

RESEARCH ARTICLE

DIMERIA RAJANIANA* (POACEAE): A NEW SPECIES FROM THE COASTAL WETLANDS OF NORTHERN KERALA, INDIA*M.K. Ratheesh Narayanan^{1*}, C.N. Sunil², Sidharth Sathyan Nair³, K. Chaithra³ and M.K. Lakshmi Nandana⁴**¹Department of Botany, Payyanur College, Edat P.O., Kannur – 670 327, Kerala, India²S.N.M. College, Maliankara P.O., Ernakulum – 683 516, Kerala, India³PG and Research Department of Botany, Sir Syed College, Karimbam P.O, Taliparamba, Kannur – 670 142, Kerala, India (Affiliated to Kannur University)⁴School of Agriculture, Lovely Professional University, Phagwara, Punjab, IN-144411Email: dratheeshpoduval73@gmail.com

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Abstract: A new species of the genus *Dimeria* from northern Kerala, India, *Dimeria rajaniana* Sunil, Ratheesh & Sidharth, is described. A comprehensive taxonomic account, including its distribution, ecology, and comparison with related taxa, is provided, along with photographic plates of the habit and dissected floral parts to facilitate identification.

Keywords: Coastal, *Dimeria*, Kannur, Kerala

INTRODUCTION

The genus *Dimeria* R.Br. (1810:204), belonging to the family *Poaceae* (Tribe Andropogoneae), is a relatively less explored grass genus distributed across tropical and subtropical regions of the Old World. Members of the genus occur widely in Tropical Asia, extending from India to China, Japan, Korea and the Philippines, and also in Sri Lanka, Northern Australia and Madagascar (Bor, 1953; Teerawatananon *et al.*, 2014; Kiran Raj *et al.*, 2015; Naik *et al.*, 2016). According to Plants of the World Online (POWO, 2025), the genus currently comprises about 57 accepted species worldwide.

India represents one of the major centres of diversity for the genus, particularly the Peninsular region, where a large proportion of the species occur. Recent taxonomic assessments indicate that about 39–42 species are distributed in India, nearly half of which are endemic to the country (Prasanna *et al.*, 2020; Nagaraju *et al.*, 2023). The Western Ghats region, especially the state of Kerala, contributes significantly to this diversity, with about 23 species along with several infraspecific taxa reported from the state.

Species of *Dimeria* are morphologically characterized by their distinctive inflorescence consisting of usually paired, divergent racemes bearing solitary, laterally compressed spikelets. The spikelets are with a cylindrical callus, keeled glumes and margins lacking auricles at the apex (Sreekumar

& Nair, 1991; Kellogg, 2015; Kiran Raj *et al.*, 2015a). Based mainly on rachis and pedicel characters, Bor (1953) proposed an infrageneric classification of the genus into three sections: *Dimeria* sect. *Annulares* Bor., sect. *Capillares* Bor. and sect. *Loriformes* Bor., covering species from India, Sri Lanka and Myanmar. Subsequently, Kiran Raj *et al.* (2015b) established an additional section, *Dimeria* sect. *Dimeria*, based on the type species *Dimeria acinaciformis* R.Br.

Despite several taxonomic treatments and regional floristic accounts (Hooker, 1897; Fischer, 1934; Blatter & McCann, 1935; Cooke, 1958; Bor, 1952, 1960; Kulkarni, 1988; Bhat & Nagendran, 2001), the genus remains incompletely explored, particularly in the diverse ecosystems of the Western Ghats. Continued floristic explorations in this region frequently reveal populations that do not conform to any previously described taxa.

