

**PANICUM CURVIFLORUM (FORMERLY P. TRYPHERON) AND
P. SUMATRENSE (P. MILIARE AUCT.) (GRAMINEAE) IN
SOUTHEAST ASIA**

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SUMMARY

Panicum sumatrense Roth ex R. & S. (Gramineae) includes *P. miliare* auct. non Lamk. and *P. psilopodium* Trin. The combination *Panicum trypheron* Schult. is replaced by *P. curviflorum* Hornem.; this species has two varieties.

INTRODUCTION

Panicum sumatrense Roth ex R. & S. is a minor cereal which for a long time was known as *P. miliare* Lamk. until Bor (1960, 1961) discovered that the type of this name unfortunately did not belong to the species, but, instead, to *P. antidotale* Retz., and so *P. miliare* auct. non Lamk. had to be renamed.

Its presumably wild ancestor is *P. psilopodium* Trin. and the two forms are often kept distinct. *Panicum sumatrense* would be the cultivated form and is said to be distinct by broader leaf blades and a more compact panicle with larger, subpersistent spikelets, cf. Stapf (fide Hook. f., 1896, who was clearly not very satisfied that this was so), Fischer (in Gamble, 1934), Bor (1960), Monod (1968), Majumdar (1973), and Cope (1982). These differentiating characters, at least in the herbarium, appear to be so inconstant and with so many intermediate forms, that it seems better to unite the two into a polymorphic species, as was suggested by some, e.g. Duthie (1888, in nota) and Schmid (1958), who presumably knew the taxa in the field, and Jansen (1953).

Although the two are quite different *Panicum sumatrense* is often confused with *P. trypheron* Schult. Wallich distributed seeds and material of the latter to some of his correspondents in Europe under the name *Panicum tenellum* Roxb., a name first mentioned invalidly in Roxburgh's Catalogue (1814) and formally described in his Flora (1820). Quite likely Wallich obtained his material from plants thus labeled in the Botanical Garden of Calcutta. Both Roxburgh and he were apparently unaware that this was a later homonym of *P. tenellum* Lamk. (1791), the oldest name for what presently is known as *P. lindleyanum* Nees ex Steud. (Veldkamp & Scholz, 1989).

When the formal description of *P. tenellum* Roxb. was published in 1820 several authors independently observed the homonymy and proposed new names for it. Schultes (1824) called it *P. trypheron*, and as he seemed to have been the first to use a legitimate combination, it was generally accepted. Sprengel (1825) referred to both Schultes and Roxburgh and thus *P. roxburghii* is another of his superfluous names.

However, one of the recipients of Wallich's materials was his compatriot Hornemann in Copenhagen, who in 1819, thus one year before Roxburgh's publication, described the specimen he had raised from seed and renamed it *P. curviflorum* Hornem.

Few until recently have been aware of the names Hornemann proposed in this work until Mabberley (1984) pointed out their existence, and even then, only by chance did we stumble on *P. curviflorum*.

Unfortunately no vouchers, if ever made, are present among his specimens in C, KIEL, and S, which suggests he may have described a living plant.

As the description is probably not easily accessible to many, we here cite it:

29. (26–27). *P. curviflorum mihi*: panicula patente, glumis acuminatis curvatis, culmo ramoso, foliis subhirtis.

Hab. in Ind. orient. O. C. *Missum* a celeb. Wallichio sub nomine *P. tenelli* Roxb. sed cum alia extat spec. Panicum hujus nominis, *curviflorum* ob flores curvatos nominavi. — *P. tenellum Lamarckii* in omnibus partibus triplo major est et foliis hirtis gaudet.

In the above '29.' refers to the number of the species, while it is indicated that it should be placed between *Panicum* no. 26 (*P. capillare*) and 27 (*P. altissimum*) of his previous work (vol. 1, 1807).

'O. C.' indicates that it was an annual from the glass house.

From the statements that the leaves were hairy and that the glumes were acuminate and curving, and also because of the reference to *P. tenellum* Roxb. there can be no doubt that the plant described here is the same as *P. trypheron*. And so the species that everybody since 1824 has called *P. trypheron* must now unfortunately become *P. curviflorum*.

