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RESEARCH ARTICLE

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Mapania sapuaniana (*Cyperaceae*), a new sedge species from Sarawak

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Key words

Borneo
Cyperaceae
Mapania
Sarawak
taxonomy

Abstract *Mapania sapuaniana*, a spectacular new sedge species from Lanjak Entimau, Sarawak, is described and illustrated. It is closely related to *M. richardsii* and *M. borneensis* but differs in having broad leaves with a distinct pseudopetiole, reddish purple or maroon coloration on the underside of the leaf and petiole and an inflorescence composed of several spikes.

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INTRODUCTION

Mapania Aubl. is a pantropical genus previously thought to comprise 84 species (Govaerts et al. 2007). Borneo and Peninsular Malaysia are considered to be centres of diversity for the genus with 25 and 16 species recorded, respectively (Simpson 1992). The genus is poorly known and includes many narrowly endemic species. There is little information on pollination biology and chromosome numbers and record of the morphological variation within the genus is rather limited (Meekiong et al. 2009). About 50 % of the species recorded for Borneo are endemic (Simpson 1992). However, there is still much to be learn about this genus, particularly from Borneo. The number of species may increase as more remote areas become accessible in Sabah and Sarawak (Shabdin et al. In press).

Mapania species are problematic to identify, due to the lack of good discontinuous morphological characters. Asian species, especially, show a wide range of morphological variation, where the appearance of the whole inflorescence changes as it matures, although individual structures remain constant in shape and size (Simpson 1992). Flowering and fruiting material is often essential for identification and requires dissection to enable the taxonomically important structures to be seen. Regardless of the morphological problems that occur in *Mapania*, their highly reduced inflorescence structure has led to differing interpretations and uncertain homologies (Muasya et al. 1998). Interpretation of the basic reproductive unit is difficult for all the genera within the tribe *Hypolytreae*, including *Mapania*. Various interpretations have been given (Simpson 1992, Bruhl 1995, Goetghebeur 1998) and we follow that of Simpson (1992), i.e. a basic inflorescence unit with a highly contracted axis giving rise to a pseudanthium, with the axis supporting several floral bracts (4–7 in *Mapania*) of which some or all have male flowers, the whole unit being surmounted by a bractless, apparently terminal female flower (Fig. 1).

Lanjak Entimau Protected Forest (LEPF) was constituted as a Wildlife Sanctuary in 1983 (Soepadmo & Chai 2000). The sanctuary comprises an area of 187 000 hectares that is adjacent to the border with Indonesia, and situated within Sri Aman, Sibu, Sarikei and Kapit divisions. Based on specimens from several herbaria (SAR, SING and K), only five species

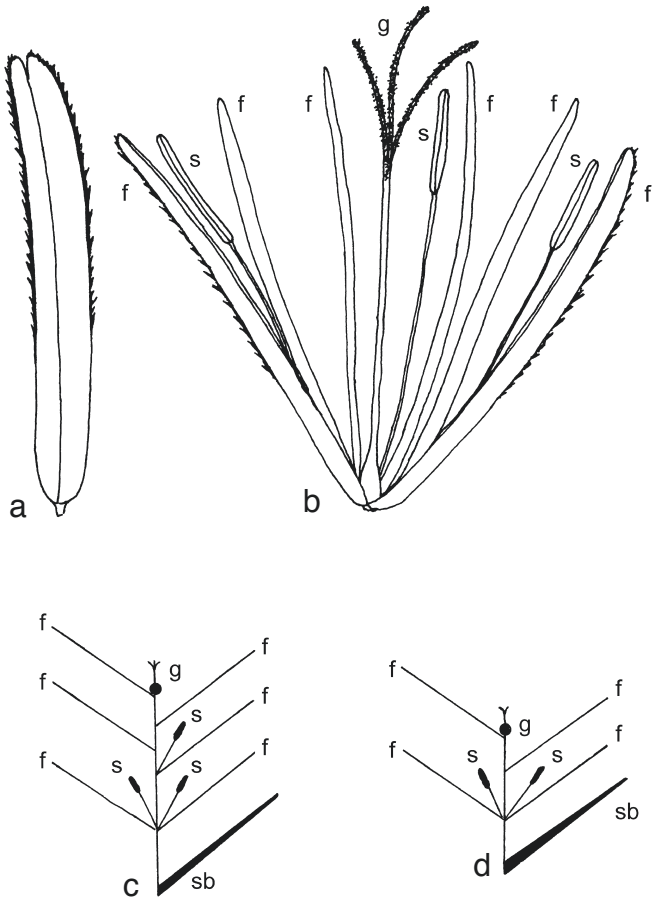

Fig. 1 Generalised structure of the spicoid in *Mapania*. a. Spicoid with lowest two floral bracts unseparated; b. spicoid with lowest two floral bracts separated; c, d. schematic diagrams to interpret the structure of a spicoid with six and four floral bracts, respectively (axis exaggerated). sb = spicoid bract; f = floral bract; s = staminate flowers (stamens); g = pistillate flower (gynoecium). From Simpson (1992: 12).

