

REVISION OF PANICUM AND WHITEOCHLOA IN MALESIA (GRAMINEAE-PANICEAE)

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SUMMARY

A revision is given for the 25 Malesian representatives of *Panicum* L. (Gramineae). *Whiteochloa* C.E. Hubb., a satellite genus, is represented by a single species, and is a new generic record for Malesia.

NOTES ON PANICUM

The genus *Panicum* L. never has been surveyed completely for Malesia. The largest account was made about 140 years ago by Miquel (1857), who for the Dutch East Indies enumerated not less than 47 species, some more or less optimistically included, as was his wont. Since then the generic delimitation has changed drastically. *Panicum* then was a dustbin, and many of its former taxa are included now in several other genera, while of course Miquel's nomenclature is completely out of date.

In this classical sense, Merrill (1921) enumerated 26 species for Borneo, of which 11 have been retained in *Panicum* here. In 1923 Merrill had 36 species for the Philippines, of which 17 are left. Backer (1950) annotated 38 of the more or less economically important species for Indonesia; only 14 are 'true' *Panicum*.

In the modern sense Gilliland (1971) included 12 for the Malay Peninsula. Henty (1969) had 11 for New Guinea, of which 10 now belong to *Panicum*.

In Jansen's unpublished manuscript of the Flora Malesiana treatment of the Gramineae (Leiden) 27 species and 4 varieties were enumerated, and from this he (1953) extracted some brief notes on 15 species and 3 varieties. Since then 9 of these have been renamed or reduced, while one, *Panicum capillipes* Benth., belongs to *Whiteochloa* C.E. Hubb. and is a new generic record for Malesia. Of the 12 not discussed in his paper 6 more had to be renamed. I here recognize 25 taxa, of which 4 or 5 have been introduced for fodder or by accident.

Most of the changes in name or identity are scattered over the literature and easily escape the attention, or are proposed here.

Panicum archboldii Hitchc. is identical with *Hymenachne aurita* (Nees) Backer, as was already pointed out by S.T. Blake (1969). Zuloaga et al. (1992) following Pilger (1940) included it in the otherwise strictly American section *Laxa* (Hitchc. & Chase) Pilger. It has been regarded also as a species of *Sacciolepis* Nash by various authors. As I have not yet studied the genera *Hymenachne* and *Sacciolepis* closely, it is at present included here as *Panicum auritum* Presl ex Nees.

Panicum cambogiense Balansa is identical with *P. luzonense* Presl.

Panicum hayatae Camus turned out to be identical with *P. costatispiculum* Ohwi and has an interesting disjunct distribution.

Panicum humidorum F. Ham. ex Hook. f. (incl. var. *perakense* Hook. f.) replaces *P. parvispiculum* Ohwi (non Nash, 1897) or *P. ohwii* Beetle.

Panicum humile Nees ex Steud. is not a later homonym and *P. austro-asiaticum* Ohwi is therefore superfluous. *Panicum walense* Mez is synonymous with this.

Panicum khasianum Munro ex Hook. f. is the same as *P. oblongispiculum* Ohwi, and has a disjunct distribution reminiscent of several montane and subalpine species that occur in the Himalayas and then in N Sumatra, sometimes for some reason not venturing farther down the Bukit Barisan than the Leuser complex.

Panicum laevifolium Hack. is *P. schinzii* Hack. It was found in 1953 near Jakarta (van Leeuwen C; L), and according to Jansen's manuscript would be cultivated elsewhere in Java as a fodder grass. Whether this is correct and how widely it has spread since then is unknown. The species has been included here as the status of this and many of such intentionally or accidentally introduced species is absolutely unclear, and with little support in the herbaria.

I have noticed that some species quite common outside, yea, sometimes even growing against their walls, were hardly or not at all represented inside the institutes, or only from remote places or ancient collections. The knowledge of grasses in Malesia to be presented in the Flora Malesiana is based mainly on pre-WW II collections. In Papua New Guinea, thanks to the efforts of the LAE staff, and especially Mr. E.E. Henty, the situation is slightly better. However, with at least 11 species now known to occur, 9 are represented by only 29 collections in the NGF- and LAE-series, as far as I have seen them, which is indicative for this area as well. With at least 33 species in neighbouring Queensland, more may well be expected, especially in the dry areas of Merauke/Western Province and the Central Province. Thus there is only a vague idea about what is really going on in grasses (and other herbs)!

Panicum macrocladum Chase is identical with *P. seminudum* Domin.

Panicum maximum Jacq. recently (Webster, 1987) has been included in *Urochloa* Beauv., a decision that needs confirmation or rejection. I maintained it here in *Panicum*.

Panicum miliare Lam. is *P. antidotale* while *P. montanum* is *P. notatum* as was already pointed out by Bor (1960) in an often overlooked appendix.

Panicum queenslandicum Domin is a new record for Malesia and also has a disjunct distribution, occurring in Northern Australia and then in Buru, where it was only found once. This distribution is reminiscent of that of *Aristida superpendens* Domin, also known from Buru, the Western Province of Papua New Guinea, and Northern Australia. It was misidentified by Jansen (1953) as *P. trachyrhachis* Benth.

Panicum trachyrhachis Benth. is not restricted to N Australia and New Guinea and perhaps Timor, but also occurs very locally in SE Thailand (as *P. kerrii* C.E. Hubb.), Cambodia and S Vietnam (as *Ichnanthus harmandii* Camus or *P. harmandii* Stieber).

I have pointed out elsewhere (Veldkamp, Eijs & Zoetemeyer, 1989), that *Panicum trypheron* Schult. is identical with *P. curviflorum* Hornem. with *P. suishaense* Hayata as a variety, including *P. elegantissimum* Hook. f.

Panicum viale Chase is the Australian *P. effusum* R.Br. extending the distribution of this species to Malesia.

Many species of *Panicum* are very widely spread. Some have an economic importance as weeds (*P. repens* L., *P. sarmentosum* Roxb.), as cereals (*P. miliaceum* L., *P. paludosum* Roxb., *P. sumatrense* Roem. & Schult.), or as fodder (*P. antidotale* Retz., *P. maximum* Jacq., *P. miliaceum* L., *P. paludosum* Roxb., *P. sarmentosum* Roxb., *P. schinzii* Hack.). A brief survey outlining the present situation therefore seemed useful and may, perhaps, induce further collecting.

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This study was based on the specimens available in L, and seen in BO, K, P, and U. For the descriptions use was made of the DELTA programs developed by Dallwitz (1980) and Dallwitz, Paine & Zurcher (1993), the use of which is greatly simplified by Gouda's TAXASOFT program (vs. 1995). The key was constructed with Pankhurst's DEDIT and BIGKCONI programs (Pankhurst, 1988).

REFERENCES

- Backer, C.A. 1950. In K. Heyne, De nuttige planten van Indonesië 1: 212–237. 's Gravenhage, Bandung.
- Blake, S.T. 1969. Taxonomic and nomenclatural studies in the Gramineae, no. 2. Proc. Roy. Soc. Queensland 81: 21.
- Bor, N.L. 1960. The grasses of Burma, Ceylon, India and Pakistan: 701. Oxford, etc.
- Dallwitz, M.J. 1980. A general system for coding taxonomic descriptions. Taxon 29: 41–46.
- Dallwitz, M.J., T.A. Paine & E.J. Zurcher. 1993. User's Guide to the DELTA System: a General System for Processing Taxonomic Descriptions. 4th ed. 136 pp. Canberra.
- Gilliland, H.B. 1971. A revised Flora of Malaya, vol. 3. Grasses of Malaya: 131–143. Singapore.
- Henty, E.E. 1969. A manual of the grasses of New Guinea. Bot. Bull. Lae 1: 140–143.
- Jansen, P. 1953. Notes on Malesian grasses. I. Reinwardtia 2: 314–318.
- Merrill, E.D. 1921. A bibliographic enumeration of Bornean plants. J. Str. Br. Roy. As. Soc., Special No.: 44–47.
- Merrill, E.D. 1923. An enumeration of Philippine flowering plants 1: 61–70. Manila.
- Miquel, F.A.W. 1857. Flora Indiae batavae 3: 444–457. Amsterdam, Utrecht, Leipzig.
- Pankhurst, R.J. 1988. An interactive program for the construction of identification keys. Taxon 37: 747–755.
- Pilger, R. 1940. Gramineae III. Unterfamilie Panicoideae. In A. Engler & K. Prantl, Die Natürliche Pflanzenfamilien ed. 2, 14e: 15. Leipzig.
- Veldkamp, J.F., A.W.M. Eijs & R.B. Zoetemeyer. 1989. *Panicum curviflorum* (formerly *P. trypheron*) and *P. sumatrense* (*P. miliare* auct.) (Gramineae) in Southeast Asia. Blumea 34: 77–85.
- Webster, R. 1987. Australian Paniceae: 241. Berlin, Stuttgart.
- Zuloaga, F.O., R.P. Ellis & O. Morrone. 1992. A revision of *Panicum* subgenus Phanopyrum section Laxa (Poaceae: Panicoideae: Paniceae). Ann. Missouri Bot. Gard. 79: 770–818.

PANICUM

Panicum L., Sp. Pl. 1 (1753) 55; Webster, Pan. Austr. (1987) 118. — Lectotype: *Panicum milia- ceum* L.

Annuals or perennials. Ligule a row of hairs to a setose membranous collar. Inflorescence a panicle with branches pointing to all directions and ending in a spikelet. Bristles absent. Spikelets disarticulating as a whole, abaxial, dorso-ventrally compressed, muticous. Lower glume present, shorter than the spikelet, 0–9-nerved. Upper glume

about as long as the spikelet, 3–15-nerved. First lemma epaleate to paleate, male, herbaceous, not longitudinally grooved, without a hyaline area at the base. Rhachilla internode not or hardly developed. Second lemma coriaceous, base unappendaged, margins inrolled. $x = 9, 10$.

Distribution — About 500 species, mainly in the tropics, 25 in Malesia.

KEY TO THE TAXA

- 1a. Lower glume collar-shaped. — Ligule a ciliolate to pilose collar 2
 - b. Lower glume ovate 3
- 2a. Sheaths glabrous, margins glabrous. Ligule a pilose collar. Blades glabrous. Upper glume 3.3–3.9 mm long. First lemma usually paleate and sterile, rarely epaleate 17. *P. paludosum*
 - b. Sheaths glabrous to sparsely pilose, margins pilose. Ligule a ciliate rim. Blades pilose. Upper glume 2.6–3 mm long. First lemma paleate, male 19. *P. repens*
- 3a. Ligule a membranous glabrous or ciliolate collar 4
 - b. Ligule a pilose collar or a row of hairs 13
- 4a. Second lemma minutely muriculate or finely longitudinally rugulose 5
 - b. Second lemma smooth (sometimes with some apical prickles) 6
- 5a. Plants annual. Culms geniculate at base or creeping. Nodes puberulous. Sheath margins pilose. Blades ovate-lanceolate, 2.5–7 cm long, base asymmetrical. Spikelets 1.2–1.4 mm long. Glumes with a distinct internode, lower glume 0.6–0.7 mm long, acuminate, upper glume obtuse. First lemma paleate, sterile, obtuse. First palea 0.3–0.6 times as long as the lemma. Second lemma sessile, minutely muriculate, apex acute. Anthers 0.4–0.5 mm long 25. *P. trichoides*
 - b. Plants perennial. Culms erect. Nodes glabrous. Sheath margins glabrous. Blades linear, 8–27.5 cm long, base rounded. Spikelets 2.2–3 mm long. Glumes without a distinct internode, lower glume 0.8–1.2 mm long, acute, upper glume acute. First lemma paleate, male, acute. First palea as long as the lemma. Second lemma stipitate, finely longitudinally rugulose, apex apiculate. Anthers 1.1–1.5 mm long *Whiteochloa capillipes*
- 6a. Blades base pseudo-petiolate. Upper glume 2.5–3.1 mm long. Second lemma apically microscopically scaberulous to ciliolate 7
 - b. Blades base rounded, truncate, or cordate. Upper glume 1.3–2.4 mm long. Second lemma glabrous 8
- 7a. Plants annual. Ligule a membranous glabrous collar. Blades linear-lanceolate. Pedicels smooth. Lower glume 2.2–3 mm long, 0.6–0.8 times as long as the spikelet. Upper glume 11–15-nerved. First lemma paleate, sterile, or paleate and male, 9–11-nerved. Second lemma apically microscopically scaberulous, apiculate 8. *P. hayatae*
 - b. Plants perennial. Ligule a membranous ciliolate collar. Blades linear. Pedicels scaberulous. Lower glume 0.7–1.3 mm long, 0.3–0.4 times as long as the spikelet. Upper glume 5-nerved. First lemma epaleate, 5-nerved. Second lemma apically microscopically ciliolate, acute to acuminate 11. *P. khasianum*
- 8a. Blades linear, margin glabrous at base 9
 - b. Blades ovate- to linear-lanceolate, margin pectinate at base 11

- 9a. Plants perennial. Culms 1–2 m long. The lowermost longest panicle branch 7.5–20 cm long. Spikelets not yawning at maturity. Lower glume obtuse to acute. Upper glume acute. Second lemma apex acute to acuminate 10
 b. Plants annual. Culms 0.08–0.6 m long. The lowermost longest panicle branch 3–6 cm long. Spikelets yawning at maturity. Lower glume acuminate to mucronate. Upper glume acuminate. Second lemma apex obtuse 10. *P. humile*
- 10a. Rhizome present. Sheath margins glabrous. Panicle branches spikeled to base. Spikelets 2–3 mm long. Lower glume 0.3–0.5 times as long as the spikelet, upper glume and first lemma faint transverse veinlets. Second lemma acute. Anthers 2 2. *P. auritum*
 b. Rhizome absent. Sheath margins pilose. Panicle branches naked at base. Spikelets 1.4–1.7 mm long. Lower glume 0.5–0.7 times as long as the spikelet, upper glume and first lemma without transverse veinlets. Second lemma apex acuminate. Anthers 3 9. *P. humidorum*
- 11a. Blades base cordate. Pedicels longer than the spikelets. Spikelets obtuse to acute. Glumes with a distinct internode, lower glume 1.6–2.7 mm, 0.6–0.9 times as long as the spikelet. Anthers 0.7–1.5 mm long 12
 b. Blades base rounded. Pedicels shorter than to as long as the spikelets. Spikelets acuminate. Glumes without a distinct internode, lower glume 0.8–1.3 mm, 0.4–0.5 times as long as the spikelet. Anthers 0.3–0.6 mm long 3. *P. bisulcatum*
- 12a. Plants annual. Culms geniculate at base or creeping. Blades ovate-lanceolate. Panicle effuse, branches with minute glandular patches. Spikelets 1.9–2.1 mm long. Upper glume acuminate. First lemma paleate, sterile, acuminate 4. *P. brevifolium*
 b. Plants perennial. Culms erect or scrambling. Blades lanceolate to linear-lanceolate. Panicle laxly contracted, the branches erecto-patent or lax, branches without glandular patches. Spikelets 2.2–3 mm long. Upper glume obtuse to acute. First lemma epaleate, acute 16. *P. notatum*
- 13a. First lemma with transverse veinlets (best seen when soaked) 14
 b. First lemma without transverse veinlets 16
- 14a. Plants annual. Blades base rounded, truncate, or cordate. Spikelets acute. Upper glume acute. First lemma acute, its palea 0.8–1 times as long as the lemma 15
 b. Plants perennial. Blades base gradually narrowed into the sheath. Spikelets acuminate. Upper glume acuminate. First lemma acuminate, its palea 0.5–0.6 times as long as the lemma 7. *P. effusum*
- 15a. Nodes bearded, sheaths tuberculate hispid, margins pilose. Blades puberulous, pilose or tuberculate hispid, base rounded or cordate, margin pectinate at base. Main axis of panicle puberulous. Spikelets not yawning at maturity. Glumes with a distinct internode, lower glume obtuse to acute, 5–9-nerved, upper glume with transverse veinlets. Second lemma apex obtuse. Anthers 0.7–1.3 mm long 12. *P. luzonense*
 b. Nodes, sheaths, sheath margins, blades glabrous. Blades base truncate, margin glabrous at base. Main axis of panicle glabrous. Spikelets yawning at maturity. Glumes without a distinct internode, lower glume acuminate, 1-nerved, upper glume without transverse veinlets. Second lemma apex acute. Anthers 1.5–1.8 mm long 21. *P. schinzii*

- 16a. Culms erect or geniculate at base. Pedicels scaberulous or pilose under the spikelet. Spikelets acute to caudate. Second lemma apex obtuse, acute, or acuminate 17
 b. Culms scrambling. Pedicels smooth. Spikelets obtuse. Second lemma apex apiculate 20. *P. sarmentosum*
- 17a. Glumes without a distinct internode. Second lemma apex acute to acuminate 18
 b. Glumes with a distinct internode. Second lemma apex obtuse 20
- 18a. Sheath margins and blades glabrous. Lowermost branches of the panicle solitary or fascicled. Spikelets not yawning at maturity. Upper glume 7–11-nerved. First lemma 7–9-nerved. Second lemma sessile, smooth, shiny, apex acute 19
 b. Sheaths margins pilose. Blades tuberculate hispid. Lowermost branches of the panicle whorled. Spikelets yawning at maturity. Upper glume 5-nerved. First lemma 5-nerved. Second lemma stipitate, transversally rugose, dull, apex acuminate 13. *P. maximum*
- 19a. Plants perennial. Nodes puberulous. Blades base gradually narrowed into the sheath or truncate. Pedicels shorter than the spikelets. Lower glume 3-nerved. Upper glume 7-nerved 1. *P. antidotale*
 b. Plants annual. Nodes glabrous or bearded. Blades base rounded. Pedicels as long as to longer than the spikelets. Lower glume 7-nerved. Upper glume 11-nerved 23. *P. sumatrense*
- 20a. Blades base not cordate nor strongly asymmetrical. Nodes glabrous. Blades underneath with up to 11 major nerves 21
 b. Blades base cordate or strongly asymmetrical. Nodes puberulous to bearded. Blades underneath with 13–15 major nerves 14. *P. miliaceum*
- 21a. Culms hollow, not inflated at base. Second lemma sessile 22
 b. Culms hollow, inflated at base. Second lemma stipitate. — Lowermost panicle branches whorled to fascicled. Spikelets yawning at maturity. Upper glume acuminate to mucronate 24. *P. trachyrhachis*
- 22a. Lowermost panicle branch solitary. Spikelets yawning at maturity 23
 b. Lowermost panicle branches whorled. Spikelets not yawning at maturity. — Upper glume 7-nerved 18. *P. queenslandicum*
- 23a. Upper glume 7-nerved 24
 b. Upper glume 5-nerved. — Panicle effuse. First lemma 3–5-nerved 15. *P. mindanaense*
- 24a. First lemma 7–9-nerved 25
 b. First lemma 5-nerved. — Sheath margins glabrous, base of blades truncate. First palea absent to 0.21 times as long as the lemma 5. *P. caudiglume*
- 25a. Sheath margins pilose, base of blades gradually narrowed into the sheath to rounded. First palea 0.5–0.7 times as long as the lemma 6. *P. curviflorum* var. *suishaense*
 b. Sheaths margins glabrous, base of blades truncate. First palea 0.1–0.3 times as long as the lemma 22. *P. seminudum*

1. *Panicum antidotale* Retz.

