Encycl. Suppl. 4: 309. 1816. "Cette plante croît au Brésil. (V. s. in herb. Desfont. & Desv.)." The type, bearing the name in Poiret's script, was examined in the herbarium of the Botanic Garden, Florence. The spikelets are nearly glabrous, only a few globular hairs being borne near the margins of the glume and sterile lemma.

Paspalum papillosum Spreng. Nov. Prov. Hal. 47. 1819. "Habitat in Brasilia. Otto." The type, bearing the name in Sprengel's script was examined in the Berlin Herbarium. The spikelets are densely to sparsely beaded with globular hairs.

Paspalum horticola maritimum Salzm.; Doell in Mart. Fl. Bras. 2^o: 54. 1877. "Locis cultis mari adjacentibus vel propinquis (n. 677)" Salzmann, Bahia. A specimen so named by Salzmann, part of the type collection, is in the United States National Herbarium. The spikelets are plentifully beaded with globular hairs.

DESCRIPTION

A slender annual in dense tufts, often forming mats; culms branching at the lower nodes, spreading or ascending, 20 to 45 cm., rarely to 60 cm., tall, glabrous; nodes glabrous or nearly so; sheaths strongly keeled, densely papillose-pilose with long hairs on the margin, at least toward the summit, commonly on the keel also, and often throughout, the lower broad and overlapping, sometimes nearly glabrous; ligule very minute, with a ring of hairs 0.5 to 1 mm. back of it; blades flat, drying revolute and often tortuous, ascending, 2 to 15 cm. long, 1.5 to 2.5 mm. wide (the uppermost rudimentary), conspicuously papillose-pilose and with a dense short pubescence as well on both surfaces, the under surface, under a lens, minutely papillose-roughened, the mid nerve and thickened margins prominent beneath; racemes 2, rarely 1 or 3, paired, divergent, 1.5 to 6 cm., commonly 2 to 4 cm., long, yellowish, the slender peduncle short-exserted or included, with a pair of membranaceous auricles 0.5 to 1 mm. long on either side between the racemes; rachis about 0.7 mm. wide, minutely winged, scaberulous, pubescent at base; spikelets solitary, 1.2 to 1.4, rarely to 1.5 mm. long, 1 to 1.2 mm. wide, subhemispheric; glume and sterile lemma 3-nerved, or the mid nerve suppressed in the lemma, equal or the glume slightly narrower than the fruit, rarely reduced or wanting, both from sparsely to densely beaded with subglobular hairs, often beaded around the margin only, rarely glabrous, the lemma sometimes pigmented down the mid nerve and near the margin; fruit nearly the size of the spikelet, stramineous, very minutely papillose-striate.

Most of the plants from South America and the West Indies have the characteristically beaded spikelets. Those of continental North America are mostly beaded around the margin only. A few are glabrous and a few plentifully beaded. In the following, all from the Pacific slope of Panama, the second glume is wanting in all or in some of the spikelets: Killip 4134, Pittier 4515, 4622, 4866, 4871. In the first (two specimens with 15 pairs of racemes) the spikelets are uniformly without the glume and the sterile lemma is glabrous or with a few globular hairs only. In all the others the spikelets of some of the racemes are without glumes and some with glumes. In most cases spikelets with well developed glumes, small narrow glumes, and glumes wanting, are found in a single raceme. If it were not for these specimens Killip 4134 would seem to be worthy of subspecific rank.

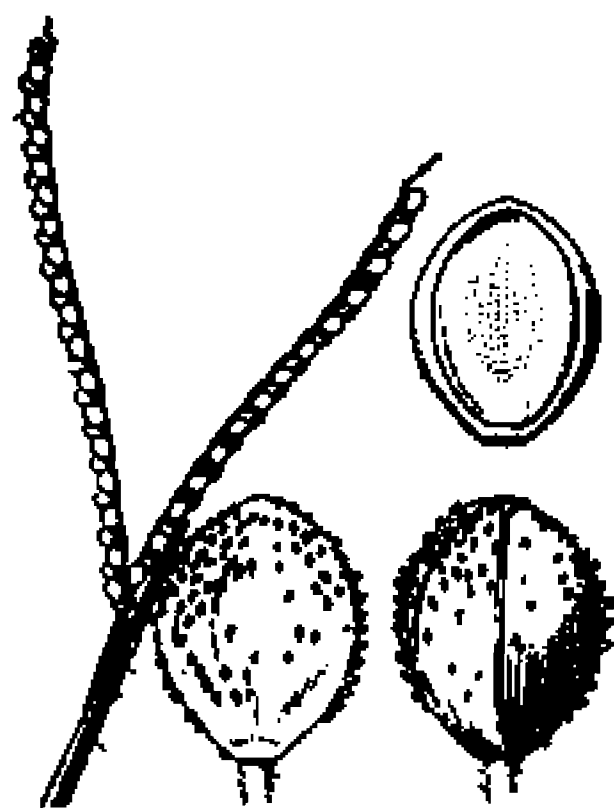


FIGURE 92.—*P. multicaule*.
From type collection of
P. papillosum

DISTRIBUTION

Moist eroded places in savannas and open, usually disturbed or washed ground, mostly at low altitudes; southern Mexico to Brazil and Bolivia; also Trinidad.

VERA CRUZ: Minatitlán, *Smith* 564.

HONDURAS: Siguatepeque, *Standley* 55851.

COSTA RICA: Gresca, *Jiménez* 1123. Buenos Aires, *Tonduz* 4869b. Boruca, *Tonduz* 4470, 4474.

PANAMA: San Felix, *Pittier* 5149. Aguadulce, *Pittier* 4866, 4871. Canal Zone, *Hitchcock* 9188, 9197½. Juan Díaz, *Killip* 4134. Chepo, *Pittier* 4515, 4622.

CUBA: Laguna Santa Barbara, *Ekman* 18115. Mendoza, *Shafer* 10862. Herradura, *Baker & Abarca* 4185; *Hitchcock* 472. Chiragota, *Wright* 3844 in part. Isle of Pines, *Britton & Wilson* 14805.

DOMINICAN REPUBLIC: Cotuy, *Abbott* 850h.

TRINIDAD: Piarco Savanna, *Broadway* 2126; *Hitchcock* 10340; *Warming* 839.

O'Meara Savanna, *Britton & Hazen* 1572. Pitch Lake, *Amer. Gr. Nat. Herb.* 574.

COLOMBIA: Santa Marta, *Smith* 2158. Mesa de los Santos, *Killip & Smith* 15236.

VENEZUELA: Mene Grande, *Pittier* 11001.

BRITISH GUIANA: Penal Settlement, *Hitchcock* 17081, 17104, 17105, 17137. Bartico, *Hitchcock* 17187. County Berbice, *Abraham* 98.

FRENCH GUIANA: Cayenne, *Broadway* 170. Without locality, *Leprieur* 83.

BRAZIL: Santarem, *Spruce* in 1849-50. Marajó Island, *Goeldi* 183. Pará, *Goeldi* 13. Castanhal, *Goeldi* 304. Maceió, *Chase* 7854. Parafuso, *Chase* 7986. Bahia, *Chase* 7884; *Salzmann*. Serra do Cipó, *Chase* 9190. Without locality, *Burchell* 1565 (*P. conjugatum* and *P. vaginatum* mixed with *P. multicaule*); *Riedel* 29.

PERU: Colonia Perené, *Hitchcock* 22087.

BOLIVIA: Tipusani, *Bang* 1426a. San Carlos, *Buchtien* 16 in 1927.

92. *Paspalum pictum* Ekman

Paspalum pictum Ekman, *Ark. för Bot.* 10¹⁷: 11. pl. 1, f. 6. 1911. "Prov. Matto Grosso, Cuiabá, loco humido, argilloso, aprico ad rivulum, * * * legit G. O. Malme, 2.5.03, sub numero 3222 Exp. II Regn." The type specimen, in the Stockholm Herbarium, bearing the name and "orig. spec." in Ekman's script, has spikelets more strongly pigmented than in any of the other specimens examined.

Paspalum maculatum Nash, *N. Amer. Fl.* 17: 186. 1912. "Type collected on the savannas of Boruca, Costa Rica, November 1891, *Pittier* 4474 (herb. John Donnell Smith, in herb. U. S. Dep. Agr.)." In this specimen, now in the United States National Herbarium, the glume and sterile lemma are pigmented at the summit only.

DESCRIPTION

A slender tufted annual; culms branching from the lower nodes, erect, the base often curved, 25 to 50 cm. tall, glabrous; nodes glabrous; sheaths keeled, glabrous, the lower broad and overlapping; ligule 1.5 to 2 mm. long; blades folded, the junction with the sheath obscure, erect, or tortuous and spreading in age, 4 to 18 cm. long, 1.5 to 2 mm. wide opened out (the upper rudimentary), sparsely papillose-pilose on the upper surface toward the base; racemes 1 to 4, commonly 2, about 0.5 to 1 cm. distant, arcuate-spreading, strongly curved in age, 1.2 to 5 cm. long, yellowish, the slender peduncle short-exserted or, especially on the branches, included in the sheath; rachis very slender with a few long hairs at the base, otherwise glabrous; spikelets in pairs on slender smooth pedicels, crowded, 1 to 1.1 mm. long, about 0.7 mm. wide, obovate-pyriform, turgid, glabrous; glume

and sterile lemma very thin in texture, 3 to 5-nerved (or the midnerve suppressed in either), both narrower and the glume a little shorter than the fruit, usually pigmented at the tip and occasionally elsewhere with dark purple; fruit pale, papillose-roughened.

DISTRIBUTION

Moist places in savannas, Costa Rica to Brazil and Bolivia.

COSTA RICA: Boruca, *Pittier* 4474.

COLOMBIA: Llano de San Martín, *Karsten*. Villavicencio, *Pennell* 1437.

BRAZIL: Cuyabá, *Malme* 3222. Est. Rio de Janeiro, *Glaziou* 22597 in part.

BOLIVIA: Buenavista, *Steinbach* (*Herb. Osten*) 14954.



FIGURE 93.—*P. pictum*. From duplicate type

93. *Paspalum clavuliferum* Wright

Paspalum clavuliferum Wright, Anal. Acad. Cienc. Habana 8: 203, 1871; Fl. Cub. 195. 1873. "[3444 p. p.]" The type, collected by

"C. Wright in Cuba. Orientali, 1859, 1860," is in the Gray Herbarium. Three peduncles bear a solitary raceme, the fourth a pair. The spikelets are 1.2 to 1.4 mm. long, sparsely pubescent with capitellate hairs.

Paspalum falcula Doell in Mart. Fl. Bras. 2²: 61. 1877. "Habitat locis cultis prope Bahia (Salzmann n. 1830), nec non a cl. Lhotsky (n. 68) in Brazilia lectum (herb. Reg. Berolin.)." A specimen named *Paspalum horticola* by Salzmann (see below), collected "in locis cultis prope Bahia," is in the United States National Herbarium. Several duplicates of this collection have been examined, but none bear the number 1830. In Doell's herbarium in Freiburg is a specimen of "Salzmann 1834" bearing the name in his script. The spikelets of these Salzmann specimens are 1.1 to 1.2 mm. long, pubescent with capitellate hairs.

Paspalum horticola Salzm.; Doell in Mart. Fl. Bras. 2²: 60, 1877 as synonym of *P. falcula*, Salzmann 675 being cited. Several Salzmann specimens bearing this name have been examined but none bear this number.

Paspalum pittieri Hack.; Beal, Grasses N. Amer. 2: 88. 1896. "Mexico, Pringle 2359." The type, collected in "Wet places, hills near Guadalajara, Jalisco, 19, October, 1889," is in the herbarium of the Michigan Agricultural College. Solitary and paired racemes are borne on the same plant. The spikelets are 1.4 mm. to 1.5 mm. long, sparsely pubescent with capitellate hairs. This name was earlier listed without description by Tonduz,³⁰ and was later published as new by Hackel³¹ himself, who cited "Costa Rica: Llanos de Tunicares (650 m). *Pittier* nr. 507." This specimen, in the Hackel Herbarium, bears the name in Hackel's script. The spikelets are glabrous, 1.2 to 1.3 mm. long.

DESCRIPTION

A very slender tufted annual; culms branching at the lower and sometimes at the middle nodes, erect to spreading, 5 to 45 cm. tall, glabrous; nodes glabrous; sheaths keeled, sparsely papillose-pilose to glabrous except near the margin toward the summit, the lower mostly overlapping; ligule 0.5 to 1 mm.

³⁰ Bull. Herb. Boiss. 3: 461. 1895.

³¹ Oesterr. Bot. Zeit. 51: 234. 1901.

long; blades flat or slightly revolute, ascending, 3 to 16 cm. long, 1.5 to 3 mm. wide (the uppermost rudimentary), sparsely to rather densely papillose-pilose on both surfaces and commonly short-pubescent as well as on the upper, occasionally on both surfaces, the lower under a lens minutely papillose-roughened, the mid nerve prominent beneath; racemes solitary or paired, rarely with a third

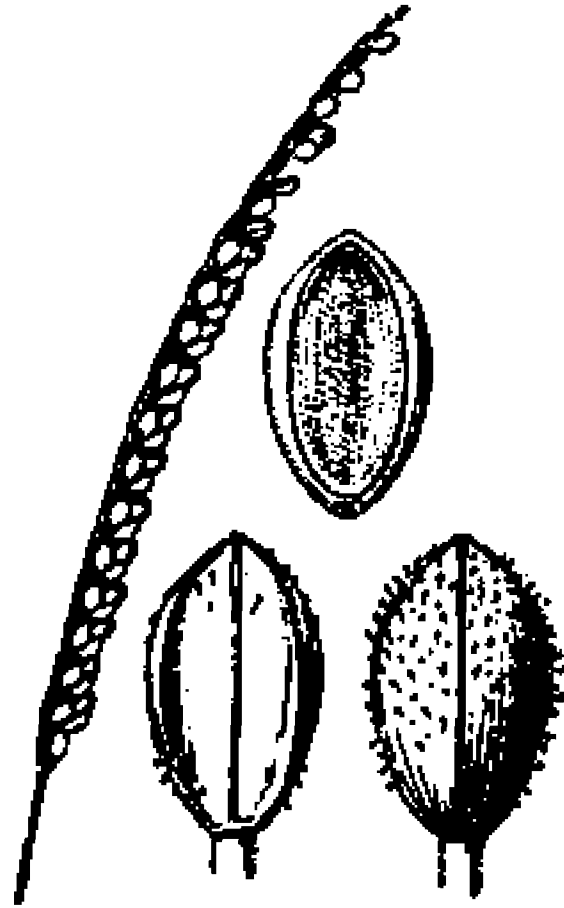


FIGURE 94.—*P. clavuliferum*. From duplicate type

below, arcuate, 1 to 5.5 cm. long, the filiform peduncle finally long-exserted; rachis about 0.5 mm. wide, minutely scaberulous, commonly short-pubescent at base; spikelets paired, the secondary one sometimes rudimentary, loosely crowded, 1.2 to 1.4 mm. long, rarely only 1.1 or as much as 1.5 mm. long, about 0.8 mm. wide, elliptic-obovate; glume and sterile lemma 3-nerved, or the mid nerve suppressed in the lemma, the glume equaling the lemma or slightly shorter, from very sparsely to rather densely pubescent with capitellate hairs, the lemma glabrous or with a few hairs, rarely both glabrous; fruit nearly the size of the spikelet, stramineous, minutely papillose-roughened.

This weedy little annual varies in the size of the spikelets and in the amount of pubescence. The Salzmann collections, upon which *P. falcula* is based, and Pringle 2359, the type of *P. pittieri*, represent the extremes. Other collections from Brazil and from Mexico have spikelets from 1.2 to 1.4 mm. long, as in Wright 3444, the type of *P. clavuliferum*.

DISTRIBUTION

Moist spots in sandy savannas and barrens, eroded places in open or brushy slopes, waste and cultivated ground, mostly at low altitudes; southern Mexico, Cuba, and Porto Rico to Brazil.

JALISCO: Guadalajara, Pringle 2359, 11762.

COLIMA: Alzada, Hitchcock 7065.

COSTA RICA: Llanos de Tunicares, Pittier 507.

PANAMA: Chepo, Pittier 4525.

CUBA: La Coloma, Ekman in Amer. Gr. Nat. Herb. 954. Cajalbana, Léon & Charles 4858. Jagüey Chico, Ekman 16982. Gavilanes, Léon & Clement 6655. Placetas del Sur, Léon 6417, 6418. Zaza de Tunas, Léon 942. Baraguá, Hitchcock 23379½. Guaro, Hitchcock 23430. Eastern Cuba, Wright 3444 in part.

PORTO RICO: Campo Alegre, Stevenson 2454.

COLOMBIA: Santa Marta, Smith 175.

BRITISH GUIANA: Rupununi Savanna, Melville 109.

BRAZIL: Cachoeira, Chase 8094, 8107½. Parafuso, Chase 7979. Bahia, Salzmann. Serra do Cipó, Chase 9111. Lagoa Santa, Chase 8987. Bello Horizonte, Chase 8908. Pernambuco, Pickel 1584, 1605.

94. *Paspalum parviflorum* Rohdé

Paspalum parviflorum Rohdé; Flügge, Monogr. Pasp. 98. 1810. "Insula Portorico. Exemplar pulcherrimum liberalitati Amicissimi Rohdédi debeo." Flügge's types have not been located. A specimen in the British Museum "ex herb. Nolte" collected in Porto Rico by Rohdé in 1809, and one in the Willdenow Herbarium from Porto Rico may be parts of the type collection. The first is 15 cm. tall, the second 12 cm.

Paspalum vestitum Steud. Syn. Pl. Glum. 1: 17, 1854, as synonym of *P. parviflorum*. "Hrbo. Lenorm. * * * Calcutta." In the Lenormand Herbarium

at Caen is a specimen labeled "Calcutta Wallich E. T. Mr. Babington 1847," which bears the name in Steudel's script. This agrees with the description and is undoubtedly the type, but the label with the locality must have been misplaced. The species is not known from the Eastern Hemisphere. In the Drake Herbarium in Paris is a specimen named *Paspalum vestitum*, but not by Steudel, labeled "Guyane, Leprieur." The type is probably part of the same collection.

Paspalum parviflorum var. *humilis* Nees; Doell in Mart. Fl. Bras. 2²: 45. 1877. No collection is cited here nor by Nees³² in differentiating var. β without naming it. In the Berlin Herbarium is a specimen of Sello's no. 275 bearing the name in Nees' script. A second slip reads "486 Campos Vittoria." The culms are 5.5 to 8 cm. tall.

DESCRIPTION

A slender densely tufted conspicuously pilose annual; culms branching from the lower and middle nodes, ascending or spreading, 4 to 17 cm. tall, glabrous, nodes glabrous; sheaths mostly overlapping, keeled, sparsely to densely papillose-pilose; ligule about 0.2 mm. long; blades mostly flat, ascending, or in age folded and tortuous, 1.5 to 6.5 cm. long, 1 to 2 mm. wide (the uppermost rudimentary), conspicuously papillose-pilose on both surfaces with fine hairs as much as 4 or 5 mm. long, and usually with a short pubescence on the upper surface as well, the mid nerve prominent beneath; racemes 2 to 4, rarely 1, 2 to 10 mm. distant, spreading or reflexed, 6 to 26 mm. long, the filiform peduncle short-exserted or included in the upper sheath; rachis about 0.4 mm. wide, strongly zigzag, triangular, scabrous on the angles and usually with a few long hairs at base; spikelets solitary on flat ascending-ciliate pedicels, not imbricate, 0.8 mm. long, 0.4 to 0.5 mm. wide, oblong-elliptic; glume and sterile lemma hyaline in the middle tearing apart early and toward maturity reduced to a raised rim around the spikelet, the stramineous smooth shining fruit exposed in the middle, the rim under a lens densely covered with very minute capitellate hairs; fruit about the size of the spikelet.

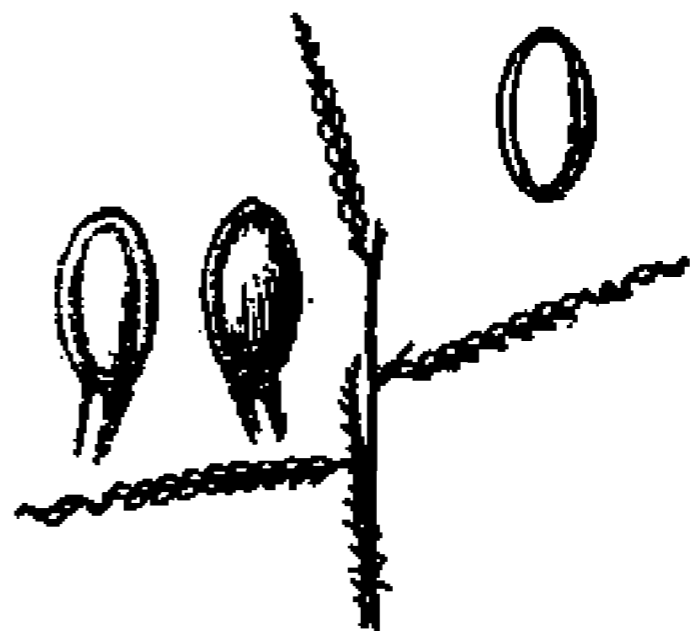


FIGURE 95.—*P. parviflorum*.
From Chase 8001

DISTRIBUTION

Sandy savannas and sand barrens, Panama and Porto Rico to Brazil.

PANAMA: Orange River, Killip 4260.

PORTO RICO: Without locality, Rohde in 1809 (British Museum).

FRENCH GUIANA: Cayenne, Jelski in 1867. Without locality, Leprieur 85.

BRAZIL: Marajó Island, Goeldi 95. Parafuso, Chase 8001. Bahia, Sello 486.

Between Barão de Melgaco and Pimenta Buena, Kuhlmann 1682. Salto Bello, Kuhlmann 1682a. Without locality, Capanema (Jard. Bot. Rio Jan.) 5416.

95. *Paspalum standleyi* Chase

Paspalum standleyi Chase, Journ. Washington Acad. Sci. 17: 146. 1927. "Type in the U. S. National Herbarium, no. 1,269,445, collected in marshy thicket, Juan Díaz, Province of Panama, January 11, 1924, by Paul C. Standley, no. 30543."

³² Agrost. Bras. 50. 1829.

DESCRIPTION

A slender tufted perennial, forming leafy mats, the culms spreading, some of them rooting at the lower nodes or creeping; culms 20 to 27 cm. long,

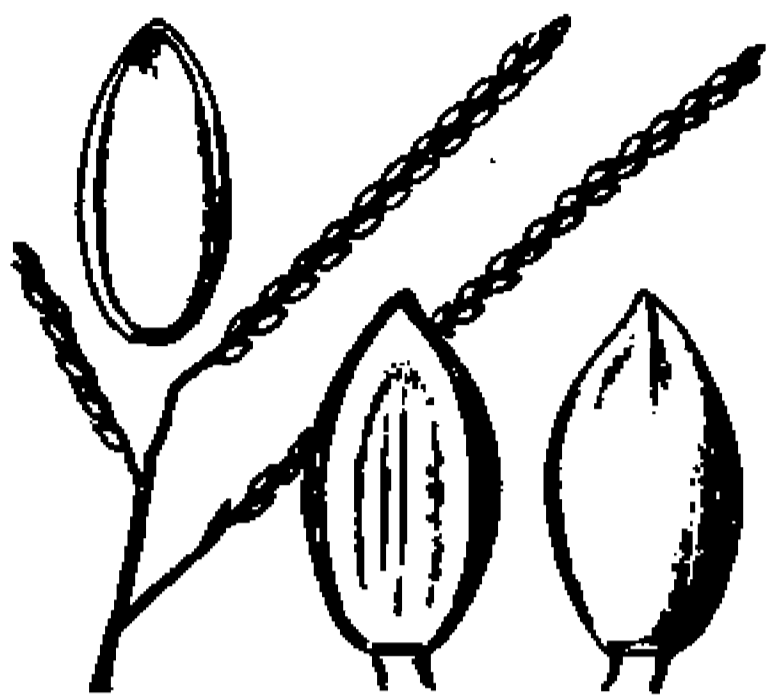


FIGURE 96.—*P. standleyi*. From type specimen

slender, simple or branching at the base, glabrous or sparsely pilose below the nodes; nodes bearded with ascending hairs, the upper sparsely so; leaves aggregate at base, the sheaths keeled, the lower rather broad, papillose-pilose, especially along the mid nerve and margin on the collar, the upper glabrous except on the margin and collar; ligule minute; blades flat, spreading, 3 to 6 cm. long, 3 to 6 mm. wide (upper blades mostly rudimentary), rounded at base, sparsely papillose-pilose on the lower surface, papillose or with a few hairs to glabrous on the upper; racemes 3 or 4, spreading, 2.2

to 4 cm. long, on a slender glabrous common axis 1 to 1.5 cm. long, the axils glabrous or nearly so; rachis slender, dark purplish, glabrous; spikelets solitary on short flat pedicels scarcely imbricate, narrowly ovate, somewhat unsymmetrical, subacute, depressed plano-convex, 1.6 mm. long, 0.9 mm. wide, glabrous, pale or purple-tinged; glume and sterile lemma equal, barely exceeding the fruit, the mid nerve suppressed, the marginal nerves strong, the sterile lemma obscurely longitudinally wrinkled in the middle; fruit 1.5 mm. long, 0.7 mm. wide, pale.

This species is allied to *Paspalum hyalinum* Nees of Brazil, from which it differs in its spreading habit, softer foliage, the blades much shorter and broader and in the slightly larger spikelets, the thin glume and sterile lemma not hyaline and tearing in the middle as in *P. hyalinum*.

Known only from the type collection.

96. *Paspalum microstachyum* Presl

Paspalum microstachyum Presl, Rel. Haenk. 1: 215. 1830. Habitat unknown. The type, collected by Haenke, was examined in the National Museum at Prague by A. S. Hitchcock. It consists of two fragments of flowering culms. A slip on which is written "Philippines" is pinned to the sheet, but this is obviously by mistake. The pubescence on the spikelets is rather appressed.

Paspalus effusus Nees, Journ. Bot. Kew Misc. 2: 104. 1850. Not *P. effusum* Rasp. 1825. "Gardner hrbr. nr. 4033. Brasilia." The type, bearing the name in Nees' script, is in the herbarium at Cambridge, England. This collection in the Delessert Herbarium is marked "Goyaz." In these specimens the pubescence on the spikelets is rather long and loose.

Paspalum cognatissimum Steud. Syn. Pl. Glum. 1: 18. 1854. "Jameson Hrbr. nr. 552. Guayaquil," Ecuador. The type, bearing the name in Steudel's script, is in the Paris Herbarium. A duplicate in the United States National Herbarium bears a slip in Jameson's script "552. From the level country near Guayaquil." In these the pubescence on the spikelets is appressed, as in Presl's type.

DESCRIPTION

A slender branching annual; culms ascending to erect from a geniculate base, sometimes rooting at the lower nodes, 20 to 135 cm. long, branching at the lower and middle nodes, often purplish, compressed, glabrous; nodes blackish, glabrous; sheaths mostly much shorter than the internodes, keeled, rather loose, glabrous to papillose-pilose; ligule about 0.3 mm. long, with a row of hairs just back of it;

blades flat, rather thin, spreading, 3 to 30 cm. long, 6 to 20 mm. wide, the lower tapering to a narrow base, the middle and upper from rounded to deeply cordate-clasping (the upper not reduced), papillose-ciliate toward the base, from glabrous to papillose-pilose on both surfaces, usually glabrous or only sparsely pilose beneath, the margins very scabrous; panicles terminal and axillary, subpyramidal, lax, nodding, of 6 to 35 slender, spreading or arcuate racemes, solitary or fascicled along a slender, flat axis 5 to 22 cm. long, the lower racemes distant, 3 to 8 cm. long, the upper gradually approximate and shorter; rachis membranaceous, flat, 0.5 to 0.6 mm. wide, bearing a few long hairs at the base and usually with a few scattered along the margin; spikelets in pairs on long slender pedicels, not at all crowded, 1.5 to 1.6 mm. long, about 0.9 mm. wide, elliptic, subacute, rather turgidly plano-convex, olivaceous; glume and sterile lemma equal, thin, 3-nerved, the lateral nerves sometimes faint, pubescent with soft appressed to spreading hairs fruit about 1.5 mm. long, horn-color, smooth and shining.

DISTRIBUTION

Roadsides, waste places, and in cultivated ground, at low altitudes, Guatemala to Ecuador and Brazil.

GUATEMALA: Alta Vera Paz, *Goll* 78.

HONDURAS: Tela, *Standley* 54784. Lancetilla Valley, *Standley* 52837, 53161.

EL SALVADOR: Sonsonate, *Hitchcock* 8980; *Standley* 22287. San Miguel, *Standley* 21086.

NICARAGUA: Masaya, *Hitchcock* 8650. Jinotepe, *Hitchcock* 8714. San Juan del Sur, *Hitchcock* 8602. Ile de Omotepe, *Levy* 1138.

COSTA RICA: Atenas, *Hitchcock* 8523. Puntarenas, *Hitchcock* 8554. Hacienda de Zent, *Tonduz* 362. Matina, *Pittier* 9755.

PANAMA: David, *Hitchcock* 8348. Chorrera, *Hitchcock* 8151. Las Sabanas, *Heriberto* 192. Las Cruces Trail, *Standley* 29142. Canal Zone, *Hitchcock* 8011, 8025; *Killip* 4006; *Pittier* 4436; *Popenoe* 54; *Standley* 25292, 26105. Matías Hernández, *Pittier* 6789. Chepo, *Pittier* 4462. Taboga Island, *Hitchcock* 8069; *Standley* 27083.

COLOMBIA: Santa Marta, *Smith* 214, 2530.

VENEZUELA: Without locality, *Fendler* 1738.

BRAZIL: Goyaz, *Gardner* 4032.

ECUADOR: Guayaquil, *Jameson* 552. Milagro, *Hitchcock* 20177. Between Santa Rosa and La Chorita, *Hitchcock* 21138.

Brevia.—Low tufted perennials with filiform culms and slender stolons; racemes 1 or 2, not more than 15 mm. long. Confined to the West Indies.

Spikelets not wrinkled nor beaked.....97. *P. breve*
Spikelets wrinkled and beaked.....98. *P. edmondi*

97. *Paspalum breve* Chase

Paspalum breve Chase in Urban, *Symb. Antill.* 7: 166. 1912. "Cuba prov. Habana prope Marianao, 16. Nov. 1910: Fr. Léon n. 1996 (specimen authenticum U. S. Nat. Herb. n. 690378)." The type consists of 2 stoloniferous mats.



FIGURE 97.—*P. microstachyum*. From *Jameson* 552

DESCRIPTION

A low glabrous stoloniferous perennial, in favorable situations forming dense leafy mats; culms mostly numerous in the tuft, subfiliform, flat, 5 to 10 cm. tall, rarely taller; stolons slender with short joints and short pilose scales, bearing leafy shoots at every joint; nodes glabrous; sheaths crowded and overlapping at base, keeled, hyaline-margined, glabrous or with a few scattered hairs, the upper sheath bladeless; ligule scarcely 0.5 mm. long; blades mostly 3 to 6 cm. long, rarely longer, 2 to 4 mm. wide, flat or folded, or subinvolute in drying, sometimes sparsely ciliate toward the base; racemes solitary (rarely a second one below), 8 to 15 mm., mostly about 10 mm., long, the rachis about 0.7 mm. wide, sometimes with a few hairs at the base; spikelets solitary, somewhat imbricate, 1.4 mm. long, 1 mm. wide, broadly oval, rather turgid, the smooth, shining glume and sterile lemma 3-nerved, equal; fruit nearly the size and shape of the spikelet, brownish.

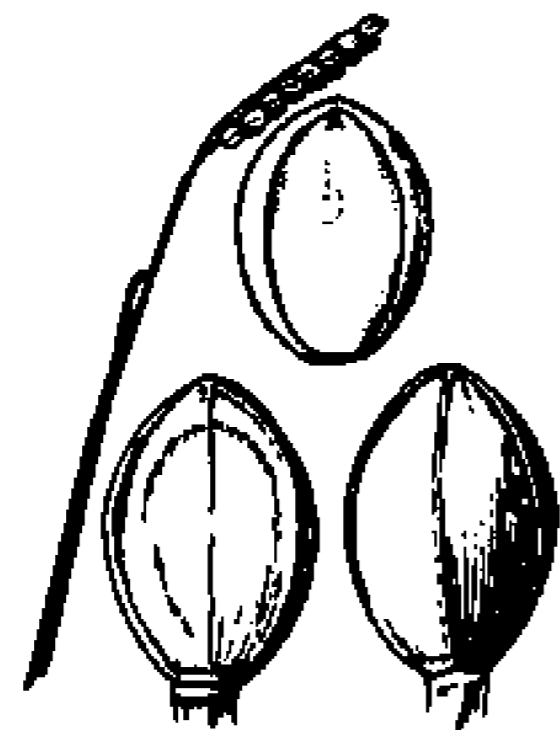


FIGURE 98.—*P. breve*.
From type specimen

Rarely the glume is obscurely ciliate near the base. In Ekman's no. 449 the glumes are ciliate around the margin, one culm is 17 cm. long, the blades are as much as 12 cm. long and pilose in the lower half.

DISTRIBUTION

Stony, mostly calcareous slopes; Cuba and Haiti.

CUBA: Marianao, Léon 1996, 3477. Cojimar, Léon 1997. Bacuranao, Wilson & Léon 2872, 11599. Sierra de Anafe, Ekman 16906. Sancti Spiritus, Léon 4100. Manatí, Léon 5681½. Bayate, Ekman 9843. Loma del Gato, Léon, Clement & Roca 9811.

HAITI: La Source, Ekman H 3379. Grande Riviere, Ekman H 449. Pestel, Eyerdam 357.

98. *Paspalum edmondi* Léon

Paspalum edmondi Léon in Britton, Mem. Torrey Club 16:58. 1920. "Palm barren, sabana de Motembo, Santa Clara (Léon & Edmond 8607)." Specimens from the same locality were transplanted in Vedado, Havana (Léon & Edmond's no. 8682). Brother Léon explained in a letter that the description was drawn from both numbers. The plants found at Motembo (January 4, 1919) were without inflorescence but bloomed in May. A small plant of no. 8607 and well developed plants of no. 8682 were kindly sent to the United States National Herbarium by Brother Léon. The type specimens are preserved in the Colegio De La Salle Herbarium, Vedado, Havana.

DESCRIPTION

A low caespitose profusely stoloniferous perennial with short slender rhizomes; culms compressed, filiform, 2 to 6 cm. tall; stolons as much as 15 cm. long (probably longer), the short very slender joints ascending-pubescent, the foliage conspicuously spreading-pilose, the narrow flat blades 5 to 15 mm. long; leaves of the relatively few flowering culms crowded at the base; nodes ascending-pubescent; sheaths pilose, or the upper nearly glabrous; ligule about 1 mm.

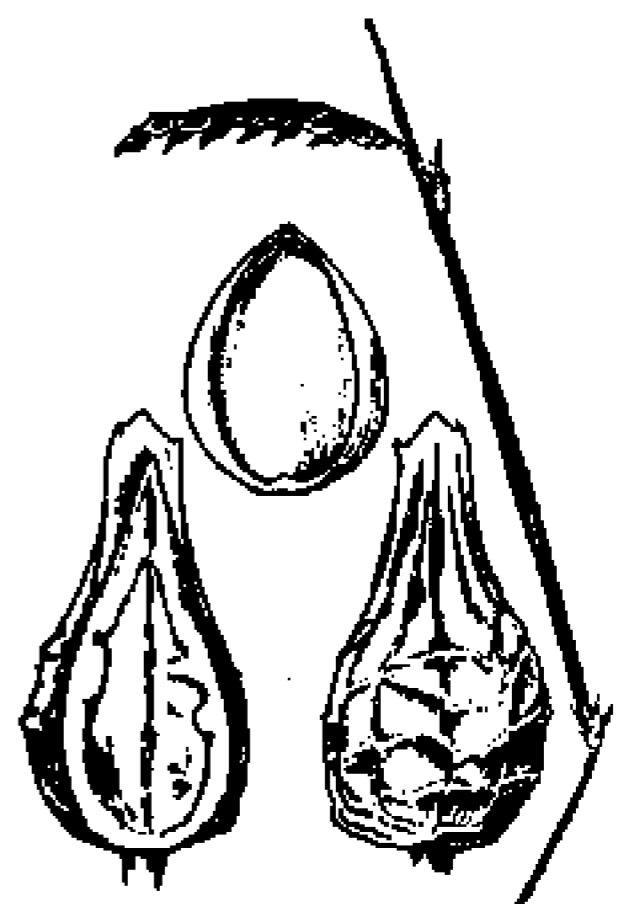


FIGURE 99.—*P. edmondi*.
From duplicate type

long; blades 1 to 6 cm. long, 1 to 2 mm. wide, sparsely pilose on the upper surface toward the base, rather thin, flat or subinvolute toward the tip; raceme solitary, 10 to 15 mm. long; rachis flat, 0.5 mm. wide, pilose at base; spikelets solitary, on slender pubescent pedicels, slightly imbricate, glabrous, 1.5 to 2 mm. long; about 1 mm. wide, broadly ovate with the apex prolonged into a prominent beak; glume 7-nerved, irregularly transversely wrinkled in the lower half, the wrinkles apparently smoothing out at maturity, narrowed above into a firm flat sometimes minutely toothed beak; sterile lemma nearly equaling the glume, long-pointed, except toward the apex deeply hollowed between the raised somewhat fluted margins; fruit 1.2 to 1.4 mm. long, about 1 mm. wide, ovate, subacute, minutely papillose, brown at maturity.

This striking species is known only from the type locality. Our fragment of *Léon & Edmond* 8607 consists of little tufts along a slender rhizome, the blades rather firm and subinvolute, obviously a dry-season phase. The spikelets of no. 8682 vary in size, the beak in some shorter and more pointed than shown in figure 99. In these smaller spikelets the glume is scarcely or not at all wrinkled.

DISTRIBUTION

Palm barrens on serpentine, Santa Clara, Cuba.

CUBA: Motembo, *Ekman* 16822; *Léon & Edmond* 8607, 8682.

Orbiculata.—Perennials, rooting and branching at the lower nodes; blades flat; racemes 2 to 4 (to 8 in *P. jimenezii*); spikelets solitary, depressed-biconvex or plano-convex, the midnerves commonly suppressed, the lateral nerves forming a narrow flat ring about the spikelet. Plants of low altitudes.

Spikelets suborbicular.

Blades 1 to 6 cm. long; spikelets 1 to 1.2 mm. long.---99. *P. orbiculatum*.

Blades 5 to 13 cm. long; spikelets 1.7 to 1.8 mm. long.---101. *P. hitchcockii*.

Spikelets not suborbicular, more or less elliptic.

Spikelets pubescent, blunt.-----102. *P. reptatum*.

Spikelets glabrous or obscurely pubescent at base only, subacute.

Culms 10 to 30 cm. long; spikelets 1.3 to 1.5 mm. long.

100. *P. jimenezii*.

Culms 50 cm. long or more; spikelets 2.5 to 2.7 mm. long.

103. *P. amphicarpum*.

99. *Paspalum orbiculatum* Poir.

Paspalum orbiculatum Poir. in Lam. Encycl. 5: 32. 1804. "Ledru * * * de Porto-Ricco (V. s. in herb. Lam.)." The specimen in the Lamarek Herbarium in Paris bears the name in Poiret's script. There is a duplicate in the general Paris Herbarium and another in the Florence Herbarium. The latter bears the date 1798.

Paspalum pusillum Vent.; Flüge, Monogr. Pasp. 100. 1810. "Insula St. Thomae. Ventenat. Porto Rico. Ledru. Specimen mihi dono dedit defunctus Ventenat." Specimens of the Ventenat collection from St. Thomas were examined in the Willdenow and the Kunth herbaria in Berlin, in the Delessert Herbarium, and in the British Museum. The last bears a printed label "Type specimen,"³³ undoubtedly added at the British Museum. Flüge cites *Paspalum orbiculatum* Poir., but gives no reason for publishing a new name.

³³ See p. 1.

Paspalum serpens Presl; Trin. Gram. Pan. 102. 1826. "V. spp. Brasil. (N. ab. Esenb.)" The name is credited to "Presl. ined.," but this was probably an error for Nees. The specimen in the Trinius Herbarium is labeled "*Pasp. serpens* N. Es. Bras. Amazonas. ex hb. reg. monac." Nees publishes the species as his own,³⁴ citing "Habitat in ripis praeruptis Tapajoz fluvii et fluminis Amazonum prope Santarem provinciae Paraënsis." Nees' type in the Munich Herbarium (of which the Trinius specimen is doubtless a part), was collected by Martius.

Paspalum geniculatum Steud. Syn. Pl. Glum. 1: 18. 1854. Not *P. geniculatum* Raf. 1817. "Cayenne." The type, in the Paris Herbarium, bearing the name in Steudel's script, was collected by Leprieur.

Paspalum lenormandi Husn. Enum. Glum. 12. 1871. "No. 73 * * * Didier (Mart.[inique])." Specimens of this collection were examined in the Berlin, Brussels, and Montpellier herbaria.

DESCRIPTION

A low creeping perennial, with long leafy stolons and ascending flowering branches, often forming dense mats; culms 10 to 60 cm. long, decumbent and rooting at the nodes, the internodes short, very slender, compressed, glabrous,



FIGURE 100.—*P. orbiculatum*.
From duplicate type in
Paris Herbarium

the flowering branches 5 to 20 cm. tall; nodes glabrous or appressed-pubescent; sheaths loose, compressed, ciliate at the summit, otherwise glabrous; blades flat, spreading, 1 to 6 cm. long, 1.5 to 7 mm. wide, abruptly narrowed at base into a minute petiole, usually with a ring of hairs back of the ligule, otherwise glabrous or minutely pubescent on the petiole and rarely on the lower surface; racemes 2 to 7, commonly 3 or 4, ascending or spreading, 0.6 to 2.3 cm. long, 1 to 10 mm. distant, on a slender narrowly winged axis, the peduncle included or short-exserted; rachis membranaceous, about 0.8 mm. wide, scabrous on the margin and with a few hairs at base; spikelets slightly or scarcely imbricate, 1 to 1.2 mm. long, about 0.9 mm. wide, depressed subhemispheric, greenish golden at maturity turning ruddy brown between the slightly raised pale margins, the flat pedicels sometimes bearing a few stiff hairs; glume and sterile lemma equal, 2-nerved, rarely obscurely 4-nerved, the mid-nerves suppressed, very thin in texture, glabrous or rarely pubescent; fruit 0.9 to 1 mm. long, at maturity reddish chestnut except the margins of the lemma, smooth and shining, the palea slightly convex.

The following specimens have spikelets obscurely to rather densely pubescent: *Deam* 6038, *Cook & Griggs* 431, *Pittier* 362, from Guatemala; *Pittier* 3426, Panama; *Rothenay* in 1844, French Guiana; *Burchell* 8864, *Goeldi* 207, *Kuhlmann* 3357, Brazil; and *Rojas* 3350, Paraguay.

DISTRIBUTION

Moist open ground, along streams and ditches, in savannas and old fields, mostly at low altitudes, southern Mexico and the West Indies to Paraguay.

VERA CRUZ: Minatitlán, *Smith* 562. Hacienda de Santa Barbara, *Liebmann* 153. *Sanborn, Orcutt* 3245.

GUATEMALA: San Tomás, *Deam* 6038. Finca Sepacuité, *Cook & Griggs* 431. Puerto Barrios, *Pittier* 362.

HONDURAS: Lancetilla Valley, *Standley* 53253, 56576. Puerto Sierra, *Wilson* 467.

EL SALVADOR: San Miguel, *Standley* 21108.

³⁴ Nees, *Agrost. Bras.* 50. 1829.

COSTA RICA: San José, *Pittier* 1183. Chemin de Carrillo, *Biolley* 3108. Port Limon, *Hitchcock* 8432.

PANAMA: Bocas del Toro, *Hart* 92. Fató, *Pittier* 4147. Canal Zone, *Hitchcock* 7966, 8389; *Pittier* 3426, 4613; *Standley* 30432.

CUBA: Guantánamo, *Ekman* 15806. Cajóbabó, *Léon* 12315.

PORTO RICO: Mayaguez, *Britton & Hess* 2835. Guaynabo, *Whetzel, Kern & Toro* in 1924. Pueblo Viejo, *Sintenis* 1229. San Juan, *Heller* 664. Cayey, *Chase* 6739. Sierra de Naguabo, *Britton & Cowell* 2186.

WINDWARD ISLANDS: Martinique, *Duss* 4507.

TRINIDAD: St. Joseph, *Amer. Gr. Nat. Herb.* 575. Oropuche Lagoon, *Britton, Hazen & Freeman* 1139.

COLOMBIA: Córdoba, *Pittier* 536.

VENEZUELA: Without locality, *Fendler* 2536.

BRITISH GUIANA: Georgetown, *Hitchcock* 16620. Coast lands, *Jenman* 6005, 6477. Tumatumari, *Hitchcock* 17341.

DUTCH GUIANA: "Surinam," *Weigelt* in 1827.

FRENCH GUIANA: Notaille, *Rothenay* in 1844.

BRAZIL: Marajó Island, *Goeldi* 85, 207. Rio Branco, *Kuhlmann* 3357. Rio Tocantin, *Burchell* 8864. Manáos, *Kuhlmann* 1680. Pernambuco, *Chase* 7736; *Pickel* 1358. Matto de São João, *Chase* 8142. São Leopoldo, *Dutra* in *Mus. Nac. Rio Jan.* 16496.

PARAGUAY: Carapeguá, *Rojas* 3350.

ECUADOR: Balao, *Eggers* 14668. Teresita, *Hitchcock* 20434. Milagro, *Hitchcock* 20202. Portovelo, *Hitchcock* 21257.

100. *Paspalum jimenezii* Chase, sp. nov.

DESCRIPTION

A slender perennial in small tufts or loose mats; culms 10 to 30 cm. long, decumbent at base, rooting and branching at the lower nodes, compressed, glabrous; nodes glabrous or sparsely appressed-pubescent, sheaths compressed, ciliate on the margin except toward the base, pubescent on the collar; ligule very minute; blades flat, ascending or spreading, 2.5 to 9 cm. long, 2 to 5 mm. wide (the uppermost reduced), rounded at base, the narrowed junction with the sheath puberulent within, the blade otherwise glabrous or with a few hairs on the margin at base; racemes 2 to 8, ascending or spreading, 1.5 to 4 cm. long, the common axis 0.5 to 2 cm. long, the peduncle included or short-exserted; rachis membranaceous, about 0.8 mm. wide, pubescent at base; spikelets not imbricate, 1.3 to 1.5 mm. long, 0.9 to 1 mm. wide, ovate-elliptic, subacute, greenish stramineous, the flat pedicels glabrous; glume and sterile lemma equal, pointed beyond the fruit, 2-nerved, the mid nerves suppressed, thin in texture, glabrous; fruit 1.1 to 1.3 mm. long, pale.

Type in the U. S. National Herbarium, no. 951752, collected along the margin of Río Bebedero, at Las Playitas, Guanacaste, Costa Rica, January 5, 1913, by Otón Jiménez (no. 742).

Known only from the type collection. Señor Otón Jiménez writes (translated), "This species is very common along the margin of Río Bebedero, in a place called Las Playitas belonging to the Faboga ranch, but the area of distribution is restricted. There is in Las Playitas a region 300 meters long by 50 wide in which there is no other vegetation than this paspalum. The general aspect is similar

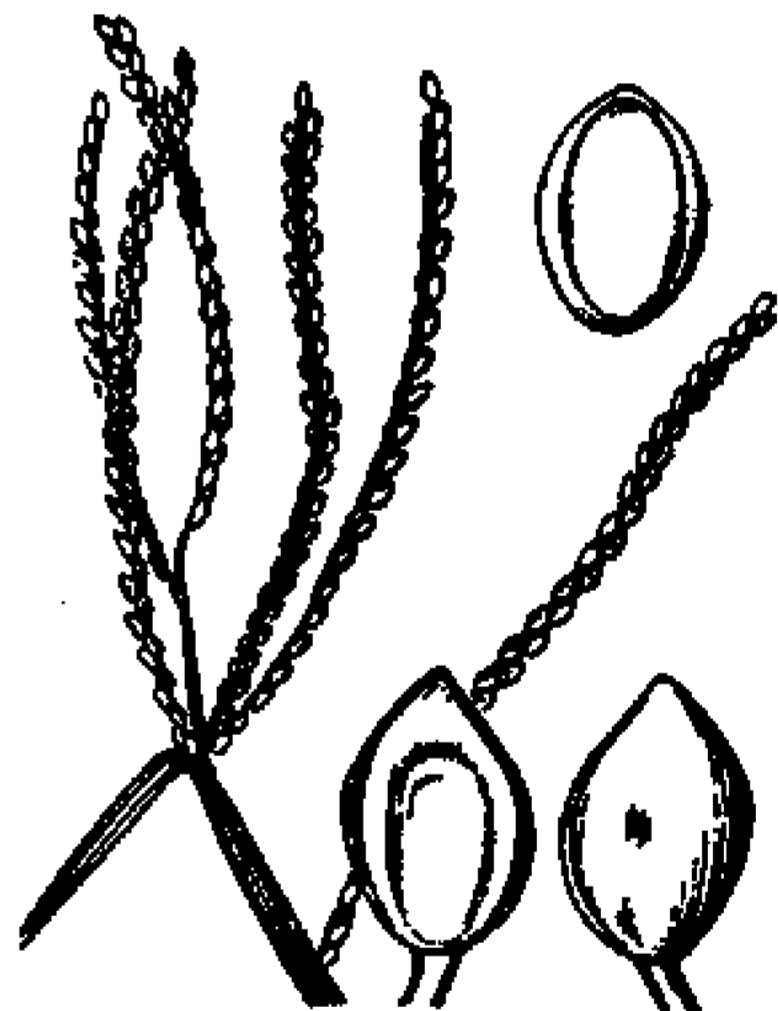


FIGURE 101.—*P. jimenezii*. From type specimen

to that of *Cynodon dactylon*. I did not see this species elsewhere in a distance of 20 kilometers explored in the vicinity of Bebedero. This species is frequently found growing with *Panicum laxum* Swartz."

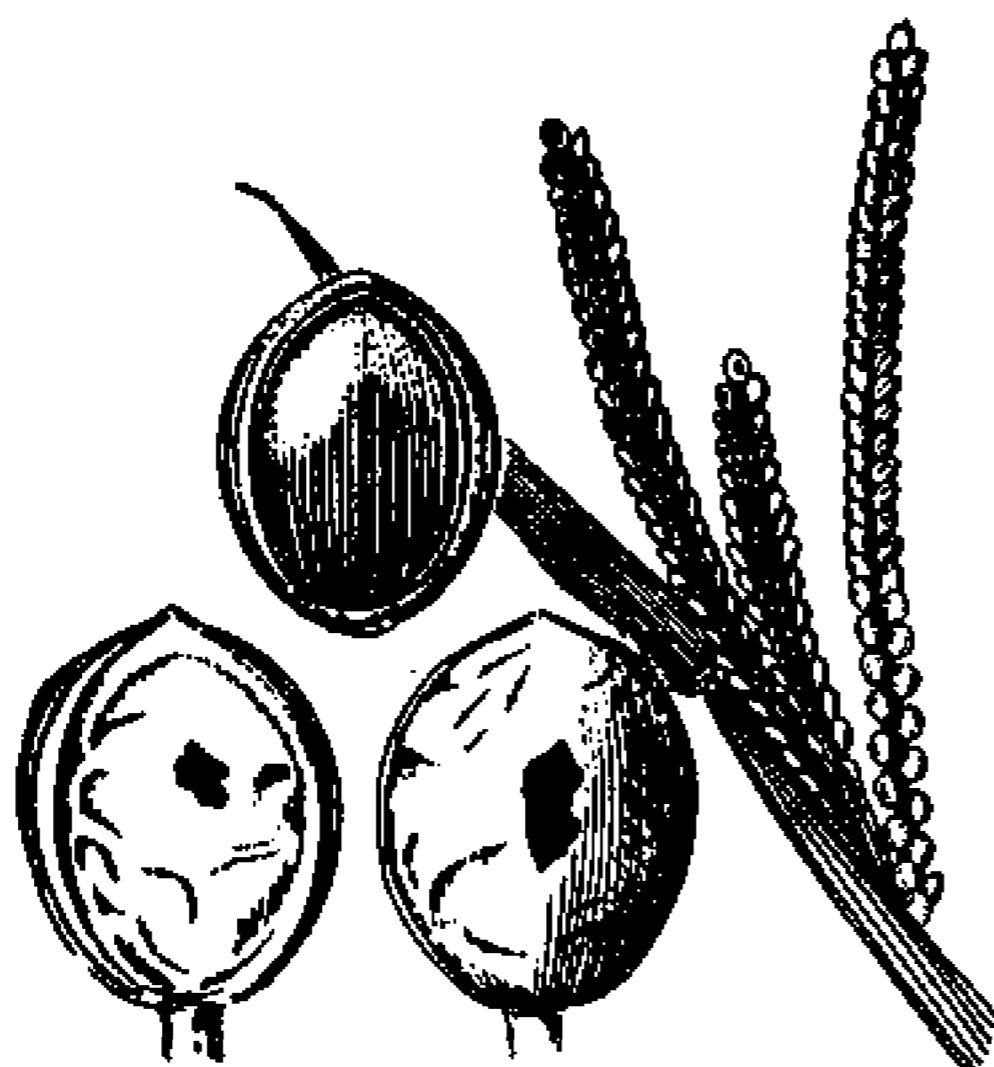


FIGURE 102.—*P. hitchcockii*. From type specimen

101. *Paspalum hitchcockii* Chase, sp. nov.

DESCRIPTION

A glabrous creeping subaquatic perennial with ascending flowering branches sometimes forming extensive colonies; culms 30 to 50 cm. or more long (5 to 10 cm. in dwarf plants), decumbent and rooting at the nodes, the internodes rather short, relatively stout, compressed, the flowering branches 12 to 30 cm. tall, repeatedly branching; nodes glabrous or sparsely appressed-pubescent; sheaths loose, compressed, rarely with a few hairs at the truncate summit; ligule very minute; blades flat, ascending to spreading, 5 to 13 cm. long, 4 to 9 mm. wide, rounded at base, the junction with the sheath sparsely puberulent within; racemes 2 or 3, ascending, relatively thick, 1.5 to 4 cm. long, the common axis 2 to 10 mm. long, narrowly winged, the peduncle usually included in the somewhat inflated sheath; rachis membranaceous, 1.2 to 1.5 mm. wide, sometimes minutely pubescent at base; spikelets mostly imbricate, 1.7 to 1.8 mm. long, about 1.5 mm. wide, depressed-hemispheric, light-olivaceous, the pedicels flat; glume and sterile lemma equal, 2 to 4 nerved, the mid nerves suppressed or developed in terminal spikelets, loose and irregularly wrinkled, very thin and fragile, commonly showing holes toward maturity; fruit about 1.6 mm. long, reddish brown, smooth and shining, very minutely whitish puberulent around the summit, especially of the palea.

Type in the U. S. National Herbarium, no. 951763, collected along a pool in mud or shallow water, east of Cartagena, Colombia, November 20, 1912, by A. S. Hitchcock (no. 9914).

In the type specimen one of the terminal racemes is double, two rachises being grown together back to back, each with a single row of spikelets. This teratological form has not been observed elsewhere in the genus.

Pittier's no. 4632 consists of dwarf plants.

DISTRIBUTION

Margins of lagoons and ponds, at low altitudes, Panama and Colombia.

PANAMA: Chepo, Pittier 4632.

COLOMBIA: Cartagena, Hitchcock 9914.

102. *Paspalum reptatum* Hitchc. & Chase

Paspalum reptatum Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 318. 1917. "Type in the U. S. National Herbarium, no. 865563, collected in wet ground in savannas west of Manacas, Province of Santa Clara, Cuba, by Brother Léon and F. R. Cazanias, December 28, 1915 (no. 5850)."

DESCRIPTION

A creeping subaquatic perennial with ascending flowering branches and cleistogamous spikelets borne in minute sheaths at the very base; culms 30 to

100 cm. or more long, decumbent and rooting at the nodes, the internodes sometimes as much as 10 cm. long, commonly shorter, slender, compressed, glabrous, the flowering branches 10 to 40 cm. long, commonly repeatedly branching; nodes glabrous or minutely appressed-pubescent; sheaths loose, commonly separating from the culm, compressed, the lower mostly velvety-pubescent, the upper usually glabrous; ligule minute; blades flat, spreading, 3 to 10 cm. long, 2 to 5 mm. wide, velvety-pubescent to glabrous; racemes 2 or 3, commonly overtopped by the upper leaf, divergent or reflexed, 1 to 4 cm. long, 5 to 10 mm. distant on a slender flattened axis; rachis pubescent at the base; spikelets not imbricate, 1.5 to 1.7 mm. long, 1.2 mm. wide, elliptic-obovate, blunt; glume and sterile lemma equal, 3-nerved, the mid nerve often suppressed in the glume, frequently also in the lemma, finely pubescent, yellowish-green, blotched with brown; fruit 1.4 to 1.5 mm. long, at maturity reddish-brown, shining, the margins of the lemma lighter in color, very obscurely and minutely puberulent around the summit.

The cleistogamous spikelets are mostly somewhat distorted by pressure, but similar in size and shape to those of the racemes. They are very inconspicuous, solitary, partly inclosed in minute sheaths at the primary base, rarely at the rooting and branching nodes.

DISTRIBUTION

In mud or shallow water, margins of ponds and depressions in savannas, Cuba and Jamaica.

CUBA: Pinar del Río, *Ekman* 18249. Manacas, *Léon & Cazanás* 5850. Jagüey Chico, *Ekman* 16983.

JAMAICA: Inverness, *Harris* 12717.

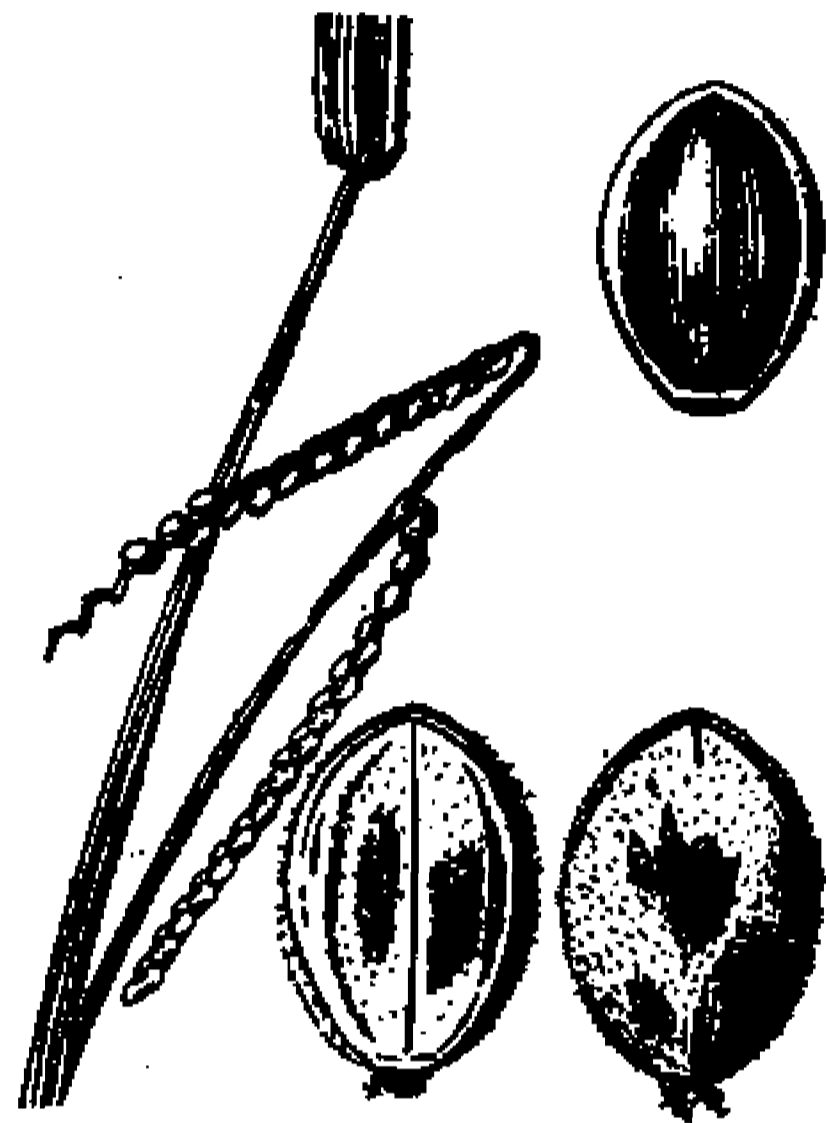


FIGURE 103.—*P. reptatum*. From type specimen

103. *Paspalum amphicarpum* Ekman, sp. nov.

DESCRIPTION

A glabrous widely creeping aquatic or subaquatic perennial with ascending flowering branches and solitary cleistogamous spikelets borne on short subterranean branches from the base or from rooting nodes; culms 50 to 75 cm. or more long, decumbent and rooting at the nodes, the internodes 2 to 8 cm. long, compressed, relatively stout, wiry, glabrous, the flowering branches 30 to 40 cm. long, simple or sparingly branching; nodes appressed-pubescent or the upper glabrous; sheaths loose, strongly keeled, ciliate toward the summit, sometimes pubescent on the collar; ligule nearly obsolete; blades folded at base, flat above, spreading, 5 to 15 cm. long, 3 to 6 mm. wide (the uppermost reduced), the base as wide as the summit of the sheath, the junction densely appressed-pubescent within; racemes 2 or 3, divergent, 2 to 4.5 cm. long, 4 to 15 mm. distant on a very narrowly winged axis, the peduncle short-exserted or included; rachis membranaceous, about 0.8 mm. wide, densely short-pubescent at the very base; spikelets mostly rather distant, 2.5 to 2.7 mm. long, 1.4 to 1.5 mm. wide, elliptic, subacute, green, lightly blotched with brown, the pedicels flat; glume and sterile lemma equal, pointed beyond the fruit, 2-nerved, the mid nerves suppressed or rarely developed, the glume minutely pubescent on either side at the base; fruit about 2.2 mm. long, brownish, smooth and shining, under a lens showing very minute pubescence of thickish white hairs toward the summit; subterranean spikelets solitary, 4 to 5 mm. long, about 2 mm. wide, pointed; glume and sterile lemma

3 to 5 nerved, the glume pubescent on either side at base; fruit 3 to 3.2 mm. long, plump, reddish-brown, smooth and shining, the minute pubescence denser than in the fruit of the aerial spikelets, appearing like a whitish bloom, especially toward the summit of the palea.

Type in the U. S. National Herbarium, no. 1,296,159, collected at the edge of a pool near Laguna de Piedras, Pueblo Nuevo, Mangas, Province of Pinar del Rio, Cuba, October 8, 1923, by Dr. E. L. Ekman (no. 17565).

"On land this species looks like the specimens sent [as described above] and flowers, albeit never abundantly; in water it has floating elongated leaves and never flowers."—Note by Doctor Ekman.

This is the only known species of *Paspalum* in which subterranean cleistogenes are produced, as in the genus *Amphicarpum*. The spikelets of the aerial racemes are immature. The spikelets and fruit are probably darker brown at maturity

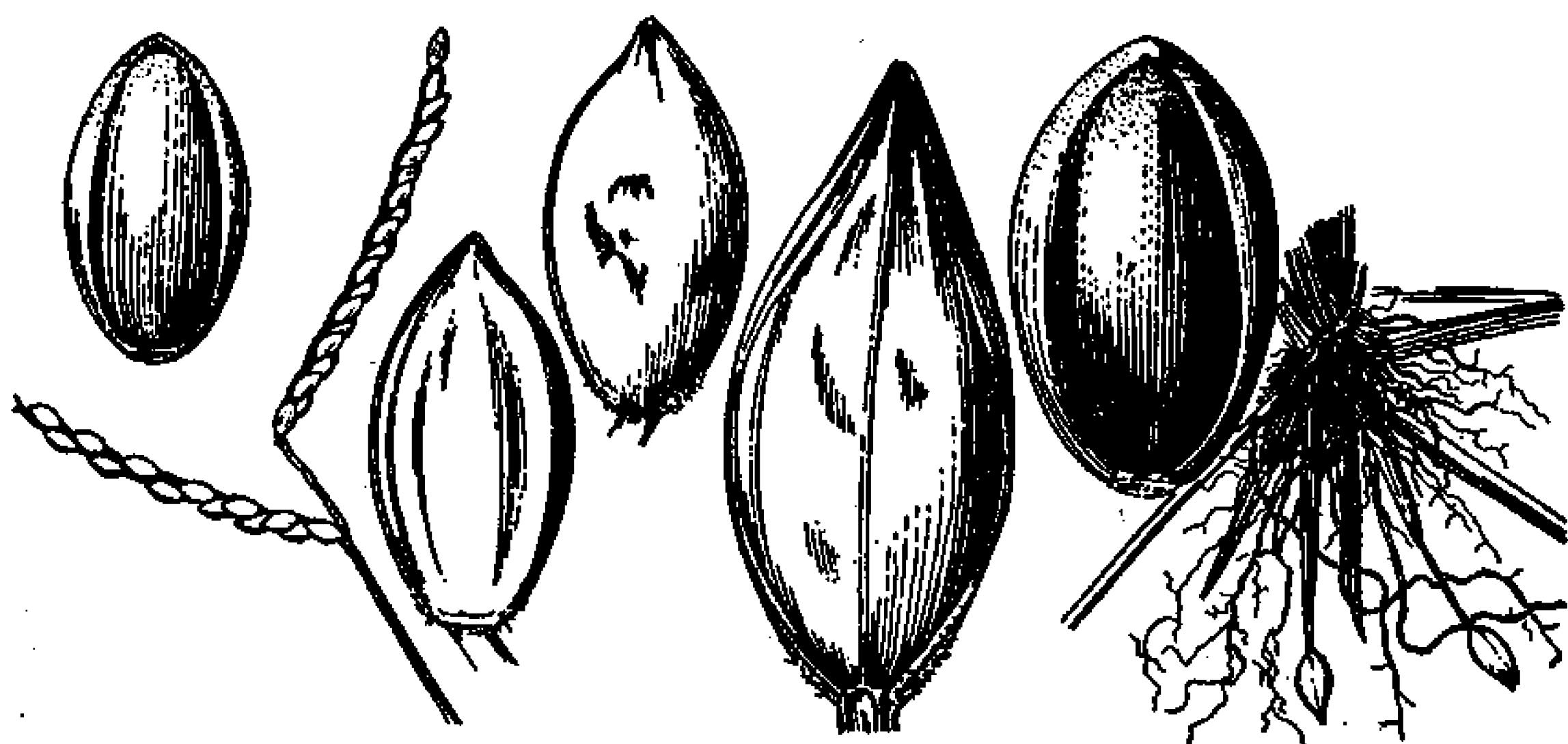


FIGURE 104.—*P. amphicarpum*. From type specimen

Represented in the United States National Herbarium by the type collection only. Doctor Ekman writes, "As yet only known from Pinar del Río, from Mangas to Tacotaco, but will undoubtedly also be found in Habana and Matanzas along the south coast."

Conjugata.—Creeping stoloniferous perennials, with flat lax blades and two slender, yellow racemes, paired, or rarely a third below.

Racemes rarely more than 12 cm. long; spikelets 1.4 to 1.8 mm. long.

104. *P. conjugatum*.

Racemes usually more than 12 cm. long; spikelets mostly 2 mm. long.

104a. *P. conjugatum pubescens*.

104. *Paspalum conjugatum* Bergius

Paspalum conjugatum Bergius, Act. Helv. Phys. Math. 7: 129. pl. 8. 1762. "Habitat in Surinamo." The type has not been examined, but the plate identifies the species. The description fails to note the ciliate margin of the spikelets.

Paspalum tenue Gaertn. f. Fruct. & Sem. 2: 2. pl. 80. 1791. *P. conjugatum* Bergius is cited as synonym. The figure of the spikelet shows the ciliate margin.

Paspalum ciliatum Lam. Tabl. Encycl. 1: 175. 1791. "Ex America calidiore. Comm. D. Richard." The type, in the Lamarck Herbarium in Paris, bearing the name in Lamarck's script, is a single flowering culm. An attached slip reads "de Cayenne, Leblond."

Paspalum africanum Poir. in Lam. Encycl. Suppl. 4: 314. 1816. "Recueillie en Afrique par M. de Beauvois." The type has not been located. Stapf²⁵ refers this to *P. conjugatum* and the description applies fairly well to it. In the Delessert Herbarium is a specimen of *P. conjugatum* collected by Beauvois in Oware, Africa, and named by him *P. citiatum* Lam.

Paspalum renggeri Steud. Syn. Pl. Glum. 1: 17. 1854. "Paraguay (legit beat. Rengger, communicavit Fleischer.)" The type, in the Paris Herbarium, bearing the name in Steudel's script, has sparsely pubescent blades and spikelets 1.5 mm. long.

Paspalum sieberianum Steud. Syn. Pl. Glum. 1: 17. 1854. "*P. conjugatum* Sieb. Agr. nr. 127. N. Holl." In the Dumond d'Urville Herbarium in Caen is a specimen of Sieber's no. 127 named "*Sieberianum* Steud." in Steudel's script. It consists of two flowering culms of *P. conjugatum*, each with a pair of terminal racemes and a third raceme 10 and 15 cm. below. This exceptional inflorescence agrees exactly with Steudel's description.

Paspalum longissimum Hochst.; Steud. Syn. Pl. Glum. 1: 19. 1854. "Hrbr. Kappler nr. 1556 * * * Surinam." Specimens of this collection were examined in the Leipzig, Delessert, and Drake herbaria. Those in the Leipzig and Drake herbaria have a third raceme below the pair. The spikelets are 1.7 mm. long.

Paspalum bicrurum Salzm.; Doell in Mart. Fl. Bras. 2²: 55, 1877, as synonym of *P. conjugatum*. Salzmann specimens from Bahia, Brazil, bearing this name, were examined in several herbaria. Those in Delessert, Drake, and Caen, and part of that in Kew are *P. conjugatum*. Part of the Kew specimen and two specimens from Montpellier have pubescent blades and spikelets 1.8 to 2 mm. long and belong to the variety *pubescens*.

Paspalum conjugatum var. *parviflorum* Doell in Mart. Fl. Bras. 2²: 55. 1877. "Manáos prov. do Alto Amazonas: (Spruce n. 894, *Paspalum* 23); * * * provinciae Piauiensis (Gardner n. 3502)." Spruce's no. 894 in the Munich Herbarium, bearing the name in Doell's script, has spikelets 1.5 to 1.6 mm. long, and sparsely pubescent blades. Gardner's no. 3502 in the Brussels Herbarium is the same form. The varietal name is crossed out and "D" signed below by Doell.

Paspalum conjugatum var. *tristachyum* Vandery. Bull. Agric. Congo Belge 9: 245. 1918. "Bas-Kasai: Dima; région du Moyen-Kwilu: Kikwit." Africa. A specimen collected by Father Vanderyst in Dima, in 1915, and bearing the name in his writing was kindly sent by him to the United States National Herbarium. This has three racemes.

Stapf²⁶ refers *Digitaria conjugata* Schult. to *Paspalum conjugatum*, but that name is based on *Panicum conjugatum* Roxb.,²⁷ which was described from Coromandel, India. From the description it is obvious that this is not *Paspalum conjugatum* but some species related to *Panicum distachyum* L., now referred to *Brachiaria distachya* (L.) A. Camus.

DESCRIPTION

An extensively creeping perennial, with long leafy stolons and ascending to suberect flowering branches, frequently purplish below, commonly forming a dense cover; culms as much as 2 meters long, rooting at the nodes, the internodes 1 to 15 cm. long, compressed, wiry, glabrous, the flowering branches commonly 20 to 50 cm. tall, sometimes 1 meter or more tall, simple or sparingly

²⁵ Fl. Trop. Afr. 9: 570. 1919.

²⁶ Fl. Trop. Afr. 9: 570. 1919.

²⁷ Fl. Ind. 1: 291. 1820.



FIGURE 105.—*P conjugatum*. From Baker 90

branching; nodes pubescent or glabrous, those of the stolons usually conspicuously pilose; sheaths loose, compressed, ciliate on the margin, often pubescent on the collar, otherwise glabrous, those of the stolons short and broad; ligule 1 to 1.5 mm. long; blades flat, spreading, rather thin, 5 to 22 cm., commonly 8 to 12 cm., long, 5 to 15 mm. wide, slightly narrowed to the base, usually with a tuft of long hairs at the very base, the margin scabrous to short-ciliate, otherwise glabrous or sparsely papillose-pubescent on the upper or on both surfaces; racemes 2, paired or nearly so, rarely a third below, widely divaricate, often arcuate, slender, 4 to 15 cm., commonly 8 to 12 cm., long; rachis narrowly winged, about 0.8 mm. wide, densely pubescent at the base; spikelets solitary, imbricate, 1.4 to 1.8 mm. long, 1 to 1.2 mm. wide, flattened concavo-convex, ovate, subacute to abruptly apiculate, pale yellow, the pedicels flat; glume and sterile lemma equal, very thin and closely appressed to the fruit, 2-nerved, the mid nerves suppressed, the nerves of the glume papillose-ciliate with long fine hairs, forming a delicately fringed margin to the spikelet, both otherwise glabrous; fruit about 1.5 mm. long, pale, not strongly indurate.

DISTRIBUTION

A common weed in cultivated and waste ground, along ditches and roadsides throughout the Tropics from sea-level to about 1,500 meters, extending north into the southern United States and south to Argentina; less common in the Eastern Hemisphere, probably native of America. It is not grazed by stock when other forage is available; called "sour grass" in the British West Indies.

FLORIDA: Tampa, *Hitchcock* 948. Hillsborough County, *Fredholm* 6356, 6473.

Alva, *Francis* 5. Paradise Key, *Mosier* 153.

ALABAMA: Mobile, *Mohr* in 1885.

LOUISIANA: Baton Rouge, *Joor* 18 in 1885. New Orleans, *Cocks* 418. Pointe-a-la-Hache, *Langlois* 25. Avery Island, *Hitchcock* 19864. Without locality, *Hale*.

TEXAS: Brownsville, *Hitchcock* 5408.

TAMAULIPAS: Victoria, *Palmer* 419 in 1907.

SAN LUIS POTOSÍ: Las Canoas, *Pringle* 3129.

SINALOA: Culiacán, *Palmer* 1549 in 1891.

JALISCO: Tequila, *Palmer* 367 in 1886.

VERA CRUZ: Jalapa, *Hitchcock* 6609. Córdoba, *Bourgeau* 1659; *Hitchcock* 6407; *Kerber* 49. Mirador, *Liebmann* 160. Pital, *Liebmann* 158. Zacuapan, *Purpus* 2158. Minatitlán, *Smith* 573. Motzorongo, *Smith* 631. Sanborn, *Orcutt* 3248.

MORELOS: Cuernavaca, *Hitchcock* 6818; *Pringle* 6215.