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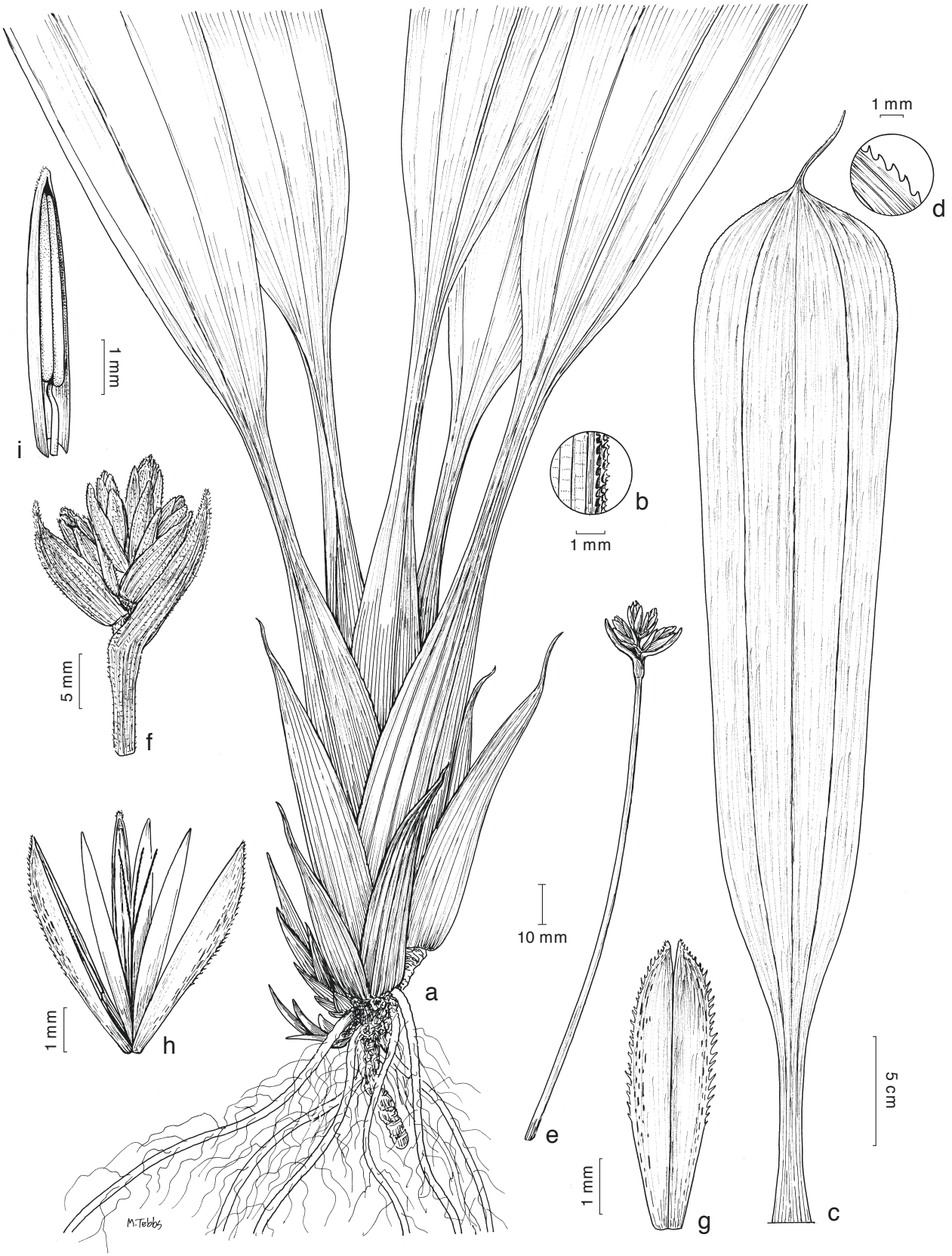

Fig. 2 *Mapania sapuaniana* Shabdin. a. Habit; b. detail of sheath margin; c. leaf; d. detail of leaf margin; e. inflorescence; f. spike; g. unopened spicoid; h. open spicoid; i. floral bract and stamen (all: *Kalu et al. MK1801*, RNG). — Drawn by Margaret Tebbs.

