Urochloa trichopus (Hoch.) Stapf (Poaceae: Paniceae): An addition to the Flora of Karnataka, India

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Abstract

Urochloa trichopus (Hoch.) Stapf, a grass species native to Africa, the Arabian Peninsula, and Madagascar, is reported here for the first time from Karnataka (India). A detailed taxonomic description with photographs is provided to facilitate its identification.

Keywords

Angiosperms, Gramineae, non-native, new record, Bengaluru.

Introduction

Urochloa P.Beauv. (Family: Poaceae, Subfamily: Panicoideae, Tribe: Paniceae, Subtribe: Melinidinae) is a pantropical genus of over a hundred C4 grass species (Watson et al. 1992; Kellogg 2015). Of these, twenty-seven species and a further eight varieties are reported from India (Kellogg et al. 2020). The genus, *sensu lato*, is morphologically diverse, paraphyletic, and includes many species previously assigned to the genera *Brachiaria* (Trin.) Griseb., *Chaetium* Nees, *Scutachne* Hitchc. & Chase, *Megathyrsus* (Pilg.) B.K. Simon & S.W.L. Jacobs and *Eriochloa* Kunth (Kellogg 2015; Delfini et al. 2023; Masters et al. 2024). Many characters previously used to delimit the genus – mucronate upper lemma, abaxial spikelet orientation, transversely rugulose upper floret, racemose inflorescences – have subsequently been found to be of limited taxonomic value due to the occurrence of intermediate forms and high variability within the expanded genus (Bor 1960; Clayton and Renvoize 1986; Ashalatha and Nair 1993; Veldkamp 1996; Vorontsova 2022). As such, the genus is likely to undergo further revision (Vorontsova 2022). African *Urochloa* include several globally-important forage grasses such as *U. brizantha* and *U. maxima* (Jacq.) R.D. Webster (≡ *Megathyrsus maximus* (Jacq.) B.K.Simon & S.W.L.Jacobs). Several African *Urochloa* are invasive in their introduced ranges and are known to negatively impact ecosystems (Pivello et al. 1999; Zenni and Ziller 2011; Rojas-Sandoval and Acevedo-Rodríguez 2022; Duque et al. 2022).

During routine grass collections for study, a small population of *Urochloa* species was observed growing in an open-canopied, semi-wild habitat inside Gandhi Krishi Vigyan Kendra campus, Bengaluru (945 m ASL), amidst invasive plants such as *Parthenium hysterophorus* L. and *Calyptocarpus vialis* Less. and native plants such as *Setaria flavida* (Retz.) Veldkamp and *Sida spinosa* L. Examination of the literature indicated that the species was *U. trichopus* (Hochst.) Stapf, not previously reported from Karnataka (Sharma 1984; Karnataka Biodiversity Board 2019; Kellogg et al. 2020).

U. trichopus is a savanna woodland and grassland grass native to Africa, the Arabian Peninsula, and Madagascar. Morphologically and phylogenetically, it is closely allied to *U. mosambicensis* (Hack.) Dandy, which, together with *U. panicodies* P.Beauv. and *U. ramosa* (L.) T.Q.Nguyen form the Trichopus clade (Masters et al. 2024). Sosef (2016) noted that *U. trichopus* differs from *U. mosambicensis* largely by its annual, as opposed to perennial, habit.

Deeming the distinction taxonomically insufficient, he synonymized the latter with the former. The Trichopus clade has local significance as livestock feed and *U. trichopus* was introduced into India as a fodder crop (Bor 1960). It has been reported from Uttar Pradesh (Kellogg et al. 2020) and Telangana (Siddabathula and Yadav 2021) and, as *U. mosambicensis*, from Rajasthan and Tamil Nadu (Kabeer and Nair 2009; Kellogg et al. 2020). Given that many *Urochloa* fodder species are capable of being strongly competitive, producing allelopathic compounds, and altering fire regimes (Gorgone-Barbosa et al. 2015; Masters et al. 2024), *U. trichopus* merits careful evaluation of its potential as an invasive in India.

Methods

Specimens were processed by standard herbarium techniques and deposited at the National Centre for Biological Sciences. Micro-morphological characters were photographed using a Leica M125 C encoded stereo microscope (Leica Microsystems GmbH, Germany) and measured in Fiji (Schindelin et al. 2012).

Taxonomic treatment

Urochloa trichopus (Hochst.) Stapf in Oliv., Fl. Trop. Afr. 9: 589 (1920). ≡ *Panicum trichopus* Hochst. in Flora 27: 254 (1844). ≡ *Eriochloa trichopus* (Hochst.) Benth. in J. Linn. Soc., Bot. 19: 89 (1881). ≡ *Helopus trichopus* (Hochst.) Steud. in Syn. Pl. Glumac. 1: 100 (1854). = *Urochloa mosambicensis* (Hack.) Dandy in J. Bot. 69: 54 (1931). = *Panicum mosambicense* Hack., Bol. Soc. Brot. 6: 140 (1888). = *Echinochloa notabilis* (Hook. f.) Rhind, Grasses of Burma 50 (1945; as "notabile"). = *Panicum notabile* Hook. f., Fl. Brit. India (J.D. Hooker). 7(21): 32 (1896). = *Urochloa pullulans* Stapf, Fl. Trop. Afr. 9 (1920) 590, nom. superfl. = *Urochloa pullulans* Stapf var. *mosambicensis* Stapf, Fl. Trop. Afr. 9 (1920) 590, comb, incorr.

