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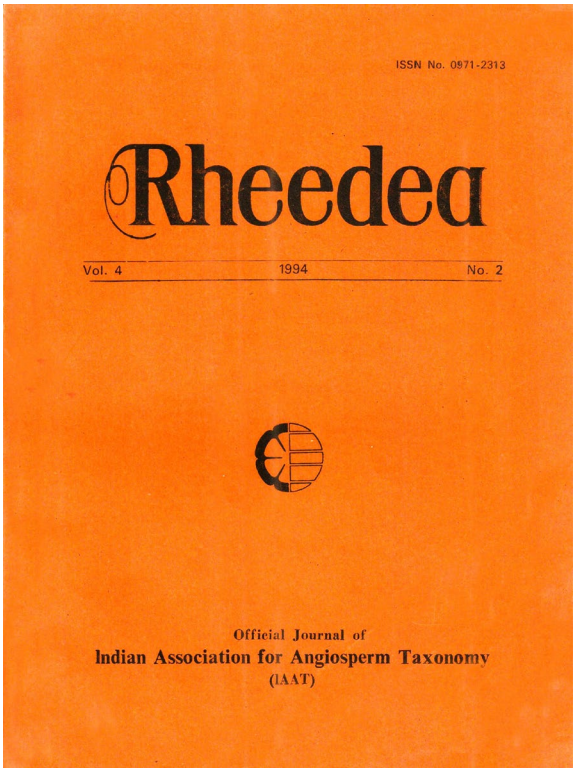

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Revision of *Leptochloa* Beauv. (incl. *Diplachne* Beauv.) (Poaceae) in Malesia

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Abstract

The genus *Leptochloa* Beauv. with 8 species in Malesia is revised. The generic status is studied and *Diplachne* Beauv. is treated as congeneric. *Leptochloa mucronata* (Michx.) Kunth is reduced to a subspecies of *Leptochloa panicea* (Retz.) Ohwi.

Generic status of *Leptochloa* and *Diplachne* in Malesia

Leptochloa and *Diplachne* were both established by Palisot de Beauvois (1812). *Leptochloa* was based on *Leptochloa virgata* (L.) Beauv. and *Leptochloa filiformis* (Lam.) Beauv. and on the invalidly named *L. capillacea* while *Diplachne* was based on the American *Diplachne fascicularis* (Lam.) Beauv. The genus was later lectotypified with *Leptochloa virgata* by Nash (1913). Both genera were placed in the same "cohors" which suggested that Pailsot de Beauvois regarded them as more or less closely related. In his "Tabula Methodica" he mentioned the lemmas of *Diplachne* to be shortly awned while the lemmas of *Leptochloa* were said to be awnless.

Following P. de Beauvois, *Leptochloa* and *Diplachne* were usually distinguished by most 19th century authors, e.g. by Kunth (1815), who placed *Diplachne* in his "*Bromeae verae*" and *Leptochloa* in the *Chlorideae*. In contrast, Endlicher (1936) cited *Diplachne* as a synomym of *Leptochloa*. Meisner (1843) recognised the structural similarities of the inflorescence in *Diplachne* and *Leptochloa* and A. Gray (1848) reduced *Diplachne* to a section in *Leptochloa*. Scribner (1891, 1900) sank *Diplachne* in *Leptochloa* by omitting even the sectional status. This view was subsequently held my most North-American agrostologists who merged *Diplachne* with *Leptochloa* (e.g. Hitchcock 1903, 1951) which was followed by Veldkamp (1971) for the Malesian species. In South-America most authors followed Parodi (1927) who maintained the genera as distinct, mainly on the basis of differences in the shape of the grain. According to Parodi's

observations the grain is dorsally flattened and shallowly elliptic or concavo-convex without a groove in *Leptochola*. Mc Neill (1979) reconsidered the generic status and concluded that *Diplachne* and *Leptochloa* were readily distinguishable at first glance. In his opinion, the arguments to unite them were largely irrelevant and he gave the following distinguishing characters:

Leptochloa: Spikelets small, laterally compressed and imbricately inserted on evidently secund racemes; lemmas keeled on the back.

Diplachne: Spikelets larger, more or less terete and distant, inserted on indistinctly secund racemes; lemmas rounded on the back.