Panicum antidotale Retz., Obs. Bot. 4 (1786) 17. — Type: *Koenig s.n.* (LD holo; K fragm.).
Panicum miliare Lam., Tabl. Encycl. Méth. Bot. 1 (1791) 173. — Type: *Sonnerat in Hb. Lamarck* (P holo; fragm. & photo in K, IDC microfiche 6207).
Panicum proliferum Lam., Tabl. Encycl. Méth. Bot. 4 (1798) 747. — Type: *Hb. Lamarck* (P holo, IDC microfiche 6207).
Panicum sumatrense auct. non Roem. & Schult.

Plants perennial, rhizome long, woody. Culms 0.6–1.5 m long, geniculate at base to erect, hollow, not inflated. Nodes minutely puberulous. Sheaths glabrous, margins glabrous. Ligule a pilose collar. Blades linear, 21–45 cm by 4–20 mm, glabrous, green, base gradually narrowed into the sheath to truncate, margin glabrous at base, underneath with 7–14 major nerves. Panicles lax, 14–45 by 5–15 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, spikeled to base or not, the lowermost solitary to fascicled, the lowermost longest one 8–11.5 cm long. Pedicels shorter than the spikelets, scaberulous. Spikelets not yawning at maturity, 2.25–3.5 mm long, acute to acuminate. Glumes without a distinct internode. Lower glume ovate, 1–1.7 mm long, 0.47–0.66 times as long as the spikelet, obtuse to acute, 3-nerved. Upper glume 2.25–3.1 mm long, acute to acuminate, glabrous, 7-nerved, nerves without transverse veinlets. First lemma paleate, male, acute to acuminate, 7–9-nerved, nerves without transverse veinlets. First palea as long as the lemma. Second lemma sessile, apex acute, straight, smooth, shiny, glabrous. Anthers 3, 1.4–1.65 mm long. $2n = 18$.

Distribution — S Russia to India (Madras), cultivated elsewhere: Malesia: Java (Jakarta), Papua New Guinea (Morobe Prov.: Erap, Moitaka).

Habitat — Sand dunes, dry riverbeds, drought resistant, c. 60 m altitude.

Uses — Good fodder, but becoming bitter when old, and a soil binder. In India used against sore throats and as an antidote for rabies (but see note).

Vernacular name — Blue panic (E.).

Note — The combination has for a long time been misapplied to *P. sumatrense* Roth ex Roem. & Schult. and the uses may actually apply to that.

2. *Panicum auritum* Presl ex Nees

Panicum auritum Presl ex Nees, Agrost. Bras. (1829) 176. — *Hymenachne aurita* [?Presl ex Balansa in Morot, J. Bot. 4 (1890) 144, nomen, no basion.] Backer in K. Heyne, Nutt. Pl. Ned. Indië 1 (1922) 197. — *Sacciolepis aurita* Camus, Fl. Gén. Indo-Chine 7 (1922) 459. — Lectotype: *Haenke s.n.*, ‘Luzon’ (PR holo, ?Hb. Triniius 0592.02 in LE, microfiche IDC BT-16/1; MO, W). *Panicum auritum* Nees var. *procerius* Presl, Rel. Haenk. 1 (1830) 305. — Type: *Haenke s.n.* (PR holo).

[*Panicum javanicum* Nees & Blume, ined., non Poir. (1816). — *Panicum auritum* Nees var. *procerius* Nees, Kew J. Bot. (1850) 97, nomen, non Presl.] — *Panicum insulicola* Steud., Syn. 1 (1853) 78. — *Sacciolepis insulicola* Ohwi, Bull. Tokyo Sc. Mus. 18 (1947) 3. — Syntypes: ‘Java, Ceylon’.

Panicum javanum Nees ex Buse in Miq., Pl. Jungh. 3 (1854) 376. — Lectotype: *Junghuhn s.n.* (L holo, sh. 908.91-2190).

Panicum javanum Buse var. *angustifolium* Buse in Miq., Pl. Jungh. 3 (1854) 376. — Type: *Jung-huhn s.n.* (L holo, sh. 908.91-2195).

Hymenachne polymorpha Balansa in Morot, J. Bot. 4 (1890) 143 (incl. var. *genuina*, nom. inval.).

— *Panicum balansae* Crevost & Lemarié, Cat. Indochine 1 (1917) 380, nom. superfl. — *Panicum polymorphum* Camus in Lecomte, Not. Syst. 2 (1912) 249. — *Sacciolepis polymorpha* Chase ex Camus, Fl. Gén. Indo-Chine 7 (1922) 458 (incl. var. *genuina*, nom. inval.). — Lectotype: *Balansa* 455 (L holo).

Panicum archboldii Hitchc., Brittonia 2 (1936) 121. — Type: Brass 5923 (NY holo; BRI, K).

Panicum extensum auct. non Steud. (quoad *Cuming* 2409, Sumatra!).

Sporobolus pulchellus auct. non R. Br.

Plants perennial, rhizome and cataphylls present. Culms 0.5–2(–4) m long, erect to geniculate at base or sometimes scrambling, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous, margins glabrous. Ligule a membranous ciliolate collar. Blades flat or loosely involute, linear, (5–)10–60 cm by (2–)4–35 mm, (sub-)glabrous, base truncate to cordate, margin glabrous at base, apex long-acuminate, underneath with 7–18 major nerves. Panicle contracted, the branches appressed to laxly contracted, erecto-patent, (5–)9–45 by (0.5–)2–15 cm. Main axis scaberulous, glabrous. Panicle branches scaberulous, glabrous, spikeled to base, the lowermost solitary, without glandular patches, the lowermost longest one (1–)1.5–18 cm long. Pedicels shorter than the spikelets, scaberulous. Spikelets not yawning at maturity, 2–3 mm long, acute. Glumes without a distinct internode. Lower glume ovate, 0.75–1.3 mm long, 0.3–0.5 times as long as the spikelet, acute, faintly 3–5-nerved. Upper glume 2–3 mm long, acute, glabrous, 5–7-nerved, nerves with very faint transverse veinlets. First lemma epaleate to paleate, sterile, acute, glabrous, 5(–7)-nerved, nerves with very faint transverse veinlets. First palea 0–0.55 times as long as the lemma (very inconspicuous, check in dry spikelet). Second lemma sessile, smooth, shiny, glabrous to apically microscopically scaberulous, apex acute, straight. Anthers 2, 0.75–0.9 mm long. $2n = 30, 36, 60, 72$.

Distribution — Sri Lanka, India to S China (Hainan, Kwantung); Malesia: widespread, not seen from the Lesser Sunda Islands, rare in New Guinea (Western Prov.).

Habitat — Shallow water, but usually collected on dry land in sunny to slightly shaded humid places, swampy savanna forest, thickets, *Imperata* fields, teak forest, along roads, old gardens, locally abundant, 0–1100 m altitude.

Uses — Readily eaten by cattle, with a high nutritive value.

3. *Panicum bisulcatum* Thunb.

Panicum bisulcatum Thunb., Nov. Acta Soc. Sc. Upsal. 7 (1815) 141. — *Panicum grossarium* auct. non L. (1759): Thunb., Fl. Jap. (1784) 48. — Syntypes: *Thunberg* s.n., 1817, 1818 (UPS holo, IDC microfiche 1036).

Panicum acroanthum Steud., Syn. 1 (1853) 87. — Lectotype: *Anonymus* 2 (L holo, sh. 908.91 1717; K).

Panicum amoenum auct. non Balansa.

Plants annual. Culms 0.25–1.5 m long, geniculate at base to creeping and rooting from the decumbent nodes, hollow, not inflated. Nodes glabrous. Sheaths glabrous, margins glabrous to pilose. Ligule a ciliolate erose collar. Blades linear-lanceolate, 5–18 cm by 3–12 mm, glabrous to sparsely puberulous above, green, base rounded, margin sparsely pectinate at base, underneath with 8–11 major nerves. Panicles lax, 7–30 by 4–20 cm. Main axis glabrous. Panicle branches eglandular, naked at base,

the lowermost one solitary, 5–15 cm long. Pedicels shorter than to as long as the spikelet, smooth to scaberulous, glabrous. Spikelets not yawning at maturity, 2–2.4 mm long, acuminate. Glumes without a distinct internode. Lower glume ovate, 0.8–1.3 mm long, 0.4–0.53 times as long as the spikelet, acute to acuminate, 1–3-nerved. Upper glume and first lemma acuminate, glabrous to minutely, sparsely puberulous, 5-nerved, nerves without transverse veinlets; upper glume 2–2.4 mm long; first lemma epaleate. Second lemma sessile, apex acute, straight, smooth, shiny, glabrous. Anthers 3, 0.3–0.6 mm long (cleistogamous). $2n = 36, 54$.

Distribution — NE India to China, Japan, probably introduced in Australia (Queensland to Victoria); Malesia: Philippines (Mindanao: Davao), Celebes (Tondano).

Habitat — Forest margins, 0–1060 m altitude.

Notes — Webster (1987) reported anthers 1.2–1.6 mm long, presumably in chasmogamous spikelets. I have only seen cleistogamous ones, where the pale anthers were aggregated with the stigmas in the tip of the fertile lemma.

I have not seen BS 49069, 49704 (from Mindanao) cited by Jansen (1953). At least the first has the same number as the type of *Ancistrachne ancylotrichum* (Quisumb. & Merr.) S.T. Blake.

4. *Panicum brevifolium* L.

Panicum brevifolium L., Sp. Pl. 1 (1753) 59. — Lectotype: *Hb. Linn.* 80.64 (LINN holo).

Panicum ovalifolium Poir. in Lam., Encycl., Suppl. 4 (1816) 279. — Type: *Hb. Desvaux in Hb. Lamarck* (P holo, not found, not on IDC microfiche 6207).

Panicum hirtifolium Ridley, Fl. Malay Penins. 5 (1925) 228. — *Panicum brevifolium* L. var. *hirtifolium* Jansen, Reinwardtia 2 (1953) 315. — Syntypes: *Ridley* 12046 (SING holo; K; Semangkok Pass), *Nur* s.n. (SING; Kuala Lumpur).

Plants annual. Culms 0.3–1.2 m long, creeping and geniculate at base, rooting from the decumbent nodes, hollow, not inflated at base, glabrous to pilose. Nodes glabrous to bearded (on one side). Sheaths glabrous to pilose, margins pilose. Ligule a membranous glabrous to ciliolate collar. Blades ovate-lanceolate, 1.75–8 cm by 5–27 mm, glabrous to appressed pilose, base cordate, margin pectinate at base, underneath with 9–13 major nerves. Panicle effuse, 2.5–15 by 2–8 cm. Main axis smooth, glabrous to pilose. Panicle branches glabrous to pilose, with minute glandular patches, naked at base, the lowermost solitary to fascicled (1–3), the longest one 1.5–8 cm long. Pedicels longer than the spikelets, usually smooth. Spikelets not yawning at maturity, 1.9–2.1 mm long, acute. Glumes with a distinct internode. Lower glume ovate, 1.65–1.95 mm long, 0.88–0.96 times as long as the spikelet, acute, 1–3-nerved. Upper glume and first lemma acuminate, glabrous to sparsely puberulous, 5-nerved, nerves without transverse veinlets; upper glume 1.8–1.9 mm long; first lemma paleate, sterile (said to be sometimes male). First palea 0.88–1 times as long as the lemma. Second lemma sessile, smooth, shiny, glabrous, apex acute, straight. Anthers 3, 0.75–1 mm long. $2n = 36$.

Distribution — Tropical Africa and Asia, possibly introduced in at least part of Malesia: Malay Peninsula (probably all states, present before 1816: *Anon.*, K), Singapore, Sumatra (W & E Coast), Bangka, Java (Jakarta, Bogor, Priangan, Kediri, etc.), Borneo (Sarawak, Sabah, W Kalimantan), Philippines (Balabac, Tawitawi).

Habitat — Shady localities, in thickets, forest margins, trails, coffee plantations, rice fields, locally dominant, 0–1000 m altitude.

Uses — Said to be nutritious fodder.

Notes — Plants with long-hairy blades and inflorescence branches are found in the Malay Peninsula, Sumatra, and Java, and have been distinguished as var. *hirtifolium*.

This species is peculiar by the shape of its blades, length of the first glume, and especially because of the minute glands on the inflorescence branches.

5. *Panicum caudiglume* Hack.

Panicum caudiglume Hack., Oesterr. Bot. Z. 51 (1901) 428. — Type: *Ridley s.n* (W holo; SING).

Plants annual. Culms 0.3–1 m long, erect to geniculate at base, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous or tuberculate hispid upwards, margins glabrous. Ligule a pilose collar. Blades linear, 3–30 cm by 3–15 mm, tuberculate hispid, green, base truncate, margin pectinate at base, underneath with 8–11 major nerves. Panicles lax, 15–60 by 2.5–15 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches glabrous to sparsely pilose, eglandular, naked at base, the lowermost one solitary, 5–19 cm long. Pedicels shorter to longer than the spikelets, scaberulous. Spikelets yawning at maturity (the fertile lemma turned c. 90°), 2.7–3.9 mm long, acuminate to caudate. Glumes distant. Lower glume ovate, 2.7–3.9 mm long, as long as the spikelet, acuminate to aristate, 3–5-nerved. Upper glume and first lemma glabrous, nerves without transverse veinlets; upper glume 2.1–2.7(–3) mm long, acute to acuminate, (5–)7-nerved; first lemma epaleate to paleate, sterile, acute to acuminate, 5-nerved. First palea 0–0.21 times as long as the lemma. Second lemma sessile, apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 0.75–0.9 mm long.

Distribution — Malesia: Java (especially the northern plains), Kangean Archipelago, Philippines (Luzon, Mindanao), Lesser Sunda Islands (Bali, Sumba, Sumbawa, Flores, Timor, Wetar, Kisar).

Habitat — Periodically dry soil under seasonal climatic conditions, sunny or slightly shaded places, fields, roads, dikes, beaches, dry forests, locally sometimes so abundant that the panicles give a purple hue to the fields, 0–250(–660) m altitude.

Uses — Locally used as a fodder.

6. *Panicum curviflorum* Hornem.

Panicum curviflorum Hornem., Hort. Bot. Hafn., Suppl. (1819) 116; Veldkamp, Eijs & Zoetemeyer, Blumea 34 (1989) 77. — Type: *Hb. Hornemann* (holo not in C, KIEL, S), cultivated in Copenhagen in 1818, from seed obtained from Wallich as *P. tenellum* Roxb. Neotype: as of next name.

Panicum tenellum Roxb. [Hort. Beng. (1814) 7, nomen], Fl. Ind. 1 (1820) 309, non Lam. (1791).

— *Panicum trypheron* Schult., Mant. 2 (1824) 244. — *Panicum roxburghii* Spreng., Syst. 1 (1825) 320, nom. superfl. — Type: *Hb. Roxburgh 814* (BM holo; CAL, K: Icon. Ined. 814).

var. *suishaense* (Hayata) Veldkamp

Panicum curviflorum Hornem. var. *suishaense* (Hayata) Veldkamp in Veldkamp, Eijs & Zoetemeyer, Blumea 34 (1989) 81. — *Panicum suishaense* Hayata, Icon. Pl. Form. 6, Suppl. (1917) 98. — *Panicum trypheron* Schult. var. *suishaense* Hsu, J. Jap. Bot. 38 (1938) 84. — Type: *Hayata s.n.* (TI holo).

