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Taxonomic revision of *Microstegium* s.str. (*Andropogoneae*, *Poaceae*)

C.-H. Chen^{1,3}, J.-F. Veldkamp², C.-S. Kuoh³

Key words

Andropogoneae
Leptatherum
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taxonomic revision

Abstract *Microstegium* excl. *Leptatherum* (*Andropogoneae*, *Poaceae*) is revised. There are at least 16 species and one variety. By lack of type materials eight names could not be placed, while, moreover, another three were invalidly published. An identification key is provided, synonymy, descriptions, and notes are given. A new combination is proposed.

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INTRODUCTION

Microstegium Nees (*Poaceae*, *Andropogoneae*) occurs in tropical and subtropical Africa, Asia, Australia, and some Pacific islands (Clayton & Renvoize 1986, Koyama 1987, Watson & Dallwitz 1992, Hsu 2000). They are creeping or rambling annuals or perennials with broadly linear to lanceolate leaf-blades, inflorescences of 1–many subdigitate racemes; internodes filiform to clavate or inflated; sessile spikelet: lower glume dorsally with a deep longitudinal groove or a broadly concave channel, the margins sharply inflexed and usually keeled; upper glume often shortly awned; lower floret well-developed, reduced to a palea or absent; upper lemma linear to cordate and usually with a long awn, usually accompanied by a small palea; stamens 3, rarely 1; pedicelled spikelet resembling the sessile one, occasionally slightly smaller and male (Clayton & Renvoize 1986).

The genus *Microstegium* was first described by Trinius (1832: 304) as *Pollinia* Trin., a name previously used by Sprengel (1815) for what now is a synonym of *Chrysopogon* Trin., so *Pollinia* is a later homonym and illegitimate, yet it was long in general use (e.g. by Hackel 1889: 170–182). Then *Microstegium* was proposed by Nees (1836) with a single species, *M. willdenovianum* Nees, and thus the type of *Microstegium*. Now this name has become a synonym of *M. vimineum* (Trin.) A.Camus. The type specimen, *Wallich 8838* in B is lost, but there are duplicates in BM, CAL, E, G, K (K-W: microfiche IDC 7394), L, and P. Recognition of *Microstegium* was mainly due to Camus (1921) who gave a brief survey mainly based Trinius (1832) and Steudel (1854b).

Over the years the constituent species had been described in a number of genera, e.g. *Leptatherum* Nees (1841), with as the type *L. royleanum* Nees, now a synonym of *M. nudum* (Trin.) A.Camus (= *Leptatherum nudum* (Trin.) C.Hui Chen, Kuoh & Veldk.). In most subsequent publications this genus was regarded as a synonym of *Microstegium*. However, Tzvelev

(1966) considered it to be a distinct section of *Microstegium*, based on the slender and hairless racemes, abruptly acute glume apex and concave dorsal face of the lower glumes. He included *M. nudum* (= *L. nudum*) and *M. nudum* (Trin.) A.Camus subsp. *japonicum* (Miq.) Tzvelev (= *Leptatherum boreale* (Ohwi) C.Hui Chen, Kuoh & Veldk.) in it. In these taxa there are two stamens per floret, while there are usually three in the other species of *Microstegium*, with the only exception of *M. tenue* (Trin.) Hosok. with only 1.

These observations were more recently supported by studies of the phylogeny of chloroplast gene *ndhF* sequences in *Andropogoneae* (Spangler et al. 1999, Spangler 2000). These suggested that *M. vinimeum* and *M. nudum*, the types of *Microstegium* and *Leptatherum*, were not in one monophyletic clade but were separated far apart in the cladogram. The weakness in the strict consensus tree was that most internal nodes had only relatively low support (Spangler et al. 1999). However, three other nuclear genes, waxy (Mason-Gamer et al. 1998), phytochrome B (Mathews et al. 2002) and the nuclear ribosomal DNA internal transcribed spacers (nrITS) (Chen et al. 2009) showed similar patterns of evolution. These repeated patterns across genes reflected the polyphyly of *Microstegium* rather than a coincidental convergence (Kellogg 2000, Mathews et al. 2002). Chen et al. (2009) consequently reinstated *Leptatherum* and included three species: *L. boreale* (Ohwi) C.Hui Chen, Kuoh & Veldk., *L. nudum* (Trin.) C.Hui Chen, Kuoh & Veldk., and *L. somae* (Hayata) C.Hui Chen, Kuoh & Veldk.

Among the three species of *Leptatherum*, *L. somae* (Hayata) C.Hui Chen, Kuoh & Veldk. is the type of *Polliniopsis* Hayata (1918: 76–77) (usually and erroneously written as '*somaï*'). Hayata regarded it as distinct genus because of the binate spikelets which are both pedicelled, with a 2-aristate lower glume, and an upper glume, lower lemma and upper lemma each with a long awn. So a single spikelet has three awns. There are 2 stamens per floret. Ohwi (1942a) regarded it as a species of *Microstegium*, *M. somae* (Hayata) Ohwi. Koyama (1987) went even further and reduced it to a subspecies *M. japonicum* subsp. *somae* (Hayata) T.Koyama.

Subsequent authors have substantially expanded *Microstegium* s.l. by the inclusion of new taxa or transferring taxa originally included in some other genera such as *Andropogon* L., *Arthraxon* P.Beauv., *Coelarthron* Hook.f., *Ephebopogon* Nees, *Eulalia*

¹ Endemic Species Research Institute, #1, Ming-Sheng E. Rd., Chi-Chi, Nantou, Taiwan 552.

² Naturalis Biodiversity Center, section NHN, Leiden University, P.O. Box 9514, 2300 RA Leiden, The Netherlands; corresponding author e-mail: jan-frits.veldkamp@naturalis.nl.

³ Department of Life Science, National Cheng-Kung University, #1, Ta-Hsueh Road, Tainan City, Taiwan 700.

Kunth, *Ischaemum* L., *Leptatherum* Nees, *Nemastachys* Steud., *Pollinia* Trin. (non. Spreng.), *Polliniopsis* Hayata, *Psilopogon* Hochst., and *Spodiopogon* Trin., and so on. In this way there are more than 200 names pertaining to this small genus. Recently authors have recognized 20 taxa (Tzvelev 1989), 30 (Lazarides 1980) to 35 (Clayton & Renvoize 1986). We here have accepted 17 taxa, but we cannot place two earlier described species, *M. pleiostachyum* (Lauterb. & K.Schum.) A.Camus (1921) and *M. calochloa* (Lauterb. & K.Schum.) Pilg. (1940), and six new species described more recently, *M. borianum* Sur (1982), *M. monoracemum* W.C.Wu (1985), *M. multecilium* B.S.Sun (Sun et al. 1999), *M. batangense* (S.L.Zhong) S.M.Phillips & S.L.Chen, *M. lanceolatum* (Keng) S.M.Phillips & S.L.Chen (2006: 593–598), and *M. butuoense* Y.C.Liu & H.Peng (2011), because of not having seen their types. These new taxa were distinguished by characters that appear to be rather variable, hence it is quite possible that they will turn out to be synonyms of existing species. In addition there are 3 invalidly published names, *M. triaristatum* B.M.Yang (1980), *Pogonatherum glabratum* (Brongn.) Roberty subvar. *mairei* Roberty (1960), and *Pogonatherum glabratum* (Brongn.) Roberty subvar. *micromegas* Roberty (1960), that could not be identified.

Though the details of the nomenclature of *Microstegium* have been clearly described by Henrard (1940) and Bor (1952), most of the taxonomic studies of this genus are very local and incomplete. Therefore we undertook this overall taxonomic revision of the entire genus *Microstegium* s.str. (excl. species of *Leptatherum*.)

MATERIALS AND METHODS

Application of the DELTA system

A list of characters for *Microstegium* was prepared. It was based on the descriptions of Taiwan taxa in Hsu (2000) and other publications (Aiken et al. 1996, Watson & Dallwitz 1994). We entered the character states obtained from the herbarium specimens into the DELTA system. A data editor program running under Windows 95/98 is available in the most updated version of DELTA programs released in 1999 (Partridge et al. 1999, Coleman et al. 2010). It was necessary to export the data to three basic files, CHARS, ITEMS, and SPECS, from this editor because all the other functions of DELTA are still run under MS-DOS. Two essential directive files, TONAT and LAYOUT, were edited, and the descriptions of the taxa were generated from these by the program CONFOR (Chen & Kuoh 2000a, b, Dallwitz et al. 2009, Coleman et al. 2010).

TAXONOMIC TREATMENT

Microstegium

Microstegium Nees (1836) 447; Bor (1952) 209; Sur (1985) 167. — [*Microstegium* Nees sect. *Eumicrostegium* Honda (1930) 403, nom. inval.]. — *Pogonatherum* P.Beauv. sect. *Microstegium* (Nees) Roberty (1960) 388. — [*Microstegium* Nees sect. *Vimineae* Tzvelev (1961) 22, nom. inval.]. — Type: *Microstegium willdenovianum* Nees, nom. superfl. [= *Microstegium vimineum* (Trin.) A.Camus], see note.

Pollinia Trin. (1832) 304, non Spreng. (1815). — Lectotype: *Pollinia spectabilis* Trin. [= *Microstegium spectabile* (Trin.) A.Camus], designated by Keng (1939: 297).

[*Ephepogon* Nees & Meyen ex Steud. (1840) 556, nom. inval. — Voucher: *Ephepogon gratus* Nees & Meyen ex Steud. [= *Microstegium fasciculatum* (L.) Henrard].

Coelarthron Hook.f. (1896a) 163. — Type: *Coelarthron brandisii* Hook.f. [= *Microstegium brandisii* (Hook.f.) Rhind].

Ischnochloa Hook.f. (Apr. 1896a) 147; (May 1896b) t. 2466. — Type: *Ischnochloa falconeri* Hook.f. [= *Microstegium falconeri* (Hook.f.) Clayton].

Microstegium Nees sect. *Monantha* Honda (1930) 403, 409. — Type: *Microstegium monanthum* (Nees ex Steud.) A.Camus. [= *Microstegium fasciculatum* (L.) Henrard].

Pogonatherum P.Beauv. sect. *Ischaemopsis* Roberty (1960) 381. — Type: *Pogonatherum rufispica* (Steud.) Roberty [= *Microstegium rufispicum* (Steud.) A.Camus].

Annuals or perennials. Ligule a glabrous to ciliate collar-shaped membrane, rarely absent. Leaf blades sometimes pseudopetiolate. Inflorescence espatheate, composed of spicate main branches, solitary or digitate, subdigitate, or non-digitate, usually disarticulating transversally at the joints, joints slender, linear or not, joints and pedicels without a longitudinal, translucent furrow. Pedicel free of the rachis. Spikelets in sessile and pedicellate pairs, dorsoventrally compressed; callus short. Glumes awned or muticous, very dissimilar; lower glume rounded to sulcate on the back, 4–6-nerved; upper glume cymbiform, 3-nerved. Sessile spikelets without a pedicel, deciduous with the adjacent joint and pedicel of the pedicelled spikelet, with incomplete florets, lower floret well-developed, bisexual, to reduced to absent, lower lemma and palea variably reduced to both absent. Upper lemma acute to deeply cleft, muticous to 1-awned from the apex or sinus, awn with or without a column, then either wavy or geniculate, glabrous. Upper palea present or not. Lodicules absent, or 2. Stamens 1–3. Styles 2, free to their bases. Caryopsis not grooved; hilum short; embryo large. $x = 10$.

Distribution — At least 16 species and one variety in the (sub)tropics of the Old World.

Notes — According to the Nees manuscript in E *Leptatherum* and *L. royleanum* were renamings of *Pollinia* Trin. and *P. nuda* Trin. (Dr. H.J. Noltie, in litt.).

The type of *Microstegium willdenovianum* has not been found in the Willdenow herbarium (B, using IDC microfiche 7440), making the correct application of the generic name somewhat uncertain. Nees's description, however, refers clearly enough to the current concept. Steudel (1854b: 411), who saw Nees's specimens in B, cited *Arthraxon 8838 Wall. Cat.* (the type of *Andropogon vimineus*) *Panicum – Hornem. in Herb. Willd.* As the specimen was collected in Nepal, it most likely would also be a Wallich collection, many of which, if not all, Willdenow got through Hornemann. There is no *Arthraxon*, *Leptatherum*, *Microstegium*, or *Pollinia* listed in the catalogue to the IDC microfiche. The specimen was not found under *Panicum* (or *Andropogon* and some other educated guesses).

KEY TO THE TAXA OF MICROSTEGIUM

1. Pedicel margins glabrous 2
1. Pedicel margins ciliate 4
2. Culm-nodes glabrous; inflorescence a solitary raceme; lower florets absent; upper lemma awn geniculate; upper palea absent 6. *M. falconeri*
2. Culm-nodes pubescent; inflorescence of digitate racemes; lower florets present; upper lemma awn flexuous; upper palea present 3
3. Leaf-blade surface glabrous 8a. *M. fauriei* var. *fauriei*
3. Leaf-blade surface tomentose 8b. *M. fauriei* var. *geniculatum*
4. Lower glume surface pilose 5
4. Lower glume surface glabrous 6
5. Pedicels linear; both the sessile and pedicelled spikelets well-developed; sessile spikelet upper glume apex muticous 4. *M. dispar*
5. Pedicels clavate; pedicelled spikelets obviously reduced; sessile spikelet upper glume apex awned 13. *M. stapfii*
6. Rachis internodes linear 7
6. Rachis internodes pyriform 14

7. Ligule a ciliate membrane; upper glume lanceolate 14. *M. steenisii*
7. Ligule an eciliate membrane; upper glume elliptic. 8
8. Leaf-blade base with a pseudopetiole 10. *M. petiolare*
8. Leaf-blade base without a pseudopetiole 9
9. Culms decumbent; awns geniculate 16. *M. vimineum*
9. Culms rambling 10
10. Rachis internode as long as the lower spikelet 9. *M. glabratum*
10. Rachis internode obviously shorter than the lower spikelet 11
11. Upper lemma awn without a column, flexuous 12
11. Upper lemma awn with a twisted column, geniculate 13
12. Culms of moderate stature; leaf blades linear, 5–10 by 0.8–1.5 cm; lower glume apex obtuse; upper palea present 1. *M. biaristatum*
12. Culms robust; leaf blades narrowly lanceolate, 10–15 by 1.5–2.5 cm; lower glume apex acute; upper palea absent 12. *M. spectabile*
13. Spikelets 2–2.5 mm long; upper palea absent or minute 3. *M. delicatulum*
13. Spikelets 2.5–4.5 mm long; upper palea present 7. *M. fasciculatum*
14. Inflorescence a single raceme 2. *M. brandisii*
14. Inflorescence composed of digitate racemes 15
15. Ligule a fringe of hairs; pedicels pyriform 5. *M. eucnemis*
15. Ligule an eciliate membrane; pedicels clavate 16
16. Leaf-sheaths outer margin hairy; upper glume apex mucicous; anthers 3 11. *M. rufispicum*
16. Leaf-sheaths outer margin glabrous; upper glume apex awned; anthers 1 15. *M. tenue*

1. *Microstegium biaristatum* (Steud.) Keng — Map 1

Microstegium biaristatum (Steud.) Keng (1932) 92. — *Andropogon biaristatus* Steud. (1854b) 379. — Type: *Wallich Cat.* 8823 p.p. (holo P; B, lost?, CAL ?, microfiche IDC 7394; L).

Pollinia wallichiana Nees ex Steud. (1854b) 410. — *Pollinia ciliata* Trin. subsp. *wallichiana* (Nees ex Steud.) Hack. (1889) 177. — *Pollinia ciliata* Trin. var. *wallichiana* (Nees ex Steud.) Hack. (1899) 723. — *Microstegium ciliatum* (Trin.) A. Camus var. *wallichianum* (Nees ex Steud.) Honda (1930) 405. — Type: *Wallich Cat.* 8822 (holo P; BM, E, K, microfiche IDC 7394).

Andropogon formosanus Rendle (31 March 1904) 371. — Type: *Henry 1167* (holo K; BM, MO).

Pollinia monantha Nees ex Steud. var. *formosana* Hack. (31 May 1904) 527. — *Pollinia formosana* (Hack.) Hayata (1918) 75, t. 44. — *Microstegium formosanum* (Hack.) A. Camus (1921) 201. — *Pollinia ciliata* Trin. var. *formosana* (Hack.) Honda (1925) 42. — *Microstegium ciliatum* (Trin.) A. Camus var. *formosanum* Honda (1930) 404. — Type: *Matsumura s.n.* (holo W).

Andropogon formosanus Rendle var. *minor* Rendle (1904) 372. — Type: *Hance 10746 p.p.* (holo BM; K).

[*Pollinia* sp. near *P. monantha*: Merr. (1906) 327]. — *Pollinia monantha* Nees ex Steud. var. *elmeri* Hack. (1908) 167. — *Microstegium elmeri* (Hack.) A. Camus (1921) 200. — *Pollinia glabrata* (Brongn.) Trin. var. *elmeri* (Hack.) Merr. (1923) 34. — Type: *Elmer 6524* (holo W).

Pollinia ciliata Trin. var. *glabrata* Ridl. (1925) 198. — Lectotype: *Ridley 13861* (holo SING), designated here with assistance from Ms. S. Lee (SING).

Pollinia glaberrima Honda (1925) 42. — *Microstegium glaberrimum* (Honda) Koidz. (1929) 394. — Type: *Soma s.n. 1914* (holo TI).

Pollinia sumatrensis Ridl. (1926) 94. — Type: *SF 14788 (Boden Kloss)* (holo K; SING).

Microstegium bifforme Keng (1932) 91. — Type: *B.C. Ching 8452* (holo N; US).

Microstegium ciliatum (Trin.) A. Camus var. *integrum* Ohwi (1942a) 157. —

Microstegium ciliatum (Trin.) A. Camus subsp. *integrum* (Ohwi) T. Koyama (1987) 427, 516. — Type: *Nagasawa 520* (holo KYO).

Microstegium ciliatum auct. non A. Camus.

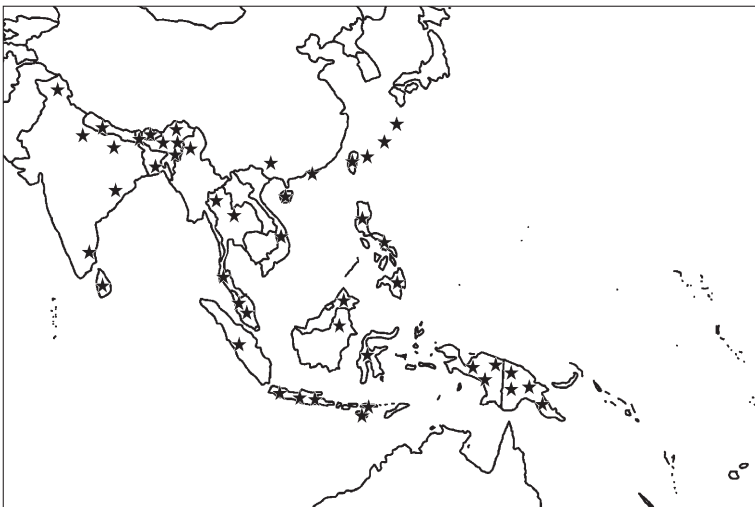
Microstegium fasciculatum auct. non Henrard.

Pollinia ciliata auct. non Trin.

Pollinia grata auct. non Hack.

Perennials, mat-forming. Culms rambling, of moderate stature, 30–160 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous, oral hairs absent. Ligule a glabrous membrane, 0.5–2 mm long. Blades lanceolate to linear, 3–15 cm by 3–15 mm, firm, margins scabrous, apex acute to acuminate, glabrous to sparsely hairy on both sides, without tubercle-based hairs. Panicles 3–12 cm long, common axis 0.5–2 cm long. Racemes 3–20, digitate, ascending, straight, 3–10 cm long. Rachis semiterete, margins ciliate, internodes linear, 2.5–3.5 mm long. Sessile spikelets oblong to lanceolate, 2–4.5 mm long, callus setose. Lower glume oblong to lanceolate, chartaceous to coriaceous, midrib glabrous, dorsally longitudinally grooved, scaberulous, rough all over, glabrous, margins glabrous, apex obtuse, entire or dentate. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex acute, mucicous or awned, awn up to 4 mm long. Lower florets absent or present, reduced, barren. Upper lemma orbicular, c. 0.5 mm long, veined, apex incised to 0.2th of the lemma length, awn from a sinus, flexuous, column absent, awn 6–12 mm long. Upper palea present, ovate, c. 0.5 mm long, as long as the lemma, membranous. Anthers 3, 1–1.8 mm long. Pedicels linear, flattened, c. 2 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones to variously reduced.

Distribution — India (Arunachal Pradesh, Assam, Bihar, Manipur, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttar Pradesh), Sri Lanka, Thailand (N: Chiang Mai; NE: Loei; Peninsular: Phangnga, Phattalung), Vietnam, S China (Fujian, Guangdong, Guanxi, Guizhou, Hainan, Hong Kong, Hunan, Jiangxi, Sichuan, Yunnan), Taiwan, Ryukyu Isl.; Malesia: Sumatra (E Coast, Padang), Malay Peninsula (Pahang, Penang, Perak, Selangor), Java (Bogor, Kediri, Kedu, Pasuruan, Priangan),



Map 1 Distribution of *Microstegium biaristatum* (Steud.) Keng.

