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MISCELLANEOUS NOTES ON SOUTHEAST ASIAN GRAMINEAE. IX[1] SETARIA AND PASPALIDIUM

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SUMMARY

Paspalidium Stapf is reduced to *Setaria* and five new combinations for the Malesian species are proposed. *Setaria parviflora* (Poir.) Kerguélen is a very polymorphous species and, among others, includes *S. pallide-fusca* (Schumach.) Stapf & C.E. Hubb. *Setaria sphacelata* (Schumach.) Stapf & C.E. Hubb. var. *sericea* (Stapf & C.E. Hubb.) Clayton is renamed.

SETARIA

Setaria Beauv. is a very polymorphic genus not clearly distinct from those where the rhachis of the branches terminates in a dead end or single bristle. Some American species have been included in *Setaria* section *Paurochaetium* Pilg. (Pilger, 1940) or subgenus *Paurochaetium* Rominger (1962) while the c. 22 Australian species have been placed in *Paspalidium* Stapf. They obviously belong in a single supraspecific taxon best placed in *Setaria*, as was previously suggested by me (1980) and also pointed out by Webster (1987: 203).

Led by the same conviction Morat (1978) placed *S. jaffrei* in *Setaria*, although the terminal bristle is minute and sometimes even absent; the structure of the inflorescence is reminiscent of that found in many Australian species of *Paspalidium*.

In 'true' *Paspalidium* the primary branches alternate on one or on opposite sides of the common axis, but in looser and denser inflorescences this becomes obscure and intermediary forms are present. As *Paspalidium* cannot be delimited satisfactorily, it is here reduced to *Setaria*.

For convenience's sake a key and an enumeration of the species with distribution, habitat, and some notes are given. As several species have an extensive synonymy, the nomenclature is reduced to the basionym and an occasional synonym referred to in the notes.

1) Continued from Blumea 38 (1993) 219.

KEY TO THE TAXA

1a. Inflorescence lax, interrupted, composed of racemes with secund spikelets in two rows 2
b. Inflorescence a lax panicle or dense and bottle-brush-shaped, the spikelets not secund nor in two distinct rows 6
2a. Plants terrestrial. Branches of the inflorescence scaberulous. Lower glume ovate, obtuse to apiculate 3
b. Plants semi-aquatic. Branches of the inflorescence setulose. Lower glume collar-shaped, truncate 4
3a. Blades involute, margin at base glabrous. Inflorescences 0.3–0.6 cm wide (including bristles), branches filiform, branches of the inflorescence apex ending in a bristle. Lower glume amplexicaul ..... **3. S. distans**
b. Blades flat or folded, margin at base with bulbous-based bristles. Inflorescences 8–10 cm wide (including bristles), branches ribbon-like, apex ending in a point. Lower glume hemi-amplexicaul ..... **4. S. flavida**
4a. The lower branches of the inflorescence much shorter than the adjoining internode of the common axis, apex ending in a bristle. Spikelets moderately plano-convex. Second lemma transversally rugose 5
b. The lower branches of the inflorescence as long as to longer than the adjoining internode of the common axis, apex ending in a point. Spikelets strongly plano-convex. Second lemma subsmooth to transversally rugulose . **5. S. geminata**
5a. Lower glume shorter than the upper glume, amplexicaul. Upper glume 1.5–2.8 mm long, 0.5–0.8 times as long as the spikelet. First lemma paleate, male **7. S. media**
b. Lower glume subequal to the upper glume, hemi-amplexicaul. Upper glume 0.4–1.2 mm long, 0.16–0.48 times as long as the spikelet. First lemma epaleate **11. S. punctata**
6a. Blades plicate. Inflorescences a lax panicle 7
b. Blades not plicate. Inflorescences dense, bottle-brush-shaped 10
7a. Ligule margin setose. Blades base somewhat pseudo-petiolate. Spikelets ellipsoid. Lower glume ovate, acute. First lemma acute to acuminate 8
b. Ligule margin ciliolate. Blades base truncate. Spikelets ovoid to oblong. Lower glume subrotund to deltoid, apiculate. First lemma apiculate ... **2. S. clivalis**
8a. Plants perennial. Culms erect, branching extra-vaginally at base (note cataphylls). Blades setulose or glabrous above, margin at base glabrous. Common axis of inflorescence glabrous, scaberulous, branches scaberulous. Second lemma persistent, transversally rugulose 9
b. Plants annual. Culms geniculate and rooting at base, branching intra-vaginally at base. Blades pilose above, margin at base with bulbous-based bristles. Common axis of inflorescence pilose, branches pilose. Second lemma easily detachable from the spikelet, transversally rugose ..... **1. S. barbata**
9a. Leaf blades 1–3 cm wide. Panicle usually contracted, branches short, at most 6 cm long. Lower glume amplexicaul, 0.9–1 mm long. Lower lemma acuminate, apex not falcate, usually subequal to slightly longer than the distinctly rugose upper lemma ..... **8b. S. palmifolia** var. **blepharoneuron**

b. Leaf blades 3–12 cm wide. Panicle usually expanded, branches long, up to 30 cm long. Lower glume hemi-amplexicaul, 1.1–2 mm long. Lower lemma acuminate, apex often contracted into a falcate cusp, often longer than the nearly smooth to finely rugulose upper lemma **8a. S. palmifolia** var. **palmifolia**