The species discussed above can be keyed out as follows:

KEY TO THE TAXA

- 1a. Plants hairy. Spikelets \pm yawning at maturity. Lower glume 0.5–0.7 times as long as the spikelet, slightly keeled or hardened towards the tip, acuminate to cuspidate 2
- b. Plants usually glabrous but for the basal sheaths. Spikelets not yawning. Lower glume 0.25–0.5 times as long as the spikelet, not keeled towards the tip, truncate to acute 2. ***Panicum sumatrense***
- 2a. Culms usually geniculate at base to \pm spreading. Blades usually flat, (3–)5–10 mm wide. Pedicels sometimes with a short hair below the 2.5–3.2 mm long spikelet. Upper lemma 1.5–2 mm long

1a. ***Panicum curviflorum* var. *curviflorum***

- b. Culms stiff, ± erect. Blades usually infolded or with the margins involute, 3–5 (–8) mm wide. Pedicels usually with several hairs below the 3–4 mm long spikelet. Upper lemma 2–2.5 mm long

1b. *Panicum curviflorum* var. *suishaense*

It must be pointed out that in the Flora of Java 3 (1968) 550 (and in Backer's previous publications) the two species have been mixed up: '*P. psilopodium*' is *P. sumatrense*, and '*P. sumatrense*' is *P. curviflorum* (*P. trypheron*).

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1. *Panicum curviflorum* Hornem.

- Panicum curviflorum* Hornem., Hort. Bot. Hafn., Suppl. (1819) 116. — T y p e: *Hb. Hornemann* (holo not in C, KIEL, S), cultivated in Copenhagen, 1818, from seed obtained from Wallich as *P. tenellum* Roxb. — N e o t y p e: as of the next combination, here proposed.
Panicum tenellum Roxb. [Hort. Beng. (1814) 7, nom. nud.] Fl. Ind. 1 (1820) 309; ed. 2 (1832) 306; non Lamk. (1791). — *Panicum trypheron* Schult., Mant. 2 (1824) 244; Hook. f., Fl. Br. Ind. 7 (1896) 47; Camus, Fl. Gén. I.-C. 7 (1922) 447; Blatter & McCann, Bombay Gr. (1935) 158; Henr., Blumea 4 (1941) 505; Bor, Grasses (1960) 331; Raizada & Jain, Ind. For. Rec. n.s. 5 (Bot.) (1964) 154, fig. 1, 1; Zaheer, Wealth of India 7 (1966) 231; Khosla & Mehra, Taxon 22 (1973) 650; Gould & Soderstrom, Can. J. Bot. 52 (1974) 1083; Bir et al., Taxon 29 (1980) 710; Shetty & Shetty, Trans. Br. Mycol. Soc. 88 (1987) 409, fig. — *Panicum roxburghii* Spreng., Syst. 1 (1825) 320. — T y p e: *Hb. Roxburgh* (BM), India, cultivated in the Calcutta Botanical Gardens.
Panicum neesianum W. & A. ex Steud., Syn. 1 (1853) 74; O. Ktze, Rev. Gen. Pl. 2 (1891) 7. — T y p e: *Hb. Wight 2040* (P, holo; K), Ceylon.

Panicum sumatrense auct. non R. & S.: Monod in Backer & Bakh. f., Fl. Java 3 (1968) 550.

Panicum elegantissimum auct. non Hook. f.: Banerjee, J. Bomb. Nat. Soc. 68 (1971) 494, fig.;

Uniyal & Banerjee, J. Econ. Tax. (1985) 708.

a. var. curviflorum, stat. nov.

