

THE NORTH AMERICAN SPECIES OF ISACHNE.

By A. S. HITCHCOCK.

INTRODUCTION.

This tropical genus of grasses is, in technical characters, anomalous in the tribe Paniceae, to which it belongs, in that the spikelet has two fertile florets instead of one. That is, throughout the tribe, with the exception of *Isachne*, the spikelet has one terminal fertile floret and one sterile floret, this consisting of a lemma only, of a lemma and palea, or of a lemma, palea, and a staminate flower. In *Isachne* the lateral floret contains a perfect flower and normally develops a seed.

There are seven species in North America, a few more in South America, and several in the tropics of the Old World.

DESCRIPTION OF THE GENUS AND SPECIES.

ISACHNE R. Br.

Isachne R. Br. Prodr. Fl. Nov. Holl. 196. 1810. A single Australian species, *I. australis*, is described.

DESCRIPTION.

Perennial or rarely annual grasses with simple or usually branching stems, flat, strongly nerved blades, and paniculate inflorescence. Spikelets obovoid to subglobose. Glumes membranaceous, about equal and as long as the fruits or at maturity exceeded by them. Lower floret perfect or staminate, its lemma and palea indurate and similar in form and texture to those of the upper floret. Both florets (or fruits) plano-convex, obtuse, equal in size or the upper shorter, the pair usually remaining attached by the minute rachilla joint between them.¹

Isachne polygonoides is exceptional in that the lower floret is unlike the upper. In all the species the lower floret of some of the spikelets may fail to perfect a grain. When sterile the floret is often longer and the lemma less convex than when fertile, the spikelets on the same panicle thus having a somewhat diverse appearance.

KEY TO THE SPECIES.

Florets appressed-pubescent.

Blades ovate-clasping.....1. *I. polygonoides*.

Blades linear.....2. *I. leersioides*.

¹ For further discussion see Chase, Genera Paniceae. IV. Proc. Biol. Soc. Washington 24: 149. 1911.

Florets glabrous, or the palea minutely hispidulous.

Panicle contracted, spikelike, not over 3 cm. long, the branches appressed or the lower sometimes ascending; plants low and spreading.....3. *I. pygmaea*.

Panicles open, the branches spreading or ascending.

Blades about 3 mm. wide, thick, rigid, pungent, with conspicuously thickened midrib.....4. *I. rigidifolia*.

Blades mostly 5 to 20 mm. wide, firm but not pungent nor with thickened midrib.

Plants trailing; blades rarely over 5 cm. long.....5. *I. rigens*.

Plants clambering; blades mostly more than 5 cm. long.

Glumes pubescent; blades firm, not over 12 cm. long and 1 cm. wide.

6. *I. angustifolia*.

Glumes glabrous (rarely obscurely pubescent at the tips); blades mostly over 15 cm. long and 1.5 cm. wide.

Spikelets aggregate toward the ends of the branches and branchlets.

7. *I. arundinacea*.

Spikelets not aggregate; panicle loosely flowered.....8. *I. disperma*.

1. *Isachne polygonoides* (Lam.) Doell.

Panicum polygonoides Lam. Encycl. 4: 742. 1798. "Cette plante croît à Cayenne, & m'a été communiquée par le citoyen Leblond." The type, in the Paris Herbarium, is an entire plant.

Panicum trachyspermum Nees, Agrost. Bras. 212. 1829. "Habitat in graminosis prope Pará provinciae Paraensis." The type, collected by Martius, has been examined in the Munich Herbarium.

Isachne trachysperma Nees in Seem. Bot. Voy. Herald 224. 1857. Based on *Panicum trachyspermum* Nees.

Isachne polygonoides Doell in Mart. Fl. Bras. 2²: 273. 1877. Based on *Panicum polygonoides* Lam.

DESCRIPTION.

