



Cyperus melanostachyus Kunth (Cyperaceae): A New Report to Indian Flora

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ABSTRACT

During the survey collection of *Cyperus* species for seed morphometric analysis, an interesting species was collected, which is not matching with any species from Karnataka and India. After identification and seed morphometric studies, it is identified as *Cyperus melanostachyus* Kunth that is addition to India which is earlier reported from Argentina, Brazil, Mexico, Canada, California etc with a distinguishing characters like the middle part of the glume is dark brown, margin is green color and arrangement of testa cells on the seed.

Keywords: Bhanvasi, New record, Sedges, Seed morphometry, Uttara Kannada district.

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Introduction

Cyperaceae is one of the biggest family in monocots, which records around 5,733 species across the globe (11). India records around 500 species within 35 genera until now (6). Western Ghats records 187 Species out of which 72 species belongs to genus *Cyperus* (8). There are Pre-Linnaeus contribution to the family by and There are other historical works on the family Cyperaceae, they are Retzius (13), Willdenow (17), Steudel (15), Benthem (1) & Pax (10) have done more detailed study on study his family. On certain authentic Cyperaceae of Linnaeus reports was the first on to do extensive study on Indian Cyperaceae (3). In Karnataka Cyperaceae records 196 species and out of which (21) Genera, (181) species, (11) subspecies and (4) varieties (14 & 12). Earlier the Flora of presidency of Bombay records 110 species under 14 genera (4) and Flora of Presidency of Madras record 161 species under 20 genera (5) of Cyperaceae members. Flora of Peninsular India records 24 genera recording 89 *Cyperus* species and 8 varieties and 7 sub-species (6).

During the field survey in Uttara Kannada district, collected a *Cyperus* species and is identified by seed morphometry, the key character of *Cyperus* genus is the leaves are arranged in three ranks, and inflorescence are umbel type. The diagnostic features of species is dark colored spikelets, narrow inflorescence, slender, Perennial, well-developed bracts but in *Cyperus compressus* L. the spikelet's are more flattened, same sizes and annual. After analysis, seed ornamentation of many species in that region has been conducted which is not similar to the structure and ornamentation to our seed. Some authors on seed morphometry reports for seed are not similar to seed which we have collected at Bhanvasi, Uttara kananda, Karnataka with characters like horizontal undulations, punctulate, brown color (7, 9 & 14). Therefore, this species *Cyperus melanostachyus* Kunth. is recorded as new report to India, which is earlier reported from Brazil, Mexico, U.S.A., and America (Figure 01).

***Cyperus melanostachyus* Kunth** F.W. H. Von Humboldt, A. J. A.

Bonpland & C. S. Kunth, Nov. Gen. Sp. 1: 207 (1816). *Cyperus niger* Ruiz & Pav., Fl. Peruv. [Ruiz & Pavon] 1: 47 (1798), nom. illeg. *Cyperus melanostachyus* var. *capitatus* (Britton) G. C. Tucker & Gandhi, Paper Botany 27:111 (2002); *Cyperus melanostachyus* var. *gracilis* Liebm. Mexico Halvgr., 202 (1850); *Cyperus melanostachyus* var. *robustus* Liebm. Mexico Halvgr.: 201 (1850). Figure 02

Habit is Perennial, 5-30 cm tall. **Rhizomes** 1-2 mm in diameter, soft, producing culms 1-20 mm apart. Culms 1.4 mm in diameter, trigonous to triquetrous, smooth. **Leaves** 3-7, 3-15 cm long, 1.5 mm wide, broadly v-shaped, the margins scabrellate for the entire length, or apically only. **Inflorescence** bracts 2-3, 1-10 cm long, 1-3 mm wide, broadly v-shaped, the margins and keel scabrellate. **Rays** 1-2, 3-30mm long; rays sometimes absent. **Spikes** 7-16 mm in diameter, loosely to densely ovoid to hemi spherical; rachis 1-2 mm long, or absent. **Spikelets** 5-9 mm long, 1.8-2.3 mm wide, linear to oblong-linear, flattened; rachilla persistent, 0.4 0.6 mm wide, 0.4-0.5 mm thick, quadrate, stramineous to reddish brown, successive scale scars 1 mm apart, wings absent. **Scales** deciduous, 4-18, 1 mm wide, ovate to orbiculate, apex obtuse, laterally nerveless, black, or light brown, medially distinctly bicarinate basally, 2 nerved, green or greenish brown. **Stamens** 2; filaments; anthers 7 mm long, narrowly ellipsoid, the connective apex not prolonged. **Style** 6 mm long; stigmas 2. **Achenes** pale brown yellow, with ruff surface, 0.8-1.2 mm long.