10a. Bristles antrorsely scaberulous. First lemma paleate, sterile or male..... 11

b. Bristles retrorsely scaberulous. First lemma epaleate. — Branches of the inflorescence with a shortly elongated axis. Spikelets not distinctly secund. Involucre consisting of one bristle. Upper glume obtuse. Second lemma easily detachable from the spikelet ..... **14. S. verticillata**

11a. Branches of the inflorescence with an elongated axis. Spikelets not distinctly secund. Involucre consisting of 0–3 bristles. Lower glume amplexicaul. Upper glume obtuse to mucronate. Second lemma easily detachable from the spikelet 12

b. Branches of the inflorescence with the axis not elongated. Spikelets not secund. Involucre consisting of 4–15 bristles. Lower glume hemi-amplexicaul. Upper glume rounded to apiculate. Second lemma persistent 13

12a. Branches of the inflorescence pilose. Spikelets ellipsoid and apparently stipitate because of the developed internode between the glumes, strongly plano-convex. Lower glume acute. First lemma obtuse ..... **6. S. italica**

b. Branches of the inflorescence subglabrous. Spikelets ellipsoid and moderately plano-convex. Lower glume acuminate to apiculate. First lemma apiculate **13. S. viridis**

13a. Involucre with one well-developed spikelet. — Throat of leaf blade usually with a tuft of hairs..... 14

b. Involucre with 2–4 spikelets ..... **12. S. sphacelata**

14a. Spikelets usually 1.9–2.4 mm long. Lower glume usually 0.8–1 mm long. Upper glume usually 1–1.35 mm long. Common in Malesia . **9. S. parviflora**

b. Spikelets 2.8–3.5 mm long. Lower glume 1.3–2 mm long. Upper glume 1.95–2.55 mm long. Very rarely cultivated and escaping in Malesia **10. S. pumila**

1. **Setaria barbata** (Lam.) Kunth

Setaria barbata (Lam.) Kunth, Révis. Gram. 1 (1829) 47. — *Panicum barbatum* Lam., Tabl. Encycl. 1 (1791) 171. — *Panicum viaticum* Salzm. ex Doell in Mart., Fl. Bras. 2, 2 (1877) 155, nom. superfl., non Griff. (1851). — *Chamaeraphis viatica* O. Ktze, Rev. Gen. Pl. 2 (1891) 770, nom. superfl. — *Chaetochloa barbata* Hitchc. & Chase, Contr. U.S. Natl. Herb. 18 (1917) 348, comb. incorr. — Lectotype: *Commerson s.n.* (P-LA holo, IDC microfiche 6207, fiche 689, US, fragm., L ['*Commerson 136*'], US).

Distribution – Originally probably from West Africa, now pantropically introduced; in Malesia: Singapore, N Sumatra (E Coast), Java (widespread), Lesser Sunda Islands (Timor), Celebes (Minahasa), Philippines (Cebu), Irian Jaya (Manokwari), no doubt elsewhere.

Habitat – Moist, preferably moderately shady locality, waste areas, gardens, not withstanding trampling, 0–900 m altitude.

Uses – Liked by cattle, loved by rabbits and grass carps; good value as fodder. Young shoots are eaten in the Priangan as a vegetable.

2. **Setaria clivalis** (Ridley) Veldkamp

Setaria clivalis (Ridley) Veldkamp, Misc. Pap. Landbouwhogeschool Wageningen 19 (1980) 317, t. 1, map 1. — *Panicum clivale* Ridley, J. Str. Br. Roy. As. Soc. 45 (June 1906) 242. — *Setaria laxa* Merr. var. *nativitatis* Jansen, Reinwardtia 2 (1953) 343 (*'navitatis'*), comb. incorr. — Type: *Ridley 99* (SING holo; BM, L).

Distribution – Malesia: Sumatra (Tapanuli), Java, Kangean I., Christmas I., Lesser Sunda Islands (Lombok, Sumba, Flores, Timor), Philippines (Luzon).

Habitat – Shady places, under shrubbery, bambu and teak forests, grass fields, waste places, on calcareous soil, coastal areas, apparently preferring a dry distinct monsoon; 0–1150 m altitude.

Uses – Readily eaten by cattle, nutritional value high to very high, but yield insufficient; young shoots used as a vegetable.