MATERIALS AND METHODS

During recent botanical explorations in the coastal mangrove-associated wet paddy fields of northern Kerala, on 6th January 2026, the authors collected an unusual population of *Dimeria*. Detailed examination of the specimens, together with a critical review of relevant taxonomic literature and comparison with herbarium collections including MH, CALI, CAL and K indicated that the material represents a distinct

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and previously undescribed species belonging to *Dimeria* sect. *Loriformes*. Fresh materials were collected from coastal wetlands of Edat of Kerala State, India and herbarium specimens were prepared following international standards (Vogel, 1987; Forman and Bridson, 1989). Additionally, the specimens were preserved in FAA solution for subsequent microscopic examinations. All measurements and morphological character assessments were carried out using fresh samples. Photomicrographs were taken with trinocular stereo zoom microscope (Nikon, SMZ-45T). The species is described and illustrated here as *Dimeria rajaniana*, and its morphological characters are compared with closely allied species.

RESULT

Taxonomic treatments: *Dimeria rajaniana* Sunil, Ratheesh & Sidharth *sp. nov.* (Fig. 1).

Type: — INDIA, Kerala, Kannur Distr., Poruni Vayal: Kunhimangalam, 12°5'39" N 75°13'49" E, alt. ±1 m MSL), 06 January 2026, *Ratheesh, Sidharth & Sunil* 0051 (Holotype: MH!; Isotypes CALI!, SNMH!).

Diagnosis:

The new species is morphologically similar to *Dimeria copeana* Sreek. *et al.*, but differs in its annual habit (vs. perennial); rachis of raceme 0.8–1 mm wide (vs. 0.25–0.5 mm wide); pedicel glabrous (vs. margins scabrid and bristly hairy at apex); callus glabrous in the spikelets towards lower half of the raceme and sparsely hairy in those towards upper half, with hairs up to 0.2 mm long (vs. callus densely hairy throughout the raceme, with hairs ca. 0.5 mm long); spikelets towards lower half of the raceme either unawned or with an imperfect awn, while those towards upper half perfectly awned (vs. all spikelets perfectly awned with a column); upper glume glabrous or scabrid (vs. long ciliate along the keel, sides and margins); and upper lemma of spikelets towards lower half of the raceme acute at apex either unawned or bearing an imperfect awn, where as those towards upper half bifid at the apex, with a well-developed perfect awn from the sinus (vs. upper lemma of all spikelets throughout the raceme bifid at the apex and bearing a perfect geniculate awn).

Description

Annual tufted herbs. Culms slender, branched, 20–60 cm tall; upper nodes bearded. Leaves distributed along the culms; sheaths up to 5 cm long, rounded on

the back, glabrous or sparsely hairy towards the apex; blades 3.5–8 × 0.2–0.4 cm, linear-lanceolate or lanceolate, 9–11-nerved, base more or less truncate, apex acuminate; margins long-ciliate with bulbous-based hairs, the hairs up to 4 mm long; ligule membranous, hyaline, ca. 1 mm long, more or less truncate and prominently fimbriate at the apex. Racemes 2–4, well exerted from the spatheole, 3.5–8 cm long; rachis 0.8–1 mm wide, trigonous, glabrous or scabrid along the angles. Spikelets 2–3.2 × 0.5–1 mm, oblong or oblong-elliptic, apex rounded to acute; those towards lower half of the raceme unawned or with a rudimentary awn, those towards upper half with a well-developed geniculate awn; pedicels short, 0.1–0.2 mm long, concave at the apex, glabrous; callus short, 0.1–0.2 mm long, glabrous in the spikelets towards lower half of the raceme and glabrous or sparsely hairy in those towards upper half, with hairs up to 0.2 mm long. Lower glume 1.8–2.8 × 0.25–0.3 mm, linear-oblong, apex acuminate, acute or obtuse, keeled on the back; keel wingless or narrowly winged towards the apex; surfaces glabrous or sparsely scabrid on the sides. Upper glume 2–3 × 0.5–0.8 mm, oblong, apex rounded, obtuse or acute, chartaceous, keeled on the back; keel scabrid and narrowly winged; sides chartaceous, glabrous or scabrid. Lower lemma hyaline, 1.5–2 × 0.4–0.6 mm, oblanceolate to obovate, apex rounded to acute; margins ciliate. Upper lemma hyaline, 1.7–2.2 × 0.4–0.5 mm; in spikelets towards lower half of the raceme oblong to oblong-elliptic with an acute apex, unawned or with a rudimentary awn; in spikelets of the upper half oblanceolate with a bifid apex and bearing a well-developed awn from the sinus; awn geniculate, up to 6 mm long, with a column ca. 2 mm long. Lodicules 2, small, wedge-shaped. Stamens 2; filaments 0.5–1 mm long; anthers 1.6–2 mm long, oblong, yellow. Ovary ca. 0.3 × 0.2 mm, ellipsoid; style 0.4–0.6 mm long; stigmas 2, ca. 1 mm long, plumose, creamy-yellow.

