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***Panicum maculatum* Aubl.: its type and the correct use of *Lasiacis maculata* (Aubl.) Urb. (Poaceae, Paniceae)**

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ABSTRACT

The type of *Panicum maculatum* Aubl. is confirmed here in order to establish the correct application of *Lasiacis maculata* (Aubl.) Urb. The interpretation of the Plumier's plate on which *Panicum maculatum* Aubl. is based confirms that this species cannot be referred to *Lasiacis ligulata* Hitchc. & Chase as reported either by old or recent literature, but to *Lasiacis sorghoidea* (Desv. in Ham.) Hitchc. & Chase (= *P. sorghoideum* Desv. in Ham.). A nomenclatural synopsis for *L. maculata* (Aubl.) Urb. is also provided so as to clarify its nomenclatural framework.

KEY WORDS

Poaceae,
Paniceae,
Panicum maculatum,
Lasiacis,
nomenclature.

RÉSUMÉ

Panicum maculatum Aubl.: son type et l'utilisation correcte du nom *Lasiacis maculata* (Aubl.) Urb. (Poaceae, Paniceae).

Le type du *Panicum maculatum* Aubl. est confirmé ici afin d'établir l'application correcte du nom *Lasiacis maculata* (Aubl.) Urb. L'interprétation de la planche de Plumier, sur laquelle se fonde *Panicum maculatum* Aubl., confirme que cette espèce ne peut pas être rapportée à *Lasiacis ligulata* Hitchc. & Chase, comme indiqué dans la littérature ancienne comme récente, mais à *Lasiacis sorghoidea* (Desv. in Ham.) Hitchc. & Chase (= *P. sorghoideum* Desv. in Ham.). En outre un synopsis de *L. maculata* (Aubl.) Urb. est fourni pour clarifier son histoire nomenclaturale.

MOTS CLÉS

Poaceae,
Paniceae,
Panicum maculatum,
Lasiacis,
nomenclature.

INTRODUCTION

One of the most intriguing nomenclatural and taxonomical problems which passionated many neotropical agrostologists either in the past or in recent times has been represented by *Panicum maculatum* Aubl. Aublet (1775), in his *Histoire des Plantes de la Guiane Française*, described *P. maculatum* in a Charles Plumier's manuscript endorsed by a colour plate drawn by himself from a plant he saw in Martinique. The description given by Aublet (1775) is very scanty and without correct interpretation of C. Plumier's manuscript and table is impossible to identify *P. maculatum* Aubl. As Hitchcock (in Hitchcock & Chase 1910) established the genus *Lasiacis* (Griseb.) Hitchc., from the sectio *Lasiacis* Griseb. (Grisebach 1864) within the genus *Panicum* L., *Panicum maculatum* Aubl. became a doubtful name within *Lasiacis* (Griseb.) Hitchc. Hitchcock himself (1920) attributes *P. maculatum* Aubl. to *Lasiacis ligulata* Hitchc. & Chase (Hitchcock & Chase 1917) on the basis of the description given by Schultes in Roemer & Schultes (1824) resulting on material collected by C. Bertero (L, TO!) in the West Indies improperly referred to "*P. arborescens* L." and "*P. latifolium* L."

As a matter of fact many botanists in the past (e.g., Schlechtendal & Chamisso 1833) and in recent years (e.g., Lourteig 1983) misunderstood *P. maculatum* Aubl. assigning it to the two most widespread *Lasiacis* species present between Caribbean and South American areas, i.e. *Lasiacis ligulata* Hitchc. & Chase and *Lasiacis sorghoidea* (Desv. in Ham.) Hitchc. & Chase.

Urban (1919) considered *P. maculatum* Aubl. as an acceptable name and proposed (Urban 1921) the new combination *Lasiacis maculata* (Aubl.) Urb. (= *L. sorghoidea* (Desv. in Ham.) Hitchc. & Chase), but in more recent important contributions to the neotropical grass taxonomy and floristics (Davidse 1978, 2003; Judziewicz 1990; W3Tropicos Database 2004), *P. maculatum* Aubl. is still considered as a doubtful name and consequently of uncertain application. On the other hand, in recent years other authors like Adams (1972), Fournet (1978), Lourteig (1983) and Tovar (1993) reported *P. maculatum* Aubl. as the accepted name within

Lasiacis (Griseb.) Hitchc., under the combination *L. maculata* (Aubl.) Urb., considering in its synonymy *L. sorghoidea* (Desv. in Ham.) Hitchc. & Chase and/or *L. ligulata* Hitchc. & Chase.