3. **Setaria distans** (Trin.) Veldkamp, *comb. nov.*

Panicum distans Trin., Sp. Gram. 2 (1829) t. 172. — *Paspalidium flavidum* Camus var. *distans* Hook. f., Fl. Brit. India 7 (1896) 29. — *Paspalidium distans* Hughes, Kew Bull. (1923) 317. — Lectotype: 'Nova Hollandia'.

Paspalidium disjunctum S.T. Blake, Proc. Roy. Soc. Queensl. 84 (1973) 65, t. 7, f. 5. — Type: *S.T. Blake 19899* (BRI holo; L).

Distribution – Australia (W Australia to New South Wales); Malesia: New Guinea: Aru Islands (Trangan), Papua New Guinea (W Province). Said to occur in the Bonin Islands also (as *Paspalidium pacificum* Tuyama, non Hitchc. & Chase, or *P. tuyamae* Ohwi, but I have seen no specimens). If true, it would be a very curious disjunction.

Habitat – Wet soil in savanna forests, sea shore, sometimes weedy, 0–35 m altitude.

Note – Webster (1987: 159) cited *R. Brown 6098* as the type of *Panicum distans*. As Trinius described the species, the holotype might be expected to be in LE, but was not found there by C.E. Hubbard; S.T. Blake (1973) suggested that Trinius may have had Brown's material on loan; then the holotype is in BM, the specimens marked 'A' by S.T. Blake, and an isotype in K.

4. **Setaria flavida** (Retz.) Veldkamp, *comb. nov.*

Panicum flavidum Retz., Obs. Bot. 4 (1786) 15. — *Paspalidium flavidum* Camus, Fl. Gén. Indo-Chine 7 (1922) 419. — Type: *Koenig in Herb. Retzius* (LD holo).

Distribution – Mauritius, Réunion, India to Australia (Queensland), Solomons; in Malesia: Sumatra (Lampung), Java, Madura, Kangean, Lesser Sunda Islands (Lombok, Sumba, Sumbawa, Flores, Timor, Kisar), Philippines (Sulu Arch., Luzon, Bohol, Cebu, Mindanao), Celebes (Tala), Moluccas (Buru).

Habitat – Areas with a moderate to strong dry season, lightly shaded grassfields, along roads, in open teak forest and waste places, locally common, 0–500 m altitude.

5. Setaria geminata (Forssk.) Veldkamp, *comb. nov.*

Panicum geminatum Forssk., Fl. Aegypt.-Arab. (1775) 18. — *Paspalidium geminatum* Stapf, Fl. Trop. Afr. 9 (1920) 585. — *Echinochloa geminata* Roberty, Bull. I.F.A.N., A 17 (1955) 64. — Type: *Forsskål s.n.* (C holo).

Panicum fluitans Retz., Obs. Bot. 3 (1783) 8. — Type: *Koenig in Herb. Retzius* (LD holo).

Panicum brizaeforme Presl, Rel. Haenk. 1 (1830) 302. — Lectotype: *Haenke* (MO holo, from Luzon, fide Lamson-Scribner, 1899; specimen in PR from Mexico).

Distribution – Pan(sub)tropical, for Malesia only a very few collections: Malay Peninsula (Selangor), Sumatra (E Coast), Java (Jakarta, Surabaya).

Habitat – Sandy beach wall, brackish ditches and swamps close to the sea, locally abundant, at low altitude, up to 1500 m in Africa.

Uses – Fodder for cattle.

6. Setaria italica (L.) Beauv.

Setaria italica (L.) Beauv., Agrost. (1812) 51, 170, 178. — *Panicum italicum* L., Sp. Pl. 1 (1753) 56. — *Panicum glomeratum* Moench, Meth. Pl. (1794) 207, nom. superfl. — *Pennisetum italicum* R. Br., Prod. 1 (1810) 195. — *Chamaeraphis italica* Kuntze, Rev. Gen. Pl. 2 (1891) 767. — *Ixophorus italicus* Nash, Bull. Torrey Bot. Club 22 (1895) 423. — *Chaetochloa italica* Scribn., U.S. Dept. Agric. Div. Agrost. Bull. 4 (1897) 39, comb. incorr. — *Panicum viride* L. subsp. *italicum* Asch. & Graebn., Syn. Mitteleur. 2 (1899) 77. — *Setariopsis italica* Sampaio, Ann. Fac. Sc. Porto 19 (1934) 69. — Lectotype: *Herb. Linn. 80-14* (LINN holo).

Distribution – Originally probably from warm-temperate subtropical Eurasia, introduced elsewhere, formerly widely spread in Malesia: Malay Peninsula (Perak, Malacca, Pahang), Singapore, Sumatra (throughout), Java (lower mountain regions), Madura, Kangean, Lesser Sunda Islands (Alor, Bali, Flores, Kisar, Lombok, Roti, Sumba, Sawu, Solor, Tanimbar I., Timor, Wetar), Kalimantan (Karimata Islands), Philippines (throughout), Celebes (Minahasa, Toraja, Ujung Pandang), Moluccas (Ambon, Buru, Ceram, Halmaheira, Kai Islands, Ternate, Tidore, Uliassar, Talaud), New Guinea (Biak).