MICHOACÁN: Coahuayula, *Emrick* 48.

COLIMA: Manzanillo, *Hitchcock* 7030. Colima, *Palmer* 16 in 1897, 1272 in 1891. Paso del Río, *Emrick* 193.

OAXACA: Tecomanaca, *Conzatti* 4042¾. Tomellín, *Hitchcock* 6222; *Rose, Painter & Rose* 10050.

GUATEMALA: Sepacuité, *Collins & Goll* 05; *Cook & Doyle* 324. Chamá, *Johnson* 260; *Popenoe* 893. Finca Mocca, *Johnson* 115. Quiriguá, *Blake* 7706; *Holway* 594; *Standley* 23885. Gualan, *Blake* 7674. Quebradas, *Pittier* 8505. Puerto Barrios, *Standley* 24724. San Pablo, *Salas* 4. Escuintla, *Hitchcock* 9006; *Seler* 2576. Ojo de Agua, *Heyde & Luz (Dist. Smith)* 3902. Ciudad Vieja, *Tejada* 344.

HONDURAS: Lancetilla Valley, *Standley* 53315. San Pedro Sula, *Thieme* 374, (*Dist. Smith*) 5592. Ruatan Island, *Gaumer* in 1886. Bonacca Island, *Gaumer* in 1887.

EL SALVADOR: San Salvador, *Velasco* 7. Ahuachapán, *Standley* 19825.

NICARAGUA: Chinandega, *Baker* 2012.

- COSTA RICA: Río Bebedero, *Jiménez* 739. Alajuelita, *Tonduz* 8828. San José, *Pittier* 3009, *Tonduz* 758. Tuís, *Tonduz* 11402. General, *Tonduz* 3364. Cañas Gordas, *Pittier* 7354. Puerto Viejo, *Biolley* 7470. Carrillo, *Pittier* 3109. Buenos Aires, *Tonduz* 4862. Mole de San Rafael, *Pittier* 2601. Los Conventillos, *Tonduz* 2860.
- PANAMA: El Boquete, *Hitchcock* 8193. Bocas del Toro, *Carleton* 171. Porto Bello, *Pittier* 2444, 2480. Río Indio de Fató, *Pittier* 4260. Canal Zone, *Hitchcock* 7909; *Maxon* 6516; *Pittier* 2084, 3435, 3436; *Standley* 25651, 26463, 28584, 30063. Puerta Obaldía, *Pittier* 4314.
- BERMUDA: Paget, *Collins* 157.
- BAHAMAS: Nassau, *Curtiss* 192.
- CUBA: Mariel, *Ekman* in *Amer. Gr. Nat. Herb.* 960. Santiago de los Baños, *Léon* 4430; *Palmer & Riley* 541. Los Palacios, *Shafer* 11804. Herradura, *Hitchcock* 474. Buenaventura, *Wilson* 9404. Bejucal, *Liebmann* 161. Habana, *Léon* 939b, 939c, 1984; *Wilson* 1277. Santiago de las Vegas, *Baker* 90; *Baker & Wilson* 543; *Hitchcock* 473; *Léon* 782; *Wilson* 1006. Arroyo Apolo, *Léon* 302. Guanamar, *Léon* 5075. Hanábana, *Wright* 767. Guines, *Léon* 938. Sancti Spiritus, *Léon* 938c. Santiago de Cuba, *Léon* 938d. Gran Piedra, *Shafer* 9025. Bayale, *Ekman* 10370.
- JAMAICA: Montego Bay, *Hitchcock* 9688. Ipswich, *Hitchcock* 9629. Troy, *Harris* 12611; *Hitchcock* 9797. Savoy, *Harris* 11640. Ewarton, *Hitchcock* 9433. Bog Walk, *Hitchcock* in 1890. Hope Garden, *Harris* 11448, 12282. Cinchona, *Harris* 11308; *Hart* 755. Constant Spring, *Hitchcock* 9260. Bath, *Maxon* 2363; *Nichols* 202. Mill Bank, *Maxon & Killip* 138. Port Antonio, *Fredholm* 3306.
- HAITI: Marmelade, *Leonard* 8204. St. Michel, *Leonard* 7731. Gonave Island, *Leonard* 5187. Port-au-Prince, *Buch* 1591; *Ekman* 8040; *Leonard* 3425. Pétionville, *Leonard* 4871, 5062. Mission, *Leonard* 3711. Fond Parisien, *Leonard* 4183. Mirabalais, *Cook, Scofield & Doyle* 80. Plaisance, *Cook, Scofield & Doyle* 180.
- DOMINICAN REPUBLIC: Haina, *Faris* 101. Río Gurabito, *Eggers* 1964. Sánchez, *Abbott* 70, 83, 204.
- PORTO RICO: Mayaguez, *Britton & Hess* 2833; *Chase* 6152; *Heller* 4397; *Sintenis* 99; *Underwood & Griggs* 175. Bayamon, *Chase* 6389. Pueblo Vieja, *Chase* 6404. Río Piedras, *Johnston* 381; *Stevenson* 3219. Sierra de Luquillo, *Chase* 6722; *Wilson* 159.
- VIRGIN ISLANDS: St. Thomas, *Eggers* in 1881; *Hitchcock* 16306. St. Croix, *Hitchcock* 16341; *Ricksecker* 223; *Thompson* 26.
- LEEWARD ISLANDS: St. Christopher, *Hitchcock* 16350, 16365. Antigua, *Hitchcock* 16390. Dominica, *Hitchcock* 16424; *Jones* 16, 24.
- WINDWARD ISLANDS: Montserrat, *Shafer* 38. Martinique, *Duss* 1276; *Hitchcock* 16443. Barbados, *Bot. Station Herb.* 269. St. Lucia, *Brooks* 34; *Glasgow* 3; *Hitchcock* 16484; *Kemp* 19½, 32, 42½. Grenada, *Broadway* 19; *Hitchcock* 17664.
- TRINIDAD: St. Ann, *Britton & Hazen* 1685. Port of Spain, *Hitchcock* 9952. Caura River Valley, *Britton & Hazen* 1201. Without locality, *Sieber* 366.
- TOBAGO: Scarborough, *Broadway* 4361; *Hitchcock* 10228.
- COLOMBIA: Santa Marta, *Smith* 178. Buenaventura, *Hitchcock* 19897. Cali, *Pittier* 640. Córdoba, *Pittier* 537. Río Frío, *Pittier* 1581. Tierra Alta, *Pennell* 4689, Medellín, *Toro* 38. Vuelta de Acuña, *Pennell* 3797. Puerto Wilches, *Killip & Smith* 14755. Libano, *Pennell* 3213. Quetame, *Pennell* 1748. Nalgaima, *Rusby & Pennell* 1177. La Cumbre, *Pennell* 5011. Popayán, *Lehmann* 8543.

- VENEZUELA: Bobures, *Jahn* 347, 349. Carayaca, *Jahn* 307. Tovar, *Fendler* 1725. Gusremales, *Pittier* 9098. Albacoa, *Curran & Haman* 1040. Caracas, *Bailey* 358; *Pittier* 6166. Island of Margarita, *Johnston* 198; *Miller & Johnston* 178. Cristóbal Colón, *Broadway* 523. Ciudad Bolívar, *Bailey* 1314. Santa Catalina, *Rusby & Squires* 359.
- BRITISH GUIANA: Waini River, *Gleason* 3673. Georgetown, *Hitchcock* 16613. Coast region, *Jenman* 3967.
- DUTCH GUIANA: Paramaribo, *Kuyper* in 1913; *Samuels* in 1916.
- FRENCH GUIANA: Cayenne, *Broadway* 132, 425.
- BRAZIL: Obidos, *Rodrigues (Jard. Bot. Rio Jan.)* 5413. Marajó, *Goeldi* 249. Pará, *Goeldi* 33, 73. Ceara, *Allemão* 1652. Bahia, *Chase* 8055; *Dorsett & Popenoe* 446b; *Glocker* 201. Rio Condas, *Curran* 189. Franklin Sampaio, *Dorsett* 215b. Rio de Janeiro, *Bailey* 371; *Gardner* 208; *Glaziou* 6957, 9055, 17366; *Holway* 1418, 1476. Jacarepaguá, *Chase* 8409. Itereré, *Sampaio* 2919. Sorocaba, *Mosén* 3005. Guaratuba, *Dusén* 13539. Porto Alegre, *Malme* in 1902.
- PARAGUAY: Between Río Apa and Río Aquidaban, *Fiebrig* 4652, 4696. Sierra de Amambay, *Hassler* 10015, 12088. Central Paraguay, *Morong* 247.
- ECUADOR: Balao, *Eggers* 14646. Guayaquil, *Mille* 304. Milagro, *Hitchcock* 20161, 20599. Tenguel, *Holmgren* 58. Galápagos Islands, *Stewart* 1312, 1313, 1314, 1316.
- PERU: Callao, *Wilkes Expl. Exped.* Chosica, *Macbride* 2878; *Macbride & Featherstone* 506. Colonia Perené, *Hitchcock* 22089. Muña, *Macbride* 4057. Without locality, *Lechler* 2275.
- BOLIVIA: Rurrenabaque, *Cárdenas (Mulford Biol. Expl.)* 1175. Buena Vista, *Steinbach* 5160. Río Surutú, *Steinbach* 6836. Mapiri, *Buchtien* 69, 1162. Hacienda Simaco, *Buchtien* 5325. Coroico, *Buchtien* 2504a. La Florida, *Hitchcock* 22633. Antahuacana, *Buchtien* 2504. Villamontes, *Pflanz* 2007.
- ARGENTINA: Posadas, *Ekman* 570, 571. Formosa, *Jørgensen* 2424.
- HAWAIIAN ISLANDS: Oahu, Honolulu, *Hitchcock* 13729, 14067. Nuuanu Valley, *Forbes* in 1908. Makiki, *Heller* 1975. Hauula, *Farmer* in 1895. Hawaii, Paauhau, *Rock* in 1909. Hilo, *Hitchcock* 14182; *Newell* in 1917. Without locality, *Hillebrand* 492.
- AFRICA: Gold Coast, *Howes* 907. Nigeria, *Jeffreys* 31. Sierra Leone, *Thomas* in 1915. Angola, *Gossweiler* 9068. Kamerun, *Zenker* 269. Mauritius, *Vaughan* A 4.
- INDIA: Bengal, *Nusker* 1227. Khasia, *Clarke* 18499. Ceylon, *Alston* 268; *Vening* in 1916.
- MALAY PENINSULA: Selangor, *Ridley* in 1914. Pahang, *Henderson* 17944. Malacca, *Bot. Gard. Singapore* 1324. Singapore, *Debeaux* in 1860. Lingga, *Bünnemeyer* 7398.
- SUMATRA: Fort de Kock, *Bünnemeyer* 1320. Bérastagi, *Fairchild & Dorsett* in 1926; *Yates* 509. Habinsaran, *Bartlett* 7944. Rumpit, *Fairchild & Dorsett* in 1926. Mt. Singgalang, *Fairchild & Dorsett* 688. Banka, *Bünnemeyer* 1394, 2246; *Tuxen* in 1921.
- JAVA: Pasoeroean, *Backer* 23079b.
- CHINA: Canton, *Hitchcock* 18681; *Levine* 1237. Hongkong, *Hitchcock* 18635. Island of Hainan, *Hitchcock* 19656.
- FORMOSA: Taihoku, *Sasaki* 21418.
- INDO-CHINA: Haiphong, *Hitchcock* 19526. Vinh, *Hitchcock* 19289. Hue, *Eberhardt* 2191; *Hitchcock* 19303. Cambodia, *Godefroy* in 1875; *Jullien* in 1874. Cochín-China, *Germain* in 1880. Iles de Poulo-Condor, *Harmand* 859.
- BORNEO: Sandakan, *Ramos* 1700.

PHILIPPINE ISLANDS: Luzon, *Elmer* 16497, 18184; *Hitchcock* 18030; *Loher* 1745; *Mearns B. S.* ²⁸ 2981; *McGregor* 61, *B. S.* 2333; *Merrill* 34, 122, 1137, (*Kneucker Gram.*) 607; *Romas B. S.* 1385, *B.S.* 8224; *Santos* 29; *Serviñas B. S.* 16878. Polillo, *McGregor B. S.* 10426; *Robinson B. S.* 9294. Batan, *Robinson B. S.* 6249. Mindanao, *Fernandez B. S.* 24382; *Robinson B. S.* 9973; *Weber* 1013; *Williams* 2377. Basilan, *De Vore & Hoover* 50. Palawan, *Ledesma* in 1913.

MARIANNE ISLANDS: Guam, *Thompson* 294.

AMBOINA: *Robinson* 1653.

CAROLINE ISLANDS: Yap, *Volkens* 110.

NEW GUINEA: "Bisiat-abu, Papua," *White* 285.

ARU ISLANDS: Batavia, *Savinier* 164.

SAMOA: Tutuila, *Setchell* 506a, 550.

SOCIETY ISLANDS: Tahiti, *Setchell & Parks* 84.

104a. *Paspalum conjugatum pubescens* Doell

Paspalum conjugatum var. *pubescens* Doell in *Mart. Fl. Bras.* 2²: 55. 1877. "Prope Bahia (Martius), in civitate Paraguay (Rengger) et in Guiana gallica (ex cl. L. Cl. Richard)." Differentiated only by "Foliis pubescentibus." The Martius specimen in the Munich Herbarium, bearing the name in Doell's script, has pubescent blades and spikelets 1.7 to 1.8 mm. long. A specimen in the Paris Herbarium, labeled "Guiana Gall. ex Richard," with the varietal name in Richard's script and "*conjugatum*" added in Doell's script, has pubescent blades and spikelets 1.8 mm. long.

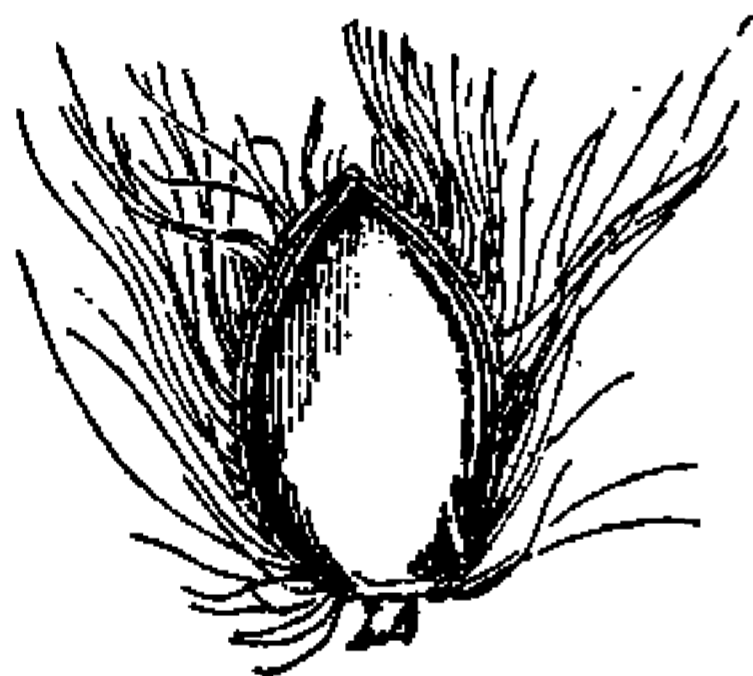


FIGURE 106.—*P. conjugatum pubescens*. From *Calderón* 945

DESCRIPTION

On the average coarser than the species, the blades commonly 15 to 20 cm., occasionally 25 cm., long, usually papillose-pubescent on both surfaces; racemes commonly 10 to 15 and occasionally as much as 20 cm. long; spikelets 1.7 to 2.2 mm. long, rather more copiously ciliate than usual in the species.

Plants with elongate racemes and spikelets at least 2 mm. long differ sufficiently in aspect to warrant subspecific rank, but about 40 per cent as many intermediates, with spikelets 1.7 to 1.9 mm. long, some of them with shorter racemes, render the distinction dubious. Both the specimens named by Doell, mentioned above, are of this intermediate group. A subspecies can not be differentiated on the pubescence of the blades, because fully 30 per cent of the specimens of the species itself, with spikelets not more than 1.6 mm. long, have pubescent blades.

DISTRIBUTION

Along ditches and banks and in waste ground, sometimes growing with the species, Mexico and the Lesser Antilles to Brazil.

VERA CRUZ: Orizaba, *Botteri* 110; *Bourgeau* 2752; *Hitchcock* 6318.

OAXACA: Tuxtepec, *Conzatti* 3770.

CHIAPAS: Ocuilapa, *Nelson* 3055.

GUATEMALA: Cobán, *Popenoe* 901. Secanquím, *Pittier* 206. Chamá, *Johnson* 279. Quiriguá, *Standley* 23798.

EL SALVADOR: San Salvador, *Calderón* 945. Zent Farm, *Pittier* 16734. Port Limon, *Cook & Doyle* 462.

²⁸ Bureau of Science, Manila.

PANAMA: Bocas del Toro, *Hart* 81.

VIRGIN ISLANDS: St. Thomas, *Eggers* in 1881.

WINDWARD ISLANDS: Grenada, *Broadway* 1744.

COLOMBIA: Santa Marta, *Smith* 128, 2744.

VENEZUELA: Federal District, *Pittier* 11083.

BRAZIL: Olinda, *Chase* 7655. Macelo, *Chase* 7838. Matto de São João, *Chase* 8154. Bahia, *Salzmann*. Viçosa, *Bailey* 1163, 1165; *Chase* 9426½, 9502. Lavras, *Chase* 8840; *Dorsett* 150b. Rio de Janeiro, *Chase* 8195. Santos, *Bailey* 972. Campinas, *Novaes* 1277. Franca, *Löfgren & Edwall* 2020. São Leopoldo, *Dutra* 555. Without locality, *Glaziou* 4315, 4316.

Dilatata.—Rather stout to robust perennials in leafy clumps; blades flat; racemes few to numerous; spikelets in pairs, flat; conspicuously silky-ciliate. Good forage grasses.

Racemes commonly 3 to 5; culms geniculate at base **105. *P. dilatatum*.**

Racemes commonly 12 to 18; culms erect **106. *P. urvillei*.**

105. *Paspalum dilatatum* Poir.

Paspalum dilatatum Poir. in Lam. Encycl. 5: 35. 1804. "Recueillie à Buenos-Ayres par Commerson. (V. s. in herb. Lam.)" The type, in the Paris Herbarium, has three racemes.

Paspalum platense Spreng. Syst. Veg. 1: 247. 1825. "Monte Video." The type in the Berlin Herbarium, bearing the name in Sprengel's script, was collected by Otto. The specimen has but two racemes.

Paspalum ovatum Nees; Trin. Gram. Pan. 113. 1826. "Brasil (Besser)." The type was examined by A. S. Hitchcock in the Trinius Herbarium. The plant has nine racemes, with spikelets 2.8 mm. long. It was collected by Eschscholz and communicated by Besser. Nees later³⁹ published the species as new, dividing it into α *grandiflorus* (see below) and β *parviflorus*. Under the latter he cites "Escholz in Herb. Trin.," presumably the specimen cited by Trinius under *P. ovatum* (see below), but this does not agree with the Martius specimen cited by Nees under β (see synonymy under *P. urvillei*).

Paspalum lanatum Spreng. Syst. Veg. 4: Cur. Post 30. 1827. Not *P. lanatum* H. B. K. 1816. "Rio Grande, Sello." The specimen in the Berlin Herbarium accompanied by a ticket with the name in Spengel's script and "Rio Grande" (no collector given), does not agree with Sprengel's description, and is, therefore, rejected as the type. It is *Paspalum ferrugineum* Trin. or an allied species. In the Trinius Herbarium is a specimen sent to Trinius by Sprengel as a new species, *P. lanatum*. It was collected at Montevideo by Otto. This has two racemes, as described by Sprengel, and otherwise agrees with his diagnosis. The long hairs of the spikelets are rather more copious than usual. It may be part of the collection upon which *P. platense* is based.

Paspalum eriophorum Schult. Mant. 2: 560. 1827. Based on *P. lanatum* Spreng., not *P. lanatum* H. B. K. Sprengel's diagnosis is copied.

Paspalus ovatus var. *grandiflorus* Nees, Agrost. Bras. 43. 1829. "Monte Video, (Sellow.) Herb. Reg. Berol." The type, in the Berlin Herbarium, bearing the name in Nees' script, has spikelets 3 mm. long.

Paspalum selloi Spreng.; Nees, Agrost. Bras. 43. 1829, as synonym of *P. ovatum* var. *grandiflorum*. "Spr. Herb. Willd."

³⁹ Agrost. Bras. 43. 1829.

Paspalum velutinum Trin.; Nees, Agrost. Bras. 43. 1829, as synonym of *P. ovatum* var. *parviflorum*. "Escholz in herb. Trin.," the only reference to Trinius, would appear to be the basis of this name. This is presumably the same as the Eschscholz specimen communicated by Besser in the Trinius Herbarium referred to under *P. ovatum* above.

Paspalum pedunculare Presl, Rel. Haenk. 1: 217. 1830. Habitat unknown. The type, collected by Haenke, was examined in the National Museum in Prague. There are 6 racemes with spikelets 2.9 to 3 mm. long. The specimen was probably collected at Montevideo or Buenos Aires, ports at which Haenke touched before crossing to Chile.

Paspalum dilatatum var. *decumbens* Vasey, Bull. Torrey Club 13: 166. 1886. No specimen nor locality is mentioned, but in a later work⁴⁰ "Louisiana (A. B. Langlois)" is cited. Langlois' no. 27 from Point-a-la-Hache, Louisiana, bearing notes and the name in Vasey's hand, is taken as the type. The spikelets are 3.2 mm. long.

Paspalum dilatatum var. *sacchariferum* Arech. Anal. Mus. Nac. Montevideo 1: 90, 1894; Gram. Uruguay 70. 1894 (reprint). "Los campos gramíneos de la República Uruguaya." There is a specimen in the United States National Herbarium from Arechavaleta bearing the name in his script. This is a rather robust plant with spikelets 3 to 3.5 mm. long.

Paspalum dilatatum forma *paucispica* Hack. in Stuck. Anal. Mus. Nac. Buenos Aires 11: 60. 1904. "Stuckert: Herb. arg. no. 11206." The type in Stuckert's herbarium at the Delessert Herbarium consists of two plants about 50 cm. tall with 3, 4, and 5 racemes.

Digitaria dilatata Coste, Fl. France 3: 553. 1906. Based on *Paspalum dilatatum* Poir.

DESCRIPTION

A rather stout perennial, in clumps of few to several culms and leafy sterile shoots from a knotted base of very short rhizomes; culms ascending to suberect from a curved or decumbent base, or some of the culms of a clump widely spreading, 40 to 175 cm. tall, simple, or sparingly branching from the lower nodes, compressed, glabrous; nodes glabrous or the lower sparsely pubescent; sheaths commonly overlapping, rather loose, compressed, the lower harshly pilose toward the base, sometimes conspicuously so, otherwise glabrous or ciliate at the summit; ligule about 3 mm. long; blades flat, ascending to spreading, 6 to 45 cm., commonly 10 to 25 cm., long, 3 to 12 mm. wide (the uppermost reduced), at base about as wide as the summit of the sheath, usually sparsely ciliate at base, otherwise glabrous, the margin scabrous; panicle erect or nodding, of 2 to 11, commonly 3 to 5, ascending to drooping rather broad racemes, the lower 4 to 11 cm., commonly 6 to 8 cm., long, the slender flattened common axis 2 to 20 cm. long; rachis narrowly winged, about 1.2 mm. wide, bearing numerous long white hairs at the base, the margin scabrous; spikelets on slender flattened pedicels, closely imbricate, 2.8 to 3.8 mm. long, about 2 mm. wide (excluding the hairs), ovate, pointed, depressed plano-convex or almost concavo-convex; glume slightly exceeding the sterile lemma, both pointed beyond the fruit, 5 to 9 nerved (lateral nerves obscure), sparsely covered with silky hairs on the surface, the glume in addition bearing on the marginal internerves a fringe of long white silky hairs, from rather scant to copious and woolly; fruit 2.4 to 2.6 mm. long, broadly elliptic, pale, minutely papillose-striate.

This species, commonly known as paspalum or paspalum grass and recently as Dallis grass, is introduced in the Southern States, where it is considered a valuable pasture grass. (See p. 4 for discussion of economic value.)

⁴⁰ Contr. U. S. Nat. Herb. 3: 19. 1892.



FIGURE 107.—*P. dilatatum*. From Hitchcock 297

"Panicles from which the spikelets have been stripped are tied into whisk brooms and used in South Carolina for brushing cotton lint from clothing, being much better for that purpose than ordinary whisk brooms."—J. B. Norton.

DISTRIBUTION

In low ground, from rather dry prairie to marshy meadows, New Jersey to Tennessee and Florida, and west to Arkansas and Texas; also adventive in Oregon, Colorado, Arizona, and California; sparingly introduced in the West Indies and in Central America; native of South America from Brazil to Argentina; also in Chile, probably introduced. Also escaped in Hawaii and Guam, the Philippines, India, Africa, and Australia, and naturalized in southern France.

NEW JERSEY: Camden, *Martindale* in 1882.

VIRGINIA: Fort Monroe, *Vasey* in 1879. Hampton, *Churchill* in 1927. Williamsburg, *Grimes* 3715, 4336.

NORTH CAROLINA: Wilmington, *Biltmore Herb.* 5690; *Hitchcock* 3868. Tryon, *Davis* 1566.

SOUTH CAROLINA: Oconee County, *Anderson* 1523. Yemassee, *Chase* 7102.

GEORGIA: Chicamauga, *Harper* 368. Stone Mountain, *Hitchcock* 3870; *Small* in 1893. Litonia, *Eggert* in 1897. Augusta, *Kearney* 210.

FLORIDA: Pensacola, *Scribner* 506. Milton, *Chase* 4324; *Swallen* 411. Marianna, *Swallen* 496, 543. Lake City, *Chase* 4285; *Combs* 202; *Hitchcock* 3869. Hillsborough County, *Fredholm* 6363. Titusville, *Nash* 2298.

TENNESSEE: Knoxville, *Ruth* 78.

ALABAMA: Marshall County, *Baker* in 1882. Springhill, *Mohr* in 1888. Mobile, *Curtiss* 6502; *Kearney* 14; *Mohr* in 1893.

MISSISSIPPI: Starkville, *Tracy* (*Dist. Seymour*) 19 and in 1892. Agricultural College, *Kearney* 35; *Pollard* 1335; *Ricker* 844. Florence, *Holt* 16. Biloxi, *Tracy* 7107.

ARKANSAS: Faulkner County, *Demaree* 2832. Little Rock, *Letterman* in 1879 and 1887. Pine Bluff, *Hitchcock* 16111.

LOUISIANA: Shreveport, *Ball* 96; *Hitchcock* 297; *Tracy* in 1897. Coushatta, *Ball* 114. Calhoun, *Ball* 68. Rayville, *Ball* 16. Melville, *Bush* 196. Baton Rouge, *Hitchcock* 3871; *Joor* in 1885; *McCulloch* in 1883. Burnside, *Combs* 1410. Lake Charles, *Allison* 147; *Tracy* 3685. Covington, *Anect* 57; *Arsène* 11410, 12235. New Orleans, *Joor* in 1885; *Waite* in 1885. Point-a-la-Hache, *Langlois* in 1883, 1885, and 1887. "Opelousas & Gulf R. R.," *Ravenel* in 1869. Without locality, *Carpenter* in 1840.

TEXAS: Fort Worth, *Ruth* 249. Ennis, *Smith* in 1897. Tatum, *Reverchon* 3455. Walker County, *Warner* in 1920. Wallisville, *Wallis* in 1880, 1881, and 1882. Galveston, *Tracy* 7370. Houston, *Fisher* 87. Waller County, *Thurrow* in 1898. Marathon, *Swallen* 1144. Without locality, *Nealley* in 1884.

OREGON: Linnton, *Nelson* 486; *Suksdorf* 1971.

COLORADO: Delta, *Lute* in 1928.

ARIZONA: Tucson, *Hitchcock* 3474.

CALIFORNIA: Butte County, *Rower* in 1905. Whittier, *Davidson* 3160.

GUATEMALA: Puerto Barrios, *Pittier* 360.

EL SALVADOR: Dept. Ahuachapán, *Padilla* 347.

COSTA RICA: Guadalupe, *Tonduz* 9395. Volcán de Turrialba, *Standley* 35180.

BERMUDA: Agricultural Station, *Brown, Britton & Bisset* 2005. Shelley Bay, *Collins* 156.

CUBA: Mariel, *Ekman* 12855, in *Amer. Gr. Nat. Herb.* 962.

JAMAICA: Richmond Park, *Harris* 12708.

DOMINICAN REPUBLIC: Haina, *Paris* 329.

- BRAZIL:** Marajó Island, *Goeldi* 204. Pará, *Goeldi* 131. Juiz de Fóra, *Chase* 8509, 8598. Southern Brazil, *Sello* 76.
- URUGUAY:** Montevideo, *Arechavaleta* 77; *Rural Federation of Montevideo* in 1924. Atahualpa, *Herter* 334. Dept. Colonia, *Herter (Herb. Osten)* 18784. Without locality, *Arechavaleta* in 1893 and 1894.
- ARGENTINA:** Posadas, *Ekman* 576. Pergamino, *Parodi* 35.
- CHILE:** Valparaiso, *Gunther* 7. Santiago, *Claude Joseph* 2271. Budi, *Claude Joseph* 2020. Punta, *Claude Joseph* 2164.
- HAWAIIAN ISLANDS:** Kauai, Lihue, *Forbes* 737. Oahu, Honolulu, *Hitchcock* 14072. Schofield Barracks, *Hitchcock* 13981. Molokai, *Hitchcock* 15153. Hawaii, Papaaloo, *Forbes* 325. Kukaiau Ranch, *Hitchcock* 14214. Hilo, *Newell* in 1917.
- FRANCE:** Bordeaux, *Neyrant* in 1900. Tréjus, *Bertrand* in 1902.
- AFRICA:** Union of South Africa, Pretoria, *Davy* 788. Natal, Newcastle, *Wood* 6189. Island of Mauritius, *Vaughan* A 5.
- INDIA:** Madras, *Bourne* 3027.
- PHILIPPINE ISLANDS:** Manila, *Hitchcock* 18099.
- MARIANNE ISLANDS:** Guam, *McGregor* 516.
- AUSTRALIA:** Port Jackson, *Pierce (Kneucker Gram.)* 804a.

106. *Paspalum urvillei* Steud.

Paspalus ovatus var. *parviflorus* Nees, *Agrost. Bras.* 43. 1829. "Inter Sorocaba et Villa Campanha, provinciarum S. Pauli et Minarum (Martius).—Escholz in *Herb. Trin.*" The Martius specimen, in the Munich Herbarium, bearing the name in Nees' script, is taken as the type. The Eschscholz specimen in the Trinius Herbarium is *P. dilatatum*. (See synonymy under that species.)

Paspalum urvillei Steud. *Syn. Pl. Glum.* 1: 24. 1854. "Ex Hrbo. Urville." A specimen in the Dumont-d'Urville Herbarium at Caen, bearing the name in Steudel's script, consists of part of a culm with a panicle 25 cm. long, of 20 racemes. The spikelets are 3 mm. long or nearly so. No locality is given for the specimen. It probably came from southern Brazil.

Paspalum dilatatum var. *parviflorum* Doell in *Mart. Fl. Bras.* 2²: 64. 1877. "Prope Pernambuco (*Forsell*) * * * Lagoa Santa (*Warming*)." Doell refers *P. ovatum* Nees to *P. dilatatum*, but does not cite the var. *parviflorum* Nees. The Forsell specimen has not been located. In Doell's herbarium in Freiburg there is a packet containing spikelets from Warming, Lagoa Santa, bearing the name in Doell's script. The spikelets are only 2 to 2.2 mm. long.

Paspalum virgatum var. *parviflorum* Doell in *Mart. Fl. Bras.* 2¹: 89. 1877. "Raben in Brasilia lecta (n. 161), loco accuratius non indicato." Raben's no. 161, in the Brussels Herbarium was so named in pencil in Doell's script. The word "*virgatum*" has been erased, but is still discernible, and "*dilatatum*" written over it in Doell's script. The spikelets are 2.3 mm. long.

Paspalum virgatum var. *pubiflorum* Vasey, *Bull. Torrey Club* 13: 167. 1886. No specimen or locality is cited. In a later paper⁴¹ Vasey cites "Texas (G. C. Nealley) and Louisiana (A. B. Langlois)." The Langlois specimen in the United States National Herbarium, collected May 28, 1884, at Atakopus, Louisiana, bears notes on the sheet in Vasey's hand and three varietal names, two of them under *P. dilatatum*. The name as published was not written on the sheet by Vasey. The Nealley specimen is incomplete, hence the description must have been drawn up from the Langlois collection, which is therefore taken as the type. The spikelets are 2.5 to 2.7 mm. long.

⁴¹ *Contr. U. S. Nat. Herb.* 3: 20. 1892.

Paspalum larrañagai Arech. Anal. Mus. Nac. Montevideo 1: 60. pl. 2. 1894; Gram. Uruguay. 48. pl. 2. 1894 (reprint). "En el Salto, * * * viñedos de Harriague, y en la Vitícola Salteña." Uruguay. The type has not been examined, but the description and the plate identify the species. The spikelets are given as 2 mm. long. A specimen collected by Arechavaleta in 1892 and bearing the name in his hand is in the United States National Herbarium. The spikelets are 2.1 to 2.2 mm. long.

Paspalum vaseyanum Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 17: 32. f. 328. 1899. Based on "*P. virgatum pubiflorum* Vasey, not *P. pubiflorum* Rupr."

Paspalum griseum Hack.; Corrêa, Flora do Brazil 128. 1909. Given, without description, as the botanical name of capim milhã grande. Glaziou's no. 16559, bearing this name in Hackel's script, but crossed out by him, is taken as the type.

DESCRIPTION

A stout erect perennial in clumps of few to many culms, purplish below; culms 75 cm. to 2.5 meters tall, simple or branching from the lower, sometimes from the middle nodes, subcompressed, glabrous; nodes glabrous; sheaths keeled toward the summit, the lower loose, coarsely hirsute or glabrescent toward the summit, the upper glabrous or sometimes ciliate on the margin or with a few hairs at the summit, rarely sparsely hirsute, often somewhat auricled; ligule 3 to 5 mm. long; blades flat, ascending, relatively firm, 12 to 48 cm., commonly 20 to 30 cm., long, 3 to 15 mm. wide, rarely to 65 cm. long and 2 cm. wide (the uppermost reduced), slightly rounded at base or narrowed to the width of the sheath, densely long-pilose at the very base on the inside, otherwise glabrous, the margin scabrous; panicle erect, 10 to 42 cm. long, of 6 to 25, commonly 12 to 18, ascending to slightly drooping racemes, the lower 7 to 14 cm. long, the upper gradually shorter, narrowly ascending, the slender common axis angled, glabrous; rachis narrowly winged, about 0.8 mm. wide, with a few long hairs at the base, the margin scabrous; spikelets on slender flattened pedicels, imbricate, 2 to 3 mm., commonly 2.2 to 2.7 mm. long, 1.2 to 1.5 mm. wide (excluding the hairs), ovate, abruptly pointed, depressed plano-convex; glume and sterile lemma equal, pointed beyond the fruit, thin in texture, 3 to 5-nerved, both copiously edged with long silky white hairs, the glume sparsely clothed with appressed silky hairs throughout, the lemma glabrous or nearly so in the middle; fruit 1.8 to 2 mm. long, elliptic, pale, nearly smooth.

Some of the Brazilian specimens (Doell's type of *P. dilatatum* var. *parviflorum*, Chase 8174 and 8637) have spikelets only 2 to 2.2 mm. long.

This species, known as Vasey grass, is readily grazed while young, and in some sections of the South is cut for hay. (See p. 4 for economic value.)

DISTRIBUTION

Along ditches and roadsides, and in waste ground, mostly in rather moist soil; North Carolina to Florida and west to Texas; also in southern California, Guatemala, and Cuba; native from Brazil to Argentina; introduced in Bolivia, Chile, and the Hawaiian Islands.

NORTH CAROLINA: Wilmington, Hitchcock 3872.

SOUTH CAROLINA: Orangeburg, Hitchcock 3873.

GEORGIA: Athens, Weatherwax in 1921.

FLORIDA: Kissimmee, Swallen 230.

ALABAMA: Mobile, Bush 205; Curtiss 6508; Kearney 43; Mohr in 1893; Tracy 7049.



FIGURE 108.—*P. ureillei*. From Chase 4388

MISSISSIPPI: Starkville, *Tracy* 1412 and in 1892; Agricultural College, *Kearney* 37.

LOUISIANA: Alexandria, *Ball* 173, 451. Atakopus, *Langlois* 151. Baton Rouge, *Hitchcock* 3874. Lake Charles, *Chase* 4388, 6107. Covington, *Arsène* 11403, 12245, 12349. Port Eads, *Tracy & Lloyd* 477.

TEXAS: Galveston, *Hitchcock* 3875. Hockley, *Thurrow* in 1906. Seabrook, *Fisher* 5067. Sheldon, *Reverchon* 4180. Houston, *Nealley* in 1892; *Thurrow* 11 in 1912. Beaumont, *Reverchon* 4180 A. San Antonio, *Hitchcock* 5192, 5327. Without locality, *Nealley* in 1884, 1886, and 1892.

CALIFORNIA: Palm Springs, *Parish* 8620.

GUATEMALA: Puerto Barrios, *Hitchcock* 9148; *Pittier* 363.

CUBA: Baraguá, *Hitchcock* 23353.

BRAZIL: Marajó Island, *Goeldi* 259. Anna Florencia, *Chase* 9473. Viçosa, *Chase* 9433. Serra do Cipó, *Chase* 9265. Itacolumy, *Chase* 9425. Juiz de Fóra, *Chase* 8637. Est. Minas Geraes, *Glaziou* 20561a. Alto da Serra, *Chase* 9767. Rio de Janeiro, *Chase* 8174, 8235. Sorocaba, *Mosén* 3511. Itapetininga, *Löfgren* 469. Campinas, *Novaes* 1278. Rio Pardo, *Jürgens* G 41. São Leopoldo, *Dutra (Mus. Nac. Rio Jan.)* 16478. Central Brazil, *Glaziou* 470. Without locality, *Glaziou* 477; *Sello* 3567.

URUGUAY: Montevideo, *Rural Federation of Montevideo* in 1924. Without locality, *Arechalaveta* in 1893 and 1898.

PARAGUAY: Rio Apa, *Hassler* 11916. Sierra de Amambay, *Hassler* 9902. Central Paraguay, *Morong* 549.

BOLIVIA: Sorata, *Gunther* in 1926.

ARGENTINA: Tapias, *Venturi* 2329. Posadas, *Ekman* 577. Córdoba, *Stuckert* 5416, 12917, (*Kneucker Gram.*) 365. Dept. San Alberto, *Stuckert* 10793. Terr. de Formosa, *Jørgensen* 3300. Prov. Catamarca, *Venturi* 3771, 7165. Prov. Tucumán, *Venturi* 1782. Without locality, *Jørgensen* 1145.

CHILE: Curico, *Claude Joseph* 5734.

HAWAIIAN ISLANDS: Oahu, Manoa Valley, *Hitchcock* 13737, 14081.

AFRICA: Transvaal, *Barborton, Thorncroft* in 1904.

Fasciculata.—A robust creeping perennial with flat blades and large fiabellate panicles. One allied species in South America.

107. *Paspalum fasciculatum* Willd.

Paspalum fasciculatum Willd.; Flüge, Monogr. Pasp. 69. 1810. The species is divided into α "Brasilia. Hoffmannsegge;" β "Peruvia. Humboldt et Bonpland," and γ "America meridionalis. Humboldt et Bonpland." The Hoffmannsegge specimen, in the Wildenow Herbarium in Berlin, taken as the type, consists of pieces of a large plant with a panicle 15 cm. long, the spikelets ciliate along the edges. The Humboldt and Bonpland specimen in the Berlin Herbarium is marked "Habitat in Peruv. Humb. 3813. gamalote," and also " β in loc. siccioribus, γ in humidis." There are two pieces on the sheet, but nothing to indicate which is which. In the general Paris Herbarium is a specimen marked 'Bonpl. 3813, Guayaquil. *Paspalum fasciculatum*' in Bonpland's script. Another of the same collection is marked var. β . In the segregated Humboldt, Bonpland, and Kunth Herbarium is a specimen labeled "Guayaquil San Borodon & Estero del Lagarto." These specimens are rather small plants with smaller panicles. Kunth⁴² cites only the latter collection.

Paspalum vaginatum var. *pleostachyum* Doell in Mart. Fl. Bras. 2^o: 75. 1877. "Prope Manãos prov. do Alto Amazonas * * * (Spruce n. 1460*)." A specimen of this collection bearing the name in Doell's script is in the Drake

⁴² H. B. K. Nov. Gen. & Sp. 1: 89. 1816.

Herbarium in Paris. It is a depauperate specimen of *P. fasciculatum* only 70 cm. long, and with but 7 racemes. In the Kew Herbarium this collection bears a note by Spruce: "Barra, shore of river, frequent, but so much nipped by goats that I have never seen but these two specimens in flower."

Paspalum fasciculatum var. *glabratum* Doell in Mart. Fl. Bras. 2²: 91. 1877. Based on *P. fasciculatum* γ H. B. K., which is described as having glabrous spikelets.

DESCRIPTION

A large extensively creeping leafy stoloniferous perennial, the glabrous compressed culms sometimes as much as 1 cm. thick and several meters long, the bases rooting at the nodes and forming a tangled mass, the stolons, especially in open ground, as much as 5 meters long, with reduced usually pilose leaves, the erect sparingly branching flowering culms 0.7 to 2 meters tall, the leaves on the sterile shoots aggregate at the summit in a flabellate mass; nodes from glabrous to densely bearded; sheaths broad, relatively short, densely ciliate on the margin, sparsely papillose-pilose toward the summit at least on the keel, rarely glabrous;



FIGURE 109.—*P. fasciculatum*. From Hitchcock 7899

ligule firm, about 0.7 mm. long, with a dense ring of long hairs back of it; blades flat, ascending to spreading, 20 to 60 cm. long, 1.2 to 3 cm. wide (the uppermost and those of the ultimate branches reduced), slightly rounded at base, very scabrous on the margins, both surfaces from glabrous to sparsely papillose-pilose, the pubescence on the lower surface mostly along the prominent midnerve; panicle short-exserted, mostly flabellate in outline, of 7 to 30, commonly 12 to 20, racemes, ascending to drooping, 7 to 17 cm. long, aggregate on a rather short stout angled axis, bearing long white hairs in the axils; rachis 1 to 1.5 mm. wide, the margin scabrous and occasionally bearing a few scattered long hairs; spikelets solitary on flat pedicels, mostly imbricate, 4 to 4.5 mm., rarely to 5 mm., long, 1.5 to 1.8 mm. wide, elliptic, abruptly acuminate, depressed plano-convex; first glume often developed as a minute nerveless hyaline scale, large and 1 to 3-nerved in occasional spikelets; second glume and sterile lemma equal, pointed beyond the fruit, lightly 3 to 7-nerved, the glume from copiously to sparsely silky-ciliate on the margin, occasionally glabrous or nearly so, the lemma glabrous

or sparsely ciliate toward the summit, often slightly wrinkled within the paler border; fruit 3.7 to 3.8 mm. long, at maturity light brown, smooth and shining.

This species is a common weed in banana plantations in Costa Rica. It is eaten by cattle, but the situations in which it grows are usually inaccessible to them.

DISTRIBUTION

Borders of streams, low ground, and swamps, at low altitudes, southern Mexico to Ecuador and Argentina. In common with other large grasses this is called "gamalote" in Spanish America; in El Salvador it is called "camalote negro."

VERA CRUZ: Córdoba, *Hitchcock* 6428.

TABASCO: San Juan Bautista, *Rovirosa* 260.

GUATEMALA: Cubilquitz, *Türkheim* II. 181. Cobán, *Popenoe* 909. Puerto Barrios, *Hitchcock* 9150.

EL SALVADOR: Ateos, *Calderón* 1881. San Salvador, *Calderón* 1150, 1151; *Renson* in 1922. Sonsonate, *Hitchcock* 8966.

COSTA RICA: San José, *Hitchcock* 8464; *Tonduz* 7225. Puntarenas, *Hitchcock* 8576. San Francisco de Guadalupe, *Pittier* 7147, 16118. Port Limon, *Hitchcock* 8424. Without locality, *Tonduz* 220.

PANAMA: Canal Zone, *Hitchcock* 7899, 8114; *Killip* 12125; *Piper* 5215; *Pittier* 4020, 4435, 6841. Changuinola Valley, *Dunlap* 199.

TRINIDAD: St. Joseph, *Hitchcock* 10029.

TOBAGO: Plymouth, *Hitchcock* 10281.

COLOMBIA: Island of Mompas, *Curran* 366. Magangue, *Pennell* 3933.

VENEZUELA: Lower Orinoco, *Rusby & Squires* 356.

DUTCH GUIANA: Paramaribo, *Kuyper* in 1913.

BRAZIL: Pará, *Goeldi* 114, 115. Tabatinga, *Kuhlmann* 1280.

PARAGUAY: Central Paraguay, *Morong* 535. Trinidad, *Rojas* 1688. Río Paraguay, *Lorentz* 70.

ECUADOR: Balao, *Eggers* 14104.

ARGENTINA: Terr. de Formosa, *Jørgensen* 2426. Puerto Formosa, *Parodi* 8345.

Laevia.—Perennials, with very short rhizomes; culms rather tall, compressed, simple or occasionally with reduced flowering branches from the lower or middle sheaths; racemes few to several; spikelets solitary (in *P. praecox*, *P. lentiferum*, and *P. erectum* solitary or paired), from broadly oval to orbicular, depressed plano-convex, glabrous.

Spikelets solitary; glume and sterile lemma firm.

Spikelets orbicular, 3 to 3.2 mm. long, scarcely one-third as thick; blades usually equaling the base of the panicle or overtopping it.

110. *P. circulare*.

Spikelets longer than broad, more than one-third as thick; panicle usually much exceeding the blades.

Sheaths and blades pilose, mostly conspicuously so... 109. *P. longipilum*.

Sheaths and blades from glabrous or nearly so to sparsely pilose.

108. *P. laeve*.

Spikelets solitary and paired in the same raceme (rarely all solitary or all paired).

Lower sheaths strongly compressed-keeled; spikelets suborbicular; glume and sterile lemma thin, the cells visible.

Spikelets 2.2 to 2.5 mm. (rarely to 2.8 mm.) long; foliage not conspicuously villous..... 111. *P. praecox*.

Spikelets 2.7 to 3.4 mm. long; lower sheaths and blades mostly conspicuously villous at least at base.....112. *P. lentiferum*.
Lower sheaths not compressed; spikelets broadly obovate; glume and sterile lemma rather firm, minutely papillose-roughened.....113. *P. erectum*.

108. *Paspalum laeve* Michx.

Paspalum laeve Michx. Fl. Bor. Amer. 1: 44. 1803. "Hab. in Georgia." The type specimen, in the Paris Herbarium, is a single culm with 4 leaves and 3 racemes. The spikelets are 2.5 mm. long and brownish tinged. The plant is glabrous and just about the average for this variable species, not the form with short blades crowded at base nor the one with elongate blades. In the Drake Herbarium is a second specimen labeled "*Paspalum laeve* Michaux, Georgia" in Richard's script. This consists of two plants, each with 4 racemes.

Paspalum undulosum LeConte, Journ. de Phys. 91: 284. 1820. "Habitat in Georgia." The specimen bearing this name in LeConte's handwriting in the herbarium of the Academy of Natural Sciences, Philadelphia,⁴³ is part of a culm of a tall plant of *P. laeve*. This agrees with the description except in "spicis 4-6," this having 8 racemes, the upper two much reduced. LeConte evidently had other material.

Paspalum angustifolium LeConte, Journ. de Phys. 91: 285. 1820. "Habitat in Carolina et Georgia." The specimen bearing this name in LeConte's handwriting in the herbarium of the Academy of Natural Sciences, Philadelphia,⁴³ is part of a culm of a slender narrow-leaved plant, bearing 3 racemes. This specimen agrees with the description and is accepted as the type, though LeConte evidently drew up his description from additional material, since he says "spicis 2-3."

Paspalum leconteanum Schult. Mant. 2: 168. 1824. Based on *P. undulosum* LeConte, the name changed because of *P. undulatum* Poir.

Paspalum punctatum Bertol. Mem. Accad. Sci. Bologna 2: 599. pl. 42. f. a-e. 1850. The type, from Alabama, has not been seen. The description and plate indicate a specimen like the type of *P. angustifolium*.

Paspalum alternans Steud. Syn. Pl. Glum. 1: 26. 1854. "Hartman hrbr. nr. 40. Louisiana." The type has not been located. The sheaths and blades are described as being sparsely pilose toward the margin and base, the blades 2 to 4 inches long.

Paspalum tenue Darby, Bot. South. States 576. 1857. Not *P. tenue* Gaertn. 1791. "Geo. and northward." The type has not been located. The description applies to the long-leaved form of *P. laeve*.

Paspalum laeve var. *undulosum* Wood, Class-book 782. 1861. Based on *P. undulosum* LeConte.

Paspalum laeve var. *angustifolium* Vasey, Bull. Torrey Club 13: 165. 1886. Based on *P. angustifolium* LeConte.

Paspalum laeve var. *brevifolium* Vasey, Contr. U. S. Nat. Herb. 3: 18. 1892. "*P. undulosum* LeConte" is cited as a synonym, but a brief description is given. This is presumably intended as a new variety rather than a change of name. The specimen in the United States National Herbarium, bearing the name in Vasey's script, was collected in Texas by Nealley in 1886. The culm blades are as much as 15 cm. long.

Paspalum australe Nash in Britton, Man. 1039. 1901. "Type collected by Dr. J. K. Small, at Stone Mt., Ga., Aug. 1-6, 1895," in the herbarium of the New York Botanical Garden, is the form with relatively short blades, pilose

⁴³ See footnote 57, p. 32.

above and sometimes toward the base beneath, and sheaths pilose on the margin.

Paspalum laeve australe Nash in Hitchc. Rhodora 8: 205. 1906. Based on *P. australe* Nash.

DESCRIPTION

A tufted perennial commonly with numerous erect or ascending leafy shoots at the base; culms erect or ascending, 0.4 to 1 meter tall, rarely taller, simple or rarely with concealed or short-exserted raceme-bearing branches in the lower sheaths, compressed, glabrous; sheaths compressed-keeled, several usually crowded at the base, glabrous or pilose on the margins or sometimes on the back toward the summit; ligule brown, 2 to 3 mm. long; blades usually folded at base, flat or folded above, rather firm, commonly erect or nearly so, sometimes glaucous, 5 to 30 cm. long, rarely longer, 3 to 10 mm., rarely 12 mm., wide, the uppermost often reduced, glabrous to ciliate or sparsely pilose on the upper surface, or sometimes toward the base beneath; racemes 2 to 5, commonly 3 or 4, rarely 6 to 8, spreading or ascending, 3 to 10 cm. long, rarely longer, the common axis slender, glabrous; rachis about 1 mm. wide, with a tuft of long hairs at the base; spikelets not crowded, 2.5 to 3 mm. long, 2 to 2.5 mm. wide, broadly oval to suborbicular; glume and sterile lemma equal, toward maturity the tip of the fruit usually exposed, 5-nerved, the middle of the lemma commonly russet-brownish; fruit nearly the size and form of the spikelet.

Forms of this exceedingly variable species have been regarded as distinct species or varieties. A prolonged study of a large amount of material has failed to correlate any two of the different characters. Michaux's type is about half-way between *P. angustifolium* and the short-leaved form, *P. laeve brevifolium* Vasey, though the type of the latter is not itself one of the conspicuously short-leaved specimens with short, nearly naked culms. The forms have been differentiated as follows: Plants with elongate blades and racemes, the blades glabrous or pilose near the margin, as *P. angustifolium*; those with blades (usually short) sparsely pilose above and sheaths pilose on the margin, as *P. australe*; and those with short, glabrous leaves, mostly crowded toward the base, as *P. laeve* proper. If we try to segregate the specimens into these groups, however, the intermediate specimens are more numerous than those referable to definite forms, and the material so segregated appears scarcely more homogeneous than does the intermediate material. Pubescence, particularly, varies greatly in a single plant. The commoner form, especially in the Gulf States, is *P. angustifolium*, mostly with blades sparsely pilose toward the base. The more pubescent form, *P. australe*, is found mostly near the coast in pineland.

In Mississippi is a form like *P. laeve brevifolium* but with spikelets only 2 to 2.2 mm. long. This is found only in low pine woods along the Gulf Coast. The following are of this form: Horn Island, Tracy 2860. Biloxi, Chase 4330, 4350, 4354; Tracy 4624; Tracy & Ball 23.

Where it grows plentifully this species affords a nutritious hay. Together with the allied species it is called field paspalum.

DISTRIBUTION

Fields, meadows, open woods, and waste ground, especially common in red clay soil, New Jersey and Pennsylvania to Florida and eastern Texas.

NEW JERSEY: Camden, Scribner 14. Cold Spring, Pennell 2203.

PENNSYLVANIA: Nottingham, Pennell 2273. Philadelphia, Scribner in 1878.

MARYLAND: Hyattsville, Scribner in 1888. Lanham, Maxon 5893; Maxon & Standley 14. Bethlehem, Killip 7265.

DISTRICT OF COLUMBIA: Chain Bridge, Chase 3634. Chevy Chase, Chase 2600, 9937. Washington, Chase 2593; Scribner in 1894; Steele in 1896; Vasey in 1882. Takoma Park, Amer. Gr. Nat. Herb. 966.



FIGURE 110.—*P. laeve*. From Chase 2600

VIRGINIA: Fourmile Run, Steele in 1896. Lanexa, Grimes 4148. Portsmouth, Noyes 109. Dismal Swamp, Chase 3648. Ocean View, Kearney 1473. Norfolk County, Kearney 1785. Cape Henry, Hitchcock 3876; Norton 313. Virginia Beach, Britton in 1895; Hitchcock 3877; Williams 3091.

WEST VIRGINIA: Baileysville, *Morris* 1284.

NORTH CAROLINA: Biltmore, *Biltmore Herb.* 814a. Black Mountain, *Standley & Bollman* 10431. Columbus, *Townsend* in 1897. Heiligs Mill, *Small & Heller* in 1891. Magnetic City, *Weatherby* 15. Wilmington, *Hitchcock* 3878; *Kearney* 254.

SOUTH CAROLINA: Clemson College, *House* 2342. Hartsville, *Coker* in 1908. Ebenezer, *Bartlett* 2826. Batesburg, *McGregor* 180. Aiken, *Kearney* 240; *Ravenel* in 1882. Anderson, *Davis* 1591. Orangeburg, *Hitchcock* 3879. Isle of Palms, *Norton* 367a. Without locality, *Delile* in 1806.

GEORGIA: Fannin County, *Smith* 2586. Americus, *Tracy* 3667. Savannah, *Kearney* 182. Blakely, *Harper* 1904. Thomasville, *Tracy* 3672.

FLORIDA: Milton, *Chase* 4317; *Swallen* 369, 388. Chipley, *Combs* 630. Marianna, *Swallen* 532; *Tracy* 3678. Chattahoochee, *Curtiss* 5937; *Tracy* 3681. Quincy, *Combs* 409. Tallahassee, *Combs* 367, 385; *Kearney* 78. Monticello, *Combs* 310½, 344. Jefferson County, *Hitchcock* 2506. Madison, *Combs* 292. Suwanee County, *Hitchcock* 2499. Lake City, *Combs* 158½. Jacksonville, *Curtiss* 5092 in part, 5098; *Kearney* 154a. Pablo Beach, *Chase* 7059. Gainesville, *Chase* 4255; *Combs* 718, 726. Ellzey, *Combs* 810. Lake Butler, *Baker* 302. Kissimmee, *Swallen* 234. Hillsborough County, *Fredholm* 6399. Fort Myers, *Hitchcock* 501.

KENTUCKY: Pineville, *Garman* in 1911.

TENNESSEE: Hollow Rock, *Eggert* in 1897; *Gattinger* in 1886. Robertson County, *Gattinger* in 1886. Knoxville, *Scribner* in 1893. Roan Mountain, *Hitchcock* 3881.

ALABAMA: Lookout Mountain, *Ruth* 80. Scottsboro, *Chase* 4505. Valley Head, *Ruth* 22. Dixie, *Tracy* 8040. Selma, *Kearney* 5, 11. Chehaw, *Hitchcock* 3880. Auburn, *Pollard & Maxon* 69, 75. Tuskegee, *Carver* 50, 75. Union Springs, *McCarthy* 309. Mobile, *Mohr* in 1884. Without locality, *Buckley*.

MISSISSIPPI: Panola County, *Eggert* in 1896. Lake, *Tracy* 1561, 1571. Nicholson, *Kearney* 347, 351, 354. Biloxi, *Kearney* 308; *Tracy* 1886, 1887, 1892, 1896, 3775, 3866, 4625, 4626; *Tracy & Ball* 20.

LOUISIANA: Calhoun, *Ball* 48½. Lake Charles, *Tracy* 3685. Covington, *Arsène* 11009, 11401½.

TEXAS: Texarkana, *Plank* 94; *Tharp* 2014. Beckville, *Reverchon* 3464. Industry, *Wurzlów* in 1892. Hempstead, *Hall* 809.

109. *Paspalum longipilum* Nash

Paspalum laeve var. *pilosum* Scribn. Tenn. Agr. Exp. Sta. Bull. 7: 34. 1894. No particular locality in Tennessee is given for the variety. In the Scribner Herbarium, now in the United States National Herbarium, is a specimen collected at Madisonville, Tennessee, by F. L. Scribner, and marked in his hand "*Paspalum laeve* Mx. var.," which is probably the type.

Paspalum longipilum Nash, Bull. N. Y. Bot. Gard. 1: 435. 1900. "Type collected by the writer [G. V. Nash] at Eustis, Lake Co. [Fla.] * * * no. 1027." This specimen is in the herbarium of the New York Botanical Garden and duplicates of it are in the National Herbarium. The sheaths, especially the lower, are conspicuously pilose with long spreading hairs; the blades are long-pilose on the upper surface and, except for a few hairs on the midvein, glabrous beneath.

Paspalum plenipilum Nash in Britton, Man. 73. 1901. "In dry places, N. J." The type, in the herbarium of the New York Botanical Garden, was collected in the vicinity of Clifton, Passaic County, N. J., by George V. Nash, August 31, 1892. In this specimen the sheaths are pilose, but less conspicuously so than in

the type of *P. longipilum*; the blades are pilose on both surfaces, more sparsely so beneath.

DESCRIPTION

Similar to *P. laeve*, the culms usually ascending or spreading, the leafy shoots at base mostly fewer, a raceme-bearing branch often borne (usually hidden) in next to the lowest sheath; sheaths pilose with long hairs, often conspicuously so, but sometimes very sparsely; blades usually flat, pilose on both surfaces or glabrous or nearly so beneath, commonly less erect than in *P. laeve*; racemes 2 to 6, commonly 2 or 3, on the average more lax and spreading than in *P. laeve*; spikelets 2.5 to 2.8, rarely to 3 mm. long, 2 to 2.4 mm. wide, the fruit usually covered at maturity, the sterile lemma often tinged with russet.

This species is fairly distinct from *P. laeve*, but a few specimens grade into the form represented by the type of *P. australe*. A few others, with spikelets 2.8 to 3 mm. long, are scarcely distinguishable from *P. circulare*, but the spikelets are less rounded and the glume and sterile lemma rather thicker.

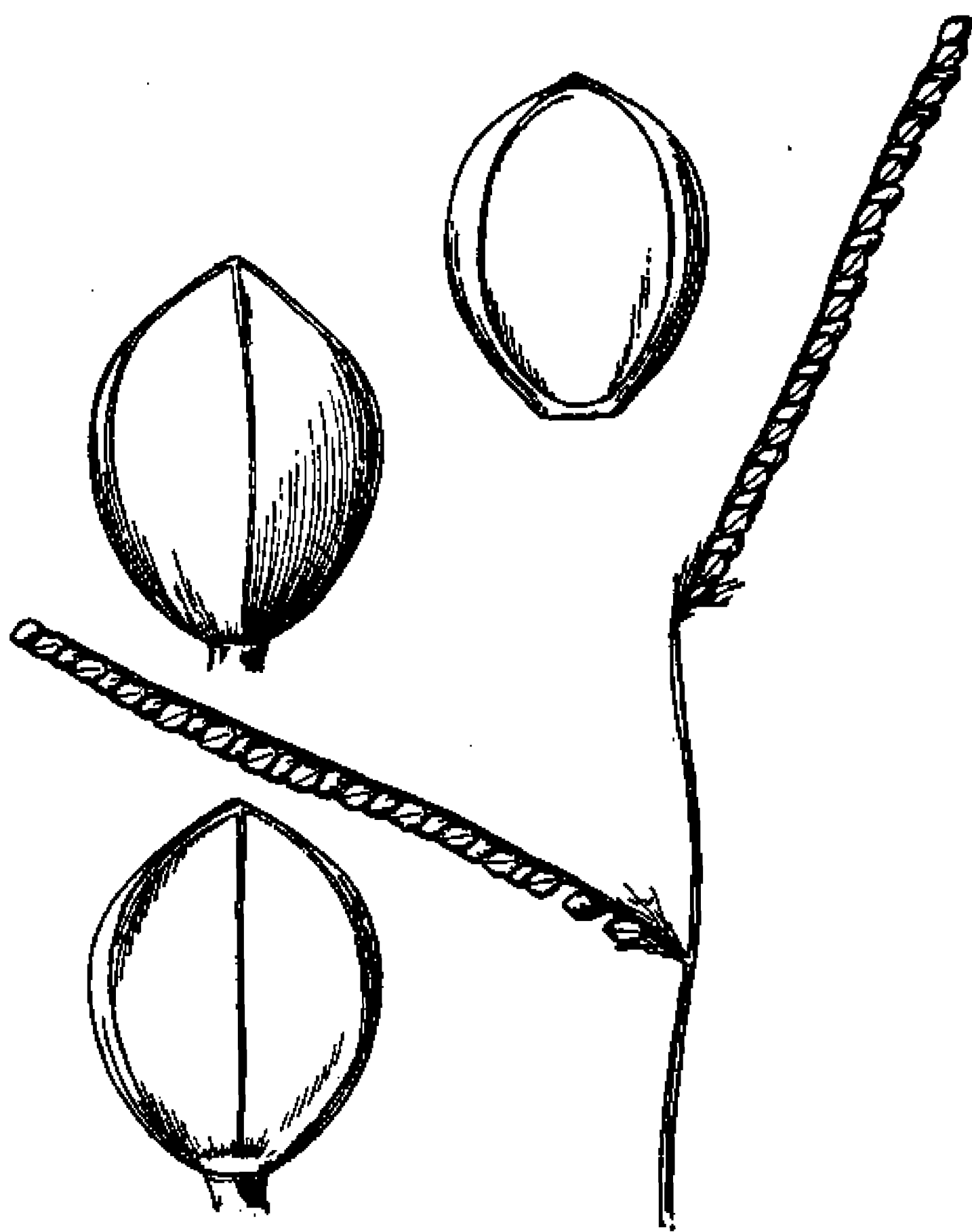


FIGURE 111.—*P. longipilum*. From type collection

This species is common in the savannas and flatwoods of Florida where it is an important constituent of native pastures.

DISTRIBUTION

Damp mostly sandy soil, savannas, open woods, and wet pine barrens, New York to Tennessee and Florida and west to Texas.

NEW YORK: Bronx Park, *Nash* in 1896.

NEW JERSEY: Cold Spring, *Pennell* 2144; *Stone* 8232.

PENNSYLVANIA: Allentown, *Pretz* 1403. Without locality, *Brinton*.

DELAWARE: Townsend, *Canby* in 1865.

MARYLAND: Prince George County, *Smith* 2754. California, *Hitchcock* 7863.

Chesapeake Beach, *Chase* 6137. Ocean City, *Commons* 312.

DISTRICT OF COLUMBIA: Washington, *Mohr* in 1882; *Ward* in 1878.}

VIRGINIA: Hunting Creek, *McAtee* 2782. Portsmouth, *Chase* 3684; *Noyes* 109½, 110. Norfolk, *Kearney* 296.

NORTH CAROLINA: French Broad River, *J. D. Smith* in 1880. Asheville, *Hitchcock* 3882. Biltmore, *Hitchcock* 3883. Wilmington, *Hitchcock* 3884, 3885.

SOUTH CAROLINA: Ebenezer, *Bartlett* 2836. Floyds, *Norton* 358b. Sumter, *J. D. Smith* in 1884.

GEORGIA: Rome, *McCarthy* in 1888. Cedartown, *Ball* in 1904. Athens, *Harper* 114. Stone Mountain, *Hitchcock* 3886. Thomson, *Bartlett* 1503. Savannah, *Kearney* 184. Camilla, *Tracy* 3670.

FLORIDA: Pensacola, *Combs* 528. Apalachicola, *Biltmore Herb.* 8338. Milton, *Swallen* 416. Marianna, *Swallen* 538. Tallahassee, *Nash* 2344. Monticello, *Combs* 309. Chattahooche, *Tracy* 3677. Lake City, *Combs* 77, 197; *Hitchcock* 2504. Jacksonville, *Combs* 2; *Curtiss* 4990 in part. Gainesville, *Chase* 4230; *Combs* 759. Waldo, *Combs* 693. Homosassa, *Combs* 948. Crystal, *Combs* 1002. Eustis, *Chase* 4057, 4083; *Hitchcock* 2507; *Nash* 507, 600, 1027, 1340, 2080. Orlando, *Baker* 303. Orange City, *Hood* 28. Sanford, *Chase* 4040. Titusville, *Chase* 3983. Merritt Island, *Swallen* 178. Tampa, *Combs* 1351. Bartow, *Combs* 1217½. Fort Myers, *Chase* 4145.

TENNESSEE: Madisonville, *Scribner* in 1891. Knoxville, *Scribner* in 1889. Wolf Creek, *Kearney* 944. Without locality, *Gattinger* in 1878.

ALABAMA: Birmingham, *Hitchcock* 3887. Auburn, *Tracy* 3740, 3792. Tuskegee, *Carver* 24, 51, 74. Spring Hill, *Bush* 207. Mobile, *Hitchcock* 3888; *Mohr* in 1885.

MISSISSIPPI: Waynesboro, *Kearney* 170. Biloxi, *Tracy* 3739.

LOUISIANA: Natchitoches, *Ball* 165. Baton Rouge, *Hitchcock* 3889. Covington, *Arsène* 11015½.

TEXAS: Waller, *Hitchcock* 1188.

110. *Paspalum circulare* Nash

Paspalum circulare Nash in *Britton Man.* 73. 1901. "In moist or dry fields, N. Y. to N. C.; also in Mo." In the herbarium of the New York Botanical Garden is a specimen marked in Nash's handwriting "Type of *Paspalum circulare* Nash." This was collected in Bergen County, New Jersey, August 18, 1889, by George V. Nash.

Paspalum praelongum Nash in *Small, Fl. Southeast. U. S.* 74, 1326. 1903. "Type, Washington, D. C., Nash, Sept. 5, 1894, in *Herb. Nash.*" This specimen, now in the herbarium of the New York Botanical Garden, is a stouter plant than the type of *P. circulare*, the sheaths rather sparsely pilose, the blades pilose on both surfaces, some of them as much as 30 cm. long.

Paspalum laeve circulare Stone, *Ann. Rep. N. J. Mus.* 1910: 187. 1911. Based on *P. circulare* Nash.

DESCRIPTION

An ascending perennial with leafy shoots at the base, in dense tufts; culms few to several, commonly 30 to 80 cm., sometimes to 1.3 meters, tall, compressed, glabrous, often with branches bearing one

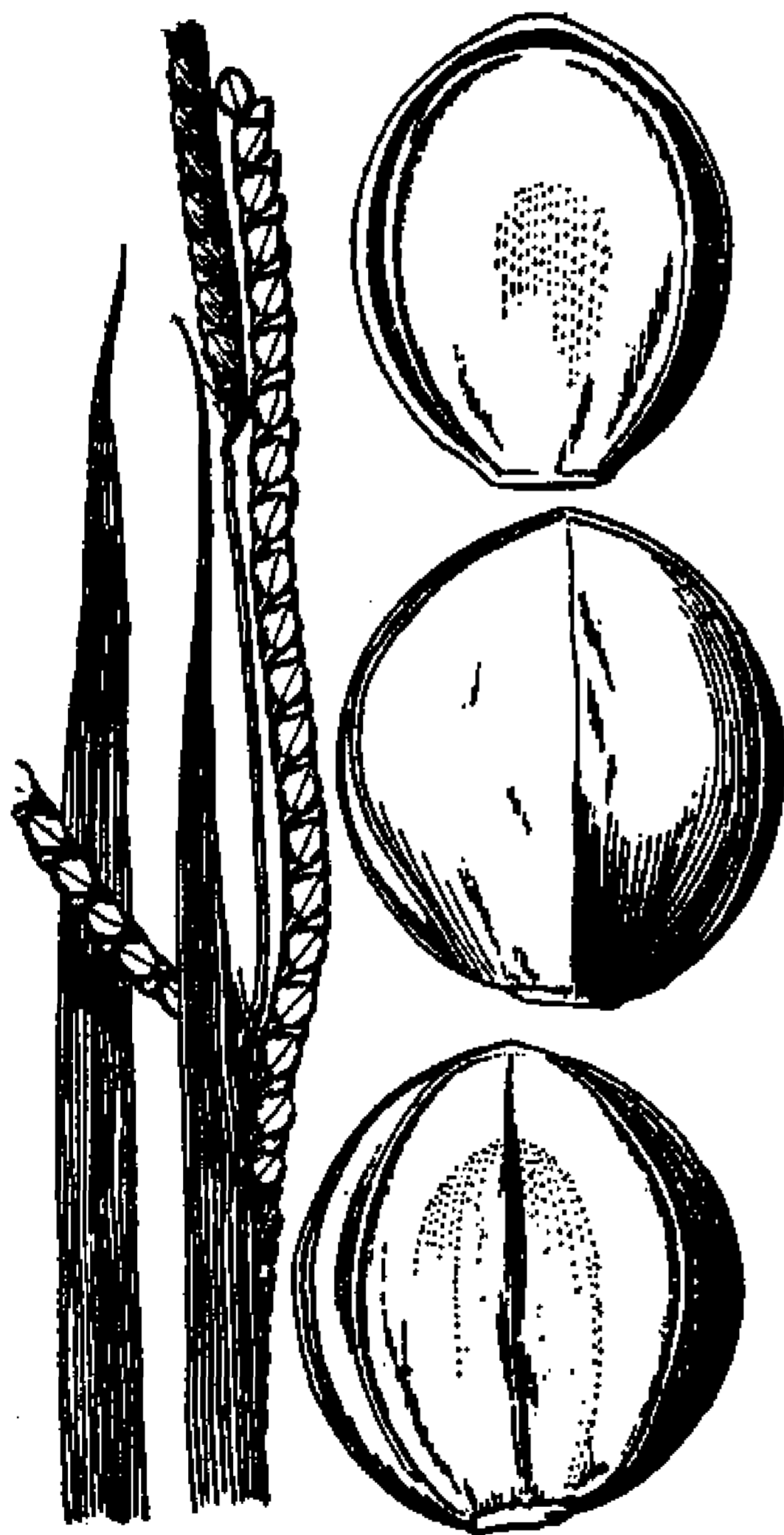


FIGURE 112.—*P. circulare*. From type and *Chase* 3836

leaf and a single raceme more or less concealed in the middle sheaths, rarely with a longer branch from a lower node; sheaths compressed, rather thin and loose, mostly elongate, the lower sparsely to densely pilose or glabrous, the upper glabrous or nearly so; ligule brown, 2 to 3 mm. long; blades flat, erect or sub-erect, rather thin, scarcely narrowed at the base, commonly 15 to 30 cm. long,

or those of the midculm sometimes longer, 5 to 10 mm. wide, commonly equaling or exceeding the inflorescence, sometimes reaching only to its base, or the inflorescence short-exserted, usually pilose on the upper surface, at least toward the base, and glabrous beneath, sometimes pilose on both surfaces; racemes 2 to 7, mostly suberect or the lower spreading, 5 to 12 cm. long, the common axis slender, glabrous; rachis scarcely 1 mm. wide, with a few long hairs at the base; spikelets approximate, 2.8 to 3.2 mm. long, nearly orbicular; glume and sterile lemma equal, covering the fruit, 5-nerved, rather thin, the cells showing more plainly than in *P. laeve* and *P. longipilum*; fruit nearly the size and form of the spikelet.

The greater amount of material of this species is reasonably distinct, differentiated from *P. laeve* by stouter culms with longer blades and thicker racemes of larger rounder spikelets. But nearly glabrous plants of drier ground are often more slender, with shorter blades, and are scarcely distinguishable from *P. laeve*. The larger plants with rather densely pilose lower sheaths are the form described as *Paspalum praelongum*, but pubescence is not coupled with larger size. In the material distributed under *Amer. Gr. Nat. Herb.* 969 for example, the culms are 1 to 1.3 meters tall, but are glabrous or nearly so.

Paspalum circulare is the leafiest of the *Laevia* group and is a palatable forage grass. In southern Indiana it forms an important constituent of the native pasture.

DISTRIBUTION

Fields and meadows and open waste ground, Connecticut to North Carolina and Mississippi and west to Kansas and Texas.

CONNECTICUT: Orange, *Woodward* in 1910; *Woodward & Bissell* 5846. Franklin, *Woodward* in 1910. Groton, *Bissell* in 1905.

NEW YORK: New York, *Bicknell* in 1896. Yonkers, *Nash* in 1898.

NEW JERSEY: Woodbridge, *Lighthipe* in 1891. Cold Spring, *Stone* in 1910. Monmouth County, *Knieskern*. Lawnside, *Stone* 10743.

PENNSYLVANIA: Lehigh County, *Krout*. Conewago, *Heller* 701. Reinholdsville, *Porter* in 1866. Chambersburg, *Porter* in 1897.

INDIANA: Atherton, *Deam* 24010. Linton, *Deam* 24042. Madison, *Deam* 18846. Huntingburg, *Deam* 28316. State Reservation, Clarke County, *Deam* 7538. Laconia, *Deam* 30189. Hovey Lake, *Deam* 10155. Mt. Vernon, *Deam* 29090. Chrisney, *Deam* 28973. Vincennes, *Deam* 45566.

ILLINOIS: Marshall, *Bock & Chase* 18½. Robinson, *Bock & Chase* 28. Flat Rock, *Bock & Chase* 36. Maude, *Bock & Chase* 50. Browns, *Bock & Chase* 53. Wabash County, *Schneck* in 1880. Albion, *Bock & Chase* 57. Brownsville, *Bock & Chase* 62, 72, 74. Harrisburg, *Bock & Chase* 67, 69, 70. Richland County, *Ridgway* 3250, 3314. Eichorn, *Bock & Chase* 77, 78. Homberg, *Bock & Chase* 101. Metropolis, *Bock & Chase* 103, 106. Grand Chain, *Bock & Chase* 142. Unity, *Bock & Chase* 162. Mill Creek, *Bock & Chase* 165, 168, 174. Carbondale, *Bock & Chase* 178. Ruma, *Bock & Chase* 188. Red Bud, *Bock & Chase* 194.

