



Trachys deccanensis (Poaceae): A new species from semiarid zone of peninsular India

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Abstract

Trachys deccanensis M. Anil Kumar & B.R.P. Rao, a new species belongs to the tribe Paniceae, subfamily Panicoideae and family Poaceae is described here. The novel species is allied to *T. narasimhanii* Ravich. in having longer spikes, lanceolate spikelets and absence of vestigial floral glumes, but distinctly differs in leaf texture, spike arrangement, nature and number of spikelets in individual clusters at each node of the rachis. The new species is also allied to *T. copeana* Kabeer & V.J. Nair in having two or three digitate racemes, single cluster of spikelets, number of spikelets in individual cluster at each node of the rachis; but distinctly differs in leaf texture, nature and texture of spikelets in individual cluster at each node of rachis and lanceolate spikelets. Description, illustration, microscopic images, comparative morphology of the new species with the allied species and a key for identification of *Trachys* species have been provided.

Keywords: Andhra Pradesh, India, New Grass, *Trachys deccanensis*

Introduction

Trachys Pers. was erected as a monospecific genus in the tribe Paniceae, of subfamily Panicoideae and family Poaceae with type species, *T. muricata* (L.) Pers. (Clayton & Renvoize, 1986). Later, *T. copeana* Kabeer & V.J. Nair (Kabeer & Nair, 2009), *T. narasimhanii* Ravich. (Ravichandran, 2013) were added to the genus. All the three species of *Trachys* have been confined to India, Myanmar and Sri Lanka (Bor, 1960; Karthikeyan *et al.*, 1989; Clayton *et al.*, 2006; Kabeer & Nair, 2007, 2009; Ravichandran, 2013); of these, *T. muricata* is found in India, Myanmar and Sri Lanka; *T. copeana* and *T. narasimhanii* are endemic to the state of Tamil Nadu, India. The genus is characterized by stoloniferous habit, tomentose leaves, 1–3 spike-like racemes, fragile leafy rachis, clusters of spikelets disarticulating along with rachis as segments (Clayton & Renvoize, 1986; Watson & Dallwitz, 1994).

Part of explorations held in 2016 in the semiarid zone of peninsular India, we could collect few curious specimens of grasses resembling *Trachys*. in the cultivated fields of Kadivella village near Yemmiganur, Kurnool district, Andhra Pradesh. Critical examination of pertinent literature and type specimens of all three species of *Trachys* namely *T.*

copeana and *T. narasimhanii* deposited in Madras Herbarium and *T. muricata* through online Kew Herbarium Catalogue revealed that the present collection is allied to *T. narasimhanii* Ravich. and *T. copeana* Kabeer & V.J. Nair, but distinctly differs in both vegetative and reproductive characters, which warrants new species status. The present paper provides description, illustration, digital microscopic images, and comparative morphology of the novel species with its allied species, *T. narasimhanii* and *T. copeana* (Table 1), and key for identification of *Trachys* species.

***Trachys deccanensis* M. Anil Kumar & B.R.P. Rao, sp. nov. Figs. 1,2**

Trachys deccanensis is allied to *T. narasimhanii* Ravich., but distinctly differs from the latter in having glabrous leaves (densely tomentose in *T. narasimhanii*), digitate spikes (divaricate in *T. narasimhanii*), spikelets dissimilar in texture, sessile spikelets glabrous, pedicelled ones ciliate on lower lemmas (all spikelets are glabrous in *T. narasimhanii*), single cluster at each node comprising three spikelets (two clusters, each with two to seven spikelets in *T. narasimhanii*) and without any sterile spikelets (sterile spikelets present in *T. narasimhanii*). This species is also allied to *T. copeana* Kabeer & V.J. Nair but

