

GRASSES of Telangana

**NAGARAJU SIDDABATHULA
&
P.V. PRASANNA**



**BOTANICAL SURVEY OF INDIA
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भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

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Cover photo (front) : *Mnesithea granularis*

(back) : 1. *Paspalum distichum*

2. *Eulalia phaeothrix*

3. *Paspalum scrobiculatum*

4. *Bothriochloa pertusa*

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Botanical Survey of India



FOREWORD

Grasses, undoubtedly an unique group of plants occupy every conceivable habitat on earth and well known for their wide array of services provided to mankind and ecosystem. The grass family (Poaceae), occupies high pedestal in plant kingdom due to species richness. Botanical Survey of India has published several noteworthy publications on grasses. Present publication on “Grasses of Telangana” is an attractive addition in this regard. With an objective of providing a detailed taxonomic account of grasses of newly carved out Telangana state from united Andhra Pradesh in 2014, the project was carried out as in-house scientific programme of BSI from 2017-2022.

The book presents vivid taxonomic descriptions for 273 species of grasses under 95 genera. Elegantly designed 156 photo plates depicting microscopic features of spikelets facilitate easy identification of grasses otherwise known for their misidentifications owing to intricate floral morphology. The publication is intended to negate the commonly prevailing notion of difficulty in correctly identifying grasses. 1 new species and 41 new records to the state are the outcomes of the present study. Diverse stake-holder's requirements in getting first hand knowledge on the grass diversity of Telangana state are fulfilled with this publication.

I appreciate authors for fruitfully completing the task of bringing out this e-publication in widely acceptable attractive format on grasses of the Telangana state.

(A.A. MAO)



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Cymbopogon caesius



PREFACE

Disseminating Plant taxonomy research findings in the form of popular publications is one of the key objectives of Botanical Survey of India. State wise floristic accounts on some largest families of Indian angiosperms have been published by the department. One such family of monocotyledons, the 'Poaceae' (Gramineae) has been accorded priority in this regard. Current publication on "Grasses of Telangana State" is an outcome of project carried out under BSI Annual Research Programme from Deccan Regional centre, Hyderabad during 2017-2022. After the formation of Telangana state in 2014, emphasis was given to fulfill the gap areas in the flora of the state.

'Poaceae' was chosen to document all the grass species and to prepare a profusely illustrated user friendly compendium. Thorough field surveys and critical studies have resulted in 1 new species and 41 species as new distributional records to the Telangana state. This publication contains detailed descriptions for 273 species of grasses, their distributional data, field notes and 163 photo plates attractively elucidating the vegetative and minute floral parts. It is hoped that this book will meet the needs of teachers, students, forest managers, researchers and amateurs in identifying the grasses of Telangana state and other Indian states too. Authors welcome constructive suggestions from the users of this publication.

Authors



CONTENTS

Foreword	I
Acknowledgements	V
Preface	VII
Introduction	1
Taxonomic Treatment	57
List of Abbreviations	357
Bibliography	359
Index	368



INTRODUCTION

Human beings have used grasses for food, fodder, and shelter since time immemorial. The grass family Poaceae (Gramineae) provides the world's major grain crops (cereals and millets) such as rice (*Oryza* spp.), wheat (*Triticum* spp.), maize (*Zea mays*), barley (*Hordeum vulgare*), jowar (*Sorghum* spp.), bajra (*Pennisetum* spp.), and oats (*Avena* spp.). Livestock depends on grasses for forage. Grasslands are the most highly productive ecosystems on earth, and their depletion causes ecosystem imbalance and the extinction of many dependent species. This is because grasslands are the ideal habitats for various plants, birds, mammals, and amphibians (Burgess & al., 2007). Grasslands also play a pivotal role in the global carbon cycle (Gibson, 2009).

Grassland vegetation differs from forests because of its rejuvenation potential. Grasslands are grounds covered by vegetation dominated by grasses with little or no tree cover (Suttie & al., 2005). Grasslands and other graminoid-dominated habitats occupy about 30–40% of Earth's land surface (Blair & al., 2014). The notable feature of grasslands is that they are overwhelmed or co-dominated by graminoid vegetation, including the true grasses (members of the family Poaceae) and other grass-like species such as sedges (Cyperaceae members). However, the term grassland can also be used in a broader sense to encompass ecosystems with a significant grass cover interspersed with varying degrees of woody vegetation, including savannas and scrub (woodlands).

Grasses are highly successful from an evolutionary perspective, with about 12000 species belonging to about 779 genera (Kellogg, 2015; Soreng & al., 2017; Hodkinson, 2018; POWO, 2022). In India, 1391 species belong to 242 genera (Prasanna *Pers. comm.*), whereas in Southern India 732 taxa under 155 genera (Nagaraju & al., 2021). The family name, Poaceae, was coined by Jussieu (1789), and the grouping of the genera was based on several stamens and florets. Additional evidence like leaf epidermis, leaf anatomy (Prat, 1936; Brown, 1958), cytology, morphology (Ardulov, 1931), embryology (Reeder, 1957), and the inclusion of molecular data from proteins and nucleic acids revealed the evolutionary lineages of the grasses (Hamby & Zimmer, 1988; Hilu & Esen, 1988; Doebley & al., 1990; Davis & Soreng, 1993; Hsiao & al., 1994; Nadot & al., 1994; Barker & al., 1995; Clark & al., 1995; Duvall & Morton, 1996). Molecular phylogenetic studies strongly support the placement of grasses in Poales, a grouping of 14 families. The family Poaceae dominates species number/diversity under the clade 'graminoid' (APG IV, 2016; Wolowski & al., 2016).

The family Poaceae are classified at higher taxonomic ranks by Clayton & Renvoize (1986) and Watson & Dallwitz (1994), mainly based on morphology and anatomy. Kellogg (2015) and Soreng & al. (2015 & 2017) recognized 12 subfamilies but differed in identifying the genera and tribes. Kellogg (2015) recognized 698 genera, 30 tribes, and 53 subtribes, whereas Soreng et al. (2017) recognized 768, 52 tribes, and 90 subtribes. Kellogg (2015) thus chose to use fewer ranks below subfamily, avoiding all supertribe names and tribes in small or single

Pogonatherum crinitum

tribe subfamilies or subtribes in small tribes. In contrast, Soreng & al. (2015 & 2017) perpetuated tribal terms since they are integral ranks in the botanical code and have been used to classify the grasses for some 200 years (Hodkinson, 2018).

STUDY AREA

Telangana, the 29th state of the Indian Union, was carved out of united Andhra Pradesh in 2014. It is part of the phytogeographical of the Deccan Plateau in the central stretch of the eastern seaboard of the Indian Peninsula. The state lies between 15° 50'–19° 55' North latitudes and 77° 14'–78° 50' East longitudes, with an area of 114,840 km². The state of Maharashtra borders towards north and north-west, Karnataka to the west, Chhattisgarh towards the north-east, and Andhra Pradesh to the south. **(Map 1)**

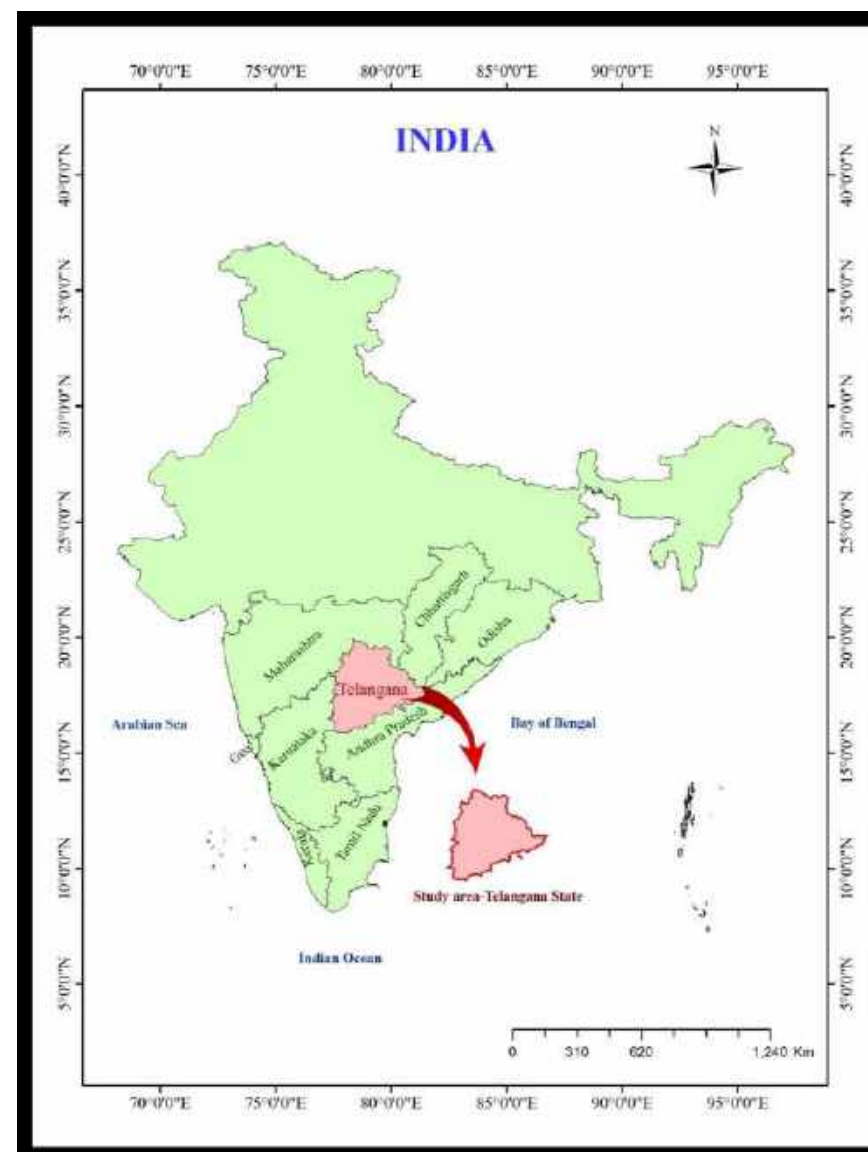
The state is divided into 33 revenue districts viz., Adilabad, Bhadrachalam, Kothagudem, Hyderabad, Jagtial, Jangaon, Jayashankar Bhupalpally, Jogulamba Gadwal, Kamareddy, Karimnagar, Khammam, Kumuram Bheem, Mahabubabad, Mahabubnagar, Mancherla, Medak, Medchal, Mulugu, Nagar Kurnool, Nalgonda, Narayanpet, Nirmal, Nizamabad, Peddapalli, Rajanna Sircilla, Rangareddy, Sangareddy, Siddipet, Suryapet, Vikarabad, Wanaparthy, Warangal (Rural), Warangal (Urban) and Yadadri Bhuvanagiri. **(Map 2)**

The terrain comprise mostly plains, gentle slopes, and undulating hills. Isolated peaks and rocky clusters are found all over the state. The elevation ranges between 30m to 900m. The high elevation areas of 800m to 900m are distributed in parts of the Nallamala hills of Mahabubnagar district. **(Map 3)**

The region is drained by two major rivers, the Godavari and the Krishna, and several minor rivers like the Bhima, Manjira, and Musi. The state has 3 National Parks (Kasu Brahmananda Reddy, Mahavir Harina Vanasthali, and Mrugavani), 7 Wildlife Sanctuaries (Eturunagaram, Pakhal, Pranahita, Kinnerasani, Manjira, Pocharam, and Shivaram), and 2 Tiger Reserves (Kawal and Nagarjunasagar - Srisailem). The annual rainfall, mainly from the southwest monsoon, ranges from 900–1500 mm in the northern region and 700–900 mm in the southern part. The predominant soil types are chalk, red sandy soils, dubbas, deep red loamy soils, and black cotton soils. The state's climate remains primarily dry throughout the year, with a hot and dry period between April and June (summer). Between December and January (winter), the lowest temperatures are recorded. The maximum and minimum temperatures recorded are 47°C and 16°C, respectively.

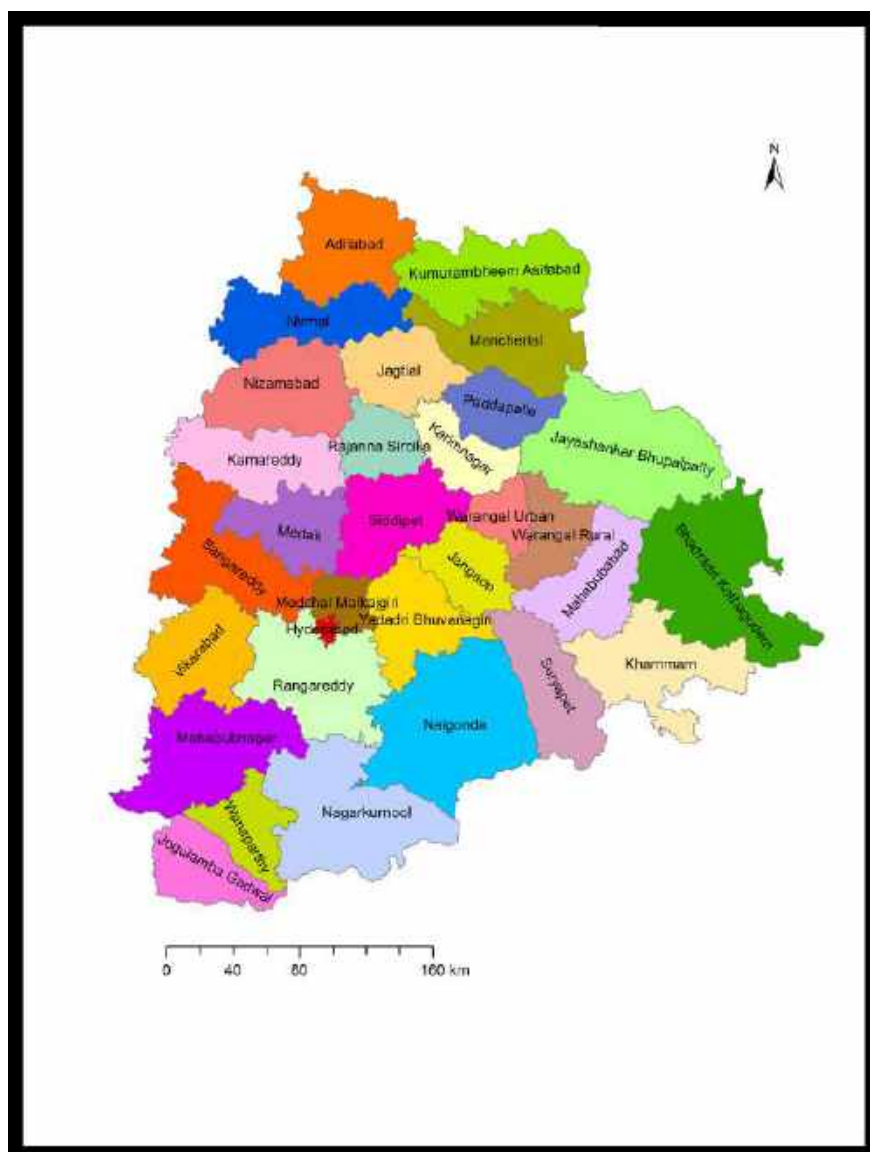
Telangana state has 6 prominent vegetation types viz., (1) Tropical moist deciduous forest, (2) Tropical dry deciduous forest, (3) Tropical thorn forest, (4) Tropical riparian fringe forest, (5) Scrub, and (6) Savannah (Reddy & Reddy, 2016). Savannah-type vegetation, dry deciduous forests, and scrub forests harbor many grassland patches.

The present study aims to assess the taxonomic status, diversity, and composition of the grasslands of Telangana state **(Plate 1-7)**. The study results are presented by way of a user-friendly grass flora to ease the identification of grasses aided by workable keys. Brief discussions on the economic significance, endemism, and threat perception of the grasses of Telangana are also included in the introductory/general chapters.



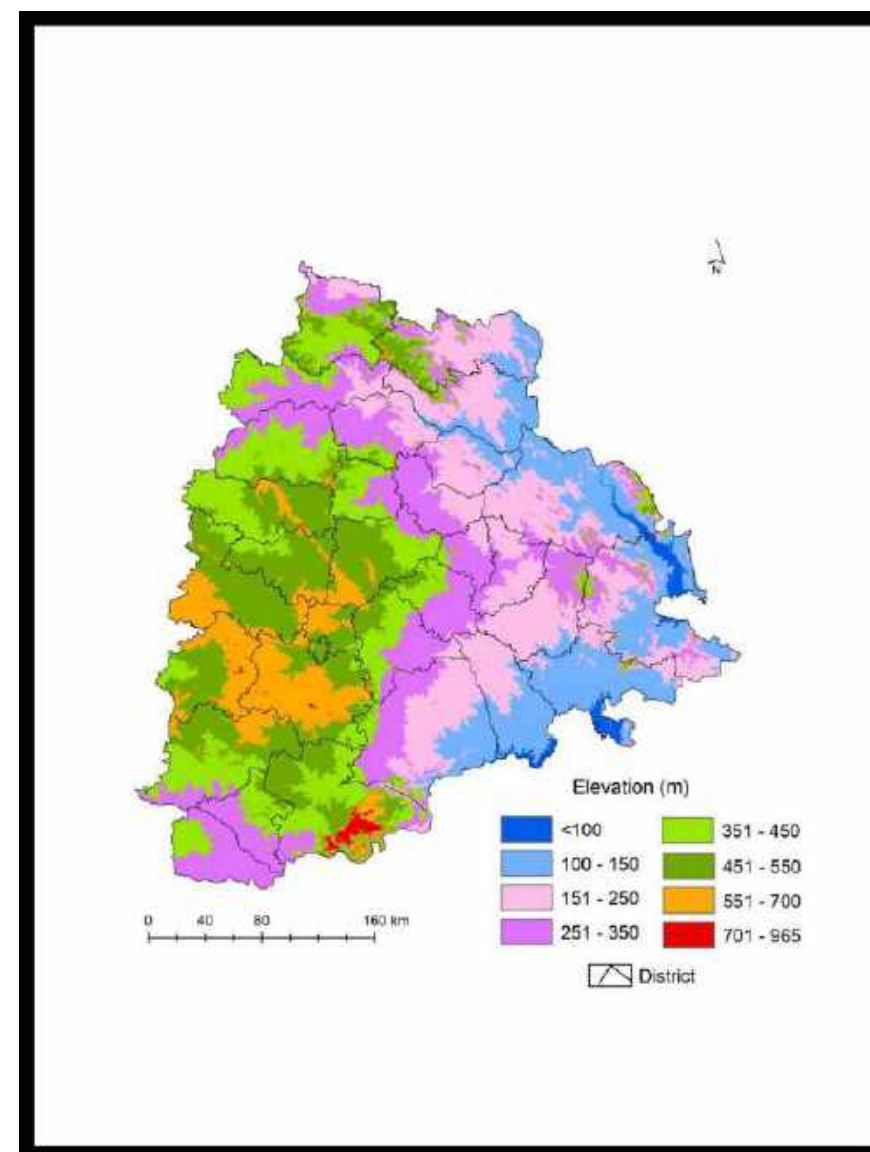
Map 1. Telangana State.

During the present study, plant exploration tours were conducted to survey the dominant grass habitats in Telangana state from April 2017 to March 2022. Exploration sites were mapped with satellite imagery before conducting the field tours. Random sampling, belt, and line transect methods were followed to collect plant specimens based on the homogeneity and heterogeneity of the habitat. During the study, altogether 430 field numbers have been collected, resulting in the identification/description of 273 taxa belonging to 95 genera under 14 tribes.



Map 2. Telangana District boundaries.

Voucher specimens of the grass species were collected to prepare the standard herbarium specimen for incorporation in the herbarium of the Deccan Regional Centre of Botanical Survey of India (Acronym: BSID). Field observations like abundance, habitat, inflorescence pattern, soil type, associated species, threat factors, etc. were recorded in the field, and data entry was made for the specimen label. GPS coordinates for each collected specimen were recorded for geo-tagging subsequently. The collected plant specimens were tagged with the field number and processed by standard herbarium techniques. Specimens were dried, mounted, labeled, and incorporated.



Map 3. District wise elevation range

Photographs of each species' habitat, habit, and inflorescence were taken with Panasonic Lumix FZ-28 and Sony Cyber-shot cameras. Garmin Montana 650 GPS was used to record the geographical coordinates and elevation. Specimens were identified with the help of standard taxonomic works on grasses like Blatter & McCam (1935), Bor (1960), Kabeer & Nair (2009), and published revisionary works on specific grass genera. Spikelets were dissected using Olympus SZ-61 stereo microscope with Magcam DC series.

Various herbaria viz., SKU (Sri Krishnadevaraya University, Ananthapuramu, A.P.), BSID (BSI, DRC, Hyderabad), CAL (Central National Herbarium, Howrah), KU



Plate 01. Grassy hills in Vikarabad district: A. Anantagiri hills; B. Damagundam Reserve Forest.

(Kakatiya University, Warangal, T.S.), HY (Osmania University, Hyderabad, T.S.) and MH (BSI, SRC, Coimbatore, T.N.) were consulted for studying the available grass specimens from Telangana State.

Present study has been carried out on a number of taxa. The correct botanical name is in boldface for each grass taxon, followed by the authority and original citation. Basionym and meaningful synonyms are cited in italics. While citing the author names, titles of the books, periodicals, journals, and standard abbreviations have been followed. The citation of the species is followed by a detailed description, phenology, distribution and field notes. Artificial keys to



Plate 02. A. Dominance of *Heteropogon contortus* (L.) P.Beauv. at Amrabad Tiger Reserve; B. Panoramic view of Vatavarlappally & Lingala (Nallamala Forest)

genera, species and infraspecific taxa, and colour photo plates for **181** plant species are provided. In the present work Clayton & Renvoize (1986) classification is followed with a few exceptions of placing certain genera as per Grass phylogeny classification (Soreng & al., 2017).

PREVIOUS WORK

Since 19th century, several botanists have significantly contributed to the grass flora of the region. Walker (1849) and Bradley (1849) discussed agricultural,



Plate 03. A. Grassy patches on hill top at Wanaparthy district; B. Manyam Konda-Devarakadra- Mahabubnagar district.

medicinal and other economically important species of Daulatabad and Warangal districts. Campbell (1898) enumerated the forest plants of the region in his *Glimpses of the Nizams Dominions*. Patridge (1911) described 450 species belonging to 69 families and provided keys to taxa, information on local names, and economic importance of the plants in his book, *Forest Flora of Hyderabad State*. Khan (1953) revised it with additional information and described 567 wild and cultivated species. Gamble and Fischer (1915–1935) explored the united Andhra Pradesh, which includes a few areas under the Eastern Ghats bordering



Plate 04. A. View of hillocks near Koilakonda project, Mahabubnagar district; B. Moosi River Project-Nalgonda district.

Andhra Pradesh presently in Telangana State and adjoining states have the plant wealth in their *Flora of the Presidency of Madras*. Suxena (1947) listed 115 grass species from Hyderabad State and documented them in the Nizam's Dominions, Hyderabad. The scientists from the Southern Regional Centre of the Botanical Survey of India have explored certain areas in the Telangana region. Sebastine & al. (1960) listed 28 grass species from Medak; Thothathri (1964) has listed 29 grass species from Nagarjunakonda valley of Nalgonda district. Sebastine & Henry (1966) have reported the 33 grass species from Pakhal and the surrounding



Plate 05. A. Dominance of *Dimeria ornithopoda* Trin. in Pakhal WLS in Warangal district; B. Bamboo forest in Warangal district.

regions of Narsampet taluk in the Warangal district. Subba Rao & Kumari (1967) listed 23 genera and 34 species of grasses from Kodimial, Manthani and Raikal of Karimnagar district.

Rajagopal (1973), has treated 108 species of Poaceae in his work, *Flora of Hyderabad: including the study of the foliar epidermal characters of species as an aid to taxonomy*. Pullaiah & al. (1992) documented 85 grass species in their book *Flora of Adilabad District*. About 60 species of Poaceae were enumerated by Pullaiah & Rao (1995) in the *Flora of Nizamabad District*. Pullaiah & al. (1998)



Plate 06. Wetlands: A Undrukonda-Suryapet district; A. Peddapalli-Karimnagar district.

listed 83 species from Medak District. Pullaiah & Mohammed (2000), reported 70 species of Poaceae in the *Flora of Rangareddy District*. Naqvi (2001), reported 100 species of Poaceae in the *Flora of Karimnagar District*. Rao & al. (2001), enumerated 44 grass species in the *Flora of Nalgonda District*. Reddy (2001) has listed 103 species of Poaceae in his work, *Floristic studies in Warangal District*. Ramana (2010) has recorded 118 species of Poaceae in his Ph.D. thesis, *Flora of Hyderabad District*, submitted to Osmania University, Hyderabad.

In recent years, the state floras such as *Flora of Telangana: The 29th State of India* (Pullaiah, 2015) and *Flora of Telangana State* (Reddy & Reddy, 2016)



Plate 07. A. Forest-Eturunagaram WLS in Mulugu district; B. Grassy hills in Nagar Kurnool district.

include 208 grass species and 198 grass species, respectively. In addition, Reddy (2018) has reported additional grasses (30 species) with additional information, with the total species of Poaceae reported being 228. Simultaneously, field surveys were carried out by scientific personnel of BSI, Hyderabad in protected areas of Telangana state for collecting and recording the plant's wealth, including grasses, of the State. Annamma (2018) enumerated 48 genera and 66 species of Poaceae from Kawal Wildlife Sanctuary (Tiger Reserve), Adilabad District, in her Ph.D. thesis. Swamy (2019) has recorded 51 genera and 83 species of Poaceae from Pocharam Wildlife Sanctuary, Medak District.

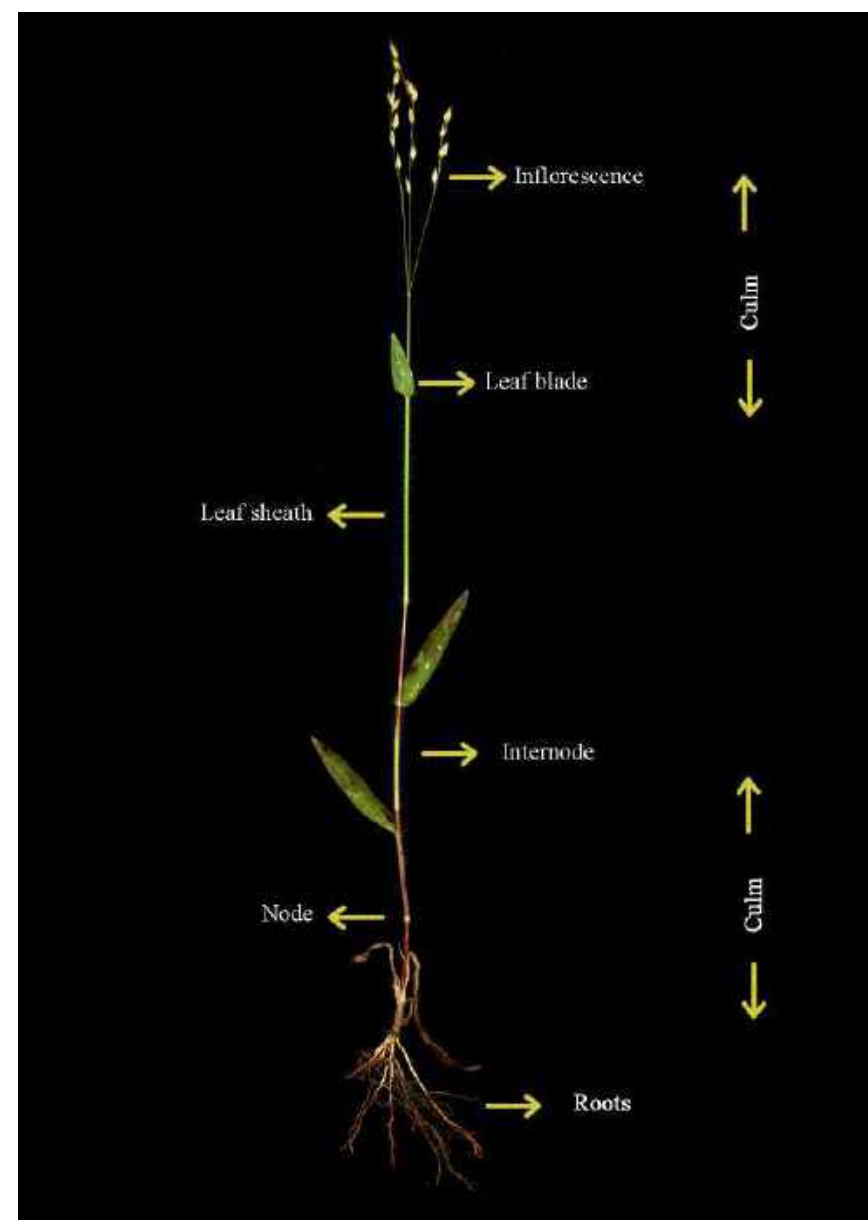


Plate 08. **Grass habit:** *Alloteropsis cimicina* (L.) Stapf

GRASS MORPHOLOGY

Grass habit **Plate 08**

The common grass habit for most species is an upright, cylindrical, rarely compressed culm (stem) anchored to the soil by adventitious roots. The culm consists of nodes and internodes with leaves distichously arising from the nodes. The inflorescence usually comprise numerous spikelets composed of one or more florets containing the flower parts (pistil and stamens).

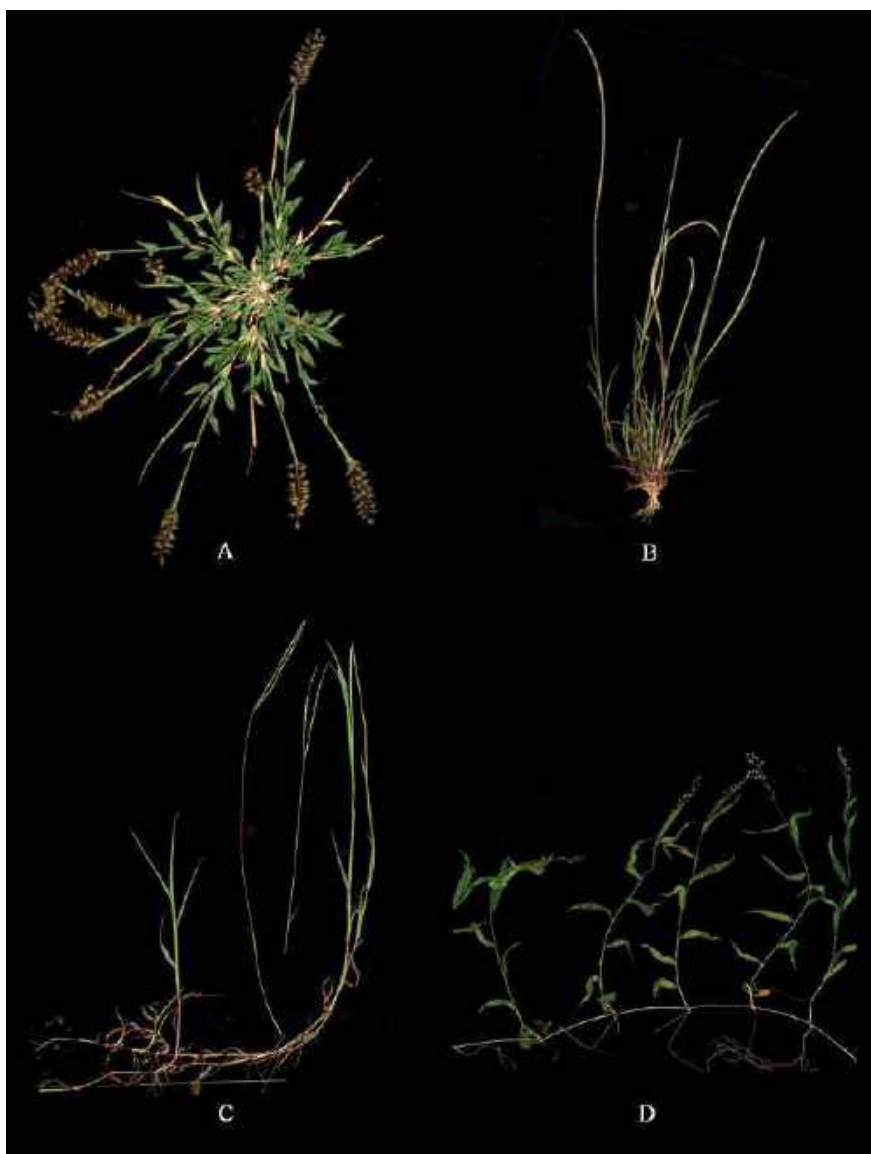


Plate 09. **Different habit types:** A. *Tragus mongolorum* Ohwi; B. *Microchloa indica* (L.f.) P.Beauv.; C. *Digitaria longiflora* (Retz.) Pers.; D. *Cyrtococcum trigonum* (Retz.) A.Camus

HABIT

Grasses are caespitose or solitary; annuals or perennials.

Plate 09

ROOT SYSTEM

The luxuriant fibrous root system anchors the growing grass plant and is composed of adventitious roots (fibrous) originating from the lower culm nodes. Additional prop roots (*Sorghum halepense*, *Polytoca gigantea*) emerge from the lower culm nodes just above ground level in some grasses. Most grasses



Plate 10. **Root system:** A. *Eragrostiella bifaria* (Vahl) Bor; B. *Chrysopogon zizanioides* (L.) Roberty; C. *Zea mays* L.; D. *Dendrocalamus strictus* Nees

with geniculate culms root at the lower nodes. Occasionally, they have woody rootstock, rhizomatous and stoloniferous rootstock which remains dormant in unfavorable conditions.

Plate 10

CULMS

The grass stem is referred as culm comprising series of internodes and nodes. The internodes at the base of the culm are very short, and in the upper portion of a culm, they extend to a considerable length. Internodes are usually



Plate 11. **Culm nodes:** A. *Polytoca gigantea* (J.Koenig) Mabb.; B. *Heteropogon triticeus* (R.Br.) Stapf ex Craib; C. *Urochloa mutica* (Forssk.) T.Q.Nguyen; D. *Dichanthium foveolatum* (Delile) Roberty

hollow but sometimes are solid as in *Saccharum* or filled with white pith as in *Sorghum*. Culms are mostly glabrous, particularly the sections are enveloped by leaf sheaths. Nodes vary and in some species, they are hairy, whereas in others they are glabrous. Branches usually occur at basal nodes or from the middle and upper nodes known as tillers.

Plate 11

FOLIAGE

A grass leaf is divided into the following parts: sheath, ligules, collar, and blade.

Plate 12

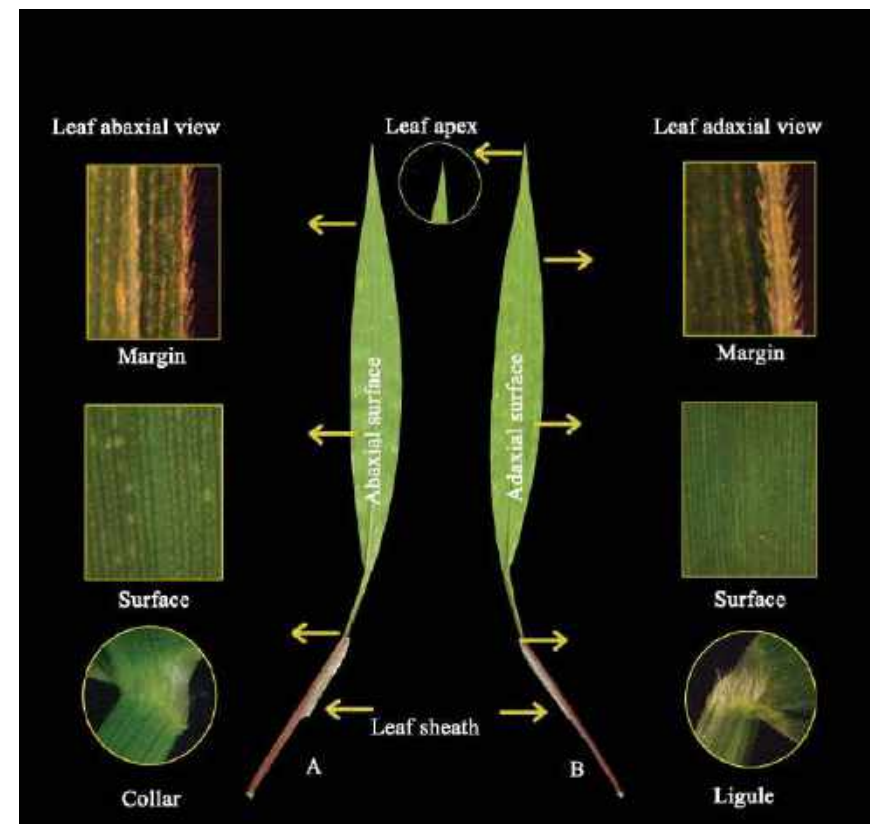


Plate 12. **Grass leaf:** *Setaria verticillata* (L.) P.Beauv.

Leaf-sheaths: The leaf sheath originates at the node, protects the internodes' growing zone, and structurally strengthens the culm. Sheaths are usually open, sometimes split with overlapping margins or margins fused for all or part of their length. The sheath may be compressed or round or occasionally keeled at the midrib. In some species, sheaths are longer than the blades, and in a few species, they are longer than the adjacent internodes. Usually, sheaths are of a paler shade of green than the blades and are often tinged with pink or purple at the base. They are also tinted with darker color near the blades. The tints are not consistent enough to be of much value in identification. The presence or absence of hairs on the sheath margins, surface, and the junction with the blade is an essential characteristic for identification.

Ligules: A ligule is a tissue clasping the stem or bud shoots, inside the leaf at the junction of the blade and sheath on the adaxial (adjacent) surface. Ligules are usually present, and they may be simply a fringe of hairs, membranous or hyaline, ciliolate or ciliate membrane, or absent. The length of ligules may vary within a species. The shape and margin are usually relatively constant, and they provide reliable distinguishing characteristics for identification.

Plate 13

Collars: The collar is also found between the blade and the sheath. It may be vertically broad or narrow, continuous, or divided by a midrib. If the collar extends diagonally, it is referred to as oblique. Collars are usually smooth but may be hairy

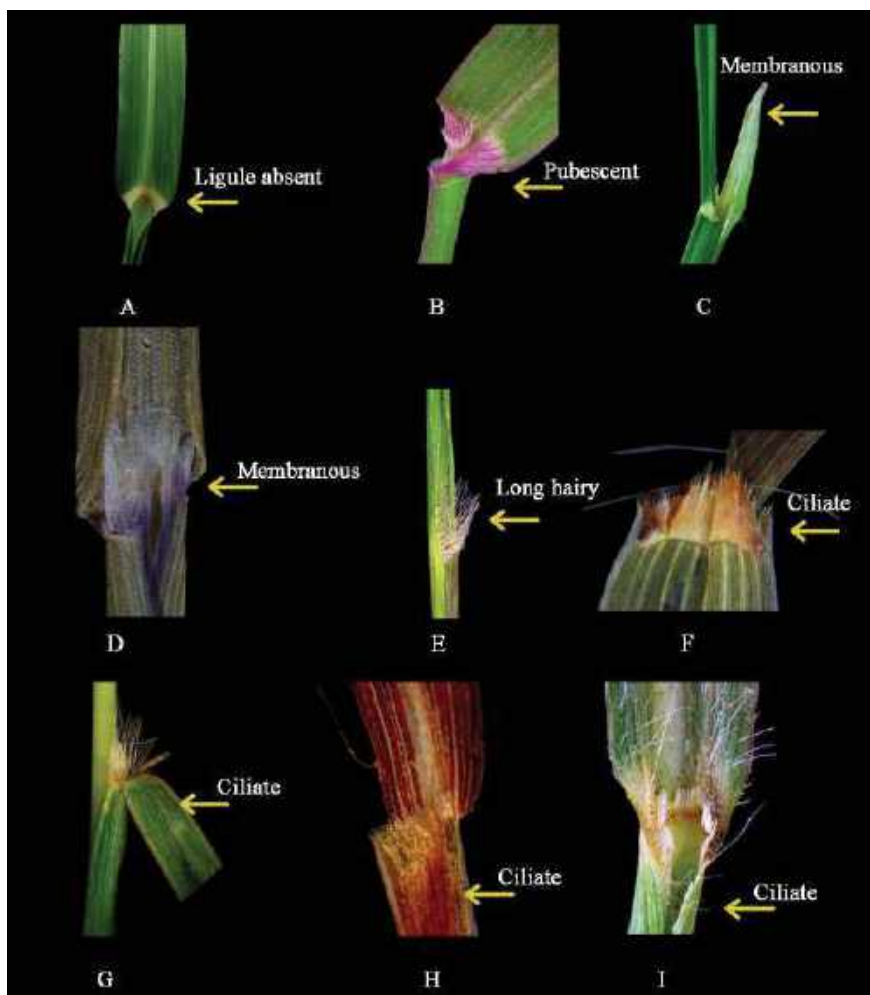


Plate 13. **Ligule diversity:** A. *Echinochloa colona* (L.) Link; B. *Sorghum halepense* (L.) Pers.; C. *Oryza sativa* L.; D. *Digitaria longiflora* (Retz.) Pers.; E. *Imperata cylindrica* (L.) P.Beauv.; F. *Dinebra retroflexa* (Vahl) Panz.; G. *Dichanthium foveolatum* (Delile) Roberty; H. *Dimeria connivens* Hack.; I. *Polytoca gigantea* (J.Koenig) Mabb.

over the whole surface or only on the inner and lowermost portion of the margin. Collars are generally green or yellowish-green and may be yellow or red.

Blades: The blade or lamina is the upper portion of the leaf above the collar, ligule, and auricle. There is considerable variation in the blades' length and width, and the ratio between these two characteristics is helpful for identification. Blades are usually linear to lanceolate, but blades are filiform or ovate in some species. There is a great deal of variation among species in the shape of the blade apex and base and hairiness of the upper and lower surfaces and margins. Blade venation is usually parallel, although sometimes there are prominent cross veins. Frequently, there are considerable differences between blades from the upper and lower parts of the same plant and between blades taken from different plants of the same species.



Plate 14. **A. Solitary spike:** *Eragrostiella bifaria* (Vahl) Bor; **B. Paired spike:** *Dimeria orissae* Bor; **C. Unilateral spike:** *Microchloa indica* (L.f.) P.Beauv.; **D. Digitate spike:** *Dactyloctenium aegyptium* (L.) Willd.

INFLORESCENCE

Different inflorescence types are seen in grasses. Broadly, they are spikes, racemes, and panicles.

Spikes: In a spike, the spikelets are attached directly (sessile) to the unbranched central axis without pedicels.

Plate 14

Racemes: A raceme is an unbranched inflorescence with each spikelet borne on single pedicels directly on the axis. This type of inflorescence is rare in the grasses, but there are many species for which more than one raceme is found



Plate 15. **Different forms of Racemes:** A. *Digitaria abludens* (Roem. & Schult.) Veldkamp; B. *Bothriochloa pertusa* (L.) A. Camus; C. *Bothriochloa kuntzeana* (Hack.) Henard

in the inflorescence, which is then technically referred to as a panicle. **Plate 15**

Panicles: A panicle is an inflorescence in which the central axis has several lateral, whorled or individual indeterminate branches, with each branch terminating in a pedicellate spikelet. A true panicle does not have any leaf sheaths within the inflorescence. A raceme is a compound inflorescence in the tribe Andropogoneae consisting of one to many units (branches) of one sessile and one or two pedicellate spikelets. This arrangement is typical of the Andropogoneae

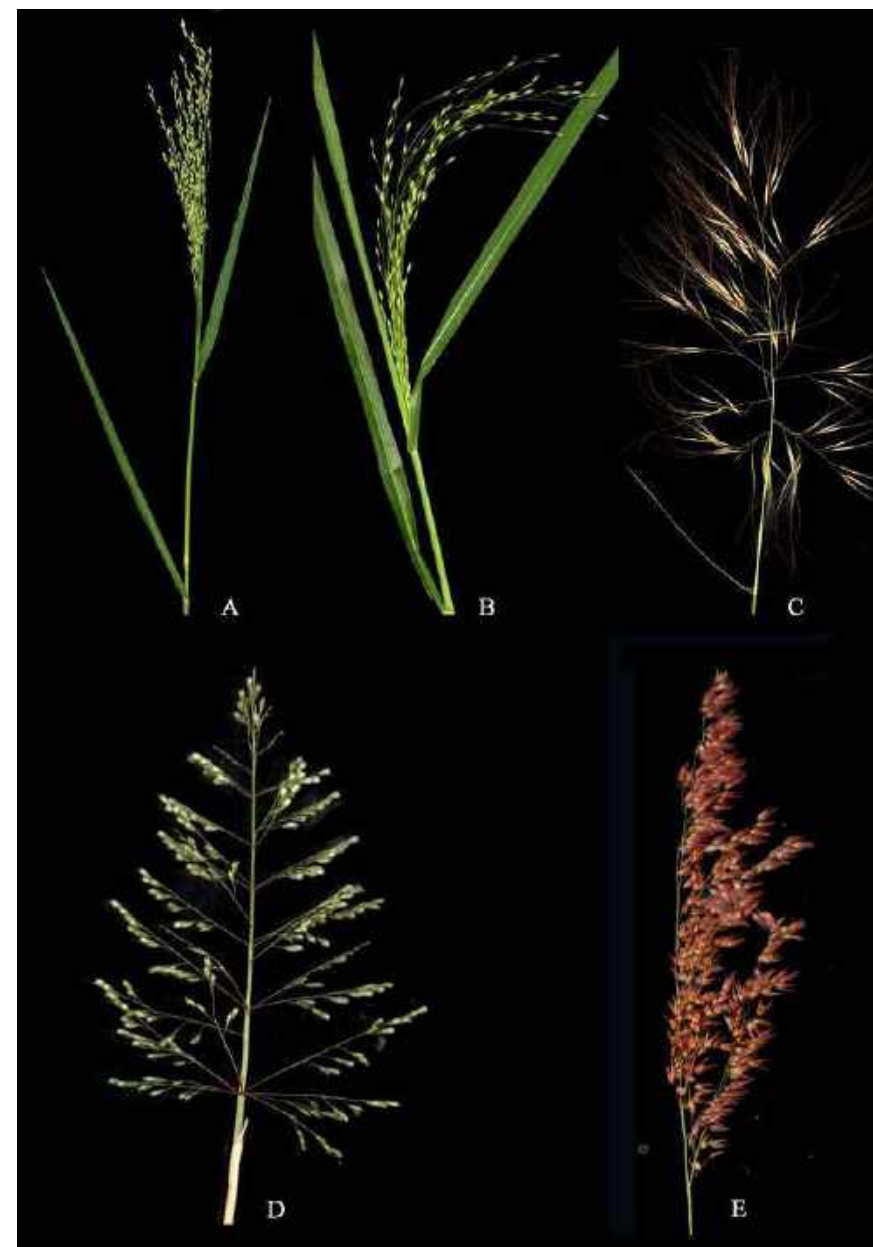


Plate 16. **True panicle:** A. *Panicum repens* L.; B. *Panicum paludosum* Roxb.; C. *Aristida hystrix* L.f.; D. *Sporobolus coromandelianus* (Retz.) Kunth; E. *Melinis repens* (Willd.) Zizka

and in many of the older published floras it was referred to as "racemes."

True panicle: The central axis of inflorescence bears verticillate, irregular, and alternate branches; which may be open, open, or contracted. **Plate 16**

False panicle: A group of spikelets is enclosed by a spathe like a sheath, present at the terminal ends of branches. **Plate 17**



Plate 17. **False panicle:** A. *Cymbopogon caesius* (Hook. & Arn.) Stapf; B. *Themeda triandra* Forssk.; C. *Iseilema antheophoroides* Hack.

SPIKELET

Spikelet is a structure of two sterile bracts (the glumes) with a minor axis and several florets (each floret consisting of the lemma, palea, and flower). **Plate 18**

Different shapes of grass spikelets depicted **Plate 19**

Glumes: The glumes are the outermost pair of bracts enclosing the spikelet

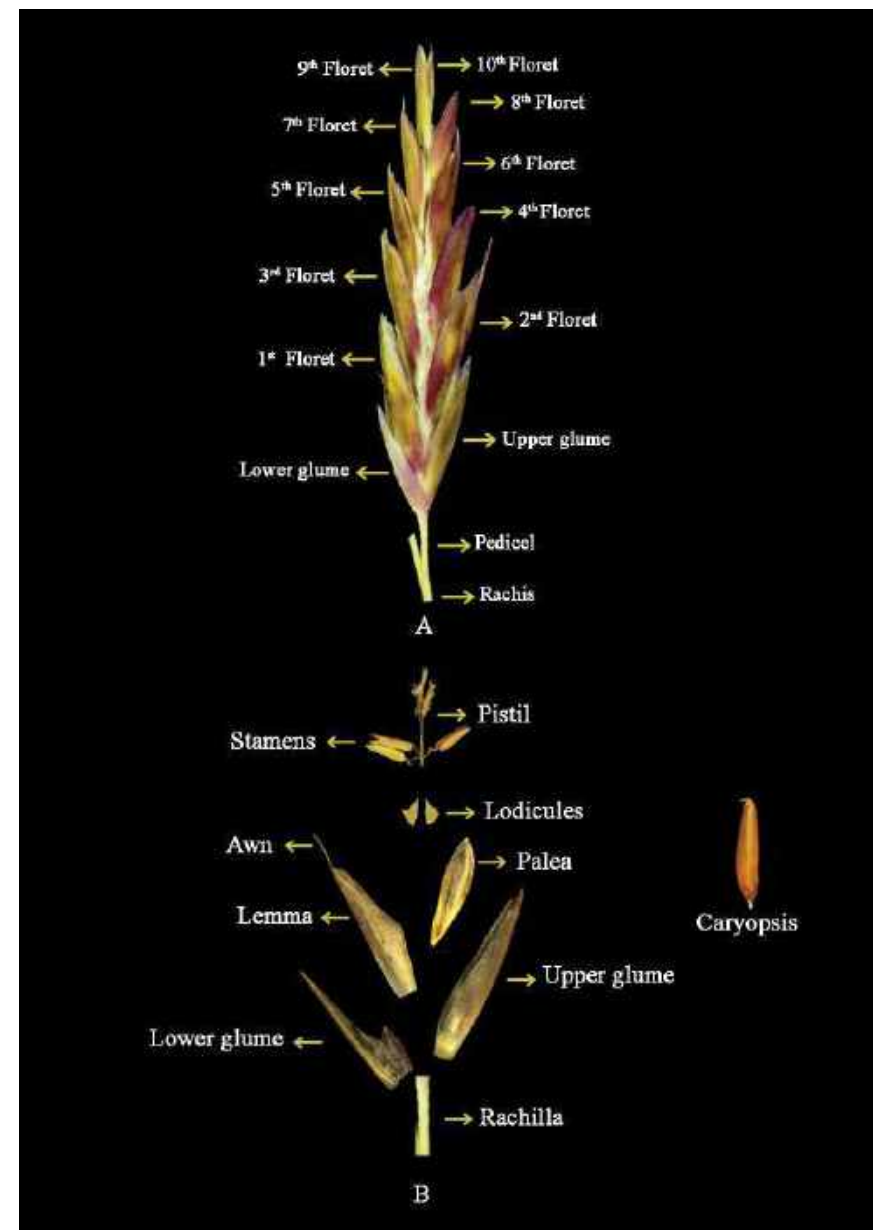


Plate 18. A. **General view of spikelet;** B. **Dissected spikelet parts:** *Tripogon jacquemontii* Stapf

at the base, and protect the flowers inside before opening, which are either hairy and may have an awn (a bristle-like extension). These are variable in size and shape. In some species, the lower glume is entirely absent (*Eriochloa*). Patterns of glumes in grasses **Plates 20 & 21**

Callus: This is the hard base of the spikelet having numerous hairs. Different forms of callus **Plate 22 (A–C)**

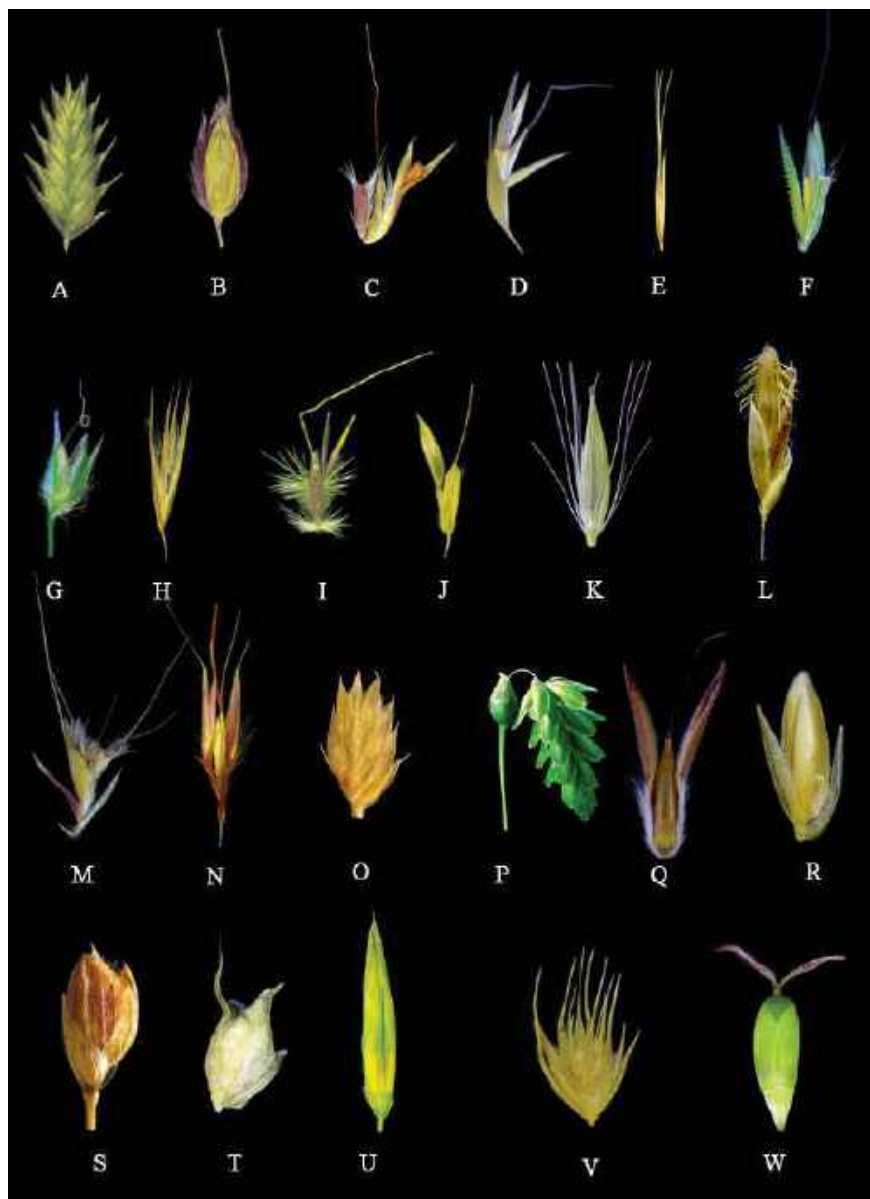


Plate 19. **Diverse shapes of grass spikelets:** A. *Acrachne racemosa* (B.Heyne ex Roth) Ohwi; B. *Alloteropsis cimicina* (L.) Stapf; C. *Andropogon pumilus* Roxb.; D. *Apluda mutica* L.; E. *Aristida adscensionis* L.; F. *Arthraxon lanceolatus* var. *echinatus* (Nees) Hack.; G. *Arundinella ciliata* (Roxb.) Nees ex Miq.; H. *Arundo donax* L.; I. *Bothriochloa kuntzeana* (Hack.) Henrard; J. *Capillipedium filiculme* (Hook.f.) Stapf; K. *Cenchrus hohenackeri* (Hochst. ex Steud.) Morrone; L. *Centotheca lappacea* (L.) Desv.; M. *Chloris quinquasetica* Bhide; N. *Chrysopogon fulvus* (Spreng.) Chiov.; O. *Coelachyrum lagopoides* (Burm.f.) Senaratna; P. *Coix lacryma-jobi* L.; Q. *Cymbopogon gidarba* (Steud.) A.Camus; R. *Cynodon barberi* Rang. & Tadul.; S. *Cyrtococcum trigonum* (Retz.) A.Camus; T. *Dactyloctenium aegyptium* (L.) Willd.; U. *Diplachne fusca* (L.) P.Beauv. ex Roem. & Schult.; V. *Elytrophorus spicatus* (Willd.) A.Camus; W. *Polytoca gigantea* (J.Koenig) Mabb.

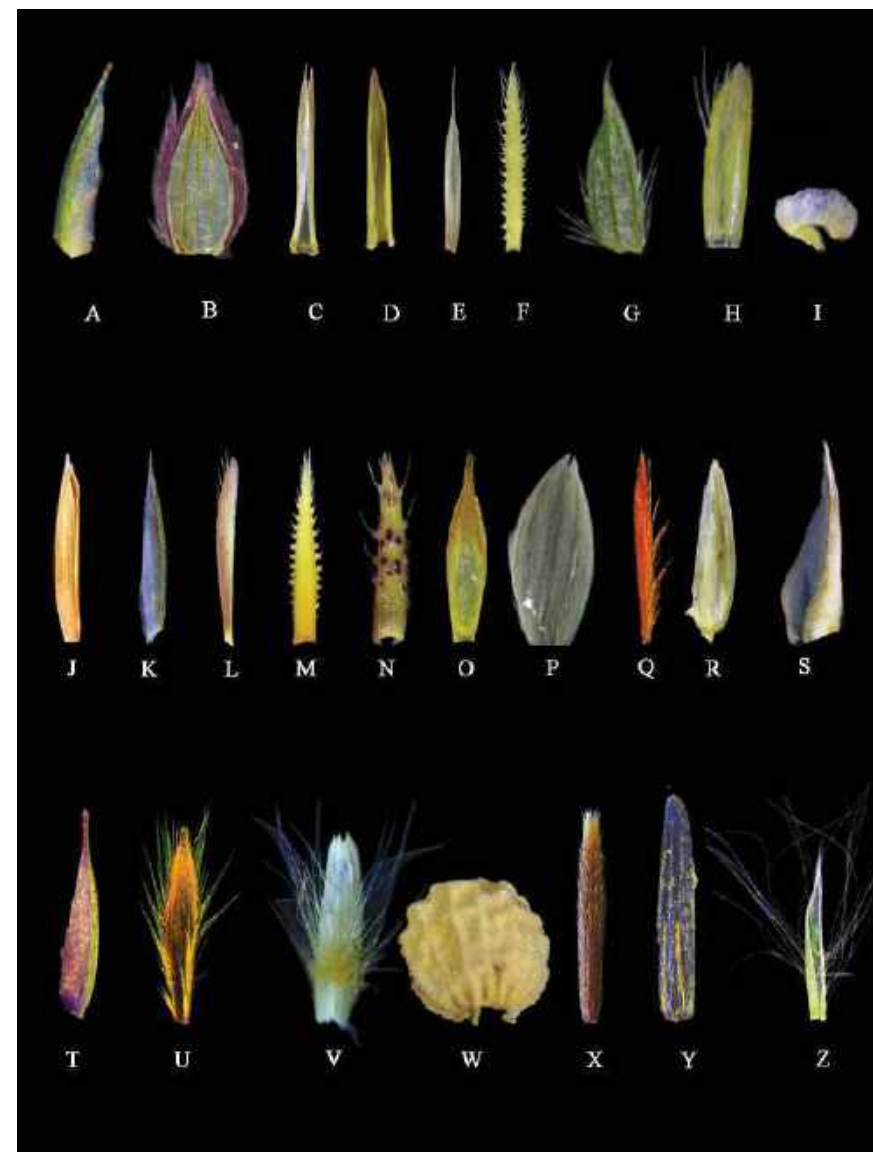


Plate 20. **Patterns of glumes:** A. *Acrachne racemosa* (B.Heyne ex Roth) Ohwi; B. *Alloteropsis cimicina* (L.) Stapf; C. *Andropogon pumilus* Roxb.; D. *Apluda mutica* L.; E. *Aristida adscensionis* L.; F. *Arthraxon lanceolatus* var. *lanceolatus* (Roxb.) Hochst.; G. *Arundinella ciliata* (Roxb.) Nees ex Miq.; H. *Capillipedium filiculme* (Hook.f.) Stapf; I. *Cenchrus hohenackeri* (Hochst. ex Steud.) Morrone; J. *Centotheca lappacea* (L.) Desv.; K. *Chloris quinquasetica* Bhide; L. *Chrysopogon fulvus* (Spreng.) Chiov.; M. *Chrysopogon lawsonii* (Hook.f.) Veldkamp; N. *Chrysopogon zizanioides* (L.) Roberty; O. *Cymbopogon coloratus* (Hook.f.) Stapf; P. *Digitaria longiflora* (Retz.) Pers.; Q. *Dimeria connivens* Hack.; R. *Eleusine indica* (L.) Gaertn.; S. *Eragrostiella bifaria* (Vahl) Bor; T. *Eragrostis unioides* (Retz.) Nees ex Steud.; U. *Eulalia trispicata* (Sult.) Henrard; V. *Eulaliopsis binata* (Retz.) C.E.Hubb.; W. *Mnesithea granularis* (L.) de Koning & Sosef; X. *Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.; Y. *Heteropogon triticeus* (R.Br.) Stapf ex Craib; Z. *Imperata cylindrica* (L.) P.Beauv.

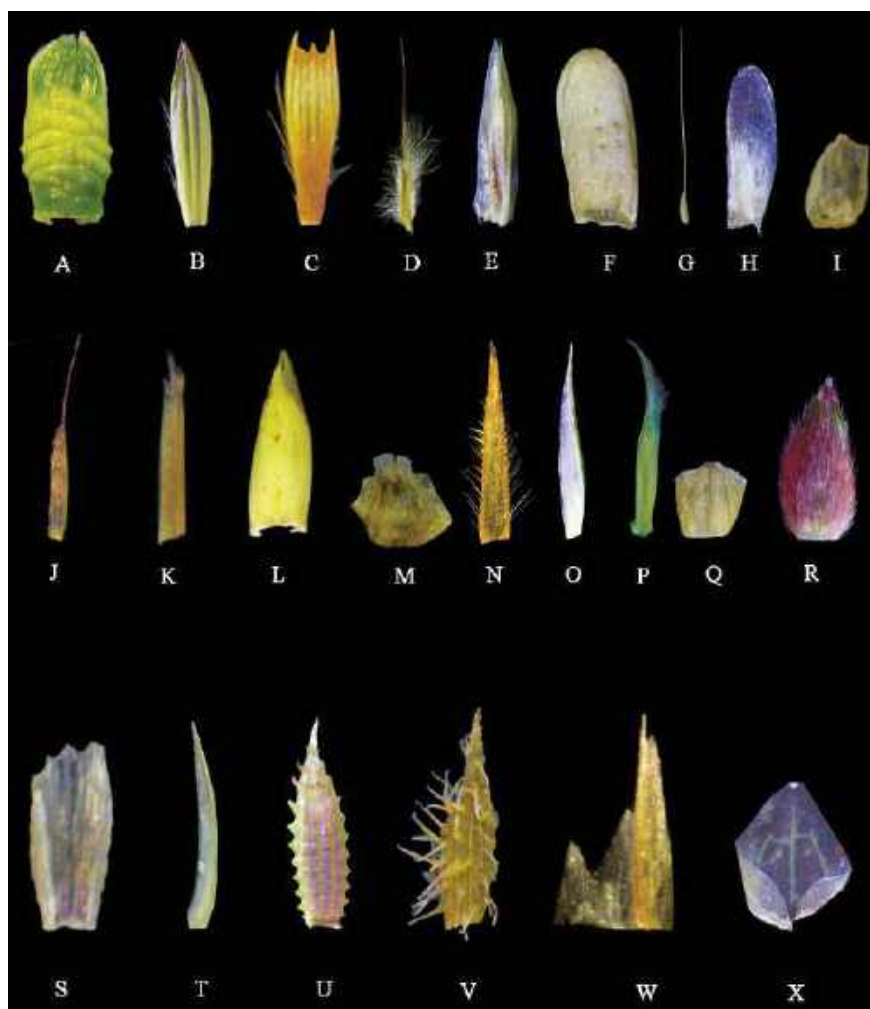


Plate 21. **Patterns of glumes in grasses:** A. *Ischaemum rugosum* Salisb.; B. *Iseilema prostratum* (L.) Andersson; C. *Lophopogon tridentatus* (Roxb.) Hack.; D. *Melanocenchris jacquemontii* Jaub. & Spach; E. *Microchloa indica* (L.f.) P.Beauv.; F. *Ophiuros exaltatus* (L.) Kuntze; G. *Oplismenus burmanni* (Retz.) P.Beauv.; H. *Oropetium villosulum* Stapf ex Bor; I. *Panicum paludosum* Roxb.; J. *Perotis indica* (L.) Kuntze; K. *Pogonatherum crinitum* (Thunb.) Kunth; L. *Rottboellia cochinchinensis* (Lour.) Clayton; M. *Sacciolepis interrupta* (Willd.) Stapf; N. *Schizachyrium brevifolium* (Sw.) Nees ex Buse; O. *Schoenefeldia gracilis* Kunth; P. *Sehima nervosum* (Rottler) Stapf; Q. *Setaria flavida* (Retz.) Veldkamp; R. *Sorghum halepense* (L.) Pers.; S. *Sporobolus diandrus* (Retz.) P.Beauv.; T. *Tetrapogon tenellus* (J.Koenig ex Roxb.) Chiov.; U. *Thelepogon elegans* Roth; V. *Tragus mongolorum* Ohwi; W. *Tripogon bromoides* var. *anantaswamianus* (Sreek., V.J.Nair & N.C.Nair) Sang.Dey & Prasanna; X. *Urochloa panicoides* P.Beauv.

Lemma: This is the lowermost of two bracts enclosing the flower. Characters such as shape, texture, size, venation, development, and position of awn are of taxonomic importance. The lemma may be minute but never absent. Lemma diversity in grasses

Plate 22 (D–U)

Palea: The uppermost of two bracts enclosing the flower. The lemma and

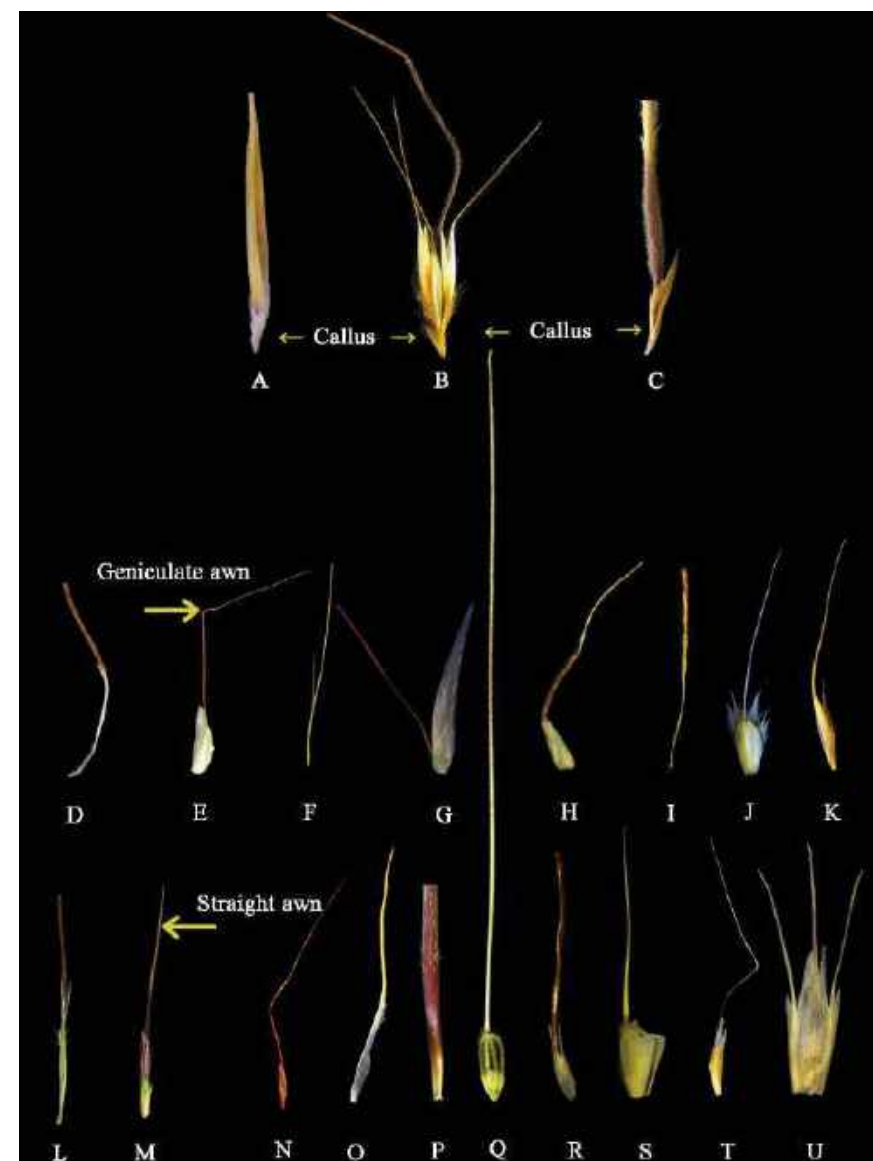


Plate 22. **A-C. Different forms of callus:** A. *Aristida adscensionis* L.; B. *Chrysopogon fulvus* (Spreng.) Chiov.; C. *Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.; **D-U. Lemma diversity:** D. *Andropogon pumilus* Roxb.; E. *Apluda mutica* L.; F. *Aristida redacta* Stapf; G. *Arthraxon lanceolatus* var. *echinatus* (Nees) Hack.; H. *Arundinella ciliata* (Roxb.) Nees ex Miq.; I. *Capillipedium fliculme* (Hook.f.) Stapf; J. *Chloris quinquesetica* Bhide; K. *Chrysopogon fulvus* (Spreng.) Chiov.; L. *Cymbopogon coloratus* (Hook.f.) Stapf; M. *Dichanthium foveolatum* (Delile) Roberty; N. *Dimeria connivens* Hack.; O. *Eulaliopsis binata* (Retz.) C.E.Hubb.; P. *Heteropogon triticeus* (R.Br.) Stapf ex Craib; Q. *Oryza rufipogon* Griff.; R. *Sehima nervosum* (Rottler) Stapf; S. *Tetrapogon tenellus* (J.Koenig ex Roxb.) Chiov.; T. *Thelepogon elegans* Roth; U. *Tripogon bromoides* var. *anantaswamianus* (Sreek., V.J.Nair & N.C.Nair) Sang.Dey & Prasanna.

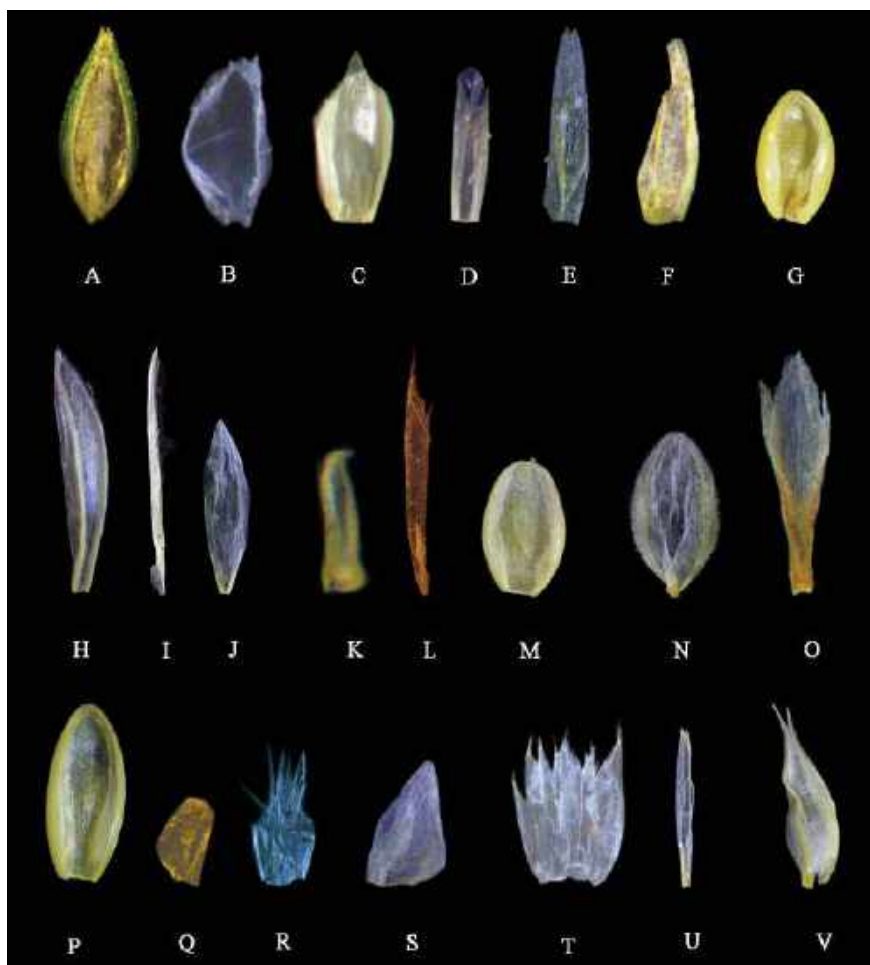


Plate 23. **View of palea in different species:** A. *Acrachne racemosa* (B.Heyne ex Roth) Ohwi; B. *Andropogon pumilus* Roxb.; C. *Apluda mutica* L.; D. *Aristida adscensionis* L.; E. *Arthraxon lanceolatus* var. *echinatus* (Nees) Hack.; F. *Arundinella ciliata* (Roxb.) Nees ex Miq.; G. *Urochloa ramosa* (L.) T.Q.Nguyen; H. *Chloris virgata* Sw.; I. *Chrysopogon fulvus* (Spreng.) Chiov.; J. *Coix lacryma-jobi* L.; K. *Cymbopogon coloratus* (Hook.f.) Stapf; L. *Dimeria connivens* Hack.; M. *Echinochloa colona* (L.) Link; N. *Eragrostiella bifaria* (Vahl) Bor; O. *Eragrostis japonica* (Thunb.) Trin.; P. *Eriochloa procera* (Retz.) C.E.Hubb.; Q. *Eulalia trispicata* (Schult.) Henrard; R. *Eulaliopsis binata* (Retz.) C.E.Hubb.; S. *Mnesithea granularis* (L.) de Koning & Sosef; T. *Imperata cylindrica* (L.) P.Beauv.; U. *Lophopogon tridentatus* (Roxb.) Hack.; V. *Melanocenchris jacquemontii* Jaub. & Spach.

palea together protect the flower. View of palea in different species **Plate 23**

Lodicules: Minute scales between the lemma and fertile flower parts, possibly representing the perianth. The lodicules are generally 2, sometimes 3 or even absent; they may be short or elongated, truncated, or pointed. Diverse shapes of lodicules **Plate 24 (A–D)**

Androecium: The collective term used for the male sexual organs, the

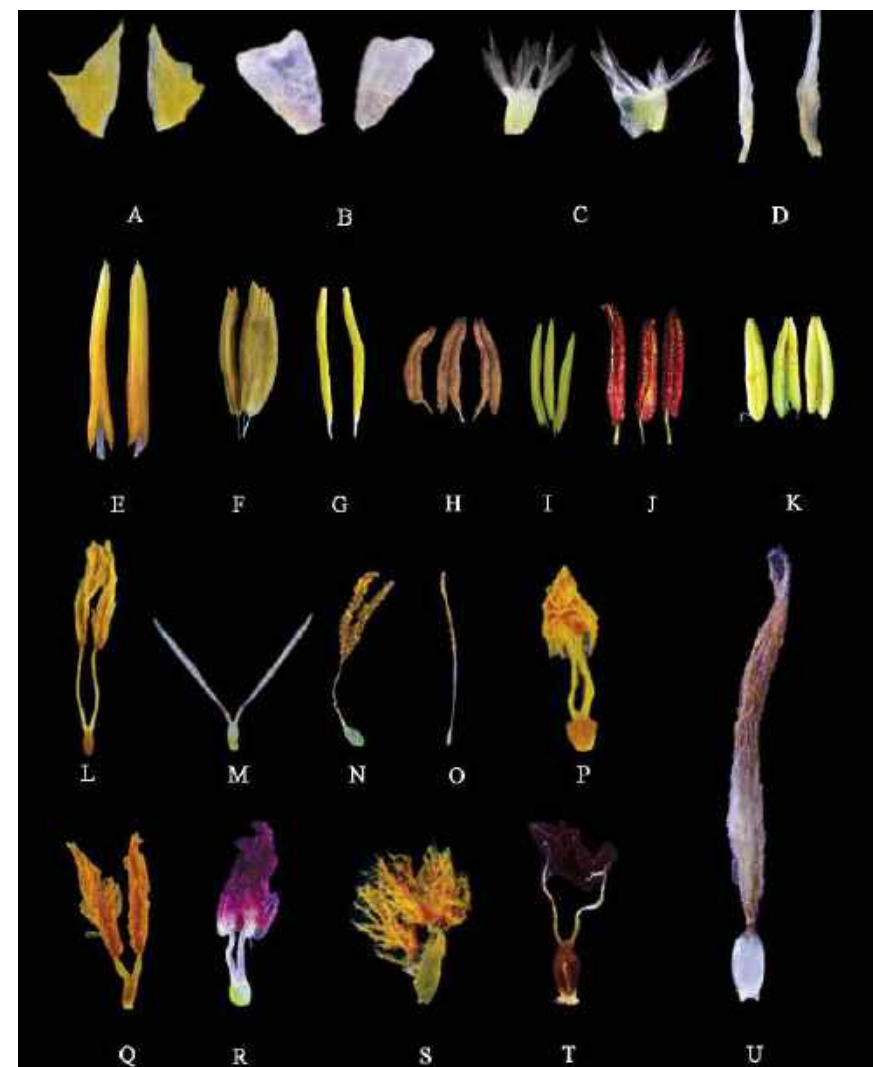


Plate 24. A-D. **Diverse shapes of lodicules:** A. *Ophiuros exaltatus* (L.) Kuntze; B. *Polytoca gigantea* (J.Koenig) Mabb.; C. *Sorghum halepense* (L.) Pers.; D. *Aristida adscensionis* L.; E-K. **Androecium diversity:** E. *Cenchrus hohenackeri* (Hochst. ex Steud.) Morrone; F. *Coix lacryma-jobi* L.; G. *Lophopogon tridentatus* (Roxb.) Hack.; H. *Ophiuros exaltatus* (L.) Kuntze; I. *Sehima nervosum* (Rottler) Stapf; J. *Schizachyrium exile* (Hochst.) Pilg.; K. *Sorghum halepense* (L.) Pers.; L-U. **Gynoecium diversity:** L. *Apluda mutica* L.; M. *Arthraxon lanceolatus* var. *echinatus* (Nees) Hack.; N. *Imperata cylindrica* (L.) P.Beauv.; O. *Lophopogon tridentatus* (Roxb.) Hack.; P. *Mnesithea granularis* (L.) de Koning & Sosef; Q. *Ophiuros exaltatus* (L.) Kuntze; R. *Sorghum halepense* (L.) Pers.; S. *Sporobolus diandrus* (Retz.) P.Beauv.; T. *Urochloa panicoides* P.Beauv. U. *Cenchrus hohenackeri* (Hochst. ex Steud.) Morrone

stamens. Most of the grasses have three stamens. However, some grasses have one stamen (*Pogonatherum*), two stamens (*Sporobolus*), or even six stamens (*Leersia*, *Oryza*) also. Androecium diversity **Plate 24 (E–K)**

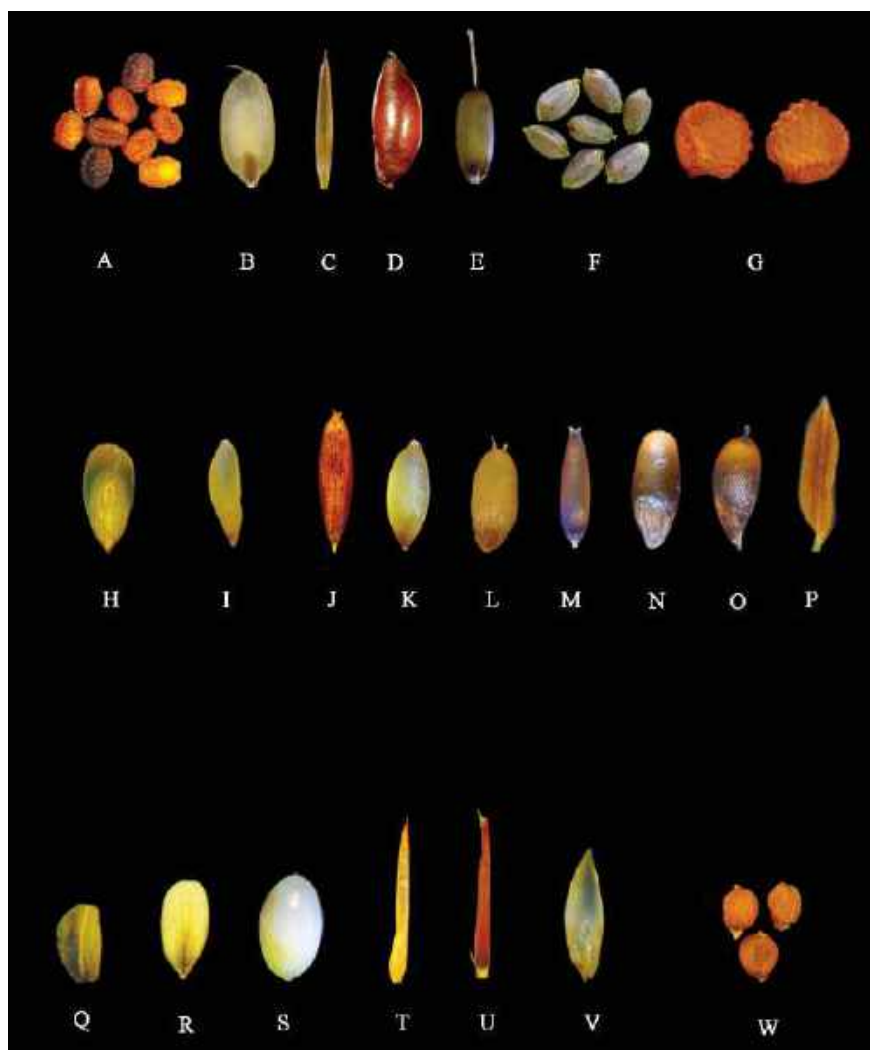


Plate 25. **Different caryopsis forms:** A. *Acrachne racemosa* (B.Heyne ex Roth) Ohwi; B. *Alloteropsis cimicina* (L.) Stapf; C. *Aristida adscensionis* L.; D. *Cenotheca lappacea* (L.) Desv.; E. *Cenchrus hohensekeri* (Hochst. ex Steud.) Morrone; F. *Eleusine indica* (L.) Gaertn.; G. *Dactyloctenium aegyptium* (L.) Willd.; H. *Chloris quinquesetica* Bhide; I. *Chloris virgata* Sw.; J. *Enteropogon dolichostachyus* (Lag.) Keng; K. *Microchloa indica* (L.f.) P.Beauv.; L. *Melanocenthris jacquemontii* Jaub. & Spach; M. *Oropetium roxburghianum* (Schult.) S.M. Phillips; N. *Oropetium thomaeum* (L.f.) Trin.; O. *Oropetium villosulum* Stapf ex Bor; P. *Pogonatherum crinitum* (Thunb.) Kunth; Q. *Tetrapogon tenellus* (J.Koenig ex Roxb.) Chiov.; R. *Trachys muricata* (L.) Pers. ex Trin.; S. *Sacciolepis indica* (L.) Chase; T. *Schizachyrium brevifolium* (Sw.) Nees ex Buse; U. *Schizachyrium exile* (Hochst.) Pilg.; V. *Schoenefeldia gracilis* Kunth; W. *Sporobolus coromandelianus* (Retz.) Kunth

Gynoeceum: The female element of a flower is the pistil. Generally, this consists of a basal ovary with two styles bearing feathery stigmas in grasses. *Zea* and *Dendrocalamus*, which have a single style are an exception. Gynoeceum diversity.

Plate 24 (L–U)

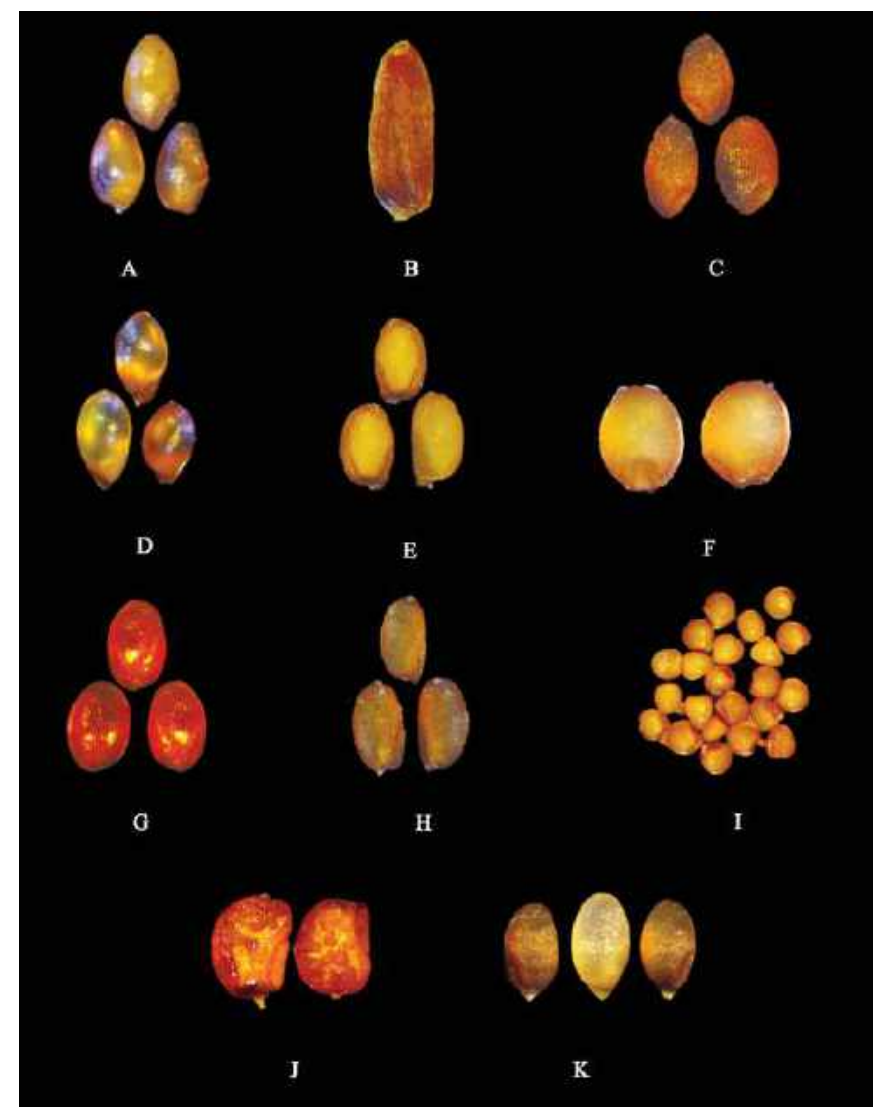


Plate 26. **Caryopsis diversity in *Eragrostis* spp.:** A. *Eragrostis amabilis* (L.) Wight & Arn.; B. *Eragrostis atrovirens* (Desf.) Trin. ex Steud.; C. *Eragrostis gangetica* (Roxb.) Steud.; D. *Eragrostis japonica* (Thunb.) Trin.; E. *Eragrostis macilenta* (A.Rich.) Steud.; F. *Eragrostis minor* Host; G. *Eragrostis nutans* (Retz.) Nees ex Steud.; H. *Eragrostis pilosa* (L.) P.Beauv.; I. *Eragrostis tenuifolia* (A.Rich.) Hochst. ex Steud.; J. *Eragrostis tremula* Hochst. ex Steud.; K. *Eragrostis unioloides* (Retz.) Nees ex Steud.

