BRACHIAIRA, UROCHLOA (GRAMINEAE–PANICEAE) IN MALESIA

J.F. VELDKAMP
Rijksherbarium / Hortus Botanicus, P.O. Box 9514, 2300 RA Leiden. The Netherlands

SUMMARY

A revision of the 17 species of Urochloa Beauv. (Gramineae) in Malesia is given. Because Brachiaria (Trin.) Griseb. has been nearly completely reduced to Urochloa, 3 new combinations are proposed. A new combination is also required for Urochloa paspaloides Presl. Brachiaria eruciformis (J.E. Sm.) Griseb. has been introduced in a few places in Malesia.

INTRODUCTION

As I have discussed elsewhere [Veldkamp, Taxon 45 (1986) 319] the genus Brachiaria (Trin.) Griseb. is to be nearly completely reduced to Urochloa Beauv. To summarize that paper, it must be noted that B. eruciformis (J.E. Sm.) Griseb. (sometimes referred to by its synonym Panicum caucasicum Trin.) has been cited as the type of Brachiaria, but that species under any name was not included in Trinius’ original concept of Panicum L. sect. Brachiaria, and so cannot be its type. This species occurs in Africa and the Mediterranean, and is introduced widely elsewhere, e.g. here and there in Malesia. Together with B. malacodes (Mez & K. Schum.) H. Scholz and B. schoenfelderi C.E. Hubb. & Schweick. from Namibia and Zimbabwe it belongs to a distinct genus and if Brachiaria is not conserved somehow for them a new genus is to be described. The most simple way to avoid this and also to maintain the current, be it erroneous, use although in a very limited sense, is to appoint B. eruciformis as the conserved type. For an extensive discussion on the generic differences see Morange & Zuloaga [Darwiniana 31 (1992) 43–109].

Because of the near total reduction of Brachiaria to Urochloa this requires 3 new combinations for Malesian taxa which are here proposed.

ACKNOWLEDGEMENTS

This revision is based on material seen in L, and during visits to K, P, U, US, and WAG. Special thanks are due to Drs. R.J. Soreng (BH) and N.N. Tzvelev (LE) for their help in the solution of the identity of Panicum glumare Trin.

KEY TO THE TAXA OF BRACHIARIA AND UROCHLOA

1a. Spikelets disarticulating below the glumes. Second lemma dull and variously sculptured: finely reticulately or longitudinally granular, longitudinally punctate-striate, or transversally rugulose. — First lemma 5–7-nerved ............... 2

2

1b. Spikelets disarticulating above the glumes. Second lemma variously sculptured: finely reticulately or longitudinally granular, longitudinally punctate-striate, or transversally rugulose. — First lemma 3–4-nerved ....... 3

3a. Inflorescences mostly flaccid; 1st lemma variously sculptured: finely reticulately or longitudinally granular, longitudinally punctate-striate, or transversally rugulose. — First lemma 4–5-nerved ....... 4

4a. First lemma 4–5-nerved longitudinally granular. — Second lemma variously sculptured: longitudinally punctate-striate or transversally rugulose. — Fourth lemma 7–11-nerved ....... 5

5a. Fourth lemma 7–9-nerved longitudinally granular. — Fourth lemma 9–11-nerved longitudinally granular. ...
b. Spikelets disarticulating above the glumes. Second lemma shiny, smooth. —
Culms 0.25–0.35 m high. Blades linear, base rounded. Rhachis of racemes margins scabrous, puberulous, axils puberulous. Spikelets solitary, 1.6–1.9 mm long. Lower glumes 0.2–0.4 mm long, 0.12–0.2 times as long as the first lemma, 0- or 1-nerved. First lemma 3–5-nerved. Brachiaria cruciformis

2a. Spikelets paired
b. Spikelets solitary

3a. Lower glumes 0- or 1-nerved
b. Lower glumes 5–7-nerved

4a. Blades linear, 14–30 cm long. Common axis 15–22 cm long. Rhachis of racemes 0.5–1.2 mm wide. Lowermost racemes branched, 6–12 cm long. Spikelets 2.8–3.3 mm long. Lower glumes acute. Upper glumes and first lemmas acuminate, with cross-veins. First lemma back slightly sulcate. Brachiaria mutica
b. Blades ovate-lanceolate to-linear-lanceolate, 1–9 cm long. Common axis 1–8 cm long. Rhachis of racemes 0.2–0.4 mm wide. Lowermost racemes simple, 1.7–5 cm long. Spikelets 1.6–2.2 mm long. Lower glumes erose or truncate. Upper glumes and first lemma acutely ‘pinched’, without cross-veins. First lemma back flattened. Brachiaria reptans

5a. Lower glumes 0.3–0.6 times as long as the first lemma, base amplexicaul, acute. First lemma back slightly sulcate
b. Lower glumes 0.7–0.9 times as long as the first lemma, base not amplexicaul, acuminate to subcaudate. First lemma back flattened. Brachiaria glumaris

6a. Ligule with 0.8–1.5 mm long hairs. Blades base rounded. Lowermost racemes densely spiked. Spikelets base either rounded or stipitate. Lower glumes with cross-veins
b. Ligule with c. 0.4 mm long hairs. Blades base subcordate. Lowermost racemes laxly spiked. Spikelets base cuneate. Lower glumes without cross-veins

7a. Blades linear. Pedicels pilose. Spikelets 3.2–4.4 mm long. Glumes remote. Lower glumes 1.8–2.5 mm long, 0.5–0.6 times as long as the first lemma. Upper glumes and first lemmas acuminate ‘pinched’ or subcaudately ‘pinched’. Second lemma apex ‘pinched’

8a. Rhachis of racemes triquetrous, 0.2–0.4 mm wide. First lemma acutely to acuminate ‘pinched’ or mucronate
b. Rhachis of racemes ribbon-like, 0.4–5 mm wide. First lemma acute to acuminate

9a. Sheaths either glabrous, or more or less hirsute to pilose. Spikelets 2.6–3.4 mm long. Lower glumes 1–1.9 mm long, with cross-veins. Upper glumes and first lemmas acute or acuminate ‘pinched’

b. Sheaths puberulous. Spikelets 2–2.2 mm long. Lower glumes c. 0.7 mm long, without cross-veins. Upper glumes and first lemmas acutely ‘pinched’

17. Brachiaria villosa
10a. Culms 1.2–2 mm wide at base. Peduncle either glabrous or pilose below the inflorescence. Spikelets base cuneate. Upper glumes and first lemmas acuminate ‘pinched’. Second lemma acutish, finely longitudinally granular or transversally rugulose ................................. 4. U. fusiformis

b. Culms 0.7–1 mm wide at base. Peduncle puberulous below the inflorescence. Spikelets base rounded. Upper glumes acute. First lemma mucronate. Second lemma apex ‘pinched’, finely reticulately granular ............ 6. U. holosericea

11a. Spikelets ellipsoid to obovate. Lower glumes 5–11-nerved. Second lemma rounded, acutish, or apiculate ................................................................. 12

b. Spikelets ovate. Lower glumes 3-nerved. Second lemma mucronate. — Spikelets 3.6–5.1 mm long. Lower glumes 1.95–3.3 mm long, often with 1–few median bristles ................................. 8. U. mosambicensis

12a. Spikelets 4.5–6 mm long. Lower glumes 2.2–4.1 mm long. Second lemma 3.6–4.6 mm long, shiny. Anthers 2–3.5 mm long ................................. 13

b. Spikelets 2.4–4.3 mm long. Lower glumes 1.3–1.9 mm long. Second lemma 1.9–2.8 mm long, dull. Anthers 0.7–1.7 mm long ................................. 15

13a. Blades 8–15 mm wide. Margins scaberulous to spinulose. Peduncle pilose below the inflorescence, rhachis of racemes 1.3–5 mm wide, margins and axils pilose. Pedicels glabrous or puberulous. Spikelets base stipitate. Glumes remote. Lower glumes 0.4–0.6 times as long as the first lemma, base amplexicaul, with cross-veins. Upper glumes distally pilose. Second lemma finely longitudinally punctate-striate ................................. 14

b. Blades 3–5 mm wide, margins smooth. Peduncle glabrous below the inflorescence. Rhachis of racemes c. 1 mm wide, margins and axils glabrous. Pedicels pilose. Spikelets base rounded. Glumes approximate. Lower glumes 0.8–0.9 times as long as the first lemma, base hemi-amplexicaul, without cross-veins. Upper glumes puberulous. Second lemma transversally rugulose ................................. 2. U. dictyoneura

14a. Rhachis of racemes 1.3–1.6 mm wide. Pedicels glabrous. Lower glumes truncate to rounded. Upper glumes and first lemmas acute. Second lemma acutish ................................................................. 1. U. brizantha


15a. Upper glumes distally pilose. Second lemma acutish ................................. 16

b. Upper glumes glabrous. Second lemma rounded ................................. 17

16a. Culms geniculate at base. Rhachis of racemes 0.7–1.0 mm wide. Lower glumes with cross-veins. Upper glumes 7-nerved ................................. 10. U. piligera


17a. Spikelets 2.4–3.0 mm long. Second lemma 1.9–2.3 mm long. — Very rare in Malesia ................................................................. 3. U. distachya

b. Spikelets 3.2–4.3 mm long. Second lemma 2.6–2.8 mm long. — Widely spread in Malesia ................................................................. 15. U. subquadripara
BRACHIARIA


Annuals. Ligule a fringe of hairs. Inflorescence a panicle of racemes. Branches terminating in a spikelet. Bristles absent. Pedicels present. Spikelets more or less appressed to the rhachis, secund, adaxial, disarticulating above the glumes, dorso-ventrally compressed, solitary, paired, 2-flowered. Callus not differentiated. Lower glume present, 0- or 1-nerved; upper glume 3–5-nerved. First lemma paleate, neuter to male, 3–5-nerved, muticous. Second lemma chartaceous to cartilaginous, shiny, smooth, margins recurved and clasping the palea, not noticeably thinner than body, apex rounded, muticous. x = 9.