Culms decumbent, branching and spreading, rooting at the lower nodes, the flowering branches ascending, 10 to 30 cm. tall, glabrous, the nodes glabrous but the base of the sheath hispid; sheaths mostly shorter than the internodes, papillose-hispid or glabrate; ligule a ring of stiff hairs about 2 mm. long; blades ovate or ovate-lanceolate, 2 to 5 cm. long, 7 to 17 mm. wide, cordate-clasping and ciliate at base, acute or somewhat acuminate at apex, scabrous on the upper surface, puberulent or pubescent beneath; panicles numerous, ovoid, partially inclosed in the sheaths or finally exerted, the branches and branchlets slender, spreading, stiff and more or less implicate, the pedicels 2 to 4 mm. long, enlarged at the summit; spikelets about 1.5 mm. long; first glume glabrous; second glume sparsely hispidulous; lower floret ovate, only slightly turgid, greenish, glabrous, cartilaginous rather than indurate, exceptional for the genus in resembling the glumes rather than the upper floret; upper floret pubescent, whitish, indurate, hemispherical.

This species appears to be an annual. It is distinguished from all our other species by the ovate clasping blades and by the dissimilarity of the two florets.

DISTRIBUTION.

Moist ground, often in the water, Guatemala to Brazil.

GUATEMALA: Chupadero, Heyde & Lux 3916.

COSTA RICA: Buenos Aires, Tonduz 4874. Boruca, Tonduz 4623. Turrialba, Tonduz 8233. San Ramón, Tonduz 17909.

PANAMA: Porto Bello, Pittier 2454. Dolega, Hitchcock 8333. Coclé, Pittier 4917. Chepo, Pittier 4531. Corozal, Hitchcock 9198. David, Hitchcock 8375. Gatún Lake, Amer. Gr. Nat. Herb. 599. Juan Diaz, Killip 4060.

TRINIDAD: Piarco Savanna, Amer. Gr. Nat. Herb. 598.

COLOMBIA: Corinto, *Pittier* 1005.

BRITISH GUIANA: Without locality, *Jenman* 5975.

FRENCH GUIANA: Without locality, *Leprieur* 69.

BRAZIL: Bahia, *Riedel* in 1831.

EXPLANATION OF PLATE 25.—*Isachne polygonoides*. Specimen from Panama, *Amer. Gr. Nat. Herb.* 599. Natural size.

2. *Isachne leersioides* Griseb.

Isachne leersioides Griseb. Mem. Amer. Acad. n. ser. 8: 533. 1862. This is in the second part of *Plantae Wrightianae*. The only specimen cited is Wright's no. 755. Grisebach's specimen of this number, which is the type, is without locality other than eastern Cuba. A specimen in the Gray Herbarium is labeled Monte Verde.

DESCRIPTION.

Culms slender, branched, trailing, glabrous, striate, 1 to 2 meters long; sheaths on the main culms much shorter than the elongate internodes, overlapping on the flowering branches, appressed papillose-hispid or nearly glabrous; ligule a very short membrane, ciliate with stiff hairs about 1 mm. long; blades linear, ascending, rather firm, 5 to 15 cm. long, 0.5 to 4 mm. wide, long-acuminate, cartilaginous-margined, scabrous or hispidulous on both surfaces; panicles terminating the branches, ovoid or oblong, 5 to 15 cm. long, as much as 7 cm. wide, the branches mostly single, rather stiffly ascending or spreading, bearing from near the base stiffly spreading branchlets, the spreading pedicels 2 to 3 mm. long; spikelets about 1 mm. long; glumes hispidulous; florets appressed-pubescent.

DISTRIBUTION.

Dry cliffs and pine barrens, Cuba.

CUBA: Sierra de las Yeguas, *Léon* 5078. Zaza del Sur, *Léon* 6730. Sierra del Cabañete, *Léon* 6520. Cajalbana, *Léon* 4843. Woodfred, *Shafer* 3013. La Perla, *Shafer* 8561. Monte Verde, *Wright* 755.

EXPLANATION OF PLATE 26.—*Isachne leersioides*. Specimens from Cuba, *Léon* 4843 and 5078. Natural size.