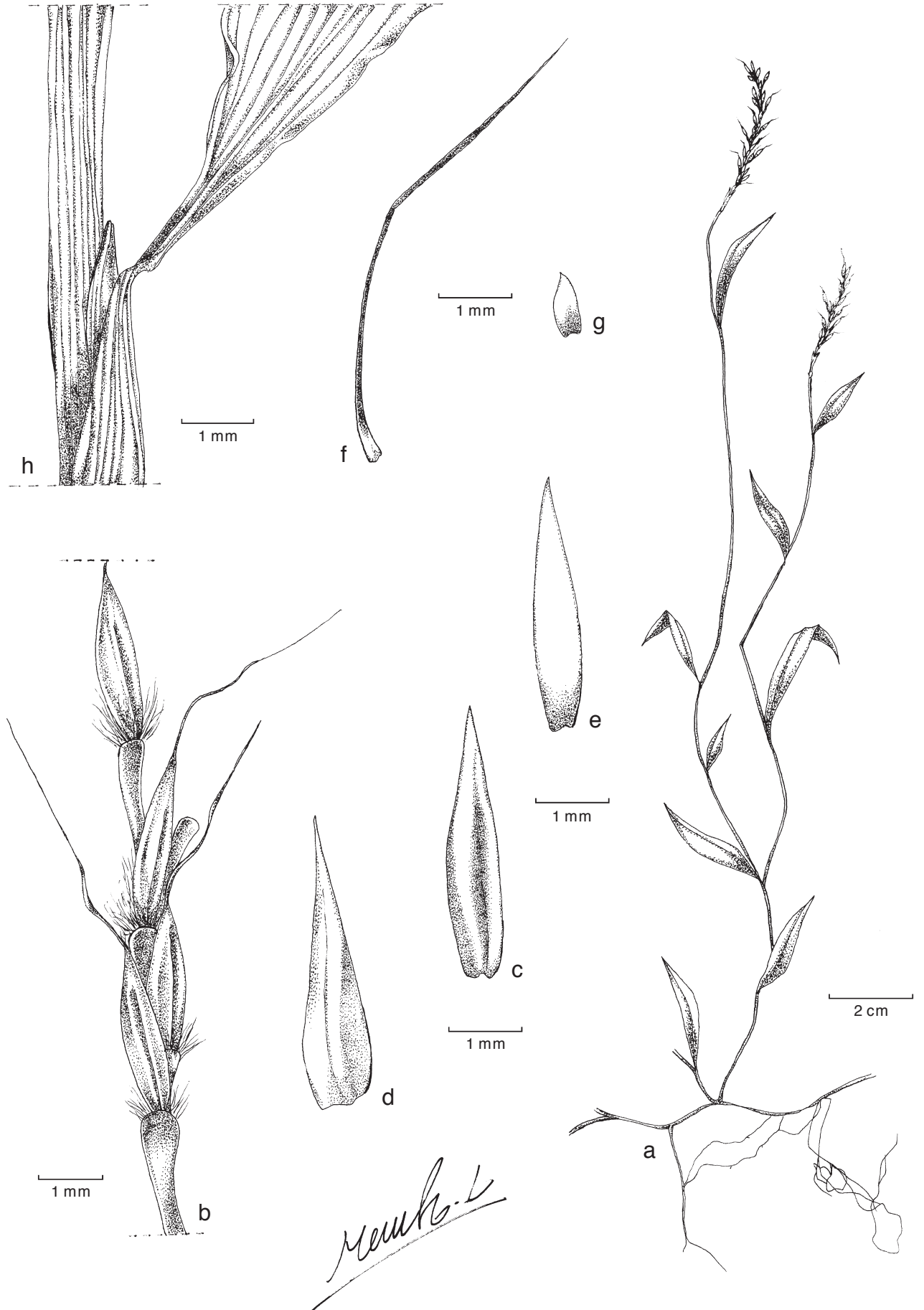


Fig. 1 *Microstegium brandisii* (Hook.f.) Rhind. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. lower lemma; f. upper lemma with awn; g. upper palea; h. joint of leaf sheath and leaf blade (all: Kurze 1217, K).

Borneo (Kalimantan: B. Raya; Sabah), Philippines (Mindoro), Celebes (E, Minahasa), Lesser Sunda Islands (Flores, Sumba, Wetar), New Guinea: Irian Jaya: Snow Mts, Enerotali; Papua New Guinea: Western, W Highlands, W Sepik, Central Prov.

Habitat — Open areas, grassland, on granitic boulders along river, moist slopes, along trail, in thickets, forest edge, always on good soil, 0–2300 m altitude.

Collector's notes — Decumbent, scrambling, broadly erect, forming dense vegetation with few flowering culms, 0.3–2 m. Lower stems brownish, rooting at the nodes; erect part green. Blades dark green above, dull green underneath. Inflorescence green, contracted, spike-like, racemes divergent to erect. Spikelets brownish, green, maroon. Anthers purplish. Stigmas white. Flowering at 9:30 a.m.

Notes — The name *M. ciliatum* has been used for the taxon which has flexuous awn from the apex of upper lemma since its basionym, *Pollinia ciliata*, was published. However, the type of *M. ciliatum* (*Pollinia ciliata*), *Wallich 8815-B*, is closer to *M. fasciculatum* actually and the legitimate name for this species should be *M. biaristatum*.

This species has been illustrated by Hsu (1975), Osada (1993), Liu (1997), and Chen & Phillips (2007: 832–836) as *M. ciliatum*.

2. *Microstegium brandisii* (Hook.f.) Rhind — Fig. 1; Map 2

Microstegium brandisii (Hook.f.) Rhind (1945) 632. — *Coelarthron brandisii* Hook.f. (1896a) 164; (1897) t. 2517. — Type: *Brandis s.n.* (holo K).

Pollinia clavigera Backer (1922) 110 (reprint p. 34). — *Microstegium clavigerum* (Backer) Henrard (1940) 453. — Type: *Backer 21177* (holo BO; L).

Microstegium eucnemis auct. non A.Camus.

Pollinia eucnemis auct. non Nees ex Steud.

Annuals, mat-forming. *Culms* rambling, slender, 25–40 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous or puberulous, outer margin glabrous, oral hairs scanty or absent. Ligule a glabrous membrane, 0.5–0.75 mm long. Blades ovate to lanceolate, 1.5–8 cm by 6–15 mm, firm, margins smooth, apex acute, glabrous or sparsely pilose. *Panicles* 3–7 cm long. Racemes solitary, ascending, straight or arcuate. Rachis angular, margins villous, internodes pyriform, 3–4 mm long. *Sessile spikelets* oblong to lanceolate, 3–6 mm long, callus pilose or setose. Lower glume oblong to lanceolate, coriaceous, midrib glabrous, dorsally concave, scaberulous all over, glabrous, margins ciliate or setose, apex acute, entire or dentate. Upper glume elliptic, back acute, glabrous, midrib ciliate, apex acute, mucro 1–5 mm long. Lower florets absent to paleate, male. Lower lemma when present, oblong to lanceolate, c. 4 mm long. Upper lemma lanceolate, 1.5–2.25 mm long, without veins, apex entire or incised to 0.33–0.5th of the lemma length, awn apical or from a sinus, geniculate, column straight to twisted, 11–16 mm long. Upper palea elliptic, 1–2 mm long,

0.75th times as long as the lemma, membranous. Anthers 3, 1.5–2.5 mm long. *Pedicels* broadly clavate, V-shaped, 2.5–3 mm long, margins pubescent. Pedicelled spikelets variously reduced, male or neuter.

Distribution — Burma (provenance of type uncertain), Malasia: W to E Java (Padalarang to Madura), and Taiwan.

Habitat — Grassy road margins, near *Tectona grandis* (Teak), on bare limestone, 50–700 m altitude.

Collector's notes — Caespitose. Rachis fragile.

Notes — *Microstegium brandisii* is usually treated as a synonym of *M. eucnemis*. However, *M. eucnemis* has erect culms and its inflorescence has 3–5 digitate racemes. *Microstegium brandisii* has procumbent culms and its inflorescence is a solitary raceme. In our opinion, it is more appropriate to combine it with *M. clavigerum*.

This is another example of a disjunct distribution of drought plants between Burma and E Java. Curiously, it has been also found in Taiwan recently.

3. *Microstegium delicatulum* (Hook.f.) A.Camus — Fig. 2; Map 3

Microstegium delicatulum (Hook.f.) A.Camus (1921) 200. — *Pollinia delicatula* Hook.f. (1896a) 117. — Type: *Kurz 1204* (holo K), designated by Bor (1952).

Annuals, mat-forming. *Culms* rambling, weak, 30–90 cm long, rooting from the lower nodes. Nodes bearded. Sheaths glabrous, outer margin glabrous, oral hairs absent. Ligule a glabrous membrane, 0.2–0.5 mm long. Blades elliptic, 5–10 cm by 4–8 mm, flaccid, base attenuate to slightly rounded, pseudopetiole absent, margins scabrous, apex acute to acuminate, glabrous to sparsely pilose on both sides, without tubercle-based hairs. *Panicles* 4–8 cm long, common axis 0.5–2 cm long. Racemes 3–5, digitate, ascending, straight, 4–8 cm long. Rachis fragile, flattened, margins ciliate, internodes linear, c. 1.5 mm long. *Sessile spikelets*, oblong to lanceolate, 2–2.5 mm long, callus setose. Lower glume oblong to lanceolate, chartaceous, midrib glabrous, dorsally flat or concave, smooth or scaberulous, rough at apex, glabrous, margins glabrous, apex obtuse, entire. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, acute, mucro c. 0.5 mm long. Lower florets absent. Upper lemma orbicular, c. 0.5 mm long, without veins, glabrous, apex incised to 0.2th of the lemma length, awn from a sinus, geniculate, column twisted, (incl. column) 6–8 mm long. Upper palea absent or minute. Anthers 3, c. 1 mm long. *Pedicels* linear, flattened, 1–1.5 mm long, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — India (Assam), Burma (Pegu, Mandalay, Rangoon, Shan), Thailand (N: Nan; E: Nakhon Ratchasima), China (Guangdong, Yunnan).

Habitat — Forest margins, roadsides, c. 600 m altitude.



Map 2 Distribution of *Microstegium brandisii* (Hook.f.) Rhind.

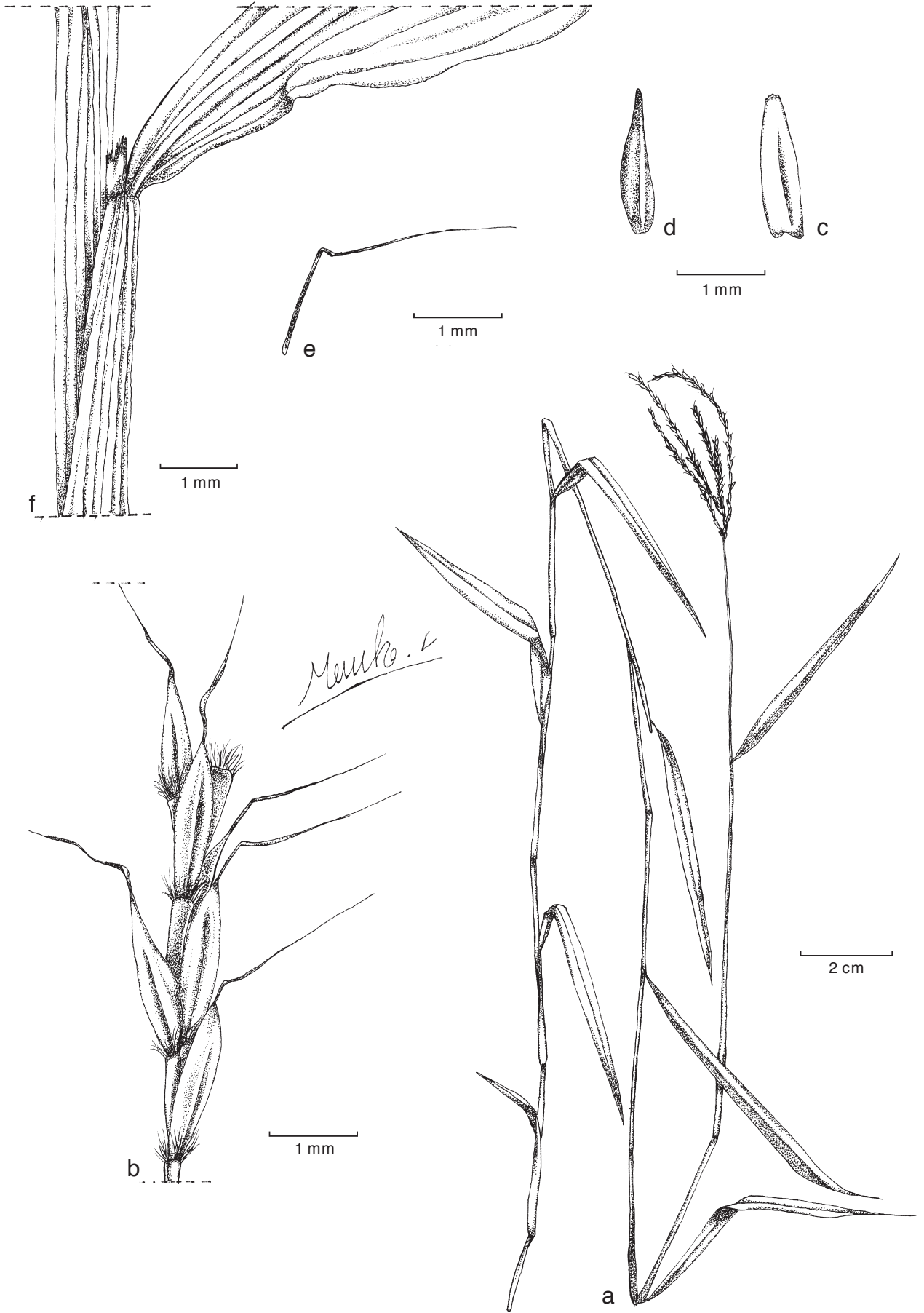


Fig. 2 *Microstegium delicatulum* (Hook.f.) A. Camus. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. upper lemma with long flexuous awn; f. joint of leaf sheath and leaf blade (all: Kurz 2738, K).

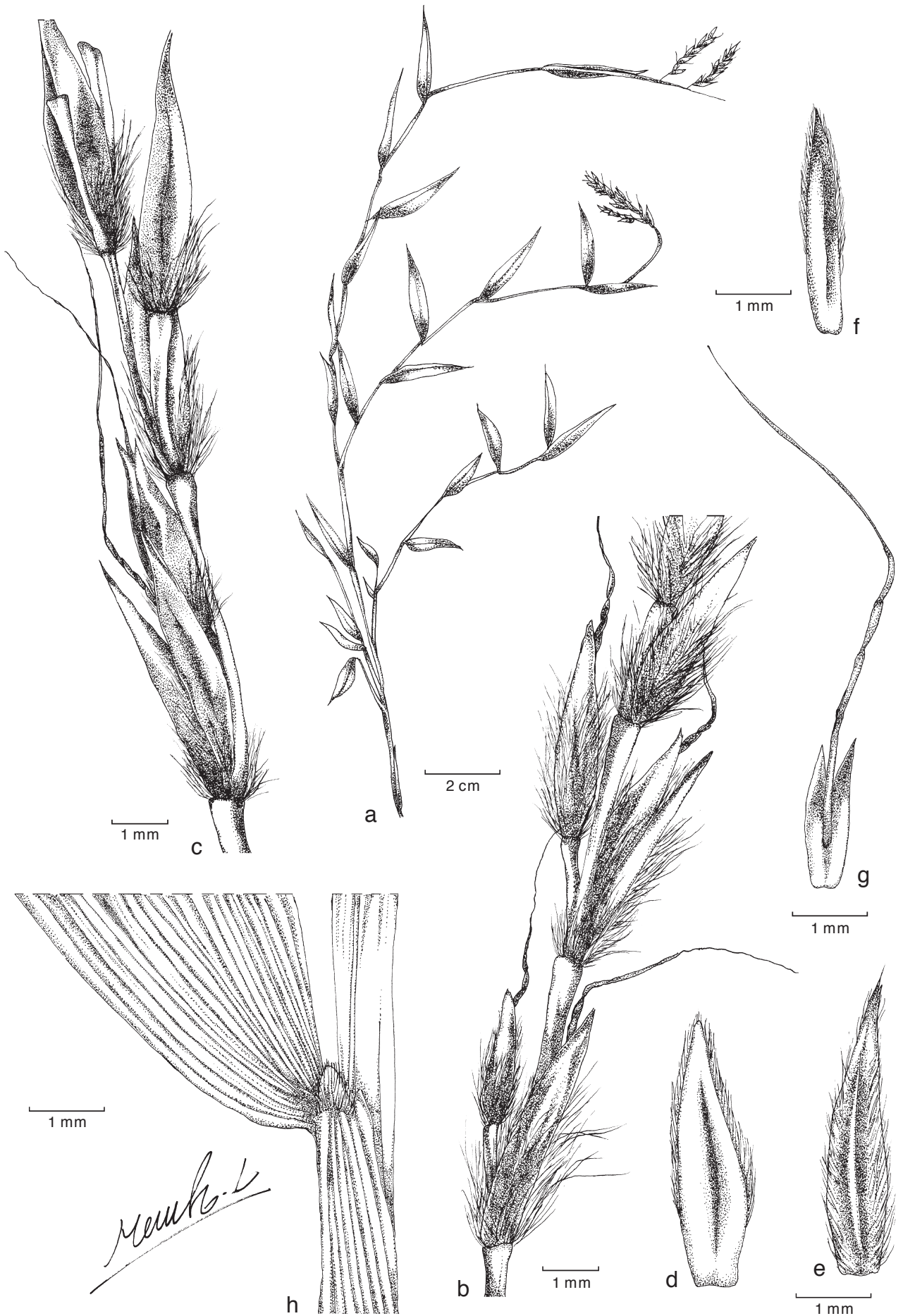


Fig. 3 *Microstegium dispar* (Nees) A. Camus. a. Habit; b. spikelets (front view); c. spikelets (rear view); d. lower glume; e. upper glume; f. lower lemma; g. upper lemma with awn; h. joint of leaf sheath and leaf blade (all: van Steenis 4299, K).



Map 3 Distribution of *Microstegium delicatulum* (Hook.f.) A. Camus.

4. *Microstegium dispar* (Nees) A. Camus — Fig. 3; Map 4

Microstegium dispar (Nees) A. Camus (1921) 200. — *Pollinia dispar* Nees ex Steud. (1854b) 410. — *Eulalia dispar* (Nees ex Steud.) Kuntze (1891) 775. — Type: *Junghuhn s.n.* (holo B, lost?; not found in L, U), Java, prope Mt Sumbing. — Neotype: *Docters van Leeuwen-Reijnvaan 8968* (holo L; BO), designated here.

Pollinia geminata Merr. (1918) 16. — Type: *Koorders 40873* (holo BO; K, L).

Annuals, mat-forming. *Culms* prostrate, of moderate stature, 60–150 cm long, rooting from the lower nodes. Nodes pubescent. Sheaths glabrous or pilose, outer margin glabrous, oral hairs absent, or bearded. Ligule a ciliolate membrane, 0.2–0.5 mm long. Blades lanceolate to linear, 2–12 cm by 3–10 mm, firm, base attenuate, margins scabrous, apex acute or acuminate, below glabrous to sparsely to densely pilose with tubercle-based hairs. *Panicles* 3.5–7 cm long, common axis c. 0.5 cm long. Racemes 2–5, digitate, ascending to patent, straight, 2–6 cm long. Rachis semiterete, margins ciliate, internodes linear, 3.25–4.75 mm long. *Sessile spikelets* lanceolate, 4–6 mm long, callus setose. Lower glume lanceolate, coriaceous, midrib glabrous, dorsally flat or concave, smooth, pilose at base, margins setose, apex acute, entire. Upper glume elliptic, back acute, pilose near the base, midrib glabrous, apex acute, mucous. Lower florets well-developed, paleate or epaleate. Lower lemma oblong, 3.5–4.5 mm long. Upper lemma lanceolate, 2.5–3.5 mm long, without veins, apex incised to 0.5–0.75th of the lemma length, awn from a sinus, geniculate, column straight or slightly twisted, 10–17 mm long. Upper palea absent or minute. Anthers 3, 2.5–3 mm long. *Pedicels* linear, semiterete, 2.5–3 mm long, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — Malesia: Java (Priangan to Besuki: Arjuno, Hyang, Ijen, Ipi, Kawi, Kelut, Lawu, Merbabu, Papandajan, Sindoro, Sumbing), Lesser Sunda Islands ((Bali (Abang, Agung), Lombok (Rinjani)).



Map 4 Distribution of *Microstegium dispar* (Nees) A. Camus.

Habitat — Locally abundant in sunny open areas, grass jungles, *Casuarina* forest, colouring the vegetation pink (*Van Steenis 4554*, BO), 1500–2800 m altitude.

Collector's notes — *Culms* erectopatent, or, on slopes, patent to hanging, red. Blades obliquely deflexed, red suffused.

Note — Distribution disjunct.