Type: holotype: *Cyperus melanostachyus* Kunth, Argentina, 1882-02-01, Royal Botanic Gardens, Kew (K000632078).

Specimen examined: India, Karnataka: Uttara Kannada District, Bhanvasi, Ancient Shri Madhukeshwara Temple, 14.535450, 75.017316, 530-630 msl, 24 October, 2024, Spoorthi Deshi & Shreyas Betageri [University of Agricultural Science, Bangalore-22 (UASB 5761); Karnatak Science College, Dharwad (HKSCD 20502)] (Figure 4)]

Flowering & Fruiting: August-December.

Habitat & Ecology: Lawn in Ancient Madhukeshwara temple, Bhanavasi, on the bank of River Varada. The lawn in temple is disturbed for chopping the grasses to level them. In addition, recorded *Fimbristylis* sp. associated at one corner of lawn.

Distribution: Oklahoma, Western California, U.S.A., Mexico, Central America, Argentina, California, [India (Karnataka-Present record)].

Micro Morphology

Achene Morphology: Achenes 0.9-1.2 mm long, 0.4-0.6 mm wide, lenticular, ovoid-ellipsoid, apex apiculate, base slightly stiptatae, the faces convex, the surface with transverse undulations, punctulate, brown. Undulations record 0.05 mm in length and 0.012 mm in width (Figure 3). SEM imaging of eight *Cyperus* species from Khandeshi region showed not transverse undulations, but showed minor polygonal radial and tangential walls are much prominent forming the colliculate surface (7). Taxonomic Significance of Achene Micro- And Macromorphology in *Cyperus* L. (Cyperaceae) reported twelve *Cyperus* species variation of primary sculpture with the proposition three ornamentation patterns: reticulate, rugose, and granulate. Ornamentation of achene surface is anticlinal walls, superficial silica bodies and the contour of the epidermal

cells (14). Taxonomic Significance of Achene Morphology in the Genus *Cyperus* L. (Cyperaceae) In Goa, India reported using SEM achene studies of 21 species. Achenes shape and epidermal patterns were found distinctive and consistent within the species or infraspecific taxon. Variation in the epidermal cells is evident concerning size of the cell, nature of periclinal wall, the number, thickness and sinuosity of anticlinal walls per cell, and presence or absence of silica bodies (9). Therefore, the above observations are not similar to our *Cyperus melanostachyus* achene morphology.

Conservation Status: After survey, analysis there are less than 30 individuals in the garden of that temple. We did not get anywhere near the temple. As this species is Data Deficient (DD) as per IUCN red list due to lack knowledge of this species (IUCN, 2025).