3. *Isachne pygmaea* Griseb.

Isachne pygmaea Griseb. Fl. Brit. W. Ind. 553. 1864. "Hab. Jamaica!, Macf., probably an alpine grass, like the preceding [*I. rigens*]." The type, collected by Macfadyen but without exact locality, has been examined in the Grisebach Herbarium.

DESCRIPTION.

Plants low, the slender branches spreading, glabrous, the flowering shoots usually less than 15 cm. tall, rarely as much as 30 cm. long; sheaths glabrous, ciliate on the margins; ligule a very short hispidulous ring; blades narrowly oblong-lanceolate, 0.5 to 2 cm., or rarely 3 cm. long, rarely over 2 mm. wide, spreading, glabrous or puberulent, the white cartilaginous margin somewhat scabrous; panicles long-exserted, narrow, compact and spikelike, usually less than 2 cm. long, the lower branches short and somewhat distant, appressed or rarely ascending; spikelets about 1.3 mm. long, nearly sessile; glumes glabrous, about two-thirds as long as the spikelet; florets glabrous.

DISTRIBUTION.

Grassy banks. This rare grass has a very limited distribution, being known only from a small area in the Blue Mountains of Jamaica between Newcastle and Cinchona, at about 1,500 meters altitude.

JAMAICA: Cold Spring Gap, *Amer. Gr. Nat. Herb.* 419; *Harris* 11314, 12490. Moodys Gap, *Britton* 3375.

EXPLANATION OF PLATE 27.—*Isachne pygmaea*. Specimen from Jamaica, *Amer. Gr. Nat. Herb.* 419. Natural size.

4. *Isachne rigidifolia* (Poir.) Urban.

Agrostis rigidifolia Poir. in Lam. Encycl. Suppl. 1: 257. 1810. "Cette plante croît à l'île de Saint-Domingue. (V. s. in herb. Desfont.)" Poiret gives as a synonym *Milium rigidum*. The type has been examined at the Florence Herbarium. It is now in the Webb Herbarium, which contains the Desfontaines Herbarium.

Milium rigidum Poir. in Lam. Encycl. Suppl. 1: 257. 1810, as synonym of *Agrostis rigidifolia* Poir.

Milium rigidifolium Roem. & Schult. Syst. Veg. 2: 319. 1817. Based on *Agrostis rigidifolia* Poir.

Panicum rigidifolium Kunth, Rév. Gram. 1: 37. 1829. Based on *Agrostis rigidifolia* Poir.

Isachne rigidifolia Urban, Symb. Antill. 4: 85. 1903. Based on *Agrostis rigidifolia* Poir. The specimen which Urban mentions, *Sintenis* 1359 from Sierra de Luquillo, Porto Rico, is *Isachne angustifolia*.

DESCRIPTION.

Culms spreading and branching, the flowering shoots firm and rigid, 15 to 40 cm. tall; sheaths glabrous, stiffly ciliate on the margin, overlapping on the flowering shoots; ligule a very short, lacerate or ciliate membrane; blades oblong, 2 to 4 cm. long, 2 to 4 mm. wide, firm, rigidly spreading, pungently pointed, glabrous, the cartilaginous margin and thick midrib whitish; panicles long-exserted, open, oblong, rather narrow, 2 to 5 cm. long, the branches ascending or spreading, bearing the branchlets mostly on the lower side, the pedicels rigid, 1 to 2 mm. long; spikelets about 2 mm. long, purplish, borne obliquely upon the pedicels; glumes glabrous or sparsely appressed-hispidulous near apex; florets smooth.

The species is easily recognized by its smooth, rigid, spreading, pungently pointed, conspicuously distichous blades.

DISTRIBUTION.

Mountain bogs, West Indies.

SANTO DOMINGO: Río Yaque, *Fuertes* 1729.

LEEWARD ISLANDS: Guadeloupe, *Duss* 3190.

WINDWARD ISLANDS: Martinique, *Duss* 1312; *Hahn* 1435.