Table 1. Comparison of *Trachys deccanensis*, *T. copeana* and *T. narasimhanii*

Characters	<i>T. deccanensis</i> , sp. nov.	<i>T. copeana</i> (based on protologue)	<i>T. narasimhanii</i> (based on protologue)
Culms	Up to 80 cm high	Up to 40 cm high	Up to 70 cm high
Ligule	1–2 mm long, membranous	0.6–0.8 mm long, membranous	1–2.5 mm long, tuberculate
Leaf sheath	Glabrous/nearly glabrous	Pubescent	Pubescent
Racemes	3, digitate, 6–9 cm long	2 or rarely 3, digitate, up to 5.5 cm long,	2, divaricate, 2–9 cm long
Peduncles	6–12 cm long, bearded near apex	5–8 cm long, bearded near apex	5–11 cm long, bearded near apex
Spikelet clusters	5–6 mm apart, comprising one cluster of spikelets, each cluster with 3 bisexual spikelets, similar in size, dissimilar in texture	4–5.5 mm apart, comprising one cluster of spikelets, with 3 similar bisexual spikelets	2–4 mm apart, comprising 2 clusters, each cluster with 2–7 spikelets of dissimilar in size, often bisexual and one spikelet is barren
Sterile spikelets	Absent	Absent	Present
Spikelets	Lanceolate, 5.3–5.6 × 2–3 mm, apex acute to acuminate	Broadly ovate, 4–4.2 × 2–3 mm, apex acute	Narrowly lanceolate, 4–5 × 2–4 mm, apex acute to acuminate
Pedicels	1–1.5 mm long	0.6–1 mm long	1–2 mm long
Lower Glume	0.2–0.5 mm long, apex obtuse	0.3–0.4 mm long, apex acute	0.2–0.5 mm long, apex obtuse
Upper Glume	2–3.7 mm long, apex acuminate, 3-veined, sparsely ciliate at margins or glabrous	1.8–3 mm long, acute to acuminate, 3-veined, sparsely ciliate at margins or glabrous	2–3.7 mm long, apex acuminate, chartaceous, 3-veined, sparsely ciliate all along
Lower Lemma	Lanceolate, 3.5–5.5 mm long, margins thick, apex acuminate, inconspicuously 9–11-veined	Broadly ovate or lanceolate, 3.5–4.2 mm long, more or less bulged and dome-shaped up to middle and flat above, margins hyaline, apex acute, prominently 11–13-veined (faint when young)	Broadly lanceolate, 3.5–5 mm long, margins hyaline, apex acuminate, coriaceous, 9–11-veined
Lower Palea	0.3–0.5 mm long, often reduced	0.7–1.4 mm long, at times reduced	0.3–0.5 mm long, reduced
Upper Lemma	Lanceolate, 3–3.2 mm long, acuminate, 3-veined, hyaline	Ovate to lanceolate, 3.2–3.8 mm long, acute, 3-veined, chartaceous	Lanceolate, 3–3.2 mm long, acuminate, 3-veined, hyaline

Characters	<i>T. deccanensis</i> , sp. nov.	<i>T. copeana</i> (based on protologue)	<i>T. narasimhanii</i> (based on protologue)
Upper Palea	Lanceolate, 3–3.1 mm long, apex sharply acute, thin-chartaceous	Ovate to lanceolate, 3.2–3.5 mm long, apex acute, chartaceous	Lanceolate, 3–3.1 mm long, apex acute, slightly chartaceous
Pedicelled Spikelets	Distinctly ciliate on dorso-lateral side of its sterile lemmas	Glabrous	Glabrous or glabrescent
Anthers	1–1.2 mm long	1.3–1.5 mm long	1–1.5 mm long

distinctly differs in glabrous leaves (densely tomentose in *T. copeana*), spikelets dissimilar in texture, sessile spikelets lanceolate (ovate in *T. copeana*), glabrous and pedicelled ones ciliate on lower lemmas (all spikelets are glabrous in *T. copeana*).

Type: INDIA, Andhra Pradesh: Kurnool district, Cultivated fields of Kadivella village near Yemmiganur, 16.11.2016. B. Ravi Prasad Rao, K.V. Subbaiah & M. Anil Kumar 52099 (holo, SKU; iso, CAL).