Habitat – Cultivated and escaping to dry fields, disturbed areas, old clearings, up to 1450 m altitude.

Vernacular names – Foxtail millet, Hungarian grass, Italian millet, millet (E.).

Uses – An ancient cereal, already cultivated in the Bronze Age in Europe, used in porridge by the aborigines of Central Malaya and Dayaks. Now of slight importance as a bird seed, a famine crop, or for ancestor rituals, and as fodder, thatching, and straw, but said to be unsuitable for horses. Delicious cakes can be made with sugar and coconut.

In India grains are used as a sedative with childbirth. Said to make beer more intoxicating. By some stated not to be a good cereal, as it would be a siccative and constipative, but other sources report it as a laxative and diuretic. In Madura a concoction of pounded grain was used against fever.

Notes – Very polymorphic due to its ancient cultivation, but rather uniform in Malesia.

Burkill [Dict. Econ. Prod. Mal. Pen. (1935) 2034] reports the occurrence of two races in Malaya without further specification. A collection (*Kafrawi MS 1029*, L) from Singapore differs from others seen by the larger spikelets and their parts: 2.6–3 mm long, lower glume 1.2–1.35 mm long, 0.46–0.49 times as long as the spikelet, 4- or 5-nerved, upper glume c. 2.25 mm long, 7- or 8-nerved, anthers 0.9 mm long, yellow and not purple as in the others.

Some report spikelets as long as 3.5 mm with anthers of 1.55 mm. I have seen none of these in Malesia.

Supposed to have been derived from *S. viridis* with which it may hybridize naturally (Darmency et al., 1987). The generally sterile (but not all!) hybrids are indistinguishable from *S. viridis* var. *major* (Gaud.) Posp., which may have originated a wild × crop hybrid.

In Timor a race was (is?) present where the bristles are virtually absent.

Monstrosities with distally forked inflorescences as depicted by Rumphius occasionally occur.

7. **Setaria media** Veldkamp, *spec. nov.*

?Paspalidium punctatum Camus var. *longiglume* Jansen, Reinwardtia 2 (1953) 319. — Type: *Backer 22843* (BO holo).

Paspalidium punctatum auct. non Camus.

Plantae semi-aquaticae, inflorescentiae laxae interruptae e racemis compositae, rami taeniformes setulosi apice in seta terminato, infimi axis communis internodiis contiguis breviores, spiculae secundae biseriatae moderate plano-convexae 2.8–3.2 mm longae, gluma inferior superiore brevior amplexicaulis torquata truncata, lemma primum paleatum, secundum transversaliter rugosum. — Typus: *van Royen 4592* (L holo).

Plants perennial, semi-aquatic, caespitose. *Culms* erect to geniculate and rooting at base, long-creeping, floating, branching extra-vaginally at base (note cataphylls), 0.9–2 m long. Ligule a scarious setose collar. Blades flat to folded, not plicate, 13–25 cm by 4.5–8 mm, glabrous above, base truncate, margin at base glabrous, apex gradually acute. *Inflorescences* lax and interrupted, 16–36 by 0.4–1.2 cm (including bristles), common axis glabrous, scaberulous. Branches of the inflorescence with an elongated axis, ribbon-like, with 2–more secund spikelets, the lower much shorter than the adjoining internode of the common axis, setulose, apex ending in a bristle. Involucre absent. Bristles 2.25–6.5 mm long, antrorsely scaberulous. *Spikelets* ellipsoid, moderately plano-convex, 2.8–3.2 mm long. *Lower glume* shorter than the upper glume, amplexicaul, collar-shaped, 0.5–1.1 mm long, 0.16–0.37 times as long as the spikelet, truncate, 0-nerved. *Upper glume* 1.5–2.85 mm long, 0.5–0.8 times as long as the spikelet, truncate to rounded, 3–5-nerved. *First lemma* paleate, male (rarely epaleate), acuminate, 3–5-nerved. *Second lemma* persistent, apiculate, transversally rugose. Anthers 1.3–1.9 mm long.

Distribution – Irian Jaya, Merauke.

Habitat – Along creek, grass plains and marshy meadows behind dunes, ricefields, 0–5 m altitude.