EXPLANATION OF PLATE 28.—*Isachne rigidifolia*. Specimen from Martinique, *Hahn* 1435. Natural size.

5. *Isachne rigens* (Swartz) Trin.

Panicum rigens Swartz, Prodr. Veg. Ind. Occ. 23. 1788. "Jamaica." The type, in the Swartz Herbarium at Stockholm, is an ample specimen.

Isachne rigens Trin. Gram. Pan. 252. 1826. Based on *Panicum rigens* Swartz.

DESCRIPTION.

Culms tufted, glabrous, slender, wiry, trailing, 1 to 2 meters long, as much as 2 mm. thick, the numerous flowering shoots curving upward, 10 to 30 cm. long; sheaths glabrous or puberulent, ciliate on the margin; ligule a ring of stiff hairs about 0.5 mm. long; blades narrowly oblong-lanceolate, 2 to 5 cm. long, 2 to 5 mm. wide, spreading, moderately firm but not stiff and rigid, scabrous on both surfaces and on the cartilaginous margin; panicles ovoid or oblong, 2 to 5 cm. long, the branches and branchlets stiffly ascending or spreading, the pedicels 1 to 2 mm. long; spikelets 1.8 to 2 mm. long; glumes minutely hispidulous; rachilla between the two florets minutely villous; palea of upper floret sparsely appressed-hispidulous.

DISTRIBUTION.

Damp shady banks, Blue Mountains, Jamaica, at 1,000 to 2,000 meters altitude; also in northern South America.

JAMAICA: Cinchona, *Amer. Gr. Nat. Herb.* 420; *Harris* 11316, 11333, 11417, 11432, 12480. Abbey Green, *Hitchcock* 9362; *Harris* 11585. Catherines Peak, *Hitchcock* 9732. Clyde River, *Harris* 11445. Cold Spring Gap, *Harris* 11336, 12489. Hardware Gap, *Harris* 11543. Sir Johns Peak, *Harris* 11595.

COLOMBIA: Santa Marta, *Smith* 207.

VENEZUELA: Without locality, *Fendler* 1637, 2504.

EXPLANATION OF PLATE 29.—*Isachne rigens*. Specimen from Jamaica, *Harris* 12489. Natural size.

6. *Isachne angustifolia* Nash.

Isachne angustifolia Nash, *Bull. Torrey Club* 30: 377. 1903. "On the summit of El Yunque, Luquillo Mountains, Porto Rico, Wilson no. 160." The type, in the New York Botanical Garden Herbarium, is a long branched shoot with numerous leaves and several panicles.

DESCRIPTION.

Culms clambering, as much as 2 meters long and 2 mm. thick, hard and wiry, with a long naked base, branching from the upper nodes, the branches long, leafy, nearly parallel, bearing secondary branches toward the ends, the whole forming a wide, flabellate or loosely corymbose mass, in its most characteristic development pushing through the jungle of stream bank or trail side and hanging over bushes; sheaths appressed papillose-pilose or roughened with papillae, or glabrous, the margin ciliate; ligule a ring of very short stiff hairs less than 0.5 mm. long; blades narrowly lanceolate, 3 to 15 cm. long, but mostly more than 5 cm. long, 5 to 12 mm. wide, rather firm and stiffly spreading, scaberulous or glabrate, papillose-ciliate at base or papillose only; panicles ellipsoid or oblong, as much as 15 cm. long, the branches stiffly ascending or finally spreading, the branchlets and pedicels finally divaricate, these and the main axis scabrous; spikelets about 1.5 mm. long; glumes minutely hispidulous toward the tip; florets and rachilla glabrous.

DISTRIBUTION.

Rocky slopes among brush, Porto Rico (at higher altitudes) and Guadeloupe.