However, what is reported by Emmet Judziewicz about *L. maculata* (Aubl.) Urb. (Judziewicz 1990: 303) is noteworthy: "Aublet's description is too brief to permit identification and no type was cited, only the illustration in Plumier's unpublished manuscript 4, t. 82 (not seen), which must serve as the type. [...] Until the plate can be examined, *L. maculata* must be regarded as a name of uncertain application". Meanwhile, Davidse (2003: 280) is of the same opinion, without any specific reference to the Plumier's plate, that *L. maculata* (Aubl.) Urb. can be applied to "either *Lasiacis sorghoidea* (Desv. ex Ham.) Hitchc. & Chase or *L. ligulata* Hitchc. & Chase, but until the type can be examined, its application remains uncertain".

Owing to the conflictual opinions, the scope of this contribution is to definitely elucidate the identification and consequent application of *P. maculatum* Aubl. and the correct use of *Lasiacis maculata* (Aubl.) Urb.

THE TYPE OF *PANICUM MACULATUM* AUBL.: THE ULTIMATE ACT OF A NEVER ENDED DEBATE?

As pointed out by Lourteig (1983) the Aublet's descriptions cannot be well interpreted because the names are based on pre-linnean publications and without careful investigation of them we are not able to define either their nomenclature or taxonomy leading to mistakes and misconceptions in their current identification.

Aublet (1775: 51) provides a brief description and a polynomial in the protologue of *P. maculatum* from C. Plumier's unpublished manuscript as follows:

"5. PANICUM (*maculatum*) scandens, caule arundinaceo.

Milium arundinaceum, scandens & maculatum. Plum. *Mss.* 4. tab. 82"

Jean Baptiste Christophe Fusée Aublet (1720-1778), during his stay of two years (1762-1764) in

French Guyana, made many drawings and preserved the specimens which constituted the basis of his four volumes *Histoire des plantes de la Guiane Française*. The Aublet's main herbarium is kept in part at BM and P (Staffeu & Cowan 1976), and after many attempts in the past (see Davidse 1978) and recently by us, it was not possible to trace any specimen to be considered as the type of *P. maculatum* Aubl. Anyway, a possible endeavor in order to find the type of *P. maculatum* Aubl. can be done taking into consideration the Plumier's description and table both cited in the Aublet's protologue.

According to Pennell (1945), Howard (1975), Staffeu & Cowan (1983), Rankin Rodríguez & Greuter (1999) and McClellan & Regourd (2000), Charles Plumier (1646-1704) did not collect plants during his stay in the Caribbean area between 1689 and 1695 but instead made drawings and descriptions of the plants he saw in the field, even if some specimens of Pteridophytes recently have been discovered in the Vaillant, Danty d'Isnard and Jussieu herbaria at P (Cremers & Aupic 2007). A Plumier's collaborator, Joseph Donat Surian, collected some specimens that from his return to Paris in 1691 have been kept at P (Pennell 1945; Rankin Rodríguez & Greuter 1999) but they cannot be considered as type material which Plumier's names are based, except in several cases as suggested by Staffeu & Cowan (1983: 301). In the Surian's herbarium at P no specimen has been found under *P. maculatum* Aubl. Furthermore Staffeu & Cowan (1983: 301) suggest that "The types of Plumier's American plants are his original drawings", so that the original Plumier's plate cited by Aublet (1775) may be considered the type for *P. maculatum* Aubl.

At the Bibliothèque centrale du Muséum national d'Histoire naturelle in Paris where the original unpublished Plumier's manuscripts and the related drawings of Caribbean plants are preserved in a set of 8 volumes under the common title "*Botanicon americanum*" (cf. also Rankin Rodríguez & Greuter 1999), we have found the manuscript cited in the Aublet's protologue including the related beautiful colour plate n. 82 (Figs 1; 2).

The description (Fig. 1) is in accordance with the related plate and is as follows:

"*Radicem habet hac planta ex innumeris fibris compactam crassiusculis, longissimis nigricantibus et tenuissimis villis et ruttescentibus capillaris.*

Eius summum caput plurimas producet arundines seu arundinaceos culmos digitum minimum crassos, fistulosos, longisque intervallis nodosos rados variegatos, ac tandem membranaceis inductis usque ad medium internodium contextos.

Longissimi sunt sive culmi seu arundines, potissimum arborum vicinarum filamenta nactae. Cum et enim altissime sese excrentes et supra arborum ramos scandentes, longissimos ramos suos fistulosos etiam sed tenues cum late diffundunt ut fere totam arboris quam occupant superficiem complectantur.

His ultimis ramis ad nodos singulos arundinacea inhaerent folia alterno fila ordinata, pediculo seco dimidiam internodii partem amplectentia tres aut quator pollices longa, unum circuler lata, acuminata, caule paulisper rudia, neruulisque quinque aut sex in longum sulcata.

Singuli ultimi rami in iubam seu paniculam definunt ampliam speciosam et late diffusam ex multis glumis constantem membranaceis concavis acuminatis, axique affixis tenuissimo nigricante et dentato in mediis glumis flores nascuntur apetalis duobus aut tribus staminibus constantes. Pistillum autem quod vix dimidium acicula minoris adaequat quodque ex calyce bifolco ex duabus sulicet glumis compacto surgit a bis in semen rotundum orobo paulo maius glumisque aliis nigricantibus et squamatis involutum.