Notes – Ohwi (msc.) distinguished a *Paspalidium longiglume* from Jakarta and perhaps from Surabaya, published as var. *longiglume* by Jansen. It would differ by

having spikelets more than 3 mm long, a more collar-shaped lower glume, a well-developed, 5-nerved upper glume, and a male lower floret with a palea about as long as the lemma. The population near Merauke conforms to this description, but is otherwise as *S. punctata*. Not having seen Ohwi's specimens (all in BO) I cannot confirm that the two are identical. The resulting disjunction is suspicious, and it might be possible that this is a hybrid between *S. flavida* and *S. punctata*, and then introduced in Merauke, where it was said to be locally dominant behind the dunes of Borim, and along the road from Mopa. It was noted to grow in a ricefield abandoned by Javanese (!). It is, however, not the hybrid as described by Singh et al. (1966: 522).

The lower lemma was once observed to be epaleate.

8. **Setaria palmifolia** (Koenig) Stapf

For synonymy see under the typical variety.

a. var. **palmifolia**

Setaria palmifolia (Koenig) Stapf, J. Linn. Soc., London, Bot. 42 (1914) 186; Saw et al., Floribunda 1 (1988) 21. — *Panicum palmifolium* Koenig, Naturforsch. 23 (1788) 208 (*'palmaefolium'*). — Type: *Koenig s.n.* (BM holo).

Distribution – India to China, Japan, throughout Malesia to New Guinea, not in Australia; introduced elsewhere.

Habitat – Moist places under thickets, stream banks, forest paths, in coffee (sometimes in tea) plantations, locally abundant, up to 2050 m altitude.

Vernacular names – Highland pitpit, palm grass (E.).

Uses – A minor cereal in the Philippines. Locally cultivated for its edible young shoots and fleshy leaf sheaths in New Guinea, where boiled pith is used against stomach ache, diarrhoea, fever, colds. An ornamental in greenhouses.

b. var. **blepharoneuron** (A. Braun) Veldk.

Setaria palmifolia (Koenig) Stapf var. *blepharoneuron* (A. Braun) Veldkamp in Saw et al., Floribunda 1 (1988) 22. — *Panicum neurodes* Schult. var. *blepharoneuron* A. Braun, App. Gen. & Sp. Nov. Hort. Reg. Berol. 1855 (1856) 20. — Type: *Wallich 8703* (B holo; K, L).

Distribution – India, Sri Lanka, to S China, Japan; in Malesia: Celebes (Tondano).

Uses – Emollient and diuretic; young shoots edible; leaves used in a decoction for irregular menstruation.

9. **Setaria parviflora** (Poir.) Kerguélen

Setaria parviflora (Poir.) Kerguélen, Lejeunia 120 (1987) 161. — *Cenchrus parviflorus* Poir. in Lam., Encycl. Méth. 6 (1804) 52. — *Setaria ventenatii* Kunth, Révis. Gram. 1 (1830) 251, t. 37, nom. superfl. — *Panicum ventenatii* Steud., Nom. Bot. ed. 2, 1 (1840) 317; 2 (1841) 265, 574, non *P. parviflorum* R. Br. (1810). — *Chamaeraphis ventenatii* Beal, Gr. N. Amer. 2 (1896) 153, nom. superfl. — *Chaetochloa corrugata* (Ell.) Scribn. var. *parviflora* Scribn. & Merr., U.S. Dept. Agric. Div. Agrost. Bull. 21 (1900) 24, t. 12, nom. superfl. — *Chaetochloa parviflora* Scribn. ex Millsp., Field Mus. Bot. 2 (1900) 26, comb. incorr. — *Chaetochloa ventenatii* Nash in Kearney, Contr. U.S. Nat. Herb. 5 (1901) 515, nom. superfl. — Type: *Ventenat* (P-LA holo; US photo).

Panicum pallide-fuscum Schumach., Beskr. Guin. Pl. (1827) 78. — *Setaria pallide-fusca* Stapf & C.E. Hubb., Kew Bull. (1930) 259. — *Setaria glauca* (L.) Beauv. var. *pallide-fusca* Koyama, J. Jap. Bot. 37 (1962) 237. — *Setaria pumila* (Poir.) Roem. & Schult. subsp. *pallide-fusca* Simon, Austrobaileya 2 (1984) 248. — Type: *Thonning* (C holo).

Setaria glauca (L.) Beauv. subsp. *subtesselata* (incl. forma *normalis*, nom. inval.) Buse, Pl. Jungh. 3 (1854) 369. — Lectotype: *Junghuhn s.n.* (L holo, sh. 903.342-138).

Setaria surgens Stapf, Kew Bull. (1909) 265. — Type: *Versteeg 1907* (K holo, but said not to be there by Reeder; BO, L, provided with a label by Stapf).

Setaria montana Reeder, J. Arnold Arbor. 29 (1948) 304. — Type: *Brass 11488* (A holo; US).

Setaria roemeri Jansen, Reinwardtia 2 (1953) 340, t. 18 (*'roemerii'*). — Type: *Roemer 611* (L holo).

Distribution – Pan(sub)tropical, widespread in Malesia.