MISSOURI: Sheffield, *Bush* 5086, 5087. Allenton, *Letterman* in 1897. Webb City, *Bush* 5183; *Palmer* 3067, 31488. Springfield, *Hoover* in 1897; *Standley* 1802, 8581, 9080, 9579, 9726, 9769. Cedar Gap, *Metcalf* 915. Greene County, *Bush* 107. Carthage, *Palmer* 3140. Monteer, *Bush* 8723, 8723 A. Purdy, *Bush* 3248. Howell County, *Bush* 59. Poplar Bluff, *Letterman*. McDonald County, *Bush* 63. Delta, *Palmer* 31640. Paw Paw, *Bush* 213.

KANSAS: Cherokee County, *Hitchcock* 872.

DELAWARE: Wilmington, *Commons* 86.

- MARYLAND: Riverdale, *Chase* 3836. Berwyn, *Chase* 9945, 9946, 9965, 9967. Chevy Chase, *Chase* 9969.
- DISTRICT OF COLUMBIA: Washington, *Vasey* in 1882; *Ward* in 1877.
- VIRGINIA: Arlington, *Ball & Paddock* 47; *Chase* 3021½. Hampton, *Churchill* in 1927.
- WEST VIRGINIA: Summersville, *Univ. Exp. Sta.*
- NORTH CAROLINA: Chapel Hill, *Coker* 35. Graphiteville, *Standley & Bollman* 10098. Tar River, *McCarthy* in 1884. Heiliga Mill, *Small & Heller* 198. Greenville, *Chase* 4571.
- KENTUCKY: Poor Fork, *Kearney* 195. Without locality, *Kearney* 253.
- TENNESSEE: Nashville, *Gattinger*. Knoxville, *Scribner* in 1889. Tullahoma, *Gattinger* 3570. Sumner County, *Gattinger* in 1883.
- MISSISSIPPI: Starkville, *Chase* 4442, 4447, 4450; *Kearney* 62; *Tracy* 1530. Centerville, *Tracy* 3687. Holly Springs, *Tracy* 1533. Without locality, *Tracy* 25.
- ARKANSAS: Fayetteville, *Hitchcock* 16096. Benton, *Greenman* 4297. Clay County, *Eggert* in 1896; Pine Bluff, *Eggert* in 1896; *Hitchcock* 16126. Fulton, *Bush* 887. Texarkana, *Heller* 4234. Winslow, *Ruth* 62. Hagler, *Chamberlain* 123. Central Arkansas, *Harvey* in 1884.
- LOUISIANA: Calhoun, *Ball* 48. Oberlin, *Ball* 189. Coushatta, *Ball* 117. Alexandria, *Ball* 172, 642. Abbeville, *Langlois* 19. Rayville, *Ball* 10. Baton Rouge, *Hitchcock* 3890.
- TEXAS: Texarkana, *Heller* 4193; *Tharp* 2016. Houston, *Hall* 810. Industry, *Wurzlöw* in 1892. Waller County, *Thurrow* in 1898. Brazos County, *Nealley* 91 in 1882. Tyler, *Reverchon* 2214. Corpus Christi, *Hitchcock* 3891. Without locality, *Nealley* in 1884, 1886, and 1889; *Plank* 46.
- OKLAHOMA: Sapulpa, *Bush* 691. Without locality, *Sheldon* in 1891.

111. *Paspalum praecox* Walt.

Paspalum praecox Walt. Fl. Carol. 75. 1788. No locality given, presumably from South Carolina. The type specimen, so far as known, is not in existence, not being in the Walter Herbarium in the British Museum.⁴⁴ The brief description is hardly sufficient to identify the species, but it does not disagree with the species to which Michaux,⁴⁵ Elliott,⁴⁶ and subsequent authors applied it. Walter does not mention the leaves; Michaux describes the plant, and Elliott the leaves, as glabrous.

DESCRIPTION

A slender erect perennial, consisting of small tufts of 1, rarely 2 or 3, flowering culms and, in spring, 1 to several leafy shoots arising from short scaly rhizomes, these shoots flowering in late summer and autumn and producing few to several short rhizomes with loose overlapping scales; culms simple, compressed, glabrous, 0.5 to 1 meter tall; sheaths compressed-keeled, the lower overlapping, commonly purplish, glabrous or the lower, especially of the young shoots, silky villous, rarely the others pilose at the summit; ligule brown, about 3 mm. long; blades usually folded at base, flat above, rather firm, ascending, 10 to 30 cm., commonly 15 to 25 cm., long, 3 to 7 mm. wide, the uppermost reduced, glabrous or sometimes pilose on the upper surface toward the base; racemes 2 to 8, commonly 4 to 6, narrowly ascending to arcuate-spreading, 2 to 7 cm. long, the common axis very slender; rachis about 1.5 mm. wide, purplish, pilose at the narrowed base; spikelets solitary or in pairs, commonly both in the

⁴⁴ See Hitchcock, Ann. Rep. Mo. Bot. Gard. 16: 42. 1905.

⁴⁵ Fl. Bor. Amer. 1: 44. 1803.

⁴⁶ Bot. S. C. & Ga. 1: 106. 1816.

same raceme, usually crowded, strongly flattened, 2.2 to 2.8 mm. long, 2 to 2.3 mm. wide, suborbicular, glabrous, yellowish green or purple-tinged; glume and sterile lemma equal, 5-nerved (lateral pair obscure), thin and fragile, under a lens minutely papillose-striate; fruit nearly the size and form of the spikelet, pale, under a lens strongly papillose.

DISTRIBUTION

Wet pine barrens, borders of cypress swamps, moist places in flatwoods, and wet savannas, in the Coastal Plain, North Carolina to central Florida and along the Gulf to Texas.

NORTH CAROLINA: Craven County, *McCarthy* in 1884. Wilmington, *Hitchcock* 224; *Kearney* 280. Between Greenville and Masonboro, *Chase* 4598. Commissary, *Chase* 7182. Without locality, *Delile*.

SOUTH CAROLINA: Sumter County, *Stone* 377.

GEORGIA: Rome, *McCarthy* in 1888. Jessup, *Kearney* in 1893. Manor, *Tabor* 40.

FLORIDA: Suwanee County, *Hitchcock* 2500. Jacksonville, *Combs* 24; *Curtiss* 3569 in part, 4024, 4744 and in 1875; *Kearney* 143. Baldwin, *Combs* 62. Pablo Beach, *Chase* 7046. Duval County, *Fredholm* 5232; *J. D. Smith* 572. Lockhart, *Baker* 320. Grasmere, *Combs & Baker* 1142. Kissimmee, *Swallen* 275. Kicco, *Piper* in 1921. Without locality, *Chapman*; *Rugel* 368.

ALABAMA: Mobile, *Kearney* 54; *Mohr* in 1884.

MISSISSIPPI: Mississippi City, *J. D. Smith* 664. Beauvoir, *Tracy* 4500. Biloxi, *Tracy* 2026, 2048, 3666, 3867, 4499; *Tracy & Ball* 25, 26.

TEXAS: Hempstead, *Hall* 805. Without locality, *Nealley* 1886.

112. *Paspalum lentiferum* Lam.

Paspalum lentiferum Lam. Tabl. Encycl. 1: 175. 1791. "E Carolina D. Fraser." The type specimen, bearing the name in Lamarck's script, in the Lamarck Herbarium in Paris, is part of a single culm, 45 cm. long, with four racemes. The single leaf present is glabrous.

Paspalum lanuginosum Bosc; Beauv. Ess. Agrost. 12, 1812, nomen nudum. In the DeCandolle Herbarium is a specimen so named in Bosc's script, collected by him in Carolina. The sheaths are loosely silky-pilose.

Paspalum lanuginosum Willd.; Steud. Nom. Bot. ed. 2. 2: 271, 1841, as synonym of *P. lentiferum* Lam. Not *P. lanuginosum* Nees, 1829. In the Willdenow Herbarium is a specimen collected by Bosc, doubtless the same collection as that so named by Bosc himself (see paragraph above).

Paspalum curtisianum Steud. Syn. Pl. Glum. 1: 26. 1854. "M. A. Curtis legit in Carolina." The type specimen in the Steudel Herbarium, in the Paris Herbarium, bearing the name in Steudel's script, consists of two plants, one with two, the other with three racemes. The lower sheaths and lower part of the blades are softly villous.

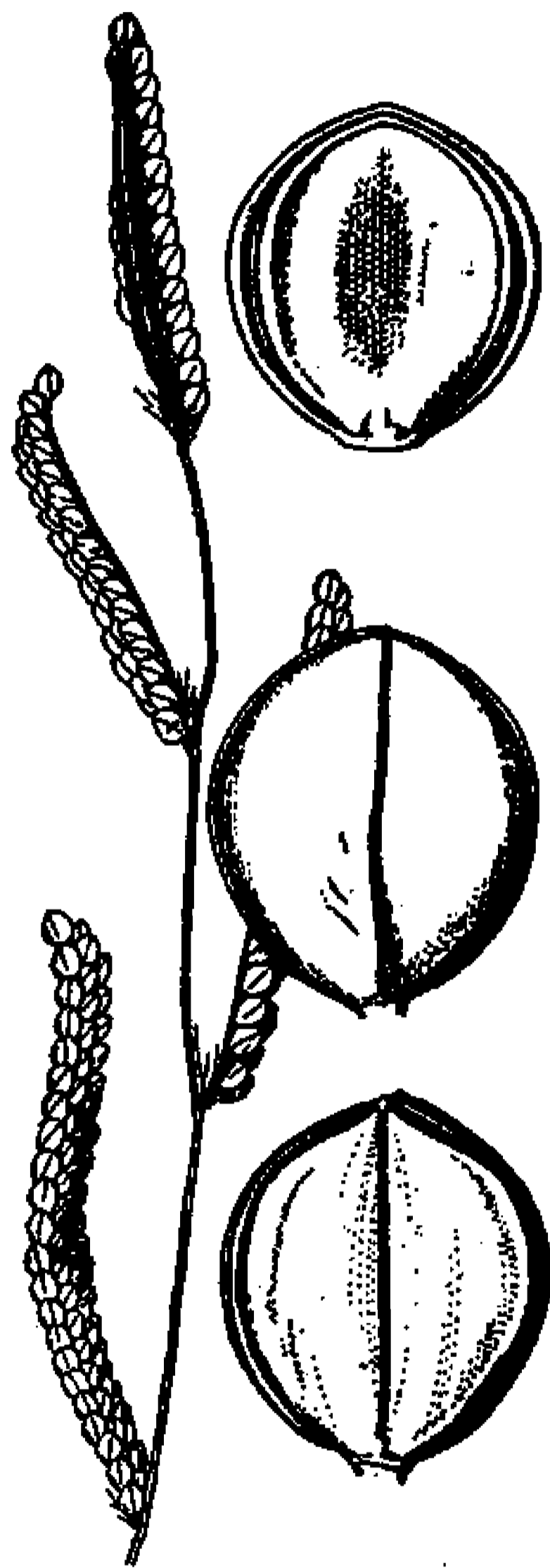


FIGURE 113.—*P. praecox*. From *Stone* 377

Paspalum praecox var. *curtisianum* Vasey, Bull. Torrey Club 13: 165. 1886. Based on *P. curtisianum* Steud.

Paspalum glaberrimum Nash in Small, Fl. Southeast. U. S. 76, 1326. 1903. "Type, Nash, Pl. Cent. Penins. Fla., no. 1619, in Herb. Nash." This specimen, now in the herbarium of the New York Botanical Garden, is a rather stout plant with sheaths pilose at the junction with the blade and blades pilose on the upper surface, the plant otherwise glabrous.

Paspalum tardum Nash in Small, Fl. Southeast. U. S. 76, 1326. 1903. "Type, Nash, Pl. Fla. no. 2047, 1895, in Herb. Nash." This specimen, now in the herbarium of the New York Botanical Garden, is a slender plant with blades pilose on the upper surface, glabrous beneath, and sheaths, except the lowermost, glabrous or sparsely papillose-pilose near the margin and summit.

Paspalum kearneyi Nash in Small, Fl. Southeast. U. S. 77, 1326. 1903. "Type, Nicholson, Miss., Kearney, no. 357, 1896, in Herb. C. U. [Columbia University]." The type is slender, like that of *P. tardum*, but the blades are conspicuously

pilose on both surfaces; the spikelets are 3 mm. long, but oval rather than orbicular.

Paspalum amplum Nash in Small, Fl. Southeast. U. S. 77, 1326. 1903. "Type, Marianna, Fla., Tracy, no. 3682, 1897, in Herb. Nash." This specimen, now in the herbarium of the New York Botanical Garden, is about 90 cm. tall, the lower sheaths appressed-villous, the others sparsely pilose at the summit, otherwise glabrous, the blades elongate, pilose at the base and short-pubescent on the upper surface.

The species described by LeConte⁴⁷ as *Paspalum virgatum* is, as shown by specimens from him in the Paris and Berlin herbaria, *P. lentiferum*. LeConte credits the name to Walter and cites *P. plicatulum* Michx. as a synonym. The description shows that LeConte must have confused the two species.

DESCRIPTION

An erect perennial of the same habit as *P. praecox*, the culms less slender than in that, sometimes robust and as much as 1.5 meters tall, the rhizomes on the average more numerous; sheaths usually not so strongly keeled as in *P. praecox*,

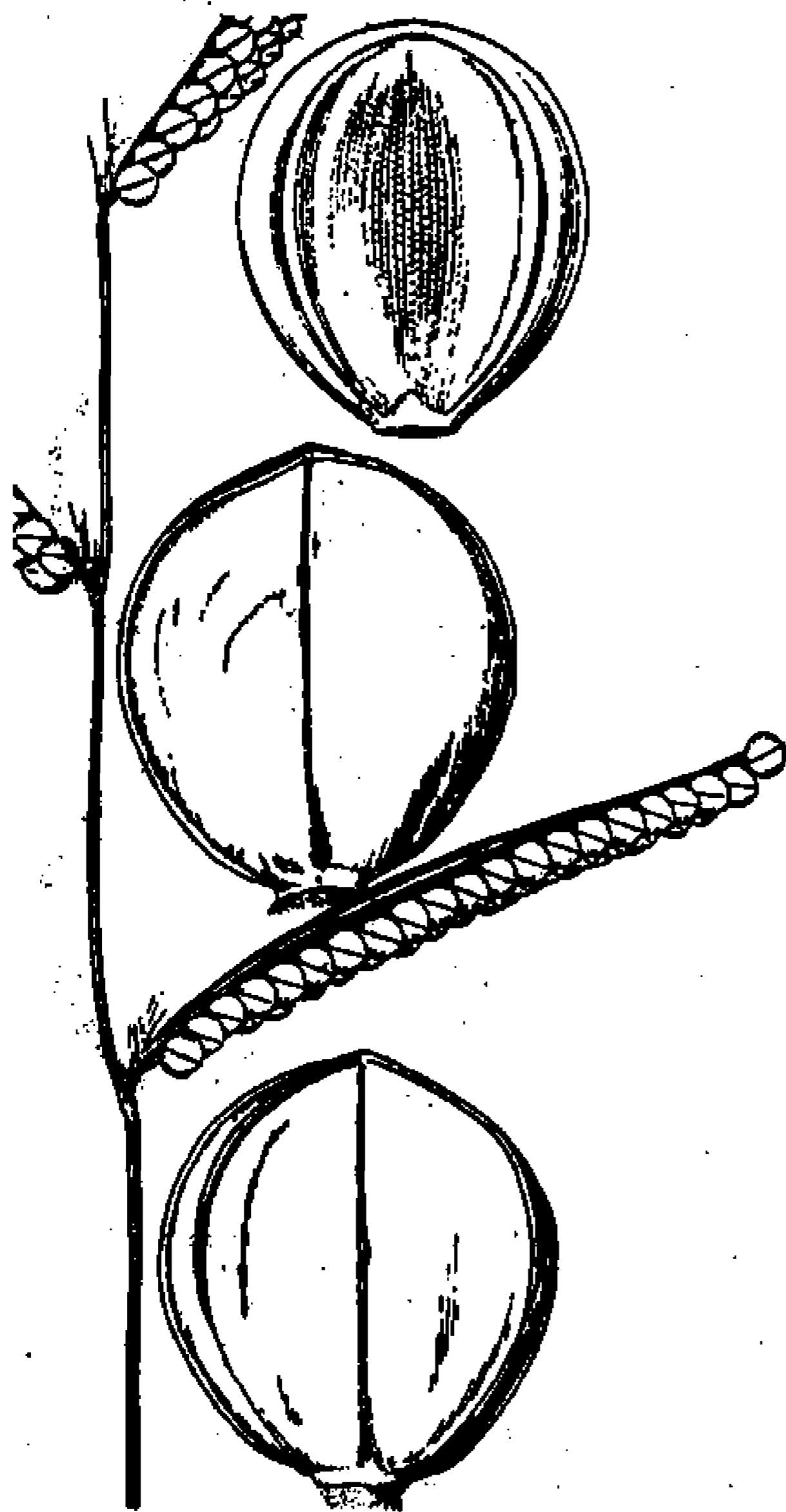


FIGURE 114.—*P. lentiferum*. From Harper 1629

from densely silky-villous; especially the lower ones, to glabrate; ligule brown, about 3 mm. long; blades firm, flat above or folded throughout, sometimes flexuous, ascending, 15 to 50 cm. long, 3 to 10 mm. wide, the uppermost reduced,

⁴⁷Journ. de Phys. 91: 284. 1820.

pilose, often conspicuously so, on both surfaces, or glabrous beneath, occasionally glabrate on the upper surface except at the base; racemes 2 to 9, commonly 4, or 5, usually spreading at maturity, 3 to 10 cm. long; rachis 1.5 to 1.7 mm. wide, pilose at the narrowed base; spikelets solitary or, more commonly, in pairs, usually crowded, 2.7 to 3.4 mm. long, broadly oval to orbicular, the glume and lemma in color, texture, and nerving like those of *P. praecox*.

This variable species intergrades with *P. praecox*, from which it is here delimited by the more robust culms, pilose foliage, and larger spikelets, but these three characters are not always found in the same specimen. The types of *P. tardum* and *P. kearneyi* are slender specimens approaching the intergrading forms.

DISTRIBUTION

Moist pine barrens, borders of flatwoods, and cypress swamps, and in savannas on the Coastal Plain, from North Carolina to southern Florida and along the Gulf to Texas.

NORTH CAROLINA: Wilmington, *Chase* 4606; *Hitchcock* 3892.

GEORGIA: Stone Mountain, *Hitchcock* 3893. Wrightsville, *Harper* 1335. Bulloch County, *Harper* 900. Coffee County, *Harper* 672. Cornelia, *Harper* 1486. Empress, *Harper* 1629.

FLORIDA: Avondale, *Combs* 485. Milton, *Chase* 4319; *Swallen* 446. Bay Head, *Combs* 632, 638. Apalachicola, *Chapman* (*Biltmore Dist.*) 3048a. Aspalaga, *Chapman* (*Biltmore Dist.*) 6075a. Lake City, *Rolfs* 767. Jacksonville, *Curtiss* 3569 in part, 3573 in part, 4990 in part, 5194, 5580. Pablo Beach, *Combs* 45. New River, *Hitchcock* 2498. Ellzey, *Combs* 815, 819. Crystal, *Combs* 1026. Homosassa, *Combs* 974, 975. Eustis, *Nash* 1619, 2047. Grasmere, *Combs & Baker* 1158. Fellsmere, *Tracy* 9388. Sanford, *Chase* 4038. Fort Florida, *Hood* 6. Eau Gallie, *Curtiss* 5728. Brevard County, *Fredholm* 6056, 6150. Titusville, *Chase* 3998. Kissimmee, *Swallen* 276. Osceola County, *Fredholm* 5950. Hernando County, *Hitchcock* 2505. Tampa, *Garber* in 1876. Bartow, *Combs* 1194½, 1202, 1229. Arcadia, *Combs* 1276. Fort Myers, *Hitchcock* 500, 3894; *Standley* 12975, 13073, 19042; *J. P. Standley* 117; *Westgate* 3460, 3621. Lemon City, *Eaton* 647. Without locality, *Chapman*; *Fredholm* 5232a; *Simpson* in 1889.

ALABAMA: Mobile, *Mohr* (*Herb. Geol. Surv.*) 1803; *Tracy* 6737. Baldwin County *Mohr* in 1878 and 1893.

MISSISSIPPI: Waynesboro, *Kearney* 132, 172. Nicholson, *Kearney* 357. Bay St. Louis, *Langlois* 22. Beauvoir, *Tracy* 4500. Biloxi, *Tracy* 3665, 3666a, 3744, 3865; *Tracy & Ball* 27. Ocean Springs, *Kearney* 290; *Tracy* 116, 117, 154. Scranton, *Pollard* 1206. Horn Island, *Tracy* 2864, 4627, 6472, 7401.

LOUISIANA: Oberlin, *Ball* 188. Covington, *Arsène* 11013, 11015, 11327, 12568. New Orleans, *Drummond* 443. Lake Charles, *Allison* 258; *Tracy* 3683.

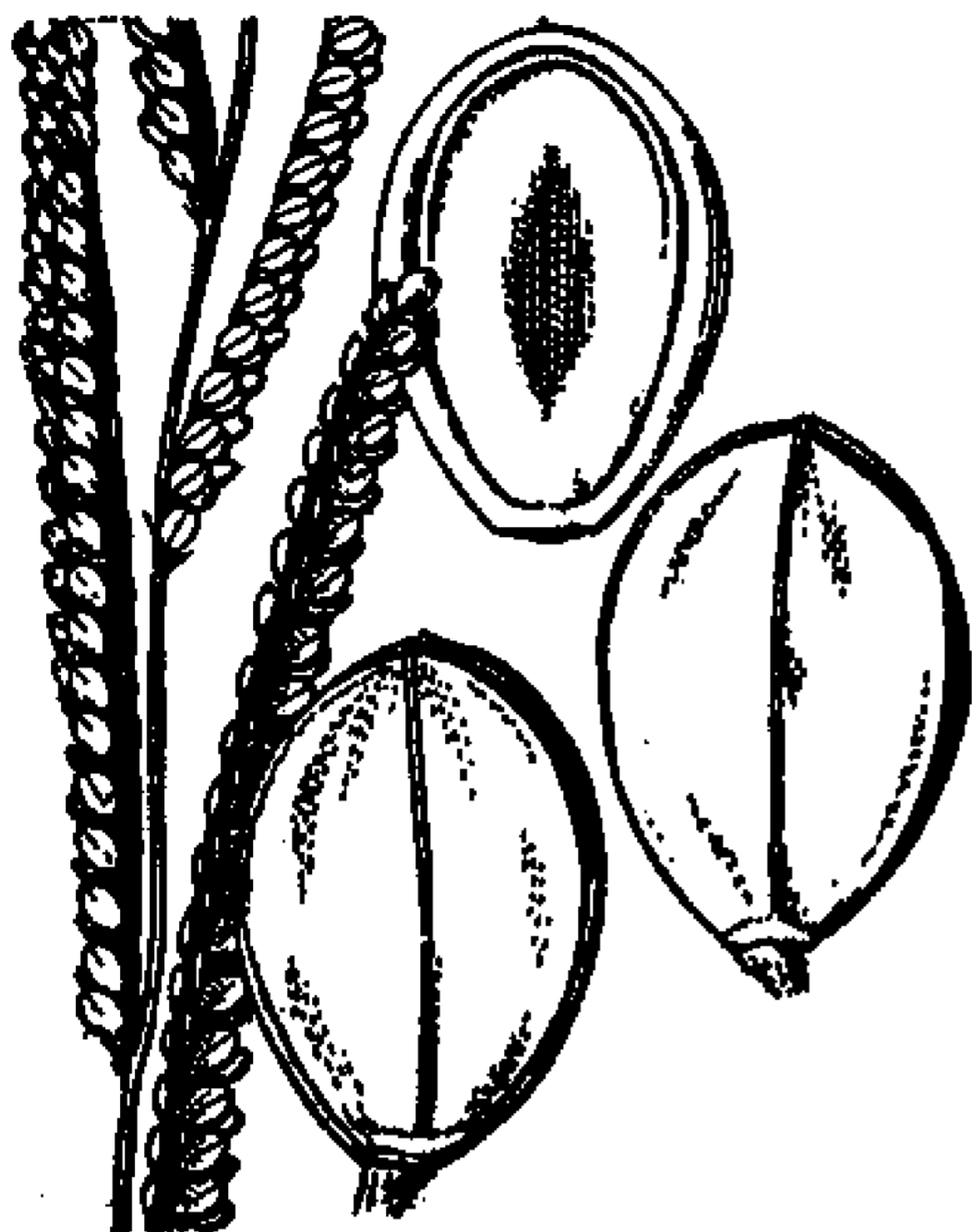
TEXAS: Hardin County, *Tharp* 3105. Houston, *Hall* 806. Harris County, *Thurrow* in 1888. Without locality, *Nealley* in 1884.

113. *Paspalum erectum* Chase, sp. nov.

DESCRIPTION

A slender tufted erect perennial; culms simple, about 1 meter tall, glabrous; nodes glabrous; sheaths overlapping, long-pilose toward the summit, sometimes densely so at the junction with the blade, the upper glabrous, the prophylla of the basal sheaths large and firm; ligule delicate-membranaceous, lacerate, a dense ring of long white hairs back of it; blades folded, ascending from an erect base,

15 to 30 cm. long, 2 to 5 mm. wide, the uppermost rudimentary, long-pilose toward the base on the upper surface, the margins very scabrous; racemes 4 or 5, erect or narrowly ascending, 4.5 to 8 cm. long, the slender rather stiff common axis 8 to 10 cm. long; rachis 1 mm. wide, scabrous and with a few long hairs at the base; spikelets in pairs, crowded, on minute scabrous pedicels, 2.8



mm. long, 2 mm. wide, rounded-obovate, depressed-convex on the back, pale, mostly tinged with faded purple, glabrous; glume and sterile lemma equal, 5-nerved, the marginal ones obscure, under a lens minutely papillose-roughened; fruit pale, papillose-striate.

Type in the U. S. National Herbarium, no. 929913, collected in prairie, Alzada, Colima, Mexico, altitude 450 meters, September 21, 1910, by A. S. Hitchcock (no. 7078).

This is the collection referred to *Paspalum glaberrimum* Nash by Chase in Hitchcock's Mexican Grasses.⁴⁸

Floridana.—Mostly robust perennials, with simple culms, flat blades, and heavy racemes of large turgid glabrous spikelets.

FIGURE 115.—*P. erectum*. From type specimen

Culms ascending; leaves crowded toward the base.....114. *P. difforme*.

Culms erect or suberect, leafy throughout.

Glume and sterile lemma slightly inflated and wrinkled, green.

Sheaths and blades hirsute.....115. *P. floridanum*.

Sheaths and blades glabrous or nearly so.....115a. *P. floridanum glabratum*.

Glume and sterile lemma not inflated and wrinkled, rusty-tinged.

.....116. *P. giganteum*.

114. *Paspalum difforme* LeConte

Paspalum difforme LeConte, Journ. de Phys. 91: 284. 1820. Described from Georgia. There are two specimens so named in LeConte's script, one in the LeConte Herbarium in the Academy of Natural Sciences, Philadelphia, with three racemes, and one in the Paris Herbarium, with two inflorescences, one of these with 3, the other with 4 racemes. LeConte's description reads "spicis 3-4," for which reason the Paris specimen is taken as the type. By a typographical error the specific name is spelled "Clifforme."

DESCRIPTION

An ascending perennial, the culms solitary or few from a short knotty rhizome usually with a few leafy sterile shoots at base; culms simple, 35 to 75 cm. tall, rarely taller, compressed, glabrous; nodes glabrous; leaves commonly crowded at the base, the upper blade usually below the middle of the culm, the upper sheath bladeless; sheaths keeled, glabrous or pilose on the keel and margin, or the lowermost sometimes pilose throughout, the lower short and overlapping, the upper elongate; ligule rather firm, about 2 mm. long; blades flat from a folded base, firm, commonly stiffly ascending at a uniform angle, 7 to 25 cm., commonly 10 to 15 cm., long, 5 to 10 mm. wide, pilose on the upper surface toward the base,

⁴⁸ Contr. U. S. Nat. Herb. 17: 236. 1913.

sometimes to the apex, rarely pilose on both surfaces, or glabrous; racemes 2 or 3, rarely 1 or 4, ascending to suberect, thick, 3.5 to 8 cm., rarely 10 cm., long, the common axis slender; rachis about 1 mm. wide, pilose at the base, occasionally sparsely ciliate to near the summit, commonly strongly zigzag; spikelets in pairs (one of the pair sometimes rudimentary), usually crowded, 3.5 to 4 mm. long, about 3 mm. wide, oval to obovate, turgid; glume and sterile lemma equal, covering the fruit at maturity, firm and papery, somewhat inflated and irregularly wrinkled, 5-nerved, the lateral nerves obscure; fruit 3 to 3.5 mm. long, 2.3 to 2.5 mm. wide, pale or tawny.

This species is closely related to *P. floridanum* and a few of the more pubescent specimens approach that species.

DISTRIBUTION

Moist sandy soil in open ground and in flatwoods, in the Coastal Plain, Georgia, to Orange County, Florida, and west near the Gulf to Louisiana.

GEORGIA: Thalman, *Chase* 7060.

FLORIDA: Suwanee County, *Hitchcock* 3895. Wewahitchka, *Chapman* (*Biltmore Dist.*) 3044b in part. Jacksonville, *Curtiss* 5021; *Hitchcock* 3896. Duval County, *Curtiss* 3570.

Orange Bend, *Chase* 4110.

ALABAMA: Tuskegee, *Carver* 83. Mobile, *Kearney* 38; *Mohr* in 1883, 1888, 1891, and 1892.

MISSISSIPPI: Bay St. Louis, *Langlois* 20. Biloxi, *Chase* 4347½; *Tracy & Ball* 32. Ocean Springs, *Kearney* 296; *Tracy* 100.

LOUISIANA: Covington, *Arsène* 11777.

115. *Paspalum floridanum* Michx.

Paspalum floridanum Michx. Fl. Bor. Amer. 1: 44. 1803. "Hab. in Florida et Georgia." The type, in the Paris Herbarium, is a single scarcely mature plant about 60 cm. tall, the lowermost sheaths pubescent, the others glabrous, the three erect racemes about 6 cm. long. The label reads "*Paspalum floridanum*, Georgia et Florida."

Paspalus macrospermus Flügge, Monogr. Pasp. 172. 1810. "In Carolina legit Oculatissimus Bosc." The type has not been located. In the Vahl Herbarium in the Copenhagen Herbarium is a Bosc specimen from Carolina so named which agrees with Flügge's description and may be part of the type collection. In the Willdenow Herbarium a specimen of *Paspalum bosceanum* is labeled "*Paspalum glabrum*" with "*macrospermum*" added. Flügge cites "*Pasp. glabrum* Bosc ined." as synonym, but this specimen does not agree with Flügge's description.

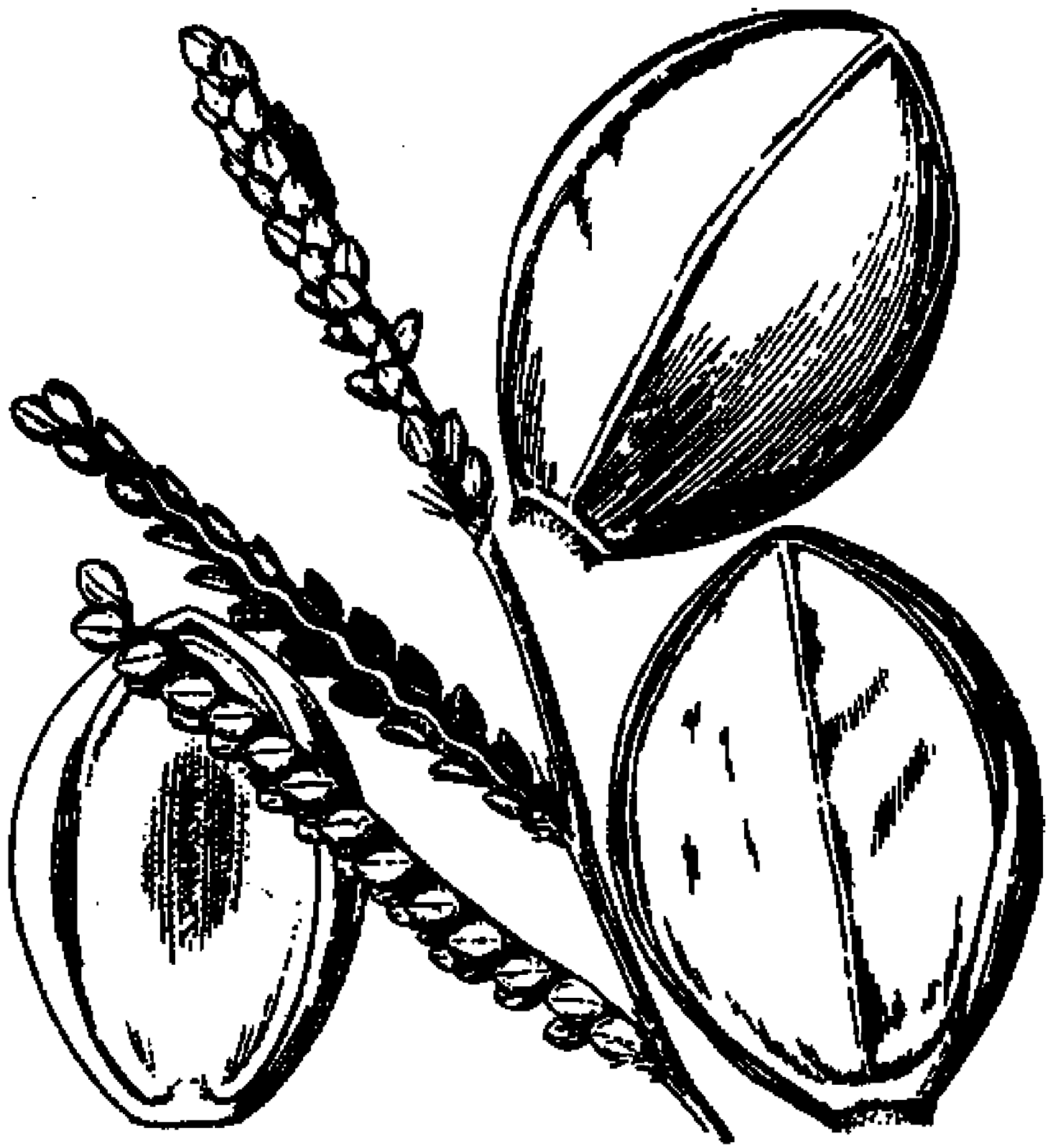


FIGURE 116.—*P. difforme*. From type specimen

Paspalum glabrum Bosc; Flüge, Monogr. Pasp. 172. 1810, as synonym of *P. macrospermum*. Bosc's specimen so labeled in the herbarium of Padua is *P. floridanum*. Bosc sent out other species under this name. Two of his specimens so named are in the Delessert Herbarium; one is *P. lentiferum*, the other *P. laeve*. One in the Florence Herbarium and another in the Willdenow Herbarium are *P. boscianum*.

Paspalum laevigatum Bosc; Poir. Encycl. Suppl. 4: 313, 1816, as synonym of *P. floridanum*.

Paspalum laeve var. *floridanum* Wood, Class-book 782. 1861. Presumably based on *P. floridanum* Michx., though only *P. macrospermum* Flüge is cited as synonym.

DESCRIPTION

An erect perennial, the culms solitary or few together from short stout scaly rhizomes, simple, from rather slender to stout, 0.8 to 2 meters, commonly 1 to 1.5 meters, tall, compressed, glabrous; leaves rather numerous, several crowded

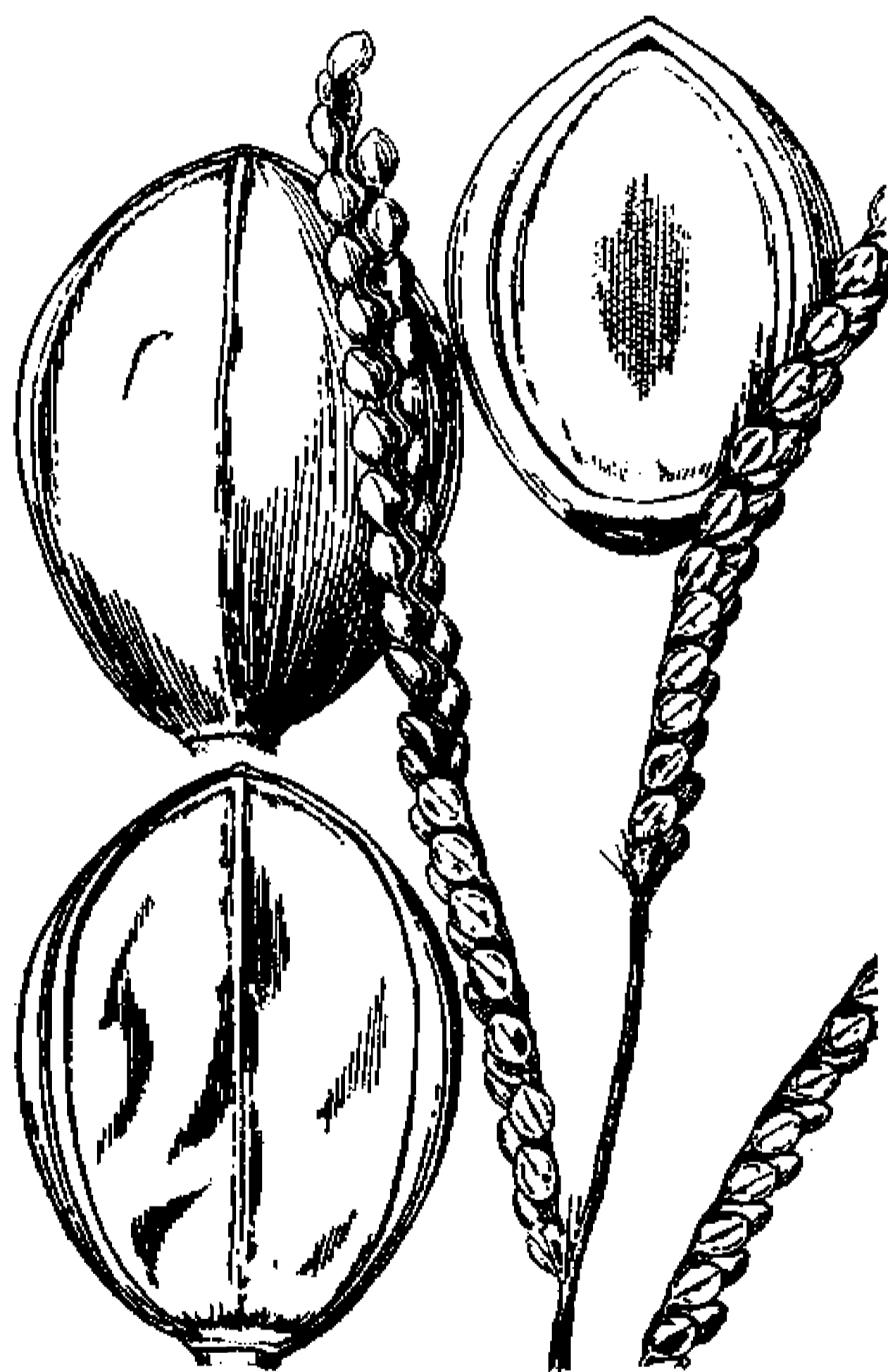


FIGURE 117.—*P. floridanum*. From type specimen and Chase 4221

at the base, the sheaths, especially the lower, mostly overlapping, keeled, from nearly or quite glabrous to densely rather harshly tawny-villous; ligule firm, 2 to 3 mm. long; blades firm, commonly folded at base and flat above, sometimes folded throughout or subinvolute, mostly ascending or with the summits spreading, 12 to 50 cm. long, 4 to 10 mm. wide, the upper reduced, from at least pilose on the upper surface at base to densely villous like the sheaths, usually villous on the upper surface and glabrate beneath; racemes usually 2 to 4, sometimes 5 or 6, rarely more or solitary, 4 to 12 cm. long, thick, usually suberect or ascending, or the whole inflorescence slightly nodding, the common axis slender; rachis 1 to 1.5 mm. wide, usually strongly zigzag, pilose at the base, scabrous and sometimes sparsely long-ciliate throughout; spikelets in pairs (one of the pair sometimes rudimentary), crowded, 3.6 to 4 mm. long, 2.8 to 3.1 mm. wide, usually 4 mm. long and 3 mm.

wide, oval, pale; glume and sterile lemma equal, scarcely covering the fruit at maturity, firm and papery, slightly inflated, irregularly wrinkled, 5-nerved; fruit about 3.5 mm. long and 2.5 mm. wide, oval, light brown, under a lens minutely papillose-striate.

Tracy's no. 3689 consists of several large plants approaching var. *glabratum*, in which several of the racemes are forked.

DISTRIBUTION

Low moist sandy soil, pine woods, flatwoods, savannas, and low prairies, in the Coastal Plain from Virginia to central Florida and along the Gulf to Texas, and north in the valleys to Missouri and Oklahoma.

- MISSOURI: Webb City, *Palmer* 970.
- VIRGINIA: Parhams Point, *Ward* in 1885. Williamsburg, *Grimes* 3218. Dismal Swamp, *Chase* 3644. Norfolk, *Jensen* in 1906. Clapham Junction, *Mackenzie* 1718. Princess Anne County, *Kearney* 2168.
- NORTH CAROLINA: Bolton, *Heller* 14117. Wilmington, *Hitchcock* 3898; *Kearney* 262; *McCarthy* in 1885. Between Greenville and Masonboro, *Chase* 4587. Without locality, *McCarthy* in 1884.
- SOUTH CAROLINA: Aiken, *Ravenel* in 1869 and 1882. Florence, *Ball* 688. Orangeburg, *Hitchcock* 29. Floyds, *Norton* 358c.
- GEORGIA: Thomasville, *Tracy* 3671. Americus, *Tracy* 3668. Sumter County, *Harper* 477. Savannah, *Kearney* 179. Ruskin, *Ricker* 910.
- FLORIDA: Avondale, *Combs* 492. De Funiak Springs, *Combs* 471. Chipley, *Combs* 540, 594. Bay Head, *Combs* 636, 637. Marianna, *Tracy* 3669. Wewahitchka, *Chapman* (*Biltmore Dist.*) 3044b. Chattahoochee, *Tracy* 3676, 3684. Monticello, *Combs* 343a. Madison, *Combs* 239. Lake City, *Rolfs* 820. Jacksonville, *Curtiss* 5517, 5750; *Kearney* 149, 151, 153, 165. Hastings, *Tracy* 8848. Waldo, *Combs* 701. Gainesville, *Chase* 4221. Levy County, *Hitchcock* 2508. Orange Bend, *Chase* 4109.
- TENNESSEE: Jackson, *Bain* 183.
- ALABAMA: Selma, *Kearney* 13. Chehaw, *Hitchcock* 3897. Tuskegee, *Carver* 89. Bolling, *J. D. Smith* in 1884. Tensaw, *Tracy* 8024. Spring Hill, *Bush* 334. Mobile, *Kearney* 37, 55; *Mohr* in 1878, 1884, 1888, 1890, and 1896. Without locality, *Winchell* 333.
- MISSISSIPPI: Lake, *Tracy* 1560. Waynsboro, *Kearney* 143. Nicholson, *Kearney* 345. Bay St. Louis, *Langlois* 21. Biloxi, *Chase* 4326, 4329½, 4347; *Kearney* 205, 239; *Ricker* 852; *Tracy* 2040, 3689, 3690, 3692, 3694, 3743; *Tracy & Ball* 28, 29, 31; *Tracy & Lloyd* 450. Ocean Springs, *Kearney* 289; *Pollard* 1100; *Tracy* 23, 130, 7016. Bayou Porto, *Tracy* 4505. Cat Island, *Tracy & Lloyd* 435.
- ARKANSAS: Texarkana, *Letterman* in 1894. Fayetteville, *Hitchcock* 16079. Fulton, *Bush* 1049. Northwest Arkansas, *Harvey* 17, 18, and in 1884.
- LOUISIANA: Oberlin, *Ball* 186. Calcasieu, *Cocks* 2197. Calhoun, *Ball* 38. Alexandria, *Ball* 171. Lake Charles, *Allison* 51; *Chase* 4390; *Tracy* 3664. Covington, *Arsène* 11137, 11156, 11259, 11512, 11710, 12518, 12538, 12572; *Wurzlöw* in 1913.
- TEXAS: Weatherford, *Tracy* 8212. Fort Worth, *Hitchcock* 16137. Lake Worth, *Ruth* 1000. Dallas, *Reverchon* in 1900. Texarkana, *Heller* 4194. Bowie County, *Eggert* in 1896. Longview, *Letterman* in 1881. Hardin County, *Tharp* 3097. Houston, *Fisher* 110, 257. Waller County, *Thurrow* in 1898. Pierce, *Tracy* 7398. Brazos County, *Nealley* 89 in 1882.
- OKLAHOMA: Miami, *Stevens* 2302. Stillwater, *Featherly* in 1895.

115a. *Paspalum floridanum glabratum* Engelm.

?*Paspalum altissimum* LeConte, Journ. de Phys. 91: 285. 1820. "Habitat prope Salem Carolinae borealis." The specimen in the herbarium of the Academy of Natural Sciences, Philadelphia, bearing a ticket in LeConte's handwriting "*Paspalum altissimum* mihi," is a slender plant about 1.2 meters tall, with 2 racemes, blades pilose on the upper surface, and sheaths mostly pilose along the margin. This plant, referable to *P. floridanum*, does not agree with LeConte's description "Glabrum, * * * spicis 4-5 alternis * * * Gramen rigidum, quinque pedale," and is not taken as the type.⁴⁹ No other specimen so named by

⁴⁹ See footnote, p. 32.

LeConte has been found. The description would appear to have been drawn from such a plant as *Small & Heller* 200, from North Carolina, or from a tall, less conspicuously pubescent plant of *P. floridanum*, such as *Hitchcock* 29 from South Carolina. Because of the uncertainty this name is not taken up for the subspecies.

?*Paspalum laeve* var. *altissimum* Wood, Class-book 782. 1861. Based on *P. altissimum* LeConte.

Paspalum floridanum var. *glabratum* Engelm.; Vasey, Bull. Torrey Club 13: 166. 1886. No specimen nor locality is cited. In the United States National Herbarium are three specimens bearing this name in Vasey's script. Of these a complete plant collected by Doctor Mohr at Mobile, Ala., June, 1884, is selected as the type, the other two specimens lacking the base.

Paspalum glabratum Mohr, Bull. Torrey Club 24: 21. 1897. Based on *Paspalum floridanum* var. *glabratum* Engelm.

DESCRIPTION

More robust and taller than the species, sometimes geniculate at base, often producing a flowering branch from one of the middle nodes late in the season; foliage glabrous or pilose near the junction of the sheath and blade only, or the lowermost sheaths pilose; blades commonly less firm, longer and more often flat throughout; racemes on the average longer, usually more spreading.

Extreme specimens of this form appear quite distinct from the typical rather slender *P. floridanum* with villous foliage, but there are many plants with villous foliage as large as or larger than many of the glabrous plants referred to this subspecies. Besides these there are several tall robust plants with long spreading racemes, which have foliage conspicuously villous. Among the latter are *Bain* 183, *Noyes* 106, and *Tracy & Lloyd* 435. It might be better to include all under *P. floridanum*, but the extremes are so striking and relatively so numerous that it is more convenient to have distinct names for them.

DISTRIBUTION

Brackish marshes and low, sandy, mostly open ground, southern New Jersey to central Florida, west to Texas and southeastern Kansas.

NEW JERSEY: Cold Spring, *Pennell* 2168. Cape May, *Parker* in 1882.

KANSAS: Cherokee County, *Hitchcock* 873.

DELAWARE: Sussex County, *Commons* in 1875.

MARYLAND: Annapolis, *Bartlett* 3068. Anne Arundel County, *J. D. Smith* in 1879. Bay Ridge, *Scribner* in 1897. Ocean City, *Canby*; *Commons* 310. Eastern Shore, *Canby*.

VIRGINIA: Dismal Swamp, *Chase* 3645. Cape Charles City, *Canby & Rose* 805. Princess Anne, *Kearney* 2142.

NORTH CAROLINA: Heiligs Mill, *Small & Heller* 200. Salisbury, *Biltmore Herb.* 3044a. Raleigh, *Ashe*. Wadesboro, *J. D. Smith* in 1884. Columbus County, *McCarthy* in 1884. Eastern North Carolina, *McCarthy* in 1884 and 1885.

SOUTH CAROLINA: Lexington, *Corley* in 1879.

GEORGIA: Floyd County, *Chapman*. Thompsons Mills, *Allard* in 1908. Sumter County, *Harper* 623. Savannah, *Kearney* 185.

FLORIDA: Avondale, *Combs* 490. Bay Head, *Combs* 635. Monticello, *Combs* 343. Jacksonville, *Combs* 18; *Kearney* 161. Duval County, *Fredholm* 155. Homosassa, *Combs* 986. Orlando, *Baker* 300; *Combs* 1174.

ALABAMA: Eufala, *McCarthy*. Mobile, *Kearney* 56; *Mohr* 44 in 1884.

MISSISSIPPI: Starkville, *Chase* 4443; *Kearney* 66. Biloxi, *Chase* 4329; *Tracy* 2049, 3690, 3691, 3693, 3795, 8602; *Tracy & Ball* 30. Ocean Springs, *Pollard* 1118; *Tracy* 118.

ARKANSAS: Miller, *Eggert* in 1896.

TEXAS: Polytechnic, *Ruth* 258. Handley, *Ruth* 259. Terrell, *Hitchcock* 9213. Lake Worth, *Ruth* 1442. Greenville, *Tharp* 2012. Mineola, *Letterman* in 1882. Upshur County, *Palmer* 31721. Ennis, *Smith* in 1897. Troup, *Letterman* in 1882. College Station, *Hitchcock* 3899. Waller County, *Thurrow* in 1898. Houston, *Hall* 811. Wallisville, *Wallis* in 1879. Columbia, *Bush* 311. Galveston, *Hitchcock* 9214. Without locality, *Nealley* in 1886; *Reverchon* in 1879; *Wright*.

OKLAHOMA: Limestone Gap, *Butler* 20.

116. *Paspalum giganteum* Baldw.

Paspalum giganteum Baldw.; Vasey, Bull. Torrey Club 13: 166. 1886. No specimen nor locality is cited. In the United States National Herbarium is a specimen labeled in Vasey's handwriting "*Paspalum giganteum* Bald. in Herb. Phil. Acad." This was collected at "Pablo Creek, E. Florida," by A. H. Curtiss in 1875. It is the upper part of a very tall plant with a single flat blade 45 cm. long and 2.3 cm. wide. This is evidently the basis of Vasey's description and is taken as the type. The four racemes are 18 to 23 cm. long. (An additional inflorescence of 3 racemes is mounted on the sheet.) The sheaths, the upper two only being present, are very sparsely papillose-pilose, and the blade is sparsely ciliate and bears a few scattered hairs on the upper surface. This pubescence on the upper leaves suggests that the plant probably had pilose lower sheaths.

Paspalum longicilium Nash, Bull. N. Y. Bot. Gard. 1: 435. 1900. "Collected by the writer [G. V. Nash] at Eustis, Lake Co. [Florida], July 16-31, 1894, no. 1359." The type, in the Herbarium of the New York Botanical Garden, is a robust plant more than 2 meters tall, the upper sheaths and blades sparsely pilose and ciliate as in the type of *P. giganteum*, the lower sheaths densely long-pilose. This name is erroneously listed as "*P. longissimum* Nash" by Schumann.⁵⁰

DESCRIPTION

A robust erect perennial, the culms mostly solitary, with one of two erect leafy shoots at base, from short scaly rhizomes, simple, erect, or the summit somewhat nodding, commonly 1.5 to 2 meters tall, sometimes taller, slightly compressed, sometimes as much as 8 mm. thick, glabrous; leaves rather numerous, the sheaths mostly overlapping, the lower commonly crowded, scarcely keeled, from glabrous to sparsely papillose-pilose, the lower sometimes densely so; ligule 2 to 3 mm. long, fragile; blades flat, relatively lax, ascending or spreading, elongate, sometimes as much as 60 cm. long (the lowermost shorter), commonly 10 to 23 mm. wide, slightly narrowed to the base, pilose on the upper surface above the ligule, otherwise glabrous or nearly so on both surfaces, the margins glabrous or sparsely ciliate with stiff ascending hairs; racemes commonly 3 or 4, sometimes 2, ascending, spreading, or somewhat drooping, 10 to 20 cm. long, occasionally longer, rarely less than 10 cm. long, the common axis slender; rachis about 1.5 mm. wide, scabrous on the margins and with a tuft of long hairs at the base, otherwise glabrous; spikelets in pairs, crowded, 3 to 3.8 mm. long, 2.5 to 3 mm. wide, commonly 3.5 mm. long and 2.6 mm. wide, oval to obovate, usually russet-tinged; glume and sterile lemma barely covering the fruit at maturity, thinner than in

⁵⁰ Just, Bot. Jahresb. 28: 1, 416. 1902.

P. floridanum, not papery and wrinkled, 5-nerved, glabrous, or with a few inconspicuous hairs at the summit of the glume; fruit nearly the shape and size of the spikelet, stramineous.

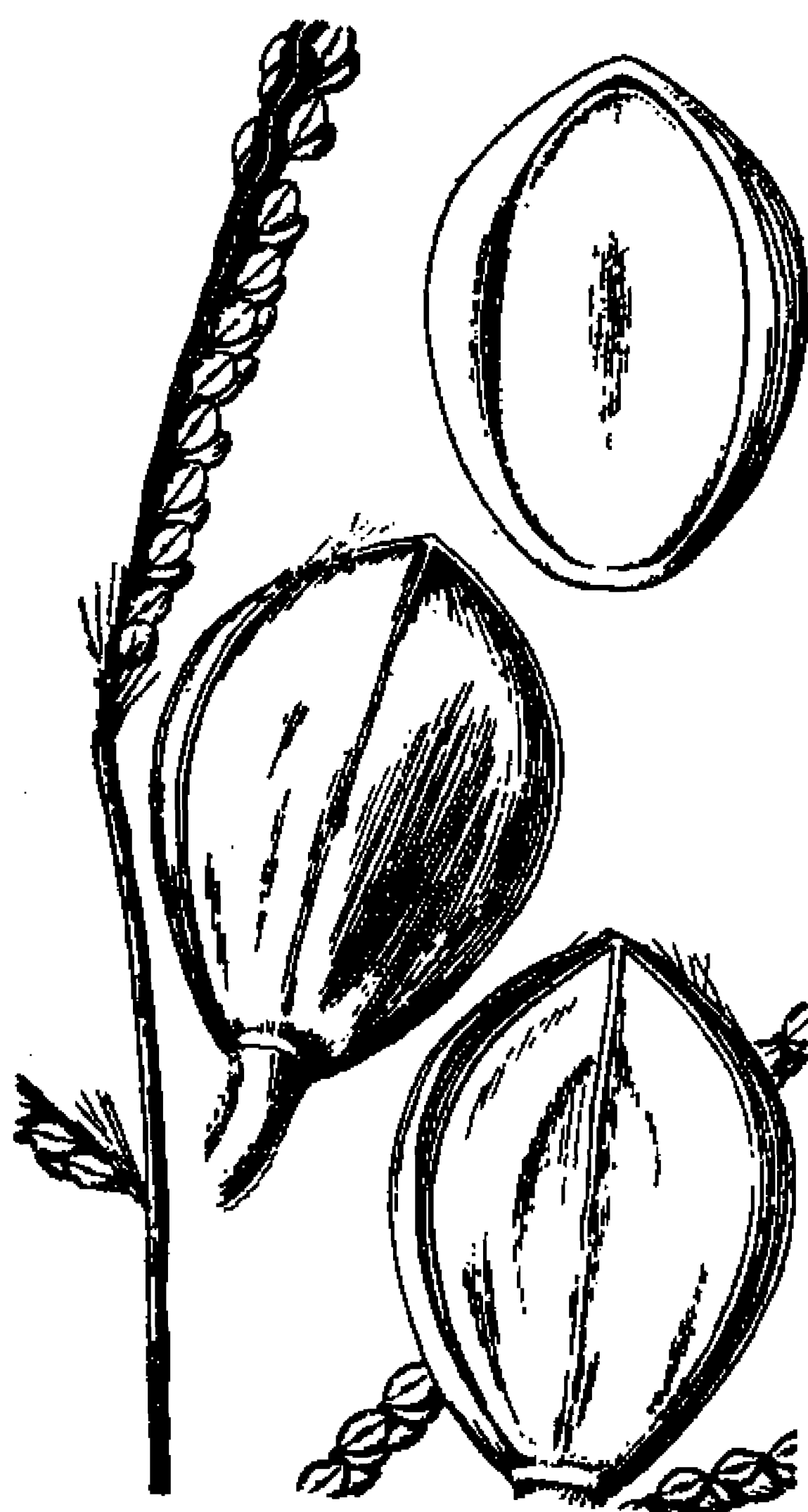


FIGURE 118.—*P. giganteum*. From type specimen

have no forage value, grazing animals avoiding them because of the cutting edges of the blades.

Spikelets pubescent, at least toward the summit; blades flat, more or less arcuate-spreading.

Fruit brown at maturity.

Spikelets obovate, obtuse.....117. *P. virgatum*.

Spikelets elliptic, subacute.....118. *P. conspersum*.

Fruit pale. Spikelets abruptly acute or subacute.

Rachis not ciliate; spikelets 3.5 mm. or more long.....119. *P. acutum*.

Rachis conspicuously ciliate; spikelets less than 3 mm. long.

Lower sheaths reticulate, glabrous.....120. *P. plenum*.

Lower sheaths not reticulate, hirsute.....121. *P. nelsoni*.

Spikelets glabrous; blades V-shaped in cross-section, ascending.

Spikelets suborbicular, crowded; rachis ciliate.

Panicle not pyramidal, the racemes rarely more than 50; glume and sterile lemma rather firm in texture.....124. *P. millegrana*.

Panicle elongate-pyramidal, the racemes commonly more than 70, short and crowded at the summit; glume and sterile lemma fragile.

125. *P. densum*.

DISTRIBUTION

Moist sandy soil, open ground, stream banks, flatwoods, and hammocks, on the Coastal Plain from Georgia to southern Florida and along the Gulf to Mississippi.

GEORGIA: Without locality, *Baldwin*.

FLORIDA: Jacksonville, *Curtiss* in 1896.

Pablo Creek, *Curtiss* in 1875. Mouth

of St. Johns River, *Curtiss* 3571.*

Dunnellon, *Combs* 916. Homosassa,

Combs 959. Daytona, *Francis* 3.

Eustis, *Nash* 1208, 1359, 1754. Her-

nando County, *Hitchcock* 9217.

Titusville, *Chase* 4025. Tampa, *Tracy*

6705. Manavista, *Tracy* 6717. Pal-

metto, *Tracy* 7035. Fort Myers,

Hitchcock 499, 9215. Between Coco-

nut Grove and Cutler, *Small & Carter*

1258. Sykes Hammock, *Small,*

Mosier & Small 6764. Without local-

ity, *Curtiss*; *Simpson* in 1890.

MISSISSIPPI: Biloxi, *Ricker* 853.

Virgata.—Tall robust perennials; blades firm with sharp-cutting edges; panicles of few to numerous racemes; spikelets in pairs, 2 to 3.9 mm. long. Mostly at low altitudes in tropical and subtropical America. These grasses

Spikelets obovate-elliptic; rachis not ciliate.

Racemes slender; spikelets not crowded; rachis 0.7 mm. wide.

122. *P. secans*.

Racemes thick, spikelets somewhat crowded; rachis 1 mm. wide.

123. *P. arundinaceum*.

117. *Paspalum virgatum* L.

Paspalum virgatum L. Syst. Nat. ed. 10. 2: 855. 1759. "Sloan. jam. t. 69. f. 2" is the only citation given. In the Linnaean Herbarium there is a specimen received from Jamaica, from Patrick Browne. This, examined in 1907 by A. S. Hitchcock,⁵¹ is taken as the type, since Linnaeus gives an original diagnosis of his own, citing Sloane's illustration only. It is the same species as the original of Sloane's figure.

Paspalus virgatus a linneanus Flügge, Monogr. Pasp. 189. 1810. Based on *P. virgatum* L.

Paspalus virgatus γ jacquinianus Flügge, Monogr. Pasp. 190. 1810. "Jacq. Ic. Tab. 11. * * * Insulae Caribaeae Jacquin." Jacquin's collection was not found in the Vienna Herbarium but in the Willdenow Herbarium is a specimen of *P. virgatum* received from Jacquin, which is probably the plant Flügge saw.

Paspalus virgatus δ willdenowianus Flügge, Monogr. Pasp. 190. 1810. "In locis siccis prope Param in Brasilia. Willdenow." This specimen collected by Hoffmannsegg, in the Willdenow Herbarium, is a robust plant occupying two sheets.

Paspalum virgatum var. *stramineum* Griseb. Fl. Brit. W. Ind. 543. 1864. "Trin. Ic. t. 131." Jamaica, March; and Antigua, Wulschlaegel, are also cited for the variety. Trinius' plate and the Wulschlaegel plant in the Grisebach Herbarium are *P. virgatum*; the March specimen in the Grisebach Herbarium is *P. arundinaceum* Poir. The description covers both. The name applies better to *P. arundinaceum*, though immature spikelets of *P. virgatum* are also straw-colored. Since two of the three citations refer to *P. virgatum* Grisebach's variety is referred to that, Wulschlaegel's specimen from Antigua being taken as the type.

Paspalum leucocheilum Wright, Anal. Acad. Cienc. Habana 8: 203, 1871; Fl. Cub. 194. 1873. "Isla de Pinos por el Sr. D. José Blain." The type, in the Gray Herbarium, is a small plant with an immature partly included panicle, the racemes erect, the spikelets puberulent throughout.

Paspalum virgatum var. *ciliatum* Doell in Mart. Fl. Bras. 2²: 88. 1877. "*Paspalum virgatum a Linneanus* Flügge 189, vix Linné Sp. pl. ed. II, 81." Linnaeus described the racemes as villous at the base and Doell renames Flügge's variety with rachis-margin pilose.

DESCRIPTION

A robust leafy perennial in large dense clumps, purplish below; culms simple, erect, or the outer curved at base, 1 to 2 meters tall, subcompressed, glabrous; nodes glabrous; sheaths elongate and overlapping, usually papillose-hirsute along the margin and on the collar, occasionally on the keel toward the summit, rarely pilose throughout, the lower spongy and succulent, reticulate in drying; ligule 1.5 to 2 mm. long; blades flat, ascending-recurved, 30 to 75 cm. long, 1 to 2.5 cm., rarely to 3 cm., wide (the uppermost much reduced), slightly rounded at base or narrowed to the width of the sheath, long-hirsute at the very base on the inside and often on the margin toward the base, otherwise glabrous, the margin serrulate; panicle slightly nodding, 12 to 40 cm., commonly 15 to 25 cm., long, of 3 to

⁵¹ See Hitchcock, Contr. U. S. Nat. Herb. 12: 116. 1908.

29, commonly 10 to 16, thick ascending to drooping racemes, the lower 5 to 15 cm., rarely 20 cm., long, the upper gradually shorter, the common axis angled, occasionally scabrous on the angles; rachis purplish, 1 to 1.5 mm. wide, with copious long white hairs at the base, the margin very scabrous and commonly with scattered long quill-like hairs; spikelets in pairs on angled pedicels, crowded, 2.2, rarely to 3, mm. long, 1.8 to 2.3 mm. wide, obovate, grayish, drying yellowish to rusty or purplish brown; glume and sterile lemma equal, rather loose, 5-nerved, one or both often minutely apiculate, the glume pubescent with silky hairs along the margin, at least toward the summit, otherwise from glabrous to rather densely puberulent, the lemma glabrous to puberulent, occasionally with short silky hairs along the margin toward the summit, the sterile palea occasionally developed; fruit 2 to 2.2 mm. long, chestnut-brown at maturity, papillose-striate.



FIGURE 119.—*P. virgatum*. From Hitchcock 9555

Most of the specimens from the West Indies have spikelets about 2.5 mm. long, obscurely puberulent or glabrous except around the margin; the greater number of those from continental North America have spikelets 2.5 to 3 mm. long, commonly puberulent to finely pubescent. The British Guiana specimens are mostly of the West Indian form, but those of the rest of South America are more like the form of continental North America. The material as a whole does not fall into two distinct forms, many smaller spikelets being puberulent and larger ones being nearly glabrous, but the greater number of specimens show the tendencies indicated.

Oliva's no. 68, from Mexico, *Pittier* 12386, from Costa Rica, and *Chase* 7718, from Brazil, have blades puberulent on the upper surface.

Called "talquezal" in El Salvador and "caguazo" in Cuba, and "cortedero," in common with its allies, in other Spanish American countries. The name *Paspalum virgatum* has been incorrectly applied to *P. urvillei*, cultivated for forage (see p. 4).

DISTRIBUTION

Open, mostly moist or swampy ground, southern Texas and Mexico, and the West Indies to Brazil, at rather low altitudes.

TEXAS: Brownsville, *Hitchcock* 5414.

JALISCO: Guadalajara, *Hitchcock* 7363.

- VERA CRUZ: Córdoba, *Finck* 7; *Fisher* 54; *Hitchcock* 6413, 6434. Santa Rosa, *Fisher* 63.
- OAXACA: Oaxaca, *Hitchcock* 6188.
- CHIAPAS: Ocuilapa, *Nelson* 3035.
- MEXICO (Republic of): Huentitan, *Oliva* 68.
- GUATEMALA: Secanquim, *Pittier* 250. Cristina, *Blake* 7625. Quiriguá, *Standley* 23841, 24131. Puerto Barrios, *Standley* 24719. La Aurora, *Morales* 719. Escuintla, *Hitchcock* 9000. Atescatempa, *Heyde & Lux* (*Dist. Smith*) 6402. Estanzuela, *Heyde & Lux* (*Dist. Smith*) 3898.
- EL SALVADOR: San Salvador, *Calderón* 869, 1154. Sonsonate, *Calderón* 1690.
- NICARAGUA: Masaya, *Hitchcock* 8639.
- COSTA RICA: Guanacaste, *Pittier* 2690. Puntarenas, *Hitchcock* 8579. San José, *Hitchcock* 8467. Alajuelita, *Pittier* 2996. Talamanca, *Tonduz* 8691. Cocos Island, *Pittier* 12386.
- PANAMA: Canal Zone, *Celestine* 20; *Hitchcock* 7903; *Killip* 4109, 4356; *Piper* 5199, 5203; *Pittier* 2079, 3724, 6768; *Popenoe* 13; *Standley* 26338, 28456, 31784. Panamá, *Standley* 26882. Taboga Island, *Hitchcock* 8082; *Pittier* 3604 (depauperate). Chepo, *Pittier* 4647, 4693.
- CUBA: Santiago de los Baños, *Leon & Hioram* 4366, 4367; *Palmer & Riley* 628. El Guama, *Palmer & Riley* 97. Herradura, *Hitchcock* 468; *Tracy* 9127. Habana, *Tracy* 9120, 9122, 9123, 9124. Marianao, *Leon* 1995. Guanabacoa, *Leon* 2639. Santiago de las Vegas, *Baker & Wilson* 595. Cano, *Leon* 1990. Guines, *Leon* 578. Florida, *Leon* 3962 (abnormal). Santayana, *Ekman* 15335. Isle of Pines, *Britton & Wilson* 14456; *Curtiss* 501; *Palmer & Riley* 1057; *Taylor* 42. Without locality, *Wright* 3446 in part.
- JAMAICA: Troy, *Harris* 12602; *Hitchcock* 9791; *Maxon* 2980. Ipswich, *Hitchcock* 9603. Bull Head Mountain, *Hitchcock* 9529, 9555. Between Ewarton and Linstead, *Amer. Gr. Nat. Herb.* 576. Between Ewarton and Moneague, *Hitchcock* 9445. Appleton, *Hitchcock* 9655. Annotta Bay, *Harris* 12660a. Half Way Tree, *Harris* 12897. Castleton Gardens, *Hitchcock* 9400, 9405. Gordon Town, *Hart* 729. Between Bog Walk and Spanish Town, *Hitchcock* 9290. Newcastle, *Hitchcock* 9347. Port Antonio, *Fredholm* 3299.
- HAITI: Pilate, *Leonard* 9672. Plaisance, *Leonard* 9174, 9223, 9408. Dondon, *Leonard* 8650. Port-au-Prince, *Ekman H* 2172; *Leonard* 10080. Morne Titon, *Christ* 2185.
- DOMINICAN REPUBLIC: Haina, *Faris* 407. Sánchez, *Abbott* 71. Without locality, *Wright Parry & Brummel* 620.
- PORTO RICO: Aguada, *Chase* 6599. Mayaguez, *Chase* 6173, 6257. Utuado, *Underwood & Griggs* 794. Vega Baja, *Chase* 6792. Catano, *Chase* 6642; *Heller* 1373. Rio Piedras, *Cowgill* 695; *Heller* 625. Cayey, *Chase* 6740. Mamayes, *Chase* 6649; *Eggers* 1176. Rio Grande, *Chase* 6705, 6706. Luquillo Mountains, *Wilson* 227. Loma Icaco, *Shafer* 3394. Island of Vieques, *Chase* 6703.
- VIRGIN ISLANDS: St. Jan, *Hornbeck* (*Copenhagen Herb.*).
- LEEWARD ISLANDS: Antigua, *Hitchcock* 16372. Guadeloupe, *Hitchcock* 16401. Dominica, *Hitchcock* 16439; *Jones* 19.
- WINDWARD ISLANDS: Hahn 1060; *Hitchcock* 16447. Barbados, *Dash* 455. St. Lucia, *Brooks* 29; *Hitchcock* 16477; *Kemp* 2. Grenada, *Broadway* 144 and in 1905.
- TRINIDAD: Port of Spain, *Hitchcock* 9997. St. Joseph, *Hitchcock* 10030. Aripo Savanna, *Hitchcock* 10073. Point à Pierre, *Broadway* 4947. San Fernando, *Hitchcock* 10118. Oropuche Lagoon, *Britton, Hazen & Freeman* 1150. Siparia, *Broadway* 4987. Cedros, *Broadway* 4939. Matura, *Broadway* 2369. Without locality, *Sieber* 11.

- TOBAGO: Scarborough, *Hitchcock* 10201. Botanic Station, *Broadway* 4390. Rockley Vale, *Broadway* 4058. Frenchfield, *Eggers* 5553.
- COLOMBIA: Santa Marta, *Smith* 125, 126. Buenaventura, *Hitchcock* 19913. Frasuquillo, *Pennell* 4590. Puerto Wilches, *Killip & Smith* 14780. Puerto Berrio, *Pennell* 3747. Bogotá, *Uribe*. Neiva, *Rusby & Pennell* 1121. Santa Rosa, *Killip* 11568. Córdoba, *Killip* 5051.
- BRITISH GUIANA: Georgetown, *Hitchcock* 16552. Lamaha Dam, *Jenman* 3660. Coast regions, *Jenman* 4437, 6199. Rockstone, *Gleason* 649. Tumatumari, *Gleason* 34; *Hitchcock* 17336.
- DUTCH GUIANA: Paramaribo, *Kuyper* in 1913. "Surinam," *Weigelt*.
- BRAZIL: Marajó Island, *Goeldi* 184, 191, 199. Rio Branco, *Kuhlmann* 3352. Falls of Madeira, *Rusby* 213. Pernambuco, *Chase* 7718; *Pickel* 1397. Bahia, *Blanchet*. Anna Florencia, *Chase* 9488. Salto d'Itiquira, *Glaziou* 22607. Goyaz, *Gardner* 3504.
- ECUADOR: Tena, *Williams* in 1924.
- PERU: Colonia Perené, *Hitchcock* 22073, 22102. Santa Ana, *Cook & Gilbert* 1531.
- BOLIVIA: Hacienda Anacuri, *Holway* 703. Reyes, *Cárdenas (Mulford Biol. Expl.)* 1656. San Carlos, *Buchtien* 52 in 1927.

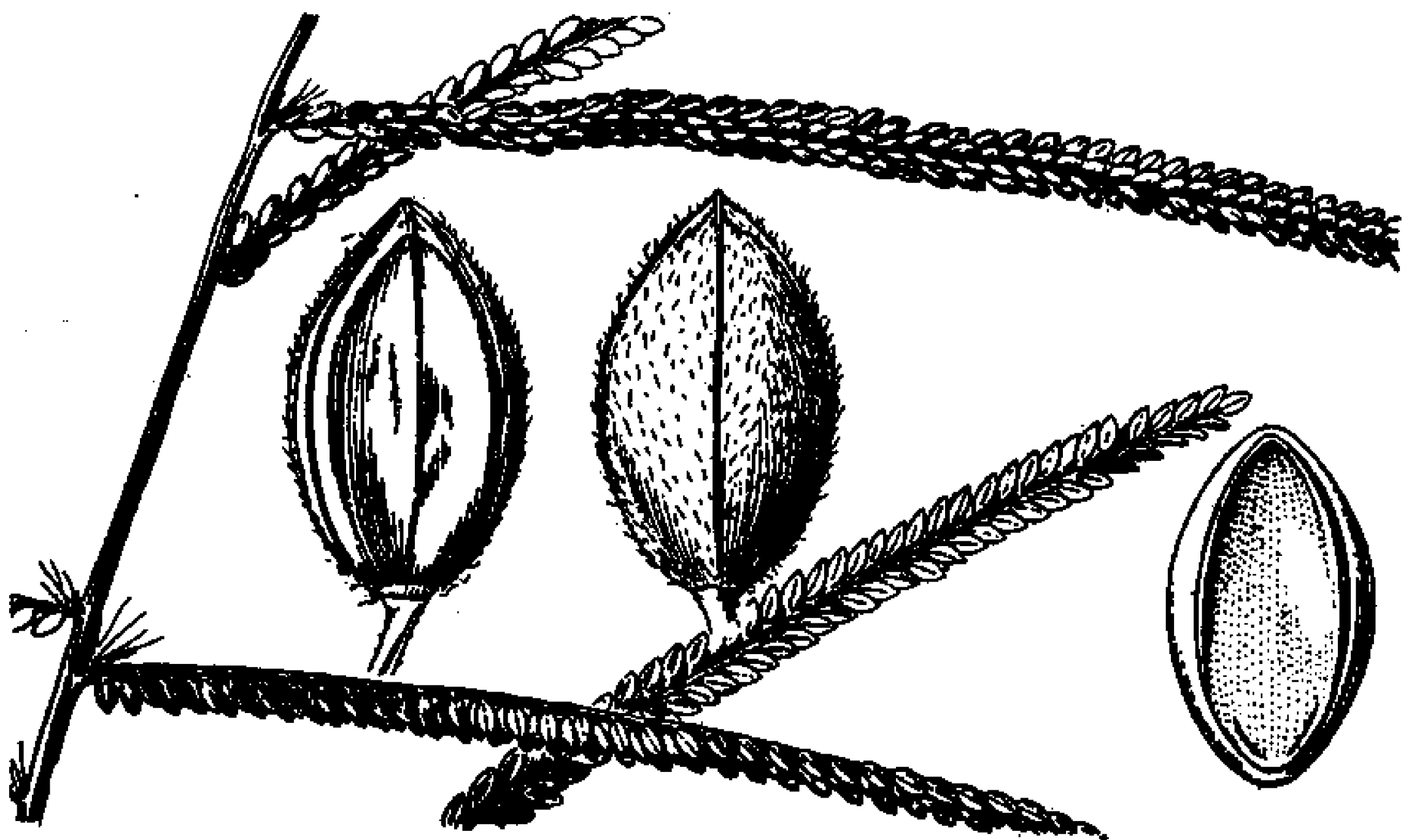


FIGURE 120.—*P. conspersum*. From type specimen and *Chase* 8513

118. *Paspalum conspersum* Schrad.