Rivulos aut sylvas humidias amat hac planta quam circa regiones arcu Regiae vicinas apud insulam Martinicanam (un?) dies adinveni."

The plate (Fig. 2) consists of a watercolour illustration of lignified, maculate stem base, median and a terminal culm; the latter with an open, large and prominent panicle with ascending and spreading branches, and the spikelets in oblique position; sheath with acuminate apex and not evident ligule which is supposed to be inconspicuous. The polynomial clearly related to *P. maculatum* Aubl. at the bottom of the plate is in Plumier's handwriting. An additional sketch of a panicle possibly attributable to *Olyra* sp. is at the bottom on the right side of the plate and a single floret belonging to the main subject is sketched below on the right side of the plate.

Milium arundinaceum scandens et maculosum.

Radice[m] habet haec planta ex innumeris fibris compactam ~~et~~
 crassiusculis, Longissimis nigricantibus et tenuissimis villis et suffruticulis capit-
 latis. Eius summum caput plurimas producit Arundines seu arundina-
 ceos culmos digitum minimum crassos, fistulosos, Longisque intervalli[n]i nodos
 unctos, vinctos equidem sed maxime inflat alicuius speciosi maculis violaceis
 totos variegatos, ac tandem membranaceis involucrijs usque ad medium internodi-
 orum contractos.

Longissimi fiunt hi culmi seu arundines, potissimum arborum vici-
 natum fulimenta nactae. Cum etenim altissime sese exerentes et supra arbo-
 rum ramos scandentes, Longissimos ramos sicut fistulosos etiam sed tenues
 cum late diffundunt ut fere totam arboris quam occupant superficiem
 complectantur.

Hi ultimi rami ad nodos singulos arundinacea inhaerent fibra
 aethero sine ordinata, pediculo sic dimidiam internodi partem amplectentia
 tres aut quatuor pediculi Longa, unum circiter lata, acuminata, vix pau-
 lisper suda, nervulisque quinque aut sex in longum sulcata.

Singuli ultimi rami in iugam seu paniculam desinunt amplam
 speciosam et late diffusam, ex multis glumis constantem membranaceis con-
 cavis acuminatis, axiisque affixis tenuissimo nigricante et dentato. in medijs glu-
 mis flores nascuntur apertali duobus aut tribus ramibus constantes. pistillum
 autem quod vix dimidium acuta minoris aequat quodque ex calyce trifido
 ex duabus sulcatis glumis compacto surgit absit in semine rotundum ovo
 paulo maius glumisque albis nigricantibus et squamatis involutum.

Rivulos aut sylvas humidas amat haec plantula quam circa
 regiones arci Regiae vicinas apud insulam Martinicam adhibet
 adinvicem.

Fig. 1. — C. Plumier's unpublished manuscript of "*Milium arundinaceum scandens et maculatum*": manuscript 4 in C. Plumier's handwriting. Photo Bibliothèque centrale du Muséum national d'Histoire naturelle, Paris.



FIG. 2. — C. Plumier's watercolour plate 82 related to manuscript 4, holotype of *Panicum maculatum* Aubl. (= *Lasiacis maculata* (Aubl.) Urb.). Photo Bibliothèque centrale du Muséum national d'Histoire naturelle, Paris.

Urban (1919: 149) in his comment on *P. maculatum* Aubl., maintains that the Plumier's plate resembles two similar species like *P. sorghoideum* Desv. in Ham. (Hamilton 1825) and *P. sloanei* Griseb. (Grisebach 1864), opting for *P. sorghoideum* (= *L. sorghoidea* (Desv. in Ham.) Hitchc. & Chase) a common species present in Martinique where the plant sketched by Plumier was found instead of *L. sloanei* that seems not to be present in Martinique, as confirmed later also by Davidse (1978) and Fournet (1978) and after a consistent check in BM and P herbaria by us. The presence of *L. sloanei* in Martinique reported by Gould (1979) seems not to be supported by any herbarium specimen.

In contrast, Davidse (1978) hypothesizes that *P. maculatum* Aubl. could be referred to *Lasiacis ligulata* Hitchc. & Chase because: "He [Urban 1919] further stated that Plumier *probably* (my emphasis) described a plant from Martinique, and since *L. sloanei* did not occur there, the name must apply to *L. sorghoidea*. However, Aublet's description almost certainly was based on a plant from the Guianas. Since *L. ligulata* is the most common species in this region, the name may actually refer to *L. ligulata*." (Davidse 1978: 1233, 1234). Both unusual and provisional postulated interpretations are difficult to accept.