Mc Neill could be right to conclude that most (if not all) American species can be assigned to one or the other genus by their size. He did, however, not give satisfactory evidence for the taxonomic relevance of this character, which could be merely artificial. Another contribution to the problem was given by Philips (1981) with a numerical analysis of the *Eragrostideae*. That analysis revealed that the generic boundaries of *Leptochloa* and *Diplachne* are not at all clear-cut and that several species of one or the other genus have exceptional characters within the genus.

When I studied the Malesian species of *Leptochloa* and *Diplachne*, I also focussed on the generic status and especially on the characters which were traditionally used for the distinction of the genera. My observations only refer to Malesian material.

1. Length of spikelets and lowest lemma.

The size of spikelets is 4—12 mm in *Diplachne* and 1.1—4.5 mm in *Leptochloa* and the size of the body of the lowest lemma is 2.5—4 mm and 0.8—2.5 mm, respectively. Spikelets of most *Diplachne* species are longer than those of most species of *Leptochloa* but there is an overlap with *Leptochloa virgata* and *Leptochloa* (*Diplachne*) *malabarica*. The variability of size is continuous from the tiny *Leptochloa neesii* and *L. panicea* to the stout *Leptochloa (Diplachne) malayana* or *Leptochloa* (*Diplachne*) *malabarica*. A separation of the genera based on this continously varying character of minior taxonomic relevance would be artificial and vague and could only be justified if there would be an association with other characters of greater taxonomic importance.

2. Insertion of the spikelets.

The insertion of spikelets on the racemes ranges from indistinctly secund in most species to clearly secund in the 1-flowered *Leptochloa nessii*. The first

type of insertion was said to be characteristic of *Diplachne* while strictly secund racemes would be a generic character of *Leptochloa*. In my observation strictly secund racemes do occur in *Leptochloa neesii* while all other species have less secund racemes. This can well be overlooked especially in species with small spikelets. Most obvious is the lax and indistinctly secund arrangement of spikelets in *Leptochloa* (*Diplachne*) *malayana* and *L. tectoneticola* with their rather big spikelets. However, *Leptochloa chinensis* may also have racemes with only indistinctly secund and distant spikelets. The type of insertion of the spikelets in *Leptochloa chinensis* does not principally differ from that of *Leptochloa* (*Diplachne*) *malabarica*. In neither species it is clearly imbricate and (or) secund.

In conclusion, arrangement of spikelets on the racemes is too variable (sometimes even within the species) to be used for distinction of *Leptochloa* and *Diplachne*.

3. Shape of the lemma.

In contrast to the generic circumscription of *Diplachne*, the lemmas are not clearly flattened or rounded on the back in the Malesian *Diplachne* species. They appear to be flattened in *Leptochloa (Diplachne) malayana* and *L. tectoneticola*. I believe that this impression is caused by the rather big lemmas of these species as compared to most other *Leptochloa* species. At a closer look, however, the lemmas are evidently keeled as e.g. the lemmas of *Leptochloa chinensis* or *Leptochloa panicea*.

4. The shape of the grain.

The grain of Malesian *Leptochloa* species may be strongly dorsally flattened, e.g. in *Leptochloa (Diplachne) malabarica*, or terete as in *Leptochloa panicea*. *Leptochloa (Diplachne) malayana* and *L. tectoneticola* have an intermediate shape of grain. *Leptochloa virgata* has a slightly dorsally flattenend grain, which was said to be characteristic of *Diplachne*. In Malesian species Parodi's (1927) characters of the grain do not allow the distinction of two genera.

A distinction of *Diplachne* and *Leptochloa* is neither possible on the basis of characters cited above, nor did I discover other characters that could be used for that purpose. All species of *Leptochloa* and *Diplachne* share the taxonomically important structure of the inflorescence. I believe that this is a strong argument to unite the genera following Veldkamp (1971) and others.

Leptochloa Beauv. ,*Agrost.: 71; 166, t. 15, f. 1. 1812.
Leptochloa sect. Euleptochloa Benth., J. Linn. Soc. 1: 108, 1882. *nom. invai.*
Lectotype: *Leptochloa virgata* (L.) Beauv.

Diplachne Beauv., Agrost.: 80: 160, t. 16, f. 9. 1812.
Leptochloa sect. Diplachne A. Gray Manual: 555 1848.
Type: *Diplachne fascicularis* (Lamk.) Beauv.