5. *Microstegium eucnemis* (Nees ex Steud.) A. Camus — Fig. 4; Map 5

Microstegium eucnemis (Nees ex Steud.) A. Camus (1921) 200; Henrard (1940) 455, isonym. — *Pollinia eucnemis* Nees ex Steud. (1854b) 409. — *Eulalia eucnemis* (Nees ex Steud.) Kuntze (1891) 775. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *eucnemis* (Nees ex Steud.) Roberty (1960) 388, nom. inval.]. — Type: *Akkul Mahmud in Wallich Cat. 8812* (holo B, lost?; CAL, G, K, microfiche IDC 7394).

Annuals or perennials, mat-forming to caespitose. *Culms* geniculate to erect, robust, 90–150 cm long, rooting in the decumbent nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous, oral hairs bearded. Ligule a fringe of hairs, 0.5–2 mm long. Blades elliptic, 10–25 cm by 10–25 mm, firm, margins scabrous, apex acute to acuminate, glabrous or moderately pilose on both sides with tubercle-based hairs. *Panicles* 5–12 cm long, common axis c. 1 cm long. Racemes 3–25, digitate, ascending, straight, 5–9 cm long. Rachis angular, margins ciliate, internodes pyriform, 3.5–4.5 mm long. *Sessile spikelets* oblong to lanceolate, 3.5–4 mm long, callus pilose or setose. Lower glume oblong to lanceolate, chartaceous, midrib ciliate, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex acute, entire. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex acute, mucro 0.5–4 mm long. Lower florets well-developed, paleate to epaleate. Lower lemma lanceolate, c. 4.5 mm long. Upper lemma elliptic, 1.25–1.5 mm long, veined, apex incised to 0.5th of the lemma length, awn from a sinus, geniculate, column twisted, (incl. column) 15–18

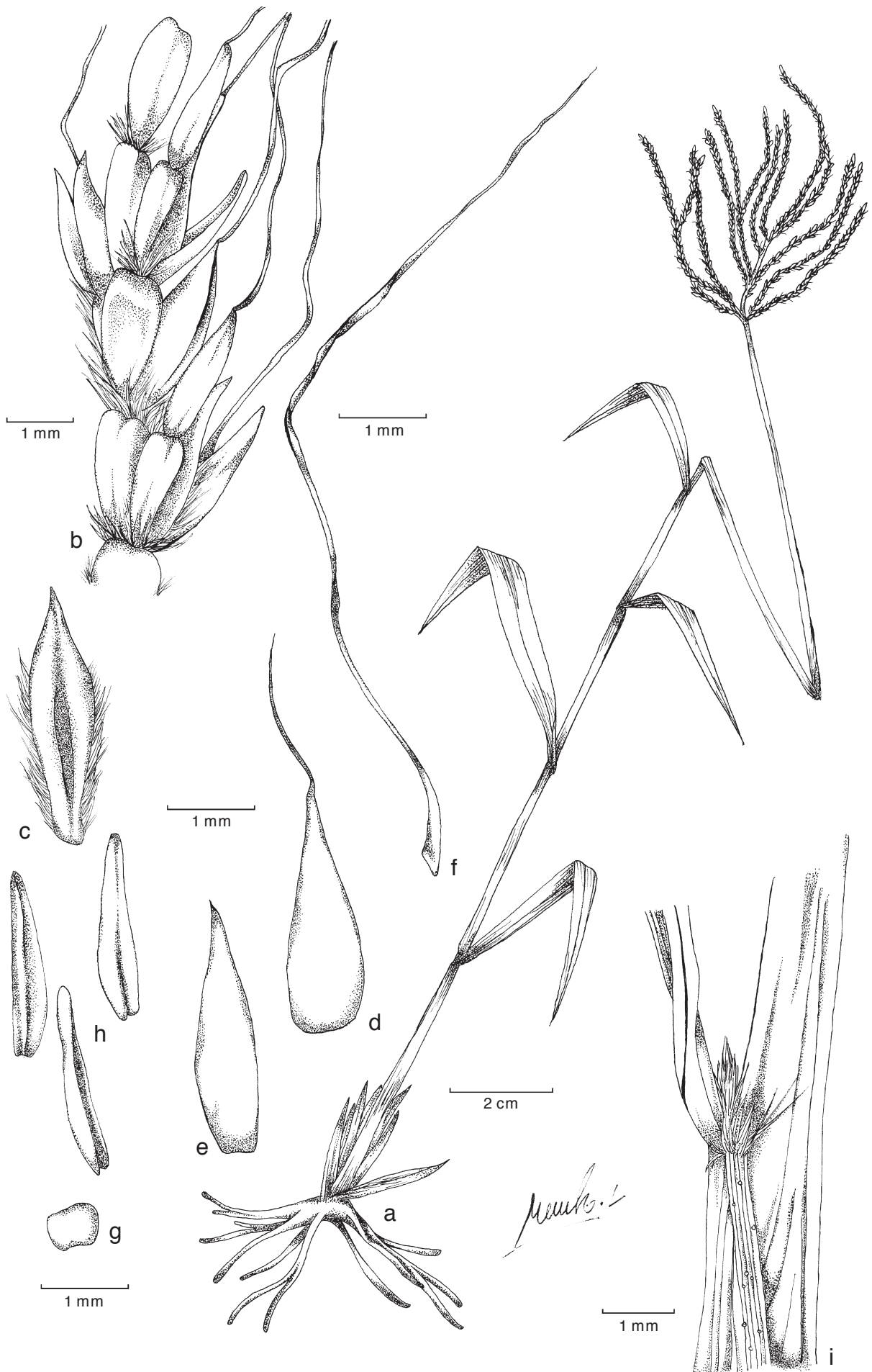
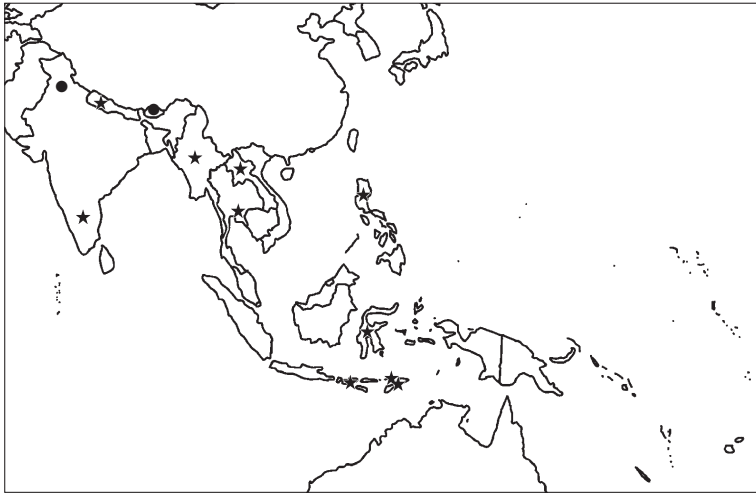


Fig. 4 *Microstegium eucnemis* (Nees ex Steud.) A. Camus. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. lower lemma; f. upper lemma with awn; g. upper palea; h. stamens; i. joint of leaf sheath and leaf blade (all: Raizada s.n., K).



Map 5 Distribution of *Microstegium eucnemis* (Nees ex Steud.) A. Camus (★) and *M. falconeri* (Hook.f.) Clayton (●).

mm long. Upper palea obovate, c. 1.25 mm long, as long as the lemma, hyaline. Anthers 3, 3–3.5 mm long. *Pedicels* broadly clavate, V-shaped, c. 3 mm long, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — N India, S India (disjunct!), Nepal, Lower Burma (frequent), Thailand (SE: Chanthaburi), Laos (Savannakhet), Malesia: Philippines (Luzon), SW Celebes, Lesser Sunda Islands (Flores, Timor, Wetar), reported for the Vogelkop (Ohwi 1942b) but specimen not seen.

Habitat — Thickets, open *Arundinaria* woodland, sandy soil (pH 5.5–6.0), at low altitude.

Collector's notes — Perennial. Compact erect tussocks, 1.1–1.5 m, rather high and branched. Foliage harsh to the touch. Inflorescence purplish.

Uses — Heavily grazed.

Notes — '*eucnemis*' is a noun not to be declined (with a beautiful shin plate: perhaps referring to the swollen joints).

Distribution disjunct.

6. *Microstegium falconeri* (Hook.f.) Clayton — Fig. 5; Map 5

Microstegium falconeri (Hook.f.) Clayton (1981) 816. — *Ischnochloa falconeri* Hook.f. (1896a) 148; in Hook. (1896b) t. 2466. — *Pogonatherum falconeri* (Hook.f.) Roberty (1960) 396. — Type: *Falconer s.n.* (holo K).

Annuals, caespitose. *Culms* decumbent, weak, 15–25 cm long, without nodal roots. Nodes glabrous. Sheaths glabrous, outer margin glabrous, oral hairs scanty. Ligule absent or a glabrous membrane, 0–0.5 mm long. Blades lanceolate, 1–4 cm by 3–7 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, margins smooth, apex acute, densely hairy on both sides, without tubercle-based hairs. *Panicles* 2–4 cm long. Racemes solitary, ascending, straight, 2–4 cm long. Rachis tenacious, flattened, margins glabrous, internodes long, slender, 5–8 mm long. *Sessile spikelets* oblong to lanceolate, 3–5 mm long, callus glabrous or puberulous. Lower glume oblong to lanceolate, coriaceous, midrib glabrous, dorsally flat, smooth, glabrous, margins glabrous, apex emarginate. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, acute, muticous. Lower florets absent. Upper lemma oblong, c. 1.2 mm long, veined, glabrous, apex incised to 0.5–0.75th of the lemma length, awn from a sinus, geniculate, column straight or slightly twisted, (incl. column) 4–8 mm long. Upper palea absent or minute. Anthers 3, 1.2–1.5 mm long. *Pedicels* linear, flattened, 1.5–4 mm long, margins glabrous. Pedicelled spikelets subequal to the sessile ones.

Distribution — India (NW Himalaya), Bhutan.

Habitat — Mossy rocks, c. 2000 m altitude.

7. *Microstegium fasciculatum* (L.) Henrard — Fig. 6; Map 6

Microstegium fasciculatum (L.) Henrard (1940) 453. — *Andropogon fasciculatum* L. (1753) 1047 ('*fasciculatus*'). — *Tripsacum fasciculatum* (L.) Raspail (1825) 306. — *Dactyloides fasciculatum* (L.) Kuntze (1891) 773. — *Chloris fasciculata* (L.) Thell. (1912) 289, non Schrad. (1824). — Lectotype: *Herb. Linn. 1211.27, lower, central specimen*, designated by Cope (in Cafferty et al. (2000) 245).

Pollinia ciliata Trin. (1832) 306. — *Pollinia lancea* Nees ex Steud. (1854b) 410, nom. superfl. — [*Pollinia ciliata* Trin. subsp. *genuina* Hack. (1889) 173, nom. inval.]. — *Eulalia ciliata* (Trin.) Kuntze (1891) 775. — [*Pollinia ciliata* Trin. var. *genuina* Hack. ex Hook.f. (1896a) 116, nom. inval.]. — *Microstegium ciliatum* (Trin.) A. Camus (1921) 201. — [*Pollinia ciliata* Trin. (unranked) *typica* Backer (1928) 49, nom. inval.]. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *ciliatum* (Trin.) Roberty (1960) 388, nom. inval.]. — Type: *Wallich ex Hornemann in Herb. Trinius 54.1* (holo LE, microfiche IDC BT-16/1; BM, C, marked as 8815-B; CAL, E, G, K, P, microfiche IDC 7394).

[*Epehobopogon gratus* Nees & Meyen ex Steud. (1840) 556, nom. nud.]. — *Pollinia ciliata* auct. non Trin.: Nees (preprint of 1843: 1841) 54; (1843) 186. — *Pollinia grata* Hack. (1889) 175. — *Eulalia grata* (Hack.) Kuntze (1891) 775. — *Microstegium gratum* (Hack.) A. Camus (1921) 201, nom. superfl. — *Pollinia ciliata* Trin. forma *grata* (Hack.) Backer (1928) 49. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *gratum* (Hack.) Roberty (1960) 388, nom. inval.]. — Lectotype: *Meyen s.n.* (holo B, lost?; *Herb. Trin. 59.1* (LE, microfiche IDC BT-16/1)), designated here.

Pollinia montana Nees ex Steud. (1854b) 409. — *Microstegium montanum* (Nees ex Steud.) Henrard (1940) 455. — Type: *Junghuhn s.n.* (Java, G. Grogg Kedong) (holo B, lost?; L, not found).

Pollinia laxa Nees ex Steud. (1854b) 410. — *Pollinia ciliata* Trin. subsp. *laxa* Hack. (1889) 176. — *Pollinia ciliata* Trin. var. *laxa* (Nees ex Steud.) Hack. ex Hook.f. (1896a) 116. — *Microstegium ciliatum* (Trin.) A. Camus var. *laxum* (Nees ex Steud.) Reeder (1948) 338. — Type: *Wallich Cat. 8823 p.p.* (holo B, lost?; BM, CAL, E, K, L, P, microfiche IDC 7394)

Pollinia monantha Nees ex Steud. (1854b) 410. — *Eulalia monantha* (Nees ex Steud.) Kuntze (1891) 775. — *Microstegium monanthum* (Nees ex Steud.) A. Camus (1921) 200. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *monanthum* (Nees ex Steud.) Roberty (1960) 388, nom. inval.]. — Type: *Wallich Cat. 8819* (holo B, lost?; BM, CAL, E, G, K, microfiche IDC 7394; P).

Pollinia vagans Nees ex Steud. (1854b) 410. — *Eulalia vagans* (Nees ex Steud.) Kuntze (1891) 775. — [*Pollinia vagans* Nees ex Steud. var. *genuina* Hack. (1889) 173, nom. inval.]. — *Microstegium vagans* (Nees ex Steud.) A. Camus (1921) 200; Hand.-Mazz. (1936) 1309, isonym; Henrard (1940) 455, isonym. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *vagans* (Nees ex Steud.) Roberty (1960) 389, nom. inval.]. — Type: *Wallich Cat. 8807-B* (holo P; BM, CAL, E, microfiche IDC 7394; G, K, W).

Pollinia vagans Nees ex Steud. var. *dubium* Hack. (1889) 173. — *Microstegium vagans* (Nees ex Steud.) A. Camus var. *dubium* (Hack.) Hand.-Mazz. (1936) 1309. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *dubium* (Hack.) Roberty (1960) 388, nom. inval.]. — Type: *Hook.f. & T. Thomson 'Pollinia micrantha'* (holo W; BM, L).

Pollinia ciliata Trin. subsp. *seminuda* Hack. (1889) 177. — *Pollinia ciliata* Trin. var. *seminuda* (Hack.) Hook.f. (1896a) 116. — Type: *Thwaites CP 411 p.p.* (holo W; PDA).

Pollinia grata Hack. var. *hirsuta* Hook.f. (1896a) 116. — Type: *Kurz 1207* (holo K).

Pollinia ciliata Trin. var. *breviaristata* Rendle (1904) 355. — *Microstegium breviaristatum* (Rendle) A. Camus (1921) 201. — Syntypes: *Mulgrave s.n.*, *Henry 3133*, *11412* (BM, E, K, MO).
Andropogon vagans Rendle (1904) 375, non *Pollinia vagans* Steud. (1854b). — Lectotype: *Sampson 300* (holo BM, not found; K), designated here.
Pollinia gracilis Ridl. (1907) 156. — *Microstegium gracile* (Ridl.) A. Camus (1921) 201. — Type: *Ridley 8476* (holo SING).
Pollinia parceciliata Pilg. (1917) 279. — *Microstegium parceciliatum* (Pilg.) Pilg. (1936) 264. — *Eulalia parceciliata* (Pilg.) Pilg. ex Peter (1936) 359. — Type: *Stolz 1447* (holo B, lost?; G, K, L, U, WAG).

Pollinia bequaertii De Wild. (1920) 132. — *Eulalia bequaertii* (De Wild.) De Wild. (1921) 2. — *Leptatherum bequaertii* (De Wild.) Robyns (1929) 89. — *Microstegium bequaertii* (De Wild.) Henrard (1940) 453. — Type: *Bequaert 391* (holo BR; K). Epithet usually, but erroneously spelled as '*bequaerti*'.
Microstegium ciliatum (Trin.) A. Camus var. *latifolium* Ohwi (1942b) 10. — Type: *Kanehira & Hatusima 13243* (holo FU; A, BO).
Microstegium montanum (Nees ex Steud.) Henrard var. *hirsutum* Jansen (1953) 306. — Type: *Van Breemen 44* (holo BO; L '*Microstegium montanum* var. *pubescens*').
Microstegium vagans (Nees ex Steud.) A. Camus var. *scandens* Bor (1962) 174. — Type: *Larsen 577* (holo K).

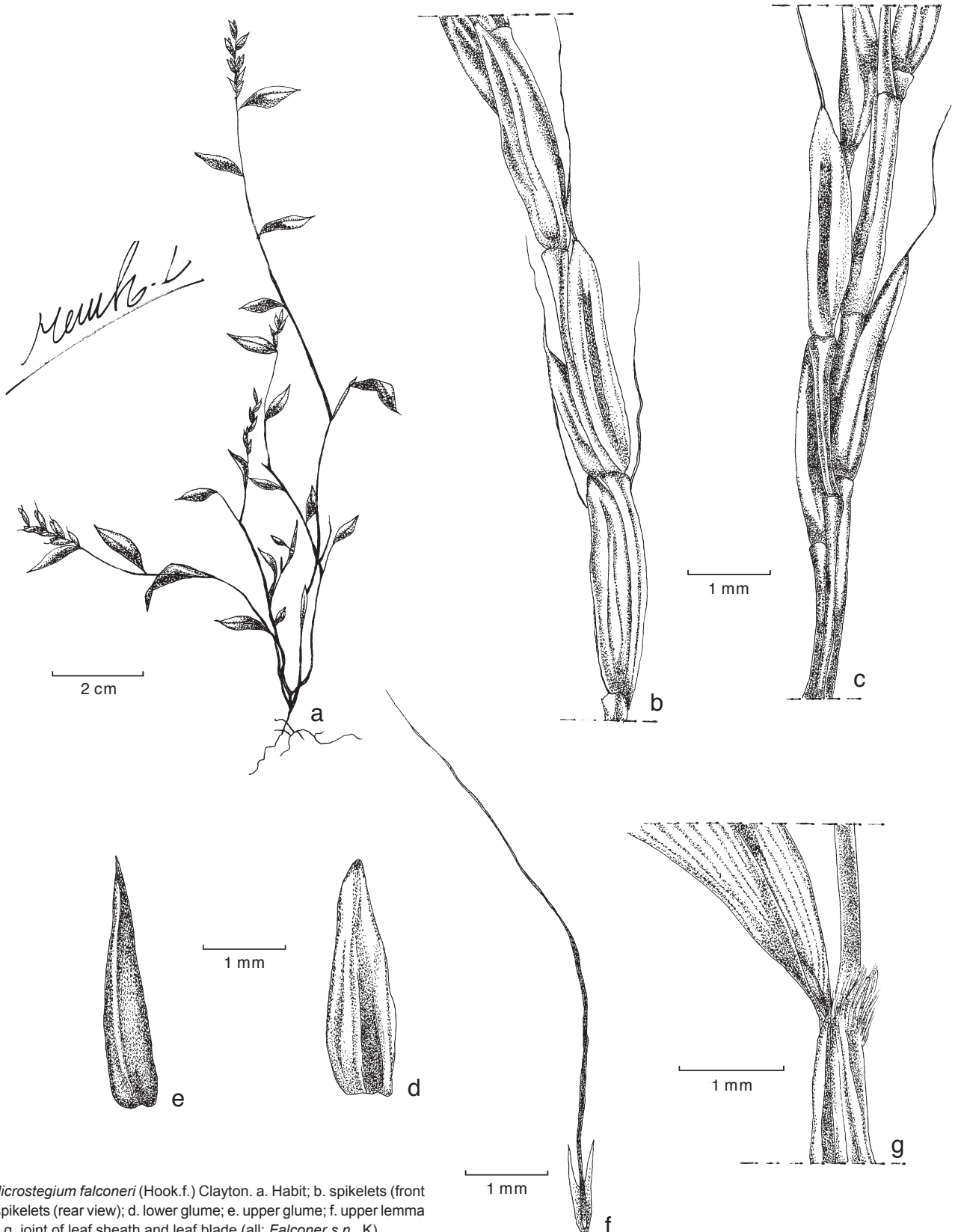


Fig. 5 *Microstegium falconeri* (Hook.f.) Clayton. a. Habit; b. spikelets (front view); c. spikelets (rear view); d. lower glume; e. upper glume; f. upper lemma with awn; g. joint of leaf sheath and leaf blade (all: *Falconer s.n.*, K).

