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BOTANY.—*New grasses from Venezuela.*[1] Zoraida Luces, Servicio Botanico, Ministerio de Agricultura y Cría, Caracas, Venezuela. (Communicated by Agnes Chase.)

In the course of a year's study, on behalf of the Ministry of Agriculture of Venezuela, in the grass division of the United States National Herbarium, under the supervision of Mrs. Agnes Chase, several undescribed species were found in the collection of Venezuelan grasses, which it was my official mission to study. The main results of my labor are condensed in a memoir on the *Genera of grasses of Venezuela*, which it is hoped will be published in the near future. Meanwhile, the new species are presented herewith. In addition there are a new genus and six new species of bamboos, which Dr. F. A. McClure kindly undertook to describe. This is the place to express to Mrs. Chase my profound gratitude for her constant help and teaching during my stay in Washington, and my sincere thanks to Dr. F. A. McClure, our foremost specialist on bamboos, and to all the friends who have aided me in my work. Following are the descriptions of the new species:

Helleria Fourn. Mex. Pl. **2**: 128. 1886

A single species, *Helleria livida* (H.B.K.) Fourn., based on *Bromus lividus* H.B.K., is included. This species was placed in *Festuca* by Willdenow (Spreng. Syst. Veg. **1**: 353. 1825). The genus differs from *Festuca* chiefly in the large loose spikelets with flexuous rachilla, the florets spreading at maturity, the lemmas and paleas thin-membranaceous, the lemma at maturity expanded from just above the base, the palea loose, narrow, acuminate; caryopsis oblong-lanceolate, concavo-convex in cross section, with a minute embryo. Densely caespitose grasses of high paramos of Mexico and the Andes of Venezuela.

[1] Received February 24, 1942.

Helleria fragilis Luces, sp. nov.
Fig. 1

Perennis, dense caespitosa; culmi 30–35 cm alti, compressiusculi; vaginae glabrae; ligula

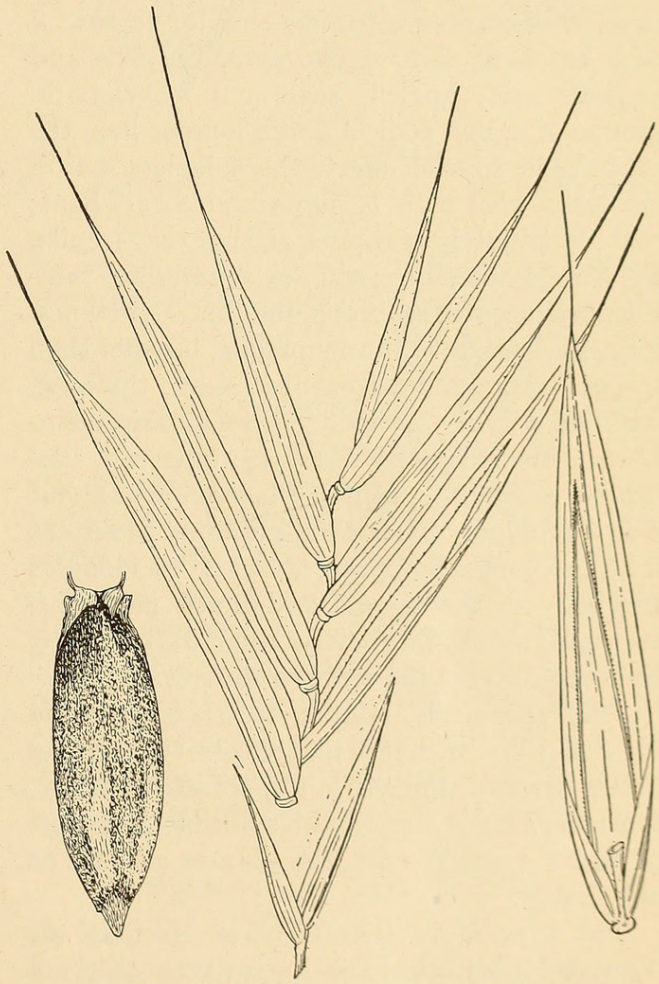

Fig. 1.—*Helleria fragilis*, spikelet and floret, ×2½; caryopsis, ×10. (Type.)

firma, acuminata, scaberrima; laminae firmae, 5–11 cm longae, involuto-setaceae, scaberrimae; panicula simplex, 7–9 cm longa, 2–4 cm lata, axi pedicellisque rigidis scabris; spiculae geminae, 3–4 cm longae, 5–7 florae, pedicello altero 5 mm, altero 8–15 mm longo; rachilla

JUN 23 1942

flexuosa, fragilissima, flosculis patentibus; glumae acuminatae, tenuiter membranaceae, prima 7–10 mm, secunda 11–15 mm longa; lemma planum, ecarinatum, 2.2–3 cm longum, 5-nervium, lanceolato-acuminatum, in aristam 5–7 mm longam attenuatum; palea subhyalina, longe acuminata quam lemma multo brevior et angustior; caryopsis oblongo-lanceolata, circa 3.5 mm longa, concavo-convexa.