Habitat – Roadsides, waste and burned areas, fields, open forest, sandy beaches, locally common, and then conspicuous by its glaucous foliage and golden to purplish reddish inflorescences, 0–1650(–2800) m altitude.

Notes – A very polymorphic species with an intricate nomenclature, at present generally known in Southeast Asia as *S. pallide-fusca*, but unfortunately to be called *S. parviflora*.

It may well be conspecific with *S. pumila* (Poir.) Roem. & Schult. (Clayton, 1979) for the two are extremely similar. To retain some order in this polymorphic group, though, it seems convenient to regard *S. pumila* as distinct because of the size (2.8–3.5 mm long) and shape (relatively broad) of the spikelets. It has been said that its leaves are twisted while straight in *S. parviflora*, but this is difficult to see when dry, and I am not sure it holds universally true.

Even so, *S. pumila* remains a very variable species with an extensive nomenclature. In older literature it is usually called *S. glauca* (L.) Beauv., but its basionym, *Panicum glaucum* L., is now considered to be best applied to pearl millet, *Pennisetum glaucum* (L.) R. Br.

Simon (1984) regarded '*Setaria pallide-fusca*' as a subspecies of *S. pumila* because of the difference in the length of the spikelets. In Malesia these are generally 1.9–2.4 mm long, but especially in the Philippines, New Guinea, and Australia there are plants with up to 3.2 mm long spikelets, which otherwise have the narrow aspect of *S. parviflora* and have therefore been included here in the latter. If accepted as a subspecies, the epithet '*subtesselata*' has priority.

In New Guinea many specimens with large spikelets have a relatively longer upper glume, which have been distinguished as *S. montana* Reeder. They apparently occur together with the 'normal' form, as was pointed out by Reeder for a paratype, *Brass 11814*, '*montana*' in A, '*pallide-fusca*' in US (and L) and is also shown by *Vink 16314*, '*parviflora*', and *16314-A*, '*montana*' (L). *Setaria montana* does seem to have a wider altitudinal range, but occurs at sea-level, too. Even longer glumes has the form described as *S. surgens*, the lower becoming acuminate, up to 0.62 times as long as the spikelet, the upper up to 0.92 as long as the spikelet. It is a matter of taste, however, where to place intermediate forms, and the taxa are included here.

Setaria surgens leads to the Australian *S. apiculata* (Scribn. & Merr.) K. Schum., which according to Webster (1987: 204) differs by (only statistically) longer spikelets and a different distribution.

A form with long inflorescences has been called *S. roemeri* by Jansen.

The sculpture of the fertile lemma is sometimes mentioned as distinctive between the various forms, but in fact ranges from faintly to distinctly transversally rugose and so offers no differences. The first lemma is sometimes also slightly indurated and rugulose.

Setaria parviflora is by some divided into an annual and a perennial taxon, *S. pallide-fusca* and *S. parviflora* s.s., respectively. The perennial one would be the only one originally present in the New World and introduced elsewhere. It is certain that perennials occur in Malesia, viz. the presence of extravaginal basal branching and cataphylls, but these might well represent different stages in development as was suggested by Stapf for *S. surgens*. Moreover, annuals and perennials are sometimes difficult to distinguish in Malesia. Naturally, because by lack of seasons such a distinction is impossible, artificially, because often basal parts have not been collected. There seems to be no other difference between the annuals and perennials than the life form and the two should not be separated. If, with an utmost degree of imagination, we keep them apart, a great deal of specimens cannot be identified.

10. **Setaria pumila** (Poir.) Roem. & Schult.

Setaria pumila (Poir.) Roem. & Schult., Syst. Nat. 2 (1817) 891. — *Panicum pumilum* Poir. in Lam., Encycl. Méth., Suppl. 4 (1816) 273. — *Panicum imberbe* Poir. var. *pumilum* Nees, Agrost. Bras. (1829) 240. — *Setaria glauca* (L.) Beauv. var. *pumila* Podpéra, Kvét. Moravy 6 (1926) 483, non Asch. & Graebn. (1906). — Type: *Herb. Desfontaines* (Fl holo; P).

Distribution – Originally from temperate to subtropical Eurasia, introduced elsewhere, e.g. in Malesia: Java (fide Jansen, msc.), Philippines (Luzon).

Habitat – Cultivated places, altitude not indicated.

Vernacular names – Yellow bristle-grass, yellow foxtail, pigeon grass (E.).

Uses – Fodder of good quality. Grains used as a minor cereal, also used as a basis for spirit. Used as a lawngrass, but may turn out to be too weedy for good use.

Note – A very polymorphic species with an intricate nomenclature. In older literature usually called *S. glauca*, but its basionym, *Panicum glaucum*, seems best applied to a *Pennisetum* species (see notes under *S. parviflora*).