Panicum elegantissimum Hook. f., Fl. Brit. India 7 (1896) 52. — Type: *Ridley 3116* (K holo; CAL, SING).

Panicum papuanum Mez, Bot. Jahrb. 56, Beibl. 125 (1921) 6. — Type: *Lesson, A° 1825* in Hb. Kunth (B holo, photo in BRI, K neg. 7011).

Panicum miliare auct. non Lam.

Panicum sumatrense auct. non Roem. & Schult.

Panicum trypheron auct. non Schult.

Plants annual to perennial, rhizome absent. Culms 0.25–1.2 m long, erect, hollow, not inflated. Nodes glabrous. Sheaths pilose to tuberculate hispid, rarely subglabrous, margins pilose. Ligule a pilose collar or a row of hairs. Blades linear, (7–) 12–50 cm by 3–8 mm, pilose, rarely subglabrous, green, base rounded to gradually narrowed into the sheath, margin more or less pectinate at base, underneath with 5–9 rather inconspicuous major nerves. Panicles effuse, 10–50 by 3.5–18 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary (to 3 together, sometimes immediately branched at base), (4–)8–19(–25) cm long. Pedicels longer than the spikelet, scaberulous, usually pilose under the spikelet. Spikelets yawning at maturity (the fertile lemma turned c. 90°), (3.1–)3.5–4.3 mm long (see note), acuminate. Glumes somewhat distant. Lower glume ovate, (1.4–)2–3 mm long, (0.45–)0.5–0.7 times as long as the spikelet, acuminate to mucronate, 5(–8)-nerved. Upper glume and first lemma glabrous, nerves without transverse veinlets; upper glume 2.8–3.8 mm long, acuminate to cuspidate, 7(–11)-nerved, first lemma paleate, sterile, acute to acuminate, (5–)7–9-nerved. First palea 0.5–0.72 times as long as the lemma. Second lemma sessile, apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 0.9–1.55 mm long.

Distribution — India (Bihar), Burma (Maymyo), Thailand (widespread) to S China (Hainan); in Malesia: Malay Peninsula (Perak), Sumatra (E Coast, Tapanuli), Java (Jakarta, Priangan, Besuki), Kangean Is., Philippines (Luzon, Semirara, Mindoro, Palawan, Culion, Mindanao), Celebes (Malili, Palu, Kendari), Lesser Sunda Islands (Flores), Moluccas (Buru), New Guinea (Waigeo, see note).

Habitat — Grass jungle, dry fields, rice fields, roadsides, savannas, on heavy marl, 0–610 m altitude.

Uses — Liked by cattle, but just barely useful as a fodder.

Notes — The var. *curviflorum* differs by the usually geniculate to more or less spreading culms, the (3–)5–10 mm wide blades, the pedicels only sometimes with short hairs below the 2.5–3.2 mm long spikelets, and the 1.5–2 mm long, stipitate upper lemma. Often mentioned for Malesia (as *P. trypheron*), but all specimens seen belong to the present variety.

Santos 7583 (L) from Cotabato is aberrant because of the absence of setae under its much smaller, c. 2.5 mm long spikelets. (Lower glume c. 1.35 mm long, 3–5-nerved. Upper glume 2.1–2.25 mm long. Anthers c. 0.75 mm long.) By these characteristics it might be referred to the continental var. *curviflorum*, but its habit is

otherwise as that of var. *suishaense*, in which it is retained here. It might represent a local entity.

Panicum elegantissimum has been regarded as distinct because it would be a perennial with larger spikelets, but the life-form cannot be distinguished in the herbarium, while there is no difference in spikelet size.

The record for Waigeo is based on a specimen collected in 1825 by Lesson, the type of *P. papuanum* Mez.

7. *Panicum effusum* R. Br.

Panicum effusum R. Br., Prodr. 1 (1810) 191. — Type: *R. Brown* 6105 (BM holo; K).

Panicum viale Chase, J. Arnold Arbor. 20 (1939) 310. — Type: *Brass* 3631 (A holo; K neg. 5627, US).

Panicum tuberculatum auct. non Presl.

Plants perennial, rhizome absent. Culms 0.4–1.2 m long, erect, hollow, not inflated at base. Nodes bearded. Sheaths tuberculate hispid, margins glabrous. Ligule a pilose collar. Blades linear, 9–29 cm by 1–4 mm, pilose, green, base gradually narrowed into the sheath, margin sparsely pectinate at base, underneath with faint (0–)5–7 major nerves. Panicles effuse, 20–42 by 14–35 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 12–20 cm long. Pedicels shorter to longer than the spikelets, scaberulous. Spikelets yawning at maturity, 2.1–2.25 mm long, acuminate. Glumes without a distinct internode. Lower glume ovate, 1.1–1.4 mm long, 0.52–0.63 times as long as the spikelet, acuminate, 1–3(–5)-nerved (laterals faint). Upper glume and first lemma acuminate, glabrous; upper glume 2.05–2.2 mm long, 5–7-nerved, nerves without transverse veinlets; first lemma paleate, sterile, 7–9-nerved, nerves with transverse veinlets. First palea 0.5–0.6 times as long as the lemma. Second lemma sessile, smooth, shiny, glabrous, apex obtuse, straight. Anthers 3, 1–1.05 mm long.

Distribution — Australia (continental); Malesia: Papua New Guinea (Central Prov.).

Habitat — Roadsides, Eucalypt savanna, 30–60 m altitude.

Note — Webster (1987) mentioned ‘muricate’ upper lemmas, and indeed under high magnification minute papils can be seen in some Australian specimens. Those from New Guinea were all smooth.

8. *Panicum hayatae* Camus

Panicum hayatae Camus in Lecomte, Not. Syst. 4 (1923) 46. — Type: *Hayata* 94 (P holo; K neg. 4999).

Panicum costatispiculum Ohwi, Bull. Tokyo Sc. Mus. 18 (1947) 14. — Type: *Lörzing* 6605 (BO holo; L).

Plants annual (?). Culms 0.7–2.3 m (or more) long, creeping and geniculate at base, rooting from the decumbent nodes, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous, margins pilose. Ligule a membranous glabrous collar. Blades linear-lanceolate, 7–18 cm by 7–16 mm, (sub)glabrous, base shortly pseudo-petiolate, margin scabrous, glabrous at base, underneath with 9–14 major nerves (with transverse veinlets). Panicle laxly contracted, the branches erecto-patent, 16–22 by 14–17 cm. Main axis smooth, glabrous. Panicle branches glabrous, eglandular,

naked at base, the lowermost one solitary, 12–15 cm long. Pedicels longer than the spikelets, smooth. Spikelets not yawning at maturity, 3.3–4 mm long, obtuse. Glumes without a distinct internode. Lower glume ovate, 2.25–3 mm long, 0.67–0.8 times as long as the spikelet, acute to acuminate, 5–7-nerved. Upper glume and first lemma glabrous, nerves without transverse veinlets; upper glume 3–3.1 mm long, acute, 11–15-nerved; first lemma paleate, sterile to male (see note), obtuse to acute, 9–11-nerved. First palea 0.9–1 times as long as the lemma. Second lemma sessile, smooth, shiny, apically microscopically scaberulous, apex apiculate, straight. Anthers 3, 1.35–1.7 mm long.

Distribution — N Vietnam; Malesia: Malay Peninsula (Pahang), Sumatra (Toba).

Habitat — Forest margins, clearings, 1200–1800 m altitude.

Notes — The Indo-Chinese specimens seen (*Eberhardt 1864*, *Hayata 94*; P) have somewhat smaller spikelets, sometimes 3-nerved lower glumes, and 3 anthers in the first floret, and not 6 as was stated twice by Camus (1923).

Note the disjunct distribution similar to that of *Chikusichloa mutica* Y.L. Keng (Veldkamp, *Blumea* 26 (1980) 389, map 1).

9. *Panicum humidorum* F. Ham. ex Hook. f.

Panicum humidorum F. Ham. ex [Wall., Cat. (1848) 8721] Hook. f., Fl. Brit. India 7 (1896) 53. — Lectotype: *Hamilton in Wallich 8721* (K holo).

Panicum humidorum F. Ham. ex Hook. f. var. *perakense* Hook. f., Fl. Brit. India 7 (1896) 54. —

Panicum perakense Merr., Philipp. J. Sc., Bot. 11 (1916) 52. — Type: *King's coll. 2546* (K holo; CAL).

Panicum parvispiculum Ohwi, Bull. Tokyo Sc. Mus. 18 (1947) 15, non Nash (1897). — *Panicum ohwii* Beetle, Leafl. W. Bot. 6 (1951) 162. — Type: *Endert 2124* (BO holo).

Panicum amoenum auct. non Balansa.

Plants perennial, rhizome absent. Culms 1–2 m long, erect to geniculate at base, rooting from the decumbent nodes, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous, margins pilose. Ligule a membranous ciliolate collar. Blades linear, 8–25 cm by 2.5–10 mm, glabrous to sparsely puberulous above, green, base truncate, margin glabrous at base, underneath with 8–13 major nerves. Panicles contracted, the branches appressed to lax, 15–35 by 2.5–11 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 7.5–20 cm long. Pedicels shorter to longer than the spikelets, smooth to scaberulous. Spikelets not yawning at maturity, 1.4–1.7 mm long, acute to acuminate. Glumes with a distinct internode. Lower glume ovate, 0.75–1.3 mm long, 0.53–0.76 times as long as the spikelet, obtuse to acute, 3-nerved. Upper glume and first lemma acute, glabrous, 5-nerved, nerves without transverse veinlets; upper glume 1.3–1.4 mm long, first lemma epaleate. Second lemma sessile, smooth, shiny, glabrous, apex acuminate (microscopically scaberulous), straight. Anthers 3, 0.75–1 mm long. $2n = 18, 36$.

Distribution — India to S China (Hainan); Malesia: Malay Peninsula (Johor, Perak, Selangor), Sumatra (Tapanuli), Java (an ancient, unnumbered collection from Banten, L), Borneo (W Kutai, Brunei, Sabah).

Habitat — Wet places, marshy meadows, old rice fields, locally common, altitude 0–100 m.

Note — *Panicum amoenum* Balansa, with which the present species has been confused, differs by e.g. the distally puberulous, 1.7–2 mm long spikelets.

10. *Panicum humile* Nees ex Steud.

Panicum humile Nees ex Steud., Syn. 1 (1854) 84. — *Panicum austro-asiaticum* Ohwi, Acta Phytotax. Geobot. 11 (1942) 45, nom. superfl. — *Panicum vescum* R.R. Stewart, Brittonia 5 (1945) 452, nom. superfl. — Type: CP 3243 (*Thwaites*) (P holo; B, BO, K, PDA, US).

Panicum walense Mez, Bot. Jahrb. 34 (1904) 146 ('watense'). — Type: Leprieur 52 (B holo; K neg. 5580).

Plants annual. Culms 0.08–0.6 m long, erect to geniculate at base, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous, margins glabrous to pilose. Ligule a membranous ciliolate collar. Blades linear, 6–16.5 cm by 1–3 mm, glabrous, green, base truncate, margin glabrous at base, underneath with 5–7 major nerves. Panicles lax, axillary and terminal, 5.5–11.5 by 2.5–5 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 3–6 cm long. Pedicels shorter than the spikelets, scaberulous. Spikelets yawning at maturity, 1.65–1.9 mm long, acuminate. Glumes with a distinct internode. Lower glume ovate, 1.2–1.5 mm long, 0.67–0.8 times as long as the spikelet, acuminate to mucronate, 3-nerved. Upper glume and first lemma glabrous, 3–5-nerved, nerves without transverse veinlets; upper glume 1.35–1.65 mm long, acuminate, first lemma paleate, sterile, obtuse to acute. First palea 0.74–0.85 times as long as the lemma. Second lemma sessile, apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 0.5–0.75 mm long.

Distribution — Tropical W Africa (Senegal to Sudan, Tanzania), Madagascar, Pakistan, Sri Lanka, to S China, Taiwan; Malesia: Andamans, Malay Peninsula (Kedah, Kelantan, Pahang, Wellesley), Sumatra (Sibolga), Borneo (Banjarmasin), Philippines (Culion, Guimaras, Luzon, Mindoro, Palawan).

Habitat — Dry areas, open waste places, grasslands, tea plantations, rice fields, presumably at low altitude, up to 1600 m in Africa.

Uses — Said to provide good fodder but with little yield. Famine cereal.

Notes — It has turned out that everybody has been copying everybody else, as usual in this business, and that *P. humile* Nees ex Steud. is *not* a later homonym of *P. humile* Thunb. ex Trin. [Gram. Pan. (1826) 164]. The latter combination was not accepted by Trinius as can be seen from the typography and the index and thus it is invalid.

Mez misread the original locality 'Walo' for 'Wato'.

11. *Panicum khasianum* Munro ex Hook. f.

Panicum khasianum Munro ex Hook. f., Fl. Brit. India 7 (1896) 54. — Lectotype: Griffith 6498 (K holo).

Panicum oblongispiculum Ohwi, Bull. Tokyo Sc. Mus. 18 (1947) 15. — Type: van Steenis 8779 (BO holo; K, L).

Plants perennial, rhizome short. Culms 1–2 m long, erect to creeping, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous to tuberculately hispid, margins glabrous to pilose. Ligule a membranous ciliolate collar. Blades linear, 13–30 cm by

10–30 mm, glabrous to sparsely pilose above, base pseudo-petiolate, margin glabrous at base, underneath with 11–13 major nerves. Panicle laxly contracted to lax, the branches erecto-patent, 15–30 by 4–30 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches glabrous, eglandular, naked at base, the lowermost one solitary, 15–20 cm long. Pedicels usually longer than the spikelets, scaberulous. Spikelets not yawning at maturity, 2.55–3.15 mm long, obtuse to acute. Glumes without a distinct internode. Lower glume ovate, 0.75–1.35 mm long, 0.33–0.47 times as long as the spikelet, acute, faintly 3–5-nerved. Upper glume and first lemma acute to acuminate, glabrous, 5-nerved, nerves without transverse veinlets; upper glume 2.55–3.15 mm long, first lemma epaleate. Second lemma sessile, smooth, shiny, apically microscopically ciliolate, apex acute to acuminate, straight. Anthers 3, 0.75–1.35 mm long. 2n = 36.

Distribution — India (E Himalaya, Khasia, Naga Hills); Malesia: Sumatra (Aceh, Agusan ridge).

Habitat — Open, boggy places, c. 2000 m altitude in Aceh.

Notes — Note the disjunct distribution reminiscent of many montane and subalpine species.

This species can be confused with *P. sarmentosum* which differs by the solid culms, panicle branches spikeled to base, pedicels usually up to as long as the spikelets, smooth, lower glume 0.48–0.83 times as long as the spikelet, the upper glume 1.65–2.5 mm long, first lemma paleate, second lemma apex apiculate, incurved.

12. *Panicum luzonense* Presl

Panicum luzonense Presl, Rel. Haenk. 1 (1830) 308. — Type: *Haenke s.n.* (PR holo, Hb. Trinius 0800.1, fragm., in LE, microfiche IDC BT-16/1).

Panicum caesioglaucum Nees ex Steud., Syn. 1 (1853) 75. — Type: 'Java' (P? holo, not found).

Panicum extensum Steud., Syn. 1 (1853) 72, non Desv. (1831). — Lectotype: *Cuming* 652 (P holo; BM, K, L).

Panicum cambogiense Balansa in Morot, J. Bot. 4 (1890) 142. — Lectotype: *Godefroy* 62 (L holo; K, fragm., P).

Panicum caesium Nees [ex Trimen in Britten, J. Bot. 23 (1885) 139, nomen; not so named in Kew J. 2 (1850) 97, but compared to it! See note] ex Hook. f., Fl. Brit. India 7 (1896) 48, non Nees (1837). — *Panicum reticulatum* Thwaites ex Trimen in Britten, J. Bot. 23 (1885) 271, non Torrey (1852). — *Panicum cruciabile* Chase, J. Arnold Arbor. 20 (1939) 309. — Type: CP 3890 (Thwaites) (PDA holo).

Panicum capillare auct. non L.

Panicum sarmentosum auct. non Roxb.

Panicum tuberculatum auct. non Presl.

Plants annual. Culms 0.15–1.55 m long, more or less erect, hollow, not inflated. Nodes bearded. Sheaths tuberculately hispid, margins pilose. Ligule a pilose collar to a row of hairs. Blades linear-lanceolate to linear, 2.5–39 cm by 3.5–13 mm, pilose, rarely puberulous or tuberculately hispid, green, base rounded to subcordate, margin pectinate at base and often along the margins, underneath without major nerves (but for midrib), or with 9–17 faint major nerves. Panicles laxly contracted, to effuse, 7–52 by 4.5–15 cm. Main axis scaberulous, pilose, rarely glabrous. Panicle branches glabrous to sparsely pilose, eglandular, spikeled to base or not, the lowermost solitary to fascicled, the longest one 3–29 cm long. Pedicels shorter to

longer than the spikelets, glabrous, scaberulous. Spikelets not yawning at maturity, 2–2.55(–2.85) mm long, acute. Glumes somewhat distant. Lower glume broadly ovate, 0.75–1.1(–1.4) mm long, 0.32–0.51 times as long as the spikelet, obtuse to acute, 5–9-nerved. Upper glume and first lemma acute, glabrous, nerves with transverse veinlets; upper glume 1.95–2.6 mm long, 9–11-nerved, first lemma paleate, sterile, 7–11-nerved. First palea 0.8–1 times as long as the lemma. Second lemma sessile, apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 0.75–1.1(–1.3) mm long. $2n = 18$.