Plant perennial, in dense tussocks; culms 30 to 35 cm tall, very slender, stiff, scabrous to glabrous, subcompressed, branching at the lower nodes, the nodes glabrous; sheaths longer than the internodes, glabrous; ligule membranaceous, acute, 3 to 5 mm long; blades 5 to 11 cm long, firm, involute, setaceous, acuminate, very scabrous; panicle simple, narrow, 7 to 9 cm long, 2 to 4 cm wide, the axis and pedicels stiff, angled, scabrous; spikelets in groups of 2, one pedicel 5 mm long or less, the other 8 to 15 mm, erect, the spikelets 3 to 4 cm long, with 5 to 7 florets and a rudiment; rachilla minutely scabrous, zigzag, very fragile, the florets spreading; glumes acuminate, thin-membranaceous, scabrous, the first 7 to 10 mm long, the second 11 to 15 mm long, broader than the first; lemma flat from just above the base, without a keel, 2.2 to 3 cm long, thin-membranaceous, minutely scabrous, 5-nerved, lanceolate-acuminate, tapering into an awn about 5 to 7 mm long; palea thin, minutely scabrous, 2-keeled, long-acuminate, about 2/3 as long as the body of the lemma and much narrower; caryopsis oblong-lanceolate, about 3.5 mm long, concavo-convex, the embryo minute.

This species is related to *Helleria livida* (H.B.K.) Fourn., but in that species the panicles are compound, the axis and pedicels capillary, flexuous, very scabrous, the spikelets in groups of three, smaller, with the glumes as long as the florets.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, a duplicate type in the U. S. National Herbarium, collected in Páramo de Tucani, Sierra Nevada de Mérida, altitude 4,500 m, State of Mérida, Venezuela, December 17, 1910, by Dr. A. Jahn, no. 62. Another collection was made on rocky ridges, higher paramos, near El Gavilan, 4,200 m, State of Mérida, Venezuela, January 25, 1929, by H. Pittier, no. 13276.

Eragrostis plurinodis Swallen, sp. nov.
Fig. 2

Perennis dense caespitosa; culmi 35–55 cm longi, graciles, ramosi, erecti vel patentes, plurinodes, internodiis inferioribus elongatis; vaginae internodiis breviores, glabrae, in ore pilosae; laminae 3–10 cm longae, 1–2 mm latae, glabrae, firmae, adscendentes, planae vel involutae; paniculae 3–6 cm longae, ramis brevibus appressis 1–3 spiculatis; spiculae 7–13 mm longae, 1.5–2 mm latae, 10–20-florae, pallidae vel purpurascentes; lemmata 2–2.1 mm longa, abrupte acuta vel subacuminata, nervis prominentibus; paleae lemmatibus paulo breviores, carinis minute ciliatis.

Fig. 2.—*Eragrostis plurinodis*, panicle, ×1; floret, ×5. (Type.)

Densely tufted perennial; culms 35–55 cm long, slender, branching or proliferous at the lower and middle nodes or with a few short flowering branches from the upper nodes, erect or apparently finally spreading and appearing like stolons, the lower internodes usually elongate, the upper ones much shorter; sheaths shorter than the internodes, glabrous or with a small tuft of hairs at the mouth; blades 3–10 cm long, 1–2 mm wide, glabrous, fine-pointed, firm, stiffly ascending, flat, or drying involute especially toward the tip; panicles 3–6 cm long, the short branches appressed, bearing 1–3 short-pediceled spikelets; spikelets 7–13 mm long, 1.5–2 mm wide, 10–20-flowered, pale but tinged with purple; lemmas 2–2.1 mm long, rather abruptly acute or subacuminate, the nerves prominent, minutely scabrous on the

keel; palea a little shorter than the lemma, minutely ciliate on the keels.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, collected in fields around Cunaviche, State of Apure, Venezuela, February 13, 1941, by C. E. Chardon, no. 249.

This species is related to *E. acuminata* Doell and *E. rufescens* Schult. but differs from the former in being perennial and from the latter in having slender, several-noded, stolonlike culms.

Luziola pittieri Luces, sp. nov.

Fig. 3

Perennis, debilis; culmi caespitosi, graciles, foliis laxis; vaginae compressae, subcarinatae, scabrae; ligula subhyalina acuminata, 10–13 mm longa; laminae planae, lineares, acuminatae, 10–35 cm longae, 2–6 mm latae; panicculae masculae femineaeque similes, pyramidales, laxae, patentes, circa 6–8 cm longae, raro usque ad 14 cm longae, axi ramisque scabris; spiculae longe pedicellatae, pallidae, masculae circa 4 mm longae, lemmate paleaque subhyalinis, lemmate 7–9-nervio, palea 9–11-nervia; spiculae femineae circa 1.5 mm longae, palea lemmateque valde 9–11-nerviis; caryopsis globosa, 1.4–1.5 mm longa, pallida, striata.