Paspalum conspersum Schrad.; Schult. Mant. 2: 174. 1817. "In Brasilia. Princeps Sereniss. Maximil. Neowidensis." A specimen so named in Schrader's script, collected by Prince Maximilian, in the Nees Herbarium, now in the Berlin Herbarium, is doubtless the type or part of the type collection. This is a robust plant without the base, the lower sheaths papillose, the uppermost glabrous, the panicle with 8 racemes.

DESCRIPTION

A robust perennial resembling *P. virgatum* in habit; sheaths papillose-pilose to glabrous, the upper commonly glabrous or nearly so, the lower pilose, not at all spongy or reticulate; blades rather more rounded at base than in *P. virgatum*, sometimes subcordate, often finely papillose-pubescent on the upper surface; panicle erect to slightly nodding, 15 to 25 cm. long, of 6 to 16 ascending to spreading or drooping racemes, 7 to 15 cm. long; rachis brownish purple, 0.7 to

1.2 mm. wide, the margin scaberulous but with no long hairs as commonly found in *P. virgatum*; spikelets 2.7 to 3 mm. long, 1.6 to 1.8 mm. wide, elliptic, slightly concavo-convex, deep purple to rusty brown; glume and sterile lemma equal, thin in texture, not loose, 5-nerved, both or the glume only pubescent with soft hairs; fruit 2.5 to 2.7 mm. long, chestnut-brown at maturity, papillose-striate, the palea somewhat concave.

This relatively rare species resembles *P. virgatum* and has been confused with it. It is distinguished by the more slender racemes of elliptic less turgid spikelets, the rachis without the long stiff hairs commonly found in *P. virgatum*.

DISTRIBUTION

Open, moist ground and along streams, up to 1,800 meters altitude, Mexico to Argentina.

JALISCO: San Nicolás, *Hitchcock* 7229.

MORELOS: Yautepec, *Rose, Painter & Rose* 8555.

BRAZIL: Serra da Gramma, *Chase* 9610. Anna Florencia, *Chase* 9487. Antonio Justiniano, *Chase* 8894. Ouro Preto, *Chase* 9339. Lavras, *Chase* 8770. Between Lavras and Formiga, *Dorsett* 211b. Between Urubú and Cambuhy, *Dorsett* 166b. Juiz de Fóra, *Chase* 8504, 8513. Jacarepaguá, *Chase* 8410. Ypiranga, *Holway* 1628. Itararé, *Dusén* 16429.

BOLIVIA: Coripata, *Hitchcock* 22696.

ARGENTINA: Alto Paraná, *Parodi* 5534. Posadas, *Ekman* 588. Formosa, *Venturi* (*Herb. Parodi*) 3467.

119. *Paspalum acutum* Chase

Paspalum acutum Chase, Journ. Washington Acad. Sci. 17: 146. f. 4. 1927. "Type in the U. S. National Herbarium, no. 1037443, collected in dry fields, Ancon, Canal Zone, September 18, 1917, by E. P. Killip (no. 4003)." The two specimens of this collection lack the base.

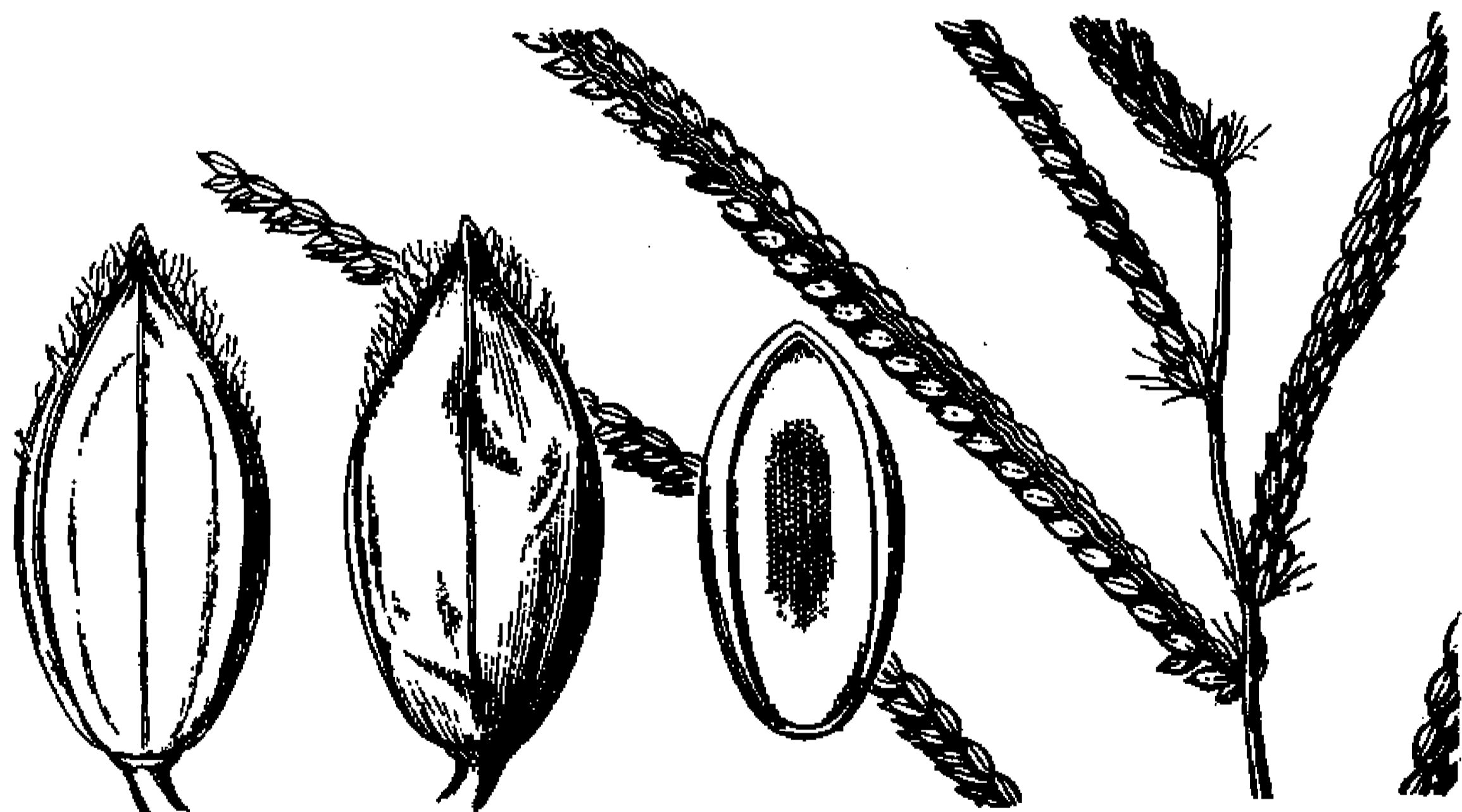


FIGURE 121.—*P. acutum*. From type specimen

DESCRIPTION

A robust perennial, 1 to 2 meters tall; culms simple, glabrous, leafy to the summit; sheaths overlapping, compressed, striate, pilose on the margin at the summit, otherwise glabrous, the junction with the blade slightly constricted,

dark colored; ligule 1.5 to 2 mm. long; blades about as wide as the sheath, slightly rounded and folded at base, flat above, 30 to 75 cm. long, 14 to 18 mm. wide, long-acuminate, glabrous beneath, sparsely pubescent on the upper surface and with long hairs back of the ligule, the margins sharply serrulate, the uppermost blade greatly reduced; panicle scarcely exerted (in specimens seen), the main axis rather slender, 5 to 15 cm. long, plano-convex, scabrous on the margins; racemes 6 to 10, thick, heavy, nodding, 8 to 12 cm. long, with a tuft of long hairs at the base; rachis 1 to 1.5 mm. wide, slightly flexuous, scabrous-serrulate on the margin, otherwise glabrous; spikelets in pairs on minute slender pedicels, imbricate, olive-green, or drying brown, elliptic, 3.5 to 3.9 mm. long, 2 mm. wide, abruptly acute; glume and sterile lemma equal, abruptly pointed beyond the fruit, 5-nerved, the lateral nerves close together near the margins, the glume silky-ciliate on the margin at least toward the summit, or nearly glabrous (spikelets varying in a single raceme), otherwise glabrous or obscurely pubescent, the lemma glabrous; fruit elliptic, 3 mm. long, 1.8 mm. wide, pale-stramineous, the lemma and palea minutely papillose-striate under a lens.

Paspalum acutum differs from *P. virgatum* L. in the more leafy culms and in the longer, pointed, elliptic spikelets, glabrous except the margin of the glume toward the summit, and in the pale fruit.

DISTRIBUTION

Low open ground, and along ditches, Panama to northern Brazil.

PANAMA: Canal Zone, Killip 4003.

BRAZIL: Pará, Goeldi 48, 129.

120. *Paspalum plenum* Chase, sp. nov.

DESCRIPTION

A robust leafy perennial in large clumps; culms simple, erect, 0.9 to 2.5 meters tall, subcompressed, glabrous; nodes glabrous, rarely exposed; sheaths elongate, overlapping, slightly keeled, the lower spongy and succulent, conspicuously reticulate in drying, glabrous or the margin ciliate and occasionally

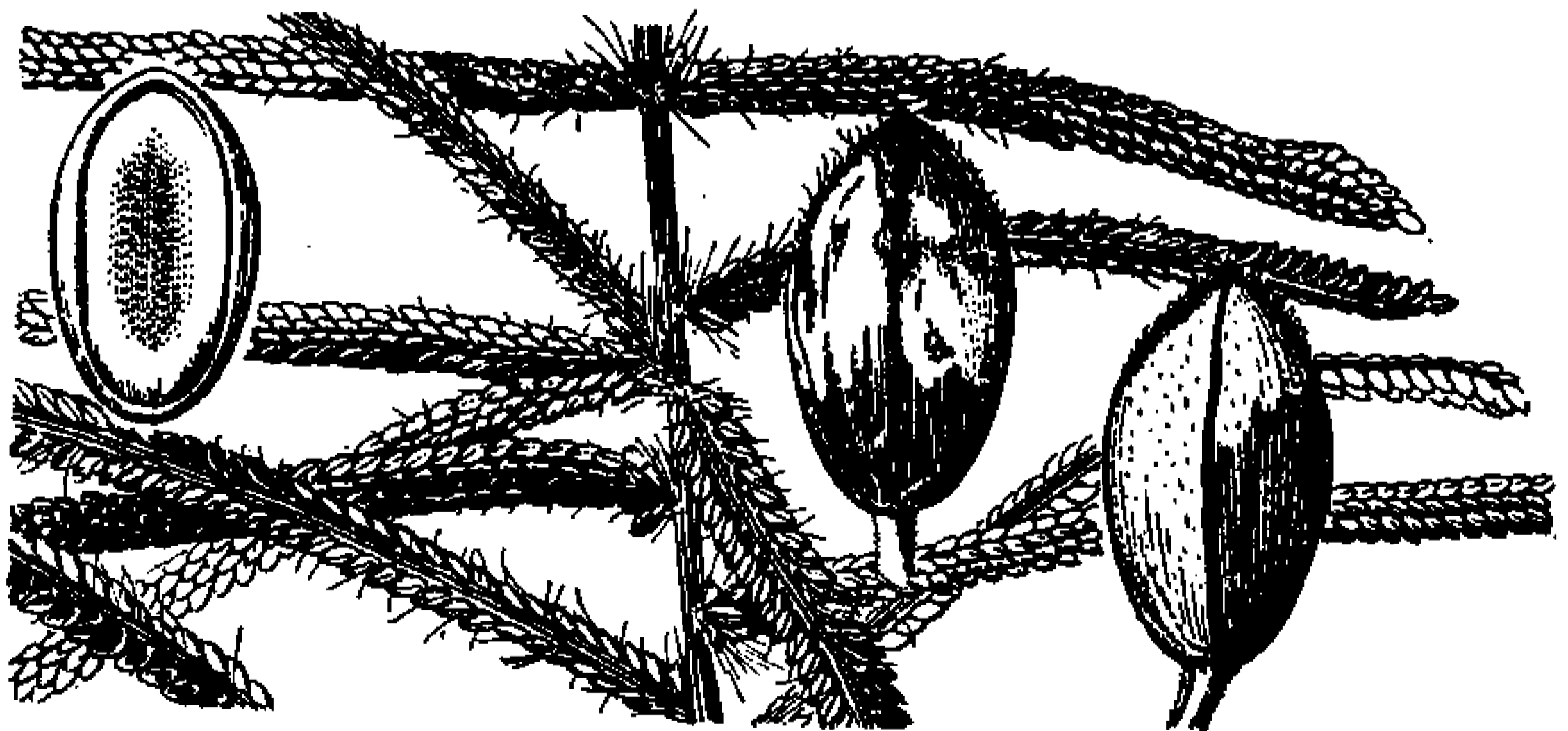


FIGURE 122.—*P. plenum*. From type specimen

hirsute at the sides on the junction with the blade; ligule rather firm, 2 to 3 mm. long, with a dense row of long stiff tawny hairs back of it; blades ascending, folded and with a thick midnerve at the base and narrowed to the width of the sheath, flat and 1.5 to 2.5 cm. wide above, 40 to 90 cm. long, attenuate to the tip (the uppermost narrow and involute), glabrous except for the dense tuft of

hairs back of the ligule, the margin and the midnerve on the under surface toward the tip sharply serrulate; panicle nodding, the numerous racemes drooping from the rather stiff axis, 18 to 40 cm. long, of 25 to 90, commonly 40 to 80, racemes, the lower 8 to 18 cm., commonly 12 to 15 cm., long, gradually shorter upward, the uppermost 2 to 3 cm., the common axis sharply angled, or toward the base subterete, scabrous on the angles toward the summit; rachis mostly purplish, 1.2 to 1.5 mm. wide, with copious long stiff hairs at the base, the margins sparsely to conspicuously ciliate with stiff hairs 5 to 8 mm. long; spikelets in pairs on angled pedicels, crowded (or rather distant at base of the lower racemes), 2.5 to 3 mm. long, 1.3 to 1.5 mm. wide, obovate-elliptic, subacute; glume and sterile lemma equal, thin in texture, 3-nerved, the glume sparsely pubescent with soft hairs along the margin toward the summit, otherwise very minutely pubescent to glabrous, the lemma glabrous, or very obscurely pubescent, both blotched with reddish purple or in age all dull brown; fruit 2.4 to 2.5 mm. long, stramineous, papillose-striate.

Type in the U. S. National Herbarium, no. 951959, collected "along a railway cut through jungle," near Jalapa, Vera Cruz, Mexico, at 1,400 meters altitude, September 3, 1910, by A. S. Hitchcock (no. 6643).

As shown by Botteri's no. 1266, Bourgeau's 2380, Galeotti's 5714, and Schaffner's 107, in the Paris Herbarium, all named "*Paspalum lentiginosum* Presl" in Fournier's script, this is the species so called in his work.⁵² Bourgeau's 2975 in the Paris Herbarium, named *P. lentiginosum* by Fournier is *P. affine*, but this number in the United States National Herbarium is *P. plenum*.

Paspalum plenum is related to *P. intermedium* Munro of South America, from which it differs in having broader spikelets, pubescent at the summit of the sterile lemma, and larger, less congested panicles of longer laxer racemes.

DISTRIBUTION

Wet open or brushy ground or in shallow water, up to 1,400 meters, southern Mexico to Costa Rica; also in Colombia.

NAYARIT (TEPIC): Yxtlan del Río, *Mexia* 829.

VERA CRUZ: Jalapa, *Hitchcock* 6643. Between Coaltepec and Jalapa, *Hitchcock* 6684. Orizaba, *Botteri* 1267 and in 1856; *Bourgeau* 2975. Monte Pacho, *Liebmann* 173. Zacuapan, *Purpus* 2906.

GUATEMALA: Cobán, *Johnson* 439; *Türckheim* 459, 3791.

COSTA RICA: Nuestro Amo, *Jiménez* 520, 533. Aguacaliente, *Pittier* 2409.

COLOMBIA: Medellín, *Toro* 569. Fredonia, *Toro* 152. Dept. Cundimarca, *Ariste Joseph* 1066.

121. *Paspalum nelsoni* Chase, sp. nov.

DESCRIPTION

An erect leafy, somewhat glaucous perennial; culms 1.9 cm. tall, subcompressed, glabrous; nodes constricted, glabrous; sheaths keeled, mostly overlapping, loose toward the summit, coarsely papillose-hirsute and with a dense tuft of stiff tawny hairs 5 to 7 mm. long on either side at the summit, the uppermost sheath glabrous, its blade reduced to a slender point; ligule firm, erose, about 3 mm. long; blades ascending, flat, or drying subinvolute, 30 to 42 cm. long, 1.2 to 1.5 cm. wide, tapering to a base scarcely as wide as the sheath, the upper surface papillose-hirsute toward the base, densely so back of the ligule, the hairs as much as 1 cm. long, and appressed hirsute toward the tip, the lower surface

⁵² Mex. Pl. 2: 9. 1886.

glabrous, the margin sharply serrulate; panicle nodding, 25 cm. long, of 18 relatively slender curving racemes, the lower 12 cm. long, the upper gradually shorter, the common axis slender, angled, purplish; rachis deep purple, about 1 mm. wide, the margin serrulate and irregularly ciliate with pale stiff hairs 5 to 7 mm. long, and with copious long hairs at the base; spikelets in pairs on slender pedicels, rather loosely crowded, 2.1 to 2.3 mm. long, about 1.3 mm. wide, obovate-elliptic, abruptly subacute; glume and sterile lemma equal, thin in texture, 3-nerved, pale to brownish, the glume silky pubescent, the hairs short and sparse except near the margin, there dense and toward the summit elongate, the sterile lemma with a few obscure hairs near the summit only, both

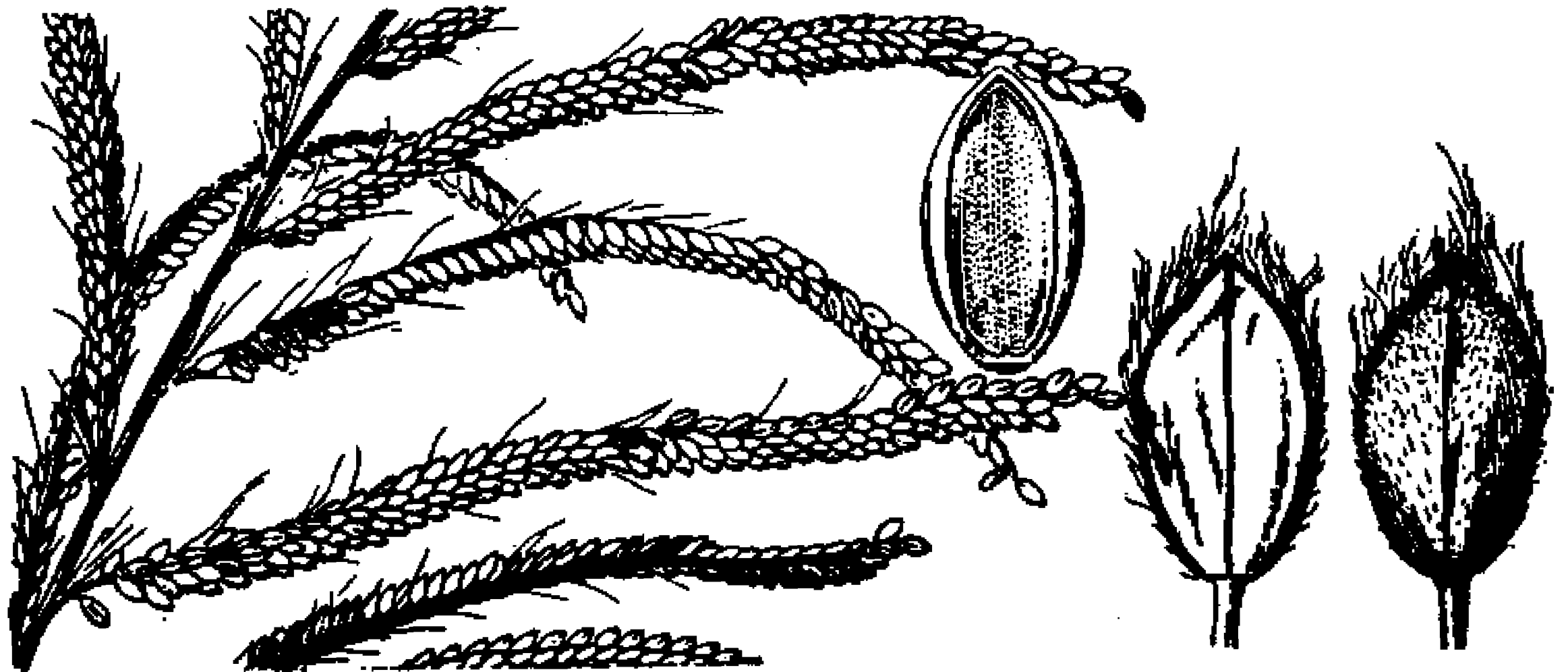


FIGURE 123.—*P. nelsoni*. From type specimen

finely speckled with brown or blotched with purple; fruit about 2 mm. long, pale, finely papillose-striate.

Type in the U. S. National Herbarium, no. 233485, collected on table-land, Ocuilapa, Chiapas, Mexico, at 1,000 to 1,200 meters altitude, August 21, 1895, by E. W. Nelson (no. 3047).

This species, known only from the type collection, was referred to *P. conspersum* Schrad. in the *Grasses of Mexico*.⁴³ It differs from that species in its glaucous color, the narrower blades tapering to the base, the coarser pubescence of the sheaths, the more slender racemes with long-ciliate rachises, and in the spikelets with long hairs at the summit. The species is named for the collector, Dr. E. W. Nelson, the zoologist, who in his field work in little known regions took the trouble to collect plants, contributing much valuable material to the United States National Herbarium.

122. *Paspalum secans* Hitchc. & Chase

Paspalum secans Hitchc. & Chase, *Contr. U. S. Nat. Herb.* 18: 319. 1917. "Type in the U. S. National Herbarium, no. 732740, collected on Monte Mesa, Porto Rico, October 17, 1913, by Agnes Chase (no. 6174)." This specimen is 1.35 meters tall, and has 9 racemes.

DESCRIPTION

A nearly erect perennial, glabrous as a whole, in large clumps with numerous long-leaved sterile shoots, commonly rather pale throughout; culms simple or rarely with a flowering branch, 75 cm. to nearly 2 meters tall; sheaths mostly

⁴³ *Contr. U. S. Nat. Herb.* 17: 239. 1913.

overlapping, commonly separating from the culm and becoming involute above, stiffly ciliate toward the summit, the lower rather loose and papery; ligule about 1.5 mm. long, with a dense row of long stiff hairs back of it; blades ascending or spreading from an erect base, firm, V-shaped in cross section but drying more or less involute, 20 to 100 cm. long, 5 to 10 mm. wide, tapering to a base narrower than the sheath, long-acuminate, stiffly ciliate toward the base, the margin very sharply serrulate; panicle of 3 to 19, commonly 7 to 12, slender spreading or arching racemes, on a slender angled axis 5 to 15 cm. long, the racemes 6 to 15, rarely to 18 cm. long; rachis about 0.7 mm. wide, sharply scabrous on the margin, short-pubescent at the very base and usually with a few long hairs; spikelets in pairs on minute scabrous pedicels, scarcely crowded, 2.3 to 2.7 mm. long, 1.5 to 1.6 mm. wide, obovate-elliptic, often minutely apiculate, pale to leaden-purplish, glabrous; glume and sterile lemma equal, rather firm, 3-nerved; fruit 2.3 to 2.4 mm. long, pale, minutely papillose-striate.

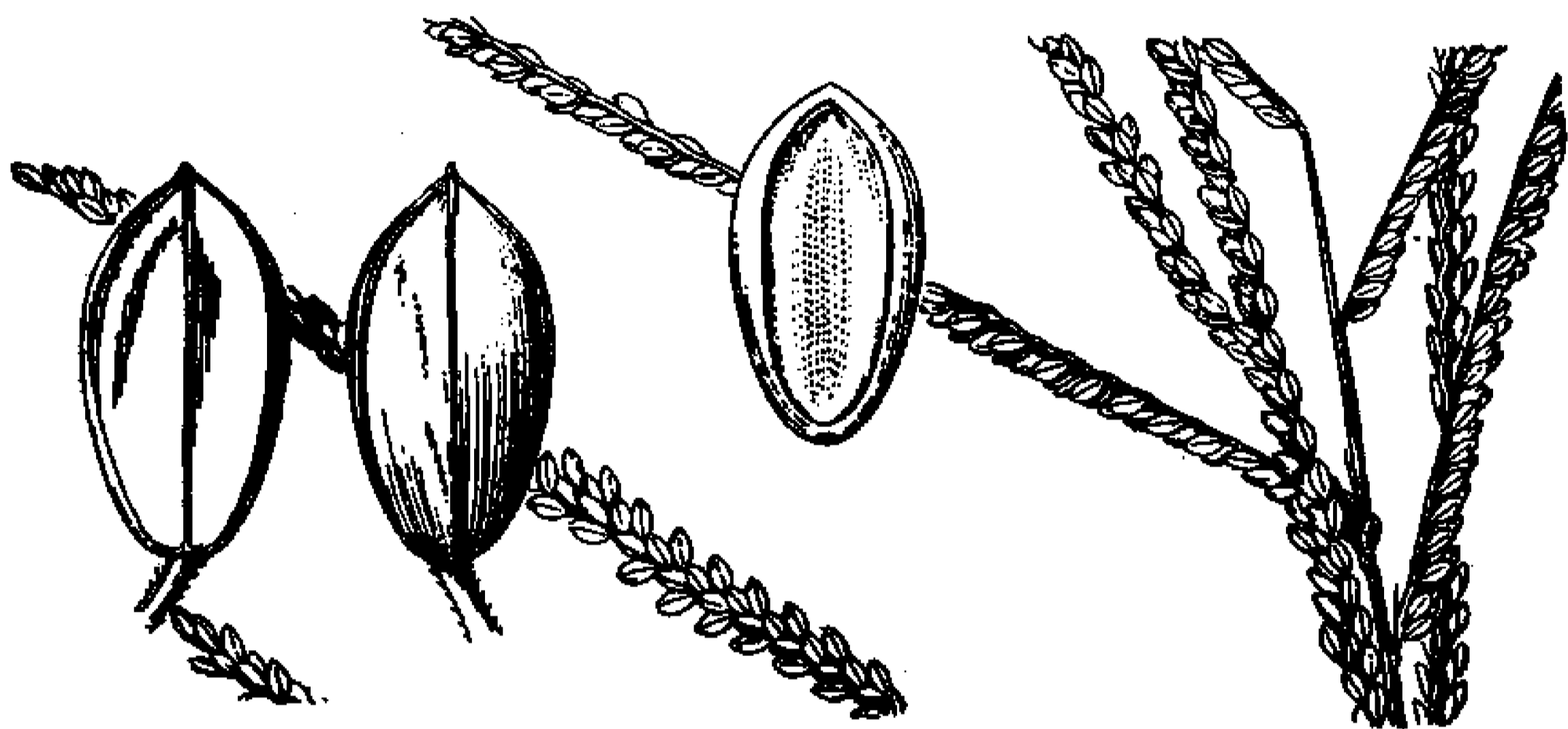


FIGURE 124.—*P. secans*. From type specimen

DISTRIBUTION

Open or brushy slopes and savannas, usually in drier situations than occupied by others of the *Virgata* group, at low altitudes, in the West Indies.

- BAHAMAS: New Providence, *Britton & Brace* 598. Inagua, *Nash & Taylor* 956.
 CUBA: Santiago de los Baños, *Léon & Hioram* 4366½. Habana, *Léon* 931b, 932. Cano, *Ekman* 184. Tunas, *Léon* 6743. Cauast, *Léon & Roig* 12961. Baraguá, *Hitchcock* 23343. Isle of Pines, *Ekman* 12223.
 JAMAICA: Montego Bay, *Hitchcock* 9670. Black River, *Hitchcock* 9649.
 HAITI: Gourjon, *Ekman* H 6451. Between Les Anglais and Chardonner, *Ekman* H 384.
 PORTO RICO: Mayaguez, *Amer. Gr. Nat. Herb.* 577; *Chase* 6150, 6174, 6309; *Holm* 84. Maricao, *Chase* 6193, 6238. Arcibo, *Chase* 6444, 6559. Lares, *Chase* 6581. Between Utuado and Adjuntas, *Chase* 6465. Campo Alegre, *Chase* 6787. Between Ponce and Santa Isabel, *Britton & Brown* 5518. Bayamon, *Chase* 6382, 6387, 6409. Catano, *Chase* 6641. Rio Piedras, *Chase* 6372; *Wetmore* 167. Trujillo Alto, *Sein* 321. Caguas, *Britton & Cowell* 1405; *Sintenis* 2539. Rio Grande, *Chase* 6707, 6716, 6723. Loma Icaco, *Shafer* 3415. Island of Vieques, *Chase* 6698.
 VIRGIN ISLANDS: St. Thomas, *Foster*. St. Croix, *Hitchcock* 16323; *Ricksecker* 434
 LEEWARD ISLANDS: Antigua, *Wullschlaegel* 603. Guadeloupe, *Hitchcock* 16408.
 CURAÇAO: *Boldingh* 4836.

123. *Paspalum arundinaceum* Poir.

Paspalum arundinaceum Poir. in Lam. Encycl. Suppl. 4: 310. 1816. "Cette plante croît à la Caroline, où elle a été recueillie par M. Martin. (V. s. in herb. Desf.)." The type, in the Desfontaine Herbarium in Florence, is labeled "Martin, Cayenne," the locality published being erroneous. According to Lasegue,⁵⁴ Martin, from the Jardin des Plantes, Paris, was stationed at Cayenne as director of colonial gardens and nurseries of French Guiana. He was never in North America. The specimen agrees with Poiret's description. In a very few spikelets of this specimen the first glume is developed.

Paspalum elatum Rich.; Doell in Mart. Fl. Bras. 2¹: 78. 1877. "(In herbarii sui, nunc Francavillani, schedula.) * * * In Guiana gallica a cl. Leprieur annis 1834 et 1847, nec non anno 1859 prope Cayenne a cl. Sagot, denique a cl. Yelsky lectum." A specimen from the Richard Herbarium Guayanensi-Antillarum, with the name and diagnosis in Richard's script and with his drawings of the spikelet, is now in the Paris Herbarium. It consists of an immature panicle and a leafy shoot. There is a second complete specimen labeled "Cayenne," and a third labeled "Guyane française, Le Prieur," both named in Richard's script. In the Brussels Herbarium is a fragmentary specimen labeled in Doell's script "Guiana gall. Leprieur in herb. sui schedula L. C. Richard." Another Leprieur specimen in the Drake Herbarium in Paris bears the name in Doell's script. These all appear to be from the same collection. In a very few spikelets the first glume is developed. In Sagot 1344, examined in Vienna and at Kew, and in Jelski's specimen from Cayenne in 1867, in the Vienna Herbarium, the first glume is more frequently developed, as described by Doell.

This is the form which Grisebach confused with *P. virgatum* under the name *P. virgatum* var. *stramineum* (see page 197) and to which Hitchcock⁵⁵ applied the name *P. virgatum schreberianum* Flügge, and Nash⁵⁶ that of *P. schreberianum* (Flügge) Nash. The identity of Flügge's variety, which was described from South America, is uncertain. Flügge's types have not been located. The description of the panicle as having about 30 racemes, the margin of the rachis subpilose, strongly suggests *P. millegrana*, which is common in South America. No specimen of *P. arundinaceum* has been seen with more than 22 racemes, nor with pilose rachis.

In the Grasses of the West Indies⁵⁷ the specimens from Cuba and Jamaica were doubtfully referred to *P. secans*. A much larger amount of material now shows the two to be distinct, though closely related.

DESCRIPTION

An erect robust glabrous perennial in large clumps; culms simple, 1.2 to 2 meters tall; sheaths elongate, overlapping, commonly separating from the culm and becoming involute above, inconspicuously ciliate at the summit or glabrous, the lower slightly or not at all reticulate in drying; ligule 2 to 3 mm. long, with a ring of stiff hairs 3 to 5 mm. long back of it; blades ascending from an erect narrow folded or involute base, firm, V-shaped in cross section, often drying conduplicate or involute, commonly 0.5 to 1 meter or more long, 5 to 10 mm. wide, with a long attenuate scabrous tip, the margin very sharply serrulate; panicle of 9 to 25, commonly 12 to 18, rather thick ascending racemes, 8 to 20 cm. long, approximate or fascicled on a sharply angled axis, 10 to 20 cm. long; rachis

⁵⁴ Musée Bot. Delessert 191. 1845.

⁵⁵ Contr. U. S. Nat. Herb. 12: 206. 1909.

⁵⁶ N. Amer. Fl. 17: 190. 1912.

⁵⁷ Contr. U. S. Nat. Herb. 18: 319. 1917.

about 1 mm. wide, sharply scabrous on the margin and with a few long hairs at the very base; spikelets in pairs on minute scabrous pedicels, crowded, or loosely arranged toward the base, 2.5 to 2.7 mm. long, about 1.8 mm. wide, obovate-elliptic, commonly leaden-purplish, glabrous; glume and sterile lemma equal, rather firm, somewhat loose, 3-nerved; fruit 2.5 mm. long, pale, minutely papillose-striate.

In most of the specimens from the Guianas a narrow first glume is developed on an occasional spikelet. This glume has been observed in only two specimens from the West Indies, *Hitchcock* 9644 and 16375. It is developed in the one specimen known from continental North America, *Standley* 25130.

DISTRIBUTION

In marshes and low open ground, occasionally in springy places on slopes; West Indies, east coast of Guatemala, and French Guiana.

GUATEMALA: Puerto Barrios, *Standley* 25130.

CUBA: Pinar del Río, *Hitchcock* 23293. Herradura, *Hitchcock* 478. Guanajay, *Palmer & Riley* 813.

Habana, *Tracy* 9125, 9126. Cano, *Ekman* 184. Batabanó, *Baker & Wilson* 2303; *Hitchcock* 477. Hanábana, *Wright* 3446 in part. Cayamas, *Baker* 3626.

JAMAICA: Black River, *Harris* 12544; *Hitchcock* 9644. Bull Head Mountain, *Hitchcock* 9536. Between Ewarton and Linstead, *Hitchcock* 9457. Annotta Bay, *Harris* 12469a.

HAITI: Plaisance, *Cook, Scofield & Doyle* 174. Trouin, *Ekman* H 2435. Gourjon, *Ekman* H 6452. Fond Parisien, *Leonard* 4174, 4187. Ennery, *Leonard* 9079.

LEeward ISLANDS: Antigua, *Hitchcock* 16375.

FRENCH GUIANA: Cayenne, *Broadway* 58; *Leprieur*.

124. *Paspalum millegrana* Schrad.

?*Paspalus virgatus* β *schreberianus* Flüge, Monogr. Pasp. 190. 1810. "America meridionalis Schreber * * * Exempla dono dederunt Schreberus." Flüge's types have not been located. (See page 1.) The brief description "spicis circiter triginta; rachi margine subpilosa; glumis undique glabris" strongly suggests *P. millegrana*, which is the commonest of the allied species with glabrous spikelets. Doell⁴⁶ refers Flüge's varieties *schreberianus* and *jacquinianus* to his *P. virgatum* & *glabriusculum*, but the only specimen cited for this variety, "R. Spruce *Paspalum* N. 16," is named by him in the Munich and in the DeCandolle herbaria *Paspalum virgatum* var. *platyaxon* Doell, for which he cites no specimen. Spruce's *Paspalum* 16 agrees with the description of *P. virgatum* var. *platyaxon*, and is taken for the type of that, and the basis of *Paspalum platyaxis* Mez, not known from North America.

Paspalum millegrana Schrad. in Schult. Mant. 2: 175. 1824. "In Brasilia. Princeps Sereniss. Maximil. Neowidensis." The type has not been located. The description applies very well to the species, found along the coast from southern Brazil to the Guianas and common throughout the West Indies, to which the name has been applied.⁴⁷

Paspalum vulnerans Salzm.; Steud, Nom. Bot. ed. 2. 2: 273, 1841, as synonym of *P. densum* Poir. The specimen so named by Salzmann in the Institut Botanique



FIGURE 125.—*P. arundinaceum*.
From *Hitchcock* 9457

⁴⁶ Mart. Fl. Bras. 2^o: 89. 1877.

⁴⁷ Contr. U. S. Nat. Herb. 12: 203, 1909; 18: 320. 1917.

of Montpellier is a rather small plant. The name doubtless refers to the cutting edges of the blades.

Paspalum karwinskyi Fourn. Mex. Pl. 2: 8. 1886. "Savana grande, inter El Chapopote et Tamalor (KARW. n. 1476)." This name was earlier listed without description by Hemsley.⁶⁰ The type was examined by A. S. Hitchcock at the herbarium of the Botanical Garden, Leningrad. The "*P. lentiginosum* Presl" from which Fournier differentiates it is, as shown by examination of a number of specimens cited, *P. plenum*. The locality cited can not be located.

Paspalum underwoodii Nash, Bull. Torrey Club 30: 375. 1903. "Type collected by Underwood and Griggs along roadsides, Mayaguez to Joyua [Porto Rico] * * * no. 149." "Joyua" is, according to a letter from Dr. E. W. Olive, an error for "La Jagua," a swampy valley back of the experiment station at Mayaguez. The type is in the herbarium of the New York Botanical Garden and a duplicate is in the United States National Herbarium.

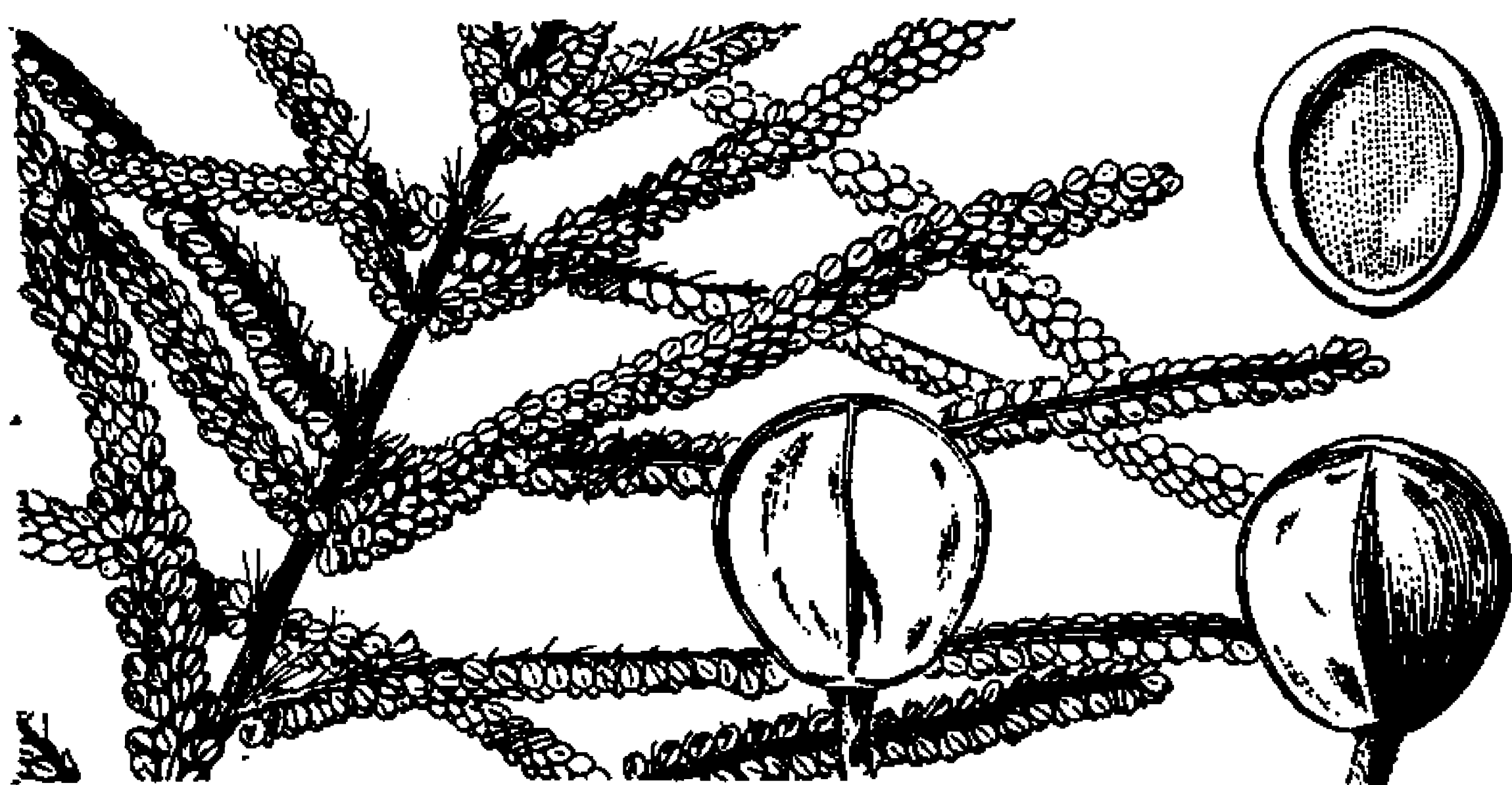


FIGURE 126.—*P. millegrana*. From Chase 7840

?*Paspalum schreberianum* Nash, N. Amer. Fl. 17: 190. 1912. Based on *P. virgatum* var. *schreberianum* Flüge, but misapplied to *P. arundinaceum* Poir.

DESCRIPTION

A robust erect or ascending perennial, glabrous as a whole, in large tough clumps, often purplish toward the base; culms simple (very rarely with a sterile branch), 0.9 to 2 meters tall, compressed; sheaths overlapping, broad and loose, the lower numerous, crowded, spongy and succulent, reticulate in drying, the upper sometimes with a few stiff hairs toward the summit, frequently hirsute on the collar; ligule 1.5 to 2 mm. long; blades ascending or spreading, firm, folded at base, V-shaped in cross section above, commonly 30 to 75 cm. long, sometimes longer, 7 to 15 mm. wide, the base as wide as the summit of the sheath, long-acuminate, densely hirsute back of the ligule, the hairs not long and conspicuous as in *P. secans*, papillose-pubescent to nearly glabrous on the upper surface, the lower surface very scabrous toward the tip, the margins very sharply serrulate; panicle of 6 to 60, commonly 12 to 25, rather thick ascending to spreading racemes approximate on a strongly angled scabrous or sparsely hispid axis 6 to 30 cm. long, the racemes 6 to 16 cm. long; rachis 0.9 to 1.2 mm. wide,

⁶⁰ Biol. Centr. Amer. Bot. 3: 479. 1885.

often irregularly flexuous, sharply serrulate and sparsely stiff-ciliate on the margin, the cilia rarely few or wanting, and with few to copious long stiff hairs in the axils; spikelets in pairs on minute scabrous pedicels, irregularly crowded, 2 to 2.4 mm. long, about 2 mm. wide, obovate-suborbicular, depressed plano-convex, pale to leaden-purplish, glabrous; glume and sterile lemma equal, scarcely covering the fruit at maturity, rather firm, 3-nerved, often slightly inflated at maturity with the midnerve of the glume raised into a keel and the sterile lemma almost obcordate; fruit 2 to 2.1 mm. long, pale, minutely papillose-striate.

DISTRIBUTION

Moist savannas, along ditches, and in low open ground at low altitudes. Honduras and El Salvador and the West Indies to southern Brazil.

HONDURAS: Tela, *Standley* 53591. Stan Creek, *Robertson* in 1890. (British Museum).

EL SALVADOR: Without locality, *Choussy* 37.

BAHAMAS: New Providence, *Krebs* (Copenhagen Herb.).

CUBA: Santiago de Los Baños, *Léon & Hioram* 4364. Pinar del Río, *Hitchcock* 23259. Habana, *Léon* 931, 4157, 4160; *Tracy* 9121. Guanabacoa, *Léon* 2870. Bajucal, *Van Hermann* 347. Cano, *Léon* 1987. Santiago de las Vegas, *Van Hermann* 142. Tunas, *Léon* 6735. San Marcos Savanna, *Léon* 9183. Lagoon Mojabraga, *Léon & Loustalot* 9413. Between Camaguey and Santayana, *Britton* 2361. Baraguá, *Hitchcock* 23366. Sierra de Nipe, *Ekman* 10118. Bayate, *Ekman* 6176. Without locality, *Wright* 3446 in part, 3840.

JAMAICA: Savanna-la-Mar, *Hitchcock* 9869. Troy, *Harris* 12657. Bull Head Mountain, *Hitchcock* 9557. Savoy, *Harris* 11620. Ashley Hall, *Harris* 12730. Annotta Bay, *Harris* 12469, 12534, 12658, 12660. Buff Bay, *Hitchcock* 9776.

HAITI: Aux Cayes, *Ekman* H 256, H 861.

DOMINICAN REPUBLIC: Haina, *Paris* 267.

PORTO RICO: Mayaguez, *Amer. Gr. Nat. Herb.* 578; *Chase* 6153, 6164, 6187, 6257½, 6303; *Goll* 923; *Heller* 4368; *Sintenis* 1223 in part; *Underwood & Griggs* 149. Maricao, *Chase* 6237. Aricebo, *Chase* 6441, 6565. Campo Alegre, *Chase* 6626. Vega Baja, *Britton & Cowell* 1449; *Chase* 6793, 6794. Bayamon, *Chase* 6373, 6646. Catano, *Chase* 6637. San Juan, *Chase* 6356, 6359, 6785. Rio Piedras, *Cowgill* 691; *Wetmore* 176. Trujillo Alto, *Chase* 6761, 6775½. Mameyes, *Chase* 6650. Rio Grande, *Chase* 6725. Fajardo, *Chase* 6704. Playa de Fajardo, *Chase* 6655. Playa de Humacao, *Eggers* 676. Island of Vieques, *Chase* 6687.

LEeward ISLANDS: Guadeloupe, *Balbis* in 1822; *Hitchcock* 16411.

TRINIDAD: Cedros, *Broadway* 4921; *Hitchcock* 10145. Icacos, *Hitchcock* 10156. Dabadie, *Broadway*. Manzanilla, *Hitchcock* 10366.

TOBAGO: Scarborough, *Hitchcock* 10285. Milford Road, *Broadway* 3066. Old Grange Road, *Broadway* 4696.

VENEZUELA: Without locality, *Goodwin* in 1919.

BRITISH GUIANA: Morawhanna, *Hitchcock* 17477. New Amsterdam, *Hitchcock* 16819. Georgetown, *Hitchcock* 16781. Rupununi Savanna, *Melville* 161.

DUTCH GUIANA: Paramaribo, *Kuyper* in 1913.

FRENCH GUIANA: Cayenne, *Broadway* 887, 971.

BRAZIL: Marajó Island, *Goeldi* 211, 213. Pará, *Goeldi* 10, 14. Pernambuco, *Chase* 7682. Maceió, *Chase* 7840. Bahia, *Glocker* 600; *Blanchet*; *Salzmann*. Rio de Janeiro, *Chase* 8219, 9810; *Wilkes Expl. Exped.* Ipanema, *Berro* in 1911. Guarujá, *Bailey* 950. Porto Dom Pedro II., *Dusén* 13890. Without locality, *Gardner*; *Glaziou* 476, 4345.

125. *Paspalum densum* Poir.

Paspalum densum Poir. in Lam. Encycl. 5: 32. 1804. "Porto-Ricco * * * Ledru (V. s. in herb. Lam.)" The type, in the Lamarck Herbarium, consists of a mature panicle and a single detached leaf.

Paspalum paniceum Smith in Ree's Cycl. 26: no. 14. 1813. "Gathered in Jamaica by W. Wright, M. D." A specimen of *P. densum* labeled "Jamaica, Dr. Wright * * * Herb. Forsyth," but with no name on the sheet, in the Kew Herbarium, appears to be part of the type collection. It agrees perfectly with the detailed description.

DESCRIPTION

A robust erect perennial, glabrous as a whole, thick and succulent at base, in large clumps; culms simple, 0.8 to 2 meters tall, compressed, the nodes from glabrous to densely appressed-hirsute; sheaths keeled, elongate, broad and loose, greatly overlapping and conspicuously equitant toward the base, flesh-colored to purplish, spongy and succulent, reticulate in drying, ciliate on the margin toward the summit and sometimes appressed-hirsute on the collar, or wholly



FIGURE 127.—*P. densum*. From type specimen and Chase 6791

glabrous; ligule 1.5 to 3 mm. long; blades ascending, firm, folded at base, V-shaped in cross-section above, commonly 50 to 80 cm., often 1 meter long, 1 to 2 cm. wide, the base equaling the summit of the sheath, the junction rather inconspicuous, long-acuminate, from sparsely to densely long-hirsute back of the ligule (rarely glabrous), the margins very sharply serrulate; panicle 12 to 30 cm., rarely to 40 cm., long, elongate-pyramidal, from tan-colored to purplish, of 50 to 100 or more rather thick racemes, the lower 5 to 9 cm. long, rather distant, finally spreading, the others successively shorter, more crowded and ascending, the tapering tip of the panicle composed of densely crowded very short racemes, the common axis strongly angled, with conspicuous tufts of long hairs in the axils; rachis 1.2 to 1.5 mm. wide, purplish brown, sharply serrulate and conspicuously ciliate with stiff hairs 2 to 5 mm. long; spikelets in pairs on slender scabrous pedicels, irregularly crowded, 1.9 to 2.2 mm. long, about 1.8 mm. wide, suborbicular, commonly somewhat unsymmetrical from pressure, depressed plano-convex, tan-colored to brownish, sometimes purple-tinged; glume and sterile lemma equal, 3-nerved, thin and fragile, under a lens very minutely papillose; fruit about 1.8 mm. long, pale, papillose-striate.

DISTRIBUTION

In marshes, wet savannas, ditches, and low open ground, or in shallow water or springy places on slopes, at low altitudes in the West Indies and Panama to Brazil, ascending the Amazon to eastern Bolivia.

- PANAMA: Canal Zone, *Hitchcock* 8020; *Killip* 4106. Sabana de Dormisolo, *Pittier* 4646.
- CUBA: Mantua, *Ekman* 11085. Hanábana, *Wright* 3447. Rodrigo, *Léon* 9135. Placetas del Sur, *Léon* 6420. Baraguá, *Hitchcock* 23381.
- JAMAICA: Bull Head Mountain, *Amer. Gr. Nat. Herb.* 579. Killits, *Harris* 11149. Appleton, *Hitchcock* 9657. Bog Walk, *Harris* 12214.
- HAITI: Marmelade, *Leonard* 8357. Kalacroix, *Leonard* 7989. St. Michel de l'Atalaye, *Ekman* H 9416. Petite-Riviere de l'Artibonite, *Ekman* H 3430.
- DOMINICAN REPUBLIC: Pimentel, *Abbott* 671.
- PORTO RICO: Vega Baja, *Chase* 6791. Between Bayamon and Catano, *Stahl* 42.
- VIRGIN ISLANDS: St. Thomas, *Riedley*.
- LEEWARD ISLANDS: Guadeloupe, *Duss* 4224.
- TRINIDAD: St. Joseph, *Hitchcock* 10025. St. Augustine, *Hart* 2155. Longdenville, *Broadway* 2618. Claxton Bay, *Hitchcock* 10115.
- COLOMBIA: Savanna de San Martin, *Shaw* in 1927.
- VENEZUELA: Mene Grande, *Pittier* 10624. Llanos del Alto-Apure, *Jahn* 192.
- BRITISH GUIANA: Parika, *Hitchcock* 16816. Lamaha, *Jenman* 3656.
- BRAZIL: Marajó Islands, *Goeldi* 86, 212, 264. Pará, *Goeldi* 1. Matto de São João, *Chase* 8140, 8148.
- BOLIVIA: Reyes, *White* 1499. Buena Vista, *Steinbach* 6898.

Coryphaea.—Robust rhizomatous perennial, in large clumps, with hirsute sheaths, long flat blades, and large panicles of numerous slender racemes. All the related species are confined to South America.

126. *Paspalum coryphaeum* Trin.

Paspalum coryphaeum Trin. Gram. Pan. 114. 1826. "Brasil. (Langsdorff.)" The type specimen in the Trinius Herbarium, labeled "In humidis prope Ytú, Brasil. Langsdorff," was examined by A. S. Hitchcock. The spikelets are 2.5 mm. long, the glume glandular-pubescent with fine hairs, the sterile lemma glabrous.

Paspalum pruinatum Trin. Gram. Icon. 3: pl. 272. 1836. "Figura ad specimen Brasilianum." In the Trinius Herbarium is a specimen collected by Langsdorff which is the original of plate 272. This is a plant with hirsute sheaths and a rather open panicle, the spikelets 2.2 mm. long, both glume and sterile lemma glandular pubescent. In the "Corrigenda et emendata," for volume 3 Trinius referred *P. pruinatum* to *P. coryphaeum* Trin.

Paspalum familiare Steud. Syn. Pl. Glum. 1: 24. 1854. "Funck coll. nr. 228 * * * Columbia." The type, bearing the name in Steudel's script, is in the Paris Herbarium. It was collected at Caripe. This is in Venezuela, not Colombia. According to Lasègue⁶¹, Funck botanized at Caripe, Venezuela, in 1840. A second sheet is marked *Funck & Schlim* 228. Each consists of the summit of a flowering culm. The sheaths are tawny-hirsute, densely so at the junction with the blade. The immature racemes are ascending, forming a narrow panicle; the spikelets are 2.3 mm. long, the glume glandular-pubescent, the sterile lemma glabrous.

⁶¹ Musée Bot. Delessert 215. 1845.

Paspalum violascens Mez, Repert. Sp. Nov. Fedde 15: 73. 1917. "Trinidad, loco accuratiore haud indicato (Trinidad Bot. Gard. herb. no. 2175)." The type, bearing the name in Mez's script, was examined in the Berlin Herbarium. A duplicate is in the United States National Herbarium. These are relatively slender plants, about 1.1 meters tall, the foliage nearly glabrous except at the junction of sheath and blade. The immature racemes are ascending, as in *P. familiare*, and not more than 8 cm. long; the spikelets are more crowded than usual, 2 mm. long or slightly more, the glume glandular-pubescent, the sterile lemma glabrous.

DESCRIPTION

A slender to robust leafy perennial, commonly glaucous-purplish, in tough clumps of few to many culms from short hard rhizomes; culms 1 to 4 meters tall, at first simple, erect to leaning, later bearing appressed to divergent flowering branches from the lower nodes in plants in open ground, from nodes 1 to 2 meters above the base in plants growing in dense colonies or among brush, the stout woody culm remaining simple until overtopping the mass of vegetation, then branching, the branches often crowded and forming dense bunches in the

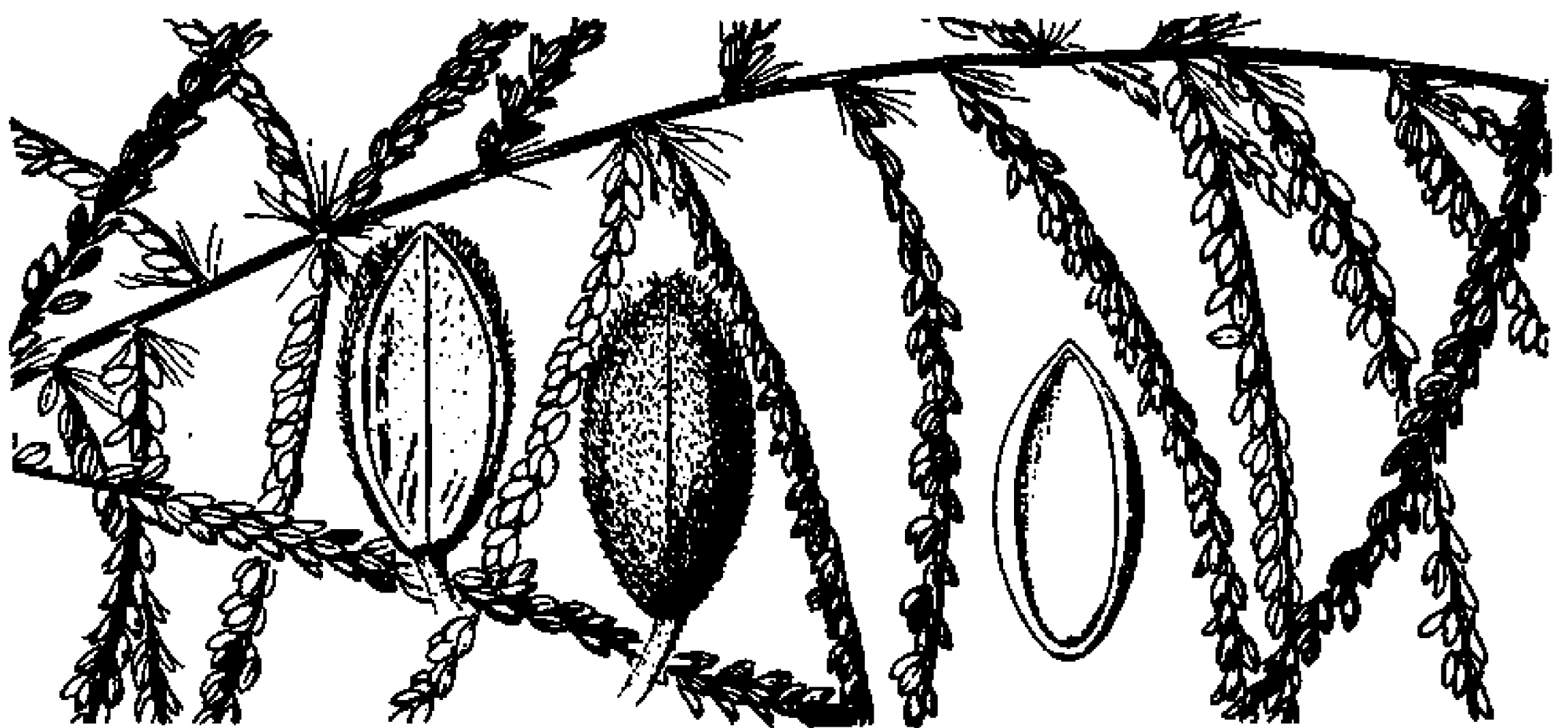


FIGURE 128.—*P. coryphaeum*. From type specimen of *P. prunosum* and Chase 9058

open above the underlying thicket, the branches simple, leaning or drooping and much more slender than the main culm below; internodes from densely papillose-hirsute, at least below the nodes, to glabrous; nodes from conspicuously to minutely tawny appressed-hirsute; sheaths mostly overlapping, those at the base of the main culm and of the branches crowded, faintly keeled, the lower papillose-hirsute to nearly glabrous, the upper ciliate toward the summit, otherwise usually glabrous, the summit often slightly auricled; ligule firm, 1 to 3 mm. long; blades flat or the scabrous margins revolute, ascending to spreading, or reflexed in age, firm, 12 to 32 cm. long, 8 to 23 mm. wide, tapering to a rounded base, with a dense tuft of long hairs back of the ligule, from densely grayish puberulent on both surfaces to glabrous, except at the base, the midnerve thick and pale; panicles from nodding with ascending racemes when young to drooping or hanging with spreading to recurved or reflexed racemes when mature; racemes 10 to 45 (rarely fewer than 10), slender to rather thick, the lower 6 to 12 cm. long, on a slender angled glabrous to very sparsely pilose common axis 10 to 25 cm. long, rachis very slender (scarcely 0.5 mm. wide), purple, bearing copious long tawny hairs at the very base, otherwise glabrous or obscurely pubescent; spikelets in pairs on slender pedicels, from loosely to rather densely arranged, commonly loose at the base, denser above, and the upper racemes denser than

the lower, 2 to 2.5 mm. long, about 1 mm. wide, elliptic; glume and sterile lemma equal, barely covering the fruit (at maturity the tip of the fruit exposed on the back), rather thin in texture, 3-nerved, the nerves farther from the margin than in most species, the glume finely glandular-pubescent, the hairs longer toward the upper margin, the lemma sparsely pubescent to glabrous, both commonly dotted or blotched with purple; fruit pale, the lemma with 5 very obscure nerves or longitudinal ridges.

Herbarium specimens of this species present a wide range of variation, but this is largely due to the fact that the plants change in habit with age and the situation in which they grow. Field work in Brazil showed that restricted colonies of this grass change as described in the preceding paragraph. The type of *P. pruinatum* represents the most characteristic simple form. A panicle from a specimen very like this type (*Chase* 9058) was chosen for illustration (figure 128). The plants from the summit of Pão de Assucar (*Chase* 8156, 8393, and 9802) agree with the type of *P. coryphaeum*, having slightly larger spikelets and nearly glabrous blades. A specimen collected by the Wilkes Exploring Expedition in the Organ Mountains and *Chase* 7754 are like the type of *P. familiare*. Hitchcock's nos. 10107 and 10192, from Trinidad, though larger and overmature, are much like the type of *P. violascens*.

In the fruiting lemma in this species five faint longitudinal ridges are visible. These and the general resemblance to *Paspalum usteri* Hack. of Brazil, allied to *P. malacophyllum*, suggest the affinity of that group to this species. In *P. usteri* the fruiting lemma is not strongly ribbed and the second glume is developed, commonly half as long as the spikelet.

DISTRIBUTION

Savannas and campos, open or brushy slopes, river banks and wood borders, Panama and Trinidad to Brazil, from near sea level to 1,100 meters altitude.

PANAMA: Savanna de Alhajuela, *Pittier* 3478.

TRINIDAD: Botanic Garden, *Broadway* 2175, 5947. St. Joseph, *Hitchcock* 10183, 10184, 10186, 10192. California, *Hitchcock* 10107. La Brea, *Trinidad Bot. Gard.* 2262. Brighton, *Hitchcock* 10092.

BRITISH GUIANA: Rupununi Savanna, *Melville* 118.

BRAZIL: Marajó Island, *Goeldi* 201. Alto Rio Branco, *Kuhlmann* 3172. Pernambuco, *Chase* 7754; *Pickel* 1561. Serra do Cipó, *Chase* 9124, 9254, 9267, 9290. Lagoa Santa, *Chase* 9104. Bello Horizonte, *Chase* 8956, 8962, 9058, 9063. Ouro Preto, *Chase* 9372. Goyaz, *Glaziou* 22605a. Organ Mountains, *Wilkes Expl. Exped.* Tijuca, *Kuhlmann* in 1916. Rio de Janeiro, *Chase* 8156, 8393, 9802; *Glaziou* 13328, 18684. São Paulo, *Holway* 1482. Jundiáhy, *Holway* 1644.

Plicatula.—Perennials and annuals with purplish compressed culms and sheaths; racemes rather heavy; spikelets at first drab turning brown or dark olivaceous; fruit dark brown, shining.

Plants perennial.

Spikelets obovate, turgid.

Sterile lemma wrinkled just within the margin.....127. *P. plicatum*.

Sterile lemma flat.....131. *P. centrale*.

Spikelets elliptic, depressed, not turgid.

Spikelets 3 mm. long; blades flat.....130. *P. leptachne*.

Spikelets not more than 2.5 mm. long; blades folded or subinvolute.

Plants subaquatic; rachis 1.5 to 2 mm. wide.....128. *P. wrightii*.

Plants terrestrial; rachis 1 mm. wide.....129. *P. motembense*.

Plants annual.

Spikelets obovate; rachis less than 1 mm. wide. 133. *P. melanospermum*.

Spikelets suborbicular.

Culms mostly stout, rather succulent; spikelets brown. 134. *P. boscianum*.

Culms slender, not succulent; spikelets drab to olivaceous.

132. *P. convexum*.

127. *Paspalum plicatulum* Michx.

Paspalum plicatulum Michx. Fl. Bor. Amer. 1: 45. 1803. "Hab. in Georgia et Florida." The type specimen, in the Paris Herbarium, is a single culm, 40 cm. tall, with 3 racemes 3.5 to 5.5 cm. long. The foliage is glabrous, except for a few hairs at the base of the blade on the upper surface. The locality given on the label is "Georgia, Florida."

Paspalum undulatum Poir. in Lam. Encycl. 5: 29. 1804. "Cette plante a été recueillie à Porto-Ricco par le citoyen Ledru. (V. s. in herb. Lam.)." The type specimen, "de portorico Ledru," is in the Lamarck Herbarium in the Paris Herbarium. There are two culms, one with 5, the other with 10 racemes.

Paspalum lenticulare H. B. K. Nov. Gen. & Sp. 1: 92. 1816. "Novae Andalusiae in declivitate montis Cocollar, in valle Caripensi, et juxta Cumanacoa." In the Willdenow Herbarium is a specimen of *P. plicatulum* marked "Humboldt," but without locality. This has 15 racemes. In the Paris Herbarium is another specimen of *P. plicatulum* from the Bonpland Herbarium so named and marked "Novae Andalusie, Caripei, Cocollard, Cumanacou." One culm has 16, the other 8 racemes. In the Berlin Herbarium is a specimen of *P. virgatum* from the Kunth Herbarium named "*Paspalum lenticulare* Kunth, Nova Andalusia" in Kunth's script. The description appears to have been drawn chiefly from specimens of *P. plicatulum*, but the statement "spicae viginti aut quatuor et viginti" must have been based on the specimen of *P. virgatum*.

Paspalum gracile LeConte, Journ. de Phys. 91: 285. 1820. Not *P. gracile* Rudge 1805. "Habitat in Georgia." A LeConte specimen, with the name in his script, in the Academy of Natural Sciences, Philadelphia, is the upper part of a culm with 4 racemes. This is accepted as the type since it agrees with the description, though LeConte evidently based his description on additional material since he says "spicis 4-5." A specimen with 5 racemes appears to have been given to Richard. This, marked "Am. Sept. Mr. La Compte.," is now in the Drake Herbarium.

Paspalus leptos Schult. Mant. 2: 173. 1824. Based on *P. gracile* LeConte, the name presumably changed because of *P. gracile* Rudge. Schultes quotes LeConte's description.

Paspalum montevidense Spreng. Syst. Veg. 1: 246. 1825. "Monte Video. Sello." The type specimen was examined in the Berlin Herbarium. On the sheet is noted in Nees' script "*Paspalus plicatulus* var. γ β mihi."

Paspalum tenue Kunth, Rév. Gram. 1: 26. 1829. Not *P. tenue* Gaertn. 1791. Based on *P. gracile* LeConte.

Paspalum multiflorum Desv. Opusc. 58. 1831. "Crescit in Brasilio." A specimen from Brazil in the Paris Herbarium, bearing the name in Desvaux's script, is a tall slender culm of *P. plicatulum* with hairy foliage.

Paspalum orthos Schult.; Kunth, Enum. Pl. 1: 57. 1833. This name is given as a synonym of *P. tenue* Kunth, but *P. leptos* is evidently intended, since the place of publication of that name is cited.

Paspalum marginatum Spreng. in Steud. Nom. Bot. ed. 2. 2: 272, 1841, as synonym of *P. undulatum* Poir. Not *P. marginatum* Trin. 1826. A specimen so named in Sprengel's script is in the Berlin Herbarium.

Paspalum campestre Schlecht. *Linnaea* 26: 131. 1853. Not *P. campestre* Trin. 1834. "Sillae de Caracas, * * * (n. 392)," collected by Wagener. The type has not been located. The description agrees well with Pittier 7164, 7287, 7305, 9434, and 9756, all collected in the mountains near Caracas.

Paspalum atrocarpum Steud. *Syn. Pl. Glum.* 1: 25. 1854. "Ex Hrbo. Urville sine loco natali." The type specimen in the Dumont-d'Urville Herbarium at Caen bears the name in Steudel's script. It is a single complete plant 25 cm. tall, such as found in pastured land. No locality is given, but the plant probably came from southern Brazil.

Paspalum antillense Husnot, *Bull. Soc. Linn. Normand. ser. 2.* 5: 260. 1871. "Husn. no. 76. Route de la Basse-Terre au camp Jacob (Guad[eloupe])." Husnot's no. 76 was examined in the Brussels Herbarium, in the Paris Herbarium, and in the British Museum. These three specimens are *P. plicatum* with blades long-ciliate on the margin toward the base. Husnot's no. 76 in the Institut Botanique of Montpellier is *P. melanospermum*. The description is not detailed enough to differentiate between the two species; but the specimen of *P. melanospermum*, having blades but sparsely ciliate, is rejected as the type, since Husnot emphasizes the long hairs toward the base of the blades.

Paspalum saxatile Salzm.; Doell in *Mart. Fl. Bras.* 2²: 76. 1877. The herbarium name of a specimen from Bahia, Brazil, cited as a synonym of *P. plicatum*. A specimen of the Salzmänn collection, "in umbrosis pr. Bahia," so named, is in the United States National Herbarium.

Paspalum decumbens Sagot; Doell in *Mart. Fl. Bras.* 2²: 77. 1877. Not *P. decumbens* Swartz 1788. A herbarium name of Sagot 1342, cited as synonym of *P. plicatum*. The specimen, collected at Cayenne in 1859, was examined in the Drake Herbarium in Paris.

Paspalum plicatum var. *intumescens* Doell in *Mart. Fl. Bras.* 2²: 78. 1877. "Prope Lagoa Santa in lacu juxta ripam (Warming)." The type, in the Doell Herbarium in Freiburg, is a specimen of *P. plicatum* with nearly glabrous foliage and 4 racemes, the sterile lemma of most of the spikelets indurate, as in Swallen 453 from Florida.

Paspalum pauperulum Fourn. *Mex. Pl.* 2: 10. 1886. "San Luis Potosí (Virlet. n. 1320)." In the Fournier Herbarium in the Paris Herbarium are two sheets of Virlet's no. 1320. One consists of a fragmentary specimen of *P. pubiflorum*; no writing of Fournier's appears on the sheet. The other specimen consists of two small plants of *P. plicatum*, one mounted alone, the other with the end of a flowering culm of *P. pubiflorum* mounted with it, the base concealed beneath the leafy base of the plant of *P. plicatum*. On this sheet is an unpublished name, "n. sp.," in Fournier's script. Fournier's description appears to be based on the mixed specimen and applies to both parts, but the spikelets are described as glabrous and the fruit as shining brown, hence the plants of *P. plicatum* are taken as the type.

Paspalum pauperulum var. *altius* Fourn. *Mex. Pl.* 2: 10. 1886. "Rio Blanco prope Orizaba (Bourg. n. 2033)." The number cited has not been located. It seems probable that it is a misprint for 2633, a tall specimen of *P. plicatum* from the locality cited.

Panicum plicatum Kuntze, *Rev. Gen. Pl.* 3²: 363. 1898. Based on *Paspalum plicatum* Michx.

The name "plicatum" is misspelled "plicatum" by Persoon.⁶²

DESCRIPTION

A rather slender perennial, in tufts of few to several culms, with numerous leafy shoots at base, sometimes with a short rhizome; culms ascending or suberect,

⁶² *Syn. Pl.* 1: 86. 1805.

often from a slightly decumbent base, 0.5 to 1 meter tall, rarely shorter or taller, glabrous, simple or with one or two branches from the lower nodes, rarely from the middle ones, the branches leafy like the primary culm; nodes glabrous, or the lower sometimes appressed-pubescent; sheaths keeled, glabrous or papillose-pilose along the margin and keel or rarely hirsute throughout, the lower crowded, commonly rather papery; ligule brown, 2 to 3 mm. long; blades mostly folded at base, flat or folded above, rather firm, erect or ascending, 10 to 50 cm. long, 3 to 10 mm. wide, the uppermost reduced, glabrous or more commonly papillose-pilose on the upper surface toward the base, sometimes, especially in the Tropics, papillose-pilose on both surfaces; racemes 2 to 19, commonly 3 to 10, 2 to 10 cm. long, usually arcuate-spreading, the common axis slender; rachis about 1 mm. wide, with a tuft of long hairs at the base; spikelets in pairs (one of the pair sometimes undeveloped), 2.1 to 3 mm. long, 1.4 to 2 mm. wide, commonly 2.5 to 2.8 mm. long, 1.8 mm. wide, obovate-oval, at first grayish, turning brown in drying and at maturity; glume and sterile lemma equal, thin in texture, 5-nerved, glabrous, or the glume often appressed-pubescent, the lemma at maturity with short transverse wrinkles just inside the slightly raised margin, rarely sparsely appressed-pubescent; fruit nearly the size and shape of the spikelet, dark brown and shining.



FIGURE 129.—*P. plicatulum*. From type specimen and Chase 7061.

A species of wide range and somewhat variable habit, the culms slender and wiry to rather robust, the foliage varying from glabrous to conspicuously pilose, the spikelets glabrous to strongly pubescent on the glume, rarely on the sterile lemma. Specimens from the Tropics are more commonly pubescent than are those of the United States.

In *Swallen* 453 the sterile lemmas of all spikelets are brown-indurate except around the margins.

DISTRIBUTION

Open ground or wet wood borders, mostly in moist sandy or clay soil, Georgia, Florida, and west to Texas, south to Argentina and throughout the West Indies; an important constituent of the campos of Brazil.

GEORGIA: Savannah, *Kearney* 193. *Thalman*, *Chase* 7061.

FLORIDA: Pensacola, *Curtiss* 5923. Milton, *Swallen* 384, 453. Chipley, *Combs* 542, 561, 598, 607. Marianna, *Swallen* 497. Madison, *Combs* 214, 240. Madison County, *Hitchcock* 2497. Suwanee County, *Hitchcock* 2496. Lake City, *Bitting* 811, 895, 1195; *Combs & Rolfs* 85, 86; *Ricker* 889. Jacksonville, *Kearney* 166. Gainesville, *Chase* 4210; *Norton* 385c. Alachua County, *Hitchcock* 9216. Bronson, *Combs* 840. Levy County, *Hitchcock* 2501. Cedar Key, *Garber* in 1876. Eustis, *Nash* 216. Tampa, *Combs* 1392. Bartow, *Combs* 1185. Peace Creek, *J. D. Smith* in 1880.

ALABAMA: Mobile, *Kearney* 48; *Mohr* in 1878, 1883, 1884, 1890, and 1891.