Flowering & fruiting: November–January.

Etymology: The specific epithet '*rajaniana*' is proposed in honour of Mr. P. P. Rajan, an environmentalist from northern Kerala, India, who dedicated his life to the conservation of mangrove ecosystems and the lateritic hill landscapes of the region. Through his persistent efforts in environmental awareness, habitat protection, and community engagement, he significantly contributed to safeguarding these ecologically fragile habitats and their unique biodiversity.

Table 1. Comparison of distinguishing characters of *Dimeria copeana* and *D. rajaniana*

Characters	<i>Dimeria copeana</i>	<i>Dimeria rajaniana</i>
Habit	Perennial herbs, stoloniferous or with thick root stock	Annual herbs without stolones or thick root stock
Rachis of raceme	0.25–0.5 mm wide	0.8–1 mm wide
Pedicel	Scabrid on the margins, with one or more bristly hairs towards the apex	Glabrous
Callus	Densely hairy throughout, hairs ca. 0.5 mm long	Glabrous towards the lower half of racemes; glabrous or sparsely hairy towards the upper half, hairs up to 0.2 mm long
Spikelets	All with a perfect awn, scaberulous column present	Unawned or with an imperfect awn towards the lower half of racemes; imperfectly or perfectly awned towards the upper half of racemes
Upper glume	Long ciliate along the keel, sides, and margins	Glabrous or scabrid along the keel and sides
Upper lemma	Apex bifid, with a perfect geniculate awn arising from the sinus; awn ca. 8 mm long	Entire at apex with or without an imperfect awn towards the lower half of racemes; bifid at apex with a perfect awn from the sinus towards the upper half; awn up to 6 mm long