Plant perennial, weak, 30–50 cm tall, branching at the straight or somewhat geniculate base, from soft slender rhizomes; culms very slender, caespitose, the nodes glabrous; foliage lax, the sheaths strongly compressed, subcarinate, glabrous, membranaceous, with transverse distant veins visible on the inner face, the margins more delicate; ligule subhyaline, long-acuminate, 10–13 mm long; blades flat, scabrous on both surfaces and on the margins, linear, acuminate, 10 to 35 cm long, 2 to 6 mm wide; inflorescence of unisexual panicles, the staminate and pistillate similar, but the pistillate often on shorter culms, pyramidal, lax, open, usually not more than 8 cm long, rarely as much as 14 cm long, the axis and branches scabrous; spikelets long-pedicellate, pale, the staminate spikelets about 4 mm long, lemma and palea obtuse, subhyaline, the nerves inconspicuous, the lemma 7–9-nerved, the palea 9–11-nerved; pistillate spikelets about 1.5 mm long, lemma and palea equal, not completely covering the caryopsis, with 9–11 conspicuous minutely scabrous nerves; caryopsis globose, 1.4–1.5 mm long, pale, striate.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, duplicate type in U. S. National Herbarium, collected near Dos Caminos, Guárico, Venezuela, by H. Pittier, no. 12530, September 12, 1927. Known only from State of Guárico,

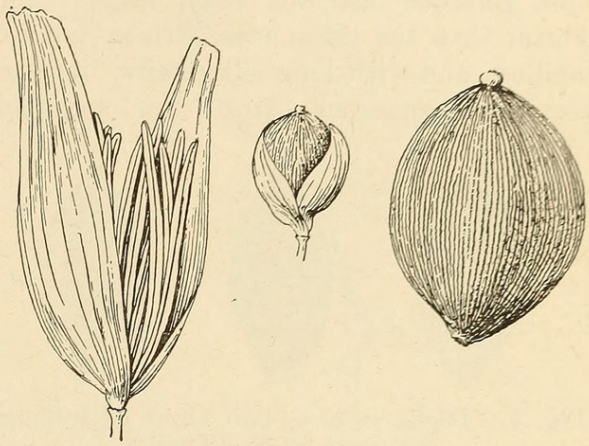

Fig. 3.—*Luziola pittieri*, staminate and pistillate spikelets, ×10; caryopsis, ×20. (Type.)

Venezuela. A second collection is from Lagoon of Mesa de El Sombrero, Guárico, in muddy places. September 10, 1917, H. Pittier, no. 12475.

This species is related to *Luziola peruviana* Gmel. and to *L. gracillima* Prod. From the first it differs in the larger staminate panicle and smaller staminate spikelets, in the smaller pistillate spikelets, the lemma and palea not exceeding the caryopsis, and in the strongly striate fruit. From *L. gracillima* it differs in the laxer blades, smaller staminate spikelets and in the larger pale pistillate spikelets, the blades of *L. gracillima* being erect and relatively stiff, the staminate spikelets 7 mm long and the pistillate spikelets dark purple and 1 mm long.

Digitaria atra Luces, sp. nov.

Fig. 4

Perennis; culmi caespitosi, gracillimi, erecti, 30–38 cm alti, nodis 2 vel 3; vaginae quam internodia breviores, striatae, papilloso-villosae; ligula membranacea, 1–1.5 mm longa; laminae marginibus involutis, flexuosae, acuminatae, 6–25 cm longae, utrinque papilloso-villosae; racemi solitarii (rarius geminati), 6–7 cm longi, rachi 3-angulata, 0.5 mm lata; pedicelli pilosuli; spiculae ellipticae, acuminatae, circa 2.5 mm longae, glumis nullis; lemma sterile palli-

dum, acutum, 3-nervium, pubescens, pilis capitellatis; fructus atra-brunnescens, minutissime papillosus, marginibus pallidis, subhyalinis.

Plant perennial, caespitose, 30 to 38 cm tall; culms very slender, somewhat flat, erect, stiff, with 2 or 3 nodes, from copiously pilose to almost glabrous near the base; sheaths much shorter than the internodes, striate, minutely papillose and with long silky hairs; ligule obtuse, membranaceous, 1 to 1.5 mm long; blades

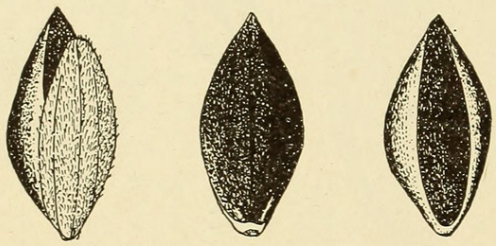

Fig. 4.—*Digitaria atra*, two views of spikelet, and fruit, ×10. (Type.)

flexuous, striate, acuminate, 6 to 25 cm long, 2 to 3 mm wide, papillose-villous on both surfaces, the hairs longer and denser toward the base, the margins involute; racemes solitary (rarely paired), 6 to 7 cm long, the rachis 3-angled, 0.5 mm wide, slightly winged; pedicels loosely pilose; spikelets elliptic, acuminate, about 2.5 mm long, both glumes wanting; sterile lemma pale, acute, 3-nerved, slightly shorter than the fruit, covered with whitish capitellate hairs; fruit blackish brown, the lemma minutely papillose-roughened, with narrow pale subhyaline margins, the base at the back with a minute stripe of pale capitellate hairs on either side, sometimes with but one stripe.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, collected by A. S. Müller in Tabay, State of Mérida, Venezuela. Only known from the type collection.