Distribution — 3 species in Africa and the Mediterranean, 1 introduced elsewhere, e.g. in Malesia.

Brachiaria erucaeformis (J.E. Sm.) Griseb.


Plants annual. Culms geniculate at base, rooting in the nodes, 0.25–0.35 m high, 0.75–1.5 mm wide at base, nodes pilose. Sheaths sparsely pilose. Ligule a hairy rim, hairs 0.5–1.1 mm long. Blades flat (i.s.), linear, 3–9 cm by 4–6 mm, base rounded, margins scaberulous, glabrous below. Peduncle apically glabrous, common axis 3–6 cm long. Racemes 6–14, alternate, erecto-patent, the lowestmost simple, rarely branched at the very base (paired), 1–3 cm long, densely spikeled, upper racemes approximate, axils hairy, rhachis triquetrous, 0.2–0.3 mm wide, hairy. Pedicels 0.3–0.45 mm long, hairy. Spikelets solitary, ellipsoid, 1.6–1.9 mm long. Glumes approximate. Lower glumes 0.2–0.4 mm long, 0.12–0.2 times as long as spikelet, base clasping, apex acute to truncate, sometimes cleft, 1-nerved, without cross-veins. Upper glumes acute, rounded on the back, 3–5-nerved, without cross-veins, without a fringe of silky hairs. First lemma apex acute, somewhat sulcate, 3–5-nerved, hairy on the keels. Palea 0.75–0.82 times as long as the lemma. Second lemma 1.35–1.4 mm long. Anthers 0.6–0.8 mm long. 2n = 18, 36.

Distribution — Originally from Africa and the Mediterranean, introduced elsewhere; in Malesia: Java (Surakarta, Semarang, Pasuruan), Madura, Papua New Guinea (Central Prov.).

Habitat — Waste places, fallow land, roadsides, locally ± common; 0–100 m alt.

Uses — In lawns, weedy, fairly good fodder.

Vernacular name — Sweet signal grass (E.).
Annuals or perennials. Ligule rim- to collar-shaped with a fringe of hairs. Inflorescence a panicle of racemes. Branches terminating in a spikelet. Bristles absent. Pedicels present. Spikelets more or less appressed to the rachis, secund, adaxial, disarticulating below the glumes, terete or dorsoventrally compressed, solitary, paired, or clustered, 2-flowered, lower floret epaleate to paleate, neuter to male, sometimes even bisexual; upper floret bisexual. Callus not differentiated. Lower glume present, 0-nerved. Upper glume 5-nerved. First lemma 7-nerved, muticous. Second lemma chartaceous to cartilaginous, dull, usually sculptured, margins recurved and clasping the palea, not noticeably thinner than body, muticous to mucronate. x = 9.

Distribution — About 120 pantropical species, 17 Malesian, 9 (11?) native.

1. Urochloa brizantha (Hochst. ex A. Rich.) R.D. Webster


Plants perennial. Culms rhizomatous, erect (rarely geniculate and rooting in the nodes, see note), 0.55–1 m high, 3.5–4.5 mm wide at base, nodes glabrous to sparsely pilose. Sheaths glabrous to pilose (at least along the margins). Ligule with 0.5–1.1 mm long hairs. Blades linear, 9–35 cm by 8–14 mm, base rounded, margins scaberulous to spinulose, glabrous to pilose below. Peduncle pilose below the inflorescence. Common axis 3.5–11 cm long. Racemes 1–5, alternate, erecto-patent. Rhachis of racemes narrowly ribbon-like, 1.3–1.65 mm wide, margins smooth to scaberulous, pilose, axils pilose. Lowermost racemes simple, 2.5–7.5(–15) cm long, densely spikeled. Upper racemes distant. Pedicels 0.2–0.5 mm long, glabrous. Spikelets solitary, ellipsoid, base stipitate, 4.5–5.4 mm long. Glumes remote. Lower glumes 2.25–3 mm long, 0.43–0.57 times as long as the first lemma, base amplexicaul, apex truncate to rounded, 7–11-nerved, with cross-veins. Upper glumes slightly shorter than the second lemma, apex acute, faintly 7-nerved, with or without, distally pilose. First lemma paleate, male (maturing after the upper floret), back flattened, apex acutish, finely longitudinally punctate-striate, shiny. Anthers 2.25–3.15 mm long. 2n = 18, 36, 54.

Distribution — Originally from tropical and South Africa, cultivated and escaping elsewhere; in Malesia: Malaya (e.g. Pahang), Java (Bogor), Cocos Keeling, Borneo (Sabah), Philippines (Quezon), New Guinea: Irian Jaya (Sentani), Papua New Guinea (Western Highlands, Morobe, Central, Solomons Prov.).

Habitat — Roadsides, coral sand, 0–1700 m altitude.

Uses — As a ground cover and an outstanding pasture grass, fairly resistant to drought, grazing, and cutting.

Vernacular names — Bread grass, large-seeded millet grass, palisade grass, signal grass, Surinam grass (E.).
Note — Closely related to *B. decumbens* and intermediates are difficult to separate. The forms introduced as pasture plants (usually as ‘*B. decumbens*’) belong to these. The ‘true’ forms can be distinguished as follows:

- Stoloniferous, culms decumbent. Blades 5–20 cm by 7–15 mm. Common axis 1–8 cm long. Racemes 2–7, 1–5 cm long. Spikelets usually in 2 rows, rhachis more or less flat, 1–1.7 mm wide. Spikelets 4–5 mm long, distally usually pubescent. Upper glume and first lemma membranous, dull *B. decumbens*
- Tufted, culms erect to geniculate at base. Blades 10–100 cm by 3–20 mm. Common axis 3–20 cm long. Racemes (1–)2–16, 4–20 cm long. Spikelets usually in 1 row (sometimes 2 rows at base), rhachis more or less crescentic with narrow, inrolled wings, c. 1 mm wide. Spikelets 4–6 mm long, usually glabrous. Upper glume and first lemma chartaceous, somewhat shiny *U. brizantha*

2. *Urochloa dictyoneura* (Fig. & De Not.) Veldkamp, comb. nov.


Plants perennial. Culms geniculate at base, rooting in the nodes or geniculate at base, not rooting in the nodes, or decumbent, c. 1.45 m high, c. 4 mm wide at base, nodes glabrous. Sheaths glabrous. Ligule with c. 0.4 mm long hairs. Blades linear, 18.5–32 cm by 3–5 mm, base rounded, margins smooth, glabrous below. Peduncle glabrous below the inflorescence. Common axis c. 6.5 cm long. Racemes 2, alternate, erecto-patent. Rhachis of racemes narrowly ribbon-like, c. 1 mm wide, margins scabrous, glabrous, axils glabrous. Lowermost racemes simple, c. 7 cm long, densely spiked. Upper racemes distant. Pedicels c. 0.75 mm long, pilose. Spikelets solitary, ellipsoid, base rounded, 4.5–4.65 mm long. Glumes approximate. Lower glumes c. 4.1 mm long, 0.89–0.92 times as long as the first lemma, base hemi-amplexicaul, apex rounded, 11-nerved, without cross-veins. Upper glumes at least as long as the second lemma, apex acuminate, 7-nerved, with many cross-veins, puberulous, apical pubescence not different from that of body. First lemma paleate, male (maturing after the upper floret), back slightly sulcate, apex acuminate, 5-nerved, with many cross-veins, palea 1 time as long. Second lemma c. 3.75 mm long, apex apiculate, transversally rugulose, shiny. Anthers c. 3.4 mm long. 2n = 42, 72.