Considering Plumier's description and colour plate, we can confirm that the species in question must be referred to *Panicum sorghoideum* Desv. in Ham., actually recognised under *Lasiacis sorghoidea* (Desv. in Ham.) Hitchc. & Chase as firstly suggested by Urban (1919, 1921) and later reported in Adams (1972), Fournet (1978) and Tovar (1993).

Lourteig (1983) confirmed the nomenclatural validity of *P. maculatum* Aubl., and the correct application of *Lasiacis maculata* (Aubl.) Urb., but she gave an incorrect taxonomical interpretation considering erroneously as synonyms both *L. sorghoidea* (Desv. in Ham.) Hitchc. & Chase and *L. ligulata* Hitchc. & Chase, which are definitively recognized as two different species (cf. Hitchcock 1920, 1922, 1927; Lemée 1955; Davidse 1978, 2003; Smith *et al.* 1982; Renvoize 1984, 1998; Judziewicz 1990; Killeen 1990; Tovar 1993; Garcia Santos & Takeo Sano 2001; Funk *et al.* 2007).

Lasiacis sorghoidea is a robust plant, frequently with maculate stem base, an inconspicuous ligule (0.3-1.5 mm long; up to 3 mm long only in Southern American populations (!) and an open, occasionally curved, dense inflorescence.

In contrast, *L. sloanei* Griseb. presents a ligule up to 1 mm long, and slender culms with open, scarcely dense inflorescences.

On the other hand, *L. ligulata* Hitchc. & Chase is characterized by a very long ligule up to 3-4(-5) mm long, with a scarcely dense inflorescence, where the spikes are normally curved. As a matter of fact, in Plumier's description no reference is made to the presence of a conspicuous ligule, and this led us to exclude any relationship with *L. ligulata* Hitchc. & Chase, as suggested by Davidse (1978).

In conclusion we assume Plumier's unpublished colour plate 82 (Fig. 2) as the holotype of *Panicum maculatum* Aubl. In order to endorse the interpretation of the unpublished Plumier's plate, we designate an epitype specimen according to Art. 9.7 of the *International Code of Botanical Nomenclature* (McNeill *et al.* 2006) as follows:

Lasiacis maculata (Aubl.) Urb.

Symbolae Antillanae 8: 751. (1921). — *Panicum maculatum* Aubl., *Histoire des Plantes de La Guiane Française* 1: 51 (1775). — Type: (unpublished iconography from a plant of Martinique) "*Milium arundinaceum scandens et maculatum*" in Plumier's *Botanicon americanum* MS 4!: t. 82 (holo-, Bibliothèque centrale du Muséum national d'Histoire naturelle!) (Figs 1; 2). — Martinique, environs de St. Pierre, Mai 1853, *Belanger* 390 (epi-, FI-Webb! [Fig. 3], here designated; isoepi-, G!, P! see also <http://www.mnhn.fr/base/sonnerat.html>).

Panicum lanatum Sw., *Prodromus descriptionum Vegetabilium maximam partem incognitorum quae sub Itinere in Indiam Occidentalem* 24. 1788, non Rottb. (1776), *nom. illeg.* — Type: Jamaica, Swartz s.n., (holo-, S; iso-, BM!).

Panicum glutinosum Lam., *Tableau encyclopédique et méthodique* 1: 174, tab. 43, fig. 3 (1791), non Sw. (1788), *nom. illeg.* — *Panicum agglutinans* Kunth, *Enumeratio Plantarum* 1: 120. (1833), *nom. illeg.* based on *P. glutinosum* Lam. (Lamarck 1791). — *Panicum divaricatum* L. var. *agglutinans* (Kunth) Hack. ex Sodiro, *Anales de la Universidad Central del Ecuador* 3 (25): 478



FIG. 3. — Epitype of *Panicum maculatum* Aubl. (= *Lasiacis maculata* (Aubl.) Urb.), "Martinique, environs de St. Pierre, Mai 1853, Belanger 390" (FI-Webb).

