SOME NEW SPECIES OF AXONOPUS (GRAMINEAE).

BY

Dr J. TH. HENRARD

(Rijksherbarium, Leiden)

(Issued June 15th, 1942).

During the preparation of an account of the grasses for the flora of Dutch Guiana many difficulties were found in the identification of species of the genus *Axonopus*. Our knowledge as to the most recent treatment is entirely based upon Doell's work for the Flora Brasiliensis. It is, however, evident that Doell did not see many types and his concept of many species proves to be incorrect. The modern genus *Axonopus* is not accepted by Doell but treated by him as a section *Emprosthion* of the large genus *Paspalum*. The difficulties arose already when he treated Fluegge's *Paspalum furcatum* which is a continental North American species. Raddi's *Paspalum obtusifolium* from Brazil, although given as a synonym, is a quite distinct species. As another synonym is mentioned by Doell in Fl. Bras., Vol. II, pars II, p. 103: *Panicum surinamense* Hochstetter in Hostm. et Kappler, Plant. Surinam. n. 1283 with the addition: "spiculis ad margines, imprimis basi, magis pilosis". The correct citation of *Panicum surinamense* Hochst. is, however, given by Steudel in his Synopsis, where the species is published. The type of Steudel was certainly not seen by Doell, but the valid publication of the year 1854 was mentioned by Doell under *Paspalum scoparium* Fluegge with the same number 1283 and the addition "partis nomine". I observe here that the synonyms under *Paspalum scoparium* Fluegge in Doell's treatment are for the greater part wrongly placed. It may be that Doell saw different plants of Hostmann and Kappler's number 1283, but the type of Steudel corresponds to only one definite species, correctly described by him.

From the description it is evident that Steudel's plant is neither *Paspalum furcatum* nor *Paspalum scoparium*. To demonstrate this we have but to compare the description from the year 1854 which runs as follows:

Panicum surinamense Hochst. (Hrbr. Dr. Hostmann nr. 1283) Erectum; culmo firmo valido elato (abscisso 3-pedali); vaginis longissimis basi cum nodis dense molliterque sursum ad vaginas tantum pilosis; foliis linearibus compressis (1′ longis in statu explanato 4—5‴ latis) glabris carina scabriusculis; racemis elongatis (6—9″) longis strictis fasciculatis (6—8); spiculis solitariis 1½-linealibus subsessilibus alternis subimbricatis

lanceolatis glabris; gluma inferiore vix ulla (nisi apex explanatus pedicelli brevissimi), superiore 3-nervia flosculum aequante. Surinam.

This description is clear and corresponds to a distinct species which is a member of the modern genus *Axonopus*.

The actual type (*Hostmann No. 1283*) was not seen by me but I was so fortunate as to find a good duplicate of this important plant at the Herbarium of Utrecht with Hostmann's number 1283, attached to the specimen. This specimen perfectly agrees with Steudel's description cited above. I could compare this specimen also with an authentic specimen of *Paspalum leptostachyus* H. B. K. in the Herbarium of Willdenow at Berlin in Willdenow's cover No. 1587. This is a distinct species, *Axonopus leptostachyus* (Fluegge) Hitchc. and different from Steudel's *Panicum surinamense*; the latter is a species of *Axonopus* and being valid, is transferred by me to that genus as **Axonopus surinamensis** (Hochst.) Henr., nov. comb., based upon Steudel's *Panicum (Digitaria) surinamense*.

It is noteworthy that the taxonomical characters in the genus *Axonopus*, applied to separate the various species are different from those generally used in the allied genus *Digitaria*. In *Digitaria* there are great differences in the characters of the spikelets, whereas the vegetative parts present but few characters to separate the species. In *Axonopus*, however, the general form of the spikelets is often nearly the same in allied species, whereas there are great differences in the vegetative parts. This is the reason why the genus *Axonopus* is readily recognizable, even at once, when there are spikelets at our disposal. *Axonopus surinamensis* is most allied to *Axonopus leptostachyus* (Fluegge) Hitchc. Both species have but few very long racemes, placed solitary along a common axis. In *Axonopus leptostachyus* the spikelets are smaller (about 2½ mm) and the fruits are darker, more obovate and less hairy at their summit. In *Axonopus surinamensis* the spikelets are larger (3½ mm), the fruit is more ovate, pale yellowish and more densily hairy at the summit. On account of the differences mentioned above, the two species are accepted as distinct, although they are closely allied. The specimen of *Axonopus leptostachyus* in Willdenow's Herbarium is probably not the actual type of Fluegge, it is at present a most valuable specimen, being received from Humboldt, the more so since Humboldt's plant, described by Fluegge, could not be located.

