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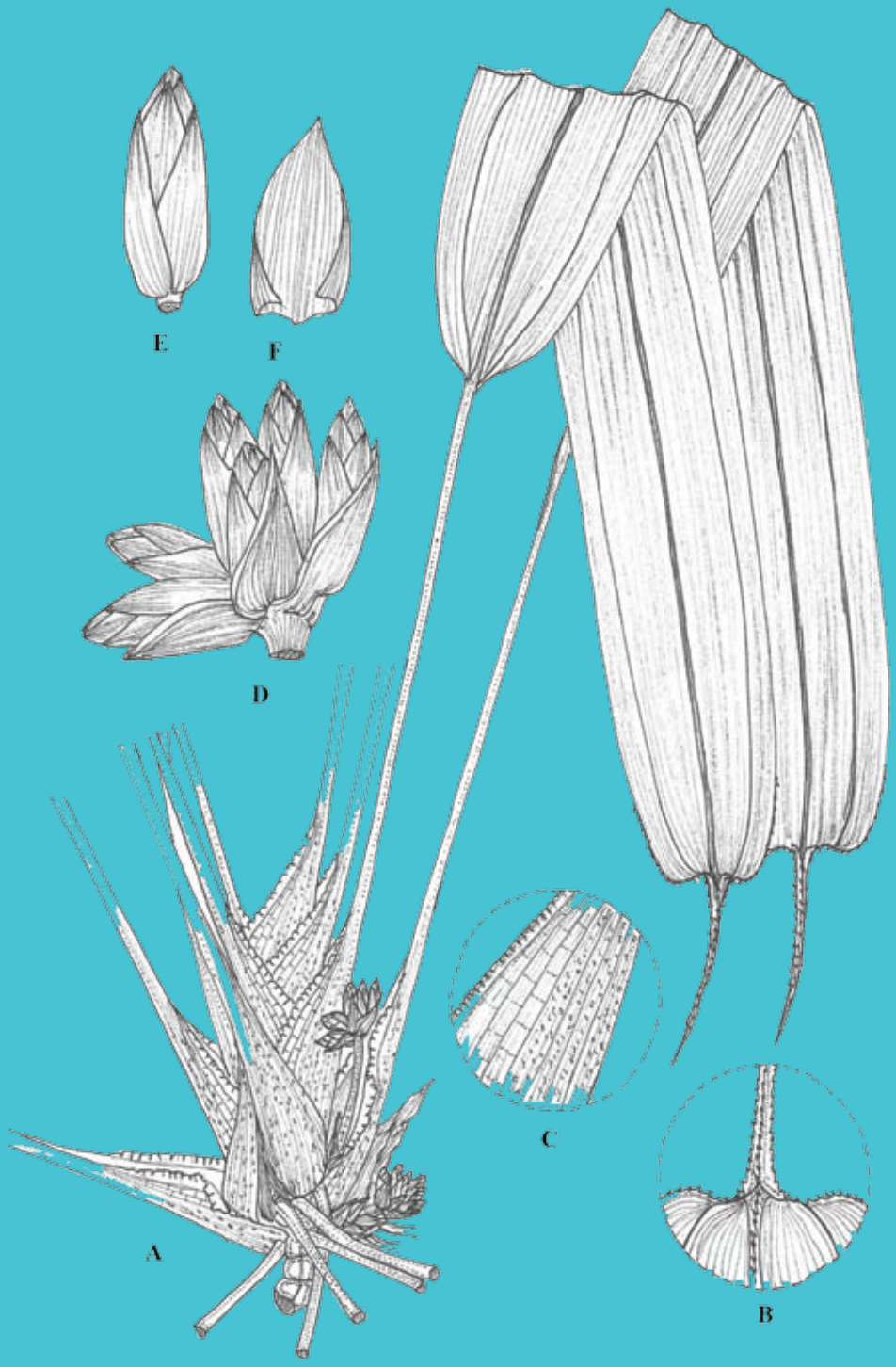

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A REVISION OF *ISEILEMA* (GRAMINEAE) IN MALESIA

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ABSTRACT
VELDKAMP, J. F. 2016. A revision of *Iseilema* (Gramineae) in Malesia. *Reinwardtia* 15(2): 123 – 127. — There are three very rare and localized species in Malesia; one from Java is new. Notes on some other Southeast Asian species are given.