Loosely tufted annual, up to 90(–120) cm tall, hairy. Culms geniculate to spreading, terete, ribbed, smooth. Nodes yellowish green to black, glabrous. Sheaths terete, with bulbous based hairs, throat with tufts of hairs up to 2(–3) mm long. Ligule a row of hairs or scarious and collar-shaped, up to 0.8 mm long, abaxially puberulous with hairs up to 1.3 mm long, erose. Blades erecto-patent, usually flat, linear, abruptly narrowed into the base, 5.5–19(–30) cm by (3–)5–10(–12) mm, hairy on both sides, the lower side more densely so, margin scabrous. Panicle erect, lax, 10–50 cm long; main axis and branches semi-terete to angular, main axis smooth, the branches scaberulous; branches 1(–3, sometimes immediately branching above its base), the lowermost longest one (2–)3–11(–16) cm long (the higher ones sometimes longer), naked in the lower 0.1–0.6th part, with (8–)many spikelets. Pedicels 3–9(–13) mm long, scaberulous, sometimes with a short hair below the spikelet (see note). Spikelets \pm paired, fusiform, yawning at maturity, 2.5–3.2 mm long, acuminate. Lower glume ovate with a clasping base, 1.5–2.1 mm long, 0.5–0.7 times as long as the spikelet, keeled or indurated toward the acuminate apex, 5(–8)-nerved, midrib scaberulous. Upper glume 2.5–3.2 mm long, slightly shorter than to as long as the spikelet, apex \pm acuminate, \pm keeled, \pm falcate, 7(–11)-nerved, smooth. Lower lemma paleate, sterile, 2.2–3 mm long, 9-nerved. Lower palea lingular, oblong, 1.7–2.3 mm long, 0.6–0.8 times as long as the lemma, scarious. Upper lemma cupuliform, 1.5–2 mm, 9-nerved, smooth. Upper palea as the lemma, 1.4–1.9 mm long, more flat. Lodicules obliquely obhastate, c. 0.3 mm long, fleshy, glabrous, indistinctly nerved. Anthers 3, linear, c. 1 by 0.2 mm, red (i.s.). Stigmas subapical, free, reddish-brown (i.s.). Caryopsis ellipsoid, 1–1.5 mm long; embryo about half as long; endosperm white, glassy.

Distribution. India (widely spread); Sri Lanka; Thailand (Payap, Udawn, Kanchanaburi); Cambodia; Vietnam; not in Malesia.

Ecology. Savannahs, open dry deciduous forest, roadsides; on limestone; 0–1700 m alt.

Chromosome numbers. $n = 9$ (Gould & Soderstrom, 1974), 18 (Khosla & Mehra, 1973), 20 (Bir et al., 1980).

Uses. Liked by cattle. Grains, which resemble those of *Setaria italica* (L.) Beauv. are used for making bread in times of scarcity (Zaheer, 1966).

Pests. Shetty & Shetty (1987) reported that *Panicum trypheron* is the host of the smut *Ustilaginoides virens* between rice harvests.

Collector's notes. Suberect annual or short-lived perennial; culms rooting from lower nodes. Panicle open, with stiffly spreading branches. Spikelets green.

Notes. *Panicum trypheron*, the most commonly used synonym of this variety, has often been mentioned for Malesia. We have seen no material of the typical variety, instead all collections belonged to var. *suishaensis*.

It has frequently been noted that *P. trypheron* would occur in tropical Africa, but the references seem to pertain to either *P. porphyrrhizos* Steud. (Blatter & McCann, 1935) or *P. phragmitoides* Stapf.

There are several reports (Ridley, 1906; Merrill, 1921) based on Hooker f. (1896) that the species has been found in Borneo. We have seen no material of it from there, nor of var. *suishaense*.

Henrard (1941) included the species in *Panicum* group 'Diffusa', which is characterized by being perennial. This, at least as far as the present variety is concerned, seems exaggerated, at most it is a long-living annual; the var. *suishaense* looks more 'perennial', but probably is not, either. Hsu (1965) placed it in sect. *Panicum*.

b. var. *suishaense* (Hayata) Veldk., *comb. nov.*

Panicum suishaense Hayata, Icon. Pl. Form. 6, Suppl. (1917) 98; 7 (1918) 62; Jansen, Reinwardtia 2 (1953) 318. — *Panicum trypheron* Schult. var. *suishaense* Hsu, J. Jap. Bot. 38 (1963) 84, ('*suishaensis*'); Taiwania 16 (1971) 290; Taiwan Gr. (1975) 569, fig. 179. — T y p e: Hayata s.n. (TI, holo), Taiwan, Suisha, A° 1912.

Panicum sumatrense auct. non R. & S.: Monod in Backer & Bakh. f., Fl. Java 3 (1968) 550.

Panicum trypheron auct. non Schult.: Ridley, J. Str. Br. Roy. As. Soc. 46 (1906) 217; Merr., Philip. J. Sc. 1, Suppl. (1906) 358; Enum. Born. Pl. (1921) 447; Backer, Handb. Fl. Java 2 (1928) 166; Onkruidfl. Suikerr. 1 (1928) 89, quoad descr.; Backer in Heyne, Nutt. Pl. Indon. (1950) 234; Anon., Icon. Corm. Sin. 5 (1976) 159, 862.