Caryopsis: In Poaceae, a small dry thin-walled fruit, with a single seed fused to the pericarp is called caryopsis or grain. The seed coat is separated from the pericarp (*Eleusine*, *Sporobolus*). It is tightly enclosed by the lemma and palea (*Aristida*, *Oryza*). Diversity of caryopsis in different species of grasses.

Plate 25 & 26

OBSERVATIONS

The project on Grasses of Telangana State was initiated with an objective to conduct critical taxonomic studies of grasses and to bring out an easily referable identification manual that will facilitate unambiguous and correct identification of Telangana grasses. The state of Telangana was carved out from the erstwhile united state of Andhra Pradesh in 2014. This newly formed state was subsequently divided into 33 revenue districts. Although several district floras are readily available, none of these have dealt exclusively with the family Poaceae. As critical studies were lacking for this significant family in Telangana, the current work has been initiated in 2017. The project was successfully completed in the year 2022. The neighboring states of Karnataka, Tamil Nadu, Andhra Pradesh, Odisha, and Maharashtra have published floras where the grasses have been treated as part of the general flora only. However, for the states of Tamil Nadu, Maharashtra and Odisha the floras have been worked out exclusively by studying grasses from a taxonomic point of view.

An analysis of grass by the flora of the neighboring states indicates that although Telangana has lesser diversity of grasses the extent of grasslands in the state is fairly good. The state-wise distribution of grass species in peninsular India is shown in **Table 1**.

Sl. No.	Name of the State	Genera	Species
1	Andhra Pradesh	129	311
2	Karnataka	124	402
3	Maharashtra	125	415
4	Odisha	100	266
5	Tamil Nadu	136	447
6	Telangana	95	273

Table 1. State-wise distribution of grasses in peninsular India

FLORISTIC ANALYSIS

This work records the occurrence of 273 taxa of grasses in the state; these include 6 infraspecific taxa (1 subspecies and 5 varieties). On analysis, it is seen that the 273 taxa of grasses in Telangana belong to 6 subfamilies, 14 tribes and 95 genera. The distribution of species in the 10 dominant tribes are shown in **Table 2**.

The comparison of the 10 dominant tribes in terms of numbers in India (Kabeer & Nair, 2009) and the present work (Nagaraju, 2022) is shown in **Table 3** and **Fig. 1** below.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
I	BAMBUSOIDEAE	BAMBUSEAE	<i>Bambusa</i>	1	<i>Bambusa bambos</i> (L.) Voss
			<i>Dendrocalamus</i>	2	<i>Dendrocalamus strictus</i> Nees
		ORYZAE	<i>Leersia</i>	3	<i>Leersia hexandra</i> Sw.
			<i>Oryza</i>	4	<i>Oryza officinalis</i> Wall. ex Watt
				5	<i>Oryza meyeriana</i> (Zoll. & Moritzi) Baill.
				6	<i>Oryza rufipogon</i> Griff.
				7	<i>Oryza sativa</i> L.
II	POOIDEAE	TRITICEAE	<i>Triticum</i>	8	<i>Triticum turgidum</i> subsp. <i>dicoccum</i> (Schrank ex Schübl.) Thell.
				9	<i>Triticum aestivum</i> L.
III	CENTOTHECOIDEAE	CENTOTHECEAE	<i>Centotheca</i>	10	<i>Centotheca lappacea</i> (L.) Desv.
IV	ARUNDIOIDEAE	ARISTIDEAE	<i>Aristida</i>	11	<i>Aristida adscensionis</i> L.
				12	<i>Aristida funiculata</i> Trin. & Rupr.
				13	<i>Aristida hystrix</i> L.f.
				14	<i>Aristida mutabilis</i> Trin. & Rupr.
				15	<i>Aristida redacta</i> Stapf
				16	<i>Aristida setacea</i> Retz.
				17	<i>Aristida stocksii</i> (Hook.f.) Domin
		ARUNDINEAE	<i>Arundo</i>	18	<i>Arundo donax</i> L.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Elytrophorus</i>	19	<i>Elytrophorus spicatus</i> (Willd.) A.Camus
			<i>Phragmites</i>	20	<i>Phragmites karka</i> (Retz.) Trin. ex Steud.
		THYSANOLAENEAE	<i>Thysanolaena</i>	21	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda
V	CHLORIDOIDEAE	PAPPOPHOREAE	<i>Enneapogon</i>	22	<i>Enneapogon persicus</i> Boiss.
		ERAGROSTIDEAE	<i>Acrachne</i>	23	<i>Acrachne racemosa</i> (B.Heyne ex Roth) Ohwi
			<i>Coelachyrum</i>	24	<i>Coelachyrum lagopoides</i> (Burm.f.) Senaratna
			<i>Dactyloctenium</i>	25	<i>Dactyloctenium aegyptium</i> (L.) Willd.
				26	<i>Dactyloctenium aristatum</i> Link
				27	<i>Dactyloctenium australe</i> Steud.
			<i>Desmostachya</i>	28	<i>Desmostachya bipinnata</i> (L.) Stapf
			<i>Dinebra</i>	29	<i>Dinebra retroflexa</i> (Vahl) Panz.
			<i>Diplachne</i>	30	<i>Diplachne fusca</i> (L.) P.Beauv. ex Roem. & Schult.
			<i>Eleusine</i>	31	<i>Eleusine coracana</i> (L.) Gaertn.
				32	<i>Eleusine indica</i> (L.) Gaertn.
			<i>Eragrostiella</i>	33	<i>Eragrostiella bifaria</i> (Vahl) Bor
				34	<i>Eragrostiella brachyphylla</i> (Stapf) Bor
				35	<i>Eragrostiella bifaria</i> var. <i>walkerii</i> (Stapf) Lazarides
			<i>Eragrostis</i>	36	<i>Eragrostis amabilis</i> (L.) Wight & Arn.
				37	<i>Eragrostis aspera</i> (Jacq.) Nees
				38	<i>Eragrostis atrovirens</i> (Desf.) Trin. ex Steud.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				39	<i>Eragrostis barrelieri</i> Daveau
				40	<i>Eragrostis cilianensis</i> (All.) Vignolo ex Janch.
				41	<i>Eragrostis ciliaris</i> (L.) R.Br.
				42	<i>Eragrostis ciliata</i> (Roxb.) Nees
				43	<i>Eragrostis coarctata</i> Stapf
				44	<i>Eragrostis gangetica</i> (Roxb.) Steud.
				45	<i>Eragrostis japonica</i> (Thunb.) Trin.
				46	<i>Eragrostis macilenta</i> (A.Rich.) Steud.
				47	<i>Eragrostis minor</i> Host
				48	<i>Eragrostis nilgiriensis</i> Vivek, G.V.S.Murthy & V.J.Nair
				49	<i>Eragrostis nutans</i> (Retz.) Nees ex Steud.
				50	<i>Eragrostis papposa</i> (Desf. ex Roem. & Schult.) Steud.
				51	<i>Eragrostis pilosa</i> (L.) P.Beauv.
				52	<i>Eragrostis riparia</i> (Willd.) Nees
				53	<i>Eragrostis tenuifolia</i> (A.Rich.) Hochst. ex Steud.
				54	<i>Eragrostis tremula</i> Hochst. ex Steud.
				55	<i>Eragrostis unioloides</i> (Retz.) Nees ex Steud.
				56	<i>Eragrostis viscosa</i> (Retz.) Trin.
			<i>Leptochloa</i>	57	<i>Leptochloa chinensis</i> (L.) Nees
				58	<i>Leptochloa panicea</i> (Retz.) Ohwi

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Oropetium</i>	59	<i>Oropetium roxburghianum</i> (Schult.) S.M. Phillips
				60	<i>Oropetium thomaeum</i> (L.f.) Trin.
				61	<i>Oropetium villosulum</i> Stapf ex Bor
			<i>Phalaris</i>	62	<i>Phalaris minor</i> Retz.
			<i>Sporobolus</i>	63	<i>Sporobolus coromandelianus</i> (Retz.) Kunth
				64	<i>Sporobolus diandrus</i> (Retz.) P.Beauv.
				65	<i>Sporobolus ioclados</i> Nees
				66	<i>Sporobolus maderaspatanus</i> Bor
				67	<i>Sporobolus spicatus</i> (Vahl) Kunth
				68	<i>Sporobolus tenuissimus</i> (Mart. ex Schrank) Kuntze
				69	<i>Sporobolus tetragonus</i> Bor
				70	<i>Sporobolus virginicus</i> (L.) Kunth
				71	<i>Sporobolus wallichii</i> Munro ex Thwaites
			<i>Trigonochloa</i>	72	<i>Trigonochloa uniflora</i> (Hochst. ex A.Rich.) P.M.Peterson & N.Snow
			<i>Tripogon</i>	73	<i>Tripogon bromoides</i> Roth var. <i>bromoides</i>
				74	<i>Tripogon bromoides</i> var. <i>anantawamianus</i> (Sreek., V.J.Nair & N.C.Nair) Sang.Dey & Prasanna
				75	<i>Tripogon filiformis</i> Nees ex Steud.
				76	<i>Tripogon jacquemontii</i> Stapf
				77	<i>Tripogon purpurascens</i> Duthie

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				78	<i>Tripogon trifidus</i> Munro ex Hook.f. var. <i>trifidus</i>
				79	<i>Tripogon trifidus</i> var. <i>sivrajianii</i> (Sunil) Sang.Dey & Prasanna
		CYNODONTEAE	<i>Chloris</i>	80	<i>Chloris barbata</i> Sw.
				81	<i>Chloris bournei</i> Rang. & Tadul.
				82	<i>Chloris gayana</i> Kunth
				83	<i>Chloris montana</i> Roxb.
				84	<i>Chloris quinquesetica</i> Bhide
				85	<i>Chloris telanganæ</i> Nagaraju, Prasanna, Y.V. Rao & S.B. Padal
				86	<i>Chloris virgata</i> Sw.
			<i>Cynodon</i>	87	<i>Cynodon barberi</i> Rang. & Tadul.
				88	<i>Cynodon dactylon</i> (L.) Pers.
				89	<i>Cynodon radiatus</i> Roth
			<i>Enteropogon</i>	90	<i>Enteropogon dolichostachyus</i> (Lag.) Keng
				91	<i>Enteropogon monostachyos</i> (Vahl) K.Schum.
			<i>Melanocenchris</i>	92	<i>Melanocenchris abyssinica</i> (R.Br. ex Fresen.) Hochst.
				93	<i>Melanocenchris jacquemontii</i> Jaub. & Spach
				94	<i>Melanocenchris rothiana</i> Nees
			<i>Microchloa</i>	95	<i>Microchloa indica</i> (L.f.) P.Beauv.
			<i>Perotis</i>	96	<i>Perotis indica</i> (L.) Kuntze

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Pommereulla</i>	97	<i>Pommereulla cornucopiae</i> L.f.
			<i>Schoenefeldia</i>	98	<i>Schoenefeldia gracilis</i> Kunth
			<i>Tetrapogon</i>	99	<i>Tetrapogon roxburghiana</i> (Schult.) P.M. Peterson
				100	<i>Tetrapogon tenellus</i> (J.Koenig ex Roxb.) Chiov.
			<i>Tragus</i>	101	<i>Tragus mongolorum</i> Ohwi
			<i>Zoysia</i>	102	<i>Zoysia matrella</i> (L.) Merr.
VI	PANICOIDEAE	PANICEAE	<i>Alloteropsis</i>	103	<i>Alloteropsis cimicina</i> (L.) Stapf
				104	<i>Alloteropsis semialata</i> (R.Br.) Hitchc.
			<i>Axonopus</i>	105	<i>Axonopus compressus</i> (Sw.) P.Beauv.
			<i>Cenchrus</i>	106	<i>Cenchrus americanus</i> (L.) Morrone
				107	<i>Cenchrus biflorus</i> Roxb.
				108	<i>Cenchrus ciliaris</i> L.
				109	<i>Cenchrus hohengeri</i> (Hochst. ex Steud.) Morrone
				110	<i>Cenchrus pedicellatus</i> (Trin.) Morrone
				111	<i>Cenchrus purpureus</i> (Schumach.) Morrone
				112	<i>Cenchrus setosus</i> Sw.
			<i>Cyrtococcum</i>	113	<i>Cyrtococcum trigonum</i> (Retz.) A.Camus
			<i>Digitaria</i>	114	<i>Digitaria abludens</i> (Roem. & Schult.) Veldkamp
				115	<i>Digitaria bicornis</i> (Lam.) Roem. & Schult.
				116	<i>Digitaria ciliaris</i> (Retz.) Koeler
				117	<i>Digitaria longiflora</i> (Retz.) Pers.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				118	<i>Digitaria radicata</i> (J.Presl) Miq.
				119	<i>Digitaria setigera</i> Roth
				120	<i>Digitaria stricta</i> Roth ex Roem. & Schult.
				121	<i>Digitaria ternata</i> (A.Rich.) Stapf
				122	<i>Digitaria tomentosa</i> (J.Koenig ex Rottler) Henrard
			<i>Echinochloa</i>	123	<i>Echinochloa colona</i> (L.) Link
				124	<i>Echinochloa crus-galli</i> (L.) P.Beauv.
				125	<i>Echinochloa frumentacea</i> Link
				126	<i>Echinochloa oryzoides</i> (Ard.) Fritsch
				127	<i>Echinochloa picta</i> (J.Koenig) P.W.Michael
				128	<i>Echinochloa stagnina</i> (Retz.) P.Beauv.
			<i>Eriochloa</i>	129	<i>Eriochloa procera</i> (Retz.) C.E.Hubb.
				130	<i>Eriochloa barbatus</i> (Trin.) S. Yadav & M.R. Almeida
			<i>Hymenachne</i>	131	<i>Hymenachne amplexicaulis</i> (Rudge) Nees
				132	<i>Megathyrsus maximus</i> (Jacq.) B.K.Simon & S.W.L. Jacobs
			<i>Melinis</i>	133	<i>Melinis repens</i> (Willd.) Zizka
			<i>Moorochloa</i>	134	<i>Moorochloa eruciformis</i> (Sm.) Veldkamp
			<i>Oplismenus</i>	135	<i>Oplismenus burmanni</i> (Retz.) P.Beauv.
				136	<i>Oplismenus compositus</i> (L.) P.Beauv.
			<i>Panicum</i>	137	<i>Panicum curvisporum</i> Hornem.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				138	<i>Panicum fischeri</i> Bor
				139	<i>Panicum humile</i> Steud.
				140	<i>Panicum miliaceum</i> L.
				141	<i>Panicum notatum</i> Retz.
				142	<i>Panicum paludosum</i> Roxb.
				143	<i>Panicum repens</i> L.
				144	<i>Panicum sparsicomum</i> Nees ex Steud.,
				145	<i>Panicum sumatrense</i> Roth
			<i>Paspalum</i>	146	<i>Paspalum distichum</i> L.
				147	<i>Paspalum scrobiculatum</i> L.
			<i>Pseudoraphis</i>	148	<i>Pseudoraphis spinescens</i> (R.Br.) Vickery
			<i>Sacciolepis</i>	149	<i>Sacciolepis indica</i> (L.) Chase
				150	<i>Sacciolepis interrupta</i> (Willd.) Stapf
				151	<i>Sacciolepis myosuroides</i> (R.Br.) Chase ex E.G. Camus & A. Camus
			<i>Setaria</i>	152	<i>Setaria flavida</i> (Retz.) Veldkamp
				153	<i>Setaria geminata</i> (Forsk.) Veldkamp
				154	<i>Setaria homonymia</i> (Steud.) Chiov.
				155	<i>Setaria intermedia</i> Roem. & Schult.
				156	<i>Setaria italica</i> (L.) P.Beauv.
				157	<i>Setaria parviflora</i> (Poir.) Kerguelen

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				158	<i>Setaria pumila</i> (Poir.) Roem. & Schult.
				159	<i>Setaria punctata</i> (Burm.f.) Veldkamp
				160	<i>Setaria verticillata</i> (L.) P.Beauv.
			<i>Stenotaphrum</i>	161	<i>Stenotaphrum dimidiatum</i> Brongn.
			<i>Trachys</i>	162	<i>Trachys muricata</i> (L.) Pers. ex Trin.
			<i>Urochloa</i>	163	<i>Urochloa deflexa</i> (Schumach.) H.Scholz
				164	<i>Urochloa distachya</i> (L.) T.Q.Nguyen
				165	<i>Urochloa kurzii</i> (Hook.f.) T.Q.Nguyen
				166	<i>Urochloa mutica</i> (Forsk.) T.Q.Nguyen
				167	<i>Urochloa panicoides</i> P.Beauv.
				168	<i>Urochloa ramosa</i> (L.) T.Q.Nguyen
				169	<i>Urochloa remota</i> (Retz.) Ashal. & V.J. Nair
				170	<i>Urochloa reptans</i> (L.) Stapf
				171	<i>Urochloa setigera</i> (Retz.) Stapf
				172	<i>Urochloa trichopus</i> Stapf
	ISACHNEAE		<i>Isachne</i>	173	<i>Isachne globosa</i> (Thunb.) Kuntze
				174	<i>Isachne pulchella</i> Roth
	ARUNDINELLEAE		<i>Arundinella</i>	175	<i>Arundinella ciliata</i> (Roxb.) Nees ex Miq.
				176	<i>Arundinella nervosa</i> (Roxb.) Nees ex Hook. & Arn.
				177	<i>Arundinella pumila</i> (Hochst. ex A. Rich.) Steud.
				178	<i>Arundinella setosa</i> Trin.

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				179	<i>Arundinella tuberculata</i> Munro ex Lisboa
			<i>Garnotia</i>	180	<i>Garnotia tenella</i> (Arn. ex Miq.) Janowski
		ANDROPOGONEAE	<i>Andropogon</i>	181	<i>Andropogon punilius</i> Roxb.
			<i>Apluda</i>	182	<i>Apluda mutica</i> L.
			<i>Arthraxon</i>	183	<i>Arthraxon castratus</i> (Griff.) V. Naray. ex Bor
				184	<i>Arthraxon depressus</i> Stapf ex C.E.C. Fisch.
				185	<i>Arthraxon hispidus</i> (Thunb.) Makino
				186	<i>Arthraxon lanceolatus</i> (Roxb.) Hochst. var. <i>lanceolatus</i>
				187	<i>Arthraxon lanceolatus</i> var. <i>echinatus</i> (Nees) Hack.
				188	<i>Arthraxon lancifolius</i> (Trin.) Hochst.
			<i>Bothriochloa</i>	189	<i>Bothriochloa bladhii</i> (Retz.) S. T. Blake
				190	<i>Bothriochloa insculpta</i> (Hochst. ex A. Rich.) A. Camus
				191	<i>Bothriochloa ischaemum</i> (L.) Keng
				192	<i>Bothriochloa kuntzeana</i> (Hack.) Henrard
				193	<i>Bothriochloa pertusa</i> (L.) A. Camus
				194	<i>Bothriochloa pseudoischaemum</i> (Nees ex Steud.) Henrard
				195	<i>Bothriochloa woodrovii</i> (Hook.f.) A. Camus
			<i>Capillipedium</i>	196	<i>Capillipedium assimile</i> (Steud.) A. Camus
				197	<i>Capillipedium filiculme</i> (Hook.f.) Stapf

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Chrysopogon</i>	198	<i>Chrysopogon aciculatus</i> (Retz.) Trin.
				199	<i>Chrysopogon asper</i> B. Heyne ex Blatt. & McCann
				200	<i>Chrysopogon fulvus</i> (Spreng.) Chiov.
				201	<i>Chrysopogon lawsonii</i> (Hook.f.) Veldkamp
				202	<i>Chrysopogon hamiltonii</i> Haines
				203	<i>Chrysopogon polyphyllus</i> Blatt. & McCann
				204	<i>Chrysopogon serrulatus</i> Trin.
				205	<i>Chrysopogon velutinus</i> (Hook.f.) Bor
				206	<i>Chrysopogon verticillatus</i> (Roxb.) Trin. ex Steud.
				207	<i>Chrysopogon zizanioides</i> (L.) Roberty
			<i>Coix</i>	208	<i>Coix aquatica</i> Roxb.
				209	<i>Coix lacryma-jobi</i> L.
			<i>Cymbopogon</i>	210	<i>Cymbopogon caesius</i> (Hook. & Arn.) Stapf
				211	<i>Cymbopogon citratus</i> (DC.) Stapf
				212	<i>Cymbopogon coloratus</i> (Hook.f.) Stapf
				213	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W. Watson
				214	<i>Cymbopogon gidarba</i> (Steud.) A. Camus
				215	<i>Cymbopogon martinii</i> (Roxb.) W. Watson
				216	<i>Cymbopogon nardus</i> (L.) Rendle
				217	<i>Cymbopogon winterianus</i> Jowitt ex Bor
			<i>Dichanthium</i>	218	<i>Dichanthium annulatum</i> (Forsk.) Stapf

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
				219	<i>Dichanthium aristatum</i> (Poir.) C.E.Hubb.
				220	<i>Dichanthium caricosum</i> (L.) A.Camus
				221	<i>Dichanthium foveolatum</i> (Delile) Roberty
				222	<i>Dichanthium mcanii</i> Blatt.
			<i>Diectomis</i>	223	<i>Diectomis fastigiata</i> PBeauv
			<i>Dimeria</i>	224	<i>Dimeria avenacea</i> (Retz.) C.E.C.Fisch.
				225	<i>Dimeria bialata</i> C.E.C.Fisch.
				226	<i>Dimeria connivens</i> Hack.
				227	<i>Dimeria deccanensis</i> Bor
				228	<i>Dimeria kanjirapallilana</i> K.C.Jacob
				229	<i>Dimeria orissae</i> Bor
				230	<i>Dimeria ornithopoda</i> Trin.
			<i>Eulalia</i>	231	<i>Eulalia trispicata</i> (Schult.) Henrard
				232	<i>Eulalia phaeothrix</i> (Hack.) Kuntze
			<i>Eulaliopsis</i>	233	<i>Eulaliopsis binata</i> (Retz.) C.E.Hubb.
			<i>Hemarthria</i>	235	<i>Hemarthria compressa</i> R.Br.
				236	<i>Heteropogon contortus</i> (L.) PBeauv. ex Roem. & Schult.
			<i>Heteropogon</i>	237	<i>Heteropogon fischerianus</i> Bor
				238	<i>Heteropogon polystachyos</i> Blatt. & McCann
				239	<i>Heteropogon triticeus</i> (R.Br.) Stapf ex Craib

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Imperata</i>	240	<i>Imperata cylindrica</i> (L.) PBeauv.
			<i>Ischaemum</i>	241	<i>Ischaemum afrum</i> (J.F.Gmel.) Dandy
				242	<i>Ischaemum ciliare</i> Retz.
				243	<i>Ischaemum rugosum</i> Salisb.
				244	<i>Ischaemum semisagittatum</i> Roxb.
			<i>Isilema</i>	245	<i>Isilema antheophoroides</i> Hack.
				246	<i>Isilema holei</i> Haines
				247	<i>Isilema jainiana</i> P.Umam. & P.Daniel
				248	<i>Isilema prostratum</i> (L.) Andersson
			<i>Lophopogon</i>	249	<i>Lophopogon tridentatus</i> (Roxb.) Hack.
			<i>Mnesithea</i>	234	<i>Mnesithea granularis</i> (L.) de Koning & Sosef
			<i>Ophiuros</i>	250	<i>Ophiuros exaltatus</i> (L.) Kuntze
			<i>Pogonatherum</i>	251	<i>Pogonatherum paniceum</i> (Lam.) Hack.
				252	<i>Pogonatherum crinitum</i> (Thunb.) Kunth
			<i>Polytoca</i>	253	<i>Polytoca gigantea</i> (J.Koenig) Mabb.
			<i>Pseudosorghum</i>	254	<i>Pseudosorghum fasciculare</i> (Roxb.) A. Camus
			<i>Rottboellia</i>	255	<i>Rottboellia cochinchinensis</i> (Lour.) Clayton
			<i>Saccharum</i>	256	<i>Saccharum officinarum</i> L.
				257	<i>Saccharum spontaneum</i> L.
			<i>Sarga</i>	258	<i>Sarga purpureoseicea</i> (Hochst. ex A.Rich.) Spangler

Sl.No	Sub-family	Tribe	Genera	Sl. No.	Species
			<i>Schizachyrium</i>	259	<i>Schizachyrium brevifolium</i> (Sw.) Nees ex Buse
				260	<i>Schizachyrium exile</i> (Hochst.) Pilg.
			<i>Setima</i>	261	<i>Setima ischaemoides</i> Forssk.
				262	<i>Setima nervosum</i> (Rottler) Stapf
				263	<i>Setima sulcatum</i> (Hack.) A. Camus
			<i>Sorghum</i>	264	<i>Sorghum arundinaceum</i> (Desv.) Stapf
				265	<i>Sorghum bicolor</i> (L.) Moench
				266	<i>Sorghum halepense</i> (L.) Pers.
				267	<i>Sorghum nitidum</i> (Vahl) Pers.
			<i>Spodiopogon</i>	268	<i>Spodiopogon rhizophorus</i> (Steud.) Pilg.
			<i>Thelepogon</i>	269	<i>Thelepogon elegans</i> Roth
			<i>Themeda</i>	270	<i>Themeda laxa</i> (Andersson) A. Camus
				271	<i>Themeda quadrivalvis</i> (L.) Kuntze
				272	<i>Themeda triandra</i> Forssk.
			<i>Zea</i>	273	<i>Zea mays</i> L.
	6	14	95		

Table 2. Arrangement of species (includes infraspecific) in the present work (as per Clayton & Renvoise, 1986)

Sl. No.	India (Kabeer & Nair, 2009)	Telangana (2022)
1	Andropogoneae 363 spp.	Andropogoneae 93 spp.
2	Paniceae 188 spp.	Paniceae 70 spp.
3	Poaceae 166 spp.	Eragrostideae 57 spp.
4	Eragrostideae 110 spp.	Cynodonteae 23 spp.
5	Triticeae 68 spp.	Aristideae 7 spp.
6	Aveneae 59 spp.	Arundinelleae 6 spp.
7	Cynodonteae 42 spp.	Oryzeae 5 spp.
8	Stipeae 39 spp.	Arundineae 3 spp.
9	Isachneae 34 spp.	Bambuseae 2 spp.
10	Arundinelleae 32	Triticeae 2 spp.

Table 3. Comparison of dominant grass tribes of India and Telangana

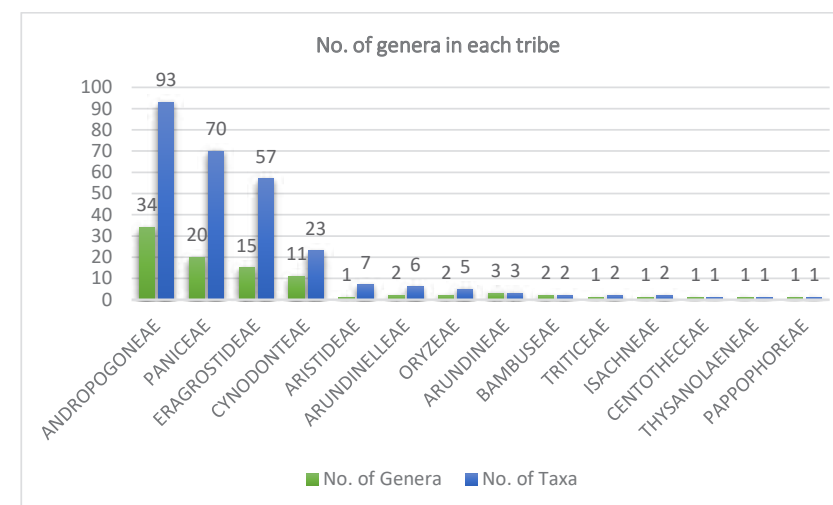


Fig. 1 Distribution of species in each tribe

An analysis at the generic level reveals the 10 most dominant genera in Telangana are: *Eragrostis*, *Urochloa*, *Chrysopogon*, *Sporobolus*, *Digitaria*, *Setaria*, *Panicum*, *Cymbopogon*, *Aristida* and *Tripogon*.

The genus *Eragrostis* is the largest genus in Telangana with 21 species. The two genera *Thysanolaena* and *Desmostachya* are monotypic and are represented in Telangana by a single species each, i.e., *Thysanolaena latifolia* (Roxb. ex Hornem.) Honda and *Desmostachya bipinnata* (L.) Stapf.

The comparison of the dominant genera in Telangana as against the top 10 genera of grasses in India is shown in **Table 4**.

Dominance analysis of the top 10 genera are depicted in **Fig. 2** below.

Sl. No.	India	Telangana
1	<i>Poa</i> (54)	<i>Eragrostis</i> (21)
2	<i>Ischaemum</i> (44)	<i>Urochloa</i> (10)
3	<i>Eragrostis</i> (36)	<i>Chrysopogon</i> (10)
4	<i>Panicum</i> (35)	<i>Sporobolus</i> (9)
5	<i>Stipa</i> (30)	<i>Digitaria</i> (9)
6	<i>Isachne</i> (30)	<i>Setaria</i> (9)
7	<i>Dimeria</i> (28)	<i>Panicum</i> (9)
8	<i>Festuca</i> (27)	<i>Cymbopogon</i> (8)
9	<i>Digitaria</i> (25)	<i>Aristida</i> (7)
10	<i>Agrostis</i> (24)	<i>Tripogon</i> (7)

Table 4. Comparison of dominant grass genera of India and Telangana

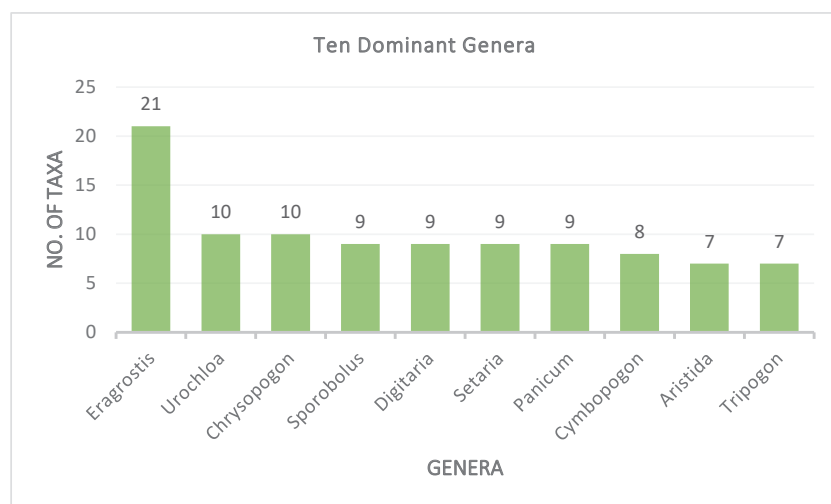


Fig. 2. Ten dominant genera

NEW PLANT RECORDS

41 species (vide **Table. 5**) have been recorded for the first time as new distributional records to the state.

Sl.No. Name of the species

- 1 *Arundinella nervosa* (Roxb.) Nees ex Hook. & Arn.
- 2 *Axonopus compressus* (Sw.) P.Beauv.

- 3 *Bothriochloa insculpta* (Hochst. ex A.Rich.) A.Camus
- 4 *Bothriochloa woodrovii* (Hook.f.) A.Camus
- 5 *Chloris quinquesetica* Bhide
- 6 *Chloris telanganae* Nagaraju, Prasanna, Y.V. Rao & S.B. Padal
- 7 *Chrysopogon hamiltonii* Haines
- 8 *Chrysopogon serrulatus* Trin.
- 9 *Chrysopogon velutinus* (Hook.f.) Bor
- 10 *Cymbopogon winterianus* Jowitt ex Bor
- 11 *Desmostachya bipinnata* (L.) Stapf
- 12 *Dimeria bialata* C.E.C.Fisch.
- 13 *Dimeria connivens* Hack.
- 14 *Dimeria deccanensis* Bor
- 15 *Eragrostis macilenta* (A.Rich.) Steud.
- 16 *Eragrostis papposa* (Desf. ex Roem. & Schult.) Steud.
- 17 *Eulaliopsis binata* (Retz.) C.E.Hubb.
- 18 *Heteropogon fischerianus* Bor
- 19 *Heteropogon polystachyos* Blatt. & McCann
- 20 *Heteropogon triticeus* (R.Br.) Stapf ex Craib
- 21 *Isachne pulchella* Roth
- 22 *Ischaemum ciliare* Retz.
- 23 *Iseilema jainiana* P. Umam. & P. Daniel
- 24 *Melanocenchris abyssinica* (R.Br. ex Fresen.) Hochst.
- 25 *Oropetium villosulum* Stapf ex Bor
- 26 *Phalaris minor* Retz.
- 27 *Pogonatherum crinitum* (Thunb.) Kunth
- 28 *Pseudoraphis spinescens* (R.Br.) Vickery
- 29 *Sarga purpureosericea* (Hochst. ex A.Rich.) Spangler
- 30 *Schizachyrium brevifolium* (Sw.) Nees ex Buse
- 31 *Schoenefeldia gracilis* Kunth
- 32 *Sehima ischaemoides* Forssk.
- 33 *Setaria homonyma* (Steud.) Chiov.
- 34 *Sporobolus ioclados* Nees

- 35 *Sporobolus tetragonus* Bor
 36 *Stenotaphrum dimidiatum* Brongn.
 37 *Tripogon bromoides* var. *anantaswamianus* (Sreek., V.J. Nair & N.C.Nair) Sang.Dey & Prasanna
 38 *Tripogon filiformis* Nees ex Steud.
 39 *Tripogon trifidus* var. *sivarajanii* (Sunil) Sang.Dey & Prasanna
 40 *Urochloa trichopus* Stapf
 41 *Zoysia matrella* (L.) Merr.

Table 5. New distributional records of grasses in Telangana

ENDEMIC/THREATENED GRASSES IN TELANGANA

Endemic floristic elements of a country or geographical region throw light on the biogeography of the area, centres of speciation, areas of extinction, vicariance and adaptive evolution of the flora occurring in the area (Ahmedullah & Nayar, 1987). It is well known that the endemic plants of any specific phytogeographic region are of high conservation value. This study has shown that there are presently only two species, *Chloris telanganae* and *Tripogon trifidus* var. *sivarajanii* are strict endemic to the state of Telangana. About 30 endemic species that are distributed in the larger region of peninsular India are also found growing in Telangana. These are: *Arthraxon depressus*, *Arundinella nervosa*, *Arundinella tuberculata*, *Bothriochloa kuntzeana*, *Bothriochloa woodrovii*, *Capillipedium filiculme*, *Chloris bournei*, *Chloris Telangana*, *Chrysopogon asper*, *Chrysopogon hamiltonii*, *Chrysopogon velutinus*, *Chrysopogon verticillatus*, *Dichanthium mccannii*, *Dimeria kanjirapallilana*, *Dimeria bialata*, *Dimeria connivens*, *Dimeria deccanensis*, *Dimeria orissae*, *Heteropogon polystachyos*, *Heteropogon triticeus*, *Iseilema antheophoroides*, *Iseilema holei*, *Iseilema jainiana*, *Lophopogon tridentatus*, *Oropetium roxburghianum*, *Oropetium villosulum*, *Spodiopogon rhizophorus*, *Tripogon bromoides* var. *anantaswamianus*, *Tripogon trifidus* var. *sivarajanii*. Most of these species, including the newly described species *Chloris telanganae* has not been assessed through the IUCN red listing process as yet. *Dichanthium mccannii*, which is mostly found restricted to the Satara (Panchagani) and Aurangabad of Maharashtra state is feared to be rare (Ahmedullah & Nayar, 1987); this species has an eastward extension of distribution in Nagarkurnool district of Telangana. However, until proper threat assessments are made in the future to confirm their conservation status, these 30 endemic species of grasses (Table 6) may be presumed to be threatened to some extent or near-threatened for the purpose of conservation.

According to Ahmedullah & Nayar (1987) there are 180 species and 21 infraspecific taxa endemic to peninsular India. The occurrence of the peninsular Indian endemics in Telangana is significant and lends some conservation value to the grass diversity of the state.

Sl. No.	Name of the species	Distribution
1	<i>Arthraxon depressus</i> Stapf ex C.E.C. Fisch.	Andhra Pradesh, Karnataka, Tamil Nadu and Telangana
2	<i>Arundinella nervosa</i> (Roxb.) Nees ex Hook. & Arn.	Andhra Pradesh, Goa, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu and Telangana
3	<i>Arundinella tuberculata</i> Munro ex Lisboa	Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Telangana and Uttarakhand
4	<i>Bothriochloa kuntzeana</i> (Hack.) Henrard	Andhra Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and Uttarakhand
5	<i>Bothriochloa woodrovii</i> (Hook.f.) A.Camus	Maharashtra and Telangana
6	<i>Capillipedium filiculme</i> (Hook. f.) Stapf	Andhra Pradesh, Goa, Karnataka, Kerala, Tamil Nadu and Telangana
7	<i>Chloris bournei</i> Rang. & Tadul.	Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and Telangana
8	<i>Chloris telanganae</i> Nagaraju, Prasanna, Y.V.Rao & S.B. Padal	Telangana
9	<i>Chrysopogon asper</i> B. Heyne ex Blatt. & McCann	Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu and Telangana
10	<i>Chrysopogon hamiltonii</i> Haines	Andhra Pradesh, Bihar and Karnataka
11	<i>Chrysopogon velutinus</i> (Hook.f.) Bor	Andhra Pradesh, Karnataka, Kerala, Maharashtra and Telangana
12	<i>Chrysopogon verticillatus</i> (Roxb.) Trin. ex Steud.	Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Odisha, Tamil Nadu and Telangana

13	<i>Dichanthium mccannii</i> Blatt.	Gujarat, Maharashtra and Telangana
14	<i>Dimeria kanjirapallilana</i> K.C. Jacob	Andhra Pradesh, Kerala, Tamil Nadu and Telangana
15	<i>Dimeria bialata</i> C.E.C. Fisch.	Andhra Pradesh, Karnataka, Kerala, West Bengal and Telangana
16	<i>Dimeria connivens</i> Hack.	Andhra Pradesh, Chhattisgarh, Jharkhand, Kerala, Maharashtra, Odisha, Rajasthan, Telangana Uttar Pradesh and West Bengal
17	<i>Dimeria deccanensis</i> Bor	Karnataka, Kerala, Maharashtra, Tamil Nadu and Telangana
18	<i>Dimeria orissae</i> Bor	Odisha, Tamil Nadu and Telangana
19	<i>Heteropogon polystachyos</i> Blatt. & McCann	Andaman & Nicobar Islands, Jharkhand, Maharashtra and Telangana
20	<i>Heteropogon triticeus</i> (R.Br.) Stapf ex Craib	Gujarat, Jharkhand, Karnataka, Maharashtra, Rajasthan and Telangana
21	<i>Iseilema antheperoides</i> Hack.	Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Tamil Nadu & Telangana
22	<i>Iseilema holei</i> Haines	Madhya Pradesh, Maharashtra and Telangana
23	<i>Iseilema jainiana</i> P. Umam. & P. Daniel	Tamil Nadu and Telangana
24	<i>Lophopogon tridentatus</i> (Roxb.) Hack.	Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu and Telangana
25	<i>Oropetium roxburghianum</i> (Schult.) S.M. Phillips	Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Telangana and Uttarakhand
26	<i>Oropetium villosulum</i> Stapf ex Bor	Karnataka, Maharashtra, West Bengal and Telangana

27	<i>Sarga purpureosericea</i> (Hochst. ex A. Rich.) Spangler	Madhya Pradesh, Maharashtra, Rajasthan and Telangana
28	<i>Spodiopogon rhizophorus</i> (Steud.) Pilg.	Gujarat, Karnataka, Kerala, Maharashtra, Goa, Rajasthan, Tamil Nadu and Telangana
29	<i>Tripogon bromoides</i> var. <i>anantaswamianus</i> (Sreek., V.J.Nair & N.C.Nair) Sang.Dey & Prasanna	Kerala, Tamil Nadu and Telangana
30	<i>Tripogon trifidus</i> var. <i>sivarajanii</i> (Sunil) Sang.Dey & Prasanna	Kerala and Telangana

Table 6. Endemic grasses

IMPORTANCE OF GRASSES

The advent of agriculture

With the shift from nomadic to a more sedentary and pastoral lifestyle, Man began to collect seeds of selected plants such as wheat, barley, and rice from the wild and domesticate them for regular food supply; the agriculture system began for humankind. Prominent among the potentially edible plants were grasses/cereals such as wheat, rye barley, sorghum, leguminous plants such as peas, beans, lentils, etc., and vegetable and fruit-bearing plants, were selectively bred for human consumption/ subsistence. In grasses, the selection of potentially essential traits such as the cohesiveness of the inflorescence ensuring that it does not disperse before harvesting was the key to the selection process. It is estimated that the domestication of grasses probably started about 10,000 years ago in southwestern Asia and the Middle East; cereals such as wheat and barley were derived from the wild species of *Triticum* and *Hordeum*, respectively. Subsequently, arable weeds such as rye (*Secale cereale*) and oats (*Avena sativa*) became domesticated as agricultural practices spread slowly in Asia and Europe. Over the ages, rice (*Oryza sativa*) became the major cereal in tropical Asia, followed by foxtail millet (*Setaria italica*). The agricultural practices (animal husbandry) slowly evolved ages ago towards establishing domesticated plant and animal species (such as wheat, corn, rice, poultry, and cattle) on which human existence is now wholly dependent.

Today, agriculture is the mainstay of many agrarian/rural communities and contributes much to the national economy in many countries. With grasses such as wheat and rice being significant contributors, India's food and agricultural production is very high and ranks second globally.

Economic uses

The extant agricultural practices include grasses which form the primary source of food (*Oryza sativa*, *Zea mays*, *Sorghum bicolor*, *Eleusine coracana*,

Panicum miliaceum, *Setaria italica*, *Saccharum officinarum*, etc.) and fodder (*Brachiaria ramosa*, *Dichanthium foveolatum*, *Eragrostis gangetica*, *Eleusine indica*, *Ischaemum ciliare*, *Paspalum scrobiculatum*, *Sorghum halepense*, *Urochloa mutica*, etc.). More than one-fifth of the calorific requirements of the human race are met by rice (*Oryza sativa*) and wheat (*Triticum aestivum*). Species of *Saccharum* and *Sorghum* serve as sugar crops. In peninsular India, a total of 143 grass species were recorded as edible (Gorade & Datar, 2014), with classification made on assessment of their palatability grade based on their use-value.

Grasses such as *Cymbopogon citratus*, *Chrysopogon zizanioides* (*Vetiveria zizanioides*), *Cynodon dactylon*, etc., also have medicinal uses.

Grasses such as *Arundo donax*, *Axonopus compressus*, *Cenchrus* sp., *Pogonatherum* sp., *Stenotaphrum dimidiatum*, *Zoysia matrella*, etc., are of high ornamental value. Grasses enjoy a place of pride in horticulture, being used mainly to develop lawns.

Grasses also are of much use in the aromatic oil industry. Lemongrass (*Cymbopogon* spp.) is used to distill aromatic oil with a citronella smell, used in the perfumery and soap-making industry. In India, the oil-yielding plants, including grasses, have been enumerated by Ahmedullah & Sanjappa (2008). Some commercial oil-yielding grasses are *Cymbopogon citratus*, *C. martini*, and *C. nardus*, all of which are utilized for various purposes such as deodorants, detergents, polishes, perfumery, and soap industry. *Chrysopogon zizanioides*, the roots of which yield the 'vetiver oil' is also used in perfumery/cosmetics, and sometimes for flavoring cold drinks (Ahmedullah & Sanjappa, 2008). In medicine, 'vetiver oil' is also used as a diaphoretic, stimulant, and local application to relieve joint pains, rheumatism, sprains, etc.

Grasses such as *Cynodon dactylon*, *Desmostachya bipinnata*, *Imperata cylindrica*, *Saccharum spontaneum*, etc., are used in certain religious rites. Many types of grass, such as *Aristida setacea*, *Arundinella setosa*, *Thysanolaena latifolia*, etc., which are used in small/local broom-making industries, are of socio-economic value. Grass species such as *Desmostachya bipinnata*, *Eulaliopsis binata*, *Saccharum spontaneum*, *Oryza sativa* (Hay), *Themeda* sp., *Cymbopogon* sp., etc., which are used for thatching in rural India, as well as species such as *Arundo donax*. *Phragmites karka*, used for fencing in villages, are also of high socio-economic value.

Bamboos, popularly known as 'green gold,' have a universal appeal due to their importance as a building material and in the paper-making industry. Some of the economically essential bamboos are *Bambusa* and *Phyllostachys*.

HABITATS OF GRASSES

Plate 27

Grasses are the successful colonizers of any habitat ranging from hot deserts to cold deserts. In a strict sense, there will be an overlap of habitats in the distribution of grasses. Based on the habitat specificity in the state of Telangana, the grasses have been broadly categorized variously as:



Plate 27. **Grass habitats:** A. *Pseudoraphis spinescens* (R.Br.) Vickery; B. *Arthraxon lanceolatus* (Roxb.) Hochst.; C. *Sacciolepis interrupta* (Willd.) Stapf; D. *Lophopogon tridentatus* (Roxb.) Hack.

Tall reed-like grasses: *Arundo donax*, *Heteropogon triticeus*, and *Phragmites karka*.

Wasteland grasses: *Alloteropsis cimicina*, *Arthraxon hispidus*, *Chloris quinquesetica*, *Cynodon dactylon*, *Dactyloctenium aegyptium*, *Digitaria ciliaris*, *Eleusine indica*, *Eragrostis unioides*, *Heteropogon contortus*, *Ischaemum indicum*, *Sporobolus diander*, *Themeda triandra*, *Tragus mongolorum* etc.

Forest grasses or shade-loving grasses: *Centotheca lappacea*, *Oplismenus burmanii*, *Oplismenus compositus*, *Cyrtococcum trigonum*, etc.

Wall grasses: *Apluda mutica*, *Arthraxon lancifolius*, *Arundinella pumila*, *Garnotia tenella*, *Heteropogon contortus*, *Tripogon bromoides*, etc.

Lawn grasses: *Axonopus compressus*, *Chrysopogon aciculatus*, *Cynodon dactylon*, *Stenotaphrum dimidiatum*, *Cenchrus species*, *Rhynchelytrum repens* (*Melinis*), *Zoysia matrella*, etc.

Grasses along with watercourses: *Arthraxon lanceolatus* var. *echinatus*, *Ischaemum rugosum*, *Panicum repens*, *Sacciolepis myosuroides*, *Sacciolepis indica*, *Saccharum spontaneum*, *Setaria puncata* (*Paspalidium*), *Thelepogon elegans*, etc.

Grasses on rocky hill slopes, in crevices: *Dimeria bialata*, *Dimeria avenacea*, *Dimeria connivens*, *Dimeria kanjirapallilana*, *Dimeria orissae*, *Dimeria ornithopoda*, *Heteropogon polystachyos*, *Oropetium roxburgianam*, *Oropetium thomaeum*, *Oropetium villosulum*, *Tripogon anantaswamianus*, *Tripogon bromoides*, *Tripogon filiformis*, *Tripogon jacquemontii*, *Tripogon purpurascens*, *Tripogon wightii*, etc.

Weeds of cultivated fields: *Echinochloa colona*, *Echinochloa crus-galli*, *Eragrostis unioides*, *Eriochloa procera*, *Leptochloa chinensis*, *Trachys muricata*, etc.

Marshy and hydrophytic grasses: *Eragrostis tenella*, *Leersia hexandra*, *Oryza rufipogon*, *Panicum repens*, *Panicum paludosum*, *Polytoca gigantea*, *Pseudoraphis spinescens*, *Sacciolepis interrupta* etc.

TAXONOMIC TREATMENT

KEY TO THE SUB-FAMILIES

- | | |
|---|---------------------------------|
| 1a. Stamens-6 | ... I. BAMBUSOIDEAE |
| 1b. Stamens 1–3 | ... 2 |
| 2a. Micro hairs absent | ... II. POOIDEAE |
| 2b. Micro hairs present | ... 3 |
| 3a. Lemmas indurated | ... VI. PANICOIDEAE |
| 3b. Lemmas membranous | ... 4 |
| 4a. Lemmas 1–3 nerved | ... V. CHLORIDOIDEAE |
| 4b. Lemmas 2-many nerved | ... 5 |
| 5a. Ligules glabrous; lemmas unlobed, retrorsely hispid | ... III. CENTOTHECOIDEAE |
| 5b. Ligules ciliate; lemmas bilobed, glabrous | ... IV. ARUNDINOIDEAE |

SUB-FAMILY: BAMBUSOIDEAE

KEY TO THE TRIBES

- | | |
|--|----------------------|
| 1a. Perennial woody plants; monocarpic | ... BAMBUSEAE |
| 1b. Annual herbaceous plants; polycarpic | ... ORYZAEAE |

TRIBE: BAMBUSEAE

Key to the genera

- | | |
|------------------------------------|--------------------------|
| 1a. Rachilla internodes distinct | ... Bambusa |
| 1b. Rachilla internodes indistinct | ... Dendrocalamus |

Bambusa Schreb.

World: c. 55 spp.; India: 29 taxa.; Telangana: 1sp.

Bambusa bambos (L.) Voss, Vilm. Blumengartn., ed. 3. 1: 1189. 1895. *Arundo bambos* L., Sp. Pl. 1: 81. 1753. *Bambusa arundinacea* (Retz.) Willd., Sp. Pl., ed. 4. 2(1): 245. 1799; Hook.f., Fl. Brit. India 7: 395. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1859. 1934; Pull., Fl. Telangana 3: 1077. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 684. 2016; Pushpa & Singh in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 300. 2020. *Bambos arundinacea* Retz., Observ. Bot. 5: 24. 1789. 'Mulla Veduru'

Caespitose, woody, perennials; rhizomatous short (pachymorph), thorny. Culms 10–32 m tall, 8–16 cm across, drooping above; internodes c. 50 cm long, hollow; nodes prominent, lower nodes rooting, shoots armed at nodes with 1–3 recurved spines and with few leaves; culms sheaths 15–35 cm long, broad, triangular, coriaceous, orange-yellow when young, straight, rounded at apex, thickly ciliate with golden hairs when young; blades c. 12 cm long, triangular, densely hirsute inside, apex acuminate; ligules narrow, with white hairs. Leaves basal and cauline; petiole 0.2–0.4 cm long; sheaths ending in a thick callus with a short bristly auricle; ligules short; blades c. 20 × 2.5 cm, linear-lanceolate, glabrous or puberulous beneath, 4–6-nerved, base rounded, apex acuminate. Synflorescence bractiferous, globose clusters. Panicle very large, often occupying the whole stem; branchlets bearing loose clusters of spikelets. Spikelets 10–30 mm long, lanceolate, glabrous, apex acute; 5–7-fertile florets. Rachilla internodes distinct. Glumes persistent, empty glumes 1-2, ovate-lanceolate, many nerved, apex acute-mucronate. Fertile lemma 7–8.5 mm long, ovate, 14–15-nerved, margins ciliate, apex acute-mucronate. Uppermost 1–3 male or neuter. Palea

oblong, 2-keeled, keels ciliate. Lodicules 3. Anthers 6. Caryopsis 4.5–7 mm long, oblong-ellipsoid, beaked.

Fl. & Fr.: Jan.–Mar.

Distrib.: Occasional in Khammam & Warangal.

Exsicc.: Warangal District: Way to Guttalogangaram from Thupakula gudem, *NRR* & *TRS* 86563 (BSID).

Dendrocalamus Nees

World: c. 73 spp.; India: 16 spp.; Telangana: 1sp.

Dendrocalamus strictus (Roxb.) Nees in *Linnaea* 9(4): 476. 1835; Pull., *Fl. Telangana* 3: 1103. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 697. 2016; Pushpa & Singh in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 304. 2020. *Bambos stricta* Roxb., *Pl. Coromandel* 1(4): 58. 1798. '*Sadanapu Veduru*' **Plate 28**

Caespitose, woody, perennials; rhizomatous short (pachymorph). Culms 10–16 m tall, erect, branched, solid-cavity; sheaths 4–11 × 6–13 cm, triangular, hairy; nodes swollen, lower nodes rooting. Leaves cauline; petiole long; sheaths 2.5–16 cm long, glabrous, apex acuminate; ligules narrow, apex ciliate-serrulate; blades 4.5–19 × 1.5–2.5 cm, linear-lanceolate, surface and margins scabrous, apex acuminate. Synflorescence bractiferous, globose clusters. Spikelets 1–3 fertile florets, bisexual, 0.8–1.2 cm long, lanceolate, compressed laterally, spiny. Glumes persistent. Lower glume ovate, chartaceous, many nerved, apex acuminate. Upper glume ovate, chartaceous, apex acuminate. Lemmas 6–7 mm long, ovate, chartaceous, apex acuminate-spiny, awned; awn 1.5–2 mm long, pungent. Palea ovate-elliptic, chartaceous, 6–7-nerved, 2-keeled, keels ciliate, apex emarginate. Lodicules 0. Anthers 6. Caryopsis 5.5–7 mm long, ovoid-subglobose.

Fl. & Fr.: Jan.–Mar.

Distrib.: Common throughout the State.

Exsicc.: Adilabad District: Tiryani-Range, Gundal West-Beat, *APS* s.n. (BSID); Khammam District: Mothugudem, *CSR* 1486 (KU); Rangareddy District: Central University, *MSM* 15172 (SKU); Warangal District: Hanumakonda, *CSR* 185 (KU).

Notes: Apart from above mentioned two wild bamboo species, the following bamboos are found to be in cultivation viz., *Bambusa tuldoidea* Munro and *Bambusa vulgaris* Schrad. ex J.C. Wendl.

TRIBE: ORYZEAE

Key to the genera

- | | | |
|-----|---|--------------------|
| 1a. | Spikelet without sterile lemma below fertile floret | ... Leersia |
| 1b. | Spikelet with 2 sterile lemmas below fertile floret | ... Oryza |

Leersia Sw.

World: c. 18 spp.; India: 2 spp.; Telangana: 1sp.

Leersia hexandra Sw., *Prodr. Veg. Ind. Occ.* 21. 1788; Hook.f., *Fl. Brit. India* 7: 94. 1896; C.E.C.Fisch. in Gamble, *Fl. Madras* 1845. 1934; Bor, *Grasses Burma*,



Plate 28. *Dendrocalamus strictus* Nees: A. Habitat; B. Culm sheath; C. Inflorescence.

Ceylon, India & Pakistan 599. 1960; Pull., *Fl. Telangana* 3: 1142. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 391. 2020. '*Naasumoru*' **Plate 29**

Rhizomatous perennials. Culms 30–110 cm high, erect or geniculate; nodes villous, rooting at lower nodes. Leaves basal; sheaths glabrous, margins smooth; ligules membranous; blades 4–18 × 0.1–0.6 cm, lanceolate-linear, flat. Panicles 4–15 cm long, lax, elliptic or oblong. Spikelets 3.5–4.2 × c. 1.5 mm, ovate-oblong, laterally compressed, falling as a unit. Glume absent. Lemma 3.5–4 mm

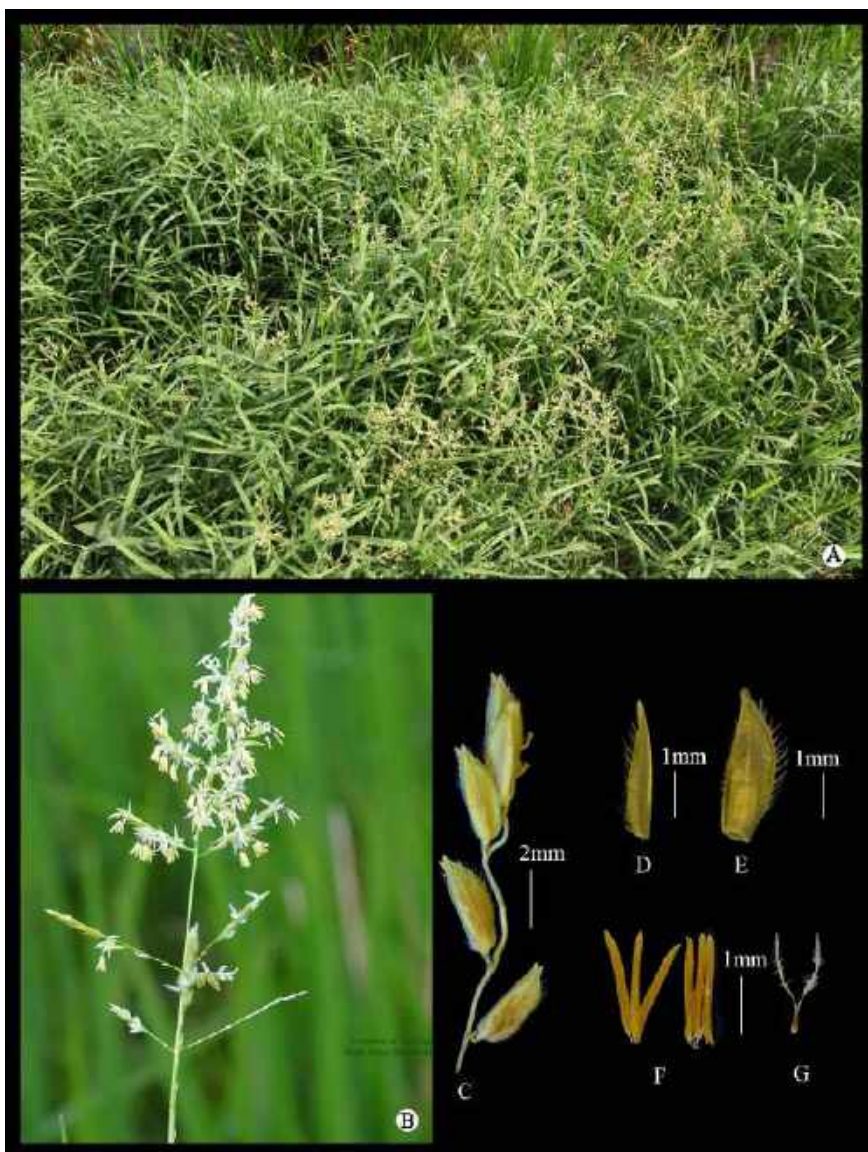


Plate 29. *Leersia hexandra* Sw.: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence. D. Lemma; E. Palea; F. Stamens; G. Pistil.

long, oblong, oblique, coriaceous, 4–5-nerved, ciliate on keels, scabrid on lateral nerves. Palea 2–3.5 mm long, linear-lanceolate, coriaceous, 5-nerved, keel ciliate. Stamens 6; anthers 1–2 × 0.3 mm, greenish-white to creamy yellow; filaments 0.2–0.4 mm long. Ovary 0.3–0.6 × c. 0.3 mm, ovate-elliptic, greenish; style 0.4–0.6 mm long, hyaline; stigma plumose, 1–1.5 mm long, greenish-creamy white.

Fl. & Fr.: Oct.–Jan.

Distrib.: Occasional in moist habitats.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR & JS* 9603 (BSID); Sambayagudem-Manugur, 24.03.2021, *SNR* 8957 (BSID); Rangareddy District: Hyderabad, *MVR* 02170 (HY).

Note: The genus is distinguished from *Oryza* by the absence of sterile lemma. Common weed in cultivated fields as well as in marshy area. Good fodder grass. Relished by cattle in young stage.

Oryza L.

World: c. 19 spp.; India: 11 spp., 1 subsp., 1 var.; Telangana: 4 spp.

Key to the species

- | | |
|---|------------------------------|
| 1a. Ligule of the lower leaves very long (12–50 mm long) | ... 2 |
| 1b. Ligule of the lower leaves much shorter (below 6 mm long) | ... 3 |
| 2a. Spikelets persistent | ... 4. <i>O. sativa</i> |
| 2b. Spikelets caducous | ... 3. <i>O. rufipogon</i> |
| 3a. Spikelets absolutely glabrous; rarely awned | ... 1. <i>O. meyeriana</i> |
| 3b. Spikelets hispid and/or pectinate-ciliate on the keels | ... 2. <i>O. officinalis</i> |

1. *Oryza meyeriana* (Zoll. & Moritzi) Baill., Hist. Pl. 12: 166. 1894. *Padia meyeriana* Zoll. & Mor., Syst. Verz. Ind. Archip. 2: 103. 1845. *Oryza meyeriana* var. *granulata* (Nees & Arn. ex Watt) Duist. in Blumea 32: 185. 1987. *Oryza granulata* Nees & Arn. ex Watt, Dict. Econ. Prod. India 5: 500. 1891; Hook.f., Fl. Brit. India 7: 94. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 604. 1960; Pull., Fl. Telangana 3: 1149. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 399. 2020.

Plate 30(A)

Caespitose perennials. Culms 30–65 cm high, decumbent. Leaves basal and cauline; sheaths keeled, 6.5–10.6 cm, mouth bearded; ligules 1.2–1.5 mm long, apex obtuse-truncate; blades 5.5–22 × 0.7–1.7 cm, linear-lanceolate, base truncate-subcordate, flat-folded, margins finely serrulate, apex acuminate. Inflorescence spiciform or racemose, 7–12 × 0.8–1.3 cm; peduncle c. 23 cm long, terete. Racemes 1.5–4.6 cm long. Spikelets few, 2–6 per raceme, alternate on rachis, paired or at times solitary, c. 5.4 × 1.6 mm, oblong-lanceolate, coriaceous, apex acute, unawned. Floret 1, bisexual with reduced involucres and glume scars. Lower glume flap like scar at pedicel apex. Upper glume absent, 1st sterile involucral lemma reduced, crescent shaped, scale c. 0.4 mm long; 2nd sterile involucral lemma 0.8–1.2 × 0.2–0.4 mm, lanceolate-subulate. Lemma 5–6 × c. 2 mm, oblong-lanceolate, boat shaped, coriaceous, dorsal granulate, margins thick, inrolled, apex acute. Palea 4.8–5.8 × c. 1 mm, oblong or ovate-lanceolate, apex acute. Lodicules 2, 0.4–0.6 mm long. Stamens 6. Ovary c. 0.6 × 0.3 mm, oblong-elliptic; style c. 0.8 mm long; stigma plumose, c. 1.7 mm long.

Fl. & Fr.: Jun.–Mar.

Distrib.: Occasionally on the bunds of paddy fields.

Exsicc.: Medak District District: Ramancheru, Perugunda, Narasapur, *RG* 96296 (BSID).

Note: A good fodder grass.

2. *Oryza officinalis* Wall. ex Watt..Dict. Econ. Prod. India 5: 501 1891.



Plate 30. A. *Oryza meyeriana* (Zoll. & Moritzi) Baill.; B–K. *Oryza rufipogon* Griff.: B. Habitat (inset: enlarged view of inflorescence); C. Inflorescence; D&E. Spikelet; F&G. Sterile lemmas; H. Lemma; I. Palea; J. Lodicules; K. Pistil.

O. officinalis subsp. *malampuzhaensis* (Krishnasw & Chandras.) Tateoka, Bot. Mag. (Tokyo) 75: 422. 1962. *O. malampuzhaensis* Krishnasw. & Chandras., Madras Agric. J. 45: 471. 1958; Bor, Grasses Burma, Ceylon, India & Pakistan 606. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 400. 2020.

Perennial, stoloniferous. Culms 0.5-1m high, branching at base. Leaves cauline, sheaths overlapping, keeled, glabrous; blades 20–50 × 1–2 cm, linear-

lanceolate, flat, glabrous, midrib prominent. Panicle 25-30 cm long, lax. Spikelets 5.5–6 × 2–2.5 mm, solitary, pedicelled, broadly oblong, deciduous, awned. Glumes 0.1–0.2 × 0.1 mm, triangular, 1-nerved, scaberulous, deciduous. Lemma 4.5–5.5 × 2–2.5 mm, boat-shaped, apex acute, keeled, sparsely hairy, awned; awn 3-4 mm long. Palea narrowly lanceolate, 3-nerved, 1-keeled, apex acute, sparsely hairy. Stamens 6. Stigmas plumose. Caryopsis oblong.

Fl. & Fr.: Sep.–Jan.

Distrib.: Rare along the margins of streams in forest, especially shady places.

Exsicc.: Nagarkurnool District, Mannanur range, Mallaiah Loddi, 01.10.2014 BSS 1742 (TBGH).

3. *Oryza rufipogon* Griff., Not. Pl. Asiat. 3: 5. 1851; Bor, Grasses Burma, Ceylon, India & Pakistan 605. 1960; Pull., Fl. Telangana 3: 1150. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 730. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 400. 2020.

Plate 30(B-K)

Caespitose annuals. Culms 80–100 cm high; erect or decumbent, spongy, nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths 5–15 cm long, glabrous, compressed, keeled; ligules 10–25 mm long, membranous; blades 5–20 × 0.6–1.2 cm, linear-lanceolate, flat, margins scabrid, apex acuminate. Panicles 10–25 cm long (with awn), lax. Spikelets 8–10 mm long, oblong. Lower glume 2–3 × 1.5–2 mm, ovate, membranous, 1-nerved, 1-keeled, apex acute. Upper glume 2–3 × 1.5–2 mm, ovate, membranous, 1-keeled, apex acute. Lemma 8–10 mm long, oblong, boat shaped, coriaceous, scaberulous, laterally compressed, 3-nerved; awn 6–9 cm long. Palea 6–8 mm long, elliptic-oblong, boat shaped, compressed, coriaceous, scaberulous, keeled, apex acute. Lodicules 2. Stamens 6. Caryopsis 5–7 mm long, oblong.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the State on the bunds of paddy fields and small pools. Used as fodder.

Exsicc.: Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 8567 (BSID); Warangal District: Jakaram, RKP 105289 (BSID); Adilabad District: Thadlapet-Range, Mallial-Beat, APS 6836 (BSID); Rangareddy District: Hyderabad, MVR 02178 (HY), Manasa hills-Rajendranagar, 24.08.2016, SNR 8555 (BSID).

Note: Distinguishable by its long awned spikelets.

4. *Oryza sativa* L., Sp. Pl. 333. 1753; Hook.f., Fl. Brit. India 7: 92. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 605. 1960; Pull., Fl. Telangana 3: 1150. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 732. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 400. 2020. '*Vadlu*' **Plate 31**

Caespitose annuals. Culms 80–150 cm high, erect, terete; lower nodes rooting. Leaves basal and cauline; sheaths flattened, ribbed, glabrous, ciliate along margins; ligules 1.5–4 cm long, lanceolate, hyaline; blades 20–60 × 0.5–1 cm,



Plate 31. *Oryza sativa* L.: A. Enlarged inflorescence; B. Matured panicle (Ready to harvest).

linear-lanceolate, margins scabrid, apex acuminate. Panicle lax, 10–30 cm long. Spikelets 5–12 mm long, oblong, ovate-oblong, laterally compressed, greenish to brownish when mature. Glume reduced. Florets 2; lower barren, upper bisexual. Lower lemma oblong-lanceolate, entire or toothed, chartaceous, empty, apex acute. Upper lemma 5–10 mm long, oblong-lanceolate, chartaceous, granulate, apex acute. Upper palea oblong-lanceolate, chartaceous, apex acuminate. Stamens 6; anthers creamy white to yellowish. Caryopsis oblong, tightly enclosed by lemma and palea.

Fl. & Fr.: Jul.–May.

Distrib.: Cultivated throughout the state.

Exsicc.: Adilabad District: Kadam-Range, Pandavapur-Beat, APS 5492 (BSID); Medak District: Pocharam Wildlife Sanctuary, RG 116407 (BSID); Rangareddy District: Hyderabad, MVR 02179 (HY); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 012003 (BSID).

Note: Staple food, hay or straw used as fodder and husk used as fuel in bricks kiln.

SUB-FAMILY: POOIDEAE

TRIBE: TRITICEAE

Triticum L.

World: c. 5 spp.; India: 7 spp.; Telangana: 2 spp.

Key to the species

- 1a. Caryopsis tightly adherent between lemma and palea, persistent ... 2. *T. turgidum* subsp. *dicoccum*
- 1b. Caryopsis free between lemma and palea, deciduous ... 1. *T. aestivum*

1. *Triticum aestivum* L., Sp. Pl. 1: 85. 1753; Hook.f., Fl. Brit. India 7: 367. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 679. 1960; Pull., Fl. Telangana 3: 1186. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 758. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. *Triticum sativum* Lam., Fl. France 3: 625. 1778. *Triticum vulgare* Vill., Hist. Pl. Dauph. 1: 153. 1787. '*Godhumalu*' **Plate 32**

Caespitose annuals. Culms about 70 cm high; nodes bearded. Leaves basal and cauline; sheaths glabrous, ribbed, margins smooth; auricles claw like; ligules 1–2.5 mm long, membranous; blades 35–60 × 1–1.5 cm, linear-lanceolate, margins scabrellate, apex acute. Spikes erect, c. 15 cm long, linear-oblong, compact or loose. Spikelets c. 1.5 cm long, ovate, laterally compressed. Glume 6–10 mm long, keeled in upper $\frac{3}{4}$, dentate at apex. Florets 3–6. Lemma rounded below, keeled above, muticous to long awned. Caryopsis oblong, grooved.

Fl. & Fr.: Throughout the year.

Distrib.: Cultivated.

Exsicc.: Rangareddy District: Hyderabad, MVR 02212 (HY), Warangal District: Chilakammanagar- Pakhal Lake, 31.03.2021, SNR 012052 (BSID).

2. *Triticum turgidum* subsp. *dicoccum* (Schrank ex Schübl.) Thell., Naturwiss. Wochenschr. n.s., 17: 470. 1918.; C.E.C.Fisch. in Gamble, Fl. Madras 1856. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 680. 1960; Pull., Fl. Telangana 3: 1186. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 758. 2016. *Triticum diococcum* Schuebl., Diss. Char. Descr. Cereal. 29. 1818; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. '*Godhumalu*'

Caespitose annuals. Culms 70–120 cm high, erect, terete; nodes pubescent. Leaves basal and cauline; sheaths smooth; ligules membranous, apex erose; blades 25–45 cm long, linear-lanceolate, flat, margins scabrous, apex acuminate. Spikes solitary, apparently 4-angled, curved when mature; rachis pilose towards apex, fragile when mature. Spikelets solitary, 8–12 mm long, oblong, laterally compressed, greenish, awned. Glume 5–9 mm long, chartaceous, greenish, 5-nerved, apex acute to awned. Florets 3; 2-fertile, 1-sterile. Lemma 8–11 mm



Plate 32. *Triticum aestivum* L.: A. Field of *Triticum*; B. Enlarged view of Inflorescence; C. Caryopses.

long, apex 2-lobed; awn from sinus, 9–14 cm long. Palea 2-keeled, keels ciliate. Lodicules 2. Stamens 3. Caryopsis oblong, grooved, often hairy, adherent and tightly enclosed between lemma and palea.

Fl. & Fr.: Dec.–Mar.

Distrib.: Cultivated in hilly regions.

Exsicc.: Rangareddy District: Hyderabad, MVR 02213 (HY).

SUB-FAMILY: CENTOTHECOIDEAE

TRIBE: CENTOTHECEAE

Centotheca Desv.

World: 4 spp.; India: 2 spp., 1 var.; Telangana: 1 sp.

***Centotheca lappacea* (L.) Desv.** in Nouv. Bull. Sci. Soc. Philom. Paris 2: 189. 1810; Hook.f., Fl. Brit. India 7: 332. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1848. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 457. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. *Cenchrus lappaceus* L., Sp. Pl. ed. 2: 1488. 1763. *Centotheca latifolia* Trin., Fund. Agrost.: 141. 1820, *nom. illeg.* non *Holcus latifolius* Osbeck, 1757. **Plate 33**

Perennials. Culms 30–135 cm high, decumbent, ribbed, geniculate, glabrous; lower nodes rooting. Leaves cauline; sheaths 5–8 cm long, margins hairy; ligules 0.6–1.3 mm long, hyaline, truncate, lacerate; blades c. 16 × 1.5 cm, narrowly elliptic-lanceolate, scabrid above, margins finely serrulate, apex acute-acuminate. Panicle lax, 11–31 × c. 18 cm, branched, alternate. Spikelets 5–8 × 0.8–1.7 mm, pedicelled, ovate, elliptic-oblong, apex acute. Lower glume 2–2.5 × c. 0.6 mm, ovate-lanceolate, chartaceous, keeled, apex acute-acuminate, mucronate. Upper glume 2.8–3.5 × c. 1 mm, oblong-elliptic, boat shaped, chartaceous, 1-keeled, apex acuminate-mucronate. Florets 2–4, bisexual or uppermost reduced; lowest floret, retrorsely hispid hairy. Lower lemma 3.5–4 × 0.7–1 mm, oblong, boat shaped, chartaceous, keeled, apex acute-retuse, mucronate. Lower palea 2–3.5 × c. 0.6 mm, oblong-elliptic, chartaceous, 2-keeled, apex acute-obtuse. Upper lemma 3.5–4.5 × c. 0.8 mm, oblong-elliptic, tuberculate hairy in upper margins, retrorsely curved spiny, apex mucronate. Upper palea c. 3.5 × 0.8 mm, similar to lower palea. Lodicules 2, c. 0.3 mm long, obovate. Stamens 2 or 3. Ovary c. 0.8 mm long, ovate-lanceolate. Caryopsis 1–1.4 × c. 0.8 mm, slightly oblique, ovate-elliptic.

Fl. & Fr.: Nov.–Jan.

Distrib.: Occasionally in shaded and moist places, mainly along the water channels.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR & JS 9519 (BSID).

Note: Fodder grass.

SUB-FAMILY: ARUNDINOIDEAE

KEY TO THE TRIBES

- | | |
|----------------------------------|--------------------|
| 1a. Lemmas 3-awned | ... ARISTIDEAE |
| 1b. Lemmas 1-awned or unawned | ... 2 |
| 2a. Hilum narrowly oblong-linear | ... ARUNDINEAE |
| 2b. Hilum punctiform | ... THYSANOLAENEAE |



Plate 33. *Centotheca lappacea* (L.) Desv.: A & B. Habitat; C. Enlarged view of inflorescence; D&E. Spikelets; F. Lower glume; G. Upper glume; H. Lower floret; I. Lower lemma; J. Upper lemma; K. Upper floret; L&M. Abaxial and adaxial view of upper lemma; N. Upper palea with extended rachilla; O. Caryopsis.

TRIBE: ARISTIDAE

Aristida L.

World: c. 330 spp.; India: 10 spp.; Telangana: 7 spp.

Key to the species

- | | | |
|-----|--|----------------------------|
| 1a. | Articulation between lemma and awns either at tip or centre or apex of column... | 2 |
| 1b. | Articulation absent between lemma and awns | ... 4 |
| 2a. | Articulation at the top of the column | ... 4. <i>A. mutabilis</i> |

- | | | |
|-----|--|-------------------------------|
| 2b. | Articulation at the base of the column | ... 3 |
| 3a. | Glumes extraordinarily unequal | ... 7. <i>A. stocksii</i> |
| 3b. | Glumes not so unequal | ... 2. <i>A. funiculata</i> |
| 4a. | Lateral awn much reduced or sometimes absent | ... 5. <i>A. redacta</i> |
| 4b. | Lateral awns well developed | ... 5 |
| 5a. | Panicle effuse, as broad as long | ... 3. <i>A. hystrix</i> |
| 5b. | Panicle contracted | ... 6 |
| 6a. | Culms erect, annual; awns of the glumes c. 5 mm long | ... 6. <i>A. setacea</i> |
| 6b. | Culms decumbent, perennial; awns of the glumes at most 2 mm long | ... 1. <i>A. adscensionis</i> |

1. *Aristida adscensionis* L., Sp. Pl. 82. 1753; Hook.f., Fl. Brit. India 7: 224. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 407. 1960; Pull., Fl. Telangana 3: 1068. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 679. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020. 'Pilli-biser gaddi'

Plate 34

Caespitose annuals. Culms 10–55 cm high, erect or geniculate, terete; nodes glabrous (dark). Leaves basal and cauline; sheaths open, glabrous; ligules c. 1 mm long, ciliate membrane; blades 2–16 × 0.1–0.4 cm, linear, conduplicate, sparsely hairy, apex acuminate. Panicle c. 20 cm long, erect, axillary and terminal, lax-contracted. Spikelets 7–10 mm long (excluding awns), lanceolate. Lower glume 3–6 × 0.5–1 mm, lanceolate, 1-nerved, margins membranous. Upper glume c. 8 mm long, linear, 1-nerved; callus 2–5 mm long. Lemma c. 9 mm long, oblong-linear, chartaceous-subcoriaceous, laterally compressed, 3-nerved, keeled; convolute, 3-awned, column absent, middle awn 10–25 mm; lateral awns 7–14 mm long, serrulate. Palea c. 1.5 × 0.3 mm, oblanceolate, membranous, hyaline, apex acute. Lodicules 2. Stamens 3. Ovary elliptic-oblong. Caryopsis c. 5.5 mm long, linear, compactly enclosed by lemma.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in plains, hill slopes, roadsides and in crevices of old walls.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, SNR 9585 (BSID)!; Mahabubnagar District: Nagarjunasagar, LR & SNR 7301 (BSID); Medak District: Nagasampally RF, RG 104200 (BSID)!; Nalgonda District: Kalvapilly, BRA 001204 (BSID)!; Rangareddy District: Hyderabad-Borabanda-Hitech city, VSK & KCS 323 (BSID)!; Adilabad District: Jannaram-Range, Alinagar-Beat, APS 3995 (BSID)!; Rangareddy District: Hyderabad, MVR 02103 (HY)!; Wanaparthy District: Amadabakula-Kothakota, SNR 8631 (BSID).

Note: Identifiable by lax inflorescence.

2. *Aristida funiculata* Trin. & Rupr., Sp. Gram. Stipac. 159. 1842; Hook.f., Fl. Brit. India 7: 226. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 407. 1960; Pull., Fl. Telangana 3: 1068. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 680. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020.

'Cheepurugaddi' Plate 35

Caespitose annuals. Culms 10–30 cm high, erect, weak, wiry, geniculate, terete; nodes brownish. Leaves mostly basal; sheaths 2.5–4.5 cm long, open,



Plate 34. *Aristida adscensionis* L. A. Habitat; B&C. Inflorescence; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma with callus; H. Palea; I. Lodicules; J. Stamens; K. Pistil; L. Caryopsis.

glabrous, margins smooth; ligules c. 0.3 mm long, fimbriate; blades 3–10 × 0.1–0.3 cm, narrowly linear, convolute or folded, glabrous, margins smooth, base sparsely ciliate, apex acuminate. Panicle 10–15 cm long, narrow lax-contracted, branches capillary. Spikelets 20–22 mm long, linear-lanceolate. Lower glume 18–22 mm long, (including 8–10 mm long awn), elliptic-lanceolate, linear, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate, aristate. Upper glume 18–20 mm long, 1-nerved, margins hyaline, apex acuminate; awn 7–8 mm long; callus 3–3.5 mm long, pungent. Lemma 6–7.5 mm long, linear-lanceolate,



Plate 35. *Aristida funiculata* Trin. & Rupr.: A. Habitat; B. Habit; C. Spikelet.

articulation at the base of column, 20–30 mm long, 3-awned, middle awn c. 55 mm long; lateral awns 35–50 mm long, scabrid. Palea 10–20 × 0.2–0.6 mm, obovate, membranous, hyaline, apex acute. Stamens 3. Ovary c. 0.5 mm long; stigma plumose. Caryopsis 1–3 mm long, oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the State.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary,

09.01.2019, SNR & JS 8566 (BSID); Nalgonda District: Hill colony & Bothya thanda, BRA 005084 & 001214 (BSID); Manasa hills-Rajendranagar, 04.09.2019, SNR & PVP 8689 (BSID); Rangareddy District: Hyderabad, MVR 02104 (HY)!

Note: Distinguishable by dwarf habit with compact inflorescence.

3. *Aristida hystrix* L.f., Suppl. Pl. 113. 1782; Hook.f., Fl. Brit. India 7: 225. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1809. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 410. 1960; Pull., Fl. Telangana 3: 1070. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 680. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020. '*Dolluba Gaddi*' **Plate 36**

Caespitose perennials. Culms about 70 cm high, erect-straggling; nodes brownish. Leaves mostly basal; sheaths 2–6 cm long, glabrous, ribbed; ligules c. 0.2 mm long, membranous; blades 3–18 × 0.2–0.3 cm, linear, distichous, convolute, flat or inrolled, apex acuminate. Panicles effuse, 10–20 cm long, as broad as length. Spikelets 10–12 mm long, lanceolate, pale purple-straw coloured. Lower glume 8–12 mm long, lanceolate-elliptic, chartaceous-subcoriaceous, 1-nerved, margins inrolled, apex acuminate, aristate; upper glume 15–18 mm long, similar to lower glume; callus c. 2 mm long, villous, pungent; Lemma 5–10 mm long, linear-lanceolate, articulation absent, subcoriaceous, margins imbricate, apex rounded; awns 25–35 mm long, scabrid. Palea 1–3 mm long, ovate, chartaceous-membranous, hyaline, apex acute. Lodicules 2. Stamens 3. Ovary c. 2 mm long, oblong; stigma plumose. Caryopsis 5–7 mm long, linear-ovate.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the state, in arid habitats.

Exsicc.: Mahabubnagar District: Nagarjunasagar, LR & SNR 7302 (BSID); Nalgonda District: Hill colony & Macharathanda, BRA 005083, 001178 (BSID); Khammam District: Ramana Gutta, RR 107993 (BSID); Rangareddy District: Manasa Hills, 06.08.2019, SNR 8603 (BSID), MVR 02105 (HY); Bilal Eidgah Road, Rajendranagar, 24.08.2016, SNR 8539 (BSID); Hyderabad: ICFRE Dhoolapally to Narsapur main road, VSK & KCS 205 (BSID).

Note: Distinguishable by its widely spreading inflorescence.

4. *Aristida mutabilis* Trin. & Rupr., Sp. Gram. Stipac. 150. 1842; Hook.f., Fl. Brit. India 7: 226. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1809. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 411. 1960; Pull., Fl. Telangana 3: 1070. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020.

Caespitose annuals. Culms about 30 cm high, weak, geniculate; nodes dark. Leaves basal and cauline; sheaths open, glabrous, margins smooth, hairy at mouth; ligules c. 1 mm long, fringe of hair; blades 3–8 × 0.1–0.2 cm, linear, convolute, glabrous, margins smooth, apex acuminate. Panicles narrow c. 20 cm long, open, linear, erect, terminal and axillary. Spikelets 6–7 mm long, linear-lanceolate, straw coloured. Lower glume 5–6 mm long, oblong-lanceolate, chartaceous, 1-nerved, 1-keeled, keel serrulate, apex acuminate-aristate. Upper glume 7–9 mm long, apex apiculate; callus 0.5–1 mm long, linear, shortly bearded. Lemma 4–5 mm long,



Plate 36. *Aristida hystrix* L.f.: A. Habitat; B&C. Inflorescence; D. Spikelet.

ovate-lanceolate, articulation at top of column, scaberulous upwards, column c. 4.5 mm long, awns 3, 15–20 mm long, slender, straight or twisted. Palea 1–1.5 mm long, elliptic, membranous, hyaline, flat, apex acute. Anthers c. 1 mm long. Stigma c. 0.6 mm long. Caryopsis 2.5–3 mm long, oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally in Adilabad.

Exsicc.: Adilabad District: Jaipur, PVP 9433 (SKU).

5. *Aristida redacta* Stapf. in Kew Bull. 1892: 85. 1892; Hook.f., Fl. Brit. India 7: 227. 1896; C.E.C.Fisch. in Gamble Fl. Pres. Madras 1809. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 412. 1960; Pull., Fl. Telangana 3: 1070. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 680. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020. **Plate 37**

Caespitose annuals. Culms 10–50 cm high, erect, weak, wiry, geniculate, terete; nodes glabrous. Leaves mostly basal; sheaths 1–9 cm long, terete, glabrous; ligules 0.1–0.6 mm long, ciliate; blades 5–16 × 0.25 cm, linear, convolute. Panicles effuse, 15–35 cm long, branched. Spikelets 2–4 mm long (excluding awn), lanceolate, margins scabrid. Lower glume 8–12 × 0.4–0.6 mm, narrowly ovate, membranous, 1-nerved, 1-keeled, keels scabrous, apex acuminate, clefted; callus hairy. Upper glume 12–12.5 × 0.5–0.6 mm, narrowly ovate, membranous, 1-nerved, 1-keeled, keel scabrous, apex clefted; awn c. 3 mm long. Lemma 4–4.5 × 0.02–0.04 mm (excluding awn), linear, coriaceous, twisted, apex awned, middle awn longer than lateral awns, 30–35 mm long; lateral awns much reduced, 1–5 mm long, at times absent. Palea 1–1.5 mm long, narrowly ovate, hyaline, apex truncate. Lodicules 2. Stamens 3. Pistil 1–3 mm long. Caryopsis 3–5 × 0.2–0.5 mm, narrowly ovate-linear.

Fl. & Fr.: Aug.–Oct.

Distrib.: Occasional on dry hill slopes and in wastelands.

Exsicc.: Rangareddy District: Manasahills, 10.10.2019, SNR 8731, 8935 (BSID); Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8715 (BSID).

Note: Distinguishable by its reduced or absence of lateral awns of lemma.

6. *Aristida setacea* Retz., Observ. Bot. 4: 22. 1786; Hook.f., Fl. Brit. India 7: 225. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1809. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 412. 1960; Pull., Fl. Telangana 3: 1071. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 680. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020. '*Gaddiparakalu*', '*Cheepurugaddi*' **Plate 38**

Caespitose perennials. Culms 50–150 cm long, base woody, erect or slightly ascending from base; nodes glabrous. Leaves mostly basal; sheaths 5–15 cm long, terete, glabrous; ligules a fringe of short hairs; leaf blades 10–35 × 0.3–0.5 cm, linear-lanceolate, convolute, coriaceous, margins inrolled. Panicles 10–35 × 2–4 cm, contracted. Racemes 8–11 cm long. Spikelets 10–16 mm long (excluding awns), linear-lanceolate, margins scabrid, apex acuminate. Lower glume 10–12 × 0.5–1 mm, linear-lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, margins flat-inrolled, apex acuminate; awn 3–5 mm long. Upper glume 13–15 × 0.5–1 mm, similar to lower glume, apex minutely 2-toothed, slightly notched; callus bearded. Lemma 8–16 × 0.2–0.9 mm, oblong-lanceolate, articulation absent, scabrid, margins involute, 3 awns, 25–30 mm long, inarticulate. Palea 1–1.5 × 0.6 mm, oblong-elliptic, chartaceous, apex acute. Lodicules 2. Stamens 3. Ovary elliptic. Caryopsis 1–2 × 0.1–0.4 mm, oblong.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the Telangana State.

Exsicc.: Karimnagar District: On the way to Kankunuru, NRR & TRS 86596 (BSID); Khammam District: Lanka pally Hills, RR 106015 (BSID); Mahabubnagar District: Gaaduthala kuruva-on the way to Umamaheswaram, SRS 111309 (BSID);



Plate 37. *Aristida redacta* Stapf: A. Habitat; B. Habit; C. Spikelet; D. Lower glume; E. Upper glume; F. Lemma with two lateral reduced awns.