Distribution — Sri Lanka, India to Australia (Northern Territory); Malesia: N Sumatra (Tapanuli, E Coast), Malay Peninsula, Singapore, Java (W, C), Kangean Archipelago, Borneo (SE Kalimantan: Hayup; Sabah), Philippines (Luzon, Mindanao, Palawan, Panay, Tawitawi), SW Celebes (Pampanua), Moluccas (Halmahera, Tanimbar Is.), New Guinea [Irian Jaya: Vogelkop (Wersar), Biak, Japen; Papua New Guinea: E Sepik, Madang, Gulf, Northern Prov.], Solomon Islands (Bougainville).

Habitat — Open, sunny to moderately shaded roadsides, waste areas, beaches, fields, grasslands, often found weedy in tea and rubber plantations, locally abundant, 0–1220 m altitude.

Uses — Of little value as a fodder.

Notes — Very variable in size. Small plants have been called *P. capillare*, which is a North American species, large ones *P. cambojiense*.

Cuming 652 is *not* the type of *Panicum caesium* Nees, J. Bot. Kew Misc. 2 (1850) 97, as has always been maintained. It *is*, however, the type of *Panicum extensum* Steud. (1853), non Desv. (1831).

Nees listed this number in a survey of the Cuming specimens in the Lindley herbarium (CGE), stating: "*Panicum caesium* N. ab E. ined.? colore minus caesio differt. Paniculae rami scaberrimi," i.e. 'differing from (my) unpublished? *Panicum caesium* by the less lavender colour. Branches of the panicle very scabrous.' The true *Panicum caesium* Nees intended here is therefore something different from this collection. It is not the *P. caesium* Nees (1837) which is a species of *Echinochloa* [aff. *E. crus-galli* (L.) Beauv.]. The aberrant form described here remained nameless until much later.

Trimen, in a checklist of CP numbers published in Britten, J. Bot. 23 (1885) 139, applied *P. caesium* to CP 3890 (*Thwaites*) (PDA holo, and elsewhere), but as he became aware of the earlier homonym he changed the name to *Panicum reticulatum* on p. 271 (description!). CP 3890 is therefore the type.

Trimen also used the latter combination in the Syst. Cat. Fl. Pl. Ceylon, p. 105, which also appeared in 1885. He was not aware of the existence of a *P. reticulatum* by Grisebach (1857) and, earlier, by Torrey (1852).

The combination *P. caesium* sensu Nees (1850) was validated by Hooker f., Fl. Brit. India 7 (1896) 48, based on references to Nees (1850) and to *Panicum reticulatum* Thwaites ex Trimen. It is a later homonym, superfluous, and also typified by CP 3890.

Chase [J. Arnold Arbor. 20 (1939) 309] gave the species the first legitimate name, *Panicum cruciabile*, clearly (lecto)typified by her with CP 3890. See her discussion.

"The sheaths are covered with short irritating hairs which break off and irritate the skin (Chase). It is not known if these hairs discourage grazing animals or not, but the hairs would have to be exceedingly irritating to baffle the omnivorous goat" [Bor, Grasses (1960) 325].

13. *Panicum maximum* Jacq.

Panicum maximum Jacq., Icon. Pl. Rar. 1 (1781) 2, t. 13. — *Urochloa maxima* Webster, Austral. Pan. (1987) 241. — Type: *Hb. Jacquin* [W holo, cf. Zuloaga, Darwiniana 23 (1979) 25, t. 6, f. e–h; BM].

[*Panicum trichoglume* K. Schum. in Engl., Glied. Veget. Usambara. Abh. Kgl. Preuß. Akad. Wissenschaft. Berlin. (1894) 38, nomen seminud.]. — *Panicum maximum* Jacq. var. *pubiglume* K. Schum. in Engl., Pflanzenw. O. Afr. B (1895) 85 ('*pubiglumis*'). — *Panicum maximum* Jacq. forma *pubiglume* K. Schum. ex Peter in Fedde, Repert., Beih. 40 (1930) 185. — Lectotype: *Holst 8716* (B holo, extant?; K).

Panicum maximum Jacq. var. *trichoglume* Eyles [Trans. Roy. Soc. S. Afr. 5 (1916) 300, nomen] ex Robyns, Mém. Inst. Roy. Col. Belge, 1, 6 (1932) 31. — *Urochloa maxima* (Jacq.) Webster var. *trichoglumis* Webster, Austral. Pan. (1987) 242 ('*trichoglume*'). — Lectotype: *Vanderyst 27725* (BR holo).

Plants perennial, rhizome present. Culms 0.6–3 m long, erect or geniculate at base, hollow to filled with marrow upwards, not inflated at base. Nodes puberulous to bearded. Sheaths sparsely tuberculately hispid, margins pilose. Ligule a pilose collar. Blades linear, 40–105 cm by 8–30 mm, very sparsely tuberculately hispid, base rounded, margin glabrous at base, underneath with 8–16 major nerves. Panicle laxly contracted, the branches erecto-patent, 12–45(–60) by 4–15 cm. Main axis smooth to scaberulous upwards, glabrous to pilose in the axils. Panicle branches glabrous, eglandular, naked at base, the lowermost 6–9-whorled, the longest one 6–20(–30) cm long. Pedicels usually shorter than the spikelets, scaberulous to rarely with a few glassy bristles under the spikelet. Spikelets somewhat yawning at maturity, 3.45–3.75 mm long, acute. Glumes without a distinct internode. Lower glume ovate, 1.3–1.65 mm long, 0.36–0.47 times as long as the spikelet, obtuse to acutish, faintly 3–5-nerved. Upper glume and first lemma acute, glabrous to puberulous (var. *pubiglume*), faintly 5-nerved, nerves without transverse veinlets; upper glume 3.15–3.6 mm long, first lemma paleate, male. First palea 0.82–1 times as long as the lemma. Second lemma stipitate, transversally rugose, dull, glabrous, apex acuminate, incurved to straight. Anthers 3, 1.35–2.2 mm long (largest in the fertile floret). $2n = 32, 36$, also 16, 18, 28, 38, 40, 42, 44, 48, 64.

Distribution — Tropical Africa, Mascarenes, Arabia, introduced (sub)pantropically. In Malesia probably widespread, but only seen from Malay Peninsula (Pahang), Singapore, Sumatra (E Coast), Bangka, Java (Jakarta, Bogor, Priangan, Semarang, Surakarta, Besuki), Celebes (Menado), Philippines (Luzon, Mindanao), Lesser Sunda Islands (Timor), New Guinea (Manokwari, Jayapura, Morobe, Central Prov.).

Habitat — Disturbed places, grassy areas, roadsides, riverbanks, plantations, etc., sometimes dominant, 0–1000(–1500) m altitude.

Uses — One of the best fodder grasses of the tropics as fodder, hay, or silage [Chen & Hutton, PROSEA 4 (1992) 172; 't Mannetje & Kersten, ibid., p. 174], but reported to be a laxative, and sometimes to contain hydrocyanic acid; used for thatching, brooms, basket weaving, famine cereal, bird food.

Vernacular names — Guinea grass (E.), green panic (for var. *pubiglume*) (E.).

Notes — A very variable species in which a number of varieties have been recognized mainly based on the indument, none of which seems acceptable. In Malesia apparently the typical form has been introduced, and, more recently, e. g. at least in Sumatra (fide 't Mannetje & Kersten), the Philippines (Luzon), and Papua New Guinea (Morobe Prov.) one with puberulous spikelets, var. *pubiglume*, erroneously called var. *trichoglume* in most instances.

The present species and a few allied ones are distinct within *Panicum* for having distinctly rugose upper lemmas. For this and other reasons Webster (1987) regarded *P. maximum* as a species of *Urochloa*, which seems rather unlikely.

14. *Panicum miliaceum* L.

Panicum miliaceum L., Sp. Pl. 1 (1753) 58. — *Milium panicum* Miller, Gard. Dict. ed. 8 (1768) sub *Milium 1*, nom. superfl. — *Milium esculentum* Moench, Meth. (1794) 203, nom. superfl. — *Panicum milium* Pers., Syn. 1 (1805) 83, nom. superfl. — *Leptoloma miliacea* Smyth, Kansas Acad. Sc. Trans. 25 (1913) 86. — Lectotype: *Hb. Linn.* 80-49 (LINN holo).

Plants annual. Culms 0.2–1(–1.5) m long, erect to geniculate at base and rooting from the decumbent nodes, hollow, not inflated at base. Nodes puberulous to bearded. Sheaths tuberculately hispid, margins pilose. Ligule a pilose collar. Blades linear, 10–42 cm by 8–20 mm, glabrous to pilose or tuberculately hispid, base cordate and asymmetrical, margin pectinate at base, underneath with 13–15 major nerves. Panicle laxly contracted, the branches erecto-patent to lax, usually more or less included at base, 10–30 by 5–15 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches glabrous, eglandular, naked at base, the lowermost solitary to whorled, the longest one 5–10 cm long. Pedicels shorter to longer than the spikelets, scaberulous. Spikelets not yawning at maturity, 4–5 mm long, acuminate. Glumes with a distinct internode. Lower glume ovate, 2.4–3.3 mm long, 0.55–0.63 times as long as the spikelet, acuminate, 5–7-nerved. Upper glume and first lemma acuminate, glabrous, 9–11-nerved, nerves without transverse veinlets; upper glume 4–5 mm long, first lemma paleate, sterile. First palea 0.28–0.3 times as long as the lemma. Second lemma sessile, smooth, shiny, glabrous, apex obtuse, straight. Anthers 3, 1.2–1.5 mm long. $2n = 36$, also 40, 49, 54, 72.

Distribution — Originally from Central Asia, now cultivated as a cereal or fodder in warm and temperate regions, sporadically so in former times in Malesia (see note).

Habitat — Waste places, abandoned fields, etc.

Uses — Formerly cultivated as a cereal and fodder, presently mainly as bird seed.

Vernacular names — Broomcorn millet, hog millet, millet (E.).

Notes — An ancient cereal already cultivated in many forms in Central Europe before 6000 BC, originally possibly from Central Asia where the species is most variable. The grains are made into a porridge as most races cannot be baked into bread.

Some attempts have been made to grow the species in Malesia, apparently without much success: Java (cultivated in Bogor as HB 4964, BO, not mentioned in the Flora of Java; Koorders 15166 from Priangan is sterile), Philippines (Negros, in 1904), Lesser Sunda Islands (Flores, Maumere, 1919), Moluccas (Tanimbar, Otimmer, in 1938).

15. *Panicum mindanaense* Merr.

Panicum mindanaense Merr., Philipp. J. Sc. 1, Suppl. (1906) 360. — Type: *Clemens* 99 (PNH lost; B = K neg. 7013).

Panicum braunii Mez, Bot. Jahrb. 56, Beibl. 125 (1921) 5, non Steud. (1854). — Lectotype: *Braun* 8 (B; photo: BRI) (see note).

Panicum mindanaense Merr. var. *pilosum* Reed., J. Arnold Arbor. 29 (1948) 270. — Type: *Kanehira* & *Hatusima* 13093 (A holo; BO, FU).

Plants annual. Culms 0.2–1 m long, erect, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous to upwards sparsely tuberculately hispid, glabrescent, margins glabrous, rarely pilose (in New Guinea). Ligule a shortly pilose collar. Blades linear, 2–35 cm by 2–6 mm, glabrous or puberulous to sparsely tuberculately hispid, base truncate, margin glabrous to pectinate at base, underneath with 5–9 major nerves. Panicles effuse, (7–)10–30 by (2–)6–15 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 6–12 cm long. Pedicels shorter to longer than the spikelets, scaberulous. Spikelets yawning at maturity, (1.9–)2.1–2.6 mm long, acute to acuminate. Glumes with a distinct internode. Lower glume ovate, (1.4–)1.8–2.6 mm long, (0.68–)0.8–1 times as long as the spikelet, acute to cuspidate, 5-nerved. Upper glume and first lemma acute to acuminate, glabrous, nerves without transverse veinlets; upper glume 1.9–2.1 mm long, 5-nerved; first lemma epaleate to paleate, sterile, 3–5-nerved. First palea very inconspicuous (check in dry spikelet), 0–0.2 times as long as the lemma. Second lemma sessile, often twisted 90°, apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 0.6–1 mm long.

Distribution — Malesia: Philippines (Bicawayan Is., Busuanga, Culion, Guimaras, Luzon, Mindanao, Palawan), Moluccas (Amboin), New Guinea: Irian Jaya (Waren, S of Manokwari; Kebar Valley; Merauke), Papua New Guinea (Morobe, New Britain, E Sepik, Western Prov.).

Habitat — Open places on creek flats, abandoned gardens, moist places, grasslands, savannas, 0–75 m altitude.

Notes — The var. *pilosum* would differ by having densely pilose, not papillose-hirsute sheaths and blades. Most specimens, however, appear to be/have been papillose hairy, and a distinction seems unwarranted, as was also observed by Henty (1969).

Chase (1939) equated *P. braunii* Mez with *P. macrocladum* (= *P. seminudum*), and remarked that *Braun* 8 does not agree entirely with Mez's description, perhaps because the lower glume was said to be 3-nerved, the upper 7-nerved, and the first lemma obtuse. The length of the spikelet was said to be up to 2 mm, which would place it in *P. mindanaense*, where it was also included by Webster (1987).

16. *Panicum notatum* Retz.

Panicum notatum Retz., Obs. Bot. 4 (1786) 18. — Type: *Wennerberg* in *Hb. Retz.* (LD holo; K neg. 4179; the Klein specm. so labeled in *Hb. Willdenow* 18741, IDC microfiche 7440, is *P. repens*).

Panicum montanum Roxb., Fl. Ind. 1 (1820) 315. — Type: *Hb. Roxburgh* 813 (BM holo; CAL, K, Icon. Ined. 813).

Panicum cordatum Buse in Miq., Pl. Jungh. 3 (Feb. 1854) 376. — Type: *Junghuhn* s.n., Oct. 1847 (L holo, sh. 908.92-517).

Panicum euchroum Steud., Syn. 1 (Mar. 1854) 98. — Lectotype: Wight Hb. 21, p.p., 'P. neesianum', 'P. arnottianum' (P holo).

Panicum cordatum Buse var. *pubescens* Buse in De Vriese, Pl. Ind. Bat. Or. 2 (1857) 111. — *Panicum montanum* Roxb. var. *pubescens* Jansen, Reinwardtia 2 (1953) 316. — Type: Kleinhoven in Hb. Reinwardt (L holo, sh. 908.92-514).

Panicum montanum Roxb. var. *merrillii* Hack. in Kneucker, Gram. Exsicc. XXVIII (1914) 823; Allg. Bot. Zeitschr. 20 (1914) 164. — Type: Kneucker 823 (Fénix & Ramos) (W holo; K, L).

Panicum luxurians auct. non Nees.

Plants perennial, rhizome present. Culms 0.75–1.5 m long, erect to scrambling, rooting from the lower nodes, hollow, not inflated at base. Nodes glabrous to puberulous. Sheaths glabrous to puberulous, margins glabrous to pilose. Ligule a membranous glabrous to ciliolate collar. Blades ovate-lanceolate to -linear-lanceolate, 4.5–18 cm by 7.5–32 mm, glabrous to puberulous ('var. *pubescens*'), green, base coriaceous, margin pectinate at base, underneath with 7–17 major nerves. Panicles laxly contracted to lax, the branches erecto-patent to patent, 13–40 by 6–23 cm. Main axis and branches glabrous, eglandular, naked at base, the lowermost solitary to fascicled, the lowermost longest one 5–25 cm long. Pedicels longer than the spikelets, smooth. Spikelets not yawning at maturity, 2.25–2.7(–3) mm long, obtuse to acute. Glumes with a distinct internode. Lower glume ovate, 1.65–2.5(–2.7) mm long, 0.67–0.97 times as long as the spikelet, obtuse to acute, 3–5-nerved, glabrous to pilose ('var. *pubescens*'). Upper glume and first lemma glabrous to pilose ('var. *pubescens*'), nerves without transverse veinlets; upper glume 1.95–2.25 mm long, obtuse to acute, faintly 3–5-nerved; first lemma epaleate, acute, 5(–7)-nerved. Second lemma sessile, smooth, shiny, glabrous, apex acute, straight. Anthers 3, 1–1.5 mm long. $2n = 18, 36$.

Distribution — India to S China (E to Guandong), Taiwan; Malesia: Malay Peninsula (Kedah, Pahang, Penang, Perak, Perlis, Selangor), Sumatra (Aceh, W & E Coast, Palembang), Riau, Bangka, Java (all over), Kangean Archipelago, Lesser Sunda Islands (Sumba, Sumbawa, Flores), Borneo (Sabah, Sarawak, Pontianak, Samarinda), Philippines (Culion, Guimaras, Luzon, Mindoro, Palawan), Celebes (SW).