Key words: *Iseilema*, Malesia, Revision.

ABSTRAK
VELDKAMP, J. F. 2016. Revisi *Iseilema* (Gramineae) di Malesia. *Reinwardtia* 15(2): 123 – 127. — Di Malesia terdapat tiga jenis yang sangat langka dengan penyebaran terbatas. Satu jenis baru dari Jawa. Catatan mengenai jenis lain dari Asia Tenggara diberikan.

Kata kunci: *Iseilema*, Malesia, Revisi.

INTRODUCTION

Iseilema Andersson is a genus with about 20 species, ranging from SE Asia to Australia (13 spp). In Malesia there are three species, all very rare and local.

The genus name is derived from "*isos*" ('ισος, equal) and "*eilèma*" ('ειλημα, involucre). There has been some confusion about the gender of the name, Andersson had *I. arguta* and *I. prostrata* (feminine), but "*eilèma*" is neuter and therefore the epithets must be neuter as well (Hackel, 1889:681).

The similarity to *Themeda* Forssk. has often been noted and some species have been included in it (or in *Anthistiria* Naezén, a synonym). For the record, Roberty (1960) reduced all taxa to *Themeda* section *Iseilema* with a single species *T. prostrata* (L.) Roberty with six varieties.

Molecular studies by Skendzic *et al*. (2007:538, 540) found it closely related to *Heteropogon* Pers. Welker *et al*. (2015) showed that the relationship with *Themeda* is consistent, but the two were resolved into different terminal branches, *Iseilema* being more associated with *Bothriochloa* Kuntze, *Capillipedium* Stapf, and *Dichanthium* Willemet, and *Themeda* linked to *Heteropogon*.

HISTORY

The first species known to Western science was *Andropogon prostratus* L. (1771: 304) based on a König collection from India (LINN 1211.8), now *Iseilema prostratum.* Willdenow (1806) renamed it to *Anthistiria prostrata.*

Steudel (1854) described *Anthistiria argutum* from Burma, and superfluously renamed *Andropogon prostratus* to *Anthistiria linneana* because of the supposed homonymy with *Anthestiria* (!) *prostrata* Trinius (1832: 321). Trinius, however, cited *Anthistiria prostrata* (L.) Willd. (1806), based on *Andropogon prostratus* L.

Andersson (1856) described four species. The lectotype, *I. prostratum*, was designated by Roberty (1960:99).

Hackel (1889) had five species.

Over the years others were added, forming a range from Pakistan, Sri Lanka, India, Burma, Thailand, to Laos and Cambodia with centres of speciation in Australia with 12 species (10 in Queensland!) and India with seven. Hackel (1889) mentioned *I. laxum* as introduced in Mauritius, but it is not mentioned by Hubbard & Vaughan (1940). Roberty (1960) cited this as "Mascareignes".

Roberty (1960) mentioned *I. membranaceum* Domin and *I. vaginiflorum* Domin for Hawaii, but the genus is not mentioned in Warren *et al*. (1990). Ms. Camus (1955) erroneously cited *I. minutiflorum* Jansen for the Philippines.

In Malesia the genus is very rare, of the three species only eight collections were seen, while two are only known from their types. Van Steenis (1936) mentioned the occurrence of *I. argutum* Nees ex Steud. for Java in much depleted areas that formerly had teak forest, on very desiccated soil and with periodic fire disturbance. This was obviously a misidentification with a species from Burma, only known to me from two collections (K, P). The Java species was recognized by Ohwi (in sched. in BO) as *I. javanicum* and he is here posthumously regarded as the first author.

Jansen (1953a, b) described two more species from Sumba and Wetar.