Vattavarlappalli, VBH 84968 (BSID); Farhabad Road to Pullachelna, SRS 109193 (BSID); Medak District: Pocharam Wildlife Sanctuary, RG 116415 (BSID); Nalgonda District: Puttamgandi, PVS 005136 (BSID); Rangareddy District: Manasa hills, 24.08.2016, SNR 8554 (BSID); Hyderabad, MVR 02106 (HY); Warangal District: Way to Gangaram, NRR & PVS 76990 (BSID), Jakaram, RKP 105277 (BSID), Basinbai, BRA 005144 (BSID).

Note: This species is identifiable by its robust habit and compact to slightly long effuse inflorescence.

7. *Aristida stocksii* (Hook.f.) Domin, Biblioth. Bot. 20: 338. 1915. *A. funiculata* var. *stocksii* Hook.f., Fl. Brit. India 7: 227. 1896; Bor, Grasses Burma,



Plate 38. *Aristida setacea* Retz.: A. Habitat; B&C. Inflorescence. D. Spikelet.

Ceylon, India & Pakistan 412. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 321. 2020.

Plate 39

Caespitose annual or perennial. Culms 8–45 cm long, geniculate, terete, glabrous, woody at base. Leaves basal and cauline; leaf sheaths 1.5–4.8 cm long, terete, glabrous; ligules membranous, 0.25–0.37 mm, a rim of hairs-fimbriate at apex; leaf blades 2–7.5 × 0.1–0.2 cm, linear-lanceolate, base truncate, margins serrulate, nerves of the adaxial surface hispid, apex acuminate. Inflorescence up to 25 cm long, contracted or slightly lax panicles, twisted when dry. Spikelets 3–4 cm long, (excluding awns). Pedicels 2–3 mm long, terete to compressed, hirsute; tufted hairs at apex of the pedicel. Lower glume 2–2.5 × c. 0.2 cm, linear, membranous, margins inrolled, apex

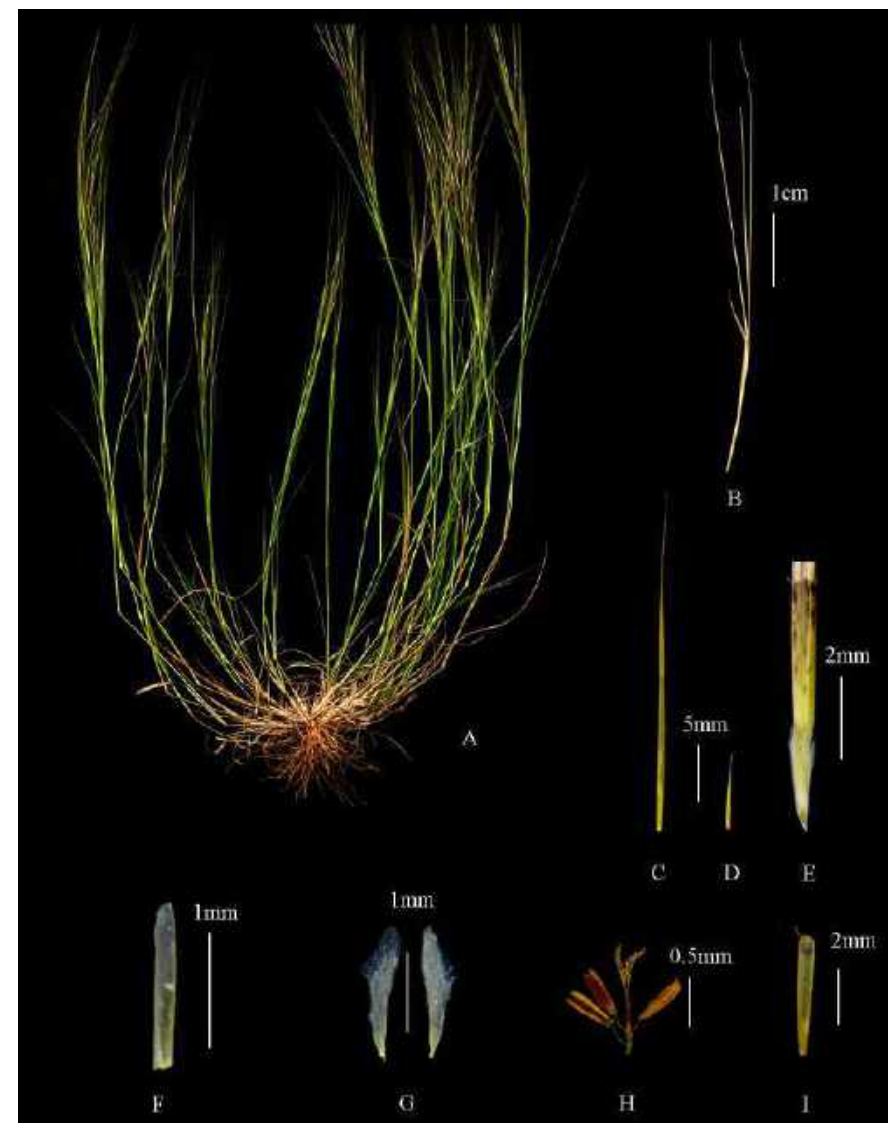


Plate 39. *Aristida stocksii* (Hook.f.) Domin: A. Habit; B. Spikelet; C. Lower glume; D. Upper glume; E. Enlarged view and lower portion of lemma with callus; F. Palea; G. Lodicules; H. Stamens with pistil. I. Caryopsis.

acuminate with an awn 2–3 mm long; minutely on dorsal surface; 1-nerved, 1-keeled, scabrid on keel. Upper glume 0.6–0.9 × c. 0.06 cm, narrowly ovate, membranous, margins inrolled, hyaline, 1-nerved, apex acuminate. Callus of floret pungent, about 2.5 mm long, hairy. Lemma 2–4.6 × 0.5–0.6 mm (without awn), linear, coriaceous; column 2.5–3 cm long, covered with white hairs c. 0.56 mm long; 3-nerved, awns 3, straight, scabrid, up to 9 cm long. Palea c. 1.5 × 0.25 mm long, narrowly ovate, hyaline, 2-nerved, apex obtuse. Lodicules 2, 1–1.7 × c. 0.25 mm. Stamens 3, anthers 0.53–0.59 mm. Pistil 1 mm long, ovary c. 0.5 mm long, stigma plumose. Caryopsis 4–4.5 × c. 0.5 mm, narrowly obovate.

Fl. & Fr.: Sep.–Dec.

Distrib.: Hilltops of Telangana. **Endemic**-India (Andhra Pradesh, Karnataka, Maharashtra, Telangana).

Exsicc.: Vikarabad District: Ananthagiri hills - Gattukondapur, 01.12.2019, SNR 8799 (BSID).

Note: *Aristida stocksii* is closely related to *A. funiculata* but differs in having glumes of variable length and lemma with lengthy awns.

TRIBE: ARUNDINEAE

Key to the genera

- | | |
|--------------------------------------|-------------------------|
| 1a. Slender grass | ... <i>Elytrophorus</i> |
| 1b. Reed like grass | ... 2 |
| 2a. Rachilla glabrous; lemma hairy | ... <i>Arundo</i> |
| 2b. Rachilla villous; lemma glabrous | ... <i>Phragmites</i> |

Arundo L.

World: 5 spp.; India: 1 sp.; Telangana: 1 sp.

Arundo donax L., Sp. Pl. 81. 1753. Hook.f., Fl. Brit. Ind. 7: 302. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1805. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 413. 1960; K.N.Reddy & C.S.Reddy, Fl. Telangana 683. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020.

Plate 40

Rhizomatous perennials. Culms 200–300 cm high, woody, bamboo like, creeping; nodes glabrous. Leaves basal and cauline; conspicuously distichous, glabrous, margins membranous; sheaths glabrous; ligules 1–2 mm long, ciliate; blades 10–60 × 1–5 cm, linear-lanceolate, flat, drooping, margins smooth, base amplexicaul or cordate, apex attenuate. Panicles 20–50 cm long, terminal, oblong, contracted; primary branches profusely divided, scaberulous. Spikelets 5–14 mm long, 2–6 flowered, lanceolate, laterally compressed. Lower glume 8–10 mm long, lanceolate, 3-nerved, apex acuminate. Upper glume c. 10 mm long, lanceolate, 3-nerved, apex acute. Lemma 8–12 mm long, ovate-lanceolate, 3–5-nerved, slightly bifid, nerves end as arista, hairy below; hairs 6–10 mm long. Palea 5–7 mm long, 2-nerved, keeled, apex slightly notched. Caryopsis 2–3 mm long, linear.

Fl. & Fr.: Nov.–Dec.

Distrib.: Occasionally in Karimnagar District

Exsicc.: Peddapalle District: Sabidam, 10.11.2019, SNR & JS 8763 (BSID).

Note: Introduced grass. Reed like culms are used for fencing.

Elytrophorus P. Beauv.

World: 2 spp.; India: 1 sp.; Telangana: 1 sp.

Elytrophorus spicatus (Willd.) E.G. Camus & A. Camus, Fl. Indo-Chine 7: 547. 1923; C.E.C.Fisch. in Gamble, Fl. Madras 1843. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 493. 1960; Pull., Fl. Telangana 3: 1118. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 710. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. *Dactylis spicata* Willd., Ges. Naturf.

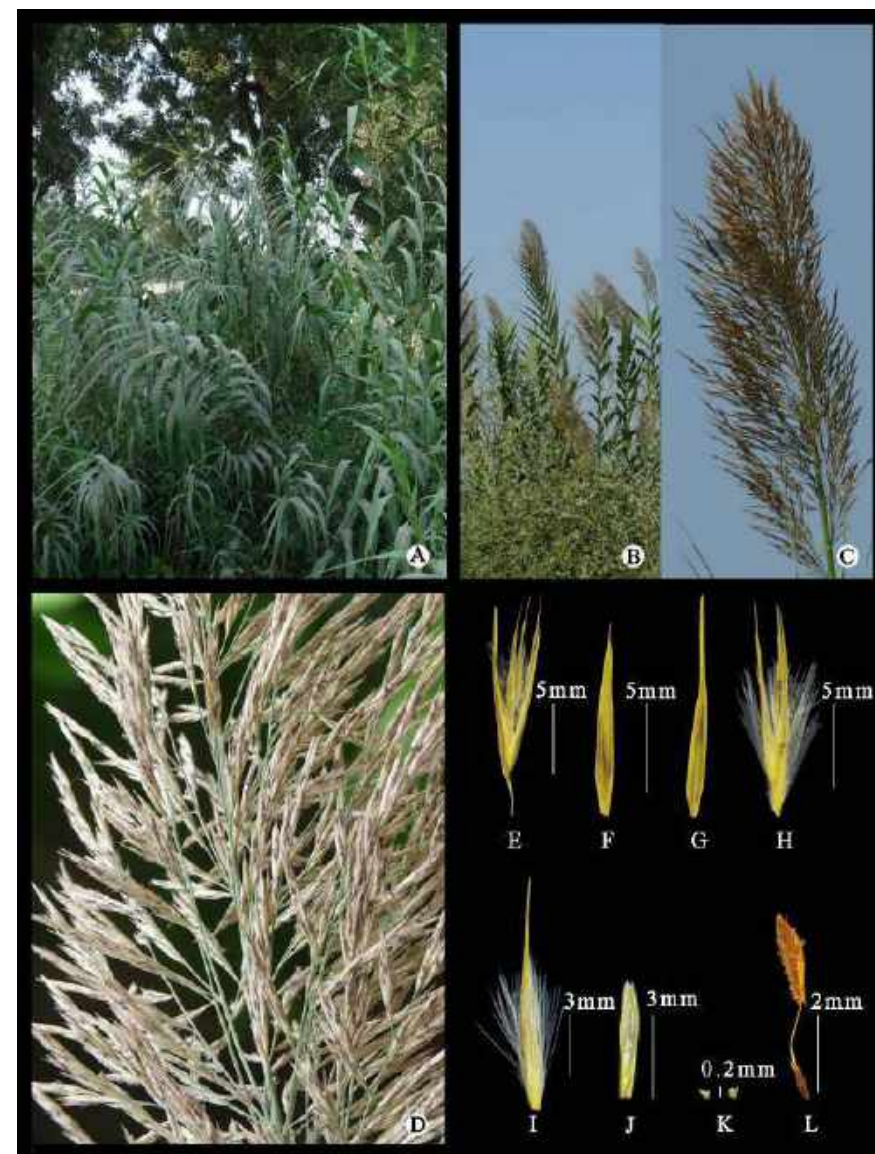


Plate 40. *Arundo donax* L.: A&B. Habitat; C&D. Inflorescence; E. Spikelet; F. Lower glume; G. Upper glume; H. Floret; I. Lemma; J. Palea; K. Lodicules; L. Pistil.

Ferunde Berlin Neue Schriften 3: 416. 1801. *Elytrophorus articulatus* P. Beauv., Essai Agrostogr. 67. t. 14. f. 2. 1812; Hook.f., Fl. Brit. India 7: 306. 1896. **Plate 41**

Caespitose annuals. Culms 10–40 cm high, erect or geniculate; nodes glabrous. Leaves cauline; sheaths 2–4 cm long, keeled, more or less ribbed; ligules c. 0.4 mm long, membranous, apex ciliate-lacerate; blades 5–20 × 0.1–0.6 cm, linear-lanceolate, flat-inrolled, sparsely hairy, margins serrulate, apex acuminate. Inflorescence 2–18 cm long, compound spike, compact, cylindric, interrupted. Spikelets c. 5 mm long, 4–6 flowered, ovate-oblong, bisexual. Lower glume

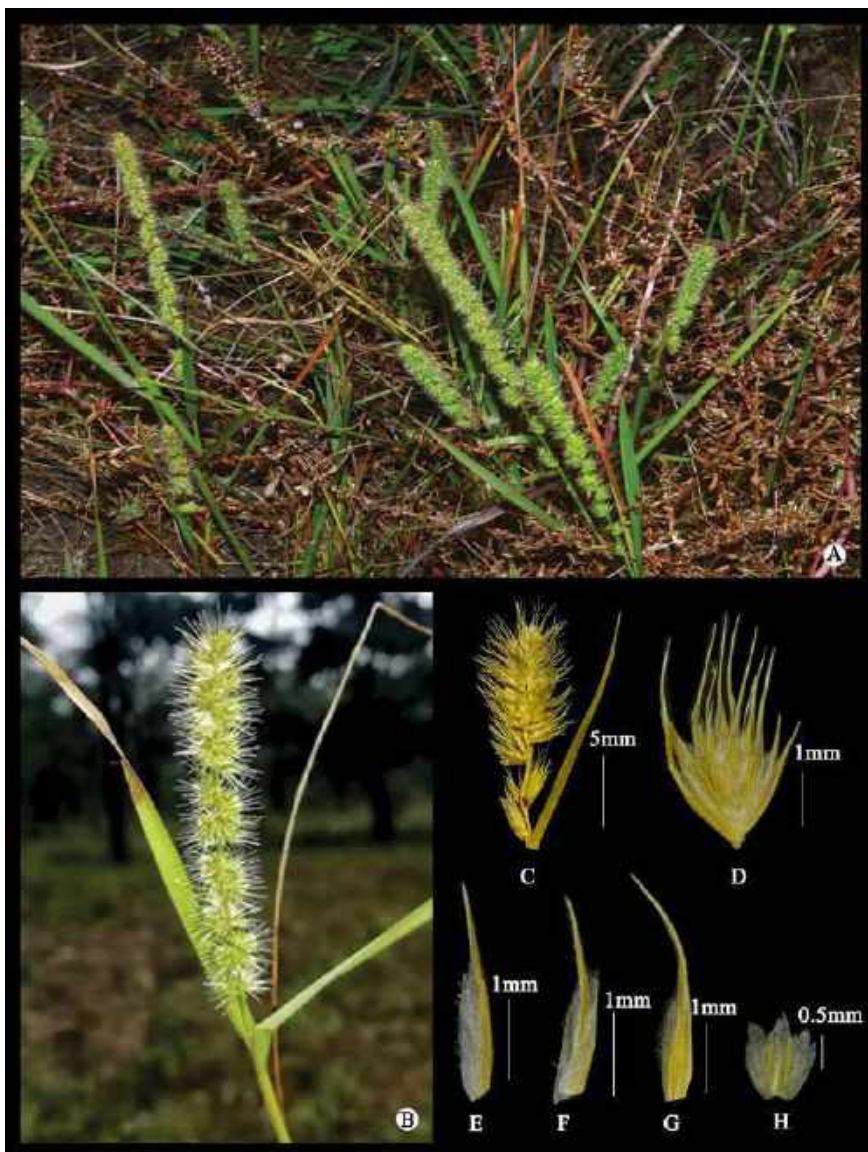


Plate 41. *Elytrophorus spicatus* (Willd.) A. Camus: A. Habitat; B&C. Inflorescence; D. Enlarged view of single raceme; E. Lower glume; F. Upper glume; G. Lemma; H. Palea.

1.5–2 mm long, lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrellate, margins ciliate, apex acuminate. Upper glume 2–2.5 mm long, elliptic-lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrellate, apex acuminate. Lemma 2–3 mm long, ovate-lanceolate, boat shaped, chartaceous, 1-keeled, keel scabrellate, margins broadly hyaline, ciliate, apex acuminate-aristate (usually awned from the tip). Palea 1.5–2 mm long, elliptic-obovate, 3-lobed, hyaline, chartaceous, 2-keeled, apex acute. Stamens 3. Caryopsis 0.5–0.8 mm long, ellipsoid, oblong-elliptic.

Fl. & Fr.: Dec.–Mar.

Distrib.: Occasional in marshy localities, rice fields, and stagnant pools.

Exsicc.: Mahabubnagar District: Jalpadi, *LR & MSR* 6201 (BSID); Medak District: Pocharam RF, *TP & MSG* 12055 (SKU); Medak District: Ramancheru, Perugunda, Narasapur, 30.01.1998, *RG* 96288 (BSID); Nizamabad District: Nagaram, *BRPR* 9710 (SKU).

Note: Distinguishable by its spicate and cylindric inflorescence.

Phragmites Adans.

World: c. 4 spp.; India: 3 spp.; Telangana: 1 sp.

Phragmites karka (Retz.) Trin. ex Steud., Nomencl. Bot. ed. 2. 2: 324. 1841.

Arundo karka Retz., Observ. Bot. 4: 21. 1786. *Phragmites vallatoria* (Pluk. ex L.) Veldkamp in Blumea 37: 233. 1992. *Arundo vallatoria* Pluk. ex L., Herb. Amb. 15. 1754; Hook.f., Fl. Brit. India 7: 304. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1807. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 416. 1960; Pull., Fl. Telangana 3: 1164. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 742. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. 'Kulapa Gaddi'

Plate 42

Caespitose perennials; rhizomatous and stoloniferous. Culms about 300 cm high, erect, straight, woody; nodes glabrous. Leaves cauline; sheaths 8–16 cm long, more or less ribbed, glabrous; ligules ciliate, membranous, apex fimbriate; blades 10–50 × 0.5–1.5 cm, lanceolate-linear, oblong, scabrid on both surfaces, base cordate, apex acuminate. Panicles c. 60 cm long, pyramidal, with wooly lower nodes. Spikelets 5–12 mm long, linear-lanceolate. Rachilla densely wooly. Glume unequal. Lower glume 2–4 mm long, oblong-lanceolate, boat shaped, 3-nerved, chartaceous, base narrowly truncate, apex acute-acuminate. Upper glume 5–7 mm long, similar to the lower glume. Florets about 6, bisexual, similar, lowest floret male. Lowest lemma 8–10 mm long, neuter. Fertile lemma 10–12 mm long, linear-lanceolate, chartaceous, 3-nerved, apex acuminate and continued as a straight awn. Palea 3–4 mm long, linear-lanceolate, chartaceous, hyaline, 2-nerved, 2-keeled, keels serrulate, apex acute and notched. Stamens 2–3. Ovary c. 0.4 mm long, oblong; style hyaline- brown; stigma plumose.

Fl. & Fr.: Sep.–Mar.

Distrib.: Commonly found gregariously growing near water sources, marshy habitats, and occasionally on field bunds.

Exsicc.: Adilabad District: Kunthala waterfalls, *GO & MSM* 5131 (SKU); Mahabubnagar District: Pochamaralu, *BRPR & CPB* 11470 (SKU); Nizamabad District: Laxmapur, *TP & BRPR* 6296 (SKU).

TRIBE: THYSANOLAENEAE

Thysanolaena Nees

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Thysanolaena latifolia (Roxb. ex Hornem.) Honda in J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 312. 1930. *Melica latifolia* Roxb. ex Hornem., Hort. Bot. Hafn.



Plate 42. *Phragmites karka* (Retz.) Trin. ex Steud.: A. Habitat; B. Closed view of inflorescence; C. A portion of the raceme; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea; I. Lodicules; J. Pistil.

Suppl. 117 (1819). *Thysanolaena maxima* (Roxb.) Kuntze, Revis. Gen. Pl. 2: 784. 1891; Bor, Grasses Burma, Ceylon, India & Pakistan 650. 1960; Pull., Fl. Telangana 3: 1183. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. *Agrostis maxima* Roxb., Fl. Ind. 1: 319. 1820.

Plate 43

Caespitose perennials; rhizomatous. Culms about 3 m high, erect, reed like. Leaves cauline; sheaths terete, pubescent, margins ciliate; ligules c. 1.5



Plate 43. *Thysanolaena latifolia* (Roxb. ex Hornem.) Honda: A. Habit; B. Inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Palea.

mm long, membranous, truncate; blades 20–45 × 2–4 cm, lanceolate, tessellate veined, glaucous below, base subcordate-semiamplexicaul, apex acuminate. Panicle 20–60 × c. 10 cm, effuse, drooping, branched, rachis flexuous. Spikelets 1–2 mm long, paired or not, ovate-lanceolate or lanceolate. Lower glume 0.5–1 mm long, ovate, chartaceous, 1-nerved, apex acute. Upper glume c. 1 mm long, more or less similar to lower one. Florets usually 2 or 3; lower sterile, median one bisexual, upper male or sterile; rachilla prolonged beyond the base of second floret and often bearing rudimentary florets. Lower lemma 1–1.5 mm long,

lanceolate, membranous to chartaceous, 1–3-nerved, glabrous or with few setose hairs. Lower palea absent. Fertile lemma c. 1.5 mm long, lanceolate, chartaceous, 3-nerved, margins ciliate, hairs 0.5–0.8 mm long. Palea oblong-lanceolate, 0.5–1 mm long, membranous, hyaline, 2-nerved. Lodicules 2, apex truncate. Stamens 2 or 3; anthers c. 0.5 mm long. Stigma plumose, purplish. Caryopsis c. 0.5 mm long, elliptic.

Fl. & Fr.: Apr.–Dec.

Distrib.: Along forest margins and banks of streams and rivers.

Exsicc.: Adilabad District: Tiryani-Range, Chintalamadira-Beat, 19.09.2014, APS 4909 (BSID); Rangareddy District: Hyderabad, MVR 02210 (HY).

Note: Distinguishable by its reed like culms. The inflorescence is used for making brooms and leaves are of great fodder value.

SUB-FAMILY: CHLORIDOIDEAE

KEY TO THE TRIBES

- | | |
|--|-------------------|
| 1a. Lemmas 9-awned | ... PAPPOPHOREAE |
| 1b. Lemmas 1-5 awned | ... 2 |
| 2a. Glumes falling with spikelet | ... ERAGROSTIDEAE |
| 2b. Glumes persistent on inflorescence | ... CYNODONTEAE |

TRIBE: PAPPOPHOREAE

Enneapogon Desv. ex P. Beauv.

World: 26 spp.; India: 4 spp.; Telangana: 1 sp.

Enneapogon persicus Boiss., Diagn. Pl. Orient. ser. 1, 5: 71. 1844. *Enneapogon schimperianus* (Hochst. ex A. Rich.) Renvoize in Kew Bull. 22: 400. 1968; Bor, Grasses Burma, Ceylon, India & Pakistan 610. 1960; K.N. Reddy & C.S.Reddy, Fl. Telangana 710. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. **Plate 44**

Caespitose perennial. Culms 8–65 cm high, wiry, nodes bearded. Leaves basal and cauline; sheaths more or less keeled; ligules apex fringe of hairs; blades 2.5–17.5 × 0.2–0.4 cm, involute, stiff, glaucous, pilose. Panicle 2.5–9.5 × 1–2 cm, linear-lanceolate, contracted, spiciform. Spikelets 6–12 mm long, solitary, oblong, laterally compressed. Pedicelled fertile floret. Lower glume 4–10 mm long, lanceolate-ovate, membranous, pubescent 5–9-veined, apex acute. Upper glume 5–12 mm long, lanceolate, ovate, membranous, 5–9-veined, pubescent, apex acute. Fertile lemma 1.5–3 mm long, oblong, chartaceous, 9-veined, villous, apex dentate; 9-fid; 9-awned. Principal lemma awn 5–10 mm long, lateral lemma awns arising from lobes; lobes ciliate. Palea keels ciliolate. Apical sterile florets 2, dissimilar. First floret male, oblong, villous, clumpy, rudimentary. Lemmas 4–7 mm long, 9-awned, ciliate. Lodicules 2.

Fl. & Fr.: Jun.–Nov.

Distrib.: Occasionally distributed in Mahabubnagar.

Exsicc.: Mahabubnagar District: Mannanur, 16.06.2008, BSS & SKB 30719 (SKU).

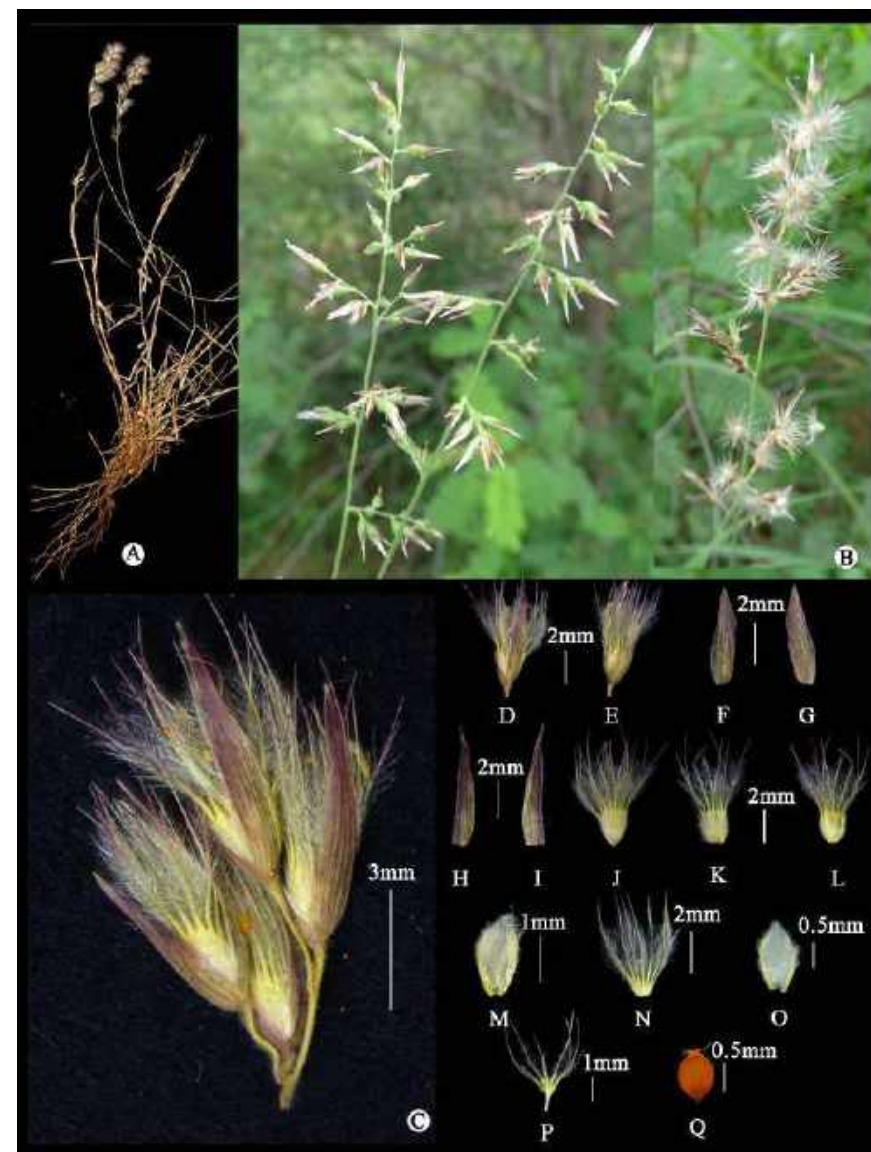


Plate 44. *Enneapogon persicus* Boiss.: A. Habit; B. Inflorescence; C. Closed view of inflorescence; D&E. Adaxial and abaxial view of spikelets; F&G. Abaxial and adaxial view of lower glume; H&I. Abaxial and adaxial view of upper glume; J. Floret; K&L. Abaxial and adaxial view of lemma (first floret); M. Palea; N. Lemma (second floret); O. Palea; P. Sterile floret; Q. Caryopsis.

TRIBE: ERAGROSTIDEAE

Key to the genera

- | | |
|--|----------------------|
| 1a. Spikelets sunk and appressed to tough rachis of raceme | ... <i>Oropetium</i> |
| 1b. Spikelets arranged on rachis of raceme | ... 2 |

- | | |
|---|---------------------------|
| 2a. Rachis terminating in a sharp point | ... Dactyloctenium |
| 2b. Rachis terminating in a spikelet | ... 3 |
| 3a. Inflorescence of solitary, digitate or racemes or globose cluster | ... 4 |
| 3b. Inflorescence a true panicle with definite central axis | ... 8 |
| 4a. Inflorescence a globose cluster of spikelets | ... Coelachyrum |
| 4b. Inflorescence not a globose cluster of spikelets | ... 5 |
| 5a. Inflorescence a solitary spike or raceme | ... 6 |
| 5b. Inflorescence digitate or subdigitate spikes or racemes | ... 7 |
| 6a. Lemma 2–6-lobed at apex | ... Tripogon |
| 6b. Lemma acute or retuse to emarginate at apex | ... Eragrostiella |
| 7a. Spikelets loosely arranged; glume aristate | ... Acrachne |
| 7b. Spikelets compactly arranged; glume acute to obtuse | ... Eleusine |
| 8a. Lemma ciliate on nerves at least in lower half | ... 9 |
| 8b. Lemma not ciliate on nerves | ... 11 |
| 9a. Spikelets subterete; lemma more or less rounded on back | ... Diplachne |
| 9b. Spikelets laterally compressed; lemma definitely keeled | ... 10 |
| 10a. Leaves flaccid and membranous | ... Trigonochloa |
| 10b. Leaves not as above | ... Leptochloa |
| 11a. Spikelet with single floret | ... Sporobolus |
| 11b. Spikelet with more than one floret | ... 12 |
| 12a. Glume aristate to awned; racemes reflexed when mature | ... Dinebra |
| 12b. Glume neither aristate nor awned | ... 13 |
| 13a. Spikelets sessile; disarticulating as a whole | ... Desmostachya |
| 13b. Spikelets pedicelled; disarticulating at various levels or not | ... Eragrostis |

***Acrachne* Wight & Arn. ex Chiov.**

World: c. 3 spp.; India: 3 spp.; Telangana: 1 sp.

Acrachne racemosa (B. Heyne ex Roem. & Schult.) Ohwi in Bull. Tokyo Sci. Mus. n. 18: 1. 1947; Bor, Grasses Burma, Ceylon, India & Pakistan 487. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 314. 2020. *Eleusine racemosa* B. Heyne ex Roem. & Schult., Syst. Veg. ed. 15, 2: 583. 1817. *Eleusine verticillata* Roxb., Fl. Ind. 1: 346. 1820; Hook.f., Fl. Brit. India 7: 295. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1840. 1934. **Plate 45**

Caespitose annuals. Culms 30–110 cm high, decumbent and geniculate, nodes dark, seldom rooting below. Leaves basal and cauline; sheaths 2–6 cm long, ribbed, keeled; ligules 1–2 mm long, apex fimbriate; blades 10–25 × 0.3–0.7 cm, linear-lanceolate, glabrous, margins ciliate, base rounded, apex acuminate. Panicle 4–18 cm long (without peduncle). Spikes 4–12, digitate-subverticillate; rachis flat-triquetrous, winged, serrulate. Spikelets 5–7 × 2–4 mm, oblong, base narrowly truncate, apex acute. Lower glume 1.5–3 × 0.2–0.4 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, apex acute-acuminate, aristate. Upper glume 1.6–2.3 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, 1-nerved, 1-keeled, margins infolded, apex acute-acuminate, aristate. Florets 6–20. Lemma 2.2–2.5 × c. 1 mm, broadly ovate, chartaceous, 3-nerved, keeled, apex acuminate, aristate, 2 or 3-lobed (usually 2-toothed). Palea 1.8–2 × 0.6–0.8 mm, ovate-lanceolate, chartaceous, 2-keeled, keels winged, margins infolded, apex acuminate-emarginate. Lodicules 2. Stamens 3. Ovary ovate-oblong. Caryopsis c. 0.8 × 0.6 mm, oblong-globose, coarsely rugose.



Plate 45. *Acrachne racemosa* (B. Heyne ex Roth) Ohwi: A. Habitat; B&C. Inflorescence; D&E. Single raceme; F. Spikelet; G. Lower glume; H. Upper glume; I. Lemma; J. Palea; K. Caryopses.

Fl. & Fr.: Mar.–Dec.

Distrib.: Floor of scrub jungles, roadsides.

Exsicc.: Nalgonda District: Yellapuram, BRA 005104 (BSID); Teetudu, BRA 00131 (BSID); Rangareddy District: PJTSAU, 16.10.2019, SNR 8927 (BSID); Hyderabad, MVR 02099 (HY).

Note: Fodder grass.

Coelachyrum Hochst. & Nees

World: c. 6 spp.; India: 1 sp.; Telangana: 1 sp.

Coelachyrum lagopoides (Burm. f.) Senaratna, Grasses Ceylon 79. 1956; Bor, Grasses Burma, Ceylon, India & Pakistan 488. 1960; Pull., Fl. Telangana 3: 1092. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 691. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 342. 2020. *Cynosurus lagopoides* Burm. f., Fl. Ind.: 29. 1768. *Eleusine brevifolia* (Willd.) R. Br. ex Hook.f., Fl. Brit. India 7: 294. 1896. *Dactylis brevifolia* Willd., Sp. Pl. ed. 4. 1: 410. 1798. *Eleusine lagopoides* (Burm. f.) Merr. in Philipp. J. Sci. 19: 339. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1840. 1934. *Coelachyropsis lagopoides* (Burm.f.) Bor in Ann. Naturhist. Mus. Wien 75: 25. 1972.

Plate 46

Caespitose annuals; stoloniferous. Culms 10–25 cm high, geniculate, ascending, leafy; nodes glabrous. Leaves basal and cauline; sheaths glabrous, compressed; ligules ciliate; blades 2–6 × 0.2–0.4 cm, oblong-lanceolate, plicate. Spike 10–15 mm across, globose, aggregated. Spikelets 4–6 mm long, elliptic-ovate, sessile, secund, Florets 4–10. Lower glume 2.5–3 mm long, ovate-oblong, membranous, aristate. Upper glume 4–5 mm long, ovate-oblong, keeled, aristate, 3–5-nerved. Lemma 4–6 mm long, ovate, 3-nerved, appressed villous in lower half, winged along keels, apex cuspidate. Palea c. 3 mm long, oblong-lanceolate, truncate, apex minutely 2-toothed, keeled, keels villous in lower half. Caryopsis 1.5–2 mm long, triquetrous, transversely rugose.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally in Mahabubnagar & Nalgonda.

Exsicc.: Mahabubnagar District: Mallapaya, 03.11.2015, SNR & LR 7320 (BSID); Nalgonda District: Teetedu, 10.10.2012, BRA 001306 (BSID); Warangal District: Raghunathapally, CSR 1067 (KU).

Note: Distinguishable by its globose inflorescence.

Dactyloctenium Willd.

World: 13 spp.; India: 4 spp.; Telangana: 3 spp.

Key to species

- | | |
|--|----------------------------|
| 1a. Annuals | ... 2 |
| 1b. Perennials | ... 3. <i>D. australe</i> |
| 2a. Stoloniferous grass; rachis tip extends up to 1.5 mm long | ... 2. <i>D. aegyptium</i> |
| 2b. Nonstoloniferous grass; rachis tip extends up to 4 mm long | ... 1. <i>D. aristatum</i> |

1. Dactyloctenium aegyptium (L.) Willd., Enum. Pl. 2: 1029. 1809 (as "*aegyptiacum*"); C.E.C.Fisch. in Gamble, Fl. Madras 1840. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 489. 1960; Pull., Fl. Telangana 3: 1101. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 697. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 348. 2020. *Cynosurus aegyptius* L., Sp. Pl. 1: 72. 1753.

Plate 47(A-K)

Mat-forming or caespitose annual; stoloniferous. Culms 8–55 cm high, decumbent, geniculate, more or less ribbed, nodes scabrous, seldom rooting



Plate 46. *Coelachyrum lagopoides* (Burm.f.) Senaratna: A. Habitat; B. Inflorescence; C. Single raceme; D. Spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Palea; I. Stamens; J. Pistil.

below. Leaves cauline and basal, sheaths open, glabrous, keeled, margins sparsely hairy; ligules c. 0.6 mm long, membranous, hyaline, apex fimbriate; blades 2–20 × 0.1–0.5 cm, linear, oblong-lanceolate, sparsely pilose or glabrous, margins ciliate with bulbous based hairs, apex acuminate. Spikes 2–9, digitate, 1.5–6.5 cm long. Spikelets 2–4.5 mm long, ovate-oblong. Lower glume 2.5 × 0.9 mm, ovate-lanceolate, boat shaped, chartaceous, 1-nerved, 1-keeled, apex acute-acuminate, mucronate. Upper glume 1.5–2.8 × 1.3 mm, broadly ovate,

chartaceous, 1-nerved, 1-keeled, keels scabrid, base bent or curved, apex acute-emarginate, aristate. Florets 2–5, bisexual. Lemma 3–3.5 × 1–1.5 mm, narrowly ovate, 1-keeled, chartaceous, apex acute, arista 0.8–1 mm long. Palea 1–2.5 × 1.5 mm, ovate-lanceolate, chartaceous, 1-keeled, margins infolded, apex acute. Stamens 3. Ovary 0.4 mm long, globose-flask like. Caryopsis 0.5–1 mm long, obovate, strongly rugose.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state in sandy soils, paddy fields, wetlands and along roadsides.

Exsicc.: Adilabad District: Alampalle, *TP & PVP* 4171 (SKU), Indhanpalli-Range, Narlapur-Beat, *APS* 3916 (BSID); Khammam District: Ramana Gutta & Mamillagudem, *RR* 107993, 105934 (BSID); Mahabubnagar District: Mallapaya, *SNR & LR* 7321 (BSID); Venkatapuram Sivaru, 06.08.2019, *SNR* 8606, 8628 (BSID); Medak District: Medak, *RG* 104160 (BSID), Choutkoor, *TP & MSG* 11904 (SKU); Nalgonda District: Donyala, gollapally, *BRA* 005082, 001329 (BSID); Rangareddy District: Rajendranagar, Manasa hills, 24.08.2016, *SNR* 8501, 8541 (BSID), Borabanda- Hitech city, *VSK & KCS* 392 (BSID), Nagole-tattianaram, *PV & VSK* 295 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, *SNR* 8985 (BSID); 28.03.2021, *SNR* 012028 (BSID); Subedari, *RKP* 105239 (BSID), Thupakulagudem, *PVSK & NRR* 76974, 84010 (BSID).

Note: It can be identified by its stoloniferous habit.

2. *Dactyloctenium aristatum* Link, Hort. Berol. 1: 59. 1827; Bor, Grasses Burma, Ceylon, India & Pakistan 489. 1960; Pull., Fl. Telangana 3: 1103. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 348. 2020. **Plate 47(L-N)**

Mat-forming annual, non-stoloniferous. Culms 5–20 cm high, erect or geniculate; nodes dark, lower nodes rooting. Leaves basal and cauline; sheaths 1–3 cm long, glabrous, ribbed, margins membranous, apex bearded; ligules 2–4 mm long, membranous; blades 5–10 cm long, linear-lanceolate, pilose on both surfaces, margins tuberculate hairy, apex acuminate. Spikes 1 or 2, digitate, 1–2 cm long; rachis slender, axial bearded, extended beyond uppermost spikelet as sharply pointed c. 0.4 cm long structure. Spikelets c. 4 × 3 mm long, many, sessile, laterally compressed, 2-rowed on broadside rachis, spreading at right angles to rachis. Glume persistent, dissimilar, shorter than spikelets. Lower glume 2.5–2.7 × 1–1.2 mm, ovate-oblong, apex acute, 1-nerved, 1-keeled, keel scabrellate, winged. Upper glume 2.5–2.8 × 1.5–1.7 mm, ovate-oblong, membranous, keeled, apex obtuse, awned, geniculate, c. 2 mm long. Florets 3. Lower lemma c. 3.2 × 2.2 mm, broadly ovate-lanceolate, cuspidate, scabrellate dorsally. Upper lemma similar to lower lemma. Palea 2–3 × 0.8–1 mm, ovate, unequal, keeled, keel narrowly winged, finely ciliate along margins. Stamens 3. Ovary subglobose; stigmas plumose. Caryopsis 0.8–1 mm long, broadly obovate- elliptic, finely granular.

Fl. & Fr.: Nov.–Feb.



Plate 47. A–K *Dactyloctenium aegyptium* (L.) Willd.; A. Habitat; B–D. Inflorescence; E. Spikelets; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Pistil; K. Caryopsis. L–N. *Dactyloctenium aristatum* Link: L. Habit; M & N. Inflorescence.

Distrib.: Sandy seashores, usually associated with *Dactyloctenium aegyptium*.

Exsicc.: Mahabubnagar District: Koilsagar, 06.08.2019, *SNR* 8620 (BSID); Venkatapuram sivaru, 06.08.2019, *SNR* 8629 (BSID); Nalgonda District: Puttamgaudi & Gollapally, *BRA* 005037, 001332 (BSID); Rangareddy District: CU, *MSM* 15176 (SKU), ICFRE, Dhoolapally to Narsapur main road, *VSK & KCS* 219 (BSID).

Note: It can be easily recognizable by a dwarf or tiny habit and aristate at end of the rachis.

3. *Dactyloctenium australe* Steud., Syn. Pl. Glumac. 1(3): 212. 1854; Bor, Grasses Burma, Ceylon, India & Pakistan 489. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 400. 2020. **Plate 48**

Stoloniferous perennial; culms, 30–85 cm. high, slender, erect or geniculately ascending; nodes glabrous, rooting at lower nodes; internodes 10–15 cm long. Leaves mostly cauline; leaf sheaths 2–12 cm long, compressed, keeled, glabrous; ligule ciliate, 0.5–1.3 mm long; leaf blades linear-lanceolate, 5–35 × 0.5–1 cm, flat, base rounded-subcordate, bulbous based hairs along the margins, apex acuminate; abaxial midvein having bulbous based hairy. Inflorescence composed of 1–4 racemes. Spikelets 3–5 flowered, oblong-elliptic, back of the rachis keeled. Lower glume oblong, 1–2 × 0.5–0.8 mm, margins entire, apex, chartaceous, light pinkish in color, keeled; keel margin serrulate. Upper glume ovate-obovate, 1.5–2.3 × 0.5–1 mm, margin entire, apex rounded to truncate, chartaceous, keeled; keel extended into a stout awn, 2–2.8 mm long, antrorsely barbed, green in color. Lemmas broadly ovate, 2.5–3 × 2–3 mm, margin entire, apex acuminate, chartaceous, keeled; keel extended into a stout awn, 1–1.2 mm long, keel scabrid. Palea lanceolate-ovate, 2–2.8 × 0.5–0.8 mm, margins entire, apex acute, keeled; keel scabrid. Stamens 3, filaments 0.3–0.6 mm long, anthers c. 0.45 × 0.3 mm. Ovary ovate-oblong c. 0.55 × 0.3 mm.

Fl. & Frs.: Aug.–Oct.

Distrib.: Open grasslands, Maharashtra, Telangana.

Exsicc.: Rangareddy district, Shadnagar, 20.07.2020, SNR 008938 (BSID).

***Desmostachya* (Stapf) Stapf**

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Desmostachya bipinnata (L.) Stapf in Dyer, Fl. Cap. 7: 632. 1900; C.E.C.Fisch. in Gamble, Fl. Madras 1819. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 491. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 349. 2020. *Briza bipinnata* L., Syst. Nat. ed. 10.2: 875. 1759. *Eragrostis cynosuroides* (Retz.) P. Beauv., Ess. Agrostogr. 162. 1812; Hook.f., Fl. Brit. India 7: 324. 1896; Rang. & Tadul., Handb. S. Ind. Grasses: t. 226. 1921. *Poa cynosuroides* Retz., Observ. Bot. 4: 20. 1786. '*Darbha gaddi*' **Plate 49**

Caespitose perennial, rhizomes, elongated, scaly, flabellate. Culms 50–150 cm high, solid, erect, more or less ribbed, innovations intravaginal. Leaves basal and cauline; sheaths open, terete-keeled, glabrous, margins hairy; ligules c. 1 mm long, apex lacerate-ciliate; blades 25–53 × 0.4–0.7 cm, linear-lanceolate, flat or convolute, inrolled, coriaceous, ribbed, margins scabrous, apex acuminate-attenuate or pungent. Inflorescence 20–55 cm long, erect, terminal; racemes numerous on the central axis, 1.3–1.7 cm long; spikelets falling entire at maturity, 5–8 × c. 1.3 mm, oblong, laterally compressed, base truncate-acute, apex acute. Lower glume 0.8–1 × c. 0.6 mm, ovate, boat shaped, chartaceous, 1-nerved, keel serrulate, apex acute. Upper glume c. 1.2 × 0.6 mm, ovate, boat shaped, chartaceous, 1-nerved, keel serrulate, apex acute. Florets 9–15; brownish at maturity. Lemma 1–1.7 ×

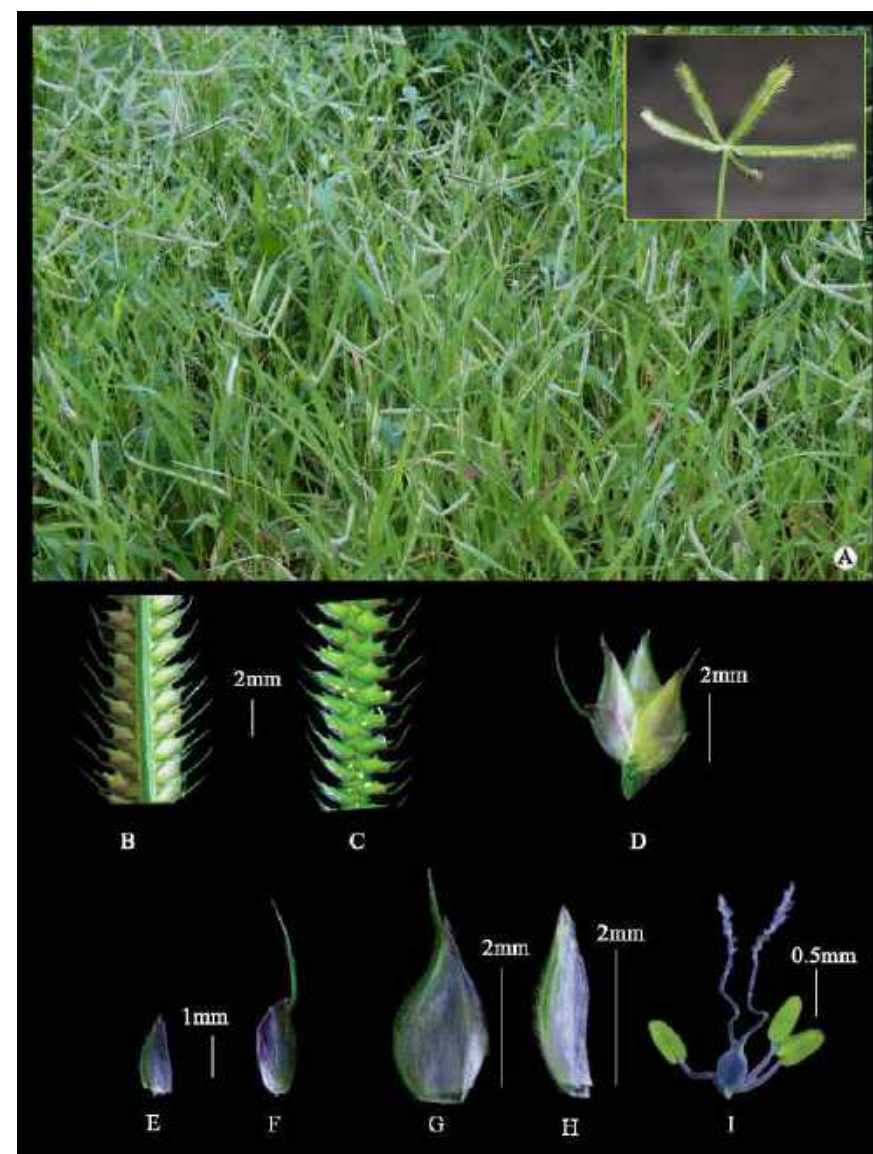


Plate 48. *Dactyloctenium australe* Steud.: A. Habitat (inset: inflorescence); B&C. Abaxial and adaxial view of inflorescence (closed view); D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea; I. Stamens with pistil.

0.5–0.8 mm, ovate-oblong, chartaceous, 1-keeled, keel serrulate, apex acute. Palea 1.6–1.7 × c. 0.6 mm, ovate-oblong, chartaceous, 2-nerved, 2-keeled, keel serrulate, apex acute. Lodicules 2. Stamens 3. Ovary c. 0.5 × 0.3 mm, elliptic; stigma plumose. Caryopsis 0.2–0.3 × 0.1–0.2 mm, obliquely ovoid.

Fl. & Fr.: Jul.–Oct.

Distrib.: In drier parts on the embankment of canals, roadsides, and garden edges.



Plate 49. *Desmostachya bipinnata* (L.) Stapf: A. Habitat; B. Inflorescence; C. Closed view of raceme; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea.

Exsicc.: Mulugu District: Laknavaram, 25.03.2021, SNR 8978 (BSID); Suryapet District: Nakrekal, 27.10.2019, SNR 8923 (BSID); Warangal District: Narasingapur, RKP 110858 (BSID).

Note: A fodder grass of limited value; good soil binder; used in Hindu rituals.

Dinebra Jacq.

World: c. 9 spp.; India: 1 sp., 1 var.; Telangana: 1 sp.

Dinebra retroflexa (Vahl) Panz., Denkschr. Konigl. Akad. Wiss. Munchen 1813: 270. 12. 1814; C.E.C.Fisch. in Gamble, Fl. Madras 1841. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 491. 1960; Pull., Fl. Telangana 3: 1114. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 708. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 358. 2020. *Cynosurus retroflexus* Vahl, Symb. Bot. 2: 20. 1791. *Dinebra arabica* Jacq., Fragm. Bot. 77. 98. t. 121. f. 1. 1807; Hook.f., Fl. Brit. India 7: 297. 1896.

Plate 50

Caespitose perennials. Culms 10–80 cm high, erect, geniculate; nodes glabrous. Leaves basal and cauline; sheaths 2–9 mm long, open, margins smooth-scabrid, glandular; ligules c. 2 mm long, membranous, apex lacerate; blades 5–25 × 0.2–0.6 cm, linear-lanceolate, glandular, apex acuminate. Racemes 5–20 cm long, oblong-cuneate, spiciform, pyramidal, deflexed. Spikelets 3–4 mm long, lanceolate, 2-seriate. Lower glume 3–3.5 mm long, lanceolate, glandular on keels, base narrowly acute-truncate, apex cuspidate. Upper glume 3.5–4 mm long, similar to lower glume. Florets 2–3; uppermost reduced to lemma. Lemma 2–2.5 mm long, narrowly ovate, chartaceous, 3-nerved, keeled, apex acute-acuminate or obtuse, emarginate, mucronate. Palea c. 1.5 mm long, linear-oblong, 2-keeled, keels finely ciliolate. Stamens 3. Ovary 0.1–5 mm long, oblong-globose; stigma plumose. Caryopsis 1–1.5 mm long, ellipsoid, trigonous.

Fl. & Fr.: Sep.–Jan.

Distrib.: Very common throughout the state as a weed in cultivated fields and along roadsides.

Exsicc.: Adilabad District: Pembli - Range, Tatiguda - Beat, APS 5460 (BSID); Mahabubnagar District: Achaaryapur - Koilkonda, Goarlapaadu Beat, SRS 109766, 109085 (BSID), Vatavaripalli, KI & NVN 18732, 18731 (SKU); Medak District: Medak, RG 104130 (BSID); Nizamabad District: Moosra forest, TP & BRPR 6062 (SKU); Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8711 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 8979 (BSID).

Note: Notable by its retroflexed arranged racemes.

Diplachne P. Beauv.

World: 2 spp.; India: 1sp.; Telangana: 1 sp.

(* Previously treated under '*Leptochloa* P. Beauv.')

Diplachne fusca (L.) P. Beauv. ex Roem. & Schult. in Syst. Veg., 2: 615. 1817; Hook.f., Fl. Brit. India 7: 329. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1829. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 492. 1960; Pull., Fl. Telangana 3: 1143. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 708. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 358. 2020. *Festuca fusca* L., Sp. Pl., ed. 2. 1: 109. 1762. *Leptochloa fusca* (L.) Kunth, Revis. Gramin. 1: 91. 1829.

Plate 51

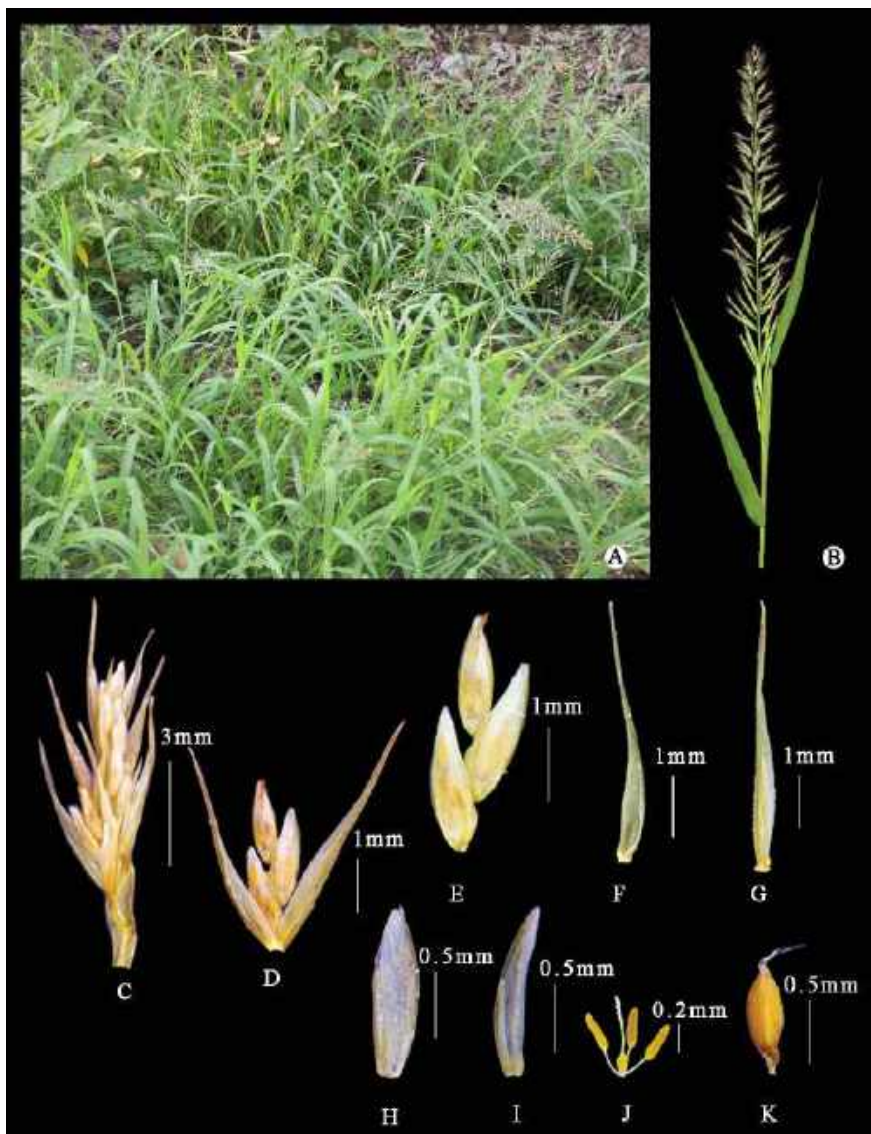


Plate 50. *Dinebra retroflexa* (Vahl) Panz.: A. Habitat; B. Inflorescence; C. Enlarged view raceme; D. Spikelet; E. Florets; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Stamens with pistil; K. Caryopsis.

Caespitose aquatic perennials. Culms 40–110 cm high, erect or geniculate; branched, lower nodes rooting. Leaves basal and cauline; sheaths 4–9 cm long, open, ribbed, keeled; ligules 4–5 mm long, membranous, apex acute; blades 10–35 × 0.1–0.5 cm, linear-lanceolate, convolute, margin scabrous, apex attenuate. Panicles c. 25 cm long. Spikelets 4–10 mm long, linear-oblong, elliptic, compressed. Lower glume 1–2.5 × 0.5 mm, lanceolate, chartaceous, 1-nerved, keeled, keel scabrous, apex acute. Upper glume 2–3.5 × 0.5–1 mm, oblong, chartaceous, 1-nerved, keeled, keel scabrid, apex mucronate. Florets 4–8, bisexual. Lemma



Plate 51. *Diplachne fusca* (L.) P.Beauv. ex Roem. & Schult.: A. Habitat; B. Inflorescence; C&D. Abaxial and adaxial view of spikelet; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I. Lemma; J. Palea; K. Lodicules; L. Stamens with pistil.

2–3.5 × 0.8–1 mm, elliptic-oblong, chartaceous, 3-nerved, villous, apex 3-lobed. Palea 3–3.5 × 0.3–0.8 mm, elliptic-oblong, chartaceous, hyaline, 2-nerved, 2-keeled, keel scabrid, apex acute-truncate. Lodicules 2. Stamens 2. Ovary oblong. Caryopsis 0.5–1 × 0.2–3 mm, oblong-elliptic.

Fl. & Fr.: Sep.-Feb.

Distrib.: Occasional in Nalgonda, Suryapet and Rangareddy. Fodder grass.

Exsicc.: Nalgonda District: Teetedu, BRA 001308 (BSID); Rangareddy District: Hyderabad, MVR 02143 (HY).

Eleusine Gaertn.

World: c. 10 spp.; India: 3 spp.; Telangana: 2 spp.

Key to the species

- 1a. Spikes stout, incurved; caryopsis globose ... 1. *E. coracana*
1b. Spikes slender, straight; caryopsis trigonous ... 2. *E. indica*

1. *Eleusine coracana* (L.) Gaertn., Fruct. Sem. Pl. 1: 8. t. 1. f. 11. 1788; Hook.f., Fl. Brit. India 7: 294. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1839. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 492. 1960; Pull., Fl. Telangana 3: 1118. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 760. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 360. 2020. *Cynosurus coracanus* L., Syst. Nat. ed. 10.2: 875. 1759. '*Raagi*' **Plate 52(A)**

Caespitose annual. Culms 25–125 cm high, compressed; nodes dark and glabrous. Leaves basal and cauline; sheaths strongly keeled, bearded at mouth, compressed, keeled; ligules hairy; blades 5–60 × 0.1–1.0 cm, linear, distichous, margins serrulate, apex acuminate. Spikes 3–7; c. 10 cm long, digitate, incurved. Spikelets 5–7 mm long, ovate-oblong, second, apex acute. Lower glume 2–3 mm long, ovate-oblong, lanceolate, chartaceous, 3-nerved, 1-keeled; keel winged, scabrid. Upper glume 3–5 mm long, elliptic-ovate, 3–5-nerved, 1-keeled; keel winged, scabrid. Florets 3–6, imbricate. Lemma 2–4.5 mm long, broadly ovate-lanceolate, chartaceous, 3–5-nerved, 1-keeled, keel broadly winged, scabrid, apex acute. Palea 2–3 mm long, oblong-lanceolate, chartaceous, 2-nerved, 2-keeled, keels broadly winged, scabrid. Stamens 3. Ovary c. 0.4 mm long, obovate-oblong; stigma plumose. Caryopsis 1–2 mm long, orbicular-globose, rugulose.

Fl. & Fr.: Sep.–Mar.

Distrib.: Cultivated in Gadwal, Mahabubnagar, Nagarkarnool, Vikarabad & Wanaparthy.

Exsicc.: Warangal District: Regional Agricultural Research Station-Warangal, 28.03.2021, SNR 012025 (BSID).

Note: Noticeable by its stout and incurved spikes and globose caryopsis.

2. *Eleusine indica* (L.) Gaertn., Fruct. Sem. Pl. 1: 8. 1788; Hook.f., Fl. Brit. India 7: 293. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1839. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 493. 1960; Pull., Fl. Telangana 3: 1118. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 360. 2020. *Cynosurus indicus* L., Sp. Pl. 1: 72–73. 1753. **Plate 52(B-L)**

Caespitose annuals. Culms about 80 cm high, erect, geniculate, subterete; nodes glabrous. Leaves mostly basal; sheaths 2–8 cm long, keeled, margins hairy; ligules 0.2–0.5 mm long, membranous, hyaline; blades 2–45 × 0.1–0.6 cm, linear-lanceolate, flat, margins serrulate, apex acute-acuminate. Spikes 1–10; 2–15 cm



Plate 52. A. *Eleusine coracana* (L.) Gaertn. (inset: inflorescence); B–L. *Eleusine indica* (L.) Gaertn. B. Habitat (inflorescence); C. Closed view of raceme; D. Spikelet; E. Floret; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Stamens; K. Pistil; L. Caryopses.

long, digitate or subdigitate. Spikelets 2–4.5 mm long, ovate-oblong, sessile, second, 2-seriate. Lower glume 1–4 × 0.2–0.6 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, keel winged, scabrid, apex acute-obtuse. Upper glume 2.5–3.5 mm long, oblong or ovate-lanceolate, chartaceous, 3–5-nerved, 1-keeled, keel winged, scabrid, apex acute. Florets 3–6, bisexual. Lower lemma 2–4 mm long, ovate-oblong, 3-nerved. Palea 2–2.5 mm long, elliptic, chartaceous, hyaline, keeled, 2-nerved, 2-keeled, keel serrulate, margins infolded, base truncate, apex acute. Upper florets reduced size gradually. Lodicules 2. Stamens 3. Ovary 0.6 mm

long, stigma plumose. Caryopsis 0.5–1.5 mm long, oblong, trigonous.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state in wet localities, gardens and along roadsides and as a weed in cultivated fields.

Exsicc.: Adilabad District: Nirmal near tank, *MHR* 14405 (SKU), Allampalle, *PVP & TP* 4172 (SKU), Tiryani RF, *PVP* 9812 (SKU), Along bank of the pocharam water fall, *GO & DAM* 5053 (SKU); Mahabubnagar District: Mayuri Eco-Park, 09.08.2019, *SNR* 8660 (BSID); Medak District: Ponnala, *CBP* 11367 (SKU); Nizamabad District: Moosra forest nursery, *TP & BRPR* 6081 (SKU); Rangareddy District: Lingampalli, *CU, MSM* 10732, 15186 (SKU); Rajendra Nagar-Manasa Hills, 24.08.2016, *SNR* 8511 (BSID)!; Hyderabad, *MVR* 02147 (HY); Warangal District: Seethrampuram-Parakala, 29.03.2021, *SNR* 012030 (BSID).

Note: Distinguishable by its slender, straight spikes and trigonous caryopsis.

Eragrostiella Bor

World: c. 6 spp.; India: 4 spp., 1 var.; Telangana: 2 spp.

Key to the species

- 1a. Leaf blades reduced; keel of palea narrowly winged ... 2. *E. brachyphylla*
 1b. Leaf blades well developed; keel of palea broadly or evenly winged ... 1. *E. bifaria*

1. *Eragrostiella bifaria* (Vahl) Bor, Indian Forester 66: 270. 1940 & Grasses Burma, Ceylon, India & Pakistan 494. 1960; Pull., Fl. Telangana 3: 1119. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana: 711. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 364. 2020. *Poa bifaria* Vahl, Symb. Bot. 2: 19. 1791. *Eragrostis bifaria* (Vahl) Steud., Syn. Pl. Glumac. 1: 264. 1854; Hook.f., Fl. Brit. India 7: 352. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1828. 1934. '*Nooli Gaddi*'

Key to the varieties

- 1a. Culms 1 or 2-noded; leaves basal; keels of palea broadly winged ... 1.1. var. *bifaria*
 1b. Culms 2–4-noded; leaves cauline; keels of palea narrowly winged ... 1.2. var. *walkeri*

1.1. var. *bifaria*

Plate 53(A-G)

Caespitose perennial. Culms 20–60 cm high, erect, terete; nodes 1 or 2, glabrous. Leaves mostly basal; sheaths 2–10 cm long, glabrous, compressed, keeled; ligules ciliate; blades 5–12 × 0.5–1 cm, filiform, convolute, rolled, puberulous above, apex acuminate. Spikes 10–30 cm long. Spikelets 0.5–2 cm long, elliptic; florets 5–20, laterally compressed, olive green or grey. Lower glumes 2–2.5 × 0.5–0.8 mm, ovate-elliptic, 1-nerved, 1-keeled, puberulous on keels, apex acute. Upper glumes 1.5–2.8 × 0.4–0.8 mm, ovate-elliptic, membranous, 1-nerved, 1-keeled, apex obtuse. Lemma 3–3.5 × 1–1.5 mm, broadly ovate, membranous, 3-nerved, margins puberulous, apex acuminate. Palea 1.5–2.5 × 0.6–0.8 mm, oblong, 2-keeled, apex obtuse; keels broadly winged, 0.2–0.4 mm wide, ciliate. Stamens 3, 0.5–0.8 mm long. Caryopsis 0.5–0.7 mm long, broadly ovoid-ellipsoid.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in fallow lands and wet rocky surfaces.

Exsicc.: Adilabad District: Ankusapuram, *GO* 4335 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 06.01.2019, *SNR* 9629 (BSID); Mahabubnagar District: Amadabakula-Kothakota, 07.08.2019, *SNR* 8633 (BSID); Appapur, *AMSR* 25688 (SKU); Mayur Eco-Park, 09.08.2019, *SNR* 8662; Medak District: Nagulabanda, *CPB* 11360 (SKU); Nagarkurnool District: Kollapur-Choutabetla, 08.08.2019, *SNR* 8648 (BSID); Nizamabad District: Arsapally, *BRPR & KH* 6487 (SKU)!; Rangareddy District: Hyderabad, *MVR* 02148 (HY); Manasahills-Rejendranagar, 24.08.2016, *SNR* 8552, 8537 (BSID); 8740, *SNR* 8740 (BSID).

Note: It can be identifiable by its basal leaves which reach up to the base of the inflorescence.

1.2. var. *walkeri* (Stapf) Lazarides, Contr. Herb. Austral. 22: 7. 1976; Pull., Fl. Telangana 3: 1120. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 364. 2020. *Eragrostis walkeri* Stapf, Fl. Ceylon 5: 298. 1900. *Eragrostiella walkeri* (Stapf) Bor, Indian Forester 66: 270. 1940 & Grasses Burma, Ceylon, India & Pakistan 495. 1960.

Caespitose perennial. Culms 35–65 cm high, erect, terete; nodes 2–4, glabrous. Leaves mostly basal; sheaths 2–10 cm long, glabrous, compressed, keeled; ligules ciliate; blades 10–35 × 0.5–1 cm, filiform, convolute, rolled, puberulous above, apex acuminate. Spikes 10–30 cm long. Spikelets 0.5–2 cm long, elliptic. Florets 5–20, laterally compressed, olive green or grey. Lower glumes 2–2.5 × 0.5–0.8 mm, ovate-elliptic, 1-nerved, 1-keeled, puberulous on keels, apex acute. Upper glumes 1.5–2.8 × 0.4–0.8 mm, ovate-elliptic, membranous, 1-nerved, 1-keeled, apex obtuse. Lemma 3–3.5 × 1–1.5 mm, broadly ovate, membranous, 3-nerved, margins puberulous, apex acuminate. Palea 1.5–2.5 × 0.6–0.8 mm, oblong, 2-keeled, keels of palea narrowly and evenly winged from base to apex, apex obtuse. Stamens 3, 0.5–0.8 mm long. Caryopsis 0.5–0.7 mm long, broadly ovoid-ellipsoid.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Mahabubnagar District: Amrabad, *BSS & SKB* 32210 (SKU); Rangareddy District: Manasa hills-Rajendranagar, 10.10.2019, *SNR* 8741 (BSID).

Notes: Closely allied to *Eragrostiella bifaria* but differs in basal leaves reaching up to middle or as long as inflorescence.

2. *Eragrostiella brachyphylla* (Stapf) Bor, Indian Forester 66: 270. 1940 & Grasses Burma, Ceylon, India & Pakistan: 494. 1960; Pull., Fl. Telangana 3: 1120. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 364. 2020. *Eragrostis brachyphylla* Stapf in Hook.f., Fl. Brit. India 7: 327. 1896; C.E.C.Fisch., in Gamble, Fl. Madras 1828. 1934. **Plate 53(H-K)**

Caespitose perennial. Culms 40–55 cm high, erect, terete; nodes 1 or 2,

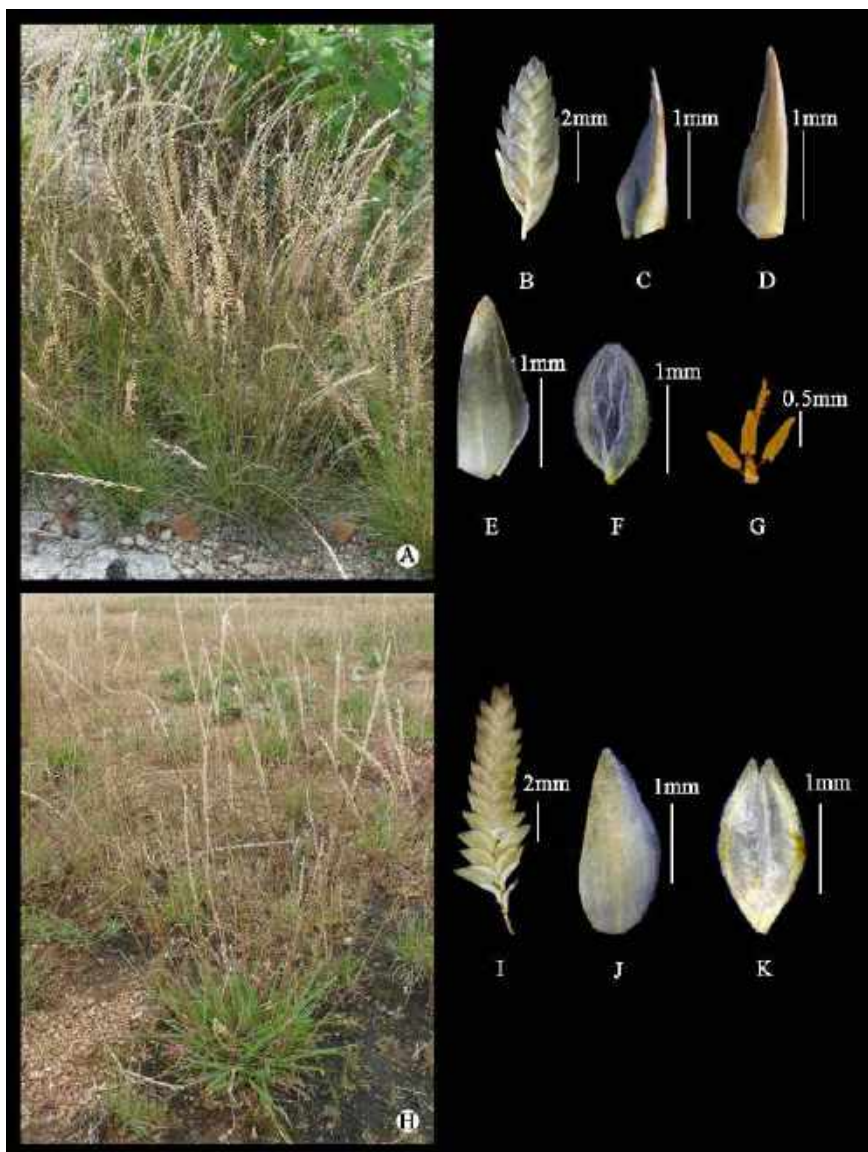


Plate 53. A–G. *Eragrostiella bifaria* (Vahl) Bor: A. Habitat; B. Spikelet; C. Lower glume; D. Upper glume; E. Lemma; F. Palea; G. Stamens with pistil; H–K. *Eragrostiella brachyphylla* (Stapf) Bor: H. Habitat; J. Lemma; K. Palea.

glabrous. Leaves mostly basal; sheaths 3–7 cm long, more or less ribbed; ligules c. 0.5 mm long, apex fimbriate; blades 2–7 × 0.1–0.2 cm, oblong-linear, flat, glabrous, incurved, apex sub-acute or obtuse. Racemes 10–25 cm long, spiciform, secund, compactly arranged, alternate-one-sided. Spikelets 3–12 mm long, linear-oblong or ovate, 2-seriate. Lower glumes 2–2.5 × 0.2–0.6 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, apex acute-acuminate. Upper glumes 2–2.5 × 0.2–0.7 mm, chartaceous, 1-nerved, 1-keeled or rounded, apex acute-retuse. Lemma c. 2 mm

long, broadly ovate, chartaceous, 3-nerved, 1-keeled, margins puberulous, apex acute-retuse. Palea 1.8–2 mm long, ovate, chartaceous, hyaline, 2-nerved, 2-keeled, keels narrowly winged, margins ciliate, apex acute-obtuse. Stamens 3. Ovary c. 0.4 mm long. Caryopsis 0.2–0.7 × 0.1–0.3 mm, globose-trigonus.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Vemapalli, GO 4771 (SKU); Ankusapuram, GO & PVP 4335 (SKU); Nizamabad District: Kamareddy, BRPR 9279 (SKU); Rangareddy District: Ananthagiri RF, MSM 11076 (SKU); Rangareddy District: Hyderabad, MVR 02149 (HY), Manasa hills-Rajendranagar, 10.10.2019, SNR 8740 (BSID).

Note: It can be differentiated from *E. bifaria* by its reduced leaf blades and narrowly winged palea.

Eragrostis Wolf

World: 422 spp.; India: 42 spp., 5 var.; Telangana: 21 spp.

Key to the species

- | | | |
|------|--|-------------------------------|
| 1a. | Florets disarticulating from above downwards | ... 2 |
| 1b. | Florets disarticulating from below upwards | ... 9 |
| 2a. | Ligules membranous; palea nerves not reach up to apex | ...10. <i>E. japonica</i> |
| 2b. | Ligules a fringe of cilia; palea nerves reach up to apex | ... 3 |
| 3a. | Lemma as well as palea margins throughout ciliate | ... 4 |
| 3b. | Lemma as well as palea margins not ciliate | ... 5 |
| 4a. | Panicle cylindric; stamens 2 | ...7. <i>E. ciliata</i> |
| 4b. | Panicle not cylindric; stamens 3 | ...8. <i>E. coarctata</i> |
| 5a. | Panicle spreading, branches capillary; palea keels scaberulous | ...2. <i>E. aspera</i> |
| 5b. | Panicle spiciform, branches stiff; palea keels ciliate | ... 6 |
| 6a. | Cilia on keels of palea stiff and prominently bulbous based | ... 7 |
| 6b. | Cilia on keels of palea smooth and not bulbous based | ... 8 |
| 7a. | Lemma scabrid; stamens 3 | ...1. <i>E. amabilis</i> |
| 7b. | Lemma with 2–3 long cilia on mid nerve; stamens 2 | ...6. <i>E. ciliaris</i> |
| 8a. | Panicle spiciform or compact, not viscous | ...17. <i>E. riparia</i> |
| 8b. | Panicle open or narrowly spiciform, viscous | ...21. <i>E. viscosa</i> |
| 9a. | Culms glandular | ... 10 |
| 9b. | Culms non-glandular | ... 16 |
| 10a. | Panicle branches capillary; spikelets less than 1 mm wide | ... 11 |
| 10b. | Panicle branches more or less stiff; spikelets more than 1 mm wide | ... 12 |
| 11a. | Panicle lower branches whorled; glumes nerveless or nerve obscure... | 16. <i>E. pilosa</i> |
| 11b. | Panicle lower nodes alternate; glumes distinctly 1-nerved | ...15. <i>E. papposa</i> |
| 12a. | Leaf margins glandular | ... 13 |
| 12b. | Leaf margins eglandular | ... 14 |
| 13a. | Spikelets crowded on panicle branches; lemmas up to 4 mm long | ...5. <i>E. cilianensis</i> |
| 13b. | Panicle spreaded on panicle branches; lemmas < 2.5 mm long | ...12. <i>E. minor</i> |
| 14a. | Spikelets margin serrate in appearance; caryopses ventrally grooved, reddish | ...18. <i>E. tenuifolia</i> |
| 14b. | Spikelets margin not serrate in appearance; caryopses ellipsoid to oblong, brownish | ... 15 |
| 15a. | Plant not glaucous; primary branches spiculate up to base; caryopsis less than 7 mm long | ...13. <i>E. nilgiriensis</i> |

- 15b. Plant glaucous; primary branches not spiculate up to base; caryopsis up to 1 mm long ...4. *E. barrelieri*
 16a. Rachilla visible between florets; spikelets less than 1.5 mm wide ...9. *E. gangetica*
 16b. Rachilla not visible between florets; spikelets > 1.5 mm wide ... 17
 17a. Palea narrowly winged on keels; stamens 2 ...20. *E. unioides*
 17b. Palea not winged on keels; stamens 2 or 3 ... 18
 18a. Florets up to 60 in number; lemma obtuse to subacute ... 19. *E. tremula*
 18b. Florets up to 36 in number; lemma acute at apex ... 19
 19a. Panicle open; caryopsis oblong ... 20
 19b. Panicle contracted; caryopsis globose ...14. *E. nutans*
 20a. Caryopsis ventrally grooved, c. 0.5 mm long, dark reddish ...11. *E. macilentia*
 20b. Caryopsis ellipsoid to oblong, c. 0.7 mm long, brownish ...3. *E. atrovirens*

1. *Eragrostis amabilis* (L.) Wight & Arn., Cat. Indian Pl.: 105, no. 1777. 1834; Stapf in Hook.f., Fl. Brit. India 7: 315. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 513. 1960; Pull., Fl. Telangana 3: 1129. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana: 717. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 364. 2020. *Poa amabilis* L., Sp. Pl. 1: 68. 1753. *Eragrostis tenella* (L.) P. Beauv. ex Roem. & Schult., Syst. veg., (ed. 15) 2: 576. 1817. '*Chinna Garika Gaddi*' **Plate 54(A-I)**

Caespitose annual. Culms 15–30 cm high, erect or geniculate; nodes dark. Leaves basal and cauline; sheaths terete, 1–5.5 cm long, glabrous, mouth bearded; ligules a line of short hairs; blades 3–8 × 0.2–0.4 cm, linear-lanceolate, ovate, glabrous, base rounded, apex acuminate. Panicle effuse. Spikelets 1.5–2.5 × 0.5–1.2 mm, broadly ovate-oblong. Lower glume 0.5–1 × 0.2–0.3, ovate, chartaceous, 1-keeled, keel scabrous, apex acute. Upper glume 1–1.5 × 0.3–0.5 mm, ovate, chartaceous, 1-nerved, 1-keeled, keel scabrous, apex acute. Florets 3–9, bisexual, imbricate, disarticulation from above downwards. Lemma 1–1.5 × 0.4–0.5 mm, broadly obovate, chartaceous, 3-nerved, 2-keeled, keel scabrid, apex acute. Palea 0.5–1 mm long, obovate-elliptic, chartaceous, 2-nerved, 2-keeled, keel scabrid, apex rounded-obtuse. Lodicules 2. Stamens 3. Caryopsis 0.4 × 0.3 mm, elliptic.

Fl. & Fr.: Jun.–Dec.

Distrib.: Common throughout the state. Fodder grass.

Exsicc.: Rangareddy District: Hyderabad, MVR 02158 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8542, 8535 (BSID).

2. *Eragrostis aspera* (Jacq.) Nees, Fl. Afr. Austr. 408. 1841; Stapf in Hook.f., Fl. Brit. India 7: 314. 1896; C.E.C.Fisch. in Gamble. Fl. Pres. Madras 1825. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 501. 1960; Pull., Fl. Telangana 3: 1121. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana: 713. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 365. 2020. *Poa aspera* Jacq., Hort. Bot. Vindob. 3: 32. 1776.

Caespitose annuals. Culms 40–100 cm high, erect, more or less ribbed, branched; nodes brownish. Leaves basal and cauline; sheaths 6–9 cm long, compressed, glabrous, margins ciliate, villous at mouth; ligules hairy; blades 10–35 × 0.4–0.7 cm, linear-lanceolate, base rounded, apex attenuate. Panicles 20–50 cm long, broadly ovate, thyriform, verticillate, rachis scabrid, peduncle enclosed by sheaths. Spikelets 4–10 mm long, linear-oblong. Lower glume 1–1.2 mm long, ovate-

lanceolate, chartaceous, hyaline, 1-nerved, 1-keeled, keel serrulate, apex acute-mucronulate. Upper glume 1–1.8 × 0.2–0.5 mm, ovate-lanceolate, chartaceous, hyaline, 1-nerved, 1-keeled, keel serrulate, apex acute-bifid, mucronulate. Florets 5–20, bisexual, fairly imbricate; rachilla fragile, disarticulating from above downwards. Lemma 1–1.5 × 0.2–0.5 mm, ovate-oblong chartaceous, hyaline, 3-nerved, apex emarginate-truncate. Palea 1.5 × 0.2–0.4 mm, obovate-oblong, chartaceous, hyaline, 2-nerved, 2-keeled, keel serrulate, apex rounded. Lodicules 2. Stamens 3. Caryopsis 0.2–0.5 × 0.2 mm, ovate-elliptic, brownish.

Fl. & Fr.: Almost throughout the year.

Distrib.: Gregariously growing grass in wet places and in sandy soils. Fodder grass.

Exsicc.: Rangareddy District: Hyderabad, MVR 02150 (HY).

3. *Eragrostis atrovirens* (Desf.) Trin. ex Steud., Nom. Bot. ed. 2. 1: 562. 1840; Bor, Grasses Burma, Ceylon, India & Pakistan 503. 1960; Pull., Fl. Telangana 3: 1122. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 713. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 365. 2020. *Poa atrovirens* Desf., Fl. Atlant. 1: 73. 1798. **Plate 54(J-R)**

Caespitose perennials. Culms tufted, 30–100 cm high, terete, geniculate, more or less ribbed, glaucous, eglandular; nodes brownish. Leaves basal and cauline; sheaths 5–18 cm long, slightly ribbed, keeled, mouth bearded; ligules 0.3 mm long, membranous; blades 3–25 × 0.5 cm, linear-lanceolate, convolute or flat. Panicles 8–25 × 3–8 cm, effuse, branched. Spikelets 1.5–2 mm long, linear-oblong. Lower glume 1–2 mm long, ovate-lanceolate, chartaceous, 1-nerved, keeled, apex acute. Upper glume c. 2.5 mm long, ovate-lanceolate, chartaceous, 1-nerved, keeled, apex acute. Florets 5–40, linear, grey coloured, bisexual, imbricate, disarticulating from below upwards; rachilla persistent. Lemma 1.5–2.25 mm long, broadly ovate, chartaceous, 3-nerved, 1-keeled, apex acute. Palea 1–2 mm long, elliptic, chartaceous, hyaline, 2-nerved, 2-keeled, scabrid on keels. Stamens 3. Ovary c. 0.5 mm long. Caryopsis 0.8 mm long, elliptic-oblong, ellipsoid.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state. Fodder grass and thatching.

Exsicc.: Adilabad District: Jam cheruvulu, MHR 14586 (SKU); Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 8581 (BSID); Medak District: Narsapur tank, TP & MSG 12011 (SKU); Mulugu District: Eturunagaram, 24.03.2021, SNR 8959 (BSID); Nizamabad District: Sivarnapally river, BRPR & GO 9077 (SKU); Rangareddy District: Hyderabad, MVR 02151 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8550, 8669 (BSID).

4. *Eragrostis barrelieri* Daveau, J. Bot. (Morot) 8: 289. 1894; Bor, Grasses Burma, Ceylon, India & Pakistan 503. 1960. *Eragrostis pooides* var. *barrelieri* (Daveau) Fiori in A.Fiori & al., Fl. Anal. Italia 1: 82. 1908. *Eragrostis vulgaris* subsp. *barrelieri* (Daveau) Douin in G.E.M.Bonnier, Fl. Ill. France 12: 32. 1933.

Annuals or shortly perennials. Culms 10–45 cm high, erect to ascending,



Plate 54. A–I. *Eragrostis amabilis* (L.) Wight & Arn.: A. Habit; B. Inflorescence; C. Enlarged view of inflorescence; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea; I. Caryopses; J–R. *Eragrostis atrovirens* (Desf.) Trin. ex Steud.: J. Habitat (Inset: Inflorescence); K. Spikelets; L. Lower glume; M. Upper glume; N. Lemma; O. Palea; P. Stamens; Q. Pistil; R. Caryopsis.

tufted, branched at the base; nodes brownish without or with ring like glandular pits below the nodes. Leaves mostly basal; sheaths glabrous, eglandular; ligule a fringe of hairs; blades 5–11 × 1.5–3 cm, linear-lanceolate, flat or involute, eglandular along the margin, apex acuminate. Panicle 6–22 × 7–8 cm, open, racemes alternate, peduncle 4–18 cm long. Racemes 2–4 cm long, 5–15 spikelets per raceme. Spikelets 5.5–7 × 0.6–1.2 mm, linear, solitary pedicelled, laterally compressed; pedicels

1–2 mm long, with a glandular band. Glumes dissimilar, deciduous. Lower glume 1–1.3 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, greenish with purple tinge, 1-keeled, 1-nerved, apex acute to acuminate. Upper glume 1–1.6 × 0.6–1 mm, ovate-lanceolate, chartaceous, 1-keeled, serrulate on keel, apex acute. Florets up to 16, disarticulating from below upwards, closely arranged on rachilla. Lemma 1.8–2 × 0.8–1.4 mm, oblong, membranaceous, 3-nerved, mid-nerve prominent, keel scabrid above middle, apex acute to obtuse. Palea 1.3–1.8 × 0.3–0.6 mm, persistent, oblanceolate, prominently 2-nerved, 2-keeled; keels scabrous, apex obtuse-acute. Lodicules 2. Stamens 3. Ovary ovoid. Caryopsis 0.4–0.8 × 0.1–0.4 mm, ellipsoid..

Fl. & Fr.: Oct.– Dec.

Distrib.: Occasionally grows along gravelly roadsides and agriculture fields.

Exsicc.: Nirmal District: Bhainsa Mandal, near Bondrat village, 14.11.2021, VJ & JS 0435 (BSID).

Note: It is easily distinguished by its conspicuous glandular ring below the upper nodes and pedicels.