MISSISSIPPI: Biloxi, *Kearney* 216; *Tracy* 3774, 4509. Ocean Springs, *Pollard* 1108.

LOUISIANA: Alexandria, *Ball* 613. Oberlin, *Ball* 231. Lake Charles, *Chase* 4391, 6074; *Tracy* 3673, 3686. Cameron, *Cocks* 2187; *Tracy* 8603. Crowley, *Webb* in 1912. Abbeville, *Langlois* 19. Covington, *Arsène* 12251.

- TEXAS: Texarkana, *Eggert* in 1896. Bastrop, *Painter* in 1922; *Plank* 42. Giddings, *Egeling*. Rutersville, *Wright*. Tom Green County, *Tweedy* in 1880. College Station, *Hitchcock* 9218. Brazos County, *Nealley* in 1882. Waller County, *Thurrow* in 1898. Harvester, *Hitchcock* 1196. Houston, *Bebb* 1234, 1249; *Fisher* 65, 84. Hempstead, *Hall* 801; *Tharp* 3262. Columbia, *Bush* 340. Galveston, *Hitchcock* 9220. Port Lavaca, *Allen* 15. Rockport, *Chase* 6062. San Antonio, *Hitchcock* 5326. Robstown, *Griffiths* 6505½. Sarita, *Hitchcock* 5487, 9219. Without locality, *Nealley* in 1886.
- SAN LUIS POTOSÍ: Las Canoas, *Hitchcock* 5764; *Pringle* 3772. Cárdenas, *Hitchcock* 5773½.
- SINALOA: Rosario, *Rose* 1885.
- NAYARIT (TEPIC): Acaponeta, *Rose* 3294.
- JALISCO: Guadalajara, *Palmer* 190 and 468 in 1886.
- VERA CRUZ: Jalapa, *Hitchcock* 6614. Córdoba, *Hitchcock* 6409, 6414. Orizaba, *Botteri* in 1856 and 1857; *Bourgeau* 2633, 2745, 2843; *Hitchcock* 6358, 6371. Mirador, *Liebmann* 182. Zacuapan, *Purpus* 3772, 3777, 8476. Coatzacoalcos, *Smith* 1054.
- MORELOS: Cuernavaca, *Hitchcock* 6854, 6882½.
- COLIMA: Colima, *Palmer* 144 in 1897. Alzada, *Hitchcock* 7057, 7059.
- OAXACA: Efigenia, *Nelson* 2853.
- CHIAPAS: Monserrate, *Purpus* 441.
- GUATEMALA: Cobán, *Johnson* 440; *Popenoe* 899; *Türckheim* 3837. Secanquím, *Goll* 81. La Aurora, *Morales* 708. San Lucas Tolimán, *Heyde & Lux* (*Dist. Smith*) 6403. Guatemala City, *Hayes* in 1860; *Hitchcock* 9015. Quiriguá, *Standley* 23860. Between Las Amates and Izabal, *Blake* 7746. Puerto Barrios, *Standley* 24782, 24914, 25149. Santa Rosa, *Heyde & Lux* (*Dist. Smith*) 4101.
- HONDURAS: San Pedro Sula, *Thieme* (*Dist. Smith*) 5593.
- EL SALVADOR: Dept. Ahuachapán, *Padilla* 400. San Salvador, *Calderón* 492; *Standley* 19558, 20496, 22486, 23091, 23605, 23607, 23650; *Velasco* 3. Finca San Nicolás, *Choussy* A 17.
- NICARAGUA: Masaya, *Hitchcock* 8642. Jinotepe, *Hitchcock* 8691, 8696.
- COSTA RICA: Nuestro Amo, *Jiménez* 528. Bebedero, *Jiménez* 736, 743. Alajuela, *Jiménez* 175. San José, *Hitchcock* 8466, 8510. Port Limon, *Hitchcock* 8425. Pacaca, *Pittier* 3275. Boruca, *Tonduz* 4472. Buenos Aires, *Tonduz* 4863.
- PANAMA: El Boquete, *Hitchcock* 8177, 8190, 8292, 8293. Dolega, *Hitchcock* 8339½. Aguadulce, *Pittier* 4914. Chorrera, *Hitchcock* 8124, 8138. Canal Zone, *Hitchcock* 7902, 7969, 7981, 7991, 7995, 8010, 8024; *Killip* 4012, 4031, 4099, 4116; *Maxon* 6514; *Piper* 5198, 5198½, 5206; *Pittier* 3725, 6731, 6763; *Standley* 25265, 26113, 28339, 28600, 30000, 32099. Matías Hernández, *Standley* 28979. Aguarubia, *Killip* 4280. Panamá, *Gervais* 163; *Hitchcock* 22953; *Standley* 25901, 26874, 29705. Las Cruces Trail, *Standley* 29094, 29124. Tabogo Island, *Pittier* 3622. Chepo, *Pittier* 4494. Camino del Boticario, *Pittier* 4551. Sabana de Juan Corso, *Pittier* 4742. Sabana de Dormisolo, *Pittier* 4648.
- CUBA: Pinar del Río, *Wright* 3839. Between Sumidero and Pinar del Río, *Leon* 3470. Cayajabos, *Britton, Wilson & Leon* 6026. Herradura, *Hitchcock* 457; *Tracy* 9051, 9052. San Diego de los Baños, *Leon* 4557; *Leon & Hioram* 4363, 4461. Habana, *Leon* 926; *Tracy* 9117. Wajay, *Leon* 781. Madruga, *Leon* 3454. Santiago de las Vegas, *Baker* 33, 34, 2056; *Baker & Wilson* 596; *Hitchcock* 456; *Wilson* 420, 421. Cano, *Leon* 1989. Anafe Station, *Leon* 4333. Campo Florido, *Leon* 3462. Hanábana, *Wright* 768. Manacas, *Leon & Cananás* 5844. Sancti Spiritus, *Leon* 927b, 5364. Tuinicú, *Leon* 927. Zaza del

- Sur, *Sergius* 2777. Placetas del Sur, *Léon* 6419. Isle of Pines, *Britton & Wilson* 14707; *Britton, Britton & Wilson* 15015, 15354, 15631; *Ekman* 12040; *Palmer & Riley* 947; *Taylor* 38.
- JAMAICA: Troy, *Harris* 12608; *Hitchcock* 9788; *Maxon* 2812. Lititz, *Harris* 12681, 12701. New Forest, *Hitchcock* 9843. Southern Manchester, *Harris* 12695. Savoy, *Harris* 11615. Ipswich, *Hitchcock* 9601. Bull Head Mountain, *Hitchcock* 9524, 9549. Between Ewarton and Moneague, *Hitchcock* 9443. Between Bog Walk and Spanish Town, *Hitchcock* 9290½. Bog Walk, *Ridley* 5. Gordontown, *Hart* 679; *Hitchcock* 9330. Guava Ridge, *Harris* 11289. Cold Spring Gap, *Harris* 11353. Castleton, *Harris* 11284. Castleton Gardens, *Hitchcock* 9392. Hope Gardens, *Hitchcock* 9319. Windsor, *Maxon & Killip* 1719.
- HAITI: Marmelade, *Leonard* 8079, 8241. St. Michel de l'Atalaye, *Ekman* H 8350; *Leonard* 7124, 7354, 7355, 7579. Kalacroix, *Leonard* 7853. Port-au-Prince, *Ekman* H 7115. Port-à-Piment, *Ekman* H 411. Furcy, *Leonard* 4296.
- DOMINICAN REPUBLIC: Azua, *Fuertes* 1846. Guaina Mica, *Eggers* 2547. Pimental, *Abbott* 632, 689.
- PORTO RICO: Mayaguez, *Britton & Cowell* 4070; *Chase* 6151; *Underwood & Griggs* 147. Maricao, *Sintenis* 358. Lares, *Chase* 6592. Salta de Morovis, *Chase* 6466. Coamo Springs, *Chase* 6546. Atolateja, *Goll* 235. Vega Baja, *Chase* 6430. Dorado, *Johnston* 1011. Bayamon, *Chase* 6644. Rio Piedras, *Cowgill* 423; *Johnston* 538. Trujillo Alto, *Chase* 6777; *Hioram* 320. Between Aibonito and Cayey, *Chase* 6339. Mameyes, *Chase* 6652. Juncos, *Sintenis* 2612.
- VIRGIN ISLANDS: St. Thomas, *Britton & Schafer* 375; *Eggers* 4. St. Croix, *Hitchcock* 16339; *Thompson* 254. Virgin Gorda, *Britton & Fishlock* 1097. Tortola, *Britton & Schafer* 764.
- LEEWARD ISLANDS: Guadeloupe, *Duss* 2673. Dominica, *Hitchcock* 16438.
- WINDWARD ISLANDS: Martinique, *Duss* 548, 720, 4011. St. Lucia, *Hitchcock* 16473; *Kemp* 7.
- TRINIDAD: Port of Spain, *Hitchcock* 9983. St. Ann, *Broadway* 4616. St. Joseph, *Hitchcock* 10190. San Fernando, *Hitchcock* 10112. La Brea, *Broadway* 4970. Pitch Lake, *Hitchcock* 10090. Without locality, *Broadway* in 1918.
- TOBAGO: Scarboro, *Hitchcock* 10213. Government House, *Broadway* 3148.
- COLOMBIA: Buenaventura, *Hitchcock* 19899. Savanna de San Martín, *Shaw* in 1927; *Dawe* 231. La Cumbre, *Pennell & Killip* 5949. Córdoba, *Killip* 5050. Zarzal, *Pennell, Killip & Hazen* 8470. Corinto, *Pittier* 992, 999. Toribio, *Pittier* 1472. Cauca Valley, *Lehmann* 3457. Popayán, *Lehmann* 5398.
- VENEZUELA: Mene Grande, *Pittier* 10581. Tovar, *Fendler* 1737; *Pittier* 12822, 12823. Between Tabay and Mucurubá, *Pittier* 12878. Caracas, *Pittier* 7164, 7287, 7305, 7386, 9434. San Lázaro, *Pittier* 9756. Los Teques, *Pittier* 6098. Barquisemito, *Funck & Schlim* 823.
- BRAZIL: Marajó Island, *Goeldi* 161, 206. Pernambuco, *Chase* 7659; *Pickel* 1395, 1402, 1583. Cachoeira, *Chase* 8092. Parafuso, *Chase* 7987. Bahia, *Salzmann*. Caldas, *Henschen* III. 1343xxx. Rio Forto, *Glaziou* 22590. Lavras, *Chase* 8846, 8847. Oliveira, *Chase* 8863. Bello Horizonte, *Chase* 8973, 8976; *Holway* 1321. Lagoa Santa, *Chase* 9044. Serra do Cipó, *Chase* 9114, 9256, 9281. Barbacena, *Chase* 8672. Between Sitio and Dr. Sá Fortes, *Chase* 8677. Monte Ser-rat, *Chase* 8359. São João, *Holway* 1659. Lapa, *Holway* 1607. Alta da Serra, *Holway* 1504. São Caetano, *Holway* 1582. São Jose des Campos, *Löfgren* 3812. Serrinha, *Dusén* 16434. Campo de Serra Geral, *Ule* 1614. Rio Grande do Sul, *Malme* 117. Without locality, *Riedel*.

PARAGUAY: Puerto Casado, *Rojas* 2316, 2783, 2787. Río Apa, *Hassler* 8079. Villa Sana, *Fiebrig* 5190. San Salvador, *Rojas* 2720, 2730. Lower Río Pilcomayo, *Rojas* 114. Cordillera de Altos, *Fiebrig* 876.

URUGUAY: Cerro Largo, *Herter* (*Herb. Osten*) 18622a in part. Durazno, *Schroeder* (*Herb. Osten*) 18742. La Paloma, *Wetmore* 848. Montevideo, *Arechavaleta*; *Sello* 74, 781; *Lombardo* 1801.

BOLIVIA: Coripata, *Hitchcock* 22675. Río Pirai, *Herzog* 1345. Buena Vista, *Steinbach* 6873, 7036.

ARGENTINA: Posadas, *Ekman* 581, 582. Formosa, *Jørgensen* 2425. San Marcos, *Parodi* 12. Buenos Aires, *Parodi* (*Herb. Osten*) 15239.

128. *Paspalum wrightii* Hitchc. & Chase

Paspalum wrightii Hitchc. & Chase, *Contr. U. S. Nat. Herb.* 18: 310. 1917. "Type in the U. S. National Herbarium, no. 865562, collected in Cuba by Charles Wright (no. 3843)."

DESCRIPTION

A subaquatic perennial; culms 1.5 to 1.7 meters long, leafy to the summit, simple, lush, decumbent or floating at the base, with rootlets at the distant nodes; sheaths glabrous, the lower loose, overlapping, the upper close, elongate; ligule 1 mm. long; blades sub-erect, rather firm, 20 to 40 cm. long, about 5 mm. wide (the uppermost greatly reduced), involute toward the summit, scabrous on the margin and bearing a tuft of long hairs just back of the ligule; racemes 5 to 9, ascending, 4 to 8 cm. long, the common axis slender, 8 to 10 cm. long, not hairy in the axils or with one or two hairs only; rachis 1.5 to 2 mm. wide, glabrous, the margin minutely scabrous; spikelets in pairs, closely imbricate, 2.2 to 2.5 mm. long, about 1.4 mm. wide, elliptic to slightly obovate, glabrous; glume and sterile lemma equal, thin, slightly and irregularly wrinkled, 3-nerved or with an additional obscure pair near the margin; fruit about 2.2 mm. long, 1.2 mm. wide, elliptic, chestnut-brown, the rolled margins of the lemma pale.

DISTRIBUTION

Margin of pools and streams, Province of Pinar del Río, Cuba, sometimes forming extensive colonies.

CUBA: Pinar del Río, *Wright* 3843. Arroyo Mateo Sánchez, *Ekman* 17910; *Amer. Gr. Nat. Herb.* 978

129. *Paspalum motembense* Léon

Paspalum motembense Léon in *Britton, Bull. Torrey Club* 53: 457. 1926. "Grassy place, Sabana de Motembo, Santa Clara, Cuba (*Léon and Loustalot* 9354) * * *. The type specimen is preserved in the Herbarium of the New York Botanical Garden." Brother Léon's own specimen of this collection was lent for study. The spikelets are immature.



FIGURE 130.—*P. wrightii*. From type specimen

DESCRIPTION

A glabrous erect perennial with a short rhizome; culms 60 cm. tall, simple, compressed, leafy below; sheaths overlapping, keeled; ligule 1 to 1.5 mm. long; blades ascending, mostly folded, 20 to 30 cm. long, 5 to 8 mm. wide (opened out), the junction with the sheath inconspicuous, the base slightly narrower than the sheath, the long-acuminate apex convolute; racemes several (8 in the only specimen seen), ascending, the lower 4.5 to 5 cm. long, the upper gradually shorter, the slender angled common axis 15 cm. long; rachis 1 mm. wide, very narrowly winged; spikelets in pairs on short flat scabrous pedicels, rather crowded, 2.5 mm. long, 1.2 to 1.4 mm. wide, elliptic, brownish-yellow; glume and sterile lemma equal, thin, loose, slightly and irregularly wrinkled, the glume 5-nerved and very obscurely appressed-pubescent toward the summit, the lemma 3-nerved, glabrous; fruit 2.3 mm. long, brown, probably smooth and shining at maturity, the margins of the lemma pale.



FIGURE 131.—*P. motembense*.
From type specimen

This species is closely related to *Paspalum wrightii*, being distinguished chiefly by its terrestrial habit, its glabrous blades, its much narrower rachis, and by the very slightly wrinkled glume and sterile lemma.

Known only from the type collection.

130. *Paspalum leptachne* Chase, sp. nov.

DESCRIPTION

A rather robust nearly glabrous perennial, with a short woody rhizome; culms erect from a slightly curved base, 1.3 to 1.5 meters tall, strongly compressed, simple; sheaths slightly keeled toward the summit, rather loose, the lower overlapping, purplish, the lowermost short, bladeless and hirsute, the others sparsely pubescent along the margin toward the summit, otherwise glabrous; ligule 1.5 to 2 mm. long, lacerate; blades flat, spreading from an ascending base, rather firm, 20 to 30 cm. long, 7 to 10 mm. wide, the base equaling in width the summit of the sheath (the uppermost blade reduced), very minutely pubescent on the upper surface and near the base hirsute, the margin scabrous; racemes 8 or 9, narrowly ascending, 5 to 13 cm. long, the common axis about 15 cm. long, scabrous on the sharp angles; rachis 1.7 to 1.8 mm. wide, purplish-gray, with a few stiff hairs at the base; spikelets in pairs (one of the pair often undeveloped toward the base) on slender pedicels, 3 mm. long, 1.7 mm. wide, elliptic, subacute; glume and sterile lemma equal, subhyaline, fragile, commonly torn, rather faintly 5-nerved, tawny, the dark fruit

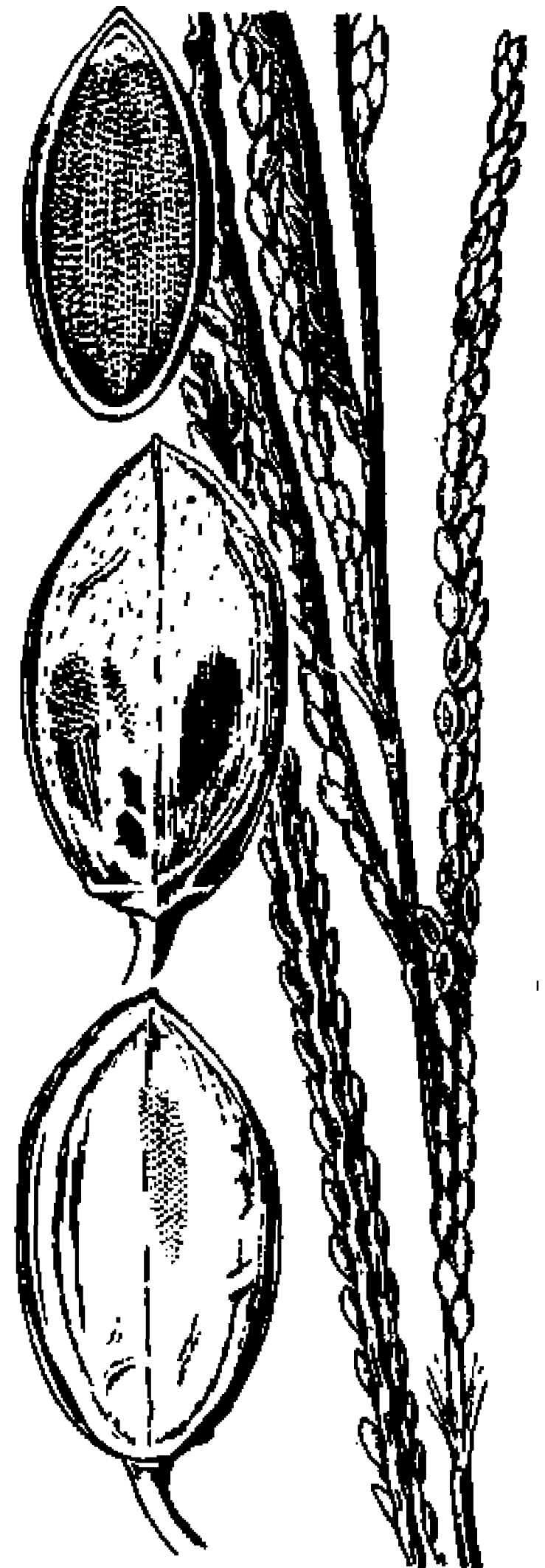


FIGURE 132.—*P. leptachne*.
From type specimen

showing through and its strong papillae impressed in places, the glume obscurely appressed-pubescent, the lemma sometimes slightly wrinkled near the margin; fruit about 2.6 mm. long, dark brown and papillose, the summit and base pale (possibly because immature).

Type in the U. S. National Herbarium, no. 300853, collected near Pedro Paulo, in the foothills of the Sierra Madre, Territorio de Tepic [now Nayarit], Mexico, August 3, 1897, by J. N. Rose (no. 1961).

Known only from the type specimen and a single duplicate. The species is related to *Paspalum motembense*, *P. wrightii*, and the South American *P. modestum* Mez, but there is nothing to suggest a subaquatic habit except that the culms appear to have been somewhat succulent toward the base.

131. *Paspalum centrale* Chase

Paspalum centrale Chase, Journ. Washington Acad. Sci. 17: 145. f. 2. 1927. "Type in the U. S. National Herbarium, no. 950876, collected in open flat meadow near the coast, La Union, El Salvador, November 13, 1911, by A. S. Hitchcock (no. 8789)."

DESCRIPTION

A rather low perennial, in small to rather dense and spreading tufts; culms often branching from the lower nodes, sometimes from the middle ones, ascending to spreading, occasionally geniculate and rooting at the lower nodes, 15 to 60 cm. long, usually 30 to 45 cm., ridged, glabrous; nodes glabrous; sheaths rather loose, mostly exceeding the internodes, from sparsely to conspicuously pilose, sometimes glabrous except near the margins, rarely throughout; ligule brown, 2 to 3 mm. long; blades flat, ascending, 5 to 25 cm. long, 3 to 10 mm. wide, commonly 10 to 20 cm. long and 5 to 7 mm. wide, the uppermost reduced, long-acuminate, about as wide at the base as the summit of the sheath, pilose throughout, often sparsely so or rarely subglabrous on the under surface; racemes 2 to 6, distant about one-fourth to two-thirds their length, or the upper closer, 2 to 7 cm. long, mostly spreading, often arcuate, the common axis slender, narrowly winged, rather stiff, sometimes bearing scattered long hairs toward the summits of the internodes; rachis 1 to 1.3 mm. wide, long-pilose at the base, the hairs sometimes as much as 10 mm. long, hispidulous and sometimes with a few scattered long hairs on the margins and on the midnerve above; spikelets mostly solitary (the secondary one of the pair rudimentary, or a few developed in some racemes), slightly or scarcely imbricate, 2 to 2.3 mm. long, 1.7 to 1.8 mm. wide, elliptic-obovate, olivaceous to brownish, glabrous; glume and sterile lemma barely or scarcely covering the fruit, rather fragile, 5-nerved, the outer one of the lateral pair of nerves sometimes obscure; fertile lemma and palea shining, very minutely papillose-striate, at first pale, turning dark brown.

This species is closely related to *Paspalum boscianum* Flügge, from which it differs in being perennial, not so coarse and less branching in habit, in the pilose foliage, and in the relatively slender racemes, with narrower rachises and mostly solitary, rather less turgid spikelets. The panicles of depauperate plants of *P. boscianum* with solitary spikelets resemble shorter-racemed panicles of *P. centrale*, but such plants are readily distinguished by the difference in foliage. The spikelets

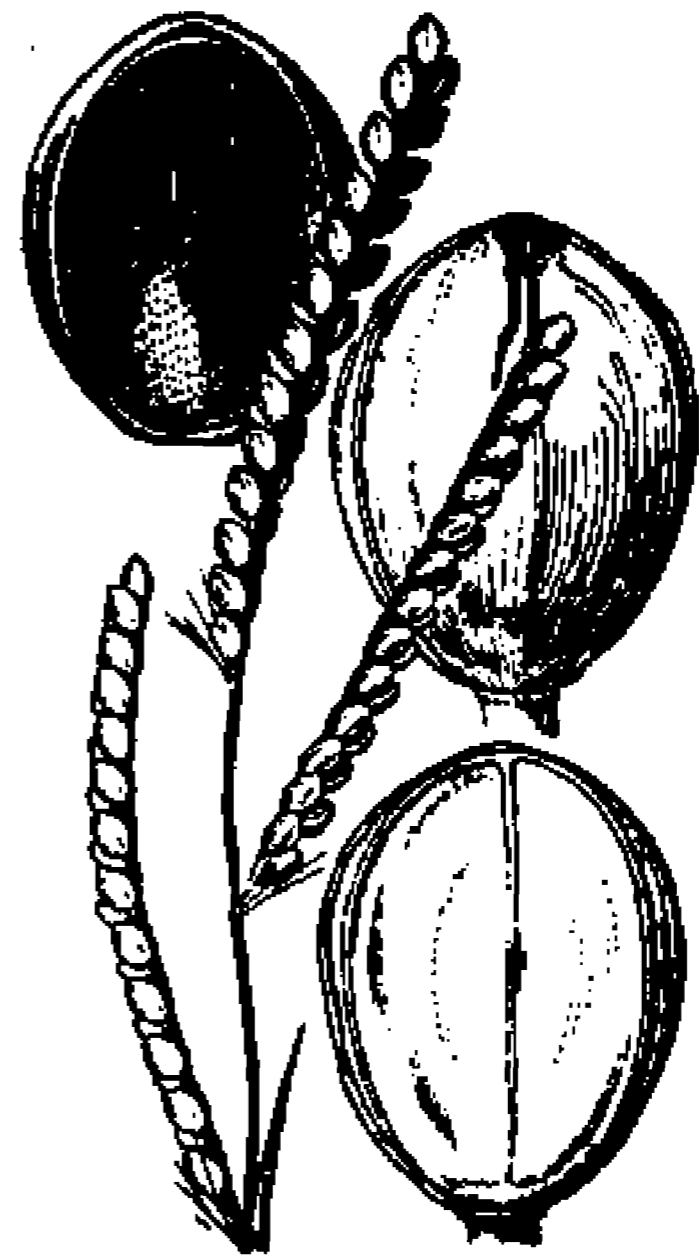


FIGURE 133.—*P. centrale*.
From type specimen

of *P. centrale* never assume the rust-brown color characteristically (but not constantly) found in those of *P. boschianum*. Some plants resemble *P. convexum* especially if the perennial character is not evident. The spikelets are always glabrous in *P. centrale*, less rounded, and usually smaller than in *P. convexum* and the lateral pair of nerves of the sterile lemma is obscure and very close to the intermediate pair, while in *P. convexum* the sterile lemmas are plainly 5-nerved.

DISTRIBUTION

Along ditches and in moist open ground near the coast, El Salvador to Panama.

EL SALVADOR: Ahuachapán, *Padilla* 391. Acajutla, *Hitchcock* 8992. La Unión, *Hitchcock* 8788, 8789.

NICARAGUA: Corinto, *Hitchcock* 8754.

COSTA RICA: Puntarenas, *Hitchcock* 8532, 8543, 8544, 8569. Atenas, *Hitchcock* 8524½.

PANAMA: Chiriquí, *Hitchcock* 8345. Canal Zone, *Hitchcock* 7985, 8004, 8005, 8008, 8059; *Pittier* 6817. Laguna de Portalo, *Pittier* 4621. Sabana de Juan Corso, *Pittier* 4527. Panama, *Standley* 26796, 27782. Chivi Chivi, *Killip* 4077. Matías Hernández, *Pittier* 6760, 6779.

132. *Paspalum convexum* Humb. & Bonpl.

Paspalus convexus Humb. & Bonpl. in Flüge, Monogr. Pasp. 175. 1810. "Jorullo. Humboldt et Bonpland." In the Nova Genera⁶³ the locality is given as the Volcano Jorullo [Michoacán], Mexico. The Humboldt and Bonpland specimen in the Berlin Herbarium bears the name in Kunth's script. Specimens of this collection were examined also in the Willdenow Herbarium, in the Paris Herbarium, and in the British Museum. In these the sheaths are glabrous or bear a few papillae only, the blades are papillose-pubescent on both surfaces, and the spikelets are glabrous, 2.8 mm. long.

Paspalum villifolium Steud. Syn. Pl. Glum. 1: 20. 1854. "Lhotsky legit verosimiliter in Brasilia." The type specimen, bearing the name in Steudel's script, is in the Paris Herbarium. It is a small plant with pubescent foliage and sparsely appressed-pubescent spikelets about 2.5 mm. long.

Paspalum ancylocarpum Nees; Steud. Syn. Pl. Glum. 1: 27. 1854. "Lhotsky legit in Brasilia." The type specimen, in the Berlin Herbarium, bearing the name in Nees' script, consists of three small plants with pubescent foliage and nearly glabrous spikelets 2.5 mm. long.

Paspalum hemicryptum Wright, Anal. Acad. Cienc. Habana 8: 204, 1871; Wright & Sauv. Fl. Cubana 196. 1873. "3847 [Wright] El Salado * * * San Cristobal," Cuba. The type in the Herbarium Sauvalle, Academia de Ciencias de la Habana, consists of two depauperate tufts with conspicuously pilose foliage, the nearly glabrous spikelets 2.2 to 2.3 mm. long.

Paspalum convexum Willd.; Doell. in Mart. Fl. Bras. 2²: 79, 1877, as synonym of *P. ancylocarpum* Nees.

Paspalum inops Vasey, Contr. U. S. Nat. Herb. 1: 281. 1893. "Collected at Guadalajara [Mexico] by Dr. Edward Palmer (no. 592) in 1866." The type, in the United States National Herbarium, consists of two plants 25 and 30 cm. tall, with pubescent foliage, the spikelets 2.3 to 2.5 mm. long, obscurely appressed-pubescent.

Paspalum inops var. *major* Vasey in Beal, Grasses N. Amer. 2: 89. 1896. "Mexico, Pringle 1875." The type specimen, in the United States National Herbarium, collected in "sandy alluviums of canyons, Sierra Madre, Chihuahua," Mexico, is a larger plant than the type of *P. inops*, the stouter culms 40 to 45

⁶³H. B. K. Nov. Gen. & Sp. 1: 91. 1816.

cm. tall, the sheaths glabrous, the blades only sparsely pilose toward the base, and the glabrous spikelets 2.7 to 3 mm. long.

Paspalum comosum Flügge; Knuth, Repert. Sp. Nov. Fedde 88 (Beih.): 106. 1926. Listed without description, "ex herb. Pittier. Miranda: Valencia (Pittier n. 8638)," in a catalogue of the flora of Venezuela. This collection in the United States National Herbarium is *Paspalum convexum* Flügge. The name "comosum" is doubtless an error for "convexum." Valencia is in the State of Carabobo, not in Miranda. The same collection with correct locality is cited as *P. convexum* on the same page by Knuth.

DESCRIPTION

A tufted leafy annual, branching at the base; culms suberect to geniculate-ascending, sometimes widely spreading, usually with short leafy flowering branches from the lower and middle nodes, 10 to 75 cm. usually 20 to 40 cm. tall, glabrous; nodes glabrous; sheaths loose, mostly shorter than the internodes, from glabrous to conspicuously papillose-pilose; ligule brown, fragile, about 2 mm. long; blades flat, ascending, rather lax, 5 to 23 cm. long, 3 to 11 mm. wide, commonly 8 to 15 cm. long and 5 to 10 mm. wide, the uppermost usually reduced but sometimes about as large as the others, commonly scarcely wider at base than the sheath, but sometimes broader and somewhat clasping, from conspicuously papillose-pilose to short-pubescent or sparsely pilose toward the base only; racemes 1 to 4, commonly 2 or 3, thick, ascending or spreading at maturity, 1.5 to 7 cm., commonly 2 to 4 cm., long, usually distant half to two-thirds their length, the common axis slender, flexuous, glabrous; rachis 1 to 2 mm. wide, long-pilose at the base, otherwise glabrous; spikelets in pairs, crowded, 2.2 to 3 mm. long, nearly as wide, obovate-suborbicular, turgidly plano-convex, drab to olivaceous; glume and sterile lemma scarcely covering the fruit at maturity, rather thin, 5-nerved, appressed-pubescent to glabrous; fruit broadly-obovate, dark brown, shining.

Like many weedy annuals this species is exceedingly variable, plants of cultivated ground being large and luxuriant and bearing spikelets up to 3 mm. long, while those of sterile places are dwarfed and bear spikelets only 2.2 to 2.5 mm. long. Subglabrous foliage is found in larger plants only, but many large plants are as pubescent as the smaller ones. The larger spikelets are found usually in the larger plants, but some of them have spikelets only 2.5 mm. long.

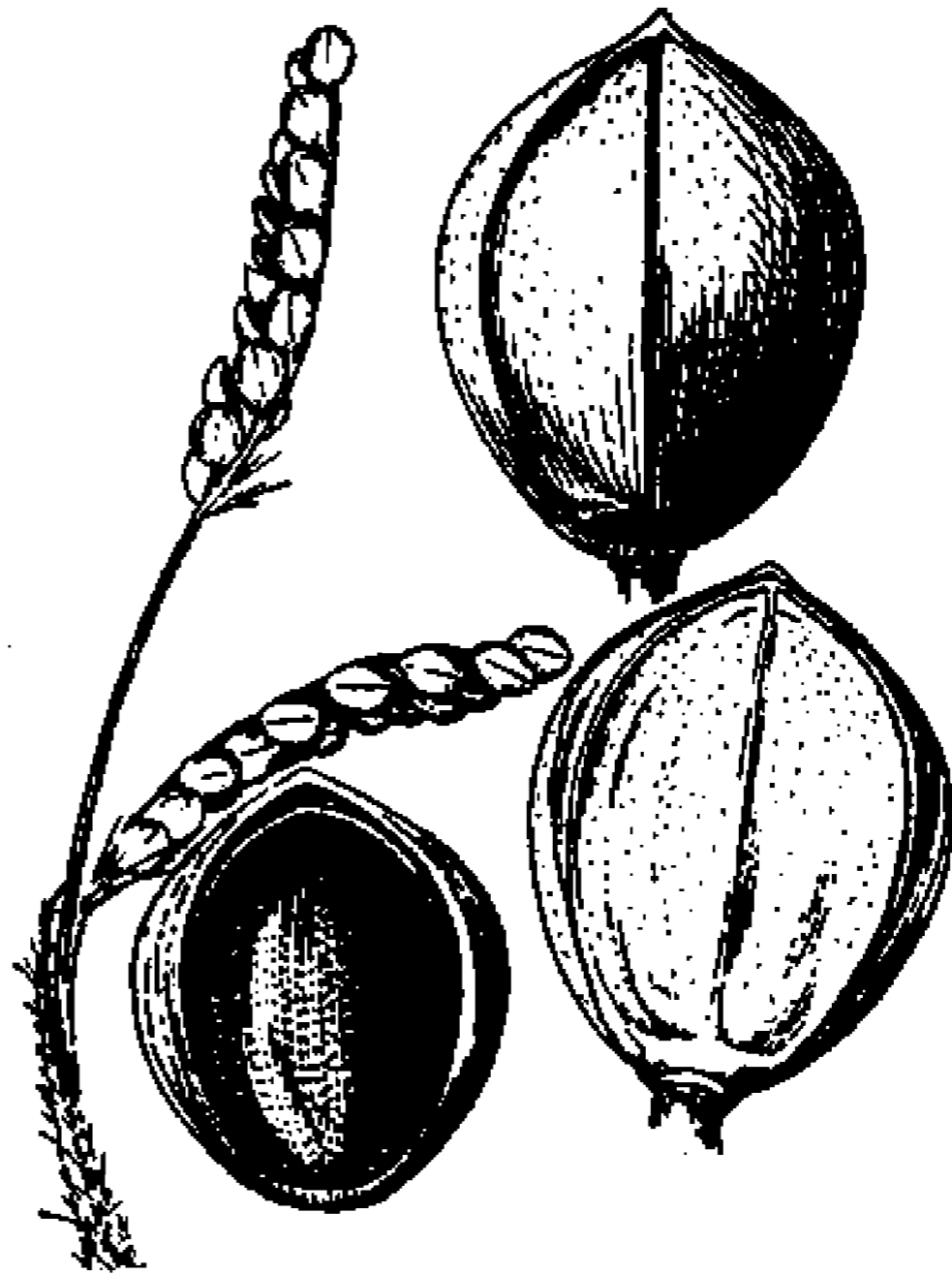


FIGURE 134.—*P. convexum*. From type specimen of *P. inops*

DISTRIBUTION

Open ground, cultivated and waste places, northern Mexico to Brazil; also in Cuba and Trinidad, probably introduced.

CHIHUAHUA: Sierra Madre, *Pringle* 1175, 1875.

SINALOA: Lodiago, *Palmer* 1658 in 1891.

ZACATECAS: Plateado, *Rose* 2781.

DURANGO: Durango, *Hitchcock* 7592. Without locality, *García* 644, 786.

JALISCO: Guadalajara, *Palmer* 592 in 1886; *Pringle* 11761. San Pedro, *Hitchcock* 7284, 7290. San Nicolás, *Hitchcock* 7190, 7221, 7222, 7223. Zapotlán, *Hitchcock* 7120, 7134. Valencia, *Hitchcock* 7005. La Junta, *Hitchcock* 6999.

- GUANAJUATO: Guanajuato, *Dugès* in 1897.
 VERA CRUZ: Jalapa, *Hitchcock* 6657. Coatepec, *Hitchcock* 6668.
 PUEBLA: Puebla, *Arsène* 2284a.
 MEXICO: Federal District, *Pringle* 6427, 9583.
 MORELOS: Cuernavaca, *Hitchcock* 6830, 6863, 6868; *Orcutt* 3889.
 MICHOACÁN: Uruápan, *Hitchcock* 6957, 6958, 6993, 6994. Morelia, *Arsène* 2478, 2644a.
 COLIMA: Alzada, *Hitchcock* 7064.
 GUERRERO: Santa Fé, *Hitchcock* 6692.
 MEXICO (Republic of): "Mezquitán" *Oliva* 97.
 GUATEMALA: Cobán, *Türckheim* 3830; *Johnson* 6. Guatemala City, *Hitchcock* 9017, 9095. Volcano Pacaya, *Kellerman* 6245.
 EL SALVADOR: Volcano San Salvador, *Hitchcock* 8931, 8953.
 NICARAGUA: Masaya, *Hitchcock* 8659. Jinotepe, *Hitchcock* 8703.
 COSTA RICA: Puntarenas, *Wercklé* in 1917. San José, *Tonduz* 3017. Santa María de Dota, *Standley* 42488. Guadalupe, *Hitchcock* 8474. San Rafael de Cartago, *Pittier* 6982. San Francisco de Guadalupe, *Pittier* 9036, 9049. Atenas, *Hitchcock* 8522½, 8524.
 PANAMA: Dolega, *Hitchcock* 8332. David, *Hitchcock* 8369. Aguadulce, *Pittier* 4959. Río Tecumen, *Standley* 29397. Nuevo San Francisco, *Standley* 30752.
 CUBA: El Salado, *Wright* 3847. Gamboa, *Ekman* 15008.
 TRINIDAD: La Brea, *Broadway* 4983.
 VENEZUELA: Guarico, *Pittier* 12509. Valencia, *Pittier* 8638. Caracas, *Bailey* 56, 273.
 BRAZIL: Serra do Cipó, *Chase* 9109, 9162. Lagoa Santa, *Chase* 8989, 9043.

133. *Paspalum melanospermum* Desv.

Paspalum melanospermum Desv. in Poir. in Lam. Encycl. Suppl. 4: 315. 1816. "Cayenne [French Guiana] (* * * herb. Desv.)." The type has not been located. The description and the comparison with *P. coromandelianum* and *P. scrobiculatum* (so called) suggested the form described under this name in Grasses of the West Indies⁶⁴ but in the present paper referred to *P. boscianum*. Later collections from British Guiana show that the common form of that region is the one with wrinkled spikelets, described as *P. olivaceum* in Grasses of the West Indies. Hence that is probably the form described as *P. melanospermum*.

Paspalum amazonicum Trin. Linnaea 10: 294. 1836. "Ega, ad fl. Amaz." This is described in a paper on the grasses of tropical America collected by Pöppig. The type specimen was examined in the Trinius Herbarium by A. S. Hitchcock, and a duplicate by the writer in the Vienna Herbarium.

Paspalum humile Steud. Syn Pl. Glum. 1: 25. 1854. "*P. caespitosum*. Hochst. Hrbr. Kappler nr. 1543, non Flügg. Surinam." The type specimen, bearing the name in Steudel's script, was examined in the Drake Herbarium in Paris. It is a small, erect plant like *Broadway* 15.

Paspalum caespitosum Hochst.; Steud. Syn. Pl. Glum. 1: 25, 1854, as synonym of *P. humile*. This name and *Kappler* 1543 are cited by Doell⁶⁵ under *P. plicatulum* Michx., *P. plicatulum* var. *microspermum* Doell, and *P. dissectum* L.

Paspalum plicatulum var. *microspermum* Doell in Mart. Fl. Bras. 2²: 78. 1877. "*Paspalum caespitosum* Hochstetter et *Paspalum humile* Steud. * * * prope Villa de Uberava et Lagoa Santa prov. Minarum (Regnell III. n. 1343) * * * Surinamia (*Kappler* n. 1543.)" Several collections from different localities were distributed under Regnell no. III. 1343, followed by one or more x's. None has been found from the localities cited. Specimens of *Regnell* III. 1343 x and

⁶⁴ Contr. U. S. Nat. Herb. 18: 311. 1917.

⁶⁵ Mart. Fl. Bras. 2²: 76, 78, 79. 1877.

xx belong to *P. yaguaronense* Henr. Kappler 1543 is taken as the type of *P. plicatulum* var. *microspermum*.

Paspalum olivaceum Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 310. 1917. "Type in the U. S. National Herbarium no. 559837, collected in the island of Guadeloupe, September 23, 1897, by Père Duss (no. 3915)."

DESCRIPTION

A leafy nearly glabrous annual, olivaceous when dry, commonly purplish stained; culms glabrous, slightly fleshy, compressed-striate when dry, 40 to 70 cm. long, ascending from a decumbent base, often rooting at the lower nodes, finally bearing simple ascending floriferous branches; sheaths loose, thin, compressed; ligule erose, 1.5 to 2 mm. long; blades lax, erect, at least at the flat or folded base, commonly 10 to 15 cm. long, rarely 20 cm. long, 5 to 10 mm. wide, usually pilose on the upper surface at base, otherwise glabrous; panicle short-exserted from the bladeless upper sheath, the slender subflexuous axis 4 to 8 cm. long of 2 to 7 arcuate-spreading racemes, 1 to 6 cm. long; rachis scarcely 1 mm. wide, a few long hairs at the base; spikelets mostly in pairs, 2 mm. long, 1.5 mm. wide, obovate, strongly convex on the back, chestnut to rust-brown; glume and sterile lemma equal, 5-nerved, thin and commonly torn, glabrous or the glume obscurely strigose, the lemma often minutely wrinkled inside the slightly raised margin; fruit obovate-hemispherical, dark brown, shining.

DISTRIBUTION

Open, mostly moist ground, Guadeloupe, Martinique, and northern South America to the Amazon valley.

LEEWARD ISLANDS: Guadeloupe, Duss 3915; Husnot 76 in part.

WINDWARD ISLANDS: Martinique, Duss 4012; Hitchcock 16445.

COLOMBIA: Santa Marta, Smith 124.

VENEZUELA: Dividivi, Pittier 10835, 10861.

BRITISH GUIANA: Morawhanna, Hitchcock 17470. Parika, Hitchcock 16812. Lama, Jenman 6004. Penal Settlement, Hitchcock 17064, 17102. Kyk-over-al Island, Hitchcock 17198. Wismar, Hitchcock 17279. Akyma, Hitchcock 17427, 17438. Rockstone, Gleason 635. Tumatumari, Gleason 24; Hitchcock 17339. Rupununi Savanna, Melville 145.

DUTCH GUIANA: "Surinam," Weigelt in 1827.

FRENCH GUIANA: Cayenne, Broadway 15. Without locality, Leprieur 80, 87.

BRAZIL: Marajó Island, Goeldi 288, 293. Pará, Goeldi 28; Huber in 1907.

BOLIVIA: Buena Vista, Steinbach 5459.

134. *Paspalum boscianum* Flüge

Paspalum virgatum Walt. Fl. Carol. 75. 1788. Not *P. virgatum* L. 1759. Presumably described from South Carolina. No specimens of *Paspalum* are found in Walter's herbarium.⁶⁶

Paspalus boscianus Flüge, Monogr. Pasp. 170. 1810. "*Paspalum brunneum*. Bosc. inedit. * * * In Carolina detexit Clarissimus Bosc, qui mecum exemplaria communicavit." The type has not been located, but the detailed

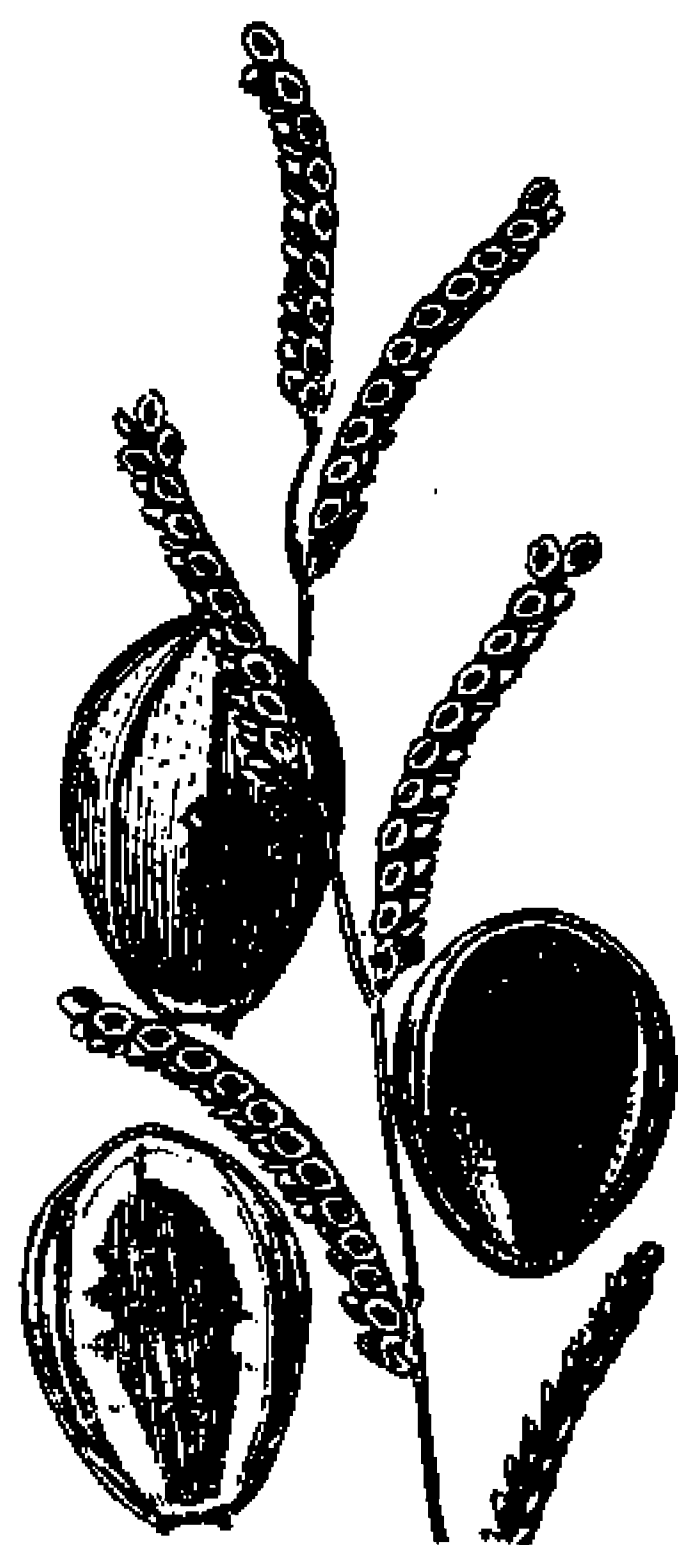


FIGURE 135.—*P. melanospermum*. From type specimen of *P. olivaceum*

⁶⁶ See Ann. Rep. Mo. Bot. Gard. 16: 41. 1905.

description leaves no uncertainty. A specimen in the Willdenow Herbarium at Berlin received from North America as *Paspalum brunneum* and on which the name "*Boscianum*" is written is possibly part of the type material. The spikelets are paired below, but solitary toward the ends of the racemes.

Paspalum brunneum Bosc; Flüge, Monogr. Pasp. 171. 1810, as synonym of *P. boscianum*.

Paspalum purpurascens Ell. Bot. S. C. & Ga. 1: 108. pl. 6, f. 3. 1816. "Grows in moist soils. Common," presumably about Charleston, South Carolina. The type specimen was examined in the Elliott Herbarium in the Charleston Museum. The detailed description also identifies the species.

Paspalum confertum LeConte. Journ. de Phys. 91: 285. 1820. "Habitat in Georgia." The LeConte specimen bearing this name in the herbarium of the Academy of Natural Sciences, Philadelphia, is the upper part of a large plant with a mature inflorescence.

Paspalum virgatum var. *purpurascens* Wood, Class-book 781. 1861. Based on *P. purpurascens* Ell.

The species described by Muhlenberg⁶⁷ as *P. virgatum* L. is *P. boscianum*.



FIGURE 136.—*P. boscianum*. From Kearney 152

DESCRIPTION

A rather succulent annual, branching at the base and commonly from the middle nodes, usually conspicuously brownish purple, glabrous as a whole; culms 20 cm. to 1 meter, commonly 40 to 60 cm., long, ascending to widely spreading, sometimes rooting at the lower nodes, drying ridged; sheaths longer than the internodes, broad and loose, with a thin rusty-brown margin, the lowermost rarely pilose; ligule brown, 2 to 3.5 mm. long; blades flat, ascending, 10 to 40 cm. long, 6 to 18 mm. wide, commonly 15 to 30 cm. long and 8 to 10 mm. wide, about as wide at the base as the summit of the sheath or slightly wider and rounded, papillose-pilose on the upper surface toward the base, the hairs as much as 5 mm. long, scabrous on the margin, otherwise glabrous; racemes 2 to 15, commonly 4 to 11 in depauperate plants or on branches sometimes solitary, 2.5 to 9 cm. long, commonly 4 to 7 cm. thick, finally spreading, approximate on an angled, rather stiff slender axis, often forming somewhat heavy short-exserted panicles; rachis 2 to 2.5 mm. wide with a thick midrib and firm wings, scabrous on the margin and with a tuft of long hairs at the base; spikelets in pairs (the inner one of the pair sometimes undeveloped), crowded, 2 to 2.2 mm. long, 1.7 to 2 mm. wide, obovate-suborbicular, strongly plano-convex, glabrous, ashy gray turning to rusty brown, often conspicuously contrasting with the gray-green rachis; glume

⁶⁷ Descr. Gram. 94. 1817.

and sterile lemma barely covering the fruit, rather fragile, 5-nerved, the lateral pair of nerves closely parallel and near the margin; fruit dark brown, shining, very minutely papillose-striate.

Small slender specimens with 1 to 4 racemes and spikelets mostly solitary (one of the pair undeveloped) are the form described by Nash⁶⁸ as *Paspalum scrobiculatum* L. The fertile lemma is said to be "scrobiculate." This can only refer to the lunate line of thin texture through which the radicle pushes in germination and which is well marked in all species of *Paspalum* and *Panicum* with strongly indurate fertile lemmas. In Linnaeus's description of *Paspalum scrobiculatum* (see p. 228) he says of the flatter valve of the calyx (the sterile lemma) "in medio pari scrobiculorum impresso."

The Porto Rico specimens are relatively small slender plants, but the spikelets are mostly in pairs. This form was listed as *P. boscianum* by Nash in the grasses of Porto Rico⁶⁹ but in Hitchcock and Chase's Grasses of the West Indies⁷⁰ it was described under the name *Paspalum melanospermum* Desv. (Small specimens from Florida were the basis for including that State in the range given.) As in other species of this group, the sterile lemma is occasionally indurate like the fertile lemma or partly indurate.

This species, called bull-grass, bull-paspalum, and purple paspalum, furnishes a good hay in the Southeastern States. It is especially valuable for dairy cows, but is hard to cure.

DISTRIBUTION

Moist or wet open ground, along ditches and ponds, and sometimes a weed in cultivated fields, Virginia to Florida and Louisiana; also in Guatemala, Panama, Porto Rico, and northern Brazil. A specimen was found on ballast grounds, Philadelphia, Pa., in October, 1879, by Burk.

PENNSYLVANIA: Philadelphia, *Burk* in 1879.

VIRGINIA: Dismal Swamp, *Chase* 3670. Norfolk County, *Kearney* 2341.

NORTH CAROLINA: West Raleigh, *Stanton* 1288. Elizabeth City, *McCarthy* in 1883. Newbern, *Kearney* 1951. Wilmington, *Canby* in 1867; *Hitchcock* 9222; *Kearney* 281. Eastern North Carolina, *McCarthy* in 1884 and 1885. Without locality, *Curtis*.

SOUTH CAROLINA: Oconee County, *Anderson* 1406, 1539. *Anderson*, *Davis* 7905. Florence, *Ball* 684. Aiken, *Ravenel*. Orangeburg, *Hitchcock* 9223.

GEORGIA: Lafayette, *Harper* 351. Dalton, *Harper* 367. Currahee Mountain, *Small* in 1894. Stone Mountain, *Chase* 4510; *Hitchcock* 9224. Augusta, *Kearney* 205; *McCarthy* in 1888. Milledgeville, *J. D. Smith* in 1884. Macon, *J. D. Smith* in 1883. Bibb County, *J. D. Smith* in 1883. Without locality, *Chapman*.

FLORIDA: Pensacola, *Combs* 522. Chipley, *Combs* 566. Bay Head, *Combs* 640. Chattahoochee, *Tracy* 3663. Quincy, *Combs* 395, 423. Tallahassee, *Combs* 384; *Nash* 2346. Monticello, *Combs* 310, 322. Jefferson County, *Hitchcock* 2495. Madison, *Combs* 242, 293. Lake City, *Combs & Rolfs* 124, 159; *Rolfs* 819. Jacksonville, *Combs* 36; *Curtiss* 3573, 4025, 5022, 5745, 5760; *Kearney* 152. Gainesville, *Combs* 746. Fort Myers, *Standley* 18884. Without locality, *Chapman*.

TENNESSEE: Knoxville, *Ruth* 77. Hiwassee Valley, *Ruth* in 1892 and 1893. Blount County, *Gayle* in 1890.

ALABAMA: Scottsboro, *Chase* 4496. Cullman County, *Eggert* in 1897. Tuscaloosa, *Smith* in 1877. Tysonville, *Hitchcock* 9227. Chehaw, *Hitchcock* 9226.

⁶⁸ In *Small*, Fl. Southeast. U. S. 74. 1903.

⁶⁹ Bull. Torrey Club 30: 376. 1903.

⁷⁰ Contr. U. S. Nat. Herb. 18: 311. 1917.

- Auburn, *Tracy* 3959. Tuskegee, *Carver* 91. Mobile, *Curtiss* 6509; *Hitchcock* 9225; *Kearney* 36; *Mohr* in 1880.
- MISSISSIPPI: Starkville, *Kearney* 8; *Tracy* (*Pollard Dist.*) 1411. Woodville, *Phares* in 1878. Moss Point, *Tracy* 4630. Biloxi, *Chase* 4355; *Tracy* 4629. Ocean Springs, *Tracy* 119.
- LOUISIANA: Calhoun, *Ball* 39. Oberlin, *Ball* 216. Cotes Blanches, *Langlois* in 1884. Plaquemines Parish, *Langlois* 26.
- GUATEMALA: Cobán, *Türckheim* (*Dist. Smith*) 66. Cubilquitz, *Türckheim* (*Dist. Smith*) 7795. Chamá, *Johnson* 454.
- PANAMA: David, *Hitchcock* 8359. Chivi Chivi, *Killip* 4084. (Both collections have spikelets with indurate sterile lemmas and the first glume mostly developed.)
- PORTO RICO: Mayaguez, *Chase* 6172. Maricao, *Chase* 6234. Sierra Laquillo, *Chase* 6724; *Hioram* 367.
- VIRGIN ISLANDS: St. Thomas, *Herb. Ventenat* (*Delessert Herb.*).
- BRAZIL: Marajó Island, *Goeldi* 290.

PASPALUM SCROBICULATUM L. (*Mant.* 1: 29. 1767. "Habitat in India orientali."), a shorter, stouter, more freely branching and more prolific species with larger spikelets, unequally biconvex rather than plano-convex, the glume and sterile lemma 7-nerved, the latter more or less wrinkled (scrobiculate), was found on ballast at Camden, N. J. (*Martindale* in 1879) and at Abilene, Tex. (*Bentley* in 1899). Doctor Stapf⁷¹ says that the original *P. scrobiculatum* of Linnaeus represents the cultivated form of India, and renames it "*P. scrobiculatum* var. *frumentaceum* Stapf." It is to this cultivated form that Linnaeus' detailed description applies and not to the several species of the Old World that are commonly called *P. scrobiculatum*, nor to forms of the American *P. boscianum*.

Malacophylla. (*Anachyris* Nees; *Paspalum* Sect. *Eremachyrion* Doell;⁷² *P.* Subsect. *Anachyris* Benth. & Hook.⁷³).—Perennials with panicles of several to many racemes; spikelets concavo-convex, both glumes suppressed (reduced only in one Brazilian species), the fertile lemma strongly longitudinally ridged. Only one of the 5 species represented in North America.

135. *Paspalum malacophyllum* Trin.

Paspalum malacophyllum Trin. *Gram. Icon.* 3: pl. 271. 1831. "Figura ad specimen Brasilianum." The type, in the Trinius Herbarium, collected at Cuyabá, by Langsdorff, is a large plant with softly pubescent foliage.

Anachyris paspaloides Nees, *Journ. Bot. Kew Misc.* 2: 103. 1850. "Gardner hrbr. nr. 4031. Brasilia." The type specimen, in the Lindley Herbarium at Cambridge, bears the name in Nees's script (the generic name spelled *Anachyrium*). Duplicates are in the Kew, Berlin, Delessert, Vienna, and United States National herbaria. These plants are scarcely as robust as the type of *P. malacophyllum*, and have subglabrous sheaths, the lower blades tapering to a narrow base, the upper rounded at base. Steudel⁷⁴ gives the generic name "*Anachyrium*," as found in Nees's writing.

Wirtgenia paspaloides Nees; Doell in *Mart. Fl. Bras.* 2²: 40, 1877, as synonym of *Paspalum malacophyllum* Trin.

Paspalum malacophyllum β *glabrescens* Doell in *Mart. Fl. Bras.* 2²: 41. 1877. The specimens cited by Doell under *P. malacophyllum* are not differentiated into

⁷¹ In *Prain, Fl. Trop. Afr.* 9: 575. 1919.

⁷² *Mart. Fl. Bras.* 2²: 40. 1877.

⁷³ *Gen. Pl.* 3: 1097. 1883.

⁷⁴ *Syn. Pl. Glum.* 1: 33. 1854.

varieties. In the Brussels Herbarium Regnell's no. III. 1340 in 1867 bears this varietal name in Doell's script. The sheaths and blades are nearly glabrous except in the throat.

Paspalum malacophyllum γ *petiolatum* Doell in Mart. Fl. Bras. 2²: 41. 1877. In the Brussels Herbarium Burchell 8857 is named var. *petiolatum* in Doell's script. (The Burchell number cited under the species as a whole is 8858. That number was not found.) The blades taper to the base, as in Gardner 4031.

Paspalum malacophyllum δ *ciliatum* Doell in Mart. Fl. Bras. 2²: 41. 1877. In the DeCandolle Herbarium Gardner 2347 is named var. *ciliatum* in Doell's script. A duplicate is in the United States National Herbarium. The plants are more slender than Gardner 4031, but are much like that, the sheaths scarcely more ciliate.

Anachyris setaria Fourn. Mex. Pl. 2: 2. 1886. "San Luis de Potosí (VIRL. n. 1327)." The type, in the Fournier Herbarium in Paris, bearing the name in Fournier's script, consists of two culms with overmature panicles. Mounted on the sheet with these is a plant of *Paspalum conjugatum* Berg., apparently sterile but with young racemes inclosed in the sheaths. This plant must be the basis for Fournier's description "e rhizomate erumpentibus."

DESCRIPTION

An olivaceous or glaucous-purplish leafy perennial in large clumps from short scaly rhizomes; culms 0.7 to 2 meters tall, erect to leaning, terete, glabrous, at first simple, later bearing leafy flowering branches similar to the main culm; nodes glabrous; sheaths from rather densely papillose-pilose toward the summit to nearly glabrous except on the margin at the summit; ligule rather firm, about 2 mm. long, commonly forming a truncate summit to the sheath and uniting with the thin pilose margin, a conspicuous tuft of long, stiff hairs just back of the ligule; blades flat, or the margins revolute, spreading to drooping, 12 to 35 cm. long, 8 to 35 mm. wide, the lower and middle ones tapering to a narrow base, this often elongate in the lower blades, the upper rounded or cordate, from rather densely softly pubescent on both surfaces, the pubescence coarser and longer toward the base and sparsely stiffly ciliate on the scabrous margin, to glabrous on both surfaces except at the base, commonly appressed-puberulent beneath and glabrous or nearly so on the upper surface except at base, the midnerve prominent beneath; panicles nodding, mostly 10 to 25 cm. long, of 10 to 45 pale to purple, ascending to arcuate or reflexed racemes, 2 to 10 cm. long, approximate or fascicled on a strongly angled scabrous axis; rachis 1 to 1.7 mm. wide, narrowly winged, long-pilose at the base and often sparsely long-ciliate on the scabrous margin; spikelets in pairs, crowded, 1.8 to 2 mm. long, about 1 mm. wide, oblong-elliptic, concavo-convex, pale to dark purplish brown, glabrous; glume wanting, the sterile lemma as long as the fruit but slightly narrower, 5-nerved, the middle internerves thin in texture and deeply sunken; fertile lemma papillose-striate, with 7 prominent longitudinal ridges (5 showing from the back), the concave palea of like texture.

Millspaugh and Chase in *Plantae Yucatanae*⁷⁵ and Nash⁷⁶ referred the Yucatan specimen to *P. elongatum* Griseb., a related species of South America.

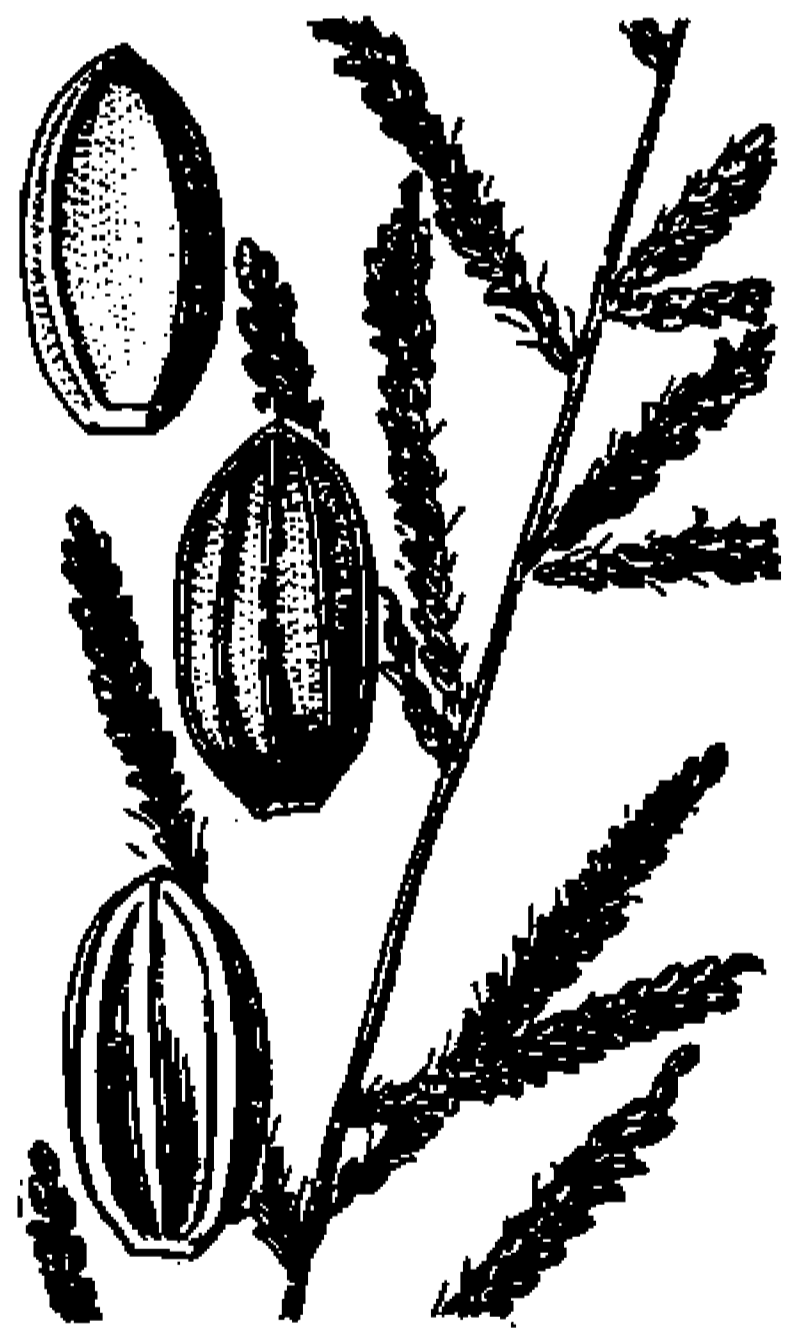


FIGURE 137.—*P. malacophyllum*.
From Schott 593

⁷⁵ Field Mus. Bot. 3: 27. 1903.

⁷⁶ N. Amer. Fl. 17: 171. 1912.

DISTRIBUTION

Upland savannas, open slopes, and cliffs, up to 1,400 meters altitude, Mexico to Bolivia and Argentina.

YUCATÁN: Merida, *Schott* 593 (Field Mus.).

SAN LUIS POTOSÍ: *Virlet* 1327 (Paris Herb.).

BRAZIL: Piauí, *Gardner* 2347. Serra Mantiqueira, *Chase* 8695½. Serra do Cipó, *Chase* 9258. Oliveira, *Chase* 8892. Lavras, *Chase* 8769, 8791. Caldas, *Regnell* III. 1340. Goyaz, *Gardner* 4031, 4043. São João, *Holway* 1725. Jundiáhy, *Holway* 1645, 1646.

PARAGUAY: Between Río Apa and Río Aguidaban, *Fiebrig* 5180. Puerto Casado, *Rojas* 2788.

BOLIVIA: Samaipata, *Herzog* 1756, 1836. Hacienda Casana, *Buchtien* 7110.

ARGENTINA: Bonpland, *Ekman* 568. Dept. San Martín, *Stuckert* (*Kneucker Gram.*) 665. Santiago del Estero, *Lillo* 6240; *Venturi* 5711. Dept. Andalgalá, *Jørgensen* 1353. Prov. Catamarca, *Venturi* 7227. Prov. Salta, *Venturi* 3727. Prov. Tucuman, *Venturi* 1782.

Gardneriana.—Rigid perennials; spikelets with both glumes suppressed or minute; fruit strongly indurate-papillose. Only one of the four species known from North America.

136. *Paspalum gardnerianum* Nees

Paspalum gardnerianum Nees, Journ. Bot. Kew Misc. 2: 103. 1850. "Gardner hrbr. 3503 et 3510. Brasilia." The type, no. 3503, bearing the name, in Nees' script, is in the herbarium at Cambridge. Gardner's 3510 was examined in the Berlin Herbarium. In these plants the blades are nearly glabrous.

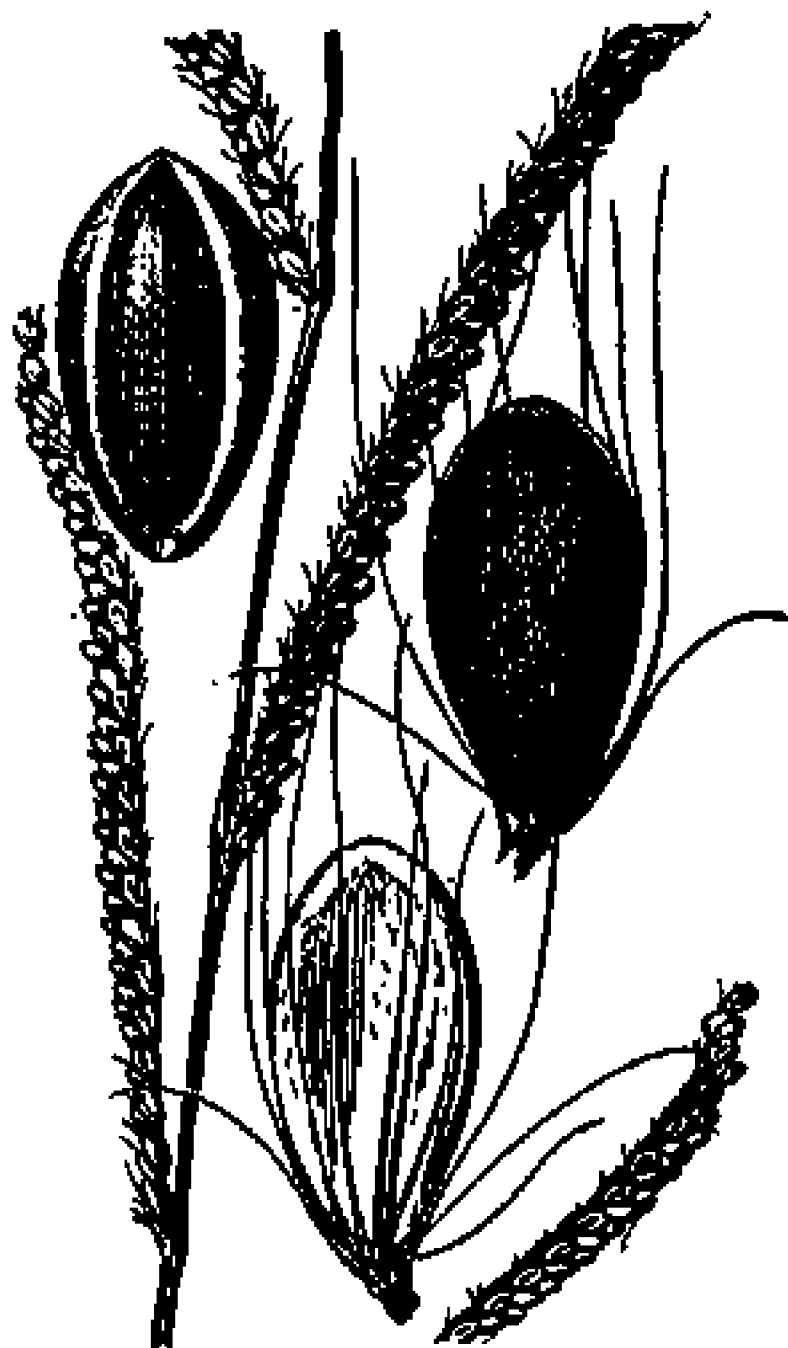


FIGURE 138.—*P. gardnerianum*.
From type collection

Paspalum gardnerianum var. *oligostachyum* Doell in Mart. Fl. Bras. 2²: 42. 1877. "Lagoa Santa provinciae Minarum * * * (Warming)." The type has not been examined. The only description is "Spicis 1-2." In *Chase* 9030, collected at Lagoa Santa, the inflorescence consists of 1 or 2 racemes. Culms bearing but 1 or 2 racemes are not infrequently found in clumps with culms bearing 3 to several racemes.

Paspalum gardnerianum var. *vestitum* Kuhlmann. Comm. Linhas Telegr. Matto Grosso 67: 49. 1922. Collected by "Tenente Boanerges de Sousa em campos Novos de Serra do Norte, M. Grosso (n. 6947)." The type has not been examined. The variety is differentiated from the species by the long tubercle-based hairs on the sheaths and blades. Nees and Doell both describe the blades of this species as glabrous, but they are rarely wholly glabrous, being mostly puberulent to pilose. In *Kuhlmann* 1664 and *Glaziou* 22601, and in some of the plants of *Glaziou* 22602, the pubescence is exceptionally long.

DESCRIPTION

A slender stiffly erect perennial, mostly in small tufts with a hard, slightly enlarged, densely woolly base; culms simple or occasionally bearing an erect branch from a lower node, 50 to 110 cm. tall, terete, glabrous; nodes glabrous or the lower appressed-pubescent; leaves olivaceous, often drying reddish brown,

numerous, the sheaths mostly overlapping, the lower appressed-pubescent, at least toward the base, to densely papillose-pilose, the upper from glabrous to sparsely papillose-pilose, commonly pubescent at least along the margin toward the summit, minutely auricled; ligule minute or nearly obsolete; blades flat or drying involute, firm, ascending to spreading, 5 to 25 cm. long, 3 to 7 mm. wide, from glabrous on both surfaces to puberulent or papillose-pilose, mostly puberulent on the upper surface, and with a few long hairs at the base, the midnerve and margins thick, pale; racemes 1 to 9, commonly 3 to 5, erect to arched-spreading, the lower 2.5 to 8 cm. long, rather remote on a slender axis; rachis about 0.9 mm. wide, densely pilose at the very base, the hairs not conspicuously long; spikelets, in pairs, crowded, the short pedicels bearing several stiff golden hairs longer than the spikelets, and forming an involucre-like tuft below the sterile lemma, the spikelets 1.6 to 1.9 mm. long, about 0.9 mm. wide, very turgidly plano-convex; glume wanting, the sterile lemma yellowish brown, 2 to 3 nerved, the midnerve commonly suppressed, sparsely pubescent or glabrous; fruit chestnut-brown, strongly papillose-striate, the margins of the lemma pale and smooth.

DISTRIBUTION

Savannas, campos, and open slopes, mostly in rather moist, sandy or stony ground, up to 1,300 meters altitude, Panama to Argentina.

PANAMA: Chorrera, *Hitchcock* 8169.

VENEZUELA: Nagua Nagua, *Warming* 1086 B.

BRITISH GUIANA: Rupununi Savanna, *Melville* 163.

BRAZIL: Parafuso, *Chase* 7999. Serra do Cipó, *Chase* 9127, 9183. Lagoa Santa, *Chase* 9015, 9030, 9049. Bello Horizonte, *Chase* 8964. Lavras, *Chase* 8816. Between Rio dos Couros and Rio Picatao, *Glaziou* 22602. Between Rio Bananal and Rio Torto, *Glaziou* 22601. Est. Goyaz, *Gardner* 3507, 4047; *Glaziou* 22466a, 22586, 22595, 22600. Serra do Tombador, *Kuhlmann* 1663. Between Diamantino and the beginning of Loho Linha Telegr., *Kuhlmann* 1664. São Simão, *Löfgren* 1516. Est. São Paulo, *Gerdes*. "S. Paulo-Minas Geraes," *Wacket* in 1902.

PARAGUAY: Rio Apa, *Hassler* 11904. Sierra de Amambay, *Hassler* 10090.

ARGENTINA: Itacuararé, *Parodi* 4701.

UNGROUPED SPECIES

The remaining species have no close allies.

137. *Paspalum pulchellum* Kunth

Reimaria elegans Humb. & Bonpl.; Flüge, Monogr. Pasp. 216. 1810. Not *Paspalum elegans* Flüge op. cit. 183. "Cumana. Humboldt et Bonpland." A specimen in the Willdenow Herbarium labeled "*Paspalum tristachyon*, *Reimaria elegans*. Habitat in Cumana" and with a slip marked "Humboldt," is probably the type.⁷⁷ The culms are without bases, the blades involute and appressed-pubescent, the racemes 2 and 3, the spikelets 1.9 mm. long.