MORPHOLOGY

The genus is rather similar to *Themeda* because of the spatheate and capitulate terminal inflo-rescences with four involucral spikelets. One

difference is that in *Iseilema* these capitules would fall off as a unit, but this is also the case in *T. gigantea* (Cav.) Hack. In the other species of *Themeda* the spikelets disintegrate. The involucral spikelets are shortly pedicelled, whereas in *Themeda* they are paired, one sessile, the other subsessile. It has been suggested (Hackel, 1889:679) that these diaspores are dispersed by the wind, while in *Themeda* the fertile spikelets would be epizoochoric.

Some species are provided with small to minute annular structures especially in the inflorescences. These generally have been taken for glands, *e.g.* by Sprengel (1815: 14, as *Cymbopogon glandulosus* Spreng. = *Iseilema prostratum*), Hubbard (1935c), and Uppuluri & Satyavati (1968:668). Andersson (1856) called them "tubercles". I have seen no field notes on whether they secrete anything or are visited by insects.

Iseilema Andersson

Iseilema Andersson, *Nova Acta Regiae Soc. Sci.* Upsal., III, 2 (1856) 231, 250. — *Anthistiria* Naezén [unranked] *Iseilema* (Andersson) Benth. & Hook. f., Gen. Pl. 3 (1883) 1136. —*Ischaemum* L. sect. *Iseilema* Roberty, Boissiera 9 (1960) 99. — Lectotype: *Iseilema prostratum* (L.) Andersson, designated by Roberty [who reduced all taxa to a single species of *Themeda* Forssk. in Boissiera 9 (1960) 99], followed by Clayton & Renvoize (1986: 360).

Annual or perennial. Culms solid. *Ligule* collar-shaped, membranous. *Inflorescence* paniculate, spatheate, decompound, spikelet-bearing axes much reduced, clustered in capitules supported by a spatheole, deciduous as a whole, involucre formed by two homogamous involucral pairs of male or sterile subsessile to shortly pedicelled spikelets, fused at base. Involucral spikelets with lower glume 5−9−nerved. Common callus usually hairy. Rachis persistent. Fertile spikelets 1 (rarely 2), pedicelled, female or bisexual; callus absent; lower glumes flat on the back. Awns (when present) stipitate or from a small sinus. Pedicels free from the joints. Pedicelled spikelets 2, variously reduced, male to sterile. x = very variable, probably derived from 10.

Distribution. *ca.* 20 spp. in SE Asia to Australia, three in Malesia, all very local and rare (Java, Sumba, Wetar).

Key to the taxa

1a. Plants annual, culm 0.1−0.4 m long, nodes glabrous. Leaf blades 5−16 cm by 0.5−2.6 mm wide. Callus hairs 1.5−2 mm long. Involucral spikelets 4 mm long. Fertile spikelets 3−4 mm long. Awn geniculate *i.s.*, 8−18 mm long. Anthers *ca.* 2 mm long ……..…….... 2

b. Plants perennial, culm 1.3−2 m long, nodes barbate. Leaf blades 10−60 cm by 5−8 mm wide. Callus hairs 1 mm long. Involucral spikelets 4.5−5 mm long. Fertile spikelets 6−7 mm long. Awn more or less straight *i.s.*, 3−8 mm long. Anthers 1.4−1.5 mm long. — Spathes and glumes of the involucral spikelets on the keels glandular. — Java. ..... 1. *I. javanicum*

2a. Leaf blades distally smooth. Spatheoles and peduncles eglandular. Involucral spikelets with lower glumes glabrous, keels eglandular, purple mottled. Fertile spikelet *ca.* 4 mm long. Pedicelled spikelets with lower glumes with eglandular keels. Awn 18−20 mm long. — Wetar ……..…… 2. *I. maculatum*

b. Leaf blades distally scabrid. Spatheoles and peduncles glandular. Involucral spikelets with lower glumes distally hairy, keels glandular, not mottled. Fertile spikelet 3−3.5 mm long. Pedicelled spikelets with lower glumes with glandular keels. Awn 8−10 mm long. — Sumba ……...……. 3. *I. minutiflorum*

1. **Iseilema javanicum** Ohwi & Veldk., *spec. nov.* — Type: *Van Steenis 8166-d* (holo L; BO *1443573, -4*; E, K).

new § *Iseilema argutum* auct. non Andersson: Van Steenis, Jubileum Uitg. Trop. Nat. (1936) 111; C. Monod in Backer & Bakh. f., Fl. Java 3 (1968) 616.