5. *Eragrostis cilianensis* (All.) Vignolo ex Lutati, *Malpighia* 18: 386. 1904; C.E.C.Fisch. in Gamble, *Fl. Madras* 1827. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 503. 1960; Pull., *Fl. Telangana* 3: 1122. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 713. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 365. 2020. *Poa cilianensis* All., *Fl. Pedem.* 2: 246, t. 91, f. 2. 1785. *Eragrostis major* Host, *Icon. Descr. Gram. Austriac.* 4: 14. t. 24. 1809; Stapf in Hook.f., *Fl. Brit. India* 7: 320. 1896.

Caespitose annuals. Culms about 55 cm high, erect or geniculate; nodes dark. Leaves basal and cauline; sheaths open, more or less ribbed, glandular, mouth bearded; ligules c. 0.4 mm long, rim of hairs; blades 3–19 × 0.2–1 cm, linear-lanceolate, flat-convolute, margins serrulate, glandular, base cordate, apex acuminate. Panicles 10–18 × 3–5 cm, broadly ovate, lax. Spikelets 1–2 cm long, broadly ovate-oblong, glandular. Lower glume 1.5–2 × 0.4–0.6 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keel serrulate, apex acute to acuminate. Upper glume 1.5–2 × 0.4–0.8 mm, lanceolate-ovate, chartaceous, greenish, 3-nerved, 1-keeled, scabrid on the keel, apex acute-acuminate. Florets 4–40, bisexual, imbricate, disarticulating from below upwards, olive green-grey, often purplish tinged. Lemma 1.5–2.5 × c. 1 mm, broadly ovate-lanceolate, chartaceous, 3-nerved, 1-keel, glandular on keels, 3-nerved, apex acuminate-mucronate, retuse. Palea 1.5–2 mm long, elliptic-lanceolate, chartaceous, 2-nerved, ciliate along keels, margins infolded, apex retuse-acute. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis 0.4 mm long, orbicular.

Fl. & Fr.: Jan.– Sep.

Distrib.: Occasional in cultivated fields, on hill slopes and in waste lands. Fodder grass.

Exsicc.: Adilabad District: Sattennapalle, TP & PVP 4152 (SKU); Rangareddy District: Hyderabad, MVR 02152 (HY); Warangal District: Seetharampuram-Parakala, 29.03.2021, SNR 012029 (BSID).

Note: Distinguishable by its glandular nature on the margins of leaf blades and pedicels.

6. *Eragrostis ciliaris* (L.) R. Br. in Turkey, Narr. Exped. Zaire 478. 1818; Hook.f., Fl. Brit. India 7: 314. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1825. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 506. 1960; Pull., Fl. Telangana 3: 1124. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 365. 2020. *Poa ciliaris* L., Syst. Nat. ed. 10. 2: 875. 1759.

Caespitose annuals. Culms 8–55 cm high, erect, geniculate; nodes dark. Leaves generally cauline; sheaths 1–1.5 cm long, glabrous, open, compressed, ribbed, mouth bearded; ligules c. 2 mm long, ciliate; blades 3–5 × 0.1–0.4 cm, linear-lanceolate, oblong, flat-involute, margins incurved, apex acute-acuminate. Panicles 2–9 cm long, wooly, spiciform, glandular. Spikelets c. 5 mm long, oblong, glandular. Lower glume 0.2–0.4 × 0.1–0.2 mm, lanceolate-oblong, boat shaped, chartaceous, yellowish-green or purplish, 1-nerved, 1-keeled, keel scabrid, apex acute-acuminate. Upper glume 0.4–0.7 × 0.2 mm, oblong-lanceolate, boat shaped, chartaceous, yellowish-green or purplish, 1-nerved, 1-keeled, keel scabrid, apex acute-acuminate. Florets 5–12, bisexual, imbricate, greenish with pink tinge, disarticulating from above downwards. Lemma 1–1.5 mm long, lanceolate or oblong-ovate, boat shaped, chartaceous, 3-nerved, 1-keeled, keels scabrid, base with 2–3 long ciliate, apex acute-mucronate. Palea c. 1.5 mm long, elliptic-oblong, chartaceous, 2-nerved, 2-keeled, keels bulbous based ciliate, 0.4–0.8 mm long, apex acute, obtuse-retuse. Stamens 2. Ovary ovate-oblong. Caryopsis 0.5 mm long, ovoid-ellipsoid or oblong.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state in wet places and in river beds in sandy soils.

Exsicc.: Nalgonda District: Peddagattu (Peddavra), BRA 5053 (BSID).

7. *Eragrostis ciliata* (Roxb.) Nees ex Steud., Nomencl. Bot., ed. 2, 1: 562. 1840; Hook.f., Fl. Brit. India 7: 313. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1825. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 506. 1960; Pull., Fl. Telangana 3: 1124. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 714. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 365. 2020. *Poa ciliata* Roxb., Fl. Ind. 1: 336. 1820.

Caespitose perennial. Culms 20–80 cm high, erect or geniculate, nodes brown. Leaves mostly cauline; sheaths 1.5–3 cm long, keeled, moth bearded; ligules membrane, apex fringe of cilia; blades 3–10 × 0.5 cm, linear-lanceolate, margins inrolled, serrulate, base ciliate, apex acuminate. Panicles spiciform, cylindric, densely compact, branches alternate-subwhorled, 1.5–6 × 0.75–1.5 cm, oblanceolate-oblong. Spikelets 3.8–5 × 1.5–2.5 mm, ovate-lanceolate. Glume deciduous. Lower glume 0.8–1.5 × 0.2–0.5 mm, oblong-ovate, lanceolate, chartaceous, yellowish-green, margins ciliate, 1-nerved, keeled, scabrid along keel, apex acute-acuminate. Upper glume 0.8–1.5 × 0.2–0.5 mm, ovate-lanceolate, chartaceous, yellowish-green, margins ciliate, 1-nerved, 1-keeled, scabrid along keel, apex acute-acuminate. Florets 5–7, disarticulating from

above downwards. Lemma 1–1.8 × 0.2–0.8 mm, ovate-lanceolate, boat-shaped, chartaceous, 3-nerved, 1-keeled, keel serrulate, margins ciliate, apex acuminate. Palea 1–1.2 mm long, ovate-elliptic, 2-keeled, flap margins ciliate, stiff, bulbous based. Stamens 2. Caryopsis 0.4–0.5 × 0.2–0.3 mm, ovoid-ellipsoid, deep brown.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Rangareddy District: Hyderabad, MVR 02153 (HY).

8. *Eragrostis coarctata* Stapf in Hook.f., Fl. Brit. India 7: 313. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1825. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 507. 1960; Pull., Fl. Telangana 3: 1124. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 714. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 365. 2020.

Caespitose perennials. Culms 20–65 cm high, erect or geniculate, wiry; nodes glabrous. Leaves mostly cauline; sheaths 2–6 cm long, ribbed, glabrous-tuberculated based hairs, mouth bearded; ligules 0.2–0.4 mm long, apex ciliate; blades 3–18 × 0.2–0.7 cm, linear-lanceolate, convolute, base truncate-rounded, apex acuminate. Panicles compact, spiciform, branched, 5–12 × 0.5–1.5 cm. Spikelets 2–4 × 1.5–2 mm, oblong-lanceolate. Glume subequal. Lower glume 0.5–1.5 × 0.2–0.7 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keels scabrid, margins ciliate, apex acute. Upper glume 1–1.5 × 0.2–0.7 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keels scabrid, margins ciliate, apex acute. Florets 10, bisexual, imbricate, slightly compressed, disarticulating from above downwards. Lemma 1.5–2 mm long, oblong-lanceolate, boat shaped, chartaceous-membranous, 3-nerved, 1-keeled, keel scabrid, apex acute-acuminate-mucronate. Palea c. 1 mm long, oblong-elliptic, chartaceous, 2-nerved, 2-keeled, ciliate on keels, apex acute-obtuse. Stamens 3. Ovary elliptic. Caryopsis 0.5 mm long, ovoid-ellipsoid, yellowish-brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Occasionally in Khammam and Rangareddy.

Exsicc.: Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR 9510 (BSID); Sambayyagudem-Manugur, 24.03.2021, SNR 8954 (BSID); Rangareddy District: Mohmmadabad, MSM 10550 (SKU).

9. *Eragrostis gangetica* (Roxb.) Steud., Syn. Pl. Glumac. 1: 266. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 508. 1960; Pull., Fl. Telangana 3: 1125. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 715. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 366. 2020. *Poa gangetica* Roxb., Fl. Ind. 1: 341. 1820. *Eragrostis stenophylla* Hochst. ex Miq. in Anal. Bot. Ind. 2: 27. 1851 & in Nieuwe Verh. Eerste Kl. Kon. Ned. Inst. Wetensch. Amsterdam ser. 3(4): 39. 1851; Stapf in Hook.f., Fl. Brit. India 7: 318. 1896, p.p.

Plate 55(A-E)

Caespitose annuals. Culms 20–80 cm high, erect or geniculate, more or less compressed, ribbed, glaucous; nodes brownish. Leaves basal and cauline; sheaths 2–4 cm long, compressed, keeled, more or less ribbed, glabrous, mouth

bearded; ligules fimbriate; blades 4–15 × 0.3–0.6 cm, linear-lanceolate, flat-involute, base cordate, apex acuminate. Panicles 8–20 × 1–3 cm, pyramidal branched, alternate. Spikelets 5–10 mm long, elliptic-oblong. Lower glume c. 1 mm long, ovate-lanceolate, chartaceous, 1-nerved, 1-keeled, keel serrulate, apex acuminate. Upper glume 1–1.5 mm long, ovate-oblong, chartaceous, 1-nerved, keeled, keel scabrid. Florets 5–20, bisexual, disarticulating from below upwards. Lemma 1.3–1.8 × 0.3–0.5 mm, ovate-lanceolate, chartaceous, 3-nerved, apex acute-emarginate. Palea 0.5–1 × 0.2–0.6 mm, chartaceous, 2-nerved, 2-keeled, keels scabrid, margins infolded, base truncate, apex acute. Lodicules 2. Stamens 2. Ovary oblong. Caryopsis 0.5 mm long, ovoid-ellipsoid, deep brown.

Fl. & Fr.: Jul.–Jan.; Almost throughout the year.

Distrib.: Common throughout the state. Fodder grass; brooms making.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8561 (BSID); Nizamabad District: Mudhali RF, *BRPR* & *CPB* 7206 (SKU); Rangareddy: Hyderabad: *MVR* 02155 (HY), Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8538 (BSID).

10. *Eragrostis japonica* (Thumb.) Trin., Mem. Acad. Imp. Sci. St. Petersburg, Ser. 6, Sci. Math. 1: 405. 1830; C.E.C.Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 509. 1960; Pull., Fl. Telangana 3: 1125. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 715. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 366. 2020. *Poa japonica* Thunb., Fl. Jap. 51. 1784. *Eragrostis interrupta sensu* Stapf in Hook.f., Fl. Brit. India 7: 316. 1896 incl. vars., non (R. Br.) P. Beauv., 1812. *Eragrostis diarrhena* (Schult.) Steud., Syn. Pl. Glumac. 1: 266. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 507. 1960. *Poa diarrhea* Schult., Mant. 2: 616. 1824.

Plate 55(F-L)

Caespitose perennials. Culms 8–80 cm high, erect or geniculate, ribbed; nodes dark. Leaves basal and cauline; sheaths 5–10 mm long, compressed, keeled, glabrous; ligules 0.2–0.6 mm long, apex fimbriate; blades 5–25 × 0.2–1 cm, linear, glabrous, margin flat-inrolled, base rounded-cordate, apex acuminate. Panicles spiciform, interrupted, branches whorled, 5–50 × 1–3 cm. Spikelets 4–7 mm long, oblong-lanceolate. Lower glume 0.2–0.6 × 0.2–0.3 mm, ovate-lanceolate, chartaceous, hyaline, 1-nerved, 1-keeled, keel scabrid, apex acuminate. Upper glume c. 1 mm long, ovate-lanceolate, chartaceous, hyaline, 1-nerved, apex acute-acuminate. Florets 5–10, bisexual, minute, disarticulating from above downwards. Lemma 0.5–1.5 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, apex acute-acuminate. Palea 0.3–0.7 × 0.2–0.4 mm, ovate-elliptic, chartaceous, hyaline, 2-nerved, 2-keeled, keel scabrid, apex acute. Stamens 2. Ovary obovate-elliptic. Caryopsis 0.2–0.3 mm long, obovoid, brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state. Fodder grass and also brooms making.

Exsicc.: Adilabad District: Sone, *TP* & *PVP* 1057 (SKU); Bhadradi

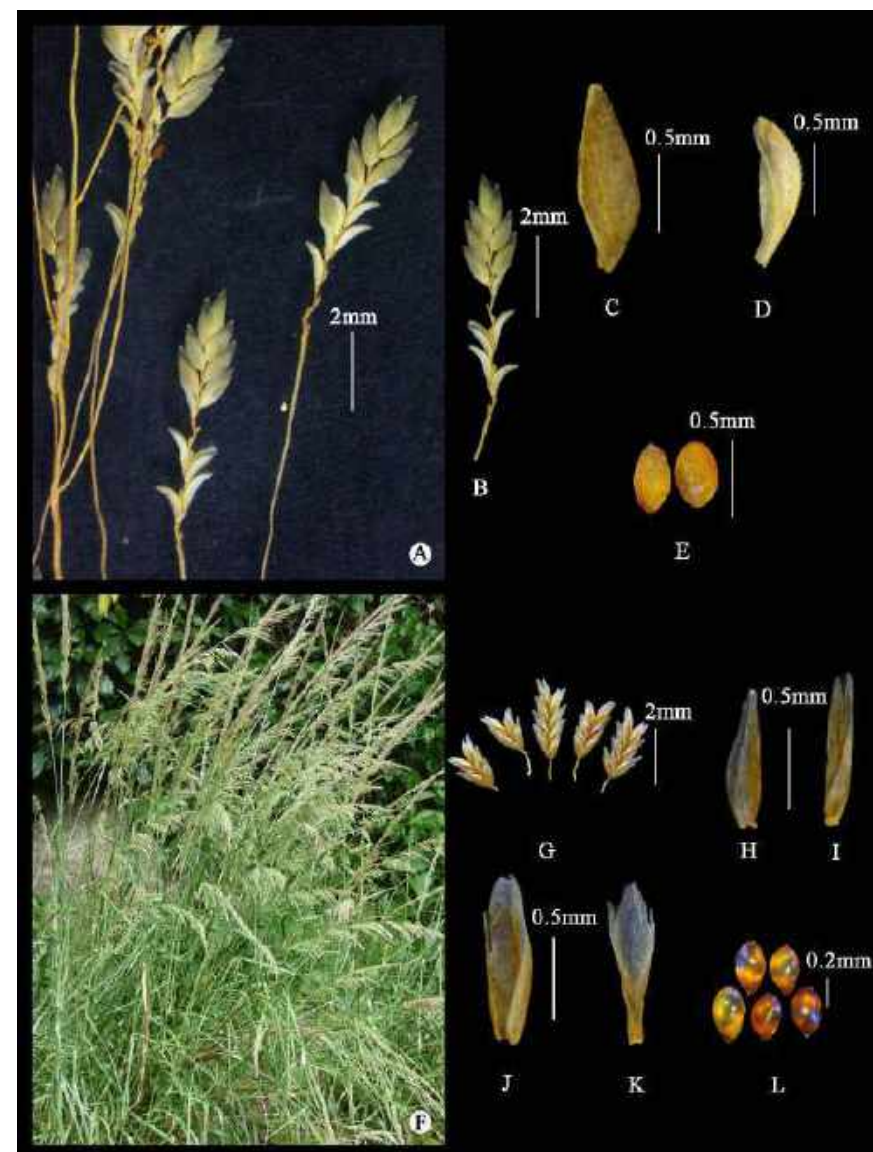


Plate 55. A–E. *Eragrostis gangetica* (Roxb.) Steud.: A. Inflorescence; B. Spikelet; C. Lemma; D. Palea; E. Caryopsis; F–L. *Eragrostis japonica* (Thunb.) Trin.: F. Habitat; G. Inflorescence; H. Lower glume; I. Upper glume; J. Lemma; K. Palea; L. Caryopses.

Kothagudem District: Kinnerasani Wildlife Sanctuary, 05.01.2019, *SNR* 9601, 9602, 9534 (BSID); Sambayyagudem-Manugur, 24.03.2021, *SNR* 8953 (BSID); Medak District: Poacharam RF & Patur fields, *TP* & *MSG* 12056, 12117 (SKU); Vikarabad District: Damagundam, 02.12.2019, *SNR* 8906 (BSID).

11. *Eragrostis macilenta* (A. Rich.) Steud., Syn. Pl. Glumac. 1: 268. 1854; Bor, Grasses Burma, Ceylon, India & Pakistan 509. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 366. 2020. *Poa macilenta* A.

Rich., Tent. Fl. Abyss. 2: 428. 1850.

Caespitose annuals. Culms 5–65 cm high, erect or geniculate; nodes dark. Leaves basal and cauline; sheaths terete-compressed, eglandular; ligules fringe of hairs; blades 1.5–18 × 0.2–0.4 cm, linear, margins eglandular. Panicle effuse, branched, whorled at lower nodes, eglandular, 2.5–30 cm long, elliptic-ovate. Spikelets 3–6 × 1–2 mm, solitary, oblong, eglandular. Glume deciduous. Lower glume 1–1.5 mm long, ovate, chartaceous, 1-nerved, 1-keeled, apex acuminate. Upper glume 1–1.5 mm long, ovate, chartaceous, 1-nerved, 1-keeled, apex acuminate. Florets 5–14, similar, bisexual, divergent, disarticulating from below upwards, rachilla persistent. Lemma 1.3–1.6 mm long, orbicular-ovate, membranous, dark greenish-black, 3-nerved, lateral nerves obscure, 1-keeled, keel scabrid, apex acute. Palea ovate-elliptic, 2-nerved, 2-keeled, keel scabrous, apex acute. Stamens 3; anthers 0.3–0.5 mm long. Caryopsis 0.5 mm long, oblong, dark reddish.

Fl. & Fr.: Feb.–Aug.

Distrib.: Occasionally in Mahabubnagar and Wanaparthy.

Exsicc.: Mahabubnagar District: Venkatapuram sivaru, 06.08.2019, SNR 8630 (BSID).

12. *Eragrostis minor* Host, Icon. Descr. Gram. Austriac. 4: 15. 1809 (as “*minorem*”); Stapf in Hook.f., Fl. Brit. India 7: 321. 1896; Pull., Fl. Telangana 3: 1127. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 716. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020. *Eragrostis pappiana* (Chiov.) Chiov. in Ann. Bot. (Rome) 8 (3): 371. 1980; Bor, Grasses Burma, Ceylon, India & Pakistan 512. 1960. ‘*Good Bali Gad*’ **Plate 56(A-H)**

Caespitose, annuals. Culms 5–90 cm high, erect or geniculate, subterete, ribbed. Leaves basal and cauline; sheaths compressed, ribbed, margins slightly hairy, glandular, mouth bearded; ligules 0.4 mm long, hairs; blades 5–14 × 0.2–0.5 cm, linear, flat-infolded, margin glandular, apex acuminate. Panicles 3–20 cm long, ovate-oblong, open. Pedicels with glandular bands. Spikelets 3–10 × 1–2 mm, linear-oblong, glandular. Glumes subequal, deciduous. Lower glume 1–1.5 mm long, ovate, chartaceous, glandular, 1-nerved, 1-keeled, apex acute. Upper glume 1–1.2 mm long, ovate-lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acute. Florets 5–15, bisexual, imbricate, disarticulating from below upwards. Lemma 1.2–2.1 mm long, ovate, chartaceous, 3-nerved, 1-keeled, keel glandular, apex obtuse. Palea 1–1.5 mm long, ovate-elliptic, hyaline, 2-nerved, 2-keeled, keel scabrid. Stamens 3. Caryopsis 0.4–0.8 mm long, globose-oblong, reddish-brown.

Fl. & Fr.: Jun.–Feb.

Distrib.: Common throughout the state.

Exsicc.: Nagarkurnool District: Vattam, 08.08.2019, SNR 8645 (BSID); Rangareddy District: Hyderabad, MVR 02156 (HY).

13. *Eragrostis nilgiriensis* Vivek, G.V.S. Murthy & V.J. Nair, Nordic J. Bot.

31(6): 700. 2013; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020.

Tufted annual. Culms 10–30 cm high, erect or geniculate, glabrous; internodes up to 6.5 cm long with a glandular band just below each node. Leaves basal and cauline; sheaths 3–5 cm long, ciliate, bearded at mouth; ligules 0.2–0.5 mm long, a fringe of cilia; blades 2.5–5.5 × 0.1–0.35 cm, linear to lanceolate, base rounded-subcordate, sparsely ciliate on upper surface, glabrous on lower surface, apex acuminate. Panicles 3.5–9 × 1–3.5 cm, effuse, with a glandular ring on peduncle just below panicle; peduncles 6–8 cm long; racemes 3–4 cm long, alternate with punctate glands, scabrous along angles; pedicels 1–2.5 mm long, with punctate glands. Spikelets 3.5–8 × 1–1.5 mm, narrowly oblong, linear-lanceolate, apex acute. Lower glume 0.6–1 mm long, ovate-lanceolate, membranous-chartaceous, 1-nerved, 1-keeled, apex acute. Upper glume 0.8–1.3 mm long, ovate, membranous-chartaceous, 1-nerved, 1-keeled, apex acute. Florets 3–15, closely arranged, disarticulating from below upwards; palea persistent. Lemma 1.3–1.5 × 0.4–0.7 mm, elliptic-ovate, chartaceous, 3-nerved, 1-keeled, scabrid on keel, apex acute. Palea 1–1.4 × 0.2–0.3 mm, elliptic to oblanceolate, apex obtuse to acute, membranous, 2-nerved, 2-keeled, scaberulous on keels. Stamens 3. Ovary oblong-ellipsoid. Caryopses 0.2–0.5 × 0.2–0.4 mm, ellipsoid.

Fl. & Fr.: Sep.–Nov.

Distrib.: Common along the forest fringes, roadsides and wastelands in black soils. **Endemic-India** (Tamil Nadu, Telangana).

Exsicc.: Kamareddy District: Tadwai, 04.10.2022, VI & JS 0790 [Department of Botany, Telangana University, Nizamabad, Telangana (TUH)].

14. *Eragrostis nutans* (Retz.) Nees ex Steud., Nomencl. Bot., (ed.2) 1: 563. 1840; C.E.C.Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 511. 1960; Pull., Fl. Telangana 3: 1127. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 716. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020. *Poa nutans* Retz., Observ. Bot. 4: 19. 1786. ‘*Pedda garikai*’ **Plate 56(I-L)**

Caespitose, perennials. Culms 30–75 cm high, erect or geniculate, nodes dark. Leaves basal and cauline; sheaths terete-keeled, margin inrolled, mouth bearded; ligules 0.1–0.2 mm long, apex fimbriate; blades 4–11.5 × 0.2–0.3 cm, linear-lanceolate, flat-inrolled, base truncate-rounded, apex acuminate. Panicles spiciform, 6–13 cm long, ovate-oblong. Spikelets 2–4.5 × 1–1.5 mm, oblong-lanceolate. Lower glume 0.2–0.6 × 0.2–0.4 mm, lanceolate-oblong, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acute. Upper glume 0.8–1 × 0.2–0.4 mm, lanceolate-oblong, 1-nerved, 1-keeled, keel scabrid, apex acute. Florets 10–20, bisexual, imbricate, disarticulation from below upward. Lemma 1–1.5 × 0.3–0.76 mm, ovate, chartaceous, 3-nerved, apex acute. Palea 0.8–1.25 × 0.2–0.45 mm, obovate-elliptic, chartaceous, hyaline, 2-nerved, 2-keeled, keel scabrid, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary elliptic. Caryopsis 0.4–0.6 × 0.2–0.4 mm, ovoid-globose, deep brown.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional on the bunds of cultivated fields.

Exsicc.: Vikarabad District: Damagundam, 02.12.2019, SNR 8917 (BSID).

Note: Identified by its reduced florets towards the apex and persistent palea.

15. *Eragrostis papposa* (Roem. & Schult.) Duf. ex Steud., Nomencl. Bot., ed. 2(1): 564. 1840; Bor, Grasses Burma, Ceylon, India & Pakistan 512. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020. *Megastachya papposa* Roem. & Schult., Syst. Veg. 2: 585. 1817, *nom. illeg.*, *pro syn.* *Poa papposa* Duf. ex Roem. & Schult., Syst. Veg. 2: 585. 1817.

Perennial. Culms 10–60 cm high, erect or ascending; nodes brownish; internodes c. 6 cm long. Leaves basal and cauline; sheaths c. 4.5 cm long, one margin ciliate; ligule a fringe of cilia; leaf blades 2–15 × 0.2–0.3 cm, linear to lanceolate, glaucous, often form a compact cushion, margins infolded. Panicles 2–25 × 6–13 cm, open, ovate; branches up to 6 cm long, alternate, scabrous along angles; pedicels up to 1 cm long, capillary, with or without glands. Spikelets 8–9.8 × 1.2–1.5 mm, 20–25 flowered. Lower glume 0.79 × 0.17 mm, elliptic, coriaceous, 1-nerved, 1-keeled, keel serrate, apex obtuse. Upper glume 1.01 × 0.25 mm, ovate, coriaceous, 1-nerved, 1-keeled, keel serrate, apex obtuse-acute. Lemma 1–1.5 × 0.3–0.6 mm, ovate-boat shaped, coriaceous, 3-nerved, apex obtuse. Palea 0.8–0.94 × 0.3–0.6 mm, elliptic-ovate, apex emarginate, 2-nerved; 2 keeled, serrulate on keels. Stamens 2, 0.2 × 0.16 mm. Ovary 0.23 × 0.22 mm, globose. Caryopsis 0.4 × 0.3 mm, oblong-ellipsoid, yellowish-brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state.

Exsicc.: Rangareddy District: Manasahills-Rajendranagar, 24.08.2016, SNR 8516 (BSID).

16. *Eragrostis pilosa* (L.) P. Beauv., Ess. Agrostogr. 175. 1812; Stapf in Hook.f., Fl. Brit. India 7: 323. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1827. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 512. 1960; Pull., Fl. Telangana 3: 1127. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020. *Poa pilosa* L., Sp. Pl. 1: 68. 1753.

Plate 56(M-S)

Solitary annuals. Culms 8–80 cm high, erect or geniculate, glandular; nodes dark. Leaves basal and cauline; sheaths 1.5–5 cm long, open, glabrous, keeled, margins smooth, moth bearded; ligules 1–2 mm long, fimbriate; blades 5–25 × 0.2–0.4 cm, linear-lanceolate, flat-folded, apex acuminate. Panicles 4–25 × 2–4 cm, lax, glandular, axils pilose. Spikelets 2.5–4 × 0.7–0.9 mm, oblong-lanceolate, purplish-green or grey. Glumes unequal, deciduous. Lower glume 0.3–0.4 × 0.2 mm, lanceolate, membranous-chartaceous, hyaline, 1-nerved, keeled, apex acute. Upper glume 0.5–0.9 × 0.4–0.5 mm, ovate-lanceolate, chartaceous, hyaline-greenish, 1-nerved, 1-keeled, keel scabrid. Florets 4–6, loosely imbricate, disarticulation from below upwards. Lemma 1–1.5 × 0.3–0.4 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, keel serrulate, apex acuminate-obtuse. Palea 0.8–1 × 0.2 mm, ovate-elliptic, lanceolate, 2-nerved,

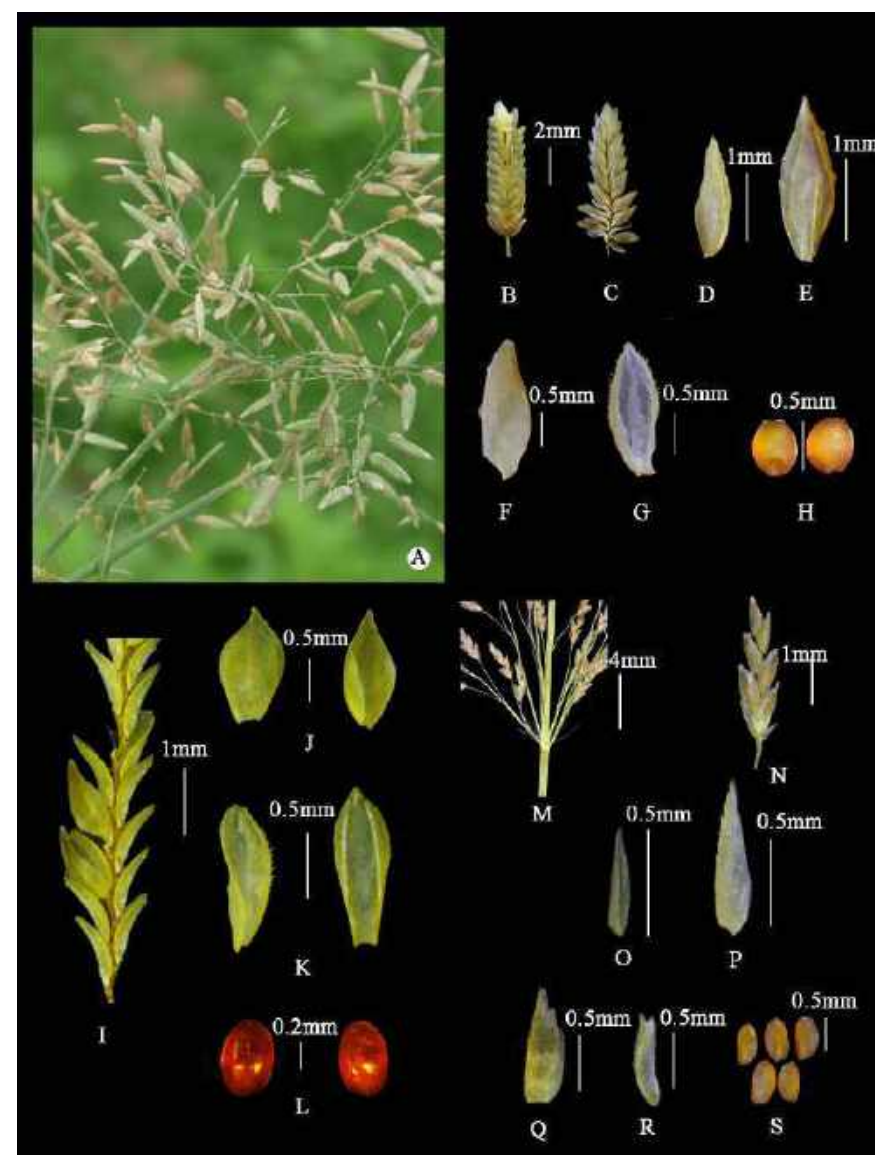


Plate 56. A–H. *Eragrostis minor* Host: A. Inflorescence; B&C. Spikelets; D. Lower glume; E. Upper glume; F. Lemma; G. Palea; H. Caryopses; I–L. *Eragrostis nutans* (Retz.) Nees ex Steud.: I. Enlarged portion of the spikelet; J. Abaxial and adaxial view of lemma; K. Abaxial and adaxial view of palea; L. Caryopses; M–S. *Eragrostis pilosa* (L.) P.Beauv.: M. Lower portion of the inflorescence; N. Spikelet; O. Lower glume; P. Upper glume; Q. Lemma; R. Palea; S. Caryopses.

2-keeled, keel scabrid, apex acute-emarginate. Caryopsis 0.5 mm long, ellipsoid-oblong, base cuneate, yellowish-brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state.

Exsicc.: Mahabubnagar District: Koilsagar Dam, Manyamkonda, 06.08.2019, SNR 8619, 8622 (BSID); Rangareddy District: Hyderabad, MVR 02157 (HY); Manasa hills-Rajendra Nagar, 24.08.2016, SNR 8508 (BSID).

17. *Eragrostis riparia* (Willd.) Nees, Fl. Bras. Enum. Pl. 2(1): 512. 1829; C.E.C.Fisch. in Gamble, Fl. Madras 1825. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 513. 1960; Pull., Fl. Telangana 3: 1127. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 717. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 367. 2020. *Poa riparia* Willd., Ges. Naturf. Ferunde Berlin Neue Schriften 4: 185. 1803. *Eragrostis tenella* (L.) P. Beauv. ex Roem. & Schult. var. *riparia* (Willd.) Stapf in Hook.f., Fl. Brit. India 7: 315. 1896.

Caespitose perennials. Culms 5–40 cm high, erect, wiry; nodes glabrous. Leaves basal and cauline; sheaths 1.5–3.5 cm long, ribbed, keeled, glabrous, mouth bearded; ligules membranous, hairy; blades 2–10 × 0.2–0.4 cm, narrowly linear-lanceolate, inrolled, apex acuminate. Panicles spiciform, cylindric, glandular, 5–8 × 0.5–2.5 cm. Spikelets 1–3 × 1.5 mm, ovate-oblong, glandular. Glumes subequal. Lower glume 0.6–0.8 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, hyaline, 1-nerved, keeled, keel scabrid, apex acute. Upper glume 0.9–1 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, 1-nerved, keeled, keel scabrid, apex acute. Florets 4–11, bisexual, imbricate, disarticulating from above downwards. Lemma 1–1.5 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, keel serrulate, apex acute-emarginate. Palea 0.7–1 × 0.2–0.4 mm, obovate-elliptic, chartaceous, hyaline, 2-nerved, 2-nerved, keels long ciliate, apex truncate. Lodicules 2. Stamens 3. Ovary ovate-elliptic. Caryopsis 0.2–0.4 × 0.2–0.3 mm, ellipsoid-ovoid, light brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Occasional in sandy soils and in dry ploughed fields.

Exsicc.: Nalgonda District: Krishna River Bank, KMS 9819 (CAL).

18. *Eragrostis tenuifolia* (A. Rich.) Hochst. ex Steud., Syn. Pl. Glumac. 1: 268. 1854; Stapf in Hook.f., Fl. Brit. India 7: 322. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1827. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 514. 1960; Pull., Fl. Telangana 3: 1129. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 718. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 368. 2020. *Poa tenuifolia* A. Rich., Tent. Fl. Abyss. 2: 425. 1850. **Plate 57(A-F)**

Caespitose perennials. Culms 10–70 cm high, geniculate, more or less ribbed; nodes brownish. Leaves basal and cauline; sheaths 5–10 cm long, keeled, more or less ribbed, margin covered with shaggy hairs; ligules a row of hairs; blades 3–20 × 0.3–0.5 cm, narrowly linear-lanceolate, margins serrulate, base truncate-rounded, apex acuminate. Panicles 5–15 × 4–5.5 cm, lax, ovate. Spikelets 4–6 mm long, linear-lanceolate. Lower glume 1–1.25 mm long, ovate-lanceolate, chartaceous, 1-nerved, apex fimbriate, lobed. Upper glume 0.5–1 × 0.2–0.6 mm, oblong-ovate, lanceolate, chartaceous, 1-nerved, keeled, keel serrulate, apex acute. Florets 5–15, imbricate, grey or black, disarticulating from below upwards.

Lemma 1.5–2.5 × 0.5–1 mm, elliptic-ovate, lanceolate, chartaceous, 3-nerved, keeled, keel scabrid, apex acute-mucronate. Palea persistent, 1–1.9 mm long, elliptic to oblanceolate, chartaceous, 2-nerved, 2-keeled, keel serrulate, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary 0.2–0.4 mm long. Caryopsis 2 mm long, oblong-ellipsoid, dark reddish.

Fl. & Fr.: Mar.–Oct.

Distrib.: Common through the state; as a weed in cultivated fields and along roadsides.

Exsicc.: Medak District: Ramayampet, BRPR & CPB 11520 (SKU); Rangareddy District: Hyderabad, MVR 02159 (HY); Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8725 (BSID).

19. *Eragrostis tremula* (Lam.) Hochst. ex Steud., Syn. Pl. Glumac. 1: 269. 1854; Stapf in Hook.f., Fl. Brit. India 7: 320. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1827. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 514. 1960; Pull., Fl. Telangana 3: 1131. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 718. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 368. 2020. *Poa tremula* Lam., Tabl. Encycl. 1: 185. 1791. **Plate 57(G-N)**

Caespitose annuals. Culms 20–100 cm high, erect or geniculate. Leaves basal and cauline; sheaths open, glabrous, compressed, margin smooth, bearded at mouth; ligules 1–1.5 mm long, membrane ciliate; blades 5–20 × 0.2–0.6 cm, linear-lanceolate, sparsely hairy, base rounded, apex attenuate. Panicles 6–25 cm long, lax. Spikelets 4–25 mm long, linear. Florets 10–many, disarticulating from below upwards; pedicels eglandular. Glume subequal, persistent. Lower glume 0.5–1.5 mm long, ovate-lanceolate, membranous-chartaceous, 1-nerved, 1-keeled, keel scaberulous, apex acute. Upper glume 1–1.5 mm long, ovate-lanceolate, membranous-chartaceous, 1-nerved, 1-keeled. Florets 10–55, bisexual, similar. Lemma 1.5–2 mm long, broadly ovate, chartaceous, 3-nerved, 1-keeled, apex obtuse-subacute. Palea 0.8–1 mm long, elliptic, oblong-obovate, 2-nerved, 2-keeled, scabrellate on keels, apex obtuse. Lodicules 2. Stamens 2 or 3. Stigma 2. Caryopsis 0.5 mm long, globose, yellowish-brown.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in moist localities and as a weed in cultivated fields. Fodder grass.

Exsicc.: Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR 9590 (BSID); Rangareddy District: Hyderabad, MVR 02160 (HY).

20. *Eragrostis unioides* (Retz.) Nees ex Steud., Syn. Pl. Glumac. 1: 264. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 515. 1960; Pull., Fl. Telangana 3: 1131. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 718. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 338. 2020. *Poa unioides* Retz., Observ. Bot. 5: 19. 1788. **Plate 58(A-K)**



Plate 57. A–F. *Eragrostis tenuifolia* (A. Rich.) Hochst. ex Steud.: A. Spikelet; B. Abaxial and adaxial view of Lemma; C. Abaxial and adaxial view of palea; D. Stamens; E. Pistil; F. Caryopses; G–N. *Eragrostis tremula* Hochst. ex Steud.: G. Inflorescence; H&I. Spikelet; J. Lower glume; K. Upper glume; L. Lemma; M. Palea; N. Caryopses.

Caespitose perennials. Culms 20–80 cm high, terete or erect, geniculate; nodes brownish, lower rooting. Leaves basal and cauline; sheaths 4–5.5 cm long, compressed, ribbed, glabrous; ligules a rim of hairs; blades 5–20 × 0.3–0.7 cm, linear-lanceolate, convolute. Panicles 10–25 cm long, lax. Spikelets 3–7 mm long, ovate, green-pale purple. Lower glume 0.8–1.5 mm long, oblong-lanceolate, chartaceous, purplish, 1-nerved, keeled, keel serrulate, apex acute. Upper glume 1.5–2.5 mm long, ovate-lanceolate, chartaceous, 1-nerved, apex mucronate. Florets 20–70, bisexual,

disarticulating from below upwards, both lemma and palea deciduous. Lemma 1.5–2.5 mm long, ovate-elliptic, boat shaped, chartaceous, pinkish, 3-nerved, keel serrulate, apex acute-obtuse. Palea 1.5–2 mm long, elliptic-lanceolate, membranous to chartaceous, hyaline, 2-nerved, 2-keeled, scabrid on keels, margins infolded, base acute, apex retuse-rounded. Lodicules 2. Stamens 2. Ovary oblong-elliptic; stigma plumose. Caryopsis 0.4–0.7 mm long, ellipsoid-obovoid, reddish-brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state, in paddy fields, along the bunds and the margins of ponds.

Exsicc.: Adilabad District: Gopalapatnam RF, GO 4409 (SKU); Ankusapuram, GO 4372 (SKU); Mulugu District: Kumavaram-Tadvai, 24.03.2021, SNR 8973 (BSID); Rangareddy District: Hyderabad, MVR 02161 (HY), Manasa hills-Rajendranagar, 24.08.2016, SNR 8536; 24.10.2019, SNR 8696 (BSID).

21. *Eragrostis viscosa* (Retz.) Trin., Mem. Acad. Imp. Sci. St. Petersburg, Ser. 6, Sci. Math. 1 (4): 397, 1830; C.E.C. Fisch. in Gamble, Fl. Madras 1826. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 515. 1960; Pull., Fl. Telangana 3: 1132. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 719. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 368. 2020. *Poa viscosa* Retz., Observ. Bot. 4: 20. 1786. *'Banka Gaddi'* **Plate 58(L-Q)**

Caespitose annuals. Culms 20–78 cm high, viscous, erect or geniculate; glandular circle or spots below nodes. Leaves basal and cauline; sheaths 2–3 cm long, compressed, terete-keeled, viscous near the mouth (glandular); ligules fimbriate; blades 8–22 cm long, linear-lanceolate, convolute, viscous, glandular, margins ciliate, apex acuminate-attenuate. Panicles 7–19 × 1.2–5.5 cm, ovate, spiciform-effuse, branched, glandular, viscous. Spikelets 2.5–4 × 0.8–1.2 mm, ovate-oblong. Lower glume 0.7–1.5 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, greenish, 1-nerved, 1-keeled, keel serrulate, apex acute-acuminate. Upper glume 1–1.2 × 0.2–0.4 mm, ovate-lanceolate, chartaceous, greenish, 1-nerved, 1-keeled, keel serrulate, apex acute-acuminate. Florets 4–20, purplish-green; disarticulating from above downwards, entire florets. Lemma 1–1.5 mm long, broadly elliptic-ovate, chartaceous, 3-nerved, keeled, keel serrulate, apex acute-obtuse. Palea 0.8–1 mm long, obovate-oblongate, falcate, chartaceous, 2-nerved, 2-keeled, keels ciliate, margins eciliate, apex acute-obtuse. Stamens 3. Caryopsis 0.3–0.4 × 0.1–0.3 mm, ovoid-ellipsoid, light brown.

Fl. & Fr.: Almost throughout the year.

Distrib.: Common throughout the state; fallow lands.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR 9576 (BSID); Rangareddy District: Attapur, 22.08.2019, SNR 8676 (BSID); Hyderabad, MVR 02162 (HY); Manasa hills-Rajendranagar, 26.10.2019, SNR 8699 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 8987 (BSID); Seetharampuram-Parakala, 29.03.2021, SNR 012033 (BSID).

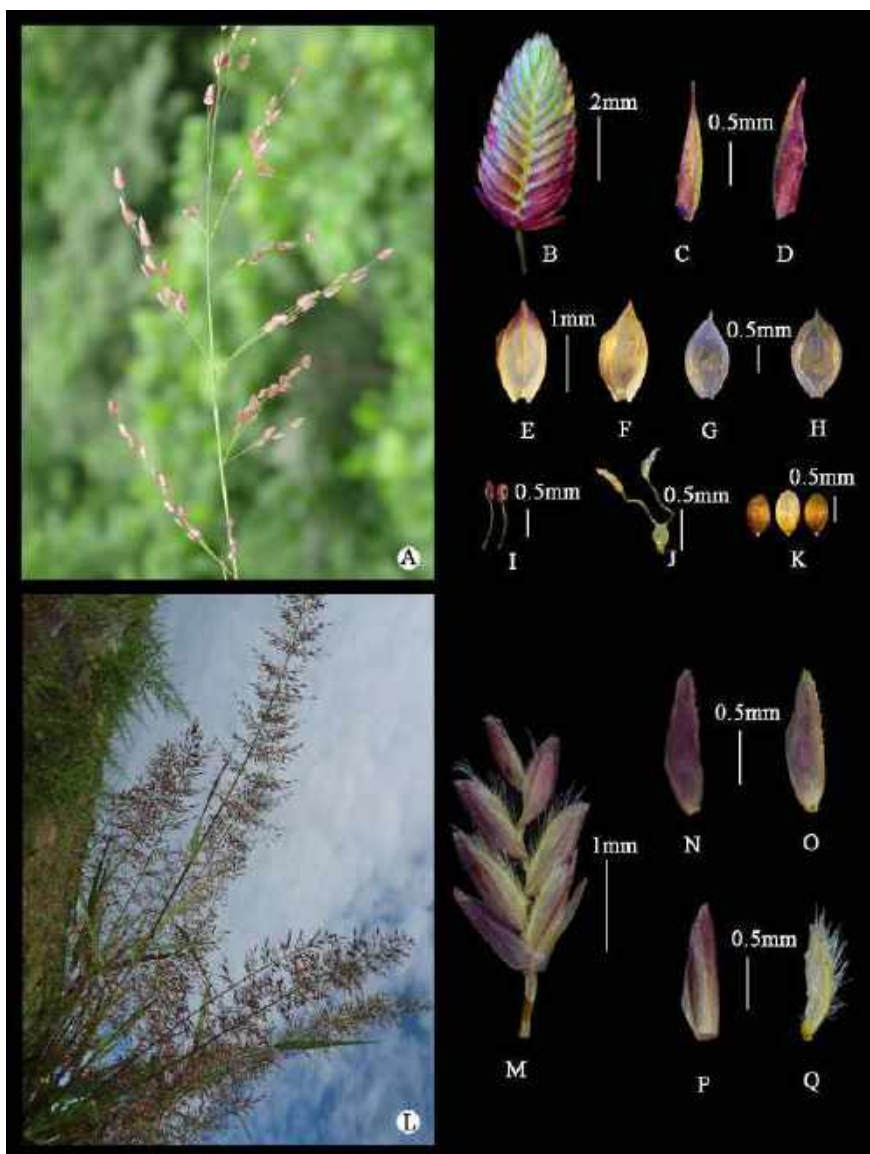


Plate 58. A–K. *Eragrostis unioides* (Retz.) Nees ex Steud.: A. Inflorescence; B. Spikelet; C. Lower glume; D. Upper glume; E&F. Abaxial and adaxial view of lemma; G&H. Abaxial and adaxial view of palea; I. Stamens; J. Pistil; K. Caryopses; L–Q. *Eragrostis viscosa* (Retz.) Trin.: L. Inflorescence; M. Spikelet; N. Lower glume; O. Upper glume; P. Lemma; Q. Palea.

Leptochloa P. Beauv.

World: c. 29 spp.; India: 5 spp.; Telangana: 2 spp.

Key to the species

- | | |
|---|----------------------------|
| 1a. Culms stout; spikelets 4–9-flowered | ... 1. <i>L. chinensis</i> |
| 1b. Culms slender; spikelets 2–3-flowered | ... 2. <i>L. panicea</i> |

1. *Leptochloa chinensis* (L.) Nees, Syll. Pl. Nov. 1: 4. 1824; Hook.f., Fl. Brit. India 7: 299. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1820. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 516. 1960; Pull., Fl. Telangana 3: 1143. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 726. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 391. 2020. *Poa chinensis* L., Sp. Pl. 69. 1753.

Plate 59(A-B)

Caespitose annuals. Culms 30–110 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 5–11 cm long, compressed, keeled, mouth bearded; ligules c. 1 mm long, membranous, apex acuminate-truncate; blades 10–42 × 0.2–0.5 cm, linear-lanceolate, scaberulous, margin involute, base truncate, apex acuminate. Panicles 5–40 × 5–10 cm, oblong, open. Spikelets 2–4 × 1.3 mm, oblong, apex acute. Lower glume 1–1.5 × 0.2–0.4 mm, oblong-lanceolate, 1-nerved, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate. Upper glume 1–1.9 × 0.2–0.6 mm, oblong-lanceolate, chartaceous-subcoriaceous, 1-nerved, 1-keeled, keel scabrid, apex acute-acuminate. Florets 4–5, bisexual, disarticulate from glumes. Lemma 1–2 × 0.4–0.7 mm, ovate-lanceolate, chartaceous, 3-nerved, 1-keeled, keel scabrid, apex 2-lobed-emarginate. Palea 1–1.5 × 0.4 mm, elliptic-oblong, chartaceous, 2-nerved, 2-keeled, keel scabrid, base truncate, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary elliptic-oblong. Caryopsis 0.5–1 × 0.5 mm, oblong-elliptic.

Fl. & Fr.: Oct.–Jan.

Distrib.: Occasional in marshy habitats and as a weed in cultivated fields. Forage grass.

Exsicc.: Adilabad District: Bijjipur RF, GO & PVP 4877 (SKU); Suryapet District: Moosi River Project, 27.10.2019, SNR 8748 (BSID); Mulugu District: Eturunagaram, 24.03.2021, SNR 8961 (BSID); Rangareddy District: Hyderabad, MVR 02171 (HY).

2. *Leptochloa panicea* (Retz.) Ohwi, Bot. Mag. 55: 311. 1941; Hook.f., Fl. Brit. India 7: 299. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1820. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 517. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 392. 2020. *Poa panicea* Retz., Observ. Bot. 11. 1783. *Dinebra panicea* (Retz.) P.M. Peterson & N. Snow in Ann. Bot. (Oxford) 109 (7): 1326. 2012.

Plate 59(C-K)

Caespitose annuals. Culms 30–110 cm high, erect or geniculate; nodes glabrous, rooting below. Leaves basal and cauline; sheaths 4–9 cm long, flattened, open, ribbed, glabrous, mouth bearded; ligules c. 1.5 mm long, apex lacerate-ciliate; blades 4–11 × 0.2–0.4 cm, filiform, involute, apex attenuate. Panicle 10–18 cm long, branched, spiciform. Spikelets 1.5–2 mm long, lanceolate, oblong-ovate. Lower glumes 0.8–1 × 0.2–0.5 mm, linear-lanceolate, chartaceous, 1-nerved, keel scabrid, apex acute-cuspidate. Upper glume 1–1.5 mm long, linear-lanceolate, membranous-chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate. Florets 2–3, bisexual, disarticulate from above downwards. Lemmas 0.4–1.5 mm long, elliptic, 3-nerved, pilose, 1-keeled, apex retuse-acute. Palea 0.2–0.7 × 0.2–0.5 mm, elliptic, 2-nerved, 2-keeled, keel scabrid, apex acute. Stamens 3. Ovary lanceolate-elliptic. Caryopsis broadly elliptic.

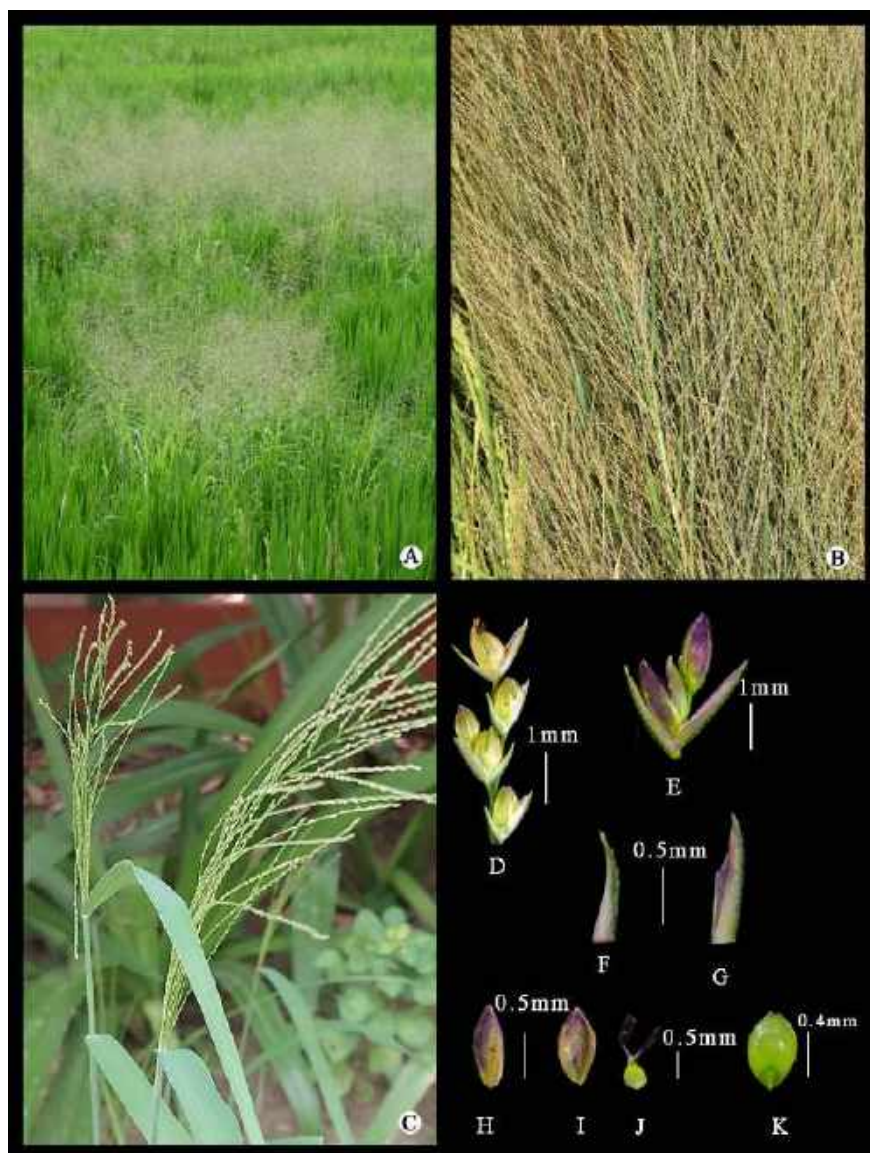


Plate 59. A–B. *Leptochloa chinensis* (L.) Nees: A. Habitat; B. Enlarged view of inflorescence; C–K. *Leptochloa panicea* (Retz.) Ohwi: C. Habitat; D. Closed view of inflorescence; E. Spikelet; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Pistil; K. Caryopsis.

Fl. & Fr.: May–Jan.

Distrib.: Occasional in cultivated fields and wastelands. Fodder grass.

Exsicc.: Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 8991 (BSID); Hanamakonda, RKP 105364 (BSID).

Oropetium Trin.

World: 6 spp.; India: 4 spp.; Telangana: 3 spp.

Key to the species

- | | |
|--|--------------------------------|
| 1a. Spikelets unawned | ... 2 |
| 1b. Spikelets awned | ... 1. <i>O. roxburghianum</i> |
| 2a. Lemma dorsally scaberulous at upper part | ... 2. <i>O. thomaeum</i> |
| 2b. Lemma densely villous | ... 3. <i>O. villosulum</i> |

1. *Oropetium roxburghianum* (Steud.) S.M. Phillips in Kew Bull. 30(3): 469. 1975. *Lepturus roxburghianus* Steud., Syn. Pl. Glumac. 1: 357. 1854; Hook.f., Fl. Brit. India 7: 365. 1896; Pull., Fl. Telangana 3: 1148. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 729. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 399. 2020. *Tripogon roxburghianus* (Steud.) Bhide in J. Proc. Asiat. Soc. Bengal 7(8): 515. 1912; C.E.C.Fisch. in Gamble, Fl. Madras 1834. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 524. 1960.

Plate 60

Caespitose perennials. Culms 5–27 cm high. Leaves mostly basal; sheaths c. 3 cm long, compressed, glabrous; mouth bearded; ligules membranous; blades 1.5–5 cm long, linear-filiform, convolute, margin hairy, apex acuminate. Spikes 3–10 cm long, solitary. Spikelets 2–4.5 × 0.5–1 mm long, oblong, sunken in hollows of rachis, rachilla jointed. Lower glume 0.8 mm long, oblong, hyaline, lobed, 1-nerved, apex oblique-truncate. Upper glume 2.5–3 × 0.5–1.5 mm, elliptic-coriaceous, 3-nerved, margin inflexed, apex acute. Lemma 2.5–3 mm long, oblong-elliptic, membranous, 3-nerved, margin inflexed, apex 2-toothed. Palea 2–2.5 × 0.5–1 mm, elliptic, hyaline, 2-nerved, 2-keeled, margins inflexed, apex retuse-emarginate. Lodicules 2. Stamens 3. Caryopsis 1–1.5 mm long, oblong.

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasionally in rocky crevices.

Exsicc.: Nagar-Kurnool District: Amaragiri-Somasila, 08.08.2019, SNR 8652, (BSID); Wanaparthi District: Amadabakula-Kothakota, 07.08.2019, SNR 8635 (BSID); Suryapet District: Nakrekal village, 27.10.2019, SNR 8746 (BSID).

Note: It is similar to *Tripogon purpurascens*, but distinguishable by its inflorescence in having sunken rachis.

2. *Oropetium thomaeum* (L. f.) Trin., Fund. Agrost. 98, t. 3. 1822; Hook.f., Fl. Brit. India 7: 366. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1830. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 474. 1960; Pull., Fl. Telangana 3: 1149. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 730. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 399. 2020. *Nardus thomaea* L. f., Suppl. Pl. 105. 1781.

Plate 61

Caespitose annuals. Culms 4–11 cm high, erect, branched; nodes glabrous. Leaves mostly basal; sheaths 5–10 mm long, keeled; ligules 1–1.3 mm long, membranous, apex truncate; blades 10–35 × 3–8 mm, filiform-linear, margin tubercle based hairs, apex acute-acuminate. Inflorescence terminal spike, solitary, 20–50 mm long, linear-oblong, straight-curved, slightly bulgy,



Plate 60. *Oropetium roxburghianum* (Schult.) S.M. Phillips: A. Habitat; B. Habit; C&D. Enlarged portion of the spike; E. Spikelet; F. Lower glume; G. Upper glume; H. Floret; I. Rachilla; J&K. Abaxial and adaxial view of Lemma; L&M. Abaxial and adaxial view of palea; N. Lodicules; O. Stamens; P. Pistil; Q. Caryopsis.

scaberulous. Spikelets sessile, solitary, sunken, lanceolate, as long as upper glume, embedded in the rachis along the both sides. Lower glume $0.3-0.4 \times 0.1-0.2$ mm, broadly oblong, membranous, hyaline, nerveless, apex truncate and irregularly 4-5-dentate. Upper glume $1.5-2 \times 0.3-0.4$ mm, lanceolate-oblong, chartaceous-subcoriaceous, 3-nerved, apex acute, serrulate. Floret 1, bisexual, callus present. Lemma $1.1-1.5 \times 0.5-0.6$ mm, obovate, boat-shaped, chartaceous-membranous, dorsally scaberulous at upper part, faintly 3-nerved, apex obtuse-mucronulate



Plate 61. *Oropetium thomaeum* (L.f.) Trin.: A. Habita; B. Closed view of spike; C. Lower glume; D. Upper glume; E. Floret; F. Lemma; G&H. Abaxial and adaxial view of palea; I. Stamens; J. Pistil; K. Caryopsis.

or slightly emarginate, 1-keeled, keel serrulate. Palea as long as lemma, oblong-slightly obovate, membranous, hyaline, 2-nerved, faintly keeled or not, apex slightly 3-4 dentate. Lodicules 2. Stamens 3. Caryopsis $0.8-1 \times 0.3-0.4$ mm, oblong-obovate.

Fl. & Fr.: Jul.-Nov.

Distrib.: Grows in rocky crevices, gravelly, rocky and sandy soils in plains, dry deciduous forests and on hillocks.

Exsicc.: Mahabubnagar District: Koilsagar Dam, 06.08.2019, SNR 8621 (BSID); Mahabubnagar District: Venkatapuram-Sivaru, 06.08.2019, SNR 8601 (BSID); Rangareddy District: Rajendranagar, Manasahills, 24.08.2019, SNR 8532 (BSID); Hyderabad, MVR 02177 (HY); Tolichowk, Mdlines, 04.09.2019, SNR 8681 (BSID).

Note: In previous works (Bor, 1960; Yadav, 2012) the lemma was described as glabrous, but the illustration made by J.D. Hooker on the type specimen K000245052 shows the lemma as scaberulous in the upper part of the dorsal surface and during the present work also the same scaberulous lemma seen.

3. *Oropetium villosulum* Stapf ex Bor, Kew Bull. 4(4): 571. 1950 & Grasses Burma, Ceylon, India & Pakistan 474. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 399. 2020. Plate 62

Caespitose annuals. Culms 5–15 cm high, erect or geniculate, simple-branched, slender, violet tinged at base; nodes glabrous; Leaves mostly basal; sheaths 3–9 mm long, compressed, sparsely villous; ligules 0.5–2 mm long, membranous, apex ciliolate; blades 8–30 × 4–10 mm, linear-narrow lanceolate, apex acute-shortly acuminate. Inflorescence terminal spike, solitary, straight, enclosed at the base by a subtending leaf, 10–30 mm long, narrow linear-oblong. Spikelets elliptic, sessile, solitary, sunken, as long as upper glume, arranged in 2-rows. Lower glume 0.9–1.4 × 0.2–0.4 mm, oblong-ovate, membranous, hyaline, apex obtuse and 3–4-dentate. Upper glume 2–2.7 × 0.3–0.4 mm, oblong-lanceolate, coriaceous, 3-nerved, margin inflexed, apex acute-shortly acuminate. Floret 1, bisexual; callus pubescent. Lemma 1.5–1.8 × 0.5–0.8 mm, elliptic, chartaceous, 3-nerved, dorsal and margin hairy, apex truncate-subacute. Palea 1.4–1.7 × 0.3–0.45 mm, ovate-elliptic, membranous, hyaline, dorsally villous, 2-nerved, 2-keeled, apex muticous. Lodicules 2. Stamens 3. Ovary elliptic-suborbicular, gibbous. Caryopsis 1.2–1.5 × 0.4–0.5 mm, oblong-obovate, brownish.

Fl. & Fr.: Jul.–Sept.

Distrib.: Endemic-India.

Exsicc.: Rangareddy District: Tolichowk, Mdlines, 26.08.2019, SNR 8680 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2021, SNR 8704 (BSID).

Note: It can be identified by its bulged inflorescence.

Phalaris L.

World: 17 spp.; India: 05 spp., 1 var.; Telangana: 1 sp.

***Phalaris minor* Retz., Observ. Bot. 3: 8. 1783; Hook.f., Fl. Brit. India 7: 221. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 616. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 406. 2020. Plate 63**

Tufted annuals. Culms 30–52 cm high, erect to geniculate; lower nodes rooting, rounded and swollen. Leaves cauline and basal; sheaths 3.5–6 cm long, fastigiate and keeled, terete, more or less ribbed, membranous-chartaceous towards ligule. blade 5–18 × c. 1.2 cm, lanceolate-linear, base rounded to semiamplexicaul, margins serrulate, apex acuminate; ligule 5–6 mm long,



Plate 62. *Oropetium villosulum* Stapf ex Bor: A. Habitat (Inset: Inflorescence); B. Habit; C&D. Abaxial and adaxial view of spikelet; E. Lower glume; F. Upper glume; G. Floret; H&I. Abaxial and adaxial view of lemma; J&K. Abaxial and adaxial view of palea; L. Stamens; M. Pistil; N. Caryopsis.

lanceolate, membranous, acute. Panicle 2.5–5 × 1–2.5 cm, cylindrical, dense head like; peduncle 8–22 cm, ribbed. Racemes 1–1.5 cm long, up to 12 spikelets, mostly closer to axis; rachis with serrulate margins. Spikelets 4–5 × 2.8–3.2 mm (including wings), ovate-elliptic, base rounded, apex acute; pedicels 1–2.5 mm long, scabrid; disarticulating above persistent glumes. Glumes similar, winged, enclosing florets. Lower glume 4–4.5 × 1–2.3 mm, broadly ovate-elliptic, boat

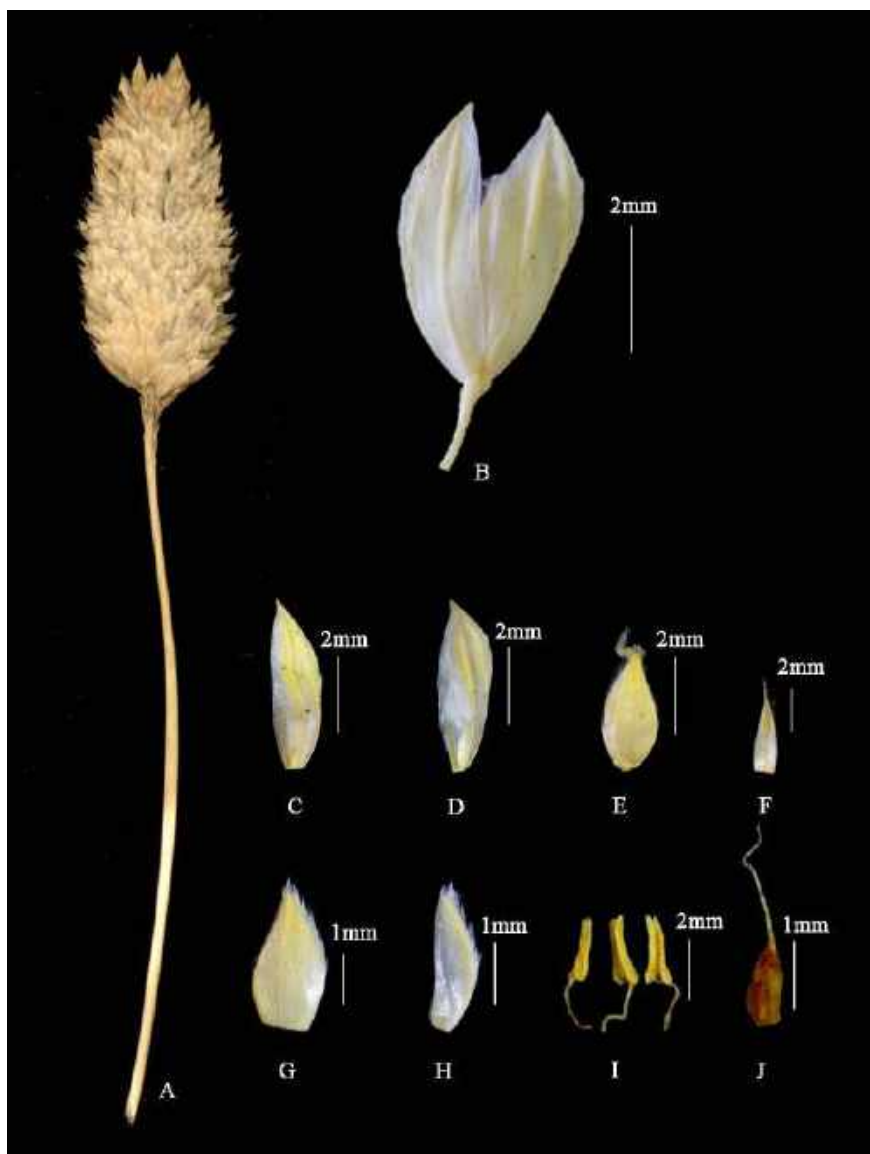


Plate 63. *Phalaris minor* Retz.: A. Inflorescence; B. Spikelet; C. Lower glume; D. Upper glume; E. Sterile and fertile florets; F. Sterile lemma; G. Fertile lemma; H. Fertile palea; I. Stamens; J. Pistil.

shaped, margins entire, apex acute, chartaceous to membranous, 3-nerved, keeled; keel broadly winged, from middle to apex, c. 3.5 mm width, margin serrulate to lobed. Upper glume 4–4.5 × 1–2 mm, broadly ovate-elliptic, boat shaped, margins entire, apex acute, chartaceous-membranous, 3-nerved, keeled; keel broadly winged, from middle to apex, c. 0.3 mm width, margin serrulate to lobed. Florets 2; lower floret reduced to minute sterile lemma, upper floret well developed, bisexual. Lower lemma 1–1.4 × c. 0.3 mm, lanceolate, totally reduced,

scale like, subulate, margins entire, apex acuminate, chartaceous, acute, ciliate dorsally and at apex. Lower palea absent. Upper lemma 2.5–3 × 1–2 mm, broadly ovate, boat shaped, margins ciliate towards apex, apex acute, chartaceous-subcoriaceous, 5-nerved, mid nerve prominent, others faint; appressed hairy on dorsal surface and glabrous towards middle. Upper palea 2–2.5 × 0.5–0.8 mm, ovate-elliptic-lanceolate, chartaceous, hyaline-greenish, prominently 2-nerved, 1-keeled towards middle, sometimes faintly 2-keeled; ciliate on keels, otherwise glabrous. Stamens 3; anthers 1–1.5 × 0.15–0.25 mm, filaments 2–2.5 mm, hyaline. Ovary oblong, 0.5–1.2 × 0.3–0.4 mm, brown; style 1–1.5 mm, hyaline; stigma plumose, 1–1.5 mm, brown. Caryopsis ovate-broadly elliptic.

Fl. & Fr.: Mar.-Apr.

Distrib.: Weed in cultivation fields.

Exsicc.: Rangareddy District: Bilal Eidgah Road, Walanthary, 01.06.2020, SNR 8933 (BSID).

Sporobolus R. Br.

World: 223 spp.; India: 20 spp., 1 subsp.; Telangana: 9 spp.

Key to the species

- | | |
|--|----------------------------------|
| 1a. Panicle effuse | ... 2 |
| 1b. Panicle contracted or spiciform | ... 7 |
| 2a. Lower glume less than ½ of lemma | ... 3 |
| 2b. Lower glume more than ½ of lemma | ... 7. <i>S. tetragonus</i> |
| 3a. Lower glume like a scale | ... 4 |
| 3b. Lower glume not scale like | ... 5 |
| 4a. Panicle branches whorled or sub-whorled towards apex, racemes sparsely long hairy, glandular | ... 1. <i>S. coromandelianus</i> |
| 4b. Panicle branches not whorled, racemes glabrous, eglandular | ... 6. <i>S. tenuissimus</i> |
| 5a. Lower glume apex truncate | ... 2. <i>S. diandrus</i> |
| 5b. Lower glume apex acute or obtuse | ... 6 |
| 6a. Primary branches alternate | ... 9. <i>S. wallichii</i> |
| 6b. Primary branches whorled at below | ... 3. <i>S. ioclados</i> |
| 7a. Panicle always spicate (cylindrical) | ... 5. <i>S. spicatus</i> |
| 7b. Panicle not cylindrical | ... 8 |
| 8a. Leaves acute at apex, lower glume much shorter than lemma... | 4. <i>S. maderaspatanus</i> |
| 8b. Leaves acuminate-pungent at apex, lower glume as long as lemma | ... 8. <i>S. virginicus</i> |

1. *Sporobolus coromandelianus* (Retz.) Kunth, Revis. Gramin 1: 68. 1829; Hook.f., Fl. Brit. India 7: 252. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1817. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 627. 1960; Pull., Fl. Telangana 3: 1178. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 751. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 428. 2020. *Agrostis coromandeliana* Retz., Observ. Bot. 4:19.1786.

Plate 64(A-H)

Mat-forming annuals or perennials. Culms 10–40 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 1.5–3 cm long, margin ciliate, mouth bearded; ligules membranous, apex fringe of hairs; blades 2–9 × 0.3–0.6 cm, linear-lanceolate, scabrid, margin serrulate, base truncate-subcordate, apex acute-acuminate. Panicle 4.2–10 × 1–3 cm, effuse, pyramidal, branched, whorled, glandular. Spikelets 1–1.3 × 0.4–0.6 mm, elliptic-lanceolate,

base rounded, glabrous, apex acute. Lower glume 0.3–0.4 mm long, ovate-oblong, chartaceous, scale-like, hyaline, base rounded, apex truncate-obtuse. Upper glume 1–1.2 × 0.2–0.3 mm, oblong-elliptic, membranous, base obtuse, apex acuminate. Lemma 1–1.2 × 0.2–0.35 mm, elliptic-lanceolate, membranous, 1-nerved, tubercled, apex acuminate. Palea 0.8–1.1 × c. 0.2 mm, elliptic-lanceolate, chartaceous, hyaline, glabrous, 2-nerved, 2-keeled, base acute, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis 0.6–0.8 × 0.5–0.6 mm, oblong-ovate.

Fl. & Fr.: Jun.–Feb.

Distrib.: Common throughout the state.

Exsicc.: Rangareddy District: Hyderabad, MVR 02205 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8505 (BSID); Wanaparthy District: Amadabakula-Kothakota, 07.08.2019, SNR 8632 (BSID).

Note: It can be identifiable by its whorled inflorescence.

2. *Sporobolus diandrus* (Retz.) P. Beauv., Ess. Agrostogr. 26. 1812. *Sporobolus indicus* (L.) R. Br., Prodr. Fl. Nov. Holland. 170. 1810. *Agrostis indica* L., Sp. Pl. 1: 63. 1753; Bor, Grasses Burma, Ceylon, India & Pakistan 629. 1960; Pull., Fl. Telangana 3: 1178. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 751. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 428. 2020. *Agrostis diandra* Retz., Observ. Bot. (Retzius) Fasc. v. 19. (1788) 1789.

Plate 64(I-Q)

Caespitose perennials. Culms 8–90 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 1.5–5 cm long, keeled, membranous, margins ciliate, mouth bearded; ligules membranous, apex ciliate; blades 2.5–8.5 × 0.2–0.3 cm, linear-lanceolate, convolute, margin ciliate, scabrous, apex acuminate-attenuate. Panicles 20–25 × c. 5 cm. Spikelets 1–1.5 × 0.3–0.4 mm, lanceolate-elliptic, base obtuse-rounded, apex acute-acuminate. Lower glume 0.5–0.7 × c. 0.3 mm, ovate-oblong, membranous, hyaline, apex truncate-lobed. Upper glume 0.8–1 × c. 0.3 mm, oblong-elliptic, base rounded, membranous, scabrous margins incurved, apex acute-acuminate. Lemma 1–1.3 × c. 0.5 mm, elliptic-lanceolate, boat-shaped, membranous, glabrous, apex acute to acuminate. Palea 1–1.5 × c. 0.3 mm, lanceolate-elliptic or elliptic-oblong, membranous, slightly hyaline, glabrous, margins inflexed, apex acute-obtuse. Lodicules 2. Stamens 2–3. Ovary ovate-lanceolate. Caryopsis 0.6–1 × c. 0.5 mm, oblong-obovate, tetragonus, pericarp brown.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Vempalli, GO & PVP 4777 (SKU)!; Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 8563 (BSID); Wanaparthy District: Amadabakula-Kothakota, 07.08.2019, SNR 8636 (BSID); Warangal District: Chennarao Pet-Narsampet, 30.03.2021, SNR 012044 (BSID); Rangareddy District: Hyderabad, MVR 02206 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8548 (BSID); 04.09.2019, SNR 8683, 8686 (BSID);



Plate 64. A–H. *Sporobolus coromandelianus* (Retz.) Kunth: A. Habitat (Inset: Inflorescence; B. Spikelet; C. Lower glume; D. Upper glume; E. Lemma; F. Palea; G. Pistil; H. Caryopses; I–Q. *Sporobolus diandrus* (Retz.) P.Beauv.: I. Habit; J. Enlarged view inflorescence; K. Spikelet; L. Lower glume; M. Upper glume; N. Lemma; O. Palea; P. Anthers; Q. Pistil.

MD lines-Towlichowk, 22.0.2019, SNR 8678 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 8990 (BSID).

3. *Sporobolus ioclados* (Nees ex Trin.) Nees, Fl. Afr. Austral. III.: 161. 1841; Bor, Grass. Burma Ceylon India Pakistan: 632. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 428. 2020. *Vilfa ioclados* Nees ex Trin. in Mem. Acad. Imp. Sci. St.-Petersbourg, Ser. 6, Sci. Math. 4: 65. 1840.

Sporobolus marginatus Hochst. ex A.Rich., Tent. Fl. Abyss. 2: 397. 1850.

Tufted annuals, stoloniferous perennials. Culms 15–60 cm high, decumbent, roots thick with a layer of minute soil particles, nodes glabrous. Leaves basal and cauline; sheath 5–10 cm long, keeled and flabellate, more or less ribbed, margins hyaline, hairy on one margin; ligule 0.6–1 mm long, membranous rim of white hairs; blade 5–15 × 0.4–0.7 cm, linear-lanceolate, flat, glaucous, rounded at base, margins cartilaginous, usually bearing stiff spine like hairs, apex acuminate-sharply pungent. Panicle 10–18 × 3–6 cm, linear-oblong, pyramidal; peduncle 16–30 cm long, terete. Racemes 1–4 cm long, spreading, whorled below, alternate to subwhorled towards apex; rachis glandular patches, barren below, secondary 2–6 mm long, branches usually appressed on rachis. Spikelets 1–1.7 × c. 0.4 mm, oblong-lanceolate, pedicelled; pedicels 0.6–1 mm long, terete, smooth-glandular; entire spikelet disarticulating from pedicel apex. Lower glume 0.3–0.5 × c. 0.2 mm, oblong, chartaceous, greenish, apex obtuse-subacute. Upper glume 1.5–1.9 × 0.3–0.4 mm, oblong-lanceolate, chartaceous, greenish, prominently 1-nerved, scabrellate dorsally above middle, margins hyaline, apex acute-acuminate. Floret 1, bisexual. Lemma 1.2–1.6 × 0.2–0.4 mm, oblong-lanceolate, chartaceous, greenish, prominently 1-nerved, margins hyaline, apex acute. Palea c. 1.3 × 0.4 mm, oblong, chartaceous, greenish, faintly 2-nerved, margins incurved, apex acute-retuse. Stamens 3; anthers 0.5–0.8 mm long. Ovary c. 0.3 mm long, oblong-elliptic, style short, stigma plumose, white-yellowish. Caryopsis c. 0.6 × 0.4 mm, oblong-elliptic, wedge shaped.

Fl. & Fr.: Aug.–Dec.–

Distrib.: Occasionally in open barren and fallow lands.

Exsicc.: Mahaboobnagar District: Kollapur, 14.12.2008, BSS & SKB 32917(SKU).

4. *Sporobolus maderaspatnus* Bor in Kew Bull. 1957: 234. 1957 & Grasses Burma, Ceylon, India & Pakistan 632. 1960; Pull., Fl. Telangana 3: 1179. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 752. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020. *Sporobolus orientalis* sensu Hook.f., Fl. Brit. India 7: 251. 1896, non Kunth, 1833; C.E.C.Fisch. in Gamble, Fl. Madras 1817. 1934.

Caespitose perennial stoloniferous. Culms 20–50 cm high, decumbent, geniculate, nodes glabrous. Leaves basal and cauline; sheaths 2–5 cm long, ribbed, scaberrulous, base fastigiate; ligules 0.5–1 mm long, membranous, apex fimbriate; blades 5–28 × 0.2–0.3 cm, linear-lanceolate, flat, convolute, margin scabrous-spinulose, apex acuminate-acute. Panicle 4–11 × 0.7–3 cm, lanceolate, spiciform, branched. Spikelets 1.6–2 × 0.4–0.6 mm, lanceolate-elliptic, apex acuminate-acute. Lower glume 0.2–0.5 × 0.2–0.4 mm, ovate-oblong, chartaceous, scabrous, hyaline, base cordate, apex acute. Upper glume 1.5–2 × 0.5–0.6 mm, elliptic-lanceolate, chartaceous, 1-nerved, base rounded, apex acute. Floret 1, bisexual. Lemma 1.8–2 × 0.4–0.6 mm, oblong-elliptic, boat-shaped, membranous, 1-nerved, apex acute. Palea 1.8–2 × 0.2–0.4 mm, oblong-lanceolate, chartaceous, margins incurved, 2-nerved, 2-keeled, apex acuminate, bifid. Lodicules 2. Stamens

3. Ovary wedge-shaped. Caryopsis c. 1 mm long, elliptic-obovate, compressed, brown.

Fl. & Fr.: Jun.–Dec.

Distrib.: Occasionally in Gadwal, Mahabubnagar, Wanaparthy & Nagarkurnool.

Exsicc.: Mahabubnagar District: Kollapur, BR & BSS 32917 (SKU).

5. *Sporobolus spicatus* (Vahl) Kunth, Revis. Gramin. 1: 67. 1829; Hook.f., Fl. Brit. India 7: 250. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1817. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 632. 1960; Pull., Fl. Telangana 3: 1180. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A. Mao & S.S. Dash (eds.), Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020. *Agrostis spicata* Vahl, Symb. Bot. 1: 9. 1790.

Plate 65

Mat-forming perennials; stoloniferous. Culms 10–50 cm high, erect or geniculate, wiry; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths, 1.5–4.5 cm long, keeled, flat, mouth bearded; ligules 0.2–0.5 mm long, apex ciliate; blades 0.5–14 × 0.4–0.5 cm, linear-lanceolate, flat, ribbed, puberulous, abaxially velvety, margins involute, base truncate, apex acuminate-spiny pungent. Panicles 3.7–10.5 × 0.2–0.3 cm, spicate, compact, branched. Spikelets 1.5–2 × 0.3–0.5 mm, lanceolate-elliptic, disarticulating from above glume. Lower glume 0.5–0.9 × 0.2–0.3 mm, ovate-oblong, chartaceous, hyaline, base truncate, apex obtuse-acute. Upper glume 0.7–1.5 × 0.2–0.4 mm, lanceolate-oblong, membranous, hyaline, glabrous, base rounded, apex acute-minutely lobed. Lemma 0.9–1.5 × 0.2–0.5 mm, oblong-lanceolate, elliptic-boat shaped, chartaceous-membranous, glabrous, keeled, 1-nerved, apex acute. Palea 1–1.5 × 0.3–0.5 mm, oblong-lanceolate, chartaceous, hyaline, glabrous, keeled, acute obtuse. Lodicules 2. Stamens 3. Ovary lanceolate-oblong. Caryopsis 0.6–1 × 0.4–0.6 mm, oblong-ovate, purple-brown.

Fl. & Fr.: Throughout the year.

Distrib.: Occasionally in Wanaparthy.

Exsicc.: Wanaparthy District: Amadabakula, 09.08.2019, SNR 8659 (BSID); Warangal District: Battupally-Kazipet, 27.03.2021, SNR 012009 (BSID).

Note: It can be recognized in the field by its mat forming habit near water sources and in having spicate inflorescence.

6. *Sporobolus tenuissimus* (Schrank) Kuntze, Revis. Gen. Pl. 3: 369. 1893; Bor, Grasses Burma, Ceylon, India & Pakistan 633. 1960; Pull., Fl. Telangana 3: 1180. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A. Mao & S.S. Dash (eds.), Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020. *Panicum tenuissimum* Schrank in Denkschr. Koenigl.-Baier. Bot. Ges. Regensburg 2: 26. 1822. *Sporobolus minutiflorus* (Trin.) Link, Hort. Berol. 1: 88. 1827; Hook.f., Fl. Brit. India 7: 248. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1817. 1934.

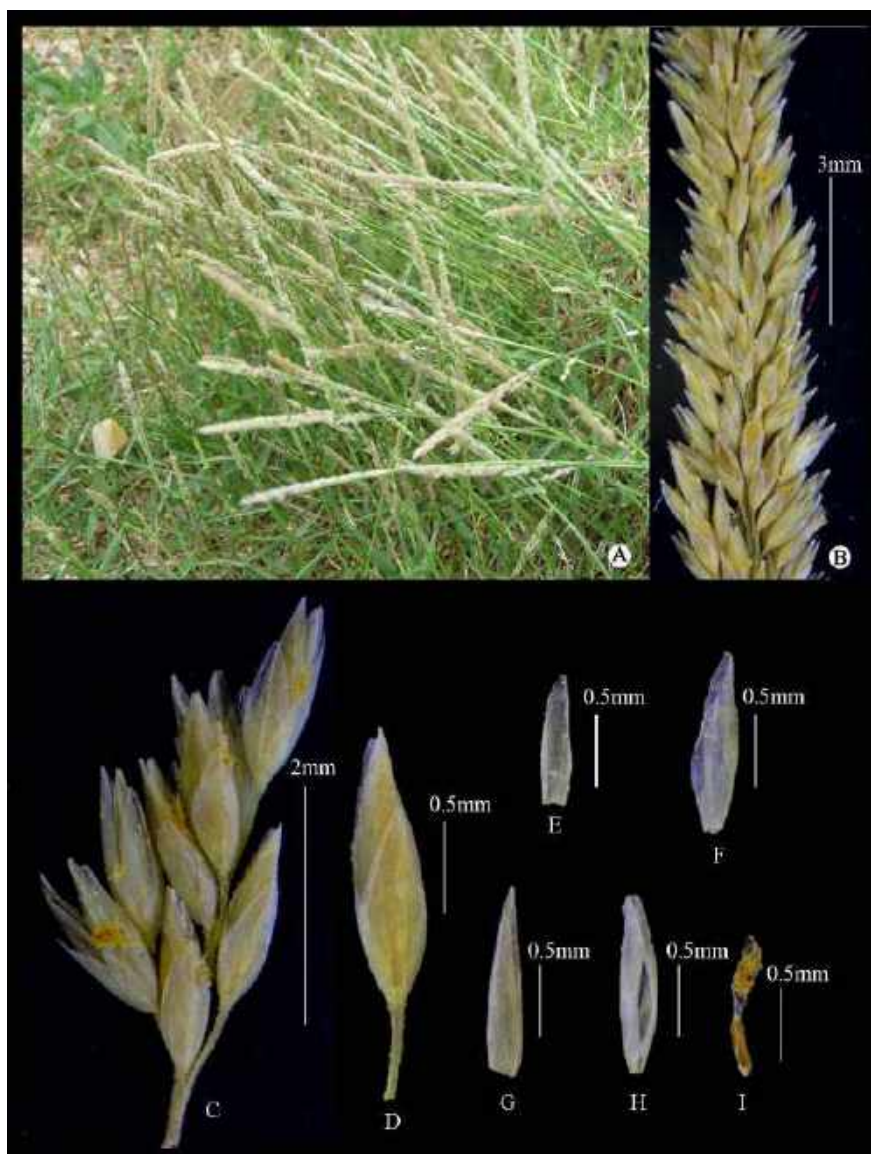


Plate 65. *Sporobolus spicatus* (Vahl) Kunth: A. Habitat; B. Enlarged view of spike; C. closed view of raceme; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea; I. Pistil.

Caespitose annuals. Culms 20–95 cm high; nodes glabrous. Leaves basal and cauline; sheaths 2–9 cm long, flat, ribbed, keeled, chartaceous-membranous, margin smooth; ligules c. 0.3 mm long, apex fimbriate; blades 2.5–21 × c. 0.3 cm, linear-lanceolate, flat, margin convolute, base round-obtuse, apex acute-acuminate. Panicles 10–28 × 3–4.5 cm, effuse, branched. Spikelets 0.7–1 × c. 0.2 mm, ovate-elliptic, pedicelled, apex acute. Lower glume 0.2 mm long, ovate-oblong, chartaceous, glabrous, hyaline, base rounded, apex truncate-lobed. Upper glume 0.4–0.6 × c. 0.2 mm, elliptic-oblong, membranous, glabrous, hyaline base truncate, apex acute-

fringed. Lemma 0.6–1 × c. 0.3 mm, oblong-lanceolate, elliptic, membranous, glabrous, margins slightly curved, 1-nerved, base rounded, apex lobed-acute. Palea 0.4–0.8 × c. 0.2 mm, oblong-elliptic, chartaceous, glabrous, hyaline, scabrid, 2-nerved, 2-keeled, base acute, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary 0.3 mm long, obovate. Caryopsis, 0.4–0.8 × c. 0.4 mm, obovoid, brown.

Fl. & Fr.: Jul.–Dec.

Distrib.: Occasional in Mahabubnagar, Medak, & Rangareddy.

Exsicc.: Medak District: Narsapur forest nursery, *TP & MSG* 12019 (SKU); Rangareddy District: Hyderabad, *MVR* 02207 (HY).

7. *Sporobolus tetragonus* Bor, Kew Bull. 4(2): 251.1949, Grasses Burma, Ceylon, India & Pakistan 633.1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020. *Sporobolus pulchellus* sensu Hook.f., Fl. Brit. India 7: 252. 1896, non R.Br., 1810.

