The endemic tanglehead grass *Heteropogon fischerianus* Bor and the giant speargrass *Heteropogon triticeus* (R. Br.) Stapf ex Craib, new records for the flora of Telangana state, India

Nagaraju Siddabathula¹*, Ravi Kiran Argela², Rajeev Kumar Singh² & L. Paramesh³

¹Botanical Survey of India, Deccan Regional Centre, Kendriya Sadan, Sulatan Bazar, Hyderabad- 500095, Telangana, India.
²Botanical Survey of India, Southern Regional Centre, TNAU Campus, Lawley Road, Coimbatore - 641 003, Tamil Nadu, India.
³Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad - 500030, Telangana, India.

Email: nagaraju.siddabathula@gmail.com

ABSTRACT

*Heteropogon fischerianus* Bor and *H. triticeus* (R. Br.) Stapf ex Craib collected for the first time from Ranga Reddy district, Telangana, India and reported here as new records for the flora of Telangana state. Detailed taxonomical description and first time micrographs of *H. fischerianus* and *H. triticeus* are provided for easy identification. For the name *H. contortus var. distichus* C.E.C. Fisch. no specific herbarium specimen was cited as holotype in the protologue and also yet not lectotypified, and so, lectotype is designated here for this name. Additionally, second-step lectotype is needed for the name *H. triticeus* (R. Br.) Stapf ex Craib and is designated here.

KEYWORDS: Anantagiri hills, dry deciduous forest, endemic, lectotype, Ranga Reddy district.

Introduction

The genus *Heteropogon* Pers. (Family Poaceae) consists of 6 species [namely *H. contortus* (L.) P. Beauv. ex Roem. & Schult., *H. fischerianus* Bor., *H. melanocarpus* (Elliot) Benth., *H. polystachyus* (Roxb.) Schult., *H. ritchiei* (Hook. f.) Blatt. & McCann and *H. triticeus* (R. Br.) Stapf ex Craib] distributed in tropical and subtropical areas of World (Karthikeyan et al., 1989; The Plant List, 2013; Mabberley, 2017; Kabeer & Nair, 2009). In India all these 6 species are found, in which *H. fischerianus*, *H. polystachyus* and *H. ritchiei* are endemic to India (Singh et al., 2015). The diversity and the level of endemism suggest that India is the centre for evolution and diversification of the genus *Heteropogon* and might be centre of origin also. Species of *Heteropogon* are commonly known as tangle head grasses. So far, only one species *H. contortus* was reported from the Telangana state (Pullaiah, 2015; Reddy & Reddy, 2016). *Heteropogon* has paired spikelets, in which lower equal sized known as homogamous spikelets, upper one awned bisexual spikelet and one awnless sterile spikelet known as homogamous spikelets. The twisted dry awn of bisexual spikelet straightens when moistened and able to bore the soil for seed germination. The genus *Heteropogon* is a tussock group of grass which grows as singular plants in clumps, tufts, hummocks or bunches. The species of *Heteropogon* are the ideal grasses for rehabilitation by providing the habitat and food for herbivores, birds and insects. The giant speargrass is an important food source for many granivores. In the field we observed the Indian silverbill or white-throated munia birdseeds on the grains of *Heteropogon* species.

Received 20 December 2019 | Accepted 19 January 2020 | Published online 3 February 2020


Acknowledgement

The authors are thankful to the Director, Botanical Survey of India, Kolkata, Head of Office, Botanical Survey of India, Deccan Regional Centre, Hyderabad and Head of Office, Botanical Survey of India, Southern Regional Centre, Coimbatore for facilities. Thanks are also due to the forest officials of Vikarabad for the genuine help during explorations.

Copyright © Siddabathula et al. 2020. NECEER, Imphal allows unrestricted use, reproduction, and distribution of this article in any medium by adequate credit to the author(s) and the source of publication.

NeBIO, An International Journal of Environment and Biodiversity

Official publication of North East Centre for Environmental Education (NECEER), Imphal | ISSN 2278-2281 (Online), 0976-3597 (Print) | www.nebio.in
These tanglehead grasses help to increase carbon sequestration, work as desertification controllers and also prevent the soil erosion.

