



Fimbristylis prasadii (Cyperaceae), a new species from Karnataka, India

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ABSTRACT: *Fimbristylis prasadii*, a new species of Cyperaceae is described from the Bhatkal Lateritic Plateau in Karnataka, India. It morphologically resembles *F. pauciflora* R.Br., but can be recognised by the well-developed ligulate leaves, membranous or subchartaceous glumes with 1-nerved keel, occurrence of 3 stamens, triquetrous nutlet with its prominent angles almost winged towards apex and subtruncate with a shallow depression at apex. Also, the epidermal cells on nutlet surface are transversely linear-oblong. A detailed description, distribution, phenology, images of the plant and its floral parts, and a comparison with related species are provided.

KEY WORDS: Cyperaceae, *Fimbristylis pauciflora*, *Heleocharoides*, Konkan region, Lateritic plateau, new species, taxonomy.

INTRODUCTION

Fimbristylis Vahl, is one of the prominent and largest genera of the sedge family Cyperaceae belonging to the tribe Abildgaardieae (Larridon *et al.*, 2021) with approximately 313 species, widely distributed across the tropical and subtropical regions (POWO, 2026). In India, the genus is well represented, with 128 taxa, including 117 species, 5 subspecies and 6 varieties (Prasad *et al.*, 2020) from diverse habitats, including wetlands, grasslands, lateritic Plateau, and coastal ecosystems. The Western Ghats and adjacent areas of southwest India alone account for 97 species, highlighting the area's exceptional biodiversity (Sanilkumar *et al.*, 2021; Ratheesh Narayanan *et al.*, 2023; Mujaffar *et al.*, 2024). Prasad and Singh, (1997) did a detailed study on distribution and endemism of Indian *Fimbristylis* and found that majority of the species are distributed in peninsular India, followed by northeast India. They also noticed predominant endemism of the genus in peninsular India.

The lateritic plateaus of the Konkan region support a considerable diversity of *Fimbristylis* species, emphasising the ecological importance of these unique habitats. During a recent field survey of the lateritic plateaus of Bhatkal and Mugali, Karnataka, the authors collected an interesting species of *Fimbristylis*. A detailed morphological examination and thorough review of relevant literature (Clarke, 1894; Fischer, 1931; Kern, 1974; Koyama, 1985; Prasad and Singh, 2002; Shuren *et al.*, 2010; Wadoodkhan, 2015; Patil and Prasad, 2020) indicated that the specimens belong to a new species of

the genus. Although it shows some morphological resemblance with the species *F. pauciflora* R.Br., it exhibits some differences viz. well-developed ligulate leaves, membranous or subchartaceous glumes with 1-nerved keel, shorter empty lower glumes, presence of three stamens, triquetrous obovoid-pyriform nutlet with prominent angles and subtruncate with shallow depression at apex, and transversally oblong epidermal cells on the nutlet surface (Table 1). This study provides the detailed description of a new species, comparisons with related taxa, a photographic plate (Fig. 1), and a distribution map (Fig. S1).

MATERIALS AND METHODS

Fresh materials were collected from two different localities in the Konkan region of Karnataka 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 distribution map was created using QGIS Ver 3.10.11. A comparative study of morphological characters with specimens available in various herbaria along with an examination of protologues, digital images of type specimens of related species and relevant literature, confirmed the novelty of the taxon

**Table 1.** Comparison of distinguishing characters of *Fimbristylis prasadii* and *F. pauciflora*

Characters	<i>Fimbristylis prasadii</i>	<i>Fimbristylis pauciflora</i>
Culms	4–8 cm long, 0.5–1 mm thick.	(5–)10–30 cm long, 0.25–0.5 mm thick.
Leaves	Well-developed, 2–6 cm long; ligule a fringe of short hairs	Reduced to membranous sheaths or 1 or 2 with a short (sometimes up to 6 cm long), filiform blade; ligule absent.
Spikelets	Terete or somewhat flattened, 4–7 × 0.8–2 mm, lanceolate or oblanceolate.	Terete, 3–6 × 1–1.5 mm, oblanceolate, or narrowly oblong.
Glumes	Membranous or subchartaceous, 2.5–4 × 1.6–2 mm, ovate or ovate-lanceolate, with 1-nerved keel; lower 1 or 2 empty glumes shorter, up to 2.5 mm long.	Cartilaginous, 2.5–3 × ca. 1.5 mm, lanceolate, with 3–5(–ovate-lanceolate, with 1-nerved keel; lower 1 or 2 empty glumes longer, 3–4 mm long.
Stamens	3	1–2(–3)
Nutlet	Triquetrous with the angles almost winged towards apex, 1.6–2 mm long, obovoid-pyriform, subtruncate with a shallow dorsiventrally compressed, 0.75–0.9 mm long, obovoid, depression at apex, yellowish to stramineous, smooth; epidermal cells transversely linear-oblong.	Obtusely trigonous with convex faces, not winged, usually 0.75–0.9 mm long, obovoid, depression at apex, stramineous to brown, whitish verruculose; epidermal cells irregular, isodiametric or elliptic.