This is the only American species of *Digitaria* in which the second glume is wholly suppressed. In *D. gracillima* (Scribn.) Fernald the second glume is one-fourth to two-thirds as long as the dark brown fruit, but in that the 2 to 5 long slender racemes are distant on an elongate axis. The African group allied to *D. uniglumis* (Rich.) Stapf, with blackish fruit and suppressed or reduced second glume, has panicles of several to very numerous racemes on an elongate axis, and the pedicels bear stiff hairs as long as the spikelets.

Digitaria fragilis (Steud.) Luces, comb. nov.

Paspalum fragile Steud. Syn. Pl. Glum. **1**: 17. 1854. The type specimen, collected in Cumaná, Venezuela, by Funck & Schlim, no. 724, the name in Steudel's script, is in the Paris Herbarium.

Digitaria rhachitricha Henr. Blumea **1**: 95. 1934. Based on *Funck & Schlim* 724, but the locality given as Colombia. It seems probable that some specimens of this collection were distributed with the name written on a Colombia label, but that the plants really came from Cumaná. The specimen of this number in the Boissier Herbarium in Geneva is labeled "Venezuela, Cumaná."

Mesosetum chaseae Luces, sp. nov.

Fig. 5

Perenne, caespitosum, valde stoloniferum, stolonibus foliosis, 70–100 cm longis; culmi floriferi erecti, 60–65 cm alti; vaginae glabrae, marginibus ciliatis; ligula minuta, fimbriato-ciliata; laminae firmae, planae vel subinvolutae, 3–13 cm longae, 3–7 mm latae, acuminatae, marginibus cartilagineis, papilloso-hispidis; racemus 5.4–7.5 cm longus, 4–5 mm latus, rachi 1 mm lata, anguste alata, marginibus scabris; spiculae imbricatae, lateraliter compressae, pallidae, 5 mm longae; glumae aequales, circa 4.5 mm longae, gluma prima 3-nervia, nervo centrali scabro, supra medium carinato subalato, apice mucronato; gluma secunda naviculata, 5–7-nervia; lemma flosculae masculae naviculatum, 5 mm longum, quam glumae latius et longius, 5-nervium; palea 4 mm longa; fructus circa 4.5 mm longus, elliptico-lanceolatus, acuminatus, lemmate subcompresso apice subcarinato, carina minute hirsuta.

Plant perennial, caespitose, with strong leafy stolons, 70 to 100 cm long, branching at the nodes, the nodes pubescent, the internodes subcompressed, glabrous, purplish; flowering culms simple or sparingly branching, erect, 60 to 65 cm tall; leaves about 9, rather crowded on the lower half of the culm, the sheaths shorter than the internodes, glabrous, the margins ciliate, the hairs longer toward the summit, the collar with a ring of erect hairs or glabrescent; ligule minute, fimbriate-ciliate; blades firm,