Culms stiffly tufted, ± erect. Blades usually infolded or with the margins involute, (7–)12–35.5 cm by 3–5 mm. Lowest longest branch of the panicle (4–)8–19(–25) cm long. Pedicels usually with several (0.7–)1–1.7 mm long hairs below the spikelet. Spikelets (3.2–)3.5–4.2 mm long. Upper glume 2.9–3.8 mm long. Lower lemma 2.7–3.4 mm long; lower palea 1.8–2.1 mm long. Upper lemma 2–2.5 mm long; upper palea 2–2.4 mm long. Caryopsis 1.6–1.8 mm long.

D i s t r i b u t i o n. Thailand (Sisaket); South & North Vietnam; Taiwan; S China (Hainan); Malesia: Malaya (fide Merr., 1906); Sumatra (E Coast), Java (Jakarta, Priangan, Besuki), Kangean Isl., Borneo (fide Hook. f., 1896), Philippines (Luzon: Bukidnon, Cagayan, Cotabato, Lepanto, Mountain, and Zambales Prov.; Semirara; Mindoro; Palawan; Culion; Mindanao: Davao Prov.), Lesser Sunda Islands (Flores, see note), Celebes (Malili, Kendari).

E c o l o g y. Grass jungle, dry field, roadside, on heavy marl, 0–500 m.

C o l l e c t o r ' s n o t e s. Glumes etc. dark reddish and green.

V e r n a c u l a r n a m e. Jukut titiran (Sund.).

U s e s. Just barely useful as a fodder (Backer, 1950).

N o t e s. The main character used by Hayata (1918) and Hsu (1963) to distinguish *P. suishaense* from *P. trypheron* is the habit: a stiff tuft with long, ascending basal leaves. No clear distinctive quantitative floral characters are mentioned, or it should be that Hayata described the lower glume as oblong and sub-3-nerved. Jansen (msc.), too, uses the term 'sub-3-nerved' for *P. suishaense*, but in the specimens he saw and which were seen by us the glume is 5-nerved just as in *P. trypheron*. Hsu studied the lodicules, but in the case *P. trypheron* and *P. suishaense* (re-

garded as varieties by him), he does not mention them for the latter. We did not see any differences.

A character used by e.g. Jansen (msc.) to distinguish between the taxa is the base of the blades, which would be abruptly narrowed in *P. trypheron*: however, this turned out to be an independable distinction. In both 'taxa' both the extremes and the intermediates are present. The length of the hairs on the pedicels of *P. suishaense*, too, are not as absolute a character as might be hoped. In the typical variety they are usually absent, but often within the panicle there may be one or two (or more) spikelets subtended by a hair. These are especially distinct when the spikelet has dropped off. In var. *suishaense* there are usually several hairs below the spikelet, but the odd spikelet in the inflorescence may have none at all. Several spikelets ought to be checked therefore.

Quantitative characters observed by us that distinguish between the two taxa are the width of the expanded leaf and the lengths of the spikelet and upper lemma: *P. suishaense* has narrower leaves and longer spikelets and upper lemmas.

The two collections from Flores (*Schmutz 5031, 5049*) are somewhat aberrant by the exceptionally short and wide leaves. The size of the spikelets that are subtended by several hairs and the general distribution of the variety support the inclusion here.

Although recorded in the literature for Malaya and Borneo, we have not seen material from there.

Blake (Proc. Roy. Soc., Queensland 81, 1969, 23) included *Panicum papuanum* Mez [Bot. Jb. 56, Beibl. 12, 1921, 6; type *Lesson s.n.* ex Hb. Kunth, holo in B, photo in BRI, K, iso in P?), New Guinea, Waigiou, A° 1825]. We have not seen this specimen. We have not seen any other record of *P. curviflorum* from New Guinea but from its description, e.g. size of spikelet only 2 mm, we agree with Chase (J. Arn. Arbor. 20, 1939, 309) that it is more likely the same as *P. mindanaense* Merr.

2. *Panicum sumatrense* Roth ex R. & S.