Annuals or perennials. Ligule membranous, reduced to fringed hairs. Blades linear. Panicles of a few to numerous, solitary to crowded, more or less secund racemes. Spikelets loosely to densely, imbricately inserted, dorsally to laterally compressed to (sub-) terete, 1—12-flowered. Rachilla disarticulating above the glumes and between the florets; process present or not. Glumes 1-nerved, keeled. Callus minute, glabrous to pubescent. Lemmas 3-nerved, with a prominent midrib to strongly keeled, dorsally compressed or triangular or terete in section, apex entire or bilobed. Palea 2-keeled, pubescence variable. Stamense 3 (in Malesia). Caryopsis dorsally strongly flattened or trigonous or terete. x = 9, usually 10.

Distribution: 37 species in the tropics and warm temperate areas of the world, 8 in Malesia, 2 introduced.

Key to the species

1. Spikelets 2—12-flowered; glumes smooth or at most scaberulous.....2.
1. Spikelets 1-flowered; glumes scabrous.....*Leptochloa neesii*

2. Sheaths and blades glabrous; spikelets 3—12-flowered .....3.
2. Sheaths and blades (at the base) covered with tubercle-based hairs; spikelets 2- or 3-flowered.....*Leptochloa panicea*

3. Ligule minute, fringed, 0.2—0.5 mm long; inflorescence more or less flabellate.....4.
3. Ligule conspicuous, 0.7—2 mm long; inflorescence not flabellate.....6.

*Only synonyms used in Malesian literature are given. For further synonymy see Clayton and Renvoize (1986).

4. Inflorescence lax; racemes glabrous at base; spikelets 5—10 mm long, rather distant on the rachis.....5.
4. Inflorescence dense; racemes pubescent at base; spikelets 2.5—4.5 mm long, dense on the rachis..... *Leptochloa virgata*

5. Spikelets 5—8 mm long; lemmas muticous or shortly mucronate, glabrous..... *Leptochloa malayana*.
5. Spikelets 7—10 mm long; lemmas distincly awned; awn 0.5—2.5 mm long; first lemma with ciliate margins .....7.

6. Spikelets 2.1—4.0 mm long, rather densely inserted (5—9/cm on the rachis); lemmas not awned, lateral lemma nerves not produced .....7.
6. Spikelets 4.0—10 mm long, rather loosely inserted (2 / cm on the rachis); lemmas shortly awned; lateral lemma nerves usually shortly produced ..... *Leptochloa malabarica*

7. Sheaths and blades smooth or at most scaberulous; inflorescence 2—3-times longer than wide (20-30 cm by 5—10 cm); lemmas finely appressed hairy between the nerves..... *Leptochloa chinensis*
7. Sheaths and blades very scaberulous, inflorescence much longer than wide(25—45 cm by 4—7 cm); lemma glabrous between the nerves..... *Leptochloa scabra*

1. **Leptochloa chinensis** (L.) Nees, Syll. Ratisb. 1: 4. 1822.
Poa chinensis L., Sp. Pl.: 69. 1753.
Type: *Osbeck* s.n. in Hb. Linne 87-3 2(LINN, holo).
Leptochloa tetraquetra Presl, Rel. Haenke 1: 288. 1830.
Type: *Haenke* s.n. (PR, holo).

Aquatic to semi-aquatic annual or short-lived perennial, sometimes stoloniferous. Culms erect to ascending, 0.1—0.9 m long, rooting at nodes. Sheaths loose, somewhat inflated, glabrous, smooth or scaberulous. Ligule lacerate or fringed into cilia, 05—1.5 mm long. Blades flat, 10—25 cm by 2.5—12 mm, glabrous, smooth or scaberulous. Panicles 20—30 cm by 5—10 cm, not flabellate. Racemes not crowded towards the top, 1—3 together, 3—7 cm long, erecto-patent, straight or flexuous, glabrous at base. Spikelets 5—7/ cm of the rachis, 2.1—4.0 mm long, 4—6(—7)-flowered. Rachilla process minute. Glumes smooth, sometimes mucronate; lower glumes 0.5—1.5 mm

long; upper glumes 1.1—1.8(—2) mm long. Lemmas lanceolate; first lemma 1.1—1.8 mm long, hairy on the nerves and finely appressed hairy on the surface, apex entire, not awned. Anthers 0.2—0.3 mm long. Caryopsis elliptic, dorsally slightly compressed, 0.5—0.8 mm long. 2n = 36, 40, 54.