PORTO RICO: Utuado, *Sintenis* 6421. Rio Icaco, *Shafer* 3477. Adjuntas, *Sintenis* 4045. El Yunque, *Sintenis* 1355. Maricao, *Chase* 6222; *Britton & Cowell* 4271. Sierra Luquillo, *Hioram* 369. Cayey, *Chase* 6750. Monte Alegrillo, *Britton, Stevens & Hess* 2566. Monte Torrecilla, *Britton, Cowell & Brown* 5595.

LEEWARD ISLANDS: Guadeloupe, *Duss* 2705.

EXPLANATION OF PLATE 30.—*Isachne angustifolia*. Specimens from Porto Rico, *Chase* 6222 and 6750. Natural size.

7. *Isachne arundinacea* (Swartz) Griseb.

Panicum arundinaceum Swartz, *Prodr. Veg. Ind. Occ.* 24. 1788. "Jamaica." The type, in the Swartz Herbarium at Stockholm, consists of two shoots, one with a young unexpanded panicle, the other with a spreading panicle past maturity. The glumes of the former are hispid at the summit, of the latter glabrous.

Panicum glaucescens H. B. K. *Nov. Gen. & Sp.* 1: 104. 1816. "Crescit locis planis, propatulis Novae Andalusiae juxta Bordones et in excelsis, opacatis Andium prope Pasto." The type, in the Paris Herbarium, "in excelsis prope Pasto," is a shoot with several leaves and a small, rather dense panicle.

Isachne panicea Trin. *Gram. Pan.* 253. 1826. Trinius unites *Panicum arundinaceum* and *P. dispernum*, giving both names as synonyms, but his description applies better to the first ("Panicula densiuscula").

Isachne arundinacea Griseb. *Fl. Brit. W. Ind.* 553. 1864. Based on *Panicum arundinaceum* Swartz.

DESCRIPTION.

Culms climbing among shrubs or small trees to a height of as much as 6 meters, as much as 5 mm. thick at base, with strong canes and elongate branches; sheaths glabrous, or rarely slightly scabrous, ciliate on the margin, sometimes a little papillose near the summit, overlapping on the flowering shoots; ligule of stiff hairs as much as 5 mm. long; blades narrowly lanceolate, as much as 20 cm. long and 2 cm. wide, long-acuminate, scabrous, sometimes becoming smoothish, often papillose on the margin at base; panicles ovoid or ellipsoid, as much as 12 cm. long and 10 cm. wide, rounded at summit, the branches ascending or the lower finally spreading, branched from about the middle, the spikelets somewhat aggregate on the branchlets, the panicle thus rather compactly flowered at the periphery, the pedicels 0.5 to 2 mm. long; spikelets about 1.5 mm. long; glumes glabrous or with a few short stiff hairs at the summit; florets glabrous.

DISTRIBUTION.

Wooded hillsides, Jamaica, at an altitude of 1,000 to 2,000 meters; also southern Mexico to South America.

VERACRUZ: Consoquitla, *Liebmann* 331, 332. Mirador, *Liebmann* 333, 335. Orizaba *Müller* 78; *Pringle* 5570. Zacuapan, *Purpus* 2000. Jalapa, *Smith* 1804.

OAXACA: Without locality, *Galeotti* 5868.

CHIAPAS: Chicharras, *Nelson* 3764. Without locality, *Purpus* 7410.

GUATEMALA: Cobán, *Smith* 1854; *Türckheim* 87. Secanquím, *Pittier* 252.

COSTA RICA: Cañas Gordas, *Pittier* 11009. Los Palmares, *Pittier* 10651. Juan Viñas, *Cook & Doyle* 338. La Palma, *Tonduz* 12567. Tucurrique, *Tonduz* 12798, 12970. Chirripó, *Tonduz* 166. La Hondura, *Jiménez* 535.

PANAMA: El Boquete, *Hitchcock* 8277.

JAMAICA: Catherines Peak, *Amer. Gr. Nat. Herb.* 418; *Eggers* 3583. Gordon Town, *Hart* 708. Wallenford, *Harris* 11551, 11567. Content Gap, *Harris* 11517. Abbey Green, *Hitchcock* 9386. Bryans Hill, *Harris* 11529. Cold Spring Gap, *Harris* 11337, 12491. Flamstead, *Harris* 11468, 11581. Whitfield Hall, *Harris* 11583, Mount Lebanon, *Harris* 12487.