During botanical exploration for the project “Grasses of Telangana state” under the aegis of the Botanical Survey of India, the giant speargrass *H. triticeus* had drawn the authors’ attention by its unique appearance of height above 2 m and cream coloured culms with elongated internodes (Fig. 2) in grassland patches of dry deciduous forests associated with *Alternanthera sessilis* (L.) R. Br. ex DC., *Andropogon pumilus* Roxb., *Apluda mutica* L., *Arthroxon echinatus* (Nees) Hochst., *Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult., *Indigofera linifolia* (L.f.) Retz., *Indigofera cordifolia* B. Heyne ex Roth, *Ischaemum afrum* (J.F. Gmel.) Dandy, *Iseiilema prostratum* (L.) Andersson, *Lavandulabia pinnata* (Roth) Kunz., *Lepidagathis cristata* Willd., *Ophiurus exaltatus* (L.) Kunz., *Sehima nervosum* (Rottler) Stapf, *Senna uniflora* (Mill.),*H. S. Irwin & Barneby and Themeda quadrivalvis* (L.) Kunz. Apart from the giant speargrass, the endemic tanglehead grass *Heteropogon fischerianus* Bor having glabrous spikelet (Fig. 1) was also collected in dry deciduous forestof Anantagiri Hills. The identity of these two grass species was ascertained after detailed studies of type specimens, protologue and relevant literature. First time, micrographs for these two grass species were also prepared after dissections of spikelets. The collected specimens are deposited in Botanical Survey of India, Deccan Regional Centre herbarium (BSID), Hyderabad. Taxonomic citation with current nomenclature, detail description, phenology, habitat and notes are provided for each taxon. In the protologue of *H. contortus var. distichus* C.E.C. Fisch., no specific herbarium specimen was cited as holotype and also yet not lectotypified. Therefore, lectotype are designated here for this name and the guidelines and recommendations of the Article 9 of the ICN (Turland et al. 2018) are followed. Furthermore, second-step lectotype is needed for the name *H. triticeus* (R. Br.) Stapf ex Craib and is designated here as per Art. 9.17 of ICN.

**Taxonomy**


   Lectotype (designated here): India, Tamil Nadu, Kodaikanal, Pulneys (Palani), Jesmond hill, 1 July 1901, *Bourne 2026* (K000245942!); isolectotypes CAL!, MH000026091!.

   Remaining syntypes: India, Tamil Nadu, Kodaikanal, Pulneys (Palani), Jesmond hill, 1 July 1901, *Bourne 2025* (CAL!, G001659231!, K000245941!, US001326111!); Tamil Nadu, Poonachi, Anamalai, 10 Oct. 1901, *C.A. Barber 3719* (FRC!, MH000026081!).

   Tufted perennials; culms 40–120 cm high, erect, compressed, branched, glabrous; nodes glabrous. Leaf blades linear, 35–40 cm long, prominently distichous, glabrous, apex acuminate, margins cartilaginous; leaf sheaths5–7.5 cm long, compressed, keeled, glabrous, distichous; ligule rounded, densely ciliolate, 0.8–1 mm long. Racememterinal, solitary, 3–5 cm long, glabrous; lower 4–8 pairs of homogamous (male or barren) unawned spikelets; upper heterogamous (bisexual) spikelets; joints scabrous, apex thickened; sessile and pedicelled spikelets more or less similar except broadly winged margins of lower glume of pedicelled spikelets; hermaphrodite (sessile) spikelets elliptic, 7.5–8 mm long, awned; callus 3.2–3.5 mm long, clothed with dark brownish hairs, pointed; lower glume oblong, 4.5–5.5 × 0.5–0.8 mm, coriaceous, grooved dorsally, puberulous, brownish, apex truncate; upper glume linear-oblong, 4.5–5 × 0.5–0.7 mm, coriaceous, dorsally grooved, pale, sigmoidal incurved, apex truncate or minutely 3-toothed, margins chartaceous; lower lemma linear-lanceolate, 2.8–3 × 0.5 mm, hyaline, apex truncate; upper lemma flattened, hyaline, reduced to a base of awn; awn 8–10 cm long, scaberulous; palea oblong, 4.3–4.5 mm long, membranous, apex ciliate; stigma purplish; pedicelled spikelets narrowly ovate, 7–9 × 1.5–2 mm, awnless; lower glume lanceolate, 6.5–7 × 1.5–2 mm, 2-keeled; keels narrowly winged, 0.5–0.6 mm long, apex acute, margins infolded; upper glume elliptic, 7.5–8 × 1 mm, apex acute, margins ciliate towards apex. Lower lemma elliptic, 5.3–5.5 mm long, hyaline, margins ciliate; upper lemma lanceolate, 4.3–4.5 mm long, hyaline. Stamens 3; anthers 2.8–3 mm long. (Fig. 1)

   Notes: Fischer (1934) described *Heteropogon contortus var. distichus* based on the specimens collected from Anamalai by Barber and from Kodaikanal by Bourne. In the protologue, he mentioned only the precise locality and collector name, but did not provide the date of collection, collection number and name of herbarium where specimens housed. Sevenoriginal specimens collected by Bourne from Kodaikanal and three by Barber from Anamalaiwere traced. Of these, the specimen at K (K000245942) is better preserve as compared to others and is therefore chosen here as the lectotype as it agrees well with the protologue.

   Bor (1951) described *Heteropogon fischerianus* as new species and treated *H. contortus var. distichus* C.E.C. Fisch. under synonym of his new species, but as per ICN (Turland et al. 2018) the name *H. fischerianus* Bor should be treated as a new name (nom. nov.) for *H. contortus var. distichus* C.E.C. Fisch.