Habitat — Rather dry, somewhat shaded localities, steep slopes, gullies, thickets, along roads, old clearings, jati forest, secondary scrub, sometimes locally common, 0–1250(–2000) m altitude.

Note — The var. *pubescens*, or *P. euchroum*, is distinguished by the pubescent blades, axils of the inflorescence, upper glumes, and first lemmas. This pubescence is variable, however, and this taxon cannot be recognized.

17. *Panicum paludosum* Roxb.

Panicum paludosum Roxb. [Hort. Beng. (1814) 8, nomen], Fl. Ind. 1 (1820) 310. — *Panicum decompositum* R. Br. var. *paludosum* Trimen, Syst. Cat. Fl. Pl. Ceylon (1885) 105. — *Panicum proliferum* Lam. var. *paludosum* Stapf, Fl. Cap. 7 (1899) 407. — Type: Hb. Roxburgh 806 (BM holo; CAL, K: Icon. Ined. 806).

Panicum proliferum auct. non Lam.

Panicum sumatrense auct. non Roem. & Schult.

Plants perennial aquatics, rhizome said to be present (not collected). Culms 0.25–1 m long (erect part), geniculate at base to creeping, rooting from the decumbent nodes,

hollow, inflated. Nodes glabrous. Sheaths glabrous. Ligule a pilose collar. Blades linear, 9–30 cm by 5–15(–22) mm, glabrous, green, base truncate, margin glabrous to pectinate at base, underneath with 9–12(–19) major nerves. Panicles laxly contracted, the branches erecto-patent to lax, 8.5–25(–30) by 2.5–12(–30) cm. Main axis glabrous. Panicle branches eglandular, naked at base, the lowermost solitary to subopposite or whorled, the longest one 6–13(–20) cm long. Pedicels longer than the spikelet, glabrous, scaberulous. Spikelets not yawning at maturity, 3.3–3.9(–4.5) mm long, acuminate. Glumes without a distinct internode. Lower glume collar-shaped, 0.5–1 mm long, 0.15–0.29 times as long as the spikelet, truncate to erose to abruptly acute, 0-nerved. Upper glume and first lemma acuminate, glabrous, 7–9-nerved, nerves with or without transverse veinlets; upper glume 3.3–3.9(–4.1) mm long, first lemma paleate (rarely completely epaleate), sterile. First palea (0–)0.32–0.7 times as long as the lemma. Second lemma sessile, acuminate, smooth, shiny, glabrous. Anthers 3, 1–1.65 mm long. $2n = 36, 54$.

Distribution — India, Sri Lanka to S China, Australia (Northern Territory to New South Wales); in Malesia: Sumatra (Aceh, E Coast, Tapanuli), Malay Peninsula (Kedah, Langkawi, Pahang, Penang), Java (Banten, Jakarta, Bogor, Priangan, Kediri), Madura, Borneo (*Korthals s. n.*, no locality), Philippines (Guimaras, Luzon, Mindanao), Celebes (Minahasa, SW), New Guinea: Irian Jaya (Vogelkop, Jayapura, Merauke), Papua New Guinea (E Sepik, Western and eastern Highlands, Morobe Prov.).

Habitat — Shallow water, bogs, ditches, rice fields, often floating, locally dominant, 0–1650(–2030) m altitude.

Uses — Favourite fodder of elephants and cattle. In India flour is used for making cakes.

18. *Panicum queenslandicum* Domin

Panicum queenslandicum Domin in Fedde, Repert. 10 (1911) 58. — Type: *Hartmann in Hb. von Mueller A°* 1877 (PR holo; K = K neg. 7232).

Panicum trachyrhachis auct. non Benth.

var. *queenslandicum*

Plants perennial, rhizome absent. Culms 0.3–0.8(–2.5) m long, erect, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous, margins glabrous. Ligule a pilose collar. Blades to involute, linear, 12–35 cm by 1.5–4 mm when expanded, glabrous, green, base truncate, margin glabrous at base, underneath without or with c. 11 major nerves. Panicles lax, 15–35 by 16–40 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost whorled, the longest one 12–30 cm long. Pedicels shorter to longer than the spikelets, scaberulous. Spikelets not yawning at maturity, 3.5–5.25 mm long, acuminate. Glumes somewhat distant. Lower glume ovate, 2.5–4.9 mm long, 0.7–0.93 times as long as the spikelet, acuminate, 5–9-nerved (laterals faint). Upper glume and first lemma acuminate, glabrous, 7-nerved, nerves without transverse veinlets; upper glume 3.35–5.1 mm long, first lemma paleate, sterile. First palea 0.41–0.64 times as long as the lemma. Second lemma sessile (sometimes with a minute stipe), apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 1.3–1.6 mm long.

Distribution — Australia (S Queensland, New South Wales); Malesia: Moluccas (Buru), New Guinea: Irian Jaya (Merauke), Papua New Guinea (Western Prov.).

Habitat — Dry woodlands, margin of swampy depressions in tall grassland, at low altitudes.

Note — The distribution is reminiscent of that of *Aristida superpendens* Domin.

19. *Panicum repens* L.

Panicum repens L., Sp. Pl. ed. 2 (1762) 87; Backer in K. Heyne, Nutt. Pl. Indon. (1950) 230. — Lectotype: Alströmer in Hb. Linn. 80.47 (LINN holo, microfiche IDC).

Panicum ischaemoides Retz., Obs. Bot. 4 (1786) 17. — *Panicum repens* L. var. *ischaemoides* Boerl., Ann. Jard. Bot. Buitenzorg 8 (1890) 62. — Type: Koenig s.n. (LD holo; K, fragm.).

Panicum convolutum Beauv. ex Spreng., Syst. Veg. 1 (1825) 319. — Type: Hb. Willdenow 18855 (B holo, microfiche IDC 7440, Hb. Trinius 0652.02, fragm., in LE, microfiche IDC BT-16/1).

Panicum tuberosum Llanos, Fragm. Pl. Filip. (1851) 40. — Type: Not extant. Neotype: Merrill Sp. Blanc. 708 (L holo; K).

Panicum miliare auct. non Lam.

Panicum notatum auct. non Retz.

Panicum sumatrense auct. non Roem. & Schult.

Paspalum cartilagineum auct. non Presl.

Plants perennial, terrestrial or aquatic, rhizome present. Culms (0.15–)0.3–0.8(–1.5) m long, erect or geniculate at base or creeping, and rooting from the decumbent nodes, over 1.5 m long, hollow, inflated. Nodes glabrous. Sheaths glabrous to sparsely pilose, margins pilose. Ligule a ciliate rim. Blades linear, 4–22(–30) cm by 2.5–6(–9) mm, pilose above, rarely glabrous, green, base truncate, margin pectinate at base, underneath with 7–9 major nerves. Panicles laxly contracted, the branches erecto-patent, (7–)13–22 by 2–9 cm. Main axis glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, (3.5–)8.5–14(–19) cm long. Pedicels as long as to longer than the spikelet, glabrous, scaberulous. Spikelets not yawning at maturity, 2.6–3(–3.25) mm long, acuminate. Glumes without a distinct internode. Lower glume collar-shaped, 0.45–0.8 mm long, 0.15–0.24 times as long as the spikelet, truncate, 0-nerved. Upper glume and first lemma acuminate, glabrous, 9-nerved, nerves without transverse veinlets; upper glume 2.6–3 mm long; first lemma paleate, male. First palea 0.8–0.92 times as long as the lemma. Second lemma sessile, apex acuminate, straight, smooth, shiny, glabrous. Anthers 3, 1.3–1.5 mm long. $2n = 36, 40, 45, 54$.

Distribution — Pan(sub)tropic, probably introduced in Malesia: Sumatra, Riau Archipelago, Bangka, Malay Peninsula, Singapore, Java (at least since early 19th century), Madura, Kangean Archipelago, Borneo (W Kalimantan, Sabah, Sarawak), Philippines (Catanduanes, Cebu, Iloilo, Luzon, Mindanao, Mindoro), Celebes, Muna, Lesser Sunda Islands (Sumba, Sumbawa, Flores, Timor, Sawu), New Guinea: Irian Jaya (Sorong).

Habitat — Sunny to slightly shaded, usually humid places, swinging moors along lake shores, sometimes along sandy sea shores (salt and heavy metal resistant), edges of mangrove, pioneer on hot mud near solfatares (Jeng), tea and *Cinchona* plantations, surviving periodic inundations, 0–2000 m altitude.

Uses — Insufficient to highly nutritive fodder and hay, depending on the author. Good binder of sandy soil, used for turfs and lawns ("an eyesore, without reservations the most pernicious of all weeds, sparse in growth, poor in leaf, exhausting the soil, harming other plants in their growth, an ineradicable weed, each a reason to shun it. Surface parts not resistant to long, sudden desiccation of the soil or dense shade, but subterranean parts (at least 50 cm deep) survive for many years. Rhizomes used against inflammations of the ovary and abnormal periods", Backer). Said to contain cyanogenic acid on occasion.

Vernacular names — Torpedo grass, Victoria grass (E.).

Note — Never seen with open flowers or ripe grains, propagating vegetatively only.

20. *Panicum sarmentosum* Roxb.

Panicum sarmentosum Roxb., Fl. Ind. 1 (1820) 311. — Type: *Roxburgh 1778* (BM holo; CAL, K, Icon. Ined. 1778).

Panicum incomtum Trin., Gram. Pan. (1826) 200. — Type: *Chamisso in Hb. Trinius 0760.02* (LE holo, microfiche IDC BT-16/1).

Panicum concinnum Nees, J. Kew Misc. 2 (1850) 97, non Schrad. (1838). — Lectotype: *Cuming 2284* (CGE holo; K, L, P), said to have come from the Philippines, but in fact comes from Malacca.

Panicum tjicoyaense Steud., Syn. 1 (1853) 70. — *Panicum myrianthum* Buse in Miq., Pl. Jungh. 3 (1854) 374, nom. superfl. — Type: *Zollinger 338* (P holo; K neg. 7181, K, L).

Panicum vacillans Steud., Syn. 1 (1853) 75. — Type: *Cuming 679* (P holo; K, L).

Panicum campylogrammum Buse in Miq., Pl. Jungh. 3 (1854) 375. — Type: *Junghuhn s.n.* (L holo, sh. 908.92-299).

Panicum incomtum Trin. var. *pubescens* Buse in Miq., Pl. Jungh. 3 (1854) 375. — Lectotype: *Junghuhn s.n.* (L holo, sh. 903.342- 208).

? *Panicum sarmentosum* Roxb. var. *parvispiculatum* Jansen, Reinwardtia 2 (1953) 318. — Type: Beccari PC-12128 (FI holo, see note).

Plants perennial, rhizome present (?). Culms 0.7–8 m long, scrambling, rooting from the lower nodes, filled with marrow, not inflated at base. Nodes glabrous to puberulous. Sheaths disarticulating at base, glabrous to pilose, margins pilose. Ligule a pilose collar. Blades linear, (12–)16–38(–45) cm by 10–30 mm, glabrous to puberulous, green, base rounded to slightly pseudo-petiolate, margin glabrous to hairy at base, underneath with 11–18 major nerves. Panicle laxly contracted, the branches erecto-patent, (12–)18–37(–50) cm long, 5–17(–27) cm wide. Main axis smooth, sometimes viscid (see note), pilose to glabrous upward. Panicle branches puberulous to glabrous upward, eglandular, spikeled more or less to base, the lowermost solitary to paired, the longest one 5–19 cm long. Pedicels shorter than to as long as the spikelets, smooth. Spikelets not yawning at maturity, (1.5–)2–2.55 mm long, obtuse. Glumes without a distinct internode. Lower glume ovate (see note), 1.05–1.9 mm long, 0.48–0.83 times as long as the spikelet, acute, 3–5-nerved, glabrous to puberulous. Upper glume and first lemma acute, glabrous to puberulous, 5-nerved, nerves without transverse veinlets; upper glume 1.65–2.5 mm long; first lemma paleate, sterile. First palea 0.55–0.77 times as long as the lemma. Second lemma sessile, smooth, shiny, glabrous to apically microscopically scaberulous, apex apiculate, incurved. Anthers 3, 0.9–1.1 mm long. $2n = 36$.

Distribution — India to Taiwan, S China, Australia (Queensland); Malesia: Sumatra (widespread), Enggano, Lingga, Bangka, Billiton, Malay Peninsula (all states except perhaps Negri Sembilan, Perlis), Java (widespread, especially in the West), Borneo (widespread), Celebes (Central, SE), Philippines (Luzon, Mindoro, Palawan, Panay), Lesser Sunda Islands (Flores, Lombok, Sumba), New Guinea: Irian Jaya (Bird's Head, Merauke, no doubt more common), Papua New Guinea (widespread on the mainland).

Habitat — Sunny to somewhat shaded localities, steep riverbanks, ravines, edges of (secondary) forest, thickets, old clearings, scrambling to the tops of scrubs and low trees, locally dominant, (0–)50–1200(–1800?) m altitude.

Uses — Good fodder. Roots chewed with betel nuts would form an aphrodisiac. Juice used in New Guinea as a blue-green stain for net-bags (*Derbyshire* 278, L). May turn into an aggressive weed in e.g. rubber plantations, where it may out-compete *Calopogonium mucunoides* Desv. (Leguminosae) (*van der Hegge Zijnen* s.n., 6/1927, BO).

Notes — Some authors distinguished two taxa here [see Majumdar, Bull. Bot. Soc. Bengal 27 (1973) 49]:

- Blades 30–40 cm long. Panicle usually contracted, branches viscid. Spikelets more or less elliptic, 1.8–2 mm long, greenish dull, strongly nerved. Lower glume 3–5-nerved. Upper lemma dorsally slightly humped *P. incomtum*
- Blades 25–30 cm long. Panicle larger, more open, branches not viscid. Spikelets more or less orbicular, 1.5–1.8 mm long, shiny blackish. Lower glume 1–3-nerved. Upper lemma dorsally rounded *P. sarmentosum* s.s.

I cannot find any difference of note among the material available.

Var. parvispiculatum would differ by the small spikelets, similar to those of *P. humidorum*, but that species has strictly erect, simple, hollow culms, a membranous ciliolate collar-shaped ligule, a contracted panicle, acute to acuminate spikelets, distant glumes, a shorter upper glume, and no first palea. Not having seen the type, I could not ascertain its identity.

Veldkamp 8307 (L) from S Borneo is curious because of the absence of the lower glume.

21. *Panicum schinzii* Hack.

Panicum schinzii Hack. in Schinz, Verh. Bot. Ver. Brandenburg 30 (1888) 142. — Type: *Schinz* 641 (Z holotype; W?).

Panicum laevifolium Hack., Bull. Hb. Boiss. 3 (1895) 378. — Syntypes: *Rehm* 4697, 5123, 6552, 6614 (W).

Plants annual. Culms 0.3–1.1 m long, erect to geniculate at base, hollow. Nodes glabrous. Sheaths glabrous. Ligule a pilose collar. Blades linear, 10–40 cm by 5–15 mm, glabrous, green, base truncate, margin glabrous at base, underneath with 7–9 major nerves. Panicles lax, 10–35 by 5–15 cm. Main axis glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 10–17 cm long. Pedicels longer than the spikelet, glabrous, scaberulous. Spikelets yawning at maturity, 2–3.1 mm long, acute. Glumes without a distinct internode. Lower glume ovate, 0.9–1.1

mm long, 0.17–0.37 times as long as the spikelet, abruptly acuminate, 1-nerved. Upper glume and first lemma acute, glabrous, 7–9-nerved; upper glume 2–3.1 mm long, acute, glabrous, 7–9-nerved, nerves without transverse veinlets; first lemma paleate, male, nerves with transverse veinlets. First palea as long as the lemma. Second lemma sessile, acute, smooth, shiny, glabrous. Anthers 3, 1.5–1.8 mm long. $2n = 18, 40$.

Distribution — South Africa, introduced elsewhere; in Malesia: Java.

Uses — Good fodder for cattle.

Vernacular name — Land grass (E.).

Note — Part of the complex around *P. coloratum* L., distinct by being a glabrous 0.3–1.1 m tall annual, leaves 10–40 cm by 5–15 mm, bases truncate, panicles 10–35 cm long, spikelets 2–3.1 mm long, first floret paleate, male, second lemma acute, smooth.

22. *Panicum seminudum* Domin

Panicum seminudum Domin, Bibl. Bot. 5 (1915) 320. — Type: *Domin 1/1910* (PR holo; K fragm., not found).

Panicum braunii Mez, Bot. Jahrb. 56, Beibl. 125 (1921) 5, non Steud. (1854). — Lectotype: *Braun 8* (B holo; photo: BRI, K).

Panicum macrocladum Chase, J. Arnold Arbor. 20 (1939) 308. — Type: *Brass 6568* (A holo; K neg 5628, BRI, K, L, US).