11. **Setaria punctata** (Burm. f.) Veldkamp, *comb. nov.*

Panicum punctatum Burm. f., Fl. Ind. (1768) 26. — *Panicum brizoides* L., Mant. 2 (1771) 184, nom. superfl. — *Paspalidium punctatum* Camus, Fl. Gén. Indo-Chine 7 (1922) 419. — *Paspalum punctatum* Stapf ex Ridley, Fl. Malay Penins. 5 (1925) 218. — Lectotype: *Plukenet* (BM holo) (see note).

Panicum mucronatum Roth ex Roem. & Schult., Syst. Veg. 2 (1817) 425. — *Paspalidium mucronatum* Ohwi, Acta Phytotax. Geobot. 11 (1942) 33. — Type: *Heyne* (B, extant?).

Paspalum pluriracemosum Steud., Syn. 1 (1853) 27. — Lectotype: *Cuming 532* (P holo; L).

Distribution – E Africa to China, Malesia: Malay Peninsula (Perlis, Kedah, Selangor, Johor), Sumatra (E Coast), Java (Surabaya, Pasuruan), Borneo (Tanjungredeb), Philippines (Leyte, Luzon, Mindanao, Samar), Celebes (Palu).

Habitat – In up to 2 m deep fresh water, open muddy places, marshes, along rivers, locally plentiful, 0–70 m altitude.

Note – Clayton & Renvoize (1982) cited a Plukenet specimen as the (lecto)type. This makes *Panicum brizoides* L., usually cited as a synonym of *Echinochloa colonum* (L.) Link, superfluous and homotypic. If a Burman specimen can be located (G?) this should have preference.

12. **Setaria sphacelata** (Schumach.) Stapf & C.E. Hubb. ex Moss ex Stapf & C.E. Hubb.

Setaria sphacelata (Schumach.) Stapf & C.E. Hubb. ex Moss [Kew Bull. (1929) 184, 195, nomen] ex Stapf & C.E. Hubb., Fl. Trop. Afr. 9 (1930) 795. — *Panicum sphacelatum* Schumach., Beskr. Guin. Pl. (1827) 78. — Type: *Thonning* (C holo).

Notes – Moss is often cited as the author of the combination. Kartesz & Ghandi (1990) have clearly shown that this was erroneous and that he published a nomen nudum, first validated by Stapf & Hubbard (1930).

Setaria sphacelata is a very polymorphic species. Clayton (1979: 503) has divided it into 5 varieties which intergrade completely, but "those that wish to indicate the approximate position of their plants within it may have a means of doing so."

Setaria anceps var. *sericea* Stapf ex Broun & Massey (1929) is a nomen nudum, validly published by Stapf & C.E. Hubbard (1930). This automatically generated the autonym *S. anceps* var. *anceps*, which varietal epithet has priority over '*sericea*'.

var. **anceps** (Stapf & C.E. Hubb.) Veldkamp, *comb. nov.*

Setaria anceps Stapf ex Stapf & C.E. Hubb., Fl. Trop. Afr. 9 (1930) 793, incl. var. *anceps* by implication because of the next entry. — Lectotype: *Howes 983* (K holo).

Setaria anceps Stapf & C.E. Hubb. var. *sericea* Stapf ex Stapf & C.E. Hubb., Fl. Trop. Afr. 9 (1930) 794. — *Setaria sphacelata* (Schumach.) Stapf & C.E. Hubb. var. *sericea* Clayton, Kew Bull. 33 (1979) 506, nom. superfl. — Type: *Schweinfurth 182* (K holo).

In Malesia the varieties *anceps, splendida,* and intermediates are cultivated and escaping (see Hacker, 1992).

1a. Culms 4–10-noded, 3–6 mm in diameter at base, up to 2 m tall. Blades 3–10 mm wide. Panicle 7–25 cm long ..... var. **anceps**

b. Culms 6–16-noded, 6–12 mm in diameter at base, up to 3 m tall. Blades 10–20 mm wide. Panicle 20–50 cm long ..... var. **splendida**

13. **Setaria verticillata** (L.) Beauv.

Setaria verticillata (L.) Beauv., Agrost. (1812) 51, 171, 178. — *Panicum verticillatum* L., Sp. Pl., ed. 2, 1 (1762) 82. — *Pennisetum verticillatum* R. Br., Prod. 1 (1810) 195. — *Chamaeraphis italica* (L.) Kuntze var. *verticillata* Kuntze, Rev. Gen. Pl. 2 (1891) 768. — *Chamaeraphis verticillata* Porter, Bull. Torrey Bot. Club 20 (1893) 196. — *Ixophorus verticillatus* Nash, Bull. Torrey Bot. Club 22 (1895) 422. — *Chaetochloa verticillata* Scribn., U.S. Dept. Agric. Div.