Perennials, mat-forming. *Culms* rambling, robust or of moderate stature, 50–300 cm long, rooting from the lower nodes. Nodes glabrous or bearded. Sheaths glabrous to pilose, outer margin hairy, oral hairs absent or bearded. Ligule a glabrous membrane, 1–3 mm long. Blades linear to lanceolate, 5–30 cm by 5–25 mm, flaccid, base attenuate to slightly rounded,

pseudopetiole absent, margins scabrous, apex acute or acuminate, glabrous to densely pilose on both sides with tubercle-based hairs. *Panicles* 5–15 cm long, common axis 1–3 cm long. Racemes 3–25, usually digitate, sometimes racemose, ascending, straight, 4–15 cm long. Rachis fragile, angular, margins ciliate, internodes linear, 2–3 mm long. *Sessile spikelets*

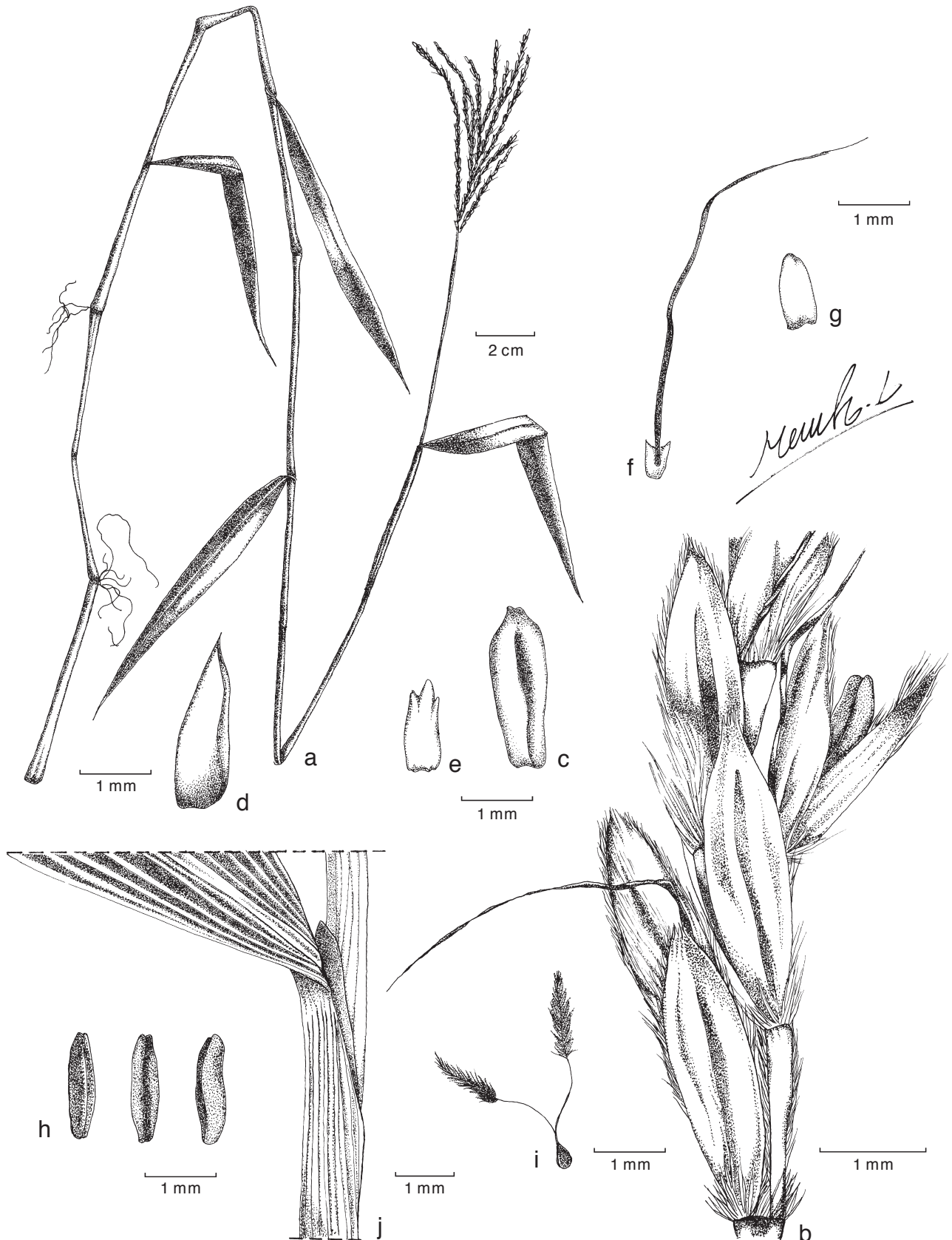
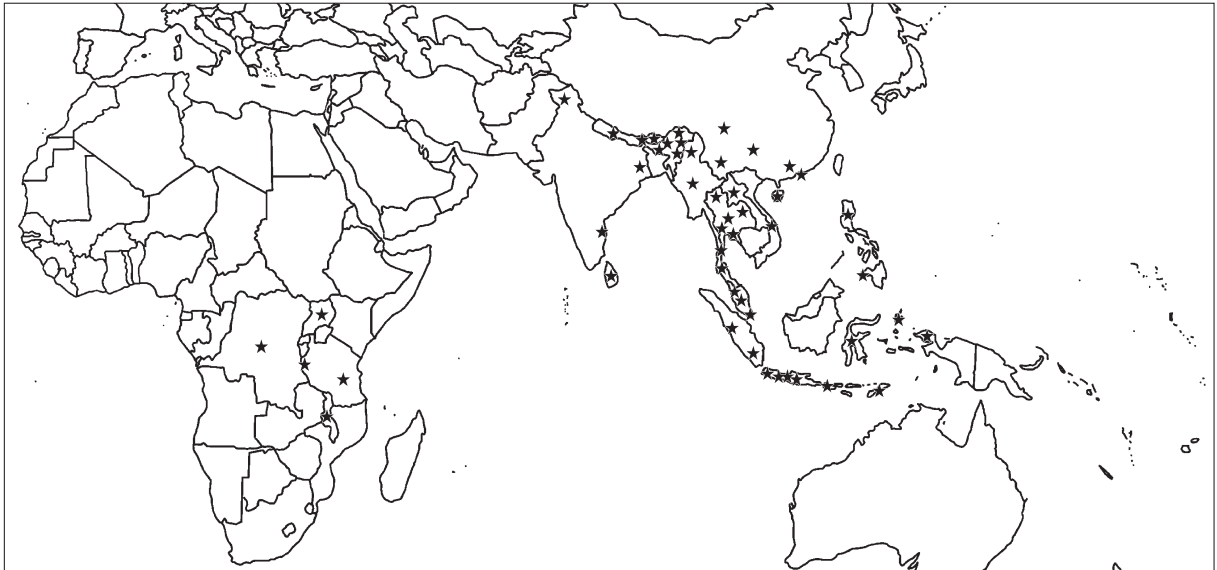


Fig. 6 *Microstegium fasciculatum* (L.) Henrard. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. lower lemma; f. upper lemma with awn; g. upper palea; h. pistil; i. stamens; j. joint of leaf sheath and leaf blade (all: Sampson 300, K).



Map 6 Distribution of *Microstegium fasciculatum* (L.) Henrard.

oblong, 2.5–4.5 mm long, callus pilose or setose. Lower glume elliptic to oblong, coriaceous, midrib glabrous, dorsally flat or longitudinally grooved, smooth, glabrous, margins glabrous, apex emarginate or obtuse, entire. Upper glume elliptic, back acute, glabrous, midrib ciliate, apex entire, acute to acuminate, mucous or mucro up to 4 mm long. Lower florets absent ('*monantha*') or when present reduced, male, paleate or sterile, epaleate. Upper lemma orbicular, 0.5–1.25 mm long, without veins, glabrous, apex incised to 0.1–0.25th of the lemma length, awn absent (forma '*mutica*') or present (forma '*aristata*'), from a sinus, geniculate, column twisted, 3–20 mm long. Upper palea oblong, 0.3–1 mm long, as long as the lemma, membranous, apex entire. Anthers 3, 1–2.7 mm long. *Pedicels* linear, semiterete, 1.5–2 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones. $2n = 60$.

Distribution — Africa (Tanzania, Zaire, Uganda, Congo, Malawi), India (Arunachal Pradesh, Assam, W Bengal, Manipur, Meghalaya, Nagaland), Nepal, Sikkim, Bhutan, Sri Lanka, Burma (widespread), Thailand (N: Chiang Mai, Lampang, Phrae, Tak; NE: Nakhon Phanom, Ranong; E: Chaiyaphum; SE: Chonburi; SW: Kanchanaburi, Rachaburi, Utaithani; Peninsular: Nakorn si Thammarat, Phuket), Vietnam, Laos, S China (Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Yunnan), Taiwan, Malesia: Malay Peninsula (Kelantan, Penang, Perlis), Singapore, Sumatra (W, S), Java (widespread), Lesser Sunda Islands (Sumbawa, Timor), Celebes, Moluccas (Morotai), Philippines (Luzon, Mindanao), New Guinea (Vogelkop).

Habitat — Open, disturbed areas, fallow fields, roadsides, fire damaged thickets and savannas, clearing in hardwood or deciduous forest, secondary forest, with much bamboo, overgrown rubber plantation, in hedges, shaded river side, dry sandy soil, sandstone, granite, limestone, marl, 0–1830 m altitude.

Uses — Readily eaten by cattle and horses with a sufficient feeding value.

Collector's notes — Perennial. Roots pale brown. Culms thicket-forming, vegetation forming, scrambling for several meters, erect-decumbent, rooting at the lower nodes, rather weak, (pale) green, green with purple, stramineous, glossy dark violet, 0.6–3 m long. Roots pale brown. Blades (glossy) dark green above, dull pale to dark green below. Inflorescence erect, axes yellowish, green, green with violet, dull maroonish. Racemes erectopatent. Spikelets whitish, greyish, pale green with pale green margins and nerves, pale yellowish, turning red-brownish, purplish brown, dull violet, hairs pale pink, white,

brown, magenta, maroonish, violet. Paleas pale green, white. Awns glossy brown, dull dark red, maroonish, purple, lower half dark magenta, dark violet, dark maroon, upper half pale brown, tan, whitish. Filaments white. Anthers (pale) yellow, greenish brown with purple dots, orange, tan. Stigmas white, pale green, dark maroon, purple.

Notes — Because of the separation here of *M. biaristatum* and *M. fasciculatum*, it is not possible to reconstruct the distribution of these species from literature. We based ours on the specimens examined to reconstruct them.

Noltie (2000) noted that in most specimens from Bhutan there is a lower floret, but that it is absent in the isotypes of *P. wallichiana* Nees and *P. laxa* Nees. Also absent in *M. vagans*, except in the type where there is a large palea.

Microstegium fasciculatum sometimes has the pedicelled spikelet much reduced, whereby in keys the genus cannot be reached: *Phakam* 69 (Thailand; L).

Depicted by Chen & Phillips (2007) as *M. ciliatum*.

8. *Microstegium fauriei* (Hayata) Honda

a. var. *fauriei* — Map 7

Pollinia fauriei Hayata (1917) 99, nomen; 7 (1918) 73, t. 41. — *Microstegium fauriei* (Hayata) Honda (1930) 410. — *Microstegium fauriei* (Hayata) Honda subsp. *fauriei* (Hayata) T.Koyama (1987) 428, 516. — Type: *Faurie* 215 (holo TI).

Annuals, mat-forming. Culms rambling, slender, 50–100 cm long, rooting from the lower nodes. Nodes pubescent. Sheaths glabrous, outer margin glabrous, oral hairs absent or ciliate. Ligule a glabrous membrane, 2–3 mm long. Blades lanceolate, 5–20 cm by 3–10 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, margins scaberulous, apex acute to acuminate, glabrous. Panicles 5–13 cm long, common axis 1–2 cm long. Racemes 4–10, digitate, ascending or patent, flexuous, 5–12 cm long. Rachis fragile, flattened, margins glabrous, internodes linear, 5–8 mm long. Sessile spikelets lanceolate, 4.5–5 mm long, callus pilose. Lower glume lanceolate, coriaceous, midrib glabrous, dorsally concave, smooth, glabrous, margins setose, apex acute, entire or dentate. Upper glume elliptic, back acute, glabrous, midrib setose, apex entire, acute, mucro 0.3–1.5 mm long. Lower florets, reduced, male or barren, epaleate. Upper lemma oblong, 0.8–1.5 mm long, veined, glabrous, apex incised to 0.25th of the lemma length,

awn from a sinus, flexuous, column absent, 16–37 mm long. Upper palea ovate, c. 2 mm long, 0.66–1 times as long as the lemma, membranous, apex entire. Anthers 3, 1.5–1.8 mm long. *Pedicels* linear, flattened, 2–4 mm long, margins glabrous. Pedicelled spikelets subequal to the sessile ones.

Distribution — Taiwan.

Habitat — Montane forests, humid places, trail sides, at medium altitude.

Notes — *Microstegium geniculatum* can be distinguished from *M. fauriei* mainly by the tomentose leaf blades. In a previous study (Chen et al. 2009), the clade formed by these two taxa had a strong bootstrap support (99 % in both NJ tree and MP tree), but the internal sistergroup relationship did not (69 % in NJ tree and 62 % in MP tree). It seems therefore more appropriate to treat them as varieties.

This species has been illustrated by Hsu (1975) and Liu (1997).

b. var. *geniculatum* (Hayata) C.Hui Chen, Kuoh & Veldk., *comb. nov.* — Map 7

Pollinia geniculata Hayata, Icon. Pl. Formos. [6, Suppl. (1917) 99 (nomen)]; 7 (1918) 73, t. 40. — *Microstegium geniculatum* (Hayata) Honda (1930) 410. — [*Pogonatherum aureum* (Bory) Roberty forma *geniculatum* (Stapf) Roberty (1960) 392, nom. inval., quoad *M. geniculata* (Hayata) Honda, non *Eulalia geniculata* Stapf]. — *Microstegium fauriei* (Hayata) Honda subsp. *geniculatum* (Hayata) T.Koyama (1987) 429, 516. — Type: *Hayata Jan.* 1912 (holo TI).

Pollinia hendersonii C.E.Hubb. (1927) 79. — *Microstegium hendersonii* (C.E.Hubb.) C.E.Hubb. (1934) 227, t. 105 (comb. nov. in legend!). — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *hendersonii* (C.E.Hubb.) Roberty (1960) 388, nom. inval.]. — Type: *SF 17940* (Henderson) (holo K; SING).

Culms rambling, 70–150 cm long. Ligule c. 1.6 mm long. Blades linear to lanceolate, 10–22 cm by 6–12 mm, moderately puberulous on both sides. *Panicles* 8–18 cm long. Racemes 3–10, ascending, 8–17 cm long. Rachis internodes 6–7 mm long. *Sessile spikelets* upper glume apex acuminate, mucro 0.5–1.5 mm long. Upper lemma awn 11–48 mm long. Upper palea 0.8–1.8 mm long, as long as the lemma. Anthers c. 2 mm long. *Pedicels* c. 3 mm long.

Distribution — Vietnam, S China (Fujian, Guangdong, Hainan), Taiwan, Malesia: Malay Peninsula (Pahang), N Sumatra (Aceh, E Coast), Sabah.

Habitat — Open, half shaded place, among boulders, on sand, near small stream, moist slope, slopes under *Pinus*, along path, roadside, 900–2400 m altitude.

Collector's notes — Creeping to scrambling, erect. Inflorescence very pale green.

Notes — Roberty (1960: 388, 392) erroneously equated *Eulalia geniculata* Stapf from Africa with *Microstegium geniculatum*. We presume the combination *Pogonatherum aureum* forma *geniculatum* was based on the first.

This species has been illustrated by Hsu (1975) under the name of *M. geniculatum* and by Chen & Phillips (2007).

9. *Microstegium glabratum* (Brongn.) A.Camus — Fig. 7; Map 8

Microstegium glabratum (Brongn.) A.Camus (1921) 201; Hosok. (1934) 663, isonym. — *Eulalia glabrata* Brongn. (1831) 93. — *Pollinia glabrata* (Brongn.) Trin. (1836) 70. — *Andropogon glabratus* (Brongn.) Steud. (1840) 91, non Roxb. [*Herb. Roxburgh in Wallich Cat. 8805-A* (in syn.; microfiche IDC 7394)]. — [*Pogonatherum glabratum* (Brongn.) Roberty (1960) 388, nom. inval.]. — Type: *Dumont d'Urville s.n. 'Borabora'* (holo P).

Nemastachys taitensis Steud. (1854b) 357. — *Microstegium taitense* (Steud.) A.Camus (1921) 201. — Type: *Dumont d'Urville s.n. 'Taiti'* (holo P).

Pollinia gracillima Hack. (1889) 179. — *Eulalia gracillima* (Hack.) Kuntze (1891) 775. — *Microstegium gracillima* (Hack.) A.Camus (1921) 201. — Type: *Anon.* (holo G) sub '*Leptatherum royleani*', Tahiti.

Pollinia monantha Nees ex Steud. var. *leptathera* Hack. (1908) 167. — Type: *Merrill 5212* (holo W, not found; L, P).

Pollinia glabrata (Brongn.) Trin. var. *luzonensis* Hack., *Kneucker Exsicc.* 785 (1914); *Allg. Bot. Z. Syst.* 20 (1915) 143. — Type: *Kneucker Exsicc.* 785 (*Fénix & Ramos*) (holo KR, lost; BM, K, L, WAG).

Microstegium nudum auct. non A.Camus.

Annuals, mat-forming. *Culms* rambling, weak, 25–60 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous or hairy, oral hairs scanty or absent. Ligule a glabrous membrane, 0.5–0.8 mm long. Blades lanceolate, 5–16 cm by 2–10 mm, flaccid, base attenuate to slightly rounded, pseudopetiole absent, margins scaberulous, apex acute to acuminate, glabrous or sparsely puberulous on both sides, without tubercle-based hairs. *Panicles* 4–10 cm long, common axis 0.5–1 cm long. Racemes 4–11, digitate, ascending, straight, 4–9 cm long. Rachis fragile, flattened, margins glabrous, internodes linear, 2.5–3.5 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, oblong to lanceolate, 2.5–3 mm long, callus glabrous or puberulous. Lower glume oblong, coriaceous, midrib glabrous, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex obtuse, entire. Upper glume elliptic, back acute, glabrous, midrib ciliate, apex entire, attenuate, mucro c. 0.5 mm long. Lower florets absent. Upper lemma oblong, 0.5–1 mm long, without veins, glabrous, apex entire, awn flexuous, column absent, 10–15 mm long. Upper palea ovate, 0.5–1 mm long, as long as the lemma, membranous, apex entire. Anthers 3, 0.7–1 mm long. *Pedicels* linear, flattened, 2–2.5 mm long, margins glabrous. Pedicelled spikelets subequal to the sessile ones.

Distribution — Malesia: Philippines (Luzon, Mindanao, Mindoro, Samar), Sabah, Borneo, Lesser Sunda Islands, Melanesia, Micronesia: Palau, Mariana Islands. Polynesia: New Caledonia, Vanuatu, Fiji, Samoa, Tahiti, Bora Bora, Raiatea. China (Hainan Island). Taiwan. Japan (S Ryukyu Islands).

Habitat — Forming dense vegetation, shaded, humid places, in fringe of wood, limestone, on serpentine, red clay, near brook, 80–1500 m altitude.



Map 7 Distribution of *Microstegium fauriei* (Hayata) Honda var. *fauriei* (●) and *M. fauriei* (Hayata) Honda var. *geniculatum* (Hayata) C.Hui Chen, Kuoh & Veldk. (★).

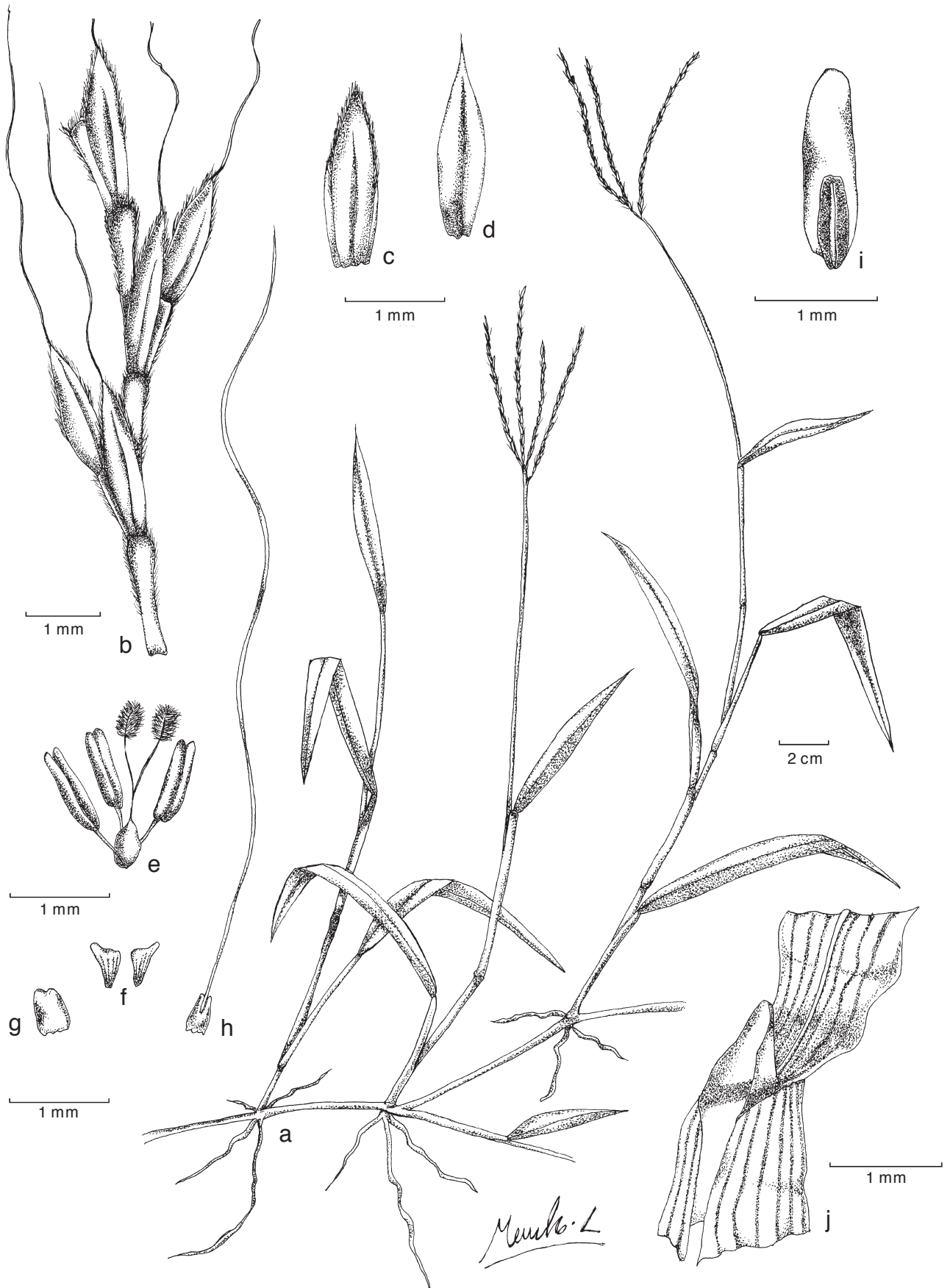


Fig. 7 *Microstegium glabratum* (Brongn.) A. Camus. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. pistil and stamens; f. lodicules; g. upper palea; h. upper lemma with long flexuous awn; i. caryopsis; j. joint of leaf sheath and leaf blade (all: *Veldkamp 7926*, L).