Paspalum pulchellum Kunth, Mém. Mus. Hist. Nat. 2: 68. 1815. Based on *Reimaria elegans* Humb. & Bonpl. as published by Flüge. This name was again published as new the following year,⁷⁸ "*Reimaria elegans* Flüge" being cited, but the locality given as "ripa fluminis Orinoci inter Atures et Raudal de Javariveni." There are two specimens of this collection in the Paris Herbarium, both from the Bonpland Herbarium. The racemes are 2 and 4 in one specimen

⁷⁷ See page 1.

⁷⁸ H. B. K. Nov. Gen. & Sp. 1: 90. pl. 26. 1816.

and 2 and 3 in the other. Another, marked "Orinoco ex coll. Humboldt," in the Berlin Herbarium, has 3 racemes.

Paspalum tristachyum Willd.; Steud. Nom. Bot. ed. 2. 2: 273, 1841, as synonym of *P. pulchellum*. Not *P. tristachyon* Lam. 1791, nor *P. tristachyum* LeConte 1820. "Willd. hrb." See above, under *Reimaria elegans*.

Paspalum arenicolum C. Muell. Bot. Zeit. 19: 325. 1861. "Surinam, in arenosis prope Saron: Kegel Majo 1846 legit." The type, bearing the name in Mueller's script, in the Berlin Herbarium, is an overmature plant, most of the spikelets fallen. It is Kegel's no. 1266.

DESCRIPTION

A slender erect perennial, in dense tufts of few flowering culms and numerous leafy sterile shoots, the basal foliage mostly 10 to 25 cm. high, the culms nearly naked above; culms simple, 25 to 75 cm. tall, compressed, glabrous; nodes glabrous to appressed-pubescent; lower sheaths and those of the sterile shoots

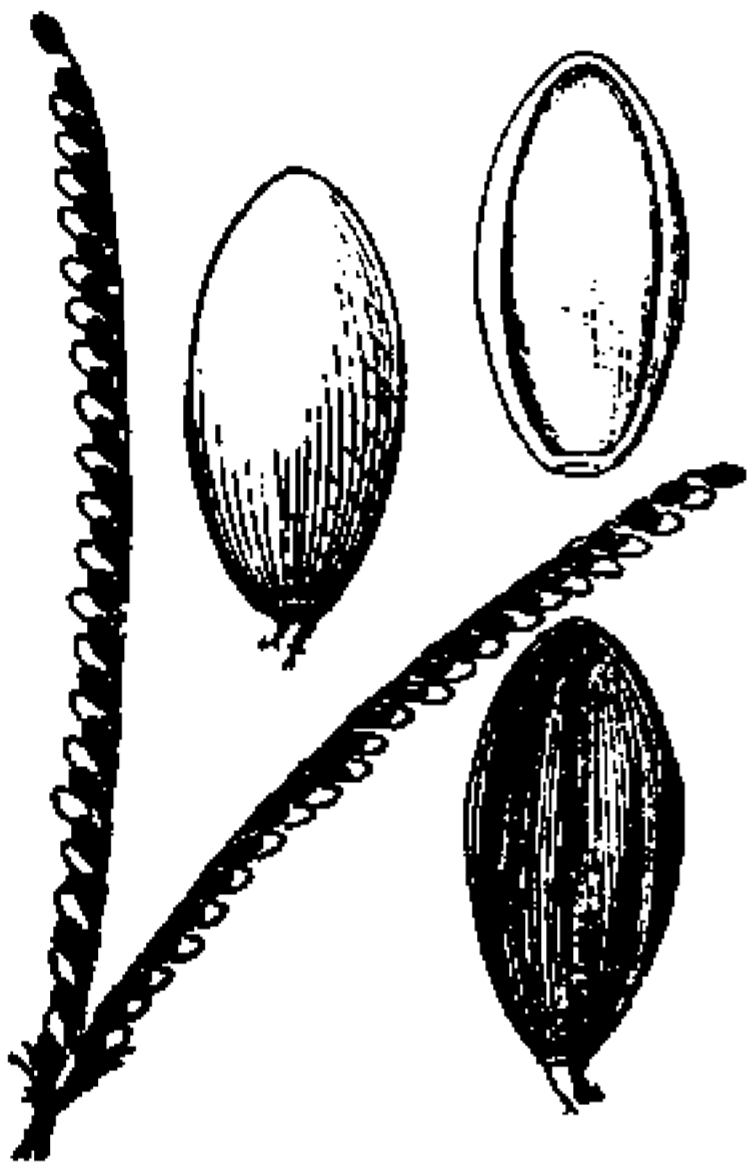


FIGURE 139.—*P. pulchellum*. From Hitchcock 10066

short, much overlapping, densely pilose to glabrous except along the margin, the upper longer but much shorter than the elongate internodes, bladeless, sparsely pilose to glabrous, usually ciliate on the margin; ligule minute, pale, obscured in the long hairs at the base of the blade; blades flat in moist situations or in wet weather, becoming involute, erect to spreading, often loosely curled, 5 to 25 cm. long, rarely longer, 1.5 to 4 mm. wide, from sparsely to densely papillose-pilose; racemes 2 or 3, commonly 2, rarely 4, suberect to widely spreading, 2 to 9 cm. long, approximate or the common axis 0.5 to 2 cm. long, narrowly winged toward the summit and extending into minute auricles at the base of the upper raceme; rachis about 0.8 mm. wide with a dense tuft of pale hairs at base, the margins thin; spikelets solitary, not crowded, 1.7 to 2 mm. long, about 1 mm. wide, strongly plano-convex, glabrous; glume wanting; sterile lemma barely equaling the fruit, 3-nerved, commonly dark purple; fruit smooth and shining, pale or somewhat leaden-purple toward maturity.

The racemes of this species, showing the alternate dark faces and pale backs of the spikelets, are unlike those of any other species of the genus.

DISTRIBUTION

Sandy, mostly moist savannas and pinelands, at low altitudes, Guatemala, Cuba, Dominican Republic, Trinidad, and south to Brazil.

GUATEMALA: Cristina, Blake 7612, 7666.

CUBA: Guane, Léon & Roca 6936. Herradura, Baker & Dimmock 4813; Ekman in Amer. Gr. Nat. Herb. 984; Hitchcock 469. Hanábana, Wright 171. San Marcos, Léon 9185. Placetas del Sur, Léon & Roca 8156. Nagua, Léon 11344. Isle of Pines, Britton & Wilson 14282; Ekman 11715. Without locality, Wright 3439.

DOMINICAN REPUBLIC: Matas, Eggers 2439.

TRINIDAD: Comuto Station, Hitchcock 10066. Arouca, Hitchcock 10338.

VENEZUELA: Cumana, Humboldt & Bonpland (Berlin Herb.).

BRITISH GUIANA: Lama Stop-off, Hitchcock 16974; Jenman 4532. Lama Savanna, Jenman 6014. Rupununi Savanna, Melville 144.

DUTCH GUIANA: "Surinam," *Hostmann* 1318, 1321.

FRENCH GUIANA: Without locality, *Leprieur* 77.

BRAZIL: Marajó Island, *Goeldi* 181, 194, 195. *Parafuso*, *Chase* 7981, 7982.

138. *Paspalum bifidum* (Bertol.) Nash

Panicum floridanum Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 248. 1834. Not *Paspalum floridanum* Michx. 1803. "Florid. Alabam." A specimen so named in the Trinius Herbarium is labelled "Georgia." Another in the Berlin Herbarium, which appears to be part of the same collection, gives *Beyrich* as collector. No specimen from Florida or Alabama so named was found in the Trinius Herbarium. The description leaves no doubt of the identity of the species.

Panicum bifidum Bertol. Mém. Acad. Sci. Bologna 2: 598. pl. 41. f. 2. e-h. 1850. No locality is cited, but the species is described in a paper on plants of Alabama. Although the type has not been located, the detailed description and the illustration identify the species.

Panicum alabamense Trin.; Steud. Syn. Pl. Glum. 1: 64. 1854. "Lincolnton. Am. sptr." Steudel explains that neither in Trinius' printed papers nor his manuscripts had he found this name. It was on a ticket in the herbarium of M. A. Curtis. Lincolnton is in the uplands of western North Carolina. The species is not known from North Carolina and it is especially unlikely that it was found in the uplands. Curtis probably collected it in Alabama, but may have sent it from his home at Lincolnton. In the Trinius Herbarium there is a specimen marked "*Panicum alabamense* teste Trin." Steudel's specimen from Curtis has not been located.

Paspalum racemosum Nutt.; Chapm. Fl. South. U. S. 571. 1860. "(*Panicum alabamense* Trin.) * * * Florida to North Carolina and westward." Chapman presumably took the name from a specimen so named by Nuttall, though such a specimen has not been located. Doctor Hale, of Tulane University, sent out specimens of *P. bifidum* named "*Paspalum racemosum* Nutt.," one of them being now in the United States National Herbarium. Chapman may have taken the name from one of these. In the National Herbarium is a specimen from Chapman collected by him in eastern Florida and named in his script "*P. racemosum* S. Fl."

Paspalum interruptum Wood, Class-book 783. 1861. "La. and Tex. (Hale). (*P. racemosum* Nutt. nec Jacq.)" *Paspalum racemosum* Nutt. is the same as *Eriochloa sericea* Munro. Wood's description applies not to that but to *P. bifidum*. One of Hale's collections sent out as *Paspalum racemosum* Nutt. was doubtless the plant described, the name being confused with *P. racemosum*. Wood seems not to have seen Chapman's Flora, published the preceding year.

Paspalum bifidum Nash, Bull. Torrey Club 24: 192. 1897. Based on *Panicum bifidum* A. Bertol.

Beal⁷⁹ describes this species under the name *P. racemosum* Lam.

DESCRIPTION

A slender erect perennial forming small colonies from numerous short rhizomes, the overlapping scales densely pubescent; culms simple, 50 to 120 cm. tall, compressed, glabrous; nodes glabrous or minutely pubescent; leaves somewhat aggregate toward the base, often glaucous, the sheaths narrow, the lower commonly free from the culm, from villous to nearly glabrous; ligule about

⁷⁹ Grasses N. Amer. 2: 87. 1896.

2 mm. long; blades flat, ascending, 10 to 50 cm. long, 3 to 14 mm. wide (the upper commonly obsolete), tapering to a base as narrow as the summit of the sheath, the junction obscure, from conspicuously villous on both surfaces to glabrous except on the upper surface toward the base, the margin scabrous; racemes 2 to 6, rarely to 8, commonly 3 or 4, at first erect, spreading toward maturity, 4 to 16 cm. long, distant on a slender flat axis; rachis very slender, subflexuous, with copious long hairs at the base; spikelets in pairs, distant to irregularly approximate on slender stiff, angled pedicels, elliptic-obovate, turgidly biconvex, 3.3 to 4 mm. long, 2.2 to 2.5 mm. wide, glabrous, olivaceous to russet-brown and commonly blotched with purple; first glume developed into a minute thin scale or wanting in the same raceme (rarely wholly wanting in an entire



FIGURE 140.—*P. bifidum*. From Curtiss 5590

Chase 4270. Old Town, *Combs* 866. Fannin, *Combs* 867. Crystal, *Combs* 1001. Grasmere, *Baker* 17; *Combs & Baker* 1040, 1059. Clarcona, *Meislahn* 64. Orange City, *Hood* 81. Tampa, *Garber* in 1877. Fort Myers, *Hitchcock* 9235. Without locality, *Chapman*.

ALABAMA: Auburn, *Earle & Baker* in 1897. Wilcox County, *Buckley* in 1840. Mobile, *Mohr* in 1888.

MISSISSIPPI: Starkville, *Tracy* in 1890.

LOUISIANA: Alexandria, *Hale* in 1840.

TEXAS: Dallas, *Reverchon* 1066 and in 1877. Waller County, *Thurrow* in 1898.

inflorescence); second glume shorter than the fruit, strongly 7-nerved; sterile lemma barely equaling the fruit or slightly shorter, 5-nerved; fruit strongly indurate, stramineous, very obscurely papillose-striate.

This species, with its irregular racemes and biconvex spikelets with 5 to 7 nerved second glume and sterile lemma, shows affinity to *Panicum*. The first glume is so inconstant a differentiating character between *Panicum* and *Paspalum* as to have little value. *Paspalum bifidum* is not closely related to any known species in either genus.

DISTRIBUTION

Sandy pine and oak woods, occasionally in hammocks, nowhere common, on the Coastal Plain from South Carolina to Texas.

SOUTH CAROLINA: Aiken, *Ravenel* in 1866. Orangeburg, *Hitchcock* 9228.

GEORGIA: Woodbury, *Harper* 1249. Sumter County, *Harper* 632.

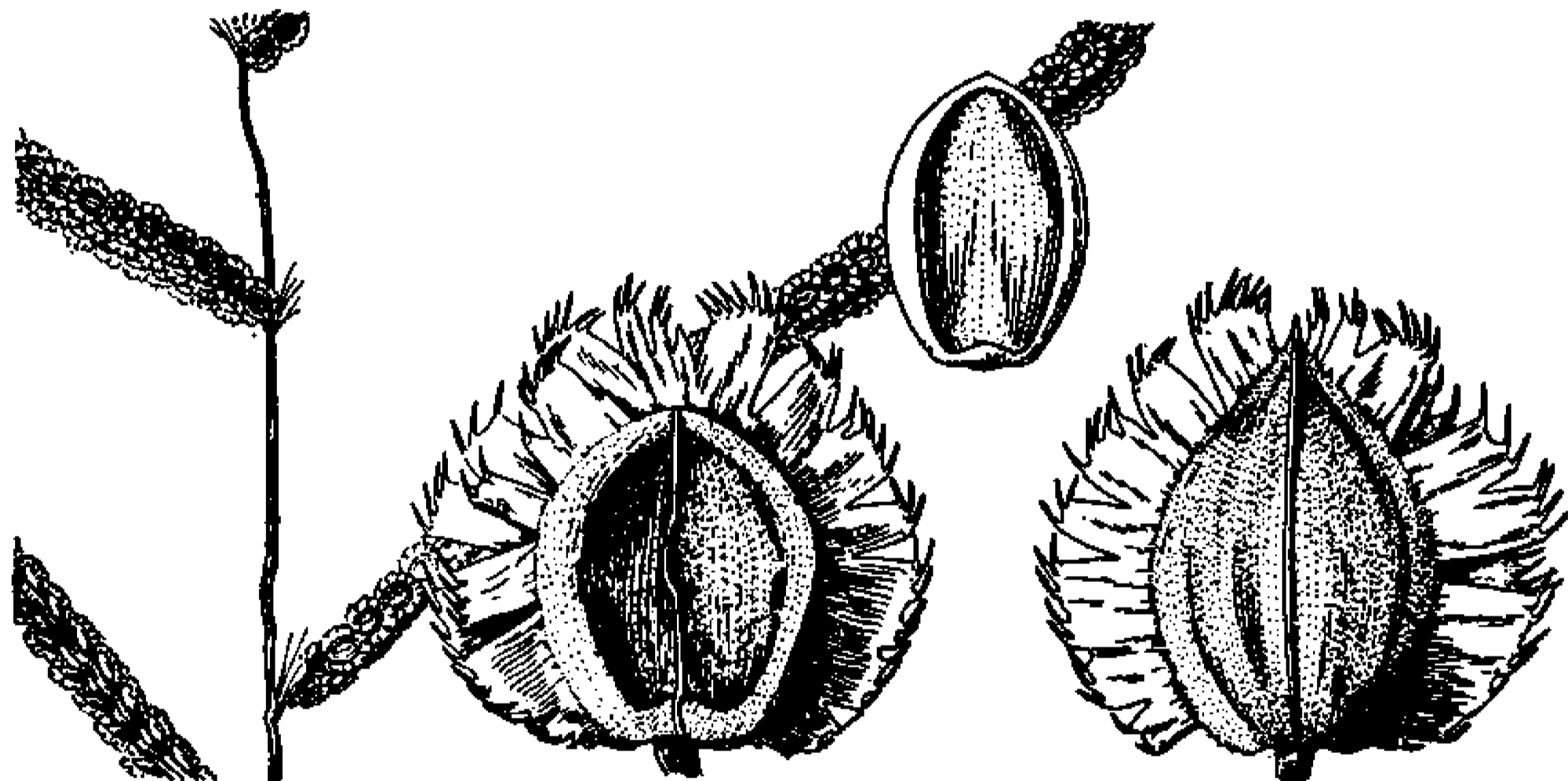
FLORIDA: Pensacola, *Combs* 533. Galt City, *Combs* 481. De Funiak Springs, *Combs* 472. Chipley, *Combs* 558, 581, 593. River Junction, *Nash* 2579. Madison, *Combs* 285. Jacksonville, *Curtiss* 5080, 5590. Duval County, *Curtiss* 3572. Gainesville,

139. *Paspalum fimbriatum* H. B. K.

Paspalum fimbriatum H. B. K. Nov. Gen. & Sp. 1: 93. pl. 28. 1816. "Prope Ibague et in devexis montis Quelamanae (Regno Novogranatensi)," Colombia. In the Paris Herbarium is a specimen with the name and "Novo Granatensis, Rio Magd." in Bonpland's script and a little drawing of the spikelet on a Bonpland label. This is doubtless the type. The plant is 20 cm. tall.

DESCRIPTION

An erect or suberect annual, branching at the base, often finally from the middle nodes; culms 25 to 100 cm. tall, glabrous; nodes glabrous to appressed-pubescent; sheaths much overlapping at base, the upper slightly shorter than the internodes, compressed, conspicuously ciliate, otherwise glabrous or sometimes sparsely pilose; ligule thin-membranaceous, brown, lacerate, 1.5 to 2 mm. long; blades flat, thin, ascending, 5 to 30 cm., rarely as much as 40 cm., long, commonly 10 to 20 cm. long, 5 to 12 mm. wide (the upper reduced), narrowed to a rounded base, ciliate like the sheaths, the cilia very short or obsolete toward the apex; panicles short-exserted, erect, the slender narrowly winged axis 5 to 15 cm., commonly 8 to 10 cm., long, the margins minutely scabrous, the 3 to 8 ascending or spreading rather broad racemes 2.5 to 8 cm. long; rachis narrowly winged,

FIGURE 141.—*P. fimbriatum*. From Hitchcock 9773

about 1.5 mm. wide, scabrous on the margin, rarely sparsely ciliate, a tuft of long hairs at the very base; spikelets in pairs, 2.2 to 2.3 mm. long, 1.5 to 2 mm. wide, with a broad, firm, notched wing, the spikelet with the wing being about 3 mm. long and as wide or wider, compressed, pale or sometimes blotched with purple; glume and sterile lemma fragile, minutely and sparsely papillose under a lens, the glume slightly larger, apiculate, 3-nerved, the marginal nerves strong, bearing a stiff, notched wing 0.5 to 1 mm. wide, stiffly ciliate on the rim, the cilia pointing toward the apex of the spikelet, the lemma slightly concave, 3-nerved, winged like the glume or more commonly only partly winged or wingless; fruit pale, 2 mm. long, 1.4 mm. wide, ovate, obscurely roughened.

Paspalum scutatum Nees of Brazil, with wingless shield-shaped spikelets, is the only known ally of this striking species.

DISTRIBUTION

Savannas, open and waste ground, mostly in somewhat moist places, Panama, the West Indies, and northern South America; introduced in Hawaiian Islands.

PANAMA: Canal Zone, Standley 28583.

BAHAMAS: Andros, Small & Carter 8926. New Providence, Curtiss 3.

- CUBA: Baraguá, *Hitchcock* 23352. Preston, *Hitchcock* 23402. San Germán, *Léon* 9764. Santiago de Cuba, *Ekman* 8000.
- JAMAICA: Montego Bay, *Hitchcock* 9691; *Maxon & Killip* 1669. Troy, *Harris* 12584; *Hitchcock* 9792. Ipswich, *Hitchcock* 9625; *Maxon & Killip* 1521, 1524. New Forest, *Hitchcock* 9840. Between Ewarton and Linstead, *Hitchcock* 9422. Between Ewarton and Moneague, *Hitchcock* 9439. Castleton, *Maxon* 768. Bog Walk, *Hitchcock* in 1890. Kingston, *Cockerell* in 1892. Constant Spring, *Amer. Gr. Nat. Herb.* 565. Hope Gardens, *Harris* 11847; *Maxon* 1642; *Ridley* 6. Gordon Town, *Hart* 567, 687. Ramble, *Hitchcock* 9483. Cinchona, *Harris* 11267. Bryaris Ridge, *Perkins* 1486. Port Antonio, *Fredholm* 3284. Buff Bay, *Hitchcock* 9773; *Maxon & Killip* 292; *Millsbaugh* 944. Without locality, *Lloyd* 1033; *Parkhurst* 13.
- HAITI: Plaisance, *Leonard* 9406. Gonave Island, *Leonard* 3173, 3217, 3221. Port-au-Prince, *Cook, Scofield & Doyle* 53, 61; *Hitchcock* 19869, 22956; *Leonard* 2796, 2820. Pétionville, *Leonard* 4881. Fond Varettes, *Buch* 1217; *Leonard* 3837. Miragoane, *Ekman* H 7264.
- PORTO RICO: Mayaguez, *Britton* 2378; *Chase* 6296; *Holm* 91. Santa Rita, *Chase* 6537. Peñuelas, *Sintenis* 4766. Between Aibonito and Ponce, *Chase* 6329. Ponce, *Heller* 6219. Between Ponce and Coamo, *Underwood & Griggs* 576. Coamo Springs, *Chase* 6550. Bayamon, *Hioram* 358. Island of Vieques, *Chase* 6665; *Shafer* 2476.
- VIRGIN ISLANDS: St. Croix, *Hitchcock* 16333; *Ricksecker* 238; *Rose, Fitch & Russell* 3532; *Thompson* 2.
- LEEWARD ISLANDS: Antigua, *Hitchcock* 16386; *Rose, Fitch & Russell* 3409. Guadeloupe, *Hitchcock* 16410. Dominica, *Hitchcock* 16423; *Jones* in 1913.
- WINDWARD ISLANDS: Montserrat, *Shafer* 707. Martinique, *Duss* 1275; *Hitchcock* 16466; *Husnot* 71. Barbados, *Bot. Station Herb.* 200; *Freeman* 5022; *Hitchcock* 16522. St. Lucia, *Hitchcock* 16490; *Kemp* 52. Grenada, *Hitchcock* 17668.
- TRINIDAD: Port of Spain, *Hitchcock* 10011.
- COLOMBIA: Cúcuta, *Killip & Smith* 20965.
- VENEZUELA: Tovar, *Fendler* 1713. Duaca, *Pittier* 11207. Guama, *Pittier* 11164. Valencia, *Pittier* 9022. Caracas, *Bailey* 544; *Pittier* 6157. El Valle, *Pittier* 9708. Los Teques, *Pittier* 6093. Siquire Valley, *Pittier* 6000. Without locality, *Eggers* 13090.
- BRITISH GUIANA: Georgetown, *Hitchcock* 16836. Demerara, *Kortnight* in 1911.
- BRAZIL: Parahyba, *Pickel* 1719.
- HAWAIIAN ISLANDS: Honolulu, *Hitchcock* 13561, 13672.

140. *Paspalum saccharoides* Nees

Saccharum polystachyum Swartz, Prodr. Veg. Ind. Occ. 21. 1788. Not *Paspalum polystachyum* R. Br. 1810. "St. Christopher." The type, bearing the name in Swartz's script, was kindly lent from Stockholm. No locality other than "ind. occ." is written on the sheet. In his later work⁸⁰ "Masson" is given as the collector. This specimen, collected by Francis Masson, is in the Banks Herbarium in the British Museum. A fragment of a raceme was kindly deposited in the United States National Herbarium.

Paspalum saccharoides Nees in Trin. Gram. Icon. 1: pl. 107. 1828. Based on *Saccharum polystachyum* Swartz, but the description and plate probably drawn from Sieber's no. 137, "ex Ind. occ.," in Trinius's herbarium.

Panicum saccharoides Kunth, Rév. Gram. 2: 237. pl. 30. 1830. Based on *Saccharum polystachyum* Swartz, but the figure drawn from a specimen collected at Cumana, Venezuela.

⁸⁰ Swartz, Fl. Ind. Occ. 1: 127. 1797.

Moenchia speciosa Wender; Steud. Nom. Bot. ed. 2. 2: 153, 1841, as synonym of *Panicum saccharoides*.

Tricholaena saccharoides Griseb. Syst. Unt. Veg. Karaib. 117. 1857. Based on *Panicum saccharoides* Kunth.

Syllepis polystachya Fourn. in Hack. in Mart. Fl. Bras. 2^o: 251, 1883, as synonym of *Imperata caudata*; Fourn. Mex. Pl. 2: 52. 1886. The name is based on *Saccharum polystachyum* Swartz, but misapplied to a species of *Imperata*. (See page 9.)

Paspalum polystachyum Kuntze, Rev. Gen. Pl. 2: 786. 1891. Not *P. polystachyum* R. Br. 1810. Based on *Saccharum polystachyum* Swartz.

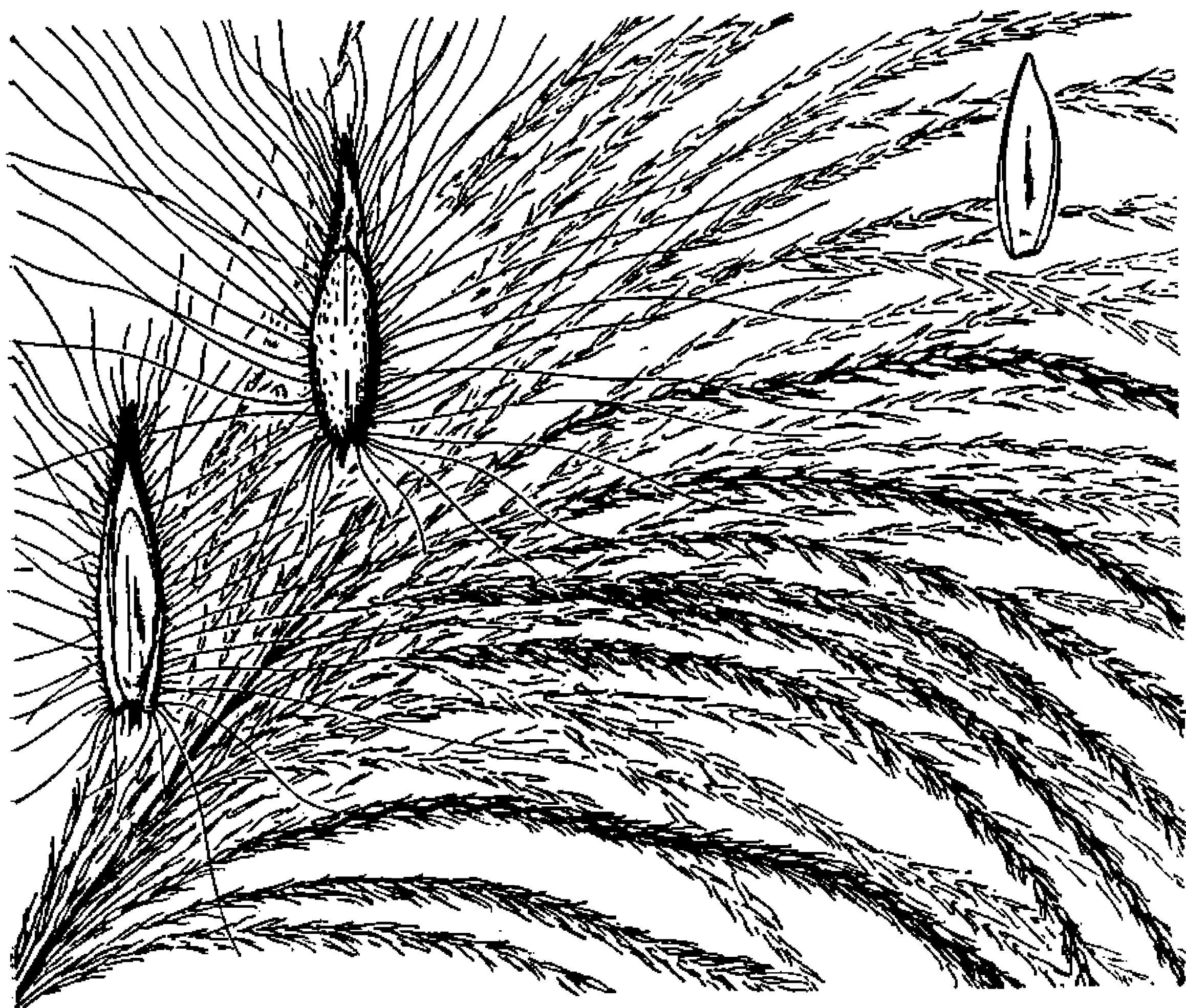


FIGURE 142.—*P. saccharoides*. From Hitchcock 7904

DESCRIPTION

A robust branching perennial growing in tough clumps; culms 1 to 2 meters long, ascending to suberect, often decumbent or creeping at base, with erect branches, subcompressed, glabrous; nodes glabrous, the lower commonly forming a narrow ridge; sheaths overlapping, sometimes sparsely papillose-pilose or papillose only, more commonly glabrous, densely silky-ciliate, at least toward the summit, or in age glabrescent; ligule a minute, firm, very obscure membrane, with a dense row of long hairs back of it; blades flat, often subinvolute in drying, spreading, firm, 15 to 30 cm. long, 8 to 15 mm. wide, tapering to a slender tip, finely papillose-pilose on the upper surface, glabrous beneath; panicle subflabellate, feathery, composed of 30 to 50 slender silky drooping racemes 15 to 30 cm. long, solitary or fascicled on a relatively short axis; rachis about 0.6 mm. wide, often naked from 5 to 20 mm. at the base, a tuft of silky hairs at the very base; spikelets solitary, not crowded, 2.5 to 3 mm. long, excluding the hairs, about 0.7 mm. wide, lanceolate, acuminate, subcordate at

base on slender flat pedicels, those toward the base of the raceme sometimes elongate; glume and sterile lemma thin in texture, 3-nerved, the midnerve obscure or suppressed, the glume sparsely pubescent on the back and bearing a fringe of pale silky hairs as much as 5 to 8 mm. long arising from papillae on the lateral nerves, interspersed with short hairs, the hairs widely spreading at maturity; sterile lemma shorter than the glume, glabrous; fruit about 1.9 mm. long, acute, the pale smooth lemma and palea but slightly indurate.

DISTRIBUTION

Open, brushy or jungly slopes, mostly in moist spots, up to 1,800 meters altitude, Costa Rica and the Lesser Antilles to Bolivia.

COSTA RICA: Port Limon, *Hitchcock* 8438. San Francisco Dos Ríos, *Pittier* 6907.

CENTRAL AMERICA: Without locality, *Oersted* 14008.

PANAMA: Canal Zone, *Hayes* 219; *Hitchcock* 7904, 8045; *Kenoyer* 112; *Pittier* 3745.

LEeward ISLANDS: Guadeloupe, *Duss* 3366. Dominica, *Imray* 311.

WINDWARD ISLANDS: Martinique, *Duss* 1317. Grenada, *Broadway* 62, 2919, and in 1905; *Smith* 192, 843.

TRINIDAD: Cedros, *Hitchcock* 10134. Without locality, *Broadway* in 1919.

TOBAGO: Adelphi, *Broadway* 3979. Center of island, *Hitchcock* 10278.

COLOMBIA: Santa Marta, *Smith* 161. Villavicencio, *Pennell* 1505. Libano, *Pennell* 3349. Dept. Cundimarca, *Ariste Joseph* 1021. Fredonia, *Toro* 184.

VENEZUELA: Carayaca, *Jahn* 304.

ECUADOR: Huigra, *Rose* 22645. Between Huigra and Naranjapata, *Hitchcock* 20652. Between Baños and Cashureco, *Hitchcock* 21761.

PERU: Chicoplaya, *Ruiz* (Berlin Herb.).

BOLIVIA: Coripata, *Hitchcock* 22686. Antahuacana, *Buchtien* 2513. Sarampiuni, *Buchtien* 65 in 1927.

DOUBTFUL SPECIES

In the following list are given the names assigned to species of *Paspalum* and credited to North America which have not been accounted for in the preceding pages and which can not definitely be excluded from *Paspalum* as here limited. The list includes several nomina nuda which are mentioned only because the names are given in the Index Kewensis and consequently have become a part of the literature upon the genus.

PASPALUM CILIATUM Rottb. Act. Lit. Univ. Hafn. 1: 285. 1778. Name only, in a list of plants of Surinam.

PASPALUM COMPRESSUM Raf. Fl. Ludov. 15. 1817. "Panic 1. Rob. p. 335." Robin⁸¹ gives a brief description of a species of *Paspalum* of the Louisiana prairies, which is 5 or 6 feet high, the seeds of which are eaten by birds. Neither this description nor Rafinesque's are sufficient to identify the species. *Paspalum boscianum* Flüge most nearly agrees with the description.

PASPALUM DECUMBENS Rottb. Act. Lit. Univ. Hafn. 1: 285. 1778. The name is given in Index Kewensis, but Rottboell merely mentions a decumbent paspalum in a sheep pasture in Surinam (Dutch Guiana).

PASPALUM DIFFUSUM Rottb. Act. Lit. Univ. Hafn. 1: 285. 1778. No description, only the statement that the seeds are eaten by birds in Surinam.

PASPALUM FUSCATUM Spreng.; Steud. Nom. Bot. ed. 2. 2: 257, 271, 1841, as synonym of *Panicum hybridum* Trin., name only, from Guadeloupe. Probably *Panicum*.

⁸¹ Flore Louisianaise 335. 1807.

PASPALUM GENICULATUM Raf. Fl. Ludov. 15. 1817. "Panic 2. Rob. p. 335." Neither Robin's description nor Rafinesque's is sufficient to identify the species.

PASPALUM MONONEURON Steud. Syn. Pl. Glum. 1: 24. 1854. "Oaxaca," Mexico. The type has not been located. The description does not apply to any species known to us.

PASPALUM RUDIMENTOSUM Steud. Syn. Pl. Glum. 1: 24. 1854. "Oaxaca," Mexico. The type has not been located. The description suggests a specimen of *P. affine* Steud., having blades smaller than usual and racemes with abortive spikelets at base.

PASPALUM SUPINUM Rich.; Hornem. Hort. Hafn. 1: 77. 1813. "Hab. ad Baltimore, in Amer. sept.," introduced in the Royal Botanic Garden in Copenhagen in 1807. The description suggests *P. supinum* Bosc, but that is not known from the region of Baltimore. Probably *P. pubescens*.

PASPALUM TRIGLUME Steud. Syn. Pl. Glum. 1: 27. 1854. "Oaxaca," Mexico. The type has not been located. From the description it seems probable that the plant does not belong in *Paspalum*, but is rather a species of *Panicum*.

EXCLUDED SPECIES

Besides the valid species and the names accounted for in synonymy within the genus *Paspalum* there are a great many names that, as *Paspalum* is limited, excluding *Syntherisma* and *Axonopus*, are referable to these and other genera. Names based on North American collections or applying to species known from North America are given in the following list. Names followed by generic names only have not been identified specifically.

Paspalum adpressum Pers. (Error in Ind. Kew. for *Digitaria appressa* Pers.) = *Panicum geminatum* Forsk.

Paspalum appendiculatum Presl = *Axonopus appendiculatus* (Presl) Hitchc. & Chase.

Paspalum appressum Lam. (not *P. appressum* Forsk.) = *Panicum geminatum* Forsk.

Paspalum aristatum Moench = *Beckmannia erucaeformis* (L.) Host.

Paspalum aureum (Beauv.) H. B. K. = *Axonopus aureus* Beauv. Misapplied to *Axonopus chrysoblepharis* (Lag.) Chase.

Paspalum brevifolium Flügge = *Syntherisma longiflora* (Retz.) Skeels.

Paspalum capillare Lam. = *Axonopus capillaris* (Lam.) Chase.

Paspalum carolinianum Poir. = *Syntherisma* sp.

Paspalum chinense Nees = *Syntherisma chinensis* (Nees) Hitchc.

Paspalum chrysoblephare (Lag.) Doell = *Axonopus chrysoblepharis* (Lag.) Chase.

Paspalum compressum (Swartz) Rasp. (not *P. compressum* Raf.) = *Axonopus compressus* (Swartz) Beauv.

Paspalum conjugatum var. *subcordatum* Griseb. = *Axonopus compressus* (Swartz) Beauv.

Paspalum cubense Spreng. = *Homalocenchrus monandrus* (Swartz) Kuntze.

Paspalum cynosuroides (L.) Brot. = *Spartina cynosuroides* (L.) Roth.

Paspalum dactylon (L.) Lam. = *Capriola dactylon* (L.) Kuntze.

Paspalum depressum Steud. = *Axonopus* sp.

Paspalum digitaria C. Muell. (not *P. digitaria* Poir.) = *Axonopus furcatus* (Flügge) Hitchc.

Paspalum digitatum (Swartz) Kunth = *Syntherisma digitata* (Swartz) Hitchc.

Paspalum effusum (L.) Rasp. = *Milium effusum* L.

Paspalum erucaeforme (L.) Spreng. = *Beckmannia erucaeformis* (L.) Host.

Paspalum filiforme (L.) Flügge. (not *P. filiforme* Swartz) = *Syntherisma filiformis* (L.) Nash.

- Paspalum filostachyum* Rich. = *Axonopus compressus* (Swartz) Beauv.
Paspalum fournierianum Ricker; Schell. in Schinz & Thell. (name only) = *Axonopus deludens* Chase.
Paspalum furcatum Flügge = *Axonopus furcatus* (Flügge) Hitchc.
Paspalum furcatum var. *filiforme* (Muhl.) Doell = *Syntherisma filiformis* (L.) Nash.
Paspalum furcatum var. *parviflorum* Doell. = *Axonopus compressus* (Swartz) Beauv.
Paspalum furcatum var. *villosum* Vasey = *Axonopus furcatus* (Flügge) Hitchc.
Paspalum glabrum Cassidy (not *P. glabrum* Poir.) = *Syntherisma* sp.
Paspalum guadaloupense Steud. = *Axonopus compressus* (Swartz) Beauv.
Paspalum humifusum (Pers.) Poir. = *Syntherisma ischaemum* (Schreb.) Nash.
Paspalum lanatum H. B. K. = *Leptocoryphium lanatum* (H. B. K.) Nees.
Paspalum laticulmum Spreng. = *Axonopus compressus* (Swartz) Beauv.
Paspalum longissimum var. *guadalupense* Steud.; Griseb. = *Axonopus compressus* (Swartz) Beauv. Erroneously cited as synonym of *P. conjugatum*.
Paspalum michauxianum var. *villosum* Vasey = *Axonopus furcatus* (Flügge) Hitchc.
Paspalum paspaloides villosum (Vasey) Scribn. & Ball = *Axonopus furcatus* (Flügge) Hitchc.
Paspalum pilosum Spreng.; Steud. (not *P. pilosum* Lam.) = *Thrasya thrasyoidea* (Trin.) Chase.
Paspalum platycaulon Poir. = *Axonopus compressus* (Swartz) Beauv.
Paspalum platycaule Willd.; Steud. = *Axonopus* sp.
Paspalum platyphyllum Griseb. (not *P. platyphyllum* Schult.) = ***Brachiaria extensa***, nom. nov. The name *Brachiaria platyphylla* (Griseb.) Nash, based on *Panicum platyphyllum* Munro, which is based on *Paspalum platyphyllum* Griseb., used in the revision of *Brachiaria*⁸² is not valid, because of the earlier *Paspalum platyphyllum* Schult.
Paspalum punctatum (L.) Flügge = *Eriochloa punctata* (L.) Hamilt.
Paspalum purpusii Mez = *Axonopus purpusii* (Mez) Chase.
Paspalum racemosum Nutt. (not *P. racemosum* Lam.) = *Eriochloa sericea* Munro.
Paspalum raunkiaerii Mez = *Axonopus compressus* (Swartz) Beauv.
Paspalum rosei Scribn. & Merr. = *Axonopus rosei* (Scribn. & Merr.) Chase.
Paspalum sanguinale (L.) Lam. = *Syntherisma sanguinalis* (L.) Dulac.
Paspalum sericeum Scheele = *Eriochloa sericea* Munro.
Paspalum serotinum (Walt.) Flügge = *Syntherisma serotina* Walt.
Paspalum strictum Brot. (not *P. strictum* Pers.) = *Spartina stricta* (Ait.) Roth.
Paspalum tenue Willd.; Steud. (not *P. tenue* Gaertn.) = *Axonopus compressus* (Swartz) Beauv.
Paspalum tristachyon Lam. = *Axonopus compressus* (Swartz) Beauv.
Paspalum uniflorum (Salzm.) Steud. = *Axonopus compressus* (Swartz) Beauv.
Paspalum velutinum (DC.) Kunth = *Syntherisma velutina* (DC.) Chase.
Paspalum villosum Willd.; Steud. (not *P. villosum* Thunb.) = *Syntherisma* sp.

⁸² Chase, The North American Species of *Brachiaria*. Contr. U. S. Nat. Herb. 22: 40. 1920.

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70. Conjugatum.
71. Virgatum.
83. Conjugatum.
152. Notatum.
195. Paniculatum.
204. Conjugatum.
513. Paniculatum.
632. Plicatum.
671. Densum.
689. Plicatum.
830. Minus.
850. Minus.
850b. Multicaule.
1119. Paniculatum.
1172. Laxum.
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564. Notatum.
565. Fimbriatum.
566. Filiforme.
567. Rupestre.
568. Caespitosum.
569. Caespitosum.
570. Molle.
571. Blodgettii.
572. Laxum.
573. Decumbens.
574. Multicaule.
575. Orbiculatum.
576. Virgatum.
577. Secans.
578. Millegrana.
579. Densum.
908. Pubiflorum.
914. Notatum.
934. Langei.
940. Paniculatum.
942. Bakeri.
943. Rocanum.
944. Alterniflorum.</p> |
|--|---|

⁶⁴ American grasses from the U. S. National Herbarium, Smithsonian Institution, distributed by the Systematic Agrostologist, U. S. Department of Agriculture.

AMER. GR. NAT. HERB.—Continued

- 945. Rottboellioides.
- 946. Filiforme.
- 947. Lindenianum.
- 948. Nanum.
- 949. Rupestre.
- 950. Saugetii.
- 954. Clavuliferum.
- 957. Reptatum.
- 958. Amphicarpum.
- 960. Conjugatum.
- 962. Dilatatum.
- 966. Laeve.
- 978. Wrightii.
- 984. Pulchellum.

ANDERSON, A. P.

- 1406. Boscianum.
- 1523. Dilatatum.
- 1524. Pubiflorum glabrum.
- 1539. Boscianum.
- 1540. Pubiflorum glabrum.

ANDERSSON, N. J.

- 8. Distichum.

ANECT, BROTHER

- 57. Dilatatum.

ANTHONY, H. E., AND TATE, G. H. H.

- 79. Racemosum.

ARECHA VALETA, JOSÉ

- 2 (in 1890). Pumilum.
- 77. Dilatatum.
- 79 (in 1874). Pumilum.
- 201. Distichum.

ARISTE JOSEPH, BROTHER

- A 458b. Prostratum.
- A 463a. Prostratum.
- A 550. Candidum.
- 1021. Saccharoides.
- 1066. Plenum.

ARSÈNE, BROTHER G.

- 58. Arsenei.
- 333. Distichum.
- 1411. Arsenei.
- 1601. Distichum.
- 1604. Crinitum.

ARSÈNE, BROTHER G.—Continued

- 2284. Crinitum.
- 2284a. Convexum.
- 2377. Tenellum.
- 2384. Arsenei.
- 2384b. Lividum.
- 2471. Humboldtianum.
- 2478. Convexum.
- 2644. Tenellum.
- 2644a. Convexum.
- 2693. Arsenei.
- 2805. Pubiflorum.
- 2813. Humboldtianum.
- 2917. Notatum.
- 3129. Prostratum.
- 3132. Acuminatum.
- 3176. Lividum.
- 3362. Distichum.
- 5268. Lividum.
- 5849. Humboldtianum.
- 6283. Notatum.
- 6301. Lividum.
- 6665. Humboldtianum.
- 8272. Tenellum.
- 8277. Lividum.
- 8324. Arsenei.
- 8535. Arsenei.
- 8684. Prostratum.
- 8831. Distichum.
- 10268. Paucispicatum.
- 10272. Lividum.
- 10348. Pubiflorum.
- 10349. Lividum.
- 11009. Laeve.
- 11013. Lentiferum.
- 11015. Lentiferum.
- 11015½. Longipilum.
- 11137. Floridanum.
- 11156. Floridanum.
- 11259. Floridanum.
- 11260. Pubescens.
- 11285. Ciliatifolium.
- 11327. Lentiferum.
- 11401½. Laeve.
- 11403. Urvillei.
- 11410. Dilatatum.
- 11512. Floridanum.
- 11710. Floridanum.
- 11777. Difforme.
- 12235. Dilatatum.
- 12245. Urvillei.
- 12251. Plicatulum.
- 12349. Urvillei.

ARSÈNE, BROTHER G.—Continued

12518. Floridanum.
12538. Floridanum.
12568. Lentiferum.
12572. Floridanum.

BACKER, C. A.

- 23079b. Conjugatum.

BAILEY, L. H. AND E. Z.

56. Convexum.
112. Stellatum.
148. Trachycoleon.
247. Notatum.
263. Unispicatum.
273. Convexum.
358. Conjugatum.
371. Conjugatum.
447. Trachycoleon.
544. Fimbriatum.
950. Millegrana.
972. Conjugatum pubescens.
1162. Paniculatum.
1163. Conjugatum pubescens.
1165. Conjugatum pubescens.
1181. Decumbens.
1189. Paniculatum.
1205. Pilosum.
1218. Decumbens.
1222. Pilosum.
1228. Paniculatum.
1314. Conjugatum.

BAIN, S. M.

175. Pubiflorum glabrum.
183. Floridanum.

BAKER, C. F.

2. Notatum.
33. Plicatulum.
34. Plicatulum.
90. Conjugatum.
1699. Distichum.
1836. Distichum.
2012. Conjugatum.
2056. Plicatulum.
2587. Alterniflorum.
2968. Notatum.
3459. Lineare.
3626. Arundinaceum.

BAKER, C. F., AND ABARCA

4185. Multicaule.

BAKER, C. F., AND DIMMOCK.

4813. Pulchellum.

BAKER, C. F., AND O'DONOVAN

4417. Saugetii.

BAKER, C. F., TRACY, S. M., AND
HASSELBRING, H.

3096. Lividum.
3097. Notatum.

BAKER, C. F., AND WILSON, P.

385. Distichum.
543. Conjugatum.
595. Virgatum.
596. Plicatulum.
2303. Arundinaceum.

BAKER, C. F., AND ZARRAGOITIA

4545. Alterniflorum.

BAKER, C. H.

17. Bifidum.
60. Ciliatifolium.
248. Ciliatifolium.
250. Debile.
300. Floridanum glabratum.
302. Laeve.
303. Longipilum.
320. Praecox.

BALL, C. R.

10. Circulare.
12. Pubescens.
12a. Ciliatifolium.
16. Dilatatum.
38. Floridanum.
39. Boscianum.
47. Pubescens.
47a. Ciliatifolium.
48. Circulare.
48½. Laeve.
68. Dilatatum.
96. Dilatatum.
103. Distichum.
108. Pubiflorum glabrum.
113. Pubescens.

BALL, C. R.—Continued

114. Dilatatum.
 117. Circulare.
 147. Pubiflorum glabrum.
 148. Pubiflorum.
 159. Repens.
 165. Longipilum.
 170. Pubescens.
 171. Floridanum.
 172. Circulare.
 173. Urvillei.
 179. Pubiflorum.
 186. Floridanum.
 187. Pubescens.
 188. Lentiferum.
 189. Circulare.
 216. Boscianum.
 221. Dissectum.
 231. Plicatulum.
 451. Urvillei.
 496. Pubiflorum.
 555. Ciliatifolium.
 613. Plicatulum.
 642. Circulare.
 684. Boscianum.
 688. Floridanum.
 939. Pubiflorum.
 941. Distichum.
 1155. Stramineum.
 1655. Stramineum.

BALL, C. R., AND PADDOCK, A. E.

47. Circulare.

BANG, MIGUEL

308. Paniculatum.
 1312. Distichum.
 1426a. Multicaule.
 2590. Humboldtianum.

BARBADOS BOTANIC STATION
 HERBARIUM⁸⁵

200. Fimbriatum.
 269. Conjugatum.
 277. Vaginatum.

BARRETT, O. W.

73. Paniculatum.

BARTLETT, H. H.

1503. Longipilum.
 2826. Laeve.
 2836. Longipilum.
 2838. Pubescens.
 3068. Floridanum glabratum.
 7944. Conjugatum.

BASILE, BROTHER

34. Pubiflorum.
 35. Pubiflorum.

BEBB, ROBERT

1093. Ciliatifolium.
 1108. Ciliatifolium.
 1234. Plicatulum.
 1249. Plicatulum.
 1431. Stramineum.
 2673. Stramineum.

BECCARI, O.

3528. Vaginatum.

BERNOULLI AND CAIRO

938. Acuminatum.
 964. Repens.

BERRO, M. B.

6733. Pumilum.

BILTMORE HERBARIUM

- 814a. Laeve.
 815b. Setaceum.
 815c part. Longepedunculatum.
 3044a. Floridanum glabratum.
 3044b. Floridanum.
 3044b part. Difforme.
 3048a. Lentiferum.
 4302a. Ciliatifolium.
 4307a. Dissetum.
 5690. Dilatatum.
 6075a. Lentiferum.
 8338. Longipilum.

BIOLLEY, P.

2651. Pectinatum.
 3108. Orbiculatum.
 7470. Conjugatum.

⁸⁵ See also Dash, J. S.

BITTING, A. W.

811. Plicatulum.
831. Ciliatifolium.
833. Supinum.
895. Plicatulum.
1007. Ciliatifolium.
1195. Plicatulum.

BLACK, R. A.

33. Distichum.

BLAKE, S. F.

7445. Pectinatum.
7612. Pulchellum.
7625. Virgatum.
7627. Paniculatum.
7666. Pulchellum.
7674. Conjugatum.
7702. Paniculatum.
7706. Conjugatum.
7744. Minus.
7746. Plicatulum.
7799. Caespitosum.
7812. Decumbens.
7815. Caespitosum.
7833. Vaginatulum.
7834. Decumbens.

BLANCHET, J. S.

230. Distichum.

BOCK, F. A., AND CHASE, V. H.

18. Pubescens.
18½. Circulare.
28. Circulare.
36. Circulare.
40. Pubescens.
50. Circulare.
51. Pubescens.
53. Circulare.
54. Pubescens.
57. Circulare.
58. Pubescens.
59. Pubescens.
62. Circulare.
67. Circulare.
68. Pubescens.
69. Circulare.
70. Circulare.
72. Circulare.
73. Pubescens.
74. Circulare.
77. Circulare.

BOCK, F. A., AND CHASE, V. H.—Con.

78. Circulare.
79. Pubescens.
100. Pubescens.
101. Circulare.
103. Circulare.
104. Pubescens.
106. Circulare.
142. Circulare.
143. Pubescens.
145. Pubiflorum glabrum.
147. Pubiflorum glabrum.
150. Pubiflorum glabrum.
151. Pubescens.
162. Circulare.
163. Pubescens.
165. Circulare.
168. Circulare.
174. Circulare.
177. Pubescens.
178. Circulare.
188. Circulare.
191. Pubescens.
193. Pubescens.
194. Circulare.
198. Pubescens.
203. Pubescens.
206. Stramineum.

BOGUSCH, E. R.

498. Debile.
500. Debile.
1487. Distichum.

BOIVIN, L. H.

1498. Nutans.

BOLDINGH, I.

4836. Secans.

BOTTERI, M.

- 110 (in 1856). Conjugatum pubescens.
110. Lividum.
566. Lividum.
659. Botterii.
1267. Plenum.
1286. Lividum.

BOURGEAU, E.

532. Distichum.
1150. Tenellum.
1658. Variabile.
1659. Conjugatum.

BOURGEAU, E.—Continued

- 2298. Minus.
- 2544. Lividum.
- 2598. Variabile.
- 2633. Plicatum.
- 2641. Humboldtianum.
- 2642. Paniculatum.
- 2745. Plicatum.
- 2749. Notatum.
- 2752. Conjugatum pubescens.
- 2843. Plicatum.
- 2975. Plenum.

BOURNE, F. S. A.

- 3027. Dilatum.

BRACE, L. J. K.

- 4805. Molle.
- 5258. Caespitosum.

BRADY, A. C.

- 6179. Nutans.

BRANDEGEE, T. S.

- 2. Vaginatum.
- 40. Squamulatum.

BRITTON, N. L.

- 465. Distortum.
- 1475. Filiforme.
- 1902. Laxum.
- 2175. Caespitosum.
- 2361. Millegrana.
- 2368. Paniculatum.
- 2378. Fimbriatum.

BRITTON, N. L., AND BRACE, L. J. K.

- 340. Vaginatum.
- 404. Laxum.
- 513. Distichum.
- 598. Secans.

BRITTON, N. L. AND E. G.

- 7225. Decumbens.
- 9068. Decumbens.

BRITTON, N. L. AND E. G., AND BROWN, S.

- 6630. Laxum.
- 6950. Propinquum.
- 7038. Laxum.

BRITTON, N. L. AND E. G., AND COWELL, J. F.

- 2103. Paniculatum.

BRITTON, N. L. AND E. G., AND WILSON, P.

- 14939. Bakeri.
- 15015. Plicatum.
- 15114. Lineare.
- 15354. Plicatum.
- 15359. Blodgettii.
- 15631. Plicatum.

BRITTON, N. L., AND BROWN, S.

- 5391. Paniculatum.
- 5518. Secans.
- 6230. Paniculatum.
- 6402. Paniculatum.

BRITTON, N. L., AND COWELL, J. F.

- 476. Paniculatum.
- 1013. Paniculatum.
- 1405. Secans.
- 1449. Millegrana.
- 2186. Orbiculatum.
- 4070. Plicatum.
- 4118. Decumbens.
- 4149. Paniculatum.
- 9872. Paniculatum.

BRITTON, N. L., COWELL, J. F., AND BROWN, S.

- 4476. Notatum.
- 4636. Laxum.
- 4639. Laxum.
- 4686. Laxum.
- 4690. Laxum.
- 4717. Laxum.
- 4909. Laxum.
- 5041. Laxum.

BRITTON, N. L., COWELL, J. F., AND HESS, W. E.

- 1656. Caespitosum.
- 1839. Caespitosum.

BRITTON, N. L., AND FISHLOCK, W. C.

- 986. Laxum.
- 1041. Laxum.
- 1097. Plicatum.

BRITTON, N. L., AND HAZEN, T. E.

1201. *Conjugatum*.
1572. *Multicaule*.
1582. *Decumbens*.
1685. *Conjugatum*.
1688. *Decumbens*.

BRITTON, N. L., HAZEN, T. E., AND
FREEMAN, W. G.

1139. *Orbiculatum*.
1150. *Virgatum*.

BRITTON, N. L., HAZEN, T. E., AND
MENDELSON, W.

1249. *Nutans*.

BRITTON, N. L., AND HESS, W. E.

2833. *Conjugatum*.
2835. *Orbiculatum*.

BRITTON, N. L., AND MILLSPAUGH, C. F.

3089. *Caespitosum*.

BRITTON, N. L., AND SHAFER, J. A.

257. *Laxum*.
292. *Laxum*.
375. *Plicatum*.
506. *Laxum*.
694. *Laxum*.
764. *Plicatum*.
880. *Laxum*.
1624. *Notatum*.
1680. *Decumbens*.
2135. *Decumbens*.
3027. *Laxum*.

BRITTON, N. L., STEVENS, F. L., AND
HESS, W. E.

2395. *Laxum*.
2398. *Blodgettii*.

BRITTON, N. L., AND WHEELER, W. M.

190. *Laxum*.

BRITTON, N. L., AND WILSON, P.

148. *Langei*.
6116. *Capillifolium*.
14282. *Pulchellum*.
14456. *Virgatum*.
14695. *Minus*.
14697. *Rottboellioides*.

BRITTON, N. L., AND WILSON, P.—Con.

14707. *Plicatum*.
14805. *Multicaule*.
14890. *Caespitosum*.
15665. *Propinquum*.

BRITTON, N. L., WILSON, P., AND
LÉON, BROTHER.

6026. *Plicatum*.
15294. *Bakeri*.
15337. *Bakeri*.
15790. *Blodgettii*.

BROADWAY, W. E.

15. *Melanospermum*.
19. *Conjugatum*.
58. *Arundinaceum*.
62. *Saccharoides*.
131. *Paniculatum*.
132. *Conjugatum*.
144. *Virgatum*.
170. *Multicaule*.
261. *Nutans*.
425. *Conjugatum*.
426. *Decumbens*.
468. *Decumbens*.
523. *Conjugatum*.
876. *Nutans*.
887. *Millegrana*.
971. *Millegrana*.
1729. *Nutans*.
1744. *Conjugatum pubescens*.
1793. *Distichum*.
1793½. *Notatum*.
2126. *Multicaule*.
2175. *Coryphaeum*.
2369. *Virgatum*.
2603. *Pilosum*.
2618. *Densum*.
2811. *Nutans*.
2919. *Saccharoides*.
2996. *Paniculatum*.
3045. *Vaginatum*.
3066. *Millegrana*.
3148. *Plicatum*.
3979. *Saccharoides*.
4058. *Virgatum*.
4361. *Conjugatum*.
4390. *Virgatum*.
4513. *Distichum*.
4616. *Plicatum*.

BROADWAY, W. E.—Continued.

- 4655. *Vaginatam*.
- 4685. *Paniculatum*.
- 4696. *Millegrana*.
- 4914. *Nutans*.
- 4921. *Millegrana*.
- 4939. *Virgatum*.
- 4947. *Virgatum*.
- 4969. *Pilosum*.
- 4970. *Plicatulum*.
- 4983. *Convexum*.
- 4987. *Virgatum*.
- 5331. *Nutans*.
- 5947. *Coryphaeum*.
- 6353. *Distichum*.
- 6946. *Pumilum*.
- 7437. *Oligostachyum*.

BROOKS, A. J.

- 29. *Virgatum*.
- 34. *Conjugatum*.

BROWN, S., AND BRITTON, N. L.

- 56. *Propinquum*.
- 100. *Vaginatam*.
- 826. *Distichum*.

BROWN, S., BRITTON, N. L., AND
BISSET, P.

- 2005. *Dilatatum*.

BRYANT, E. M.

- 5. *Nutans*.

BUCH, W.

- 1091. *Heterotrichon*.
- 1217. *Fimbriatum*.
- 1591. *Conjugatum*.
- 1760. *Distachyon*.
- 1929. *Paniculatum*.

BUCHINGER.

- 960. *Notatum*.

BUCHTIEN, OTTO

- 14. *Pilosum*.
- 15. *Pilosum*.
- 16. *Multicaule*.
- 33. *Paniculatum*.
- 47. *Decumbens*.
- 48. *Decumbens*.

BUCHTIEN, OTTO—Continued

- 52. *Virgatum*.
- 65. *Saccharoides*.
- 69. *Conjugatum*.
- 79. *Minus*.
- 415. *Paniculatum*.
- 1162. *Conjugatum*.
- 1164. *Paniculatum*.
- 2504. *Conjugatum*.
- 2504a. *Conjugatum*.
- 2513. *Saccharoides*.
- 3125. *Humboldtianum*.
- 3126. *Distichum*.
- 4196. *Paniculatum*.
- 4269. *Paniculatum*.
- 4518. *Distichum*.
- 5314. *Decumbens*.
- 5323. *Paniculatum*.
- 5325. *Conjugatum*.
- 6435. *Paniculatum*.
- 6436. *Paniculatum*.
- 6445. *Decumbens*.
- 7105. *Decumbens*.
- 7106. *Decumbens*.
- 7108. *Pilosum*.
- 7110. *Malacophyllum*.

BÜNNEMEYER

- 1320. *Conjugatum*.
- 1394. *Conjugatum*.
- 2246. *Conjugatum*.
- 7398. *Conjugatum*.

BURCHELL, W. J.

- 1565. *Vaginatam*
- 1565 part. *Multicaule*.
- 8864. *Orbiculatum*.

BUSH, B. F.

- 59. *Circulare*.
- 63. *Circulare*.
- 107. *Circulare*.
- 183. *Repens*.
- 196. *Dilatatum*
- 205. *Urvillei*.
- 207. *Longipilum*.
- 209. *Ciliatifolium*.
- 213. *Circulare*.
- 225. *Setaceum*.
- 264. *Langei*.
- 294. *Distichum*.
- 311. *Floridanum glabratum*.

BUSH, B. F.—Continued

334. Floridanum.
 336. Pubescens.
 340. Plicatulum.
 376. Repens.
 432. Pubiflorum glabrum.
 687. Repens.
 691. Circulare.
 887. Circulare.
 943. Pubescens.
 963. Langei.
 969. Ciliatifolium.
 978. Pubiflorum glabrum.
 1049. Floridanum.
 1055. Dissectum.
 1163. Stramineum.
 1303. Repens.
 1763. Pubescens.
 1771. Stramineum
 3128. Pubescens.
 3129. Pubescens.
 3248. Circulare.
 3393. Pubiflorum glabrum.
 3695. Repens.
 3711. Pubiflorum glabrum.
 4818. Stramineum.
 4823. Pubescens.
 5086. Circulare.
 5087. Circulare.
 5164. Repens.
 5183. Circulare.
 6200. Repens.
 6329. Stramineum.
 6501. Stramineum.
 8156. Stramineum.
 8165. Stramineum.
 8723. Circulare.
 8723A. Circulare.
 9944. Repens.

BUTLER, G. D.

20. Floridanum glabratum.

CALDERÓN, SALVADOR

486. Costaricense.
 492. Plicatulum.
 645. Paniculatum.
 869. Virgatum.
 944. Adoperiens.
 945. Conjugatum pubescens.
 1150. Fasciculatum.
 1151. Fasciculatum.
 1152. Humboldtianum.

CALDERÓN, SALVADOR—Continued

1154. Virgatum.
 1333. Paniculatum.
 1690. Virgatum.
 1744. Langei.
 1879. Repens.
 1881. Fasciculatum.
 2272. Stellatum.

CANBY, W. N., AND ROSE, J. N.

805. Floridanum glabratum.

CAPANEMA, G.

5416. Parviflorum.
 5417. Vaginatum.
 5418. Distichum.
 5427. Vaginatum.

CÁRDENAS, MARTIN (MULFORD BIOL.
EXPL.)

1175. Conjugatum.
 1656. Virgatum.

CARLETON, M. A.

171. Conjugatum.
 182. Paniculatum.

CARVER, G. W.

6. Setaceum.
 14. Ciliatifolium.
 16. Pubescens.
 24. Longipilum.
 38. Distichum.
 50. Laeve.
 51. Longipilum.
 74. Longipilum.
 75. Laeve.
 83. Difforme.
 89. Floridanum.
 90. Setaceum.
 91. Boscianum.

CELESTINE, BROTHER

20. Virgatum.

CHAMBERLAIN, EDITH

123. Circulare.

CHAMBLISS, C. E.

84. Ciliatifolium.

CHANDLER, H. P.

5331. Distichum.

CHAPLINE, W. R.

38147 (Forest Serv.). Supinum.

CHAPMAN, A. W.

3044b part. Floridanum.

3044b part. Difforme.

3048a. Lentiferum.

6075a. Lentiferum.

CHASE, AGNES

2575. Pubescens.

2586. Pubescens.

2593. Laeve.

2600. Laeve.

2941. Pubescens.

3003. Pubescens.

3008. Pubescens.

3011. Pubescens.

3018. Pubescens.

3021½. Circulare.

3122. Setaceum.

3491. Pubescens.

3494. Setaceum.

3494½. Debile.

3568. Psammophilum.

3634. Laeve.

3644. Floridanum.

3645. Floridanum glabratum.

3648. Laeve.

3649. Pubescens.

3650. Setaceum.

3670. Boscianum.

3684. Longipilum.

3685. Setaceum.

3836. Circulare.

3840. Blodgettii.

3849. Ciliatifolium.

3853. Ciliatifolium.

3861. Blodgettii.

3862. Supinum.

3869. Longepedunculatum.

3878. Laeve.

3883. Monostachyum.

3886. Longepedunculatum.

3927. Vaginatam.

3928. Caespitosum.

3950. Rigidifolium.

3951. Ciliatifolium.

3960. Ciliatifolium.

3961. Distichum.

3971. Debile.

3974. Longepedunculatum.

3975. Ciliatifolium.

CHASE, AGNES—Continued

3976. Ciliatifolium.

3983. Longipilum.

3987. Longepedunculatum.

3988. Ciliatifolium.

3993. Ciliatifolium.

3998. Lentiferum.

4003. Ciliatifolium.

4010. Ciliatifolium.

4025. Giganteum.

4027. Debile.

4033. Longepedunculatum.

4034. Longepedunculatum.

4035. Longepedunculatum.

4038. Lentiferum.

4040. Longipilum.

4042. Supinum.

4046. Ciliatifolium.

4046½. Setaceum.

4047. Longepedunculatum.

4048. Longepedunculatum.

4049. Ciliatifolium.

4054. Ciliatifolium.

4056. Longepedunculatum.

4057. Longipilum.

4069. Debile.

4071. Rigidifolium.

4075. Propinquum.

4083. Longipilum.

4084. Ciliatifolium.

4089. Distichum.

4090. Supinum.

4092. Langei.

4093. Pubiflorum glabrum.

4096. Langei.

4107. Ciliatifolium.

4108. Pubiflorum glabrum.

4109. Floridanum.

4110. Difforme.

4111. Ciliatifolium.

4117. Supinum.

4124. Supinum.

4128. Supinum.

4138. Supinum.

4145. Longipilum.

4145½. Ciliatifolium.

4146. Longepedunculatum.

4147. Supinum.

4152. Longepedunculatum.

4160. Distichum.

4167. Longepedunculatum.

4168. Ciliatifolium.

4169. Debile.

CHASE, AGNES—Continued

4178. *Supinum*.
 4184. *Rigidifolium*.
 4186. *Debile*.
 4197. *Supinum*.
 4210. *Plicatum*.
 4221. *Floridanum*.
 4223. *Ciliatifolium*.
 4230. *Longipilum*.
 4231. *Supinum*.
 4236. *Pubescens*.
 4237. *Ciliatifolium*.
 4255. *Laeve*.
 4270. *Bifidum*.
 4275. *Ciliatifolium*.
 4285. *Dilatatum*.
 4311. *Ciliatifolium*.
 4313. *Dissectum*.
 4317. *Laeve*.
 4319. *Lentiferum*.
 4324. *Dilatatum*.
 4326. *Floridanum*.
 4327. *Rigidifolium*.
 4329. *Floridanum glabratum*.
 4329½. *Floridanum*.
 4330. *Laeve*.
 4345. *Pubescens*.
 4347. *Floridanum*.
 4347½. *Difforme*.
 4350. *Laeve*.
 4354. *Laeve*.
 4354½. *Rigidifolium*.
 4355. *Boscianum*.
 4367. *Ciliatifolium*.
 4388. *Urvillei*.
 4390. *Floridanum*.
 4391. *Plicatum*.
 4398. *Langei*.
 4399. *Pubescens*.
 4402. *Pubescens*.
 4415. *Langei*.
 4417. *Pubescens*.
 4435. *Ciliatifolium*.
 4436. *Ciliatifolium*.
 4440. *Pubiflorum glabrum*.
 4441. *Ciliatifolium*.
 4442. *Circulare*.
 4443. *Floridanum glabratum*.
 4447. *Circulare*.
 4450. *Circulare*.
 4480. *Pubescens*.
 4494. *Longepedunculatum*.
 4496. *Boscianum*.

CHASE, AGNES—Continued

4505. *Laeve*.
 4510. *Boscianum*.
 4511. *Ciliatifolium*.
 4546. *Ciliatifolium*.
 4547. *Ciliatifolium*.
 4552. *Ciliatifolium*.
 4571. *Circulare*.
 4572. *Supinum*.
 4574. *Debile*.
 4587. *Floridanum*.
 4598. *Praecox*.
 4606. *Lentiferum*.
 5293. *Stramineum*.
 5872. *Pubescens*.
 6044. *Stramineum*.
 6047. *Stramineum*.
 6052. *Pubescens*.
 6062. *Plicatum*.
 6064. *Stramineum*.
 6074. *Plicatum*.
 6075. *Supinum*.
 6087. *Ciliatifolium*.
 6107. *Urvillei*.
 6136. *Setaceum*.
 6137. *Longipilum*.
 6150. *Secans*.
 6151. *Plicatum*.
 6152. *Conjugatum*.
 6153. *Millegrana*.
 6154. *Paniculatum*.
 6164. *Millegrana*.
 6170. *Decumbens*.
 6172. *Boscianum*.
 6173. *Virgatum*.
 6174. *Secans*.
 6176. *Decumbens*.
 6182. *Laxum*.
 6186. *Decumbens*.
 6187. *Millegrana*.
 6193. *Secans*.
 6220. *Rupestre*.
 6233. *Distichum*.
 6234. *Boscianum*.
 6235. *Decumbens*.
 6236. *Notatum*.
 6237. *Millegrana*.
 6238. *Secans*.
 6239. *Paniculatum*.
 6246. *Rupestre*.
 6257. *Virgatum*.
 6257½. *Millegrana*.
 6259. *Rupestre*.

CHASE, AGNES—Continued

6262. Molle.
 6264. Decumbens.
 6274. Rupestre.
 6275. Rupestre.
 6279. Laxum.
 6282. Propinquum.
 6287. Notatum.
 6296. Fimbriatum.
 6299. Rupestre.
 6300. Laxum.
 6303. Millegrana.
 6307. Vaginatium.
 6309. Secans.
 6312. Rupestre.
 6313. Laxum.
 6314. Notatum.
 6315. Rupestre.
 6322. Molle.
 6323. Rupestre.
 6329. Fimbriatum.
 6338. Molle.
 6339. Plicatulum.
 6340. Decumbens.
 6343. Vaginatium.
 6344. Notatum.
 6346. Laxum.
 6356. Millegrana.
 6359. Millegrana.
 6361. Decumbens.
 6367. Laxum.
 6368. Minus.
 6369. Laxum.
 6372. Secans.
 6373. Millegrana.
 6382. Secans.
 6387. Secans.
 6389. Conjugatum.
 6390. Paniculatum.
 6399. Decumbens.
 6401. Notatum.
 6402. Laxum.
 6404. Conjugatum.
 6408. Laxum.
 6409. Secans.
 6423. Laxum.
 6424. Notatum.
 6427. Caespitosum.
 6428. Molle.
 6430. Plicatulum.
 6433. Propinquum.
 6437. Laxum.
 6439. Propinquum.

CHASE, AGNES—Continued

6441. Millegrana.
 6444. Secans.
 6446. Laxum.
 6459. Paniculatum.
 6465. Secans.
 6466. Plicatulum.
 6473. Decumbens.
 6478. Paniculatum.
 6483. Distichum.
 6489. Caespitosum.
 6494. Distichum.
 6499. Laxum.
 6537. Fimbriatum.
 6546. Plicatulum.
 6550. Fimbriatum.
 6553. Paniculatum.
 6559. Secans.
 6565. Millegrana.
 6572. Propinquum.
 6573. Laxum.
 6575. Laxum.
 6579. Blodgettii.
 6580. Blodgettii.
 6581. Secans.
 6584. Laxum.
 6585. Notatum.
 6588. Saugetii.
 6591. Laxum.
 6592. Plicatulum.
 6597. Saugetii.
 6598. Saugetii.
 6599. Virgatum.
 6601. Laxum.
 6605. Blodgettii.
 6605½. Laxum.
 6607. Molle.
 6608. Molle.
 6609. Laxum.
 6613. Propinquum.
 6618. Laxum.
 6625. Laxum.
 6626. Millegrana.
 6634½. Propinquum.
 6635. Laxum.
 6637. Millegrana.
 6639. Notatum.
 6641. Secans.
 6642. Virgatum.
 6644. Plicatulum.
 6646. Millegrana.
 6648. Decumbens.
 6649. Virgatum.

CHASE, AGNES—Continued

6650. Millegrana.
 6652. Plicatum.
 6655. Millegrana.
 6658. Laxum.
 6661. Propinquum.
 6665. Fimbriatum.
 6678. Laxum.
 6687. Millegrana.
 6690. Distichum.
 6694. Vaginatam.
 6697. Laxum.
 6698. Secans.
 6703. Virgatum.
 6704. Millegrana.
 6705. Virgatum.
 6706. Virgatum.
 6707. Secans.
 6716. Secans.
 6718. Decumbens.
 6722. Conjugatum.
 6723. Secans.
 6724. Boscianum.
 6725. Millegrana.
 6727. Paniculatum.
 6729. Notatum.
 6739. Orbiculatum.
 6740. Virgatum.
 6741. Molle.
 6756. Laxum.
 6759. Laxum.
 6761. Millegrana.
 6775½ Millegrana.
 6777. Plicatum.
 6779. Notatum.
 6785. Millegrana.
 6787. Secans.
 6791. Densum.
 6792. Virgatum.
 6793. Millegrana.
 6794. Millegrana.
 6811. Rupestre.
 6813. Rupestre.
 6820. Molle.
 7001. Setaceum.
 7003. Setaceum.
 7007. Pubescens.
 7008. Pubescens.
 7017. Ciliatifolium.
 7030. Ciliatifolium.
 7046. Praecox.
 7059. Laeve.
 7060. Difforme.

CHASE, AGNES—Continued

7061. Plicatum.
 7096. Ciliatifolium.
 7102. Dilatum.
 7113. Ciliatifolium.
 7143. Setaceum.
 7144. Debile.
 7182. Praecox.
 7195. Setaceum.
 7516. Setaceum.
 7638. Nutans.
 7655. Conjugatum pubescens.
 7656. Pleostachyum.
 7659. Plicatum.
 7682. Millegrana.
 7701. Distichum.
 7718. Virgatum.
 7727. Pumilum.
 7730. Oligostachyum.
 7731. Nutans.
 7736. Orbiculatum.
 7754. Coryphaeum.
 7758. Vaginatam.
 7761. Pumilum.
 7769. Pleostachyum.
 7838. Conjugatum pubescens.
 7839. Vaginatam.
 7840. Millegrana.
 7854. Multicaule.
 7859. Oligostachyum.
 7860. Pilosum.
 7863. Oligostachyum.
 7865. Molle.
 7868. Paniculatum.
 7874. Molle.
 7884. Multicaule.
 7890. Pilosum.
 7903. Pleostachyum.
 7919. Repens.
 7963. Molle.
 7971. Pilosum.
 7979. Clavuliferum.
 7981. Pulchellum.
 7982. Pulchellum.
 7983. Pumilum.
 7986. Multicaule.
 7987. Plicatum.
 7999. Gardnerianum.
 8001. Parviflorum.
 8020. Vaginatam.
 8025. Pilosum.
 8037. Distichum.
 8045. Pleostachyum.