Plants annual. Culms 0.4–1.7 m long, erect, hollow, not inflated at base. Nodes glabrous. Sheaths glabrous to tuberculately hispid, margins glabrous. Ligule a pilose collar. Blades linear, 4–31 cm by 3.5–6.5 mm, glabrous to tuberculately hispid, green, base truncate, margin pectinate at base, underneath with 7–11 major nerves. Panicles effuse, 15–47 by 15–20 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost one solitary, 14.5–17.5 cm long. Pedicels as long as to longer than the spikelets, scaberulous. Spikelets yawning at maturity, 2.7–3.7 mm long, acuminate. Glumes with a distinct internode. Lower glume ovate, 2.1–3 mm long, 0.7–0.92 times as long as the spikelet, acute to acuminate, 5–7-nerved. Upper glume and first lemma acuminate, glabrous, 7-nerved, nerves without transverse veinlets; upper glume 2.5–3.2 mm long; first lemma paleate, sterile. First palea 0.17–0.33 times as long as the lemma (check in dry spikelet). Second lemma sessile (often turned 90°), the apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 1.3–1.5 mm long.

Distribution — Australia (W Australia, Northern Territory, Queensland), Malesia: Papua New Guinea (W, Central Prov.).

Habitat — Damp or swampy soil in savanna forests, 0–60 m altitude.

Note — Because of the spikelet length of c. 2 mm *P. braunii* is included here, as was suggested by Chase (sub *P. macrocladum*), who remarked that the lectotype did not exactly match the description.

23. *Panicum sumatrense* Roth ex Roem. & Schult.

Panicum sumatrense Roth ex Roem. & Schult., Syst. Veg. 2 (1817) 434. — Lectotype: *Heyne in Hb Roth s.n.* (B holo; K neg. 2108).

Panicum psilopodium Trin., Diss. Alt. (1826) 217. — *Panicum sumatrense* Roem. & Schult. subsp. *psilopodium* de Wet, J. Agric. Trad. Bot. Appl. 30 (1983) 159. — Lectotype: *Lindley* sub *P. ramosum* Koen. (LE holo; BM, CGE, L, fragm.).

Panicum crispum Llanos, Fragm. Pl. Filip. (1851) 41. — Type: Not extant, Philippines. Neotype: *Merrill Philip. Pl. 1764* (L holo).

Panicum miliare auct. non Lam.

Panicum trypheron auct. non Schult.

Plants annual. Culms 0.2–0.77(–0.95) m long, erect to geniculate at base, hollow. Nodes glabrous to bearded. Sheaths glabrous to tuberculately hispid, margins glabrous. Ligule a pilose collar. Blades linear, 4–23(–60) cm by 3–7(–20) mm, glabrous, green, base rounded, margin glabrous to pectinate at base, underneath with 7–9(–12) major nerves. Panicles lax, (3–)7–26 by 4–7 cm. Main axis usually glabrous, sometimes pilose. Panicle branches eglandular, naked at base, the lowermost one solitary, 4.5–20 cm long. Pedicels usually longer than the spikelet, glabrous, scaberulous. Spikelets not yawning at maturity, (2–)3–3.5(–4) mm long, acute. Glumes without a distinct internode. Lower glume ovate, (0.8–)1.4–1.65 mm long, 0.44–0.51 times as long as the spikelet, acute to acuminate, 7- nerved. Upper glume and first lemma acuminate, glabrous, nerves not anastomosing; upper glume (2.2–) 3–3.6(–4) mm long, 11-nerved; first lemma paleate, sterile, 9-nerved. First palea 0.7–1 times as long as the lemma. Second lemma sessile, acute, smooth, shiny, glabrous. Anthers 3, 1.3–1.8 mm long. $2n = 14, 36, 40, 54$.

Distribution — Senegal, E Africa, Pakistan, Sri Lanka to N Vietnam; Malesia: Sumatra (?Bengkulu, only known from type), Java (E of Ceribon), Madura, Philippines (Luzon), SW Celebes (Pampanua), Lesser Sunda Islands (Flores, Roti, Timor). An example of the drought track through Wallacea.

Habitat — Savannah, forest edge, edge of rice field, grassy roadsides, on heavy soil, 0–1500 m altitude. Able to thrive on soils which otherwise yield little or nothing and producing a crop even in famine years.

Uses — Foliage palatable, by some regarded as hardly of any fodder value, by others said to be a quick growing fodder, producing a thin and soft straw consumed readily by cattle.

In India several races are cultivated. The husked grain (husk 20%) is not tasty, dehusked it is cooked like rice and eaten, used for fermentation, and made into flour for puddings and cakes. Eaten by women in childbed affected by cold.

Vernacular names — Blue panic, little millet, sama (E.).

Notes — For more remarks see also Veldkamp, Eijs & Zoetemeyer (1989).

Self-pollination seems to be the rule.

Some have distinguished between the cultivated and the wild form, but the differentiating characters are so inconstant that it seems better to regard this as a polymorphic species.

- Blades usually more than 9 mm wide. Panicle effuse, smaller, not nodding. Pedicels usually longer than the spikelets. Spikelets 2–3 mm long, readily disarticulating at maturity. Wild *P. psilopodium*
- Blades usually less than 9 mm wide. Panicle contracted, large, often nodding. Pedicels usually shorter than the spikelets. Spikelets 2–3.5 mm long, persistent or disarticulating at maturity. Cultivated and escaping *P. sumatrense*

24. *Panicum trachyrhachis* Benth.

Panicum trachyrhachis Benth., Fl. Austral. 7 (1878) 490. — *Panicum brachyrachis* Benth. ex Hack. in Warb., Bot. Jahrb. 13 (1890) 258 (sphalm.). — Lectotype: Schultz 343 (K holo).

Ichnanthus harmandii Camus, Not. Syst. 3 (1914) 84. — *Panicum harmandii* Steyermark, Syst. Bot. 7 (1982) 113. — Lectotype: Harmand M9 (P holo; K neg. 5153, L, US, fragm.).

Panicum kerrii C.E. Hubb., Kew Bull. (1927) 78. — Type: Kerr 9581 (K holo).

Panicum virgatum auct. non L.

Plants robust, annual to perennial, rhizome absent. Culms 0.55–2.4 m long, erect, hollow, inflated at base. Nodes glabrous, covered by the sheaths. Sheaths tuberculately hispid, margins glabrous. Ligule a pilose collar. Blades linear, 30–60 cm by 5–8 mm (when expanded), glabrous, green, base gradually narrowed into the auriculate sheath, margin pectinate all over, underneath with c. 9 major nerves. Panicles lax to effuse, 60–115 by 7–50 cm. Main axis smooth to scaberulous upwards, glabrous. Panicle branches eglandular, naked at base, the lowermost fascicled to whorled, the longest one 27–47 cm long. Pedicels shorter than the spikelets, scaberulous. Spikelets yawning at maturity (the fertile lemma turned c. 90°), 3.15–3.75 mm long, acuminate to caudate. Glumes somewhat distant. Lower glume ovate, 2.25–3.45 mm long, 0.71–1 times as long as the spikelet, acuminate to aristate, 3–5-nerved. Upper glume and first lemma glabrous, nerves without transverse veinlets; upper glume 3–3.6 mm long, acuminate to mucronate, 5–7-nerved, first lemma paleate, sterile, acuminate, 9-nerved. First palea 0.7–0.8 times as long as the lemma. Second lemma stipitate (without appendages at base), apex obtuse, straight, smooth, shiny, glabrous. Anthers 3, 1.2–1.5 mm long.

Distribution — SE Thailand (Trat), Cambodia (Battambang = Siemreap), S Vietnam (Loc Ninh, Donnai); Malesia: Lesser Sunda Islands (Timor, fide Hackel), New Guinea (Irian Jaya: Merauke; Papua New Guinea [Western Prov., and perhaps elsewhere, fide Hackel], N Australia (W Australia to Queensland). Note the disjunct distribution.

Habitat — Rice fields, moist places, 0–900 m altitude.

Uses — May become a pest in rice fields.

Notes — Specimens from Australia have fertile lemmas with a spongy stipe, reminiscent of *Yakirra nulla* Lazarides & Webster. Elsewhere the stipe is inconspicuous and no more than a small protuberance. I have not seen any lateral appendages which caused it to be described in *Ichnanthus* by Camus.

De la Savinière 613 (Celebes, BR, cited by Jansen, 1953), *Zeye* s.n. from Timor, and unspecified material from New Guinea cited by Hackel (W) were not seen. They may be misidentified specimens of *P. caudiglume*. A.H. Jansen 17 (L) from Buru turned out to be *P. queenslandicum*.

25. *Panicum trichoides* Sw.

Panicum trichoides Sw., Prodr. Veg. Ind. Occ. (1788) 24. — Syntypes: *Swartz* s.n. (S holo; K neg. 18294–18298, US, fragm.).

Panicum capillaceum Lam., Tabl. Encycl. 1 (1791) 173. — Type: *Le Dru* in *Hb. Lamarck* (P holo, IDC 6207-691).

Panicum andrewsii Rendle in Andrews, Monogr. Christmas Isl. (1900) 192, t. 18 ('*andrewsi*'). — Lectotype: Andrews, A° 1897 (BM holo; K).

Panicum brevifolium auct. non L.

Plants annual. Culms 0.1–0.8 m long, creeping and geniculate at base, rooting from the decumbent nodes, hollow, not inflated at base. Nodes puberulous. Sheaths puberulous to tuberculately hispid upward, margins pilose. Ligule a membranous ciliolate collar. Blades ovate-lanceolate, 2.5–7 cm by 5–19 mm, pilose to tuberculately hispid, base asymmetrical, margin pectinate at base, underneath with 7–10 major nerves. Panicle laxly contracted, the branches erecto-patent to effuse, 4–21 by 3–11 cm. Main axis smooth to scaberulous upward, glabrous to pilose. Panicle branches glabrous, eglandular, naked at base, the lowermost solitary to fascicled in threes, the longest one 2–10 cm long. Pedicels longer than the spikelets, smooth. Spikelets not yawning at maturity, 1.2–1.4 mm long, acute. Glumes with a distinct internode. Lower glume ovate, glabrous to sparsely puberulous, 0.6–0.75 mm long, 0.47–0.53 times as long as the spikelet, acuminate, faintly 1–3-nerved. Upper glume and first lemma obtuse, glabrous to puberulous, 3–5-nerved, nerves without transverse veinlets; upper glume 1–1.2 mm long. First lemma paleate, sterile; palea 0.36–0.6 times as long as the lemma. Second lemma sessile, minutely muriculate, shiny, glabrous, apex acute, straight. Anthers 3, 0.4–0.5 mm long. $2n = 18$.

Distribution — Tropical America, introduced elsewhere; in Malesia: Java (Semarang, Kediri, Surabaya, Malang, Besuki), Christmas Is., Kangean Is., Sabah (Mata Manuk Is.), Lesser Sunda Islands (Lombok, Sumba, Sumbawa, Flores, Timor, Wetar), Philippines (Luzon, Culion), New Guinea (Irian Jaya: Merauke; Papua New Guinea: Western, Madang, Central Prov.).

Habitat — Periodically dry, slightly shaded localities, thickets, shaded roadsides, gardens, open parts of teak forest, locally abundant, 0–600(–1000) m altitude.

Vernacular name — Masher grass (E.).

Note — There is some resemblance to the common *Cyrtococcum accrescens* (Trin.) Stapf, which differs at first sight by the linear-lanceolate to linear blades, the gibbous, laterally flattened spikelets, and the finely, longitudinally striate fertile lemma with a small, greenish crest at the apex.

SPECIES EXCLUDENDAE

Panicum tuberculatum Presl, Rel. Haenk. 1 (1830) 307. — Type: *Haenke s.n.* (PR holo) = *Panicum mertensii* Roth ex Roem. & Schult.

This is one of Haenke's many mislabeled specimens, probably coming from Mexico. [Hitchcock & Chase, Contr. Nat. Herb. U.S. 15 (1910) 141.]

WHITEOCHLOA

Whiteochloa C.E. Hubb., Proc. Roy. Soc. Queensl. 67 (1952) 109; Lazarides, Brunonia 1 (1978) 67, 406. — Type: *Whiteochloa semitonsa* (Benth.) C.E. Hubb.

Ligule a ciliolate to setose collar. Blades linear. Panicle branches determinate [ending in a bristle in *W. cymbiformis* (Hughes) Simon]. Spikelets laterally compressed. Lower glume present, 3–5-nerved; upper glume as long as the spikelet, 5–7-nerved. First lemma paleate, male, convex, with a translucent dorsal groove, which is not always well-developed and may be hidden by the lower glume. Rhachilla internode well-developed. Second lemma shorter than the first, stipitate, dorso-ventrally compressed, apiculate, smooth to finely transversally rugulose, margins incurved.

Distribution — In Australia 6 species, of which one also in Malesia.

Note — This is one of the satellite genera of *Panicum*, which have recently been accepted as distinct by Lazarides (1978), and Clayton & Renvoize (1986). It differs from *Panicum* s.s. mainly by the more or less filiform stipe of the upper floret. Webster [Austral. Pan. (1987) 255] erroneously has stated that the species would be dioecious.

Whiteochloa capillipes (Benth.) Lazarides

Whiteochloa capillipes (Benth.) Lazarides, Brunonia 1 (1978) 79, t. 3. — *Panicum capillipes* Benth., Fl. Austral. 7 (1878) 484. — Lectotype: Schultz 806 (K holo; B).

Plants perennial, rhizome and cataphylls present. Culms 0.5–1.2 m long, erect, hollow. Nodes glabrous. Sheaths glabrous to tuberculately hispid. Ligule a ciliate rim. Blades flat, linear, 8–27.5 cm by 2.5–7 mm, glabrous to pilose, green, base rounded, margin pectinate at base, apex acute to long acuminate, underneath with 5–7 major nerves. Panicles effuse, 10–30 by 5–18 cm. Main axis glabrous to pilose. Panicle branches smooth to scaberulous, naked at base, ending in a spikelet, the lowermost one solitary, 3–17 cm long, branched. Pedicels longer than the spikelet. Spikelets not yawning at maturity, 2.2–3 mm long, acute to acuminate. Glumes approximate; lower glume ovate, 0.8–1.2 mm long, 0.37–0.43 times as long as the spikelet, acute, 3–5-nerved; upper glume acute, glabrous, 5-nerved, nerves not anastomosing. First lemma acute, glabrous, 5-nerved, nerves not anastomosing; palea about as long as the lemma. Second lemma finely longitudinally rugulose, shiny, white, glabrous. Anthers 3, 1.1–1.5 mm long.

Distribution — Australia (Northern Territory); Malesia: New Guinea: Aru Islands (Trangan: Buwalda 5305, BO).

Notes — Said by Lazarides to be an annual or short-lived perennial, but all specimens seen had short rhizomes and many cataphyll-covered basal buds, which indicates a true perennial.

This is one of the species that make the Aru Islands so interesting biogeographically. .

INDEX TO COLLECTORS

Only numbered or dated collections have been included. Identifications cited between brackets were not seen by me. (T) indicates a type collection.

Panicum

ant	= 1. <i>antidotale</i> Retz.
aur	= 2. <i>auritum</i> Presl ex Nees
bis	= 3. <i>bisulcatum</i> Thunb.
bre	= 4. <i>brevifolium</i> L.
cau	= 5. <i>caudiglume</i> Hack.
cur	= 6. <i>curviflorum</i> Hornem. var. <i>suishaense</i> (Hayata) Veldk.
eff	= 7. <i>effusum</i> R. Br.
hay	= 8. <i>hayatae</i> Camus
hmd	= 9. <i>humidorum</i> F. Ham. ex Hook. f.
hml	= 10. <i>humile</i> Nees ex Steud.
kha	= 11. <i>khasianum</i> Munro ex Hook. f.
luz	= 12. <i>luzonense</i> Presl
max	= 13. <i>maximum</i> Jacq. 'var.' <i>maximum</i>
mxp	= 13. 'var.' <i>pubiglume</i> K. Schum.
mil	= 14. <i>miliaceum</i> L.

Panicum

min	= 15. <i>mindanaense</i> Merr.
not	= 16. <i>notatum</i> Retz.
pal	= 17. <i>paludosum</i> Roxb.
que	= 18. <i>queenslandicum</i> Domin var. <i>queenslandicum</i>
rep	= 19. <i>repens</i> L.
sar	= 20. <i>sarmentosum</i> Roxb.
sch	= 21. <i>schinzii</i> Hack.
sem	= 22. <i>seminudum</i> Domin
sum	= 23. <i>sumatrense</i> Roth ex Roem. & Schult.
tra	= 24. <i>trachyrhachis</i> Benth.
tri	= 25. <i>trichoides</i> Sw.

Whiteochloa

whi	= <i>Whiteochloa capillipes</i> (Benth.) Lazarides
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A.O. Cameron Highlands SP/A: max — Adj. Landbouw. Pamekasan 13: rep — Adj. Veearts Donggala 60: rep — Adj. Veearts Gorontalo 7: rep; 13: pal; 33: max — Aet 795: sar — Aet & Idjan 974: luz — Agama 9490: tri — Alston 15161: hay; 17048: cur — Amdjah 797: aur — Anang 270: cau; 502: luz; 599: aur — Andrews A° 1897: tri — Anonymous HB 4964: mil — Anta 16: sar; 432: sar; 1089: bre — ANU 1883 (Kellman): max; 26058 (Shea): not; 26213 (Shea): not — Arendsen Hein 14: rep.