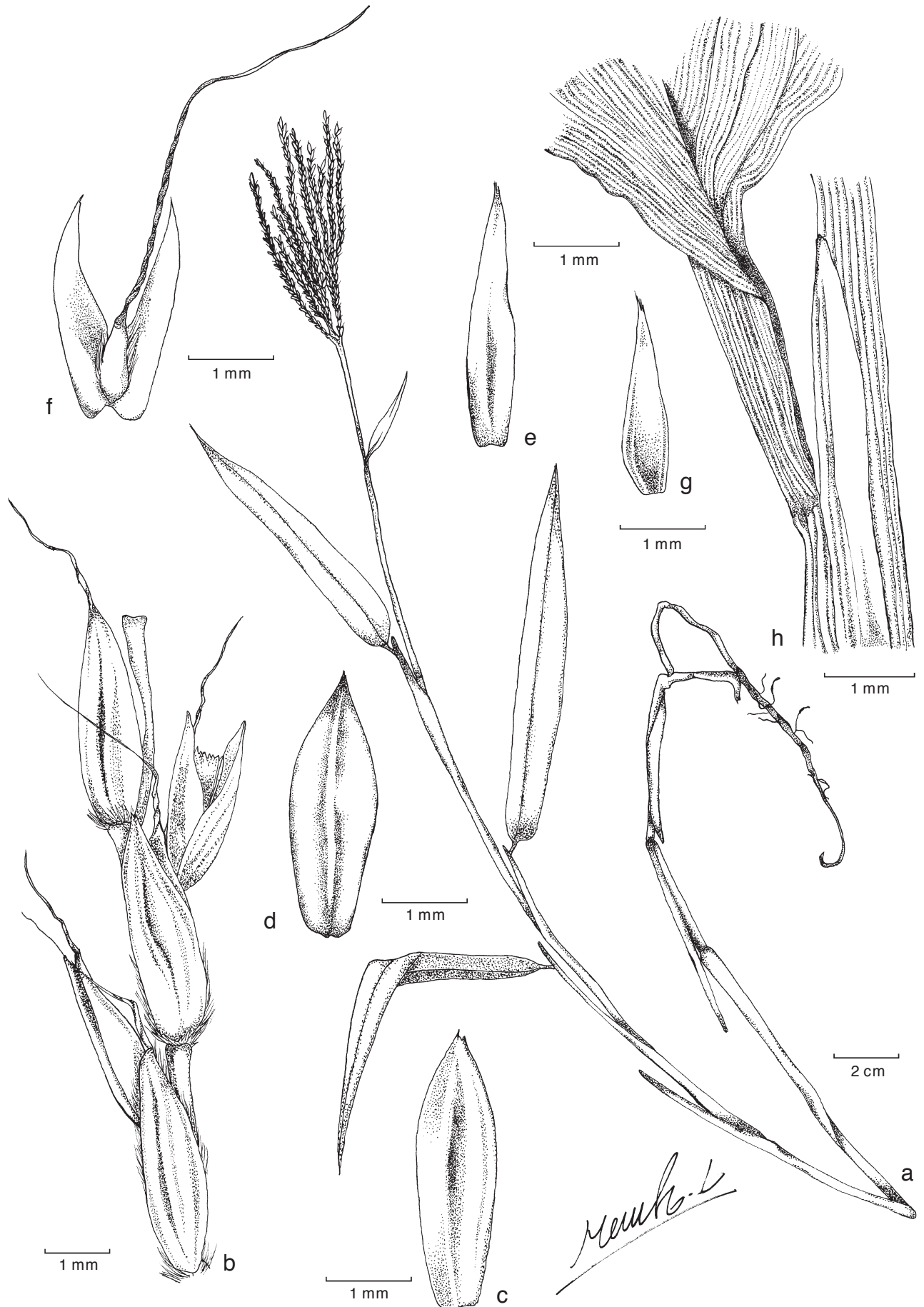
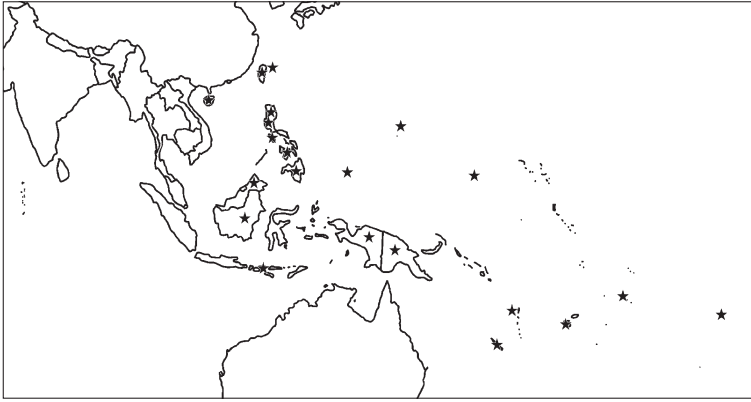


Fig. 8 *Microstegium petiolare* (Trin.) Bor. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. lower lemma; f. upper lemma with awn; g. upper palea; h. joint of leaf sheath and leaf blade (all: *Polunin, Sykes & Williams 5760, K*).



Map 8 Distribution of *Microstegium glabratum* (Brongn.) A.Camus.

Note — Apparently not in India (i.e. not mentioned by Sur 1985) although Wallich mentioned specimens in the Roxburgh herbarium. The line drawing of this species (Fig. 7) has been published previously (Chen et al. 2011a).

10. *Microstegium petiolare* (Trin.) Bor — Fig. 8; Map 9

Microstegium petiolare (Trin.) Bor (1938) 87. — *Spodiopogon petiolaris* Trin. (1832) 301. — *Andropogon petiolaris* (Trin.) Steud. (1854b) 398. — [*Andropogon petiolatus* Dalzell (1861) 303, orth. var.]. — *Ischaemum petiolare* (Trin.) Hack. (1889) 238. — Type: *Wallich in Herb. Hornemann* (holo C; in *Herb. Trin.* 66.1, LE, a beautiful drawing and fragments, microfiche IDC BT-16/1). Bor (1952) and Sur (1985) have *Wallich 8807* (BM, CAL, K, microfiche IDC 7394), Roberty (1960) cited 8807-A (G).

Pollinia lehmannii Arn. & Nees (preprint of 1843: 1841) 54; (1843) 186 ('*lehmannii*'). — *Spodiopogon lehmannii* (Arn. & Nees) Griseb. (1868) 91. — Type: Not indicated, presumably *Herb. Lehmann s.n.* (? holo S).

Microstegium yunnanense R.J.Yang (1984) 221. — Type: *R.J. Yang & Y.G. Han 77025* (holo SYAU).

Perennials, mat-forming. Culms rambling or scandent, reed-like or robust, 60–100(–400) cm long, rooting from the lower nodes. Nodes pubescent. Sheaths glabrous, outer margin glabrous or hairy, oral hairs absent. Ligule a glabrous membrane, 3–6 mm long. Blades lanceolate or elliptic, 5–30 cm long, 10–25 mm wide, firm, base attenuate to slightly rounded, base pseudo-petiole present, margins scabrous, apex acuminate, gradually attenuate, pilose, sparsely or moderately hairy on both sides, without tubercle-based hairs. Panicles 6–16 cm long, common axis 1.5–5 cm long. Racemes 8–20, digitate, ascending, straight, 6–14 cm long. Rachis fragile, semiterete, margins ciliate, internodes linear, internodes 3–4.5 mm long. Sessile spikelets without a short stalk, deciduous with the adjacent joint and pedicel, elliptic, 4.5–5 mm long, spikelet callus puberulous. Lower glume elliptic, coriaceous, midrib glabrous, dorsally concave, scaberulous, rough all over, glabrous, margins ciliate, apex acute, entire. Upper glume elliptic, back acute, glabrous,

midrib glabrous, apex entire, acute, muticous. Lower florets present, well-developed, paleate, male or barren, with palea. Lower lemma present, 4–5 mm long, muticous. Upper lemma oblong, 3–4 mm long, without veins, glabrous, apex incised, incised to 0.5–0.6th of the lemma length, apex awned, awn from a sinus, geniculate, column twisted, (incl. column) 6–8 mm long. Upper palea absent or minute. Anthers 3, 2.5–3 mm long. Pedicels linear, semiterete, 3.5–4 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — India (Meghalaya, Orissa), Nepal, Sikkim, Thailand (Chiangmai, Loei), Burma (Kachin, Mandalay), China (Yunnan).

Habitat — Grasslands, thickets, along paths, 1525–2100 m altitude.

Uses — Forage.

Collector's notes — Culms erect, sometimes scrambling, c. 1.2 m tall.

Notes — 1. The species has been illustrated by Chen & Phillips (2007).

2. The collection *Evrard 1777* (L, P) from S Vietnam (Dalat) is best placed here, although it differs in some respects. It is a new record for the country.

– Ligule 1.5 mm long. Racemes 1–7. Lower glume apex emarginate and more or less 2-winged. Anthers c. 1.7 mm long. Pedicels 2.5–3 mm long. *Evrard 1777*

– Ligule 3–6 mm long, Blades Racemes 8–20. Lower glume apex acute. Anthers 2.5–3 mm long. Pedicels 3.5–4 mm long *M. petiolare*

11. *Microstegium rufispicum* (Steud.) A.Camus — Fig. 9; Map 9

Microstegium rufispicum (Steud.) A.Camus (1921) 200; Henrard (1940) 455, isonym. — *Andropogon rufispicus* Steud. (1854a) 59, nom. nud.; (1854b) 379 ('*rufispica*'). — *Pollinia rufispica* Hack. (1889) 171. — *Eulalia rufispica*



Map 9 Distribution of *Microstegium petiolare* (Trin.) Bor. (★) and *M. rufispicum* (Steud.) A.Camus (●).

(Steud.) Kuntze (1891) 775. — *Pollinia ciliata* Trin. forma *rufispica* (Steud.) Backer (1922) 110; reprint: 34. — [*Pollinia ciliata* Trin. (unranked) *rufispica* (Steud.) Backer (1928) 49, incl. (unranked) *aristata*, nom. inval.]. — *Pogonatherum rufispicum* Roberty (1960) 382 ('*rufispica*'). — Type: Zollinger 2193 (holo P; BM, G, K).

Pollinia ciliata Trin. (unranked) *mutica* Hack. ex Backer (1928) 49. — Lectotype: *Gisius* 38 (holo L), designated here (as forma on some labels).

Perennials, mat-forming. Culms prostrate, reed like or robust, 60–500 cm long, without nodal roots, nodes glabrous. Sheaths puberulous to pilose, outer margin hairy, oral hairs bearded. Ligule a glabrous membrane, 1–2 mm long. Blades lanceolate, 10–25 cm by 8–15 mm, flaccid, base attenuate to slightly rounded, pseudopetiole absent, margins scabrous, apex acute to acuminate, glabrous to densely hairy on both sides, without

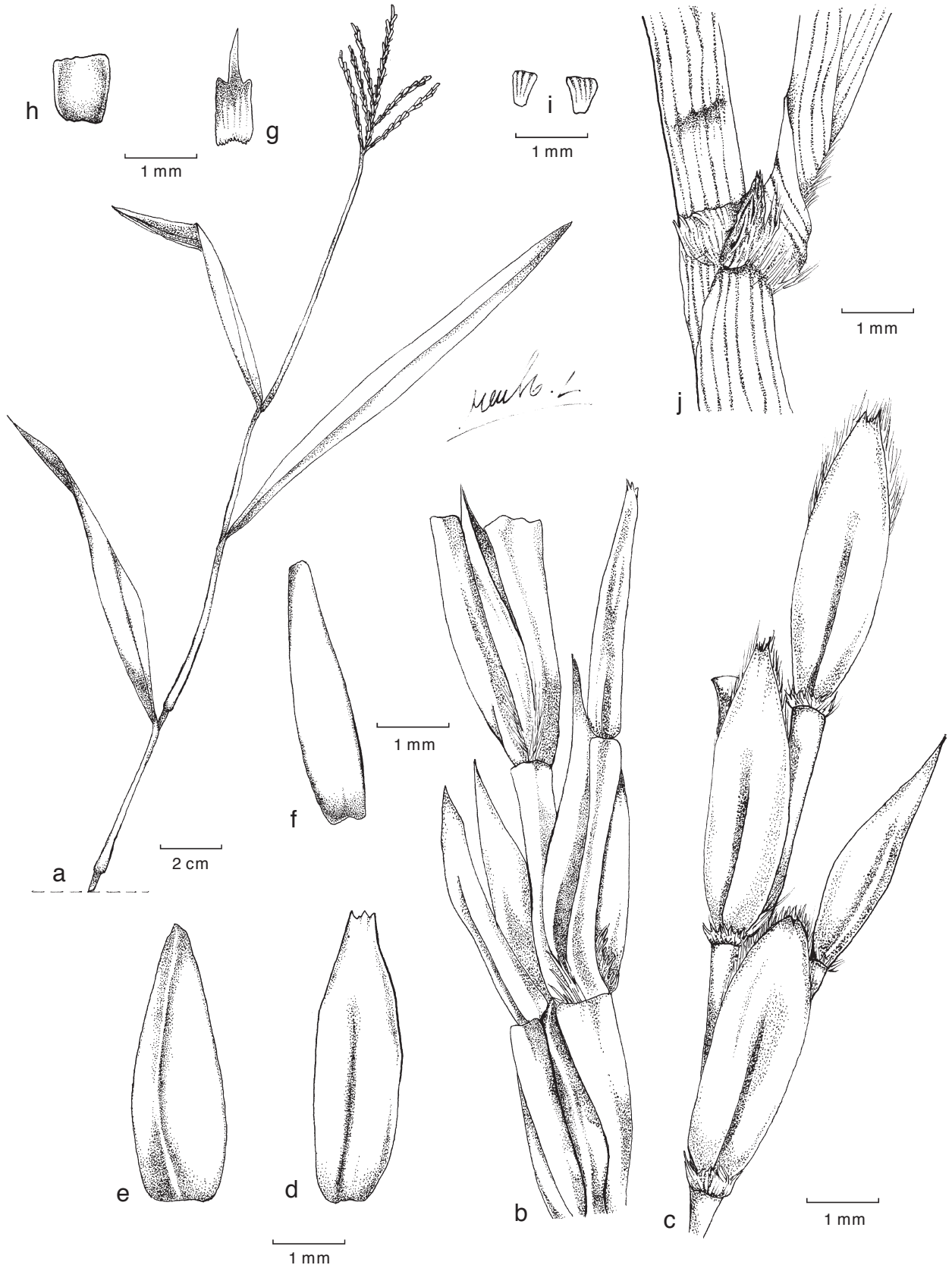


Fig. 9 *Microstegium rufispicum* (Steud.) A. Camus. a. Habit; b. spikelets (front view); c. spikelets (rear view); d. lower glume; e. upper glume; f. lower lemma; g. upper lemma; h. upper palea; i. lodicules; j. joint of leaf sheath and leaf blade (all: Zollinger 2193, K).

tubercle-based hairs. *Panicles* 5–15 cm long, common axis 1–3 cm long. Racemes 2–5, digitate, ascending, straight, 4–15 cm long. Rachis fragile, angular, margins glabrous or ciliate, internodes pyriform, 4–6 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, oblong, 5–7 mm long, callus puberulous. Lower glume elliptic, coriaceous, midrib glabrous, dorsally concave or longitudinally grooved, smooth, glabrous, margins ciliate, apex obtuse, entire. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, acute, muticous. Lower florets well-developed, male, paleate to barren, epaleate. Lower lemma lanceolate, 3–4 mm long, muticous. Upper lemma elliptic, 3.5–4 mm long, without veins, glabrous, apex entire, muticous or awned, awn from a sinus, straight, column absent, awn 0–14 mm long. Upper palea present or absent, ovate, 1–1.5 mm long, c. 0.33th times as long as the lemma, membranous, apex entire. Anthers 3, 3–4 mm long. *Pedicels* clavate, semiterete, 4–4.5 mm long, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — Malesia: E Java (Besuki, Pasuruan).

Habitat — Forest trail, grass jungles, shrub jungles, grassy slopes, 1500–2800 m altitude. Locally numerous to abundant.

Uses — Forage.

Collector's notes — Bright green.

Note — Backer (1928) distinguished tentatively between *Pollinia ciliata aristata* Hack. and *mutica* Hack. as intergrading forms within groups: valid, but rankless. The typical form is awned. Hackel (1889) said that awned and unawned spikelets occur within the same inflorescence, but as a rule they are of a single type, while in large areas only a single form occurs. Backer noted also a difference in the pubescence of the joints and glumes.

12. *Microstegium spectabile* (Trin.) A.Camus — Fig. 10; Map 10

Microstegium spectabile (Trin.) A.Camus (1921) 200; Hosok. (1935) 310, isonym. — *Pollinia spectabilis* Trin. (1832) 305. — *Eulalia spectabilis* (Trin.) Kuntze (1891) 775. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *spectabile* (Trin.) Roberty (1960) 389, nom. inval.]. — Type: *Mertens in Herb. Trinius* 57.1 (LE, microfiche IDC BT-16/1).

Pollinia spectabilis Trin. var. *ternatana* Backer (1922) 113; reprint: 37. — Lectotype: *Beguin* 73 (holo BO), designated here with aid from Mr. A. Sumadijaya (BO).

Microstegium spectabile (Trin.) A.Camus forma *cryptochaetum* Ohwi (1941) 550. — Type: *Hatusima* 11084 (holo FU).

Microstegium okamotoi Honda (1942) 16. — Type: *Okamoto* 1 (holo TI).

Microstegium gratum auct. non Hack.

Annuals, mat-forming. *Culms* rambling, robust, 100–170 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous or hairy, oral hairs absent or ciliate. Ligule a glabrous membrane, c. 1 mm long. Blades lanceolate, 10–18 cm by 10–20 mm, firm, base attenuate to

slightly rounded, pseudopetiole absent, margins scabrous, apex acute to acuminate, glabrous. *Panicles* 7–14 cm long, common axis 1–2.5 cm long. Racemes 10–40, digitate, ascending, straight, 7–10 cm long. Rachis fragile, semiterete, margins ciliate, internodes linear, 2.7–3.3 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, oblong to lanceolate, 2.5–4 mm long, callus pilose. Lower glume oblong to lanceolate, coriaceous, midrib ciliate, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex acute, entire. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, attenuate, muticous or mucro c. 1 mm long. Lower florets absent or present, paleate or barren and epaleate. Lower lemma absent to present, oblong, c. 0.5 mm long, muticous. Upper lemma linear, c. 1 mm long, without veins, glabrous, apex entire, awn apical, flexuous, column absent, 4–10 mm long. Upper palea absent or minute. Anthers 3, 1.5–2 mm long. *Pedicels* linear, flattened, 2–2.5 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — Burma (Northern part), China (Hong Kong), Taiwan, Malesia: Sumatra, Borneo, Celebes (Tomohon), Philippines (Mindanao), Lesser Sunda Islands (Flores), Moluccas (Halmahera, Ternate), New Guinea (widespread), Micronesia (Solomon Islands).

Habitat — Young secondary rain forest, sandy flood banks, 350–2000 m alt.

Notes — In the forma *cryptochaetum* from Ponape the awn is absent.