- (1889). — Type: Tab. 43, fig. 3. in Lamarck (1791) (lecto-, here designated).
- Panicum sorghoideum* Desv. in Ham., *Prodromus Plantarum Indiae Occidentalis* 10 (1825). — *Panicum lanatum* Sw. var. *sorghoideum* (Desv.) Griseb., *Flora of the British West Indian Islands* 551 (1864). — *Lasiacis sorghoidea* (Desv. in Ham.) Hitchc. & Chase, *Contributions from the United States National Herbarium* 18: 338 (1917). — Type: Porto Rico, *Desvieux Herb.* 24. (holo-, P!).
- Panicum orinocense* Willd. ex Spreng., *Systema Vegetabilium* 1: 316 (1825), *pro syn.* — Type: *Humboldt s.n.*, *P. orinocense* 1, Venezuela, Orinoco, s.d., (lecto-, B-W!, here designated; isolecto-, B-W! [5 sheets!], BM!).
- Panicum arborescens* Sieb. ex Trin., *De Graminibus paniceis* 208. 1826, non L. (1753), *pro syn.* — Type: Martinique, *Sieber* 267 (lecto-, BM!, here designated; isolecto-, FI-Webb!, GOET!, HAL!, L!, P!, W!).
- Panicum divaricatum* L. var. *latifolium* Schltld. & Cham., *Linnaea* 6: 33 (1831). — Type: *Sieber* 120 (lecto-, HAL!; isolecto, L!).
- Panicum divaricatum* L. var. *lanatum* Schltld. & Cham., *Linnaea* 6: 33. (1831). — Type: Jamaica, *Willdenow Herb.* 18760 (holo-, B).
- Panicum fuscum* Sieb. ex C.Presl, *Abhandlungen der Böhmischen Gesellschaft der Wissenschaften, nebst der Geschichte derselben* 3: 550 (1845), *pro syn.* — *Panicum martinicense* Griseb., *Flora of the British West Indian Islands* 552. 1864, *nom. illeg.*, based on *P. fuscum* Sieb. ex C.Presl (1845). — *Panicum fuscum* Sieb. ex Griseb., *Flora of the British West Indian Islands* 552. 1864, *pro syn.* — Type: Martinique, *Sieber*, 1822, *Flora Martin.* No. 29 (lecto-, GOET! designated by Hitchcock [1920]; isolecto-, FI-Webb!, HAL!, L!, MO, P!, US, W!).
- Panicum praegnans* Steud., *Synopsis Plantarum Glumacearum* 1: 74 (1854). — *Panicum maculatum* Aubl. var. *pilosum* Fourn., *Mexicanas plantas* 32 (1886), *nom. illeg.*, based on *P. praegnans* Steud. — Type: Mexico, Oaxaca *Buchinger* 488 (lecto-, P! designated by Hitchcock [1920]).
- Panicum guaraniticum* Speg., *Anales de Sociedad Científica Argentina* 16: 107 (1883). — *Lasiacis guaranítica* (Speg.) Parodi, *Notas del Museo de La Plata, Botánica* 8: 95 (1911). — Type: Argentina, Misiones, Posadas, Mar 1883, *von Gulich s.n.* (holo-, LPS).
- Panicum swartzianum* Hitchc., *Contributions from the United States National Herbarium* 12: 140 (1908), *nom. illeg.*, based on *Panicum lanatum* Sw. — *Lasiacis swartziana* (Hitchc.) Hitchc., *Botanical Gazette (Crawfordsville)* 51: 302 (1911).
- Lasiacis patentiflora* Hitchc. & Chase, *Contributions from the United States National Herbarium* 18: 338 (1917). — *Lasiacis sorghoidea* (Desv.) Hitchc. & Chase var. *patentiflora* (Hitchc. & Chase) Davidse, *Annals of the Missouri Botanical Garden* 64: 375 (1978). — Type: Tobago, 20.XII.1912, *Hitchcock* 10268, (holo-, US; iso-, US, L!, W!).
- Lasiacis acuminata* Swallen, *Memoirs of the New York Botanical Garden* 9: 267 (1957). — Type: Venezuela, Territorio Amazonas, Great Rapids of the Orinoco, Isla Carestia at Saltos Carestia y Galio, 5 km north of Sanariapo, 100-200 m, erect to 2 m, 11.XI.1953, *Maguire, Wurdack & Bunting* 36171 (holo-, US; iso-, NY!).