Annuals. Culms 20–55 cm high, erect, nodes c. 0.20 × 1 mm, glabrous. Leaves mostly basal; sheaths 1–5.6 × 0.3–0.6 cm, glabrous; ligule c. 0.7 × 1.2 mm, fringe of hairs; blades 1.5–10 × 0.4–0.6 cm, linear-lanceolate, flaccid, surface rough on both sides, base rounded, margins scabrous with tuberculate-ciliate hairs, apex acuminate, hairy. Inflorescence 8–25 × 2.5–8 cm, open panicle, elliptic, effuse; primary branches whorled at most nodes; peduncle 5–25 cm long, terete; pedicels 1–1.5 mm long. Spikelets 1–1.5 × 0.5–0.8 mm, solitary, lanceolate, pale green. Glumes deciduous, unequal, reaching apex of the florets. Lower glume c. 1.0 × 0.3 mm, lanceolate, hyaline, rough, nerveless, apex acute, scabrous. Upper glume c. 1.5 × 0.7 mm, elliptic, membranous, rough, scabrous above, 1-nerved, keeled, apex acute. Lemma c. 1.6 × 0.5 mm, elliptic, membranous, scabrous on upper third part, 1-nerved, apex obtuse-acute. Palea 0.9–1.4 × 0.4–0.5 mm, membranous, 2-veined, apex acute. Stamens 3; anthers c. 0.3 mm long, linear. Ovary c. 0.2 mm long, elliptic; stigma c. 0.5 mm long, plumose. Caryopsis c. 0.8 × 0.45 mm, ellipsoid, brownish, quadrangular.

Fl. & Fr.: Aug.–Apr.

Distrib.: Occasionally in open areas.

Exsicc.: Bhadradi Kothagudem district: Kinnerasani Wildlife Sanctuary, Allapally, 30.09.2019, *JS* 009805 (BSID).

8. *Sporobolus virginicus* (L.) Kunth, Revis. Gramin. 1: 67. 1829; Hook.f., Fl. Brit. India 7: 249. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1818. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 634. 1960; Pull., Fl. Telangana 3: 1180. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020. *Agrostis virginica* L., Sp. Pl. 1: 63. 1753.

Caespitose perennials; rhizomatous-stoloniferous. Culms 10–50 cm high, geniculate; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths 1–7.3 cm long, ribbed, glabrous, margin serrulate, mouth bearded; ligules c. 0.3 mm long, membranous, apex fimbriate; blades 1.2–9.3 × c. 0.3 mm, linear-lanceolate, apex acuminate-pungent. Panicle 22.5–11.5 × 0.2–0.6 cm,

spiciform. Spikelets 2–3 × 0.3–1 mm, elliptic-lanceolate, apex acute. Lower glume 1.8–2 × 0.5–0.7 mm, ovate-elliptic, chartaceous, hyaline, glabrous, base rounded, apex acute-acuminate. Upper glume 1.8–2.3 × 0.8–1 mm, elliptic-lanceolate, membranous, margins incurved, apex acute. Lemma 1.8–2.1 × 0.4–0.7 mm, ovate-lanceolate, elliptic-lanceolate, chartaceous, 3-nerved, 1-keeled, margin incurved, apex acuminate-acute. Palea 2–2.1 × c. 0.5 mm, lanceolate-oblong, chartaceous, hyaline, margins infolded, 2-nerved, 2-keeled, apex acute. Lodicules 2. Stamens 3. Ovary elliptic-oblong. Caryopsis 0.2–0.6 × c. 0.4 mm, obovate-oblong, brown.

Fl. & Fr.: Jun.–Feb.

Distrib.: Occasionally in Medak, Rangareddy & Vikarabad.

Exsicc.: Rangareddy District: Hyderabad, MVR 02208 (HY).

9. *Sporobolus wallichii* Munro ex Trimen in J. Bot. 27: 171.1889; Hook.f., Fl. Brit. India 7: 248. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1817. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 634. 1960; Pull., Fl. Telangana 3: 1181. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 429. 2020.

Caespitose annuals. Culms 14–60 cm high, geniculate; nodes glabrous. Leaves basal and cauline; sheaths 2.7–15.6 cm long, keeled, flat, scabrous; ligules 0.3–0.4 mm long, membranous, apex fimbriate; blades 6.5–25 × 0.2–0.4 cm, linear-lanceolate, flat, convolute, apex acuminate. Panicles 18–30 × 1–2 cm, spreading, branched. Spikelets 1.2–2 × 0.3–0.5 mm, elliptic-oblong, apex acute. Lower glume 0.4–0.6 × c. 0.3 mm, ovate-oblong, chartaceous, hyaline, glabrous, base rounded, apex obtuse. Upper glume 0.6–1.2 × c. 0.4 mm, ovate-elliptic, membranous, scabrid, hyaline, base truncate, apex acute or lobed. Lemma 1.4–2 × c. 0.5 mm, elliptic, chartaceous-membranous, margin incurved, base rounded, apex acute. Palea 1.5–1.8 × c. 0.3 mm, lanceolate-elliptic, chartaceous, glabrous, 2-nerved, 2-keeled, margin inflexed, apex acute. Lodicules 2. Stamens 3. Ovary c. 0.5 mm long, lanceolate. Caryopsis 0.7–1 × c. 0.5, ovate-obovate, brown.

Fl. & Fr.: Jun.–Mar.

Distrib.: Occasionally in Mahabubnagar, Wanaprathy & Nagarkurnool.

Exsicc.: Mahabubnagar District: Mannanur, BSS & SKB 3060 (SKU), Farahabad, MVS & BML 38017 (SKU).

Trigonochloa P.M. Peterson & N. Snow.

World: 2 spp.; India: 1 sp.; Telangana: 1 sp.

Trigonochloa uniflora (Hochst. ex A.Rich.) P.M.Peterson & N.Snow, Ann. Bot. (Oxford) n.s., 109(7): 1328 (2012). *Leptochloa uniflora* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 409. 1850. Hook.f., Fl. Brit. India 7: 297. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1820. 1934; Bor, Grass. Burma Ceylon India Pakistan 517. 1960; Pull., Fl. Telangana 3: 1143. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 392. 2020.

Caespitose annuals. Culms 15–72 cm high, geniculate. Leaves basal

and cauline; sheaths 3–6.5 cm long, keeled, more or less ribbed; ligules c. 1.5 mm long, ovate, apex lacerate; blades 7–12 × 1.5–2 cm, elliptic-lanceolate, membranous, margins cartilaginous, apex acuminate-acute. Panicle 15–25 cm long, lax. Racemes many, alternate-sub whorled, 3–7 cm long. Spikelets subsessile, secund, 1.5–2.5 × 0.2–0.4 mm, narrowly lanceolate, apex acuminate. Lower glume 1.5–2.5 × 0.2–0.4 mm, oblong-lanceolate, chartaceous, 1-nerved, keeled, keel scabrid, margins serrulate, apex acuminate. Upper glume 2–2.5 × 0.2–0.4 mm, chartaceous, 1-nerved, keeled, keel scabrid, margins serrulate, apex acuminate. Floret 1, bisexual. Lemma 1–1.7 × 0.4–0.7 mm, oblong-ovate, chartaceous-membranous, 3-nerved, 1-keeled, margins ciliate, apex acute. Palea 1.5 × 0.4 mm, elliptic-lanceolate, membranous-chartaceous, base truncate, greenish, 2-nerved, 2-keeled, apex acute. Lodicules 2. Stamens 3. Ovary obovate-elliptic. Caryopsis c. 1 mm long, oblong-lanceolate.

Fl. & Fr.: Oct.–Feb.

Distrib.: Common throughout the state, along roadsides and other waste places.

Exsicc.: Medak District: Medak, RG 104162 (BSID).

Tripogon Roem. & Schult.

World: 35 spp.; India: 30 spp.; Telangana: 5 spp.

Key to the species

- | | | |
|-----|---|--------------------------------|
| 1a. | Lemmas cleft at the apex into 2 lobes | ... 2 |
| 1b. | Lemmas cleft at the apex into 4 lobes | ... 4 |
| 2a. | Median awn as long as or longer than the lemma | ... 5. <i>T. trifidus</i> |
| 2b. | Median awn shorter than the lemma, (at times absent) | ... 3 |
| 3a. | Perennials with wiry roots forming tufts, leaves glabrous | ... 3. <i>T. jaquemontii</i> |
| 3b. | Perennials with fibrous roots, forming a close tuft, leaves covered with matted white hairs | ... 4. <i>T. purpurascence</i> |
| 4a. | Median awn shorter than or nearly equal to the lemma | ... 1. <i>T. bromoides</i> |
| 4b. | Median awn twice as long as the lemma or more | ... 2. <i>T. filiformis</i> |

1. *Tripogon bromoides* Roem. & Schult., Syst. Veg., ed. 15. 2: 600. 1817; Hook.f., Fl. Brit. India 7: 287. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1834. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 519. 1960; Pull., Fl. Telangana 3: 1185. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 757. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 436. 2020.

Key to the varieties

- | | | |
|-----|--|-------------------------------------|
| 1a. | Two minute acute projections present on outer side of lateral awns | ... 1.1. var. <i>anataswamianus</i> |
| 1b. | Minute acute projections present on outer side of lateral awns | ... 1.2. var. <i>bromoides</i> |

1.1. var. *anataswamianus* (Sreek., V.J.Nair & N.C.Nair) Sang.Dey & Prasanna, Indian J. Forest. 43(2): 151. 2021. *Tripogon anataswamianus* Sreek., V.J. Nair & N.C. Nair, in Bull. Bot. Surv. India 25: 185. 1985; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 436. 2020. **Plate 66**

Caespitose perennials. Culms 15–45 cm high, erect; nodes glabrous. Leaves

basal and cauline; sheaths smooth, mouth bearded, base fastigiate; ligules membranous, apex fimbriate; blades 14–40 × 0.2–0.5 cm, linear-lanceolate, glaucous, flat-convolute, villous. Spike 12–18 cm long. Spikelets 7–12 mm long, oblong-lanceolate. Lower glume 3–5 mm long, ovate-lanceolate, 1-nerved, apex acuminate-aristate. Upper glume 5–8 × 0.7–1 mm, lanceolate, notched with arista from sinus; arista 0.8–1 mm long. Florets 7–10, similar, bisexual; callus bearded. Lemma 4.5–7 × 0.9–1 mm (including awns), ovate-lanceolate, boat shaped, chartaceous-subcoriaceous, apex dentate, 6-fid, lobes acute, 3-awned, barbellate, median awn from the sinus, lateral awns from the apex of lateral lobes. Palea 3–4 × 1–1.4 mm, elliptic, chartaceous, 2-nerved, 2-keeled, keels ciliate, margins infolded, apex emarginate. Stamens 3. Ovary c. 0.6 mm long, obovate. Caryopsis 1.5–2.2 × 0.3–0.4 mm, oblanceolate.

Fl. & Fr.: Oct.–Feb.

Distrib.: Occasionally in forest grasslands. **Endemic-India** (Kerala, Tamil Nadu & Telangana).

Exsicc.: Suryapet District: Nakrekal village, 27.10.2019, SNR 8745 (BSID); Vikarabad District: Ananthagiri Hills, 21.09.2019, 30.11.2019, SNR 8718, 8788, 8790 (BSID); Damagundam, 02.12.2019, SNR 8908 (BSID).

Note: It can be differentiated from other *Tripogon* species by its 6-fid lemma with 3-awns.

1.2. var. *bromoides*

Caespitose perennials. Culms 20–50 cm high, erect or geniculate. Leaves basal and cauline; ram sheaths fibrous, persistent; leaf sheaths 3–10 cm long, ribbed, hairy, mouth bearded; ligules 0.2 mm long, membranous, apex ciliate; blades 2.5–15 × c. 0.2 cm, linear-lanceolate, convolute, margins hairy, apex attenuate-acuminate. Racemes 4–25 × c. 0.5 cm, terminal. Spikelets 7–10 × c. 2.5 mm, oblong-lanceolate, alternate, imbricate, apex acute. Lower glume 1.6–4 × c. 0.8 mm, oblong-ovate, chartaceous, hyaline, 1-nerved, keeled, margin 2-lobed, apex acute and notched with mucro. Upper glume 2.4–6 × c. 0.8 mm (including arista), oblong-lanceolate, chartaceous, apex 2-lobed, acute. Florets 5–16, callus bearded. Lemma 2–4 × c. 1.2 mm, oblong-lanceolate, chartaceous, apex 3-fid, lobes acute, central lobe bidentate, 1-awned or mucronate, barbellate, median awn from sinus, c. 3 mm long. Palea 2–3 × 0.8–1 mm, elliptic-oblanceolate, membranous, hyaline, 2-nerved, 2-keeled, keels narrowly winged, ciliate-scabrid, margin infolded, apex acute-emarginate. Lodicules 2. Stamens 3. Ovary obovate-elliptic. Caryopsis 1.2–1.5 × c. 0.4 mm, oblong.

Fl. & Fr.: Almost throughout the year.

Distrib.: In grasslands, slopes, forest margins and roadsides of high hills

Exsicc.: Mancheril District: Gandhari Khilla, bokkala gutta, JS 9177 (BSID); Mahabubnagar District: Appapur, 13.02.2002, MSR 24543 (SKU), Iriapenta, BRPR & BSS 32280 (BSID).

Note: Good fodder and sand binding grass.

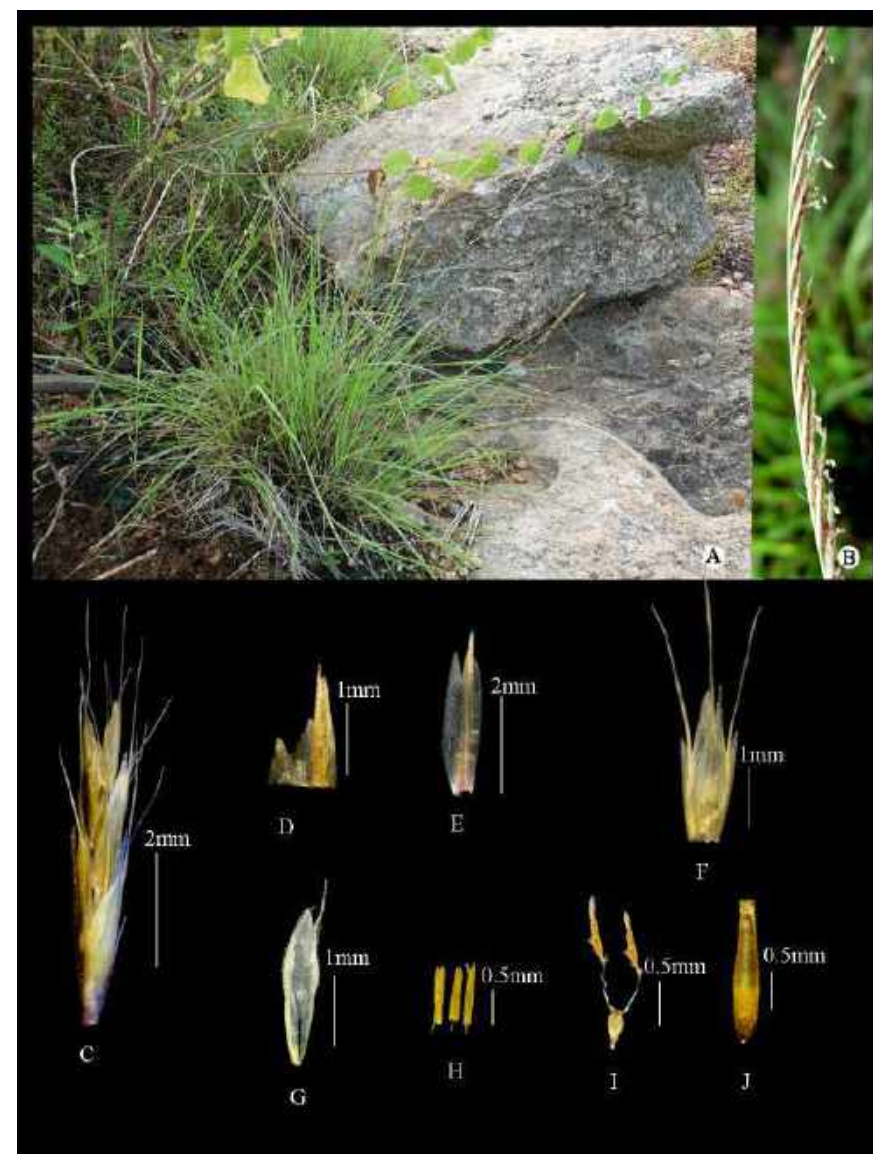


Plate 66. *Tripogon bromoides* var. *anantaswamianus* (Sreek., V.J.Nair & N.C.Nair) Sang. Dey & Prasanna: A. Habitat; B. Closed view of spike; C. Spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Palea; H. Stamens; I. Pistil; J. Caryopsis.

2. *Tripogon filiformis* Nees ex Steud., Syn. Pl. Glumac. 1: 301. 1854; Hook.f., Fl. Brit. India 7: 288. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 521. 1960; N.P. Singh et al. in Bull. Bot. Surv. India 18: 139. 1979; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 436. 2020.

Caespitose perennial. Culms 10–45 cm high, terete, slender, erect, glabrous; nodes glabrous. Leaves basal and cauline; sheaths 2–8 cm long, terete, glabrous; ligules membranous; blades 5–10 cm long, filiform, glabrous, apex

acuminate-setaceous. Racemes 5–19 cm long. Spikelets 3.5–8 mm long (including awn), linear-lanceolate. Florets 3–6. Lower glumes 1.1–2 mm long, ovate-oblong, membranous, asymmetric, 1-nerved, apex notched. Upper glume 2.1–3.2 mm long, ovate-oblong, membranous, 1-nerved, 2-toothed below the apex, shortly aristulate, 0.4 mm long. Lemma 5–7.5 × 1–1.5 mm (including awn), ovate-oblong, membranous, 3-nerved, base bearded, apex dentate, 4-fid, lobes obtuse, 3-awned, barbellate; median awn from sinus, 2.5–3 mm long; lateral awns from apex of the lateral lobes, 0.35–0.8 mm long, subequal. Palea 1.5–2.5 × 0.25–0.60 mm, elliptic-oblong, hyaline, 2-keeled, keels ciliate, apex obtuse. Stamens 3, 0.5–0.73 × 0.13–0.15 mm. Ovary c. 0.25 × 0.15 mm, oblong. Caryopsis elliptic-oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Grows in rocky crevices.

Exsicc.: Vikarabad District: Ananthagiri hills 21.09.2019, *SNR* 8714, 8719 (BSID); Naskal Range-Parigi, 01.12.2019, *SNR* 8798 (BSID).

Note: It can be identified by its long filiform awn.

3. *Tripogon jacquemontii* Stapf in Bull. Misc. Inform. Kew 1892: 85. 1892; Hook.f., Fl. Brit. India 7: 286. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1823. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 522. 1960; Pull., Fl. Telangana 3: 1185. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 757. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 437. 2020. **Plate 67(A-K)**

Caespitose perennials. Culms 20–110 cm high, erect, glaucous. Leaves basal and cauline; ram sheaths fibrous; leaf sheaths 3–8 cm long, terete-keeled; ligules membranous, apex fimbriate; blades 5–30 × 0.2–0.3 cm, linear-lanceolate, filiform, inrolled, glaucous, apex acute-attenuate. Racemes 5–20 cm long, spiciform. Spikelets 7.5–16 × 1.6–3 mm, linear-lanceolate. Lower glume 1.5–3.5 × 0.8–1 mm, lanceolate, asymmetrical, chartaceous, 1-nerved, 1-keeled, keel scabrellate, apex mucronate and acute with a lobe below middle. Upper glume 3.5–4.5 × 1.2–1.5 mm, oblong, chartaceous, 1–3-nerved, 1-keeled; apex acute-mucronate, 0.2–0.4 mm long. Florets 4–20; callus bearded. Lemma 3–4 × 1.5–2 mm, ovate-lanceolate, chartaceous, 3-nerved, apex 2-fid, lobes acute-acuminate, 1-awned from sinus; lateral lobes unawned. Palea 3–3.5 × 0.5–1 mm, chartaceous, 2-nerved, 2-keeled, keels scabrellate, narrowly winged, apex emarginate. Stamens 3. Caryopsis 1.5–2.3 × 0.3–0.5 mm, linear-oblong, brownish.

Fl. & Fr.: Nov.–Jan.

Distrib.: Occasionally in forest grassland. **Endemic** - Peninsular India.

Exsicc.: Mahabubnagar District: Mallelatheertham, 06.08.2008, *BSS* & *SKB* 32217 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8706 (BSID); 30.11.2019, *SNR* 8784 (BSID); Naskal Range, Parigi, 01.12.2019, *SNR* 8797 (BSID); Damagundam, 02.12.2019, *SNR* 8907 (BSID); Warangal District: Moosi project, 27.10.2019, *SNR* 8759 (BSID).

Note: Robust grass.

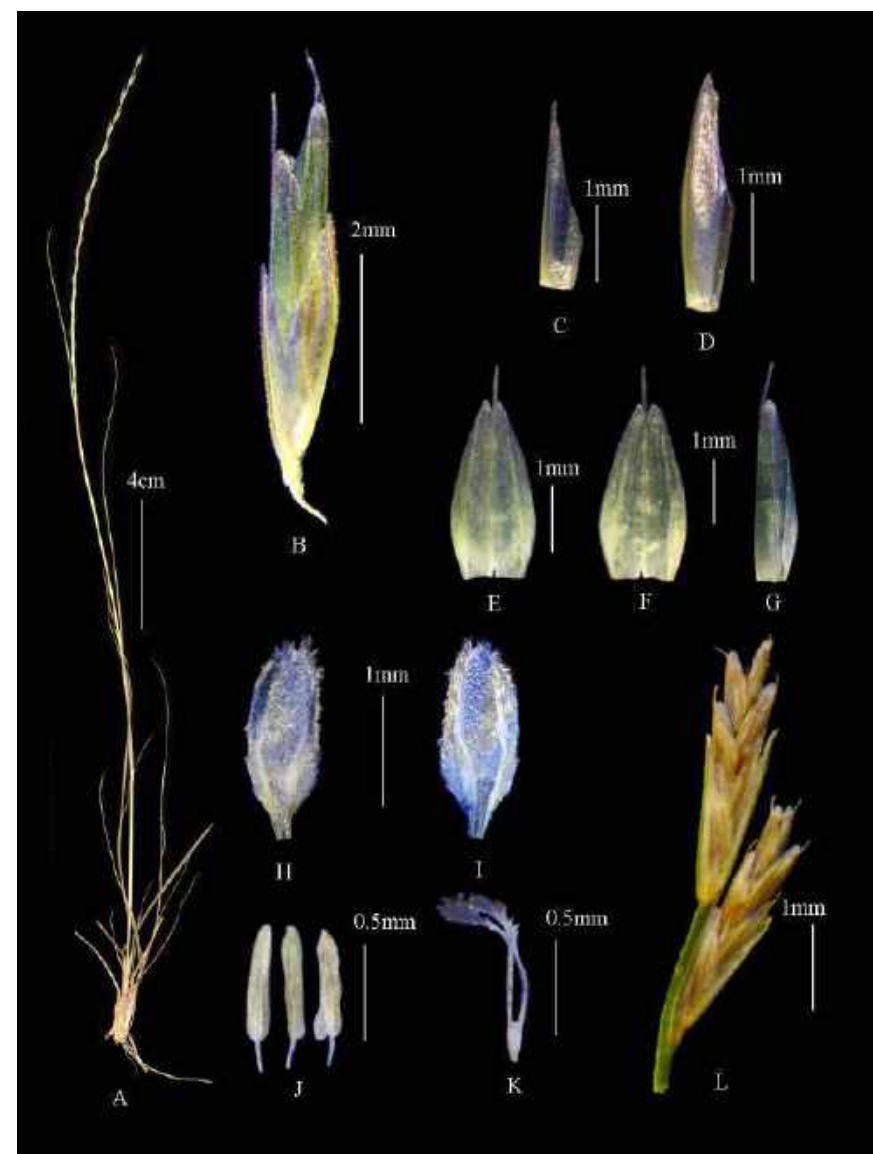


Plate 67. A–K. *Tripogon jacquemontii* Stapf: A. Habit; B. Spikelet; C. Lower glume; D. Upper glume; E–G. Abaxial, adaxial and side view of lemma; H&I. Abaxial and adaxial view of palea; J. Stamens; K. Pistil; L. *Tripogon purpurascens* Duthie: Spikelets.

4. *Tripogon purpurascens* Duthie in Ann. Roy. Bot. Gard. (Calcutta) 9: 74. 1901; Bor, Grasses Burma, Ceylon, India & Pakistan 522. 1960; Pull., Fl. Telangana 3: 1186. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 437. 2020. **Plate 67(L)**

Caespitose perennial; ram sheaths persistent. Culms 9–50 cm high, erect; nodes glabrous. Leaves basal and cauline; sheaths 1–2 cm long; ligules membrane, apex ciliate; blades 5–15 × 0.3–1 cm long, filiform, convolute; adaxially pilose

scabrous-hispidulus, abaxially glabrous; margins scabrous, apex acute-attenuate. Racemes 3–17 cm long, solitary, linear. Spikelets 3.5–5 × 0.5–1 mm, oblong. Lower glume 0.5–1 × 0.3–0.5 mm, lanceolate, chartaceous, 1-nerved, lobed lower middle, apex acuminate. Upper glume 1.2–3.1 × 0.9–1.1 mm, lanceolate, coriaceous, 1-nerved, margins scarious, apex acute-acuminate. Florets 2–5, similar, bisexual, imbricate. Lemma 1.5–2.3 × 0.6–0.9 mm, oblong-lanceolate, coriaceous, 3-nerved, apex dentate, 2-fid, lobes truncate, mucronate or awn, 0.2–0.5 mm long, barbellate. Palea 1.5–3.1 × 0.5–1 mm, oblong-elliptic, 2-nerved, 2-keeled, keel winged and ciliate, apex acute. Stamens 3. Caryopsis 1.5–2.5 × 0.3–0.8 mm, oblong-elliptic.

Fl. & Fr.: Jul.–Aug.

Distrib.: Most of the hillocks of Telangana.

Exsicc.: Mahabubnagar District: Appapur, *BSS & SKB* 32220 (SKU); Vikarabad District: Anantagiri Hills, 21.09.2019, *SNR* 8709 (BSID).

5. Tripogon trifidus Munro ex Stapf in Hook.f., *Fl. Brit. India* 7: 286. 1896; Bor, *Grass. Burma, Ceylon, India & Pakistan* 524. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 400. 2020.

Key to the varieties

- | | |
|---|----------------------------------|
| 1a. Median awn as long as or shorter than lemma | ... 5.1. var. <i>sivarajanii</i> |
| 1b. Median awn longer than lemma | ... 5.2. var. <i>trifidus</i> |

5.1. var. sivarajanii (Sunil) Sang.Dey & Prasanna, *Indian J. Forest.* 43(2): 157. 2021. *T. sivarajanii* Sunil, *Sida* 18(3): 809. 1999. *T. jayachandranii* Arum. & Murugan, *Indian J. Forest.* 40(2): 159. 2017. *T. nallamalayanus* Rasingam & J. Swamy, *Phytotaxa* 351(4): 296. 2018.

Caespitose perennials. Culms 20–30 cm high, erect; nodes glabrous. Leaves basal and cauline; sheaths, 6–11.5 cm long, terete, glabrous; ligules 0.3–0.4 mm long, membranous, truncate, apex ciliate; blades 17–37 × 0.04–0.12 cm, linear, filiform, convolute, 5–8-nerved, abaxially scabrid, adaxially glabrous, margin scabrid, apex acuminate. Racemes 15–25 cm long. Spikelets 11–17 × 2–7.5 mm (excluding awns), narrowly elliptic, laterally compressed. Lower glume 3.5–4 × c. 0.7 mm, lanceolate, membranous, 1-nerved, lobed below the middle, apex acuminate. Upper glume 4–5 × 0.6–0.7 mm, narrowly lanceolate, membranous, 1-nerved, apex acuminate. Florets 11–16. Lemma 3.5–3.6 × 1–1.7 mm (excluding awn), ovate, membranous, base glabrous, 3-nerved, 1-keeled, 2-fid, lobes acute, 1-awned, arising from sinus 3–4 mm long, geniculate, barbellate, lateral lobes unawned. Palea 2.4–2.5 × 0.8–0.9 mm, obovate-oblongate, 2-keeled, keel ciliate, apex emarginate. Lodicules 2. Stamens 3. Ovary c. 0.3 × 0.1 mm, glabrous.

Fl. & Fr.: Nov.–Jan.

Distrib.: Occasionally in Forest grassland. **Endemic**-Telangana.

Exsicc.: Mahabubnagar District: Umamaheswaram, *LR & JS* 7396 (BSID).

5.2. var. trifidus

Caespitose. Culms 15–55 cm high. Leaves basal and cauline; leaf sheaths

glabrous, smooth, rarely with few hairs at the mouth, basal sheaths papery, fibrous at maturity, persistent; ligules c. 0.3 mm, membranous, finely ciliate; blades 15–25 × 0.1–0.2 mm, flat-convolute, glabrous, apex attenuate; Spikes 5–25 cm long, flexuous; rachis somewhat flattened, angular, glabrous. Spikelets 4.2–12 mm long, 2-rowed, sessile, erect-slightly divergent. Lower glumes 1.5–2.5 × 0.4–0.5 mm, asymmetrical, narrowly lanceolate, broadly lobed on one side, marginal tooth reaching halfway, apex acute. Upper glumes 3.4–3.5 × 0.4–0.5 mm, lanceolate, 2-toothed with c. 1 mm long arista at apex. Fertile florets 5–13, loosely to densely imbricate. Lemmas 2.7–4.2 × 0.9 mm, elliptic, base bearded, membranous, bifid; median awn from sinus, 5–13 mm long, flexuous, lacking hyaline teeth between median awn and those produced from lateral veins; lateral veins extended into 0.45–0.6 mm long awn. Paleas 2.5–3.8 × 0.9 mm, chartaceous, broadly oblong, obtuse-bifid at apex.

Fl. & Fr.: Nov.–Jan.

Distrib.: Occasionally in forest grassland.

Exsicc.: Vikarabad District: Anantagiri hills-Gattukondapur, 01.12.2019, *SNR* 8800 (BSID).

TRIBE: CYNODONTEAE

Key to the genera

- | | |
|---|---------------------------|
| 1a. Spikelets with 2–5 fertile florets | ... 2 |
| 1b. Spikelets with 1 fertile floret | ... 3 |
| 2a. Lemma 5–11 nerved | ... Pommereulla |
| 2b. Lemma 3-nerved | ... Tetrapogon |
| 3a. Racemes persistent; spikelets breaking up at maturity | ... 4 |
| 3b. Racemes deciduous or spikelets falling entire | ... 8 |
| 4a. Glumes shorter than floret; lemma exposed | ... 5 |
| 4b. Both glumes exceeding and closed around floret; lemma concealed | ... Microchloa |
| 5a. Spikelets 2-several flowered; lemma sinuously awned | ... 6 |
| 5b. Spikelets 1-flowered | ... Cynodon |
| 6a. Lemma laterally compressed; grain trigonous-subterete | ... 7 |
| 6b. Lemma and grain dorsally compressed | ... Enteropogon |
| 7a. Lemma with a straight awn | ... Chloris |
| 7b. Lemma with long sinuous awn | ... Schoenefeldia |
| 8a. Spikelets 2-several flowered with rachilla extension | ... Melanocenchris |
| 8b. Spikelets 1-flowered without rachilla extension | ... 9 |
| 9a. Lower glume very small, suppressed | ... 10 |
| 9b. Lower glume well developed | ... Perotis |
| 10a. Spikelets solitary, born on the central axis | ... Zoysia |
| 10b. Spikelets-2, on short recemelets | ... Tragus |

Chloris Sw.

World: c. 53 spp.; India: 11 spp.; Telangana: 7 spp.

Key to the species

- | | |
|--|--------------------------|
| 1a. Florets 2 | ... 7. <i>C. virgata</i> |
| 1b. Florets 3, 4 or 5 | ... 2 |
| 2a. Florets 3 | ... 3 |
| 2b. Florets 4 or 5 | ... 4 |
| 3a. Spikelets above 3 mm long; second floret hairy along margins | ... 3. <i>C. gayana</i> |
| 3b. Spikelets up to 2.5 mm long; second floret glabrous | ... 1. <i>C. barbata</i> |

- 4a. Perfect florets 2 ... 2. *C. bournei*
 4b. Perfect floret 1 ... 5
 5a. Culms glabrous below the inflorescence ... 4. *C. montana*
 5b. Culms puberulous below the inflorescence ... 6
 6a. Spikelets perfectly with five awns; lowest lemma not bearded.. 5. *C. quinquesetica*
 6b. Spikelets with four awns (rarely five awns); lowest lemma densely long-bearded ... 6. *C. telanganae*

1. *Chloris barbata* Sw., Fl. Ind. Occid. 1: 200. 1797; Hook.f., Fl. Brit. India 7: 292. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1838. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 465. 1960; Pull., Fl. Telangana 3: 1087. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 688. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. *Andropogon barbatus* L., Mant. Pl. Altera 302. 1771, (as "*barbatum*"). 'Uppu Gaddi' **Plate 68**

Caespitose perennials. Culms 20–95 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 2–14 cm long, keeled, compressed; ligules membranous, truncate; blades 2–30 × 0.1–0.6 cm, linear-lanceolate, flat. Racemes 3–10; c. 10 cm long, digitate, glabrous below the inflorescence. Spikelets 2–3 mm long, obovate-elliptic, callus bearded. Lower glume 1–1.5 mm long, lanceolate, chartaceous, hyaline 1-nerved, 1-keeled, keel scabrid. Upper glume 2.5–3 mm long, lanceolate, chartaceous, hyaline, scabrid on keels. Florets 3, 1-fertile, 3-awned. Fertile lemma c. 3 mm long, obovate-elliptic, 3-nerved, awns 4–6 mm long, sparsely hairy on back and densely ciliate along margins. Palea 2.5–3 mm long, oblong-elliptic, hyaline, 2-nerved. 2-keeled, keel scabrid, apex acute-obtuse. Sterile lemma 2, 1–1.5 mm long, obovate-globose, truncate, 3-nerved, awn 4–6 mm long. Caryopsis 1–1.8 mm long, ovate-oblong, trigonous.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Mahabubnagar District: Amrabad, BSS & SKB 32208 (SKU); Rangareddy District: Hyderabad, MVR 02119 (HY); Rajendranagar-Manashills, 24.08.2016, SNR 8507 (BSID); Warangal District: Regional Agricultural Research Station, 26.03.2021, SNR 8988 (BSID); Wanaparthy District: Amadabakula, 09.08.2019, SNR 8655 (BSID).

2. *Chloris bournei* Rang. & Tadul. in J. Indian Bot. Soc. 2: 189. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1838. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 466. 1960; Pull., Fl. Telangana 3: 1087. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 688. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020.

Caespitose perennials; stoloniferous. Culms 30–80 cm high, nodes glabrous; lower nodes rooting. Leaves mostly basal; sheaths 4–6 cm long, compressed, keeled; ligules 0.5–1 mm long, membranous, apex ciliate; blades 2–11 × 0.3–0.5 cm, linear-lanceolate, margin serrulate, apex attenuate. Racemes 3–5; c. 8 cm long, digitate, pubescent below the inflorescence. Spikelets 3–4 mm long; callus bearded. Lower glume 2–2.5 mm long, lanceolate-ovate, membranous, hyaline, 1-nerved, keeled, scabrid, margin infolded, apex acute. Upper glume 3–4 mm



Plate 68. *Chloris barbata* Sw.: A. Habitat; B. Inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Palea.

long, elliptic, chartaceous, 1-nerved, 1-keeled, keel barbellate, apex mucronate. Florets 4, 2-fertile, 4-awned. Fertile lemma 3–4 mm long, ovate-elliptic, coriaceous, 3-nerved, marginal nerves hairy, bearded at base, apex bifid, awned; awn barbellate. Palea 3–3.5 mm long, elliptic, cuneate, 2-nerved, 2-keeled, keel winged, ciliate, apex acute. Stamens 3. Ovary elliptic. Caryopsis 2–2.5 mm long, trigonous. Sterile lemma 2, 1–2 mm long, obovate, epaleate, awned.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally in grassy patches. **Endemic** - Peninsular India.

Exsicc.: Adilabad District: Indhanpalli-Range, Narlapur-Beat, APS 3926 (BSID).

3. *Chloris gayana* Kunth in Revis., Gramin. 1: 293, pl. 58. 1830; Bor, Grasses Burma, Ceylon, India & Pakistan 466. 1960; Pull., Fl. Telangana 3: 1088. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. **Plate 69(A-J)**

Caespitose perennials; stoloniferous. Culms 60–110 cm high, erect or geniculate; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths 8–10 cm long, compressed, keeled, glabrous, mouth bearded, ligules membranous, apex ciliate; blades 2–25 × 0.5–0.7 cm, linear, base rounded-truncate, apex acuminate. Racemes 5–15; 5–10 cm long, digitate, glabrous below the inflorescence. Spikelets 2.5–3 mm long, ovate-lanceolate, secund. Lower glume 1–2 × 0.2–0.4 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate. Upper glume 1.5–3 × 0.4–0.5 mm, oblong-lanceolate, chartaceous, 3-nerved, keeled, keel scabrid, apex acuminate-aristate. Florets 3, 1-ferile, callus bearded. Lower lemma 2–2.5 × 0.4–0.6 mm, oblong-elliptic, boat shaped, coriaceous-chartaceous, 3-nerved, ciliolate on nerves above, apex acuminate, 2-toothed, awned, barbellate. Palea 1–1.5 × 0.3–0.4 mm, oblanceolate, chartaceous, 2-nerved, 2-keeled, keel scabrid, apex acute-obtuse. Lodicules 2. Stamens 3. Caryopsis 0.2–0.5 × 0.2 mm, elliptic. Upper lemma 2.2 mm long, oblong, awn c. 2.1 mm long, third lemma 1–1.6 mm long, cuneate, neuter, unawned.

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasionally in Adilabad, Medak & Rangareddy.

Exsicc.: Adilabad District: Indhanpalli-Range, Narlapur-Beat, APS 3908 (BSID); Rangareddy District: Rajendranagar-Manasahills, 22.10.2019, SNR 8932 (BSID); Hyderabad, MVR 02118 (HY); Warangal District: Regional Agricultural Research Station, 28.03.2021, SNR 012017 (BSID).

4. *Chloris montana* Roxb., Fl. Ind. 1: 331. 1820; Hook.f., Fl. Brit. India 7: 292. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1838. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 466. 1960; Pull., Fl. Telangana 3: 1088. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020.

Caespitose perennials; stoloniferous. Culms 20–45 cm high, geniculate; nodes glabrous, nodes below rooting. Leaves basal and cauline; sheaths 3.1–5 cm long, compressed, keeled, glabrous; ligules membranous, apex fimbriate; blades 5–15 × 0.3–0.5 cm, linear, oblong-lanceolate, glabrous-sparsely pilose, apex acuminate. Racemes 3–10, digitate, glabrous below the inflorescence. Spikelets 2.5–3 mm long, oblong or cuneate. Lower glume 1–2 mm long, oblong-lanceolate, chartaceous, 1-nerved, 1-keeled, scabrid. Upper glume 2.5–3 mm long, oblong-lanceolate, chartaceous, 1-nerved, keeled, keel scabrid. Florets 4 or 5, 1-fertile, awned; callus bearded. Fertile lemma 2–3 mm long, oblong-oblanceolate, 3-nerved,

margins ciliate, apex obtuse-emarginate, awn c. 7 mm long. Palea 2–2.5 mm long, oblong, chartaceous, hyaline, 2-nerved, 2-keeled, keel scabrid, apex acute. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis 2–2.6 mm long, oblong-trigonus. Sterile lemma 1.5–2.1 mm long, elliptic, truncate, awns c. 7 mm long.

Fl. & Fr.: Sep.–Dec.

Distrib.: Occasional in Medak, Rangareddy & Vikarabad.

Exsicc.: Rangareddy District: Hyderabad, MVR 02120 (HY).

5. *Chloris quinquesetica* Bhide in J. Proc. Asiat. Soc. Bengal (N.S.) 8: 311. 1912; Bor, Grasses Burma, Ceylon, India & Pakistan 466. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. **Plate 69(K-T)**

Caespitose perennials. Culms about 60 cm high; erect or decumbent; nodes glabrous, rooting lower nodes. Leaves basal and cauline; sheaths terete or sub-compressed; ligules membranous; blades 2–15 × 0.3–0.5 cm, linear, ovate-lanceolate, flat, margins minutely scabrid, base truncate, apex acuminate. Racemes 2.5–5 cm long, digitate, puberulous below the inflorescence. Spikelets 2 × 0.9 mm, obovate, five awned; awns c. 6.5 mm long. Lower glume 3.49 × 0.42 mm, elliptic-lanceolate, membranous, 1-nerved, scabrid on nerves, apex mucronate. Upper glume 3.6–4 × 0.7–0.8 mm, narrowly ovate, membranous, 1-nerved, keeled, scabrid on keels, apex mucronate. Florets 5; 1-fertile; 4-neuter; awns 5. Fertile lemma c. 2.51 × 1.16 mm, elliptic-obovate, coriaceous, hairy on dorsal side, margins inflexed, ciliate, 3-nerved, apex acute; awned; awn 7–8 mm long, straight. Palea c. 2.61 × 0.80 mm, narrowly obovate-oblanceolate, margins inflexed, 2-nerved, 2-keeled, keel ciliate, slightly hairy on upper surface, apex 2-toothed. Stamens 3. Ovary c. 1.3 mm long. Caryopsis 1.79 × 0.77 mm.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Indhanpalli-Range, Narlapur-Beat, APS 3939 (BSID); Rangareddy District: Manasa hills-Rajendranagar, 24.08.2019, SNR 8502, 8503 (BSID); 04.09.2021 SNR 8684 (BSID).

Note: It can be identified by its 5 awned spikelets.

6. *Chloris telanganæ* Nagaraju, Prasanna, Y.V. Rao & S.B. Padal in Phytotaxa 434 (2): 195. 2020. **Plate 70(A-M)**

Caespitose, perennials; stoloniferous. Culms 17–60 cm high, geniculate, terete, glabrous, brown. Leaves basal and cauline; sheaths 2–6.5 cm long, keeled, glabrous; ligules 1–1.9 mm long, membranous, hairy on back; blade 1–19.5 × 0.1–0.14 cm, linear, margins serrulate, glabrous, apex acuminate. Culms puberulous below the inflorescence. Peduncle c. 20 cm long. Spikes 4–5; 3–11.5 cm long, appressed or slightly divergent. Spikelets densely imbricate, spreading widely; rachis angular and scabrid, 3–10 cm long. Spikelets 3–3.2 × 1–1.5 mm, oblanceolate. Lower glume 1.5–2 × 0.4–0.9 mm, linear-lanceolate, chartaceous, 1-nerved, keeled, keel scabrid, apex acute-finely mucronate, lacerate. Upper glume 3–3.5 × 0.4–1 mm, linear-lanceolate, 1-nerved, keeled, scabrid on keel,

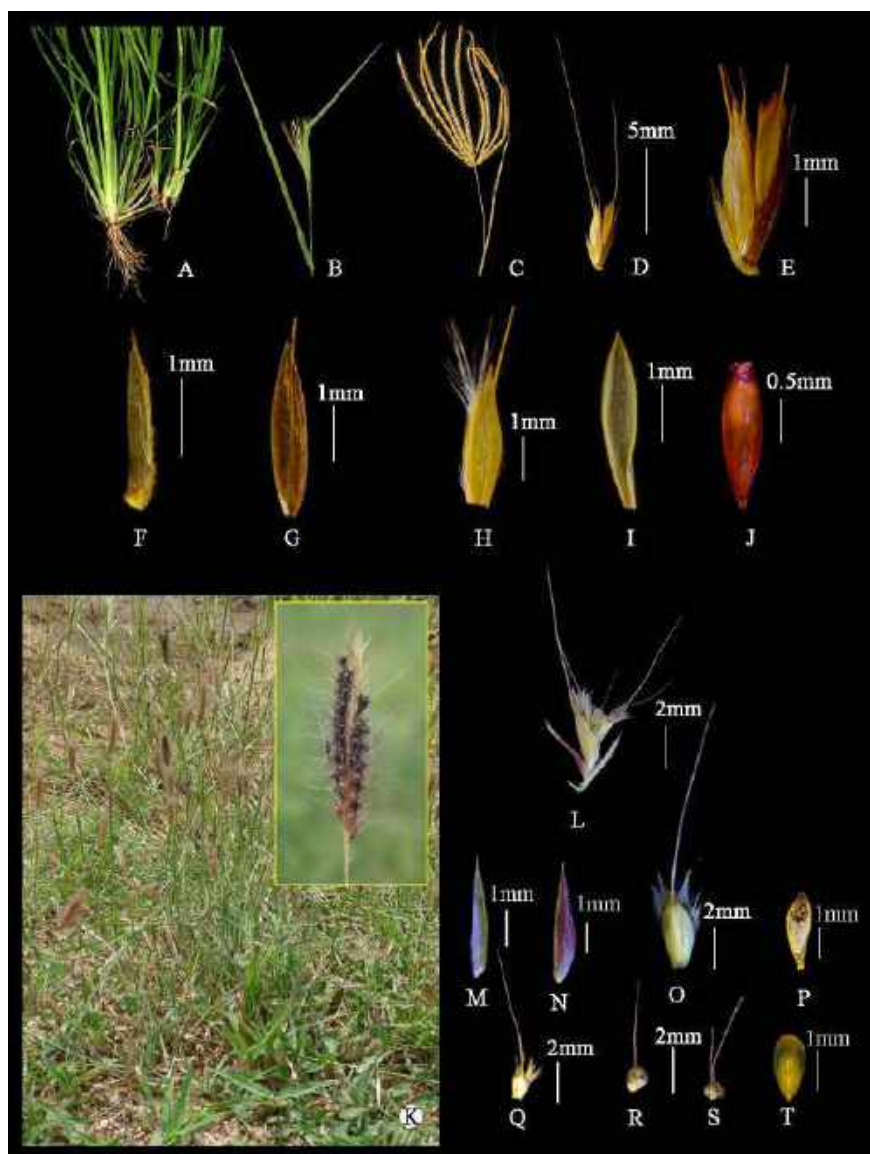


Plate 69. A–J. *Chloris gayana* Kunth: A. Lower portion of the habit; B&C. Inflorescence; D. Spikelet; E. Enlarged view of spikelet; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Caryopsis; K–T. *Chloris quinquesetica* Bhide: K. Habitat (Inset: Inflorescence); L. Spikelet; M. Lower glume; Upper glume; O. Lemma; P. Palea; Q–S. Sterile lemma; T. Caryopsis.

apex acuminate-shortly mucronate-lacerate. Florets 4-5, lowest one fertile, others sterile; disarticulating above persistent glumes; callus at base, pungent, 0.5–0.7 mm long. Fertile lemma 3–3.2 × 1–1.2 mm, broadly elliptic, elliptic-obovate, chartaceous, 3-nerved, sparsely hairy on both sides of the mid nerve and densely hairy on lateral nerves, hairs 1–1.2 mm long; awn arise from back, 10–12.5 mm long, straight, barbellate. Fertile palea shortly stalked, 2–2.9 ×

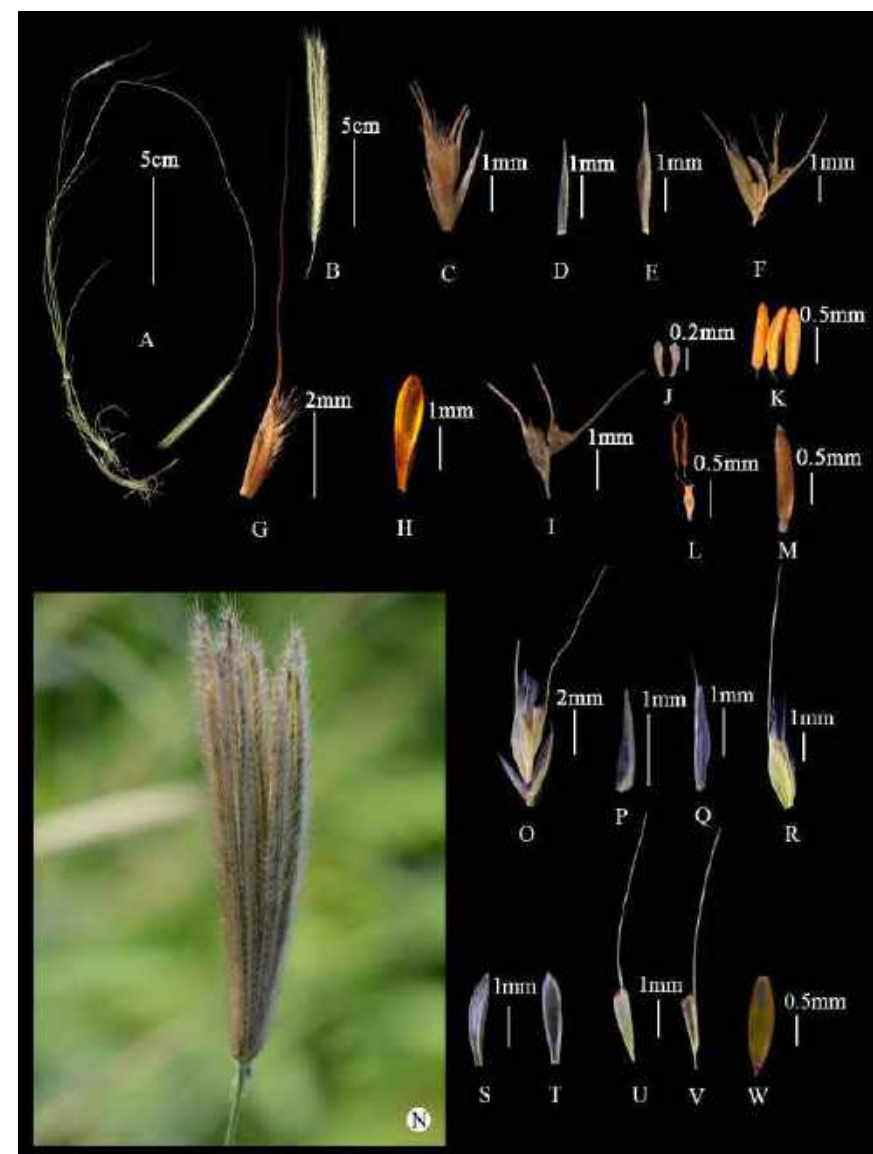


Plate 70. A–M. *Chloris telanganae* Nagaraju, Prasanna, Y.V. Rao & S.B. Padal: A. Habit; B. Inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Fertile and sterile florets; G. Fertile lemma; H. Palea; J. Lodicules; K. Stamens; L. Pistil; M. Caryopsis; N–W. *Chloris virgata* Sw.: N. Inflorescence; O. Spikelet; P. Lower glume; Q. Upper glume; R. Lemma; S. Abaxial and adaxial view of palea; U&V. Sterile lemma; W. Caryopsis.

1–1.5 mm, oblanceolate, emarginate at apex, 2-nerved, 2-keeled, keels scabrid, pustulose-pilose towards upper portion on back side. First sterile lemma 1–1.2 × 1 mm, obovate, chartaceous, 3-nerved, apex acute-obtuse, awn 6.5–9 mm long, scabrid. Second sterile lemma c. 1 × 1 mm, obovate to orbicular, acute-obtuse, 3-nerved, awn 7–7.2 mm long. Third sterile lemma c. 1 × 1 mm, obovate-orbicular, acute-obtuse, awn 4–4.5 mm long. Fourth sterile lemma 0.5 × 0.5 mm,

obovate-orbicular, apex acute-obtuse, awn 2–2.1 mm long. Lodicules 2. Stamens 3. Caryopsis 1–1.5 × 0.4 mm, oblong or oblong-lanceolate, strongly dorsally flattened.

Fl. & Fr.: Throughout the year.

Distrib.: **Endemic** - Telangana.

Exsicc.: Rangareddy District: AG college-Rajendranagar, 01.08.2018, SNR 8518 (BSID).

7. *Chloris virgata* Sw., Fl. Ind. Occid. 1: 203. 1797; Hook.f., Fl. Brit. India 7: 291. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 468. 1960; Pull., Fl. Telangana 3: 1089. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 690. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020. **Plate 70(N-W)**

Caespitose perennials. Culms 30–50 cm high, erect; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths keeled, glabrous, mouth bearded; ligules membranous; blades 5–20 × 0.25–0.6 cm, linear-lanceolate, margins scabrid, apex acute. Racemes 5–10; c. 8 cm long, digitate, crowded, puberulous the below the inflorescence. Spikelets 3–4 mm long (excluding awn), obovate. Lower glume 1–1.5 × 0.2 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate. Upper glume 2–3 mm long, lanceolate, chartaceous, 1-nerved, 1-keeled, keel barbellate, apex 2-toothed, awn 0.5–0.9 mm long. Florets 2; 1-fertile; 2-awned; callus ciliate. Fertile Lemma 2–3.9 mm long, oblong, coriaceous, 3-nerved, keeled, margin keel densely long hairy towards apex; awn 5–8 mm long. Palea 2–2.8 × 0.5 mm, obovate, hyaline, 2-nerved, 2-keeled, keel narrowly winged, scabrid, apex acute. Caryopsis 1.5–2 × 0.5 mm, trigonous. Sterile Lemma 1.5–2 mm long, lanceolate, truncate, awn 5–6 mm long.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common in wastelands, sandy soils in wet habitats and along forest margins.

Exsicc.: Adilabad District: Indhanpalli-Range, Narlapur-Beat, APS 3939 (BSID); Mahabubnagar District: Borapuram, BSS & SKB 32286 (SKU); Rangareddy District: Hyderabad, MVR 02122 (HY); Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8705, 8727 (BSID).

***Cynodon* Rich.**

World: c. 14 spp.; India: 5 spp., 1 f.; Telangana: 3 spp.

Key to the species

- 1a. Rachis flexible, often reflexed when mature, margins winged; lower glume bent or curved ... 3. *C. radiatus*
- 1b. Rachis straight and stiff, not reflexed when mature, margins not winged; lower glume straight to slightly bent ... 2
- 2a. Upper glume subequal to slightly longer than lemma; lemma hairs clavellate ... 1. *C. barberi*
- 2b. Upper glume usually shorter than lemma; lemma hairs ciliate and not clavellate ... 2. *C. dactylon*

1. *Cynodon barberi* Rang. & Tadul. in J. Bombay Nat. Hist. Soc. 24: 846.

1916; C.E.C.Fisch. in Gamble, Fl. Madras 1836. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 469. 1960; Pull., Fl. Telangana 3: 1100. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 696. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 347. 2020. **'Garika Gaddi' Plate 71(A-I)**

Caespitose perennials; stoloniferous. Culms 20–50 cm high; nodes glabrous, nodes rooting; ram sheaths persistent. Leaves basal and cauline; sheaths keeled, moth sparsely bearded; ligules ciliate; blades 1–5 × 0.2–0.4 cm, sparsely hispid on upper surface, margin cartilaginous-scabrid. Spikes 4–5; c. 5 cm long. Spikelets 2–2.5 × 0.5–0.8 mm, ovate, laterally compressed, 1-flowered. Lower glume 1.8 mm long, linear, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acute. Upper glume 2–2.4 mm long, linear, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex mucronate. Lemma 2–2.5 × 0.5–0.7 mm, coriaceous, keeled, keel hispid, margin inrolled, clavellate hispid, apex obtuse-acute. Palea 2–2.1 × 0.2–0.4 mm, lanceolate, chartaceous, hyaline, keel hispid, apex acute. Stamens 2. Caryopsis 1 mm long, oblong.

Fl. & Fr.: Aug.–Nov.

Distrib.: Common throughout the state in wastelands and river beds.

Exsicc.: Mahabubnagar District: Bhavanisagar, 06.08.2019, SNR 8614 (BSID); Rangareddy District: Hyderabad, MVR 02132 (HY).

2. *Cynodon dactylon* (L.) Pers., Syn. Pl. 1:85. 1805; Hook.f., Fl. Brit. India 7: 288. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1835. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 469. 1960; Pull., Fl. Telangana 3: 1100. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 696. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 347. 2020. *Panicum dactylon* L., Sp. Pl. 1: 58. 1753. **'Garika Gaddi' Plate 71(J)**

Mat-forming perennials; stoloniferous; rhizomatous-covered with white scales. Culms about 50 cm high, glossy, nodes rooting; ram sheaths persistent. Leaves basal and cauline; sheaths keeled, mouth villous; ligules 0.2–0.4 mm long, membranous, apex ciliate; blades 2–6 × 0.3–0.5 cm, narrowly linear, margin scabrid, apex acuminate-pungent. Racemes 2–8; 3–7 cm long, digitate, greenish or light purple coloured. Spikelets 2–2.6 × 1–1.5 mm, oblong-lanceolate, secund, laterally compressed, rachilla produced beyond the glume. Lower glume 1–2 mm long, curved, lanceolate, chartaceous, 1-nerved, keeled, keel scabrid, apex acute. Upper glume 1.5–2.2 × 0.17 mm, lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate, ciliate. Lemma 2–2.22 × 0.5–0.9 mm, ovate-oblong, chartaceous, 3-nerved, keel scabrid. Palea 1.5–2.16 × 0.4 mm, chartaceous, 2-nerved, keel scabrid, apex acute. Lodicules 2. Stamens 3. Ovary obovate. Caryopsis c. 1 mm long, flattened.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Adilabad District: Sattennapalli, TP & PVP 4151 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, SNR 9552 (BSID); Sambayyagudem-Manuguru, 24.03.2021 SNR 8956 (BSID); Rangareddy District:



Plate 71. A–I. *Cynodon barberi* Rang. & Tadul.: A. Habitat; B&C. Enlarged portion of the spike; D. Spikelet; E. Lower glume; F. Upper glume; G. Lemma; H. Palea; I. Anthers; J. *Cynodon dactylon* (L.) Pers.: J. Habitat.

Hyderabad, MVR 02134 (HY); Manasahills-Rajendranagar, 24.08.2016, SNR 8520 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 8989 (BSID); Wanaparthy District: Amadabakula, 09.08.2019, SNR 8657 (BSID).

3. *Cynodon radiatus* Roth ex Roem. & Schult., Syst. Veg. 2: 411. 1817; Pull., Fl. Telangana 3: 1101. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3:

347. 2020. *Cynodon arcuatus* J. Presl in C. Presl, Reliq. Haenk. 1 (4-5): 290. 1830; Bor, Grasses Burma, Ceylon, India & Pakistan 469. 1960. *Cynodon dactylon* var. *intermedius* (Rang. & Tadul.) C.E.C.Fisch. in Gamble, Fl. Madras 1835. 1934.

Caespitose perennials; stoloniferous; rhizomatous. Culms 25–45 cm long, geniculate; nodes slightly swollen, lower nodes rooting. Leaves basal and cauline; sheaths compressed, moth sparsely bearded; ligules 0.4 mm long, membranous, apex ciliolate; blades 1.5–15 × 0.1–0.7 cm, linear-lanceolate, ovate, scabrid above and along margins. Racemes 4–8; c. 10 cm long, digitate, rachis tumid. Spikelets 1.7–2.25 mm long, elliptic, base rounded, apex acute. Lower glume 1–1.5 mm long, curved, lanceolate, 1-nerved, keeled, keel scabrid, apex acute. Upper glume c. 2 mm long, lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acute. Lemma 2–2.25 mm long, ovate-lanceolate, chartaceous, 3-nerved, scabrid with clavellate hairs, apex acute. Palea 1.8–2 mm long, lanceolate, chartaceous, 2-keeled, margin infolded, apex acute. Stamens 3. Ovary ovate. Caryopsis c. 1 mm long, oblong.

Fl. & Fr.: Aug.–Feb.

Distrib.: Occasional in plains and hill slopes.

Exsicc.: Adilabad District: Indhanpalli-Range, 26.10.2013, APS 3904 (BSID); Narlapur-Beat, Sattenapally, TP & PVP 4098 (SKU); Rangareddy District: Hyderabad, MVR 02133 (HY).

Enteropogon Nees

World: 14 spp.; India: 4 spp.; Telangana: 2 spp.

Key to the species

- 1a. Inflorescence composed of only one spike; spikelets with two fertile florets and the upper most one sterile ... 2. *E. monostachyos*
 1b. Inflorescence composed of 2-4 spikes; spikelets with one fertile floret and two rudimentary florets above it.....1. *E. dolichostachyus*

1. *Enteropogon dolichostachyus* (Lag.) Keng, Clav. Gen. Sp. Gram. Prim. Sin. 197. 1957. *Chloris dolichostachya* Lag., Gen. Sp. Pl. 5. 1816; Bor, Grasses Burma, Ceylon, India & Pakistan 466. 1960; Hook.f., Fl. Brit. India 7: 466. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1838. 1934; Pull., Fl. Telangana 3: 1087. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 689. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 363. 2020. **Plate 72(A-K)**

Caespitose perennials. Culms 40–110 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths glabrous; ligules membranous, truncate; blades 5–27 × 0.2–0.5 cm, linear-lanceolate, apex acuminate. Spikes 4–9; 11–18 cm long, digitate. Spikelets 4–5 mm long, linear-lanceolate, 2-flowered; only one fertile, other reduced; callus bearded, 1.2–1.8 mm long. Lower glume 0.8–2 × 0.2–0.4 mm, linear-lanceolate, chartaceous, 1-nerved, keeled, keel serrulate, apex acuminate. Upper glume 4–6 × 0.5–1 mm, lanceolate, chartaceous-membranous, 1-nerved, apex acuminate. Fertile lemma 4.5–5.5 × 0.5–0.9 mm, lanceolate, chartaceous, margins inflexed, awns 14–20 mm long. Palea 4.5–6 × 0.5–0.9 mm, lanceolate, coriaceous, hyaline, 2-nerved, keeled, margins inflexed, apex acute. Sterile lemma reduced to scale, awn 5–9 mm long, barbellate. Caryopsis 5–5.5 × 1–1.5 mm, oblong-lanceolate, dorsally compressed.

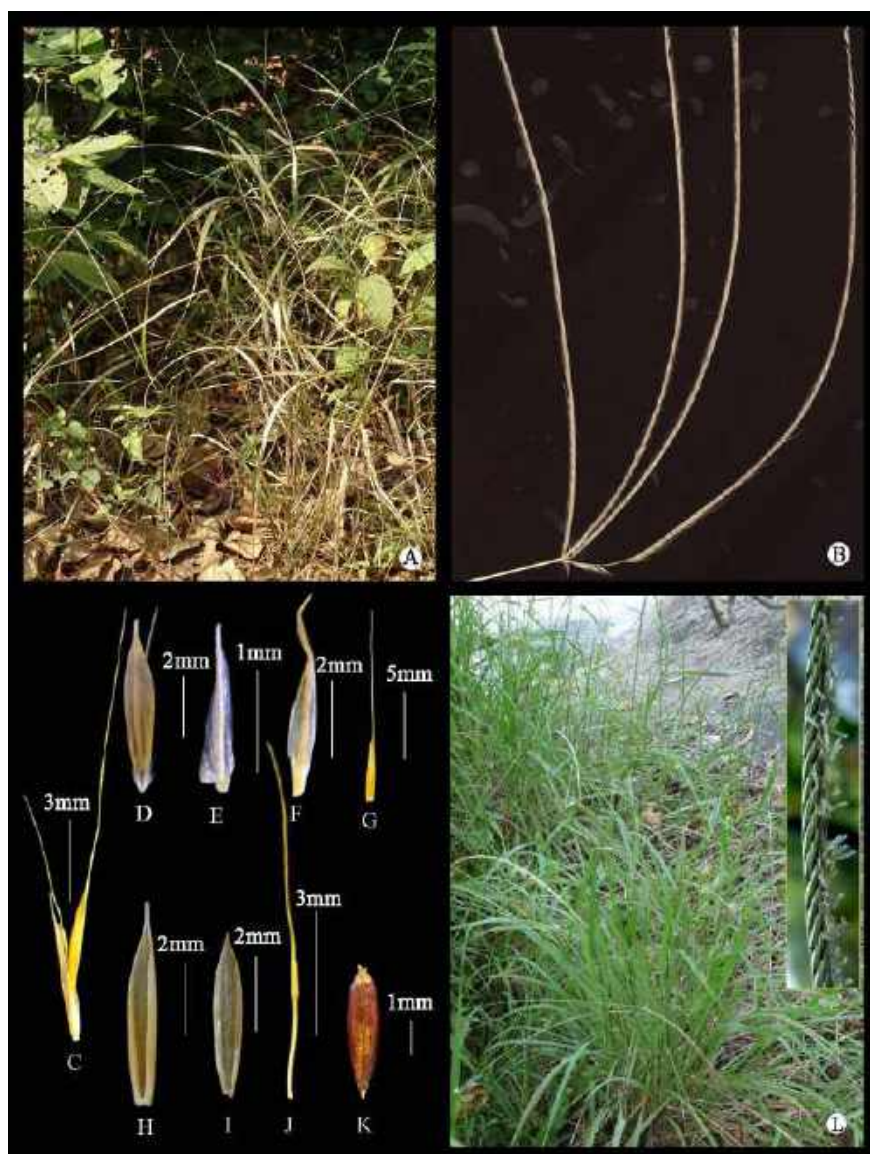


Plate 72. A–K. *Enteropogon dolichostachyus* (Lag.) Keng: A. Habitat; B. Inflorescence; C&D. Spikelet; E. Lemma; F. Upper lemma; G. Fertile floret; H. Lemma; I. Palea; J. Sterile lemma. K. Caryopsis; L. *Enteropogon monostachyos* (Vahl) K.Schum.: Habitat (Inset: enlarged view of inflorescence).

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in Khammam, Mahabubnagar, Nagarkurnool, Vikarabad & Wanaparthy.

Exsicc.: Bhadradri Kothagudem District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR 9538 (BSID).

Note: Forest grass. This species is distinguishable by wiry culms and long

inflorescence.

2. *Enteropogon monostachyos* (Vahl) Schum., Abh. Konigl. Akad. Wiss. Berlin 17. 1894; C.E.C. Fisch., in Gamble, Fl. Madras 3:1834. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 472. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 364. 2020. *Cynosurus monostachyos* Vahl, Symb. Bot. 2: 20. 1791.

Plate 72(L)

Perennials. Culms 40–60 cm high, tufted, geniculate; nodes glaucous, rooting at lower nodes. Leaves basal and cauline, sheaths 6–10 cm, keeled, terete at apex, long shaggy hairy on margins; ligule 1–2 mm, membranous with long white hairs; blades 10–35 × 0.3–0.6 cm, linear-lanceolate, attenuate, infolded-flat, margins finely serrulate. Inflorescence a spicate raceme, curved at maturity; peduncle 10–15 cm. Raceme 10–20 cm, rachis triquetrous, scabrid on margins. Spikelets 6–12 × 0.7–1 mm, oblong-lanceolate, alternate, closely imbricate. Lower glume 2.5–3 × 0.2–0.5 mm, narrowly lanceolate, membranous to chartaceous, 1-nerved, apex acuminate, mucronate to shortly awned; 1-keeled, scabrellate on keel. Upper glume 3.5–5 × 0.2–0.8 mm, lanceolate, chartaceous, 2-lobed, 1-nerved, apex acuminate, shortly awned; 1-keeled, scabrellate on keel. Florets 3 with extended rachilla; lower 2 bisexual, upper one male or reduced; disarticulating above persistent glumes. Lower lemma 5–6.5 × 0.8–1.3 mm, oblong to elliptic, lanceolate, deeply 2-lobed, awned in sinus, chartaceous to subcoriaceous, margins inrolled, 3-nerved, keeled, apex acuminate; awn 5–8 mm, straight, barbellate. Palea 4.5–6.5 × 0.8–1 mm, elliptic-lanceolate, chartaceous, 2-nerved, 2-lobed, 2-keeled, apex acuminate. Lodicules 2. Stamens 3. Ovary 0.3–0.6 × 0.3 mm, elliptic. Caryopsis 0.2–5 × 0.8–1 mm oblanceolate-elliptic. Middle floret similar to lower floret, but smaller. Uppermost floret highly reduced, 1–3 × 0.2–0.3 mm long, awn 2–4 mm, barbellate.

Fl. & Fr.: Aug. – Mar.

Distrib.: In rocky areas as occasional clumps, deep forest.

Exsicc.: Nagarkurnool District: Mannanur range, Devunisari, 19.11.2017, ARK & BSS 3388 (TBGH).

Melanocenchris Nees

World: 3 spp.; India: 3 spp.; Telangana: 3 spp.

Key to the species

- | | |
|--|------------------------------|
| 1a. Annuals; leaves usually cauline | ... 2 |
| 1b. Perennials; leaves mostly basal | ... 3. <i>M. rothiana</i> |
| 2a. Clusters of spikelets including the awns, 8 mm long | ... 2. <i>M. jaquemontii</i> |
| 2b. Clusters of spikelets including the awns, 10 mm or more long | ... 1. <i>M. abyssinica</i> |

1. *Melanocenchris abyssinica* (R. Br. ex Fresen.) Hochst. in Flora 38: 274. 1855; Bor, Grasses Burma, Ceylon, India & Pakistan 473. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 394. 2020. *Eutriana abyssinica* R. Br. ex Fresen. in Mus. Senckenberg. 2: 142. 1837. *Gracilella royleana* Hook.f. var. *plumosa* (Jaub. & Spach) Hook.f., Fl. Brit. India 7: 284. 1896. *Melanocenchris plumosa* Jaub. & Spach, Ill. Pl. Orient. 4: 37. 1851.

Caespitose, densely tufted annual. Culms 5–25 cm high. Leaves cauline

and basal; sheaths few long hairs; ligule a hairy ridge; blades 1.5–5 cm long, flat or convolute, glabrous, margins ciliate, pointed acutely. Inflorescence filiform, 1–4 cm long, flexuous, recurved, rachis trigonous. Clusters of spikelets 5–8.5 cm long, green or purple, awns of involucre glumes longer than the glumes, awns of floral glume short.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Vikarabad District: Ananthagiri Hills, 30.11.2019, SNR 8791 (BSID).

2. *Melanocenchris jacquemontii* Jaub. & Spach, III. Pl. Orient 4: 36. t. 325. 1851; Bor, Grasses Burma, Ceylon, India & Pakistan 473. 1960; Pull., Fl. Telangana 3: 1144. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 726. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 394. 2020. *Gracilea royleana* (Nees ex Steud.) Hook.f., Fl. Brit. India 7: 284. 1896. *Melanocenchris royleana* Nees ex Steud., Syn. Pl. Glumac. 1: 218. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1832. 1934.

Plate 73

Caespitose annuals. Culms about 20 cm high, erect, slender. Leaves cauline; sheaths compressed, tubercle based hairy; ligules 0.4 mm long, apex ciliate-frimbriate; blades 2–5 × 0.2 cm, narrowly linear, convolute, margin scabrous, apex acuminate-pointed. Racemes c. 5 cm long, filiform, rachis triquetrous. Spikelets 6–8 mm long, ovate-oblong, green with purple tinge. Florets 2. Lower florets bisexual. Upper floret male. Lower glume 6–7 mm long (including awn), oblong, subulate, rigid, antrorsely barbellate. Upper glume 4–5 mm long, oblanceolate, chartaceous, 3-nerved, margin ciliate, broadly winged. Lower lemma 6–7 mm long, ovate-oblong, chartaceous, 3-nerved, keeled, margin serrulate, apex 3-lobed, awn 0.7 mm long. Lower palea 4–5 mm long, elliptic, 2-nerved, 2-keeled, keel ciliate, apex acute, 2-toothed. Upper lemma 3–3.5 mm long, lanceolate, chartaceous, 3-nerved, keeled, apex acute, awned. Lodicules 2. Ovary oblong. Caryopsis 2 mm long, oblong, compressed.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Adilabad District: Bellampally, PVP & TP 9453 (SKU); Medak District: Choutkoor fields, TP & MSG 11931 (SKU); Nizamabad District: Manchippa, TP & BRPR 6008 (SKU); Rangareddy District: Hyderabad, MVR 02173 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8549 (BSID); 22.08.2019, SNR 8666 (BSID); 04.09.2019 SNR 8692 (BSID); Suryapeta District: Nakrekal Village, 27.10.2019, SNR 8760 (BSID); Vikarabad District: Ananthagiri RF, MSM 11072 (SKU); Wanparthy District: Amadabakula-Kothakota, 07.08.2019, SNR 8634 (BSID).

Note: This species is distinguishable from *M. monoica* by its cauline leaves.

3. *Melanocenchris rothiana* Nees in Proc. Linn. Soc. London 1: 95. 1841. *M. monoica* (Rottler) C.E.C.Fisch. in Gamble, Fl. Madras 1831. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 473. 1960; Pull., Fl. Telangana 3: 1145. 2015; K.N.Reddy &



Plate 73. *Melanocenchris jacquemontii* Jaub. & Spach: A. Habitat; B. Habit; C. Inflorescence; D. Spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Upper lemma; I. Lower palea; J. Upper palea; K. Caryopsis.

C.S.Reddy, Fl. Telangana 727. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 394. 2020. *Pommereulla monodia* Rottler, Ges. Naturf. Freunde Berlin Neue Schriften 4: 218. 1803. *Gracilea nutans* Koenig ex Rottler in Ges. Naturf. Freunde Berlin Neue Schriften 4: 218. 1803; Hook.f., Fl. Brit. India 7: 283. 1896.

Caespitose perennials; rhizomatous. Culms 5–20 cm high; nodes glabrous. Leaves mostly basal; sheaths 1–2 cm long, margin tubercle based hairy; ligules c. 0.5 mm long, apex fimbriate; blades 0.5–4 cm long, lanceolate, convolute, stiff,

glaucous, margin serrulate, base truncate, ciliate, apex acute. Racemes c. 4.5 cm long, spiciform, exserted. Spikelets c. 5 mm long, ovate. Florets 2–3; secund. Lower florets bisexual. Upper florets male or neuter. Lower glume c. 4 mm long, oblong, margins ciliate, apex acuminate; awn c. 4 mm long, pilose. Upper glume c. 4 mm long, subulate; awn 3–4 mm long, densely ciliate. Lower lemma c. 4 mm long, broadly ovate, chartaceous, 3-nerved, margin sparsely ciliate, apex acute, awned, barbellate. Lower palea c. 4 mm long, oblong, 2-nerved, 2-keeled, keel narrowly winged, ciliolate, apex acute or 2-toothed, keel ciliolate. Other lemma glabrous on margins. Stamens 3. Ovary obovate.

Fl. & Fr.: October–Dec.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Mahabubnagar District: Mallelatheertham, 25.04.2008, *BSS & SKB* 30632 (SKU), Venkarapuram, 06.08.2019, *SNR* 8612 (BSID); Rangareddy District: Hyderabad, *MVR* 2174 (HY).

Note: It can be distinguishable from *M. jacquemontii* by its segregated leaves at the base.

Microchloa R. Br.

World: 6 spp.; India: 2 spp.; Telangana: 1 sp.

Microchloa indica (L. f.) P. Beauv., Ess. Agrostogr. 168. 1812; C.E.C.Fisch. in Gamble, Fl. Madras 1830. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 473. 1960; Pull., Fl. Telangana 3: 1145. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 727. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 395. 2020. *Nardus indica* L. f., Suppl. 105. 1782.

Plate 74

Caespitose annuals. Culms 3–23 cm high, terete, erect or geniculate, glabrous, nodes glabrous. Leaves mostly basal; sheaths 1–2 cm long, keeled, ribbed; ligules 0.2 mm long; blades 1–2 cm long, oblong, sparsely hairy, margins serrulate, apex acute-abruptly pointed. Spike 2–10 cm long, linear, slender, curved. Spikelets sessile, 2–2.2 × c. 0.4 mm, elliptic-lanceolate, apex acuminate, callus bearded. Lower glume 2–2.6 × 0.2–0.4 mm, narrowly oblong-lanceolate, chartaceous, 3-nerved, margins infolded, apex acuminate. Upper glume 2–2.5 × 0.4–0.6 mm, narrowly elliptic, subcoriaceous, 1-nerved, ribbed-like band, margin infolded, apex acute. Floret 1; 2.2 × 0.52 mm, bisexual. Lemma 1–1.8 × 0.7–0.8 mm, elliptic-lanceolate, chartaceous, 3-nerved; margin ciliate, incurved; apex acuminate; arista 0.2 mm long. Palea 1–1.3 × 0.4–0.6 mm, elliptic-lanceolate, 2-nerved, 2-keeled, keel ciliate, margin infolded, apex acute. Ovary 0.4–0.6 mm long, narrowly oblong. Caryopsis 1–1.8 × 0.3–0.45 mm, ellipsoid.

Fl. & Frs.: Oct.–Mar.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Mahabubnagar District: Appapur, 13.09.2002, *AMSR* 25676 (SKU); Rangareddy District: Hyderabad, *MVR* 02175 (HY); Manasahills-Rajendranagar, 24.08.2016, *SNR* 8533 (BSID); 04.09.2019, *SNR* 8688 (BSID); 10.10.2019, *SNR* 8736 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8701 (BSID).

Note: Characterized by curved inflorescence like sickle.

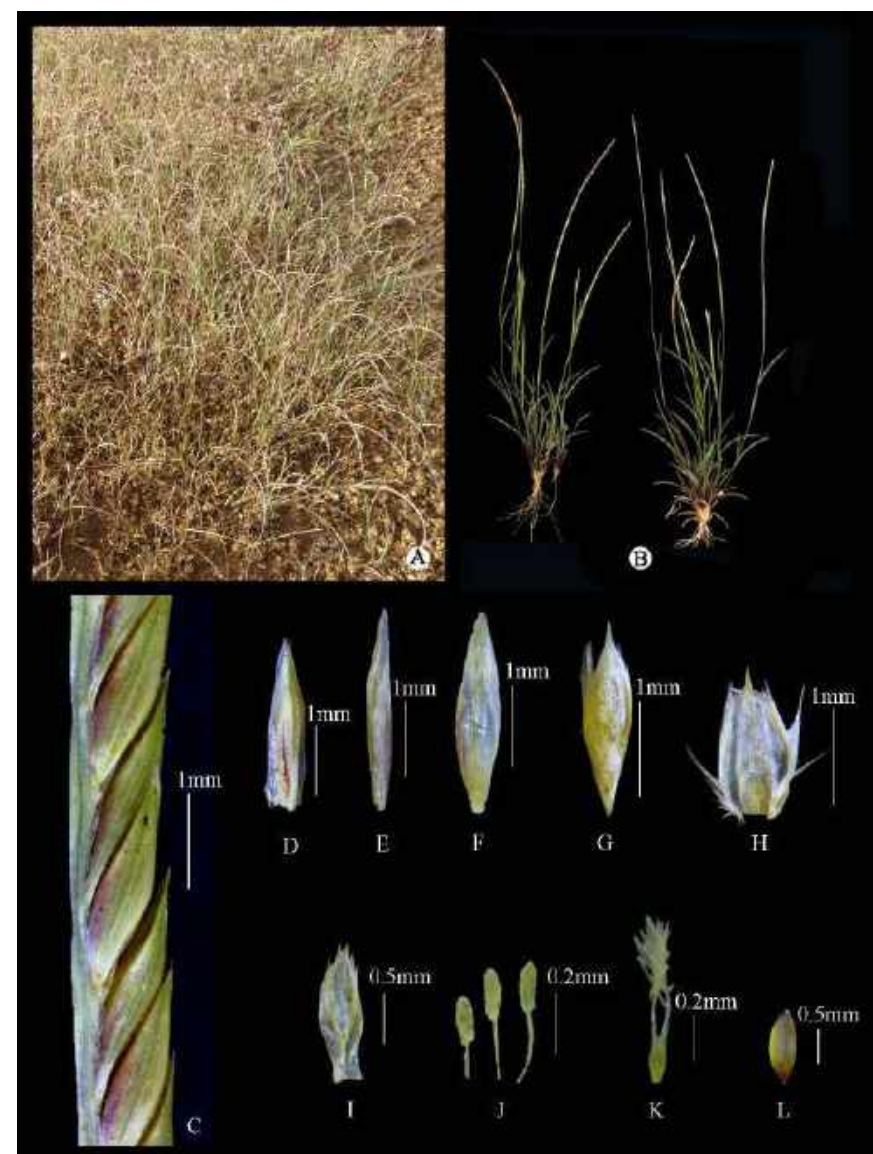


Plate 74. *Microchloa indica* (L.f.) P.Beauv.: A. Habitat; B. Habit; C. Enlarged portion of the spike; D. Spikelet; E. Lower glume; F. Upper glume; G. Floret; H. Lemma; I. Palea; J. Stamens; K. Pistil; L. Caryopsis.

Perotis Aiton

World: 16 spp.; India: 2 spp., 1 var.; Telangana: 1 sp.

Perotis indica (L.) Kuntze, Revis. Gen. Pl. 2: 787. 1891; C.E.C.Fisch. in Gamble, Fl. Madras 1814. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 611. 1960; Pull., Fl. Telangana 3: 1163. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 741. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 405.

2020. *Anthoxanthium indicum* L., Sp. Pl. 1: 28. 1753. 'Nakkathoka Gaddi' **Plate 75**

Caespitose annuals. Culms 60–120 cm high, erect or geniculate, branched, nodes glabrous. Leaves basal and cauline; sheaths 2–3.5 cm long, glabrous; ligules c. 0.4 mm long, membranous, apex fimbriate; blades 1–8 × 0.1–0.9 cm, ovate-lanceolate, margin scabrid. Racemes 20–26 cm long, purple coloured. Spikelets 2–3.5 × 1.2–2 mm, linear, lanceolate, apex acute-emarginate, 2-awned. Lower glume c. 2.01 × 0.29 mm, linear-lanceolate, chartaceous, 1-nerved, 1-keeled, keel scabrous, apex acute-acuminate; awn c. 15 mm long, capillary. Upper glume c. 2 × 0.26 mm, linear, chartaceous, 1-nerved, margins inrolled; awn c. 5 mm long. Lemma 1–1.5 × 0.32 mm, membranous, hyaline. Palea 1–1.5 mm long, linear-lanceolate, chartaceous. Stamens 3. Ovary c. 0.3 mm long. Caryopsis 1.5–2 mm long, linear.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state

Exsicc.: Adilabad District: Ankusapuram, GO 4306 (SKU); Jaipur RF, GO & PVP 4960 (SKU), Vempalli, PVP & GO 4787 (SKU); Kothapalli RF, GO 4519 (SKU); Mahabubnagar District: Devarakadra, 06.08.2019, SNR 8623 (BSID); Rangareddy District: Hyderabad, MVR 02193 (HY); Mansahills-Rajendranagar, 24.08.2016, SNR 8529 (BSID); Rudraram, MSM & TP 12722 (SKU).

Note: Recognisable in the field by its pink to violet colour inflorescence.

Pommereulla L.f.

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Pommereulla cornucopiae L.f., Nov. Gram. Gen. 31. 1779; Hook.f., Fl. Brit. India 7: 300. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 620. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 412. 2020.

Plate 76(A-G)

Tufted annuals or perennials. Culms 10–45 cm high, decumbent to geniculate; rooting at lower nodes. Leaves mostly basal, distichous, sheaths 2–6 cm, flabellate, keeled, margins hyaline; ligule a membranous rim; blades 2.5–5.5 × 0.2–0.4 cm, linear-lanceolate, apex obtuse to sub-acute. Inflorescence 3–8 cm long, a terminal spike; rachis triquetrous to flat. Spikelets 0.6–1.2 × 0.3–0.6 cm, obovate to oblanceolate, dorsally compressed. Lower glume 6–8 × 0.4–0.6 mm, oblanceolate to elliptic-lanceolate, broader above middle, membranous to chartaceous, 1-nerved, apex acuminate; keeled, keel scabrellate. Upper glume 8–11 × 1 mm, elliptic-lanceolate, chartaceous, 3-nerved, keeled, keel and margins serrulate, apex acuminate. Florets 5; lower 2 sterile, epaleate; upper 3 bisexual, paleate and uppermost one with reduced empty lemma; rachilla 2.5–3.5 mm long; callus pungent. Sterile lemmas obovate, 6.5–7.8 × 2–2.5 mm, 4-lobed at apex, lateral 2 lobes larger and mucronate, middle two lobes with arista of 1–1.4 mm, awned from back, chartaceous to subcoriaceous, 7-nerved, dorsally long villous; awn 7–8 mm, straight, barbellate, subterminal, without column. Fertile lemmas 6–6.5 × 2 mm, similar in size and texture to sterile lemmas, but with 3-lobed apex, middle lobe formed by fusion of two lobes, bicuspidate, arista 0.8–1 mm; awn 4–6 mm long, at times uppermost fertile floret with 3 lobes. Fertile paleas 3–3.8 × 1.4 mm, ovate-lanceolate, chartaceous, 2-nerved, 2-keeled, apex acute to blunt; keels winged.

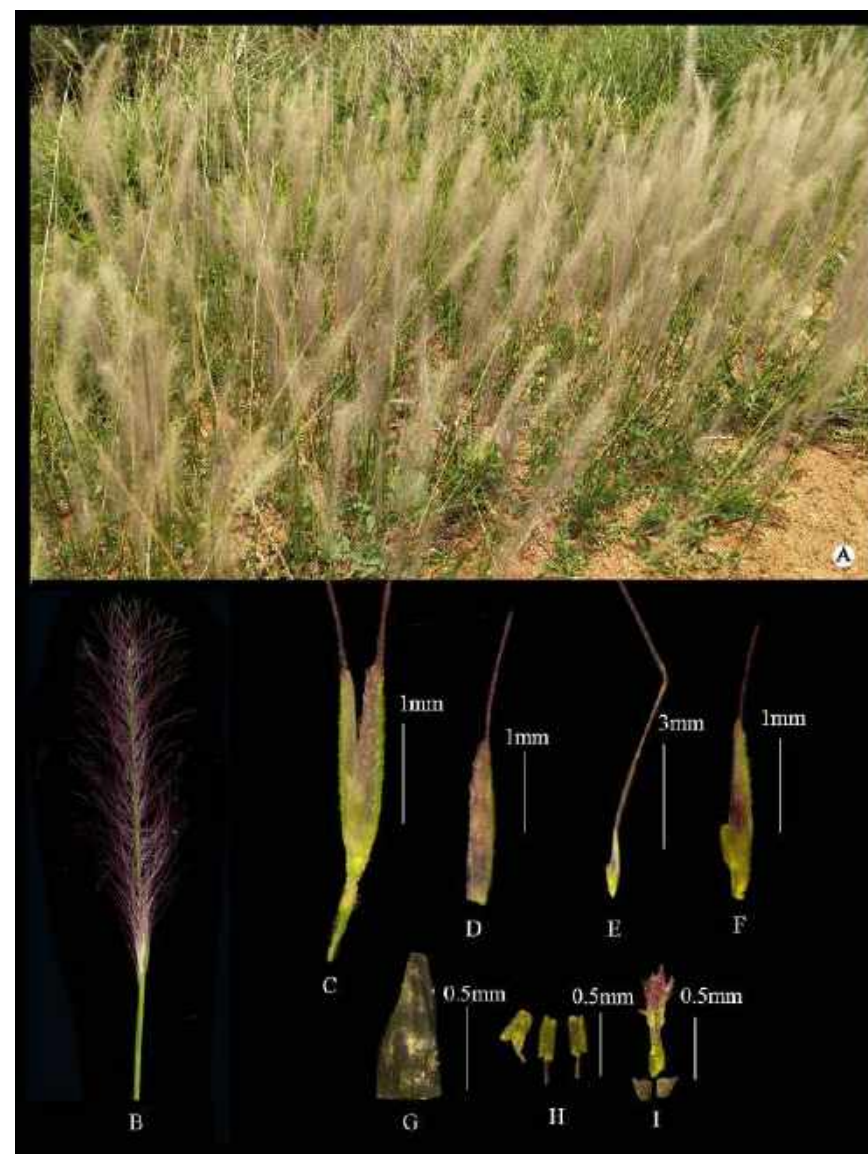


Plate 75. *Perotis indica* (L.) Kuntze: A. Habitat; B. Inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Enlarged view of upper glume; G. Palea; H. Stamens; I. Lodicules with pistil.