Plants perennial. Culms 1.3−2 m long, eglandular below nodes. Culm nodes barbate. *Leaf* blades 10−60 cm by 5−8 mm, margins distally scabrid, apex acute. *Spatheoles* glandular or not. *Peduncles* very short, eglandular. Capitule callus hairs *ca.* 1 mm long. Involucral spikelets pedicels 0.5−1 mm long, longer than broad, glabrous to pilose. Involucral spikelets 4.5−5 mm long, lower glumes not mottled, glabrous, not sulcately nerved, 7−or 9−nerved; lower glumes keels glandular. Fertile spikelet 6−7 mm long; base glabrous or hairy. Awn more or less straight *i.s.*, 3−8 mm long. Pedicelled spikelets well-developed; lower glumes glandular. Anthers 1.4−1.5 mm long.

Distribution. Malesia: Java [Indramayu, Cirebon, Houtvesterij (Forestry Reserve) Plosokerep].

Habitat. Marshy grass fields, in former teak forests, locally abundant, fire-climax savannah on very poor soil with *e.g. Andropogon amboinicus* (L.) Merr. [= *Sorghum nitidum* (Vahl) Pers.], *Polytoca bracteata* R. Br. [=*Polytoca digitata* (L. f.) Druce], 0−30 m alt. See Van Steenis (1936) for an extensive description.

Specimen examined. Java: *Bernard 6-1925* (BO); Van 3-7-1923, *Harreveld sn*. (BO); Java, Indramayu, Cirebon, Plosokerep, *van Steenis 7483* (BO, L); *8166-d* (BO, E, K, L); *6680* (BO, L); teak forest area, *17522* (BO, L). ; *van Steenis 8166-d* (T) (BO, L); *van Steenis 17522* (BO, L).

Collector's notes. Tall, *ca.* 2 m. Sheath base, culms more or less waxy whitish.

Notes. Differs from *I. argutum* from Burma as follows:

a. Culms 0.1−1 m long, nodes glabrous. Peduncles glandular. Involucral spikelets with lower glumes sulcately 5−nerved, nerved, keels pilose, eglandular. Fertile spikelet 3−5.2 mm long. Awn geniculate *i.s.* Anthers 2−3 mm long..... *I. argutum*
b. Culms 1.3−2 m long, nodes barbate. Peduncles eglandular. Involucral spikelets with lower glumes not sulcately 7−or 9−nerved, keels glandular. Fertile spikelet 6−7 mm long. Awn more or less straight *i.s.* Anthers 1.4−1.5 mm long..... *I. javanicum*

Slightly different from *I. thorelii* A. Camus from Continental SE Asia. The differences may be explained by the paucity of material and their development and is summarised as follows:

a. Culms 1.3−2 m long. Involucral spikelets with lower glumes glabrous. Awns more or less straight *i.s.*, 3−8 mm long. Anthers 1.4−1.5 mm long. — Java..... *I. javanicum*
a. Culms 0.6−1.3 m long. Involucral spikelets with lower glumes pilose in lower half. Awns geni-culate *i.s.*, 8−13 mm long. Anthers *ca.* 2 mm long. — Continental SE Asia..... *I. thorelii*

2. ISEILEMA MACULATUM Jansen

Iseilema maculatum Jansen, Reinwardtia 2 (1953) 302. — Type: *Elbert 4685* (holo L, *sh. 941.215—87*; perhaps FR, K).