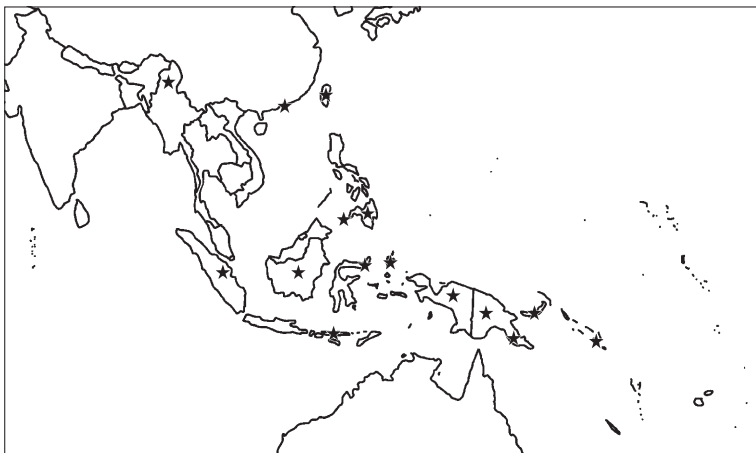
Honda (1942: 16) described an endemic species *M. okamotoi* in Taiwan based on only one specimen which was collected in Kaohsiung County and its holotype is deposited in the herbarium TI. It is odd that after its publication, no other authors mentioned this name anymore (Hsu 1975, 1978, 2000, Koyama 1987, Chen & Phillips 2006). After comparing the type specimen with the specimens deposited in the European herbaria mentioned above, we conclude that *M. okamotoi* is a synonym of *M. spectabile* (Chen et al. 2011b).

The line drawing of this species has been published previously (Chen et al. 2011b).

13. *Microstegium stapfii* (Hook.f.) A.Camus — Fig. 11; Map 11

Microstegium stapfii (Hook.f.) A.Camus (1921) 200. — *Pollinia stapfii* Hook.f. (1896a) 115. — Type: *Kurz s.n.* (holo K).

Perennials, mat-forming. *Culms* rambling, robust, 40–80 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin hairy, oral hairs absent. Ligule a ciliate membrane, 0.7–1 mm long. Blades elliptic, 10–15 cm by 10–20 mm, flaccid, base attenuate to slightly rounded, pseudopetiole present, margins scabrous, apex attenuate, acute, moderately



Map 10 Distribution of *Microstegium spectabile* (Trin.) A.Camus.

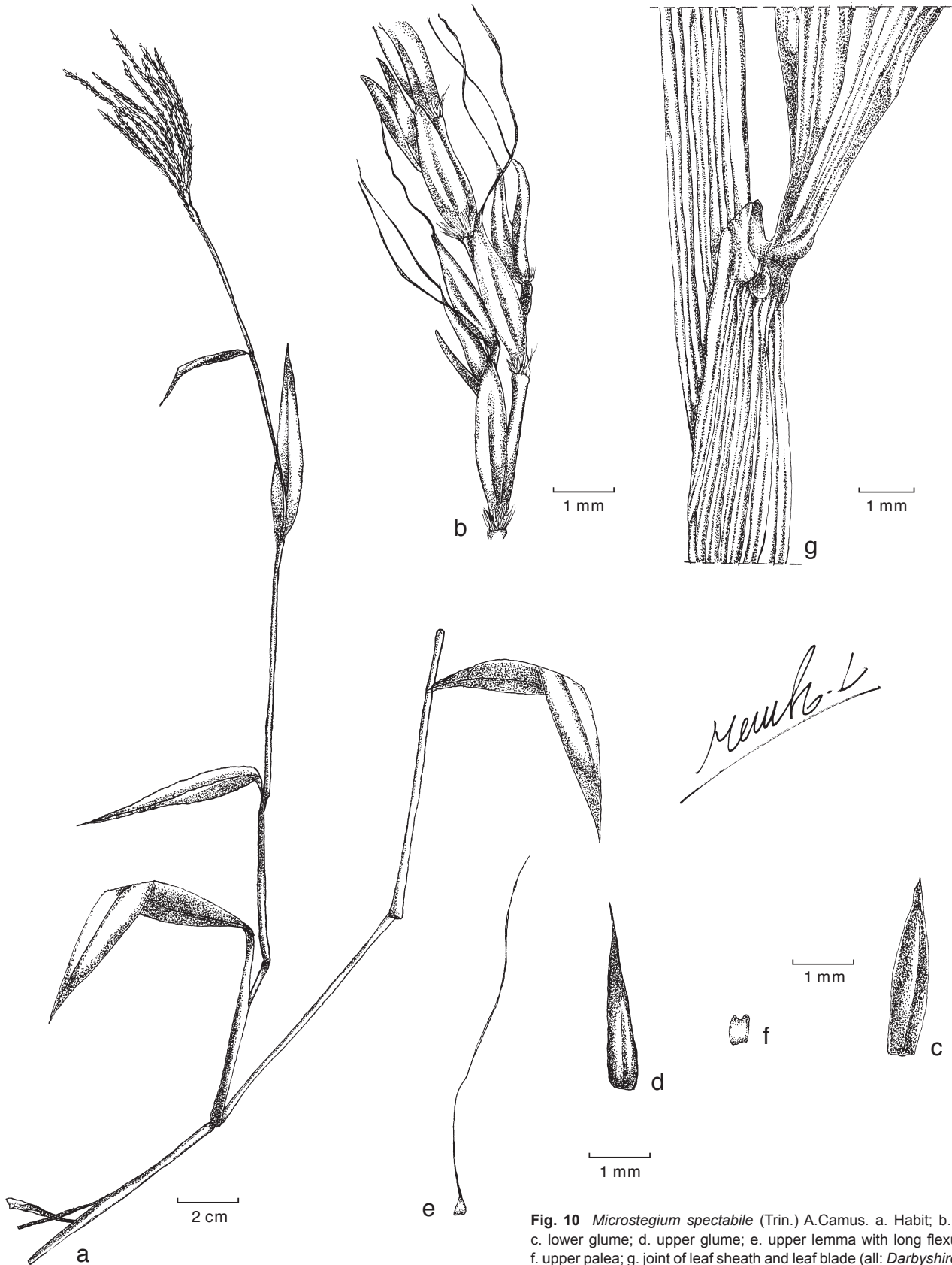


Fig. 10 *Microstegium spectabile* (Trin.) A. Camus. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. upper lemma with long flexuous awn; f. upper palea; g. joint of leaf sheath and leaf blade (all: Darbyshire 7953, L).

hairy on both sides, without tubercle-based hairs. *Panicles* 5–8 cm long, common axis 1.5–2.5 cm long. *Racemes* 6–9, digitate, ascending, straight, 4–7 cm long. *Rachis* fragile, angular, margins ciliate, internodes pyriform, c. 4.5 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, elliptic, c. 4.5 mm long, callus setose. Lower glume elliptic, coriaceous, midrib glabrous, dorsally longitudinally grooved, smooth, pilose all over, margins glabrous, apex

obtuse, erose. Upper glume lanceolate, back acute, pilose, midrib glabrous, hairy near the apex, apex dentate, acute, awned, awn c. 2 mm long. Lower florets reduced, male or barren, epaleate. Upper lemma lanceolate, c. 1.5 mm long, veined, glabrous, apex incised to 0.1–0.25th of the lemma length, awn from a sinus, geniculate, column twisted, awn (incl. column) 20–24 mm long. Upper palea oblong, 1–1.5 mm long, as long as the lemma, hyaline, apex erose. Anthers 3, c. 3 mm long.

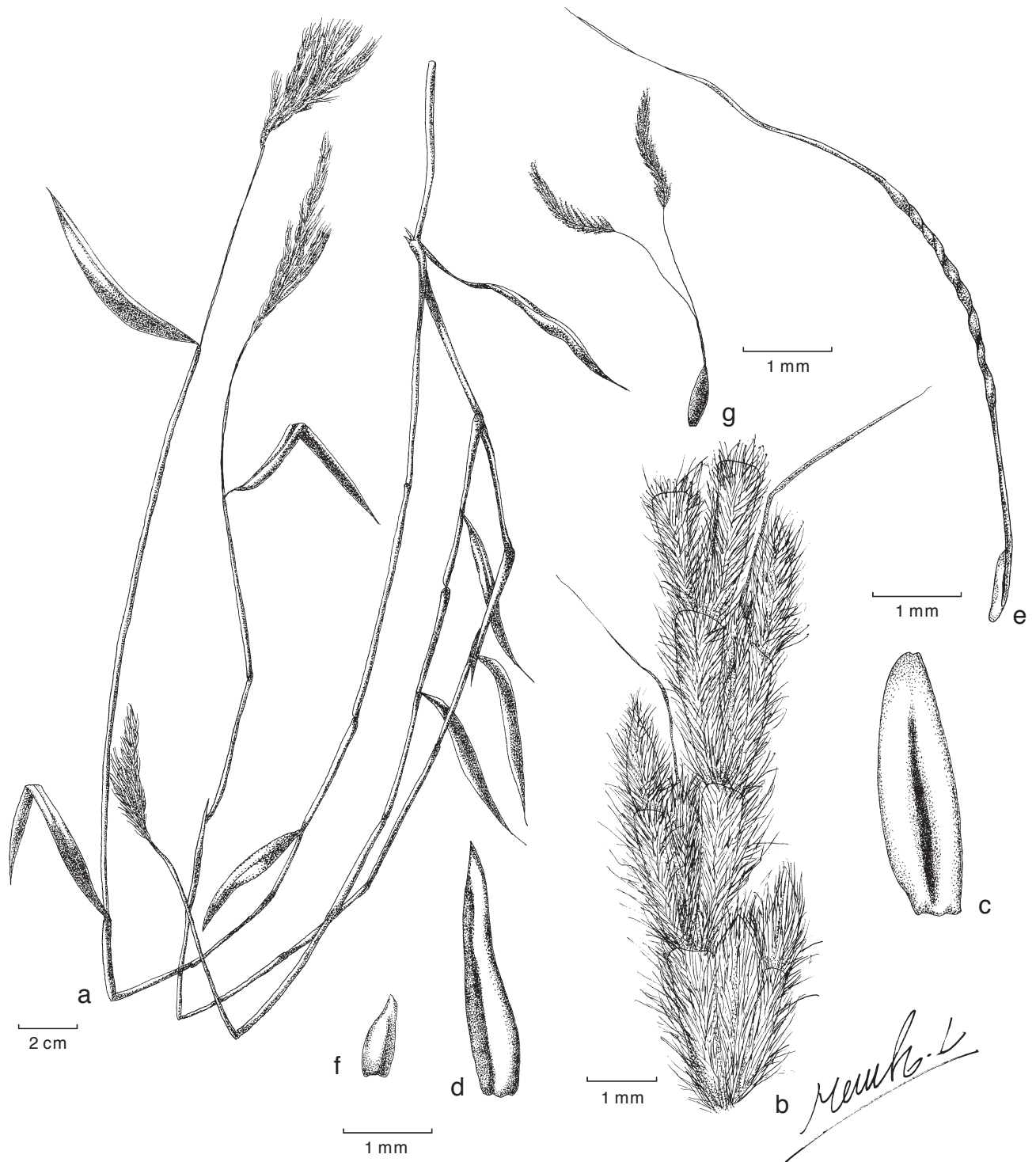


Fig. 11 *Microstegium stapfii* (Hook.f.) A. Camus. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. upper lemma with long flexuous awn; f. upper palea; g. pistil (all: Kurz s.n., K).

Pedicels clavate, V-shaped, c. 4 mm long, margins pubescent. Pedicelled spikelets variously reduced, c. 0.25 as long as the sessile, female or sterile.

Distribution — Burma (Arakan, Sagaing).

Habitat — Low sandstone hills.

Note — Known only from the type specimen.

14. *Microstegium steenisii* Jansen — Fig. 12; Map 11

Microstegium steenisii Jansen (1953) 306. — Type: Van Steenis 4320 (holo BO; L).

Annuals, mat-forming. *Culms* geniculately ascending, of moderate stature, 50–80 cm long, rooting from the lower nodes.

Nodes pubescent. Sheaths glabrous, outer margin glabrous, oral hairs bearded. Ligule a ciliolate membrane, 0.5–0.7 mm long. Blades lanceolate, 4–5 cm by 6–8 mm wide, firm, base attenuate to slightly rounded, pseudopetiole absent, margins scabrous, apex acute to acuminate, glabrous to moderately hairy on both sides with tubercle-based hairs. *Panicles* c. 3 cm long, common axis c. 0.5 cm long. Racemes 2–4, digitate, ascending, straight, 4–5 cm long. Rachis fragile, semiterete, margins ciliate, internodes linear, 1–1.5 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, lanceolate, c. 5 mm long, callus setose. Lower glume lanceolate, coriaceous, midrib glabrous, dorsally concave, smooth, glabrous, margins setose, apex acute, entire. Upper glume lanceolate, back acute, glabrous or pilose, midrib

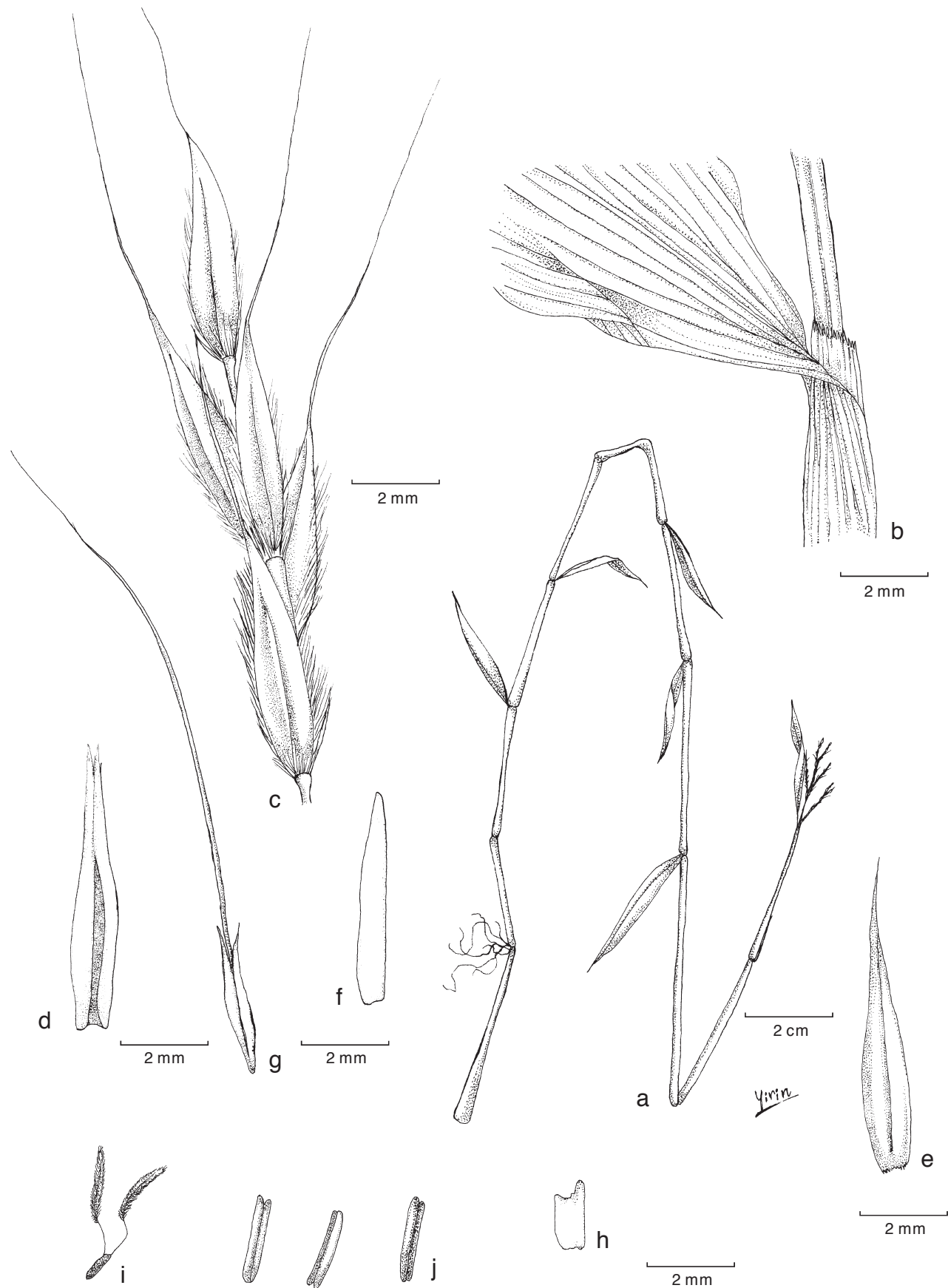
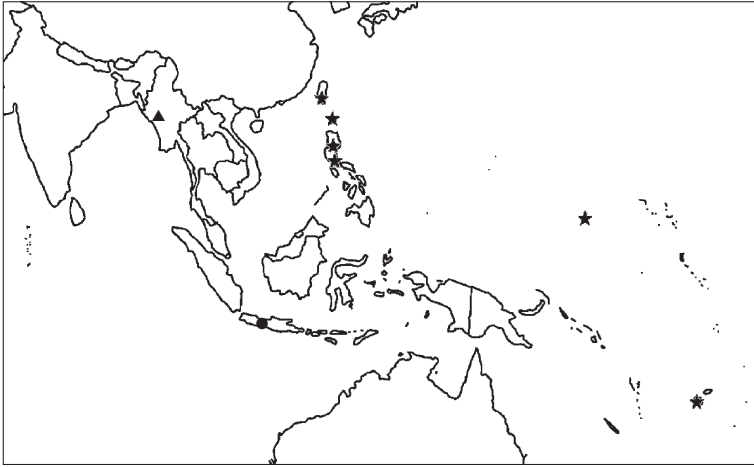


Fig. 12 *Microstegium steenisii* Jansen. a. Habit; b. joint of leaf sheath and leaf blade; c. spikelets; d. lower glume; e. upper glume; f. lower lemma; g. upper lemma with long flexuous awn; h. upper palea; i. pistil; j. stamens (all: van Steenis 4320, L).



Map 11 Distribution of *Microstegium stapfii* (Hook.f.) A. Camus (▲), *M. steenisii* Jansen (●), and *M. tenue* (Trin.) Hosok. (★)

glabrous, hairy near the base, apex entire, acute, mucous or mucro c. 0.8 mm long. Lower florets well-developed, paleate, or barren, epaleate. Lower lemma lanceolate, c. 4.5 mm long, mucous. Upper lemma oblong, 3–4 mm long, without veins, glabrous, apex incised to 0.25th of the lemma length, awned from a sinus, awn flexuous, column absent, 10–15 mm long. Upper palea oblong, c. 2.3 mm long, c. 0.33th times as long as the lemma, membranous, apex entire. Anthers 3, c. 1.5 mm long. *Pedicels* linear, flattened, c. 2.5 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — Malesia: Java (Papandayan).

Habitat — Mountains, c. 2040 m altitude.

Note — Known only from the type specimen.

15. *Microstegium tenue* (Trin.) Hosok. — Fig. 13; Map 11

Microstegium tenue (Trin.) Hosok. (1938) 150; Jansen (1953) 307, isonym. — *Pollinia tenuis* Trin. (1832) 306. — *Eulalia tenuis* Kuntze (1891) 775. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *tenue* Roberty (1960) 389, nom. inval.]. — Type: *Chamisso 24 in Herb. Trinius 58.1* (LE, microfiche IDC BT-16/1; W).

Pleuroplitis producta Griseb. (1853) 478. — *Andropogon productus* (Griseb.) Regel (1866) 760, t. 2, f. 16–21. — Type: *Eschscholtz s.n.* (holo LE, L. film 35, neg. 23).

Annuals, mat-forming. *Culms* rambling, weak, 20–100 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous, oral hairs absent or ciliate. Ligule a glabrous membrane, c. 1 mm long. Blades linear or lanceolate, 4–20 cm by 4–8 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, margins scabrous, apex acute to acuminate, glabrous to sparsely pilose on both sides, with tubercle-based hairs. *Panicles* 3–5 cm long, common axis c. 0.5 cm long. Racemes 2–4, digitate, ascending, straight, 2–5 cm long. Rachis fragile, flattened, margins ciliate, internodes pyriform, 1.5–2 mm long. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, lanceolate, 2–3 mm long, callus puberulous. Lower glume oblong to lanceolate, coriaceous, midrib glabrous, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex entire or dentate. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, acute, mucro 1–3 mm long. Lower florets present, well-developed, paleate or barren, epaleate. Lower lemma lanceolate, c. 1.5 mm long, mucous. Upper lemma lanceolate, c. 0.3 mm long, without veins, glabrous, apex entire, awn geniculate, column twisted, 7–12 mm long. Upper palea absent or minute. Anthers 1, c. 0.5 mm long. *Pedicels* clavate, flattened, c. 1.5 mm long, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — Taiwan, Philippines (Luzon), Micronesia (Kosrae).

Habitat — Dry open slopes, cliffs, 0–1200 m altitude.

Notes — The only specimen in Taiwan was collected in 1960. It is unclear whether this species is still extant there (Chen et al. 2011b).

The line drawing of this species has been published previously (Chen et al. 2011b).

16. *Microstegium vimineum* (Trin.) A. Camus — Map 12

Microstegium vimineum (Trin.) A. Camus (1921) 201. — *Andropogon vimineus* Trin. (1832) 268. — *Eulalia viminea* (Trin.) Kuntze (1891) 775. — *Pollinia viminea* (Trin.) Merr. (1923) 35. — [*Microstegium vimineum* (Trin.) A. Camus var. *typicum* Honda (1930) 407, nom. inval.]. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *vimineum* (Trin.) Roberty (1960) 389, nom. inval.]. — Type: *Wallich Cat. 8838 in Herb. Trinius 329.1* (holo LE, fragm., microfiche IDC BT-16/1; CAL, E, G, K, NY, microfiche IDC 7394; L, P, MO) Bor (1952) and Sur (1985) cite '8832' (CAL), which is the type of *Pollinia imberbis*. We suggest this is a misprint.