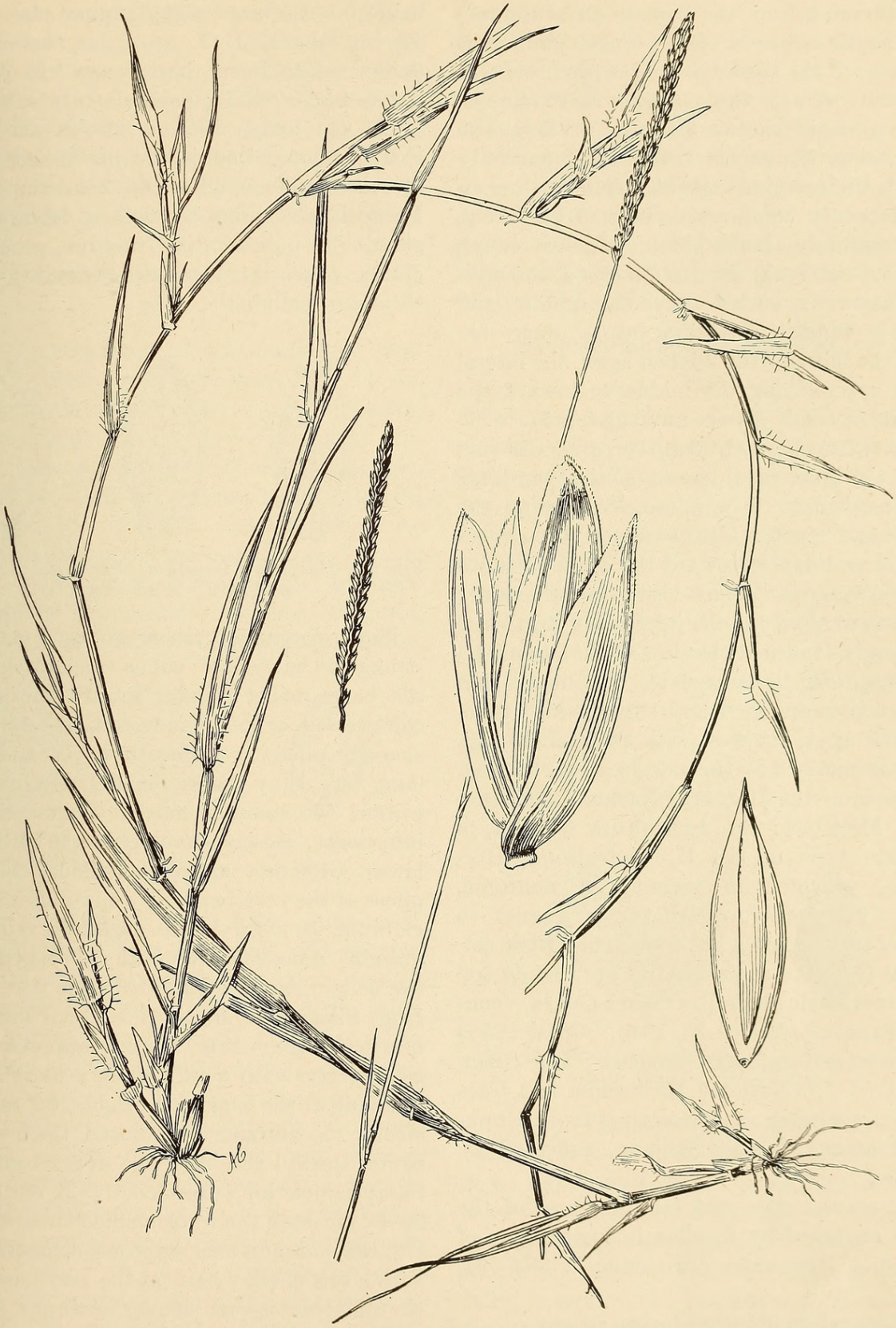

Fig. 5.—*Mesosetum chaseae*, flowering plant, stolon, and reverse view of raceme, ×½; spikelet, ×10 (duplicate type); mature fruit, ×10. (*Chase* 12550.)

flat to subinvolute, 3 to 13 cm long, 3 to 7 mm wide, tapering from the base to an acuminate apex, papillose-hispid on the upper surface at least toward the base, the nerves prominent on the lower surface, the margins cartilaginous, papillose-hispid; raceme 5.4 to 7.5 cm long, 4 to 5 mm wide, the rachis 1 mm wide, narrowly winged, the margins scabrous; spikelets imbricate, laterally compressed, pale, 5 mm long, very minutely scaberulous; glumes equal, about 4.5 mm long, the first 3-nerved, the midnerve scabrous, keeled above the middle, and narrowly winged, extending into a mucro between the lobes of the 2-lobed apex, the lateral nerves approaching the midnerve toward the summit; second glume naviculate, 5- to 7-nerved, with obliquely transverse nerves visible on the inner face; lemma of the staminate floret naviculate, 5 mm long, exceeding the glumes and much wider, 5-nerved, the nerves stronger and darker toward the apex, with obliquely transverse veins visible on the inner face toward the summit, its palea 4 mm long, the margins inflexed, hyaline; fruit about 4.5 mm long, elliptic-lanceolate, acuminate, the lemma subcompressed and slightly keeled toward the apex, the keel with short stiff hairs, the palea enclosed by the margins of the lemma.

Type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, a duplicate type in the U. S. National Herbarium; collected in vicinity of Santomé, State of Anzoátegui, Venezuela, August to November 1940, by A. G. Sandoval. Other collections from the same locality are "sandy soil above morichale along Rio Guara Guara, vicinity of Santomé, March 25, 1940," *Chase* 12550 (very overmature); and *Sandoval*, July 1940.

In the U. S. National Herbarium is a fragmentary specimen of this species from Rupununi Savanna, British Guiana, collected by Melville.

This species does not fall into any of the groups proposed by Swallen in his revision of the genus *Mesosetum* (Brittonia 2: 363–392. 1937).

Paspalum indutum Luces, sp. nov.

Fig. 6

Perenne, subrobustum, basi hirsutissimum; culmi erecti, 100–115 cm alti, nodis longe villosis; vaginae subcompressae, collo velutissimae, infimae appresso-villosissimae, supremae basi pilosae, marginibus glabris vel pilosissimis; ligula 0.5–1.5 mm longa; laminae planae, 4.5–42 cm longae, 3–11 mm latae, acuminatae, dense velutissimae, basi longe villosissimae, nervo medio valido; panicula tota subviscida, 17–21 cm longa, racemis 25–32, axi scabro, sparse piloso, basi et axillis longe villoso; spiculae geminae, ellipticae, 2–2.5 mm longae, 1 mm latae; gluma secunda et lemma sterile glanduloso-pubescentia fructum occultantia, gluma 5-nervia; lemmate 3-nervio; fructus ellipticus, pallidus.

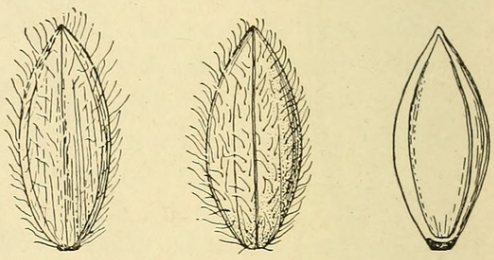

Fig. 6.—*Paspalum indutum*, two views of spikelet, and fruit, ×10. (Type.)