Distribution: E. Africa, to China, Japan. In Malesia: Malay Peninsula (Penang, Singapore), Sumatra (Medan), Java (widely distributed and common), Lesser Sunda Islands (Bali, Sumbawa, Flores), W. Borneo (Kapus lakes), Celebes (Poso, Wawotobi), Philippines (Luzon, Mindoro, Samar, Mindanao), New Guinea: Iran Jaya (Jayapura), Papua New Guinea (Morobe, New Britain Prov.).

Habitat: Weed in wet to dry places, e.g. old fields, disturbed places, rice fields, marsh land, swamp forests, along roads, banks of rivers and lakes; tolerant to frequent flooding, 20—900 m alt.

Veranacular name: Red Sprangletop (E.).

Uses: Good fodder grass for cattle. Grain used in times of scarcity.

Specimens examined: Backer 5512; 6436; 7414; 7610; 7890; 13763; 14897; 18724; 18857; 19103; 22049; 24546; 26326; 26538; 36073. *Bakhuizen v. d. Brink* 4062; 4887. *Buwalda* 2872; 8019. *Carr* 11073. *Clason* 141; 157; 193; 207; 257. *Coert* 10. *Colps* 203. *Endert* 2095; 2178. *Funke* 10/1915. *Hallier f.* 643. *Jaag* 1770. *Johansson et al.* 284. *Junghuhn* 171. *Kievits* 1025. *Kjellberg* 865. *Kneucker* 874 *(Merrill)*. *Koorders* 25347. *Lam* 732. *Lorzing* 12898. *Main* 1975. *Nedi & Idjan* 45. NGF 11575 *(Henty)*; NGF 14398 *(Henty)*; NGF 49128 *(Henty)*; NGF 49294 *(Henty)*; PNH 15626 *(Edano)*; PNH 34758 *(Steiner)*; PNH 34918 *(Steiner)*. *Popta* 13A/21A. *Rahmat si Boeea* 8246. *Reinwardt* 16. *J. V. Santos* 4004; 4025; 4621-a; 4884; 5981; 6520; 6744; 6832; 6866; 7427. *Schmutz* 4449; 5659. SF 39295 *(Sinclair)*; SF 39446 *(Sinclair)*; *de Wit* 4111.

2. **Leptochloa malabarica** (L). Veldk. Blumea 19: 64. 1971.
Tsiama-pulu Rheede, Hort. Mal.: 12, 83, t. 45. 1703.
Poa malabarica L., Sp. Pl. ed. 1: 69. 1753.
Diplachne malabarica Merr., Bull. Torrey Bot. Club 60: 633. 1933.
Lectotype: Rheede, Hort. Mal.: 12, t. 45. 1703.

Festuca fusca L., Syst. ed. 10, 2: 876. 1759.
Diplache fusca Beauv. ex R. & S., Syst. Veg. 2: 615. 1817.
Leptochloa fusca Kunth, Rev. Gram. 1: 91. 1829.
Type: Hasselquist s. n. Hb. Linne 92. 21 (LINN, holo).

Bromus polystachyos Forssk., Fl. Aegypt.- Arab.: 23. 1775.
Diplachne polystachya Back., Bull. Jard. Bot. Btzg. III, 2: 325. 1920.
Type: *Forsskahl* s.n. (C, holo).
For further synonymy see Merrill (1933).

Stout caespitose perennial. Culms erect to ascending, 0.5—1.5 m long. Sheaths loose, glabrous, scaberulous. Ligule 1.0—4.0 mm long. Blades flat or infolded, 10—30 cm by 1.5—5.0 mm glabrous, scaberulous. Panicles more or less dense, 15—30 cm by 3—5 cm, not flabellate. Racemes less than 10, 1—3 together, 7—14 cm long. Spikelets 2/ cm of the rachis, slightly laterally compressed, 4.0—10 mm long, (3—)4—7(—12)-flowered. Rachilla process absent. Glumes lanceolate or ovate, often slightly mucronate; lower glumes 1.4—2.5 mm long; upper glumes 2—4.2 mm long. First lemma 2.7—4.0 mm long, lower margins pilose (hairs 0.3—0.5 mm long), usually shortly awned (ca. 1 mm long). lateral veins usually minutely produced. Anthers 0.7—1 mm long. Grain obovate, 1.1—1.3 mm long, dorsally compressed, base acute. 2n=20.