Stoloniferous annual or short-lived perennial. Culms to 80 cm long; nodes hairy, rooting from lower nodes. Leaves elliptic to linear-lanceolate, 4–11 × c. 0.8 cm, obtuse to rounded, margins undulate, apex sharply acute to acuminate, flat, glabrous; ligules 1–2 mm long, hyaline, membranous; leaf sheath laterally compressed, sharply keeled in lower leaves, 3–10 cm long, enclose up to half of internode length, glabrous, margins thin-hyaline, mouth with few tuberculate hairs or glabrous. Racemes spike-like, three in digitate, 6–9 cm long, spikelets in clusters, arranged alternately on the under surface of rachis without any vestigial structures, clusters of spikelets arranged apart 4.5–6 mm distance, pubescent at the divergence zone; joints triquetrous, 4.5–6 × 1.2–2.2 mm, straight to curved, margins winged, glabrous, green, many-veined; peduncles 6–12 cm long, terete, bearded near apex. Raceme joints bulged, 2–3 mm across, comprising one cluster of spikelets; cluster size 6.5–7 × 2–4 mm, each cluster with three bisexual spikelets which are similar in size, dissimilar in texture; entire cluster disarticulating at maturity. Spikelets narrowly lanceolate, 5.3–5.6 × 2–3 mm, base truncate, apex acute-acuminate, coriaceous, yellow-brown; pedicels stout, 1–1.5 mm, greenish yellow. Glumes shorter than spikelets; lower glume reduced, scale-like, 0.2–0.5 × 0.2–0.3 mm, base truncate, apex obtuse, subcoriaceous, veinless.

Upper glume lanceolate, 2–3.7 × 0.5–0.8 mm, base truncate, apex obtuse, chartaceous, glabrous or sparsely ciliate at margins, green, prominently 3-veined. Spikelets with 2 florets; lower barren with 2 lodicules; upper bisexual. Lower sterile lemma lanceolate, 3.5–5.5 × 2–3 mm, base truncate, apex obtuse, coriaceous, yellow-brown, inconspicuously 9–11-veined, margins thick, in-rolled. Lower palea oblong, often reduced, 0.3–0.5 × 0.2–0.3 mm. Upper lemma lanceolate, 3–3.2 × 1–2 mm, base truncate, apex obtuse, hyaline, 3-veined, margins in-rolled, envelop the margins of palea. Upper palea lanceolate, similar to its lemma in shape, 3–3.1 × 1–1.5 mm, thin-chartaceous. Lodicules 2. Stamens 3; anthers 1–1.2 mm long, yellow. Ovary oblong, c. 0.7 × 0.3 mm; style c. 2 mm long; stigma plumose, 1.5–2 mm long, light brown. Caryopsis not seen. Pedicelled spikelets similar to sessile spikelets in size and sex, but are hairy, hairs from dorsal side of lower sterile lemmas, usually in two prominent lines in the middle.

Flowering & fruiting: June–December.

Habitat: Rare, found in rainfed cultivated fields associated with *Trachys muricata*, *Alloteropsis cimicina* (L.) Stapf and *Digitaria* spp.

Distribution: Till date, this new species is known only from its type locality, Kadivella village near Yemmiganur, Kurnool district, Andhra Pradesh.

Etymology: The specific epithet is named after “Deccan Plateau”, one of the biogeographic zones of India, where the type locality is situated.

Conservation Status: Seen only a few specimens in one occasion in the type locality. Further explorations are needed in adjacent similar habitats to estimate the exact size of the population and evaluate the conservation status of this species. However, its provisionally assessed here as Data Deficient.