Plants annual. Culms 0.25−0.45 m long, eglandular below nodes. Culm nodes glabrous. *Leaf* blades 6−16 cm by 0.5−1.5 mm, distally smooth, apex acute. *Spatheoles* eglandular. *Peduncles* very short, eglandular. Capitule callus hairs *ca.* 1.5 mm long. Involucral spikelets pedicels *ca.* 1 mm long, longer than broad, glabrous. Involucral spikelets *ca.* 4 mm long; lower glumes purple mottled, glabrous, keels eglandular, not sulcately nerved, 5− or 7−nerved. Fertile spikelet *ca.* 4 mm long, base glabrous. Awn geniculate i.s, 9–18 mm long. Pedicelled spikelets well-developed; lower glumes eglandular. Anthers *ca.* 2 mm long.

Distribution. Malesia: Lesser Sunda Isl. (Wetar).

Habitat. Dry *Eucalyptus* savannahs near the coast; up to 50 m alt.

Note. Only known from the type collection.

3. ISEILEMA MINUTIFLORUM Jansen

Iseilema minutiflorum Jansen, Acta Bot. Neerl. 2 (1953) 382, t. 10. — Type: *Monod de Froideville 2012* (holo BO*1888838*; A, K, BRI, L, SING).

Plants annual. Culms 0.1–0.3 m long, under the nodes eglandular, nodes glabrous. *Leaf* blades 3–7 cm by 1.2–2.6 mm, margins distally scabrid, apex acute. *Spatheoles* glandular. *Peduncles* very short, minutely glandular. Capitule callus hairs 1.5--2 mm long. Involucral spikelets pedicels *ca.* 0.4 mm long, longer than broad, pilose. Involucral spikelets *ca.* 3 mm long. Lower glumes purple mottled, keels pilose in upper half keels glandular (40 x!), not sulcately 5- or 7-nerved. Fertile spikelet 3–3.5 mm long, base hairy. Awn geniculate *i.s*., 8–10 mm long. Pedicelled spikelets well-developed (fide Jansen, *n.v*.). Lower glumes glandular. Anthers *n.v*.

Distribution. Malesia: Lesser Sunda Isl. (Sumba).

Habitat. In grass vegetation on limestone, subjected to annual burning, *ca.* 50 m alt. In groups on shallow soil, apparently a short living species.

Note. Only known from the type collection.

OTHER SPECIES

For the identification of the Malesian species, it was necessary to look more closely at some Continental Asian ones. As in general their descriptions were incomplete, I had to make some of my own, which I think might be useful to other students of the genus.

1. ISEILEMA ARGUTUM (Nees ex Steud.) Andersson

Iseilema argutum (Nees) Andersson, Nova Acta Regiae Soc. Sci. Upsal., III, 2 (1856) 252 ("*arguta*"). — *Anthistiria arguta* Nees ex Steud., Syn. Pl. Glumac. (1854) 1:401. — [*Themeda prostrata* (L.) Roberty var. *arguta* Roberty, Boissiera 9 (1960) 100, nom. inval.]. — Type: *Wallich 8769 (Akkul Mahmud)* (holo P; G, L, fragm.; K, IDC microfiche 7394, ? W).

Plants perennial. Culms 0.1−1 m long, with minute dot-like glands or eglandular (with some minute glands: 40 ×!) below nodes. Culm nodes glabrous.

Leaf blades 5.5−18 cm by 2−6 mm, margins distally scabrid, apex acute or obtuse-apiculate. *Spatheoles* glandular. *Peduncles* very short, glandular. Capitule callus hairs *ca.* 1.5 mm long. Involucral spikelets pedicels 0.6−1 mm long, longer than broad, glabrous or pilose. Involucral spikelets 4.5−6 mm long; lower glumes not mottled, keels pilose, eglandular, sulcately 5-nerved. Fertile spikelet 3−5.2 mm long, base hairy. Awn geniculate *i.s*., 4.5−18 mm long. Pedicelled spikelets well-developed or reduced to the pedicels; lower glumes eglandular or glandular (margins long hairy). Anthers 2−3 mm long.

Distribution. Burma: Bago Div., Pyay ("Prome": *Wallich 8769*); Magwe Div. (*U Thein Lwin 398*, K). Kress *et al*. (2003) also reported Ayeyarwadi, Mandalay, Yangon.