CHASE, AGNES—Continued

8047. *Pleostachyum*.
 8047½. *Oligostachyum*.
 8050. *Molle*.
 8055. *Conjugatum*.
 8081. *Pumilum*.
 8083. *Pilosum*.
 8092. *Plicatulum*.
 8094. *Clavuliferum*.
 8095. *Molle*.
 8107½. *Clavuliferum*.
 8126. *Pilosum*.
 8140. *Densum*.
 8142. *Orbiculatum*.
 8148. *Densum*.
 8154. *Conjugatum pubescens*.
 8156. *Coryphaeum*.
 8172. *Pumilum*.
 8174. *Urvillei*.
 8189. *Nutans*.
 8195. *Conjugatum pubescens*.
 8199. *Nutans*.
 8213. *Notatum*.
 8219. *Millegrana*.
 8221. *Vaginatulum*.
 8234. *Pumilum*.
 8235. *Urvillei*.
 8240. *Paniculatum*.
 8258. *Distichum*.
 8259. *Nutans*.
 8341. *Nutans*.
 8346. *Pilosum*.
 8348. *Paniculatum*.
 8351. *Decumbens*.
 8359. *Plicatulum*.
 8360. *Notatum*.
 8393. *Coryphaeum*.
 8409. *Conjugatum*.
 8410. *Conspersum*.
 8438. *Pumilum*.
 8443. *Pumilum*.
 8458. *Vaginatulum*.
 8479. *Nutans*.
 8483. *Nutans*.
 8483½. *Decumbens*.
 8492. *Pumilum*.
 8504. *Conspersum*.
 8509. *Dilatatum*.
 8513. *Conspersum*.
 8519. *Paniculatum*.
 8531. *Pilosum*.
 8534. *Pilosum*.
 8562. *Nutans*.

CHASE, AGNES—Continued

8567. *Nutans*.
 8586. *Pumilum*.
 8598. *Dilatatum*.
 8600. *Paniculatum*.
 8612. *Paniculatum*.
 8637. *Urvillei*.
 8650. *Paniculatum*.
 8672. *Plicatulum*.
 8677. *Plicatulum*.
 8691. *Notatum*.
 8695½. *Malacophyllum*.
 8735. *Paniculatum*.
 8752. *Distichum*.
 8769. *Malacophyllum*.
 8770. *Conspersum*.
 8791. *Malacophyllum*.
 8816. *Gardnerianum*.
 8840. *Conjugatum pubescens*.
 8846. *Plicatulum*.
 8847. *Plicatulum*.
 8863. *Plicatulum*.
 8892. *Malacophyllum*.
 8894. *Conspersum*.
 8908. *Clavuliferum*.
 8944. *Pilosum*.
 8956. *Coryphaeum*.
 8962. *Coryphaeum*.
 8964. *Gardnerianum*.
 8973. *Plicatulum*.
 8976. *Plicatulum*.
 8984. *Paniculatum*.
 8987. *Clavuliferum*.
 8989. *Convexum*.
 8999. *Decumbens*.
 9015. *Gardnerianum*.
 9030. *Gardnerianum*.
 9043. *Convexum*.
 9044. *Plicatulum*.
 9049. *Gardnerianum*.
 9058. *Coryphaeum*.
 9063. *Coryphaeum*.
 9092. *Notatum*.
 9100. *Stellatum*.
 9104. *Coryphaeum*.
 9109. *Convexum*.
 9111. *Clavuliferum*.
 9114. *Plicatulum*.
 9120. *Nutans*.
 9121. *Pilosum*.
 9124. *Coryphaeum*.
 9127. *Gardnerianum*.
 9162. *Convexum*.

CHASE, AGNES—Continued

9183. Gardnerianum.
 9190. Multicaule.
 9199. Nutans.
 9212. Pectinatum.
 9216. Pectinatum.
 9250. Pectinatum.
 9253. Stellatum.
 9254. Coryphaeum.
 9256. Plicatum.
 9258. Malacophyllum.
 9263. Paniculatum.
 9265. Urvillei.
 9267. Coryphaeum.
 9281. Plicatum.
 9290. Coryphaeum.
 9295. Stellatum.
 9308. Stellatum.
 9333. Distichum.
 9339. Conspersum.
 9372. Coryphaeum.
 9374. Pumilum.
 9425. Urvillei.
 9426½. Conjugatum pubescens.
 9433. Urvillei.
 9448. Nutans.
 9473. Urvillei.
 9487. Conspersum.
 9488. Virgatum.
 9502. Conjugatum pubescens.
 9504. Paniculatum.
 9510. Decumbens.
 9512. Nutans.
 9610. Conspersum.
 9614. Nutans.
 9622. Acuminatum.
 9632. Paniculatum.
 9636. Nutans.
 9767. Urvillei.
 9768. Pumilum.
 9802. Coryphaeum.
 9810. Millegrana.
 9864. Paniculatum.
 9895. Pumilum.
 9930. Nutans.
 9937. Laeve.
 9938. Pubescens.
 9945. Circulare.
 9946. Circulare.
 9948. Pubescens.
 9963. Ciliatifolium.
 9964. Pubescens.
 9965. Circulare.

CHASE, AGNES—Continued

9967. Circulare.
 9969. Circulare.

CHOUSSY, F.

- A 17. Plicatum.
 A 18. Humboldtianum.
 37. Millegrana.

CHRIST, H.

1800. Heterotrichon.
 2185. Virgatum.

CLAUDE JOSEPH, BROTHER

2020. Dilatum.
 2164. Dilatum.
 2270. Distichum.
 2271. Dilatum.
 2640a. Distichum.
 4146. Distichum.
 4718. Distichum.
 5734. Urvillei.

CLAUSSEN, P.

1020. Stellatum.

CLEMENTS, F. E.

2427. Unispicatum.
 2817. Stramineum.

CLOKEY, I. W.

1928. Tenellum

COCKS, R. S.

418. Conjugatum.
 2187. Plicatum.
 2197. Floridanum.
 3009. Distichum.
 3010. Langei.
 3512. Dissectum.

COKER, W. C.

35. Circulare.

COLLINS, F. S.

- 155 part. Ciliatifolium.
 155 part. Propinquum.
 156. Dilatum.
 157. Conjugatum.

COLLINS, G. N., AND DOYLE, C. B.

124. Stellatum.

COLLINS, G. N., AND GOLL, G. P.

05. *Conjugatum*.
06. *Paniculatum*.

COMBS, ROBERT

2. *Longipilum*.
4. *Setaceum*.
18. *Floridanum glabratum*.
24. *Praecox*.
30. *Distichum*.
31. *Distichum*.
36. *Boscianum*.
45. *Lentiferum*.
52. *Distichum*.
56. *Longepedunculatum*.
62. *Praecox*.
64. *Setaceum*.
76. *Longepedunculatum*.
77. *Longipilum*.
158½. *Laeve*.
197. *Longipilum*.
202. *Dilatatum*.
214. *Plicatulum*.
229. *Longepedunculatum*.
229½. *Supinum*.
232. *Setaceum*.
236. *Ciliatifolium*.
239. *Floridanum*.
240. *Plicatulum*.
241. *Distichum*.
242. *Boscianum*.
243. *Ciliatifolium*.
257. *Ciliatifolium*.
285. *Bifidum*.
292. *Laeve*.
293. *Boscianum*.
304. *Ciliatifolium*.
309. *Longipilum*.
310. *Boscianum*.
310½. *Laeve*.
317. *Distichum*.
322. *Boscianum*.
323. *Supinum*.
343. *Floridanum glabratum*.
343a. *Floridanum*.
344. *Laeve*.
345. *Setaceum*.
350. *Setaceum*.
351. *Dissectum*.
357. *Ciliatifolium*.
359. *Ciliatifolium*.
367. *Laeve*.
377. *Setaceum*.

COMBS, ROBERT—Continued

384. *Boscianum*.
385. *Laeve*.
388. *Distichum*.
395. *Boscianum*.
402. *Setaceum*.
404. *Supinum*.
405. *Ciliatifolium*.
409. *Laeve*.
420. *Distichum*.
423. *Boscianum*.
435. *Ciliatifolium*.
436. *Ciliatifolium*.
442. *Setaceum*.
459. *Ciliatifolium*.
471. *Floridanum*.
472. *Bifidum*.
481. *Bifidum*.
485. *Lentiferum*.
490. *Floridanum glabratum*.
492. *Floridanum*.
495. *Supinum*.
501. *Dissectum*.
515. *Setaceum*.
518. *Pubescens*.
519. *Ciliatifolium*.
522. *Boscianum*.
527. *Dissectum*.
528. *Longipilum*.
533. *Bifidum*.
539a. *Distichum*.
540. *Floridanum*.
542. *Plicatulum*.
543. *Ciliatifolium*.
546. *Setaceum*.
558. *Bifidum*.
561. *Plicatulum*.
566. *Boscianum*.
578. *Dissectum*.
581. *Bifidum*.
593. *Bifidum*.
594. *Floridanum*.
598. *Plicatulum*.
606. *Setaceum*.
607. *Plicatulum*.
629. *Pubescens*.
630. *Laeve*.
632. *Lentiferum*.
635. *Floridanum glabratum*.
636. *Floridanum*.
637. *Floridanum*.
638. *Lentiferum*.
639. *Ciliatifolium*.

COMBS, ROBERT—Continued

640. Boscianum.
 679. Dissectum.
 689. Dissectum.
 693. Longipilum.
 699. Pubescens.
 701. Floridanum.
 710. Distichum.
 718. Laeve.
 719. Supinum.
 720. Debile.
 726. Laeve.
 728. Distichum.
 735. Ciliatifolium.
 736. Ciliatifolium.
 746. Boscianum.
 755. Supinum.
 759. Longipilum.
 765a. Vaginatum.
 766. Vaginatum.
 770. Ciliatifolium.
 782. Longepedunculatum.
 800. Ciliatifolium.
 808. Supinum.
 810. Laeve.
 815. Lentiferum.
 819. Lentiferum.
 833. Dissectum.
 840. Plicatulum.
 844. Rigidifolium.
 852. Debile.
 866. Bifidum.
 867. Bifidum.
 872. Repens.
 892. Debile.
 896. Rigidifolium.
 901. Supinum.
 905. Debile.
 911. Rigidifolium.
 912. Repens.
 916. Giganteum.
 917. Ciliatifolium.
 922. Caespitosum.
 925. Ciliatifolium.
 942. Vaginatum.
 948. Longipilum.
 956. Monostachyum.
 959. Giganteum.
 965. Distichum.
 974. Lentiferum.
 975. Lentiferum.
 986. Floridanum glabratum.
 993. Rigidifolium.
 1001. Bifidum.

COMBS, ROBERT—Continued

1002. Longipilum.
 1019. Debile.
 1020. Longepedunculatum.
 1020½. Supinum.
 1026. Lentiferum.
 1174. Floridanum glabratum.
 1175. Supinum.
 1176. Pubescens.
 1179. Setaceum.
 1185. Plicatulum.
 1194½. Lentiferum.
 1201. Repens.
 1202. Lentiferum.
 1217½. Longipilum.
 1223. Rigidifolium.
 1229. Lentiferum.
 1245. Distichum.
 1272. Distichum.
 1276. Lentiferum.
 1285. Ciliatifolium.
 1293. Vaginatum.
 1318. Longepedunculatum.
 1318½. Ciliatifolium.
 1329. Ciliatifolium.
 1351. Longipilum.
 1374. Setaceum.
 1375. Rigidifolium.
 1392. Plicatulum.
 1405. Pubiflorum glabrum.
 1408. Ciliatifolium.
 1410. Dilatatum.
 1434. Distichum.

COMBS, R., AND BAKER, C. H.

1029. Rigidifolium.
 1032. Ciliatifolium.
 1033. Supinum.
 1034. Debile.
 1040. Bifidum.
 1059. Bifidum.
 1107. Rigidifolium.
 1142. Praecox.
 1151. Langei.
 1158. Lentiferum.

COMBS, R., AND ROLFS, P. H.

85. Plicatulum.
 86. Plicatulum.
 105. Longepedunculatum.
 121. Longepedunculatum.
 123. Supinum.
 124. Boscianum.
 128. Supinum.

COMBS, R. AND ROLFS, P. H.—Con.

- 146. Debile.
- 159. Boscianum.
- 166. Supinum.
- 175. Pubescens.
- 196. Setaceum.

COMMONS, A.

- 85. Dissectum.
- 86. Circulare.
- 87. Pubescens.
- 88. Debile.
- 232. Psammophilum.
- 310. Floridanum glabratum.
- 312. Longipilum.
- 313. Pubescens.
- 314. Dissectum.

CONZATTI, C.

- 3600. Hartwegianum.
- 3616. Notatum.
- 3641. Humboldtianum.
- 3770. Conjugatum pubescens.
- 4042 $\frac{3}{4}$. Conjugatum.
- 4364. Stellatum.

CONZATTI, C., AND GONZÁLES, V.

- 341. Notatum.
- 349. Lividum.
- 350. Pubiflorum.
- 440. Humboldtianum.
- 1160. Botterii.

COOK, O. F., AND DOYLE, C. B.

- 324. Conjugatum.
- 462. Conjugatum pubescens.

COOK, O. F., AND GILBERT, G. B.

- 858. Candidum.
- 1531. Virgatum.

COOK, O. F., AND GRIGGS, R. F.

- 431. Orbiculatum.

COOK, O. F., SCOFIELD, C. S., AND DOYLE, C. B.

- 53. Fimbriatum.
- 59. Paniculatum.
- 61. Fimbriatum.
- 80. Conjugatum.
- 87. Lindenianum.
- 91. Distichum.
- 103. Minus.
- 174. Arundinaceum.
- 180. Conjugatum.

COOPER, J. J.

- 75. Candidum.
- 5995 (Dist. Smith). Candidum.

COTTAM, W. P.

- 3388. Distichum.

COVILLE, F. V., AND FUNSTON, F.

- 1281. Distichum.

COWGILL, H. B.

- 423. Plicatum.
- 627. Decumbens.
- 691. Millegrana.
- 695. Virgatum.

CRAWFORD, D. L.

- 750. Distichum.

CURRAN, H. M.

- 189. Conjugatum.
- 258. Repens.
- 366. Fasciculatum.

CURRAN, H. M., AND HAMAN, M.

- 569. Vaginatum.
- 578. Vaginatum.
- 889. Unispicatum.
- 1040. Conjugatum.

CURTISS, A. H.

- 3. Fimbriatum.
- 156. Laxum.
- 165. Blodgettii.
- 192. Conjugatum.
- 327. Decumbens.
- 374. Distortum.
- 375. Rottboellioides.
- 379. Lineare.
- 501. Virgatum.
- 523. Lindenianum.
- 751. Vaginatum.
- 764. Distichum.
- 3563. Repens.
- 3564. Dissectum.
- 3567. Distichum.
- 3567* part. Distichum.
- 3567* part. Vaginatum.
- 3569 part. Praecox.
- 3569 part. Lentiferum.
- 3570. Difforme.
- 3571*. Giganteum.
- 3572. Bifidum.

CURTISS, A. H.—Continued

3573 part. Boscianum.
 3573 part. Lentiferum.
 3575. Caespitosum.
 3576 part. Pubescens.
 3576 part. Supinum.
 3576*. Vaginatam.
 3601. Caespitosum.
 4021. Distichum.
 4024. Praecox.
 4025. Boscianum.
 4744. Praecox.
 4990 part. Lentiferum.
 4990 part. Longipilum.
 5021. Difforme.
 5022. Boscianum.
 5078. Distichum.
 5079. Ciliatifolium.
 5080. Bifidum.
 5081 part. Dissectum.
 5081 part. Repens.
 5090. Supinum.
 5092 part. Debile.
 5092 part. Laeve.
 5098. Laeve.
 5194. Lentiferum.
 5198. Setaceum.
 5440. Blodgettii.
 5517. Floridanum.
 5580. Lentiferum.
 5590. Bifidum.
 5728. Lentiferum.
 5741. Distichum.
 5745. Boscianum.
 5750. Floridanum.
 5760. Boscianum.
 5923. Plicatum.
 5937. Laeve.
 5970. Repens.
 6017. Ciliatifolium.
 6018. Supinum.
 6502. Dilatatum.
 6508. Urvillei.
 6509. Boscianum.
 6666. Rigidifolium.

DASH, J. S.

455. Virgatum.
 584. Laxum.

DAVIDSON, A.

3160. Dilatatum.

DAVIS, JOHN

1566. Dilatatum.
 1591. Laeve.
 7905. Boscianum.

DAVY, J. B.

788. Dilatatum.

DAVY, J. B., AND BLASDALE, W. C.

5937. Distichum.

DEAM, C. C.

80. Paniculatum.
 6038. Orbiculatum.
 6205. Notatum.
 7302. Pubescens.
 7538. Circulare.
 10155. Circulare.
 13590. Pubescens.
 17161. Pubescens.
 18229. Pubescens.
 18846. Circulare.
 22201. Repens.
 22247. Repens.
 22309. Repens.
 24010. Circulare.
 24042. Circulare.
 24346. Repens.
 26068. Pubescens.
 26231. Pubescens.
 26591. Repens.
 27992. Pubescens.
 28316. Circulare.
 28973. Circulare.
 29090. Circulare.
 30189. Circulare.
 32940. Pubiflorum glabrum.
 32994. Pubescens.
 33404. Pubescens.
 35003. Pubescens.
 35006. Pubescens.
 35068. Pubescens.
 37824. Pubescens.
 39372. Stramineum.
 39689. Stramineum.
 39775A. Pubescens.
 41540. Pubescens.
 41593. Pubescens.
 41745. Pubescens.
 41829A. Pubescens.
 42159. Pubescens.
 42473. Pubescens.

DEAM, C. C.—Continued

42484. Pubescens.
42561. Pubescens.
42581. Pubescens.
45566. Circulare.

DEMAREE, D.

2832. Dilatatum.

DEVORE AND HOOVER

50. Conjugatum.

DEWEY, L. H.

125. Pubescens.
323. Pubescens.

DIDRICHSEN, F.

4384. Vaginatum.
4387. Racemosum.

DOBBIN, FRANK

15. Psammophilum.

DORSETT, P. H.

- 150b. Conjugatum pubescens.
166b. Conspersum.
211b. Conspersum.
215b. Conjugatum.
265b. Paniculatum.

DORSETT, P. H., AND POPENOE, W.

- 215c. Pilosum.
446b. Conjugatum.

DOWELL, P.

7344. Debile.

DRUMMOND, T.

342. Pubiflorum.
350. Langei.
363. Dissectum.
364. Monostachyum.
441. Distichum.
443. Lentiferum.
446. Ciliatifolium.

DUNLAP, V. C.

199. Fasciculatum.

DUSÉN, P.

130. Paniculatum.
2770. Pectinatum.
2844a. Pectinatum.
3986. Pumilum.
4023. Stellatum.
8011. Stellatum.
10611. Pectinatum.
10834. Lineare.
13256. Pectinatum.
13465. Vaginatum.
13539. Conjugatum.
13625. Paniculatum.
13783. Vaginatum.
13890. Millegiana.
15727. Pectinatum.
16429. Conspersum.
16434. Plicatum.
17864. Notatum.
17984. Pilosum.

DUSS, PÉRE.

- 545 part. Distichum.
545 part. Vaginatum.
548 part. Nesiotes.
548 part. Plicatum.
549. Paniculatum.
551. Laxum.
558. Notatum.
720. Plicatum.
1275. Fimbriatum.
1276. Conjugatum.
1317. Saccharoides.
2673. Plicatum.
2677. Paniculatum.
3366. Saccharoides.
3609. Distichum.
3915. Melanospermum.
4011. Plicatum.
4012. Melanospermum.
4059. Nutans.
4224. Densum.
4507. Orbiculatum.

DUTRA, J.

503. Notatum.
546. Sanguineolentum.
555. Conjugatum pubescens.
599. Pumilum.
16478. (Mus. Rio Jan.). Urvillei.
16496. (Mus. Rio Jan.). Orbiculatum.

EATON, A. A.

69. Ciliatifolium.
85. Caespitosum.
172. Monostachyum.
237. Caespitosum.
238. Rigidifolium.
246. Blodgettii.
269. Caespitosum.
481. Caespitosum.
483. Ciliatifolium.
647. Lentiferum.
1207. Ciliatifolium.

EBERHARDT

2191. Conjugatum.

EDWALL, G.

3035. Pilosum.

EGGERS, H. F. A.

4. Plicatum.
676. Millegrana.
691. Vaginatam.
795. Paniculatum.
1057. Paniculatum.
1176. Virgatum.
1964. Conjugatum.
2439. Pulchellum.
2547. Plicatum.
5317. Paniculatum.
5553. Virgatum.
13090. Fimbriatum.
13330. Humboldtianum.
14104. Fasciculatum.
14602. Vaginatam.
14632. Repens.
14646. Conjugatum.
14668. Orbiculatum.
14965. Racemosum.

EKMAN, E. L.⁸⁰

10. Pubiflorum.
176. Caespitosum.
184. Arundinaceum.
184 part. Secans.
264. Lindenianum.
331. Caespitosum.
504. Distichum.
568. Malacophyllum.
570. Conjugatum.
571. Conjugatum.
573. Paniculatum.

EKMAN, E. L.—Continued

576. Dilatatum.
577. Urvillei.
578. Notatum.
581. Plicatum.
582. Plicatum.
588. Conspersum.
594 (Cuba). Alterniflorum.
594 (Argentina). Stellatum.
595. Stellatum.
685. Paniculatum.
697. Saugetii.
798. Bakeri.
888. Distichum.
938. Pubiflorum.
1094. Debile.
1251. Notatum.
1253. Lividum.
1257. Lividum.
1284. Rupestre.
2756. Distachyon.
2890. Caespitosum.
3475. Laxum.
3597. Distortum.
6176. Millegrana.
6294. Alterniflorum.
6337. Saugetii.
7565. Capillifolium.
8000. Fimbriatum.
9843. Breve.
10118. Millegrana.
10370. Conjugatum.
10737. Lineare.
10784. Nanum.
10960. Propinquum.
11021. Propinquum.
11033. Vaginatam.
11085. Densum.
11093. Unispicatum.
11095. Filiforme.
11197. Filiforme.
11497. Langei.
11652. Propinquum.
11715. Pulchellum.
11957. Insulare.
12040. Plicatum.
12190. Nanum.
12219. Rottboellioides.
12220. Insulare.
12223. Secans.
12423. Distachyon.
12604. Blodgettii.
12838. Bakeri.

⁸⁰ See numbers beginning with H for Haitian collections.

EKMAN, E. L.—Continued

12855. Dilatatum.
 12908. Lindenianum.
 12966. Decumbens.
 12998. Rupestre.
 13018. Paniculatum.
 13052. Notatum.
 13392. Vaginatum.
 14093. Nanum.
 14104. Nanum.
 14146. Lineare.
 14691. Distortum.
 15008. Convexum.
 15335. Virgatum.
 15756. Pleostachyum.
 15806. Orbiculatum.
 16800. Pubiflorum.
 16805. Lividum.
 16819. Rocanum.
 16822. Edmondi.
 16904. Saugetii.
 16906. Breve.
 16982. Clavuliferum.
 16983. Reptatum.
 16990. Serratum.
 17093. Minus.
 17096. Notatum.
 17207. Bakeri.
 17269. Dissectum.
 17565. Amphicarpum.
 17910. Wrightii.
 18115. Multicaule.
 18249. Reptatum.
 18980. Acutifolium.
 19046. Capillifolium.
 H 7. Distortum.
 H 42. Blodgettii.
 H 43. Laxum.
 H 61. Saugetii.
 H 66. Ciliatifolium.
 H 256. Millegrana.
 H 334. Saugetii.
 H 384. Secans.
 H 411. Plicatulum.
 H 449. Breve.
 H 690. Saugetii.
 H 734. Notatum.
 H 861. Millegrana.
 H 863. Notatum.
 H 1017. Caespitosum.
 H 1018. Saugetii.
 H 2045. Lindenianum.
 H 2172. Virgatum.

EKMAN, E. L.—Continued

H 2210. Saugetii.
 H 2274. Heterotrichon.
 H 2302. Stellatum.
 H 2376. Langei.
 H 2401. Heterotrichon.
 H 2435. Arundinaceum.
 H 2484. Stellatum.
 H 2555. Laxum.
 H 2601. Propinquum.
 H 2749. Distachyon.
 H 2756. Vaginatum.
 H 2927. Notatum.
 H 3379. Breve.
 H 3430. Densum.
 H 3483. Decumbens.
 H 3593. Laxum.
 H 3624. Laxum.
 H 3693. Decumbens.
 H 4132. Pleostachyum.
 H 4156. Laxum.
 H 4228. Saugetii.
 H 4501. Propinquum.
 H 4919. Rupestre.
 H 5401. Alterniflorum.
 H 5948. Langei.
 H 6248. Dispar.
 H 6428. Stellatum.
 H 6451. Secans.
 H 6452. Arundinaceum.
 H 7086. Distichum.
 H 7115. Plicatulum.
 H 7246. Stellatum.
 H 7247. Heterotrichon.
 H 7264. Fimbriatum.
 H 8040. Conjugatum.
 H 8043. Laxum.
 H 8129. Paniculatum.
 H 8350. Plicatulum.
 H 8351. Alterniflorum.
 H 8837. Laxum.
 H 9416. Densum.

ELMER, A. D. E.

16497. Conjugatum.
 18184. Conjugatum.

EMRICK, G. M.

48. Conjugatum.
 193. Conjugatum.

EYERDAM, W. J.

357. Breve.

FAIRCHILD, D., AND DORSETT, P. H.

688. *Conjugatum*.

FARIS, J. A.

4. *Caespitosum*.
 11. *Propinquum*.
 89. *Saugetii*.
 101. *Conjugatum*.
 105. *Laxum*.
 107. *Saugetii*.
 109. *Caespitosum*.
 258. *Distichum*.
 267. *Millegrana*.
 329. *Dilatatum*.
 388. *Distichum*.
 407. *Virgatum*.
 414. *Paniculatum*.

FARWELL, O. A.

1435. *Pubescens*.
 1781. *Pubescens*.

FASSETT, N. C.

5164. *Stramineum*.
 5165. *Stramineum*.

FASSETT, N. C., AND HOTCHKISS, N.

2894. *Stramineum*.
 2895. *Stramineum*.
 2905. *Stramineum*.

FAURIE, U.

4474. *Vaginatium*.

FENDLER, A.

1694. *Trachycoleon*.
 1697. *Trachycoleon*.
 1698. *Heterotrichon*.
 1699. *Humboldtianum*.
 1713. *Fimbriatum*.
 1714. *Paniculatum*.
 1725. *Conjugatum*.
 1737. *Plicatulum*.
 1738. *Microstachyum*.
 2533. *Stellatum*.
 2535. *Decumbens*.
 2536. *Orbiculatum*.

FERNALD, M. L., HUNNEWELL, F. W.,
AND LONG, B.

8499. *Pubescens*.
 8505. *Pubescens*.

FERNALD, M. L., AND LONG, B.

8498. *Psammophilum*.
 17891. *Pubescens*.

FERNALD, M. L., LONG, B., AND
TORREY G. S.8502. *Pubescens*.

FERNÁNDEZ, C.

24382 (BS). *Conjugatum*.

FERNANDO, H.

36. *Alterniflorum*.
 430. *Paniculatum*.

FERRIS, R. S.

5464. *Longicuspe*.

FIEBRIG, K.

664. *Stellatum*.
 876. *Plicatulum*.
 4652. *Conjugatum*.
 4696. *Conjugatum*.
 4996. *Lineare*.
 5180. *Malacophyllum*.
 5190. *Plicatulum*.

FINCK, HUGO

7. *Virgatum*.
 17½. *Paniculatum*.

FINLAY, K.

39. *Decumbens*.

FIRMIN, BROTHER G.

255. *Humboldtianum*.
 562. *Humboldtianum*.

FISCHER, WALTER

257. *Distichum*.

FISHER, G. L.

34. *Stramineum*.
 54. *Virgatum*.
 63. *Virgatum*.
 65. *Plicatulum*.
 79. *Lividum*.
 84. *Plicatulum*.
 87. *Dilatatum*.
 110. *Floridanum*.
 116. *Langei*.
 200. *Repens*.

FISHER, G. L.—Continued

251. *Monostachyum*.
 257. *Floridanum*
 260. *Langei*.
 2012. *Langei*.
 2089. *Repens*.
 5067. *Urvillei*.

FISHLOCK, W. C.

108. *Laxum*.
 436. *Distichum*.

FORBES, C. N.

325. *Dilatatum*.
 737. *Dilatatum*.

FRANCIS, M. E.

3. *Giganteum*.
 4. *Monostachyum*.
 5. *Conjugatum*.

FREDHOLM, A.

135. *Ciliatifolium*.
 155. *Floridanum glabratum*.
 3284. *Fimbriatum*.
 3299. *Virgatum*.
 3306. *Conjugatum*.
 5232. *Praecox*.
 5232a. *Lentiferum*.
 5743. *Longepedunculatum*.
 5915. *Debile*.
 5950. *Lentiferum*.
 6056. *Lentiferum*.
 6150. *Lentiferum*.
 6356. *Conjugatum*.
 6363. *Dilatatum*.
 6366. *Supinum*.
 6380. *Distichum*.
 6383. *Ciliatifolium*.
 6387. *Pubescens*.
 6399. *Laeve*.
 6470. *Vaginatum*.
 6473. *Conjugatum*.

FREEMAN, W. G.

5022. *Fimbriatum*.
 5026. *Laxum*.

FRIEDRICHSTHAL, E.

183. *Laxum*.

FRIES, R. E.

1064. *Distichum*.

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FUENTES, M.

1846. *Plicatulum*.

FUNCK, N., AND SCHLIM, L. J.

823. *Plicatulum*.

GARBER, A. P.

224. *Monostachyum*.

GARCÍA, P. I.

644. *Convexum*.
 786. *Convexum*.

GARDNER, G.

208. *Conjugatum*.
 1187. *Vaginatum*.
 2347. *Malacophyllum*.
 3496. *Pilosum*.
 3501. *Paniculatum*.
 3504. *Virgatum*.
 3507. *Gardnerianum*.
 3542. *Sanguineolentum*.
 4030. *Stellatum*.
 4031. *Malacophyllum*.
 4032. *Microstachyum*.
 4043. *Malacophyllum*.
 4047. *Gardnerianum*.
 4390. *Trachycoleon*.

GATTINGER, A.

3570. *Circulare*.

GAUMER, G. F.

852. *Yucatanum*.
 2464. *Yucatanum*.

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197. *Laxum*.
 267. *Laxum*.
 479. *Distichum*.
 546. *Vaginatum*.

GERDES, E.

64. *Paniculatum*.

GERVAIS, BROTHER

163. *Plicatulum*.

GLASGOW, C. A.

3. *Conjugatum*.
 9. *Distichum*.

GLAZIOU, A.

470. Urvillei.
 476. Millegrana.
 477. Urvillei.
 4307. Pumilum.
 4315. Conjugatum pubescens.
 4316. Conjugatum pubescens.
 4345. Millegrana.
 6957. Conjugatum.
 9055. Conjugatum.
 13328. Coryphaeum.
 15633. Lineare.
 17353. Paniculatum.
 17366. Conjugatum
 17375. Lineare.
 17414. Stellatum.
 17909. Pilosum.
 18684. Coryphaeum.
 20085. Stellatum.
 20122. Vaginatium.
 20561a. Urvillei.
 22426. Pectinatum.
 22427. Pectinatum.
 22429. Pectinatum.
 22466a. Gardnerianum.
 22474. Lineare.
 22476. Lineare.
 22489. Sanguineolentum.
 22493. Lineare.
 22545. Stellatum.
 22548. Stellatum.
 22550. Stellatum.
 22553 part. Stellatum.
 22576. Heterotrichon.
 22577. Trachycoleon.
 22579. Pilosum.
 22586. Gardnerianum.
 22590. Plicatulum.
 22595. Gardnerianum.
 22597. Pictum.
 22600. Gardnerianum.
 22601. Gardnerianum.
 22602. Gardnerianum.
 22605a. Coryphaeum.
 22607. Virgatum.

GLEASON, H. A.

24. Melanospermum.
 34. Virgatum.
 635. Melanospermum.
 649. Virgatum.
 2198. Repens.
 3673. Conjugatum.
 3868. Decumbens.

GOELDI, ANDRÉ

1. Densum.
 10. Millegrana.
 13. Multicaule.
 14. Millegrana.
 21. Paniculatum.
 28. Melanospermum.
 29. Decumbens.
 33. Conjugatum.
 40. Nutans.
 48. Acutum.
 73. Conjugatum.
 85. Orbiculatum.
 86. Densum.
 95. Parviflorum.
 114. Fasciculatum.
 115. Fasciculatum.
 120. Repens.
 129. Acutum.
 131. Dilatatum.
 161. Plicatulum.
 181. Pulchellum.
 183. Multicaule.
 184. Virgatum.
 191. Virgatum.
 194. Pulchellum.
 195. Pulchellum.
 199. Virgatum.
 201. Coryphaeum.
 204. Dilatatum.
 206. Plicatulum.
 207. Orbiculatum.
 211. Millegrana.
 212. Densum.
 213. Millegrana.
 249. Conjugatum.
 259. Urvillei.
 264. Densum.
 288. Melanospermum.
 290. Boscianum.
 293. Melanospermum.
 304. Multicaule.
 310. Paniculatum.

GOLL, P. P.

78. Microstachyum.
 79. Paniculatum.
 80. Botterii.
 81. Plicatulum.
 235. Plicatulum.
 923. Millegrana.

GOSSWEILER, JOHN

9068. Conjugatum.

GOUIN, DOCTOR

27. Propinquum.

GOULARD

14. Vaginatium.

GRANT, G. B.

1196. Distichum.

GRAVES, C. B.

240. Psammophilum.

241. Pubescens.

245. Pubescens.

246. Pubescens.

255. Psammophilum.

GREENMAN, J. M.

4297. Circulare.

4387. Distichum.

GRIFFITHS, DAVID

1610. Distichum.

4719. Distichum.

5649. Stramineum.

5684. Stramineum.

5734. Stramineum.

6015. Distichum.

6383. Debile.

6431. Debile.

6447. Debile.

6467. Distichum.

6805. Stramineum.

GRIMES, E. J.

869. Pubescens.

907. Pubescens.

3022. Pubescens.

3218. Floridanum.

3715. Dilatatum.

4148. Laeve.

4167. Floridanum.

4336. Dilatatum.

4480. Pubescens.

GRISOL

24. Repens.

GUNTHER, E.

7. Dilatatum.

33. Candidum.

HAHN, L.

1060. Virgatum.

HALE, JOSIAH

25. Pubiflorum glabrum.

HALL, ELIHU

801. Plicatulum.

802. Stramineum.

803. Langei.

804. Pubiflorum.

805. Praecox.

806. Lentiferum.

807. Lividum.

808. Distichum.

809. Laeve.

810. Circulare.

811. Floridanum glabratum.

HANSON, H. C.

499. Langei.

HARGER, E. B.

5741. Pubescens.

HARMAND

859. Conjugatum.

HARPER, R. M.

114. Longipilum.

116. Repens.

351. Boscianum.

367. Boscianum.

368. Dilatatum.

383. Distichum.

477. Floridanum.

623. Floridanum glabratum.

632. Bifidum.

672. Lentiferum.

900. Lentiferum.

1249. Bifidum.

1335. Lentiferum.

1486. Lentiferum.

1629. Lentiferum.

1904. Laeve.

HARRIS, WILLIAM

9497. Notatum.

9674. Saugetii.

11149. Densum.

11267. Fimbriatum.

11278. Paniculatum.

11284. Plicatulum.

11287. Paniculatum.

11289. Plicatulum.

11308. Conjugatum.

HARRIS, WILLIAM—Continued

11353. Plicatulum.
 11379. Paniculatum.
 11408. Caespitosum.
 11448. Conjugatum.
 11522. Decumbens.
 11534. Paniculatum.
 11544. Notatum.
 11545. Decumbens.
 11561. Paniculatum.
 11570. Notatum.
 11606. Decumbens.
 11615. Plicatulum.
 11616. Paniculatum.
 11640. Conjugatum.
 11641. Repens.
 11645. Distichum.
 11695. Distachyon.
 11812. Repens.
 11847. Fimbriatum.
 11850. Distichum.
 12214. Densum.
 12255. Decumbens.
 12282. Conjugatum.
 12317. Caespitosum.
 12443. Notatum.
 12469a. Arundinaceum.
 12528. Distichum.
 12534. Millegrana.
 12544. Arundinaceum.
 12546. Blodgettii.
 12548. Distachyon.
 12551. Lindenianum.
 12557. Repens.
 12559. Lindenianum.
 12560. Blodgettii.
 12564. Distortum.
 12568. Distichum.
 12569. Distortum.
 12582. Serratum.
 12598. Serratum.
 12602. Virgatum.
 12608. Plicatulum.
 12610. Paniculatum.
 12611. Conjugatum.
 12620. Blodgettii.
 12620a. Saugetii.
 12657. Millegrana.
 12658. Millegrana.
 12660. Millegrana.
 12660a. Virgatum.
 12661. Vaginatum.
 12681. Plicatulum.

HARRIS, WILLIAM—Continued

12695. Plicatulum.
 12699. Caespitosum.
 12701. Plicatulum.
 12703. Blodgettii.
 12708. Dilatatum.
 12716. Distachyon.
 12717. Reptatum.
 12719. Serratum.
 12726. Caespitosum.
 12730. Millegrana.
 12748. Caespitosum.
 12758. Caespitosum.
 12897. Virgatum.
 22584. Fimbriatum.

HART, J.

65. Paniculatum.
 81. Conjugatum pubescens.
 88. Paniculatum.
 92. Orbiculatum.
 180. Decumbens.
 567. Fimbriatum.
 677. Paniculatum.
 679. Plicatulum.
 687. Fimbriatum.
 729. Virgatum.
 745. Paniculatum.
 755. Conjugatum.
 860. Vaginatum.
 865. Distichum.
 2155. Densum.
 4194. Repens.

HARTEMAN, BROTHER

16. Lividum.
 65. Humboldtianum.

HARTMAN, C. V.

659. Distichum.

HARVEY, F. L.

17. Floridanum.
 18. Floridanum.

HASSLER, E.⁶⁷

8079. Plicatulum.
 9902. Urvillei.
 10015. Conjugatum.
 10090. Gardnerianum.
 10134. Paniculatum.
 10738. Paniculatum.

⁶⁷ Some of the Hassler collections were made by T. Rojas.

HASSLER, E.—Continued

10775. Lineare.
 10784. Acuminatum.
 11058. Stellatum.
 11639. Lineare.
 11649. Paniculatum.
 11904. Gardnerianum.
 11916. Urvillei.
 11930. Acuminatum.
 12088. Conjugatum.
 12452. Distichum.
 12471. Acuminatum.
 12546. Minus.
 13033. Minus.

HASTINGS, G. T.

316. Distichum.

HAUGHT, O.

108. Racemosum.

HAYES, SUTTON

219. Saccharoides.

HEILBORN, O.

39. Candidum.

HELLER, A. A.

10. Laxum.
 164. Laxum.
 524. Molle.
 625. Virgatum.
 664. Orbiculatum.
 701. Circulare.
 764. Pubescens.
 1373. Virgatum.
 1546. Ciliatifolium.
 1699. Pubiflorum.
 1872. Pubiflorum.
 1975. Conjugatum.
 4193. Circulare.
 4194. Floridanum.
 4234. Circulare.
 4244. Pubescens.
 4368. Millegrana.
 4397. Conjugatum.
 4399. Paniculatum.
 6219. Fimbriatum.
 6227. Paniculatum.
 6354. Decumbens.
 14028. Setaceum.
 14117. Floridanum.

HENDERSON, M. R.

17944. Conjugatum.

HENRY, A.

1036. Vaginatum.

HENSCHEN, S. E.

- III. 1343xxx. Plicatum.
 III. 1345x. Trachycoleon.

HERIBERTO, BROTHER

192. Microstachyum.

HERTER, W.

327. Notatum.
 334. Dilatum.
 336. Vaginatum.

HERTER, W., HERB. OSTEN.

18621. Distichum.
 18622a part. Plicatum.
 18623. Notatum.
 18784. Dilatum.
 18814. Notatum.
 18815. Notatum.
 18826. Distichum.

HERZOG, T.

1345. Plicatum.
 1756. Malacophyllum.
 1836. Malacophyllum.

HESS, W. E.

425. Laxum.
 434. Laxum.
 435. Caespitosum.
 436. Caespitosum.
 439. Vaginatum.

HEYDE, E. T.

734. Notatum.

HEYDE, E. T. AND LUX, E. (DIST. SMITH).

3558. Paniculatum.
 3898. Virgatum.
 3902. Conjugatum.
 3903. Scabrum.
 3910. Notatum.
 4101. Plicatum.
 4298. Cymbiforme.
 4300. Candidum.
 6271. Humboldtianum.
 6402. Virgatum.
 6403. Plicatum.

HILL, E. J.

201. Stramineum.

HILLEBRAND, W.

492. Conjugatum.

HIORAM, BROTHER

12. Distachyon.

111. Laxum.

320. Plicatulum.

347. Notatum.

358. Fimbriatum.

367. Boscianum.

804. Laxum.

807. Notatum.

2633. Saugetii.

2717. Laxum.

HIORAM AND BAPTISTE, BROTHERS

1289. Distachyon.

HITCHCOCK, A. S.

18. Distichum.

29. Floridanum.

206. Longepedunculatum.

206½. Ciliatifolium.

224. Praecox.

297. Dilatatum.

298. Pubescens.

299. Pubescens.

300. Setaceum.

312. Supinum.

400. Distichum.

454. Notatum.

455. Minus.

456. Plicatulum.

457. Plicatulum.

458. Saugetii.

459. Saugetii.

461. Saugetii.

462. Nanum.

463. Lindenianum.

464. Caespitosum.

465. Caespitosum.

466. Caespitosum.

467. Caespitosum.

468. Virgatum.

469. Pulchellum.

470. Blodgettii.

471. Debile.

472. Multicaule.

473. Conjugatum.

HITCHCOCK, A. S.—Continued

474. Conjugatum.

475. Bakeri.

477. Arundinaceum.

478. Arundinaceum.

499. Giganteum.

500. Lentiferum.

501. Laeve.

505. Vaginatulum.

506. Distichum.

507. Ciliatifolium.

508. Longepedunculatum.

509. Debile.

607. Blodgettii.

607½. Caespitosum.

626. Blodgettii.

628. Ciliatifolium.

631. Ciliatifolium.

637. Caespitosum.

643. Rigidifolium.

684. Rigidifolium.

688. Longepedunculatum.

689. Blodgettii.

742. Ciliatifolium.

753. Debile.

753½. Longepedunculatum.

816. Ciliatifolium.

832. Ciliatifolium.

854. Debile.

857. Propinquum.

862. Longepedunculatum.

872. Circulare.

873. Floridanum glabratum.

948. Conjugatum.

1188. Longipilum.

1196. Plicatulum.

2340. Pubescens.

2341. Pubescens.

2342. Pubescens.

2343. Pubescens.

2381. Stramineum.

2417. Pubescens.

2419. Hartwegianum.

2420. Longepedunculatum.

2421. Longepedunculatum.

2422. Longepedunculatum.

2423. Longepedunculatum.

2424. Setaceum.

2425. Setaceum.

2426. Setaceum.

2427. Setaceum.

2428. Setaceum.

HITCHCOCK, A. S.—Continued

2429. Debile.
 2430. Debile.
 2431. Distichum.
 2432. Distichum.
 2433. Supinum.
 2434. Supinum.
 2435. Supinum.
 2436. Supinum.
 2437. Stramineum.
 2438. Stramineum.
 2439. Pubescens.
 2444. Pubescens.
 2445. Pubescens.
 2446. Pubescens.
 2447. Rigidifolium.
 2448. Ciliatifolium.
 2449. Ciliatifolium.
 2450. Ciliatifolium.
 2451. Ciliatifolium.
 2452. Ciliatifolium.
 2453. Ciliatifolium.
 2454. Ciliatifolium.
 2455. Ciliatifolium.
 2456. Ciliatifolium.
 2457. Ciliatifolium.
 2458. Propinquum.
 2459. Monostachyum.
 2460. Monostachyum.
 2461. Langei.
 2462. Blodgettii.
 2463. Caespitosum.
 2464. Caespitosum.
 2465. Vaginatum.
 2466. Vaginatum.
 2467. Vaginatum.
 2467. Fl. Pl.⁸⁸ Distichum.
 2468. Pubiflorum.
 2468. Fl. Pl. Distichum.
 2469. Pubiflorum.
 2469. Fl. Pl. Distichum.
 2470. Supinum.
 2471. Ciliatifolium.
 2473. Ciliatifolium.
 2474. Ciliatifolium.
 2475. Ciliatifolium.
 2476. Ciliatifolium.
 2477. Ciliatifolium.
 2479. Ciliatifolium.
 2481. Supinum.
 2482. Supinum.
 2483. Supinum.
 2484. Supinum.
 2485. Supinum.

HITCHCOCK, A. S.—Continued

2486. Setaceum.
 2488. Setaceum.
 2489. Rigidifolium.
 2491. Setaceum.
 2492. Longepedunculatum.
 2493. Longepedunculatum.
 2495. Boscianum.
 2496. Plicatulum.
 2497. Plicatulum.
 2498. Lentiferum.
 2499. Laeve.
 2500. Praecox.
 2501. Plicatulum.
 2502. Blodgettii.
 2503. Caespitosum.
 2504. Longipilum.
 2505. Lentiferum.
 2506. Laeve.
 2507. Longipilum.
 2508. Floridanum.
 2534. Stramineum.
 3211. Distichum.
 3474. Dilatatum.
 3518. Distichum.
 3575. Distichum.
 3600. Pubiflorum
 3601. Lentiginosum
 3615. Paucispicatum
 3616. Distichum.
 3621. Lentiginosum.
 3622. Hartwegianum.
 3623. Pubiflorum.
 3676. Distichum.
 3677. Distichum.
 3687. Distichum.
 3821. Distichum.
 3867. Lividum.
 3868. Dilatatum.
 3869. Dilatatum.
 3870. Dilatatum.
 3871. Dilatatum.
 3872. Urvillei.
 3873. Urvillei.
 3874. Urvillei.
 3875. Urvillei.
 3876. Laeve.
 3877. Laeve.
 3878. Laeve.
 3879. Laeve.
 3880. Laeve.
 3881. Laeve.
 3882. Longipilum.
 3883. Longipilum.

⁸⁸Early series of Florida plants numbered separately.

HITCHCOCK, A. S.—Continued

3884. Longipilum.
 3885. Longipilum.
 3886. Longipilum.
 3887. Longipilum.
 3888. Longipilum.
 3889. Longipilum.
 3890. Circulare.
 3891. Circulare.
 3892. Lentiferum.
 3893. Lentiferum.
 3894. Lentiferum.
 3895. Difforme.
 3896. Difforme.
 3897. Floridanum.
 3898. Floridanum.
 3899. Floridanum glabratum.
 3900. Repens.
 3901. Distichum.
 3902. Distichum.
 3903. Distichum.
 3904. Pubiflorum.
 5142. Distichum.
 5146. Pubiflorum.
 5192. Urvillei.
 5198. Pubiflorum.
 5251. Langei.
 5254. Pubiflorum.
 5260. Pubiflorum.
 5296. Pubiflorum.
 5301. Distichum.
 5326. Plicatulum.
 5327. Urvillei.
 5362. Distichum.
 5378. Hartwegianum.
 5407. Lividum.
 5408. Conjugatum.
 5414. Virgatum.
 5434. Monostachyum.
 5442. Debile.
 5464. Distichum.
 5480. Distichum.
 5488. Stramineum.
 5522. Paucispicatum.
 5549. Pubiflorum.
 5552. Paucispicatum.
 5555. Pubiflorum.
 5561. Unispicatum.
 5562. Langei.
 5563. Pubiflorum.
 5564. Hartwegianum.
 5565. Lividum.
 5572. Pubiflorum.

HITCHCOCK, A. S.—Continued

5573. Langei.
 5575. Paucispicatum.
 5587. Distichum.
 5588. Distichum.
 5590. Pubiflorum.
 5602. Distichum.
 5608. Pubiflorum.
 5683. Distichum.
 5723. Humboldtianum.
 5727. Notatum.
 5730½. Mutabile.
 5735. Pubiflorum.
 5736. Mutabile.
 5740. Lividum.
 5743. Distichum.
 5743½. Alcalinum.
 5748. Distichum.
 5748½. Hartwegianum.
 5760. Botterii.
 5764. Plicatulum.
 5765. Notatum.
 5773. Mutabile.
 5773½. Plicatulum.
 5776. Humboldtianum.
 5778. Notatum.
 5785. Vaginatum.
 5793. Setaceum.
 5811. Pubiflorum.
 5815. Distichum.
 5817. Lividum.
 5837. Distichum.
 5869. Lividum.
 5884. Distichum.
 5955. Tenellum.
 6044. Distichum.
 6059. Pubiflorum.
 6066. Distichum.
 6098. Unispicatum.
 6099. Unispicatum.
 6109. Notatum.
 6130. Hartwegianum.
 6133. Humboldtianum.
 6152. Lividum.
 6153. Botterii.
 6168. Paucispicatum.
 6173. Distichum.
 6177. Hartwegianum.
 6182. Botterii.
 6185. Botterii.
 6188. Virgatum.
 6189. Hartwegianum.
 6190. Hartwegianum.

HITCHCOCK, A. S.—Continued

6208. Lividum.
 6209. Botterii.
 6222. Conjugatum.
 6225. Distichum.
 6245. Notatum.
 6287. Squamulatum.
 6291. Distichum.
 6312. Distichum.
 6313. Lividum.
 6314. Distichum.
 6318. Conjugatum pubescens.
 6322. Notatum.
 6323. Variabile.
 6328. Botterii.
 6346. Paniculatum.
 6347. Botterii.
 6355. Humboldtianum.
 6358. Plicatum.
 6371. Plicatum.
 6374. Paniculatum.
 6377. Botterii.
 6397. Paniculatum.
 6400. Distichum.
 6407. Conjugatum.
 6409. Plicatum.
 6411. Variabile.
 6413. Virgatum.
 6414. Plicatum.
 6416. Botterii.
 6417. Langei.
 6428. Fasciculatum.
 6430. Notatum.
 6434. Virgatum.
 6439. Variabile.
 6451. Lividum.
 6549. Propinquum.
 6561. Distichum.
 6565. Notatum.
 6568. Vaginatum.
 6577. Notatum.
 6590. Minus.
 6591. Notatum.
 6603. Botterii.
 6608. Variabile.
 6609. Conjugatum.
 6613. Affine.
 6614. Plicatum.
 6617. Affine.
 6620. Lividum.
 6638. Squamulatum.
 6643. Plenum.
 6644. Variabile.

HITCHCOCK, A. S.—Continued

6644½. Langei.
 6645. Variabile.
 6647. Distichum.
 6652. Distichum.
 6654. Squamulatum.
 6657. Convexum.
 6668. Convexum.
 6679. Humboldtianum.
 6684. Plenum.
 6686. Pubiflorum.
 6692. Convexum.
 6768. Distichum.
 6818. Conjugatum.
 6823. Lividum.
 6826. Botterii.
 6830. Convexum.
 6833. Variabile.
 6837. Humboldtianum.
 6838. Notatum.
 6844. Distichum.
 6854. Plicatum.
 6863. Convexum.
 6868. Convexum.
 6874. Lentiginosum.
 6879. Hartwegianum.
 6880. Lividum.
 6881. Lividum.
 6882. Tinctum.
 6882½. Plicatum.
 6883. Tenellum.
 6910. Distichum.
 6922. Tenellum.
 6933. Lividum.
 6938. Hartwegianum.
 6944. Distichum.
 6948. Pubiflorum.
 6950. Pubiflorum.
 6955. Tenellum.
 6957. Convexum.
 6958. Convexum.
 6961. Squamulatum.
 6962. Notatum.
 6978. Squamulatum.
 6980. Humboldtianum.
 6984. Notatum.
 6992. Lividum.
 6993. Convexum.
 6994. Convexum.
 6996. Notatum.
 6999. Convexum.
 7005. Convexum.
 7030. Conjugatum.

HITCHCOCK, A. S.—Continued

7036. *Paniculatum*.
 7055. *Humboldtianum*.
 7057. *Plicatum*.
 7059. *Plicatum*.
 7064. *Convexum*.
 7065. *Clavuliferum*.
 7074. *Botterii*.
 7078. *Erectum*.
 7093. *Crassum*.
 7098. *Lentiginosum*.
 7120. *Convexum*.
 7121. *Tenellum*.
 7127. *Distichum*.
 7133. *Tenellum*.
 7134. *Convexum*.
 7141. *Notatum*.
 7147. *Lividum*.
 7153. *Jaliscanum*.
 7176. *Humboldtianum*.
 7181. *Arsenei*.
 7182. *Arsenei*.
 7183. *Notatum*.
 7190. *Convexum*.
 7196. *Pubiflorum*.
 7197. *Lividum*.
 7208. *Tenellum*.
 7220. *Pubiflorum*.
 7221. *Convexum*.
 7222. *Convexum*.
 7223. *Convexum*.
 7229. *Conspersum*.
 7230. *Pubiflorum*.
 7240. *Jaliscanum*.
 7246. *Squamulatum*.
 7281. *Notatum*.
 7284. *Convexum*.
 7290. *Convexum*.
 7297. *Humboldtianum*.
 7311. *Distichum*.
 7316. *Paniculatum*.
 7318. *Lividum*.
 7363. *Virgatum*.
 7378. *Distichum*.
 7382. *Crinitum*.
 7386. *Longiuspe*.
 7388. *Lividum*.
 7400. *Hartwegianum*.
 7404. *Tinctum*.
 7409. *Lividum*.
 7414. *Pubiflorum*.
 7415. *Distichum*.
 7481. *Distichum*.

HITCHCOCK, A. S.—Continued

7487. *Distichum*.
 7528. *Distichum*.
 7561. *Distichum*.
 7568. *Distichum*.
 7578. *Pubiflorum*.
 7592. *Convexum*.
 7735. *Paucispicatum*.
 7858. *Pubescens*.
 7863. *Longipilum*.
 7899. *Fasciculatum*.
 7902. *Plicatum*.
 7903. *Virgatum*.
 7904. *Saccharoides*.
 7907. *Paniculatum*.
 7909. *Conjugatum*.
 7939. *Decumbens*.
 7960. *Decumbens*.
 7962. *Decumbens*.
 7966. *Orbiculatum*.
 7969. *Plicatum*.
 7973. *Minus*.
 7978. *Minus*.
 7981. *Plicatum*.
 7985. *Centrale*.
 7988. *Pilosum*.
 7990. *Decumbens*.
 7991. *Plicatum*.
 7995. *Plicatum*.
 7996. *Vaginatum*.
 7998. *Notatum*.
 8004. *Centrale*.
 8005. *Centrale*.
 8008. *Centrale*.
 8009. *Notatum*.
 8010. *Plicatum*.
 8011. *Microstachyum*.
 8017. *Subciliatum*.
 8020. *Densum*.
 8024. *Plicatum*.
 8025. *Microstachyum*.
 8031. *Repens*.
 8034. *Vaginatum*.
 8042. *Vaginatum*.
 8045. *Saccharoides*.
 8047. *Nutans*.
 8055. *Paniculatum*.
 8059. *Centrale*.
 8069. *Microstachyum*.
 8071. *Paniculatum*.
 8082. *Virgatum*.
 8088. *Decumbens*.
 8096. *Pectinatum*.

HITCHCOCK, A. S.—Continued

8099. Propinquum.
 8114. Fasciculatum.
 8115. Decumbens.
 8123. Minus.
 8124. Plicatum.
 8130. Pilosum.
 8136. Notatum.
 8138. Plicatum.
 8141. Decumbens.
 8151. Microstachyum.
 8165. Propinquum.
 8169. Gardnerianum.
 8177. Plicatum.
 8186. Humboldtianum.
 8190. Plicatum.
 8192. Pilosum.
 8193. Conjugatum.
 8230. Nutans.
 8234. Minus.
 8235. Heterotrichon.
 8272. Paniculatum.
 8292. Plicatum.
 8293. Plicatum.
 8297. Heterotrichon.
 8298. Pilosum.
 8332. Convexum.
 8339. Subciliatum.
 8339½. Plicatum.
 8345. Centrale.
 8348. Microstachyum.
 8349. Paniculatum.
 8359. Boscianum.
 8361. Decumbens.
 8365. Pilosum.
 8367. Notatum.
 8369. Convexum.
 8389. Orbiculatum.
 8403. Vaginatum.
 8416. Paniculatum.
 8418. Vaginatum.
 8424. Fasciculatum.
 8425. Plicatum.
 8431. Decumbens.
 8432. Orbiculatum.
 8438. Saccharoides.
 8454. Notatum.
 8462. Pilosum.
 8464. Fasciculatum.
 8466. Plicatum.
 8467. Virgatum.
 8468. Paniculatum.
 8472. Nutans.

HITCHCOCK, A. S.—Continued

8474. Convexum.
 8477. Candidum.
 8489. Costaricense.
 8495. Distichum.
 8497. Minus.
 8510. Plicatum.
 8522½. Convexum.
 8523. Microstachyum.
 8524. Convexum.
 8524½. Centrale.
 8532. Centrale.
 8543. Centrale.
 8544. Centrale.
 8554. Microstachyum.
 8559. Paniculatum.
 8569. Centrale.
 8576. Fasciculatum.
 8579. Virgatum.
 8582. Repens.
 8583. Minus.
 8587. Propinquum.
 8594. Paniculatum.
 8602. Microstachyum.
 8603. Vaginatum.
 8606. Langei.
 8613. Paniculatum.
 8615. Notatum.
 8630. Langei.
 8639. Virgatum.
 8642. Plicatum.
 8650. Microstachyum.
 8658. Notatum.
 8659. Convexum.
 8681. Langei.
 8684. Propinquum.
 8686. Langei.
 8691. Plicatum.
 8696. Plicatum.
 8697. Humboldtianum.
 8703. Convexum.
 8714. Microstachyum.
 8724. Langei.
 8744. Langei.
 8754. Centrale.
 8761. Propinquum.
 8780. Vaginatum.
 8788. Centrale.
 8789. Centrale.
 8854. Propinquum.
 8895. Humboldtianum.
 8918. Repens.
 8931. Convexum.

HITCHCOCK, A. S.—Continued

8934. Tenellum.
 8935. Tenellum.
 8936. Nutans.
 8937. Candidum.
 8946. Trachycoleon.
 8953. Convexum.
 8956. Langei.
 8957. Costaricense.
 8958. Tenellum.
 8959. Costaricense.
 8960. Propinquum.
 8966. Fasciculatum.
 8980. Microstachyum.
 8992. Centrale.
 9000. Virgatum.
 9006. Conjugatum.
 9015. Plicatum.
 9017. Convexum.
 9020. Notatum.
 9033. Humboldtianum.
 9033½. Cymbiforme.
 9055. Squamulatum.
 9078. Botterii.
 9079. Adoperiens.
 9093. Tenellum.
 9094. Lentiginosum.
 9095. Convexum.
 9099. Tenellum.
 9144. Candidum.
 9148. Urvillei.
 9150. Fasciculatum.
 9154. Affine.
 9157. Decumbens.
 9161. Minus.
 9179. Repens.
 9188. Multicaule.
 9197½. Multicaule.
 9213. Floridanum glabratum.
 9214. Floridanum glabratum.
 9215. Giganteum.
 9216. Plicatum.
 9217. Giganteum.
 9218. Plicatum.
 9219. Plicatum.
 9220. Plicatum.
 9222. Boscianum.
 9223. Boscianum.
 9224. Boscianum.
 9225. Boscianum.
 9226. Boscianum.
 9227. Boscianum.
 9228. Bifidum.

HITCHCOCK, A. S.—Continued

9235. Bifidum.
 9260. Conjugatum.
 9275. Saugetii.
 9287. Distichum.
 9290½. Plicatum.
 9294. Lindenianum.
 9319. Plicatum.
 9334. Paniculatum.
 9347. Virgatum.
 9359. Paniculatum.
 9389. Distichum.
 9392. Plicatum.
 9394. Distichum.
 9395. Notatum.
 9400. Virgatum.
 9405. Virgatum.
 9416. Paniculatum.
 9417. Blodgettii.
 9422. Fimbriatum.
 9433. Conjugatum.
 9438. Lindenianum.
 9438½. Distortum.
 9439. Fimbriatum.
 9442. Saugetii.
 9443. Plicatum.
 9445. Virgatum.
 9454. Distichum.
 9457. Arundinaceum.
 9464. Blodgettii.
 9465. Saugetii.
 9470. Blodgettii.
 9471. Notatum.
 9476. Blodgettii.
 9480. Blodgettii.
 9482. Saugetii.
 9483. Fimbriatum.
 9494. Paniculatum.
 9495. Notatum.
 9516. Saugetii.
 9518. Distortum.
 9520. Propinquum.
 9524. Plicatum.
 9529. Virgatum.
 9533. Saugetii.
 9536. Arundinaceum.
 9540. Notatum.
 9540½. Minus.
 9544. Distortum.
 9549. Plicatum.
 9555. Virgatum.
 9557. Millegrana.
 9562. Decumbens.

HITCHCOCK, A. S.—Continued

9582. Repens.
 9593. Distichum.
 9598. Propinquum.
 9599. Saugetii.
 9599½. Blodgettii.
 9601. Plicatulum.
 9602. Paniculatum.
 9603. Virgatum.
 9624. Blodgettii.
 9625. Fimbriatum.
 9629. Conjugatum.
 9641. Vaginatum.
 9642. Distachyon.
 9644. Arundinaceum.
 9649. Secans.
 9654. Propinquum.
 9655. Virgatum.
 9657. Densum.
 9663. Lindenianum.
 9667. Vaginatum.
 9668. Blodgettii.
 9670. Secans.
 9674. Laxum.
 9678. Distachyon.
 9688. Conjugatum.
 9691. Fimbriatum.
 9696. Notatum.
 9711. Notatum.
 9765. Saugetii.
 9766. Blodgettii.
 9773. Fimbriatum.
 9775. Vaginatum.
 9776. Millegrana.
 9784. Notatum.
 9788. Plicatulum.
 9789. Distortum.
 9790. Paniculatum.
 9791. Virgatum.
 9792. Fimbriatum.
 9795. Serratum.
 9797. Conjugatum.
 9816. Blodgettii.
 9821. Notatum.
 9832. Saugetii.
 9833. Blodgettii.
 9840. Fimbriatum.
 9843. Plicatulum.
 9864. Distachyon.
 9866. Vaginatum.
 9869. Millegrana.
 9873. Lindenianum.
 9874. Blodgettii.

HITCHCOCK, A. S.—Continued

9885. Filiforme.
 9914. Hitchcockii.
 9924. Vaginatum.
 9930. Plicatulum.
 9952. Conjugatum.
 9957. Nutans.
 9957½. Decumbens.
 9960. Paniculatum.
 9982. Nutans.
 9983. Plicatulum.
 9987. Pilosum.
 9993. Paniculatum.
 9997. Virgatum.
 10011. Fimbriatum.
 10015. Nutans.
 10025. Densum.
 10029. Fasciculatum.
 10030. Virgatum.
 10036. Paniculatum.
 10040. Nutans.
 10050. Vaginatum.
 10066. Pulchellum.
 10073. Virgatum.
 10075. Pilosum.
 10086. Distichum.
 10088. Pilosum.
 10090. Plicatulum.
 10092. Coryphaeum.
 10107. Coryphaeum.
 10108. Vaginatum.
 10112. Plicatulum.
 10115. Densum.
 10118. Virgatum.
 10134. Saccharoides.
 10135. Decumbens.
 10139. Vaginatum.
 10145. Millegrana.
 10156. Millegrana.
 10175. Decumbens.
 10183. Coryphaeum.
 10184. Coryphaeum.
 10186. Coryphaeum.
 10189. Pilosum.
 10190. Plicatulum.
 10192. Coryphaeum.
 10200. Nutans.
 10201. Virgatum.
 10213. Plicatulum.
 10228. Conjugatum.
 10249. Paniculatum.
 10278. Saccharoides.
 10281. Fasciculatum

HITCHCOCK, A. S.—Continued

10283. Distichum.
 10285. Millegrana.
 10287. Vaginatum.
 10299. Nutans.
 10301. Nutans.
 10308. Decumbens.
 10337. Serpentinum.
 10338. Pulchellum.
 10340. Multicaule.
 10350. Pumilum.
 10353. Decumbens.
 10366. Millegrana.
 10414. Stramineum.
 11064. Stramineum.
 11620. Millegrana.
 12469. Millegrana.
 13341. Distichum.
 13526. Distichum.
 13561. Fimbriatum.
 13653. Pubiflorum.
 13657. Pubiflorum.
 13672. Fimbriatum.
 13729. Conjugatum.
 13737. Urvillei.
 13803. Distichum.
 13981. Dilatatum.
 14067. Conjugatum.
 14072. Dilatatum.
 14081. Urvillei.
 14182. Conjugatum.
 14214. Dilatatum.
 15153. Dilatatum.
 16079. Floridanum.
 16096. Circulare.
 16107. Distichum.
 16111. Dilatatum.
 16118. Pubescens.
 16126. Circulare.
 16137. Floridanum.
 16141. Pubiflorum.
 16306. Conjugatum.
 16313. Laxum.
 16323. Secans.
 16326. Distichum.
 16333. Fimbriatum.
 16336. Laxum.
 16339. Plicatulum.
 16341. Conjugatum.
 16350. Conjugatum.
 16351. Nutans.
 16365. Conjugatum.
 16372. Virgatum.

HITCHCOCK, A. S.—Continued

16375. Arundinaceum.
 16378. Laxum.
 16383. Vaginatum.
 16386. Fimbriatum.
 16390. Conjugatum.
 16397. Distichum.
 16401. Virgatum.
 16403. Paniculatum.
 16408. Secans.
 16409. Vaginatum.
 16410. Fimbriatum.
 16411. Millegrana.
 16421. Notatum.
 16423. Fimbriatum.
 16424. Conjugatum.
 16438. Plicatulum.
 16439. Virgatum.
 16443. Conjugatum.
 16445. Melanospermum.
 16447. Virgatum.
 16456. Paniculatum.
 16466. Fimbriatum.
 16471. Nesiotes.
 16473. Plicatulum.
 16477. Virgatum.
 16484. Conjugatum.
 16490. Fimbriatum.
 16500. Propinquum.
 16522. Fimbriatum.
 16526. Repens.
 16552. Virgatum.
 16563. Distichum.
 16613. Conjugatum.
 16620. Orbiculatum.
 16781. Millegrana.
 16812. Melanospermum.
 16816. Densum.
 16819. Millegrana.
 16836. Fimbriatum.
 16899. Pumilum.
 16973. Pumilum.
 16974. Pulchellum.
 17011. Pumilum.
 17012. Pumilum.
 17028. Pumilum.
 17034. Nutans.
 17064. Melanospermum.
 17081. Multicaule.
 17083. Nutans.
 17102. Melanospermum.
 17104. Multicaule.
 17105. Multicaule.

HITCHCOCK, A. S.—Continued

17137. Multicaule.
 17187. Multicaule.
 17190. Paniculatum.
 17195. Decumbens.
 17198. Melanospermum
 17260. Pumilum.
 17269. Pumilum.
 17278. Decumbens.
 17279. Melanospermum.
 17280. Pumilum.
 17336. Virgatum.
 17339. Melanospermum.
 17341. Orbiculatum.
 17421. Decumbens.
 17427. Melanospermum.
 17433. Pumilum.
 17438. Melanospermum.
 17460. Paniculatum.
 17465. Decumbens.
 17470. Melanospermum.
 17477. Millegrana.
 17647. Repens.
 17664. Conjugatum.
 17668. Fimbriatum.
 18030. Conjugatum.
 18034. Vaginatum.
 18099. Dilatatum.
 18105. Vaginatum.
 18194. Vaginatum.
 18580. Distichum.
 18635. Conjugatum.
 18681. Conjugatum.
 18702. Distichum.
 19198. Vaginatum.
 19252. Vaginatum.
 19289. Conjugatum.
 19303. Conjugatum.
 19401. Vaginatum.
 19485. Distichum.
 19487. Distichum.
 19526. Conjugatum.
 19542. Vaginatum.
 19656. Conjugatum.
 19781. Ciliatifolium.
 19784. Ciliatifolium.
 19787. Vaginatum.
 19864. Conjugatum.
 19869. Fimbriatum.
 19885. Caespitosum.
 19886. Saugetii.
 19890. Saugetii.
 19897. Conjugatum.

HITCHCOCK, A. S.—Continued

19899. Plicatum.
 19904. Minus.
 19907. Pumilum.
 19908. Distichum.
 19909. Pilosum.
 19913. Virgatum.
 19948. Scabrum.
 19955. Racemosum.
 20132. Racemosum.
 20134. Racemosum.
 20161. Conjugatum.
 20177. Microstachyum.
 20180. Paniculatum.
 20202. Orbiculatum.
 20274. Scabrum.
 20341. Racemosum.
 20413. Decumbens.
 20434. Orbiculatum.
 20599. Conjugatum.
 20652. Saccharoides.
 20656. Humboldtianum.
 21138. Microstachyum.
 21210. Decumbens.
 21257. Orbiculatum.
 21269. Pilosum.
 21306. Humboldtianum.
 21464. Tenellum.
 21710. Humboldtianum.
 21761. Saccharoides.
 22061. Decumbens.
 22066. Decumbens.
 22072. Paniculatum.
 22073. Virgatum.
 22076. Crassum.
 22087. Multicaule.
 22089. Conjugatum.
 22102. Virgatum.
 22132. Paniculatum.
 22338. Racemosum.
 22485. Humboldtianum.
 22597. Candidum.
 22624. Paniculatum.
 22627. Paniculatum.
 22633. Conjugatum.
 22675. Plicatum.
 22686. Saccharoides.
 22696. Consersum.
 22718. Decumbens.
 22722. Paniculatum.
 22730. Distichum.
 22790. Distichum.
 22793. Distichum.

HITCHCOCK, A. S.—Continued

22795. Humboldtianum.
 22830. Humboldtianum.
 22882. Distichum.
 22953. Plicatum.
 22956. Fimbriatum.
 23224. Notatum.
 23234. Rupestre.
 23242. Lindenianum.
 23259. Millegrana.
 23284. Minus.
 23293. Arundinaceum.
 23305. Minus.
 23326. Lindenianum.
 23340. Distachyon.
 23341. Distachyon.
 23342. Ciliatifolium.
 23343. Secans.
 23346. Blodgettii.
 23348. Lindenianum.
 23352. Fimbriatum.
 23353. Urvillei.
 23355. Rupestre.
 23360. Notatum.
 23363. Lindenianum.
 23366. Millegrana.
 23379½. Clavuliferum.
 23381. Densum.
 23402. Fimbriatum.
 23417. Rupestre.
 23418. Laxum.
 23419. Caespitosum.
 23419½. Rupestre.
 23424. Rupestre.
 23430. Clavuliferum.
 23439. Minus.
 23538. Distichum.

HOLM, T.

84. Secans.
 88. Decumbens.
 91. Fimbriatum.
 152. Rupestre.
 173. Notatum.
 199. Paniculatum.

HOLMGREN, T.

58. Conjugatum.

HOLT, E. G.

16. Dilatatum.

HOLWAY, E. W. D.

64. Humboldtianum.
 129. Humboldtianum.
 168. Candidum.
 594. Conjugatum.
 3065. Tenellum.
 3416. Pubiflorum.
 3421. Notatum.
 3437. Tinctum.
 3510. Humboldtianum.
 3514. Lentiginosum.

HOLWAY, E. W. D., AND M. M.

507. Prostratum.
 680. Paniculatum.
 703. Virgatum.
 726. Paniculatum.
 781. Distichum.
 782. Humboldtianum.
 823. Racemosum.
 1321. Plicatum.
 1418. Conjugatum.
 1464. Paniculatum.
 1476. Conjugatum.
 1482. Coryphaeum.
 1504. Plicatum.
 1510. Pilosum.
 1568. Paniculatum.
 1582. Plicatum.
 1584. Pilosum.
 1597. Paniculatum.
 1607. Plicatum.
 1612. Paniculatum.
 1624. Pilosum.
 1628. Consersum.
 1630. Paniculatum.
 1644. Coryphaeum.
 1645. Malacophyllum.
 1646. Malacophyllum.
 1650. Paniculatum.
 1657. Pilosum.
 1659. Plicatum.
 1675½. Paniculatum.
 1679. Paniculatum.
 1708. Stellatum.
 1725. Malacophyllum.
 1731. Paniculatum.
 1776. Paniculatum.
 1781. Paniculatum.
 1793. Paniculatum.
 1948. Pilosum.

Hood, S. C.

- 6. Lentiferum.
- 28. Longipilum.
- 29. Supinum.
- 66. Rigidifolium.
- 81. Bifidum.

HOSTMANN, F. W.

- 1318. Pulchellum.
- 1321. Pulchellum.

HOUSE, H. D.

- 2342. Laeve.
- 2863. Pubiflorum glabrum.
- 9750. Psammophilum.

HUBBARD, F. T.

- 406. Setaceum.
- 507. Pubescens.

HUSNOT, T.

- 71. Fimbriatum.
- 74. Distichum.
- 76 part. Melanospermum.
- 77. Nutans.
- 79. Paniculatum.

IDINEAL, BROTHER

- 278. Prostratum.

IMRAY, J.

- 311. Saccharoides.

JAHN, A.

- 192. Densum.
- 301. Molle.
- 304. Saccharoides.
- 307. Conjugatum.
- 315. Notatum.
- 347. Conjugatum.
- 349. Conjugatum.

JAMESON, W.

- 540. Repens.
- 552. Microstachyum.

JEFFREYS

- 31. Conjugatum.

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JENMAN, G. S.

- 1904. Repens.
- 3656. Densum.
- 3660. Virgatum.
- 3855*. Repens.
- 3962. Distichum.
- 3967. Conjugatum.
- 4073. Decumbens.
- 4391. Vaginatum.
- 4395. Vaginatum.
- 4437. Virgatum.
- 4442. Repens.
- 4520. Distichum.
- 4522. Vaginatum.
- 4523. Vaginatum.
- 4532. Pulchellum.
- 4586. Distichum.
- 6004. Melanospermum.
- 6005. Orbiculatum.
- 6014. Pulchellum.
- 6015. Pumilum.
- 6020. Repens.
- 6199. Virgatum.
- 6477. Orbiculatum.
- 7109. Repens.

JENSEN, HJALMAR

- 222. Vaginatum.

JERMY, G.

- 8. Pubiflorum.

JIMÉNEZ, OTÓN

- 128. Candidum.
- 160. Squamulatum.
- 175. Plicatulum.
- 387. Variabile.
- 520. Plenum.
- 523. Plenum.
- 528. Plicatulum.
- 529. Humboldtianum.
- 534. Pilosum.
- 726. Repens.
- 736. Plicatulum.
- 739. Conjugatum.
- 742. Jimenezii.
- 743. Plicatulum.
- 927. Distichum.
- 1123. Multicaule.