Distribution — Originally from Central and South Africa, cultivated elsewhere, e.g., in Malesia: Papua New Guinea.

Habitat — Woody grasslands, well adapted to wet lowlands; 40 m altitude in Papua New Guinea (up to 2300 m in Africa).

Uses — Good forage in permanently grazed pastures, potential as erosion control and ground cover.

Vernacular name — Koronivia grass (E.).

Notes — 1. Said to be widely cultivated in Southeast Asia and the Pacific just as the closely related *B. humidicola* [Schultze-Kraft & Teitzel, PROSEA 4 (1992) 60–64]. Intermediary forms are known. They are supposed to differ as follows:
— Densely tufted, stolons absent, culms erect to geniculate, but not rooting in the nodes. Contra-ligule developed. Racemes usually more than 4, margins of rhachis long-pilose. Second lemma 3–3.5 mm long, distinctly apiculate, yellowish when mature .................................................. *U. dictyoneura*

— Caespitose, stoloniferous, culms geniculate, usually rooting in the nodes. Contra-ligule absent. Racemes 2 or 3, rarely more, margins of rhachis glabrous. Second lemma 3.5–4 mm long, indistinctly apiculate, pure white when mature ........................................... *U. humidicola*

2. The only Malesian collection seen, LAE 72421, lacks the base, but was said to have been 'decumbent' and seems to resemble 'B.' *humidicola* most. It has contra-ligules, which is an unreliable character, as it is not always present in specimens otherwise attributed to *U. dictyoneura*. Stapf (1919) and, more recently, Parham [in A.C. Smith, Fl. Vit. Nov. 1 (1979) 330] have united the two.

3. *Urochloa distachya* (L.) T.-Q. Nguyen


*Brachiaria subquadripa*auct. non Hitchc.

Plants perennial (?). Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes, 0.05–0.35 m high, 0.75–1.1 mm wide at base, nodes glabrous to pilose. Sheaths glabrous and ± hirsute on the margins. Ligule with 0.4–0.6 mm long hairs. Blades ovate-linear-lanceolate to linear, 2.2–8 cm long, 3–6 mm wide, base rounded, margins scaberulous, pilose at base, sparsely pilose below. Peduncle pubescent below inflorescence. Common axis 0.5–2.6 cm long. Racemes 2 or 3(–8), alternate, erecto-patent. Rhachis of racemes ribbon-like, 0.45–0.8 mm wide. Axils glabrous. Margins of rhachis glabrous (scaberulous) or pilose (at base). Lowermost racemes simple, 1.5–3 cm long, densely spikeled. Upper racemes distant. Pedicels 0.4–0.75 mm long, glabrous. Spikelets solitary, ellipsoid to slightly obovate, 2.4–3 mm long. Glumes remote. Lower glumes 1.3–1.6 mm long, 0.33–0.6 times as long as the sterile lemma, base clasping, rounded and acute, faintly 7-nerved, with or without cross-veins. Upper glumes apex acute, faintly 5-nerved, glabrous. Sterile lemma paleate, sterile, back slightly sulcate, apex acute, faintly 5-nerved, without cross-veins, palea 0.75–0.9 times as long. Fertile lemma 1.9–2.3 mm long, apex rounded, finely transversally rugulose, dull. Anthers 0.75–1.2 mm long. 2n = 36.

Distribution — India, Sri Lanka, to Thailand, introduced elsewhere, e.g. the Andaman & Nicobars; in Malesia: Malay Peninsula (Malacca, see note), Celebes (Palu), Philippines (Sulu, see note).

Habitat — Open sandy places, inundated fields, riverbanks, 0–20 m altitude.

Uses — Good forage grass, soil binder in sandy areas, e.g. dunes, but because of its rampant habit may develop into a troublesome weed.

Vernacular names — Armgrass millet, green summer grass (E.).

Note — Most Malesian records (and all Vietnamese in P) belong to *U. subquadripara*, which is a wide-spread species, differing mainly by being annual, with longer,
more ellipsoid spikelets (and longer fertile lemmas). The two may well be varieties of the same species, but a further analysis is required to answer this. At present the two are kept separate here mainly because of established custom. The only Malay collection seen (Hervey s.n., 1891; K) may have been mislabelled as Malesian. One collection from Siasi, Sulu Archipelago, Philippines (PNH 38979, Kondo & Edaño) might belong here, because of the small spikelets. It differs from the description given above, based on Indian material by: pilose pedicels, 7-nerved upper glumes, a paleate male first floret, a second lemma with a slightly 'pinched' apex.

4. Urochloa fusiformis (Reeder) Veldkamp, comb. nov.


*Brachiaria villosa* auct. non Camus.

Plants annual. Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, usually not rooting in the nodes, 0.15–0.5 m high, 1.2–2 mm wide at base, nodes puberulous to pilose. Sheaths subglabrous to sparsely pilose. Ligule with 0.5–1.5 mm long hairs. Blades ovate-lanceolate to -linear-lanceolate, 1.7–5.5 cm by 4–8 mm, base rounded to slightly pseudo-petiolate, margins spinulose, glabrous to finely puberulous below. Peduncle glabrous to pilose below the inflorescence. Common axis 3–6 cm long. Racemes 4–8, erecto-patent. Rhachis of racemes triquetrous, 0.2–0.4 mm wide, margins scabrous, puberulous and pilose, axils puberulous. Lowermost racemes simple to branched (at base), 1–2 cm long, densely spikeled. Upper racemes distant. Pedicels 0.4–0.5 mm long, puberulous and pilose. Spikelets solitary, ellipsoid, base cuneate, 2.6–3.4 mm long. Glumes approximate. Lower glumes 1–1.9 mm long, 0.32–0.5(–0.6) times as long as the first lemma, base amplexicaul, apex acute to acuminate, 3-nerved, with cross-veins. Upper glumes at least as long as the second lemma, apex acuminately 'pinched', 5-nerved, with or without cross-veins, subglabrous to pilose, apical pubescence distinctly longer than that of body, penicillate. First lemma epaleate to paleate, sterile, back flattened to slightly sulcate, apex acuminately 'pinched', 5-nerved, with or without cross-veins, palea (0–)0.7–0.9 times as long. Second lemma 1.9–2.25 mm long, apex acutish, finely longitudinally granular to sometimes transversally rugulose, dull. Anthers 0.9–1.3 mm long. 2n = ?

Distribution — Malesia: Philippines [Culion, Luzon (Abra, Benguet, Cavite, Lepanto, Nueva Vizcaya, Rizal, Zambales), Mindanao (Cotabato)], Lesser Sunda Islands (Timor), Papua New Guinea (Central Prov.).

Habitat — Weed in ricefields, roadsides, teak forests, logged-over pine forest, rocky savanna slopes, up to 1265 m altitude.

5. Urochloa glumaris (Trin.) Veldkamp, comb. nov.

*Panicum glumare* Trin., Gram. Pan. (1826) 143; Mém. Acad. Sc. St. Pétersb. VI, 3 (1834) 244. — Type: Hb. Lindley in Hb. Trinius 0727.01 (holo LE, microfiche IDC BT-16/1, CGE) (See note).


Plants annual to perennial. Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes to decumbent, 0.2–0.75 m high, 1.5–3 mm wide at base, nodes puberulous. Sheaths glabrous, pilose along the margins. Ligule with 0.7–1.1 mm long hairs. Blades linear, 6–28 cm by 3.5–11 mm, base rounded, margins at base smooth, sometimes pilose, upwards scaberulous, glabrous to pilose below. Peduncle puberulous below the inflorescence. Common axis 0.7–7 cm long. Racemes 2–7, alternate, appressed to erecto-patent. Rachis of racemes triquetrous, 0.7–0.8 mm wide, margins scabrous, glabrous to pilose, axils puberulous. Lowermost racemes simple, 1.5–8 cm long, densely spiked. Upper racemes approximate. Pedicels 0.2–2 mm long, puberulous to pilose. Spikelets paired, ellipsoid, base rounded, (3.15–)3.4–4.75 mm long. Glumes approximate. Lower glumes 2.5–4 mm long, 0.71–0.96 times as long as the first lemma, base not claspers, apex acuminate to subcaudate, 5–7-nerved, with or without cross-veins. Upper glumes at least as long as the second lemma, apex acuminate to subcaudately ‘pinched’, 7-nerved, with cross-veins, glabrous. First lemma rarely epaleate, usually paleate, sterile (sometimes male?), back flattened, apex acuminate to subcaudately ‘pinched’, 5-nerved, with cross-veins, palea (0–)0.25 times as long. Second lemma 2.4–2.75 mm long, apex mucronate (mucro 0.33–0.67 mm long, puberulous), transversally rugulose, dull. Anthers 0.9–1.35 mm long. 2n = 36, 42.