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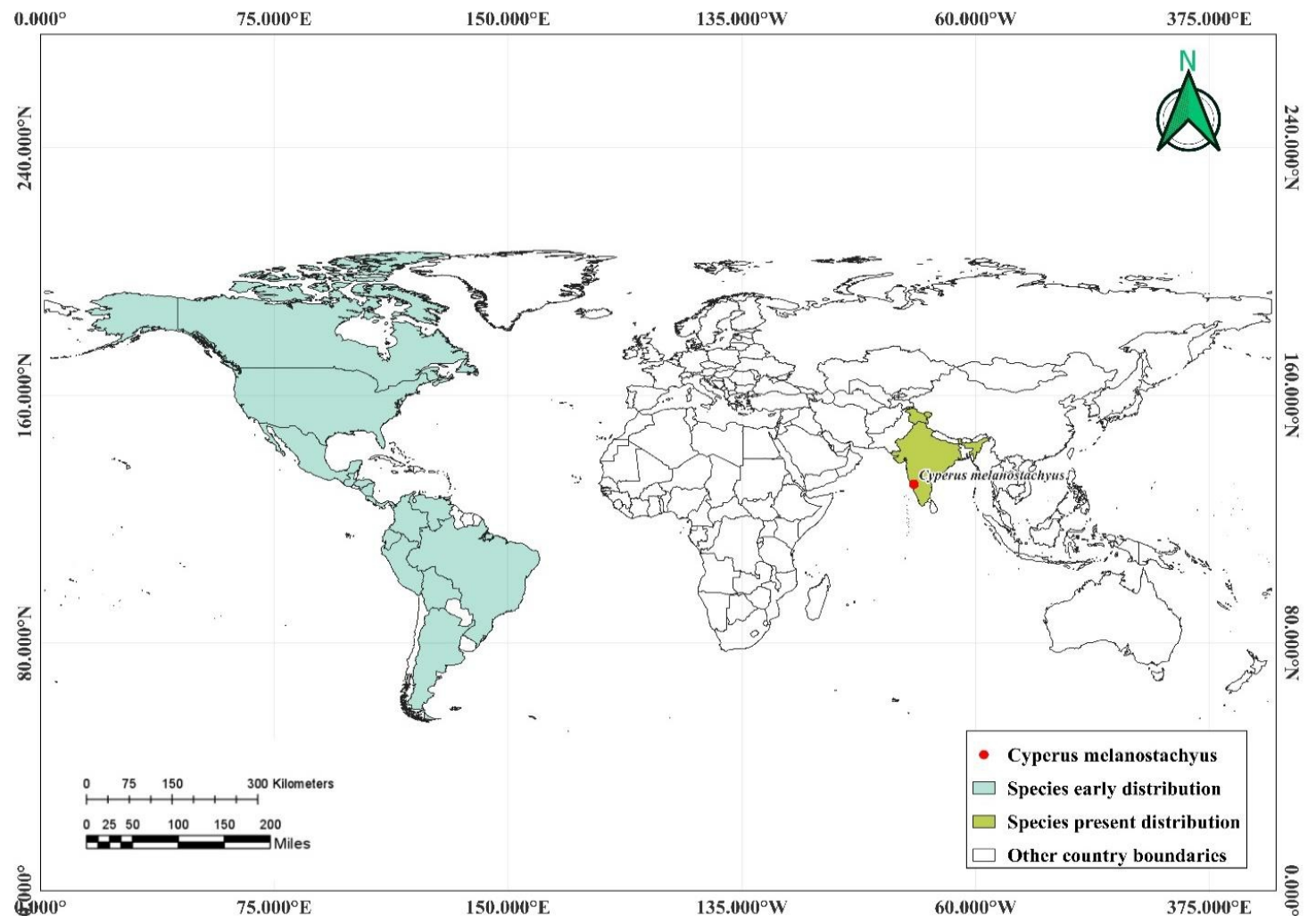


Figure 01. *Cyperus melanostachyus* Kunth. distribution map using QGIS 7.0 version