Distribution: Tropical Africa, India, Sri Lanka, SE Asia and Australia (all states). In Malesia: Malay Peninsula (Kedah, Perak), Sumatra (Uleeheue Isl. near Bandaaceh), N-coast of Java (Jakarta, Cirebon, Semarang, Bojonegoro, Surabaya, Malang), Madura, Philippines (Luzon, Mindoro, Mindanao), New Guinea: Irian Jaya (Digul), Papua New Guinea (Western Prov.).

Habitat: In swampy brackish places, e. g. coastal swamps and river banks, locally extremely abundant, at sea-level.

Uses: Eaten by cattle, apparently nutritious, but of inferior yield.

Vernacular name: Brown beetle grass, Swamp grass (E.)

Specimens examined: *Backer* 12/1904, 7592, 15500, 16301, 16677, 19712, 24130, 36074, 37547; *Dorgelo* 3271; *Elmer* 18131; *Kneucker* 554-a (*Merrill*); *J. V. Santos* 5969, 6508-a, 6870; *Scheffer* 5/8/1871; LAE 77224 (*Womersley*); *Pullen* 7029; SF 4701 (*Haniff & Nur*) (T); *van Steenis* 17437; *Versteeg* 1902.

3. **Leptochloa malayana** (C. E. Hubb.) Jansen ex Veldk., Blumea 19: 64. 1971.
Diplachne malayana C. E. Hubb., Kew Bull.: 106. 1934.
Type: SF 4701 (Haniff & Nur) (K, holo, SING).

Caespitose perennial. Culms erect, 0.3—0.6 m long. Sheaths glabrous, smooth. Ligule minute, fringed, 0.1—0.2 mm long. Blades flat or infolded, 10—25 cm by 2.5—4.5 mm, glabrous, smooth. Panicles lax, 10—18 cm by 5—8 cm, flabellate. Racemes 3—8, solitary, 3—9 cm long. Spikelets 1—3/cm on the rachis, slightly laterally compressed, 5—8 mm long, 6—10 flowered.

Rachilla process absent. Glumes lanceolate; lower glumes 2.0–2.2 mm long; upper glumes 2.9—3.5 mm long. First lemma 2.8—3.0 mm long, glabrous, apex emarginate and shortly mucronate. Anthers 0.7—0.8 mm long. Grain elliptic, dorsally compressed, 1.3—1.5 mm long, base obtuse. 2n = ?

Distribution: Thailand (Sisaket, Chantaburi, Phuket, Trang). In Malesia: Malay Peninsula (N. Kedah), Borneo (Banjarmasin).

Habitat: Dry grass land and forest margins at low altitudes.

Note: One collection from Thailand (*Larsen* 10065, L) has sterile lower lemmas and only 2 or 3 florets per spikelet.

4. **Leptochloa neesii** Benth., J. Linn. Soc. 19: 108. 1881.
Cynodon neesii Thw., Enum. Pl. Zeyl.: 371. 1864.
Type: The problem of typification has not been solved.
Cynodon polystachyon R. Br., Prodr.: 187. 1810.
Leptochloa polystachya Benth., Fl. Austr. 7: 617. 1878., *non* Kunth (1829).
Eleusine polystachya F. v. Muell., Sec. Syst. Census: 225. 1889.
Leptochloa brownii C. E Hubb., Kew Bull.: 26. 1941.
Lectotype: *R. Brown* 6238 (BM, holo).

Stout annual or short-lived perennial, sometimes stoloniferous. Culms erect to geniculate-ascending, 0.4—1 m long, often compressed at base. Sheaths glabrous or sparsely ciliate, scaberulous. Ligule lacerated, 2—4 mm long. Blades flat or infolded, 14–35 cm by 3—4 mm, glabrous, scaberulous. Panicles 13—40 by 2—3 cm, not flabellate. Racemes not crowded towards the top, 1—3 together, 3—4.5 cm long, erecto-patent, straight to flexuous, scabrous, glabrous at base. Spikelets 5—8/cm of the rachis, 1.1—1.6 mm long, 1(—2)-flowered. Rachilla process absent. Glumes scabrous; lower glumes 0.9—1.2 mm long, upper glumes 1.2—1.6 mm long, shortly mucronate, equalling or extending beyond the floret Lemmas lanceolate, 1.1—1.4 mm long, hairy on the nerves, apex entire, not awned. Anthers 0.3—0.4 mm long. Caryopsis obovate, terete, wrinkled, 0.5—0.6 mm long. 2n = 40.