Backer 27/12/1910: luz; 15/5/1927: tri; 26: rep; 157: bre; 584: not; 888: luz; 1205: sar; 1616: luz; 1656: luz; 1695: sar; 1941: sar; 2034: not; 2064: luz; 2391: rep; 2601: not; 2650: rep; 2726: cau; 3437: not; 3854: rep; 4037: sar; 4197: sar; 4244: sar; 4345: luz; 4755: rep; 5147: pal; 5181: rep; 5254: not; 5413: rep; 5737: rep; 5793: not; 5816: luz; 6394: bre; 6676: luz; 7159: rep; 7239: luz; 7493: sar; 7591: rep; 7723: cau; 7724: cau; 7784: cau; 8608: not; 8901: sar; 9004: sar; 9117: aur; 9129-bis: bre; 9334: aur; 9407: rep; 9546: not; 9921: luz; 9937: sar; 10078: luz; 10161: rep; 10292: bre; 10324: bre; 10422: bre; 10453: sar; 10501: aur; 10509: rep; 10539: bre; 10685: rep; 11155: aur; 11336: rep; 11755: rep; 11888: pal; 11894: bre; 11898: rep; 11942: luz; 12067: not; 12190: rep; 12371: rep; 12811: pal; 12828: rep; 13024: not; 13083: tri; 13400: rep; 13683: tri; 13742: rep; 13905: not; 13928: sar; 14103: sar; 14532: rep; 14689: rep; 14820: sar; 14889: rep; 15049: sar; 15174: aur; 15407: rep; 15440: rep; 15569: sar; 15734: not; 16033: rep; 16325: rep; 16529: rep; 16563: sar; 16756: rep; 17028: sar; 17427: luz; 17716: rep; 18108: not; 18214: rep; 18478: aur; 18580: luz; 18643: not; 18650: sar; 19010: rep; 19374: rep; 19702: sum; 19798: sum; 20083: rep; 20472: rep; 20973: tri; 21174: rep; 21607: rep; 21963: rep; 22079: bre; 22167: cau; 22184: bre; 22244: rep; 22571: sar; 22665: not; 22690: max; 22851: pal; 23123: bre; 23180: luz; 23399: luz; 23507: pal; 23525: bre; 23566: not; 24044: cau; 24068: cur/sum; 24123: sar; 24177: rep; 24363: rep; 24378: rep; 24407: cau; 24436: rep; 24447: cau; 24500: cau; 24687: cau; 24717: rep; 24811: not; 24986: rep; 25184: rep; 25348: sar; 25460: sar; 25515: bre; 25529: sar; 25583: max; 25589: sar; 25724: bre; 25994: sar; 26459: luz; 26561: sum; 26680: pal; 27189: rep; 27499-bis: tri; 27628: tri; 27723: rep; 27791: not; 27897: rep; 28019: cur; 28147: cur; 28155: rep; 28167: tri; 28266: cau; 28278: tri; 28291: luz; 28443: tri; 28444: cau; 28609: tri; 28630: cau; 28772: cau; 28861: tri; 28909: cau; 29164: tri; 29196: cau; 29331: tri; 29336: cau; 29389: rep; 29655: cur; 29680: cau; 29914: tri; 30013: not; 30076: pal; 30090: rep; 30121: rep; 30208: rep; 30777: cur; 30791: tri; 30905: rep; 30917: pal;

- 30989: max; 31072: rep; 31747: cau; 31915: bre; 32114: luz; 32115: luz; 32116: luz; 32148: not; 32152: pal; 32201: rep; 32202: rep; 32203: sar; 32204: rep; 32205: rep; 32507: pal; 32590: luz; 36934: tri; 37456: cau; 37486: sar; 37513: cau; 37536: tri — Bacon 209: rep — Bakhuizen van den Brink 24/2/1924: bre; 545: rep; 988: rep; 1052: sar; 1552: max; 1956: luz; 1980: luz; 2069: sar; 2741: sar; 3216: pal; 3275: bre; 3284: luz; 3306: aur; 3372: sar; 3669: bre; 4630: not; 5402: bre; 6877: not; 6879: rep; 7562: not; 7822: bre — Balansa 16/9/1886: aur; 20/11/1886: sar; 427: cur; 1625: sum — van Balgooy 5116: aur — Barber 319: bre; 320: rep — Barrie 4: max — Bartlett & LaRue 242: sar; 386: sar — Beccari PC-12128 (T): sar; PS-879: sar — Beguin 8: aur; 61: max — Berger 2939: not — Beumée 6/1917: sar; 2/1919: not; A-347: rep; 23: rep; 220: cau; 340: not; 646: tri; 696: not; 720: not; 824: not; 925: not; 962: not; 1147: not; 1334: not; 1368: not; 1717: not; 1843: not; 1962: not; 2246: not; 2324: luz; 2451: not; 2668: not; 2830: not; 3418: not; 3608: not; 3939: tri; 3968: cau; 4132: not; 4286: sar; 4478: not; 4772: not; 4819: not; 5411: cau; 5447: not; 5661: bre; 6038: sar — BF 5872 (Curran): hml; 15530 (Merritt & Darling): (tri); 16585 (Curran): (cur) — Bicknell 186: rep — Bloembergen 3104: tri; 3105: tri; 3115: tri; 3135: tri; 3549: tri; 3748: cau; 3758: tri; 3835: cau; 3839: cau — Blokhuis 13/10/1919: rep — de Boer 11: not — Boerlage 6/7/1888: sar — Bor S-13: max; S-26: rep; S-26A: rep — van Borssum Waalkes 668: rep; 794: sar; 2431: rep — Boschproefstation 8249: not — Bowers 851: pal — Brass 3631 (T): eff; 5960: min; 6342: aur; 6350: sem; 6484: aur; 6485: min; 6568 (T): sem; 7522: min; 7851: min; 7852: min; 7957: sar; 13942: aur; 23918: sar; 27580: sar — Braun 8 (T): (min) — van Breemen 22/2/1926: sum; 51: rep — Brinkman 136: rep; 227: luz; 227d: cau; 299: not — Broekhuijsen 1: luz; 11: luz — Brooke 8255: bre; 8383: bre; 8666: rep; 8918: aur; 9298: sar; 9608: bre; 10346: bre; 10554: sar; 10627: rep; 10650a: sar; 10652: bre; 10667: aur — BS 169: (cau); 442 (Mangubat): (bre); 4466 (Merrill): hml; 4478 (Merrill): cur; 4600 (Ramos): luz; 6707 (Merrill): luz; 7344 (Cestino): sar; 7429 (Ramos): pal; 7436 (Merrill): cau; 7618 (Ramos): (tri); 8122 (Ramos): luz; 9222 (Merrill): sar; 9354 (Merrill): sar; 11529 (Robinson): aur; 11607 (Merrill): min; 11608 (Merrill): hml; 17436 (Merrill): (cau); 19191 (Reillo): hml; 21997 (Ramos): luz; 21998 (Ramos): (hml); 22489 (Ramos & DeRoy): sar; 23060 (McGregor): cau; 23307 (Ramos): aur; 24082 (Ramos): cau; 26125 (Fénix): max; 29242: min; 30733 (Ramos & Edaño): sar; 39773 (Ramos): sar; 40651 (Ramos & Edaño): sar; 41285 (Ramos): min; 41440 (McGregor): rep; 43968 (Ramos & Edaño): luz; 44159 (Ramos & Edaño): aur; 44318 (Ramos & Edaño): bre; 44622 (Ramos & Edaño): min; 45416 (Ramos & Edaño): luz; 78767 (Ramos): cau; 80650 (Ramos): rep — Bünnemeijer 272: sar; 329: sar; 1230a: bre; 1251: not; 1321: not; 1390: not; 1513: not; 1571: aur; 1644: sar; 1711: max; 1984: sar; 2156: sar; 2290: sar; 2440a: bre; 2445: bre; 3522: not; 3588: not; 3984: not; 4325: rep; 6008: sar; 6059: not; 6793: sar; 8020: not; 8203: not; 10705: not — Burger 2031: not — Buwalda 2715: max; 2737: aur; 2768: sar; 2820: not; 3424: not; 4383: luz; 4384: mil; 5305: whi; 6060: aur; 7970: rep; 8013: bre; 8030: pal; 8031: rep; 8162: luz; 11305: rep — BW 6329 (Kalkman): luz; 7359 (Versteegh): pal; 8369 (Roeby): max.
- Carr 11048: eff; 11104: eff; 12525: sar — Carrick & Enoch 313: bre — de Castro 17: tri — Cheeseman 63: sar — Cid 30: aur — Cinatti 141: cau — Civ. Gezag. Taliwang 4: cau — Clason 64: rep; C-65: tri; K-72: not — Clason-Laarmann G-75: rep; 100: rep — Clemens 9-10/1906: cau; 6/1907: min; 36: sar; 99 (T): (min); 9770: sar; 10028: not; 10696: pal; 17661: hml; 17760: cau; 18208: sum; 18291: sum; 18650: cau; 21322: sar; 27589: not; 27589A: not; 27590: bre; 27662: not; 28271: not; 28274: bre; 28275: hmd; 28275A: hmd; 28300: sar; 28300A: sar; 51224: not; 51489: sar; 51562: hmd; 51566: bre — Co 2409: min — Coert 12: rep; 16: not; 502: rep; 548: rep; 832: rep; 1706: rep — Controleur van Endeh 4: rep — Coode 3780: luz — Copeland 396: (cur) — Corner 21/11/1941: aur — Cumming 652 (T): luz; 679 (T): sar; 1274: aur; 1667 p.p.: luz; 2284 (T): sar; 2409: aur.
- Danser 5443: bre; 5843: rep; 6262: max — Darbyshire 278: sar; 1171: sar — Darbyshire & Hoogland 8269: sar — Darnton 267: not — Denison H2300/56: hmd — Djambhari 204: rep — Docters van Leeuwen 24/4/1915: rep; 3238: sar; 3241: not — Docters van Leeuwen-Reijnvaan 15/3/1909: max; 7869: rep — Dorgelo 240: sum; 855: rep; 2361: tri — Dransfield et al. 924: rep.

- Edeling 3/1865: cau — Elbert 1/1908: sar; 1426: sar; 1837: sar; 1892: sar — Elmer 4229: luz; 5595: not; 5972: pal; 6589: (sum); 6735: not; 14344: aur; 16398: aur; 18095: rep — Elsener H-17: bre; 21: rep; 67: bre — Endert 2091: aur; 2102: aur; 2124 (T): (hmd); 3111: bre — Erkelens & Coert 388: rep; 394: rep — Everaarts 378: rep — Eyma 1521: not; 3939: rep.
- Fairchild 184: pal/rep — Feuilletau de Bruyn 204: pal — Forman 138: rep — Forsten 2: max; 173: bis — Forster 92: rep; 130: hmd; 133: luz — Franck 98: cur; 145: not — Frey-Wyssling 4/8/1931: rep; 72: not — Funcke 10/1913: rep.
- Gates 5675: (tri) — Geerts-Ronner 2: tri — Gezag. Sawoe 7: rep — Gibbs 2643: sar; 2678: sar — Gilmour 13: cur — Goetghebeur & Vyverman 6671: pal; 6691: pal — Gouv. Veearts Soemba 6/1934: rep — Gouv. Veearts Soembawa 1/1930: not; 3A: rep; 26: cau — Griffith KD 6492: sar — Grutterink 3187: tri; 3267: not.
- Hallier f. 27/5/1895: bre; 12/7/1895: bre; 24/8/1896: cau; 28/8/1896: sar; 619a: rep; 619b: rep; 619c: rep; 620a: bre; 620b: bre; 625a: sar; 625b: sar; 626: max; 4165: rep; 4193: sar — Hardial & Nor 49: luz — Hardial & Samsuri 234: sar — Harmsen 48: cau — van Harreveld 9/1917: rep — 't Hart & van Leeuwen M-29: cau; MA-9: max — van der Hegge Zijnen 6/1927: sar — Heyligers 1147: eff; 1171: sem; 1233: eff — Hoekstra 9: rep — Hoetagaloeng 21: rep — Hofstee 111: rep — Hollprung 808: luz — Hoogerwerf 21/8/1954: not; 74: tra; 163: min; 275: tra; 285: tra — Hoogland 3290: sar; 3557: luz; 4426: sar; 4835: luz — Hoogland & Pullen 6240: pal — Houtvester Besoeki 15: rep — Houwing 582: rep; 600: luz; 601: rep; 1159: rep — Hullett 3/1/1894: rep; 27/1/1894: max — Hume 7613: sar; 7652: bre; 8354: sar.
- Iboet 152: sar; 339: tri; 352: cau; 556: not.
- Jaag 84: tri; 98: cau; 189: cau — Jacobs 7505: tri — Jacobson 118: rep — Jaheri 82: aur; 111: sar; 131: hmd — Jansen 17: que — Jochems 1684: pal; 3175: not; 3186: luz.
- Kajewski 1897: luz — Kanehira & Hatusima 13093 (T): (min) — Karta 7: not; 9: sar; 403: cau — Kasik 56: not — Kasim 64: luz; 580: luz — KEP 55833 (Smith): sar — Kern 7313: rep; 7903: bre — Kievits 1023: rep; 1538: cur; 3463: luz — King's coll. 201: sar; 2546 (T): (hmd) — Kjellberg 347: luz; 540: cur; 3011: luz; 3027: pal; 3031: sar; 3112: luz; 3710: sar; 3722: rep — Kleinhoonte 255: max; 464: bre; 466: sar — Kneucker 612 (Merrill): rep; 731 (Merrill): cau; 732 (Merrill): sar; 816 (Merrill): aur; 819 (Merrill): max; 823 (Fénix & Ramos) (T): not; 825 (Merrill): hml — Kooper 7/1932: sum; 12: sum; 223: rep; 906: sar; 2000: cur — Koorders 1/1886: not; 15109: not; 15166: mil?; 19802: pal; 21212: not; 21247: sar; 23444: sar; 23942: sar; 25019: not; 26604: rep; 27174: not; 27755: rep; 27781: not; 31396: rep; 34567: luz; 35812: rep; 36992: sar; 37000: sar; 37001: cau; 40016: cau; 40299: max; 40452: rep; 40949: bre; 40955: aur; 41256: not; 41407: sar; 42462: not; 42474: not; 42485: not; 42516: rep; 42549: not; 44098: bre; 44102: sar; 44226: not; 44234: not — Kooy 298: cau; 757: sum; 784: max; 843: max — Kostermans 11/1938: rep; 9/1958: rep; 4019: cau; 18641: not; 22155: tri; 23844: sar — Kostermans & Anta 665: sar — Kostermans & Wirawan 29: cau — Kunstler 201: sar — Kuntze 4289: not — Kurz 12/1863: rep; 1839: bre; 1841: sar.
- LAE 50293 (Stevens): pal; 66140 (Conn & Katik): pal; 66244 (Conn): pal; 72472 (Henty & Katik): luz — Lam 3161: aur — Landbouwl. Besoeki 8: rep; 19: rep — Landbouwl. Cheribon 5: rep; 29: sum — Landbouwl. Poerworedjo 26/11/1919: rep — Lauterbach 622: sar — Leano 5427: rep — Leefmans 21/4/1924: rep; 18/11/1924: aur — van Leersum 1a: rep — van Leeuwen 6/1958: tri; B: ant; BIAK-9: luz; C: sch — Legagneux 3/1920: sum — Loeters 1975-a: cau — Loher 1712: not; 1714: rep; 1716: luz; 1718: (aur); 1719: (aur) — Lörzing 121: rep; 635: sar; 1523: rep; 1602: sar; 1871: rep; 3376: rep; 3724: luz; 3983: max; 4414: luz; 4452: not; 4453: not; 4455: sar; 4458: sar; 4496: sar; 4531: luz; 4895: pal; 6605 (T): hay; 6945: rep; 7714: pal; 7815: not; 5839: sar; 8049: rep; 8434: pal; 8649: bre; 9096: aur; 9324: not; 9615: not; 9630: sar; 9749: cur; 9879: rep; 10087: rep; 10139: pal; 11002: pal; 11120: luz; 11953: max; 12659: not; 12668: bre; 12674: pal; 12675: sar; 12676: sar; 12696: luz; 13034: aur; 13068: not; 13292: aur; 13762: luz; 13938: rep; 14022: max; 14201: cur; 14213: not/sar; 14531: luz; 14851: rep; 15113: pal; 15607, p.p.: hay/not; 16307: cur; 16348: not — Lütjeharms 3852: sar.
- van Maarseveen 10: cau — Mahmud 4807: sar; 9107: sar — Main 225: rep; 1737: sar; 2073a: hmd — Maingay KD 1727: sar — Maradjio 328: bre — Mayer 8/1896: max — van der Meer Mohr

7: rep — Merrill 10: rep; 97: pal; 123: luz; 429: rep; 458: tri; 512: sar; 554: not; 678: cur; 825: sar; 832: cau; 1608: sar; 3107: luz; 3307: cau; 3623: hml; 4136: cur; 4183: luz; 4229: luz; 4251: rep; 4466: hml; 4478: (cur); 5386: (bre); 7079: (sum); 7436: cau; 9222: sar; 9319: not; 9354: sar; 11607: min; 11608: hml; Philip. Pl. 101: aur; 110: (bre); 597: (sum); 1238: luz; 1281: cur; 1764 (T): sum; Sp. Blanc. 708 (T): rep — Metzner 76: rep; 179: cau — Meijer 2685: rep; 2775: rep; 5653: not; 5770: rep; 5874: not; 5933: not; 7292: rep; 10308: cau; 11419: cur — Meijer Drees 591: pal — de Mol 121: rep; 158: rep — Mondi 42: aur — Monod de Froideville 958: rep; 1131: cau; 1247: cau; 1251: tri; 1863: sar; 1856: not — Motley 9: hml; 109: rep; 156: not; 315: bre; 337: sar — Müller 6 (Mousset): rep; 880 (Mousset): sar — Murata et al. B-149: sar; B-251: sar; B-1998: sar; B-4253: not.

