



Taxonomic significance of capsule and seed characters of Indian species of *Murdannia* Royle (Commelinaceae)

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Abstract

Capsule and seed morphology of 26 species of *Murdannia* in India are studied using light microscopy and seeds of 23 species by scanning electron microscopy. The capsules show differences in size, shape and in the number and arrangement of seeds in the locules. The seeds also display considerable variation in size, shape, ornamentation, shape of hilum and position of embryotega. The present study provides useful characters for the delimitation of Indian species of *Murdannia*.

Keywords: *Murdannia*, Commelinaceae, India, capsule and seed morphology, LM, SEM

Introduction

Murdannia Royle with ca. 50 species has greatest diversity in tropical Asia (Faden 2000). It has largest number of species in India than in any other country in the world. It is represented by 26 species in India (Ancy, 2014), of which 8 (31%) are endemic to this region. Karthikeyan *et al.* (1989) recorded 23 species for India. Since then, 7 more names appeared in the Indian context, viz., *M. fadeniana* Nampy and Joby (2003: 79) which originally replaces *M. glauca* in India, *M. striatipetala* Faden (2001: 26) also occurring in South India, *M. satheeshiana* Joby *et al.* (2011: 41), *M. brownii* Nandikar & Gurav (2011: 227), *M. sahyadrica* Ancy & Nampy (2012: 79), *M. assamica* Nampy & Ancy (2012: 441) and *M. saddlepeakensis* M.V. Ramana *et al.* (2013: 9). *M. satheeshiana* Joby *et al.* (2011: 41) and *M. brownii* Nandikar & Gurav (2011: 227) are conspecific to *M. versicolor* (Dalzell) G. Brückner (1930: 173) and *M. saddlepeakensis* M.V. Ramana *et al.* (2013: 9) is conspecific to *M. gigantea* (Vahl) G. Brückner (1930: 173). The significance of capsules and seeds in relation to taxonomy has not been discussed so far within the genus *Murdannia*. The objective of the present study is to investigate the morphological variation in the capsules and seeds of *Murdannia* species in India, to assess its taxonomic value, and to contribute to a better understanding of the capsule and seed morphology of this genus.

Materials and Methods

The present study was based on consulting specimens in various herbaria and by studying live specimens collected from different parts of India during the past several years. Capsules and seeds from 10–50 specimens were studied for every species (only representative specimens were cited under specimens examined). Fully developed, uncontaminated seed samples were used for the analysis.

Capsules were separated carefully and examined under stereo zoom microscope. The shape and size of capsules and the number and arrangement of seeds inside each locule were observed carefully. Seeds were taken out, mounted on clean glass slides and observed under Leica MZ 7.5 stereo zoom microscope. Surface characters and ornamentations including position of embryotega and shape of hilum were noted. Scanning electron microscope (SEM) analyses of 23 species were done. For SEM, seed samples were directly mounted on aluminium stubs using double sided adhesive

TABLE 2. *Murdannia* species and the characters of seeds

Species	Seed shape	Seed size (mm)	Hilum	Embryotega
<i>M. assamica</i>	elliptic	2.22 × 1.8–2	linear	dorsal
<i>M. blumei</i>	rectangular to polygonal	0.5 × 0.5	rounded	dorsal
<i>M. crocea</i> subsp. <i>ochracea</i>	ovate to polygonal	0.8 × 0.75	elliptic to ovate	dorsal to semidorsal
<i>M. dimorpha</i>	ovate to rectangular	0.5–0.6 × 1–1.1	linear	semidorsal
<i>M. divergens</i>	ovate to rectangular	1–1.3 × 1–1.2	dotted	semidorsal
<i>M. edulis</i>	ovate to rectangular	2.6–3 × 1.9–2	oblong to elliptic	dorsal
<i>M. esculenta</i>	ovate to rectangular	1–1.5 × 1–1.2	elliptic to linear	semidorsal
<i>M. fadeniana</i>	triangular to polygonal	1.2–1.5 × 0.3–0.5	rounded to elliptic	dorsal
<i>M. gigantea</i>	ovate to elliptic	3–4 × 2.5–3	linear	dorsal
<i>M. hookeri</i>	ovate to rectangular	1.5–2 × 1–1.2	linear	semidorsal
<i>M. japonica</i>	ovate to triangular	1.8–2.2 × 1.8–2	rounded	dorsal in a pit
<i>M. juncooides</i>	ovate to rectangular	0.5–0.55 × 0.6	elliptic	dorsal
<i>M. lanceolata</i>	ovate to polygonal	0.5–0.8	dotted to elliptic	dorsal in a pit
<i>M. lanuginosa</i>	rectangular–ovate	0.3–1 × 0.8	rounded	dorsal
<i>M. loriformis</i>	ovate to elliptic	2–2.1 × 1–1.2	linear to oblong	semidorsal
<i>M. nudiflora</i>	ovate to oblong	1–1.2 × 1–1.1	elliptic	semidorsal
<i>M. pauciflora</i>	oblong to rectangular	1–1.2 × 0.7–0.9	elliptic	semidorsal
<i>M. sahyadrica</i>	rounded to elliptic	0.6–1 × 0.5–0.8	dotted to elliptic	dorsal
<i>M. semiteres</i>	ovate to rectangular	0.5–0.6	dotted	dorsal
<i>M. simplex</i>	ovate to elliptic	2–2.5 × 1–1.7	linear to oblong	semidorsal
<i>M. spirata</i>	ovate to rectangular	0.75–1.1 × 0.6–1	elliptic	semidorsal
<i>M. striatipetala</i>	ovate to rectangular	0.35–1.1 × 0.6–0.9	elliptic	semidorsal
<i>M. triquetra</i>	oblong to rectangular	1.5–2 × 1–1.1	linear	semidorsal
<i>M. vaginata</i>	broadly elliptic, dorsiventrally compressed	1.752–2.4 × 1.3–1.8	linear	dorsal
<i>M. versicolor</i>	ovate to elliptic	0.8–1.2 × 0.9–1	ovate to dotted	semidorsal
<i>M. zeylanica</i>	ovate to rectangular	0.6–1 × 0.9–1	elliptic to linear	semidorsal

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