Plant perennial, rather robust, with very strong and hairy base; culms erect, thick toward the base, rather slender toward the summit, compressed or subcompressed, 1–1.15 m tall, sparsely pilose or glabrescent, the nodes with long very silky hairs; sheaths subcompressed toward the summit, mostly shorter than the internodes, closely enveloping the culms, the lowest copiously appressed-villous, the upper pilose at the very base, very minutely papillose, glabrous to very pilose especially along the margins, a dense band of grayish silky hairs on the collar; ligule membranaceous, 0.5–1.5 mm long; blades flat, linear, 4.5–42 cm long, 3–11 mm wide, acuminate, densely appressed grayish velvety, with a tuft of silky hairs about 7 mm long at the back of the ligule, the midnerve strong, the margins often fluted, the lower narrowed toward the base, the upper rounded at base; panicle long-exserted, 17–21 cm long, of 25–32 racemes, the whole panicle somewhat viscid, the common axis scabrous, sparsely pilose, with a tuft of silky hairs at the very base and in the axils; rachis very slender, scabrous, sparsely pilose; spikelets in pairs on slender pedicels, elliptic, 2–2.5 mm long, 1 mm wide; second glume and sterile lemma equal, covering the fruit, the glume 5-nerved, the lemma 3-nerved, both glandular-pubescent, the lemma less densely so; fruit elliptic, pale.

The type is in Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, a fragment of it in the U. S. National Herbarium, collected in Pozo Hondo, near Egido, 960 m altitude, State of Mérida, Venezuela, April 1940, by R. Sergent, no. 37.

Related to *Paspalum coryphaeum* Trin., differing in the less robust culms, the narrower, velvety blades, and smaller and viscid panicles.

Paspalum nudatum Luces, sp. nov.

Fig. 7

Perenne, verisimiliter subaquaticum, caespitosum; culmi gracillimi, erecti, 30–44 cm alti; vaginae internodiis longiores, compressae, carinatae; ligula hyalina, 5–6 mm longa, acuminata; laminae erectae, involutae, glabrae, minutissime papillosae; racemi bini, conjugati, ascendentes, graciles, 3–5.5 cm longi; spiculae solitariae, pallidae, elliptico-obovatae, 1.5 mm longae, 1 mm latae, glumis nullis, lemmate sterili glabro minutissime papilloso, 5-nervio; fructus pallidus, elliptico-obovatus, papillosus.

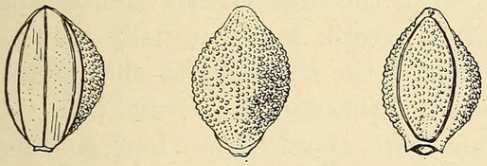

Fig. 7.—*Paspalum nudatum*, two views of spikelet, and fruit, ×10. (Type.)

Plant perennial, apparently subaquatic, caespitose; culms 30 to 44 cm tall, very slender, erect, stiff, subcompressed, with 1 or 2 nodes, glabrous; sheaths much longer than the internodes, strongly compressed, carinate, loose, the nodes visible, strongly striate, glabrous; ligule hyaline, 5 to 6 mm long, acuminate; blades firm, erect, glabrous, obscurely minutely papillose, closely involute, 0.8 mm wide as folded, narrower than the top of the sheath, with rather stiff hairs at base, back of the ligule; racemes 2, conjugate, narrowly ascending, very slender, 3 to 5.5 cm long; margins of the rachis and pedicels minutely scabrous; spikelets solitary, pale, elliptic-obovate, 1.5 mm long, 1 mm wide; both glumes wanting, the sterile lemma glabrous, very minutely papillose, 5-nerved, as long as the fruit but narrower; fruit pale, elliptic-obovate, strongly papillose.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, duplicate type in the U. S. National Herbarium, collected in Tinaquillo, altitude 422 m, State of Cojedes, Venezuela, August 8, 1940, by Carlos Chardon. Only known from the type collection.

This species resembles *Paspalum pictum* Ekman, but that has sheaths much less compressed, the racemes 1 to 4, not conjugate, the spikelets paired, more crowded, smaller, obovate-pyriform, the second glume present and the fruit less papillose.

Panicum mirandum Luces, sp. nov.

Fig. 8

Perenne, basi decumbens, nodis infra radicantes; culmi ascendentes, 90–100 cm alti, papilloso-hirsuti ramosi, ramis divaricatis, nodis pubescentibus; vaginae papilloso-pilosae; ligula minuta; laminae planae, lanceolatae, acuminatae, 6–15 cm longae, 7–16 mm latae; paniculae 12–14 cm longae lataeque, axi ramisque gracilibus, flexuosis; spiculae plerumque geminae, interdum solitariae, raro ternatae, 2 mm longae, ellipticae, glabrae, glumis et lemmate sterili 7–9-nerviis, gluma prima quam spicula brevior; gluma secunda et lemmate sterili fructum occultantibus; fructus ellipticus, brunneus, laevis, 1.5 mm longus, 1 mm latus, apiculatus.