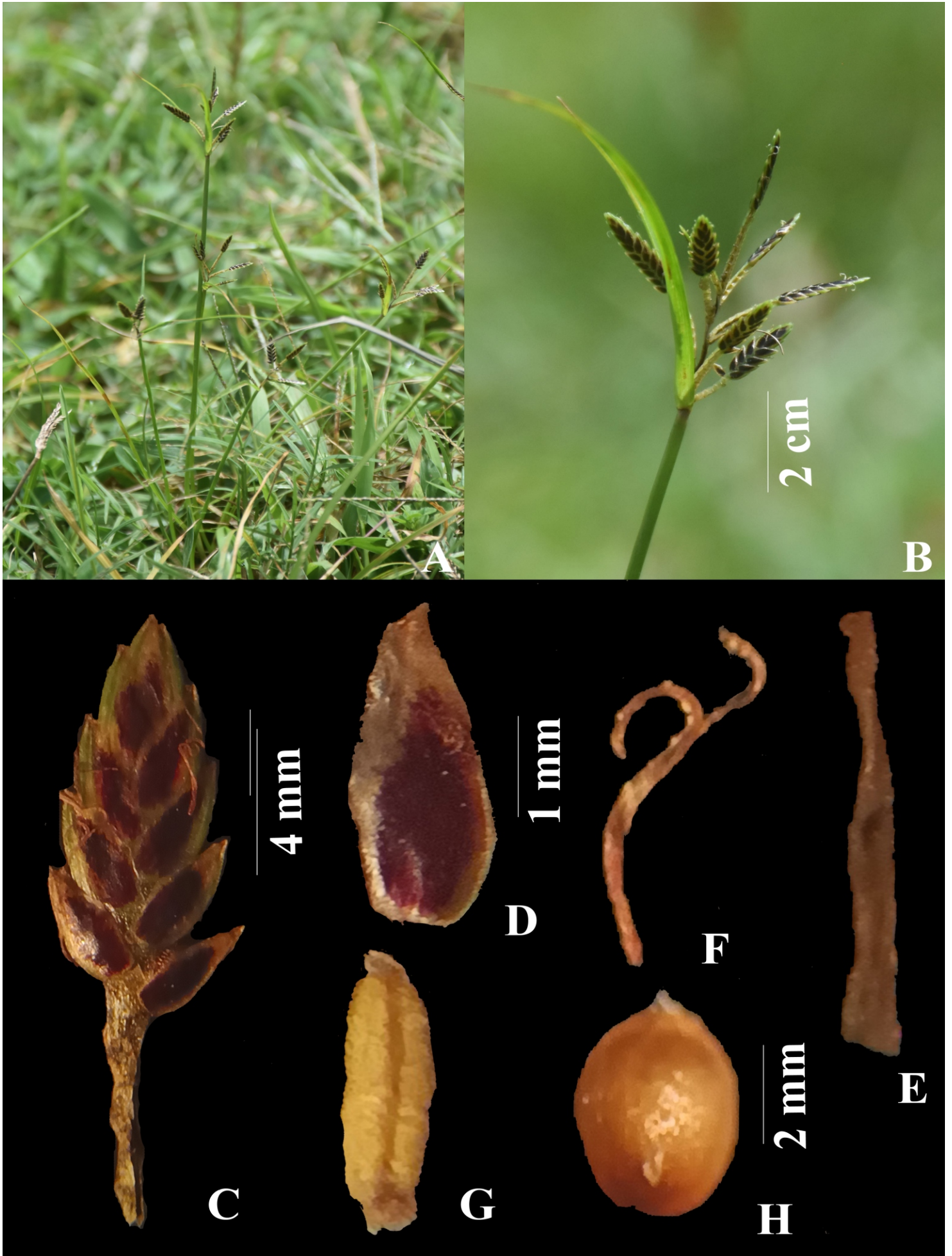


Figure 02. *Cyperus melanostachyus* Kunth. A. Habitat; B. Inflorescence; C. Spikelet; D. Glume; E. Filament; F. Stigma; G. Anther; H. Nut. (Photo by: Spoorthi Deshi)