Panicum sumatrense Roth ex R. & S., Syst. Veg. 2 (1817) 434; Roth, Nov. Pl. Sp. (1821) 50; Buse in Miq., Pl. Jungh. 3 (1854) 374; Bor, Grasses (1960) 701; in Fedde, Repert. 63 (1961) 328; Zaheer, Wealth of India 7 (1966) 228, fig. 98; Karthikeyan, Bull. Bot. Surv. India 13 (1971) 356; Purselove, Trop. Crops, Monocot. 1 (1972) 201; Majumdar, Bull. Bot. Soc. Bengal 27 (1973) 50; De Wet et al., J. Agric. Trans. Bot. Appl. 30 (1983) 159. — **L e c t o t y p e:** *Heyne s.n.* (B, photos in K), Sumatra.

Milium attenuatum Moench, Meth. (1794) 204, excl. synonym. — *Panicum miliaceum* L. var. *attenuatum* Willd., Syst. Veg. 1 (1798) 348. — *Panicum attenuatum* Willd., Enum. Pl. (1809) 1033, non *P. adnatum* Moench (1802). — **T y p e:** Not indicated, not extant.

Panicum psilopodium Trin., Diss. Alt. (1826) 217; Hook. f., Fl. Br. Ind. 7 (1896) 46; Ridley, Fl. Mal. Pen. 5 (1925) 224; Fischer in Gamble, Fl. Madras 10 (1934) 1780; Ramanathan, Curr. Sc. 19 (1950) 155; Bor, Grasses (1960) 329; Gupta, Curr. Sc. 32 (1963) 181; Zaheer, Wealth of India 7 (1966) 231; Monod in Backer & Bakh. f., Fl. Java 3 (1968) 550; Launert, Mitt. Bot. Mus. München 8 (1970) 153; Gupta & Sharma, J. Agric. Trop. Bot. Appl. 18 (1971) 85; Gupta, Genet. Iber. 23 (1971) 185; Karthikeyan, Bull. Bot. Surv. India 13 (1971) 356; Majumdar, Bull. Bot. Soc. Bengal 27 (1973) 50, t. 17; Anon., Icon. Corm. Sin. 5 (1974) 159, t. 7148; Gould & Soderstrom, Can. J. Bot. 52 (1974) 1083; Hsu, Taiwan Gr. (1975) 565,

- t. 177; Fl. Taiwan 5 (1978) 577; Cope, Fl. Pakistan (1982) 170. — *Panicum psilopodium* var. *psilopodium*: Bor, Grasses (1960) 329; Cope, Fl. Pakistan 143 (1982) 171. — S y n - t y p e s: Lindley sub *P. ramosum* Koen., *P. virgatum* Roxb. (LE, holo, BM), India.
- Panicum simplex* Rottl. ex Trin., Diss. Alt. (1826) 216. — T y p e: *Rottler s.n.* (LE, holo), 'Ind. or.'
- Panicum crispum* Llanos, Fragm. Pl. Filip. (1851) 41. — T y p e: Not extant, Philippines.
- ? *Panicum albidulum* Steud., Syn. 1 (1853) 69. — T y p e: *Kotschy 42* (P, holo; L), Sudan, Cordofan, Abu Gerad, 1841 (see note).
- Panicum psilopodium* Trin. var. *coloratum* Hook. f., Fl. Br. Ind. 7 (1896) 47. — S y n - t y p e s: *Duthie s.n.* (= ? 236, 10752: K), India; *Collett s.n.* (K, cf. Bor, 1960), Burma.
- Panicum miliare* auct. non Lamk.: Miq., Fl. Ind. Bat. 3 (1857) 451; Hook. f., Fl. Br. Ind. 7 (1896) 46; Fischer in Gamble, Fl. Madras 10 (1934) 1780; Burk., Dict. 2 (1935) 1657; Backer in Heyne, Nutt. Pl. Indon. (1950) 225; Jansen, Reinwardtia 2 (1953) 316; Schmid, l'Agron. Trop. 13 (1958) 334; Bor, Grasses (1960) 329; Sharma, J. Palyn., Sp. Vol. (1967) 37; Khosla & Mehra, Taxon 22 (1973) 560.
- Panicum trypheron* auct. non Schult.: Backer, Onkruidfl. Suikerr., Atlas 3 (1929) t. 81.