Distribution — From India to S China, Polynesia, throughout Malesia; New Caledonia, but not in Australia.

Habitat — Moist, not too dry places, sunny to slightly shaded, road sides, lawns, dikes in ricefields, open waste places, clearings, thickets, forest margins, locally common, 0–1200 m alt.

Uses — Good fodder both green and dry, relished by cattle, increases milk yield; suitable for lawns.

Note — It has been suggested that Panicum javanicum Poir. (1816) would refer to this species (e.g. by Mez, Paniceae msc. 471). If this would be accurate, Urochloa javanica (Poir.) ... would be the correct combination, which has not been made validly so far. Others have it as a synonym of Urochloa panicoides (see ‘Dubious Species‘), which was never found again in Malesia. Trinius (1826) described Panicum glumare and stated that it came from New Zealand, but this name has not been accounted for in any New Zealand flora that I have seen. It is also not in the paper by Edgar & Shand on panicoids introduced in New Zealand [New Zealand J. Bot. 25 (1987) 343]. No doubt the specimen was mislabeled. Dr. N.N. Tzvelev (LE; pers. comm.) has studied the holotype and from his comments and the photocopy of the IDC file that I have received through the kind cooperation of Dr. R.J. Soreng (BH)
I have become convinced that it represents the present species, whereby a new combination is required. *Urochloa glabra* has been regarded as a synonym of this, and so it appears from the description. Trinius (1834) equated it with his *P. glumare*.

6. *Urochloa holosericea* (R. Br.) R.D. Webster


*Brachiaria fusiformis* Reeder var. *pilicoronata* auct. non Jansen

Plants annual. Culms erect to geniculate at base, then rooting in the nodes, 0.5–0.75 m high, 0.75–1 mm wide at base, nodes pilose. Sheaths sparsely pilose. Ligule with 1–1.8 mm long hairs. Blades flat (i.s.), linear-lanceolate to linear, 2.5–7.5 cm by 2.6–6 mm, base rounded to truncate, margins spinulose, sparsely pilose to glabrous. Peduncle apically puberulous, common axis 2–7 cm long. Racemes 3–6, more or less secund, erecto-patent, the lowermost simple, 0.6–1 cm long, densely spikeled, upper racemes distant; rhachis triquetrous, c. 0.2 mm wide, puberulous and pilose; pedicels 0.5–0.75 mm long, puberulous and pilose. Spikelets solitary, ellipsoid, 2.65–3.2 mm long (incl. pubescence). Glumes approximate; lower glumes 1.35–1.5 mm long, 0.5–0.6 times as long as spikelet, base clasping, apex acute, obscurely 3-nerved, apically anastomosing; upper glumes acute, obscurely 5-nerved, without cross-veins, villous, with a dense tuft of transverse, erect to patent, long hairs more or less overtopping the apex. Sterile lemma similar, paleate, back rounded, apex mucronate, mucro 0.5–0.9 mm long; palea c. 0.95 times as long as the lemma; fertile lemma 1.6–1.9 mm long, apex apiculate, dull, finely reticulately granular. Anthers 0.75–1.4 mm long. 2n = ?

Distribution — Australia (W Australia to Queensland); Malesia: Aru Islands, Papua New Guinea (Western Prov.).

Habitat — Damp woodlands and coastal grasslands, 0–40 m altitude.

Note — The two subspecies distinguished by Webster (1987) on the presence or absence of strigose hairs on the leaves and pedicels seem untenable because of the variability present.

7. *Urochloa kurzii* (Hook. f.) R.D. Webster


Plants annual (?; fide auct.). Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes, 0.3 m high, 1–1.2 mm wide at base, nodes puberulous. Sheaths glabrous to pilose (especially along margins). Ligule with c. 0.4 mm long hairs. Blades ovate-lanceolate to ovate-linear-lanceolate, 2–6(–8) cm by 6.5–12(–18) mm, base subcordate, margins scaberulous or pilose (at base), glabrous
below. Peduncle glabrous below the inflorescence. Common axis 3–10 cm long. Racemes 3–6, alternate, appressed to erecto-patent. Rhachis of racemes triquetrous, c. 0.3 mm wide, margins scabrous, glabrous to sparsely pilose, axils glabrous to pilose. Lowermost racemes simple, 1.3–5 cm long, laxly spikeled. Upper racemes distant. Pedicels 0.4–3.75 mm long, glabrous. Spikelets paired, ellipsoid, base cuneate, 3.5–4.1 mm long. Glumes approximate. Lower glumes 1.65–2.1 mm long, 0.42–0.6 times as long as the first lemma, base clasping, acute, 5–7-nerved, without cross-veins. Upper glumes at least as long as the second lemma, apex acuminate–'pinched', 7-nerved, without cross-veins, glabrous to puberulous. First lemma paleate, sterile, back slightly sulcate, apex acuminate–‘pinched’, 7-nerved, without cross-veins, palea 0.8–0.86 times as long. Second lemma 2.25–2.55 mm long, apex apiculate to mucronate, transversally rugulose, dull. Anthers 1.1–1.3 mm long. 2n = ?

Distribution — NE India, Madras, to Thailand, ?Vietnam; Malesia: Java (Rembang, Madiun), Kangean Islands, Lesser Sunda Islands (Timor, Wetar), Moluccas (Halmahera).

Habitat — Teak forests, roadsides, beneath scrub, 100–880 m altitude.

Notes — 1. Urochloa lanceata was compared to U. kurzii by Ohwi, and I cannot find any significant differences.

2. Note the resulting disjunct distribution typical for drought grasses. The species was reported for Australia by Blake (1969), but Webster (1987) noted that one of the vouchers was U. ramosa, while a duplicate of the other one in L is this, too, so this species seems absent from Australia.

3. Brachiaria lanceata var. timorensis differs only by being more pubescent.

8. Urochloa mosambicensis (Hack.) Dandy


Plants perennial. Culms rhizomatous and stoloniferous, geniculate at base, not rooting in the nodes, 0.2–1.5 m high, 2.5–5 mm wide at base, nodes puberulous to pilose. Sheaths sparsely pilose. Ligule with 1.65–2.6 mm long hairs. Blades linear, 2–30 cm by 3–20 mm, base rounded, margins scaberulous to pilose, glabrous to pilose below. Peduncle glabrous below the inflorescence. Common axis 3–12 cm long. Racemes 3–15, erecto-patent. Rhachis of racemes narrowly ribbon-like, 0.9–1.6 mm wide, margins scabrous, glabrous to pilose at base, axils glabrous. Lowermost racemes simple, 2–9 cm long, densely spikeled. Upper racemes distant. Pedicels 0–0.5 mm long, glabrous or with 1 or 2 setae. Spikelets solitary, ovate, base rounded, 3.6–5.1 mm long. Glumes approximate. Lower glumes 1.95–3.3 mm long, often with 1–few median bristles, 0.54–0.67 times as long as the first lemma, base hemi-amplexicaul, apex rounded to truncate, 3-nerved, with cross-veins. Upper glumes at least as long as the second lemma, acuminate, 5-nerved, with cross-veins, glabrous to puberulous, apical pubescence absent to not different from that of body. First lemma paleate, male, back flattened, glabrous or with a fringe of bristles on
both sides, acuminate, 5-nerved, without cross-veins, palea 0.85–0.9 times as long. Second lemma 2.25–2.85 mm long, apex mucronate, micro 0.3–0.75 mm long, finely longitudinally punctate-striate to transversally rugulose towards the margins, dull. Anthers 1.9–2.3 mm long. 2n = 28, 30, 42.

Distribution — South to tropical East Africa, introduced elsewhere, said to have been introduced in Indonesia [McIvor, PROSEA 4 (1992) 230].

Habitat — Woody grassland, often on seasonally flooded clay, waste places, roadsides, 0–1400 m altitude in Africa.

Uses — Forage crop, and for hay.

Vernacular name — Sabi grass (E.).

Note — Description based on literature and the few specimens available in L.

9. Urochloa mutica (Forssk.) T.-Q. Nguyen


_Panicum numidianum_ Lam., Tabl. Encycl. 1 (1791) 172. — _Brachiaria numidiana_ Henrard, Blumea 3 (1940) 434. — Type: Poiret s.n. (‘ex Numidiæ’) (holo P; iso BAA, fragm., SI).

_Panicum purpurascens_ Raddi, Agrost. Bras. (1823) 47. — _Panicum pictigluma_ Steud., Syn. 1 (1853) 72, nom. superfl. — _Brachiaria purpurascens_ Henrard, Blumea 3 (1940) 434. — Type: Raddi s.n. (holo Fl; iso US, fragm.).