Willdenow's plant agrees with the description of Fluegge in the year 1810 and also with Humboldt's own description in the Nova Genera from the year 1815. *Axonopus leptostachyus* was mentioned by Hitchcock in his work on the grasses of British Guiana as found along the Mazaruni and the Essequibo River near Bartica. I saw both numbers 17114 and 17264 collected by him. The first one is a more depauperate plant with shorter, only about 12 cm long racemes, the other number is more robust and bears 25 cm long racemes. Steudel's duplicate type has at least 20 cm long racemes and Hitchcock No. 17264 therefore agrees better with this plant. Both numbers have, moreover, the same large 3½ mm long spikelets. Hitchcock's identification is wrong and his specimens, so far as I saw them, belong to *Axonopus surinamensis* (Hochst.) Henr. All specimens identified by me as *Axonopus surinamensis* have densely adpressed sericeous nodes.

Another species of this group is **Axonopus longispica** (Doell) Henr., nov. comb., based upon *Paspalum longispica* Doell as described in the Flora Brasiliensis. This species has also but few racemes but differs by the glabrous nodes. We can distinguish a number of other species by their great number of racemes of the inflorescence. In these cases the racemes are not placed solitary along the axis but each raceme, at least the lower ones in each panicle, is divided nearly from the base into many other ones of nearly equal length, giving the panicle a more dense aspect.

A new interesting species of this group is

Axonopus gentilis Henr., nov. spec. — Perennis, caespitosa; culmi erecti, elati, robusti, teretes, cum paniculis usque ad 1.5 m vel plus alti, glabri, striati, multinodes, nodis minute adpresse puberulis, inferioribus vaginis obtectis, superioribus nudis; vaginae arctae internodiis longiores, haud carinatae, striatae, scaberulae, superne, praesertim ad margines hirsutulae; laminae planae, ad 1 cm vel paulo plus latae, firmae, valde elongatae, sensim acuminatae, scabrae, nervo medio crasso praeditae, subtus inter nervis albo-lanuginosae, basi marginibus longiter hirsutae, macula triangularis praeditae, 50 cm vel plus longae, ligula brevis sed longe niveo-barbata; inflorescentia elongata, angusta, 30 cm vel plus longa, basi cuneata, racemis pluribus elongatis usque ad 15 cm longis formata, axis communis striatus, scaberulus, racemi filiformes, triangulares, dense spiculati, in axillis haud barbatis, leviter puberuli tantum, marginibus serrulatis, quasi singuli, sed a basi divisi; spiculae minute pedicellatae, quasi sessiles, glaberrimae, pusillae, ellipticae, 1.7 mm longae; gluma II, lemma sterilis et fertilis aequilongae, gluma II et lemma sterilis ambae 5-nerves, hyalinae, lemma fructifera coriacea, albidula, punctulato-scaberula.

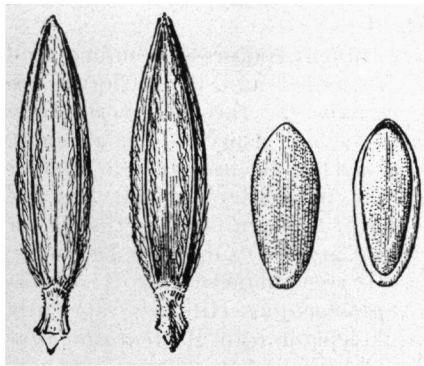
Expeditio ad fines Surinamensi-Brasilienses designandos. Iter I. Upper Sipaliwini, Camp IV, savannah, 2°N. lat., 56°W. long., leg. *H. E. Rombouts*, 23 Oct. 1935. *No. 203 Typus* (Herb. Leiden, dupl. Herb. Utr.).