Tufted annual, up to 77(–95) cm tall, usually only the basal sheaths with bulbous-based hairs and otherwise glabrous. Culms usually branched, terete, ribbed, usually smooth. Nodes yellowish brown to black, usually glabrous, sometimes barbate. Sheaths ± keeled, rather loose. Ligule usually collar-shaped, either completely consisting of hairs or scarious, 0.5–2 mm long, abaxially puberulous with hairs up to 1.9 mm long, erose. Blades erecto-patent, folded to flat, linear, 4–23(–45) cm by 3–7(–12) mm, usually smooth, margin scaberulous to ± smooth. Panicle erect, contracted to lax, oblong, (3–)7–26 mm long; main axis and branches slightly angular, main axis smooth, the branches scaberulous; branches solitary, sometimes several together, the lowermost longest one 4.5–20 cm long, naked in the lower (0–)0.18–0.5th part, with (10–)many spikelets. Pedicels 1–12 mm long, scaberulous upward. Spikelets ± paired, fusiform, not yawning, 2.2–3.5(–4) mm long, acute. Lower glume ovate with a clasping base, 0.8–1.6 mm long, 0.25–0.5 times as long as the spikelet, not keeled toward the acute to truncate apex, (3–)7-nerved, smooth. Upper glume as long as the spikelet, apex ± acuminate, ± keeled, ± falcate, 11-nerved, smooth. Lower lemma paleate, sterile, rarely male, about as long as the spikelet, 9-nerved. Lower palea lingular, oblong, 0.7–1 time(s) as long as the lemma, scarious. Upper lemma cupuliform, 1.7–2.6 mm long, obscurely 7-nerved, coriaceous, smooth. Upper palea as the lemma, but more flat. Lodicules obliquely obhastate, c. 0.4 mm long, fleshy, glabrous, 0-nerved. Anthers 3, linear, c. 1.8 by 0.2 mm, red (i.s.). Stigmas subapical, free, reddish-brown, sometimes purple (i.s.). Caryopsis ellipsoid, 1.3–2.2 by 0.7–1.1 mm; embryo ± half as long; endosperm white, glassy.

D i s t r i b u t i o n. ? Sudan and Senegal (as *P. laetum*, see note), Pakistan, India (widely spread); Sri Lanka; Tonkin; Malesia: ? Malaya (once reported from Selangor by Ridley, 1925, but not taken up by Gilliland, Rev. Fl. Mal. 3, Gram., 1971), Java (Ceribon, Pekalongan, Semarang, Madiun, Surabaya, Pasuruan, Besuki), Madura, Philippines (Luzon: Tarlac, Rizal, Benguet), Celebes (Pampanua), Lesser Sunda Islands (Flores, Roti, Timor); adventitious in Germany.

E c o l o g y. Savannah, forest edge, edge of rice field, grassy roadsides; heavy soil, 0–1890 m.

Chromosome numbers. $n=7$ (Khosla & Mehra, 1973), 18 (Gupta, 1971), $2n=36$ (Gupta, 1963), 40 (Gould & Soderstrom, 1974), 54 (Ramanathan, 1950).

Pollen. Sharma (1967); self-pollination seems to be the rule (Zaheer, 1966).

Diseases. Plants infected by the rust *Uromyces linearis* Berk. & Br. have an enlarged, flattened and exserted fertile lemma. They are not uncommon in certain parts of Pakistan and India (Bor, 1960; Cope, 1982).

Uses. Foliage palatable, but hardly of any fodder value (Burkill, 1935; Backer, 1950), but Zaheer (1966) stated that it contains 18.5 mg / 100 g carotene and may have great potentialities as a quick growing fodder, producing a thin and soft straw consumed readily by cattle.

In India several races are cultivated (Zaheer, 1966). The husked grain (husk 20%) is not tasty. It is cooked like rice and eaten. Also made into flour for making puddings and cakes. The grains of *P. psilopodium* are used for the preparation of a slightly alcoholic beverage in Assam (Zaheer, 1966). Rottler, cited by Bor (1960), noted that it was eaten by women in childbed affected by cold.

Collector's notes. Annual or perennial?; culms spreading from base. Panicle open.

Vernacular name. Little millet (Engl.), suket gulaän (Jav.).