JOHNSON, HARRY

6. Convexum.
 115. Conjugatum.
 119. Candidum.
 260. Conjugatum.
 279. Conjugatum pubescens.
 439. Plenum.
 440. Plicatum.
 441. Notatum.
 454. Boscianum.
 621. Candidum.
 831. Candidum.

JOHNSTON, J. R.

198. Conjugatum.
 375. Paniculatum.
 381. Conjugatum.
 538. Plicatum.
 1011. Plicatum.

JONES, JOSEPH

16. Conjugatum.
 19. Virgatum.
 24. Conjugatum.
 35. Paniculatum.
 39. Pumilum.
 47. Laxum.

JONES, M. E.

2307. Distichum.

JÖRGENSEN, P.

1145. Urvillei.
 1150. Distichum.
 1353. Malacophyllum.
 1765. Humboldtianum.
 2424. Conjugatum.
 2425. Plicatum.
 2426. Fasciculatum.
 2882. Stellatum.
 3298. Distichum.
 3300. Urvillei.

JULIO, BROTHER

44. Humboldtianum.

JÜRGENS, CARLOS

41. Urvillei.
 49. Distichum.

KAPPLER, A.

1561. Serpentinum.

KEARNEY, T. H.

5. Laeve.
 8. Boscianum.
 9. Ciliatifolium.
 11. Laeve.
 12. Distichum.
 13. Floridanum.
 14. Dilatum.
 26. Longepedunculatum.
 35. Dilatum.
 36. Boscianum.
 37 (in 1895). Floridanum.
 37 (in 1896). Urvillei.
 38. Difforme.
 40. Dissectum.
 43. Urvillei.
 47. Setaceum.
 48. Plicatum.
 54 (in 1895). Praecox.
 54 (in 1896). Pubiflorum glabrum.
 55. Floridanum.
 56 (in 1895). Floridanum glabratum.
 56 (in 1893). Longepedunculatum.
 62. Circulare.
 66. Floridanum glabratum.
 69. Setaceum.
 70. Ciliatifolium.
 71. Supinum.
 78. Laeve.
 85. Pubiflorum glabrum.
 93. Distichum.
 96. Ciliatifolium.
 97. Longepedunculatum.
 98. Ciliatifolium.
 110. Distichum.
 120. Vaginatum.
 132. Lentiferum.
 135. Distichum.
 136. Setaceum.
 143 (in 1896). Floridanum.
 143 (in 1895). Praecox.
 149. Floridanum.
 151. Floridanum.
 152. Boscianum.
 153. Floridanum.
 154a. Laeve.
 154b. Pubiflorum glabrum.
 161. Floridanum glabratum.
 162. Pubescens.
 165. Floridanum.
 166. Plicatum.
 170 (in 1895). Dissectum.
 170 (in 1896). Longipilum.

KEARNEY, T. H.—Continued

172. *Lentiferum*.
 179. *Floridanum*.
 182. *Laeve*.
 184. *Longipilum*.
 185. *Floridanum glabratum*.
 193. *Plicatulum*.
 195. *Circulare*.
 198. *Pubescens*.
 205 (in 1895). *Boscianum*.
 205 (in 1896). *Floridanum*.
 210. *Dilatatum*.
 216. *Plicatulum*.
 219. *Pubescens*.
 239. *Floridanum*.
 240. *Laeve*.
 253. *Circulare*.
 254. *Laeve*.
 262. *Floridanum*.
 277. *Ciliatifolium*.
 279. *Distichum*.
 280. *Praecox*.
 281. *Boscianum*.
 289. *Floridanum*.
 290. *Lentiferum*.
 292. *Ciliatifolium*.
 296 (in 1896). *Difforme*.
 296 (in 1895). *Longipilum*.
 297. *Pubescens*.
 308. *Laeve*.
 338. *Ciliatifolium*.
 345. *Floridanum*.
 347. *Laeve*.
 350. *Pubescens*.
 351. *Laeve*.
 354. *Laeve*.
 355. *Pubescens*.
 357. *Lentiferum*.
 386. *Setaceum*.
 944. *Longipilum*.
 945. *Setaceum*.
 946. *Pubiflorum glabrum*.
 1473. *Laeve*.
 1785. *Laeve*.
 1856. *Pubescens*.
 1951. *Boscianum*.
 2028. *Distichum*.
 2142. *Floridanum glabratum*.
 2168. *Floridanum*.
 2281. *Vaginatulum*.
 2296. *Distichum*.
 2341. *Boscianum*.

KELLERMAN, W. A.

8. *Stramineum*.
 30. *Stramineum*.
 5118. *Paniculatum*.
 5761. *Paniculatum*.
 5803. *Adoperiens*.
 6245. *Convexum*.
 6260. *Paniculatum*.
 6807. *Pubescens*.

KELLOGG, J. H.

39. *Pubescens*.

KEMP, J. S.

2. *Virgatum*.
 7. *Plicatulum*.
 19½. *Conjugatum*.
 32. *Conjugatum*.
 42½. *Conjugatum*.
 47. *Distichum*.
 52. *Fimbriatum*.
 56. *Distichum*.

KENOYER, L. A.

112. *Saccharoides*.
 128. *Decumbens*.

KENYON, G. G. S.

3. *Propinquum*.
 13. *Propinquum*.
 15. *Propinquum*.

KERBER, E.

24. *Variabile*.
 49. *Conjugatum*.

KILLIP, E. P.

4003. *Acutum*.
 4006. *Microstachyum*.
 4011. *Pilosum*.
 4012. *Plicatulum*.
 4027. *Minus*.
 4031. *Plicatulum*.
 4077. *Centrale*.
 4084. *Boscianum*.
 4099. *Plicatulum*.
 4106. *Densum*.
 4109. *Virgatum*.
 4112. *Paniculatum*.
 4116. *Plicatulum*.
 4125. *Nutans*.

KILLIP, E. P.—Continued

4134. Multicaule.
 4231. Repens.
 4260. Parviflorum.
 4280. Plicatum.
 4329. Paniculatum.
 4356. Virgatum.
 4510. Candidum.
 4522. Humboldtianum.
 4555. Heterotrichon.
 4558. Pilosum.
 4582. Minus.
 5050. Plicatum.
 5051. Virgatum.
 5342. Decumbens.
 6002. Decumbens.
 6315. Setaceum.
 6861. Prostratum.
 7265. Laeve.
 11568. Virgatum.
 12125. Fasciculatum.

KILLIP, E. P., AND HAZEN, T. E.

11127. Paniculatum.

KILLIP, E. P., AND SMITH, A. C.

14568. Repens.
 14755. Conjugatum.
 14780. Virgatum.
 15025. Paniculatum.
 15112. Pilosum.
 15236. Multicaule.
 15494. Scabrum.
 15573. Paniculatum.
 16192. Trachycoleon.
 16496. Notatum.
 16936. Prostratum.
 16969. Scabrum.
 17018. Candidum.
 18024. Prostratum.
 18487. Scabrum.
 19038. Trachycoleon.
 19770. Humboldtianum.
 20810. Scabrum.
 20965. Fimbriatum.

KOORDERS, S. H.

- 23079b. Conjugatum.
 23503. Conjugatum.

KUHLMANN, G.

1280. Fasciculatum.
 1663. Gardnerianum.

KUHLMANN, G.—Continued

1664. Gardnerianum.
 1680. Orbiculatum.
 1682. Parviflorum.
 1682a. Parviflorum.
 1698. Lineare.
 3121. Repens.
 3170. Subciliatum.
 3172. Coryphaeum.
 3352. Virgatum.
 3357. Orbiculatum.
 5998. Pectinatum.

LANGLOIS, A. B.

18. Debile.
 19. Plicatum.
 19a. Circulare.
 20. Difforme.
 21. Floridanum.
 22. Lentiferum.
 25. Conjugatum.
 26. Boscianum.
 151. Urvillei.

LANKESTER, C. H.

203. Paniculatum.

LATHAM, ROY

258. Pubescens.
 263. Pubescens.
 321. Pubescens.
 3520. Psammophilum.

LAWRENCE, W. E.

2095. Distichum.

LECHLER, W.

1862. Candidum.
 2275. Conjugatum.

LEHMANN, F. C.

973. Paniculatum.
 979. Pectinatum.
 1571. Distichum.
 1662. Notatum.
 3457. Plicatum.
 5398. Plicatum.
 8543. Conjugatum.

LÉON, BROTHER

- 117b. Notatum.
 268. Caespitosum.

LÉON, BROTHER—Continued

272. Lividum.
 286. Saugetii.
 302. Conjugatum.
 564. Alterniflorum.
 571. Lividum.
 578. Virgatum.
 579. Paniculatum.
 581. Alterniflorum.
 585. Alterniflorum.
 587. Langei.
 588. Lividum.
 759. Racemosum.
 768. Caespitosum.
 779. Ciliatifolium.
 781. Plicatum.
 782. Conjugatum.
 811. Vaginatam.
 926. Plicatum.
 927. Plicatum.
 927b. Plicatum.
 928. Notatum.
 929. Distichum.
 931. Millegrana.
 931b. Secans.
 932. Secans.
 933. Paniculatum.
 934. Langei.
 935. Caespitosum.
 935b. Saugetii.
 936. Caespitosum.
 937. Lividum.
 938. Conjugatum.
 938c. Conjugatum.
 938d. Conjugatum.
 939b. Conjugatum.
 939c. Conjugatum.
 940. Distichum.
 941. Distichum.
 942. Clavuliferum.
 943. Alterniflorum.
 944. Lindenianum.
 945. Alterniflorum.
 945b. Lindenianum.
 946. Distortum.
 947. Unispicatum.
 948. Saugetii.
 949. Rupestre.
 950. Rupestre.
 951. Laxum.
 953. Caespitosum.
 954. Blodgettii.
 956. Bakeri.

LÉON, BROTHER—Continued

1511. Langei.
 1527. Saugetii.
 1984. Conjugatum.
 1986. Pubiflorum.
 1987. Millegrana.
 1989. Plicatum.
 1990. Virgatum.
 1991. Distichum.
 1992. Distichum.
 1995. Virgatum.
 1996. Breve.
 1997. Breve.
 2381. Caespitosum.
 2401. Unispicatum.
 2556. Alterniflorum.
 2561. Alterniflorum.
 2614. Distachyon.
 2625. Bakeri.
 2639. Virgatum.
 2642. Distichum.
 2691. Rupestre.
 2738. Propinquum.
 2783. Distachyon.
 2870. Millegrana.
 3446. Laxum.
 3454. Plicatum.
 3457. Lindenianum.
 3462. Plicatum.
 3470. Plicatum.
 3473. Alterniflorum.
 3477. Breve.
 3478. Propinquum.
 3482. Rupestre.
 3676. Caespitosum.
 3694. Saugetii.
 3701. Caespitosum.
 3781. Paniculatum.
 3962. Virgatum.
 3978. Paniculatum.
 3980. Saugetii.
 4099. Unispicatum.
 4100. Breve.
 4157. Millegrana.
 4160. Millegrana.
 4183. Langei.
 4333. Plicatum.
 4413. Distichum.
 4430. Conjugatum.
 4468. Minus.
 4526. Notatum.
 4557. Plicatum.
 4569. Decumbens.

LÉON, BROTHER—Continued

4570. Nanum.
 4635. Lividum.
 4664. Saugetii.
 5075. Conjugatum.
 5167. Notatum.
 5272. Lindenianum.
 5273. Distortum.
 5364. Plicatulum.
 5582. Unispicatum.
 5680. Alterniflorum.
 5681½. Breve.
 6009. Filiforme.
 6204. Distichum.
 6321. Langei.
 6354. Blodgettii.
 6417. Clavuliferum.
 6418. Clavuliferum.
 6419. Plicatulum.
 6420. Densum.
 6423. Notatum.
 6734. Vaginatulum.
 6735. Millegrana.
 6743. Secans.
 7057. Distortum.
 7346. Lindenianum.
 7499. Saugetii.
 7501. Caespitosum.
 7521. Propinquum.
 7537. Distichum.
 8628. Blodgettii.
 8783. Debile.
 8981. Caespitosum.
 8982. Saugetii.
 9135. Densum.
 9142. Rupestre.
 9182. Blodgettii.
 9183. Millegrana.
 9185. Pulchellum.
 9469. Caespitosum.
 9764. Fimbriatum.
 11336. Lineare.
 11344. Pulchellum.
 11690. Blodgettii.
 11713. Caespitosum.
 11719. Blodgettii.
 12302. Rupestre.
 12305. Laxum.
 12313. Laxum.
 12314. Caespitosum.
 12315. Orbiculatum.
 12450. Saugetii.
 12457. Distichum.

LÉON, BROTHER—Continued

12470. Rupestre.
 12471. Lindenianum.
 12472. Filiforme.
 12473. Distortum.
 12558. Filiforme.
 13079. Acutifolium.
 13119. Acutifolium.

LÉON AND ARSÈNE, BROTHERS

- 11010 Rupestre.

LÉON, BROTHER, AND CAZAÑOS, F. R.

5844. Plicatulum.
 5850. Reptatum.

LÉON AND CHARLES, BROTHERS

4856. Minus.
 4857. Distortum.
 4858. Clavuliferum.

LÉON AND CLEMENT, BROTHERS

6655. Clavuliferum.
 6661. Distortum.

LÉON AND CLEMENT, BROTHERS, AND
ROCA, M.

9811. Breve.

LÉON AND EDMOND, BROTHERS

8607. Edmondi.
 8682. Edmondi.

LÉON AND HIORAM, BROTHERS

4363. Plicatulum.
 4364. Millegrana.
 4366. Virgatum.
 4366½. Secans.
 4367. Virgatum.
 4461. Plicatulum.
 5602. Saugetii.
 5604. Propinquum.

LÉON, BROTHER, AND LOUSTALOT, A.

9346. Filiforme.
 9354. Motembense.
 9376. Capillifolium.
 9382. Rocanum.
 9392. Rocanum.
 9413. Millegrana.
 9534. Distachyon.
 11337 Rocanum.

LÉON, BROTHER, AND ROCA, M.

6936. Pulchellum.
6989. Notatum.
7452. Filiforme.
7455. Propinquum.
8042. Distortum.
8156. Pulchellum.
8164. Acutifolium.
8223. Capillifolium.
8233. Rocanum.
8871. Rocanum.

LÉON, BROTHER, AND ROIG, J. T.

12961. Secans.

LÉON, BROTHER, AND SHAFER, J. A.

13670. Minus.

LÉON, BROTHER, AND VOISARD

930. Vaginatulum.

LEONARD, E. C.

2313. Setaceum.
2796. Fimbriatum.
2820. Fimbriatum.
2827. Caespitosum.
2911. Caespitosum.
2915. Caespitosum.
3173. Fimbriatum.
3217. Fimbriatum.
3221. Fimbriatum.
3339. Laxum.
3425. Conjugatum.
3626. Paniculatum.
3627. Saugetii.
3711. Conjugatum.
3837. Fimbriatum.
4075. Saugetii.
4174. Arundinaceum.
4183. Conjugatum.
4187. Arundinaceum.
4216. Caespitosum.
4296. Plicatulum.
4298. Heterotrichon.
4830. Lindenianum.
4871. Conjugatum.
4881. Fimbriatum.
5059. Distichum.
5062. Conjugatum.
5126. Caespitosum.
5187. Conjugatum.
7124. Plicatulum.

LEONARD, E. C.—Continued

7186. Caespitosum.
7289. Stellatum.
7354. Plicatulum.
7355. Plicatulum.
7418. Caespitosum.
7526. Stellatum.
7537. Heterotrichon.
7537a. Stellatum.
7579. Plicatulum.
7731. Conjugatum.
7793. Heterotrichon.
7795a. Heterotrichon.
7840. Decumbens.
7853. Plicatulum.
7855. Decumbens.
7989. Densum.
8078. Paniculatum.
8079. Plicatulum.
8080. Paniculatum.
8204. Conjugatum.
8241. Plicatulum.
8357. Densum.
8416. Distichum.
8434. Lindenianum.
8650. Virgatum.
8810. Saugetii.
8957. Heterotrichon.
9079. Arundinaceum.
9174. Virgatum.
9223. Virgatum.
9289. Paniculatum.
9336. Decumbens.
9406. Fimbriatum.
9408. Virgatum.
9672. Virgatum.
10030. Saugetii.
10080. Virgatum.

LEPRIEUR

77. Pulchellum.
80. Melanospermum.
81. Decumbens.
82. Pilosum.
83. Multicaule.
85. Parviflorum.
87. Melanospermum.
90. Oligostachyum.
91. Nutans.

LEVINE C. O.

1237. Conjugatum.

LEVY, P.

1138. *Microstachyum*.

LIEBMANN, F. M.

153. *Orbiculatum*.154. *Minus*.156 part. *Minus*.156 part. *Notatum*.158. *Conjugatum*.160. *Conjugatum*.161. *Conjugatum*.163. *Paniculatum*.164. *Paniculatum*.168. *Variabile*.169. *Affine*.173. *Plenum*.177. *Variabile*.178. *Variabile*.179. *Variabile*.182. *Plicatulum*.184. *Langei*.185. *Langei*.188. *Langei*.194. *Alterniflorum*.196. *Jaliscanum*.199. *Jaliscanum*.201. *Alterniflorum*.220. *Unispicatum*.221. *Humboldtianum*.224. *Cymbiforme*.225. *Cymbiforme*.226. *Cymbiforme*.6329. *Langei*.

LILLO, M.

4284. *Humboldtianum*.6240. *Malacophyllum*.

LINDEN, J. J.

1555. *Trachycoleon*.1813. *Lindenianum*.

LINDHEIMER, F.

567. *Pubiflorum*.1269. *Distichum*.

LINDMAN, C. A. M.

1347. *Paniculatum*.

LLAMAS, B.

3047 (Herb. Parodi). *Unispicatum*.

LLOYD, C. G.

1033. *Fimbriatum*.

LÖFGREN, ALBERT

267. *Pectinatum*.469. *Urvillei*.503. *Paniculatum*.1516. *Gardnerianum*.3812. *Plicatulum*.

LÖFGREN, A., AND EDWALL, G.

2020. *Conjugatum pubescens*.

LOHER, A.

1745. *Conjugatum*.

LOMBARDO, A

1786. *Vaginatum*.1801. *Plicatulum*.1813. *Distichum*.1818. *Vaginatum*.1978. *Notatum*.

LOOMIS, M. L.

1666. *Pubescens*.

LORENTZ, P. G.

70. *Fasciculatum*.LORENTZ, P. G., AND HIERONYMUS,
G. H.184. *Humboldtianum*.

LÜTZELBURG, P. VON

26. *Vaginatum*.5538. *Repens*.

MCATEE, W. L.

1689 A. *Vaginatum*.2164. *Repens*.2782. *Longipilum*.

MACBRIDE, J. F.

2878. *Conjugatum*.3519. *Notatum*.3749. *Heterotrichon*.3951. *Candidum*.4057. *Conjugatum*.

MACBRIDE, J. F., AND FEATHER-
STONE, W.

43. Paniculatum.
506. Conjugatum.
517. Humboldtianum.
1366. Candidum.

McCARTHY, GERALD

309. Laeve.

MACDOUGAL, D. T.

571. Distichum.

McFARLAND, F. T.

158. Pubiflorum glabrum.

McFARLAND F. T., AND ANDERSON,
W. A.

222. Repens.
255. Pubiflorum glabrum.
326. Pubiflorum glabrum.
341. Pubiflorum glabrum.

McGREGOR, E. A.

180. Laeve.

McGREGOR, R. C.

61. Conjugatum.
516. Dilatatum.
10426 (BS). Conjugatum.
23133 (BS). Conjugatum.

MACKENZIE, K. K.

1718. Floridanum.

MACQUERYS

17. Paniculatum.

MALME, G. O. A.

117. Plicatum.
1562 B. Heterotrichon.
1562 E. Stellatum.
2395. Paniculatum.
3153. Heterotrichon.
3222. Pictum.

MALTBY, F. S.

242. Pubiflorum.

MANDON, GILBERT

1254. Humboldtianum.

MARCHESI, L.

1749. Vaginatam.
1859. Notatum.
3104. Notatum.

MARSH, EVA M.

51. Pumilum.

MATHEWS, ANDREW

425. Racemosum.
426. Racemosum.

MATOS, MELLO

- 16004 (Mus. Nac. Rio Jan.). Vagina-
tum.

MAXON, W. R.

768. Fimbriatum.
1642. Fimbriatum.
2363. Conjugatum.
2812. Plicatum.
2980. Virgatum.
5893. Laeve.
6514. Plicatum.
6516. Conjugatum.
7143. Paniculatum.
7257. Vaginatam.
7337. Vaginatam.

MAXON, W. R., AND HAY, R.

3527. Adoperiens.

MAXON, W. R., AND KILLIP, E. P.

58. Decumbens.
138. Conjugatum.
190. Decumbens.
268. Paniculatum.
292. Fimbriatum.
459. Blodgettii.
504. Caespitosum.
1519. Blodgettii.
1521. Fimbriatum.
1524. Fimbriatum.
1609. Caespitosum.
1669. Fimbriatum.
1719. Plicatum.

MAXON, W. R., AND STANDLEY, P. C.

14. Laeve.

MEARNS, E. A.

- 721. Distichum.
- 742. Distichum.
- 789. Distichum.
- 1979. Distichum.
- 2619. Distichum.
- 2981 (BS). Conjugatum.

MEISLAHN, MARIE

- 64. Bifidum.
- 170a. Supinum.

MELVILLE

- 109. Clavuliferum.
- 118. Coryphaeum.
- 144. Pulchellum.
- 145. Melanospermum.
- 161. Millegrana.
- 163. Gardnerianum.

MERRILL, E. D.

- 34. Conjugatum.
- 122. Conjugatum.
- 607 (Kneucker Gram.). Conjugatum.
- 805 (Kneucker Gram.). Vaginatum.
- 1137. Conjugatum.
- 5229. Vaginatum.

METCALF, F. P.

- 915. Circulare.
- 1122. Repens.

METCALFE, O. B.

- 1501. Distichum.

MEXIA, YNEZ

- 570. Notatum.
- 829. Plenum.
- 1022. Longicuspe.
- 1830. Paniculatum.

MILLE, LUIS

- 11. Repens.
- 304. Conjugatum.

MILLER, O. O., AND JOHNSTON, J. R.

- 178. Conjugatum.

MILLER, W. DE W., AND GRISCOM, L.

- 143. Squamulatum.
- 144. Squamulatum.

MILLSPAUGH, C. F.

- 944. Fimbriatum.
- 1408. Blodgettii.
- 1907. Paniculatum.

MOLLER

- 130. Paniculatum.

MOORE, H. F.

- 237. Paniculatum.

MOORE, J. C.

- 18. Distichum.

MORALES, R.

- 700. Distichum.
- 708. Plicatum.
- 715. Tenellum.
- 719. Virgatum.
- 720. Lividum.
- 722. Notatum.
- 728a. Costaricense.

MORITZ, J. W. K.

- 1537. Trachycoleon.
- 1546. Repens.

MORONG, THOMAS

- 247. Conjugatum.
- 282. Repens.
- 535. Fasciculatum.
- 548. Notatum.
- 549. Urvillei.
- 553. Paniculatum.
- 1584. Lividum.

MORRIS, E. L.

- 1284. Laeve.

MOSÉN, H.

- 3005. Conjugatum.
- 3511. Urvillei.
- 4569. Paniculatum.

MOSIER, C. A.

- 153. Conjugatum.
- 178. Blodgettii.
- 250. Monostachyum.

MÜLLER, F.

2036. Humboldtianum.
2037. Humboldtianum.
2061. Lividum.

MUELLO

- 4703 (Herb. Parodi). Lineare.

NASH, G. V.

209. Ciliatifolium.
216. Plicatum.
507. Longipilum.
600 part. Ciliatifolium.
600 part. Longipilum.
629. Rigidifolium.
680. Pubiflorum glabrum.
946. Debile.
1001. Ciliatifolium.
1027. Longipilum.
1035. Distichum.
1205. Distichum.
1208. Giganteum.
1340. Longipilum.
1359. Giganteum.
1417 part. Longepedunculatum.
1417 part. Setaceum.
1418 part. Ciliatifolium.
1418 part. Supinum.
1426. Ciliatifolium.
1427. Propinquum.
1619. Lentiferum.
1699. Repens.
1754. Giganteum.
2019. Debile.
2047. Lentiferum.
2074. Longepedunculatum.
2080. Longipilum.
2298. Dilatum.
2344. Longipilum.
2346. Boscianum.
2359a. Ciliatifolium.
2445. Caespitosum.
2579. Bifidum.

NASH, G. V., AND TAYLOR, N.

956. Secans.
1353. Bakeri.
1445. Alterniflorum.

NEALLEY, G. C.

75. Lividum.
89. Floridanum.

NEALLEY, G. C.—Continued

91. Circulare.
92. Pubiflorum.
95. Hartwegianum.

NELSON, E. W.

486. Dilatum.
523. Lividum.
727. Squamulatum.
1262. Notatum.
2735. Sanguineolentum.
2735a. Sanguineolentum.
2853. Plicatum.
3033. Notatum.
3035. Virgatum.
3047. Nelsoni.
3055. Conjugatum pubescens.
3424. Stellatum.
6832. Pubiflorum.

NICHOLS, G. E.

202. Conjugatum.

NICOLAS, BROTHER

131. Crinitum.
5410. Distichum.

NORTON, J. B.

313. Laeve.
340. Ciliatifolium.
358a. Pubescens.
358b. Longipilum.
358c. Floridanum.
367a. Laeve.
367b. Pubescens.
367c. Ciliatifolium.
385a. Ciliatifolium.
385c. Plicatum.
563. Stramineum.
585b. Supinum.

NOVAES, C.

1272. Pectinatum.
1277. Conjugatum pubescens.
1278. Urvillei.

NOYES, E. B.

106. Floridanum
109. Laeve.
109½. Longipilum.
110. Longipilum.

NUSKER, J. D.

1227. *Conjugatum*.

OERSTED, A. S.

14008. *Saccharoides*.14107. *Minus*.

OLIVA, J. C.

31. *Longicuspe*.68. *Virgatum*.80. *Propinquum*.97. *Convexum*.

OLIVE, E. W.

9. *Distichum*.21. *Hartwegianum*.

ORCUTT, C. R.

512a. *Distichum*.2891. *Debile*.3245. *Orbiculatum*.3246. *Paniculatum*.3248. *Conjugatum*.3889. *Convexum*.

ORTEGA, J. G.

4102. *Botterii*.4333. *Humboldtianum*.

PADILLA, S. A.

347. *Dilatatum*.391. *Centrale*.393. *Crassum*.400. *Plicatulum*.594. *Langei*.

PALMER, EDWARD

16 (in 1869). *Paucispicatum*.16 (in 1897). *Conjugatum*.18. *Paniculatum*.45. *Pubiflorum*.79. *Pubiflorum*.138. *Notatum*.144 (in 1886, part). *Botterii*.144 (in 1886, part). *Paniculatum*.144 (in 1897). *Plicatulum*.190. *Plicatulum*.192. *Distichum*.206. *Lividum*.214. *Distichum*.243. *Paucispicatum*.245. *Lividum*.259. *Distichum*.261. *Pubiflorum*.

PALMER, EDWARD—Continued

286. *Humboldtianum*.295. *Notatum*.338. *Crinitum*.367. *Conjugatum*.368. *Stramineum*.369. *Pubiflorum glabrum*.391. *Distichum*.393. *Distichum*.395. *Pubiflorum*.419. *Conjugatum*.468. *Plicatulum*.592. *Convexum*.693. *Paucispicatum*.704. *Palmeri*.871. *Pubiflorum*.1265. *Paniculatum*.1272. *Conjugatum*.1549. *Conjugatum*.1552. *Lividum*.1555. *Paniculatum*.1556. *Lentiginosum*.1647. *Culiacanum*.1658. *Convexum*.1924. *Paniculatum*.

PALMER, E. J.

967. *Pubiflorum glabrum*.968. *Dissectum*.969. *Dissectum*.970. *Floridanum*.2334. *Pubiflorum glabrum*.3066. *Pubescens*.3067. *Circulare*.3140. *Circulare*.30999. *Distichum*.31488. *Circulare*.31640. *Circulare*.31679. *Ciliatifolium*.31721. *Floridanum glabratum*.

PALMER, W., AND RILEY, J. H.

97. *Virgatum*.179a. *Paniculatum*.541. *Conjugatum*.544. *Paniculatum*.628. *Virgatum*.813. *Arundinaceum*.848. *Vaginatulum*.947. *Plicatulum*.949. *Lindenianum*.978. *Minus*.1057. *Virgatum*.1119. *Notatum*.

PAMMEL, L. H.

619. Stramineum.

PARISH, S. B.

8620. Urvillei.

PARODI, L. R.

7. Alcalinum.
 8. Distichum.
 12. Plicatulum.
 35. Dilatatum.
 144. Notatum.
 145. Notatum.
 1178. Alcalinum.
 3297. Repens.
 3465. Repens.
 3993. Distichum.
 4515. Stellatum.
 4664. Stellatum.
 4701. Gardnerianum.
 5534. Consersum.
 6213. Acuminatum.
 7070. Stellatum.
 8318. Distichum.
 8345. Fasciculatum.

PARODI, L. R. (HERB. OSTEN)

15239. Plicatulum.

PAULSEN, O.

313. Vaginatulum.

PEATTIE, D. C.

1903. Caespitosum.

PEEBLES, R. H., AND HARRISON, G. J.

4745. Stramineum.

PEEBLES, R. H., HARRISON, G. J.
AND KEARNEY, T. H.

230. Distichum.

PENNELL, F. W.

1437. Pictum.
 1505. Saccharoides.
 1748. Conjugatum.
 2144. Longipilum.
 2155. Setaceum.
 2168. Floridanum glabratum.
 2203. Laeve.
 2273. Laeve.

PENNELL, F. W.—Continued

3213. Conjugatum.
 3318. Scabrum.
 3349. Saccharoides.
 3747. Virgatum.
 3797. Conjugatum.
 3933. Fasciculatum.
 3937. Repens.
 4590. Virgatum.
 4689. Conjugatum.
 5011. Conjugatum.
 5021. Paniculatum.
 13991. Candidum.

PENNELL, F. W., AND KILLIP, E. P.

5949. Plicatulum.
 5950. Paniculatum.
 8120. Paniculatum.
 8164. Pilosum.

PENNELL, F. W., KILLIP, E. P.,
AND HAZEN, T. E.

8470. Plicatulum.

PERKINS, J. R.

1078. Paniculatum.
 1485. Decumbens.
 1486. Fimbriatum.
 1487. Paniculatum.
 1488. Notatum.

PFLANZ, CARLOS

2007. Conjugatum.

PICKEL, D. B.

1346. Oligostachyum.
 1358. Orbiculatum.
 1395. Plicatulum.
 1397. Virgatum.
 1402. Plicatulum.
 1561. Coryphaeum.
 1583. Molle.
 1584. Clavuliferum.
 1586. Plicatulum.
 1605. Clavuliferum.
 1618. Oligostachyum.
 1619. Paniculatum.
 1719. Fimbriatum.

PIERCE, W. H.

804a. (Kneucker Gram.) Dilatatum.

PIPER, C. V.

4200. Distichum.
 5198. Plicatum.
 5198½. Plicatum.
 5199. Virgatum.
 5201. Paniculatum.
 5203. Virgatum.
 5204. Paniculatum.
 5205. Repens.
 5206. Plicatum.
 5207. Paniculatum.
 5208. Paniculatum.
 5215. Fasciculatum.
 5293. Minus

PITTIER, H.

206. Conjugatum pubescens.
 207. Decumbens.
 219. Humboldtianum.
 249. Paniculatum.
 250. Virgatum.
 258. Caespitosum.
 306. Distichum.
 360. Dilatatum.
 362. Orbiculatum.
 363. Urvillei.
 507. Clavuliferum.
 535. Decumbens.
 536. Orbiculatum.
 537. Conjugatum.
 538. Decumbens.
 540. Pumilum.
 640. Conjugatum.
 641. Minus.
 659. Pilosum.
 845. Notatum.
 935. Minus.
 992. Plicatum.
 993. Notatum.
 999. Plicatum.
 1183. Orbiculatum.
 1238. Candidum.
 1472. Plicatum.
 1525. Humboldtianum.
 1530. Humboldtianum.
 1539. Pilosum.
 1581. Conjugatum.
 1586. Paniculatum.
 1788. Trachycoleon.
 1832a. Trachycoleon.
 1847. Blodgettii.
 2079. Virgatum.
 2084. Conjugatum.

PITTIER, H.—Continued

2381. Nutans.
 2409. Plenum.
 2444. Conjugatum.
 2480. Conjugatum.
 2601. Conjugatum.
 2690. Virgatum.
 2695. Pectinatum.
 2996. Virgatum.
 3009. Conjugatum.
 3041. Paniculatum.
 3109. Conjugatum.
 3275. Plicatum.
 3375 part. Decumbens.
 3375 part. Nutans.
 3426. Orbiculatum.
 3435. Conjugatum.
 3436. Conjugatum.
 3478. Coryphaeum.
 3584. Pectinatum.
 3604. Virgatum.
 3622. Plicatum.
 3655. Decumbens.
 3658. Minus.
 3722. Paniculatum.
 3724. Virgatum.
 3725. Plicatum.
 3745. Saccharoides.
 4020. Fasciculatum.
 4147. Orbiculatum.
 4231. Paniculatum.
 4232. Vaginatum.
 4260. Conjugatum.
 4261. Vaginatum.
 4314. Conjugatum.
 4329. Distichum.
 4325. Notatum.
 4351. Pectinatum.
 4435. Fasciculatum.
 4436. Microstachyum.
 4453. Notatum.
 4462. Microstachyum.
 4463. Stellatum.
 4474. Pictum.
 4494. Plicatum.
 4500. Subciliatum.
 4515. Multicaule.
 4525. Clavuliferum.
 4527. Centrale.
 4551. Plicatum.
 4613. Orbiculatum.
 4621. Centrale.
 4622. Multicaule.

PITTIER, H.—Continued

4624. Minus.
 4632. Hitchcockii.
 4646. Densum.
 4647. Virgatum.
 4648. Plicatum.
 4693. Virgatum.
 4719. Nutans.
 4742. Plicatum.
 4866. Multicaule.
 4871. Multicaule.
 4914. Plicatum.
 4959. Convexum.
 5020. Stellatum.
 5063. Contractum.
 5064. Stellatum.
 5149. Multicaule.
 5185. Decumbens.
 5325. Pilosum.
 5345. Minus.
 5364. Pilosum.
 5752. Decumbens.
 5753. Nutans.
 5902. Trachycoleon.
 5924. Unispicatum.
 6000. Fimbriatum.
 6033. Trachycoleon.
 6093. Fimbriatum.
 6098. Plicatum.
 6101. Decumbens.
 6155. Humboldtianum.
 6157. Fimbriatum.
 6164. Unispicatum.
 6166. Conjugatum.
 6201. Stellatum.
 6202. Humboldtianum.
 6223. Paniculatum.
 6308. Notatum.
 6317. Vaginatam.
 6457. Unispicatum.
 6731. Plicatum.
 6760. Centrale.
 6763. Plicatum.
 6767. Paniculatum.
 6768. Virgatum.
 6779. Centrale.
 6789. Microstachyum.
 6808. Repens.
 6817. Centrale.
 6841. Fasciculatum.
 6907. Saccharoides.
 6982. Convexum.
 7147. Fasciculatum.

PITTIER, H.—Continued

7164. Plicatum.
 7177. Notatum.
 7212. Notatum.
 7216. Humboldtianum.
 7228. Unispicatum.
 7235. Unispicatum.
 7236. Lividum.
 7242. Notatum.
 7287. Plicatum.
 7305. Plicatum.
 7354 (Costa Rica). Conjugatum.
 7354 (Venezuela). Humboldtianum.
 7386. Plicatum.
 7487 part. Heterotrichon.
 7487 part. Stellatum.
 7489. Stellatum.
 7720. Paniculatum.
 7964a. Notatum.
 8169. Stellatum.
 8581. Decumbens.
 8605. Conjugatum.
 8638. Convexum.
 9022. Fimbriatum.
 9036. Convexum.
 9049. Convexum.
 9055. Pilosum.
 9098. Conjugatum.
 9301. Paniculatum.
 9434. Plicatum.
 9559. Humboldtianum.
 9616. Unispicatum.
 9626. Humboldtianum.
 9633. Lividum.
 9642. Unispicatum.
 9656. Notatum.
 9707. Notatum.
 9708. Fimbriatum.
 9734. Humboldtianum.
 9743. Unispicatum.
 9755. Microstachyum.
 9756. Plicatum.
 10218. Molle.
 10581. Plicatum.
 10622. Paniculatum.
 10624. Densum.
 10821. Minus.
 10835. Melanospermum.
 10861. Melanospermum.
 10928. Decumbens.
 11001. Multicaule.
 11083. Conjugatum pubescens.
 11164. Fimbriatum.

PITTIER, H.—Continued

11207. Fimbriatum.
 11326. Stellatum.
 11553. Unispicatum.
 11998. Stellatum.
 12386. Virgatum.
 12509. Convexum.
 12697. Vaginatum.
 12818. Trachycoleon.
 12820. Humboldtianum.
 12822. Plicatum.
 12823. Plicatum.
 12878. Plicatum.
 16118. Fasciculatum.
 16119. Costaricense.
 16120. Notatum.
 16269. Decumbens.
 16734. Conjugatum pubescens.

PLANK, E. N.

6. Pubescens.
 16 (in 1892). Stramineum.
 16 (in 1894). Distichum.
 22. Distichum.
 40. Pubiflorum.
 42. Plicatum.
 46. Circulare.
 53. Distichum.
 61. Ciliatifolium.
 72. Distichum.
 87. Langei.
 94. Laeve.

PÖPPIG, E. F.

957. Paniculatum.
 2863. Repens.

POLLARD, C. L.

611. Pubescens.
 1100. Floridanum.
 1108. Plicatum.
 1118. Floridanum glabratum.
 1131. Setaceum.
 1206. Lentiferum.
 1324. Distichum.
 1335. Dilatatum.

POLLARD, C. L., COLLINS, G. N., AND
MORRIS, E. L.

74. Caespitosum.
 124. Blodgettii.

POLLARD, C. L., AND MAXON, W. R.

69. Laeve.
 71. Setaceum.
 75. Laeve.
 527. Distichum.

POPENOE, D. H.

13. Virgatum.
 36. Repens.
 54. Microstachyum.

POPENOE, WILSON

670. Lividum.
 696. Notatum.
 893. Conjugatum.
 894. Paniculatum.
 899. Plicatum.
 901. Conjugatum pubescens.
 906. Paniculatum.
 909. Fasciculatum.
 913. Candidum.

PRETZ, H. W.

1403. Longipilum.

PRIER, C. W.

64. Distichum.

PRINGLE, C. G.

374. Pubiflorum.
 427. Pubiflorum.
 1123. Stramineum.
 1175. Convexum.
 1750. Humboldtianum.
 1875. Convexum.
 2042. Paniculatum.
 2049. Lividum.
 2359. Clavuliferum.
 2516. Lividum.
 3129. Conjugatum.
 3343. Prostratum.
 3695. Vaginatum.
 3755. Crinitum.
 3764. Alcalinum.
 3772. Plicatum.
 3774. Notatum.
 3779. Botterii.
 3854. Longicuspe.
 3991. Langei.
 5572. Humboldtianum.
 6215. Conjugatum.

PRINGLE, C. G.—Continued

- 6427. Convexum.
- 6474. Tenellum.
- 6717. Unispicatum.
- 6780. Distichum.
- 7167. Prostratum.
- 7532. Distichum.
- 7537. Pubiflorum.
- 7884. Candidum.
- 8891. Prostratum.
- 9211. Affine.
- 9583. Convexum.
- 9599. Hartwegianum.
- 9600. Tinctum.
- 11239. Tenellum.
- 11240. Notatum.
- 11757. Humboldtianum.
- 11761. Convexum.
- 11762. Clavuliferum.

PRINGLE, C. G., AND CONZATTI, C.

- 349. Lividum.

PURPUS, C. A.

- 441. Plicatum.
- 443. Squamulatum.
- 2158. Conjugatum.
- 2202. Humboldtianum.
- 2901. Humboldtianum.
- 2906. Plenum.
- 3772. Plicatum.
- 3777. Plicatum.
- 5421. Vaginatam.
- 5423. Langei.
- 5981. Affine.
- 6207. Humboldtianum.
- 8026. Adoperiens.
- 8029. Humboldtianum.
- 8476. Plicatum.
- 9200. Squamulatum.

RAMOS, M.

- 1385 (BS). Conjugatum.
- 1700. Conjugatum.
- 8224 (BS). Conjugatum.

REGNELL, A. F.

- III. 1340. Malacophyllum.
- III. 1341. Paniculatum.
- III. 1344. Stellatum.

RENSON, C.

- 353. Notatum.

24483—29—20

REVERCHON, J.

- 85. Pubiflorum glabrum.
- 87. Stramineum.
- 1066. Bifidum.
- 1067. Distichum.
- 1068. Stramineum.
- 2214. Circulare.
- 2217. Pubiflorum glabrum.
- 2217 A. Pubiflorum.
- 2832. Ciliatifolium.
- 2832 A. Stramineum.
- 3455. Dilatatum.
- 3464. Laeve.
- 3468. Ciliatifolium.
- 4174. Langei.
- 4176. Langei.
- 4180. Urvillei.
- 4180 A. Urvillei.

RICKER, P. L.

- 844. Dilatatum.
- 852. Floridanum.
- 853. Giganteum.
- 888 A. Longepedunculatum.
- 889. Plicatum.
- 902. Distichum.
- 906. Setaceum.
- 910. Floridanum.
- 912. Pubescens.
- 947. Distichum.
- 967. Setaceum.
- 969. Pubescens.

RICKSECKER, A. E.

- 223. Conjugatum.
- 238. Fimbriatum.
- 410. Laxum.
- 433. Distichum.
- 434. Secans.

RIDGWAY, ROBERT

- 2867. Repens.
- 3250. Circulare.
- 3314. Circulare.
- 3344. Repens.

RIDLEY, H. N.

- 3. Blodgettii.
- 5. Plicatum.
- 6. Fimbriatum.

RIECKEN, WILLIAM

- 19. Pubiflorum glabrum.

RIEDEL, L.

29. Multicaule.
964. Pumilum.
968. Vaginatum.

ROBINSON, C. B.

1653. Conjugatum.
6249 (BS). Conjugatum.
9294 (BS). Conjugatum.
9973 (BS). Conjugatum.

ROCA, M.

7287. Vaginatum.

RODRIGUES

5413. Conjugatum.

ROIG, J. T.

3204. Laxum.
3255. Saugetii.

ROIG, J. T., AND CREMATA, M.

2116. Rupestre.

ROJAS

37. Notatum.
104. Squamulatum.
105. Humboldtianum.

ROJAS, TEODORO

114. Plicatum.
322. Distichum.
1006. Notatum.
1014. Repens.
1688. Fasciculatum.
2313. Unispicatum.
2316. Plicatum.
2720. Plicatum.
2730. Plicatum.
2743. Unispicatum.
2757. Stellatum.
2778. Alcalinum.
2783. Plicatum.
2787. Plicatum.
2788. Malacophyllum.
3350. Orbiculatum.

ROLFS, P. H.

266. Supinum.
767. Lentiferum.
800. Ciliatifolium.
819. Boscianum.
820. Floridanum.
983. Pubescens.

ROSE, F. M.

42802. (Forest Serv.). Stramineum.

ROSE, J. N.

1543. Paniculatum.
1885. Plicatum.
1961. Leptachne.
2781. Convexum.
3294. Plicatum.
3602. Pubiflorum.
18742. Racemosum.
22075. Paniculatum.
22162. Racemosum.
22582. Candidum.
22639. Humboldtianum.
22645. Saccharoides.
22957. Candidum.
23219. Candidum.
24017. Racemosum.
24022. Racemosum.
24025. Racemosum.
24027. Humboldtianum.

ROSE, J. N., FITCH, W. R.,
and RUSSELL, P. G.

3409. Fimbriatum.
3532. Fimbriatum.
4079. Saugetii
4169. Paniculatum.

ROSE, J. N., PAINTER, J. H.,
and ROSE, J. S.

8555. Consersum.
9059. Lividum.
9383. Langei.
9455. Tenellum.
10050. Conjugatum.
10203. Humboldtianum.

ROSE, J. N., STANDLEY, P. C.,
AND RUSSELL, P. G.

12832. Humboldtianum.
14229. Paniculatum.
14859. Squamulatum.

ROTHROCK, J. T.

59. Distichum.

ROVIROSA, J. N.

44. Repens.
260. Fasciculatum.

RUDATIS, H.

1564. Vaginatum.

RUGEL, F.

15. Caespitosum.
46. Vaginatum.
49. Caespitosum.
183. Supinum.
188. Vaginatum.
368. Praecox.
384. Ciliatifolium.
392. Vaginatum.
442. Longepedunculatum.
449. Vaginatum.
753a. Alterniflorum.
869. Bakeri.

RUNYON, ROBERT, AND THARP, B. C.

4028. Langei.

RUSBY, H. H.

11. Decumbens.
198. Paniculatum.
205. Humboldtianum.
213. Virgatum.

RUSBY, H. H., AND PENNELL, F. W.

1014. Trachycoleon.
1121. Virgatum.
1177. Conjugatum.

RUSBY, H. H., AND SQUIRES, R. W.

348. Nutans.
356. Fasciculatum.
359. Conjugatum.

RUTH, ALBERT.

22. Laeve.
62. Circulare.
77. Boscianum.
78. Dilatatum.
79. Distichum.
80. Laeve.
81. Pubescens.
82. Pubiflorum glabrum.
134. Pubiflorum.
249. Dilatatum.
258. Floridanum glabratum.
259. Floridanum glabratum.
300. Pubiflorum.
479. Stramineum.
490. Stramineum.
576. Pubescens.
761. Pubiflorum.
1000. Floridanum.
1442. Floridanum glabratum.

RYDBERG, P. A.

1582. Stramineum.

ST. JOHN, HAROLD

2576. Setaceum.

SALAS, G.

4. Conjugatum.
5. Paniculatum.
6. Paniculatum.
7. Adoperiens.
380. Costaricense.

SALZMANN, P.

677. Multicaule.

SAMPAIO, A. J.

2790. Paniculatum.
2919. Conjugatum.
4098. Paniculatum.

SANTOS, J. K.

29. Conjugatum.

SASAKI, S.

21388. Distichum.
21418. Conjugatum.

SAVATIER

1188. Racemosum.

SAVINIERE, E. DE LA

164. Conjugatum.

SCHAFFNER, J. G.

136. Humboldtianum.
166. Adoperiens.
173. Humboldtianum.
1073. Distichum.

SCHIEDE, C. J. W.

855. Variabile.

SCHOMBURGK, R. H.

358. Repens.

SCHOTT, ARTHUR

593. Malacophyllum.
597. Yucatanum.

SCHROEDER, T. (HERB. OSTEN)

18736. Notatum.
18742. Plicatum.

SCHUMANN, W.

1737. Humboldtianum.

SCRIBNER, A. L.

506. Dilatatum.

SCRIBNER, F. L.

14. Laeve.

SEATON, H. E.

61. Distichum.

62. Lividum.

112a part. Botterii.

112a part. Langei.

112b. Notatum.

117. Humboldtianum.

SEIN, BROTHER

321. Secans.

SELER, C. AND E.

5. Pubiflorum.

1359a. Unispicatum.

2442. Humboldtianum.

2576. Conjugatum.

2707. Costaricense.

2715. Paniculatum.

SELLO, F.

74. Plicatum.

76. Dilatatum.

486. Parviflorum.

781. Plicatum.

3417. Notatum.

3541. Sanguineolentum.

3567. Urvillei.

5656. Stellatum.

5686. Stellatum.

SERGIUS, BROTHER

2411. Unispicatum.

2682. Unispicatum.

2777. Plicatum.

SERVINAS, V.

16878. (BS). Conjugatum.

SETCHELL, W. A.

506a. Conjugatum.

550. Conjugatum.

SETCHELL, W. A., AND PARKS, H. E.

50. Paniculatum.

84. Conjugatum.

370. Paniculatum.

SEYMOUR, F. C.

1041. Pubescens.

SHAFFER, J. A.

38. Conjugatum.

707. Fimbriatum.

2476. Fimbriatum.

2569. Laxum.

2578. Caespitosum.

2874. Distachyon.

2905. Distachyon.

3394. Virgatum.

3415. Secans.

3951. Saugetti.

7729. Rupestre.

7732. Distortum.

9025. Conjugatum.

10862. Multicaule.

11804. Conjugatum.

SHAFFER, J. A., AND LÉON, BROTHER

13539. Paniculatum.

13677. Minus.

SHANTZ, H. L.

366. Vaginatum.

SHELDON, E. P.

11305. Distichum.

SIEBER, F. W.

11. Virgatum.

20. Vaginatum.

27. Vaginatum.

II. 29. Nutans.

143. Paniculatum.

366. Conjugatum.

367. Vaginatum.

SIMPSON, J. H.

97. Langei.

184. Blodgettii.

SINGAPORE BOTANIC GARDENS

1324. Conjugatum.

SINTENIS, P.

99. *Conjugatum*.
 358. *Plicatulum*.
 1223 part. *Millegrana*.
 1229. *Orbiculatum*.
 1720. *Distichum*.
 2451. *Molle*.
 2509. *Paniculatum*.
 2539. *Secans*.
 3612. *Plicatulum*.
 2715. *Distichum*.
 4766. *Fimbriatum*.
 6857. *Vaginatum*.

SMALL, J. K.

5470. *Ciliatifolium*.

SMALL, J. K., AND G. K.

5429. *Blodgettii*.

SMALL, J. K., AND CARTER, J. J.

611. *Blodgettii*.
 1227. *Ciliatifolium*.
 1258. *Giganteum*.
 2870. *Blodgettii*.
 8658. *Caespitosum*.
 8823. *Caespitosum*.
 8926. *Fimbriatum*.

SMALL, J. K., AND HELLER, A. A.

198. *Circulare*.
 199. *Supinum*.
 200. *Floridanum glabratum*.

SMALL, J. K., AND MOSIER, C. A.

5677. *Caespitosum*.
 5916. *Caespitosum*.
 6059. *Caespitosum*.
 6460. *Caespitosum*.

SMALL, J. K., MOSIER, C. A., AND
SMALL, G. K.

6458. *Supinum*.
 6477. *Blodgettii*.
 6485. *Blodgettii*.
 6516. *Rigidifolium*.
 6519. *Supinum*.
 6740. *Blodgettii*.
 6764. *Giganteum*.
 6893. *Distichum*.
 6982. *Monostachyum*.

SMITH, C. L.

933. *Notatum*.
 1053. *Paniculatum*.
 1054. *Plicatulum*.

SMITH, C. P.

2754. *Longipilum*.

SMITH, G. W.

192. *Saccharoides*.
 843. *Saccharoides*.

SMITH, H. H.

124. *Melanospermum*.
 125. *Virgatum*.
 126. *Virgatum*.
 128. *Conjugatum pubescens*.
 142. *Stellatum*.
 143. *Heterotrichon*.
 161. *Saccharoides*.
 175. *Clavuliferum*.
 178. *Conjugatum*.
 179. *Vaginatum*.
 214. *Microstachyum*.
 215. *Paniculatum*.
 2156. *Nutans*.
 2157. *Decumbens*.
 2158. *Multicaule*.
 2159. *Distichum*.
 2170. *Trachycoleon*.
 2259. *Decumbens*.
 2530. *Microstachyum*.
 2744. *Conjugatum pubescens*.
 2750. *Repens*.

SMITH, HURON

2586. *Laeve*.

SMITH, J. D.

572. *Praecox*.
 664. *Praecox*.
 4992. *Candidum*.

SMITH, J. G.

562. *Orbiculatum*.
 564. *Multicaule*.
 573. *Conjugatum*.
 631. *Conjugatum*.

SMYTH, B. B.

232. *Stramineum*.

SODIRO, LUIS

299. *Paniculatum*.
300. *Candidum*.

SOMES, M. P.

223. *Stramineum*.
3606. *Stramineum*.
3631. *Stramineum*.

SPRUCE, R.

22. *Pilosum*.
1460*. *Fasciculatum*.
5959. *Racemosum*.

STAHL, A.

42. *Densum*.

STANDLEY, JEANETTE P.

117. *Lentiferum*.
180. *Longepedunculatum*.
248. *Monostachyum*.

STANDLEY, PAUL C.

1802. *Circulare*.
7674. *Conjugatum*.
8424. *Pubescens*.
8581. *Circulare*.
9080. *Circulare*.
9579. *Circulare*.
9726. *Circulare*.
9769. *Circulare*.
9936. *Stramineum*.
12663. *Ciliatifolium*.
12940. *Longepedunculatum*.
12975. *Lentiferum*.
13073. *Lentiferum*.
14830. *Longepedunculatum*.
18884. *Boscianum*.
18906. *Ciliatifolium*.
19042. *Lentiferum*.
19558. *Plicatum*.
19787. *Candidum*.
19825. *Conjugatum*.
20495. *Paniculatum*.
20496. *Plicatum*.
21067. *Paniculatum*.
21086. *Microstachyum*.
21108. *Orbiculatum*.
21482. *Costaricense*.
21493. *Costaricense*.
21716. *Paniculatum*.
22077. *Paniculatum*.

STANDLEY, PAUL C.—Continued

22242. *Paniculatum*.
22287. *Microstachyum*.
22441. *Adoperiens*.
22442. *Paniculatum*.
22486. *Plicatum*.
22487. *Paniculatum*.
22793. *Paniculatum*.
22824. *Costaricense*.
22874. *Costaricense*.
23090. *Paniculatum*.
23091. *Plicatum*.
23271. *Adoperiens*.
23285. *Adoperiens*.
23395. *Paniculatum*.
23516. *Paniculatum*.
23559. *Adoperiens*.
23568. *Paniculatum*.
23596. *Adoperiens*.
23605. *Plicatum*.
23607. *Plicatum*.
23649. *Paniculatum*.
23650. *Plicatum*.
23655. *Notatum*.
23798. *Conjugatum pubescens*.
23840. *Paniculatum*.
23841. *Virgatum*.
23860. *Plicatum*.
23862. *Decumbens*.
23885. *Conjugatum*.
23905. *Decumbens*.
23963. *Paniculatum*.
23978. *Paniculatum*.
24131. *Virgatum*.
24187. *Decumbens*.
24617. *Paniculatum*.
24649. *Paniculatum*.
24719. *Virgatum*.
24724. *Conjugatum*.
24726. *Decumbens*.
24782. *Plicatum*.
24789. *Paniculatum*.
24914. *Plicatum*.
25130. *Arundinaceum*.
25138. *Vaginatatum*.
25149. *Plicatum*.
25205. *Pilosum*.
25265. *Plicatum*.
25292. *Microstachyum*.
25445. *Nutans*.
25462. *Paniculatum*.
25519. *Paniculatum*.
25651. *Conjugatum*.

STANDLEY, PAUL C.—Continued

25901. Plicatum.
 25997. Paniculatum.
 26049. Nutans.
 26105. Microstachyum.
 26113. Plicatum.
 26114. Paniculatum.
 26338. Virgatum.
 26355. Minus.
 26463. Conjugatum.
 26471. Paniculatum.
 26796. Centrale.
 26820. Paniculatum.
 26874. Plicatum.
 26882. Virgatum.
 26966. Paniculatum.
 27083. Microstachyum.
 27314. Paniculatum.
 27328. Paniculatum.
 27782. Centrale.
 27953. Paniculatum.
 28339. Plicatum.
 28354. Paniculatum.
 28456. Virgatum.
 28482. Repens.
 28583. Fimbriatum.
 28584. Conjugatum.
 28600. Plicatum.
 28617. Paniculatum.
 28783. Paniculatum.
 28979. Plicatum.
 29094. Plicatum.
 29124. Plicatum.
 29142. Microstachyum.
 29299. Decumbens.
 29397. Centrale.
 29705. Plicatum.
 30000. Plicatum.
 30062. Paniculatum.
 30063. Conjugatum.
 30274. Decumbens.
 30432. Orbiculatum.
 30543. Standleyi.
 30752. Centrale.
 30799. Vaginatam.
 30881. Vaginatam.
 31202. Paniculatum.
 31464. Repens.
 31508. Paniculatum.
 31529. Paniculatum.
 31662. Decumbens.
 31784. Virgatum.
 32099. Plicatum.

STANDLEY, PAUL C.—Continued

32267. Paniculatum.
 32268. Candidum.
 32599. Squamulatum.
 32779. Candidum.
 32865. Costaricense.
 32876. Paniculatum.
 33187. Squamulatum.
 33289. Paniculatum.
 33292. Squamulatum.
 34211. Squamulatum.
 35180. Dilatum.
 36702. Paniculatum.
 37003. Paniculatum.
 37288. Minus.
 39016. Candidum.
 39018. Paniculatum.
 40953. Paniculatum.
 41256. Candidum.
 41278. Costaricense.
 41583. Squamulatum.
 41606. Candidum.
 42488. Convexum.
 52831. Paniculatum.
 52837. Microstachyum.
 53039. Ciliatifolium.
 53161. Microstachyum.
 53253. Orbiculatum.
 53315. Conjugatum.
 53464. Propinquum.
 53591. Millegrana.
 53748. Paniculatum.
 53796. Propinquum.
 54231. Propinquum.
 54484. Notatum.
 54784. Microstachyum.
 55851. Multicaule.
 55966. Notatum.
 55996. Stellatum.
 56028. Nutans.
 56212. Umbratile.
 56246. Humboldtianum
 56275. Stellatum.
 56576. Orbiculatum.
 56737. Langei.

STANDLEY, P. C., AND BOLLMAN, H. C.

10098. Circulare.
 10431. Laeve.

STANDLEY, P. C., AND TORRES, R.

47709. Nutans.
 47838. Candidum.

STANDLEY, P. C., AND VALERIO, J.

43214. Candidum.
45024. Paniculatum.
46554. Paniculatum.
46755. Decumbens.
50012. Squamulatum.
50018. Candidum.
50626. Candidum.

STEINBACH, JOSÉ

5160. Conjugatum.
5273. Notatum.
5459. Melanospermum.
6618. Humboldtianum.
6644. Humboldtianum.
6835. Distichum.
6836. Conjugatum.
6873. Plicatum.
6898. Densum.
7020. Notatum.
7036. Plicatum.
7103. Stellatum.

STEINBACH, JOSÉ (HERB. OSTEN)

14954. Pictum.
14959. Notatum.

STEVENS, G. W.

21. Stramineum.
814. Stramineum.
1120. Distichum.
1310. Pubescens.
1669. Stramineum.
2128. Repens.
2302. Floridanum.
3217. Pubescens.
4411. Repens.

STEVENSON, J. A.

2292. Laxum.
2454. Clavuliferum.
3219. Conjugatum.
5389. Distichum.

STEWART, ALBAN

1312. Conjugatum.
1313. Conjugatum.
1314. Conjugatum.
1316. Conjugatum.

STONE, WITMER

377. Praecox.
8232. Longipilum.
10743. Circulare.

STORK, H. E.

53. Minus.
279. Paniculatum.

STUCKERT, TEODORO

37. Unispicatum.
364 (Kneucker Gram.). Notatum.
365 (Kneucker Gram.). Urvillei.
367 (Kneucker Gram.). Unispicatum.
665 (Kneucker Gram.). Malacophyl-
lum.
1875. Humboldtianum.
5416. Urvillei.
5977. Notatum.
10793. Urvillei.
11048. Notatum.
12664. Notatum.
12917. Urvillei.

STÜBEL, A.

190. Contractum.

SUKSDORF, W. N.

423. Distichum.
1612. Distichum.
1971. Dilatatum.
2981. Distichum.
3213. Distichum.

SWALLEN, JASON

142. Ciliatifolium.
152. Rigidifolium.
172. Ciliatifolium.
177. Longepedunculatum.
178. Longipilum.
230. Urvillei.
234. Laeve.
246. Vaginatum.
249. Ciliatifolium.
259. Longepedunculatum.
266. Debile.
271. Distichum.
275. Praecox.

SWALLEN, JASON—Continued

- 276. Lentiferum.
- 331. Supinum.
- 340. Ciliatifolium.
- 341. Debile.
- 349. Setaceum.
- 369. Laeve.
- 384. Plicatulum.
- 388. Laeve.
- 402. Setaceum.
- 411. Dilatatum.
- 416. Longipilum.
- 423. Supinum.
- 446. Lentiferum.
- 450. Setaceum.
- 453. Plicatulum.
- 461. Ciliatifolium.
- 496. Dilatatum.
- 497. Plicatulum.
- 499. Distichum.
- 506. Setaceum.
- 532. Laeve.
- 536. Supinum.
- 538. Longipilum.
- 543. Dilatatum.
- 547. Pubiflorum glabrum.
- 561. Ciliatifolium.
- 980. Stramineum.
- 994. Pubescens.
- 1033. Ciliatifolium.
- 1053. Hartwegianum.
- 1117. Distichum.
- 1144. Dilatatum.

SYDOW, H.

- 6. Langei.

TABOR, PAUL

- 39. Debile.
- 40. Praecox.

TATE, G. H. H.

- 157. Contractum.
- 296A. Contractum.

TAYLOR, A. A.

- 38. Plicatulum.
- 40. Insulare.
- 41. Rottboellioides.
- 42. Virgatum.

TEJADA, R.

- 344. Conjugatum.

THARP, B. C.

- 1293. Pubiflorum.
- 1294. Pubiflorum.
- 1407. Lividum.
- 1732. Vaginatulum.
- 1748. Pubiflorum.
- 1768. Stramineum.
- 2005. Pubiflorum.
- 2012. Floridanum glabratum.
- 2014. Laeve.
- 2016. Circulare.
- 2024. Langei.
- 3097. Floridanum.
- 3105. Lentiferum.
- 3112. Monostachyum.
- 3225. Acuminatum.
- 3262. Plicatulum.
- 3928. Stramineum.
- 4142. Stramineum.
- 4147. Distichum.
- 4254. Repens.
- 4259. Langei.
- 4765. Monostachyum.
- 5235. Setaceum.

THIEME, C.

- 374. Conjugatum.
- 5592. (Dist. Smith). Conjugatum.
- 5593. (Dist. Smith). Plicatulum.
- 5594. Paniculatum.

THOLLON

- 692. Vaginatulum.

THOMPSON, J. B.

- 2. Fimbriatum.
- 23. Distichum.
- 26. Conjugatum.
- 242. Distichum.
- 254. Plicatulum.
- 294. Conjugatum.
- 382. Paniculatum.
- 449. Laxum.
- 463. Laxum.

THURN, E. F., IM

- 262. Contractum.

TONDUZ, A.

15. Decumbens.
 220. Fasciculatum.
 267. Paniculatum.
 306. Notatum.
 362. Microstachyum.
 683. Notatum.
 685. Tenellum.
 702. Lividum.
 750. Humboldtianum.
 752. Notatum.
 758. Conjugatum.
 769. Costaricense.
 2851. Squamulatum.
 2860. Conjugatum.
 3017 part. Convexum.
 3017 part. Costaricense.
 3364. Conjugatum.
 3649. Decumbens.
 3686. Decumbens.
 4197. Paniculatum.
 4470. Multicaule.
 4471. Minus.
 4472. Plicatum.
 4474. Multicaule.
 4862. Conjugatum.
 4863. Plicatum.
 4869b. Multicaule.
 4880. Decumbens.
 6548. Lineare.
 6946. Paniculatum.
 7193. (Dist. Smith). Candidum.
 7225. Fasciculatum.
 8038. Costaricense.
 8492. Candidum.
 8691. Virgatum.
 8821. Paniculatum.
 8822. Distichum.
 8824. Notatum.
 8828. Conjugatum.
 9395. Dilatatum.
 9854. Candidum.
 11395. Distichum.
 11402. Conjugatum.
 11767 part. Costaricense.
 11767 part. Tonduzii.
 12623. Squamulatum.
 12992. Decumbens.

TORO, R. A.

38. Conjugatum.
 152. Plenum.

TORO, R. A.—Continued

184. Saccharoides.
 569. Plenum.
 675. Candidum.

TORRES, RUBÉN.

14. Candidum.

TRACY, S. M.

19. (Seymour Dist.). Dilatatum.
 21. Ciliatifolium.
 23. Floridanum.
 25. Circulare.
 35. Setaceum.
 66. Vaginatum.
 97. Pubiflorum glabrum.
 100. Difforme.
 113. Pubescens.
 116. Lentiferum.
 117. Lentiferum.
 118. Floridanum glabratum.
 119. Boscianum.
 121. Supinum.
 128. Dissectum.
 130. Floridanum.
 147. Pubescens.
 154. Lentiferum.
 438a. Ciliatifolium.
 1411. (Dist. Pollard.) Boscianum.
 1412. Urvillei.
 1530. Circulare.
 1533. Circulare.
 1560. Floridanum.
 1561. Laeve.
 1571. Laeve.
 1886. Laeve.
 1887. Laeve.
 1891. Ciliatifolium.
 1892. Laeve.
 1893. Setaceum.
 1895. Setaceum.
 1896. Laeve.
 2026. Praecox.
 2040. Floridanum.
 2048. Praecox.
 2049. Floridanum glabratum.
 2860. Laeve.
 2864. Lentiferum.
 2870. Ciliatifolium.
 3662. Supinum.
 3663. Boscianum.

TRACY, S. M.—Continued

3664. Floridanum.
 3665. Lentiferum.
 3666. Praecox.
 3666a. Lentiferum.
 3667. Laeve.
 3668. Floridanum.
 3669. Floridanum.
 3670. Longipilum.
 3671. Floridanum.
 3672. Laeve.
 3673. Plicatulum.
 3676. Floridanum.
 3677. Longipilum.
 3678. Laeve.
 3679. Ciliatifolium.
 3680. Ciliatifolium.
 3681. Laeve.
 3683. Lentiferum.
 3684. Floridanum.
 3685 part. Dilatatum.
 3685 part. Laeve.
 3686. Plicatulum.
 3687. Circulare.
 3688. Ciliatifolium.
 3689. Floridanum.
 3690 part. Floridanum.
 3690 part. Floridanum glabratum.
 3691. Floridanum glabratum.
 3692. Floridanum.
 3693. Floridanum glabratum.
 3694. Floridanum.
 3739. Longipilum.
 3740. Longipilum.
 3741. Ciliatifolium.
 3743. Floridanum.
 3744. Lentiferum.
 3774. Plicatulum.
 3775. Laeve.
 3792. Longipilum.
 3795. Floridanum glabratum.
 3865. Lentiferum.
 3866. Laeve.
 3867. Praecox.
 3959. Boscianum.
 4499. Praecox.
 4500 part. Praecox.
 4500 part. Lentiferum.
 4501. Ciliatifolium.
 4503. Ciliatifolium.
 4504. Setaceum.
 4505. Floridanum.
 4507. Dissectum.
 4509. Plicatulum.

TRACY, S. M.—Continued

4623. Vaginatium.
 4624. Laeve.
 4625. Laeve.
 4626. Laeve.
 4627. Lentiferum.
 4628. Ciliatifolium.
 4629. Boscianum.
 4630. Boscianum.
 4631. Supinum.
 4632 part. Debile.
 4632 part. Longepedunculatum.
 4632 part. Pubescens.
 4632a. Debile.
 6454. Caespitosum.
 6466. Vaginatium.
 6472. Lentiferum.
 6705. Giganteum.
 6717. Giganteum.
 6718. Caespitosum.
 6728. Ciliatifolium.
 6737. Lentiferum.
 7016. Floridanum.
 7032. Caespitosum.
 7035. Giganteum.
 7049. Urvillei.
 7107. Dilatatum.
 7192. Caespitosum.
 7201. Ciliatifolium.
 7369. Langei.
 7370. Dilatatum.
 7388. Distichum.
 7391. Lividum.
 7395. Monostachyum.
 7397. Lividum.
 7398. Floridanum.
 7401. Lentiferum.
 7406. Pubiflorum.
 7750. Repens.
 7936. Distichum.
 7937. Stramineum.
 7938. Pubiflorum.
 8024. Floridanum.
 8027. Setaceum.
 8040. Laeve.
 8212. Floridanum.
 8231. Pubiflorum glabrum.
 8395. Lividum.
 8602. Floridanum glabratum.
 8603. Plicatulum.
 8848. Floridanum.
 8851. Caespitosum.
 8887. Pubiflorum.
 9051. Plicatulum.

TRACY, S. M.—Continued

9052. Plicatum.
 9054. Monostachyum.
 9056. (Florida) Blodgettii.
 9056. (Cuba) Distichum.
 9087. Caespitosum.
 9093. Minus.
 9105. Alterniflorum.
 9117. Plicatum.
 9118. Notatum.
 9119. Lividum.
 9120. Virgatum.
 9121. Millegrana.
 9122. Virgatum.
 9123. Virgatum.
 9124. Virgatum.
 9125. Arundinaceum.
 9126. Arundinaceum.
 9127. Virgatum.
 9306. Ciliatifolium.
 9319. Monostachyum.
 9383. Longepedunculatum.
 9385. Longepedunculatum.
 9388. Lentiferum.
 9390. Monostachyum.

TRACY, S. M., AND BALL, C. R.

20. Laeve.
 23. Laeve.
 25. Praecox.
 26. Praecox.
 27. Lentiferum.
 28. Floridanum.
 29. Floridanum.
 30. Floridanum glabratum.
 31. Floridanum.
 32. Difforme.
 33. Pubescens.
 37. Rigidifolium.

TRACY, S. M., AND LLOYD, C. G.

435. Floridanum.
 450. Floridanum.
 465. Distichum.
 477. Urvillei.

TRIANA, J. J.

258. Candidum.

TRINIDAD BOTANICAL GARDEN

2262. Coryphaeum.
 2271. Decumbens.

TÜRCKHEIM, H. VON

- 66 (Dist. Smith). Boscianum.
 161. Affine.
 440. Costaricense.
 459. Plenum.
 658 (Dist. Smith). Costaricense.
 3773. Lentiginosum.
 3790. Humboldtianum.
 3791. Plenum.
 3830. Convexum.
 3837. Plicatum.
 7697 (Dist. Smith). Minus.
 7793 (Dist. Smith). Paniculatum.
 7794 (Dist. Smith). Decumbens.
 7795 (Dist. Smith). Boscianum.
 8793 (Dist. Smith). Minus.
 8798 (Dist. Smith). Decumbens.
 II. 181. Fasciculatum.
 II. 951. Decumbens.
 II. 1210. Lividum.
 II. 1452. Decumbens.

ULE, ERNST

29. Contractum.
 973. Paniculatum.
 1614. Plicatum.
 8033. Contractum.
 8479. Contractum.

UMBACH, L. M.

- 807 (Kneucker Gram.). Stramineum.
 4178. Stramineum.

UNDERWOOD, L. M. AND GRIGGS, R. F.

147. Plicatum.
 149. Millegrana.
 175. Conjugatum.
 576. Fimbriatum.
 794. Virgatum.

VAN HERMAN, H.

142. Millegrana.
 347. Millegrana.

VAUGHAN, R. E.

- A4. Conjugatum.
 A5. Dilatatum.
 A6. Paniculatum.

VELASCO, L. V.

3. Plicatum.
 5. Paniculatum.
 7. Conjugatum.

VENTURI, S.

63. Notatum.
 1782 part. Urvillei.
 1782 part. Malacophyllum.
 2313. Unispicatum.
 2322. Unispicatum.
 2329. Urvillei.
 2395. Unispicatum.
 3467 (Herb. Parodi). Conspersum.
 3727. Malacophyllum.
 3771. Urvillei.
 5711. Malacophyllum.
 5713. Lividum.
 5717. Unispicatum.
 5728. Lividum.
 7098. Notatum.
 7165. Urvillei.
 7198. Lividum.
 7226. Unispicatum.
 7227. Malacophyllum.

VIRLET

1323. Langei.
 1327. Malacophyllum.

VOLKENS, G.

110. Conjugatum.

WARBURTON, C. W.

9. Stramineum.

WARMING, E.

808. Pumilum.
 839. Multicaule.
 1086 B. Gardnerianum.

WEATHERBY, A. G.

15. Laeve.

WEATHERWAX, PAUL

834. Blodgettii.

WEBER, C. M.

1013. Conjugatum.

WESTGATE, J. M.

3122. Blodgettii.
 3460. Lentiferum.
 3621. Lentiferum.

WETMORE, A.

167. Secans.
 176. Millegrana.
 848. Plicatulum.

WHITE, C. T.

285. Conjugatum.

WHITE, H. L.

44. Distichum.

WHITE, O. E.

1499. Densum.

WIDGREN, J. F.

870. Lineare.
 871. Pilosum.
 885. Pectinatum.
 887. Stellatum.

WILCOX, E. N.

56. Stramineum.

WILLIAMS, R. S.

1034. Paniculatum.
 2377. Conjugatum.

WILLIAMS, T. A.

3091. Laeve.
 3093. Pubescens.

WILSON, PERCY

159. Conjugatum.
 227. Virgatum.
 420. Plicatulum.
 421. Plicatulum.
 467. Orbiculatum.
 1006. Conjugatum.
 1277. Conjugatum.
 9404. Conjugatum.

WILSON, P., AND LÉON, BROTHER

2872. Breve.
 11599. Breve.
 11602. Langei.

WOOD, J. M.

6189. Dilatatum.

WOODWARD, R. W., AND BISSELL, C. H.

5846. Circulare.

WOOTON, E. O.

1077. Distichum.

WRIGHT, C.

167 part. Alterniflorum.
 169. Dissectum.
 171. Pulchellum.
 176. Nanum.
 292 part. Distichum.
 298. Bakeri.
 766. Paniculatum.
 767. Conjugatum.
 768. Plicatulum.
 769 part. Caespitosum.
 769 part. Lindenianum.
 798. Distichum.
 911. Distichum.
 947. Vaginatulum.
 1546. Distichum.
 2093. Distichum.
 3438 part. Minus.
 3438 part. Notatum.
 3439. Pulchellum.
 3440. Dissectum.
 3442. Ciliatifolium.
 3443 part. Blodgettii.
 3443 part. Caespitosum.
 3444 part. Clavuliferum.
 3444 part. Saugetii.
 3445 part. Rupestre.
 3445 part. Saugetii.
 3446 part. Arundinaceum.
 3446 part. Millegrana.
 3446 part. Virgatum.
 3447. Densum.

WRIGHT, C.—Continued

3839. Plicatulum.
 3840. Millegrana.
 3841. Alterniflorum.
 3842. Nanum.
 3843. Wrightii.
 3844 part. Multicaule.
 3845. Propinquum.
 3847. Convexum.
 3848. Filiforme.
 3851. Decumbens.
 3854. Vaginatulum.
 3864. Rottboellioides.
 3866. Nanum.

WRIGHT, C., PARRY, C. C., AND
BRUMMEL, H.

607. Laxum.
 617. Laxum.
 618. Laxum.
 620. Virgatum.
 630. Paniculatum.

WULLSCHLAEGEL, H. R.

593. Notatum.
 603. Secans.
 697. Propinquum.

YATES, H. S.

509. Conjugatum.

ZENKER, G.

269. Conjugatum.
 4026. Paniculatum.