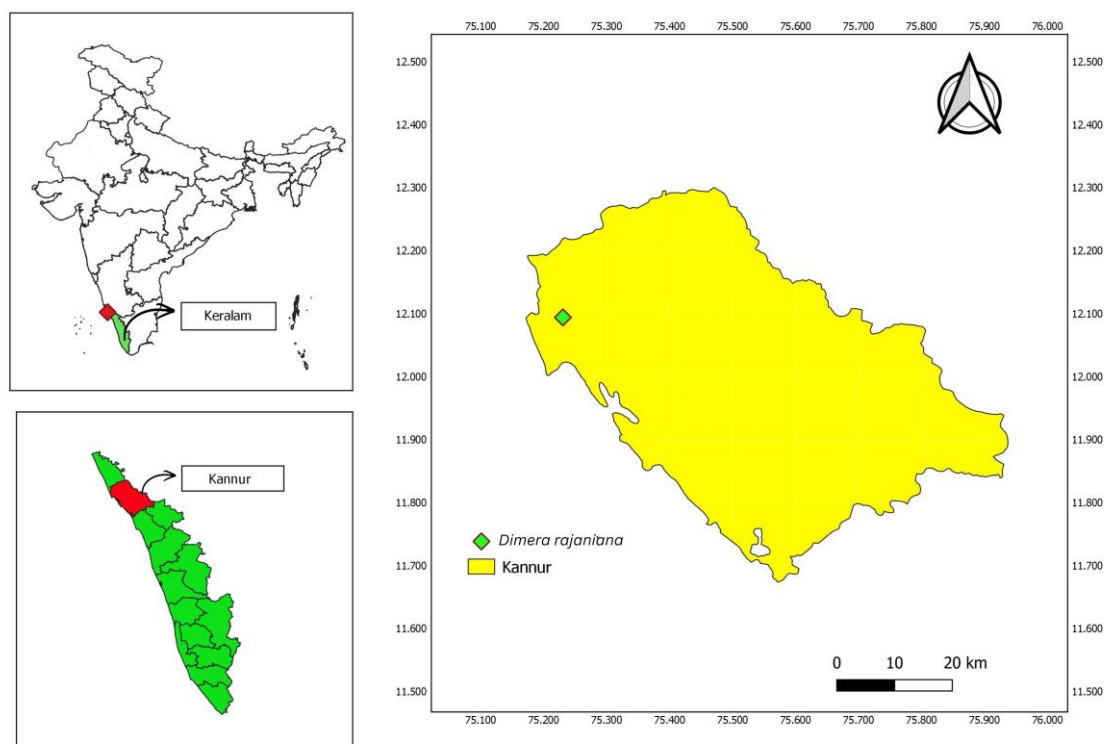
Figure 1: Map showing the Type Locality

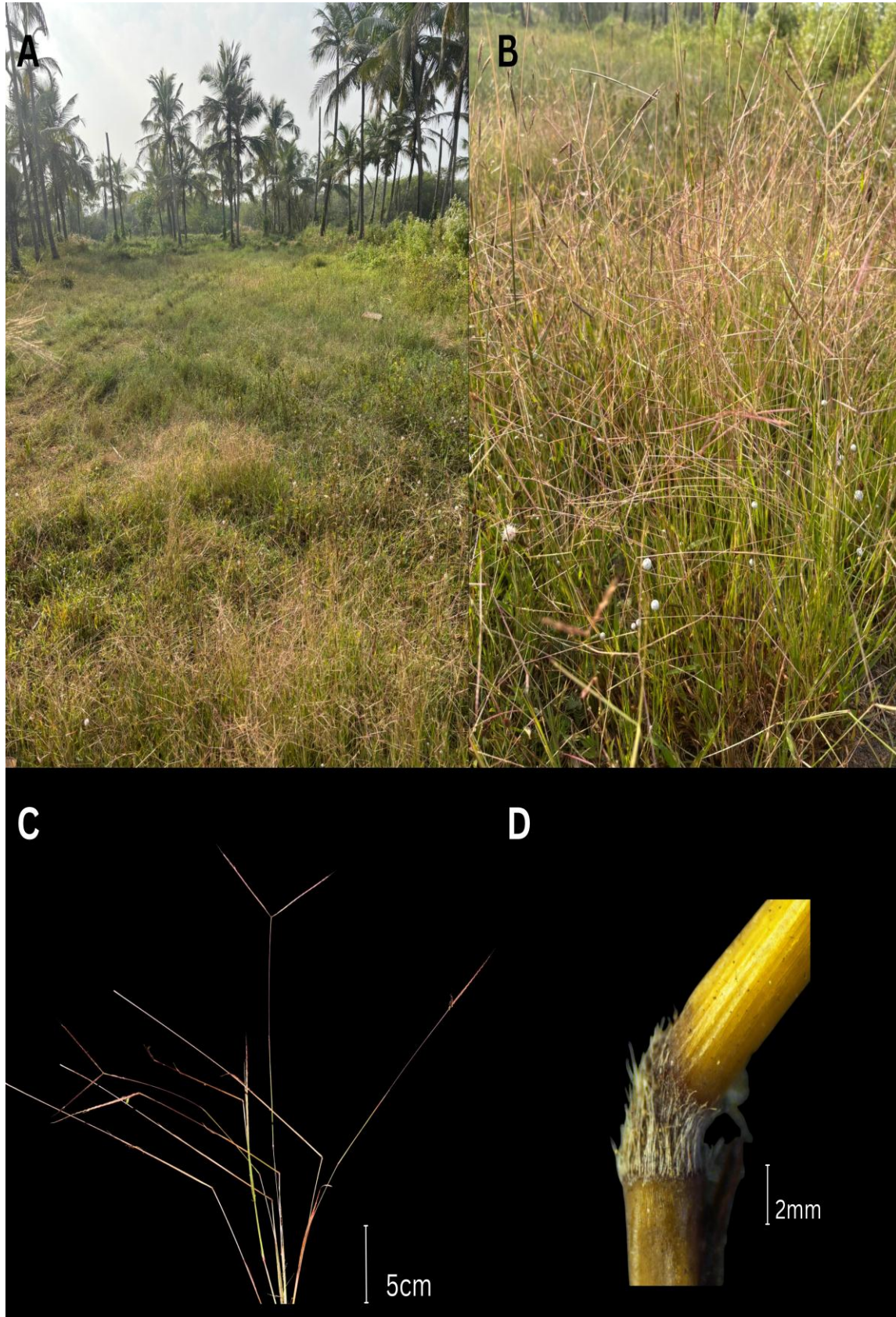
Figure 2: A. Habitat; B. Habit; C. Inflorescence; D. Node