Microstegium willdenovianum Nees (1836) 447, nom. superfl. — *Pollinia willdenoviana* (Nees) Benth. (1881) 67 ('*willdenowianum*'), nom. superfl. — *Pollinia imberbis* Nees ex Steud. var. *willdenoviana* (Nees) Hack. (1889) 178, nom. superfl. — *Microstegium vimineum* (Trin.) A. Camus var. *willdenovianum* Hack. ex A. Camus (1922) 260 ('*willdenowiana* Hack. '), nom. inval. (autonym required); Sur (1985) 175, isonym. — [*Microstegium vimineum* (Trin.) A. Camus forma *willdenovianum* Osada (1993) 702, t., nom. inval.]. — Type: '*Nepal Herb. Willd.*' (holo B, but not found in IDC microfiche 7440 sub *Andropogon* or *Arthraxon* while there is no *Microstegium* or *Pollinia* at all).

Pollinia imberbis Nees ex Steud. (1854b) 410. — [*Pollinia imberbis* Nees ex Steud. var. *genuina* Hack. (1889) 178, nom. inval.]. — *Eulalia viminea* (Trin.) Kuntze var. *imberbis* (Nees ex Steud.) Kuntze (1891) 775. — *Microstegium vimineum* (Trin.) A. Camus var. *imberbe* (Nees ex Steud.) Honda (1930) 408. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *imberbe* (Nees ex Steud.) Roberty (1960) 388, nom. inval.]. — *Microstegium imberbe* (Nees ex Steud.) Tzvelev (1961) 22. — Type: *Wallich Cat. 8832* (holo B, lost?; BM, CAL, E, G, K, microfiche IDC 7394; P).

Pollinia japonica Miq. var. *monostachya* Franch. & Sav. (1877) 190; (1878) 608. — *Pollinia imberbis* Nees ex Steud. forma *monostachya* (Franch. & Sav.) Hack. [(1889) 178, nom. in dub.]; ex Nakai (1914) # 172c; ex T. Mori (1922) 52, isonym. — *Microstegium vimineum* (Trin.) A. Camus var. *monostachyum* (Franch. & Sav.) Nakai (1952) 139. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *monostachyum* (Franch. & Sav.) Roberty (1960) 389, nom. inval. ('*monostachys*')]. — Type: *Savatier 2565* p.p. (holo P).

[*Pollinia japonica* Miq. var. *polystachya* Franch. & Sav. (1877) 190; (1878) 608, pro specim. — *Microstegium vimineum* (Trin.) A. Camus var. *polystachyum* (Franch. & Sav.) Ohwi (1942a) 156, pro specim. — *Microstegium vimineum* (Trin.) A. Camus forma *polystachyum* (Franch. & Sav.) T. Koyama (1971) 65, pro specim. — Voucher: *Savatier 2565* p.p. (P)].

Pollinia debilis Balansa (1890) 82. — *Microstegium debile* (Balansa) A. Camus (1921) 201. — [*Pogonatherum glabratum* (Brongn.) Roberty subvar. *debile* (Balansa) Roberty (1960) 388, nom. inval.]. — Type: *Balansa 1741* (holo L; G, K, P).

Eulalia viminea (Trin.) Kuntze var. *variabilis* Kuntze (1891) 775. — Type: *Kuntze s.n.* (holo NY, n.v.).

Arthraxon nodosus Kom. (1901) 448; Welzen (1981) 295. — *Microstegium nodosum* (Kom.) Tzvelev (1961) 23. — *Microstegium vimineum* (Trin.) A. Camus

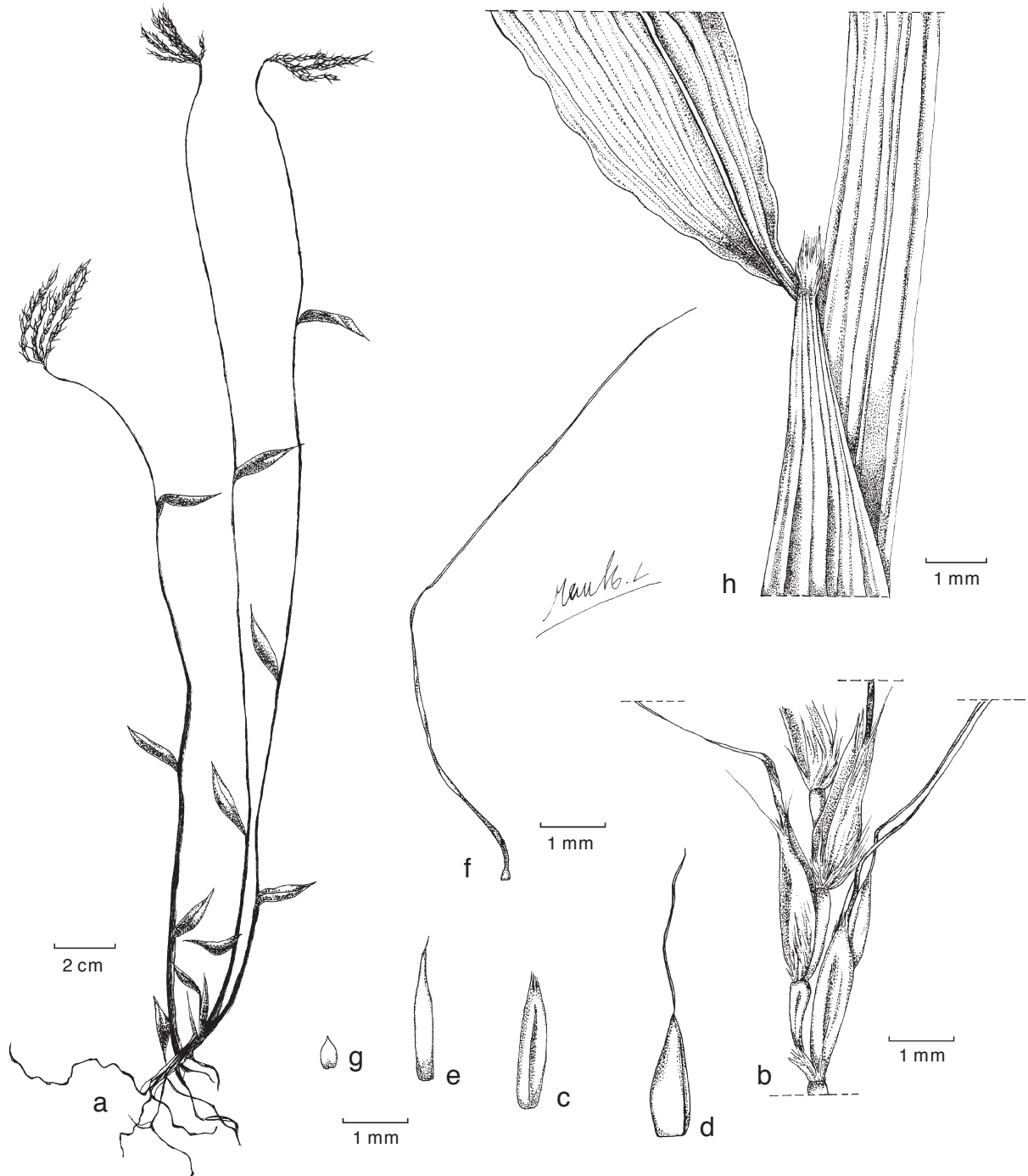


Fig. 13 *Microstegium tenue* (Trin.) Hosok. a. Habit; b. spikelets; c. lower glume; d. upper glume; e. lower lemma; f. upper lemma with awn; g. upper palea; h. joint of leaf sheath and leaf blade (all: Merrill 4310, P).

subsp. *nodosum* (Kom.) Tzvelev (1976) 695. — Lectotype: *Komarov* 28 Aug. 1897 ? = 126 (holo LE; P, TI), designated by Tzvelev (1976: 695).
Pollinia cantonensis Rendle (1904) 354. — *Microstegium cantonense* (Rendle) A. Camus (1921) 20. — *Eulalia cantonensis* (Rendle) Hitchc. (1931, '1929') 234. — Type: *Sampson in Herb. Hance* 14923 p.p. (holo BM; K).
Pollinia imberbis Nees ex Steud. subvar. *latifolia* Matsuda (1911) (281). — Type: probably *Matsuda Ao* 1892 (holo TI).
Pollinia imberbis Nees ex Steud. forma *glabriflora* Hack. ex Nakai (1914) 15. — Syntypes: *Taquet* 1833, 1835, 1912, 5052, 6109, 6110, *Nakai Ao* 1913, *Nakai* 4886.
Pollinia imberbis Nees ex Steud. var. *geniculata* Hack. ex Makino & Nemoto (1925) 1490. — Type: Book not seen. Not in Chase & Niles (1962).
Microstegium dilatatum Koidz. (1930) 38. — Lectotype: *Faurie* 6410 (holo KYO; P), designated here.
Microstegium aristulatum Robyns & Tournay (1955) 240. — Type: *Scaetta* 1613 (holo BR; K, P).
Microstegium reticulatum B.S. Sun ex H. Peng & X. Yang (1996) 213, t. 1, f. 1–10. — Type: *H. Peng* 1448 (holo YUKU).

Andropogon lasiocoelos auct. non Steud.: Steud. (1854b) 383, quoad *Buerger s.n.* — *Arthraxon lanceolatus* Miq. (1866) 288 ('*lanceolatum*'), non Hochst. (1856). — Lectotype: *Buerger s.n.* (holo L, sh. 908.83-1054), designated here.

Annuals, mat-forming. Culms decumbent, of moderate stature, 10–50 cm long, rooting from the lower nodes. Nodes glabrous or pubescent. Sheaths glabrous, outer margin glabrous or hairy, oral hairs absent, or scanty, ciliate. Ligule a glabrous membrane, 0.5–1.5 mm long. Blades elliptic or oblong, 5–10 cm by 7–15(–19) mm, firm, base attenuate to slightly rounded, pseudopetiole absent, margins scabrous, apex acute or acuminate, glabrous to densely pilose on both sides, with or without tubercle-based hairs. Panicles 3–9 cm long, common axis 0–2.5 cm long. Racemes 1–6, solitary or digitate, erect or patent, straight, 3–7 cm long. Rachis fragile, flattened, margins ciliate, internodes linear, 4–5 mm long. Sessile spikelets without

a short stalk, deciduous with the adjacent joint and pedicel, elliptic to lanceolate, 3.5–6.5 mm long, callus glabrous or pilose. Lower glume elliptic to lanceolate, coriaceous, midrib glabrous, dorsally longitudinally grooved, smooth, glabrous, margins glabrous or ciliate, apex obtuse or acute, entire or erose. Upper glume elliptic, back acute, glabrous, midrib glabrous, apex entire, acute, muticous. Lower florets absent to present and well-developed, paleate, male. Lower lemma present or absent, oblong, 1.5–3.5 mm long, muticous. Upper lemma linear, 0.5–2 mm long, veined, glabrous, apex incised to 0.25th of the lemma length, apex mucronate or awned, awn apical or from a sinus, awn straight or geniculate, column absent or straight to slightly twisted, 1–32 mm long. Upper palea absent to present, oblong, 0.5–2 mm long, as long as the lemma, membranous, apex entire. Anthers 3, 0.3–0.5 mm long. *Pedicels* linear, flattened, 3.5–4.5 mm long, margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — Africa (Congo, Cameroon), NW Iran, Pakistan, India (W Bengal, Himachal Pradesh, Meghalaya, Nagaland), Sikkim, Bhutan, Nepal, Burma (Chin), Indo-China to the Ryukyu Islands, Japan (Hokkaido, Honshu, Kyushu, Shikoku), Korea, introduced in the Caucasus, Iran, Turkey, United States (East and Gulf Coast); Malesia, apparently very rare and local, extant?: Java (*Backer 16258* (BO): Pekalongan, Yosorejo, *Lörzing 162, 163, 289* (BO): Sindoro near Sibajak, not in Monod de Froideville (1968), Philippines (Luzon, Mt Polis, Mt Pulog).

Habitat — Very wide, from saturated wetlands to rocky areas, under closed canopies, along paths, ditches, disturbed areas, 1200–2000 m altitude.

Vernacular name — Japanese stilt grass, Nepalese brown-top.

Uses — Regarded as a noxious weed in the USA (Ehrenfeld 1999, who described it as a rhizomatous perennial).

Notes — According to many authors there would be two infra-specific taxa based on the presence or absence of an awn in the sessile spikelets (*'imberbe, willdenovianum'*). The form without an awn is perhaps at most to be called *Microstegium vimineum* forma *willdenovianum*. Inflorescences with muticous basal spikelets were described as *Eulalia viminea* var. *variabilis*.

Sometimes the pedicelled spikelet is so much reduced, that in keys the genus cannot be identified (Noltie 2000).

Camus (1922) noted cleistogamous florets here and in the synonymous *M. debile*, where the anthers were not exerted,

but remained inside the spikelet even in fruit. Cleistogamous inflorescences would be hidden in the sheath (Ehrenfeld 1999).

Chen & Phillips (2006) noted that *M. reticulatum* “represents an extreme local variant from the *Microstegium vimineum* complex. It is distinguished from typical *M. vimineum* by the combination of a more delicate habit, broader leaf blades, and a conspicuously reticulately veined lower glume”. Although we have not seen the type, we find these characters insufficient to recognise the taxon at any level.

Note the disjunct distribution. Curiously, no collections from Thailand have been seen although the collections in BM, E, K, L, and P have been searched.

This species has been illustrated by Hsu (1975), Osada (1993), and Liu (1997), and by Chen & Phillips (2007) as both *M. reticulatum* and *M. vimineum*

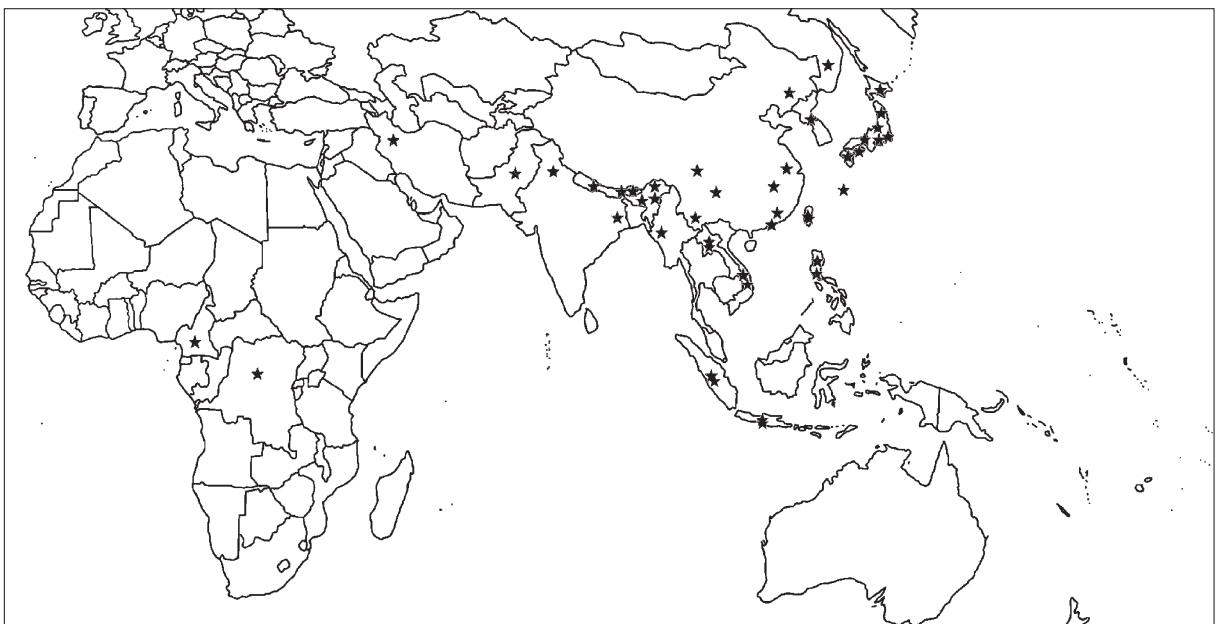
NOMINA INCERTAE SEDIS VEL INVALIDA

Microstegium batangense (S.L.Zhong) S.M.Phillips & S.L.Chen

Microstegium batangense (S.L.Zhong) S.M.Phillips & S.L.Chen (2006) 594.
— *Arthraxon batangensis* S.L.Zhong (1982) 79. — Type: West Sichuan Veget. Exped. 3898 (holo SWAU; CDBI, PE).

Description after the original publication.

Perennials. *Culms* geniculately ascending or decumbent, slender, 20–45 cm long. Nodes glabrous. Sheaths glabrous. Ligule a glabrous membrane, 0.6–1 mm long. Blades lanceolate to linear, 1–5.5 cm by 15–20 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, apex acute to acuminate, glabrous to moderately hairy, without tubercle-based hairs. *Panicles* c. 6.5 cm long. Racemes solitary, ascending, straight, 3.5–6.5 cm long. Rachis fragile, semiterete, margins ciliate, internodes long, slender. *Sessile spikelets* lanceolate, 6–7.8 mm long, callus pilose. Lower glume lanceolate to linear, coriaceous, midrib glabrous, dorsally longitudinally grooved, scaberulous, rough all over, glabrous, margins glabrous, apex acuminate, entire. Upper glume elliptic, back rounded, glabrous, midrib glabrous, apex entire, acute, awned. Lower florets paleate, male. Lower lemma lanceolate, muticous. Upper lemma linear, 3.5–4 mm long, veined, ciliate, hairy all along the margins, apex incised to 0.5th of the lemma length, awn from a sinus, geniculate, column twisted, (incl. column) 10–14



Map 12 Distribution of *Microstegium vimineum* (Trin.) A. Camus.

mm long. Upper palea membranous, apex entire. Anthers 3, c. 3 mm long. *Pedicels* linear, margins pubescent. Pedicelled spikelets variously reduced.

Distribution — China (Sichuan).

Habitat — Dry river valleys, under shrubs, 2600–3100 m altitude.

Note — Only known from the type (not seen).

***Microstegium borianum* Sur**

Microstegium borianum Sur (1982) 652, t. 1. — Type: *Deka 15683* (holo CAL).

Description after the original publication.

Perennials. *Culms* robust, up to 130 cm long. Nodes pubescent. Sheaths pubescent. Ligule a glabrous membrane, 2–4.5 mm long. Blades lanceolate, 10–25 cm by 15–20 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, apex acute to acuminate, moderately pilose on both sides with tubercle-based hairs. *Panicles* c. 10 cm long, common axis c. 1 cm long. Racemes 3–4, digitate, ascending, straight, 5–10 cm long. Rachis fragile, internodes long, slender. *Sessile spikelets* oblong to lanceolate, 5.5–6 mm long. Lower glume oblong to lanceolate, coriaceous, midrib ciliate, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex erose. Upper glume lanceolate, back acute, glabrous, midrib glabrous, apex entire, mucronate, c. 1 mm long. Lower florets paleate, barren. Lower lemma lanceolate, c. 4.5 mm long, mucinous. Upper lemma ovate to oblong, 3.5–4 mm long, veined, glabrous, apex incised to 0.5th of the lemma length, awn from a sinus, geniculate, column straight or slightly twisted, (incl. column) 9–10 mm long. Upper palea as long as the lemma, hyaline, apex entire. Pedicelled spikelets variously reduced. Anthers 3, c. 3 mm long. *Pedicels* linear, V-shaped, margins pubescent.

Distribution — India (Meghalaya).

Note — Only known from the type (not seen), said to be close to *M. petiolare*.

***Microstegium butuoense* Y.C.Liu & H.Peng**

Microstegium butuoense Y.C.Liu & H.Peng (2011) 182. — Type: *Zhu 318* (holo PE).

Description after the original publication.

Annual. *Culms* slender, straggling, eventually becoming more or less vertical for about 35 cm; nodes densely bearded. Leaf sheaths tuberculate-hispid; leaf blades elliptic lanceolate, 0.7(–2) by 0.2(–0.5) cm, both surface sparsely hispid, apex acute; ligule membranous, eciliate, c. 0.6 mm. Raceme single, 2(–3.5) cm, rachis tough, rachis internodes linear, c. 4.5 mm, ciliate with c. 1.5 mm hairs. *Sessile spikelets* c. 5.2(–6) mm; callus hairs up to 1 mm; lower glume c. 5 mm, linear-lanceolate, back flat, 4–5-veined, glabrous, apex truncate or emarginate; upper glume c. 5.5 mm, sharply keeled, apex acuminate; lower lemma lanceolate, c. 4 mm; upper lemma 3–3.5 mm, 2-lobed in upper 1/3, lobes acuminate; awn geniculate, 6–9 mm; upper palea 1 mm, ciliate with c. 0.6 mm hairs. Anthers unseen. Pedicelled spikelet similar.

Distribution — China (Sichuan).

Habitat — Alpine meadow.

Note — Only known from the type (not seen).

***Microstegium calochloa* (Lauterb. & K.Schum.) Pilg.**

Microstegium calochloa (Lauterb. & K.Schum.) Pilg. (1940) 122. — *Pollinia calochloa* Lauterb. & K.Schum. in Schum. & Lauterb. (1901) 167. — Type: *Lauterbach 37* (holo B, lost?).