(*M. cuspidata* (Miq.) Uittien*, M. latifolia* Uittien*, M. meditensis* D.A.Simpson, *M. monostachya* Uittien and *M. palustris* (Hassk. ex Steud.) Fern.-Vill.) were known from this area. However, a recent expedition by Meekiong et al. (2009) found several species previously unreported from this area, including *M. enodis* (Miq.) C.B.Clarke, *M. longiflora* C.B.Clarke, *M. obscuriflora* D.A.Simpson, *M. richardsii* Uittien and *M. sumatrana* (Miq.) Benth., as well as the five previously reported. In addition material was found that did not match any currently recognised species based on morphology. This is recognised here as a new species on the basis of a unique combination of morphological features: broad leaves with a distinct pseudopetiole and an inflorescence composed of several spikes, and reddish purple or maroon coloration on the lower leaf surface and petiole. We

Fig. 3 *Mapania sapuaniana* Shabdin. a. Plant in habitat; b. base of plant showing inflorescences; c. close up inflorescence. — Photos by K. Meekiong.

therefore describe this species based on the morphological / taxonomic species concept (Cronquist 1978).

TAXONOMY

Mapania sapuaniana Shabdin, *sp. nov.* — Fig. 2, 3

Similar to *M. richardsii* except leaf-blade oblong, 7–10.5 cm wide, with a distinct pseudopetiole between leaf-blade and sheath. Also similar to *M. borneensis* Merr. but leaf-blade 7–10.5 cm wide and inflorescence with more than 1 spike. — Typus: *Meekiong Kalu et al. MK1801* (holo SAR; iso HUMS, K, RNG), Borneo, Malaysia, Sarawak, Kapit Division, Lanjak Entimau Wildlife Sanctuary, Sungai Joh, c. 140 m alt., 27 Mar. 2009.

Etymology. The specific epithet honours Haji Sapuan, Senior Deputy Director of the Sarawak Forestry Department for his excellent endeavour in leading the 2008 Lanjak Entimau Scientific Expedition.

Moderately robust to robust, shortly rhizomatous perennial; rhizome 2–3 cm long. Cataphylls elliptic to lanceolate, 5.5–13 by 3–5 mm. *Culms* several, erect, lateral, 5–15 by 0.2 cm, glabrous, maroon or dark purplish red. *Leaves* basal, up to 55 cm long; leaf-blade oblong, 13–38 by 7–10.5 cm, apex abruptly narrowed and auriculate with narrow tip of 2–3 cm long, base gradually narrowed into a short pseudopetiole which widens again into the sheath, coriaceous to subcoriaceous, papery when dried, upper surface yellowish green and shiny, lower surface reddish purple with maroon nerves (in living material), 3-nerved, secondary nerves distinct, flat in cross-section, margins entire to scabrid near apex; pseudopetiole 10–16 by 1.5–3 cm; sheath oblong-lanceolate, 4.5–8 by 0.6–1.6 cm, apex very gradually narrowed, coriaceous, reddish green to maroon with minute blackish stripes. *Involucral bracts* several, glumaceous,

ovate-lanceolate, 8–10 by 5–7 mm, apex acute or nearly blunt, basal bract shorter, acute, maroon or purplish red, coriaceous, glabrous, nerves distinct. *Inflorescences* terminal on lateral culms from rhizomes or axil of basal-most leaves, 2–3, composed of 3–5 distinct spikes; spike elliptic, 8–11 by 5–8 mm, apex obtuse, maroon to purplish red; spicoid bracts ovate, 3–7 by 2–3.5 mm, obtuse, coriaceous to subcoriaceous, maroon or purplish red, glabrous, midrib green; floral bracts 6, free, lowest 2 bracts ovate or linear-oblong, 5.5–6 by 0.5–1 mm, acute, maroon or purplish red, keeled, wingless, hispid, upper bracts linear-lanceolate, 5–6 mm long, flat to ± keeled, glabrous; staminate flowers 3 per spicoid, anthers linear, whitish, 2–2.5 mm long; stigma branches 3; style 4 mm long. *Fruit* not known.

Distribution — Borneo, Sarawak, Kapit Division.

Habitat — Lowland mixed dipterocarp forest along streamsides, on wet slopes and on rocky slopes in pockets with thick leaf litter, thriving in deep shade; 140 m.

Conservation status — Currently this species is only recorded by the Joh River, Lanjak Entimau Wildlife Sanctuary (LEWS), Sarawak and is probably endemic to the area, since it has not been found before on several fieldtrips that we have conducted in other places in Sarawak and Peninsular Malaysia. The species occurs in a 1 km^2 area, with fewer than 100 individuals. Growing localised to this particular area, we therefore believe it to be Vulnerable (VU D2) following the IUCN (2001) Categories and Criteria.

Note — *Mapania richardsii* and *M. borneensis* are the taxa closest to *M. sapuaniana*, differing primarily in leaf size, absence/presence of pseudopetiole and number of spikes per inflorescence.

The three species may be separated using the following key:

1. Leaves without a distinct pseudopetiole, the leaf-blade gradually narrowed into a sheath . . . . . *M. richardsii*
1. Leaves with a distinct pseudopetiole between leaf-blade and sheath 2
2. Inflorescence with only 1 spike; leaf-blade 1.8–3.6 cm wide . . . . . *M. borneensis*
2. Inflorescence with more than 1 spike; leaf-blade 7–10.5 cm wide . . . . . *M. sapuaniana*

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