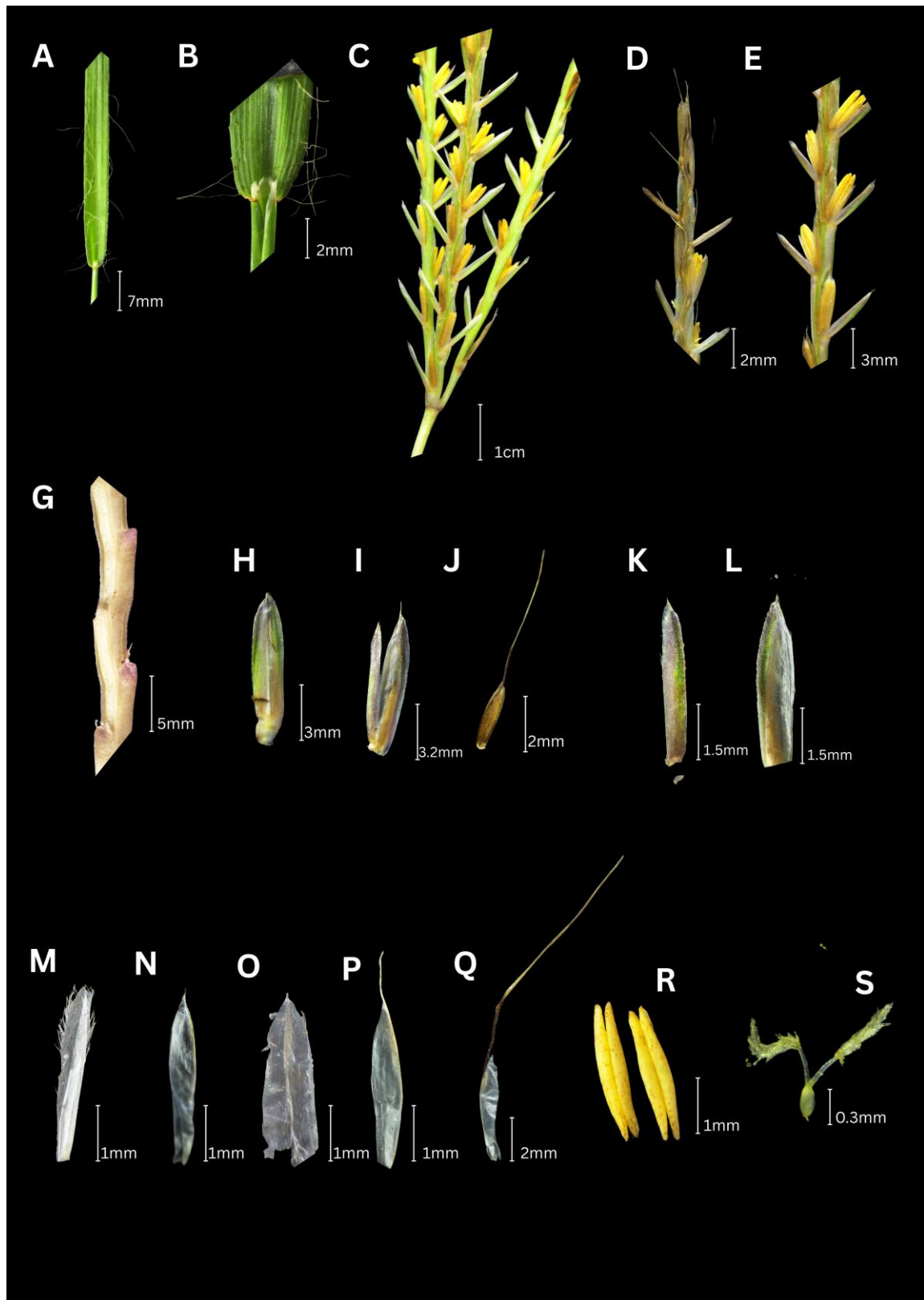
Figure 3: Morphology of the plant parts

Fig 3: A. Leaf blade adaxial view; B. Leaf showing ligule; C. Base of inflorescence showing three raceme with awnless spikelets; D. Apex of a raceme with awned spikelets; E. Basal portion of a raceme showing awnless spikelets; G. Rachis adaxial view; H. Basal awnless spikelet; I. Spikelet with rudimentary awn; J. Awned spikelet; K. Lower glume; L. Upper glume; M. Lower lemma; N & O. Awnless upper lemma; P. Upper lemma with rudimentary awn; Q. Upper lemma with perfect awn; R. Anthers; S. Pistil

DISCUSSION

Dimeria rajaniana sp. nov. can be placed under section *Dimeria* Kiran *et al.* of the genus, as it possesses a trigonous, wingless rachis and closely packed spikelets. The spikelets of this new species exhibit marked morphological variation from the base to the apex of the raceme. Spikelets at the base are awnless; moving upwards, the awn gradually develops from an arista to a rudimentary awn without a column, eventually forming a perfect geniculate awn with a well-developed column towards the apex. The number of spikelets per raceme ranges from 32 to 53, of which 14–22 at the base are either awnless or bear a rudimentary awn. Spikelet size also varies along the raceme: those at the lower portion are larger ($2.5\text{--}3.2 \times \text{ca. } 1 \text{ mm}$) and gradually decrease in size towards the upper portion ($2\text{--}2.5 \times 0.5\text{--}0.6 \text{ mm}$). The callus is glabrous in the lower spikelets of raceme and becomes sparsely hairy towards the upper portion. Similarly, spikelets are glabrous at the base but become scabrous towards the apex. The upper lemma of basal spikelets are unawned with an acute apex; this gradually transitions to an aristate form, then to an imperfect awn towards middle portion, and finally becomes bifid at the apex with a perfect geniculate awn arising from the sinus in the upper portion of the raceme.