TAXONOMIC TREATMENT

Fimbristylis prasadii Sunil, Ratheesh & Sidharth *sp. nov.*

Fig. 1

Types: INDIA, Karnataka, Uttara Kannada district, Bhatkal Plateau, 5m MSL, 3 September 2024, *C. N. Sunil, Ratheesh Narayanan & Sidharth S Nair 9347* (Holotype: MH!; Isotypes CALI!, SNMH!). INDIA, Karnataka, Uttara Kannada District, Mugali Plateaus, 9 October 2024, *C.N. Sunil, Ratheesh Narayanan and Sidharth 9365* (Paratype: SNMH!).

Diagnosis: *F. prasadii* shows some resemblance to *F. pauciflora* R.Br. in its habit corresponding to the presence of a single terminal spikelet and the absence of involucre bracts. However, it differs in having well-developed ligulate leaves; membranous to subchartaceous glumes with a 1-nerved keel; shorter lower empty glumes; consistently three stamens; triquetrous, large, smooth nutlet with prominent angles that are almost winged towards the apex; and epidermal cells on the nutlet surface that are transversely linear-oblong. (Table 1).

Description: Annual with fibrous roots. Culms tufted, slender, 4–8 cm × 0.5–1 mm, sulcate, smooth, glabrous. Leaves few, basal, ligulate, shorter than or as long as culms, 2–6 cm long, 0.6–1.4 mm wide, linear, obtuse to subacute at the apex, glabrous; sheaths 0.8–1.5 cm long, glabrous; ligule a fringe of short hairs. Inflorescence a solitary terminal spikelet. Involucre bracts absent. Spikelet erect, terete or somewhat flattened, 4–7 × 0.8–2 mm, lanceolate or oblong-lanceolate, acute at apex, 5–11-flowered, yellowish to stramineous; rachilla excavated, winged. Glumes spirally imbricate, closely adpressed, membranous or subchartaceous, 2.5–4 × 1.6–2 mm, cymbiform, ovate or ovate-lanceolate, acute at apex, glabrous, with 1-nerved keel and nerveless sides with short rust-coloured lines; lower 1 or 2 glumes empty, up to 2.5 × 1.5 mm, with up to 0.4 mm long mucro. Stamens 3; filaments 0.6–1.4 mm long; anthers 1.3–2 mm long, oblong. Ovary trigonous with prominently concave sides, ca. 0.5 × 0.35 mm, obovate; style 1.6–3 mm long, trigonous, pyramidally thickened at base, glabrous;

stigmas 3, 0.7–1.5 mm long, hirsute. Nutlet triquetrous with the prominent angles almost winged towards apex, 1.6–2 × 0.7–1.2 mm, obovoid-pyriform, subtruncate with a shallow depression at apex, gradually narrowed towards base into ca. 0.4 mm long stipe, yellowish to stramineous, smooth; epidermal cells transversely linear-oblong, in 6–8 vertical rows on each face.

Flowering and fruiting: August–October.

Distribution and Ecology: This species is currently known only from the lateritic plateaus of two localities, Bhatkal (13°57'33.27"N and 74°33'4.00"E) and Mugali (13°57'59.19"N and 74°38'52.10"E), Uttara Kannada District, Karnataka state in southern India. It grows near temporary pools along with *Eriocaulon gopalakrishnanum* K. Rashmi & G. Krishnak., *Isachne veldkampii* K.G. Bhatt & Nargendran and *Rotala malampuzhensis* R.V. Nair ex C.D.K. Cook and occupies approximately an area less than 500 hectares. These lateritic plateaus are characterized by a unique, seasonally moist environment with shallow soil that support distinct plant communities adapted to this habitat.

Etymology: The new species is named in honour of Dr. Vadhyaruparambil Prabhakaran Prasad (V. P. Prasad), former senior scientist in Botanical Survey of India and former Head of the Central National Herbarium (CAL), Howrah, Kolkata, for his outstanding contributions to the taxonomy of family Cyperaceae in India.

Preliminary conservation status assessment: Bhatkal tiger falls is a prominent tourist area and frequent human intervention occurs around Mugali area for stone excavation and other conservation related aspects. The impact of human influence may pose a serious threat to this species in the future. The current conservation assessment of this species is DD (IUCN, 2024-1). Further study is necessary to check the population status and reproductive trends to confirm the green status of the species.