Lodicules 2. Stamens 3. Ovary oblong. Caryopsis 1.5–2 × 1.2 mm obovate-wedge shaped.

Fl. & Fr.: Oct.–Feb.

Distrib.: Occasional in scrub and disturbed salinity areas.

Exsicc.: Manjeera Wildlife Sanctuary, Pulkal, LR & JS 11252 (BSID).

Schoenefeldia Kunth

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Schoenefeldia gracilis Kunth, Revis. Gramin. 1: 283, t. 53. 1830; Bor, Grasses Burma Ceylon, India & Pakistan 474. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 418. 2020. *Schoenefeldia pallida* Edgew. in J. Asiat. Soc. Bengal 21(2): 183. 1852. *Chloris pallida* Hook.f., Fl. Brit. India 7: 289. 1896. *Chloris myosuroides* Hook.f., Fl. Brit. India 7: 290. 1896. **Plate 76(H-P)**

Annuals. Culms 5–50 cm high, branched; nodes glabrous. Leaves cauline; sheaths glabrous, 5–10 cm long; ligules 0.2–0.5 mm long, membranous, apex ciliate; blades 4–9 × 0.2–0.4 cm, linear, upper surface with tubercle based long hairs, margins scabrid, apex fimbriate. Inflorescence comprising of 1–2 racemes, 5–10 cm long. Spikelets sessile, compactly arranged on raceme, alternately in 2-rows; spikelets 2.5–5 × 0.8–1.5 mm, linear-lanceolate, laterally compressed, awned. Lower glume 2–3 × 0.4–0.6 mm, linear-lanceolate, membranous, glabrous, 1-nerved, 1-keeled, keel scabrous apex aristate. Upper glume 5.5–4 × 0.3–0.7 mm, linear-lanceolate, membranous, glabrous, 1-keeled, apex aristate. Floret 1, fertile. Lemma 1.8–3 × 0.7–0.9 mm, narrowly ovate, sparsely hairy, 3-nerved, coriaceous, apex acute, flexuous awn from sinus; awn 12–16 mm long, scabrous. Palea 1–1.7 × 0.2–0.4 mm, linear-narrowly elliptic, membranous, ciliate on dorsal side, 1-keeled, hyaline, apex acute. Lodicules 2. Stamens 2. Pistil 1.8–2 mm long. Caryopsis 1–2 × 0.4–0.5 mm, elliptic.

Fl. & Fr.: Sep.–Dec.

Distrib.: Occasionally in Bhadradi Kothagudem, Peddapally & Karimnagar.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, Chatakonda Range, 16.11.2019, JS 9999 (BSID); Manchiryal District: Godavari Khani, 10.10.2019, SNR & VA 8916 (BSID).

Tetrapogon Desf.

World: c. 10 spp.; India: 3 spp.; Telangana: 2 spp.

Key to the species

- 1a. Spikelets 3–4-flowered ... 1. *T. roxburghiana*
1b. Spikelets 4–7-flowered ... 2. *T. tenellus*

1. Tetrapogon roxburghiana (Sult.) P.M. Peterson in Taxon 64(3): 460. 2015. *Chloris roxburghiana* Sult., Mant. 2: 339. 1827; Bor, Grasses Burma, Ceylon, India & Pakistan 468. 1960; *Chloris polystachya* Roxb., Fl. Ind. (Eds. Carey & Wall.) 1: 332. 1820, nom. illeg., non Lag., 1816; Hook.f., Fl. Brit. India 7: 292. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1838. 1934; Pull., Fl. Telangana 3: 1089. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 689. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 339. 2020.

Caespitose perennials; rhizomatous. Culms 50–120 cm high; nodes glabrous. Leaves mostly basal; sheaths compressed, keeled, mouth bearded; ligules 0.2–0.4 mm long, membranous; blades 10–40 × 0.2–1 cm, linear-lanceolate, margins serrulate. Racemes 13–30; 3–9 cm long, digitate, compact. Spikelets c. 2.5 mm long, elliptic-obovate. Lower glume 1–1.5 mm long, membranous-chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acute-acuminate. Upper glume c. 2.5 mm long, lanceolate-oblong, chartaceous, 1-nerved, 1-keeled, apex

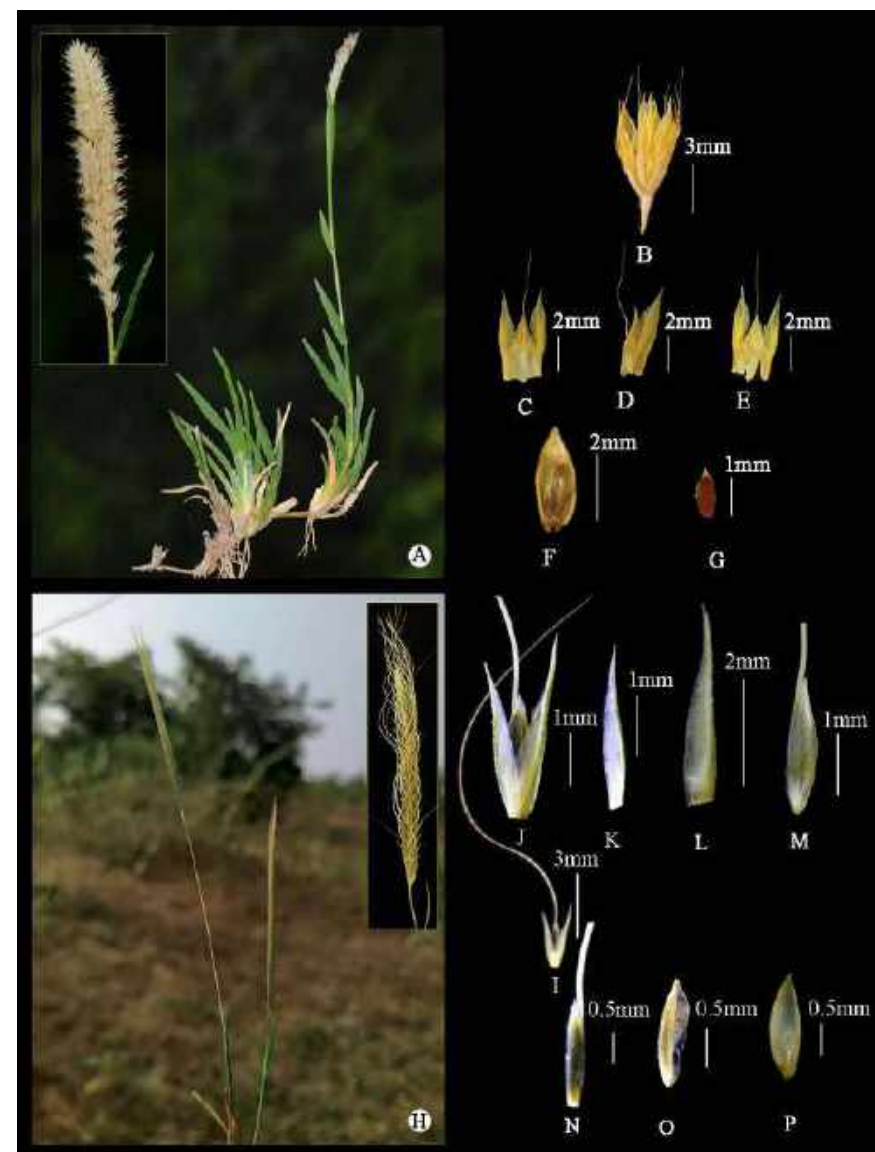


Plate 76. A–G. *Pommereulla cornucopiae* L.f.: A. Habit (Inset: Spike); B. Cluster of spikelets; C–E. Abaxial, side and adaxial view of lemma; F. Palea; G. Caryopsis; H–P. *Schoenefeldia gracilis* Kunth: H. Habit (Inset: Inflorescence); I. Spikelet; J. Lower glume; K. Upper glume; L. Floret; M. Lemma; N. Palea; O. Caryopsis.

acuminate-mucronate. Florets 3; 1-fertile; 3-awned; callus ciliate. Fertile lemma 1.5–2 mm long, elliptic, chartaceous, margins ciliate, apex 2-toothed, awn c. 14 mm long. Palea c. 1.5 mm long, elliptic, chartaceous, 2-nerved, 2-keeled, keel serrulate. Stamens 2. Ovary elliptic-oblong. Caryopsis c. 1 mm long, oblanceolate. Other lemma smaller, elliptic, reduced to glabrous, awned scales.

Fl. & Fr.: Jul.–Dec.

Distrib.: Occasional in plains, especially in arid habitats.

Exsicc.: Nizamabad District, Patharajampet railway gate, *BRPR & CPR* 7162 (SKU).

2. *Tetrapogon tenellus* (Roxb.) Chiov. in *Annuario Reale Ist. Bot. Roma* 8: 352. 1908; Bor, *Grasses Burma, Ceylon, India & Pakistan* 475. 1960; Pull., *Fl. Telangana* 3: 1181. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 753. 2016. *Chloris tenella* Roxb., *Fl. Ind.* 1: 330. 1820; Hook.f., *Fl. Brit. India* 7: 290. 1896; C.E.C.Fisch. in Gamble, *Fl. Madras* 1838. 1934; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 432. 2020. '*Eruvana Gaddi*' **Plate 77**

Caespitose perennials. Culms 20–60 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths compressed, keeled, glabrous; ligules membranous; blades 5–10 × 0.2–0.5 cm, linear-lanceolate, ciliate, apex attenuate. Racemes 1–2; c. 8 cm long, rachis angular. Spikelets 3–7 mm long, obconical, bifarious. Florets 4–6, laterally compressed. Lower glume 4–6 × 1–1.2 mm, broadly cuneate, curved, chartaceous, 1-nerved, 1-keeled, keel scabrous, apex acute. Upper glume 5–7.5 × 2–2.5 mm, broadly cuneate, chartaceous, 1-nerved, 1-keeled, keel scabrid, apex acuminate-aristate. Fertile lemma 5–6.2 × 2.5–3.5 mm, obovate, subcoriaceous, 3-nerved, hispid, apex acute-truncate; awn c. 7.5 mm long, barbellate. Palea 2–5.5 × 1–1.6 mm, elliptic, chartaceous, 2-nerved, 2-keeled, keel scabrid, margins ciliate, apex acute. Caryopsis 2–3 mm long, oblong, laterally compressed. Lemma of incomplete florets 4–5 mm long, 3-nerved, awn 6–11 mm long. Palea 3.5–5 mm long, elliptic, keel ciliate.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in sandy soils.

Exsicc.: Nalgonda District: Teetedu, *BRA* 001309 (BSID).

Tragus Haller

World: 7 spp.; India: 1 sp.; Telangana: 1 sp.

***Tragus mongolorum* Ohwi**, *Acta Phytotax. Geobot.* 10(4): 268, in adnot. 1941. *Tragus roxburghii* Panigrahi in *Kew Bull.* 29: 495. 1974; Pull., *Fl. Telangana* 3: 1184. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 756. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 338. 2020. *Tragus biflorus* Schult., *Mant.* 2: 205. 1824, quoad descript., excl. type; Bor, *Grasses Burma, Ceylon, India & Pakistan* 682. 1960; C.E.C.Fisch. in Gamble, *Fl. Madras* 1813. 1934. *Lappago biflora* Roxb., *Fl. Ind.* 1: 284. 1820, quoad descript., excl. type. **Plate 78**

Caespitose annuals; stoloniferous. Culms about 10 cm high, erect or geniculate; lower nodes rooting. Leaves basal and cauline; sheaths c. 2.5 mm long, terete-keeled; ligules c. 0.5 mm long, apex ciliate; blades 1–5 × 0.3–0.7 cm, linear-lanceolate, margin ciliate, undulate, base rounded, apex acuminate. Racemes c. 6 cm long, spiciform, rachis pubescent. Spikelets 3–4 × 2–2.5 mm, elliptic-oblong, pedicellate. Lower glume c. 0.5 mm long, elliptic, hyaline; at times absent or scale like. Upper glume 2.5–3.5 × 0.5–1 mm, elliptic-oblong, coriaceous, 5-nerved, spinous hook like projections; margins thick, incurved;

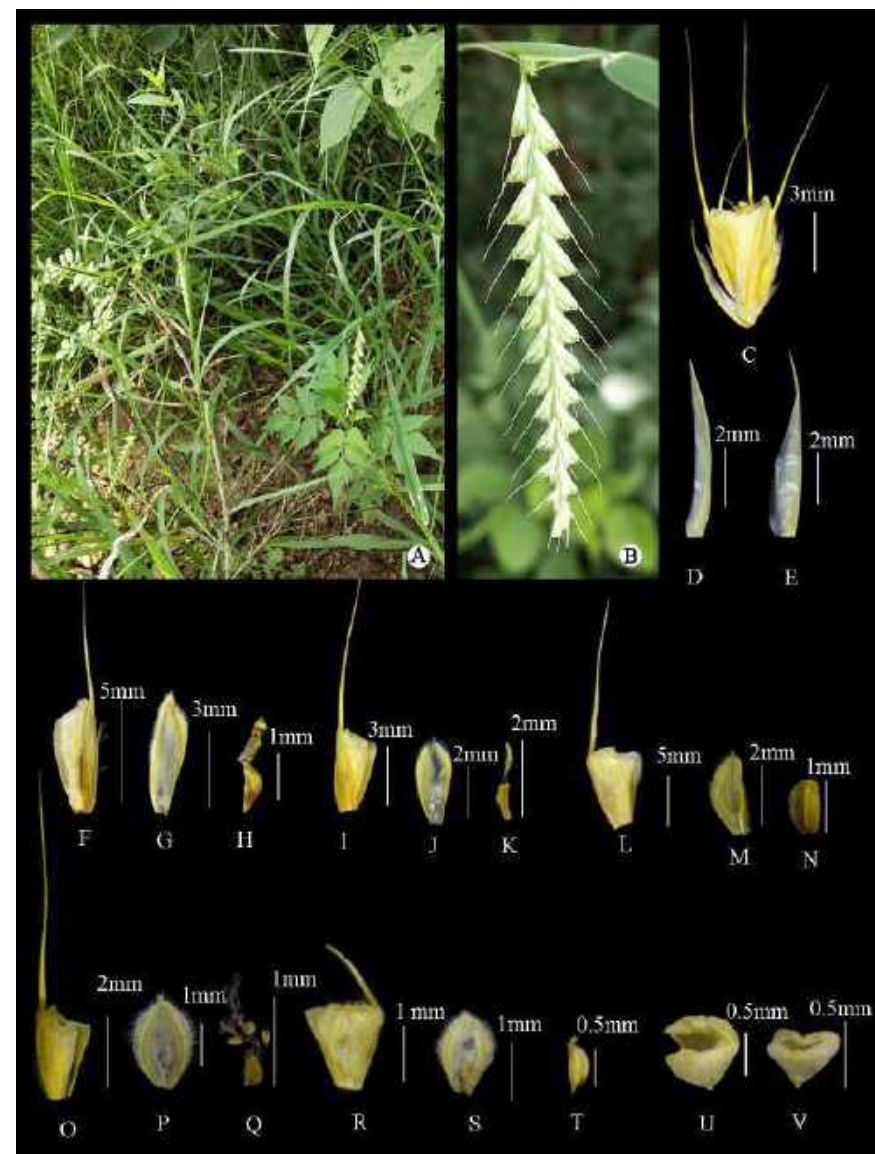


Plate 77. *Tetrapogon tenellus* (J.Koenig ex Roxb.) Chiov.: A. Habitat; B. Spike; C. Spikelet; D. Lower glume; E. Upper glume; F. First lemma; G. Palea; H. Pistil; I. Second lemma; J. Palea; K. Pistil; L. Third lemma; M. Palea; N. Caryopsis; O. Fourth lemma; P. Palea; Q. Pistil; R. Fifth lemma; S. Palea; T. Caryopsis; U. Sixth lemma; V. Seventh lemma.

base truncate, apex acuminate. Lemma 1.5–2.3 × 0.5–0.7 mm, lanceolate, chartaceous, 3-nerved, hispid, apex acuminate. Palea 1.5–2 × 0.45–0.7 mm, ovate, chartaceous-membranous, 2-nerved, margins infolded, apex acuminate. Lodicules 2. Stamens 3. Caryopsis 1–1.5 mm long, oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Throughout the state in fallow lands.



Plate 78. *Tragus mongolorum* Ohwi: A. Habitat; B. Habit; C. Paired spikelets; D. Abaxial and adaxial view of upper glume; E. Palea; F&G. Abaxial and adaxial view of lemma; H. Lodicules; I. Stamens; J. Pistil.

Exsicc.: Adilabad District: Vempalli RF, GO & PVP 4805 (SKU); Mahabubnagar District: Koyalakonda-Venkatapuram, 06.08.2019, SNR 8611 (BSID); Medak District: Choutkooor fields, TP & MSG 11945 (SKU); Rangareddy District: Hyderabad, MVR 02211 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8515 (BSID); 22.08.2019, SNR 8667 (BSID).

Note: Characterised by minute lower glume or at times absent.



Plate 79. *Zoysia matrella* (L.) Merr.: A. Enlarged view of habitat; B. Inflorescence.

***Zoysia* Willd. ('nom. cons.')**

World: c. 8 spp.; India: 2 spp., 1 var.; Telangana: 1 sp.

***Zoysia matrella* (L.) Merr.** in Philipp. J. Sci. 7: 230. 1912; C.E.C.Fisch. in Gamble, Fl. Madras 1815. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 684. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 442. 2020. *Agrostis matrella* L., Mant. Pl. 185. 1771. *Zoysia pungens* Willd. in Ges. Naturf. Freunde Berlin Neue Schriften 3: 441. 1801; Hook.f., Fl. Brit. India 7: 99. 1896.

Plate 79

Mat-forming, stoloniferous; rhizomatous; perennial. Culms 2.5–24 cm high, decumbent. Leaves basal, distichous; sheaths terete, keeled, ribbed, base fastigiate, mouth bearded; ligules 0.2 mm long, membrane, apex ciliate; blades 3–6 × c. 0.2 cm, linear, convolute-involute, scaberulous, apex acute-acuminate, pungent. Racemes 1–5 × 0.2–0.4 cm, erect, narrow. Spikelets 2.5–3.5 × c. 1 mm, oblong-elliptic, lanceolate, pedicelled, compactly arranged, callus glabrous. Lower glume absent. Upper glume 2.5–3.5 × c. 1 mm, elliptic-lanceolate, coriaceous, 1-nerved, apex acute-obtuse. Floret 1, bisexual. Lemma 1.8–2.6 × c. 0.5 mm, ovate-lanceolate, hyaline, 1-nerved, keeled, apex acute. Palea linear-oblong. Lodicules absent. Stamens 3. Ovary c. 0.5 mm long, oblong.

Fl. & Fr.: Dec.–Feb.

Distrib.: Cultivated.

Exsicc.: Rangareddy District: Hyderabad-Lacones, 20.01.2019, SNR 8922 (BSID).

Note: Ornamental lawn grass.

SUB-FAMILY: PANICOIDEAE

KEY TO THE TRIBES

- | | | |
|-----|--|--------------------------|
| 1a. | Spikelets persistent, breaking up at maturity above | ... 2 |
| 1b. | Spikelets falling entire at maturity | ... 3 |
| 2a. | Glumes deciduous; fertile floret dorsally compressed | ... ISACHNEAE |
| 2b. | Glumes persistent; fertile floret terete | ... ARUNDINELLEAE |
| 3a. | Spikelets always single | ... PANICEAE |
| 3b. | Spikelets paired, one sessile and other pedicelled | ... Andropogoneae |

TRIBE: PANICEAE

Key to the genera

- | | | |
|------|---|-------------------------|
| 1a. | Spikelets subtended by bristles | ... 2 |
| 1b. | Spikelets not subtended by bristles | ... 3 |
| 2a. | Upper lemma rugose or rugulose | ... Setaria |
| 2b. | Upper lemma smooth | ... Cenchrus |
| 3a. | Inflorescence of short racemes embedded in enlarged leafy central axis | ... Stenotaphrum |
| 3b. | Inflorescence not with racemes embedded in central axis | ... 4 |
| 4a. | Upper lemma long awned | ... Alloteropsis |
| 4b. | Upper lemma unawned or rarely shortly mucronate | ... 5 |
| 5a. | Rachis of raceme fragile at joints and disarticulating along with spikelet clusters | ... Trachys |
| 5b. | Rachis of raceme not as above | ... 6 |
| 6a. | Spikelets with button like bulged callus at base | ... Eriochloa |
| 6b. | Spikelets without such button like bulged callus at base | ... 7 |
| 7a. | Panicle branches ending in a prominent bristle like appendage | ... Pseudoraphis |
| 7b. | Panicle branches without such an appendage | ... 8 |
| 8a. | Upper lemma with a crest like structure at apex | ... Cyrtococcum |
| 8b. | Upper lemma without a crest like structure | ... 9 |
| 9a. | Glumes both awned at apex | ... Oplismenus |
| 9b. | Glumes not as above | ... 10 |
| 10a. | Panicle narrow, spiciform and cylindrical | ... 11 |
| 10b. | Panicle not as above | ... 12 |

- | | | |
|------|---|------------------------|
| 11a. | Upper glume and lower lemma membranous; upper floret gaping at apex | ... Hymenachne |
| 11b. | Upper glume and lower lemma not membranous; upper floret closed at apex | ... Sacciolepis |
| 12a. | Spikelets awned or mucronate from notched tips of upper glume and lower lemma | ... Melinis |
| 12b. | Spikelets unawned, if awned from entire tips of upper glume and lower lemma... | 13 |
| 13a. | Spikelets arranged in open or contracted panicles | ... Panicum |
| 13b. | Spikelets arranged in spikes or spike like racemes, digitate or scattered | ... 14 |
| 14a. | Lemma of upper floret cartilaginous | ... Digitaria |
| 14b. | Lemma of upper floret not cartilaginous | ... 15 |
| 15a. | Lower glume absent | ... 16 |
| 15b. | Lower glume present | ... 17 |
| 16a. | Spikelets plano-convex | ... Paspalum |
| 16b. | Spikelets biconvex | ... Axonopus |
| 17a. | Upper glume and lower lemma aristate to awned, if unawned then spikelets 4-rowed on raceme | ... Echinochloa |
| 17b. | Upper glume, lower lemma and spikelets not as above | ... 18 |
| 18a. | Spikelets disarticulating above the glumes, callus inconspicuous. Upper lemma chartaceous to cartilaginous, shiny, smooth, mucous | ... Moorochloa |
| 18b. | Spikelet disarticulating below the glumes, callus distinct | ... 19 |
| 19a. | Upper lemma indurated, dull, coarsely to finely transversely rugose, piculate to mucronate | ... Urochloa |
| 19b. | Upper lemma and palea a transversely rugose | ... Megathyrus |

Alloteropsis J. Presl

World: 5 spp.; India: 2 spp. 2 var.; Telangana: 2 spp.

Key to the species

- | | | |
|-----|--|----------------------------|
| 1a. | Basal leaf sheaths glabrous to tuberculate hairy, without remnant bases; spikelets less than 4 mm long | ... 1. <i>A. cimicina</i> |
| 1b. | Basal leaf sheaths densely woolly and with remnant bases; spikelets 5–5.5 mm long | ... 2. <i>A. semialata</i> |

1. Alloteropsis cimicina (L.) Stapf, Fl. Trop. Africa 9: 487. 1919; C.E.C.Fisch. in Gamble, Fl. Madras 1766. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 276. 1960; Pull., Fl. Telangana 3: 1060. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 677. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 317. 2020. *Milium cimicinum* L., Mant. Pl. 2: 184. 1771. **Plate 80**

Caespitose annuals. Culms 20–90 cm high, erect or geniculate; nodes hairy. Leaves basal and cauline; sheaths densely tubercled based hairy; ligules 0.2–0.3 mm long, apex ciliate; blades 2–8 × 0.5–2 cm, ovate-narrowly or lanceolate or oblong, base amplexicaul-rounded, margin ciliate, apex acute-acuminate. Racemes 2–6; c. 15 cm long, digitate, whorled. Spikelets 3–5 × 1.5–2 mm, elliptic-ovate. Lower glume 2–2.3 × 1–1.2 mm, ovate, membranous, 3–5-nerved. Upper glume 2–4 × 1–1.6 mm, ovate, chartaceous, 5-nerved, 2-keeled, keel densely hairy, apex acuminate. Florets 2; lower male; upper bisexual. Lower lemma 2.2–2.8 × 1–1.3 mm, ovate, subcoriaceous, 5-nerved, margin inflexed, apex acute-mucronate. Lower palea 1.5–2 × 0.3–0.6 mm, ovate, chartaceous, 2-nerved, apex acuminate. Upper lemma 2.5–3 × 1–1.5 mm, elliptic, subcoriaceous, margins inflexed, 5-nerved, apex acute, aristate 2.5–3.5 mm long. Upper palea 2.5–3 × 0.5–1 mm, elliptic, coriaceous, 2-nerved, 2-keeled, dorsal verruculose (warty),

margin inflexed, apex obtuse-acute. Caryopsis 1.5–2 × 0.5–1 mm, oblong.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Mahabubnagar District: Venkatapuram-Koyalakonda, 06.08.2019, SNR 8610 (BSID); TP & BRPR 6015 (SKU); Nagar Kurnool District: Kollpur-Choutubetla, 08.08.2019, SNR 8649 (BSID); Rangareddy District: Hyderabad, MVR 02100 (HY), Manasa hills-Rajendranagar, 24.08.2016, SNR 8545 (BSID); 22.08.2019, SNR 8675 (BSID); 04.09.2019, SNR 8682 (BSID).

Note: Distinguishable by glabrous to tuberculate hairy leaf sheaths.

2. *Alloteropsis semialata* (R. Br.) Hitchc., Contr. U. S. Natl. Herb. 12. 210. 1909; Bor, Grasses Burma, Ceylon, India & Pakistan 276. 1960; Pull., Fl. Telangana 3: 1062. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 317. 2020. *Panicum semialatum* R. Br., Prodr. Fl. Nov. Holland 1: 92. 1810. *Axonopus semialatus* (R. Br.) Hook.f., Fl. Brit. India 7: 64. 1896.

Caespitose perennials; rhizomatous. Culms about 105 cm high, erect, ram sheaths persistent, silky pubescent; nodes thickly bearded. Leaves mostly basal; sheaths margin long ciliate, basal densely woolly, mouth bearded; ligules fimbriate; blades 10–30 × 0.6–1 cm, linear-lanceolate, hairy, margin flat-involute, densely hairy, base tapering, apex acuminate. Racemes 2–5; c. 14 cm long, digitate, rachis slender, hairy. Spikelets 4–6 × 2.5 mm, ovate-elliptic. Lower glume 2–3 × 1–1.2 mm, ovate, coriaceous, 3–5-nerved, margin ciliate, apex mucronate, arista c. 0.2 mm long. Upper glume 4–5 mm long, elliptic, subcoriaceous, 3–5-nerved, keel broadly winged and ciliate, apex awned; awn 1–2 mm long. Florets 2; lower floret male; upper florets bisexual. Lower lemma 4–4.5 mm long, lanceolate, coriaceous, apex mucronate. Lower palea 1–1.15 mm long, hyaline, apex notched. Upper lemma 4–6 mm long, coriaceous, arista c. 4 mm long. Upper palea c. 4 mm long, 2-nerved, 2-keeled, subcoriaceous, apex ciliate. Caryopsis 1.5 mm long, ovoid.

Fl. & Fr.: Jul.–Aug.

Distrib.: Occasional in deciduous forests and in grassy slopes.

Exsicc.: Mahabubnagar District: Appapur, BSS & SKB 32223; AMR 26802 (SKU).

Note: Densely woolly leaf sheath is the key feature to recognize this species.

***Axonopus* P. Beauv.**

World: c. 78 spp.; India: 2 spp.; Telangana: 1 sp.

Axonopus compressus (Sw.) P. Beauv., Ess. Agrostogr.: 12, 154, 167. 1812; Bor, Grasses Burma, Ceylon, India & Pakistan 278. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 326. 2020. *Milium compressum* Sw., Prodr. 24. 1788.

Plate 81

Mat-forming; caespitose perennials; stoloniferous. Culms 10–28 cm long, terete to flat; nodes bearded, lower node rooting. Leaves mostly basal; sheaths

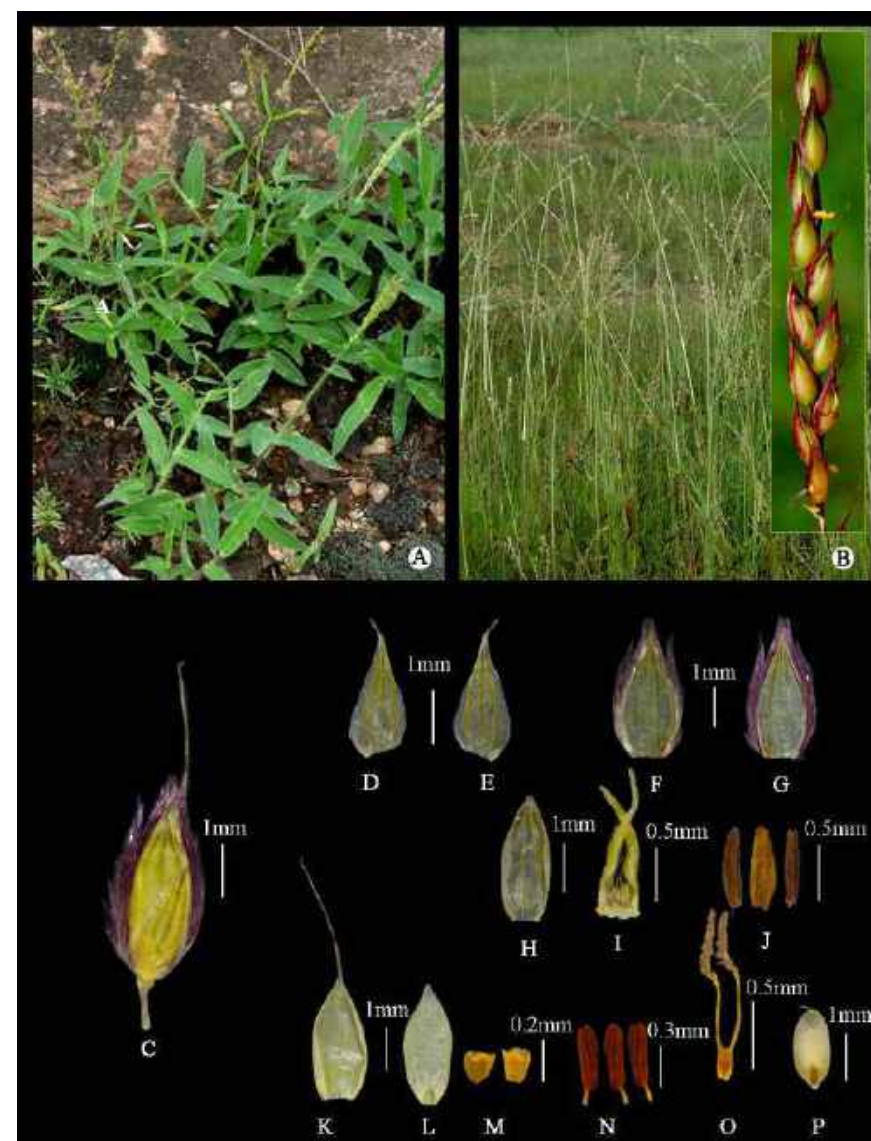


Plate 80. *Alloteropsis cimicina* (L.) Stapf: A. Habitat; B. Habit (Inset: Inflorescence); C. Spikelet; D&E. Abaxial and adaxial view of lower glume; F&G. Abaxial and adaxial view of upper glume; H. Lower lemma; I. Lower palea; J. Anthers; K. Upper lemma; L. Upper palea; M. Lodicules; N. Stamens; O. Pistil; P. Caryopsis.

2–7 cm long, strongly compressed, keeled, margins tuberculate hairy; ligules very narrow; blades 3–15 × 0.5–1.5 cm, linear-oblong, margin serrate, apex obtuse. Inflorescence terminal, 2-many, spiciform. Racemes 4.5–7 cm long, subdigitate, rachis triquetrous, margin winged, serrulate. Spikelets 1.5–2 × c. 1 mm, ovate-lanceolate, 2-rowed, sessile. Lower glume absent. Upper glume 1–2 × c. 1 mm, ovate-lanceolate, boat shaped, chartaceous, apex acuminate. Florets 2; lower barren; upper bisexual; callus bearded. Lower lemma c. 1.5 × 0.8 mm, elliptic to ovate, chartaceous, apex acuminate. Lower palea absent. Upper lemma 1–1.5 ×



Plate 81. *Axonopus compressus* (Sw.) P.Beauv.: A. Habitat; B. Inflorescence.

0.6 mm, elliptic-lanceolate, subcoriaceous, apex acute. Upper palea 1–1.5 × 0.6 mm, elliptic, subcoriaceous, apex acute-obtuse. Lodicules 2. Stamens 3. Ovary c. 1 mm long, oblong. Caryopsis c. 1 mm long, oblong.

Fl. & Fr.: Jun.–Feb.

Distrib.: Throughout the state as a lawn grass.

Exsicc.: Rangareddy District: Hyderabad, Lacones SNR (BSID).

Note: It can be easily distinguished from *Zoysia matrella* and *Stenotaphrum dimidiatum* by its digitate inflorescence and hairy margins of leaves.

Cenchrus L.

(* Previously treated under '*Pennisetum* Rich.')

World: 107 spp.; India: 22 spp.; Telangana: 7 spp.

Key to the species

- | | | |
|-----|--|-------------------------------|
| 1a. | Bristles or spines of involucre scabrid | ... 2 |
| 1b. | Bristles or spines more or less glabrous | ... 3 |
| 2a. | Antrosely scabrid | ... 3. <i>C. ciliaris</i> |
| 2b. | Retrosely scabrid | ... 2. <i>C. biflorus</i> |
| 3a. | Lemma heteromorphous, lower 3-lobed | ... 4 |
| 3b. | Lemma homomorphous, lower entire | ... 5 |
| 4a. | Spikelet pedicelled | ... 5. <i>C. pedicellatus</i> |
| 4b. | Spikelet sessile | ... 7. <i>C. setosus</i> |
| 5a. | Anther cells bearded at apex | ... 6 |
| 5b. | Anther cells glabrous at apex | ... 4. <i>C. hohenackeri</i> |
| 6a. | Wild | ... 6. <i>C. purpureus</i> |
| 6b. | Cultivated | ... 1. <i>C. americanus</i> |

1. *Cenchrus americanus* (L.) Morrone in Ann. Bot. (Oxford) n.s., 106: 127. 2010; Pull., Fl. Telangana 3: 1161. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 739. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 336. 2020. *Panicum americanum* L., Sp. Pl. 1: 56. 1753. *Pennisetum americanum* (L.) Leeke in Z. Naturwiss. 79: 52. 1907. *Panicum glaucum* L., Sp. Pl., 1: 56. 1753. '*Sajjala*'

Caespitose annuals. Culms about 250 cm high; nodes bearded. Leaves basal and cauline; sheaths flattened, margin smooth; blades 20–100 cm long, linear, flat-conducuplicate, scabrid, apex acute. Panicles c. 25 cm long, compact, cylindrical, peduncled pubescent. Spikelets c. 6 mm long, clusters, ovate-elliptic, involucre bristles many. Lower glume c. 1 mm long, obovate, membranous, apex obtuse-truncate. Upper glume c. 2 mm long, broadly ovate, hispid, apex obtuse-truncate. Florets 2; lower male; upper bisexual. Lower lemma c. 3 mm long, broadly ovate, chartaceous, 3–5-nerved, apex emarginate-truncate. Upper lemma c. 4 mm long, ovate, subcoriaceous, apex acute. Upper palea c. 3.5 mm long, oblong, margin inflexed, apex acute. Caryopsis 2–3 mm long, obovoid or ellipsoid.

Fl. & Fr.: Sep.–Nov.

Distrib.: Cultivated throughout the state.

Exsicc.: Rangareddy District: Hyderabad, MVR 02189 (HY); Warangal District: Regional Agriculture Research Station-Warangal, 28.03.2021, SNR 012026 (BSID).

2. *Cenchrus biflorus* Roxb., Fl. Ind. 1: 238. 1820; Rang. & Tadul., Handb. S. Ind. Grasses: t. 121. 1921; Bor, Grasses Burma, Ceylon, India & Pakistan 287. 1960; Pull., Fl. Telangana 3: 1084. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 686. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 336. 2020. *Cenchrus barbatus* Schumacher, Beskr. Guin. Pl.: 43. 1827; C.E.C.Fisch. in Gamble, Fl. Madras 1794. 1934. *Cenchrus catharticus* Delile, Index Seminum Hort. Reg. Bot. Monspel. 1834. 4. 1839; Hook.f., Fl. Brit. India 7: 90. 1896.

Plate 82



Plate 82. *Cenchrus biflorus* Roxb.: A. Habitat; B. Spike; C. Enlarged view of spike.

Caespitose annuals. Culms 10–40 cm high, erect or geniculate; nodes dark. Leaves basal and cauline; sheaths glabrous, flattened, keel; ligules a rim of hairs; blades 2–10 × 0.3–0.5 cm, linear-lanceolate, finely acuminate. Racemes c. 12 cm long, spiciform, cylindric, purple tinged. Peduncles exserted. Involucral bristles hard, subulate, outermost bristles reflexed, inner bristles spreading, c. 8 mm long. Spikelets 2 in each involucre, 3–5 mm long, ovate-lanceolate. Lower glume 1–1.5 × 0.5 mm, lanceolate, hyaline, apex acuminate. Upper glume 4–4.5 mm long, ovate, hyaline, 2–5-nerved, apex acute. Florets 2; lower neuter; upper fertile. Lower lemma 4–4.5 mm long, ovate, chartaceous, 5-nerved, apex

acuminate and ciliate. Lower palea 2.5 mm long, lanceolate, hyaline, 3-nerved, apex acute. Upper lemma c. 3 mm long, ovate, subcoriaceous, 5-nerved, apex cuspidate. Palea c. 3 mm long, lanceolate, chartaceous, hyaline, 2-keeled, apex acuminate. Stamens 3. Ovary ovate. Caryopsis 2.3–3 × 0.6–0.8 mm, ovoid, rugose.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in arid habitats.

Exsicc.: Mahabubnagar District: Appapur, BSS & PKB 32998 (SKU).

Note: Recognizable by the absence of lower glume.

3. *Cenchrus ciliaris* L., Mant. Pl. 2: 302. 1771; C.E.C.Fisch. in Gamble, Fl. Madras 1794. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 287. 1960; Pull., Fl. Telangana 3: 1084. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 687. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 336. 2020. *Pennisetum cenchroides* Rich. in Pers., Syn. Pl. 1: 72. 1805; Hook.f., Fl. Brit. India 7: 88. 1896. *Pennisetum ciliare* var. *ciliare* (L.) Link in Hort. Berol. 1: 213. 1827.

Plate 83

Caespitose perennials; rhizomatous. Culms about 100 cm high; nodes bearded. Leaves basal and cauline; sheaths c. 5 cm long, compressed, keeled, sparsely hairy or glabrous; ligules apex ciliate; blades 5–22 × 0.2–0.5 cm, linear, glabrous or sparsely hairy, margin ciliate, apex acute-acuminate. Racemes c. 7 cm long, cylindric, purplish, involucral bristles arranged in 1–3 whorls. Spikelets c. 5 mm long, lanceolate. Lower glume 2–3 × 1–1.5 mm, ovate-lanceolate, hyaline, 1-nerved, apex acute. Upper glume 3–3.5 mm long, lanceolate, 1-nerved, hyaline, apex acute. Florets 2, lower neuter; upper fertile. Lower lemma 5 × 1.5 mm, lanceolate, membranous, 3–5-nerved, apex cuspidate. Lower palea absent. Upper lemma c. 5 mm long, lanceolate, chartaceous, 5-nerved, apex acute. Upper palea c. 3.5 × 1.5 mm, lanceolate, hyaline, 2-nerved, apex acute. Stamens 3. Ovary oblong. Caryopsis c. 2 mm long, elliptic-oblong.

Fl. & Fr.: Aug.–Feb.

Distrib.: Cultivated

Exsicc.: Mahabubnagar District: Amrabad, BSS & PKB 32209 (SKU); Rangareddy District: Hyderabad, MVR 02188 (HY); Wanparthy District: Amadabakula, 09.08.219, SNR 8658 (BSID).

4. *Cenchrus hohackeri* (Hochst. ex Steud.) Morrone in Ann. Bot. (Oxford) n.s., 106(1): 128. 2010. *Pennisetum hohackeri* Hochst. ex. Steud., Syn. Pl. Glumac. 1: 103. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1792. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 344. 1960; Pull., Fl. Telangana 3: 1161. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 739. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 337. 2020. *Pennisetum alopecuroides* Steud., Syn. Pl. Glum. 1: 103. 1854, non Jacq., 1844; Hook.f., Fl. Brit. India 7: 84. 1896.

Plate 84

Caespitose perennials. Culms 50–160 cm high; nodes glabrous. Leaves basal and cauline; sheaths 10–14 cm long, keeled, mouth bearded; ligules apex

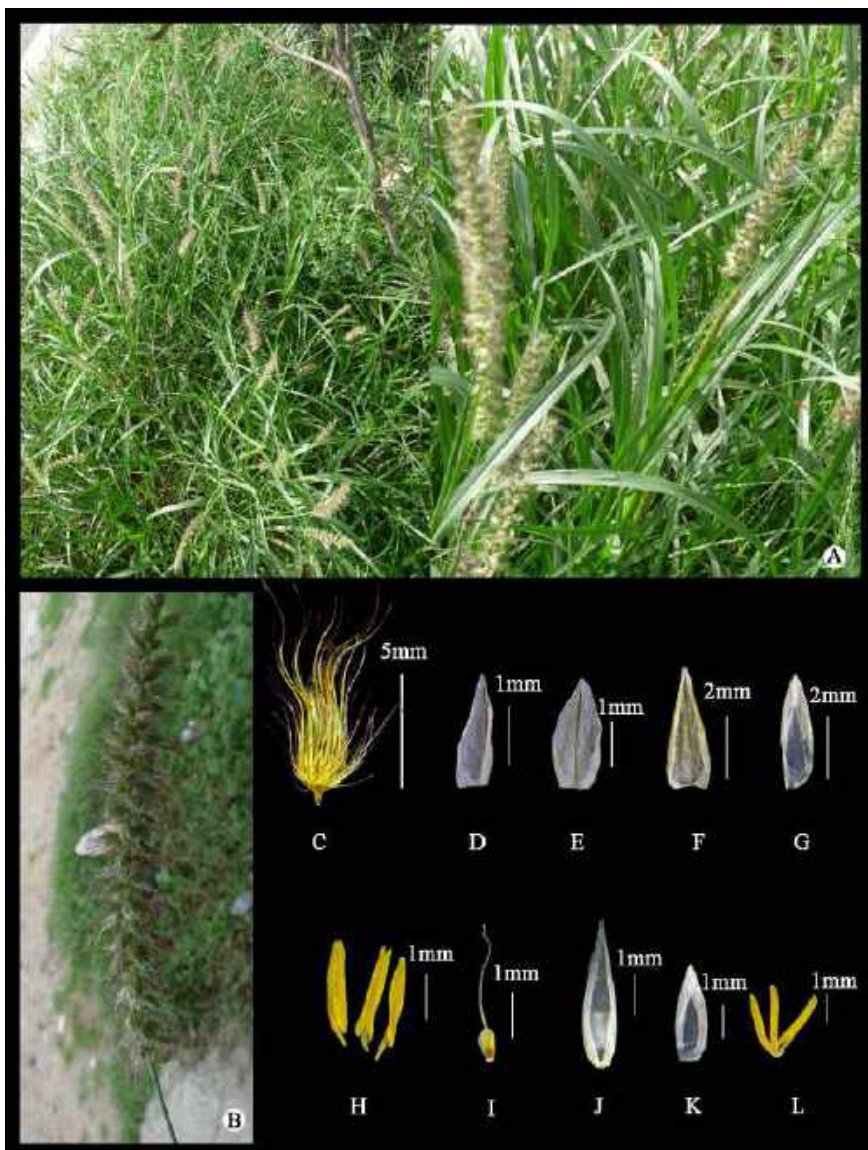


Plate 83. *Cenchrus ciliaris* L.: A. Habitat; B. Inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Lower lemma; G. Lower palea; H. Stamens; I. Pistil; J. Upper lemma; K. Upper palea; L. Stamens.

fimbriate; blades 10–50 × 0.3–0.7 cm, linear, sparsely pilose, base truncate, margin inflexed, apex attenuate. Panicles 25–30 cm long, spiciform. Spikelets 5–7.5 × 1–2 mm, lanceolate, enclosed in involucre, bristles scaberulous. Lower glume 0.2–0.5 × 0.6 mm, orbicular, membranous, apex rounded. Upper glume 3–5 mm long, lanceolate, 5-nerved, sub coriaceous, margin inrolled, apex obtuse. Lower florets male or neuter. Upper floret bisexual. Lower lemma 5–7 × 1–1.5 mm, ovate-lanceolate, 9-nerved, chartaceous, margin inflexed, apex obtuse-



Plate 84. *Cenchrus hohenackeri* (Hochst. ex Steud.) Morrone: A. Habitat; B. Inflorescence; C. Spikelet; D&E. Abaxial and adaxial view of lower glume; F&G. Abaxial and adaxial view of upper glume; J&K. Abaxial and adaxial view of lemma; L. Palea; M. Stamens; N. Lodicules with pistil; O. Caryopsis.

acute. Upper lemma 5–7 × 1–1.5 mm, ovate-lanceolate, 5-nerved, sub coriaceous-chartaceous, margin inflexed, apex acute-acuminate. Palea 6–6.8 × 1–1.5 mm, lanceolate, chartaceous, 2-nerved, margin inflexed, apex acute. Lodicules 2. Stamens 3. Ovary ovate. Caryopsis 3–3.5 × 1.3–1.6 mm, oblong.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common on bunds of cultivated fields and in dried river beds.

Exsicc.: Rangareddy District: Hyderabad, MVR 02190 (HY); Nizamabad District: Patharajampet railway gate, BRPR & CPB 7161 (SKU); Rangareddy District: Ramayyagudem, MSM & KH 10579 (SKU); Vikarabad District: Damagundam, 02.12.2019, SNR 8902 (BSID).

Note: Robust grass.

5. *Cenchrus pedicellatus* (Trin.) Morrone in Ann. Bot. (Oxford) n.s., 106(1): 128. 2010. *Pennisetum pedicellatum* Trin. in Mem. Acad. Imp. Sci. Saint-Petersbourg Ser. 6, Sci. Math., Seconde Pt. Sci. Nat. 3(2): 184. 1834; Hook.f., Fl. Brit. India 7: 86. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1792. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 346. 1960; Pull., Fl. Telangana 3: 1162. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 740. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 337. 2020. **Plate 85**

Caespitose perennials. Culms 60–120 cm high; nodes glabrous. Leaves basal and cauline; sheaths 7–10.5 cm long, sparsely hairy; ligules membranous, apex fimbriate; blades 4.5–30 × 0.2–0.7 cm, linear-lanceolate, sparsely hairy or glabrous, apex acuminate. Panicles c. 22 cm long, spiciform, interrupted. Spikelets up to 5; 3–5 × 0.4–0.6 mm, lanceolate-ovate, enclosed in involucre, bristles densely plumose, one spikelet in the involucre is pedicelled; pedicel c. 3.6 mm long. Lower glume 1–1.5 mm long, lanceolate, membranous, hyaline, 1-nerved, villous, apex acute. Upper glume 2–3 mm long, broadly ovate-lanceolate, membranous, hyaline, 5-nerved, apex villous and 3-lobed. Florets 2; lower floret neuter or male; upper floret bisexual. Lower lemma 3–4 × 0.5–1 mm, lanceolate, chartaceous, hyaline, 5-nerved, margin inflexed, apex 3-lobed, ciliate. Lower palea 0.5–1 mm long, lanceolate, hyaline, 2-nerved, 2-keeled, keel scabrid, apex rounded. Upper lemma 2–3 mm long, elliptic-lanceolate, coriaceous, faintly 3–5-nerved, apex acute-obtuse, ciliate. Upper palea 1.5–2 mm long, elliptic-lanceolate, coriaceous, margin inflexed, apex acute-obtuse. Stamens 2. Ovary ovate. Caryopsis oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Cultivated.

Exsicc.: Mahabubnagar District: Patancheru industrial area, BRPR 11316 (SKU); Rangareddy District: Central University, MSM 12734 (SKU)!, Hyderabad, MVR 02191 (HY).

6. *Cenchrus purpureus* (Schumach.) Morrone in Ann. Bot. (Oxford) n.s., 106(1): 129. 2010. *Pennisetum purpureum* Schumach., Beskr. guin. Ol. 44. 1827; Bor, Grasses Burma, Ceylon, India & Pakistan 348. 1960; Pull., Fl. Telangana 3: 1163. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 740. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 337. 2020.

Caespitose perennials. Culms about 200 cm high; nodes sparsely hairy. Leaves basal and cauline; sheaths 20–25 cm long, keeled, hairy towards apex; ligules apex fimbriate; blades 10–65 × 0.3–2 cm, linear-lanceolate, base rounded, margin sharp, apex attenuate. Panicles c. 30 cm long, enclosed in involucre, bristles glabrous. Lower glume 0.5–1 × 0.5–1 mm, ovate, hyaline, 1-nerved, apex obtuse.



Plate 85. *Cenchrus pedicellatus* (Trin.) Morrone: A&B. Habitat.

Upper glume 1.5–3.5 × 0.5–1 mm, lanceolate, membranous, hyaline, 2–3-nerved. Florets 2; lower florets neuter or male; upper florets bisexual. Lower lemma 4–5 × 1.5–2 mm, ovate-lanceolate, 3–5-nerved, membranous, margin inflexed, apex ciliate. Lower palea 2–2.5 mm long, ovate-lanceolate, membranous, hyaline, 2-nerved, margin inflexed, scabrid on margins. Upper lemma 4–5 × 1–2 mm, ovate-lanceolate, coriaceous, 7-nerved, apex acute. Upper palea 3–4 × 1 mm, lanceolate, coriaceous. Stamens 3. Ovary oblong. Caryopsis c. 3 mm long, oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Cultivated.

Exsicc.: Adilabad District: Sattenapalle fields, *TP & PVP* 4157 (SKU).

7. *Cenchrus setosus* Sw., Prodr. 26. 1788; Bor, Grasses Burma, Ceylon, India & Pakistan 348. 1960; Pull., Fl. Telangana 3: 1163. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 741. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 442. 2020.

Caespitose perennials. Culms about 90 cm high; nodes sparsely hairy. Leaves basal and cauline; sheaths c. 10 cm long, keeled, hairy towards apex; ligules apex fimbriate; blades c. 35 cm long, linear-lanceolate, base rounded, margin sharp, apex attenuate. Panicles c. 15 cm long, enclosed in involucre, bristles glabrous. Lower glume 0.5–1.5 × 0.5–1 mm, ovate, hyaline, 1-nerved, margin incurved, apex obtuse. Upper glume 1.5–3 × 1–1.5 mm, lanceolate, membranous, hyaline, 2–3-nerved. Florets 2; lower floret male; upper florets bisexual. Lower lemma 3–4 × 1 mm, ovate-lanceolate, membranous, 3–5-nerved, margin inflexed, apex ciliate. Lower palea 2–3 × 0.8–1 mm, ovate-lanceolate, membranous, hyaline, 2-nerved, margin inflexed, scabrid on margins. Upper lemma 3–4 × 1.5–2 mm, ovate-lanceolate, coriaceous, 7-nerved, apex acute. Upper palea 3–4 × 1 mm, lanceolate, coriaceous. Stamens 3. Ovary oblong. Caryopsis c. 3 mm long, oblong.

Fl. & Fr.: Jul.–Jan.

Distrib.: Occasionally in Warangal.

Exsicc.: Warangal District: Phakal, *KMS* 11596 (MH).

***Cyrtococcum* Stapf**

World: 14 spp.; India: 7 spp.; Telangana: 1 sp.

***Cyrtococcum trigonum* (Retz.) A. Camus** in Bull. Mus. Natl. Hist. Nat. 27: 118. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1785. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 292. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 348. 2020. *Panicum trigonum* Retz., Observ. Bot. 3: 9. 1783; Hook.f., Fl. Brit. India 7: 56. 1896.

Plate 86

Mat-forming stoloniferous perennials. Culms decumbent, 10–17 cm high, slender; nodes sparsely villous hairy; lower nodes rooting. Leaves mostly cauline; sheaths 1.5–1.8 cm long, tuberculate, margins ciliate; ligules membranous; blades 3–5 × 0.2–0.5 cm, lanceolate, base tuberculate hairy, apex acuminate-acute. Panicle c. 5 cm long, contracted, tuberculate. Racemes c. 2 cm long. Spikelets 1–1.5 × 0.5–0.8 mm, obovate to elliptic, gibbous on one side, hirsute hairy, apex acute. Spikelet disarticulating from above. Lower glume 0.5–1 × c. 0.4 mm, ovate, chartaceous, 3-nerved, villous dorsally, base long hairy, apex acute-obtuse. Upper glume 1–1.5 × c. 0.4 mm, obovate, gibbous, chartaceous, apex acute and slightly beaked. Florets 2; lower empty, upper bisexual. Lower lemma 1.3–1.8 × c. 0.8 mm, obovate, gibbous and beaked at apex, chartaceous, greenish, prominently 5-nerved, villous hairy dorsally especially towards apex. Upper lemma c. 1.5 × 0.6 mm, elliptic-deltoid, gibbous, 3–5-nerved, margins inflexed, apex acute. Upper palea 1–1.5 × 0.2–0.4 mm, obovate, boat shaped, base truncate, sub coriaceous,



Plate 86. *Cyrtococcum trigonum* (Retz.) A. Camus: A. Camus: A. Habitat; B. Inflorescence (Inset: Closed view of inflorescence); C. Spikelet; D. Lower glume; E. Upper glume; F. Lower lemma; G–I. Upper floret; J. Upper lemma; K. Upper palea; L. Stamens; M. Pistil.

apex acute. Caryopsis c. 0.5 mm long, oblong.

Fl. & Fr.: Jul.–Apr.

Distrib.: Occasionally forest grass in Mahabubnagar, Nagrkurnool and Vikarabad.

Exsicc.: Vikarabad District: Damagundam, 21.09.20019, *SNR* 8948 (BSID).

Digitaria Haller

World: c. 262 spp.; India: 29 spp., 1 subsp., 2 var.; Telangana: 9 spp.

Key to the species

- | | |
|---|-----------------------------|
| 1a. Inflorescence panicle, effuse | ... 9. <i>D. tomentosa</i> |
| 1b. Inflorescence spike like racemes | ... 2 |
| 2a. Spikelets < 2 mm long | ... 3 |
| 2b. Spikelets > 2 mm long | ... 5 |
| 3a. Hairs of spikelets verrucose | ... 4. <i>D. longiflora</i> |
| 3b. Hairs of spikelets clavate tipped | ... 4 |
| 4a. Tip of pedicels hairy | ... 7. <i>D. stricta</i> |
| 4b. Tip of pedicels glabrous | ... 1. <i>D. abludens</i> |
| 5a. Hairs of spikelets clavate tipped | ... 8. <i>D. ternata</i> |
| 5b. Hairs of spikelets not clavate tipped | ... 6 |
| 6a. Racemes puberulous in axils | ... 6. <i>D. setigera</i> |
| 6b. Racemes glabrous | ... 7 |
| 7a. Spikelets heteromorphous | ... 2. <i>D. bicornis</i> |
| 7b. Spikelets homomorphous | ... 8 |
| 8a. Wings of rachis serrulate | ... 3. <i>D. ciliaris</i> |
| 8b. Wings of rachis smooth | ... 5. <i>D. radicata</i> |

1. *Digitaria abludens* (Roem. & Schult.) Veldkamp in Blumea 21(1): 53–55. 1973; Pull., Fl. Telangana 3: 1107. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 703. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 351. 2020. *Panicum abludens* Roem. & Schult., Syst. Veg. ed. 15, 2: 457. 1817.

Plate 87(A-B)

Caespitose annuals. Culms 10–50 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths glabrous; ligules membranous, apex fimbriate; blades 5–15 × 0.2–0.4 cm, linear-lanceolate, flat, margin cartilaginous-serrulate, sparsely hairy, apex acuminate. Racemes 3–5, each about 10 cm long, rachis triquetrous, scabrid. Spikelets 1–1.5 mm long, loosely arranged, elliptic-oblong, softly, villous. Lower glume absent or reduced. Upper glume 0.5–1.5 × 0.3–0.6 mm, elliptic, 3–5-nerved, softly pubescent, hairs club shaped, apex acute. Florets 2; lower floret neuter; upper floret bisexual. Lower lemma 1–1.5 × 0.2–0.6 mm, softly pubescent, 5-nerved, apex acute. Lower palea absent. Upper lemma c. 2 mm long, elliptic, crustaceous, apex apiculate. Upper palea 1.5 × 0.5 mm, elliptic, 2-keeled, 2-nerved, crustaceous, apex acute. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis c. 1.5 mm long, ellipsoid.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Bellampally, PVP 9459 (SKU); Ankusapuram, GO 4347 (SKU)!; Mahabubnagar District: Appapur, AMSR 25681 (SKU); Rangareddy District: Manasa hills-Rajendranagar, 22.09.2019, SNR 8670 (BSID); 04.09.2019, SNR 8693 (BSID).

2. *Digitaria bicornis* (Lam.) Roem. & Schult., Syst. Veg. ed. 15. 2: 470. 1817; Bor, Grasses Burma, Ceylon, India & Pakistan 299. 1960; Pull., Fl. Telangana 3: 1107. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 704. 2016; Prasanna & al. in

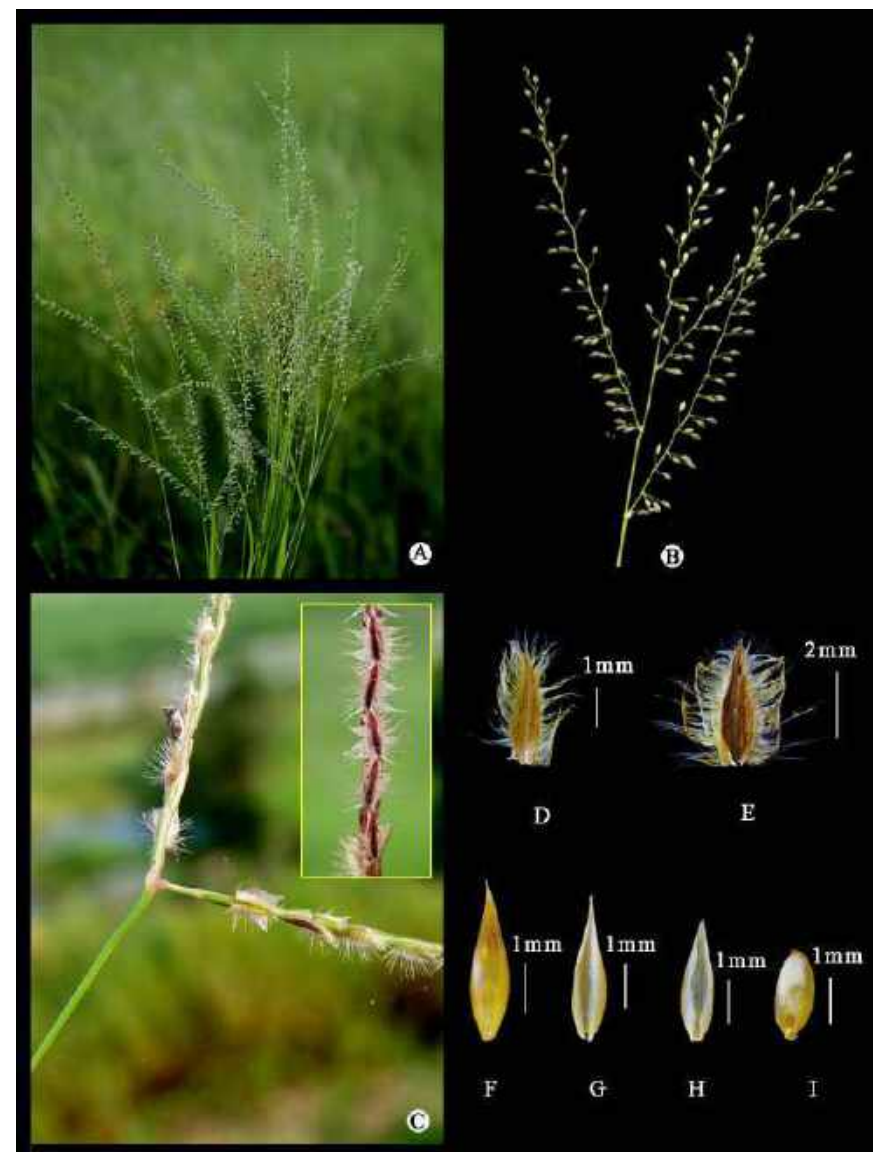


Plate 87. A–B. *Digitaria abludens* (Roem. & Schult.) Veldkamp: A&B. Inflorescence; C–I. *Digitaria bicornis* (Lam.) Roem. & Schult.: C. Inflorescence (Inset: Enlarged view of raceme); D. Upper glume; E. Lower lemma; F. Upper floret; G. Upper lemma; H. Upper palea; I. Caryopsis.

A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 352. 2020. *Paspalum bicornis* Lam., Tabl. Encycl. 1: 176. 1791. *Paspalum heterantherum* Hook.f., Fl. Brit. India 7: 16. 1896, non Nees & Meyen, 1843. *Digitaria biformis* Willd., Enum. Pl.: 92. 1809; Bor, Grasses Burma, Ceylon, India & Pakistan 299. 1960. **Plate 87(C-I)**

Caespitose; stoloniferous perennials. Culms about 80 cm high, nodes glabrous or bearded; lower nodes rooting. Leaves basal and cauline; sheaths keeled,

glabrous; ligules membranous; blades 2–10 × 0.2–0.5 cm, linear-oblong, flat, apex rounded. Racemes usually 2, each c. 10 cm long, digitate, divaricate. Rachis winged, serrulate. Spikelets paired, subsessile and pedicelled; 2–3.5 × 0.4–0.8 mm, elliptic-oblong, heteromorphous, sparsely pubescent. Lower glume 0.2–0.5 mm long, scaly, triangular, sometimes absent. Upper glume 2–2.5 × 0.2–0.4 mm, lanceolate, chartaceous, pubescent, 3-nerved, apex acuminate. Florets 2; lower floret neuter; upper floret bisexual. Lower lemma c. 3.5 × 1 mm, oblong, pubescent, 7-nerved, margin inflexed, bristly, apex acute-acuminate. Palea absent. Upper lemma 2–3.5 × 0.4–0.6 mm, elliptic-lanceolate, crustaceous, apex apiculate-acuminate. Upper palea c. 3 × 0.2–0.5 mm, elliptic, 2-keeled, 2-nerved, crustaceous, apex acuminate. Stamens 3. Ovary elliptic. Caryopsis 2–2.5 × 0.5–0.6 mm, elliptic-oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Nagarkurnool District: Vattam, 08.08.2019, *SNR* 8646 (BSID); Mahabubnagar District: Venkatapuram-Sivaru, 06.08.2019, *SNR* 8627 (BSID); Nizamabad District: Kamareddy, *BRPR* 9278 (SKU); Rangareddy District: Kondapur, *MSM* 10591 (SKU); Hyderabad, *MVR* 02140 (HY); Manasa hills-Rajendranagar, 04.09.2019, *SNR* 8685 (BSID); 24.08.2016, *SNR* 8544 (BSID); Warangal District: Cherial, *CSR* 391 (KU); Regional Agricultural Research Station-Warangal, 28.03.2019, *SNR* 012014 (BSID).

Note: Distinguishable by heteromorphous spikelets and awl shaped lower glume.

3. *Digitaria ciliaris* (Retz.) Koeler, Descr. Gram. 27. 1802; Veldkamp in Blumea 21: 32. t. 5a. 1973; Pull., Fl. Telangana 3: 1109. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 704. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 352. 2020. *Panicum ciliare* Retz., Observ. Bot. 4: 16. 1786. *Digitaria adscendens* (Kunth) Henrard in Blumea 1: 92. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 298. 1960. *Panicum adscendens* Kunth, Nov. gen. Sp. 1: 97. 1816. *Digitaria marginata* Link, Enum. Hort. Berol. Alt.: 102. 1821; C.E.C.Fisch. in Gamble, Fl. Madras 1764. 1934.

Plate 88(A-B)

Caespitose perennials. Culms 20–70 cm high, rooting at lower nodes; nodes glabrescent. Leaves basal and cauline; sheaths 3–6 cm long, strigose; ligules scarious, apex lacerate; blades 3–19 × 0.2–1 cm, linear-lanceolate, linear-oblong, margin cartilaginous, sparsely pilose, apex acuminate. Racemes 2–10; 5–15 cm long, digitate, rachis triquetrous, winged, serrulate. Spikelets 2–3 mm long, oblong, pubescent, homomorphous, apex acuminate. Lower glume 0.2–0.5 mm long, scaly, triangular. Upper glume 2–2.5 mm long, lanceolate, membranous, 3–5-nerved, pubescent, apex acute. Florets 2; lower floret neuter; upper floret bisexual. Lower lemma 2–3 mm long, oblong, 5–7-nerved, pubescent, apex acuminate-apiculate. Lower palea absent. Upper lemma 3 × 0.4–0.6 mm, oblong-elliptic, coriaceous, faintly 3-nerved, apex acuminate-apiculate. Upper palea 2.5–3 × 0.6–0.8 mm, ovate, coriaceous, 2-keeled, 2-nerved, apex acuminate. Caryopsis 1–1.5 mm long, oblong.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Mallapet beat, *TP & GO* 5451 (SKU), Jaipur RF, *PVP* 9434 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8600 (BSID); Mahabubnagar District: Amadabakula, 09.08.2019, *SNR* 8656 (BSID); Appapur, *AMSR* 25679 (SKU), Venkatapuram sivaru, *SNR* 8627 (BSID); Rangareddy District: Hyderabad, *MVR* 02141 (HY); Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8509, 8527 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8712 (BSID); Warangal District: Regional Agricultural Research Station-Warangal-Warangal, 26.03.2021, *SNR* 8986 (BSID); Govindaraopet, 25.03.2021, *SNR* 8977 (BSID).

4. *Digitaria longiflora* (Retz.) Pers., Syn. Pl. 1: 85. 1805; C.E.C.Fisch. in Gamble, Fl. Madras 1765. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 302. 1960; Pull., Fl. Telangana 3: 1110. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 705. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 353. 2020. *Paspalum longiflorum* (Retz.) J.E. Gmel., Syst. Nat., 13(2): 158. 1791. *Paspalum longiflorum* Retz., Observ. Bot. 4: 15. 1786; Hook.f., Fl. Brit. India 7: 17. 1896, p.p.

Plate 88(C-L)

Caespitose perennials; stoloniferous. Culms about 55 cm long; nodes glabrous, rooting. Leaves basal and cauline; sheaths 1–4 cm long, glabrous, keeled; ligules scarious; blades 2–8 × c. 0.5 cm, ovate-lanceolate, elliptic-lanceolate, sparsely pilose, apex acute. Racemes 2–3; 2–9 cm long, digitate, rachis winged. Spikelets 2–3; 1–2 mm long, similar, ovoid, softly pilose. Lower glume absent. Upper glume 1–1.5 × 0.5–0.7 mm, ovate, 3–7-nerved, softly pilose, apex acute. Florets 2; lower floret neuter; upper floret bisexual. Lower lemma 1.5–2 × 0.5–0.6 mm, ovate, chartaceous, 7-nerved, apex acute-acuminate. Lower palea absent. Upper lemma 1–1.5 × 0.4–0.5 mm, ovate-oblong, coriaceous, 3-nerved, apex acute. Upper palea c. 1.5 mm long, ovate, 2-nerved, apex acute. Caryopsis c. 1.2 mm long, ovoid.

Fl. & Fr.: July–Nov.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Jaipur RF, *PVP* 9435 (SKU), Ankusapuram, *GO* 4354, 4338 (SKU); Mulugu District: Kumavaram-Tadvai, 24.03.2021, *SNR* 8972 (BSID); Rangareddy District: Hyderabad, *MVR* 2142 (HY), Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8528 (BSID); 22.08.2019, *SNR* 8671 (BSID).

5. *Digitaria radicata* (C. Presl) Miq., Fl. Ind. Bat. 3: 437. 1857; Veldkamp in Blumea 21: 35. t. 5b. 1973; Pull., Fl. Telangana 3: 1110. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 705. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 353. 2020. *Panicum radicosum* C. Presl, Reliq. Haenk. 1: 297. 1830 excl. syn. *Digitaria timorensis* (Kunth) Balansa; Bor, Grasses Burma, Ceylon, India & Pakistan 306. 1960. *Panicum timorense* Kunth, Enum. Pl. 1: 83. 1833. *Paspalum sanguinale* Lam. var. *debile* Hook.f., Fl. Brit. India 7: 16. 1896.

Caespitose perennials; stoloniferous. Culms 10–55 cm high, geniculate, ribbed; lower nodes rooting. Leaves basal and cauline; sheaths 2–8 cm long, terete, keeled, mouth bearded; ligules membranous; blades 1–9 × 0.2–0.9 cm, lanceolate, base truncate, margin serrulate, apex acuminate. Racemes 2–4; 4–7 cm long, digitate, divergent, peduncle capillary, rachis winged, smooth. Spikelets binate, elliptic-lanceolate. Lower glume absent. Upper glume 1.5–2 × 0.2–0.3 mm, ovate-lanceolate, membranous, 3-nerved, apex acute. Florets 2; lower barren; upper bisexual. Lower lemma 2.4–3 × 0.5–0.7 mm, elliptic, chartaceous, 5-nerved, apex acute-acuminate. Lower palea absent. Upper lemma 2–3 × 0.4–0.7 mm, elliptic-lanceolate, coriaceous, 3-nerved, margins incurved, apex acuminate. Upper palea c. 3 × 0.6 mm, elliptic, 2-nerved, margin inflexed, apex acuminate. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis c. 2 mm long, ovate.

Fl. & Fr.: Aug.–Feb.

Distrib.: Occasionally in Adilabad, Karimnagar and Peddapally.

Exsicc.: Adilabad District: Sattenapalli *TP & PVP* 4098 (SKU).

6. *Digitaria setigera* Roth ex Roem. & Schult., Syst. Veg., ed. 15 2: 474. 1817; Bor, Grasses Burma, Ceylon, India & Pakistan 305. 1960; Veldkamp in Blumea 21: 37. t. 5e. 1973; Mondal & Mukherjee in J. Bombay Nat. Hist. Soc. 88: 306. 1991; Pull., Fl. Telangana 3: 1111. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 354. 2020.

Caespitose annuals. Culms 20–110 cm high, geniculate; nodes glabrous. Leaves basal and cauline; sheaths keeled, margin hairy; ligules membranous, apex lacerate; blades 2–10 × 0.5–1 cm, linear-lanceolate, base cordate, apex acuminate. Racemes 3–11; c. 12 cm long, digitate. Rachis winged, flat; pedicels triquetrous, margin scabrid. Spikelets 2–2.5 mm long, elliptic-oblong, homomorphous. Lower sessile, hairy along margins, upper pedicelled. Lower glume absent. Upper glume 0.5–1 mm long, chartaceous, triangular, pubescent, 3-nerved, apex acute. Florets 2; lower floret neuter; upper floret bisexual. Lower lemma 2.5–3 × 1 mm, elliptic, pubescent, 5–7-nerved, apex acute. Lower palea absent. Upper lemma 1.8–2.5 × 0.5–1 mm, oblong-lanceolate, crustaceous, apex acuminate. Upper palea 2–2.6 × 0.4–0.8 mm, ovate, crustaceous, 2-keeled, 2-nerved, margin inflexed, apex acuminate. Lodicules 2. Stamens 3. Ovary lanceolate. Caryopsis 1.5–2 × 0.6–0.8 mm, elliptic-oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional on hills.

Exsicc.: Bhadrachali Kothagudem District: Kinnerasani Wildlife Sanctuary, SNR 8600 (BSID); Mahabubnagar District: Tekulapenta, *BSS & SKB* 32922 (SKU), Appapur, *AMSR* 25680 (SKU); Medak District: Choutkoor, *TP & MSG* 11917 (SKU).

7. *Digitaria stricta* Roth in Roem. & Schult., Syst. Veg., ed. 15 bis 2: 474. 1817; Bor, Grasses Burma, Ceylon, India & Pakistan 305. 1960; Pull., Fl. Telangana 3: 1111. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 706. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 354. 2020. *Digitaria*

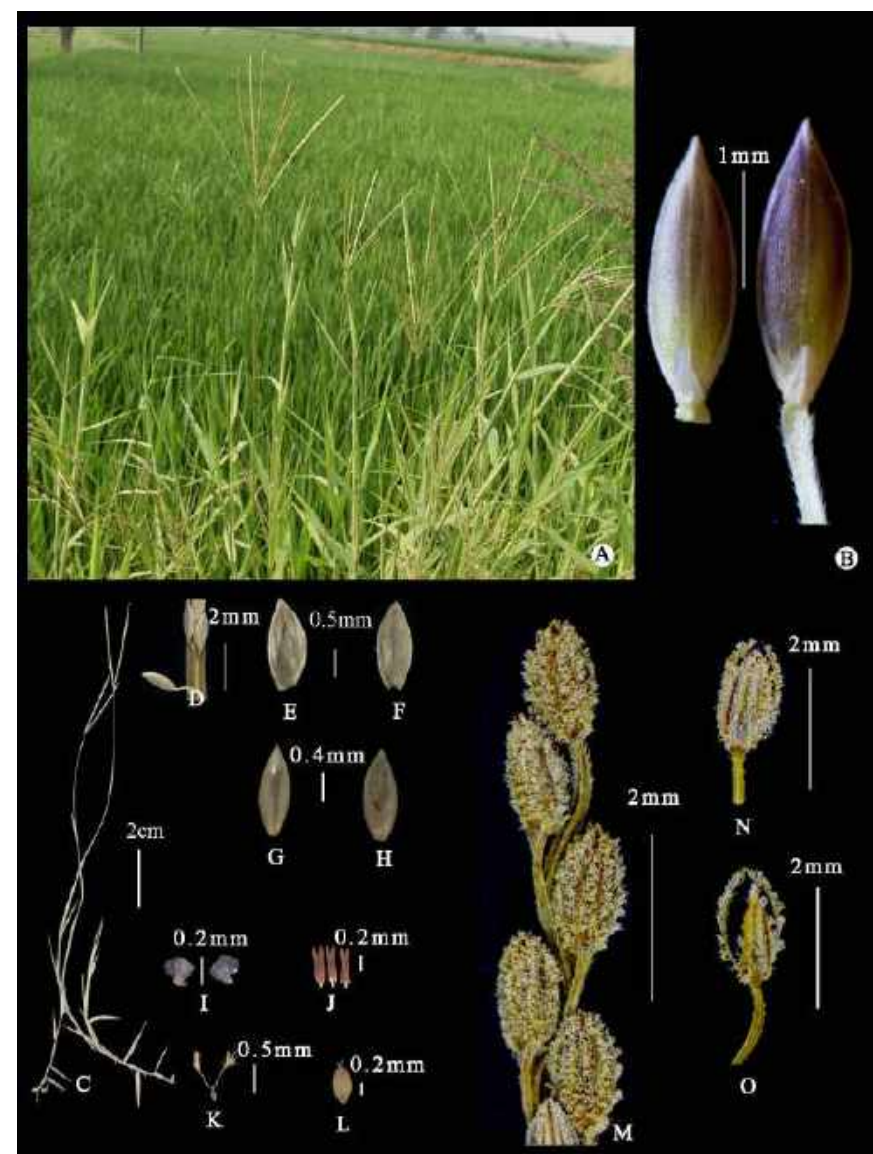


Plate 88. A–B. *Digitaria ciliaris* (Retz.) Koeler: A. Habit; B. Spikelets; C–L. *Digitaria longiflora* (Retz.) Pers.: C. Habit; D. Enlarged view of raceme; E. lower glume; F. Upper glume; G. Lemma; H. Palea; I. Lodicules; J. Stamens; K. Pistil; L. Caryopsis; M–O. *Digitaria stricta* Roth ex Roem. & Schult.: M. Enlarged view of inflorescence; N&O. Spikelets.

royleana (Nees ex Hook.f.) Prain, Bengal Pl. 1182. 1903; C.E.C.Fisch. in Gamble, Fl. Madras 1765. 1934.

Plate 88(M–O)

Caespitose annuals. Culms 20–50 cm high, erect or decumbent; lower nodes rooting. Leaves basal and cauline; sheaths compressed, glabrous, mouth bearded; ligules 1–1.5 mm long, membranous, apex lacerate; blades 5–15 × 0.2–0.6 cm, linear, scabrid, apex acute. Racemes 3–16; c. 15 cm long, digitate; rachis

winged, triquetrous. Spikelets 3, 2.1–2.6 mm long, elliptic or ovate-oblong. Lower glume absent. Upper glume 0.6–0.8 mm long, elliptic, membranous, 3-nerved, hairy, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma c. 1 mm long, elliptic, membranous, 5-nerved, hairs club-shaped, apex acute-obtuse. Lower palea absent. Upper lemma c. 1.3 mm long, ovate, thinly cartilaginous-coriaceous, apex acute. Palea similar. Stamens 3. Caryopsis c. 1 mm long, elliptic.

Fl. & Fr.: Jul.–Dec.

Distrib.: Occasional as weed in cultivated fields and in waste lands.

Exsicc.: Adilabad District: Swarnaproject, *MHR* 14560 (SKU), Nirmal, *MHR* 14471 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2021, *SNR* 8946 (BSID).

8. *Digitaria ternata* (A. Rich.) Stapf, *Fl. Cap.* 7: 376. 1898; C.E.C.Fisch. in Gamble, *Fl. Madras* 1765. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 306. 1960; Pull., *Fl. Telangana* 3: 1112. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 354. 2020. *Cynodon ternatus* A. Rich., *Tent. Fl. Abyss.* 2: 405. 1850. *Paspalum ternatum* (A. Rich.) Hook.f., *Fl. Brit. India* 7: 17. 1896.

Caespitose annuals. Culms about 80 cm high, erect; nodes glabrous. Leaves base and cauline; sheaths 1.5–12 mm long, glabrous, mouth bearded; ligules membranous, apex acute; blades 5–15 × 0.2–1 cm, linear-oblong, flat, glabrous or sparsely hairy, apex acuminate. Racemes 2–4; c. 10 cm long, digitate, glabrescent; rachis serrate, triquetrous. Spikelets 3 (ternate), 2–2.5 mm long, ovate-elliptic, pubescent. Lower glume absent. Upper glume 2 × 0.3–0.6 mm, ovate, chartaceous, 3-nerved, hairs club-shaped, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 2–2.5 mm long, elliptic, chartaceous, 5–7-nerved, hairs club-shaped (clavate tipped), apex acute. Lower palea absent. Upper lemma 2 × 0.6–0.8 mm, oblong-ovate, chartaceous-cartilaginous, 3-nerved, apex acute. Palea c. 2 mm long, elliptic, 2-nerved, apex acute. Lodicules 2. Stamens 3. Caryopsis c. 2 mm long, elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional on hills and in moist localities.

Exsicc.: Mahabubnagar District: Appapur, *AMSR* 25677 (SKU); Rampur, *BSS & SKB* 32921 (SKU); Rangareddy District: Manasahills-Rajendranagar, 4.09.2019, *SNR* 8691 (BSID).

9. *Digitaria tomentosa* (J. Koenig ex Willd.) Henrard in *Blumea* 1: 100. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 306. 1960; Pull., *Fl. Telangana* 3: 1112. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 706. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 354. 2020. *Milium tomentosum* J. Koenig ex Willd. in *Ges. Naturf. Freunde Berlin Neue Schriften* 4: 220. 1803. *Panicum subglume* Trin. in *Mem. Acad. Imp. Sci. Saint-Petersbourg*, Ser. 6, Sci. Math., Seconde Pt. Sci. Nat. 3: 292. 1835; Hook.f., *Fl. Brit. India* 7: 51. 1896; C.E.C.Fisch. in Gamble, *Fl. Madras* 1783. 1934.

Caespitose perennials; stoloniferous. Culms about 80 cm high, erect or geniculate; nodes bearded. Leaves basal and cauline; sheaths 4.5–5 cm long, ribbed, base wooly, margin hairy; ligules scarious; blades 10–16 × 0.5–1 cm, ovate-oblong, softly pubescent, margin serrulate, apex acuminate. Panicles c. 25 cm long, effuse, axils of branches pilose. Spikelets 1–2; 1–2 mm long, elliptic, distantly arranged, pubescent. Lower glume absent. Florets 2; lower neuter; upper bisexual. Lower lemma 2 × 0.4–0.6 mm, lanceolate, 5–7-nerved, pilose, apex acute. Lower palea absent. Upper lemma c. 2 mm long, coriaceous, glabrous, 3–5-nerved, base truncate, margin inflexed, apex apiculate. Upper palea 1.6–1.8 × 0.4–0.5 mm, lanceolate, 2-nerved, apex acute. Stamens 3. Ovary oblong. Caryopsis c. 1.5 mm long.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional on forest hills.

Exsicc.: Mahabubnagar District: Appapur, *AMSR* 25683 (SKU); Warangal District: Cherial, *CSR* 389 (KU).

***Echinochloa* P. Beauv.**

World: c. 33 spp.; India: 8 spp; Telangana: 6 spp.

Key to the species

- | | |
|---|------------------------------|
| 1a. Ligules present | ... 2 |
| 1b. Ligules absent | ... 3 |
| 2a. Spikelets tuberculate hispid | ... 5. <i>E. picta</i> |
| 2b. Spikelets minutely pubescent | ... 6. <i>E. stagnina</i> |
| 3a. Spikelets awned | ... 4 |
| 3b. Spikelets unawned | ... 5 |
| 4a. Awn glabrous | ... 4. <i>E. oryzoides</i> |
| 4b. Awn scabrid | ... 2. <i>E. crus-galli</i> |
| 5a. Cultivated; racemes densely crowded, incurved at maturity | ... 3. <i>E. frumentacea</i> |
| 5b. Wild; racemes not as above | ... 1. <i>E. colona</i> |

1. *Echinochloa colona* (L.) Link, *Hort. Berol.* 2: 209. 1833; C.E.C.Fisch. in Gamble, *Fl. Madras* 1776. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 308. 1960; Pull., *Fl. Telangana* 3: 1115. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 709. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 359. 2020. *Panicum colonum* L., *Syst. Nat. ed.* 10, 2: 870. 1759; Hook.f., *Fl. Brit. India* 7: 32. 1896. '*Uthagaddi*', '*Udaragaddi*' **Plate 89**

Caespitose annuals. Culms 10–95 cm high, erect or decumbent; nodes glabrous or puberulous, lower nodes rooting. Leaves basal and cauline; sheaths glabrous, keeled; ligules absent; blades 5–23 × 0.2–1 cm, linear-lanceolate, base cordate-rounded, apex acuminate. Inflorescence 5–20 cm long. Racemes 2–3 cm long, appressed. Spikelets 2.5–3 × 1–1.4 mm, elliptic-ovate, biseriate, hispid, apex acuminate. Lower glume 1–2.2 × 1–1.7 mm, ovate, 5-nerved, chartaceous, hairy, apex acute-cuspidate. Upper glume 2–2.9 × 1–1.5 mm, ovate, chartaceous, puberulous, 7–10-nerved, apex acuminate. Florets 2; lower neuter; upper bisexual. Lower lemma 2–2.5 × 1–1.3 mm, broadly ovate, 5-nerved, lateral nerves hispid-hirsute, margins inflexed, apex acute-cuspidate. Lower palea 1.9–2.3 × 0.9–1.3 mm, ovate-elliptic, chartaceous, 2-nerved,

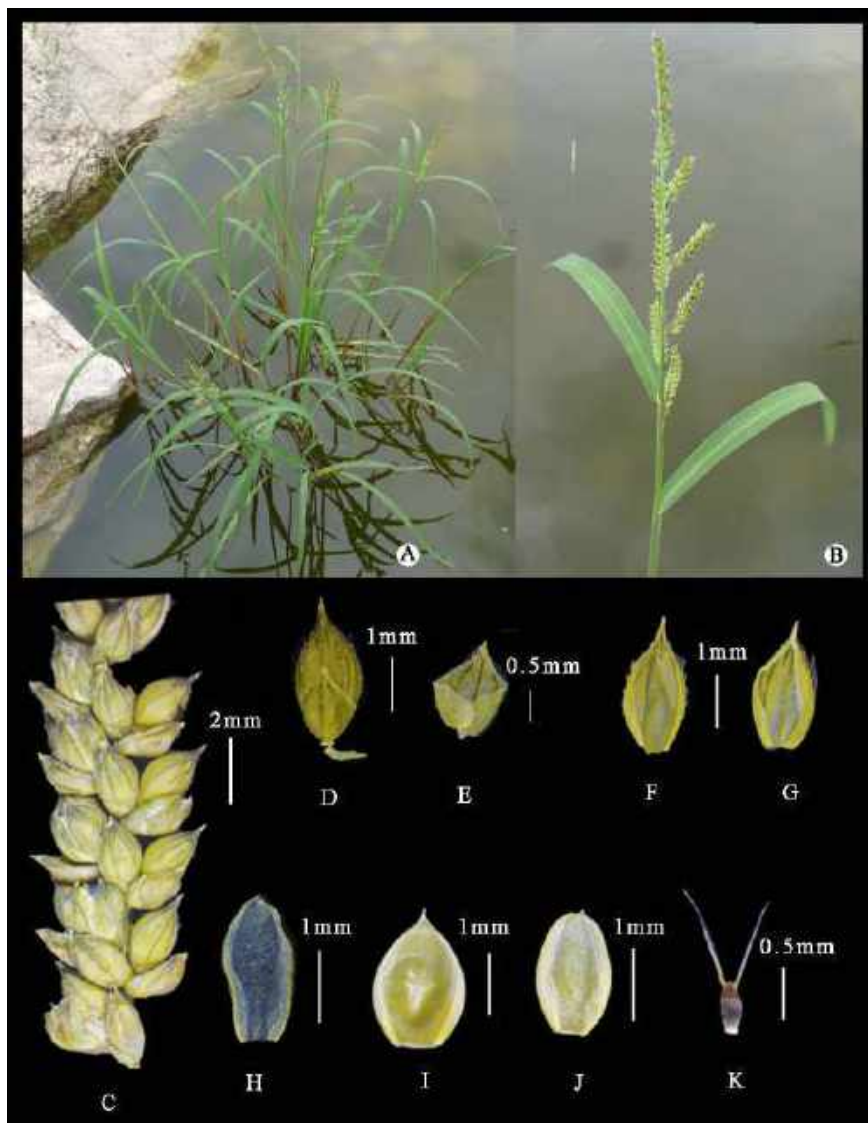


Plate 89. *Echinochloa colona* (L.) Link: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D. Spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Lower palea; I. Upper lemma; J. Upper palea; K. Pistil.

2-keeled, keel scabrous, apex obtuse-emarginate. Upper lemma 2.5–3 × 1–1.8 mm, ovate, faintly 5-nerved, crustaceous, convex, apex acuminate. Palea 1.5–2 × 1–2.5 mm, ovate, coriaceous, 2-nerved, 2-keeled, apex obtuse-rounded. Caryopsis 1.5–2.2 mm long, elliptic.

Fl. & Fr.: Jul.–Feb.