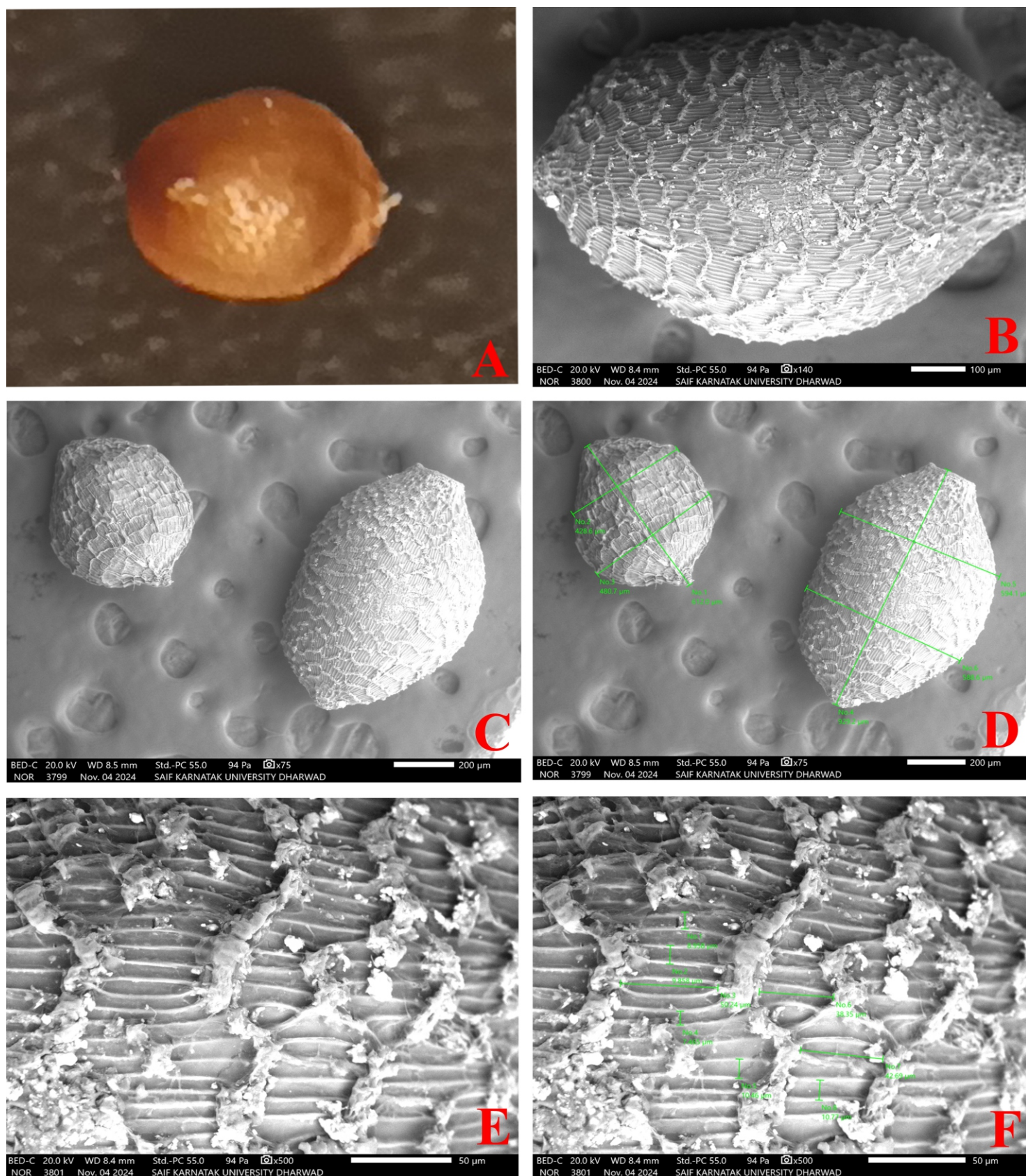


Figure 03. Seed morphometric studies of *Cyperus melanostachyus* Kunth. A. Seed in stereomicroscope; B. Seed in SEM at 75 X; C. D. Single Seed at 140X; E. F. Testa cells at 500X

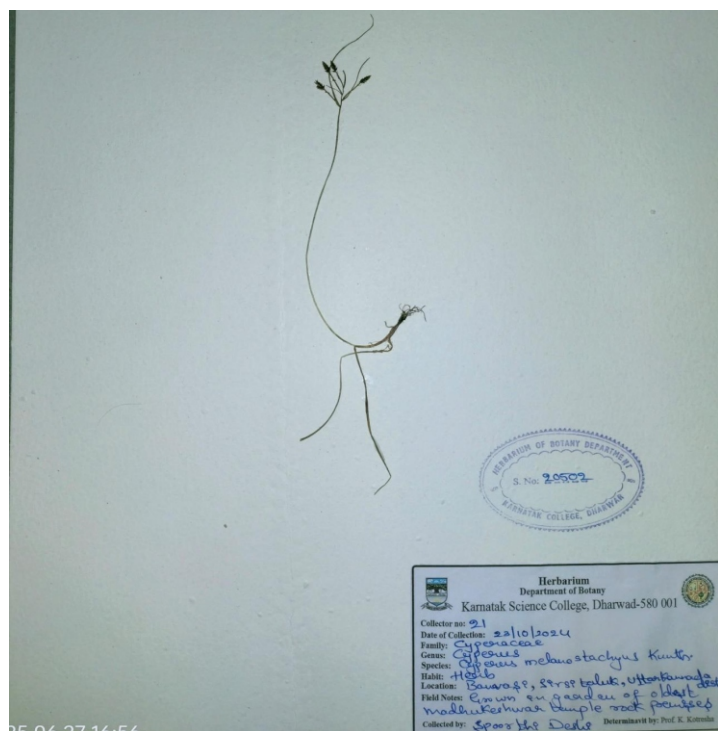


Figure 04. *Cyperus melanostachyus* Kunth. Herbarium deposited at Herbarium of Karnatak Science College, Dharwad

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