Habitat. Fairly common on black calcareous stiff clay soil; altitude unknown.

Specimen examined. Burma, montes ad Prome, *Akkul Ahmad in Wallich 8769* (G, L, fragm., K, P, W; IDC microfiche 7394).

Note. Description based on the two collections cited above.

2. ISEILEMA THORELII A. Camus

Iseilema thorelii A. Camus, Bull. Mus. Natl. Hist. 24: 540−541. 1918; in Lecomte, Fl. Indo-Chine 7: 365−366, t. 37, f. 6−8. 1922; Schmid, Agron. Trop. (Nogent-sur-Marne) 13: 235, t. 45, f. 3c−e. 1958.— Lectotype: *Thorel 2494* (holo P, P *01942662*), designated here.
? *Iseilema schmidii* A. Camus, J. Agric. Trop. & Bot. Appl. 2: 201. 1955; Schmid, Agron. Trop. (Nogent-sur-Marne) 13: 235 ("*schmidiana*"). 1958. — Type: *Schmid 2467* (holo P, not found).

Plants perennial. Culms 0.6−1.3 m long, eglandular below nodes. Culm nodes barbate. *Leaf* blades 20−34 cm by 2.5−6 mm, margins distally scabrid, apex acute. *Spatheoles* glandular. *Peduncles* very short, eglandular. Capitule callus hairs *ca.* 1 mm long. Involucral spikelets pedicels 0.5−1 mm long, longer than broad, pilose. Involucral spikelets 3.5−5.5 mm long; lower glumes not mottled, keels pilose in lower half, glandular, sulcately 5-nerved. Fertile spikelet 4.5−8 mm long, base glabrous or hairy. Awn geniculate *i.s*., 8−13 mm long. Pedicelled spikelets well-developed; lower glumes glandular. Anthers *ca*. 2 mm long.

Distribution. Continental SE Asia: Laos (Champassak ("Bassac"), Thailand (E: Nakhon Ratchasima; Central: Saraburi; SE: Chanthaburi, Prachin Buri, Sa Kaeo); Vietnam (Prov.: Binh Phuoc, Dak Lac ("Darlac").

Habitat. Open deciduous forest, savannahs, marshy places with Acanthaceae, *Impatiens, Ischaemum,* Labiatae, 100−700 m alt.

Specimen examined. Laos, Champassak ("Bassac"), *Thorel 2494* (P). Thailand, Sa Kaeo, Aran Pratet, *Put 1981* (K, P)

Notes. Notwithstanding Ms. Camus' (1955) and Schmid's (1958; "*schmidiana*") remarks, the difference from *I. schmidii* A. Camus (which could not be found in P) is not clear to me. The two species may be distinguished as follows:

a. *Leaf* blades 9−10 cm long, apex acuminate. Involucral spikelets with lower glumes glabrous. Anthers *ca.* 2.5 mm long..... *I. schmidii*
b. *Leaf* blades 20−34 cm long, apex acute. Involucral spikelets with keels of the lower glumes pilose in the lower half. Anthers *ca.* 2 mm long ..... *I. thorelii*

Roberty (1960), apparently based on a syntype in G, equated *I. thorelii* with *I. laxum* auct. non Hack. (= *I. hackelii* U.B. Shrestha & Gandhi).

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REFERENCES

ANDERSSON, N. J. 1856. Monographiae andropogonearum. I. Anthistirieae. *Nova Acta Regiae Societatis Scientiarum Upsaliensis,* III, 2: 231, 250 – 253.

BENTHAM, G. & HOOKER, J. D. 1883. *Genera plantarum* 3: 1136. Reeve & Co; Williams & Norgate, London. Bor, N.L. 1960. The grasses of Burma, Ceylon, India and Pakistan (excluding Bambuseae). *International Series of Monographs on Pure and Applied Biology. Division: Botany* 1: 187−189.

BOR, N.L. 1960. The grasses of Burma, Ceylon, India and Pakistan (excluding Bambuseae). *International Series of Monographs on Pure and Applied Biology. Division: Botany* 1: 187−189.