_Panicum molle_ auct. non Sw.

_Panicum sarmentosum_ auct. non Roxb.: Hassk., Pl. Jav. Rar. (1848) 17. — _Panicum limnaeum_ Steud., Syn. 1 (1853) 72. — Type: Hasskari s.n. (holo B, extant?). Name and specimen not found in L, P.

_Paspalum mollicolum_ auct. non Kunth.

Plants perennial. Culms tufted, not rhizomatous, stoloniferous (stolons up to 5 m long), geniculate at base, rooting in the nodes, 1–2 m high, 3–7(–10) mm wide at base, nodes pilose. Sheaths pilose. Ligule with 0.75–1.1 mm long hairs. Blades linear, 14–20(–30) cm by 7–10(–25) mm, base rounded to slightly pseudo-petiolate, margins scaberulous, below glabrous to pilose. Peduncle glabrous below the inflorescence. Common axis 15–22 cm long. Racemes 9–15(–25), alternate, erecto-patent. Rhachis of racemes triquetrous to narrowly ribbon-like, 0.5–1.2 mm wide, margins scabrous, glabrous, axils pilose. Lowermost racemes branched, 6–12 cm long, densely spikeleted. Upper racemes distant. Pedicels 0.4–1.3 mm long, pilose. Spikelets paired, ellipsoid, base rounded, 2.85–3.3 mm long. Glumes approximate. Lower glumes 0.75–1.2 mm long, 0.25–0.37 times as long as the first lemma, base hemi-amplexicaul, apex acute, 0- or 1-nerved. Upper glumes at least as long as the second lemma, apex acuminate, 5–7-nerved, with cross-veins, glabrous. First lemma paleate, male, back slightly sulcate, apex acuminate, 5-nerved, with cross-veins, palea about as long. Second lemma 2.1–2.25 mm long, apex mucronate, transversally rugulose, dull. Anthers 1.2–1.9 mm long, yellow (those of the upper floret maturing first). 2n = 18, 36.
Distribution — Originally from Brazil, introduced elsewhere; naturalized throughout Malesia (not seen from the Lesser Sunda Islands).

Habitat — Swampy places, e.g. marshes, rice fields, ditches, also in open, more or less lightly shaded places, e.g. coconut plantations, sandy beaches, vegetation-forming, 0–1530 m altitude.

Uses — Readily eaten by cattle, horses, and sheep, considered one of the best tropical fodder grasses. In moist areas it is better than *Panicum maximum*. Used as ground cover in coconut plantations, in reclamation areas, probably salt-resistant, as also found in the pes-caprae formation of beaches; prevents soil erosion, but once present, difficult to eradicate from sugarcane and coffee plantations.

Vernacular names — Buffalo grass, Dutch grass, Giant couch, Mauritius grass, Para grass, Scotch grass, Water grass (E.).

Note — Ripe fruits never seen as yet.

10. *Urochloa piligera* (F. Muell. ex Benth.) R.D. Webster


Plants annual. Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting or not in the nodes, 0.2–0.6 m high, 1–3 mm wide at base, nodes glabrous. Sheaths glabrous, or sparsely hirsute along the margins. Ligule with 0.75–1.65 mm long hairs. Blades linear, (5–)10.5–25 cm by 5–10 mm, base rounded, margins scaberulous, rarely pilose at base, glabrous below. Peduncle glabrous below the inflorescence. Common axis 6–19 cm long. Racemes 3–5, alternate, erecto-patent, rhachis of racemes ribbon-like, 0.75–1 mm wide, axils glabrous, margins glabrous. Lowermost racemes simple, 3.5–4 cm long, densely to laxly spikeled. Upper racemes distant. Pedicels 0.5–0.9 mm long, glabrous. Spikelets solitary, ellipsoid, 3.1–3.75 mm long. Glumes remote; lower glumes 1.35–1.5 mm long, 0.37–0.47 times as long as the first lemma, base clasping, acute, 9–11-nerved, with cross-veins; upper glumes acute, 7-nerved, pilose, apical hairs longest. First lemma epaleate to paleate, bisexual (and fruiting!), back slightly sulcate, apex acute, 5-nerved, without cross-veins, palea 0–1 times as long. Second lemma 2.4–2.7 mm long, acutish, transversally rugulose, dull. Anthers 1.3–1.7 mm long. 2n = ?

Distribution — Australia (W Australia to New South Wales); Malesia: Celebes (Talaud I.), Moluccas (Ternate), New Guinea: Aru Islands (P. Trangan), Irian Jaya (Kofiau I., Manokwari, Merauke), Papua New Guinea (Western, Central Prov.).

Habitat — Open sandy places near the sea shore, dry ricefields; 0–70 m altitude.

Note — The spikelets of the Malesian representatives are relatively small compared to the Australian ones (3.3–4.9 mm long), especially the lower glume (1.9–2.7 mm long). Regarded as a species distinct from *U. subquadripatra* by Webster (1987), e.g., because of absence of the first palea, which is not always true: it may be present, bearing a male or even bisexual, fruiting flower, exceptional for the tribe.
In Australia hairy and glabrous plants occur; *B. piligera* var. *intercedens* is the glabrous form, the only one found in Malesia, so recognition as a distinct taxon might be warranted.

### 11. Urochloa pubigeria (Roem. & Schult.) R.D. Webster


*Brachiaria ramosa* auct. non Stapf.

Plants annual. Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes to erect, 0.15–1 m high, 2–3.5 mm wide at base, nodes puberulous. Sheaths glabrous to puberulous, or villous. Ligule with 0.8–1.1 mm long hairs. Blades linear, 3.5–19 cm by 4–8 mm, base rounded, margins scaberulous, puberulous to pilose below. Peduncle puberulous below the inflorescence. Common axis 4–12 cm long. Racemes (5—)8—12(—16), alternate, erecto-patent. Rhachis of racemes triquetrous, 0.3–0.6 mm wide, margins scabrous, glabrous to pilose, axils puberulous. Lowermost racemes simple to branched (at base), (3—)4—5(—6) cm long, usually densely spikeled. Upper racemes distant. Pedicels 0.4–2.5 mm long, pilose. Spikelets paired, ellipsoid, base stipitate, 3.2–4.4 mm long. Glumes remote. Lower glumes 1.8–2.55 mm long, 0.5–0.6 times as long as the first lemma, base clasping, broadly acute, 5–7-nerved, with cross-veins. Upper glumes at least as long as to slightly shorter than the second lemma, apex acuminately to subcaudately ‘pinched’, 5–7-nerved, with or without cross-veins, puberulous, apical pubescence absent. First lemma paleate, sterile to male (?), back slightly sulcate, apex acuminately to subcaudately ‘pinched’, 5-nerved, with or without cross-veins, palea 0.75–0.82 times as long. Second lemma 2.25–3 mm long, apex ‘pinched’ (crested), transversally rugulose, dull. Anthers 1–1.6 mm long. 2n = ?

Distribution — India, Sri Lanka to Vietnam to Australia (W Australia, Northern Territory, Queensland); Malesia: Malay Peninsula (Penang), Java (Jakarta, Pasuruan, Banyuwangi), Lesser Sunda Islands (Flores, Timor, Wetar), New Guinea (Irian Jaya: Merauke; Papua New Guinea: Morobe Prov.).

Habitat — Dry ditches, roadsides, grass fields, dry savanna forests, locally common, 0–200 m altitude.

Notes — 1. The distribution and habitat of this species is not clear, as it is usually confused with *U. ramosa* from which it differs especially by the stipitate and acuminate spikelets. If more material can be studied, it may turn out to be indistinguishable. No mixed collections were seen.

2. The first lemma may occasionally bear staminodes; these may be immature anthers, which then mature much later than those of the second lemma.
12. Urochloa ramosa (L.) T.-Q. Nguyen


Plants annual. Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes to erect, 0.3–0.5 m high, 1–3 mm wide at base (or more), the nodes puberulous. Sheaths glabrous to puberulous (to sparsely pilose). Ligule with 1–1.5 mm long hairs. Blades ovate-linear-lanceolate, 4–19 cm by 6.5–18 mm, base rounded, margins scabrous, glabrous to puberulous below. Peduncle glabrous to puberulous below the inflorescence. Common axis 1–10 cm long. Racemes 4–16, alternate or clustered, erecto-patent, rhachis of racemes triquetrous, 0.4–0.5 mm wide, margins scabrous, glabrous or puberulous, axils puberulous. Lowermost racemes simple, 2–6.5 cm long, densely spikeled. Upper racemes distant. Pedicels 1.5–2.1 mm long, glabrous to pilose. Spikelets paired, ellipsoid, 2.8–3.2 mm long. Glumes approximate. Lower glumes 1–1.3 mm long, 0.37–0.52 times as long as the first lemma, base clasping, apex broadly acute, 5-nerved, with cross-veins. Upper glumes at least as long as the second lemma, apex acutely ‘pinched’, 7-nerved, puberulous, rarely glabrous, apical pubescence absent. First lemma paleate or paleate, sterile, usually herbaceous, rarely crustaceous (see note), back slightly sulcate, apex acutely ‘pinched’, 5–7-nerved, without cross-veins, palea 0–0.85 times as long. Second lemma 2.2–2.6 mm long, apex ‘pinched’ mucronate, transversally rugulose, dull. Anthers 0.75–0.8 mm long. 2n = usually 36, also 14, 28, 32, 42, 46, 72.