COLOMBIA: Santa Marta, *Smith* 210.

VENEZUELA: Carayaca, *Jahn* 305.

BOLIVIA: Yungas, *Bang* 297; *Rusby* 6.

EXPLANATION OF PLATE 31.—*Isachne arundinacea*. Specimen from Jamaica, *Amer. Gr. Nat. Herb.* 418. Natural size.

8. *Isachne disperma* (Lam.) Doell.

Panicum dispernum Lam. Tabl. Encycl. 1: 173. 1791. "Ex Amer. Merid. Com. D. Richard." The type, in the Paris Herbarium, is a shoot with 5 leaves and a panicle from which most of the spikelets have fallen, the pedicels slender and spreading. The locality is not indicated on the label, only the name and "ex D. Richard."

Panicum multinerve Desv.; Poir. in Lam. Encycl. Suppl. 4: 279. 1816. "Cette plante croît aux Antilles. (V. s. in herb. Desv.)." The type, in the Paris Herbarium, is said to be from Porto Rico, "Habitat in Antillis (Portoricensis)," but the statement is probably erroneous as the species is otherwise unknown from that island. The label bears, besides the name *Panicum multinerve* Desv., the name *confertum* Desv. It would appear that this specimen is the type of the latter name also, especially as no other specimen could be found that appeared to be the type.

Panicum confertum Desv.; Poir. in Lam. Encycl. Suppl. 4: 279. 1816. "Cette plante croît aux Antilles (V. s. in herb. Desv.)." See remarks under *Panicum multinerve* in the preceding paragraph. Poiret describes both species in succeeding paragraphs, but the descriptions do not differ essentially. The blades in both are

described as glabrous, while in *Isachne arundinacea*, the only other species it could be, they are scabrous.

Isachne ? dubia Kunth, Rév. Gram. 1: 42. 1829. Based on *Panicum dispernum* Lam. The question mark inserted by Kunth is accounted for by his note, "In herbario Richardi non amplius suppetit."

Isachne disperma Doell in Mart. Fl. Bras. 2²: 274. 1877. Based on *Panicum dispernum* Lam.

DESCRIPTION.

Aspect of plant as in *I. arundinacea*; sheaths glabrous or rarely papillose-hispidulous; ligule hairs as much as 2 mm. long; blades on the average larger than in *I. arundinacea*, glabrous, scabrous toward the apex; panicles as much as 20 cm. long, the branches and branchlets spreading, the spikelets in twos or threes at the ends of the branchlets, the panicle thus more open and flowered more equally throughout than in *I. arundinacea*, the spikelets not strongly aggregate toward the periphery; spikelets slightly over 1 mm. long; glumes and florets glabrous.

DISTRIBUTION.

Mountain woods, Lesser Antilles.

LEEWARD ISLANDS: St. Kitts, Britton & Cowell 395. Guadeloupe, Duss 3189.

Dominica, Eggers 1056; Jones 38.

WINDWARD ISLANDS: Martinique, Duss 1311. Grenada, Broadway 76.

TOBAGO: Amer. Gr. Nat. Herb. 597.

EXPLANATION OF PLATE 32.—*Isachne disperma*. Specimen from St. Kitts, Britton & Cowell 395. Natural size.



ISACHNE POLYGONOIDES (LAM. DOELL.)



ISACHNE LEERSIODES GRISEB.



ISACHNE PYGMAEA GRISEB.



ISACHNE RIGIDIFOLIA (POIR.) URBAN.



ISACHNE RIGENS (SWARTZ) TRIN.



ISACHNE ANGUSTIFOLIA NASH.



ISACHNE ARUNDINACEA (SWARTZ) GRISEB.



ISACHNE DISPERMA (LAM.) DOELL.