Distrib.: Common throughout the state in cultivated fields, marshy and fallow lands.

Exsicc.: Adilabad District: Nirmal tank, *MHR* 14416, 14406 (SKU), Rebbana, *GO & PVP* 4850 (SKU), Kadamdam site, *TP & PVP* 4148 (SKU); Mahabubnagar District: Venkatapuram, 06.08.2019, *SNR* 8607 (BSID), Achaaryapur-Koilkonda, *SRS* 109768 (BSID); Medak District: Ramayampet, *BRPR & CPB* 11513 (SKU), Akkannapet, *BRPR & CPB* 11559 (SKU); Mulugu District: Medaram, 24.03.2021, *SNR* 8969 (BSID); Nalgonda District: Puttamgandi, Bothya thanda, Parvedula *BRA* 5140, 1137 (BSID); Nizamabad District: Dichpally, *BRPR & KH* 6458, 6445 (SKU), Nadiapalli, *BRPR & KH* 6458 (SKU), Malkapurthanda, *TP & BRPR* 6098 (SKU); Rangareddy District: Anathasagaram, *MSM & KH* 11016 (SKU); Hyderabad, *MVR* 02144 (HY); Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8551 (BSID); Mohmmadabad, *MSM* 10500 (SKU); Warangal District: Kazipeta-Kadipikonda, 27.03.2021, *SNR* 012007 (BSID); Regional Agricultural Research Station-Warangal, 26.03.2021, *SNR* 8969, 8980 (BSID); 28.03.2021, *SNR* 012013, 012022 (BSID); Tupakulagudem, *NRR & PVSK* 76971 (BSID).

2. *Echinochloa crus-galli* (L.) P. Beauv., Ess. Agrostogr. 161, 169. 1812; C.E.C.Fisch. in Gamble, Fl. Madras 1777. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 310. 1960; Pull., Fl. Telangana 3: 1116. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 709. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 359. 2020. *Panicum crusgalli* L., Sp. Pl. 1: 56. 1753. 'Udara', 'Uda'
Plate 90(A-C)

Caespitose annuals. Culms 10–150 cm high; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths c. 12 cm long, glabrous, keeled; ligules absent; blades 5–33 × 0.5–2 cm, linear, margins cartilaginous, base rounded. Inflorescence 9–20 cm long, pyramidal. Racemes c. 5 cm long. Spikelets 3–4.5 × 2 mm, elliptic-ovate, hispid, apex acuminate-awned. Lower glume 3–3.5 mm long, ovate, chartaceous, 5-nerved, margin ciliate, apex acuminate-cuspidate. Upper glume 3–4 mm long, broadly ovate, 5-nerved, nerves hairy, apex acuminate-cuspidate. Florets 2; lower neuter or male; upper bisexual. Lower lemma 3–4 mm long, ovate-oblong, 5–7-nerved, scabrid, apex awned-cuspidate, awn 5–15 mm long. Lower palea 2.5–3 mm long, elliptic, chartaceous, hyaline, 2-nerved, 2-keeled, keels scabrid, apex acute-emarginate. Upper lemma 3–4 × 1–1.8 mm, elliptic-ovate, coriaceous-chartaceous, faintly 5-nerved, apex cuspidate. Upper palea 2–3 × 1.3–1.5 mm, elliptic, subcoriaceous, 2-keeled, 2-nerved, margin incurved, apex acute. Caryopsis 1.5–2 mm long, ellipsoid.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common throughout the state in aquatic moist habitats and as weed in paddy fields.

Exsicc.: Mulugu District: Medaram-Urattam, 24.03.2021, *SNR* 8967 (BSID); Nizamabad District: Mandora village, *TP & BRPR* 6226 (SKU); Medak District: Narsingi, *BRPR & CPB* 11530 (SKU); Suryapeta District: 27.10.2019, *SNR* 8750, 8753 (BSID); Rangareddy: Mohmadabad, *MSM* 10537 (SKU), Hyderabad, *MVR* 02145 (HY); Adilabad District: Nirmal, *MHR* 14461 (SKU); Nalgonda District: Puttamgandi, *BRA* 005140 (BSID).

Note: Source of fodder and grains.

3. *Echinochloa frumentacea* Link, Hort. Berol. 1: 204. 1827; Bor, Grasses Burma, Ceylon, India & Pakistan 311. 1960; Pull., Fl. Telangana 3: 1116. 2015; Pull., Fl. Telangana 3: 1116. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 359. 2020. *Panicum crusgalli* L. var. *frumentaceum* (Link) Trimen, Syst. Cat. Fl. Pl. Ceylon 104. 1885; Hook.f., Fl. Brit. India 7: 31. 1896.

'Udalu' **Plate 90(D)**

Caespitose perennials. Culms 30–100 cm high, erect; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 7–10 cm long, glabrous, keeled; ligules absent; blades 5–25 × 0.4–1.5 cm, linear-lanceolate, base rounded, margins cartilaginous, apex acuminate-attenuate. Inflorescence c. 20 cm long, pyramidal. Racemes c. 5 cm long. Spikelets 3–4 mm long, elliptic-ovate, hispid, awned-acuminate. Lower glume c. 3 mm long, ovate, chartaceous, 5-nerved, apex acute. Upper glume 3–4 mm long, broadly ovate, 5-nerved, nerves hairy, apex acuminate-cuspidate. Florets 2; lower neuter or male; upper bisexual. Lower lemma 3–4 mm long, ovate-oblong, 5–7-nerved, scabrid, apex acute-awned or cuspidate, awn 5–15 mm long. Lower palea c. 3 mm long, membranous, hyaline, 2-keeled, 2-nerved, apex acute-obtuse. Upper lemma 3–4 mm long, elliptic-ovate, subcoriaceous-crustaceous, faintly 5-nerved, apex cuspidate. Upper palea c. 3 mm long, chartaceous-subcoriaceous, 2-keeled, 2-nerved, base truncate, apex rounded. Caryopsis 1.5–2 mm long, ellipsoid.

Fl. & Fr.: Jun.–Feb.

Distrib.: Cultivated for food and fodder.

Exsicc.: Warangal District: Tupakulagudem, *PVSK & NRR* 76971 (BSID).

4. *Echinochloa oryzoides* (Ard.) Fritsch. in Verh. K.K. Zool.-Bot. Ges. Wien 41: 742. 189; Pull., Fl. Telangana 3: 1117. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 359. 2020. *Panicum oryzoides* Ard., Spec. Alt. 16, t. 5. 1764.

Caespitose perennials. Culms 25–100 cm high; lower nodes rooting. Leaves basal and cauline; sheaths glabrous; ligules absent; blades c. 30 × 1 cm, linear. Inflorescence c. 15 cm long. Spikelets 4.5–6.5 mm long, hispid, apex acuminate. Lower glume c. 2 mm long, ovate, membranous, 3–5-nerved, apex mucronate. Upper glume 4–4.5 mm long, membranous, hispidulous, 5-nerved, apex mucronate. Florets 2, lower barren; upper bisexual. Lower lemma c. 4 mm long, membranous, hispidulous, 5-nerved, apex mucronate, awn c. 25 mm long. Upper lemma 3–3.8 mm long, ovate, apex aristate. Palea elliptic, chartaceous, margin inflexed, apex reflexed. Stamens 3.

Fl. & Fr.: Sep.–Dec.

Distrib.: Weed in cultivated fields.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02146, 02146 (HY).

Note: Notable as weed in rice field has bad odour and closely allied to *E. crus-galli*



Plate 90. A–C. *Echinochloa crus-galli* (L.) P. Beauv.: A. Habitat; B. Inflorescence; C. Enlarged view of raceme; D. *Echinochloa frumentacea* Link: Inflorescence.

5. *Echinochloa picta* (J. Koenig) P.W. Michael in Philipp. Weed J. Sci. 5: 18. 1978; Pull., Fl. Telangana 3: 1117. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 359. 2020. *Panicum pictum* J. Koenig, Naturforscher (Halle) 23: 204. 1788. *Echinochloa stagnina* (Retz.) P. Beauv., Ess. Agrostor. 161, 171. 1812; Bor, Grasses Burma, Ceylon, India & Pakistan 311. 1960. *Panicum stagninum* Retz., Observ. Bot. 5: 17. 1788.

Plate 91(A-B)

Caespitose perennials; rhizomatous. Culms about 100 cm high; lower nodes rooting; Leaves basal and cauline; sheaths 10–13 cm long, keeled, ribbed; ligules hairy; blades 30–40 × 0.8–1 cm, linear-lanceolate, glabrous with purple bands, base truncate-rounded, apex acuminate. Inflorescence c. 20 cm long. Spikelets 4–5 mm long, elliptic, hispid. Lower glume 1–1.5 mm long, chartaceous, 3–5-nerved, base truncate-rounded, apex mucronate. Upper glume c. 4 mm long, elliptic-ovate, 7-nerved, apex aristate. Florets 2; lower male, upper bisexual. Lower lemma c. 4 mm long, broadly ovate, chartaceous, apex acuminate, awn 2–4 mm long. Lower palea 2–2.8 × 1–1.8 mm, ovate-elliptic, membranous, hyaline, 2-nerved, 2-keeled, keels ciliate, margin inflexed, apex obtuse-acute. Upper lemma c. 4 mm long, elliptic, subcoriaceous, 5-nerved, apex acute-acuminate. Upper palea 3–4 mm long, elliptic, subcoriaceous, 2-nerved, 2-keeled, apex acuminate-mucronulate. Stamens 3. Ovary oblong.

Fl. & Fr.: Jun.–Feb.

Distrib.: Occasional in cultivated fields

Exsicc.: Karimnagar District: Rampur, *AHN* 931011 (KU).

Note: A good fodder grass.

6. *Echinochloa stagnina* (Retz.) P. Beauv., Ess. Agrostogr. 161. 1812; C.E.C.Fisch. in Gamble, *Fl. Madras* 1777. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 311. 1960; Pull., *Fl. Telangana* 3: 1117. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 709. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 359. 2020. *Panicum stagninum* Retz., *Observ. Bot.* 5: 1. 1789.

Plate 91(C-D)

Solitary perennials; rhizomatous. Culms up to 100 cm high, erect or geniculate; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths ribbed, keeled, mouth ciliate; ligules fringe of hairs; blades 10–30 × 0.3–2 cm, linear-lanceolate, apex acuminate. Panicle c. 20 cm long, racemes 2–9 cm long, secund. Spikelets 3–6 mm long, ovate-lanceolate, hispid. Lower glume c. 3 mm long, broadly ovate, 5-nerved, hispid, apex acuminate. Upper glume 3–5.5 mm long, ovate, caudate-acuminate, chartaceous, 7–9-nerved, apex acuminate. Florets 2; lower male; upper bisexual. Lower lemma c. 5.5 mm long, ovate, apex acuminate, awn 4–10 mm long. Upper lemma 3–5 mm long, elliptic-ovate, crustaceous, faintly nerved. Upper palea 3–5.5 mm long, elliptic, 2-nerved, 2-keeled. Caryopsis 2–2.5 mm long, ovate-oblong.

Fl. & Fr.: Aug.–Feb.

Distrib.: Weed of cultivated fields and canals.

Exsicc.: Peddapalle District: Peddapalle-Sivaru, *SNR* 8766 (BSID); Mahabubnagar District: *SRS* 104509 (BSID); Dorna chervuvu, Mannanur, *SRS* 107458 (BSID); Nalgonda District: Bothyathanda, *BRA* 001137 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2019, *SNR* 012001 (BSID); Chennarao Pet-Narasmpet, 30.03.2021, *SNR* 012041 (BSID).



Plate 91. A–B. *Echinochloa picta* (J.Koenig) P.W.Michael: A. Habitat; B. Enlarged view of raceme; C–D. *Echinochloa stagnina* (Retz.) P.Beauv.: C. Habitat; D. Inflorescence.

***Eriochloa* Kunth**

World: c. 33 spp.; India: 2 spp.; Telangana: 2 spp.

Key to the species

- | | |
|--|---------------------------|
| 1a. Spikelets not awned; axis and pedicels not hairy | ... 2. <i>E. procera</i> |
| 1b. Spikelets shortly awned; axis and pedicels hairy | ... 1. <i>E. barbatus</i> |

1. *Eriochloa barbatus* (Trin.) S. Yadav & M.R. Almeida, *Fl. Maharashtra* 6A: 145. 2014. *Helopus barbatus* Trin., *Neue Entdeck. Pflanzenk.* 2: 49. 1821. *Panicum fatmense* Hochst. & Steud., *Unio Itin.* 806. 1837. *Eriochloa fatmensis* (Hochst.

& Steud.) Clayton in Kew Bull. 30(1): 108. 1975. *Eriochloa nubica* (Steud.) Hack. & Stapf ex Thell., Vierteljahrsschr. Naturf. Ges. Zürich 64: 697. 1919. *Helopus nubicus* Steud., Syn. Pl. Glumac. 1(2): 100. 1854.

Caespitose, perennial. Culms 10–80 cm high, compressed, erect, geniculate, rooting at lower nodes, nodes 1–4, pubescent, pinkish white in color. Leaves basal and cauline; leaf sheath 1.5–11.5 cm long, compressed, keeled, glabrous; ligule 0.6–1 mm long, hairy; leaf blade 2–20 × 0.2–0.9 cm, flat, lanceolate-linear, acuminate at apex, scaberulous along margins, glabrous. Panicles branched; racemes 5–9, 2–13.5 cm long. Rachis c. 0.45 mm width, slender, triquetrous, scaberulous. Pedicels 1–1.15 mm long, curved towards rachis, scaberulous, apex with 2.5–3.5 mm long white hairs, forming a ring. Spikelets 3.5–4.5 × 1–1.3 mm, ovate, paired or rarely solitary, hispid with appressed hairs, distinctly awned. Lower glume 0.2–0.3 mm long, reduced and fused with the rachis node to form a ring at the base of spikelet. Upper glume 3–3.5 × 1–1.3 mm, ovate, membranous, margins inrolled, 5-nerved, appressed long hairy on dorsal surface; apex acuminate to shortly awned, awn 0.5–0.7 mm long. Florets 2, lower barren and epaleate; upper bisexual. Lower lemma 3–3.5 × 1–1.3 mm, ovate, membranous, apex acuminate, margins inrolled, 5-nerved, dorsally appressed hairy. Palea absent. Upper lemma 2–2.4 × 1–1.5 mm, ovate-elliptic, coriaceous, margins inflexed, rugose on dorsal surface, glabrous; arista 0.4–0.7 mm long, barbellate. Palea 2–2.3 × 1–1.4 mm, ovate-elliptic, coriaceous, apex truncate-obtuse, 2-keeled, rugose on dorsal side; margins inflexed, smooth. Lodicules 2, c. 0.2 × 0.12 mm. Stamens 3, anthers c. 1 × 0.2 mm. Caryopsis c. 2 × 1 mm, ovate-elliptic.

Fl. & Fr.: Jul.–Aug.

Exsicc.: Rangareddy District: Manasahills-Rajendranagar, 02.08.2020, SNR & KP 008998 (BSID).

Distrib.: The species mostly found in wet and waterlogged areas in open scrub forest.

2. *Eriochloa procera* (Retz.) C.E. Hubb. in Bull. Misc. Inform. Kew 1930: 256. 1930; C.E.C.Fisch. in Gamble, Fl. Madras 1767. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 312. 1960; Pull., Fl. Telangana 3: 1132. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 719. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 370. 2020. *Agrostis procera* Retz., Observ. Bot. 4: 19. 1786.

Plate 92

Caespitose perennials. Culms 30–140 cm high, erect, nodes minutely villous. Leaves basal and cauline; sheaths keeled, glabrous; ligules 0.6–0.9 mm long, membranous, hairy; blades 5–29 × 0.4–1 cm, linear-lanceolate, base rounded-truncate, apex acuminate. Inflorescence c. 25 cm long, rachis triquetrous. Spikelets 2.5–4 × 1–1.9 mm, elliptic-lanceolate, silky villous, shortly pedicellate. Lower glume reduced to a cupular ring. Upper glume 3–4 × 0.5–1 mm, ovate-lanceolate, chartaceous, 3–5-nerved, silky villous, margins incurved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 2.5–3.3 × 1–1.5 mm, lanceolate, soft villous, margin inflexed, apex acuminate. Lower palea absent.

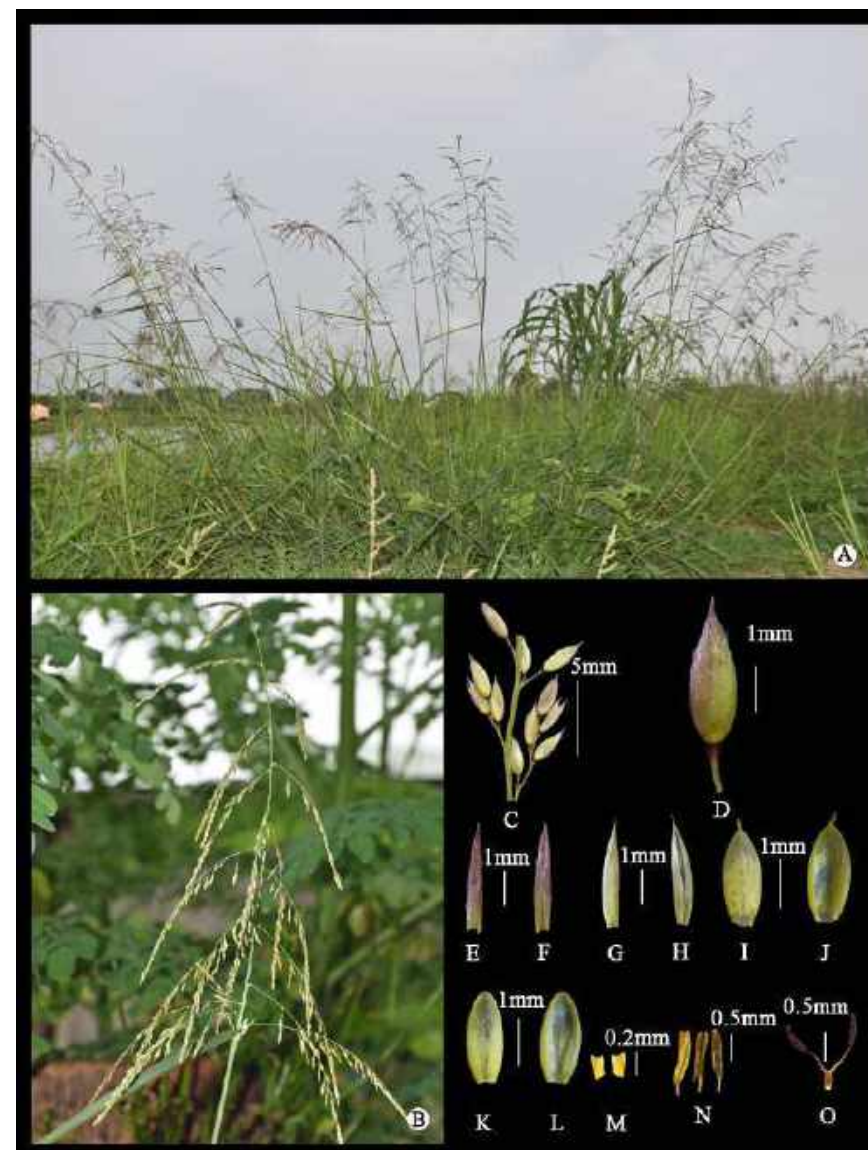


Plate 92. *Eriochloa procera* (Retz.) C.E.Hubb.: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D. Spikelet; E&F. Abaxial and adaxial view of upper glume; G&H. Abaxial and adaxial view of lower lemma; I&J. Abaxial and adaxial view of upper lemma; K&L. Abaxial and adaxial view of palea; M. Lodicules; N. Stamens; O. Pistil.

Upper lemma 2–2.5 × 1–1.3 mm, elliptic-oblong, crustaceous, faintly 3–5-nerved, margin inflexed, apex mucronate, barbellate. Upper palea 1.5–2.3 × 1–1.3 mm, elliptic-boat shaped, crustaceous, 2-keeled, 2-nerved, apex obtuse-emarginate. Caryopsis 0.5–1 mm long, ellipsoid-oblong.

Fl. & Fr.: Sep.–Mar.

Distrib.: Throughout the state. Fodder grass.

Exsicc.: Adilabad District: Nirmal tank, MHR 14437 (SKU); Mahabubnagar District: Venkapuram-Koyalasagar, 06.08.2019, SNR 8625 (BSID); Nagarkurnool: Bijnapalle, 08.08.2019, SNR 8647 (BSID); Peddapalle District: Peddapalle-Mugdapur, 10.11.2019, SNR 8768 (BSID); Rangareddy District: Hyderabad, MVR 02163 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8526 (BSID); Warangal District: Chennaraopet-Narsimpet, 30.03.2021, SNR 012045 (BSID); Regional Agricultural Research Station -Warangal, 26.03.2021, SNR 012006 (BSID).

Note: Distinguishable by in having cupular ring at the base of the spikelets.

Hymenachne P. Beauv.

World: 17 spp.; India: 3 spp.; Telangana: 1 sp.

Hymenachne amplexicaulis (Rudge) Nees, Fl. Bras. Enum. Pl. 2: 276. 1829; Pull., Fl. Telangana 3: 1136. 2015; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 382. 2020. *Panicum amplexicaule* Rudge, Pl. Guian. 1: 21. t. 27. 1805. *Hymenachne pseudointerrupta* Mull., Hal. in Bot. Zeitung (Berlin) 19: 333. 1861; C.E.C.Fisch. in Gamble, Fl. Madras 1776. 1984; Bor, Grasses Burma, Ceylon, India & Pakistan 313. 1960.

Plate 93

Caespitose perennials, creeping. Culms about 130 cm high, spongy; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths c. 1 cm long, margin ciliate; ligules membranous, apex truncate, lacerate; blades 4.5–29 × 0.3–1.2 cm, linear-lanceolate, villous, base cordate, apex acuminate. Inflorescence c. 30 cm long, spiciform, interrupted. Spikelets 6–8 × 1 mm, elliptic-lanceolate. Lower glume 2.5–3 × 0.5–0.8 mm, lanceolate, chartaceous-membranous, 3-nerved, apex acute. Upper glume 4–4.5 × 1 mm, elliptic-lanceolate, 5-nerved, scabrid above, apex acuminate. Florets 2; lower neuter; upper bisexual. Lower lemma 6–8 × 1 mm, elliptic-lanceolate, chartaceous, scabrid above, 5-nerved, apex acuminate-aristate. Lower palea absent. Upper lemma 5–6 × 1 mm, lanceolate, membranous, faintly 5-nerved, scabrid above, apex acuminate-aristate. Upper palea c. 2.5 × 0.7 mm, lanceolate, 2-nerved, margin incurved, apex acuminate. Stamens 3.

Fl. & Fr.: Sep.–Feb.

Distrib.: Common throughout the state in stagnant pools and marshy areas.

Exsicc.: Karimnagar District: Mukkunur, NRR & TRS 86599 (BSID); Mulugu District: Eturunagaram, 24.03.2021, SNR 8960 (BSID).

Megathyrsus (Pilg.) B.K.Simon & S.W.L.Jacobs

World: 2 spp.; India: 1 sp.; Telangana: 1 sp.

Megathyrsus maximus (Jacq.) B.K.Simon & S.W.L.Jacobs, Austrobaileya 6(3): 572. 2003. *Urochloa maxima* (Jacq.) R.D. Webster, Austral. Paniceae 241. 1987. *Panicum maximum* Jacq. in Collectanea 1: 76. 1787; Hook.f., Fl. Brit. India 7: 49. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1783. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 327. 1960; Pull., Fl. Telangana 3: 1152. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 732. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020.

Plate 94

Caespitose, perennials. Culms 50–250 cm high, robust, solid, glaucous;



Plate 93. *Hymenachne amplexicaulis* (Rudge) Nees: A. Habitat; B. Inflorescence; C&D Closed view of inflorescence; E&F Abaxial and adaxial view of spikelet; G. Lower glume; H. Upper glume; I. Lower lemma; J. Upper lemma; K. Palea; L. Anthers; M. Pistil.

nodes hairy, lower nodes rooting. Leaves basal and cauline; sheaths 15–31 cm long, hairy, margins ciliate, mouth bearded; ligules membranous, apex ciliate; blades 8–65 × 1–3.5 cm, linear-lanceolate, pubescent, base rounded, apex acuminate. Panicle 10–55 × 6–18 cm, whorled. Racemes 10–35 cm long. Spikelets 2–3 × 0.6–1 mm, oblong. Lower glume 0.5–1.6 × 0.4–0.8 mm, ovate, chartaceous, 3-nerved, apex obtuse. Upper glume 2–3 × 0.5–1 mm, lanceolate, chartaceous,



Plate 94. *Megathyrsus maximus* (Jacq.) B.K.Simon & S.W.L.Jacobs: A. Habitat; B&C. Spikelets; D. Lower glume; E. Upper glume; F. Lower floret; G. Upper floret.

5-nerved, apex acute-acuminate. Florets 2; lower male, upper bisexual. Lower lemma 2–2.5 × 0.5–1 mm, ovate-lanceolate, chartaceous, 5-nerved, margin inflexed, ciliate-tuberculate hairy. Lower palea 1–2.5 × 0.5–1 mm, elliptic-lanceolate, chartaceous, 2-nerved, 2-keeled, keels winged, margin incurved, apex acute. Upper lemma 1.5–2 × 0.6–1 mm, oblong, sub coriaceous, rugulose, 3–5-nerved, apex acute, ciliate. Upper palea 1.5–2 × 0.6–0.8 mm, elliptic, boat shaped, sub coriaceous, rugulose, 2-nerved, margin infolded, apex acute. Lodicules 2. Stamens 3. Caryopsis 1–1.5 × 0.4–0.6 mm, obovate.

Fl. & Fr.: May–Dec.

Distrib.: Cultivated as fodder.

Exsicc.: Rangareddy District: Hyderabad, MVR 02214 (HY), Manasa hills-Rajendranagar, 24.08.2016, SNR 8506 (BSID) 22.08.2019, SNR 8672 (BSID); Warangal District: Regional Agriculture Research Station, 26.03.2021, SNR 8997 (BSID).

Note: It can be identified by its robust habit and a transversely rugose upper lemma and palea (Simon & Jacobs, 2013).

Melinis P. Beauv.

(* Previously treated under '*Rhynchelytrum* Hochst.')

World: 23 spp.; India: 2 spp., 1 subsp.; Telangana: 1 sp.

Melinis repens (Willd.) Zizka, Biblioth. Bot. 138: 55. 1988. *Saccharum repens* Willd., Sp. Pl., ed. 4 1 (1): 322. 1997; Pull., Fl. Telangana 3: 1142. 2015. *Rhynchelytrum repens* (Willd.) C.E. Hubb. in Bull. Misc. Inform. Kew 1934: 110. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 355. 1960; Pull., Fl. Telangana 3: 1167. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 744. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 395. 2020. **Plate 95**

Caespitose perennials. Culms 50–80 cm high; nodes glabrous-sparsely hairy; lower nodes rooting. Leaves basal and cauline; sheaths ciliate-glabrous; ligules a fringe of hairs; blades 5–24 × 0.2–0.6 cm, linear-lanceolate, conduplicate, margin scabrous, apex attenuate. Panicles c. 15 cm long, pyramidal, purple-silvery white, braches capillary. Spikelets 5–10 mm long, oblong-ovate, compressed laterally, villous. Lower glume 1.5–2 × c. 0.3 mm, oblong, chartaceous, villous, 1-nerved, apex obtuse. Upper glume 6–8 × c. 1.5 mm, ovate, chartaceous, densely villous, 5-nerved, keeled, keel serrulate, apex acuminate, 2-lobed, arista c. 5 mm long. Florets 2; lower neuter or male; upper bisexual. Lower lemma 5–7 × c. 1 mm, ovate-lanceolate, coriaceous, 5-nerved, apex acuminate-arista, 7–8 mm long. Lower palea 4–5 × c. 0.6 mm, ovate-lanceolate, 2-nerved, ciliate along margins, base truncate, apex acuminate-lobed, ciliate. Upper lemma 2–4 × c. 0.5 mm, ovate-lanceolate, coriaceous, 5-nerved, apex emarginate. Upper palea 2–3 mm long, elliptic-lanceolate, coriaceous, apex acute-obtuse. Stamens 3. Caryopsis 4–5 mm long, elliptic-oblong.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common throughout the state in open habitats.

Exsicc.: Rangareddy District: Manasa hills-Rajendranagar, 24.08.2016, SNR 8531 (BSID).

Moorochloa Veldkamp

World: 3 spp.; India: 1 sp.; Telangana: 1 sp.

Moorochloa eruciformis (Sm.) Veldkamp, Reinwardtia 12(2): 139. 2004. *Brachiaria eruciformis* (Sm.) Griseb. in Ledeb., Fl. Ross. 4: 169. 1853; Bor, Grasses Burma, Ceylon, India & Pakistan 283. 1960; Pull., Fl. Telangana 3: 1081. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 685. 2016; Prasanna & al. in A.A.Mao &

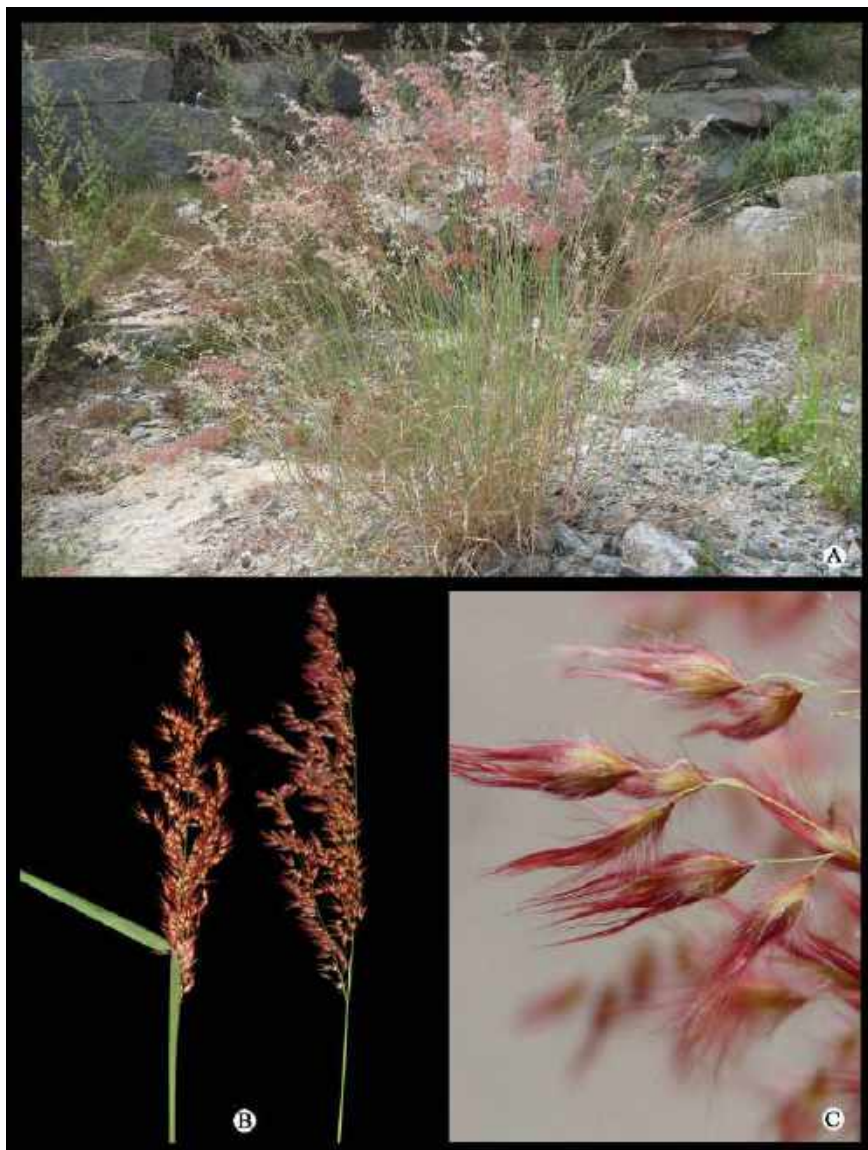


Plate 95. *Melinis repens* (Willd.) Zizka: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence.

S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 329. 2020. *Panicum eruciforme* Sm., Fl. Graec. 1: 44. t. 59. 1806. 'Domakaallu Gaddi' **Plate 96**

Caespitose annuals. Culms 10–70 cm high, erect or geniculate; nodes hairy. Leaves mostly cauline; sheaths 3–4 mm long, sparsely bulbous based hairy, mouth bearded; ligules a rim of hairs, 1–2 mm long; blades 2–7 × 0.2–0.8 cm, lanceolate, glabrescent, base rounded, apex acuminate. Racemes c. 8 cm long, secund, branches c. 2 cm long, winged. Spikelets 2–2.5 mm long, elliptic, imbricate, pubescent. Lower glume reduced as minute scale, chartaceous, apex

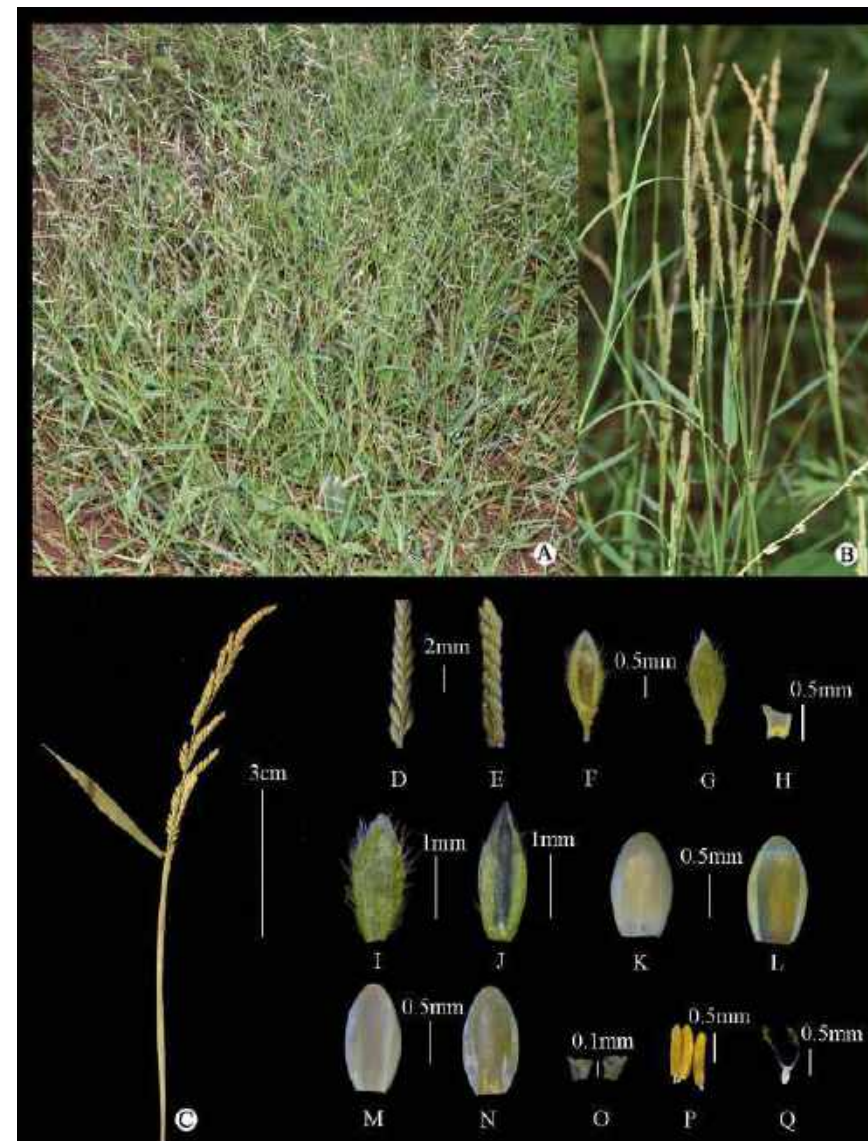


Plate 96. *Moorochloa eruciformis* (Sm.) Veldkamp: A. Habitat; B&C. Inflorescence; D&E. Enlarged view of raceme; F&G. Spikelets; H. Lower glume; I. Upper glume; J. Lower lemma; K&L. Abaxial and adaxial view of upper lemma; M&N. Abaxial and adaxial view of upper palea; O. Lodicules; P. Stamens; Q. Pistil.

truncate. Upper glume 1.5–2 mm long, ovate-oblong, chartaceous, 5-nerved, hair, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 1.5–2 mm long, sparsely hairy, 3-nerved. Lower palea 1 mm long, elliptic, hyaline, 2-nerved, apex obtuse. Upper lemma 2–2.5 mm long, oblong, coriaceous, faintly 2–5-nerved, dorsally flattened, apex obtuse. Upper palea 2–2.5 mm long, oblong, involute, apex obtuse. Stamens 2. Ovary oblong. Caryopsis 1.25–1.5 mm long, elliptic-oblong or ovoid, flattened.

Fl. & Fr.: Jul.–Dec.

Distrib.: Common throughout the state in marshy localities, plains and on Ghats.

Exsicc.: Adilabad District: Kodthala fields, *DO & DAM* 5025 (SKU); Rangareddy District: Hyderabad, *MVR* 02115 (HY); Warangal District: Regional Agriculture Research Station, 28.03.2021, *SNR* 012012 (BSID).

Oplismenus P. Beauv.

World: c. 7 spp.; India: 3 spp.; Telangana: 2 spp.

Key to the species

- | | |
|---------------------|-----------------------------|
| 1a. Awns barbellate | ... 1. <i>O. burmannii</i> |
| 1b. Awns smooth | ... 2. <i>O. compositus</i> |

1. *Oplismenus burmannii* (Retz.) P. Beauv., Ess. Agrostogr. 168, 169. 1812; Hook.f., Fl. Brit. India 7: 68. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1778. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 317. 1960; Pull., Fl. Telangana 3: 1146. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 729. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 398. 2020. *Panicum burmannii* Retz., Observ. Bot. 3: 10. 1783. *Kodijuttu Gaddi*' **Plate 97(A-B)**

Caespitose annuals; stoloniferous. Culms 15–50 cm high, trailing, slender; nodes glabrous, rooting. Leaves basal and cauline; sheaths c. 1.3 cm long, keeled, hairy, mouth bearded; ligules a rim of hairs; blades 1–6.5 × 0.3–1.2 cm, elliptic-lanceolate, sparsely hairy or glabrous, margin undulate-serrulate, base rounded-oblique, apex acuminate. Raceme c. 5 cm long, bristly. Spikelets 2–3.3 mm long, elliptic-lanceolate, pedicels with colourless bristles. Lower glume 1–1.8 mm long, ovate-lanceolate, hairy, 5-nerved, awn 8–9 mm long, barbellate. Upper glume 1–1.7 mm long, ovate-lanceolate, 5-nerved, hairy, awn 3–4.5 mm long, scabrid. Florets 2; lower neuter; upper bisexual. Lower lemma 2–2.5 × 0.4–0.6 mm, lanceolate, chartaceous, 5–9-nerved, aristate, 0.5–0.7 mm long. Lower palea absent. Upper lemma 1.5–2 × 0.4–0.6 mm, ovate-elliptic, sub coriaceous, 5-nerved, margin inflexed, apex obtuse. Upper palea 1–1.8 mm long, lanceolate, sub coriaceous, 2-nerved, apex acute-apiculate. Stamens 3. Caryopsis 0.5–1 mm long, oblong.

Fl. & Fr.: Aug.–Jan.

Distrib.: Forest grass

Exsicc.: Adilabad District: Bersaipet RF, *GO & PVP* 4600 (SKU), Sattenapalli beat, *TP & PVP* 4083 (SKU); Medak District: Narasapur forest nursery, *BRPR* 11226 (SKU), Gangapur RF, *TP & MSG* 12069 (SKU); Rangareddy District: Hyderabad, *MVR* 02176 (HY); Vikarabad: Ananthagiri hills, 21.09.2019, *SNR* 8710 (BSID); 30.11.2019, *SNR* 8780 (BSID).

Note: It is a forest grass, which grows under shady places; and which can be identified by its barbellate awn. Relished by cattle.

2. *Oplismenus compositus* (L.) P. Beauv., Ess. Agrostogr. 168, 169. 1812; Hook.f., Fl. Brit. India 7: 66. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1778. 1934;



Plate 97. A–B. *Oplismenus burmannii* (Retz.) P.Beauv.: A. Habitat; B. Inflorescence; C–J. *Oplismenus compositus* (L.) P.Beauv.: C. Habitat; D. Enlarged view of raceme; E. Spikelet; F. Lower glume; G. Upper glume; H. Lower lemma; I. Upper lemma; J. Upper palea.

Bor, Grasses Burma, Ceylon, India & Pakistan 317. 1960; Pull., Fl. Telangana 3: 1146. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 729. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 398. 2020. *Panicum compositum* L., Sp. Pl. 1: 57. 1753. '*Kodijuttu Gaddi*', '*Konda Athrica Gaddi*'

Plate 97(C-J)

Caespitose perennials; creeping. Culms 20–85 cm high, erect or

geniculate; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths c. 8 cm long, tubercle based hairy; ligules hairy; blades 1–8 × 0.3–2.5 cm, ovate-lanceolate, villous, base rounded-oblique, apex acuminate. Racemes 2–6 cm long, rachis triquetrous. Spikelets 2–4 mm long, lanceolate, awn 3–5 mm long, paired, sessile and pedicelled. Lower glume 3–3.5 mm long, ovate, chartaceous, 5-nerved, keeled, apex acute. Upper glume 1.5–3 mm long, ovate-lanceolate, chartaceous, 5–7-nerved, apex acute, arista 1–1.5 mm long. Florets 2; lower neuter; upper bisexual. Lower lemma 3–4 mm long, ovate, chartaceous 7–9-nerved, apex acute. Lower palea 2–2.5 mm long, lanceolate. Upper lemma 2–3 mm long, ovate-lanceolate, chartaceous, 5–7-nerved, margin inflexed, apex acute-acuminate-pointed. Upper palea 1.5–2 mm long, lanceolate, coriaceous, 2-nerved, apex acute. Stamens 3. Caryopsis 1–2 × 0.4–0.5 mm, oblong.

Fl. & Fr.: Jul. –Mar.

Distrib.: Forest grass.

Exsicc.: Adilabad District: Birsai pet range, Rampur beat, APS 4008 (BSID); Mahabubnagar District: Mallelatheertham, Mannanur, Umamaheshwaram SRS 108853, 111401, 11136 (BSID); Medak District: Gangapur RF, TP & MSG 12094 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8947 (BSID).

Panicum L.

World: c. 266 spp.; India: 36 spp., 1 var.; Telangana: 9 spp.

Key to the species

- | | |
|---|------------------------------|
| 1a. Rachilla produced beyond the upper lemma | ...2. <i>P. fischeri</i> |
| 1b. Rachilla not produced beyond the upper lemma | ... 2 |
| 2a. Spikelets symmetrical | ... 3 |
| 2b. Spikelets gibbous | ... 8. <i>P. sparsicomum</i> |
| 3a. Lower glume distinctly less than half as long as the spikelet | ... 4 |
| 3b. Lower glume more than half or sometimes as long as the spikelet | ... 6 |
| 4a. Spikelets persistent; lower glume broadly ovate, acute | ... 9. <i>P. sumatrense</i> |
| 4b. Spikelets deciduous; lower glume suborbicular, truncate | ... 5 |
| 5a. Culms spongy, floating; leaves not distichous, flat | ... 6. <i>P. paludosum</i> |
| 5b. Culms tough, rhizomatous; leaves distichous, usually involute | ... 7. <i>P. repens</i> |
| 6a. Leaves linear, base not cordate | ... 7 |
| 6b. Leaves lanceolate, base cordate | ... 5. <i>P. notatum</i> |
| 7a. Spikelets not gaping at maturity | ... 8 |
| 7b. Spikelets gaping at maturity | ... 1. <i>P. curviflorum</i> |
| 8a. Spikelets not more than 3 mm long | ... 3. <i>P. humile</i> |
| 8b. Spikelets 3–4 mm long | ... 4. <i>P. miliaceum</i> |

1. *Panicum curviflorum* Hornem., Hort. Hafn. Suppl. 116. 1819. *Panicum trypheron* Schult., Mant. 2: 244. 1824; Hook.f., Fl. Brit. India 7: 47. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1783. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 324. 1960; Pull., Fl. Telangana 3: 1156. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 735. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 401. 2020.

Plate 98(A)

Caespitose perennials. Culms 20–120 cm high; erect or geniculate; lower nodes rooting. Leaves basal and cauline; sheaths 5–9 cm long; ligules c. 1.5 mm

long, membranous, apex fimbriate; blades 2.5–21 × 0.4–0.7 cm, linear-lanceolate, tuberculate hairy, apex acuminate. Panicle effuse, 6–45 × 1.5–8 cm, alternate-whorled; rachis triquetrous. Spikelets 2.5–3.3 × 1–1.3 mm, oblong-lanceolate, apex acuminate. Lower glume 1.3–2.1 × c. 1 mm, ovate, chartaceous, 5–7-nerved, keel serrulate, apex acuminate. Upper glume 2–2.5 × c. 1.5 mm, ovate-lanceolate, chartaceous, base truncate, 7–9-nerved, apex acuminate-cuspidate. Florets 2; lower barren, upper bisexual. Lower lemma c. 3 mm long, elliptic, chartaceous, greenish, faintly 5–9-nerved, margin inflexed, apex acuminate. Lower palea 1–1.5 × c. 0.5 mm, ovate-lanceolate, membranous, 2-nerved, 2-keeled, margins infolded, apex acute. Upper lemma 1.4–2 × c. 1 mm, ovate, subcoriaceous, 5–7-nerved, apex acute. Upper palea 1.2–1.6 × c. 0.6 mm, ovate-elliptic, subcoriaceous, 2-nerved, apex acute-obtuse. Stamens 3. Ovary oblong. Caryopsis c. 1.3 mm long elliptic.

Fl. & Fr.: May–Feb.

Distrib.: Open grasslands. Fodder grass.

Exsicc.: Nalgonda District: Pedlipakala, Basinbavi, BRA 00504, 005143 (BSID); Rangareddy District: Hyderabad, MVR 02182 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8510, 8521 (BSID); 04.09.2019, SNR 8690 (BSID).

Note: This species has slender culms and hispid leaves.

2. *Panicum fischeri* Bor, Kew Bull. 257. 1956; Bor, Grasses Burma, Ceylon, India & Pakistan 324. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 401. 2020.

Plate 98(B)

Perennials with woody base. Culms 75–100 cm high, tufted, more or less ribbed with sparse bristle like hispid hairs. Leaves basal and cauline; leaf sheaths 6–7 cm, mouth hairy; ligule a rim of 0.5–1 mm long hairs; blades 20–26 cm, linear-lanceolate, base truncate, margins incurved, sparsely hispid hairy dorsally, apex acuminate. Panicle 20–26 × 5–7 cm, effuse; peduncle 8–15 cm long. Spikelets 3–5 × 1.5 mm, oblong-lanceolate, apex acuminate. Lower glume 1–2 × 1–1.4 mm, ovate-lanceolate, chartaceous, 5-nerved, apex acute to acuminate. Upper glume 3.5–4.4 × 1–1.5 mm, elliptic-lanceolate, chartaceous, 7-nerved, margins incurved., apex acuminate. Florets 2; lower barren, upper bisexual. Lower lemma 3.5–4.2 × 1–1.5 mm, oblong to elliptic-lanceolate, chartaceous, 7–9-nerved, margins incurved, apex acuminate. Lower palea 2–2.6 × 1–1.3 mm, ovate-lanceolate to elliptic-lanceolate, chartaceous, greenish, 2-nerved, 2-keeled, apex retuse; keels narrowly winged. Upper lemma 2–2.8 × 1.6 mm, oblong-elliptic, chartaceous to subcoriaceous, 5–7-nerved, margins incurved, apex obtuse. Upper palea 2.5–2.8 × 1–1.5 mm, oblong-elliptic, chartaceous, greenish yellow, 2-nerved, margins incurved, apex obtuse. Rachilla extending beyond upper floret; rachilla extension flap like, oblong, 2–2.6 mm long, membranous to chartaceous, apex acute to apiculate. Stamens 3. Ovary narrowly oblong, 0.3–0.5 mm.

Fl. & Fr.: Aug.–Oct.

Distrib.: Scarce in open forest slopes near rocky areas. **Endemic-India** (Andhra Pradesh, Kerala, Tamil Nadu, Telangana).



Plate 98. A. *Panicum curviflorum* Hornem. (Inset: spikelets and caryopses); B. *Panicum fischeri* Bor; C. *Panicum humile* Steud.

Exsicc.: Nagarkurnool District: Mallelathiertham, BSS 2136; Vatavarlappally, 14.07.2019, ARK & BSS 3840 (TBGH).

3. *Panicum humile* Nees ex Steud., Syn. Pl. Glumac. 1: 84. 1854; Hook.f., Fl. Brit. India 7: 48. 1896. *Panicum walense* Mez in Bot. Jahrb. Syst. 34: 146. 1904; Bor, Grasses Burma, Ceylon, India & Pakistan 324. 1960; Pull., Fl. Telangana 3: 1156. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 735. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 403. 2020. **Plate 98(C)**

Caespitose annuals. Culms 8–25 cm high, slender, erect or geniculate, branched; nodes glabrous. Leaves basal and cauline; sheaths c. 2 cm long, compressed, margin sparsely ciliate; ligules fimbriate; blades 2–10 × 0.2–0.4 cm, linear-lanceolate, base rounded, apex acute. Panicles c. 15 cm long, branches capillary. Spikelets 1.5–2 mm long, elliptic-ovate, apex acuminate. Lower glume 1–1.3 × 0.5 mm, broadly ovate, 3-nerved, chartaceous-membranous, apex acuminate. Upper glume 1.5–2 × 0.5 mm, ovate-lanceolate, membranous-chartaceous, 3-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 1–1.2 × 0.5 mm, ovate, membranous, 3–5-nerved, apex obtuse-acute. Lower palea 1 × 0.5 mm, elliptic-ovate, chartaceous, hyaline, 2-keeled, apex round-obtuse. Upper lemma 0.8–1 × 0.5 mm, elliptic, chartaceous, pallid, shining, faintly 3-nerved, apex rounded-obtuse. Upper palea 1 × 0.2–0.5 mm, ovate, crustaceous, 2-keeled, apex obtuse. Lodicules 2. Stamens 3. Caryopsis c. 1 × 0.5 mm, elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, Punukuduchelka North, JS 10846 (BSID); Rangareddy District: Hyderabad, MRS 252 (DD).

Note: It can be easily distinguished from others species by its tiny habit and purple spikelets. Usually found associated with *Paspalum scrobiculatum* L.

4. *Panicum miliaceum* L., Sp. Pl. 1: 59. 1753; Hook.f., Fl. Brit. India 7: 45. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1783. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 327. 1960; Pull., Fl. Telangana 3: 1152. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 732. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020. '*Varigalu*', '*Barigalu*'

Caespitose annuals. Culms about 100 cm high; nodes bearded, ram sheaths persistent. Leaves basal and cauline; sheaths 4–6.5 cm long, keeled, ribbed, tuberculate, mouth bearded; ligules 1–2 mm long, apex ciliate; blades 12–25 × 0.5–1.5 mm, lanceolate, sparsely hairy on both surfaces, base truncate, apex acuminate. Panicles narrowly oblong, branches filiform. Spikelets 4.5–5.1 mm long, oblong-ovate, compressed, apiculate. Lower glume 2.5–3.5 × 1.2–1.5 mm, ovate, chartaceous, apex acuminate-cuspidate. Upper glume 4.5–5 × 1–1.5 mm, ovate, chartaceous, 12-nerved, apex acuminate. Florets 2; lower barren, upper bisexual. Lower lemma 4–4.4 × 1–1.3 mm, ovate-lanceolate, apex acuminate. Lower palea 1–1.3 × c. 0.5 mm, ovate, chartaceous, 2-nerved, apex 2-lobed. Upper lemma 2–3.1 × 1–1.5 mm, elliptic, subcoriaceous, 7-nerved, apex acute. Upper palea c. 3 × 1.5 mm, elliptic, subcoriaceous, 2-nerved, apex acute. Caryopsis c. 2.5 × 1.5 mm, elliptic-ovoid.

Fl. & Fr.: Aug.–Nov.

Distrib.: Cultivated for grains and fodder.

Exsicc.: Mahabubnagar District: Kollapur, BSS & SKB 32915 (BSID).

5. *Panicum notatum* Retz., Observ. Bot. 4: 18. 1786; Bor, Grasses Burma, Ceylon, India & Pakistan 701. 1960; Pull., Fl. Telangana 3: 1154. 2015; K.N.Reddy

& C.S.Reddy, Fl. Telangana 733. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020. *Panicum montanum* Roxb., Fl. Ind. 1: 315. 1820; Hook.f., Fl. Brit. India 7: 53. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1783. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 329. 1960.

Caespitose perennials. Culms about 120 cm high, erect or trailing; lower node rooting. Leaves basal and cauline; sheaths 5–8 cm long, margin sparsely ciliate, mouth bearded; ligules 0.2–0.4 mm long, membranous, apex fimbriate; blades 8–22 × 1–3 cm, linear-lanceolate, pubescent, base broadly cordate, apex acuminate. Panicles c. 40 cm long, profusely branched; rachis scabrid. Spikelets 2–3 mm long, ellipsoid, sparsely hairy. Lower glume 1–1.5 mm long, ovate, 3-nerved, margin hairy, apex acute-acuminate. Upper glume 2–2.5 mm long, broadly ovate, margin ciliate, 5-nerved, apex acute. Florets 2, lower neuter; upper bisexual. Lower lemma 2–2.5 × 0.4–0.8 mm, ovate, 5-nerved, apex acute. Lower palea absent. Upper lemma 2–2.5 × 0.5–1 mm, elliptic, coriaceous, 5-nerved, apex acuminate. Upper palea 2–2.5 × 0.5–1 mm, elliptic, coriaceous, margin inflexed, 2-nerved. Stamens 3. Ovary 0.5 mm long, ovate. Caryopsis 1–1.5 mm long, ovate.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in Khammam, Siddipet & Warangal.

Exsicc.: Warangal District: Warangal, CSR 831 (KU).

Note: Distinguishable by effuse panicles having spreading branches.

6. *Panicum paludosum* Roxb., Fl. Ind. 1: 310. 1820; C.E.C.Fisch. in Gamble, Fl. Madras 1776. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 329. 1960; Pull., Fl. Telangana 3: 1154. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 733. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020. *Panicum proliferum* sensu Hook.f., Fl. Brit. India 7: 50. 1896, non Lam., 1797. **Plate 99**

Aquatic perennials. Culms about 100 cm high, spongy, erect or creeping; lower nodes rooting. Leaves basal and cauline; sheaths loose; ligules a rim of fine hairs; blades 8–26 × 0.6–1 cm, linear, base cordate-rounded, margin scabrid, apex acuminate. Panicles c. 20 cm long, lower branches whorled, rachis scabrid. Spikelets 3–4 mm long, ovate-lanceolate. Lower glume 0.8–1 mm long, ovate, chartaceous, 5-nerved, apex acute. Upper glume 3–3.5 mm long, elliptic-lanceolate, chartaceous, 11-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma c. 3 mm long, ovate, chartaceous, 9-nerved, apex acute. Lower palea 2–2.5 mm long, elliptic, membranous, apex obtuse. Upper lemma 2–2.5 mm long, shining, coriaceous, 5-nerved, apex acute. Upper palea c. 2 mm long, elliptic, subcoriaceous, shining, margins inflexed, 2-nerved, apex acute. Caryopsis 1–1.5 mm long, oblong.

Fl. & Fr.: Sep.–Mar.

Distrib.: Common aquatic grass throughout the state.

Exsicc.: Rangareddy District: Hyderabad, Borabanda city, VSK & KCS 32 (BSID).

Note: It is identifiable by spongy culms.

7. *Panicum repens* L., Sp. Pl., ed. 2. 1: 87. 1762; Hook.f., Fl. Brit. India 7: 49. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1783. 1934; Bor, Grasses Burma,



Plate 99. *Panicum paludosum* Roxb.: A. Habitat (Inset: Inflorescence); B. Spikelets; C&D. Abaxial and adaxial view of lower glume; E&F. Abaxial and adaxial view of upper glume; G&H. Abaxial and adaxial view of lower lemma; I&J. Abaxial and adaxial view of lower palea; K&L. Abaxial and adaxial view of upper lemma; M&N. Abaxial and adaxial view of upper palea.

Ceylon, India & Pakistan 330. 1960; Pull., Fl. Telangana 3: 1155. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 734. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020. '*Arikelu*' **Plate 100**

Caespitose perennials; rhizomatous, stoloniferous. Culms about 150 cm high. Leaves basal and cauline, distichous; sheaths flattened-keeled, margin bulbous based hairs; ligules 1–2 mm long, membranous, with a rim of hairs; blades 5–19 × 0.3–0.7 cm, linear-lanceolate, involute, rigid, base rounded-cordate, apex



Plate 100. *Panicum repens* L.: A. Habitat; B. Inflorescence; C. Spikelets.

acuminate. Panicles c. 20 cm long, contracted, rachis scabrid. Spikelets 2–2.7 mm long, ovate-lanceolate. Lower glume 1–1.5 × 1.5 mm, orbicular, chartaceous, faintly 5-nerved, apex obtuse. Upper glume 2–3.5 mm long, ovate-lanceolate, chartaceous, 5–9-nerved, apex acuminate. Florets 2; lower male; upper bisexual. Lower lemma 2–3 × 1–1.3 mm, ovate-lanceolate, chartaceous, 9-nerved, apex acute-acuminate. Lower palea 2–2.5 × 0.5–0.9 mm, elliptic, chartaceous, 2-nerved, 2-keeled, scabrid on keels, apex acuminate. Upper lemma 1.5–2 mm long, elliptic-oblong, shining, coriaceous, apex acute. Upper palea 1.5 mm long, coriaceous, 2-nerved, apex acute. Stamens 3. Ovary 0.4–0.5 × 0.2–0.3 mm, ovate.

Fl. & Fr.: Jan.–Dec.

Distrib.: Very common throughout the state.

Exsicc.: Adilabad District: Sone, TP & PVP 4032 (SKU); Rangareddy District: Manasa hills-Rajendranagar, 24.08.2016, SNR 8543 (BSID); 04.09.2019, SNR 8694 (BSID); Hyderabad, MVR 02181 (HY), Central University, MSM 15142 (SKU); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 012004 (BSID).

Note: Distinguishable by tough culms, rhizomes and whitish leaf blades.

8. *Panicum sparsicomum* Nees ex Steud., Syn. Pl. Glumac. 1: 83. 1854; Hook.f., Fl. Brit. India 7: 58. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 330. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 402. 2020. *Cyrtococcum sparsicomum* (Nees ex Steud.) A. Camus in Bull. Mis. Natl. Hist. Nat. 27: 118. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1786. 1934.

Caespitose perennials; stoloniferous. Culms about 90 cm high, branched, filiform; nodes hairy; lower nodes rooting. Leaves basal and cauline; sheaths 2–5.5 cm long, terete, ribbed, margin ciliate; ligules membranous, apex fimbriate; blades 3–7.5 × c. 0.6 cm, oblong-lanceolate, apex acuminate. Inflorescence c. 8.5 × 7 cm, effuse. Racemes alternate, nodes pubescent. Spikelets 1.1–1.5 × c. 0.5 mm, obovate-gibbous. Lower glume c. 1 × 0.5 mm, ovate-lanceolate, chartaceous, 3-nerved, base truncate, apex acuminate-cuspidate. Upper glume 1.5 × c. 0.5 mm, oblong-elliptic, chartaceous, 5-nerved, apex acute. Florets 2; lower barren, upper bisexual. Lower lemma c. 1.5 × 0.5 mm, oblong, chartaceous, 5-nerved, apex acute. Lower palea 0.5–0.8 × 0.2 mm, lanceolate, reduced. Upper lemma c. 1.5 × 0.5 mm, oblong-elliptic, subcoriaceous, 3-nerved, margins inflexed, apex acute. Upper palea c. 1 × 0.5 mm, oblong-elliptic, subcoriaceous, 2-nerved, margins incurved, apex acute. Lodicules 2. Stamens 3. Ovary c. 0.4 mm long, oblong.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in Adilabad.

Exsicc.: Adilabad District: Birsai pet range, Rampur beat, APS 4004 (BSID).

9. *Panicum sumatrense* Roth ex Roem. & Schult., Syst. Veg., ed. 15. 2: 434. 1817; Bor, Grasses Burma, Ceylon, India & Pakistan 701. 1960; Pull., Fl. Telangana 3: 1156. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 734. 2016. *Panicum psilopodium* Trin., Gram. Panic. 217. 1826; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 403. 2020. '*Ganga Saamalu*' **Plate 101**

Caespitose annuals. Culms about 100 cm high, erect or geniculate. Leaves basal and cauline; sheaths 6–8 cm long, keeled, glabrous; ligules membranous; blades 15–45 × 0.5–2.2 cm, lanceolate, finely hairy, base rounded, apex acuminate-attenuate. Panicles c. 35 cm long, contracted branches, densely spiculate. Spikelets 2–3.3 mm long, elliptic-lanceolate. Lower glume c. 1 mm long, ovate-orbicular, chartaceous, 3–5-nerved, apex acute. Upper glume 2–2.5 × 1 mm, ovate-lanceolate, 11-nerved, apex acuminate-acute. Florets 2; lower neuter;



Plate 101. *Panicum sumatrense* Roth: A. Habitat; B. Inflorescence; C. Caryopses.

upper bisexual. Lower lemma 2.5–2.8 mm long, ovate-lanceolate, 9–10-nerved, apex acuminate. Lower palea 2.5–2.8 × c. 0.6 mm, elliptic, hyaline, apex acute. Upper lemma 2–2.5 × 0.7 mm, ovate, subcoriaceous, faintly nerved, apex acute. Upper palea c. 2 × 2.2 mm, elliptic, subcoriaceous, apex acute. Caryopsis 1.4–1.8 mm long, ovoid-elliptic.

Fl. & Fr.: Aug.–Jan.

Distrib.: Cultivated.

Exsicc.: Medak District: Hansanipalli, RG 104087 (BSID); Rangareddy District: Hyderabad, MVR 02180 (HY); Warangal District: Ramanagutta, RR 108009 (BSID); PVS 84033 (BSID); Pasra, RKP 108209 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 28.03.2021, SNR 012024 (BSID); Gudappad lake, 29.03.2021, SNR 012039 (BSID).

Note: Recognizable by persistent and contracted panicles.

***Paspalum* L.**

World: 353 spp.; India: 12 spp., 4 var.; Telangana: 2 spp.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Spikelets appressed to rachis, obovate-orbicular | ... 2. <i>P. scrobiculatum</i> |
| 1b. Spikelets not appressed to rachis, ovate-elliptic | ... 1. <i>P. distichum</i> |

1. *Paspalum distichum* L., Syst. Nat. (ed. 10) 2: 855. 1759; Bor, Grass. Burma, Ceylon, India & Pakistan 338. 1960; Pull., Fl. Telangana 3: 1158. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 737. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 404. 2020. *Paspalum paspalodes* (Michx.) Scribn. in Mem. Torrey Bot. Club 5: 29. 1894 (as '*paspaloides*'). *Digitaria paspalodes* Michx., Fl. Bor.-Amer. 1: 46. 1803.

Plate 102(A-B)

Mat-forming perennials; stoloniferous. Culms about 70 cm high, decumbent; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 2–6 cm long, terete-keeled, glabrous, moth bearded; ligules membranous; blades 3–15 × 0.2–0.7 cm, linear-lanceolate, flat-conduPLICATE, margin serrulate, apex acuminate. Racemes 2, 4–8 cm long. Spikelets 2–4 mm long, ovate-elliptic, softly hairy. Lower glume absent, if present 1.5–1.8 × 0.5, ovate, apex acute. Upper glume 2–4 mm long, ovate-elliptic, chartaceous-membranous, softly hairy, margin inflexed, 5–7-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 2–3.5 × 1–1.5 mm, elliptic-lanceolate, membranous, 5–7-nerved, apex acute. Lower palea absent. Upper lemma 2–3 mm long, ovate-elliptic, crustaceous, faintly 5–7-nerved, apex acute. Upper palea 2–2.5 mm long, ovate-elliptic, crustaceous, granulose, 2-keeled, apex rounded-obtuse. Stamens 3. Caryopsis c. 1 mm long, elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Throughout the state in moist area and cultivated fields.

Exsicc.: Nizamabad District: Dichpally, BRPR & KH 6462 (SKU); Rangareddy: Hyderabad, Manasa hills-Rajendranagar, 24.08.2016, SNR 8525 (BSID), Hyderabad, MVR 02186 (HY); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 012002 (BSID).

Note: It can be easily identified by its digitate inflorescence with violet stamens and turning in to dark once pollination is over.

2. *Paspalum scrobiculatum* L., Mant. Pl. 1: 29. 1767; Hook.f., Fl. Brit. India 7: 10. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1772. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 340. 1960; Pull., Fl. Telangana 3: 1159. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 737. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl.



Plate 102. A–B. *Paspalum distichum* L.: A. Inflorescence; B. Enlarged view of inflorescence; C–Q. *Paspalum scrobiculatum* L.: C&D. Inflorescence; E&F. Enlarged view of inflorescence; G. Rachis; H&I. Spikelets; J. Lower glume; K. Upper glume; L. Lower lemma; M. Upper lemma; N. Upper palea; O. Lodicules; P. Anthers; Q. Pistil.

Pl. India Annot. Checkl. Monocot. 3: 404. 2020. *Paspalum orbiculare* G. Forst. Fl. Ins. Austr. 7. 1786. 'Agrugu', 'Arikelu' **Plate 102(C–Q)**

Caespitose perennials. Culms 20–80 cm high; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 3–11 cm long, compressed, glabrous, ribbed, fimbriate; ligules 0.4–0.6 mm long, membranous; blades 5–30 × 0.3–1 cm, linear-lanceolate, apex acute-acuminate. Racemes 2 or 3, 2–12 × c. 0.4 cm.

Spikelets 2–3.5 mm long, obovate-orbicular, second, compact, 2-rowed, apex obtuse. Lower glume absent. Upper glume 2–3.5 × 1.5–1.7 mm, obovate-orbicular, chartaceous, 5-nerved, margin inflexed, acute or obtuse. Florets 2; lower neuter; upper bisexual. Lower lemma 2.5–3.5 × c. 1 mm, orbicular, chartaceous, 3-nerved, margin infolded, apex rotundate. Lower palea absent. Upper lemma 2.5–3 mm long, orbicular, crustaceous, 3–5-nerved, margin inflexed, apex acute. Upper palea 1.5–2 mm long, ovate or orbicular, crustaceous, apex obtuse. Stamens 3. Caryopsis c. 1 mm long, oblong.

Fl. & Fr.: Throughout the year.

Distrib.: Common throughout the state in marshy habitats and on bunds of cultivated fields.

Exsicc.: Adilabad District: Kunthala, MHR 14596 (SKU); Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 05.01.2019, SNR 9512, 9612 (BSID); Medak District: Pocharam tank, TP & MSG 12037 (SKU); Nizamabad District: Laxmipur, TP & BRPR 6282 (SKU); Rangareddy District: Manasa hills-Rajendranagar, 24.08.2016, SNR 8540 (BSID), Kondapur, MSM & KH 10590 (SKU), Hyderabad, MVR 02187 (HY).

Note: It can be easily identified by its whitish obovate-orbicular spikelets. It is a polymorphic species.

***Pseudoraphis* Griff. ex Pilg.**

World: c. 7 spp.; India: 4 spp.; Telangana: 1 sp.

***Pseudoraphis spinescens* (R. Br.) Vickery**, Proc. Roy. Soc. Queensland 62: 69. 1952; Bor, Grasses Burma, Ceylon, India & Pakistan 353. 1960; Pull., Fl. Telangana 3: 1165. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 743. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 414. 2020. *Panicum spinescens* R. Br., Prodr. Fl. Nov. Holl. 1: 193. 1810. *Chamaeraphis spinescens* Poir., Encycl. Suppl. 2: 189. 1811; Hook.f., Fl. Brit. India 7: 62. 1896. 'Konjajerri Gaddi'

Plate 103

Aquatic annuals; stoloniferous. Culms about 100 cm high, trailing; nodes hairy. Leaves basal and cauline; sheaths c. 4 cm long, loose, keeled; ligules c. 1 mm long, apex lacerate; blades 2–10 × 0.2–0.5 cm, linear-lanceolate, adaxial surface sparsely tubercle based hairy, margin scabrid, apex acuminate. Panicle c. 15 cm long, pyramidal, branched, bristly, triquetrous, filiform. Spikelets 4–7 mm long, elliptic-lanceolate, apex acuminate. Lower glume 0.5–0.8 × 0.4 mm, oblong-ovate, coriaceous, granulate, apex truncate. Upper glume 4–7 × 0.4–0.8 mm, lanceolate, chartaceous, 9–11-nerved, margin scabrid, apex acuminate. Florets 2; lower male; upper bisexual. Lower lemma 4.5–5 × 0.5 mm, lanceolate, chartaceous, margin inflexed, 11-nerved, apex acuminate. Lower palea 2–4 × 0.5 mm, linear-oblong, chartaceous, hyaline, 2-nerved, 2-keeled, apex acute-obtuse. Upper lemma 1.3–1.5 × 0.4 mm, ovate-lanceolate, membranous, apex acute. Upper palea 1–1.5 × 0.4 mm, elliptic, chartaceous, apex acute. Stamens 3. Caryopsis c. 1 × 0.5 mm.

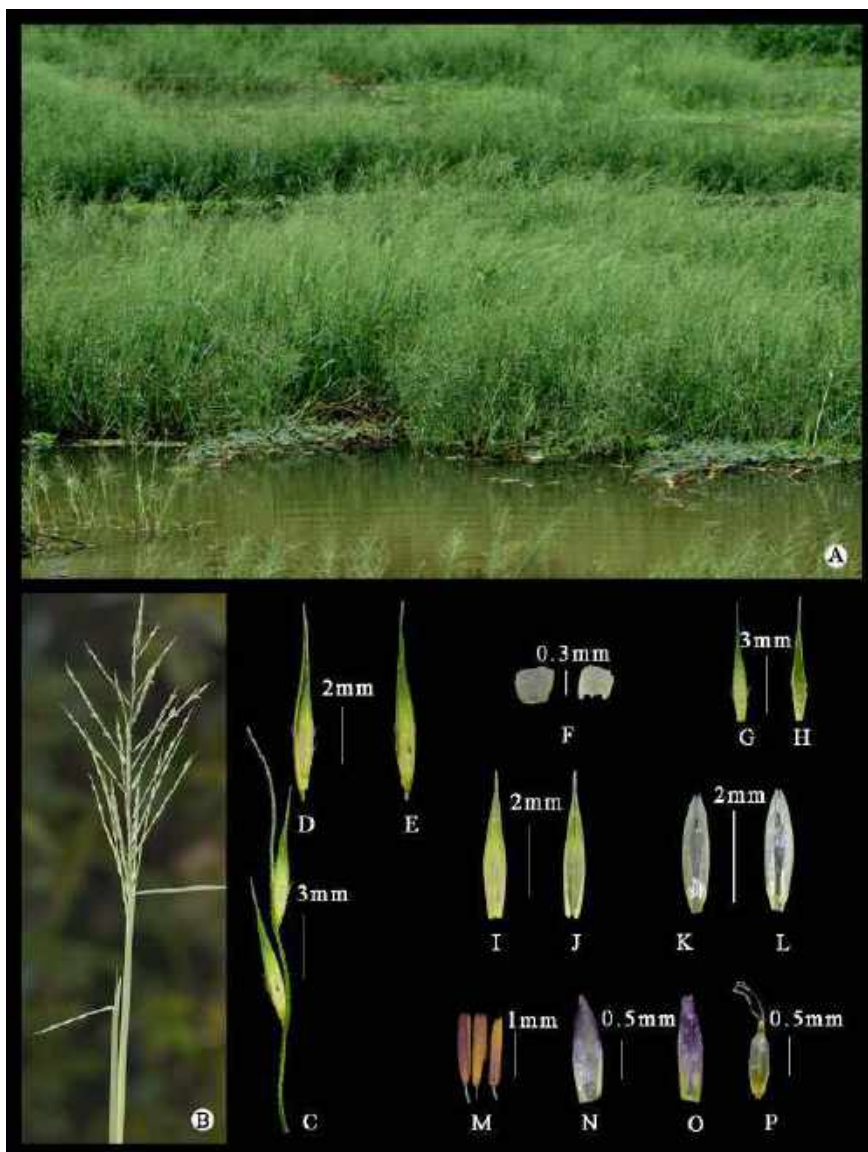


Plate 103. *Pseudoraphis spinescens* (R.Br.) Vickery: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D&E. Spikelets; F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I&J. Abaxial and adaxial view of lower lemma; M. Stamens; N. Upper lemma; O. Upper palea; P. Pistil.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in marshy habitats.

Exsicc.: Adilabad District: *Potchera*, MHR 13390 (SKU), Nirmal, MHR 14429 (SKU); Medak District: Narsapur Tank, TP & MSG 12012 (SKU); Rangareddy District: Hyderabad, MVR 02195 (HY); Vikarabad District: Ananthagiri hills, 02.12.2019,

SNR 8949 (BSID).

Note: Aquatic grass.

Sacciolepis Nash

World: c. 26 spp.; India: 4 spp.; Telangana: 3 spp.

Key to the species

- | | |
|---|------------------------------|
| 1a. Culms robust, spongy; panicles interrupted | ... 2. <i>S. interrupta</i> |
| 1b. Culms slender, not spongy; panicles uninterrupted | ... 2 |
| 2a. Panicles up to 15 cm long; spikelets slightly gibbous; lemma setosa | ... 1. <i>S. indica</i> |
| 2b. Panicles up to 25 cm long; spikelets not gibbous; lemma glabrous | ... 3. <i>S. myosuroides</i> |

1. *Sacciolepis indica* (L.) Chase, Proc. Biol. Soc. Wash. 21: 8. 1908; C.E.C.Fisch. in Gamble, Fl. Madras 1787. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 357. 1960; Pull., Fl. Telangana 3: 1169. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 745. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 417. 2020. *Aira indica* L., Sp. Pl. 2: 1231. 1753. *Hymenachne indica* (L.) Buse, Pl. Jungh. 377. 1854.

Plate 104

Caespitose perennials. Culms 10–80 cm high, erect or geniculate, weak; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 2.5–6.5 mm long, keeled, mouth bearded; ligules membranous, apex fimbriate; blades 2–20 × 0.2–0.6 cm, linear-lanceolate, base truncate, apex acuminate. Inflorescence c. 14 cm long, spiciform, cylindric. Spikelets 2–2.5 × 1–1.3 mm, ovate-elliptic, lanceolate, slightly gibbous. Lower glume 1–1.5 × 0.3–0.5 mm, ovate, chartaceous, 3-nerved, apex acute-acuminate. Upper glume 2–2.5 × 0.5–0.9 mm, cymbiform-ovate, 7–11-nerved, apex acute. Florets 2; lower male or neuter; upper bisexual. Lower lemma 1.8–2 × 0.5–0.9 mm, ovate, chartaceous, margin inflexed, 7–10-nerved, apex acute-acuminate. Lower palea 0.5–1 mm long. Upper lemma 1–1.5 mm long, ovate-lanceolate, coriaceous, convex, involute, apex acute. Upper palea 1–1.5 × 0.5 mm, ovate, coriaceous, apex acute. Stamens 3. Caryopsis c. 1 × 0.5 mm, elliptic.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common in marshy habitats.

Exsicc.: Medak District: Poacharam, TP & MSG 12038 (SKU); Rangareddy District: Hyderabad, MVR 02198 (HY), Mohammadabad, MSM & KH 10553 (SKU); Vikarabad District: Damagundam, 02.12.2019, SNR 8909 (BSID).

2. *Sacciolepis interrupta* (Willd.) Stapf, Fl. Trop. Africa 9: 757. 1920; C.E.C.Fisch. in Gamble, Fl. Madras 1787. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 358. 1960; Pull., Fl. Telangana 3: 1169. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 746. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 418. 2020. *Panicum interruptum* Willd., Sp. Pl., ed. 4 1(1): 341. 1797. *Pennisetum interrupta* (Willd.) Buse, Pl. Jungh. 377. 1854.

Plate 105

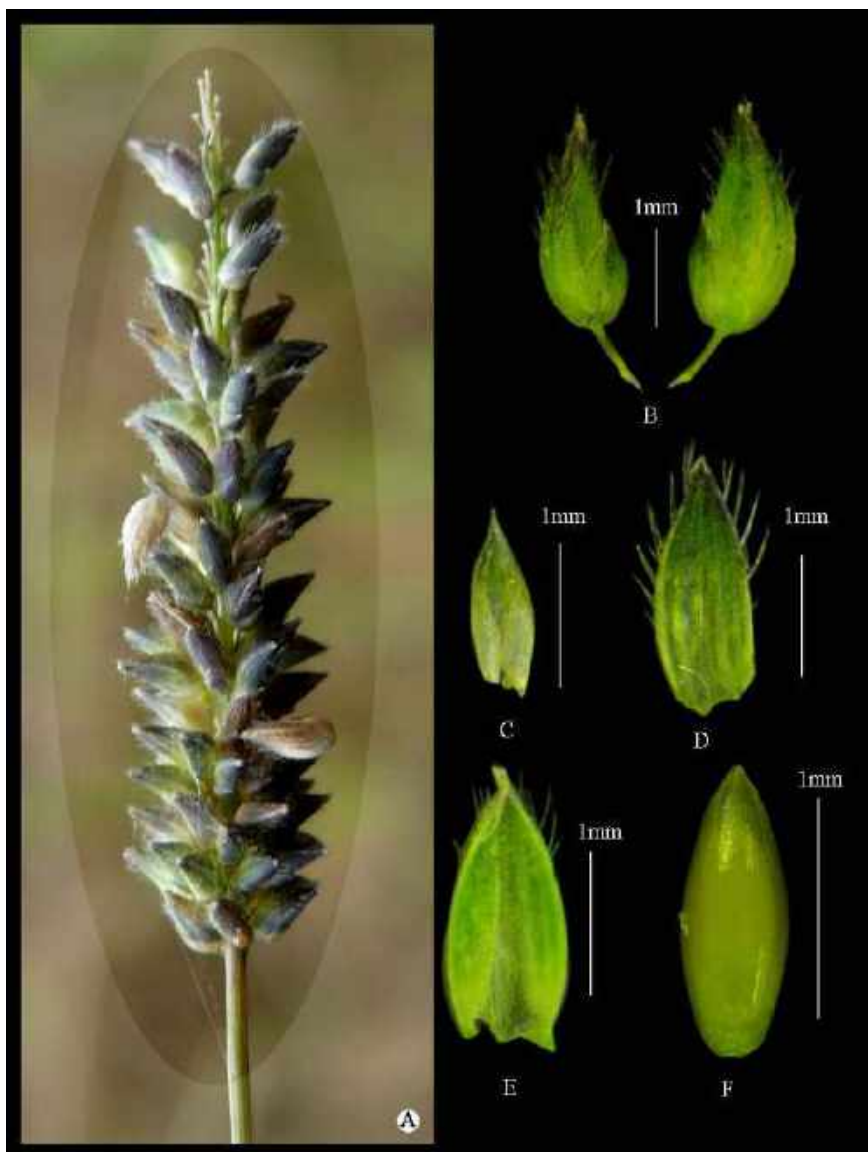


Plate 104. *Sacciolepis indica* (L.) Chase: A. Inflorescence; B. Spikelets; C. Lower glume; D. Upper glume; E. Lower lemma; F. Upper floret.

Aquatic perennials. Culms about 170 cm high, spongy, floating, branched; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 10–15 cm long, glabrous; ligules membranous, truncate-lacerate; blades 5–30 × 0.3–1.2 cm, linear-lanceolate, apex acute-acuminate. Inflorescence c. 30 cm long, spiciform, cylindric, interrupted. Spikelets 3–5 × 1–1.5 mm, ovate-lanceolate, shortly pedicelled, apex acute. Lower glume 1–1.5 × 1–1.2 mm, ovate, chartaceous, 5-nerved, apex rounded-truncate. Upper glume 3–3.5 × 1–1.5 mm, ovate-lanceolate, membranous, 9-nerved, base oblique, apex acute. Florets 2;



Plate 105. *Sacciolepis interrupta* (Willd.) Stapf: A. Habitat; B. Closed view of inflorescence; C. Enlarged view inflorescence; D. Spikelet; E. Lower glume; F. Upper glume; G. Lower glume; H. Lower lemma; I. Lower palea; J. Stamens; K. Pistil; L. Upper floret; M&N. Abaxial and adaxial view of upper lemma; O&P. Abaxial and adaxial view of upper palea; Q. Caryopsis.

lower male or neuter; upper bisexual. Lower lemma 3–3.5 × 1–1.2 mm, ovate-lanceolate, chartaceous, 8-nerved, apex acute. Lower palea 1.5–2 mm long, oblong, 2-nerved, apex acute. Upper lemma 2–2.8 × 1–1.3 mm, ovate-oblong, coriaceous, convex, apex acute. Upper palea 2–2.5 × 1–1.3 mm, ovate-oblong, coriaceous, apex acute. Caryopsis 2–2.3 × 1–1.3 mm, ovate-elliptic.

Fl. & Fr.: Aug.–Mar.

Distrib.: Common in marshy habitats. Relished by cattles.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 06.01.2019, SNR 9513 (BSID); 09.01.2019, SNR 9604, 9617 (BSID); Sambayyagudem-Manuguru, 24.03.2021, SNR 8951 (BSID); Medak District: Narayanapur RF, BRPR 11272 (SKU); Pocharam tank, TP & MSG 12040 (SKU); Nizamabad District: Dichpally near malkapur village, TP & BRPR 6109 (SKU); Rangareddy District: Manasa hills-Rajendranagar SNR 8695 (BSID), Ananthasagar, MSM 11002 (SKU).

Note: It can be differentiated from other species by its spongy culms and longer inflorescence.

3. *Sacciolepis myosuroides* (R. Br.) A. Camus, Fl. Indo-Chine 7: 460. 1922; C.E.C.Fisch. in Gamble, Fl. Madras 1787. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 358. 1960; Pull., Fl. Telangana 3: 1170. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 746. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 418. 2020. *Panicum myosuroides* R. Br., Prodr. Fl. Nov. Holland. 189. 1810; Hook.f., Fl. Brit. India 7: 42. 1896. *Hymenachne myosuroides* (R. Br.) Balansa in J. Bot. (Morot) 4: 143. 1890.

Slender annuals. Culms 10–55 cm high, erect; nodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths 5–10 cm long, sparsely hairy or glabrous; ligules membranous, truncate; blades 10–28 × 0.2–0.5 cm, linear-lanceolate, narrowly linear, sparsely pilose or glabrous. Inflorescence c. 25 cm long, spiciform, cylindric, narrow, slightly curved. Spikelets 1–2 mm long, ovate-oblong or subglobose. Lower glume 0.5–1 × 0.5 mm, ovate, chartaceous, 3-nerved, chartaceous, apex acute. Upper glume 1–2 × 0.3 mm, ovate, chartaceous, 5–9-nerved. Florets 2; lower neuter; upper bisexual. Lower lemma 1–2 × 0.3 mm, ovate, chartaceous, 5–9-nerved, apex closed. Lower palea 0.5–1 × 0.2 mm, elliptic or hyaline scale. Upper lemma 0.5–1 × 0.2 mm, ovate, coriaceous, convex, 5-nerved. Upper palea 0.5–1 × 0.2 mm, coriaceous, margins inflexed. Stamens 3. Caryopsis c. 1 mm long, elliptic.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasional in marshy localities and as a weed in paddy fields.

Exsicc.: Bhadradi-Kothagudem District: Kinnerasani Wildlife Sanctuary, 06.01.2019, SNR 9517 (BSID).

***Setaria* P. Beauv.**

World: c. 136 spp.; India: 19 spp., 1 var.; Telangana: 9 spp.

Key to the species

- | | |
|---------------------------------|-------------------------------|
| 1a. Involucral bristles present | ... 2 |
| 1b. Involucral bristles absent | ... 7 |
| 2a. Bristles retrorsely barbed | ... 9. <i>S. verticillata</i> |
| 2b. Bristles antrosely barbed | ... 3 |
| 3a. Cultivated | ... 5. <i>S. italica</i> |
| 3b. Wild | ... 4 |

- | | |
|--|-----------------------------|
| 4a. Inflorescence pyramidal, branched | ... 3. <i>S. homonyma</i> |
| 4b. Inflorescence cylindrical or spiciform, unbranched | ... 5 |
| 5a. Racemes continuous | ... 6 |
| 5b. Racemes interrupted | ... 4. <i>S. intermedia</i> |
| 6a. Bristles plumose | ... 6. <i>S. parviflora</i> |
| 6b. Bristles not plumose | ... 7. <i>S. pumila</i> |
| 7a. Spikes shorter than internodes; spikelets gibbous | ... 1. <i>S. flavida</i> |
| 7b. Spikes as long as or longer than internodes; spikelets not gibbous | ... 8 |
| 8a. Upper lemma punctate | ... 8. <i>S. punctata</i> |
| 8b. Upper lemma epunctate | ... 2. <i>S. geminata</i> |

1. *Setaria flavida* (Retz.) Veldkamp in Blumea 39: 376. 1994. *Paspalidium flavidum* (Retz.) A. Camus, Fl. Indo-Chine 7: 419. 1922; C.E.C.Fisch. in Gamble, Fl. Madras 1774. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 333. 1960; Pull., Fl. Telangana 3: 1157. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 735. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 420. 2020. *Panicum flavidum* Retz., Observ. Bot. 4: 15. 1786; Hook.f., Fl. Brit. India 7: 28. 1896. '*Ooda Gaddi*'

Plate 106

Caespitose annuals. Culms 12–70 cm high, slender; nodes glabrous. Leaves basal and cauline; sheaths 2.5–8 cm long, compressed, keeled; ligules a rim of hairs; blades 5–25 × 2–0.7 cm, linear, base rounded, apex mucronulate. Inflorescence 10–30 cm long, spiciform. Racemes 1–2.5 cm long, secund, shorter than internodes. Spikelets 1–2.5 mm long, ovoid, gibbous, 2-seriate. Lower glume c. 1 mm long, ovate, 3-nerved, apex acute-obtuse. Upper glume 2–2.5 mm long, ovate, chartaceous, 7–9-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma c. 2.5 mm long, ovate, chartaceous, 5-nerved, apex acute. Lower palea 1–2 mm long, elliptic, 2-nerved, 2-keeled, apex acute-retuse. Upper lemma c. 2 mm long, crustaceous, faintly 5-nerved, convex, punctate. Upper palea 1.8–2 mm long, elliptic, coriaceous, margins involute, 2-nerved, 2-keeled, apex acute. Stamens 3. Caryopsis c. 1.5 mm long, elliptic.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common throughout the state in plains along bunds of paddy fields and in wet habitats.

Exsicc.: Adilabad District: Vempalli, GO & PVP 4181 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 9596 (BSID); Mahabubnagar District: Bhavani Sagar, 06.08.2019, SNR 8613 (BSID); Rangareddy District: Hyderabad, MVR 02183 (HY).

Note: It can be distinguished by its spikes which are shorter than internodes.