This species is distinguished by its very robust form and by the very small spikelets, the equal outer scales not protruding above the fruit.

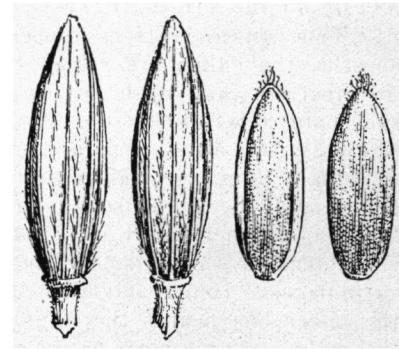
Another robust species from the same locality is

Axonopus pubivaginatus Henr., nov. spec. — Perennis, caespitosa, culmi elati, robusti, valde compressi, paucinodes, internodiis elongatis, nodis constrictis dense sericeo-barbatis, vaginae compressae, carinatae, equitantes, inferne glabrescentes, superne et ad margines pubescento-hirsutae, pilis basi tuberculatis; laminae carinato-complicatae, superne planae, basi collo dense hirsuto a vagina separatae, explanatae ad 1 cm vel plus latae, valde elongatae sensim acuminatae, scabrae, pilis paucis adspersae, ligula brevissima, barbata; inflorescentia exserta, 20 cm vel paulo plus longae, flabellata, cuneata, axis communis albreviatus, ca 5 cm longus, angulatus, striatus, scaberulus, racemi in axillis puberuli tantum, quasi singuli, sed ad basi in ramulis pluribus aequilongis divisi, racemi triangulares, marginibus scaberulo-serratis; spiculae elliptico-oblongae, superne distincte acuminatae, brevissime pedicellatae, 3 mm longae, puberulae, gluma sterilis et lemma sterilis aequilongae, circa 5-nervis, nervis prominentibus, interstitia adpresse pubescentes, lemma fertilis lanceolata, brevior, superne pilis albis praedita, coriacea, leviter striolato-punctata, albidula.

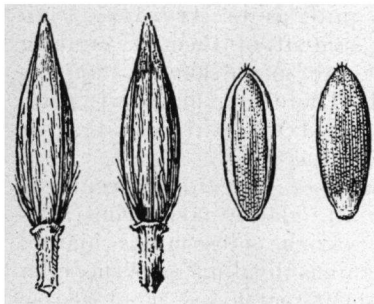
Expeditio ad fines Surinamensi-Brasilienses designandos. Iter I.



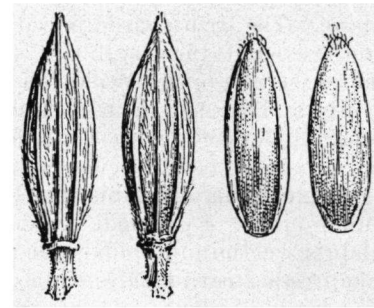
Axonopus columbiensis, nov. spec. — From type specimen — × 10.



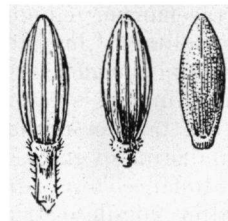
Axonopus surinamensis (Hochst.) Henr. — From Hostmann No. 1283 — × 10.



Axonopus leptostachyus (Fluegge) Hitchc. — From type specimen — × 10.



Axonopus pubivaginatus, nov. spec. — From type specimen — × 10.



Axonopus gentilis, nov. spec. — From type specimen — × 10.

Upper Sipaliwini, Camp B, leg. *H. E. Rombouts*, 20 Jan. 1936. *No. 395 H, Typus* (Herb. Leiden, dupl. Herb. Utr.).

This species differs especially in the much compressed culms and sheaths, the culms are robust but rather few-noded and the inflorescence differs from that of *A. gentilis* in the short axis, the racemes overtopping the main axis and giving the panicle a flabellate aspect. The racemes, especially the lower ones, are once more divided to the base into a number of equally long racemes, simulating secondary panicles. The spikelets are acuminate, the outer scales protruding above the fruits and the latter have a distinct short tuft of white hairs at the summit. In many characters of the spikelets there is a great resemblance with *Axonopus surinamensis* Henr. and with *Axonopus leptostachyus* Hitchc.; especially the latter has nearly the same form of spikelets, but in *A. leptostachyus* the spikelets are more hairy at the base and the fruit is more obovate and broadest above. Both *A. surinamensis* and *A. leptostachyus* have, however, very long solitary racemes.