Agrost. Bull. 4 (1897) 39, comb. incorr. — *Setariopsis verticillata* Sampaio, Herb. Portug. Seg. Apend. List. Espec. (1914) 4. — *Setaria adhaerens* (Forssk.) Chiov. subsp. & var. *verticillata* Belo-Correia [Rev. Biol. 13 (1987) 135, nom. inval.] Bol. Soc. Brot. II, 62 (1990) 289, nom. superfl. — Lectotype: *Herb. Linn. 80-7* (LINN holo), but Fl. Trop. E. Afr. 2: 522 has Scheuchzer. *Panicum adhaerens* Forssk., Fl. Aegypt.-Arab. (1775) 20. — *Setaria adhaerens* Link ex Chiov., Nuov. Giorn. Bot. Ital. n.s. 26 (1919) 77. — Type: *Forsskål in Herb. Retzius* (LD holo).

Distribution – Originally from the Old World, introduced elsewhere, possibly native in Malesia: Java (Besuki: Asem Bagus, Ijen, Puger), Lesser Sunda Islands (Bali, Sumba, Flores, Timor, Alor, Wetar), Philippines (Manila), Celebes (Kalao Tua I., Palu).

Habitat – Areas with a strong monsoon, thickets, forest margins, dry grass lands, *Borassus* savanna, beaches, open waste places, locally common, 0–750 m altitude.

Uses – Readily eaten by cattle when the plants are young, later avoided because of the many scabrous bristles that easily attach to passing fur and clothes. In Africa millet and maize are protected against rats by a layer of dried panicles laid on top of the grain. A minor cereal used for brewing in Africa or as a famine crop.

Vernacular names – Bur grass, rough bristle-grass (E.).

Notes – The temperate polyploid *S. verticillata* and tropical diploid *S. adhaerens* are sometimes distinguished as distinct taxa (Belo-Correia & Costa, 1986, 1989), but others (e.g. Clayton & Renvoize, 1982: 524) have regarded them as part of a single polymorphic species.

Setaria adhaerens would differ mainly by the glabrous margins of the sheaths, and in Malesian material this is the case; elsewhere, however, in 'typical' *S. verticillata* the margins are occasionally glabrous as well. The leaves would be more pubescent, which is incorrect. Finally, *S. adhaerens* would have smaller spikelets (up to 2 mm long), but in Malesia they are usually longer than 2.25 mm.

14. Setaria viridis (L.) Beauv.

Setaria viridis (L.) Beauv., Agrost. (1812) 51, 171, 178, t. 13, f. 3. — *Panicum viride* L., Syst. Nat., ed. 10, 2 (1759) 870. — *Pennisetum viride* R. Br., Prod. 1 (1810) 195. — *Panicum italicum* L. var. *viride* Koern. in Koern. & Werner, Handb. Getreideb. 1 (1885) 277. — *Chamaeraphis italica* (L.) Kuntze var. *viridis* Kuntze, Rev. Gen. Pl. 2 (1891) 767. — *Chamaeraphis viridis* Millsp., Fl. W. Virginia 2 (1892) 466. — *Ixophorus viridis* Nash, Bull. Torrey Bot. Club 22 (1895) 423. — *Chaetochloa viridis* Scribn., U.S. Dept. Agric. Div. Agrost. Bull. 4 (1897) 39, comb. incorr. — *Setaria italica* (L.) Beauv. subsp. *viridis* Thell., Mém. Soc. Sc. Nat. Cherbourg 38 (1912) 85. — *Setariopsis viridis* Sampaio, Herb. Portug. Seg. Apend. List. Espec. (1914) 4. — Lectotype: Not resolved.

Distribution – Originally from continental Eurasia and N Africa, introduced elsewhere, for Malesia cited by Jansen (msc.): Sumatra, Java, Philippines (Luzon, Palawan), Lesser Sunda Islands (Flores, Timor), New Guinea (Sattelberg; New Britain).

Habitat – Along trails, near the coast, airfields, abandoned fields, 0–1550 m altitude.

Uses – Cultivated for fodder, but of little value in Java because of low yield; one of the world's most noxious weeds.

Vernacular name – Green or Wild foxtail millet (E.).

EXCLUDED SPECIES

Setaria globularis Presl, Rel. Haenk. 1 (1830) 314. — *Panicum globulare* Steud., Nomencl. ed. 2, 2 (1841) 257, 574. — Type: *Haenke* (PR holo; MO).

According to Lamson-Scribner (1899) the isotype in MO is a mixture of three species: *Chaetochloa caudata* (Lam.) Scribn., now *Setaria setosa* (Sw.) Beauv., a West Indian species; *Chaetochloa composita* (Kunth) Scribn., probably a misnomer for *Setaria macrosperma* (Scribn. & Merr.) K. Schum., an American species; and a third indeterminable one. Merrill (1928) cited Hitchcock, who had found it represented by a single species in PR, tentatively referred to *Setaria rariflora* Presl, now *S. liebmannii* Fourn., from Central America.

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