CAMUS, A. 1918. Note sur le genre *Iseilema* (Graminées). *Bulletin du Muséum d'Histoire Naturelle (Paris)*24: 540−541.

CAMUS, A. 1922. *Iseilema.* In: LECOMTE, M. H. Flore générale de l' Indo-Chine 7: 365−366, t. 37, f. 6−8. Masson & Cie, Paris.

CAMUS, A. 1955. Andropogonées nouvelles du Cambodge et du Vietnam. *Journal d'agriculture tropicale et de botanique appliquée*. 2: 201−202.

CLAYTON, W. D. & RENVOIZE, S. A. 1986. Genera graminum. *Kew Bulletin, Additional Series* 13: 335, 360−361.

COPE, T. A. 1982. *Poaceae*. In: NASIR, E. & ALI, S. I. *Flora of Pakistan* 143: 315. Department of Botany, University of Karachi, Pakistan; National Herbarium, Pakistan Agricultural Research Council, Islamabad, Pakistan.

DUTHIE, J. F. 1886. Illustrations of the indigenous fodder grasses of the plains of North-western India 1: t. 28.

DUTHIE, J. F. 1888. The fodder grasses of northern India: 43. Thomason Civil Engineering College Press, Roorkee.

EDGEWORTH, M. P. 1851. Catalogue of plants found in the Banda district 1847-49: 58, preprint of Asiat. J. (1852) 182.

GANDHI, K. N. & SHRESTHA, U. B. 2008. *Iseilema hackelii*, a new name for *I. laxum* Hack. 1889 (Poaceae). *Harvard papers in botany* 13: 295−296.

HACKEL, E. 1889. *Iseilema*. In: A. & C. de CANDOLLE. Monographiæ phanerogamarum 6: 678−685. G. Masson, Paris.

HAINES, H. H. 1924. The botany of Bihar and Orissa 5: 1055−1056. Adlard, etc., London.

HOOKER, J. D. 1896. The flora of British India 7: 212, 217−219. L. Reeve & Co., Brook nr. Ashford.

HUBBARD, C. E. 1935. In *Hooker's Icones plantarum*: t. 3284−3286.

HUBBARD, C. E. & VAUGHAN, R. E. 1940. The grasses of Mauritius and Rodriguez. Director of Agriculture, Mauritius, Crown Agents for the Colonies, London.

JANSEN, P. Oct 1953a. Notes on Malaysian grasses III. *Acta Botanica Neerlandica* 2: 382−384.

JANSEN, P. 26 Oct 1953b. Notes on Malaysian grasses I. *Reinwardtia* 2: 302.

KRESS, J. R., DE FILLIPS, R. A., FARR, E. & DAW YIN YIN KYI. 2003. A checklist of the trees, shrubs, and climbers of Myanmar. Contributions from the U.S. National Herbarium 45:1−590.

KUNTZE, O. 1891. Revisio generum plantarum 2: 778. Felix, Leipzig, etc.

LINNAEUS, C. 1771. Mantissa plantarum altera: 304. Salvius, Stockholm.

NOLTIE, H. J. 2005. The botany of Robert Wight. *Regnum Vegetabile* 145: 278–279, 478, 494.

RENVOIZE, S. A. 2000. In: CAFFERTY, S. JARVIS, C. E., TURLAND, N. J. Typification of Linnaean plant names in the Poaceae. *Taxon* 49: 246.

ROBERTY, G. 1960. Monographie systématique des Andropogonées du globe. *Boissiera* 9: 99−101.

SCHMID, M. 1958. Flore agrostologique de l'Indochine. *Agronomie tropicale* (*Nogent-sur-Marne*) 13: 233−235, t. 43, f. 3 ; 45, f. 3.

SIMON, B. K. 1993. A key to Australian grasses, ed. 2: 127. Queensland Department of Primary Industries, Brisbane.