Notes. Bor (1960) mentioned *P. flexuosum* Retz. (Obs. Bot. 3, 1783, 9) as an older synonym for *P. psilopodium*, which, if correct, he ought to have adopted. Its type, which we have seen, is however an entirely different species, possibly *P. xalapense* Kunth. If this is true *P. flexuosum* is an older name, but a specialist in the American grasses is invited to confirm this.

Cope (1982) mentioned *P. flexuosum* Retz. var. *glabrum* Retz., a combination never published by Retzius. Cope (in litt.) admitted that this oversight was due to the hurry in which the manuscript had to be made. In the Retzius herbarium is an unnamed variety, which we have seen: it does indeed belong to *P. sumatrense*, so perhaps this specimen was what Bor had in mind.

An isotype of *P. albidulum* Steud. (1853) in L does not belong to *P. hygrocharis* Steud., as maintained by Stapf (Fl. Trop. Afr. 9, 1920, 716–717), which is a synonym of *P. repens* L., nor does it belong to *P. laetum* Kunth (1831) as stated by Clayton (Fl. W. Trop. Afr., ed. 2, 3, 1972, 434) and Clayton & Renvoize (Fl. Trop. E. Afr., Gram. 3, 1982, 488). Instead it is *P. sumatrense*. *Panicum laetum* would differ e.g. by the solitary spikelets. Insufficient material of the latter was available to study this matter further.

Launert (1970) pointed at possible conspecificity with the South African *P. laevifolium* Hack., but a comparison with his table (p. 154) and description given above point out several differences.

Var. *coloratum* is a form with purple or violet spikelets and hardly worthy of recognition. The typical form has greenish spikelets.

Panicum psilopodium Trin. var. *epaleatum* Keng ex Chen et al., Bull. Bot. Res. 4 (1984) 124 [Type: *Tsiang 6912* (Jiangsu Inst. Bot., holo), China, Guizhou, Du Shan, sunny place in forest, 500 m, 7 Sept. 1930] probably does not belong here. The only difference with the typical variety given was that the palea was absent, but we have never seen this, and suspect that another taxon is involved.

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INDEX TO COLLECTORS

Only numbered collections have been included. When no material was seen but the identity seemed clear from the literature, the species number has been placed between brackets.

- 1a. *Panicum curviflorum* Hornem. var. *curviflorum*
- 1b. *Panicum curviflorum* Hornem. var. *suishaense* (Hayata) Veldk.
2. *Panicum sumatranum* Roth ex R. & S.

Backer 19702, 19798: 2; 24068: 1b; 26561: 2; 28019, 28147, 29655, 30777: 1b — Balansa 427: 1b; 1625: 2 — van Beusekom et al. 4008: 1a — BF 16585 (Curran): (1b).

CCC 10471 (McClure): 1b — Clayton 5154: 1a — Clemens 18208, 18291: 2 — Copeland 396: (1b) — Curran, see BF-series.

Davidse 8337: 1a; 8370A: 2 — Davidse & Sumithraarachchi 8960: 2 — Dorgelo 240: 2.

Franck 98: 1b.

Gamble 23897: (1).

Koelz 26727: 2 — Kooper 12: 2 — Kooy 757: 2 — Kotschy 42: 2.

Landbouw Leraar Cheribon 29: 2 — Larsen 2426, 4439, 4714: (1) — Lazarides 7338: 1a; 7386: 2 — Lörzing 9749, 14201, 16307: 1b — Lowrie 9976: (1).

Mavies 82b: 2 — Maxwell 76-564: 1b — McClure, see CCC-series — Meijer 11419: 1b — Merrill 678: (1b); 4136: 1b; 4478: (1b); Philip. Pl. 1281: 1b; 1764: 2 — Misra 863: 1a — Mooney 3560: 2.

Nguyen Van Khiem 102: 1b — Noerkas 69a: 2.

Perrottet 1360: 2 — PNH 33190 (Steiner): 2.

Rappard 229: 2 — Reinwardt 7, 9: 2.

Santos 4788, 4930, 4960A, 5736, 6077, 6167: 1b; 7566: 2; 8109: 1b — Schmutz 2064A: 2; 5031, 5049: 1b?; 5655, 5828: 2 — Soderstrom & Kulatunge 1621: 2; 1760: 1a — Steiner, see PNH-series.

Thakur Rup Chand 1125: 1a.

van der Voort 3: 1b — Verheijen 2459: 2.

Wallich 8712F: 2.