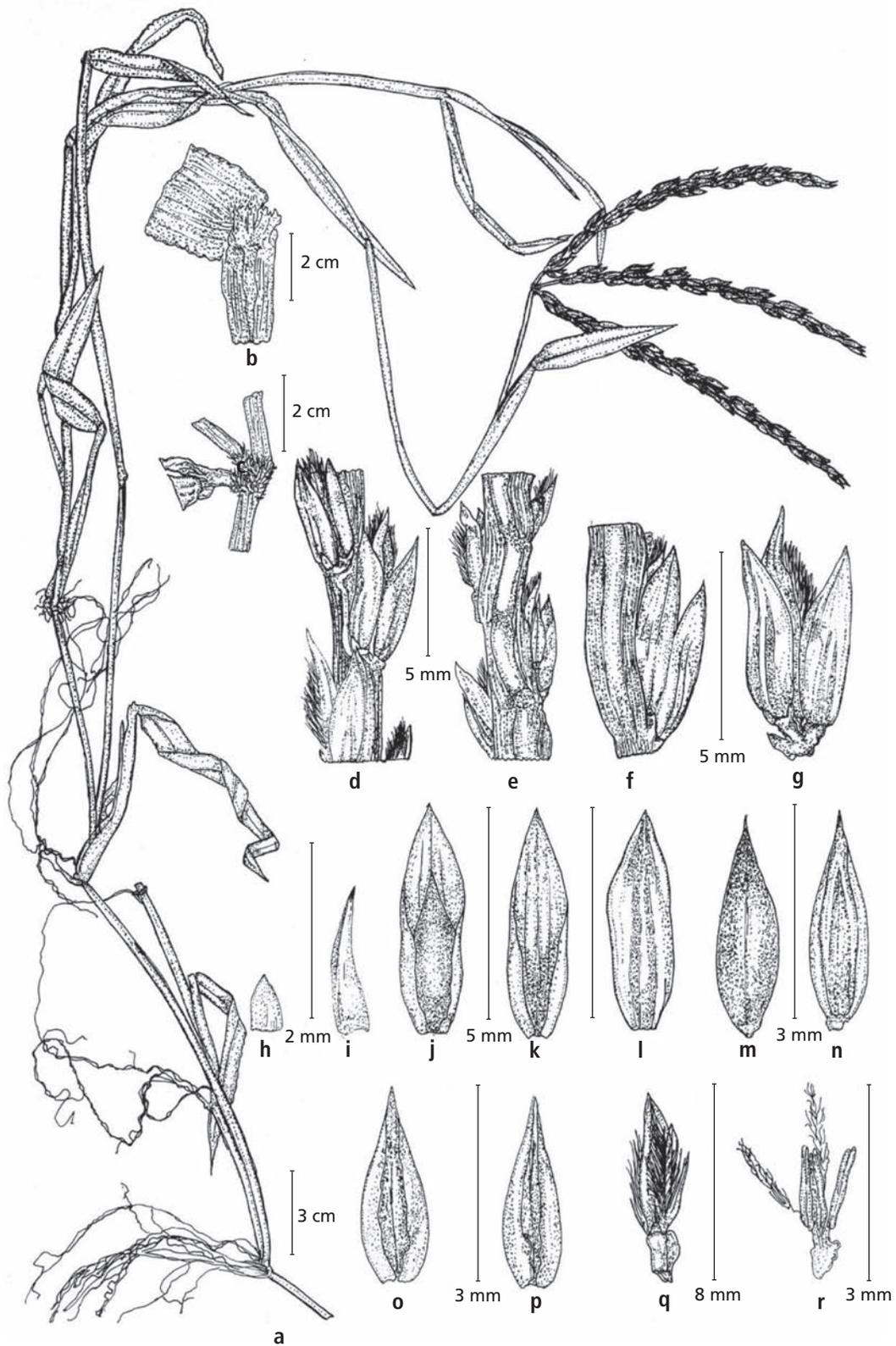


Fig. 1. *Trachys deccanensis* M. Anil Kumar & B.R.P. Rao: a. Habit; b. Portion of leaf showing ligule; c. Divergent area of spikes; d. Portion of spike, ventral view; e. Portion of spike, dorsal view; f. Spikelets cluster, with leafy rachis; g. Cluster of spikelets without rachis; h. Lower glume; i. Upper glume; j. Florets of sessile spikelet; k. Sterile lemma of sessile spikelet, ventral view; l. Sterile lemma of sessile spikelet, dorsal view; m. Upper floret, dorsal view; n. Upper floret, ventral view; o. Lemma of fertile floret; p. Palea of fertile floret; q. Pedicelled spikelet; r. Stamens and Ovary.