Distribution: India, Sri Lanka, Australia (West Australia to Queensland), in Malesia: Java (Surabaya, Pasuruan).

Habitat: Marsh-land, on heavy, wet clay of fish-ponds; weed in rice-fields, locally abundant. sea-level.

Uses: Readily eaten by cattle.

Note: The disjunct distribution with one localized population in Java is remarkable.

5. **Leptochloa panicea** (Retz.) Ohwi, Bot. Mag. Tokyo 55: 311. 1941.
subsp. **Panicea**.

Poa panicea Retz., Obs. 3: 11. 1783.
Type: *Bladh* s. n. (LD, holo).
Cynosurus tenerrimus Hornem, Enum. Pl. Hort. Hafn.: 14. 1807.
Eleusine tenerrima Hornem, Hort. Hafn. 1: 79. 1815.
Leptochloa tenerrima R. & S., Syst. Veg. 2: 581. 1817.
Type: China (C, holo).
Leptochloa filiformis Beauv. var. *humilior* Presl, Rel. Haenk. 1: 288. 1830.
Syntypes: *Haenke* s.n. (PR, holo), 'Mexico, Luzon'.
Leptochloa polystachya auct. *non* Kunth, *nec* Benth.

Annual or short-lived perennial. Culms erect or geniculate ascending, 0.2—1 m long. Sheaths pilose with deciduous, tubercle-based hairs of 2—3 mm length. Ligule lacerated, 0.5—1 mm long. Blades flat, 9—30 cm by 2—15 mm, with sparse tubercle-based hairs at base, scaberulous. Panicles 10—30 cm by 1.5—4 cm, not flabellate. Racemes not crowded towards the top, 1—5 together, 5—12 cm long, erecto-patent, straight, (sub) glabrous at base. Spikelets 8—10/cm of the rachis, 1.5—2.1 cm long, (1—)2—3-flowered. Rachilla process absent. Glumes smooth; lower glumes 0.5—1 mm long; upper glumes 0.8—1.5 mm long, acute to obtuse, sometimes shortly mucronate, *ca.* as long as the spikelet. First lemma lanceolate; 0.8—1.2 mm long, hairy on the nerves, apex entire, not awned. Anthers 0.1—0.2 mm long. Caryopsis fusiform to obovate, rugulose, deeply grooved on adaxial side, *ca.* 0.5 mm long, obtuse at the apex. 2n = 20+1B, 20 (*ssp panicea*).

Distribution: Africa, Asia, Taiwan, Japan, Micronesia (Gilbert Isl.). In Malesia: Malay Peninsula (Perlis, Kedah, Penang), Java (Jakarta, Indramayu, Madura, Pasuruan, Besuki, Kangean Isl.), Lesser Sunda Islands (Flores, Timor, Alor), Philippines (Luzon, Palawan), Papua New Guinea (E. Sepik Prov.).

Habitat: On Wet clay, grassy slopes, dry riverbeds. A bad weed in disturbed places or in rice-fields and other crops. Never in water. 0—500 m alt.

Veranacular name: Thread Sprangletop (E).

Uses: Eaten by cattle when young.

Note: The Afro-asiatic *Leptochloa panicea* and the American *Leptochloa mucronata* (''*L. filiformis*'') have been united by some authors and treated as distinct species by others.

They are very close to each other and share the character of tubercle-based hairs on the blades and sheaths which is unique in the genus. Ohwi (1941) apparently regarded them as conspecific when he cited *Leptochloa filiformis* in synonymy of *Leptochloa panicea*. Others (Lazarides 1980; Clayton, Phillips & Renvoize 1974) believed that the two species were distinct. According to Clayton et al., the absence of hairs on the lemmas of *Leptochloa mucronata* and its bigger glumes are the main differences from *Leptochloa panicea*. Lazarides based the distinction of the species on several quantitative characters of the spikelets. In contrast to Clayton et al., hairy lemmas were noted by Renvoize (1984) and Hitchcock (1903, 1951) in specimens from North and South-America which could only belong to *Leptochloa mucronata* because of their provenance. Hitchcock (1903) was, in fact, unable to distinguish between American and Asiatic specimens and therefore treated them as conspecific.