Note: *Fimbristylis prasadii* can be placed under section *Heleocharoides* Benth. (Bentham and Mueller, 1878) of the genus, as the inflorescence is a single terminal spikelet, without involucre bracts. The unique

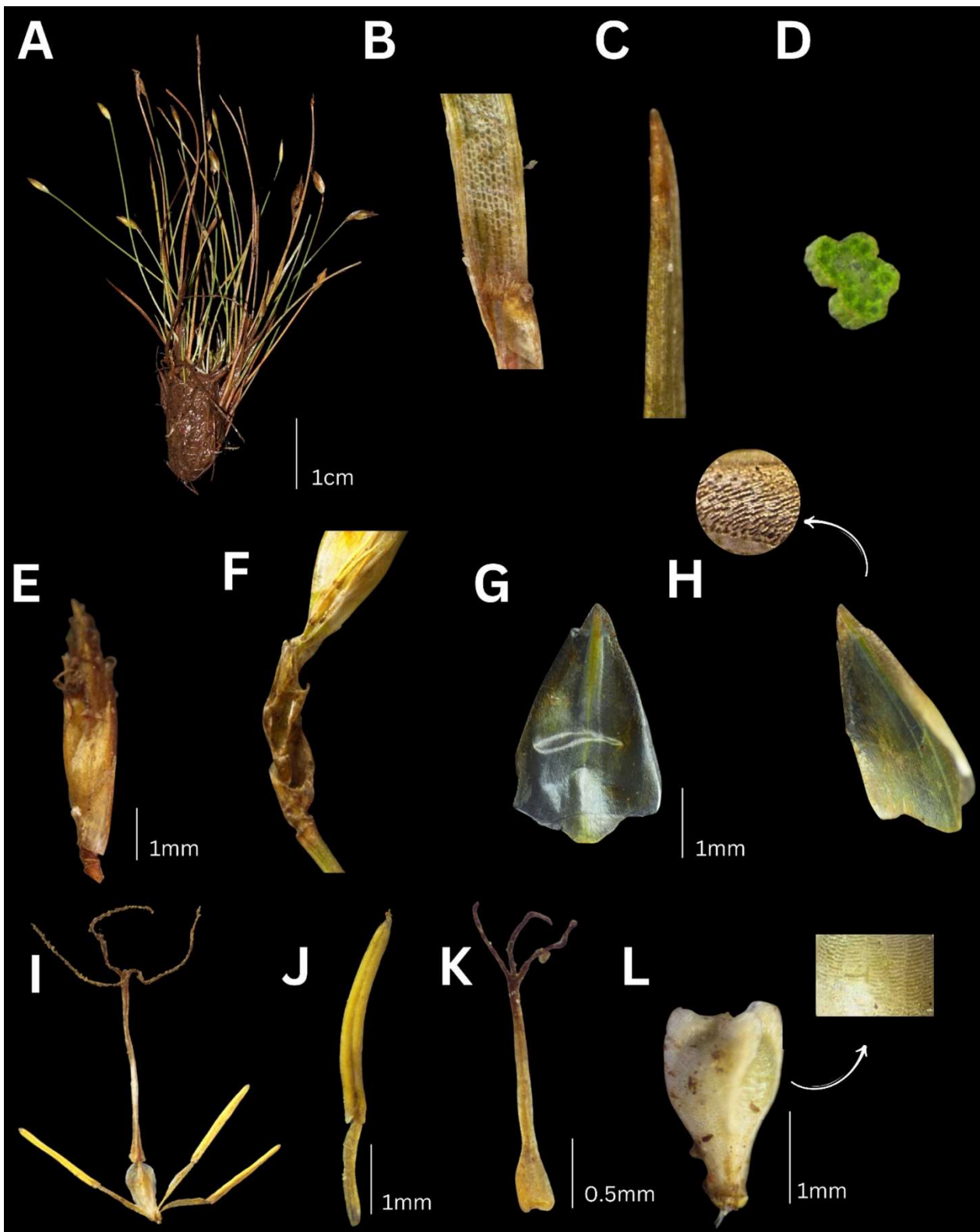


Fig. 1. *Fimbristylis prasadii* sp. nov. **A.** Habit; **B.** Basal portion of the leaf to show the ligule; **C.** Leaf apex; **D.** C.S. of the culm; **E.** Spikelet; **F.** Rachilla; **G.** Glume abaxial view; **H.** Glume side view; **I.** Flower; **J.** Stamen; **K.** Style and stigmas; **L.** Nutlet.



distinguishing character of the species is the prominently angled nutlet which is almost 3-winged and subtruncate with a shallow depression at apex. This kind of nutlet has not been noticed in any Indian species of *Fimbristylis*. Other characters for easy recognition of the species are, presence of a single terminal spikelet and absence of involucre bracts. *F. prasadii* has some similarity with the Southeast Asian species *F. fenestrata* Kük. as well, which has a single spikelet as inflorescence and its nutlet truncate and quasi-tridentate at apex. But, unlike *F. prasadii*, the inflorescence is pseudolateral, because of its erect bract which looks as continuation of the culm, pale ferruginous glume with green keel and mucronate apex, 10 – 20 cm long compressed culm, setaceous leaves, broadly obovoid and minutely reticulate nutlets. *F. prasadii* may be confused with *F. acuminata* Vahl in the field in its overall appearance, but it is quite different in many characters, especially the bladeless leaves, much bigger spikelet, distigmatic style and dorsiventrally compressed, biconvex, obovate-orbicular nutlet with 5–8 transverse wavy ridges.

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