Description after the original publication.

Mat-forming. *Culms* geniculately ascending, slender, 20–45 cm long, nodes glabrous. Sheaths puberulous, outer margin hairy. Ligule a ciliolate membrane, c. 0.5 mm long. Blades lanceolate, 4–8 mm wide, base attenuate to slightly rounded, base pseudopetiole absent, apex acuminate. *Panicles* 4–8 cm long. Racemes 3–5, digitate. Rachis fragile, subcylindrical and excavated (?), margins glabrous, internodes linear, 2.3–2.5 mm long. *Sessile spikelets* c. 3 mm long, callus puberulous to pilose. Lower glume dorsally concave, scaberulous, glabrous. Upper glume apex acuminate, mucinous. Lower florets absent. Upper lemma c. 1.5 mm long, entire, awn apical, flexuous, (incl. column) c. 17 mm long. Upper palea c. 0.6 mm long, c. 0.4th times as long as the lemma. Anthers c. 0.3 mm long. *Pedicels* c. 1.5 mm long. Pedicelled spikelets subequal to the sessile ones.

Distribution — Papua New Guinea, Kaiser Wilhelmsland, Oertzen-Gebirge, in the western Finisterre Range (5°32'S, 145°48'E, Madang Prov.).

Habitat — Abandoned plantation, 100 m altitude.

Note — Only known from the type (not seen). Possibly a form of *M. nudum*. Reported from the Vogelkop and Morobe Prov., so no doubt in between as well.

***Microstegium lanceolatum* (Keng) S.M.Phillips & S.L.Chen**

Microstegium lanceolatum (Keng) S.M.Phillips & S.L.Chen (2006) 596. — *Ischaemum lanceolatum* Keng (1931) 155, t. 1. — Type: *Maire 7039* (holo US; UC).

Description after the original publication.

Perennials, caespitose. *Culms* erect, robust, 20–40 cm long, nodes glabrous. Sheaths glabrous. Ligule a glabrous membrane, 2–3 mm long. Blades lanceolate, 3–8 cm long, 3–10 mm wide, stiff, base attenuate to slightly rounded, pseudopetiole present, margins scabrous, apex acute or acuminate, glabrous. *Panicles* c. 7 cm long, common axis c. 1.5 cm long. Racemes 2–3, paired or digitate, ascending, straight, 3–6 cm long. Rachis fragile, margins ciliate, internodes linear. *Sessile spikelets* oblong to lanceolate, 5–6 mm long, callus pilose. Lower glume oblong to lanceolate, coriaceous, midrib glabrous, dorsally longitudinally grooved, smooth, glabrous, margins glabrous, apex acute, entire or erose. Upper glume oblong, back acute, glabrous, midrib glabrous, apex entire, acute, mucinous. Lower florets paleate, male or barren. Lower lemma oblong, mucinous. Upper lemma oblong, 4–5 mm long, veined, ciliate, hairy all along the margins, apex incised to half of the lemma length, awn from a sinus, geniculate, column twisted, (incl. column) 8–12 mm long. Upper palea membranous, apex entire. *Pedicels* linear, margins pubescent. Pedicelled spikelets subequal to the sessile ones, or variously reduced.

Distribution — China (Yunnan)

Habitat — Not recorded, 2800–3000 m altitude.

Note — No specimen seen.

***Microstegium monoracemum* W.C.Wu**

Microstegium monoracemum W.C.Wu (1985) 35, f. 1. — Type: *Z.-L. Huang 10076* (holo CANT).

Description after the original publication.

Annuals. *Culms* decumbent, slender, 30–60 cm long, rooting from the lower nodes. Nodes glabrous. Sheaths glabrous, outer margin glabrous, mouth glabrous. Ligule a glabrous membrane, 1 mm long. Blades lanceolate, 1.5–3.5 cm by 3–5 mm, base attenuate to slightly rounded, pseudopetiole absent, apex acute, glabrous. *Panicles* 3–4 cm long. Racemes 1, erect, straight, 3–4 cm long. Rachis fragile, margins ciliate, internodes slender,

3–4 mm long. *Sessile spikelets* 4–4.5 mm long, callus puberulous. Lower glume lanceolate; dorsally longitudinally grooved, apex obtuse. Upper glume oblong; back acute, mucous. Lower florets absent. Upper lemma oblong; 0.8–1 mm long, apex entire, awn apical, geniculate, column twisted, (incl. column) 6–7 mm long. Upper palea oblong, 0.3–0.8 mm long, 0.37–0.8 times as long as the lemma. Anthers 3. *Pedicels* margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — Continental China (Guangzhou).

Note — This species was not included in the Chen & Phillips (2006) and in IPNI (11 Aug. 2010). It seems to be a 1-spiked form of *M. vimineum*.

***Microstegium multiciliatum* B.S.Sun, nom. inval.**

Microstegium multiciliatum B.S.Sun in Sun, Wang & Wang (1999) 95 ('*multiciliatum*'). — Type: Not indicated, invalidly published (Art. 37.1) (holo YUNU).

Description after Chen & Phillips (2006).

Perennials. *Culms* rambling, robust, 50–120 cm long, rooting from the lower nodes. Nodes pubescent. Sheaths hispid. Ligule a glabrous membrane, 1.5–2 mm long. Blades elliptic to oblong, 23–25 cm by 20–25 mm, firm, base attenuate to slightly rounded, pseudopetiole absent, apex attenuate, sparsely hairy on both sides, with tubercle-based hairs. *Panicles* c. 14 cm long, common axis c. 3 cm long. Racemes c. 10, digitate, ascending, straight, 9–12 cm long. Rachis fragile, angular, margins ciliate, internodes linear. *Sessile spikelets* without a short stalk, deciduous with the adjacent joint and pedicel, oblong, 4.5–5 mm long, callus setose. Lower glume oblong, coriaceous, midrib glabrous, dorsally longitudinally grooved, scaberulous, rough at apex, glabrous, margins glabrous, apex entire. Upper glume elliptic, back acute, glabrous, midrib ciliate, apex entire, acute, mucous. Lower florets absent or present, then well-developed, paleate, barren, and lower lemma 0–1 mm long, mucous. Upper lemma orbicular, 0.8–1 mm long, without veins, ciliolate, hairy towards the apex, apex incised, awn from a sinus, geniculate, column twisted, (incl. column) 10–12 mm long. Upper palea oblong, c. 1.5 mm long, hyaline, apex erose. Anthers 3, 3–3.5 mm long. *Pedicels* linear, margins pubescent.

Distribution — China (Yunnan).

Habitat — Mountain slopes.

***Microstegium pleiostachyum* (Lauterb. & K.Schum.) A.Camus**

Microstegium pleiostachyum (Lauterb. & K.Schum.) A.Camus (1921) 200. — *Pollinia pleiostachya* Lauterb. & K.Schum. in Schum. & Lauterb. (1901) 168. — Type: *Hellwig* 637 (holo B, extant?).

Description after the original publication.

Culms of moderate stature or slender, 120–130 cm long. Sheaths outer margin hairy. Ligule a ciliolate membrane or a fringe of hairs, c. 1.5 mm long. Blades lanceolate to linear, 6–15 cm by 8–14 mm, base attenuate to slightly rounded, pseudopetiole absent, margins scaberulous to scabrous, apex acuminate to attenuate, glabrous. *Panicles* c. 6.5 cm long. Racemes 18–34, c. 6 cm long. Rachis fragile, margins ciliate, internodes c. 2.5 mm long. *Sessile spikelets* oblong to lanceolate, c. 3 mm long, callus pilose. Lower glume dorsally flat to concave, scaberulous, rough at apex, glabrous, margins glabrous. Upper glume mucous. Lower florets absent. Upper lemma c. 1 mm long, glabrous, apex entire, awn apical, straight to flexuous, column absent, c. 9 mm long. Upper palea c. 0.5 mm long, 0.5th times as long as the lemma. Anthers c. 1.5 mm long. *Pedicels* margins pubescent. Pedicelled spikelets subequal to the sessile ones.

Distribution — New Guinea, Madang Prov., W Finisterre ('Kaiser Wilhelmsland, Oertzen Gebirge'; 5°32'S, 145°48'E).

Note — This seems to be a form of *M. spectabile*.

***Microstegium triaristatum* B.M.Yang, nom. inval.**

Microstegium triaristatum B.M.Yang (1980) 100. — Type: Not indicated, invalidly published (Art. 37.1), voucher in Herb. Biological Department of Hunan Teachers College, Changsha, Hunan.

***Pogonatherum glabratum* (Brongn.) Roberty subvar. *mairei* Roberty, nom. inval.**

[*Pogonatherum glabratum* (Brongn.) Roberty subvar. *mairei* Roberty (1960) 388, nom. inval.]. — Voucher: *Maire* 17 (G).

Distribution — S China.

***Pogonatherum glabratum* (Brongn.) Roberty subvar. *micromegas* Roberty, nom. inval.**

[*Pogonatherum glabratum* (Brongn.) Roberty subvar. *micromegas* Roberty (1960) 388, nom. inval.]. — Voucher: *Merrill* 3286 (G, L), Philippines, Luzon.

The voucher specimen in L is *Dimeria ornithopoda* Trin. actually.

NOMINA EXCLUDENDA

Microstegium pseudeulalia Hosok. (1938) 151. — *Schizachyrium pseudeulalia* (Hosok.) S.T.Blake (1969) 77. — Type: *Hosokawa* 9189 (holo FU). = *Schizachyrium pseudeulalia* (Hosok.) S.T.Blake.

Microstegium rupestre (Ridl.) A.Camus (1921) 200. — *Pollinia rupestris* Ridl. (1905) 208. — Type: *Ridley* 11018 (holo SING). = *Ischaemum digitatum* Brongn.

Acknowledgements This study was made possible by the study of specimens in A, BISH, BM, BO, CANB, E, HAST, K, KYO, L, MO, NCKU, NSW, P, PNH, PPI, PTBG, SAN, SING, SINU, TAI, TAIE, TAIF, TI, TNM, U (now in L), US, W, WAG. Their directors, keepers, and curators are gratefully acknowledged. Ms S Lee kindly checked some material in SING. Dr. RJ Soreng (US) found some rare publications.

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INDEX

Accepted names are in roman type. New names are in **bold** type; synonyms and superfluous names are in *italics*. The number after each name is the number of the species as used in this revision; (nom. inc.) refers to nomina incertae sedis vel invalida and (nom. excl.) to nomina excludenda.

Andropogon biaristatus Steud. 1
fasciculatum L. 7
formosanus Rendle 1
 var. *minor* Rendle 1
glabratus (Brongn.) Steud. 9
lasiocoleos auct. 16
petiolaris (Trin.) Steud. 10
petiolatus Dalzell 10
productus (Griseb.) Regel 15
rufispicus Steud. 11
vagans Rendle 7
vimineus Trin. 16

Arthraxon batangensis S.L.Zhong (nom. inc.)
lanceolatus Miq. 16
nodosus Kom. 16
Chloris fasciculata (L.) Thell. 7
Coelarthron Hook.f. [p. 161]
brandisii Hook.f. 2
Dactylodes fasciculatum (L.) Kuntze 7
Ephebopogon Nees & Meyen ex Steud. [p. 161]
gratus Nees & Meyen ex Steud. 7
Eulalia bequaertii (De Wild.) De Wild. 7
cantonensis (Rendle) Hitchc. 16
ciliata (Trin.) Kuntze 7

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dispar (Nees ex Steud.) Kuntze 4
eucnemis (Nees ex Steud.) Kuntze 5
glabrata Brongn. 9
gracillima (Hack.) Kuntze 9
grata (Hack.) Kuntze 7
monantha (Nees ex Steud.) Kuntze 7
parceciliata (Pilg.) Pilg. ex Peter 7
rufispica (Steud.) Kuntze 11
spectabilis (Trin.) Kuntze 12
tenuis Kuntze 15
vagans (Nees ex Steud.) Kuntze 7

Eulalia (cont.)

- viminea* (Trin.) Kuntze 16
 var. *imberbis* (Nees ex Steud.) Kuntze 16
 var. *variabilis* Kuntze 16
- Ischaemum digitatum* Brongn. (nom. excl.)
lanceolatum Keng (nom. inc.)
petiolare (Trin.) Hack. 10
- Ischnochloa* Hook.f. [p. 161]
falconeri Hook.f. 6
- Leptatherum bequaertii* (De Wild.) Robyns 7
- Microstegium Nees [p. 161]
 sect. *Eumicrostegium* Honda [p. 161]
 sect. *Monantha* Honda [p. 161]
 sect. *Vimineae* Tzvelev [p. 161]
aristulatum Robyns & Tournay 16
batangense (S.L.Zhong) S.M.Phillips & S.L.Chen (nom. inc.)
bequaertii (De Wild.) Henrard 7
biaristatum (Steud.) Keng 1
biforme Keng 1
borianum Sur (nom. inc.)
brandisii (Hook.f.) Rhind 2
breviaristatum (Rendle) A.Camus 7
butuoense Y.C.Liu & H.Peng (nom. inc.)
calochloa (Lauterb. & K.Schum.) Pilg. (nom. inc.)
cantonense (Rendle) A.Camus 16
ciliatum (Trin.) A.Camus 7
 subsp. *integrum* (Ohwi) T.Koyama 1
 var. *formosanum* Honda 1
 var. *integrum* Ohwi 1
 var. *latifolium* Ohwi 7
 var. *laxum* (Nees ex Steud.) Reeder 7
 var. *wallichianum* (Nees ex Steud.) Honda 1
ciliatum auct. 1
clavigerum (Backer) Henrard 2
debile (Balansa) A.Camus 16
delicatulum (Hook.f.) A.Camus 3
dilatatum Koidz. 16
dispar (Nees) A.Camus 4
elmeri (Hack.) A.Camus 1
eucnemis (Nees ex Steud.) A.Camus 5
eucnemis auct. 2
falconeri (Hook.f.) Clayton 6
fasciculatum (L.) Henrard 7
fasciculatum auct. 1
fauriei (Hayata) Honda 8, 8a
 subsp. *fauriei* (Hayata) T.Koyama 8a
 subsp. *geniculatum* (Hayata) T.Koyama 8b
 var. *fauriei* 8a
 var. **geniculatum** (Hayata) C.Hui Chen, Kuoh & Veldk. 8b
formosanum (Hack.) A.Camus 1
geniculatum (Hayata) Honda 8b
glaberrimum (Honda) Koidz. 1
glabratum (Brongn.) A.Camus 9
gracile (Ridl.) A.Camus 7
gracillima (Hack.) A.Camus 9
gratum (Hack.) A.Camus 7
gratum auct. 12
hendersonii (C.E.Hubb.) C.E.Hubb. 8b
imberbe (Nees ex Steud.) Tzvelev 16
lanceolatum (Keng) S.M.Phillips & S.L.Chen (nom. inc.)
monanthum (Nees ex Steud.) A.Camus 7
monoracemum W.C.Wu (nom. inc.)
montanum (Nees ex Steud.) Henrard 7
 var. *hirsutum* Jansen 7
multiciliatum B.S.Sun (nom. inc.)
nodosum (Kom.) Tzvelev 16
nudum auct. 9

Microstegium (cont.)

- okamotoi* Honda 12
parceciatum (Pilg.) Pilg. 7
petiolare (Trin.) Bor 10
pleiostachyum (Lauterb. & K.Schum.) A.Camus (nom. inc.)
pseudeulalia Hosok. (nom. excl.)
reticulatum B.S.Sun ex H.Peng & X.Yang 16
rufispicum (Steud.) A.Camus 11
rupestre (Ridl.) A.Camus (nom. excl.)
spectabile (Trin.) A.Camus 12
 forma *cryptochaetum* Ohwi 12
stapfii (Hook.f.) A.Camus 13
steenisii Jansen 14
taitense (Steud.) A.Camus 9
tenuis (Trin.) Hosok. 15
triaristatum B.M.Yang (nom. inc.)
vagans (Nees ex Steud.) A.Camus 7
 var. *dubium* (Hack.) Hand.-Mazz. 7
 var. *scandens* Bor 7
vimineum (Trin.) A.Camus 16
 forma *polystachyum* (Franch. & Sav.) T.Koyama 16
 forma *willdenovianum* Osada 16
 subsp. *nodosum* (Kom.) Tzvelev 16
 var. *imberbe* (Nees ex Steud.) Honda 16
 var. *monostachyum* (Franch. & Sav.) Nakai 16
 var. *polystachyum* (Franch. & Sav.) Ohwi 16
 var. *typicum* Honda 16
 var. *willdenovianum* Hack. ex A.Camus 16
willdenovianum Nees 16
yunnanense R.J.Yang 10
- Nemastachys taitensis* Steud. 9
- Pleuroplitis producta* Griseb. 15
- Pogonatherum* P.Beauv.
 sect. *Ischaemopsis* Roberty [p. 161]
 sect. *Microstegium* (Nees) Roberty [p. 161]
aureum (Bory) Roberty forma *geniculatum* (Stapf) Roberty 8b
falconeri (Hook.f.) Roberty 6
glabratum (Brongn.) Roberty 9
 subvar. *ciliatum* (Trin.) Roberty 7
 subvar. *debile* (Balansa) Roberty 16
 subvar. *dubium* (Hack.) Roberty 7
 subvar. *eucnemis* (Nees ex Steud.) Roberty 5
 subvar. *gratum* (Hack.) Roberty 7
 subvar. *hendersonii* (C.E.Hubb.) Roberty 8b
 subvar. *imberbe* (Nees ex Steud.) Roberty 16
 subvar. *mairei* Roberty (nom. inc.)
 subvar. *micromegas* Roberty (nom. inc.)
 subvar. *monanthum* (Nees ex Steud.) Roberty 7
 subvar. *monostachyum* (Franch. & Sav.) Roberty 16
 subvar. *spectabile* (Trin.) Roberty 12
 subvar. *tenuis* Roberty 15
 subvar. *vagans* (Nees ex Steud.) Roberty 7
 subvar. *vimineum* (Trin.) Roberty 16
rufispicum Roberty 11
- Pollinia* Trin. [p. 161]
bequaertii De Wild. 7
calochloa Lauterb. & K.Schum. (nom. inc.)
cantonensis Rendle 16
ciliata Trin. 7
 forma *grata* (Hack.) Backer 7
 forma *rufispica* (Steud.) Backer 11
 subsp. *genuina* Hack. 7
 subsp. *laxa* Hack. 7
 subsp. *seminuda* Hack. 7
 subsp. *wallichiana* (Nees ex Steud.) Hack. 1

Pollinia ciliata (cont.)

- var. *breviaristata* Rendle 7
 var. *formosana* (Hack.) Honda 1
 var. *genuina* Hack. ex Hook.f. 7
 var. *glabrata* Ridl. 1
 var. *laxa* (Nees ex Steud.) Hack. ex Hook.f. 7
 var. *seminuda* (Hack.) Hook.f. 7
 var. *wallichiana* (Nees ex Steud.) Hack. 1
 (unranked) *mutica* Hack. ex Backer 11
 (unranked) *rufispica* (Steud.) Backer 11
 (unranked) *typica* Backer 7
- ciliata* auct. 1, 7
clavigera Backer 2
debilis Balansa 16
delicatula Hook.f. 3
dispar Nees ex Steud. 4
eucnemis Nees ex Steud. 5
eucnemis auct. 2
fauriei Hayata 8a
formosana (Hack.) Hayata 1
geminata Merr. 4
geniculata Hayata 8b
glaberrima Honda 1
glabrata (Brongn.) Trin. 9
 var. *elmeri* (Hack.) Merr. 1
 var. *luzonensis* Hack. 9
gracilis Ridl. 7
gracillima Hack. 9
grata Hack. 7
 var. *hirsuta* Hook.f. 7
grata auct. 1
hendersonii C.E.Hubb. 8b
imberbis Nees ex Steud. 16
 forma *glabriflora* Hack. ex Nakai 16
 forma *monostachya* (Franch. & Sav.) Hack. 16
 subvar. *latifolia* Matsuda 16
 var. *geniculata* Hack. ex Makino & Nemoto 16
 var. *genuina* Hack. 16
 var. *willdenoviana* (Nees) Hack. 16
japonica Miq.
 var. *monostachya* Franch. & Sav. 16
 var. *polystachya* Franch. & Sav. 16
lancea Nees ex Steud. 7
laxa Nees ex Steud. 7
lehmannii Arn. & Nees 10
monantha Nees ex Steud. 7
 var. *elmeri* Hack. 1
 var. *formosana* Hack. 1
 var. *leptathera* Hack. 9
montana Nees ex Steud. 7
parceciata Pilg. 7
pleiostachya Lauterb. & K.Schum. (nom. inc.)
rufispica Hack. 11
rupestris Ridl. (nom. excl.)
spectabilis Trin. 12
 var. *ternatana* Backer 12
stapfii Hook.f. 13
sumatrensis Ridl. 1
tenuis Trin. 15
vagans Nees ex Steud. 7
 var. *dubia* Hack. 7
 var. *genuina* Hack. 7
viminea (Trin.) Merr. 16
wallichiana Nees ex Steud. 1
willdenoviana (Nees) Benth. 16
- Schizachyrium pseudeulalia* (Hosok.) S.T.Blake (nom. excl.)
Spodiopogon lehmannii (Arn. & Nees) Griseb. 10
petiolaris Trin. 10
Tripsacum fasciculatum (L.) Raspail 7