Distribution — Tropical Africa to Asia, possibly introduced in Malesia: Java (Pasuruan, Besuki), Lesser Sunda Islands (Sumba, Timor, Sawu), Christmas Island.

Habitat — Dry places with a distinct dry season, along roads, burned teak forest, grassy slopes, _Casuarina_ savanna, abandoned fields, 0–400 m altitude.

Uses — Cultivated in India as a short-duration crop. The grain is considered superior to that of _Panicum sumatrense_ Roem. & Schult. The forage is said to be one of the best but the value decreases with maturity.

Vernacular name — Browntop millet (E.).

Note — Very variable in the pubescence of the pedicels and spikelets. Apparently over the whole range of the species a curious form may occur. In this the first lemma resembles the second one and is (sub)glabrous, inflated, transversally rugulose, and indistinctly nerved. Probably introduced at least in Java, where the first collection was made in 1922. There is a collection of the ‘indurated’ form made by R. Brown in Kupang in 1803 (L), though the next collection from the Lesser Sunda Islands was in 1923.

13. Urochloa reptans (L.) Stapf


**Panicum prostratum** Lam. var. *setigerum* auct. non Buse. **Panicum setigerum** auct. non Retz.

Plants annual (?). Culms tufted, not rhizomatous nor stoloniferous, geniculate at base, rooting in the nodes, 0.1–0.65 m high, 0.7–2.5 mm wide at base, nodes glabrous to pilose. Sheaths glabrous, pilose along the margins. Ligule with 0.4–1.5 mm long hairs. Blades ovate-lanceolate to ovate-linear-lanceolate, 1–9 cm by 3–12 mm, base subcordate, margins scaberulous, pilose at base, usually glabrous below. Peduncle glabrous below the inflorescence. Common axis 1–8 cm long. Racemes 2–17, alternate, erecto-patent to patent. Rhachis of racemes triquetro-s, 0.2–0.4 mm wide, axils glabrous, margins glabrous. Lowermost racemes simple, 1.7–5 cm long, densely spikeled. Upper racemes usually approximate. Pedicels 0.1–1.5 mm long, glabrous to pilose. Spikelets paired, ellipsoid, 1.65–2(–2.25) mm long. Glumes approximate. Lower glumes 0.3–0.5(–0.75) mm long, 0.15–0.27(–0.4) times as long as the sterile lemma, base clasp, erose and truncate, 0- or faintly 1-nerved, without cross-veins. Upper glumes apex acutely 'pinched', 7–9-nerved, glabrous (rarely puberulous), apical pubescence absent. Sterile lemma paleate, sterile or male (see note 3), back rounded, apex acutely 'pinched', 5-nerved, without cross-veins, palea c. 0.9 times as long. Fertile lemma 1.3–1.5 mm long, apex rounded, mucronate (micro easily detached), transversally rugulose, dull. Anthers 0.5–1 mm long. 2n = 14, 18.

Distribution — Pantropical, throughout Malesia.
Habitat — Open waste places, beaches, old clearings, pastures, ditches, thickets, jati forest, locally abundant, 0–1000 m altitude.
Uses — Usually found as a weed, but reported as an excellent fodder. Grain sometimes eaten in India, but said to contain cyanides. Ashes from the whole plant used against snake bite in Tanzania.
Vernacular names — Creeping panic grass, Running grass (E.).
Notes — 1. Hitchcock [Contr. U.S. Nat. Hb. 12 (1908) 119] has claimed that Linnaeus described this species twice on successive pages, and that the names are homotypic. **Panicum luxurians**: Merr. [Philipp. J. Sc. 4 (1909) 249] reported to have seen the Willdenow herbarium, where there are three sheets: two from Klein from S India, and one from Bory de St. Vincent, both identified by Mez as *Panicum reptans* L. Merrill regarded the locality 'Luzoniae' as an 'apparent error', but *U. reptans* occurs widely in the Philippines.
2. As the pedicels often lack the long hairs while mixed collections were seen, the recognition of *U. reptans* var. *glabra* seems unwarranted.

3. The first floret may be staminate; the second floret is probably bisexual, but the anthers were usually already lost.

4. The spikelets may be densely puberulous, as in *B. reptans* var. *hispida*, possibly represented in Malesia by Dorgelo 2329 (Surabaya; L) (Backer, 1928, records several more instances, probably in BO), Schmutz 5721, p.p. (Flores) has puberulous spikelets reminiscent of *U. villosa*. As the latter collection is mixed with 'normal' forms, a special status does not seem acceptable.

14. **Urochloa ruziziensis** (Germain & Evrard) Morrone & Zuloaga


Plants perennial. Culms rhizomatous, tufted, erect to geniculate at base, rooting in the nodes, 0.6–1.5 m high, 3–5 mm wide at base, nodes glabrous. Sheaths pilose. Ligule with 0.8–1 mm long hairs. Blades linear, 10–25 cm by 10–15 mm, the base rounded, margins scaberulous, pilose below. Peduncle pilose below the inflorescence. Common axis 9.5–15 cm long. Racemes 3–8, often terminated by rudimentary spikelet(s), alternate, erecto-patent. Rhachis of racemes broadly ribbon-like, 2.25–5 mm wide, margins scaberulous, pilose, axils pilose. Lowermost racemes simple, 4–10 cm long, densely spikeled. Upper racemes distant. Pedicels 0.4–1 mm long, puberulous. Spikelets solitary, ellipsoid, base stipitate, 4.7–6 mm long. Glumes remote. Lower glumes 2.4–3.15 mm long, 0.5–0.67 times as long as the first lemma, base amplexicaul, apex acute, 11-nerved, with cross-veins. Upper glumes at least as long as the second lemma, apex acuminate, 7-nerved, with cross-veins, distally pilose. First lemma paleate, male (maturing after the upper floret), back flattened, apex acuminate, 5-nerved, with cross-veins, palea 0.9–0.95 times as long. Second lemma 3.6–4.35 mm long, the apex apiculate, finely longitudinally punctate-striate, shiny. Anthers 2–3.5 mm long. 2n = 18, 36.

Distribution — Originally from Africa (Congo, Ruanda, Burundi), cultivated elsewhere, e.g. in Malesia: Philippines (Luzon), Papua New Guinea (Madang, Morobe, Northern Prov.), no doubt elsewhere.

Habitat — Open areas, pastures, under coconut, 30–140 m altitude.

Uses — Pasture and fodder grass of excellent quality, drought resistant.

Vernacular name — Congo (signal) grass, itonto, Kennedy grass, ndundwa, Ruzi grass (E).

15. **Urochloa subquadripala** (Trin.) R.D. Webster


Brachiaria subquadripara Hitchc. var. hirsuta Jansen, Reinwardtia 2 (1953) 241. — Type: Lörzing 6153 (holo L; iso BO).


Brachiaria distachya auct. non Stafp.

Panicum distachyon auct. non L. (‘distachyum’).

Panicum ramosum auct. non L.

Panicum remotum auct. non Retz.

Panicum umbrosum auct. non Retz.

Plants annual (?). Culms tufted, not rhizomatous nor stoloniferous, geniculate at the base, rooting in the nodes, 0.25–0.6 m high, 1–2.25 mm wide at the base, nodes glabrous. Sheaths glabrous and more or less hirsute along the margins. Ligule with 0.5–0.75 mm long hairs. Blades ovate-linear-lanceolate to linear, 3–13(–27) cm by 3.5–7(–12) mm, base rounded, margins scaberulous, pilose at the base, glabrous to sparsely pilose below. Peduncle glabrous or pilose below the inflorescence. Common axis 2.5–9(–22) cm long. Racemes 3–6(–9), alternate, erecto-patent to reflexed, rhachis of racemes ribbon-like, 0.75–1 mm wide, axils glabrous to pilose, margins glabrous, scaberulous. Lowermost racemes simple, 2–6.5 cm long, densely spikel-ed; upper racemes distant. Pedicels 0.4–0.75 mm long, glabrous, sometimes pilose. Spikelets solitary, ellipsoid, base cuneate to shortly stipitate, 3.2–4.35 mm long. Glumes remote; lower glumes 1.35–1.95 mm long, 0.38–0.5 times as long as the first lemma, base clasping, erose and rounded to acute, 5–7(–9)-nerved, with or without cross-veins; upper glumes acute, 5–7-nerved, glabrous (once puberulous). First lemma epealeate to paleate, sterile (rarely male), back slightly sulcate, apex acute, faintly 5-nerved, without cross-veins; palea, when present, usually 0.67–0.8 times as long. Second lemma 2.6–2.85 mm long, apex rounded, finely transversally rugulose, dull. Anthers 1.1–1.35 mm long. 2n = 36, 54, 72, 84.