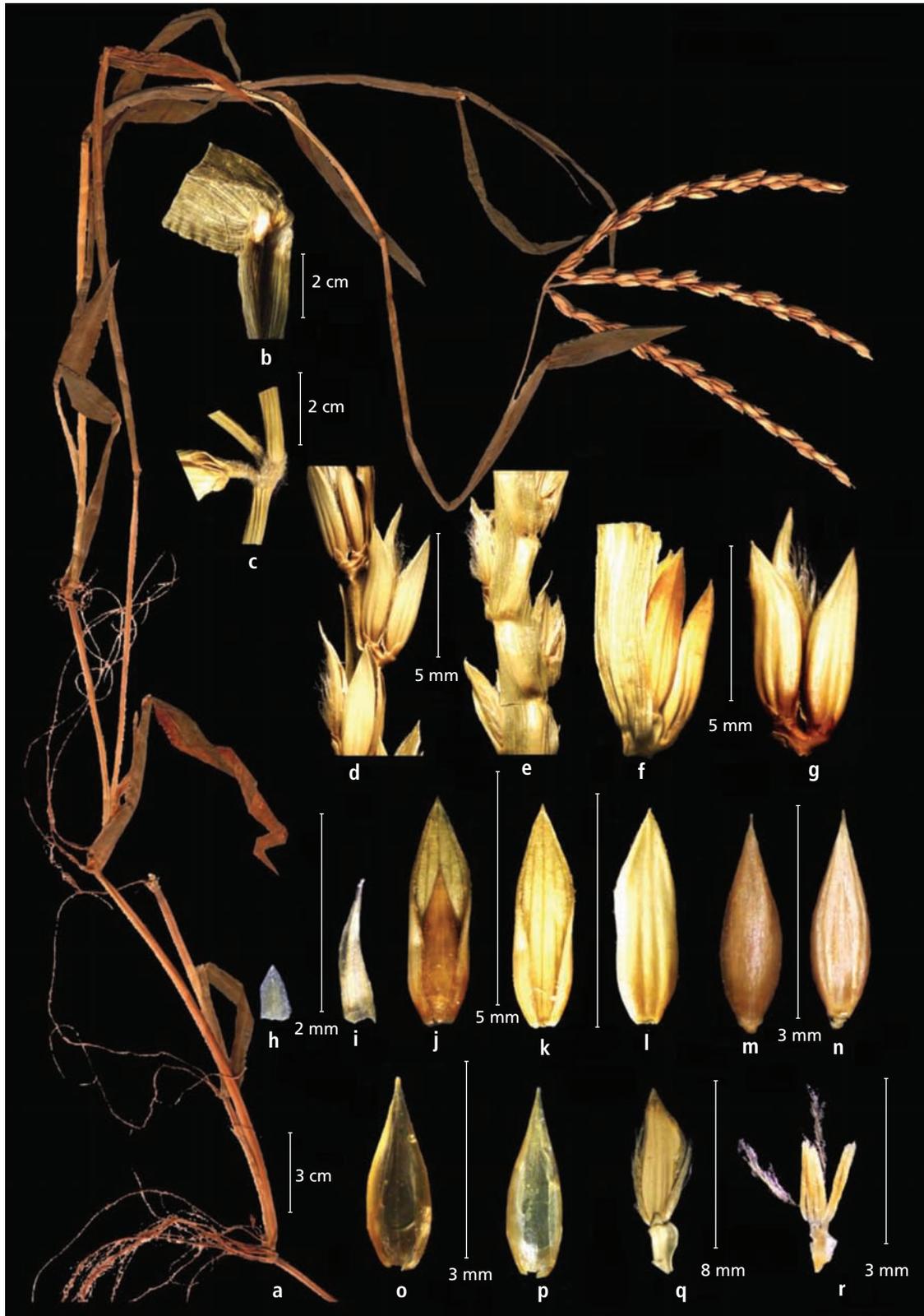


Fig. 2. *Trachys deccanensis* M. Anil Kumar & B.R.P. Rao: a. Habit; b. Portion of leaf showing ligule; c. Divergent area of spikes; d. Portion of spike, ventral view; e. Portion of spike, dorsal view; f. Spikelets cluster with leafy rachis; g. Cluster of spikelets without rachis; h. Lower glume; i. Upper glume; j. Florets of sessile spikelet; k. Sterile lemma of sessile spikelet, ventral view; l. Sterile lemma of sessile spikelet, dorsal view; m. Upper floret, dorsal view; n. Upper floret, ventral view; o. Lemma of fertile floret; p. Palea of fertile floret; q. Pedicelled spikelet; r. Stamens and Ovary.

Key to the species of *Trachys*

1. Clusters of spikelets 2 or 3 at each rachis internodes 2
1. Clusters of spikelets single at each rachis internodes 3
2. Clusters of spikelets 3; sterile lemmas broadly ovate **T. muricata**
2. Clusters of spikelets 2; sterile lemmas lanceolate **T. narasimhanii**
3. Leaves tomentose; all spikelets glabrous **T. copeana**
3. Leaves glabrous; pedicelled spikelets hairy on lower lemmas **T. deccanensis**

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