REPRESENTATIVE SELECTED MATERIAL SEEN FROM WEST INDIES AND GUYANAS

- Lasiacis maculata* (Aubl.) Urb. (previously named under *L. sorghoidea* (Desv. in Ham.) Hitchc. & Chase).
Puerto Rico. S.I., 1827, *Wydler* 222 (FI-Webb). — *Mariacao*, 13.XI.1884, *Sintenis* 215 (L). — Coamo, 13.XI.1885, *Sintenis* 3062 (K, P, W). — Aybonito, 25.XI.1885, *Sintenis* 2861 (K). — Two miles NE of Mayaguez, 23.I.1900, *Heller* 4375 (L). — Vicinity of San Juan, 6.XI.1913, *Chase* 6412 (L). — Rosario Road, Monte Mesa, 12.XII.1913, *Chase* 1809 (L, W). — Vicinity of Mayagüez, Monte Mesa, 12.XII.1913, *Chase* 6824 (L).
Virgin Islands. Scenic Drive, W slope of Mt. Eagle, 12.I.1980, *Fosberg* 5922 (BM).
Antigua. 15.X.1931, *Box* 115 (BM, K).
St. Kitts. 28.I.1932, *Box* 160 (BM, NY, K).
Martinique. 1868, *Husnot* 94 (P). — Vallée de St. Pierre, V.1870, *Hahn* 105 (K, P).
Grenada. 6.XII.1889, *Eggers* 6224 (P). — Bequia, 1950, *Howard* 11276 (BM). — St. Patrick, Marli Hill, 1.XII.1957, *Proctor* 17293 (BM).
Dominica. Vicinity of Sophia Bay, 21.I.1966, *Chambers* 2608 (BM). — St. David near Madjini, 2.II.1969, *De Filippis* 191 (BM).
Guadeloupe. S.d., *Bertero s.n.* (FI-Webb, TO). — 1839, *Beaupertuis s.n.* (P). — Gourbeyre, 31.I.1934, *Rodriguez* 2589 (P). — Grands Fonds de Saint-Anne, 18.XII.1987, *Fournet* 4272 (P). — Petit Bourg, Montebello, 16.IV.1989, *Fournet* 4482 (P).
Trinidad. Port of Spain, Fort Gorge Road, edge of jungle, 27.XI.1912, *Hitchcock* 592 (BM, C, K, L, W). — St. Anns near Port of Spain, 28.XI.1912, *Hitchcock* 594 (BM, C, K, L, P, W). — Trinidad, 19.XI.1913, *Broadway* 4841 (K). — St. Ann, 17.III.1920, *Britton & al.* 665 (K). — Aripo Road, 15.I.1926, *Broadway* 5991 (K). — Maraval, 9.XII.1928, *Broadway* 706 (BM, K). — Maracas, 26.VI.1929, *Broadway* 7233 (BM, G). — St. Anns, 21.II.1933, *Broadway* 9064 (BM, G). — Arima Valley, 1961, *Snow s.n.* (K). — Guanaco River 4 miles N de Maturita près Arima, 29.V.1975, *Raynal* 15598 (K).
Tobago. Pigeon Hill, 7.IV.1959, *Cowan* 1448 (K, NY). —

Parlatuvier-Roxborough Trace, Bloody Bay, 8.IV.1959, *Cowan 1484* (K, NY, P). — Between Studley Park and Hillsborough Dam, 24.III.1993, *Clement & Ryves 270* (BM).

Guyana. Oreala, Corentyne River, X.1879, *Jenman 256* (K). — Rupununi, western extremity of Kanuku Mts., 4-22.III.1938, *Smith 3314* (K, P, W). — Rupununi, Kanuku Mts., 14.XI.1957, *Cook 173* (K). — Rupununi, 1 mile S of Empresa, 14.IX.1963, *Goodland 715* (K, NY, P). — Kanuku Mts., slope of Nappi Mt., 8.XI.1987, *Jansen-Jacobs & al. 758* (K). — Kanuku Mts., Maipama, 17.XI.1987, *Jansen-Jacobs & al. 966* (K). — Rupununi Distr., Karanambo, 1.IX.1988, *Maas & al. 7150* (K). — Rupununi, Eastern Kanuku Mts., NE of Warimure, 23.I.1991, *Jansen-Jacobs 2182* (K, NY, P); Rupununi, Kanuku Mts., Crabwood Creek, 25.I.1994, *Jansen-Jacob & al. 3346* (K, P). — Rupununi, NE slope of Mount Shiriri, 18.VI.1995, *Jansen-Jacobs & al. 4149* (K, NY).

French Guiana. S.l., 1842, *Mélinon 397* (L, P). — Route de Kourou, 1.IX.1955, *Hook 83* (NY, P). — Route de Kourou, 28.IX.1955, *Hook s.n.* (K, NY, P). — Saül, 30.VI.1956, *Hook 91* (P). — Mount Saint-Marcel, 27.VI.2002, *De Granville & al. 15518* (K).

Suriname. Voltzberg, 21.VIII.1920, *Pulle 227* (L). — Granitic plateau \pm 8 km in line from Paka Paka (Saramacca R.) to Ebbatop (v. Asch v. Wijck-Range), 19.II.1951, *Florschütz 1563* (C). — Circa portum aeronauticum ad flumen Oelemari, 1.IV.1963, *Wessels Boer 1158* (C). — Lely Mts., 21.XI.1975, *Lindeman & al. 158* (K, NY, P).

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Puerto Rico. 1827, *Wydler 250* (FI-Webb, G). — Puerto Rico, XII.1883, *Stahl 7* (W). — Maricao, 13.XI.1884, *Sintenis 215* (BM, K, NY, W). — Prope Lares in fruticetis ad "Palina Llanos", 17.I.1887, *Sintenis 5918* (C). — Jaime Alto, vicinity of Cayey, 3.XII.1913, *Chase 6747* (L). — Near Maricao, Indiera Fria, 19-22.II.1915, *Britton & al. 4490* (K, NY).

Dominica. S.coll. 344 (K).

St. Kitts. S.d., *Walsh s.n.* (K).