Another species with solitary racemes was formerly identified for me by Prof. Hitchcock as belonging to *Axonopus leptostachyus* Hitchc. Even a superficial glance at the spikelets, however, proved that there are important differences with that species, when I compared it with the specimen in Willdenow's Herbarium at Berlin, the specimen mentioned by me above. The fruits are indeed more obovate quite as in *Axonopus leptostachyus*, but the small tuft of hairs at the summit of them is wanting, moreover the outer scales in the new plant are much longer than the fruits and exceed them at least by one third. There are, moreover, many other differences with Fluegge's species, so that I am convinced that we have here a new species, which I will describe as

Axonopus columbiensis Henr., nov. spec. — Perennis, caespitosa; culmi erecti, 4—5 nodi, valde compressi, striati, glabri, nodis contractis, glabris vel minute puberulis pilis adpressis; vaginae plus minus hiantes, compressae, carinatae, striatae, glabrae, marginibus hyalinis superne ciliatis; laminae planae, ad 1.5 cm latae, sensim acuminatae sed haud acutae, hinc inde pilis sparsis praeditae, nervo mediano crassiusculo, nervis secundariis 10—12 percursae, ad 20 cm vel paulo plus longae, haud rigidae, viridulae, collo obliquo hirsuto a vagina separatae, ligula longe pilosa, pedunculus inflorescentiae gracilis, panicula terminalis e racemis circa 5 composita, axis communis abbreviatus, circa 3 cm longus, racemi laxi, elegantes, ad 14 cm longi, racemi secundarii laterales e nodis fere omnibus erumpentes vel inter vaginas occulti, e ramis paucis, vulgo 2 compositi, axis partialis racemorum equaliter spiculatus, applanatus, distincte marginatus, spiculis solitariis breviter pedicellatis, pedicelli triquetri, puberuli; spiculae 3.5 mm longae, regulariter lanceolato-oblongae vel elliptico-oblongae, haud acuminatae, stramineo-viridulae, gluma sterilis et lemma sterilis aequilongae vel tantum minutissime inaequilongae, nervis 5 percursae, nervo mediano indistincto, inter nervos seriatim pubescentes, lemma fertilis anguste obovato-lanceolata, apice haud barbulata, 2 mm tantum longa, albidula, seriatim ruguloso-striolata.

Columbia: Santa Marta, leg. *H. H. Smith* (1898—1901) *No. 183, Typus* speciei in Herb. Lugd. Bat. sub. No. 921.5—208.

Beside the differences already mentioned above, this species is characterized by the many reduced lateral inflorescences from nearly all the nodes and by the pale greenish colour of the leaves. In the vegetative parts there is some resemblance with the very common *Axonopus compressus* (Sw.) P. B. especially as to the broad leaves and the lateral panicles included in the sheaths, but this common species is not caespitose. The spikelets are given by Hitchcock as about 2 mm long, the glume and the sterile lemma equaling the fruit or pointed beyond it. In a plate on p. 574 of his Manual, he pictures a stoloniferous plant, creeping and rooting at the nodes, the various characters of the spikelets of which are, however, in contradiction with the common idea of the typical plant as indeed the outer scales are figured as being of but equal length to the fruit. This concept of Hitchcock is again mentioned in Hitchcock's last treatment of the grasses of the West-Indies, where also the same figure is given, but in the description the spikelets are mentioned as being 2 to 3 mm long. Hitchcock observes that the species is exceedingly variable in habit, but from material at hand it is evident that two different species are mixed together in what generally is named *Axonopus compressus* P. B. The true *A. compressus*, variable as the species may be, has always spikelets where the outer scales are much protruding above the fruit, as is always very evident in dried material where the fruit may be observed through the pressed outer scales. Thus, it is clear that Hitchcock's opinion, at least as to his figures, is unacceptable. The figures represent a distinct, though closely allied species.