Nauta 7: rep — Nedi & Idjan 66: rep; 440: not; 468: luz; 483: aur — NGF 4047 (Fryar): max; 4144 (Womersley): sar; 5403 (Floyd): pal; 9542 (Henty): sar; 12440 (Henty): ant; 13641 (Henty): mpx; 14896 (Henty): max; 22054 (Gillison): eff; 28803 (Streimann): sar; 33608 (Ridsdale): sem; 37712 (Millar): sar; 38443 (Millar): tri; 38629 (Henty & Katik): min; 38670 (Henty & Katik): sem; 38708 (Henty & Katik): sem; 41945 (Henty): mpx; 41960 (Henty): max; 42865 (Henty): min; 42898 (Henty & Foreman): luz; 47949 (Streimann & Kairo): sar; 49142 (Henty): ant; 49318 (Henty & Foreman): aur; 49380 (Henty & Foreman): min; 49586 (Henty): aur; 49632 (Henty): tri; 49699 (Henty): sem; 49700 (Henty): sem — Noerkas 66: luz; 69a: sum; 146a: pal. van Ooststroom 12598: bre; 13018: pal; 13569: not; 13621: bre; 13825: not — Ottolander 405: rep; 407: max.

Paijmans 913: sar — Pleyte 843: rep — PNH 3474 (Edaño): sar; 4062 (Edaño): sar; 14161 (Edaño): sar; 15415 (Edaño): aur; 16845 (Sulit & Conklin): sar; 18099 (Farinas): rep; 18264 (Mendoza): rep; 20463 (Mendoza): luz; 33190 (Steiner): sum; 33193 (Steiner): rep; 33234 (Steiner): rep; 33296 (Steiner): max; 33659 (Gachalian): aur; 37176 (Edaño): aur; 40761 (Farinas): min; 41327 (Mendoza & Reynoso): rep; 41869 (Mendoza): aur; 42144 (Mendoza): luz; 42345 (Mendoza): luz; 42547 (Mendoza): aur; 72833 (Banlugan et al.): luz; 78309 (Gutierrez): aur; 80712 (Conklin & Buwaya): luz; 117057 (Gutierrez et al.): aur; 117904 (Madulid et al.): aur; 118150 (Madulid et al.): aur; 118266 (Madulid et al.): aur — Polak 1868: rep — Popta 83: max — Posthumus 809: aur; 876: sar; 2068: not — Pringgo Atmodjo 390: pal; 467: aur — Proppe 29: cau — Pullen 1049: sar; 1628: sar; 1632: pal; 1637: luz; 1657: aur; 1749: min; 2647: pal; 2794: sar; 3264: sem; 3285: tri; 3302: sem; 6670: sem; 6671: eff; 6832: sem; 6843: tri; 6939: eff; 6941: sem; 7015: tra; 7111: min.

Raab 60: sar; 461: sar; 584: bre — Rachmat 382: sar; 401: luz — Rahmat si Boeea 5840: not; 6013: sar; 6262: sar; 6283: not; 8503: sar; 9119: aur — Rahmat si Toeroes 3853: sar; 5617: luz — Ramos 1597: aur; Philip. Pl. 2057: luz — Rappard 52DB: rep; 229: sum — Reeder 904: luz; 905: min — Reinwardt 7: sum; 9: sum; 17: luz; 201: sar — Ridley 9/2/1915: rep; 10/2/1915: rep; 16/1/1917: bre; 30/1/1917: sar; 2/1917: hum; 5/2/1917: luz; 12/12/1920: bre, sar; 20/12/1920: bre; 1/1/1921: max; 22/1/1921: bre; 26/1/1921: not; 14/2/1921: pal; 135: tri; 3116 (T): cur; 5787: luz; 6984: hum; 7126: not; 7779: not; 11007: hum; 11010: hmd; 11015: luz; 11530: sar; 11973: sar; 12046 (T): bre; 14867: luz; 14869: sar — Ridsdale 1532-Z: cur — Robinson & Kloss 24/5/1914: not — Roessel 399: max; 560: luz; 586: luz; 769: luz; 5186: luz — van Royen 4701: sar — RSNB 2593 (Chew et al.): not — Ruttner 86: rep; 87: rep; 88: rep; 89: rep; 90: rep; 91: rep; 288: rep; 348: rep — Ryves 92KL/035: bre.

S 20842 (Anderson): bre; 33369 (Mamit): not; 33447 (Mamit): bre — SAN 39363 (Meijer): luz; 59532 (Aman & Maikin): not — Sands 613: rep — Santos 4051: max; 4169: max; 4190: aur; 4611: rep; 4674: rep; 4788: cur; 4921: aur; 4930: cur; 4960-A: cur; 5019: max; 5055: rep; 5129: luz; 5130: aur; 5133: luz; 5638: max; 5736: cur; 5824: max; 5871: rep; 5966: luz; 5990: aur; 6077: cur; 6098: hml; 6140: not; 6167: cur; 6187: hml; 6199: rep; 6205: min; 6292: hml; 6298: hml; 6316: map; 6419: hml; 6497: aur; 6499: sar; 6591: max; 6750: hml; 6781: rep; 6799: aur; 6856: luz; 6953: hml; 7085: not; 7377: rep; 7382: hml; 7410: min; 7442: sar; 7456: min; 7524: rep; 7566: sum; 7583: cur?; 7670: rep; 7701: max; 7880: luz; 8045: sar; 8080: aur; 8086: luz; 8091: aur; 8109: cur; 8112: hml; 8132: not; 8147: min; 8151: hml; 8154: pal; 8204: hml; 8252: aur — Sapiin 2157: rep — Saunders 168: luz — Sauveur & Sinke 2502: max —

- de la Savinière 1627: max — Schiffner 1505: bre; 1529: max; 1549: sar; 1583: rep; 1584: rep — Schmutz 2064A: sum; 5031: cur; 5049: cur; 5079: not; 5655: sum; 5731: cau; 5827: cau; 5828: sum; 5901: cau — SF 4450 (Nur): bre; 4505 (Nur): rep; 4534 (Nur): rep; 4535 (Nur): sar; 4599 (Nur): rep; 4603 (Burkhill): sar; 4632 (Burkhill): not; 4789 (Nur): sar; 4796 (Nur): bre; 5266 (Nur): rep; 6210 (Nur): rep; 7132 (Haniff & Nur): sar; 9329 (Holttum): sar; 9663 (Holttum): sar; 19841 (Holttum): luz; 22758 (Henderson): rep; 24076 (Henderson): aur; 25806 (Corner): rep; 25909 (Corner): bre; 26113 (Nur): luz; 28062 (Corner): rep; 29611 (Henderson): luz; 35900 (Nauen): bre; 36750 (Spare): sar; 37321 (Spare): luz; 37497 (Corner): sar; 37593 (Corner): sar; 37599 (Corner): bre; 37970 (Corner): pal; 38087 (Nauen): luz; 38230 (Henderson): hmd; 40169 (Sinclair): sar; 40968 (Gilliland): hay; 55833 (Wyatt-Smith): sar — Sinclair 18/12/1948: rep; 9828: aur — van Slooten 2331: luz; 2491: cau; 2504: cau; 2677: pal — Soderstrom & Sunarko 1379: sar — Soegeng 23: rep — Sohns 34: max; 35: not; 40: pal; 46: pal — van Steenis 467: rep; 469: max; 1489: rep; 1559: sar; 2902: cau; 3340: sar; 4166: rep; 4428: rep; 4532: rep; 5427: sar; 5673: bre; 5728: rep; 6087: not; 7534: luz; 8779 (T): kha; 9381: pal; 11808: not; 12037: rep; 12363: not; 12613: sar; 18532: hay; 18639: rep — Stone et al. 15226: rep — Sunarti & Prawiroatmodjo 11: max — Surbeck 306: not; 354: not; 361: not.
- Telford & Howard 10058: rep — Teijsmann 6/1876: min — van Thull 9: rep.
- Ultée 12: rep — University San Carlos 848: aur — UPNG 83 (Pulsford): sar; 193 (Pulsford): max; 357 (Tippett?): sem.
- Veearts Sibolga 8: sar; 23: (hml) — Veldkamp 6978: rep; 7148: not; 8307: sar — Verboom 36: not — Verheijen 2459: sum; 2723: rep; 3745: not; 4125: rep; 4418: sar; 4645: sar; 5287: sar; 5413: not — Vermeulen 21: cau — Versteeg 1948: pal — Vidal 4008: not; 4020: rep — de Vogel 3820: aur; 9794: sar — de Voogd 2383: cau; 2532: sar; 2558: cau — van der Voort 3: cur.
- Wallich 8719-B: not; 8719-C: not — Walsh 44: cau; 64: cau — Warburg 20924: (cau) — White 311: sar — Whitford 1019: sar — Whithead & Flenley 106: rep — Wichmann E-11: sem; O-15: sem — Widjaja 507: rep — de Wilde & de Wilde-Duyfjes 13519: hay; 19680: aur; 20089: rep; 20150: sar — Williams 134: not; 217: sar — Winckel 625: rep; 1525: sar — Winkler, Hans 138: aur — Winkler, Hub. 2221: sar; 3008: aur; 3077: sar; 3374: luz — Wiriosapoetro 74: rep — Wisse 391: rep; 430: not; 437: not — de Wit 4181: rep; 4201: rep; 4208: luz; 4280: not; 4285: bre — Wolf von Wülfing 1229: not — Wray 3644: bre — Wurth 14/10/1906: rep.
- Yapp 141: luz — Yates 24: sar.
- Zollinger 338 (T): sar; 3937: cau.

INDEX TO SCIENTIFIC NAMES

The letters and numbers in brackets are three letters and the number of the species under which each name can be found. Accepted names are in Roman type with code and number in bold type; synonyms and excluded species are in *italics*.

- | | |
|---|--|
| <i>Hymenachne aurita</i> Presl ex Balansa (aur 2)
<i>polymorpha</i> Balansa (aur 2) | <i>(Panicum)</i>
<i>auritum</i> Presl ex Nees (aur 2)
<i>var. procerius</i> Nees (aur 2)
<i>var. procerius</i> Presl (aur 2) |
| <i>Ichnanthus harmandii</i> Camus (tra 24) | <i>austro-asiaticum</i> Ohwi (hml 10)
<i>balansae</i> Crevost & Lemarié (aur 2) |
| <i>Leptoloma miliacea</i> (L.) Smyth (mil 14) | <i>bisulcatum</i> Thunb. (bis 3)
<i>brachyrachis</i> Benth. ex Hack. (tra 24) |
| <i>Milium esculentum</i> Moench (mil 14)
<i>panicum</i> Miller (mil 14) | <i>braunii</i> Mez (min 15, sem 22)
<i>brevifolium</i> auct. non L. (tri 25)
<i>brevifolium</i> L. (bre 4)
<i>var. hirtifolium</i> (Ridl.) Jansen (bre 4) |
| <i>Panicum</i>
<i>acanthum</i> Steud. (bis 3)
<i>amoenum</i> auct. non Balansa. (bis 3), hmd
<i>andrewsii</i> Rendle (tri 25)
<i>antidoteale</i> Retz. (ant 1)
<i>archboldii</i> Hitchc. (aur 2) | |

(Panicum)

- caesioglaucum* Nees ex Steud. (luz 12)
caesium Nees ex Hook. f. (luz 12)
cambogiense Balansa (luz 12)
campylogrammum Buse (sar 20)
capillaceum Lam. (tri 25)
capillare auct. non L. (luz 12)
capillipes Benth. (whi)
caudiglume Hack. (cau 5)
concinnum Nees (hml 10)
convolutum Beauv. ex Spreng. (rep 19)
cordatum Buse (not 16)
 var. *pubescens* Buse (not 16)
costatispiculum Ohwi (hay 8)
crispum Llanos (sum 23)
cruciabile Chase (luz 12)
curviflorum Hornem.
 var. *suishaense* (Hayata) Veldkamp (cur 6)
decompositum R. Br.
 var. *paludosum* (Roxb.) Trimen (pal 17)
effusum R. Br. (eff 7)
elegantissimum Hook. f. (cur 6)
euchroum Steud. (not 16)
extensum Steud. (luz 12)
extensum auct. non Steud. (aur 2)
harmandii (Camus) Stieber (tra 24)
hayatae Camus (hay 8)
hirtifolium Ridley (bre 4)
humidorum F. Ham. ex Hook. f. (hmd 9)
 var. *perakense* Hook. f. (hmd 9)
humile Nees ex Steud. (hml 10)
incomitum Trin. (sar 20)
 var. *pubescens* Buse (sar 20)
insulicola Steud. (aur 2)
ischaemoides Retz. (rep 19)
javanicum Nees & Blume (aur 2)
 var. *angustifolium* Buse (aur 2)
javanum Nees ex Buse (aur 2)
kerrii C. E. Hubb. (tra 24)
khaskanum Munro ex Hook. f. (kha 11)
laevifolium Hack. (sch 21)
luxurians auct. non Nees. (not 16)
luzonense Presl (luz 12)
macrocladum Chase (sem 22)
maximum Jacq. (max 13)
 forma *pubiglume* (K. Schum.) K. Schum.
 ex Peter (mxp 13)
 var. *pubiglume* K. Schum. (mxp 13)
 var. *trichoglume* Eyles ex Robyns
 (mxp 13)
mertensii Roth ex Roem. & Schult. = nom.
 excl.
miliaceum L. (mil 14)

(Panicum)

- miliare* Lam. = (ant 1)
miliare auct. non Lam. (cur 6, rep 19, sum 23)
milium Pers. (mil 14)
mindanaense Merr. (min 15)
 var. *pilosum* Reed. (min 15)
montanum Roxb. (not 16)
 var. *merrillii* Hack. (not 16)
 var. *pubescens* (Buse) Jansen (not 16)
myrianthum Buse (sar 20)
notatum auct. non Retz. (rep 19)
notatum Retz. (not 16)
oblongispiculum Ohwi (kha 11)
ohwi Beetle (hmd 9)
ovalifolium Poir. in Lam. (bre 4)
paludosum Roxb. (pal 17)
papuanum Mez (cur 6)
parvispiculum Ohwi (hmd 9)
perakense (Hook. f.) Merr. (hmd 9)
polymorphum Camus (aur 2)
proliferum Lam. = (ant 1)
 var. *paludosum* (Roxb.) Stapf (pal 17)
proliferum auct. non Lamk. (pal 17)
psilopodium Trin. (sum 23)
queenslandicum Domin
 var. *queenslandicum* (que 18)
repens L. (rep 19)
 var. *ischaemoides* (Retz.) Boerl. (rep 19)
reticulatum Thwaites ex Trimen (luz 12)
roxburghii Spreng. (cur 6)
sarmentosum Roxb. (sar 20)
 var. *parvispiculatum* Jansen (sar 20)
sarmentosum auct. non Roxb. (luz 12)
schinzii Hack. (sch 21)
seminudum Domin (sem 22)
suishaense Hayata (cur 6)
sumatrense Roth ex Roem. & Schult.
 (sum 23)
 subsp. *psilopodium* (Trin.) de Wet
 (sum 23)
sumatrense auct. non R. & S. = (ant 1, cur 6,
 pal 17, rep 19)
tenellum Roxb. (cur 6)
tjicoyaense Steud. (sar 20)
trachyrhachis Benth. (tra 24)
trachyrhachis auct. non Benth. (que 18)
trichoglume K. Schum. (mxp 13)
trichoides Sw. (tri 25)
trypheron auct. non Schult. (sum 23)
trypheron Schult. (cur 6)
 var. *suishaense* (Hayata) Hsu (cur 6)
tuberculatum auct. non Presl. (eff 7, luz 12)
tuberculatum Presl = nom. excl.

(Panicum)	
<i>tuberosum</i> Llanos (rep 19)	<i>Sacciolepis aurita</i> Camus (aur 2)
<i>vacillans</i> Steud. (sar 20)	<i>insulicola</i> Ohwi (aur 2)
<i>vescum</i> R. R. Stewart (hml 10)	<i>polymorpha</i> Chase ex Camus (aur 2)
<i>viale</i> Chase (eff 7)	<i>Sporobolus pulchellus</i> auct. non R. Br. (aur 2)
<i>virgatum</i> auct. non L. (tra 24)	<i>Urochloa</i>
<i>walense</i> Mez (hml 10)	<i>maxima</i> (Jacq.) Webster (max 13) var. <i>trichoglumis</i> (Engl.) Webster (mfp 13)
Paspalum <i>cartilagineum</i> auct. non Presl (rep 19)	Whiteochloa <i>capillipes</i> (Benth.) Lazarides (whi)