St. Thomas. 1802, *Ventenat s.n.* (BM). — St. Thomas, 11.XII.1905, *Raunkiaer 2304* (C). — St. Thomas, Water Island, 3.I.1914, *Ostenfeld 55* (C).

St. Croix. Prosperity Garden, 5.I.1906, *Raunkiaer 642* (C).

Martinique. 1870, *Hahn 1158* (K).

St. Lucia. 6.XI.1929, *Sandwith s.n.* (K)

Guadeloupe. S.d., *Bertero s.n.* (TO).

Trinidad. Green Hill, 2.XII.1910, *Broadway 4038* (BM). — Trinidad, above St. Anns, near Port Spain, among bushes along stream, high climbing, 28.XI.1912, *Hitchcock 10007* (= Am. Grass Natl. Herb. No. 589, holo-, US; iso-, BM!, G!, K!, NY!, P!, W!). — Tabaquite, 10.X.1912, *Hitchcock 10170* (L). — Cedros, 12-14. XII.1912, *Hitchcock 10157*, (L). — Cedros, XII.1914, *Hitchcock 33391* (L). — Morne Blue, 13.III.1921,

Britton & al. 2266 (G, K, NY). — Heights of Aripo, 10-26.I.1922, *Broadway 9929* (K). — Morne Blue, 18.XII.1924, *Broadway 5504* (BM, K). — Aripo Road, 15.I.1926, *Broadway 5892* (BM, K). — Zamsel Hill, Arouca, 15.II.1928, *Broadway 6811* (BM, K). — Above Spring Hill, Arima-Blanchisseuse road, 26.XII.1976, *Adams 14168* (K).

Tobago. Greenhill, 2.XII.1910, *Broadway 4038* (K, L). — Tobago, 25.X.1925, *Freeman & Williams 11426* (K). — Parlatuvier-Roxborough Trace, Bloody Bay to road-head above Roxborough, 8.IV.1959, *Cowan 1486* (K). — Mount St. George to Hillsborough Dam Road, 5.VI.1975, *Philcox & Raynal 7906* (K). — High up Roxborough to Main Ridge Road, 25.III.1993, *Clement & Ryves 330* (BM).

Guyana. Corentyne River, IX.1879, *Jenman 257* (K). — Near Bartica, VI.1884, *Jenman 2053* (K). — Berbice River, XII.1886, *Jenman 3593* (K, NY). — Pomeroon River, X.1886, *Jenman 1916* (K). — Upper Demerara River, IX.1887, *Jenman 4089* (K, NY). — Pomeroon River, IX.1904, *Bartlett s.n.* (K, NY). — Aruka River, X.1905, *Bartlett 8576* (K). — Issorora, Aruka River, 16.I.1920, *Hitchcock 17553* (BM, C, K, L, NY, P, W). — Along Potaro River, Tumatumari, VI-VII.1921, *Gleason 70* (K). — Waini River, NW Distr., 3-18.IV.1923, *De La Cruz 3663* (K). — Assakatta, NW Distr., 18-28. IX.1923, *De La Cruz 4291* (K). — Marudi Mts., c. 1 km along trail from NorMan Mines camp to Aishalton, 9.XI.1982, *Stoffers & al. 238* (K). — Region Potaro-Siparuni, Chenapou, Amerindian village (Patumona), 50 km upstream from Kaieteur Falls, 16.X.1987, *Kvist 305* (K). — Potaro-Siparuni Region, trail from Kato to Paramakatoi, 12.III.1989, *Hahn 5634* (P). — Barima-Waini Region, Aranka Head, 10.IV.1991, *McDowell 4365* (K). — Rupununi Distr., Kuyuwini Landing and Kassikaityu River, 30.X.1992, *Jansen-Jacobs & al. 3176* (NY, P). — Upper Ussequibo Region, Surama Village, c. 10 km N of new Parnapanum Rd., 19.II.1990, *McDowell 1889* (FT). — Upper Essequibo Region, Rewa River, Spider Mts., 16.IX.1999, *Jansen-Jacobs & al. 5930* (K).

French Guiana. La Mana, s.d., *Sagot 696* (P, W). — S.l., 1840, *Leprieur s.n.* (FI-Webb, L, P). — S.l., 1842, *Mélinon s.n.* (L, P). — Cayenne-route du Mohury, 2.VI.1955, *Hook 82* (K, P). — Cayenne, chemin du moulin Vidal, 13.VI.1955, *Hook 89* (K, P). — Cayenne, 2.VI.1956, *Hook s.n.* (P). — Près de Maripasoule, 1.IX.1961, *Schnell 11692* (P). — Manoi, 24.VIII.1962, *Hook 93* (P). — Cayenne, route de Stoupan, 21.VI.1970, *Oldeman B-3485* (P). — Tumuc Humac, frontière Brésil-Guyane, 25.VIII.1972, *Granville 1380* (P). — Cayenne, Montravail, 8.IV.1982, *Cremers 7761* (P). — Haute Canopi, Mont Belvédère, 23.XI.1984, *Granville 6982* (P). — Haut Oyapock, village Zidock, 20.VIII.1985, *Prévost & Grenand 1969* (K, P). — Île de Cayenne, Mont Baduel, 23.V.1987, *Hoff 5199* (P). — Saül, 28.VII.1987, *Hahn 3663* (P). — Île de Cayenne, Mont Grand Matoury, 5.IV.1995,