SKENDZIC, E. M., COLUMBUS, J. T. & CERROS-TLATILPA, R. 1970. Phylogenetics of Andropogoneae (Poaceae: Panicoideae) based on nuclear ribosomal internal transcribed spacer and chloroplast trn-L-F sequences. *Aliso* 23: 530−544.

SPRENGEL, C. 1815. Plantarum minus cognitarum pugillus 2: 14. Kümmel, Halle.

STEUDEL, E. G. 1854. Synopsis plantarum glumacearum: 401. Metzler, Stuttgart.

TRINIUS, C. B. 1832. Andropogoneorum genera speciesque complures definitionibus novis. *Mémoires de l'Académie Impériale des Sciences de St.-Pétersbourg, Sixième série, seconde partie. Sciences mathématiques, physiques et naturelles* 2: 321.

UPPULURI, M. R. & SATYAVATHI, U. 1968. Two new species of *Iseilema* Anderss. from India. *Journal of the Bombay Natural History Society* 65: 663−669.

VAN STEENIS, C. G. G. J. 1936. Landschap en flora in Indramajoe. *Jubileum Uitgave Tropische Natuur*: 111−123.

WAGNER, W. L., HERBST, D. R. & SOHMER, S. H. 1990. Manual of the flowering plants of Hawaii 2. University of Hawaii Press & Bishop Museum Press, Honolulu.

WALLICH, N. 1832. A numerical list of dried specimens ("Catalogue"): [p. 295] n. 8769−8770. Wallich, London.

WELKER, C. A. D., SOUZA-CHIES, T. T., LONGHI-WAGNER, H. M., PEICHOTO, M. C., McKAIN, M. R. & KELLONG, E. A. 2015. Phylogenetic analysis of *Saccharum s.l.* (Poaceae; Andropogoneae), with emphasis on the circumscription of the South American species. *American Journal of Botany*. 102: 248−263.

WIGHT, R. 1834. Catalogue of Indian plants: 100. Wight, London.

WILLDENOW, C. L. 1806. Species plantarum, ed. 4, 4, 2: 901−902. Nauk, Berlin.

INSTRUCTION TO AUTHORS

Scope. *Reinwardtia* is a scientific irregular journal on plant taxonomy, plant ecology and ethnobotany published in June and December. Manuscript intended for a publication should be written in English.

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References. Bibliography, list of literature cited or references follow the Harvard system as the following examples.

Journal : KRAENZLIN, F. 1913. *Cyrtandraceae* novae Philippinenses I. *Philipp. J. Sci.* 8: 163–179.
MAYER, V., MOLLER, M., PERRET, M. & WEBER, A. 2003. Phylogenetic position and generic differentiation of *Epithemateae* (*Gesneriaceae*) inferred from plastid DNA sequence data. *American J. Bot.* 90: 321–329.

Proceedings :TEMU, S. T. 1995. Peranan tumbuhan dan ternak dalam upacara adat "Djoka Dju" pada suku Lio, Ende, Flores, Nusa Tenggara Timur. In: NASUTION, E. (Ed.). Prosiding Seminar dan Lokakarya Nasional Etnobotani II. LIPI & Perpustakaan Nasional: 263–268. (In Indonesian).
SIMBOLON, H. & MIRMANTO, E. 2000. Checklist of plant species in the peat swamp forests of Central Kalimantan, Indonesia. In: IWAKUMA, T. *et al*. (Eds.) Proceedings of the International Symposium on: Tropical Peatlands. Pp.179-190.

Book : RIDLEY, H. N. 1923. *Flora of the Malay Peninsula 2*. L. Reeve & Co. Ltd, London.

Part of Book : BENTHAM, G. 1876. *Gesneriaceae*. In: BENTHAM, G. & HOOKER, J. D. *Genera plantarum 2*. Lovell Reeve & Co., London. Pp. 990–1025.

Thesis : BAIRD, L. 2002. *A Grammar of Kéo: An Austronesian language of East Nusantara*. Australian National University, Canberra. [PhD. Thesis].

Website : http://www.nationaalherbarium.nl/fmcollectors/k/KostermansAJGH.htm). Accessed 15 February 2012.

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