Figure 1. *Heteropogon fischerianus* Bor. A. Habitat; B&C. Raceme; D & E. Close-up of raceme; F–K. Sessile spikelet; F&G. Abaxial and adaxial view of lower glume; H&I. Abaxial and adaxial view of upper glume; J. Lower lemma; K. Upper lemma; L–S. Pedicelled spikelet; L. Spikelet; M&N. Abaxial and adaxial view of upper glume; O. Lower glume; P. Lower lemma; Q. Lower palea; R. Upper lemma; S. Upper palea.
Siddabathula et al. » Heteropogon fischerianus and Heteropogon triticeus: new records for the flora of Telangana state

**Figure 2.** Heteropogon triticeus (R. Br.) Stapf ex Craib. A. Habitat; B. Habit; C. Root; D. Culm; E&F. Sheath & collar; G. Node; H&I. Raceme; J–L. Close-up of raceme.
Figure 3. *Heteropogon triticeus* (R. Br.) Stapf ex Craib. A. Raceme; B–H. Pedicelled spikelet; B&B1. Lower paired florets; C. Lower glume; D. Upper glume; E. Lower lemma; F. Upper lemma; G. Lodicules; H. Palea; I–S. Sessile spikelet; I. Awn; J&K. Abaxial and adaxial view of lower glume; L&M. Abaxial and adaxial view of upper glume; N. Upper lemma; O. Lower lemma; P. Palea; Q. Lodicules; R. Anthers; S. Pistil.


Tufted perennials; culms terete, 100–300 cm high, erect, branched, glabrous; nodes glabrous. Leaf blades linear, 25–75 × 1–1.8 cm, flat, glabrous or sparsely, pilose, apex acuminate, margins scaberulous; leaf sheaths terete or compressed, 6–20 cm long, keeled, glabrous; ligule membranous, 1.5–2 mm long. Racemes solitary, 10–22 cm long, terminating the culms and its branches, with lower homogamous awnless and upper awned heterogamous spikelets; joints short; hermaphrodite spikelets narrowly ovate-elliptic, 8–11 × 2.7–3 mm, awned, callus pungent, bearded with rufous hairs; lower glume coriaceous, narrowly ovate, 8–10.5 × 1.5–3 mm, 5-nerved, hirsute on dorsal side, slit like groove from base to apex, apex truncate; upper glume coriaceous, narrowly ovate-oblong, 9–10.6 × 1.1–1.3 mm, 3-nerved, margins ciliate, densely hirsute on dorsal side, apex acute; lower lemma hyaline, narrowly ovate, 3.5–3.7 × 0.8–0.9 mm, nerveless, apex acute; palea absent; upper lemma hyaline, passing into a geniculate awn, 10–18 cm long, hairy; palea hyaline, ovate-oblong, 1.6–1.8 × 1–1.2 mm, apex ciliate hairy; lodicules 2, 2.2–2.5 × 0.8–0.9 mm; stamens 3; anthers 4.4–4.9 × 0.5–0.8 mm long; homogamous spikelets narrowly ovate, 15–18 × 3.5–4.5 mm, awnless; lower glume chartaceous, narrowly ovate, 14–16 × 3.4–4.5 mm, glabrous, 2-keeled; keel winged on one margin, inflexed, ciliate, 1-nerved, apex acuminate; upper glume hyaline, linear, 13–15 × 1.4–2 mm, margins ciliate, 1-nerved, apex acuminate; lower lemma hyaline, linear, 10–15 × 0.9–1.8 mm, margins ciliate, 1-nerved, apex acuminate; upper lemma hyaline, linear, 8–14 × 0.9–1.3 mm, margins ciliate, 1-nerved, apex acuminate; palea hyaline, narrowly ovate, 1.6–1.8 × 0.7–0.8 mm, margins ciliate, apex acute; lodicules 2, 1.4–1.5 mm long; stamens 3; anthers 9–10 mm long.Carpyosps oblong-cylindric, 2.2–2.4 × 6–6.5 mm. (Fig. 2 & 3)

Flowering and Fruiting: September–December.

Distribution: Tropical Asia to Australia. In India, it is found in Chhattisgarh, Gujarat, Karnataka, Maharashtra and Telangana. Habitat: Grassland patches in dry deciduous forests.


Notes: Brown (1810) described *Andropogon triticeus* based on the specimens collected from Australia by himself and by Joseph Banks during Captain James Cook’s first great voyage (1768–1771). Deshpande (1990) cited type information for the *A. triticeus* R.Br. as “Type: W. coast, Australia, *R. Brown s.n.*, 1801–1805 (BM!)”. There are four specimens of *R. Brown* at BM and according to Art. 9.17 of ICN (Turland et al. 2018), Deshpande’s type citation must be accepted as the first-step lectotypification because it cannot be ascertained which of the specimens at BM was selected by her as lectotype. The type citation of Deshpande can be further narrowed to a single specimen by second-step lectotypification as per Art. 9.17 of ICN. Therefore, from the four specimens of *R. Brown* at BM, the best preserved specimen BM000991834, is designated here as the second-step lectotype of the name *A. triticeus* R.Br. as it agrees well with the protologue.

References