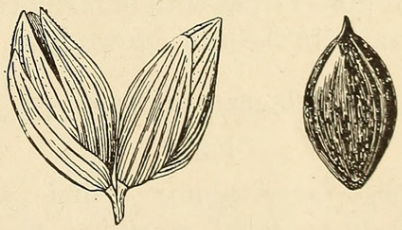

Fig. 8.—*Panicum mirandum*, paired spikelets, and fruit, ×10. (Type.)

Plant perennial, decumbent at base and producing stilt roots at the nodes; culms ascending, 90 to 100 cm tall, terete, producing divaricate branches, the internodes papillose to papillose-hirsute, the nodes densely pubescent; sheaths striate, shorter than the internodes on the main culm, longer on the branches, papillose-pilose, especially toward the summit and on the margins, densely pubescent at the junction with the blades; ligule membranaceous, less than 0.5 mm long; blades flat, somewhat firm, lanceolate, acuminate, usually asymmetric at the narrowed base, 6 to 15 cm long, 7 to 16 mm

wide, glabrous or sparsely hirsute on the upper surface, especially toward the base, faintly appressed-pubescent on the under surface, the margins scabrous and minutely fluted; panicles 12 to 14 cm long, as wide or somewhat wider, the axis and branches very slender, flexuous, pilose in the axils; spikelets usually in pairs, both sessile or nearly so at the ends of the delicate ultimate branchlets, some spikelets solitary, rarely in threes, equal, 2 mm long, elliptic, glabrous, minutely scabrous toward the summit, the nerves prominent, 7 to 9 in both glumes and sterile lemma; first glumes of both spikelets slightly shorter than the spikelets, sometimes in one of the spikelets less than half or minute; second glume and sterile lemma equal, covering the fruit; sterile palea small and delicate; fruit elliptic, dark-brown, smooth and shining, 1.5 mm long, 1 mm wide, apiculate.

The type is in the U. S. National Herbarium, no. 602176, and a fragment of it in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, collected in Guinand Estate (Cárdenas) Siquire Valley; altitude 500 to 1,000 m, State of Miranda, Venezuela, March 19–24, 1913, by H. Pittier, no. 6483. Only known from the type collection.

This species is not closely related to any other *Panicum;* it appears to be in the group with *P. ovuliferum* Trin. and *P. pantrichum* Hack. but differs from both in many characters and strikingly in the dark brown fruit.

Panicum orinocanum Luces, sp. nov.

Fig. 9

Perenne, caespitosum; culmi simplices, erecti, 30–40 cm longi, gracillimi, basi nodosi; vaginae striatae, glabrae, internodiis breviores; ligula 0.3 mm longa; laminae firmae, 2–10.5 cm longae, 1–2 mm latae, acuminatae, planae vel involutae, glabrae; panicula patens, 3–5 cm longa lataque, axi ramisque capillaribus, flexuosis; spiculae longe pedicellatae, ellipticae, 1.5–2 mm longae, nervis prominentibus; gluma prima quam dimidio spicula brevior, 3-nervia; gluma secunda et lemma sterile 6–7 nervia, firmula; fructus ellipticus, subacuminatus, circa 1.5 mm longus, 0.7 mm latus, lemmate obscure pubescenti.

Plant perennial, caespitose, the culms knotted at base, 30 to 40 cm tall, simple, very slender, erect, stiff, glabrous, the nodes usually dark, sometimes pale; sheaths striate, glabrous, shorter than the internodes; ligule membranaceous, 0.3 mm long, with a dense ring of hairs, about 1 mm. long, back of it; blades firm, linear, acuminate, flat or involute, glabrous on both surfaces, 2 to 10.5 cm long, 1 to 2 mm wide, the lower sometimes shorter; panicle open, 3 to 5 cm long and about as wide, the axis

Fig. 9.—*Panicum orinocanum*, spikelet and two views of fruit, ×10. (Type.)

and branches capillary, flexuous, glabrous; spikelets long-pedicelled, elliptic, glabrous or minutely scaberulous, sometimes with few obscure hairs at the base, 1.5 to 2 mm long, the nerves prominent; first glume 3-nerved, half as long as the spikelet or slightly shorter, second glume and sterile lemma 6- to 7-nerved, rather firm, the first slightly shorter than the second, the sterile lemma usually with a staminate flower, the sterile palea shorter than the lemma, membranaceous; fruit pale, elliptic, subacuminate, about 1.5 mm long, 0.7 mm wide, the lemma sparsely and obscurely pubescent with delicate white hairs.

The type is in the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría; a duplicate type in U. S. National Herbarium; collected in Alto Orinoco, in savannas of the Río Cataniapo, Puerto Ayacucho, altitude 88 m, Venezuela; May 23, 1940, by Ll. Williams, no. 13090.

Colombia: In thin pockets of soil in cavities of ferruginous sandstone, about 60 km southeast of Orocue, altitude about 150 m, Comisaría El Vichada, April 20, 1939, Oscar Haught, no. 2775.