Distribution — Kashmir to S China, throughout Malesia, to Queensland, in New Guinea apparently in areas with a pronounced dry season, introduced elsewhere, e.g. tropical Africa and the New World.

Habitat — Open waste places, roadsides, damp grass fields, 0–600(–900) m altitude.

Uses — Good to excellent forage grass; because it is drought resistant, a good soil-binder in sandy areas, e.g. coconut plantations, dunes, sometimes cultivated as a lawn-grass, where it may become a troublesome weed because of its rampant habit.

Vernacular names — Armgrass millet, Green summer grass, Two-spiked panic grass (E.).

Notes — 1. In Malesia confused with U. distachya, which is a Continental Asian species, differing mainly by being a highly branched perennial, with shorter, slightly more obovate spikelets (and shorter fertile lemmas). The two may well be varieties of each other, but a further analysis is required to answer this. At present the two are
kept separate here mainly because of established custom. Pohl [Fieldiana, Bot., n.s. 4 (1980) 103] has united the two.

2. *Panicum radicans* is included here on the authority of Merrill, but the description is so vague that it might as well be another *Urochloa* species.

3. Jansen distinguished *Brachiaria subquadripara* var. *hirsuta* for an exceptionally pilose specimen (but with glabrous spikelets) from Sumatra’s East Coast [compare *B. subquadripara* var. *setulosa* Chen & Jin, Acta Phytotax. Sin. 22 (1984) 472, from Yunnan with puberulous spikelets], and *B. subquadripara* var. *pubescens* for one with puberulous spikelets from Buru. Of both Malesian forms only the types have been seen.

4. I have not seen original material of *Brachiaria hybrida*, but from the descriptions given it seems to be a form with large spikelets.


Plants annual (?). Culms tufted, not rhizomatous nor stoloniferous, erect, rooting in the lower nodes, 0.4–1 m high, 3–5 mm wide at base, nodes glabrous. Sheaths glabrous. Ligule with 0.75–1.2 mm long hairs. Blades linear, 10–20 cm by 8–10 mm, base rounded, margins scaberulous, glabrous below. Peduncle glabrous below the inflorescence. Common axis 8.5–10 cm long. Racemes 3–10, erecto-patent. Rhachis of racemes narrowly ribbon-like, 1.1–1.4 mm wide, margins scaberulous, glabrous, axils glabrous. Lowermost racemes simple, 3–4.5 cm long, densely spikeled. Upper racemes approximate. Pedicels 0.4–0.6 mm long, glabrous. Spikelets solitary, ellipsoid, base cuneate, 3–3.3 mm long. Glumes remote. Lower glumes 1.35–1.5 mm long, 0.4–0.45 times as long as the first lemma, base amplexicaul, apex rounded to acute, 9–11-nerved, without cross-veins. Upper glume at least as long as the second lemma, the apex acute, 9-nerved, without cross-veins, distally pilose, pilose, apical hairs longest. First lemma paleate, male, back flattened, apex acute, 5-nerved, without cross-veins, palea c. 0.8 times as long. Second lemma c. 2.25 mm long, apex acutish, transversally rugulose, dull. Anthers 1–1.5 mm long. 2n = ?

Distribution — Lesser Sunda Islands (Tanimbar).

Habitat — Along roads, grassfields, thickets, low altitudes.

17. *Urochloa villosa* (Lam.) T.-Q. Nguyen


Plants annual. Culms geniculate at base, usually rooting in the nodes, 0.07–0.4 m high, 0.7–1.2 mm wide at base, nodes densely puberulous. Sheaths puberulous at least along the margins. Ligule with 0.3–1.1 mm long hairs. Blades flat (i. s.), lanceolate to linear-lanceolate, 1.5–4.5 cm by 4–9.25 mm, base rounded to subcordate, margins scaberulous to spinulose, usually densely puberulous on both sides. Peduncle puberulous, common axis 1.5–8 cm long. Racemes 4–12, alternate or secund, erecto-patent, the lowermost simple, 0.7–3.25 cm long, densely spikeled, upper racemes distant; rhachis triquetrous, 0.2–0.3 mm wide, puberulous and pilose; pedicels 0.3–0.6 mm long, puberulous and pilose. Spikelets solitary, ellipsoid, 2–2.85 mm long. Glumes approximate; lower glumes 0.75–1.5 mm long, 0.38–0.54 times as long as spikelet, base clasping, apex acute, faintly 3-nerved, without cross-veins; upper glumes apex ‘pinched’, 5-nerved, hairy or glabrous (see note), without an apical fringe of silky hairs. Sterile lemma paleate, back rounded to somewhat sulcate, apex ‘pinched’, 5-nerved; palea 0.86–0.93 times as long as the lemma; fertile lemma 1.8–2.1 mm long, apex ‘pinched’, dull, finely reticulately granular. Anthers 0.9–1.3 mm long. 2n = 36.

Distribution — West Africa (Mauritania to Zaïre), Sudan, India (Himalayas) to China, Taiwan, Japan; Malesia: Sumatra (E Coast, N of Toba), Java (Besuki: Ijen), Lesser Sunda Islands (Bali), Philippines (Luzon: Benguet), Irian Jaya (Arfak, Kebar), Papua New Guinea (Central Prov.). The distribution suggests introduction, but the species was already found in Luzon in 1905 and in the Arfaks in 1912.

Habitat — Open grassy slopes, savannas, riverbanks, waste places, and fields, 40–1600 m altitude.

Uses — Weed on better soil.

Notes — 1. The indument of the spikelets is variable; sometimes it is completely absent (var. glaberrima, var. glabrata, var. or forma glabriglumis). Ohwi remarked that a paratype was mixed, and so is the Ijen population.

2. Bor [Grasses (1960) 286] described a B. villosa var. barbata from Nepal with an apical row of silvery hairs on the upper glume and lower lemma (he mixed up the words ‘upper’ and ‘lower’), reminiscent of U. fusiformis. I have seen representatives also from the Punjab, Darjeeling, and Yunnan.

DUBIOUS SPECIES

D.1. Urochloa foliosa (R.Br.) R.D. Webster was recorded for New Guinea as Panicum foliosum R. Br. by K. Schum., Bot. Jahrb. 9 (1887) 196; K. Schum. & Hollr., Fl. Kaiser Wilhelmsland (1889) 21, for Hollrung 83, the latter erroneously sub Paspalum foliosum (R. Br.) K. Schum. & Hollr. Reeder (p. 383) compounded the confusion by saying it would be ‘Digitaria foliosa’ (R. Br.) Hughes. It has never been found again in New Guinea, so most likely it was a misidentification of a specimen belonging perhaps to U. subquadripala.
D.2. Urochloa panicoides Beauv.

*Urochloa panicoides* Beauv., Agrost. (1812) 53, 181, t. 11, f. 1. — Lectotype: Beauvois' plate, as the specimen, *Commerson in De Jussieu s.n. could not be found in G or P.*


Distribution — South Africa to Sudan, Yemen, India. Introduced elsewhere, e.g. N Australia.

Habitat — Abandoned fields, overgrazed pastures, disturbed areas, 0–1800 m altitude in Africa.

Note — In Fl. there is a Guichenot and an 'ex Kunth' collection of the *'pubescens'* form labeled 'Timor', while *Panicum javanicum* was described from Java. The latter has been equated, e.g. by Stapf (1920) and Gould [Fl. Ceylon 8 (1994) 447], with *U. panicoides*. These specimen(s) most likely have been mislabelled, as the species was never collected in Malesia again. In absence of the type(s) it cannot be resolved how the epithet 'javanicum' is to be applied.

