Digitaria bosseri (Poaceae: Panicoideae), a new grass from Madagascar

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Summary. A new panicoid grass species of uncertain generic affiliation is described and illustrated from the dry and spiny forest ecosystems of southern Madagascar. It is tentatively placed in the genus *Digitaria* based on its spikelet structure, pending DNA sequence data.

Key Words. Africa, Paniceae, Toliara.

Introduction

Grasses (Poaceae) are the most economically important family of plants and include cultivated rice (*Oryza sativa* L.), maize (*Zea mays* L.), bread wheat (*Triticum aestivum* L.), sugar cane (*Saccharum officinarum* L.), and bamboos. Grasses are also the best taxonomically documented of the large flowering plant families in spite of their high species number: 11,313 currently accepted species of grasses in 713 genera (Clayton *et al.* 2016). The alpha taxonomic inventory of the Poaceae in Madagascar is not yet complete and this paper is part of the ongoing project to document all Poaceae species of Madagascar and use this knowledge to understand the history of Madagascar's savannas and open canopy areas (e.g. Vorontsova *et al.* 2015, Vorontsova *et al.* 2016).

The specimens described here were not matched to any known species in Madagascar or outside. DNA sequencing work has so far not been successful due to degraded DNA. The two-flowered spikelet is typical of the Panicoideae. It is here placed tentatively in the understudied pantropical genus *Digitaria* pending molecular data. The upper floret closely resembles those of *Digitaria* in its acute shape, brown colour, and its hyaline lemma margins covering the palea (not involute as in *Panicum sensu lato*); the upper lemma is exposed due to a short upper glume as in many species of *Digitaria*. Most *Digitaria* inflorescences (including the 21 species of *Digitaria* documented in Madagascar by Bosser 1969) are composed of digitate racemes rather than panicles, except those previously placed in the North American and Chinese genus *Leptoloma* Chase, which have open panicles and longer upper glumes, but are perennials with short appressed pubescence between the nerves of the lower lemma (Henrard 1950). The small African genus *Hylebates*

Chippind. has a similar upper lemma and a short upper glume, but also a lower lemma with a short awn.

***Digitaria bosseri* Voronts. sp. nov.** Type: Madagascar, Toliara: Ankazoabo, Feb. 1963, Bosser 17263 (holotype TAN!; isotypes P02307325!, P02307335!, P02307336!, P02307337!, P02307338!, P02307339!, P02307340!, P02726866!, P06768573!).

<http://www.ipni.org/urn:lsid:ipni.org:names:77161709-1>

Delicate *annual*, loosely tufted, ascending or sprawling, the culms flexuous, 30 – 60 cm long, glabrous, the nodes dark, glabrescent. *Leaf sheaths* loosely pubescent towards the apex, with ciliate edges. *Ligule* a line of hairs. *Leaf blades* membranous, broadly linear to elliptic, 4 – 9 × 0.4 – 1.2 cm, glabrous adaxially, loosely hirsute becoming glabrous abaxially, scaberulous on both sides. *Panicles* terminal, not fully exerted, 8 – 15 cm long, usually contracted but sometimes open, with secondary level branching, the spikelets crowded at the apices of the panicle branches. *Panicle branches* in groups of 2 – 3, scabrous, with an apical appendage 0.5 – 2 mm long. *Spikelets* usually paired, pedicellate, somewhat compressed dorsally, 1.5 – 2 × 0.6 – 0.8 mm, glabrous. *Lower glume* ¼ as long as the spikelet, scale-like, membranous, translucent, apically truncate or irregular in shape, with no venation. *Upper glume* ⅓ as long as the spikelet, apically rounded, 3-veined. *Lower floret* sterile, the palea absent. *Lower lemma* not reaching the apex of the spikelet, apically emarginate or lobed, 5-veined. *Upper floret* bisexual. *Upper lemma* cartilaginous, smooth, apiculate, sometimes with a few elongated white trichomes towards the apex, brown, the margins hyaline, covering the palea at first and then exposing a section of it. *Anthers* 3, c. 1 mm long. Fig. 1.

Fig. 1. *Digitaria bosseri*. **A**, **B** habit; **C** ligule; **D** inflorescence branch; **E** spikelet; **F** lower glume; **G** upper glume; **H** lower lemma, ventral view; **J** lower lemma, dorsal view; **K** upper floret; **L** upper lemma, ventral view; **M** upper lemma, dorsal view; **N** upper lemma, ventral view; **P** lodicules; **Q** upper lemma, dorsal view; **R** immature caryopsis. Scale bar: **A**, **B** = 3 cm; **C** = 2 mm; **D** = 1.6 mm; **E** – **R** = 1 mm. From Bosser 14110. DRAWN BY LUCY T. SMITH.

RECOGNITION. *Digitaria bosseri* differs from all other species of *Digitaria* in Madagascar by its branched panicle. It also differs from all species of *Panicum*, *Urochloa*, and *Acroceras* in Madagascar by its hyaline margins of the upper lemma which are not involute.

DISTRIBUTION. South-western Madagascar. Map 1.

SPECIMENS EXAMINED. MADAGASCAR. Toliara: Ifotaka (Mandrare), Nov. 1952, *Bosser* 4131 (P02307402!, TAN!); Ifotaka (Mandrare), March 1960, *Bosser* 14098 (P00524463!, P02309342!); Ifotaka (Mandrare), March 1960, *Bosser* 14110 (P00524464!, P02309309!, P02726876!, TAN!); Miary, near Toliara, March 1962, *Bosser & Viennot* 16064 (P02307331!); 15 km on the road from Toliara to Morombe, March 1960, *Bosser* 14554 (P00524466!, P02309300!, P02309335!, P02309336!, P02309338!, TAN!); Zombitse forest near Sakaraha, Feb. 1963, *Bosser* 17702 (TAN!).

HABITAT. Dry forest, spiny forest, or secondary vegetation, often on alluvial soil, at low elevations.

Map 1. Distribution of *Digitaria bosseri*. DRAWN BY SARAH FICINSKI.

CONSERVATION STATUS. Assessed here as Near Threatened (NT) as the species is known from only five locations, and its Extent of Occurrence is estimated to be 80,000 km², almost meeting the criteria B2(a) to be assessed as Vulnerable (IUCN 2001). This inconspicuous and previously unknown grass is likely to have been missed by many collectors and hence it may be more widespread than recorded here.

ETYMOLOGY. All six known collections of this species were collected by Jean Bosser during his frequent expeditions which focused on the Poaceae. His unique experience and knowledge of Madagascar's grasses in the field enabled him to recognise unusual members of the family.

NOTES. The small terminal appendage recorded at the apex of every inflorescence branch could represent either a bristle or a sterile pedicel; further developmental studies are necessary.

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