Cremers & al. 13869 (P). — Bassin de l'Oyapock, Roche Touatou, 19.V.1995, *Cremers & De Granville 14008* (P). — Montagne Trésor, le long route de Kaw, Roura, 21.XI.1997, *Rouselle GU96/106* (MA). — Montagne Favard, au sommet de la colline, 5.XI.1998, *Poncy & Crozier 1128* (P). — Région de Saül, 3.IV.1997, *Cremers & Crozier 14636* (P).

Suriname. S.loc., s.d., *Moricand s.n.* (FI). — S.loc., s.d., *Hostmann s.n.* (FI). — S.loc., s.d., *Hostmann 13* (K). — In fruticetis Surinami, prope Lustryk, 30.XII.1837, *Splitgerber 446* (L). — In distr. Para, II-IV.1844, *Kappler 1546* (K, W). — Sandrij, 14-25.XI.1934, *Archer 2759* (K). — Charlesburg Rift, 3 km N of Paramaribo, 5.IV.1944, *Maguire & Stabel 24746* (K). — Saramacca River, trail to Coppenam River, near village, Pakka Pakka, 26.VI.1944, *Maguire 23965* (K, P). — Inter Coppename fluv. ostium et Coronie oppidum, 15.X.1948, *Lanjouw & Lindeman 1384* (K). — In montibus qui dicuntur Nassau, 17.II.1949, *Lanjouw & Lindeman 2146* (K). — Jodensavanne-Mapane kreek area, along road to Mapane creek, 21.XII.1954, *Lindeman 6933* (W). — Wilhelmina Gebergte, Zuid River, 16.IX.1963, *Irwin & al. 55790a* (K, NY, P, W). — Wilhelmina Gebergte, Kaiser Airstrip, 45 km above confluence with Lucie River, 26.IX.1963, *Irwin & al. 57618*, (K, NY, P). — Montagne Ischoli-Epoyan, 1 km du dégrad Ouarémaman, 26.VI.1972, *Sastre 1460* (P). — Nickerie, area of Kabalebo Dam Project, c. 20 km SW of Avanavero dam site, 11.XI.1976, *Heyde & Lindeman 10* (K).

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Puerto Rico. 1827, *H. Wylder 222* (FI-Webb). — Toa Alta, 11.XI.1960, *R. Woodbury s.n.* (NY).

Cuba. Pinar del Rio, Mariel, 4.VI.1921, *Ekman 12853* (NY). — Pinar del Rio, Sierra de Anafe, Loma de San Gabriel near Guanajay, 11.VII.1921, *Ekman 13035* (G). — Oriente, Mayarí arriba, at Rio Mayarí, 7.X.1922, *Ekman 15851* (G). — Santa Clara, Limones, Soledad, Cienfuegos, 29.VII.1927, *Jack 5187* (NY). — Vicinity of Soledad, VIII.1941, *Howard 6250* (NY).

Jamaica. Blue Mts., Pimento Grove, 22.I.1913, *Harris 11589* (BM, NY). — Orange River, near Montego Bay, 29-30.III.1920, *Maxon & Killip 1673* (NY). — Bog Walk and vicinity, 27.VII.1926, *Maxon 10502* (NY). — Middlesex, 28.I.1938, *Hunnewell 15226* (NY). — St. Ann Parish, 1.4 miles S of Ocho Rios at end of Fern Gully, 26.XII.1971, *Davidse & Convoy 32373* (NY).

Haiti. Port au Prince, hills between the town and Pétienville at Source Plaisance, 19.X.1924, *Ekman 2190* (C). — Vicinity of St. Louis du Nord, 30.III-7.IV 1929, *Leonard & Leonard 14292* (NY).

Santo Domingo. Macoris, 23 km W of San Pedro de Macoris, 18.X.1946, *Howard & Howard 9508* (NY). — Jaiqui' Picado, 20 miles W of Santiago, 27.XI.1969, *Bro. Liogier 17049* (NY).

Antigua. Forest NE of Dark Valley, below Boggy Peak,

16.XII.1931, *Box 119* (BM, K, US: cf. Davidse 1978). **St. Martin.** Pic du paradis, sommet, 424 m, 7.XII.1977, *Raynal 19643* (P).

Suriname. Bei Paramaribo, 1913, *Kruper 27915* (L).

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