INDEX TO SPECIMENS SEEN

<table>
<thead>
<tr>
<th>Code</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>bri</td>
<td>1. <em>Urochloa brizantha</em> (A. Rich.) R.D. Webster</td>
</tr>
<tr>
<td>dic</td>
<td>2. <em>Urochloa dicyonoeura</em> (Fig. &amp; De Not.) Veldkamp</td>
</tr>
<tr>
<td>dis</td>
<td>3. <em>Urochloa distachya</em> (L.) T.-Q. Nguyen</td>
</tr>
<tr>
<td>eru</td>
<td><em>Brachiaria eruciformis</em> (J.E. Sm.) Griseb.</td>
</tr>
<tr>
<td>fus</td>
<td>4. <em>Urochloa fusiformis</em> (Reeder) Veldkamp</td>
</tr>
<tr>
<td>glu</td>
<td>5. <em>Urochloa glumaris</em> (Trin.) Veldkamp</td>
</tr>
<tr>
<td>hol</td>
<td>6. <em>Urochloa holosericia</em> (R. Br.) R.D. Webster</td>
</tr>
<tr>
<td>kur</td>
<td>7. <em>Urochloa kurzii</em> (Hook. f.) R.D. Webster</td>
</tr>
<tr>
<td>mos</td>
<td>8. <em>Urochloa mosambicensis</em> (Hack.) Dandy (none scored)</td>
</tr>
<tr>
<td>mut</td>
<td>9. <em>Urochloa mutica</em> (Forsk.) Stapf</td>
</tr>
<tr>
<td>pil</td>
<td>10. <em>Urochloa piligera</em> (Benth.) R.D. Webster</td>
</tr>
<tr>
<td>pub</td>
<td>11. <em>Urochloa pubigera</em> (Roem. &amp; Schult.) R.D. Webster</td>
</tr>
<tr>
<td>ram</td>
<td>12. <em>Urochloa ramosa</em> (L.) T.-Q. Nguyen</td>
</tr>
<tr>
<td>rep</td>
<td>13. <em>Urochloa reptans</em> (L.) Stapf</td>
</tr>
<tr>
<td>ruz</td>
<td>14. <em>Urochloa ruaziensis</em> (Germain &amp; Evrard) Morrone &amp; Zuloaga</td>
</tr>
<tr>
<td>sub</td>
<td>15. <em>Urochloa subquadripila</em> (Trin.) R.D. Webster</td>
</tr>
<tr>
<td>tan</td>
<td>16. <em>Urochloa tanimbarensis</em> (Ohwi) Veldkamp</td>
</tr>
<tr>
<td>vil</td>
<td>17. <em>Urochloa villosa</em> (Lam.) T.-Q. Nguyen</td>
</tr>
</tbody>
</table>


Ibeto 10: ram; 147: rep.


Yates 34: sub.


**INDEX TO NAMES**

(bold = accepted name, with reference to page number)

**Brachiaria ambiguа (Trin.) Camus = glu**
- brizantha (Hochst. ex A. Rich.) Stapf = bri
- coccocosperma (Nees) Stapf ex Reeder = vil
- decumbens Stapf = ruz
- var. ruziensis (Germain & Evrard)
- Ndageneze = ruz

**Brachiaria**
- dictyoneura (Fig. & De Not.) Stapf = die
- distachya (L.) Stapf = dis
- distachya auct. non Stapf. = sub
- eruciformis (J.E. Sm.) Griseb. 416
(Brachiaria)

fusiformis Reeder = fus
var. pilicornata (Ohwi) Jansen = fus
var. pilicornata auct. non Jansen = hol
holotricha Ohwi = pub
humidicola (Rendle) Schweick. = dic
hybrida Basappa & Muniyamma = sub
isachne (Roth ex Roem. & Schult.) Stapf = eru
kurzii (Hook. f.) A. Camus = kur
lanceata Ohwi = kur
var. timorenensis (Ohwi) Jansen = kur
miliiforme (Presl) Chase = sub
mutica (Forssk.) Stapf = mut
numidiana (Lam.) Henrard = mut
paspalooides (Presl) C. E. Hubb. = glu
piligera (F. Muell. ex Benth.) Hughes = pil
var. intercedens (Domin) Hughes = pil
prostrata (Lam.) Griseb. = rep
pubigera (Roem. & Schult.) S.T. Blake = pub
purpurascens (Raddi) Henr. = mut
ramosa (L.) Stapf = ram
var. grandiflora Hughes = pub
ramosa auct. non Stapf. = pub
reptans (L.) Gardn. & C.E. Hubb. = rep
var. hispida Basappa & Muniyamma = rep
ruzizensis Germain & Evrard = ruz
subquadripara (Trin.) Hitchc. = sub
var. hirsuta Jansen = sub
var. miliiformis (Presl) Chen & Jin = sub
var. piligera (F. Muell. ex Benth.) Reeder = pil
var. pubescens Jansen = sub
var. setulosa Chen & Jin, cf. sub
subquadripara auct. non Hitchc. = dis
tanimbrensis Ohwi = tan
timorenensis Ohwi = kur
villosa (Lam.) Camus = vil
forma glabriglumis (Ohwi) Ohwi = vil
var. barbata Bor = vil
var. glaberrima Basappa & Muniyamma = vil
var. glabrata Chen & Jin = vil
var. glabriglumis Ohwi = vil
var. pilicornata Ohwi = fus
villosa auct. non Camus = fus

Digitaria distachya (L.) Pers. = dis
foliosa (R. Br.) Hughes= sd1
umbrosa (Retz.) Pers. = rep

Echinochloa eruciformis (J.E. Sm.) Rchb. = eru
ramosa (L.) Roberty = ram
reptans (L.) Roberty = rep

Hemigymnia javanica (Poir.) Alston = D. 2
Millium alternans Bubani = eru
Opismenus javanicus (Poir.) Roem. & Schult. = D. 2
Panicum ambiguum Trin. = glu
amphibium Steud. = mut
barbinode Trin. = mut
brizanthum Hochst. ex A. Rich. = bri
calaccanzense Steud. = rep
coccospernum Nees = vil
cruciforme Sibth. ex Roem. & Schult. = eru
dictyoneurum Fig. & De Not. = dic
distachyony L. = dis
distachyon auct. non L. = glu, sub
eruformes J. E. Sm. = eru
foliosum R. Br. = D. 1
glumare Trin. = glu
grossarium L. = rep
holosericium R. Br. = hol
humidicola Rendle = dic
infidum Steud. = glu
intercedens Domin = pil
isachne Roth ex Roem. & Schult. = eru
javanicum Poir. = D. 2
kurzii Hook. f. = kur
limnaeum Steud. = mut
luxurians Wild. ex Nees = rep
miliiforme Presl = sub
molle auct. non Sw. = mut
mosambicense Hack. = mos
muticum Forssk. = mut
numidianum Lam. = mut
parvum Buse = rep
pictigluma Steud. = mut
piligerum F. Muell. ex Benth. = pil
prostratum Lam. = rep
var. setigerum auct. non Buse = rep
pubescens R. Br. = pub
pubigerum Roem. & Schult. = pub
purpurascens Raddi = mut
radicans Llanos = sub
ramosum L. = ram
ramosum auct. non L. = sub
remotum auct. non Retz. = sub
reptans L. = rep
sarmentosum auct. non Roxb. = mut
setigerum auct. non Retz. = rep
subquadriparum Trin. = sub
umbrosum Retz. = rep
umbrosum auct. non Retz. = sub
urochloa Steud. = glu
villosum Lam. = vil
J. F. Veldkamp: *Brachiaria, Urochloa* 437

**Paspalum foliosum** (R. Br.) K. Schum. & Hollr. = *D. 1*

mollicomum auct. non Kunth. = mut

Setaria umbrosa (Retz.) Beauv. = rep

Urochloa ambiguа (Trin.) Pilg. = glu

**brizantha** (Hochst. ex A. Rich.) R.D. Webster 417

dictyoneura (Fig. & De Not.) Veldkamp 418

distachya (L.) T.-Q. Nguyen 419

foliosa (R. Br.) R.D. Webster = *D. 1* 432

**fusiformis** (Reeder) Veldkamp 420

glabra Brongn. = glu

**glumaris** (Trin.) Veldkamp 420

holosericea (R. Br.) R.D. Webster 422

humidicola (Rendle) Morrone & Zuloaga = *D. 2*

javanica (Poir.) Stapf = *D. 2*

kurzii (Hook. f.) R.D. Webster 422

mosambicensis (Hack.) Dandy 423

(Urochloa)

**mutica** (Forssk.) T.-Q. Nguyen 424

panicoides Beauv. = *D. 2* 433

paspaloides Presl = glu

**piligera** (F. Muell. ex Benth.) R.D. Webster 425

pubigera (Roem. & Schult.) R.D. Webster 426

pullulans Stapf = mos

var. mosambicensis (Hack.) Stapf = mos

ramosa (L.) T.-Q. Nguyen 427, see also sub kur

reptans (L.) Stapf 427

var. glabra Chen & Jin = rep

ruziziensis (Germain & Evrard) Morrone & Zuloaga 429

subquadripara (Trin.) R.D. Webster 429

tanimbarensis (Ohwi) Veldkamp 431

villosa (Lam.) T.-Q. Nguyen 431