Only recently, Snow & Davidse (1993) emphazised, in a mainly nomenclatural paper, that the two species were distinct and can be distinguished by the absence of hairs between the lemma nerves in *Leptochloa mucronata*.

Leptochloa mucronata was reported to be introduced to W. Africa, Angola and to Queensland in Australia. The name *Leptochloa filiformis* was first mentioned for Malesia by Presl (1830, as var. *humilior*) and was frequently used on herbarium sheets at L. To decide whether the name was only misapplied for *Leptochloa panicea* or whether both species occur in Malesia I studied specimens of *Leptochloa panicea* and *L. mucronata* from Asia, Africa and Americas. In my opinion there are indeed two taxa of which only one occurs in Malesia. However, the differences are of minor and mainly quantitative. So that the species are here reduced to subspecies, of *L. panicea* and they can be distinguished as follows:

1. Lower glumes 0.5—1.0 mm long; first lemma 0.8—1.2 mm long; lemma nerves with few hairs between the nerves; caryopsis 0.5—0.6 mm long, fusiform to obovate, obtuse at apex; ligule 0.5—1.0 mm long; spikelets 1.5—2.1 mm long; upper glumes 0.8—1.5 mm long. Tropical Africa and Asia, Taiwan, Japan, Malesia..... .....ssp. *panicea*

1. Lower glumes 1.2—1.8 mm long; first lemma 1.2—1.6 mm long, lemma nerves sparsely hairy between the nerves; caryopsis 0.6—1.0 mm long, elliptic, acute at apex and base, ligule 0.8—1.2(—2) mm long; spikelets 1.9—2.5 mm long; upper glumes 1.4—2.2 mm long. Tropical America, introduced in Africa, Queensland.....ssp *mucronata*

6. **Leptochloa scabra** Nees, Agrost. Bras.: 435. 1829.
Type: *Martius* s.n. (M, holo).

Stout annual. Culms 0.5—1 m long, erect. Sheaths very scabrous. Ligule lacerated, 1.5—2 mm long. Blades linear or lanceolate, 15—30 by 8—12 mm, very scabrous. Panicles several times longer than wide, 20—45 by 4—7 cm, not flabellate. Racemes not crowded towards the top, 1—3 together, 4—8 cm long, erecto-patent, straight to flexuous, scabrous, except at base. Spikelets 7—9/cm on the rachis, 2.8—3.5 mm long, 3—4-flowered. Rachilla process absent. Glumes smooth or scaberulous; lower glumes 1.4—1.6 mm long; upper glumes 1.8—2.0 mm long. First lemma lanceolate, 1.3—2 mm long, nerves, hairy, otherwise glabrous, apex entire, not awned. Anthers 0.3—0.5 mm long. Caryopsis trigonous to terete, *ca.* 1 mm long. 2n=?

Distribution: (Sub) tropical Americas. Introduced in Papua New Guinea [Western (Daru Isl.), Central (Boroko)].

Habitat: Marshes and ditches. In Papua New Guinea along paths and roads in rain forests and mangroves. 0—50 m altitude.

Note: The introduction of this American species to Papua New Guinea before 1936 was first reported by Hitchcock (1936). I have seen *Brass* 6304-A (L) which undoubtedly is this species, notwithstanding. Lazarides' (1980) remark. I have not seen. *Brass* 6304, and 3725 from Boroko, Central Province. These may be *Leptochloa virgata*.

7. **Leptochloa tectoneticola** (Back.) Jansen ex Veldk., Blumea 19: 64. 1971.
Diplachne tectoneticola Back., Bull. Jard. Bot. Btzg. III, 2: 326. 1920.
Syntypes: *Backer* 27726, 27780, *Beumee* 4716 (BO).
Diplachne petelotii Camus, Not. Syst. 4: 47. 1923.
Type: *Petelot* n. 261 (P, holo) (see note).

Caespitose perennial. Culms erect, 0.3—0.8 m. Sheaths glabrous, smooth. Ligule an inconspicuous rim, 0.25—0.5 mm long. Blades flat or infolded, 14—35 cm by 3—7 mm, glabrous, smooth. Panicles lax. Racemes 3—7, solitary, 3.5—17 cm long. Spikelets 1/cm of the rachis, (5—)7—10 mm long, (5—)7—10 flowered. Rachilla process absent. Glumes lanceolate; lower glumes 1.7—3.0 mm long; upper glumes 2.5—3.5 mm long, sometimes shortly mucronate. First lemma 2.2—3 mm long, lower margins ciliate, distinctly awned (0.5—2.5 mm long). Anthers 0.5—0.75 mm long. Grain oblong-elliptic, base obtuse, *ca.* 1.5 mm long. 2n=?.