This species is related to *Panicum micranthum* H.B.K., but that is freely branching from a delicate base, has broader pilose blades, smaller spikelets, and glabrous fruits.

Panicum cervicatum Chase, sp. nov.

Fig. 10

Perenne, olivaceum; culmi simplices subrobusti, rigidi, erecti vel ascendentes, 80–135 cm

alti; vaginae glabrae vel hispidae; ligula ciliata, 1–2 mm longa; laminae erectae vel ascendentes, durae, plerumque planae, 20–35 cm longae, 10–18 mm latae, acuminatae, glabrae, scaberulae, vel hispidae; panicula erecta, 30–50 cm longa, ramis rigidis patentibus, pedicellis rigidis, spiculis oblique positis; spiculae 6.5–8.5 mm longae 3–3.5 mm latae, turgidae, glabrae, basi constrictae; rachillae segmentum supremum (infra lemma fertile) subcarnosum, processum cartilagineum, crassiusculum, glabrum, ad basin (juxta supraque lemma sterile) gerentum; glumae et lemma sterile 9–11 nervia, acuminatae; gluma prima ovata, 3.5–4 mm longa; gluma secunda et lemma sterile hiantes, purpurascentes, fructum superantes; fructus 4–4.5 mm longus, 2.2–2.4 mm latus, ellipticus, laevis.

Fig. 10.—*Panicum cervicatum*, portion of panicle, ×1; spikelet, two views of rachilla segment, and fruit, ×10. (Type.)

Plants perennial, olivaceous, in clumps of few to several simple subrobust culms 80 to 135 cm tall, stiffly ascending to spreading, glabrous to roughened or hispid below the nodes and below the panicle; nodes appressed hispid to nearly glabrous; sheaths glabrous to strongly hispid, the lower overlapping, the others shorter than the internodes, sometimes retrorse-hispid at the summit; ligule a ring of stiff hairs 1 to 2 mm long; blades erect or ascending, stiff, flat or the margins involute in drying, 20 to 35 cm long, 10 to 18 mm wide, long-acuminate, glabrous or scaberulous to appressed-hispid on both surfaces, the firm scabrous margins hispid-ciliate, but the hairs readily breaking off; panicle erect, 30 to 50 cm long, open and nearly as wide at maturity, the stiff axis, branches, and branchlets striate, scabrous, stiffly flexuous toward the ends, the spikelets set obliquely on stiff pedicels toward the ends of the branchlets; spikelets 6.5 to 8.5 mm long, 3 to 3.5 mm wide, turgid, but constricted at base, glabrous, the glumes and sterile lemma firm, widely gaping at maturity, strongly 9- to 11-nerved, strongly pointed, blotched with dark purple, the first glume broadly ovate, about half as long as the sterile lemma, the second glume slightly longer than the sterile

lemma, both exceeding the fruit, the sterile lemma enclosing a well-developed palea; rachilla segments 0.7 to 1.2 mm long, thick, that between the sterile and fertile florets somewhat fleshy with an expanded summit and a thick cartilaginous process at the back; fruit 4 to 4.5 mm long, 2.2 to 2.4 mm wide, elliptic, smooth and shining, with a prominent scar at base.

Type in the U. S. National Herbarium, no. 1500814, collected in sandy clay cerrado aberto (campo with low scattered trees), 300–325 m altitude, Tres Lagoas, Matto Grosso, Brazil, February 4, 1930, by Agnes Chase, no. 10737.

The peculiar upper rachilla segment with the cartilaginous flaplike process is unlike anything in *Panicum* known to the writer. Before maturity this rachilla segment disarticulates at the base, remaining attached to the fruit (the flap sometimes remaining with the sterile lemma) but at maturity the rachilla segment usually breaks at the summit remaining with the sterile lemma. The specific name refers to the stiff-necked posture of the spikelets.

This species somewhat resembles *Panicum olyroides* H.B.K., to which Doell referred two early collections from Minas Geraes, *Regnell* III 1369, Caldas (examined in Brussels), and *Warming*, Lagoa Santa, in 1864 (examined in Paris). It differs from *P. olyroides* in the less diffuse panicle and in the spikelets constricted at base with relatively long rachilla segments, and in the glabrous fruit, the fruit of *P. olyroides* having a tuft of thick hairs on the margins of the lemma at base.

Sandy or sandy-clay savannas, campos, and open cerrados, southern Venezuela and Brazil.

VENEZUELA: Amazonas, Isla de El Raton, *Williams* 13221.

BRAZIL: Maranhão: Barra do Corda to Grajahú, *Swallen* 3648. Minas Geraes: Serra do Cipó, *Chase* 9138. Pratinha, *Dorsett & Popenoe* 189b; Uberlandia, *Chase* 11167. Goyaz: Annapolis, *Chase* 11519; Viannapolis, *Chase* 11281; Rio Verde, *Chase* 11713; between Jatahy and Rio Araguaya, *Chase* 11736. Matto Grosso: Near Rio Araguaya, *Chase* 11863; Tres Lagoas, *Chase* 10737; northwest of São Lourenço, *Chase* 11959; Sources du Paraguay, *Weddell* 3081. São Paulo: Casa Branca, *Chase* 10591.

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