Caespitose perennials. Culms stoloniferous, geniculately ascending, 50—100 cm tall, nodes terete, bearded, lower nodes rooting; internodes 9.5—16.2 cm long. Leaf sheath 6.1—13.0 × 0.2—1.3 cm, with longitudinal grooves, glabrous below, pubescent above, margins ciliate. Leaf blade 2.1—16.4 cm × 0.3—1.2 cm, chartaceous, lanceolate, base cordate to amplexicaul, apex acuminate, midrib prominent, margins tuberculate ciliate to glabrous, cilia ca. 2 mm. Ligule a fringe of hairs, 0.1—0.25 cm long. Inflorescence terminal or axillary, made up of racemes along a central axis, 7—35 cm long. Raceme axis 10.5—20.2 cm long, pubescent. Racemes 4—5(7), 3.3—6.2 × 0.2—0.4 cm, alternate, secund, spikelets imbricate, densely packed in two rows, disarticulating below glumes. Rachis 0.5 mm wide, wavy, pilose, margins winged, scabrid. Pedicel 0.3—0.7 mm long with 1-4 setae, 2.3—4.4 mm long. Spikelets 3.5—4.8 × 1.5—2.0 mm, abaxial, elliptic-ovate. Lower glumes 1.0—3.2 × 0.3—1.0 mm (2/3—3/4 length of spikelet), turned away from rachis, pubescent below, glabrous above, elliptic, apex rounded, 3-nerved, with 1—2 bristles on the mid-nerve inserted 2/3 from the base; bristles 1.0—2.0 mm long, geniculate, translucent white or purple. Upper glume 3.3—4.3 × 1.4—1.9 mm, pubescent, elliptic-ovate, apex attenuate-acuminate, 3—5-nerved, 3—5-keeled. Florets 2; lower male, upper bisexual. Lower lemma 3.1—4 × 1.4—1.7 mm, hyaline, elliptic-ovate, apex acuminate, margins involute, fringed with purple bristles, 3—5-nerved, 3-keeled. Lower palea similar to lower lemma, 2.5—3.6 × 1.4—1.6 mm, hyaline, 2-nerved, without keels. Stamens 3, anthers 1.3—2.0 × 0.2—0.4 mm. Lodicules fringed, 0.2—0.3 mm long. Upper lemma 1.6—2.6 × 1.3—1.6 mm, elliptic, 3—5-nerved, without keels, transversely rugulose, apex mucronate, mucro 0.5—0.8 mm long, puberulent. Upper palea 1.5—2.8 × 1.2—1.6 mm, hyaline, 3-nerved, apex obtuse, without keels, involute, winged, wings hyaline. Lodicules 0.2—0.3 mm long, cuneate,

hyaline. Stamens 3. Ovary 0.5—1.2 × 0.2—0.9 mm. Stigmas 2, 1.2—1.8 × 0.2—0.5 mm, plumose, purple at maturity. Caryopsis 1.0—2.4 × 0.5—1.5 mm, ovoid.

Notes: *U. trichopus* is distinguished from *U. panicoides*, with which it shares abaxial spikelet orientation, by the lower glume being 2/3—3/4 the length of the spikelet (versus 1/4—1/3 in *U. panicoides*) and the lower lemma having a prominent fringe of bristles (versus not).

Flowering & fruiting: June—August.

India distribution: Rajasthan, Uttar Pradesh, Tamil Nadu, Telangana, Karnataka.

Global distribution: Native to sub-Saharan Africa, Madagascar, Saudi Arabia, Yemen; introduced into India, Myanmar, Australia, Brazil, Argentina, Mexico, U.S.A.

Specimens examined: India, Karnataka, Bengaluru, 13.08533 N 77.578289 E, 945 m ASL, 23-06-2025, *S. Pulla* 23VI25A (NCBS Research Collections [NRC-P-AA-0470], NCBS, Bengaluru).

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Figures

Figure 1. *Urochloa trichopus* (Hochst.) Stapf. (A) Inflorescences. (B) Raceme.

Figure 2. *Urochloa trichopus* (Hochst.) Stapf. (A) Spikelet abaxial view. (B) Spikelet adaxial view. (C) Lower glume. (D) Upper glume. (E) Lower lemma. (F) Lower palea. (G) Upper anthecium adaxial view showing germination flap in the lower-third. (H) Upper lemma abaxial view. (I) Upper palea with gynoecium. (J) Upper palea with caryopsis. (K) Gynoecium. (L) Anthers. All scale bars 1 mm.

Figure 1.

(A)

(B)

Figure 2.