Distribution: Cambodia (Kampong-Chhnang), in Malesia: W. Java (Krawang, Cicampek), Kangean Isl. (Tambajangan).

Habitat: On heavy soils in teak-forests, locally very abundant, 50—100 m alt.

Note: The species seems to have a curious distribution, but since I have seen the type of *Diplachne petelotii* Camus from Cambodia there is no doubt that it is conspecific with the Javanese species. The species has been rarely collected and only one specimen from Malesia was available for investigation.

Specimens examined: *Backer* 27726, 27780, *Anonymous* bb 4716, *Beumee* 4716 (T).

8. **Leptochloa virgata** (L.) Beauv., Agrost.: 71, 161, 166, t. 15, f. I. 1812.
Cynosurus virgatus L., Syst. Nat. ed. 10, 2: 876. 1759.
Festuca virgata Lam., Tabl. Encycl. 1: 189. 1791.
Eleusine virgata Pers., Syn. 1: 87. 1805.
Lectotype: *Sloane,* Voy. Jamaica 1: t. 70. f. 2. 1707.
Leptochloa chinensis Nees, var. *aristata* Buse ex Miq., Pl. Jungh. 3: 352. 1854.
Lectotype: *Junghuhn* s. n., in L 908. 90—2227. (L, holo).

Stout perennial. Culms erect, 0.5—2 m long, geniculate and rooting at the nodes. Sheaths loose, glabrous, smooth. Ligule minute, fringed, 0.2—0.4 mm long. Blades flat or infolded, 10—30 cm by 5—20 mm, glabrous, or scaberulous. Panicles 10—20 by 7—12 cm, flabellate. Racemes crowded towards the top, 1—4 together, 5—15 cm long. erecto-patent, usually flexuous, pubescent at base. Spikelets 7—9 / cm on the rachis, 2.5—4.5 mm long, (2—) 3—7-flowered. Rachilla process absent. Glumes smooth; lower glumes 1.1—2.1 mm long; upper glumes 1.3—3 mm long, sometimes mucronate. First lemma lanceolate, 1.9—2.5 mm long, lower margins hairy, otherwise glabrous, apex entire or shortly bilobed, muticous or the lower 1—2(—3) lemmas shortly awned (up to 1.5 mm long). Anthers 0.1—0.3 mm long. Caryopsis trigonous, 1—1.5 mm long, with an adaxial groove. 2n=40.

Distribution: (Sub) tropical Americas. Introduced in Malesia: Java (without locality), New Guinea [Irian Jaya (Sentani Lake), Papua New Guinea (Madang, Western (Daru Isl.), Morobe, New Britain, Gulf, Central, Northern Prov., Milne Bay Prov. [Goodenough Isl., Fergusson Isl.])].

Habitat: On open rocky (basaltic) or gravelly grounds, in savannas, on river banks, inundated grass land and swampy areas, sometimes forming dense mats. Altitude 0—1000 m.

Vernacular name: Tropic Sprangletop (E).

Specimens examined: *Brass* 24438, 27265; *Demoulin* 5753; *Goetghebeur & Vyverman* 6110; t. *Hart & van Leeuwen* H-10, *Hoogland* 4834, 5040; *Jeswiet* 274; *Kalkman* 3588; *Kostermans & Soegeng* 222; LAE 68806 (*Croft et al.*) *van Leeuwen* DJ-16; NGF 3988 *(Fryar)*; NGF 7574 *(Wells)*; NGF 32379 (*Isles & Vinas)*; *Pullen* 7687; *Raynal* 16858; *van Royen & Sleumer* 6581; *Schodde & Craven* 4567; UPNG 105 *(Pulsford)*; UPNG 231 *(Gebo)*; *de Wilde & Vervoort* 398.

Doubtful Species

1. *Leptochloa uniflora* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 409. 1851. Type: *Schimper* 1701 (P, holo, K).

Note: This Afro-Indian species was erroneously mentioned by Koorders (1911) for W. Java. There is no Malesian collection of this species in L. If a *Leptochloa*, it is most likely *Leptochloa panicea*.

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