Among the three Indian species of *Dimeria* with an imperfect (i.e., without a column) or awnless upper lemma, the new species shows some similarity to *D. lehmannii* (Steud.) Hack. However, *D. lehmannii* differs markedly in several characters, including the ciliate margins of the rachis and pedicel, larger spikelets (4–4.5 mm long), a ciliate lower glume, and a larger upper glume (4–4.5 mm long) with a ciliate winged keel. In addition, all upper lemmas in *D. lehmannii* are either imperfectly awned or completely awnless. Therefore, the new species appears to represents a connecting link between taxa with a fully developed (perfectly awned) upper lemma and those with an awnless or imperfectly awned upper lemma.

CONCLUSION

At present, the species is known only from the type locality. It occurs in coastal wet paddy fields associated with mangrove ecosystems, where it grows in association with common herbs such as *Hygrophila auriculata* (Schumach.) Heine, *Limnophila repens* (Benth.) Benth., *Marsilea quadrifolia* L., *Fuirena capitata* (Brum. f.) Koyama, *Eriocaulon sexangulare* L., *Scleria caricina* (R.Br.) Benth., *Ischaemum ciliare* Retz., *Xyris pauciflora* Willd. etc.

At present, the species is known only from the type locality. According to IUCN (2024) criteria, it is categorized as “Data Deficient” (DD) due to the lack

of sufficient information on its geographic distribution and population size.

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