2. *Setaria geminata* (Forssk.) Veldkamp in Blumea 39: 377. 1994. *Paspalidium geminatum* (Forssk.) Stapf, Fl. Trop. Africa 9: 583. 1920; C.E.C.Fisch. in Gamble, Fl. Madras 1774. 1934; Burma, Ceylon, India & Pakistan 333. 1960; Pull., Fl. Telangana 3: 1157. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 736. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 420. 2020. *Panicum geminatum* Forssk., Fl. Aegypt.-Arab. 18. 1775. *Panicum paspaloides* Pers., Syn. Pl. 1: 81. 1805; Hook.f., Fl. Brit. India 7: 30. 1896.

Plate 107(A)

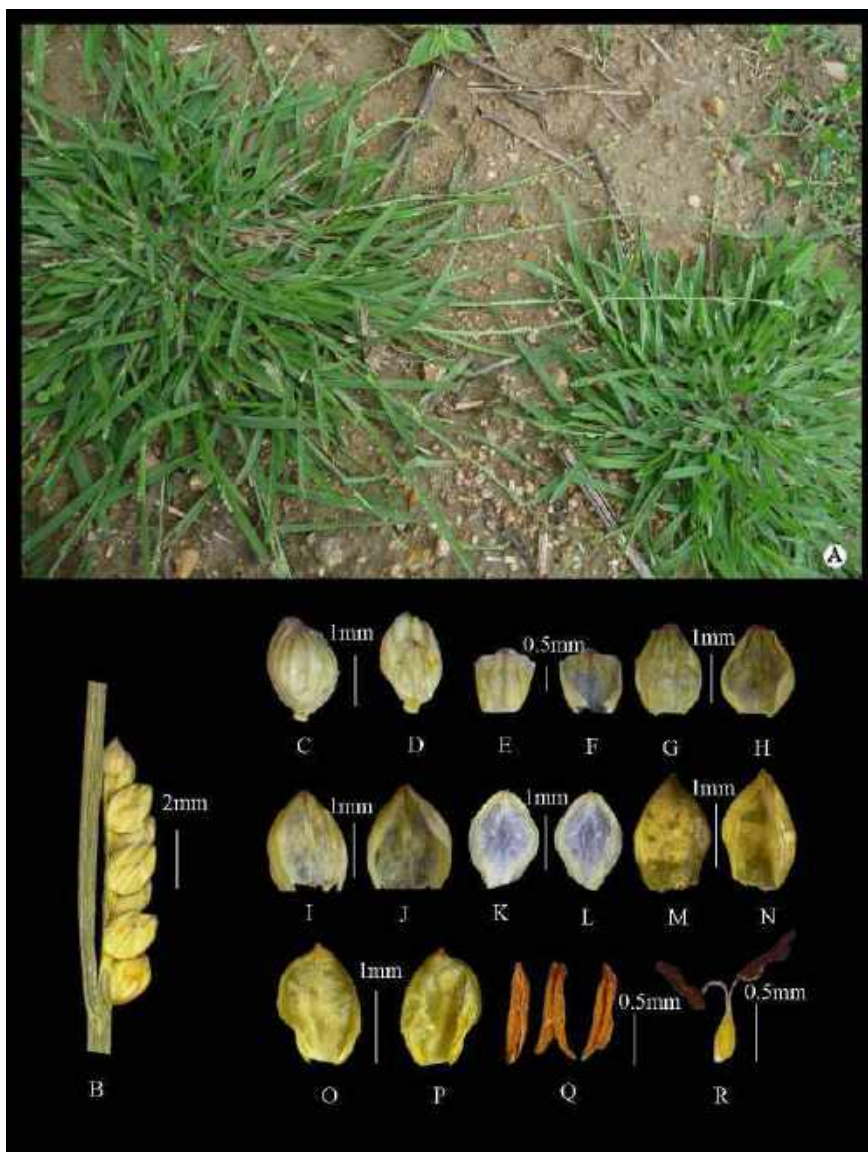


Plate 106. *Setaria flavida* (Retz.) Veldkamp: A. Habitat; B. Enlarged view of raceme; C&D. Spikelets; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I&J. Abaxial and adaxial view of lower lemma; K&L. Abaxial and adaxial view of lower palea; M&N. Abaxial and adaxial view of upper lemma; O&P. Abaxial and adaxial view of upper palea; Q. Anthers; R. Pistil.

Mat-forming perennials; rhizomatous, stoloniferous, aquatic. Culms 10–120 cm high, spongy; lower nodes rooting. Leaves basal and cauline; sheaths glabrous; ligules a rim of hairs; blades 5–20 × 0.4–1 cm, base narrowed, apex acuminate. Inflorescence c. 28 cm long. Racemes 1–3.5 cm long, many, crowded, longer than internodes. Spikelets 1.5–3 mm long, ovoid, biseriate. Lower glume

1.5 mm long, ovate, membranous, apex rounded-truncate. Upper glume 2–2.5 mm long, broadly ovate, chartaceous, 5-nerved, apex acute-blunt. Florets 2; lower male; upper bisexual. Lower lemma c. 3 mm long, ovate, chartaceous, 5-nerved, apex acute. Lower palea c. 2.5 mm long, margins inflexed, hyaline, 2-nerved, apex acute. Upper lemmas c. 2.5 mm long, broadly ovate, coriaceous, 5-nerved, apex acute-mucronate. Upper palea 1.8–2 mm long, elliptic, 2-nerved, membranous, margins inflexed, apex acute. Stamens 3. Caryopsis c. 1.3 mm long, elliptic.

Fl. & Fr.: Aug.–Mar.

Distrib.: Common throughout the state in marshy areas and often near water courses. Used as fodder.

Exsicc.: Adilabad District: Nirmal, MHR 14463 (SKU); Kadam dam, PVP & TP 4139 (SKU); Jayashankar Bhupalpally District: Chennapur-Regondi, 29.03.2021, SNR 012036 (BSID); Rangareddy District: Hyderabad, MVR 02184 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8519 (BSID); Warangal District: Gudappad-Lake, 29.03.2021, SNR 012038 (BSID); Regional Agricultural Research Station-Warangal, 26.03.2021, SNR 012005 (BSID).

Note: This species differs from *P. flavidum* by its spikes which are longer than internodes.

3. *Setaria homonyma* (Steud.) Chiov. in Nuovo Giorn. Bot. Ital. n.s. 26: 78. 1919; Bor, Grasses Burma, Ceylon, India & Pakistan 361. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 420. 2020. *Panicum homonymum* Steud., Syn. Pl. Glum. 1: 48. 1854. *Setaria rhachitricha* Cooke, Fl. Pres. Bombay 3: 435. 1958.

Plate 107(B)

Caespitose annual. Culms 20–40 cm high, terete, erect, glabrous; nodes glabrous or pubescent. Leaves basal and cauline; sheaths 3–18 cm long, compressed, glabrous or sparsely hairy, margins ciliate; ligules a row of 1–1.5 mm long hairs; blades 4–32 cm long, broadly elliptic-ovate, margins scaberrulous, nerves tubercle based hairs, base narrowed, apex acuminate. Panicle 5–20 cm long, pyramidal, branched. Involucral bristles 3–13 mm long, capillary, scaberrulous. Spikelets 2–2.7 × 1–1.5 mm, elliptic, compressed. Lower glume 0.5–1 × 0.5–0.9 mm, orbicular, hyaline, 3-nerved, apex obtuse. Upper glume c. 2.5 × 1 mm, ovate-oblong, chartaceous-membranous, 5–7-nerved, apex acute. Florets 2; lower barren; upper bisexual. Lower lemma c. 2.5 × 1.5 mm, membranous, ovate, 5–7-nerved, apex rounded-obtuse. Lower palea c. 2 × 1 mm, ovate-oblong, apex subacute. Upper lemma 1.5–2 × 1–1.3 mm, elliptic, coriaceous, 5-nerved, transversely rugose, margins incurved, apex obtuse. Upper palea 1.5–2 × 0.8–1 mm, elliptic, coriaceous, margins inflexed, 2-keeled, transversely rugose, apex obtuse. Lodicules 2. Stamens 3. Caryopsis 0.8–1 mm long, elliptic.

Fl. & Fr.: Jul.–Sep.

Distrib.: Occasionally in shady places and on hill slopes.

Exsicc.: Adilabad District: Vempalli, GO & PVP 4181 (SKU); Rangareddy District: Hyderabad, MVR 02183 (HY).

4. *Setaria intermedia* Roem. & Schult., Syst. Veg., ed. 15, 2: 489. 1817; Hook.f., Fl. Brit. India 7: 79. 1896; Pull., Fl. Telangana 3: 1173. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 748. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 420. 2020. *Setaria tomentos* (Roxb.) Kunth, Rev. Gramin. 1: 47. 1829; Bor, Grasses Burma, Ceylon, India & Pakistan 365. 1960. *Pennisetum tomentosum* Roxb., Fl. Ind. 1: 303. 1820.

Caespitose annuals. Culms 15–70 cm high, erect; nodes glabrous. Leaves basal and cauline; sheaths 1–7 cm long, terete-keeled, hairy, mouth bearded; ligules ciliate; blades 5–28 × 0.5–1.0 cm, linear-lanceolate, sparsely hairy. Panicles c. 15 cm long, spiciform, interrupted; bristles 2–10 mm long, scabrid. Spikelets 1–2 mm long, elliptic-ovate. Lower glume 0.8–1 mm long, ovate, chartaceous, 3-nerved, base truncate, apex acute. Upper glume 1–1.5 mm long, ovate, chartaceous, 5–7-nerved, apex acute. Floret 2; lower neuter or male; upper bisexual. Lower lemma c. 2 mm long, broadly ovate, chartaceous, 5–7-nerved, apex apiculate. Lower palea 1.5 mm long, elliptic, membranous, 2-nerved, 2-keeled, apex acute. Upper lemma c. 2 mm long, broadly ovate, crustaceous, rugose, 5-nerved, apex apiculate. Upper palea c. 2 mm long, elliptic-ovate, crustaceous, 2-nerved, 2-keeled, apex acute. Stamens 3. Caryopsis c. 1 mm long, elliptic.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common in cultivated fields and fallow lands in moist habitats.

Exsicc.: Mahabubnagar District: Amrabad, BSS & SKB 32202 (SKU); Medak District: Ramayampet, BRPR & CPB 11515 (SKU); Rangareddy District: Hyderabad, MVR 02200 (HY)!, Central University, MSM 15171 (SKU)!, Manasahills-Rajendranagar, 24.08.2016, SNR 8517 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8724 (BSID); Warangal District: Chennarao pet-Narasampet, 30.03.2021, SNR 012046 (BSID).

Note: Similar to *S. verticillata* but differs in involucre which are bristles antrorsely barbellate.

5. *Setaria italica* (L.) P. Beauv., Ess. Agrostogr. 51, 170, 178. 1812; Hook.f., Fl. Brit. India 7: 78. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 362. 1960; Pull., Fl. Telangana 3: 1173. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 748. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 420. 2020. *Panicum italicum* L., Sp. Pl. 1: 56. 1753. 'Korralu' **Plate 107(C)**

Solitary annuals. Culms 25–90 cm high, erect, geniculate, ribbed; nodes dark. Leaves basal and cauline; sheaths flattened, glabrous; ligules a fringe of hairs; blades linear-lanceolate, surfaces scabrid, apex attenuate. Panicles 5–25 cm long, linear-oblong, compact, spiciform interrupted-continuous. Spikelets c. 3 mm long, elliptic, compressed, subtended by 3 bristles, 10–12 mm long. Lower glume 0.5–0.7 × 0.3 mm, ovate, chartaceous, apex acute-nerves jointed. Upper

glume c. 1.5 × 1 mm, elliptic, chartaceous, 5-nerved, apex acute. Florets 2; lower barren, upper bisexual. Lower lemma c. 2 × 1 mm, ovate, chartaceous, 7-nerved, apex acute-nerves jointed. Lower palea c. 1 × 0.4 mm, oblong, membranous, apex acute, 2-lobed. Upper lemma 2 mm long, obovate, 5-nerved, rugulose, apex acute. Upper palea oblong, granulose, apex obtuse. Caryopsis c. 1.8 mm long, oblong.

Fl. & Fr.: Sep.–Mar.

Distrib.: Cultivated in Gadval, Mahabubnagar, Nagarkurool, Vikarabad & Wanaparthy.

Exsicc.: Rangareddy District: Hyderabad, MVR 02201 (HY).

6. *Setaria parviflora* (Poir.) Kerguelen, Lejeunia 120: 161. 1987. *Pennisetum polystachion* (L.) Schult., Mant. 2: 146. 1824; C.E.C.Fisch. in Gamble, Fl. Madras 1792. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 346. 1960; Pull., Fl. Telangana 3: 1162. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 740. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 421. 2020. *Pennisetum polystachyon* L., Syst. Nat. ed 10. 2: 870. 1759.

Caespitose perennials. Culms 100–250 cm high; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths terete-keeled, hairy, mouth bearded; ligules fimbriate; blades 5–35 × 0.2–1.2 cm, linear-lanceolate, surface hairy, base rounded, apex acuminate. Panicles 10–25 cm long, spiciform, rachis winged. Spikelets 3–4 mm long, lanceolate, enclosed in an involucre, involucre bristles plumose. Lower glume 1–1.5 mm long, ovate-oblong. Upper glume 3–4 mm long, ovate, chartaceous, 5-nerved, margin inflexed, apex acuminate. Florets 2; lower neuter or male; upper bisexual. Lower lemma 3–4 × 0.5–1 mm, ovate-lanceolate, chartaceous, 5-nerved, apex acuminate-lobed. Lower palea absent, if present 1–1.5 mm long, ovate, chartaceous, hyaline, 2-nerved, 2-keeled, apex acuminate. Upper lemma 2–3 × 0.4–0.5 mm, ovate-elliptic, coriaceous, faintly 5-nerved, apex obtuse-acute. Upper palea 1.5–2 × 0.2–0.3 mm, ovate, coriaceous, shiny, 2-keeled, apex obtuse-acute. Stamens 3. Caryopsis c. 1 mm long, oblong

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasional in Bhadradi-Kothagudem, Rangareddy & Vikarabad.

Exsicc.: Rangareddy District: Hyderabad, MVR 02192 (HY).

Note: It can be easily identified by its winged rachis and cylindrical inflorescence.

7. *Setaria pumila* Roem. & Schult., Syst. Veg., ed. 15. 2: 891. 1817; Pull., Fl. Telangana 3: 1174. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 749. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 421. 2020. *Panicum pumilum* Poir., Encycl. (Lamarck) Suppl. 4: 273. 1816. *Setaria pallid-fusca* (Schumacher) Stapf & C.E. Hubb. in Bull. Misc. Inform. Kew 6: 259.

1930; C.E.C.Fisch. in Gamble, Fl. Madras 1789. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 363. 1960. *Panicum pallid-fusum* Schumach., Beskr. Guin. Pl. 78. 1827. 'Nakkathoka Gaddi'

Plate 107(D)

Solitary annuals. Culms 10–75 cm high, erect or creeping, geniculate, ribbed; nodes glabrous. Leaves basal and cauline; sheaths 2–9 cm long, terete, glabrous; ligules membranous; blades 5–31 × 0.2–1 cm, linear-lanceolate, margins scabrid, glabrous to sparsely hairy, base rounded, apex acute. Panicles 2–15 cm long, spiciform, cylindric. Involucral bristles numerous, 1–8 mm long, yellow or reddish-brown, antrorsely barbed. Spikelets 1–2.3 × 1 mm, ovate-elliptic, gibbous. Lower glume c. 1.5 × 1 mm, broadly ovate, 3-nerved, hyaline, apex acute. Upper glume 2 × 0.5–1 mm, ovate, hyaline, 3–5-nerved, apex obtuse. Florets 2; lower male or neuter; upper bisexual. Lower lemma 2–2.5 × 1 mm, ovate-elliptic, membranous, 5-nerved, apex acute. Lower palea 1.5–2 × 0.5–1 mm, elliptic, hyaline, 2-nerved, apex acute. Upper lemma c. 2.2 × 1 mm, broadly elliptic, curved, coriaceous, transversely rugose, faintly 5-nerved, apex apiculate. Upper palea 2 × 0.5–0.8 mm, ovate-elliptic, rugose, crustaceous, apex acute. Stamens 3. Caryopsis elliptic.

Fl. & Fr.: Jun.–Jan.

Distrib.: Common throughout the state as a weed in cultivated fields, road sides. Fodder grass.

Exsicc.: Adilabad District: Jannaram, *TP & PVP* 4198 (SKU), Ankusapuram, *GO* 4317 (SKU); Bhandrigudem Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8599 (BSID); Mahabubnagar District: Appapur, *AMSR* 25691 (SKU), Venkatapuram-Koilakonda, 06.08.2019, *SNR* 8624 (BSID); Rangareddy District: Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8513 (BSID); 22.08.2019, *SNR* 8674 (BSID); Hyderabad, *MVR* 02203 (HY), Mohammadabad, *MSM* 10592 (SKU); Rangammgudem, *MSM* 10581 (SKU); Warangal District: Kothagadda, 25.03.0021, *SNR* 8975 (BSID); Regional Agricultural Research Station-Warangal, 28.03.2021, *SNR* 012020 (BSID).

Note: Easily identifiable by its spiciform inflorescence.

8. *Setaria punctata* (Burm. f.) Veldkamp in Blumea 39: 381. 1994. *Paspalidium punctatum* (Burm. f.) A. Camus, fl. Indo-Chine 7: 419. 1922; C.E.C.Fisch. in Gamble, Fl. Madras 1774. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 333. 1960; Pull., Fl. Telangana 3: 1158. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 736. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 421. 2020. *Panicum punctatum* Burm. f., Fl. Ind. 26. 1768; Hook.f., Fl. Brit. India 7: 29. 1896.

Aquatic perennials. Culms 60–150 cm high, trailing or floating, spongy; nodes glabrous lower nodes rooting. Leaves basal and cauline; sheaths inflated, keeled; ligules a rim of hairs; blades 5–25 × 0.2–1 cm, linear, base narrowed, apex acute-acuminate. Inflorescence c. 40 cm long, spiciform. Racemes 1–3.5 cm long, longer than internodes, appressed to the rachis. Spikelets 2–3.5 mm long, ovate-oblong, imbricate. Lower glume 1–1.2 mm long, broadly oblong-orbicular, membranous, apex slightly retuse. Upper glume c. 3 mm long, oblong-orbicular,



Plate 107. A. *Setaria geminata* (Forssk.) Veldkamp; B. *Setaria homonyma* (Steud.) Chiov. C. *Setaria italica* (L.) P.Beauv.; D. *Setaria pumila* (Poir.) Roem. & Schult.

membranous-chartaceous, 3–5-nerved, apex rounded-truncate. Florets 2; lower neuter; upper bisexual. Lower lemma 2.5–3.5 mm long, 5-nerved, apex acute-apiculate. Lower palea elliptic, chartaceous, 2-nerved, 2-keeled. Upper lemma c. 3.5 mm long, broadly elliptic, coriaceous, punctate, 5-nerved, apex acute. Upper palea 2–2.5 mm long, elliptic, crustaceous, 2-nerved, margins inflexed, apex acute. Stamens 3. Caryopsis c. 1.5 mm long, broadly elliptic.

Fl. & Fr.: Aug.–Jan.

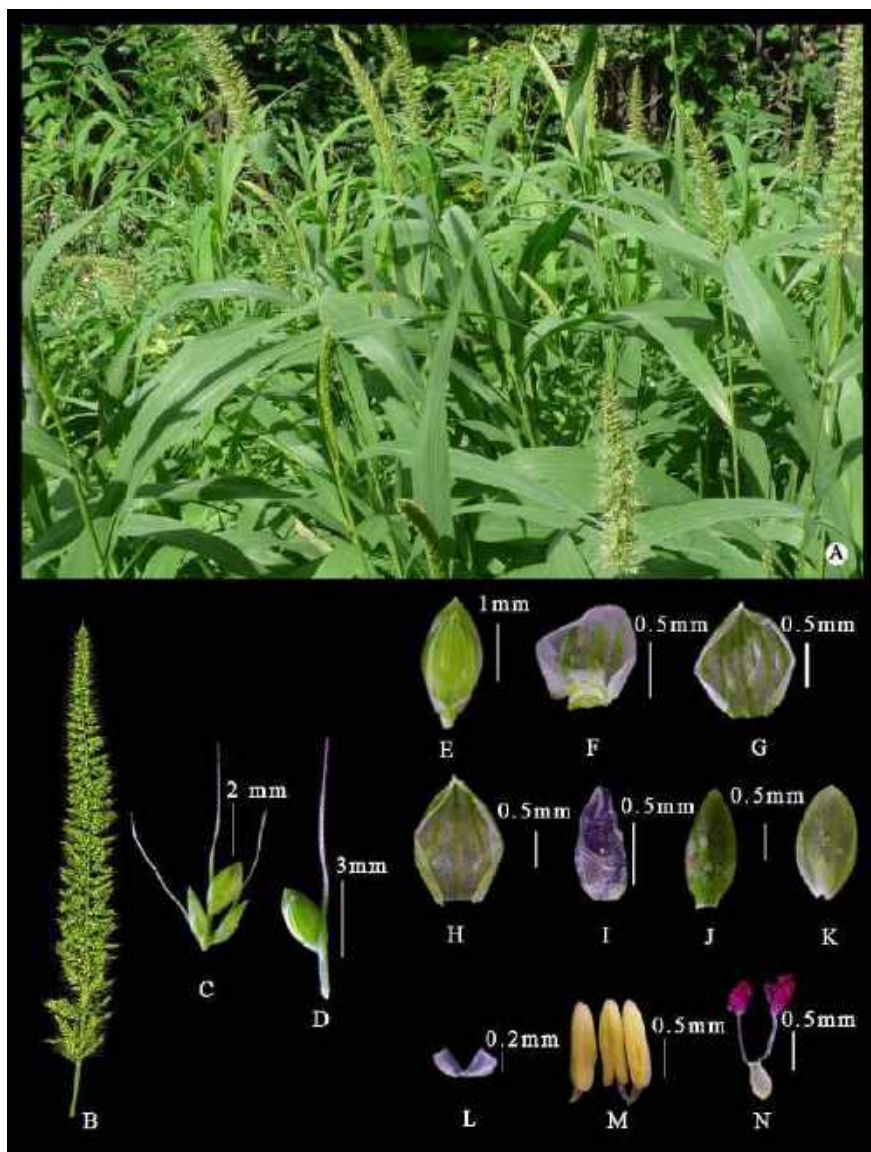


Plate 108. *Setaria verticillata* (L.) P.Beauv.: A. Habitat; B. Inflorescence; C&D. Spikelets with bristle; E. Spikelet; F. Lower glume; G. Upper glume; H. Lower lemma; I. Lower palea; J. Upper lemma; K. Upper palea; L. Lodicules; M. Stamens; N. Pistil.

Distrib.: Common throughout the state in marshy habitats.

Exsicc.: Adilabad District: Kodthala pond, *GO & DAM* 4139 (SKU); Rangareddy District: Hyderabad, *MVR* 02185 (HY); Warangal District: Rajupet-Mallampalli, 30.03.2021, *SNR* 012048 (BSID).

Note: It can be distinguished by its racemes, longer than the internodes.

9. *Setaria verticillata* (L.) P. Beauv., Ess. Agrostor. 51, 171, 178. 1812; Hook.f.,

Fl. Brit. India 7: 80. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 365. 1960; Pull., Fl. Telangana 3: 1174. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 749. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 421. 2020. *Panicum verticillatum* L., Sp. Pl., ed. 2. 1: 82. 1762. **Plate 108**

Caespitose annuals. Culms 25–100 cm high, erect or geniculate, robust; nodes glabrous. Leaves basal and cauline; sheaths glabrous; ligules a fringe of hairs; blades 5–20 × 1–4 cm, linear-lanceolate, scabrid, apex acute. Panicles c. 15 cm long, spiciform, pyramidal. Involucral bristles 7–8 mm long, retrorsely barbellate. Spikelets 2–2.5 mm long, elliptic-ovate. Lower glume c. 1 mm long, broadly ovate, membranous, hyaline, 3-nerved, apex acute. Upper glume 2–2.5 mm long, ovate, membranous, 5-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma c. 2 mm long, elliptic-ovate, 5-nerved, chartaceous-membranous, compressed, apex acute. Lower palea 0.5–0.9 mm long, oblong, membranous, apex acute. Upper lemma 1.8–2.3 mm long, elliptic-oblong, faintly rugose, coriaceous, 5-nerved, apex acute. Upper palea c. 2 mm long, elliptic, coriaceous, rugulose, apex acute. Stamens 3. Caryopsis 1–1.5 mm long, ellipsoid.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common in throughout the state as weed.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8557 (BSID); Nizamabad District: Kammarapally, *TP & BRPR* 6199 (SKU); Rangareddy District: Attapur, 22.08.2019, *SNR* 8677 (BSID); Rajendranagar, 24.08.2016, *SNR* 8514 (BSID), Hyderabad, *MVR* 02202 (HY), Central University, *MSM* 15186 (SKU); Warangal District: Regional Agricultural Research Station-Warangal, 28.03.2021, *SNR* 012027 (BSID).

Note: This species can be easily identified by its robust growth and viscid inflorescence. This species is similar to *S. intermedia* but differs in retrorsely barbellate bristles.

***Stenotaphrum* Trin.**

World: 7 spp.; India: 1 sp.; Telangana: 1 sp.

Stenotaphrum dimidiatum* (L.) Brongn., Voy. Monde, Phan. 127. 1831; C.E.C.Fisch. in Gamble, Fl. Madras 1773. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 366. 1960; Prasanna & al. in A.A. Mao & S.S. Dash (eds.), Fl. Pl. India Annot. Checkl. Monocot. 3: 421. 2020. *Panicum dimidiatum* L., Sp. Pl. 1: 57. 1753. *Stenotaphrum glabrum* Trin., Fund. Agrost. 176. 1820; Hook.f., Fl. Brit. India 7: 90. 1896. **Plate 109*

Mat-forming, perennials; stoloniferous. Culms 10–30 cm long, creeping; nodes glabrous-sparsely hairy, lower nodes rooting. Leaves mostly confined to basal; sheaths 3–4 cm long, strongly, keeled; ligules membranous apex, fimbriate; blades 4–18 × 0.5–1.2 mm, oblong-linear, flat-intoled, base rounded, margin serrulate, apex subobtuse-acute. Raceme 2–4 × 0.5 cm, solitary, spiciform; rachis flat. Spikelets 2.5–4.5 mm long, sunken, elliptic. Lower glume c. 1.6 × 1.2 mm, ovate-orbicular, chartaceous, nerveless, apex acute with ciliate. Upper glume 3–4.2 × 1.5 mm, ovate-elliptic, chartaceous, 7-nerved, apex acute, ciliate. Florets 2, lower barren or male;



Plate 109. *Stenotaphrum dimidiatum* Brongn.: A. Habitat (Carpet); B. Inflorescence.

upper bisexual. Lower lemma 3–3.5 × 0.8 mm, lanceolate, cymbiform, sub coriaceous, 5-nerved, margin incurved, hairy; apex acute. Lower palea c. 3 × 0.8 mm, ovate-lanceolate, cymbiform, hyaline, 2-nerved, 2-keeled or not, margins infolded, apex acute. Upper lemma c. 4 × 0.8 mm, ovate, sub coriaceous, 5-nerved; apex obtuse-acute, ciliate. Upper palea c. 3 × 0.8 mm, elliptic-lanceolate, chartaceous, 2-nerved, margins inflexed, apex acute, ciliate. Lodicules 2. Stamens 3.

Fl. & Fr.: Aug.–Feb.

Distrib.: Throughout the state. Most of the research institutes maintaining

the landscapes and lawn grass.

Exsicc.: Rangareddy District: Hyderabad, Lacones, 20.01.2019, SNR 8921 (BSID).

Note: Distinguishable from other lawn grasses by its strong keeled sheaths, long inflorescence with sunken rachis.

Trachys Pers.

World: 4 spp.; India: 4 spp.; Telangana: 1 sp.

Trachys muricata (L.) Pers., Syn. Pl. 1:85, 1805 ('*mucronata*'); Hook.f., Fl. Brit. India 7: 96. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1813. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 369. 1960; Pull., Fl. Telangana 3: 1148. 2015; K.N. Reddy & C.S. Reddy, Fl. Telangana 756. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 435. 2020. *Cenhrus muricatus* L., Mant. Pl. Altera 302. 1771.

Plate 110

Caespitose annuals; stoloniferous. Culms 10–50 cm long, diffuse; nodes bearded, rooting. Leaves basal and cauline; sheaths 1–7 cm long, keeled, hairy; ligules membranous; blades 2.5–14 × 0.3–1.4 cm, linear-lanceolate, 1–3-nerved, villous, base rounded, apex acute. Inflorescence 4–7.5 cm long, divergent. Spikelets 4–9.5 × 5–6.3 mm, clustered; 2-fertile; 2-barren, both more or less similar. Lower glume 2–2.5 × 0.3–0.5 mm, lanceolate, subcoriaceous, 1-nerved, apex acute. Upper glume 2.5–4 × 0.6–0.8 mm, linear, chartaceous, margin ciliate, 3-nerved, apex acuminate. Florets 2; lower neuter; upper bisexual. Lower lemma 4–7.5 × 3–4 mm, broadly elliptic, 10–13-nerved, subcoriaceous, apex acuminate-cuspidate. Lower palea c. 0.8 mm long, oblong, chartaceous, apex acute. Upper lemma 4–5 × 1–1.5 mm, lanceolate, coriaceous, margin incurved, apex acuminate. Upper palea 3–4.5 × 1.3 mm, lanceolate, coriaceous, 2-nerved, apex acute. Caryopsis 2–2.5 mm long, ovate-lanceolate.

Fl. & Fr.: Sep.–Dec.

Distrib.: Throughout the state, as a weed in cultivated fields.

Exsicc.: Mahabubnagar District: Rampur, SKB, KP & PKB 32634 (SKU); Nagarkurnool District, Thegalapalli-Koderu, 07.08.2019, SNR 8643 (BSID).

Note: It can be easily identified by its clustered spikelets.

Urochloa P. Beauv.

(Previously treated under '*Brachiaria* (Trin.) Griseb.')

World: c. 87 spp.; India: 9 spp., 1 var.; Telangana: 10 spp.

Key to the species

- | | | |
|-----|--|---------------------------|
| 1a. | Lower glume turned towards the axis or spikelets adaxial | ... 2 |
| 1b. | Lower glume turned away from the axis or spikelets abaxial | ... 9 |
| 2a. | Spikelets lanceolate | ... 8. <i>U. setigera</i> |
| 2b. | Spikelets oblong-ovate, elliptic-oblong | ... 3 |
| 3a. | Spikelets distant | ... 4 |
| 3b. | Spikelets imbricate/crowded | ... 6 |
| 4a. | Spikelets <3.25 mm long | ... 1. <i>U. deflexa</i> |
| 4b. | Spikelets >3.25 mm long | ... 5 |
| 5a. | Plants entirely glabrous; blades linear; spikelets puberulents | ... 7. <i>U. remota</i> |



Plate 110. *Trachys muricata* (L.) Pers. ex Trin.: A. Habitat; B. Inflorescence; C. Cluster of spikelets; D. Spikelet; E. Upper glume; F. Lower lemma; G. Upper lemma; Upper palea; I. Pistil; J. Stamens; K. Caryopsis.

- | | |
|--|-----------------------------|
| 5b. Plants minutely pubescent; blades lanceolate; spikelets glabrous | ... 3. <i>U. kurzii</i> |
| 6a. Rachis flat, crescent | ... 4. <i>U. mutica</i> |
| 6b. Rachis triquetrous; filiform | ... 7 |
| 7a. Spikelets >3.00 mm long | ... 8 |
| 7b. Spikelets <3.00 mm long | ... 9. <i>U. reptans</i> |
| 8a. Spikelets solitary and always in 2 rows | ... 2. <i>U. distachya</i> |
| 8b. Spikelets paired or fascicled, crowded in more than 2 rows | ... 6. <i>U. ramosa</i> |
| 9a. Lower lemma with a very conspicuous fringe of bristles | ... 10. <i>U. trichopus</i> |

9b. Lower lemma without a fringe of bristles

... 5. *U. panicoides*

1. *Urochloa deflexa* (Schumach.) H. Scholz in Bull. Mus. Natl. Hist. Nat., B, Adansonia Ser. 4, 11(4): 443. 1990. *Brachiaria deflexa* (Schumach.) C.E. Hubb. & Robyns in Bull. Jard. Bot. Etat. 9: 177. 1932; Bor, Grass. Burma Ceylon India Pakistan 281. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 329. 2020. *Panicum deflexum* Schumach., Beskr. Guin. Pl. 63. 1827. *Pseudobrachiaria deflexa* (Schumach.) Launert in Mitt. Bot. Staatssamml. Muenchen 8: 158. 1970.

Plate 111(A-J)

Caespitose annuals. Culms 10–30 cm high, erect, ribbed; lower nodes rooting. Leaves cauline; sheaths 4–5 cm long, glabrous, terete-keeled, mouth ciliate; ligules c. 1 mm long; blades 2–10.5 × 0.2–0.4 cm, broadly linear-lanceolate, flat, base rounded-truncate, apex acute. Panicle 5–12 cm long, terminal. Racemes 1–2.5 cm long; rachis triquetrous. Spikelets 3–3.5 × 1–1.2 mm, obovate-oblongate, paired. Lower glume 1–1.3 × 0.8–1.2 mm, elliptic, chartaceous, 5-nerved, apex acute. Upper glume c. 2 × 1 mm, broadly elliptic, chartaceous, 7-nerved, sparsely hirsute, apex acute. Florets 2, lower barren, upper bisexual. Lower lemma 2–2.5 × c. 1 mm, elliptic, chartaceous, 5-nerved, abaxially hairy, apex acute. Lower palea c. 2 × 0.6 mm, elliptic, membranous, 2-keeled, apex acute. Upper lemma c. 2 × 1 mm, ovate, subcoriaceous, adaxially rugose, margins inflexed, 5-nerved, apex acute. Upper palea c. 2 × 1 mm, elliptic, membranous, margin inflexed. Lodicules 2. Stamens 3. Caryopsis c. 1.4 mm long, obovate.

Fl. & Fr.: Aug.–Sept.

Distrib.: Occasionally in Nagarjunakonda valley.

Exsicc.: Mahabubnagar District: Adambakula, 09.08.2019, SNR 8654 (BSID), Nalgonda District: Nagarjunakonda valley, KCJ 9680 (CAL).

Notes: It can be identified its robust habit.

2. *Urochloa distachyos* (L.) T.Q. Nguyen, Novosti Sist. Vyssh. Rast. 13. 1966. *Brachiaria distachya* (L.) Staf, Fl. Trop. Africa 9: 565. 1919; C.E.C.Fisch. in Gamble, Fl. Madras 1769. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 281. 1960; Pull., Fl. Telangana 3: 1080. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 684. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 329. 2020. *Panicum distachyum* L., Mant. Pl. 183–184. 1771. '*Koranna Gaddi*'

Plate 111(K-L)

Annuals; stoloniferous. Culms 15–50 cm long, decumbent, geniculate; rooting at nodes; nodes pubescent. Leaves basal and cauline; sheaths 2–4 cm long, compressed, sparsely hairy; ligules hairy or fimbriate; blades 2–9.5 × 0.2–0.5 cm, ovate-lanceolate, glabrescent, margins scabrid, apex acute-acuminate. Racemes 2–3, spreading, 1.5–3 cm long, rachis below hairy. Spikelets 2.5–3.5 mm long, solitary, elliptic, secund, 2-rowed. Callus present. Lower glume c. 2 mm long, ovate, chartaceous, hyaline, 5–7-nerved, apex acute. Upper glume 2–3.5 × 0.8–1 mm, broadly ovate 5–7-nerved, chartaceous, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 3–3.5 × 0.5–1 mm, elliptic, chartaceous, margin inflexed, 5-nerved, apex acute. Lower palea 1.5–2 × 0.6–0.8 mm, elliptic,



Plate 111. A–J. *Urochloa deflexa* (Schumacher) H. Scholz: A. Habitat; B & C. Enlarged view of inflorescence; D. Abaxial and adaxial view of spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Lower palea; I. Upper lemma; J. Upper palea; K–L. *Urochloa distachya* (L.) T.Q. Nguyen: A. Habitat; B. Inflorescence.

membranous, hyaline, 2-nerved, 2-keeled, apex retuse. Upper lemma $2\text{--}2.5 \times 0.5\text{--}1$ mm, elliptic, crustaceous, faintly 5-nerved, punctate, apex acute. Upper palea c. 2.5×1 mm, elliptic, 2-keeled, 2-nerved, rugulose, apex acute. Lodicules 2. Stamens 3. Caryopsis $1\text{--}1.5 \times 1$ mm, elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in plains and near coastal areas.

Exsicc.: Adilabad District: Ankusapuram, GO 4340 (SKU); Rangareddy District: Hyderabad, MVR 02114 (HY).

Note: It can be differentiated from other species by its distantly arranged racemes.

3. *Urochloa kurzii* (Hook.f.) T.Q. Nguyen, Novosti Sist. Vysshch. Rast. 13. 1966. *Brachiaria kurzii* (Hook.f.) E.G. Camus & A. Camus, Fl. Indo-Chine 7: 438. 1922; C.E.C.Fisch. in Gamble, Fl. Madras 1770. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 283. 1960; Pull., Fl. Telangana 3: 1081. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 329. 2020. *Panicum kurzii* Hook.f., Fl. Brit. India 7: 38. 1896.

Annuals; stoloniferous. Culms 10–50 cm high, decumbent; nodes hairy; lower nodes rooting. Leaves cauline; sheaths keeled, compressed, ciliate; ligules bearded; blades $2.5\text{--}9 \times 0.7\text{--}1.3$ cm, linear-lanceolate, base rounded-cordate, pilose, apex acuminate. Racemes 7–8 cm long, arranged distantly. Spikelets $2\text{--}2.5 \times 1.5$ mm, ovate, apex acute. Lower glume 1 mm long, lanceolate-ovate, prehensile, chartaceous, 3–5-nerved, apex obtuse. Upper glume $2 \times 1\text{--}1.5$ mm, ovate, pubescent, chartaceous, 5–7-nerved, apex apiculate. Florets 2; lower neuter; upper bisexual. Lower lemma $1.5\text{--}2 \times 1\text{--}1.5$ mm, elliptic, chartaceous, 5-nerved, apex apiculate. Lower palea $0.5\text{--}1 \times 0.4\text{--}0.6$ mm, elliptic-oblong, chartaceous, apex obtuse. Upper lemma $2\text{--}2.5 \times 1\text{--}1.5$ mm, elliptic-oblong, subcoriaceous, rugose, apex apiculate. Upper palea $1.5\text{--}2 \times 1\text{--}1.5$ mm, sub coriaceous, rugose, 2-nerved, 2-keeled, margin inflexed, apex acute. Stamens 3.

Fl. & Fr.: Jul.–Oct.

Distrib.: Occasional.

Exsicc.: Mahabubnagar District: Venkatapuram-Sivaru, 06.08.2019, SNR 8604 (BSID); Rangareddy District: Hyderabad, MVR 02116 (HY).

4. *Urochloa mutica* (Forssk.) T.Q. Nguyen, Novosti Sist. Vysshch. Rast. 13. 1966. *Brachiaria mutica* (Forssk.) Stapf, Fl. Trop. Africa 9: 526. 1919; C.E.C.Fisch. in Gamble, Fl. Madras 1769. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 284. 1960; Pull., Fl. Telangana 3: 1142. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 329. 2020. *Panicum muticum* Forssk., Fl. Aegypt.-Arab. 20. 1775; Hook.f., Fl. Brit. India 7: 34. 1896.

Plate 112

Caespitose perennials. Culms 25–200 cm high, erect or geniculate; nodes bearded, lower nodes rooting. Leaves mostly cauline; sheaths 6–14 cm long, compressed, hispid; ligules hairy; blades $5\text{--}30 \times 0.6\text{--}1.5$ cm, linear-lanceolate, margin scabrid, apex acute. Inflorescence 5–22 cm long. Racemes c. 8 cm long, spreading, rachis triquetrous. Spikelets 3–4 mm long, elliptic, purple tinged. Lower glume $1\text{--}1.2 \times 0.6\text{--}0.8$ mm, ovate, chartaceous, 1-nerved, apex acute. Upper glume 3–4 mm long, elliptic-lanceolate, chartaceous, 5-nerved, apex acuminate. Florets 2; lower male, upper bisexual. Lower lemma similar to upper



Plate 112. *Urochloa mutica* (Forssk.) T.Q. Nguyen: A. Habitat; B. Inflorescence; C. Enlarged view of raceme.

glume, male. Lower palea 2–2.5 × 0.5–1 mm, lanceolate, membranous, 2-nerved, 2-keeled, apex acute. Upper lemma 2–3 × 0.4–0.6 mm, elliptic, coriaceous, finely rugose, margins involute, apex obtuse. Upper palea similar to lemma. Lodicules 2. Stamens 3.

Fl. & Fr.: Aug.–Dec.

Distrib.: Introduced for cultivation, subsequently naturalized.

Exsicc.: Peddapally District: Mugdapur, 10.11.2019, SNR 8769 (BSID);

Rangareddy District: Hyderabad, MVR 02215 (HY).

Note: It can be identified by its hispid nature on leaf sheaths and blades.

5. *Urochloa panicoides* P. Beauv., Ess. Agrostogr. 52. 1812; C.E.C.Fisch. in Gamble, Fl. Madras 1775. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 372. 1960; Pull., Fl. Telangana 3: 1187. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 759. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 440. 2020.

Caespitose annuals. Culms 50–90 cm high, erect or geniculate; nodes glabrous-pubescent, lower nodes rooting. Leaves basal and cauline; sheaths 2.5–9 cm long, compressed, keeled, densely hispid; ligules hairy; blades 2–13 × 0.5–1.5 cm, linear-lanceolate, hairy, margins undulate. Inflorescence c. 12 cm long. Racemes 2.5–7 cm long, spreading with solitary or paired spikelets. Pedicels with white spreading hairs. Spikelets 3–4.5 × 1.5–2 mm, elliptic-oblong, biseriate, densely pubescent, apex acute. Lower glume 1–1.5 × 1–1.3 mm, ovate, chartaceous, 5-nerved, base clasping, apex acute. Upper glume 3–4 × 1–1.5 mm, ovate-elliptic, 7–9-nerved, densely pubescent, apex acute. Lower male or neuter; upper bisexual. Lower lemma 3.5–4 × 1–1.5 mm, ovate-elliptic, coriaceous, abaxially long hairy, 5-nerved, margin incurved, apex acuminate. Lower palea 3–3.5 × 1–1.5 mm, elliptic, chartaceous, 2-keeled, 2-nerved, apex acute. Upper lemma 2–2.5 × 1–1.5 mm, elliptic, coriaceous, transversely rugose, margin incurved, apex 0.5–0.8 mm long mucronate. Upper palea 2–2.5 × 1–1.5 mm, ovate, coriaceous, rugose, 2-keeled, margin incurved, apex obtuse. Lodicules 2. Caryopsis elliptic.

Fl. & Fr.: Jul.–Feb.

Distrib.: Common throughout the state along bunds of cultivated fields, in grasslands and in moist habitats.

Exsicc.: Nalgonda District: Ambothu thanda, BRA 001271 (BSID); Rangareddy District: Hyderabad, Borabanda-Hitech city, VSK 356 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8728 (BSID).

6. *Urochloa ramosa* (L.) T.Q. Nguyen, Novosti Sist. Vyssh. Rast. 13. 1966. *Brachiaria ramosa* (L.) Stapf, Fl. Trop. Afr. 9: 542. 1919; C.E.C.Fisch. in Gamble, Fl. Madras 1770. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 284. 1960; Pull., Fl. Telangana 3: 1082. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 685. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 330. 2020. *Panicum ramosum* L., Mant. Pl. 1: 29. 1767; Hook.f., Fl. Brit. India 7: 36. 1896. 'Eduro Gaddi'

Caespitose annuals. Culms 10–80 cm high, decumbent, geniculate; nodes glabrous to hairy. Leaves mostly cauline; sheaths 6–10 cm long, glabrous or pubescent; ligules a rim of hairs; blades 2–18 × 0.5–1.9 cm, linear-lanceolate, apex acuminate. Panicles 2.5–10 cm long. Racemes 3–10; 3–5 cm long, lax; rachis triquetrous, with colourless hairs, winged. Spikelets 2–3 mm long, paired, ovoid, apiculate, glabrous-pubescent. Lower glume c. 1.5 × 0.5–1 mm, broadly ovate, membranous, softly pubescent, 5–7-nerved, apex acute-obtuse. Upper glume

2–3 × 1–1.5 mm, elliptic, membranous, softly pubescent, 5–7-nerved, apex acute. Florets 2; lower neuter; upper bisexual. Lower lemma 2–3 × 1–1.5 mm, elliptic, chartaceous 5-nerved, pubescent-glabrous, apex acute. Lower palea 1.5–2 × 0.6–1 mm, elliptic, membranous, hyaline, 2-keeled, 2-nerved, margin incurved, apex acute. Upper lemma 2–2.5 × 1–1.2 mm, elliptic, crustaceous, transversely rugose, apex mucronate. Upper palea 1.5–2 × 1 mm long, elliptic, coriaceous, 2-nerved, 2-keeled, apex obtuse. Caryopsis 1–2 × 1–1.3 mm, elliptic.

Fl. & Fr.: Jul.–Dec.

Distrib.: Common as a weed in cultivated fields and in moist localities.

Exsicc.: Adilabad District: Sirpur RF, *GO & PVP* 4912 (SKU); Nagarkurnool District: Thegalapalli-Koderu, 07.08.2019, *SNR* 8642 (BSID); Rangareddy District: Hyderabad, *MVR* 02216 (HY); Rajendranagar-Manasahills, 24.08.2016, *SNR* 8504 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, *SNR* 8995 (BSID).

Note: Distinguishable by its long colourless hairs on the pedicel.

7. *Urochloa remota* (Retz.) Ashalatha & V.J. Nair in Bull. Bot. Surv. India 35: 29. 1993. *Brachiaria remota* (Retz.) Haines, Bot. Bihar & Orissa 1005. 1924; C.E.C.Fisch. in Gamble, Fl. Madras 1770. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 285. 1960; Pull., Fl. Telangana 3: 1082. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 685. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 330. 2020. *Panicum remotum* Retz., Observ. Bot. 4: 17. 1786; Hook.f., Fl. Brit. India 7: 38. 1896.

Caespitose perennials; stoloniferous. Culms about 50 cm high; nodes bearded. Leaves basal and cauline; sheaths 2–3 cm long, keeled, mouth pubescent; ligules short, apex lacerate; blades 5–16 × 0.3–1 cm, narrowly linear-oblong, glabrous-sparsely hairy. Racemes c. 8 cm long, rachis capillary, triquetrous. Spikelets 1–2 mm long, elliptic-oblong, solitary or paired. Lower glume c. 1.5 mm long, ovate, membranous-chartaceous, 3–5-nerved, apex acute. Upper glume c. 1.5–2.5 mm long, elliptic, membranous, 5–7-nerved, apex acute. Florets 2. Lower floret neuter. Upper floret bisexual. Lower lemma 1.5–2.5 mm long, ovate, membranous, 5–7-nerved, apex acute. Lower palea 1.5–2 mm long, elliptic, 2-nerved, apex acute. Upper lemma c. 2 mm long, elliptic, crustaceous, rugose, apex acute. Upper palea c. 1.5 mm long, elliptic, 2-nerved, minutely rugose, apex acute. Lodicules 2. Stamens 3. Ovary oblong. Caryopsis c. 1.5 mm long, oblong.

Fl. & Fr.: Jul.–Dec.

Distrib.: Occasional in moist habitats.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02117 (HY).

8. *Urochloa reptans* Stapf, Fl. Trop. Afr. 9: 601. 1920. *Brachiaria reptans* (L.) C.A. Gardner & C.E. Hubb. in Hooker's Icon. Pl.: sub t. 3363. 1938; Bor, Grasses Burma, Ceylon, India & Pakistan 285. 1960; Pull., Fl. Telangana 3: 1082. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 686. 2016; Prasanna & al. in A.A.Mao &

S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 330. 2020. *Panicum reptans* L., Syst. Nat., ed 10. 2: 870. 1759. *Panicum prostratum* Lam., Tabl. Encycl. 1: 171. 1791; Hook.f., Fl. Brit. India 7: 33. 1896.

Caespitose annuals. Culms 10–50 cm long, decumbent; nodes pubescent, lower nodes rooting. Leaves mostly cauline; sheaths 2.5–3.5 cm long, glabrous, margin ciliate; ligules hairy; blades 1–5 × 0.6–1 cm, linear-lanceolate, margin scabrid, apex acuminate. Racemes 5–12; 1–4 cm long, spreading. Spikelets 2–2.25 × 0.8–1 mm, ovate-elliptic, pedicels with white bristles. Lower glume 0.5–0.8 mm long, obovate, membranous, faintly 3-nerved, apex truncate-rounded. Upper glume 1.5–2.25 × 0.6–1 mm, chartaceous, 5-nerved, margin inflexed, apex acute. Lower lemma 2–2.5 × 0.6–1 mm, ovate, membranous, 5–7-nerved, apex acute. Lower palea 1.5–2 mm long, elliptic, membranous, 2-keeled, apex acute. Upper lemma c. 1.5 × 1 mm, elliptic coriaceous, abaxially rugulose, 5-nerved, apex mucronate. Upper palea 1.5 × 0.6–0.8 mm, elliptic, coriaceous, abaxially rugose, 2-keeled, margins involute, 2-nerved, apex rounded. Lodicules 2. Stamens 3. Caryopsis 0.8–1 × 0.5–0.7 mm, elliptic.

Fl. & Fr.: May–Nov.

Distrib.: Common in marshy areas, in the shade of bushes and along the water courses.

Exsicc.: Adilabad District: Jaipur RF, *GO & PVP* 4959 (SKU); Mahabubnagar District: Bhavani Sagar, 06.08.2019, *SNR* 8626 (BSID); Suryapet District: Moosi Project, 27.10.2019, *SNR* 8758 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 26.03.2021, *SNR* 8982, 8992 (BSID); 28.03.2021, *SNR* 012023 (BSID).

Note: It can be identified by its compactly arranged spikelets on the spreading racemes.

9. *Urochloa setigera* (Retz.) Stapf, Fl. Trop. Africa 9: 598. 1920; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 440. 2020. *Brachiaria setigera* (Retz.) C.E. Hubb. in Hooker's Icon. Pl.: sub. t. 3363. 1938; Bor, Grasses Burma, Ceylon, India & Pakistan 286. 1960. *Panicum setigerum* Retz., Observ. Bot. 4: 15. 1786; Hook.f., Fl. Brit. India 7: 36. 1896.; C.E.C.Fisch. in Gamble, Fl. Madras 1775. 1934.

Caespitose perennials; stoloniferous. Culms 40–130 cm high, trailing; nodes bearded, lower nodes rooting. Leaves basal and cauline; sheaths 6–12 cm long, ribbed, pubescent, margins ciliate; ligules membranous, apex ciliate; blades 2–8 × 0.8–1.5 cm, broadly ovate-lanceolate, base rounded. Panicle short, 4–13 cm long. Racemes 1.5–6.5 cm; rachis triquetrous, margin scabrid. Spikelets 3–3.5 × 1–1.5 mm, ovate, paired. Lower glume 0.5–0.8 × 0.4–0.6 mm, broadly ovate, chartaceous, 3-nerved, margin pubescent, apex acute. Upper glume 3–3.5 × c. 1 mm, lanceolate, chartaceous, 9-nerved, pubescent, margins hispid, apex acuminate. Florets 2; lower male, upper bisexual. Lower lemma 2.5–3.5 × c. 1.3 mm, lanceolate, chartaceous, 5-nerved, apex acute. Lower palea 2.5–3 × c. 1 mm, elliptic, membranous, 2-nerved, 2-keeled, apex acute. Upper lemma 1.5–2 × c. 1 mm, oblong, subcoriaceous, transversely rugulose, apex shortly mucronate.

Upper palea c. 2×1 mm, elliptic, margin inflexed, apex rounded. Lodicules 2. Stamens 3. Caryopsis c. 1.5×1 mm, broadly elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally in paddy fields; good fodder grass.

Exsicc.: Nalgonda District: Mailapuram, BRA 005072 (BSID).

Note: Distinguished from *U. panicoides* by its robust habit and longer leaves.

10. *Urochloa trichopus* Stapf, Fl. Trop. Afr. [Oliver et al.] 9(4): 589. 1920; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 440. 2020. *Brachiaria stolonifera* Gooss., Bull. Misc. Inform. Kew 1934(5): 195 (1934). *Eriochloa trichopus* Hochst. ex Benth., J. Linn. Soc., Bot. 19: 89. 1881. *Urochloa mosambicensis* (Hack.) Dandy, J. Bot. 69: 54. 1931. *Panicum trichopus* Hochst., Flora 27(1): 254. 1844.

Plate 113

Caespitose perennial. Culms 30–150 cm, high, terete, erect; nodes pubescent, lower nodes rooting; internodes 5–20 cm long, terete, pubescent. Leaves basal and cauline; leaf sheaths $10\text{--}26 \times 1\text{--}2$ cm, terete-keeled, hirsute, margin serrate; ligule ciliate, $1.5\text{--}2.5$ mm long; leaf blades, linear-lanceolate, $5\text{--}40 \times 1\text{--}1.5$ cm, base amplexicaul keeled, margin ciliate and wavy at base, apex acuminate, both surface hairy, mid nerve prominent on abaxial surface. Inflorescence 10–38 cm long, terminal and axillary; exerted from sheath; racemes 6–8, $3\text{--}9 \times 0.4\text{--}0.6$ cm, alternate, peduncle hairy; spikelets paired; arranged on abaxial side, 2 rows; rachis triquetrous, angles serrulate; hispid and bristly; pedicels 0.2–0.5 mm long, bristly. Spikelets $4\text{--}5 \times 1.5\text{--}2.3$ mm, ovate-elliptic, hirsute, apex beaked. Lower glume $3\text{--}3.5 \times 1\text{--}1.3$ mm, elliptic-lanceolate, coriaceous, membranous, 3-nerved, prominent on abaxial surface, base hirsute, margins inrolled, apex truncate-lacerate, 1–2 stiff hairs (colour less) on the mid nerve of abaxial surface, $2\text{--}2.5$ mm long. Upper glume $4.5\text{--}5 \times 1.5\text{--}2.2$ mm, ovate, chartaceous, 7-nerved, nerves are joined at the apex, hispid on abaxial surface, margins entire, inrolled, acuminate at apex. Florets 2; lower floret barren or male (3–4 stamens); upper floret bisexual (3 stamens) or female. Lower lemma $4\text{--}4.5 \times 2\text{--}2.5$ mm, ovate, chartaceous, 3-nerved, 2-keeled, densely hirsute on keels, light violet in colour, sparsely hairy on dorsal surface, margins inrolled, acuminate at apex. Lower palea $3\text{--}3.7 \times 2\text{--}2.8$ mm, ovate, chartaceous, hyaline, 2-nerved, 2-keeled, sparsely hairy and flat on dorsal surface, acuminate at apex. Lodicules 2; $0.1\text{--}0.2$ mm long. Stamens 3–4; $2\text{--}2.5 \times 0.3\text{--}0.4$ mm. Upper lemma $2\text{--}2.5 \times 1.3\text{--}1.5$ mm, ovate, coriaceous, 3–5 nerved, 2-keeled at base and rugose on dorsal surface, margins inrolled; mucronate at apex, $0.6\text{--}0.8$ mm long, antrorsely barbellate. Upper palea $2\text{--}2.3 \times 1\text{--}1.4$ mm, ovate, coriaceous, 2-nerved, 2-keeled, flat on dorsal surface, indurate, rounded at apex. Lodicules 2, $0.2\text{--}0.3$ mm long. Stamens 3, $1.5\text{--}1.8 \times 0.2\text{--}0.3$ mm. Ovary $0.3\text{--}0.45 \times 0.2\text{--}0.3$ mm, oblong; stigma $0.9\text{--}1.3$ mm long, plumose.



Plate 113. *Urochloa trichopus* Stapf: A. Habitat; B. Inflorescence; C. Enlarged view of raceme; D&E. Abaxial and adaxial view of spikelet; F&G. Abaxial and adaxial view of lower glume; H. Upper glume; I&J. Abaxial and adaxial view of lower lemma; K&L. Abaxial and adaxial view of palea; M. Lodicules; N. Stamens; O&P. Abaxial and adaxial view of upper lemma; Q&R. Abaxial and adaxial view of upper palea; S. Lodicules; T. Stamens; U. Pistil.

Fl. & Fr.: Jun.–Aug.

Distrib.: Growing as a weed; as good fodder.

Exsicc.: Rangareddy District: Shadnagar, 20.07.2020, SNR 008936 (BSID).

Isachne R. Br.

World: 105 spp.; India: 34 spp., 3 var.; Telangana: 2 spp.

Key to the species

- 1a. Spikelets obovate; anthers c. 0.4 mm long ... 2. *I. pulchella*
 1b. Spikelets subglobose-elliptic; anthers c. 1.5 mm long ... 1. *I. globosa*

1. *Isachne globosa* (Thunb.) Kuntze, Revis. Gen. Pl. 2: 778. 1891; Bor, Grasses Burma, Ceylon, India & Pakistan 580. 1960; Pull., Fl. Telangana 3: 1137. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 384. 2020. *Milium globosum* Thunb., Fl. Jap. 49. 1784. *Isachne australis* R. Br., Prodr. Fl. Nov. Holland.: 196. 1810; Hook.f., Fl. Brit. India 7: 24. 1896.

Plate 114(A-C)

Caespitose perennials. Culms 10–60 cm high, erect, slender; nodes glabrous. Leaves basal and cauline; sheaths 1.5–7 cm long, densely ciliate; ligules rim of hairs; blades 1.5–10 × 0.2–0.9 cm, linear, hirsute, apex acuminate. Panicles 2–15 cm long, branches effuse-compact. Spikelets 1.5–2 × 1.5–2 mm, globose. Lower glume 1.5–2 × 1.3 mm, ovate, glabrous-hirsute, apex obtuse. Upper glume 2–2.5 × 1–1.2 mm, ovate, above setosely hirsute, 5-nerved, apex rounded. Florets 2. Lower lemma 2–2.4 × 1–1.3 mm, elliptic, membranous, 5–7-nerved, apex rounded. Palea c. 3 mm long, elliptic, membranous, 2-keeled, apex rounded. Upper lemma c. 2 × 1.5 mm, ovate-elliptic, coriaceous, abaxial surface pubescent, faintly 5–7-nerved, softly villous on back. Palea 1.8–2 × 1 mm, elliptic, pubescent, inflexed, apex rounded. Lodicules 2. Stamens 3. Caryopsis c. 1 mm long, orbicular.

Fl. & Fr.: Sep.-Nov.

Distrib.: Common in marshy areas, along margins of ponds, and in rice fields.

Exsicc.: Bhadradi Kothagudem District: Sambayyagudem-Manugur, 24.03.2021, SNR 8952 (BSID).

2. *Isachne pulchella* Roth ex Roem. & Schult., Syst. Veg. 2: 476. 1817; Bor in Kew Bull. 1952: 321. 1952 & Grasses Burma, Ceylon, India & Pakistan. 3: 582. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 385. 2020.

Plate 114(D-S)

Solitary annual; stoloniferous. Culms 10–25 cm high, terete, erect or prostrate; lower nodes rooting. Leaves basal and cauline; sheaths 0.4–2.5 cm long, terete, glabrous, margin ciliate; ligules fimbriate; blades 2–4.2 × 0.2–1 cm, ovate-lanceolate, glabrous, base rounded, apex acuminate. Panicles 2.5–5.5 cm long, spiciform. Pedicel 0.5–3 mm long. Spikelet 1.5–1.8 × 1–1.3 mm, elliptic. Lower glume 1–1.5 × 0.4–0.6 mm, broadly elliptic, membranous, glabrous, 7-nerved, apex obtuse. Upper glume 1.2–1.6 × 0.5–1 mm, broadly obovate, membranous, glabrous, 9-nerved, apex rounded. Florets 2; lower male, upper bisexual. Lower lemma 1.3–1.6 × 0.5–0.6 mm, elliptic, subcoriaceous, margins inflexed, glabrous, 5-nerved, apex obtuse. Lower palea 1.3–1.6 × 0.5–0.6 mm, elliptic, subcoriaceous, glabrous, 2-nerved, margins inflexed, apex obtuse. Lodicules 2. Stamens 3. Upper lemma 0.5–1 × 0.5–1 mm, orbicular, coriaceous, puberulous, margins inflexed, ciliate hairy, 3–5-nerved, apex obtuse. Upper palea 0.5–1 × 0.5–0.6 mm, elliptic-orbicular, coriaceous, glabrous, margin inflexed, 2-nerved, apex



Plate 114. A–C. *Isachne globosa* (Thunb.) Kuntze: A. Habitat; B. Inflorescence; C. Spikelets; D–S. *Isachne pulchella* Roth: D. Habit; E. Inflorescence; F. Enlarged view of inflorescence; G. Spikelet; H&I. Abaxial and adaxial view of lower glume; J&K. Abaxial and adaxial view of upper glume; L&M. Abaxial and adaxial view of lower lemma; N&O. Abaxial and adaxial view of lower palea; P&Q. Abaxial and adaxial view of upper lemma; R&S. Abaxial and adaxial view of upper palea.

rounded. Lodicules 2. Stamens 3. Caryopsis 0.7–1 × 0.5–0.6 mm, elliptic-orbicular.

Fl. & Fr.: Sep.–Oct.

Distrib.: Common in throughout the state, on old walls, along roadsides, and hill slopes.

Exsicc.: Adilabad District: Birsai pet range, Rampur beat, APS 4007 (BSID).

Note: It can be identified by its narrow leaves and miniature spikelets.

Arundinella Raddi

World: c. 55 spp.; India: 25 spp., 4 var.; Telangana: 5 spp.

Key to the species

- | | | |
|-----|---|------------------------------|
| 1a. | Upper lemma with two setae | ... 2 |
| 1b. | Upper lemma devoid setae | ... 4 |
| 2a. | Perennials; spikelets hairy or wooly | ... 4. <i>A. setosa</i> |
| 2b. | Annuals; spikelets covered with tubercle-based hairs | ... 3 |
| 3a. | Whole plant with tubercle based hairs; spikelets above 7 mm long | ... 5. <i>A. tuberculata</i> |
| 3b. | Not entirely covered with tubercle based hairs; spikelets below 6 mm long | ... 2. <i>A. nervosa</i> |
| 4a. | Panicles effuse; glumes covered with tubercle based hairs | ... 1. <i>A. ciliata</i> |
| 4b. | Panicles contracted; glumes glabrous | ... 3. <i>A. pumila</i> |

1. *Arundinella ciliata* (Roxb.) Nees ex Miq., Nieuwe Verh. eerste Kl. Kon. Ned. Inst. Wetensch. Amsterdam 3(4): 30. 1851; Bor, Grasses Burma, Ceylon, India & Pakistan 421. 1960; Chorgha, Prasanna & Y.V.Rao in J. Econ. Taxon. Bot. 37(2): 323. 2013; Pull., Fl. Telangana 3: 1174. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 323. 2020. *Holcus ciliatus* Roxb., Fl. Ind. 1: 321. 1820.

Plate 115

Caespitose annuals. Culms 25–50 cm high, terete, slender, tubercle based hairy; nodes hairy. Leaves basal and cauline; sheaths villous; ligules a rim of hairs; blades 2–9 × 0.3–0.5 cm, linear-lanceolate, base narrow, tubercled hairy, apex acuminate. Panicles 4–10 cm long, contracted. Spikelets 2–3 × 0.4–0.8 mm, lanceolate, tubercle based hairy. Lower glume 1–1.5 × 0.2–0.4 mm, ovate, 3-nerved, densely hairy, apex acuminate. Upper glume 1–1.8 × 0.2–0.4 mm, ovate, chartaceous-membranous, 5-nerved, apex acuminate. Florets 2; lower male; upper bisexual. Lower lemma 0.5–0.9 × 0.2 mm, ovate-lanceolate, coriaceous, 3-nerved, apex acute. Lower palea 1–1.5 × 0.3–0.5 mm, elliptic, chartaceous, 2-nerved, 2-keeled, apex acute. Upper lemma 0.4–0.7 × 0.3 mm, subcoriaceous, 4-nerved, awn 5–7 mm long. Upper palea 0.5–0.8 × 0.2 mm, oblong, chartaceous-subcoriaceous, 2-nerved, 2-keeled, apex acute. Lodicules 2. Stamens 3. Caryopsis 0.2–0.4 × 0.2 mm, ovate.

Fl. & Fr.: Oct.–Dec.

Distrib.: Occasionally on rocky surfaces of Vikarabad and Rangareddy districts.

Exsicc.: Vikarabad District: Damagundam, 02.12.2019, SNR & KP 8918 (BSID); Rangareddy District: Hyderabad, MVR 02109 (HY).

Note: It can be easily distinguishable by its tubercle-based hairs on leaf.

2. *Arundinella nervosa* (Roxb.) Nees ex Hook. & Arn., Bot. Beechey Voy. 237. 1836; Hook, f., Fl. Brit. India 7: 70. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 424. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 324. 2020. *Holcus nervosus* Roxb., Fl. Ind. 1: 320. 1820.

Plate 116(A)

Solitary annuals. Culms 10–45 cm high, branched; nodes glabrous, lower

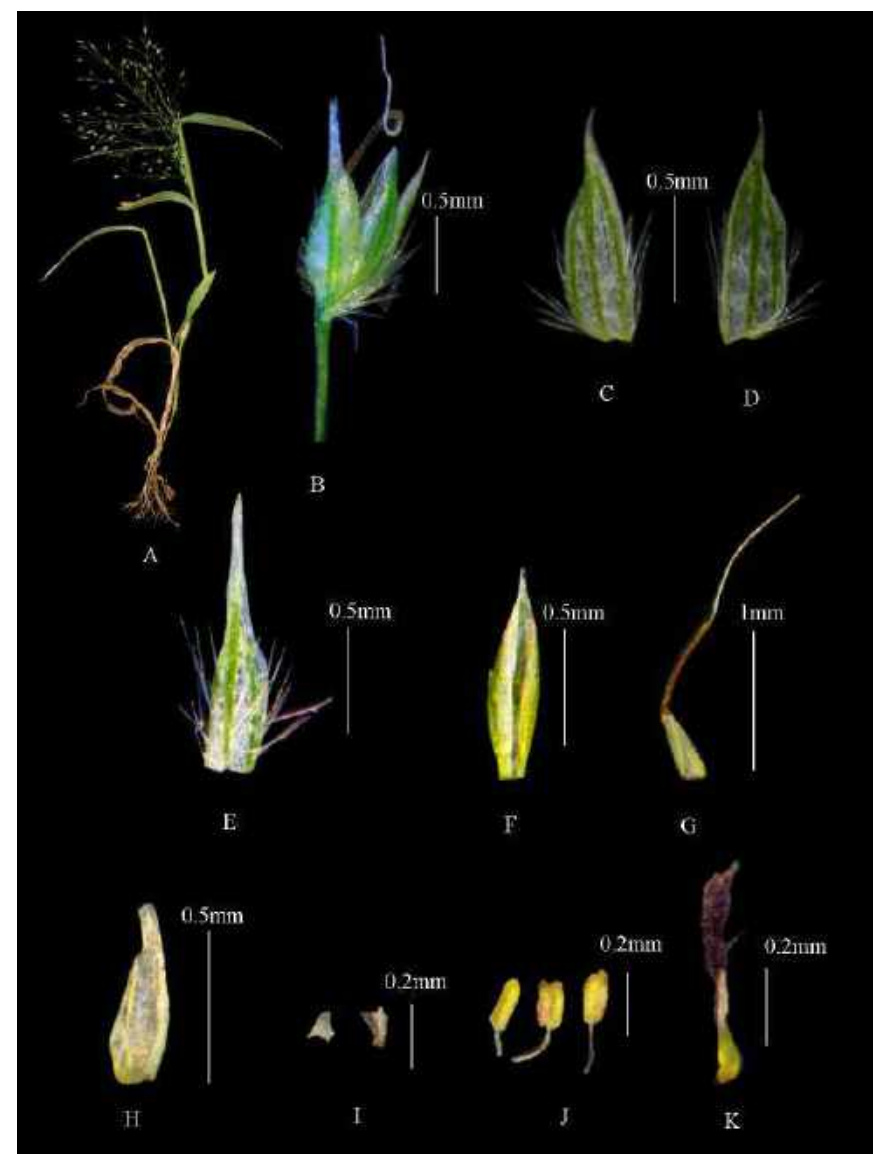


Plate 115. *Arundinella ciliata* (Roxb.) Nees ex Miq.: A. Habit; B. Spikelet; C&D. Abaxial and adaxial view of lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Upper palea; I. Lodicules; J. Stamens; K. Pistil.

nodes rooting. Leaves basal and cauline; sheaths covered with bulbous based hairs; ligules membranous; blades 10–21 × 0.2–0.6 cm, surface pubescent. Panicles 10–26 cm long, branched. Spikelet 0.4–0.6 cm long, awned. Lower glume 3–3.5 mm long, membranous, 3-nerved, apex acuminate. Upper glume 4–6 mm long, elliptic, 5-nerved, apex straight beak. Florets 2; lower male, upper bisexual. Lower lemma 2–3.5 mm long, membranous, 3-nerved, apex obtuse. Lower palea 1.5–2 mm long. Upper lemma 1–1.8 mm long, elliptic-ovate, scaberulous, median

awn twisted with slender base between two setae, 4–7 mm long. Upper palea elliptic, coriaceous, 2-nerved, 2-keeled. Lodicules 2. Stamens 3.

Fl. & Fr.: Jun.–Nov.

Distrib.: Occasionally in forest hill slopes. Endemic-India (Andhra Pradesh, Goa, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu).

Exsicc.: Nagarkurnool District: Mannanur Range, Pullaiahpalli, 8.12.2020, ARK & BSS 4330 (TBGH); Vikarabad District: Anathagiri hills, 30.11.2019, SNR 8789 (BSID); 02.12.2019, SNR 8919, 8920 (BSID).

Note: Distinguishable from other species by its bulbous based hairs on leaf sheaths.

3. *Arundinella pumila* (Hochst. ex A. Rich.) Steud., Syn. Pl. Glumac. 1: 114. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1801. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 423. 1960; Pull., Fl. Telangana 3: 1175. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 324. 2020. *Acratherum pumilum* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 414. t. 100. 1851. *Arundinella tenella* Ness ex Steud., Syn. Pl. glum. 1: 115. 1854; Hook.f., Fl. Brit. India 7: 71. 1896. **Plate 116(B)**

Caespitose annuals. Culms 10–55 cm high, erect, slender; nodes hairy. Leaves basal and cauline; sheaths 3–6 cm long, margin ciliate; ligules membranous, truncate; blades 2–18 × 0.5–1 cm, ovate-lanceolate, glabrous-sparsely hairy, apex acuminate. Panicles 13–20 cm long, lax, pyramidal, branches capillary. Spikelets 1.5–2 × 0.6–1 mm, ovate-lanceolate, pedicelled. Lower glume 1–1.5 × 0.4–0.6 mm, ovate, chartaceous-membranous, 3-nerved, apex acute. Upper glume 1.5–2 × 0.6 mm, chartaceous, 5-nerved, apex acuminate. Florets 2; lower male-neuter; upper bisexual. Lower lemma 1.5–2 mm long, ovate-lanceolate, chartaceous, 3-nerved, apex acute. Lower palea 1 × 0.3–0.5 mm, lanceolate, chartaceous, 2-nerved, 2-keeled, apex obtuse. Upper lemma 0.5–0.8 × 0.3 mm, ovate, coriaceous, lanceolate, awn c. 3 mm long; column slightly twisted. Upper palea 0.4–0.8 × 0.3 long, ovate, subcoriaceous, 2-nerved, 2-keeled, apex obtuse. Caryopsis 0.4–0.5 × 0.3 mm, elliptic-oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state on old walls, along roadsides and hill slopes.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, Jinkaladoddi, JS 9342 (BSID).

Note: It can be identified by its very slender culms, capillary branches and smaller spikelets.

4. *Arundinella setosa* Trin., Gram. Panic. 63. 1826; Hook.f., Fl. Brit. India 7: 70. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1801. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 424. 1960; Pull., Fl. Telangana 3: 1175. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 683. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 325. 2020. '*Pathioopa gaddi*' **Plate 116(C)**



Plate 116. A. *Arundinella nervosa* (Roxb.) Nees ex Hook. & Arn.; B. *Arundinella pumila* (Hochst. ex A. Rich.) Steud.; C. *Arundinella setosa* Trin.

Caespitose perennials. Culms 15–65 cm high; nodes glabrous. Leaves basal and cauline; sheaths 3–6 mm long, tubercle based hairs, mouth pubescent; ligules fimbriate; blades 5–21 × 0.2–0.4 cm, lanceolate, hispid hairy, base rounded-truncate, apex attenuate. Panicles 8–15 cm long, branches lax. Spikelets 4–6 × 1 mm, lanceolate, glabrous. Lower glume 3–3.5 × 0.3–0.6 mm, ovate-lanceolate, chartaceous, 3-nerved, apex acuminate-aristate. Upper glume 4.5–5 × 0.5–0.6 mm, lanceolate, chartaceous, 5-nerved, apex aristate. Florets 2; lower male-neuter; upper bisexual. Lower lemma 3.5–4 × 0.5–1 mm, elliptic, chartaceous, 5-nerved, apex obtuse-emarginate. Lower palea 2.5–3 × 0.5–0.6 mm, elliptic, apex acuminate.

Upper lemma 2–3 × 0.6–1 mm long, ovate-lanceolate, membranous-coriaceous, granulate, 5-nerved, awn 5–10 mm long, with 2 setae. Upper palea 1.5–2 × 0.2–0.6 mm, oblong, membranous, 2-nerved, hyaline, apex obtuse. Lodicules 2. Stamens 3.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in Mahabubnagar, Rangareddy and Vikarabad Districts.

Exsicc.: Mahabubnagar District: Appapur, BSS & MSR 32229 (SKU); Rangareddy District: Hyderabad, 02110 (HY).

Note: This species is closely allied to *A. tuberculata* but can be distinguished by its glabrous and smaller spikelets.

5. *Arundinella tuberculata* Munro ex Lisboa in J. Bombay Nat. Hist. Soc. 5: 344. 1891; Hook.f., Fl. Brit. India 7: 69. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 425. 1960; Pull., Fl. Telangana 3: 1177. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 325. 2020. Annuals. Culms 10–50 cm high, decumbent; nodes hairy. Leaves basal and cauline; sheaths 1.5–7.5 compressed, tubercled based hairs; ligules a rim of hairs; blades 2–8.5 × 0.3–0.6 cm, linear-lanceolate, tubercle based hairy, apex acuminate. Panicles 8–12 cm long, narrow. Spikelets 3.5–6 × 1.5–2 mm, ovoid, hairy, awned. Lower glume 3–4 × 1 mm, ovate, 3-nerved, densely hairy, apex acuminate. Upper glume 4–4.5 × 1.3 mm, ovate, membranous, 5-nerved, hairy on nerves, apex acuminate (beak like). Florets 2; lower male-neuter; upper bisexual. Lower lemma 4–4.4 × 0.5–1 mm, elliptic, coriaceous, apex obtuse-emarginate. Lower palea 3.5–4 × 0.5–1 mm, lanceolate, 2-nerved, 2-keeled, apex acute. Upper lemma 2–2.5 × 0.5–1 mm, lanceolate, crustaceous, abaxial surface scabrid, awn 11–14 mm long, two setae 2–2.5 mm long. Upper palea 2 × 0.6 mm, ovate-elliptic, adaxial surface tuberculate, margin inflexed, 2-nerved, apex acute. Lodicules 2. Stamens 3. Caryopsis 1.5–2 × 0.5 mm, ovate.

Fl. & Fr.: Nov.–Dec.

Distrib.: Occasionally in Vattavarlappally. Endemic-India (Andhra Pradesh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Telangana, Uttarakhand).

Exsicc.: Mahabubnagar District: Vattavarlappally, BSS & SKB 30573 (SKU).

Note: It is closely allied to *A. setosa* but can be distinguished by tubercle based hairy leaves and spikelets.

***Garnotia* Brongn.**

World: c. 29 spp.; India: 12 spp., 1 var.; Telangana: 1 sp.

Garnotia tenella (Arn. ex Miq.) Janowski, Repert. Spec. Nov. Regni Veg. 17: 86. 1921; Pull., Fl. Telangana 3: 1142. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 376. 2020. *Berghausia tenella* Arn. ex Miq., Anal. Bot. Ind. 2: 34. 1851. *Garnotia stricta* sensu Hook.f., Fl. Brit. India 7: 243. 1896, non Brongn., 1832; C.E.C.Fisch. in Gamble, Fl. Madras 1776. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 568. 1960.

Plate 117

Caespitose annuals. Culms 15–100 cm high, erect or geniculate; nodes villous. Leaves basal and cauline; sheaths 2–10 cm long, keeled, glabrous; ligules fimbriate; blades 5–22 × 0.2–1 cm, linear-lanceolate, hispid, apex acute. Panicles



Plate 117. *Garnotia tenella* (Arn. ex Miq.) Janowski: A. Habitat; B&C. Spikelets; D. Lower glume; E. Upper glume; F. Lemma; G. Palea; H. Lodicules; I. Caryopsis.

4.5–28 cm long, lax or narrowly contracted, branches fascicled, scaberulous. Spikelets 2–3.5 × 0.4–0.6 mm, lanceolate. Lower glume 2–3.5 × 0.4–0.6 mm, lanceolate, membranous, 3-nerved, apex acuminate. Upper glume 2–3.5 × 0.3–0.5 mm, lanceolate, membranous, apex acuminate. Lemma 2–3.5 × 0.5 mm, lanceolate, 3-nerved, margin inflexed, apex notched, awn 5–15 mm long. Palea 1.5–2 × 0.3 mm, ovate-lanceolate, chartaceous, margin inflexed, apex acute. Lodicules 2. Stamens 3. Caryopsis 1.2 × 0.4 mm, elliptic.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional along roadsides, in forest clearings and on old moist walls.

Exsicc.: Mahabubnagar District: Umamahewaram, 08.02.1998, *SRS* 109137 (BSID); 26.11.1999, *SRS* 111376 (BSID); Mallayalodhi, 21.10.2016, *LR & JS* 7383 (BSID); Warangal District: Regonda, *CSR* 1088 (KU).

Note: It can be distinguished by its lax or contracted panicle bearing 5–15 mm long awned narrowly ovate spikelets.

TRIBE: ANDROPOGONEAE

Key to the genera

- 1a. Spikelets unisexual ... 2
- 1b. Spikelets bisexual ... 4
- 2a. Female spikelets completely enclosed in a bead like utricle ... **Coix**
- 2b. Female spikelets not enclosed in a bead like utricle ... 3
- 3a. Female and male spikelets on separate racemes or spikes, female axillary, male terminal ... **Zea**
- 3b. Female and male spikelets on same raceme, female below and male above ... **Polytoca**
- 4a. Spikelets solitary ... 5
- 4b. Spikelets paired or triads ... 6
- 5a. Spikelets awned; rachis not fragile at nodes ... **Dimeria**
- 5b. Spikelets unawned; rachis fragile at nodes ... **Ophiuros**
- 6a. Inflorescence without an elongated central axis; racemes solitary, digitate or subdigitate ... 7
- 6b. Inflorescence with an elongated central axis, paniculate or pseudopaniculate ... 23
- 7a. Racemes solitary ... 8
- 7b. Racemes more than 2 ... 13
- 8a. Sessile spikelets globose, many pitted on dorsal surface ... **Hackelochloa**
- 8b. Spikelets not as above ... 9
- 9a. Pedicels fused to internodes, sometimes only in lower half or tip; spikelets unawned ... **Rottboellia**
- 9b. Pedicels free; spikelets awned ... 10
- 10a. Spikelets of each pair similar; joints, pedicels and callus long bearded ... **Pogonatherum**
- 10b. Spikelets of each pair dissimilar; joints, pedicels and callus not as above ... 11
- 11a. Joints and pedicels flat, clavate, three ridged on one side; groups of spikelets easily disarticulating; upper glume awned ... **Sehima**
- 11b. Joints and pedicels not as above; upper glume unawned ... **Heteropogon**
- 12a. Spikelets lower 2 to 3 pairs dissimilar, sessile, male; upper pairs similar, both pedicelled; lower glume with transverse row of hair tufts ... **Lophopogon**
- 12b. Spikelets and lower glume not as above ... 13
- 13a. Spikelets of each pair similar ... 14
- 13b. Spikelets of each pair dissimilar ... 16
- 14a. Lower glume of sessile spikelet with a median furrow on dorsal side; spikelets seldom conspicuously hairy ... **Microstegium**
- 14b. Lower glume of sessile spikelet without a median furrow on dorsal side; spikelets conspicuously villous ... 15
- 15a. Upper lemma two-toothed, awned ... **Eulaliopsis**
- 15b. Upper lemma deeply cleft, awned in the cleft ... **Eulaia**
- 16a. Pedicels and joints with a translucent median line ... **Bothriochloa**
- 16b. Pedicels and joints without a translucent median line ... 17
- 17a. Upper lemma of sessile spikelet with awn basal or sub-basal ... **Arthraxon**
- 17b. Upper lemma of sessile spikelet with awn terminal or in sinus of upper cleft ... 18

- 18a. Pedicel barren ... **Apocopis**
- 18b. Pedicel bearing a spikelet ... 19
- 19a. Lower floret of sessile spikelet male or very rarely barren, but always with a palea; lower glume of sessile spikelet with nodules or wrinkles or when smooth ... 20
- 19b. Lower floret of sessile spikelet barren and epaleate; lower glume of sessile spikelet not with nodules or wrinkles ... 21
- 20a. Pedicelled spikelet well developed; lower glume often transversely wrinkled, furrowed or with nodules on margins ... **Ischaemum**
- 20b. Pedicelled spikelet reduced to a linear curved pedicel, lower glume covered all over with transverse ridges, broken up into warts or teeth ... **Thelepogon**
- 21a. Lower glume of sessile spikelet dorsally 2-keeled at least towards apex; upper lemma of sessile spikelet well developed, cleft at apex with awn in sinus ... 22
- 21b. Lower glume of sessile spikelet dorsally rounded; upper lemma of sessile spikelet reduced to hyaline base of awn ... **Dichanthium**
- 22a. Racemes solitary, terminal, branched; pedicelled spikelet male, neuter or suppressed ... **Diectomis**
- 22b. Racemes 2-nate, digitate, usually all pairs of spikelets heterogamous and all sessile spikelets hermaphrodite ... **Andropogon**
- 23a. Racemes subtended by an involucre of 2 opposite pairs of one flowered homogamous spikelets ... 24
- 23b. Racemes not subtended by an involucre of 2 opposite pairs of one flowered homogamous spikelets ... 25
- 24a. Involucral spikelets pedicellate, deciduous; callus of bisexual spikelets not pointed ... **Iseilema**
- 24b. Involucral spikelets sessile, persistent; callus of bisexual spikelets usually pointed ... **Themada**
- 25a. Rachis joints and pedicels stout, thickening upwards ... **Apluda**
- 25b. Rachis joints and pedicels slender ... 26
- 26a. Spikelets of a pair similar; both bisexual ... 27
- 26b. Spikelets of a pair dissimilar; only one bisexual ... 29
- 27a. Spikelets awned ... **Spodiopogon**
- 27b. Spikelets unawned ... 28
- 28a. Panicle contracted and silvery white; rachis of raceme tough and not breaking up, both spikelets pedicelled ... **Imperata**
- 28b. Panicle not as above, if contracted not silvery white; rachis of raceme not tough, breaking up, one spikelet pair sessile ... **Saccharum**
- 29a. Pedicels and joints with a median translucent line, branches capillary ... **Capillipedium**
- 29b. Pedicels and joints without a median translucent line ... 30
- 30a. Panicle interrupted by spathes ... 31
- 30b. Panicle not interrupted by spathes ... 32
- 31a. Racemes solitary in upper axils forming a false panicle; pedicelled spikelets barren, reduced to glumes; glumes aristate ... **Schizachyrium**
- 31b. Racemes 2 or more together; pedicelled spikelets male, well developed; glumes not aristate ... **Cymbopogon**
- 32a. Lower glume of sessile spikelet laterally compressed; spikelets all in threes, one sessile and two pedicelled ... **Chrysopogon**
- 32b. Lower glume of sessile spikelet dorsally compressed; spikelets the upper ones in threes and rest paired, or all paired ... 33
- 33a. Spikelets paired throughout; glumes of sessile spikelets subcoriaceous ... 34
- 33b. Spikelets in threes towards apex and paired elsewhere; glumes of sessile spikelets firmly cartilaginous ... **Pseudosorghum**

- 34a. Culm nodes glabrous or pubescent; Sessile spikelet lemma awns absent or short;
Pedicelled spikelets 2-7 mm long ...**Sorghum**
- 34b. Culm nodes bearded with stiff hairs; Sessile spikelet lemma awns 2-9 cm long;
Pedicelled spikelet 5-18 mm long ...**Sarga**

Andropogon L.

World: c. 127 spp.; India: 8 spp., 1 var.; Telangana: 1 sp.

Andropogon pumilus Roxb., Fl. Ind. 1: 277. 1820; Hook.f., Fl. Brit. India 7: 170. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1753. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 93. 1960; Pull., Fl. Telangana 3: 1064. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 678. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 319. 2020. '*Goudal*'

Plate 118

Caespitose annuals. Culms 12–33 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 2–5 cm long, keeled, ribbed; ligules membranous; blades 2–14 × 0.2–0.3 cm, linear, glabrous, apex acuminate. Racemes 2; 1.5–2.5 cm long, digitate, spatheate, spathes 2–2.5 cm long. Spikelets 2, sessile and pedicelled. Sessile spikelets 3–4.45 × 0.5–0.8 mm, oblong; callus glabrous. Lower glume 3–3.5 × 0.5–1 mm, lanceolate, abaxial surface flat, 2-nerved, 2-keeled, keel scabrid, margin inflexed, apex bifid. Upper glume 4–4.5 × 0.5–0.8 mm, lanceolate, 1-keeled, keel scabrid, rugose, aristate 0.5–0.7 mm long. Florets 2; lower barren; upper bisexual. Lower lemma 2–2.8 mm long, linear-lanceolate, chartaceous, hyaline, apex acuminate. Lower palea c. 1 mm long, membranous, apex acute. Upper lemma 2–2.6 × 0.5 mm, linear, chartaceous, margin infolded, apex bifid, awn from sinus, 16–23 mm long. Pedicelled spikelet 2–3.8 mm long, lanceolate. Pedicels with ciliate margins. Lower glume c. 3.5 mm long, ovate-lanceolate, chartaceous, 1-nerved, apex acuminate. Upper glume c. 3.5 mm long, lanceolate, chartaceous, 3-nerved, apex acuminate. Lemma hyaline. Upper lemma male.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the State.

Exsicc.: Adilabad District: Choutkoor, *TP & MSG* 11928 (SKU); Rangareddy District: Palugutta, 30.11.2019, *SNR* 8774 (BSID), Hyderabad, *MVR* 02101 (HY); Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8717 (BSID).

Apluda L.

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Apluda mutica L., *Sp. Pl.* 82. 1753; C.E.C.Fisch. in Gamble, Fl. Madras 1750. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 93. 1960; Pull., Fl. Telangana 3: 1064. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 678. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 320. 2020. *Apluda varia* subsp. *aristata* (L.) Hack., *Monogr. Phan.* 6: 196. 1889; Hook.f., *Fl. Brit. India* 7: 150. 1896. '*Adavi-Korregaddi*'

Plate 119

Caespitose perennials. Culms about 210 cm high, erect or creeping; nodes glabrous. Leaves basal and cauline; sheaths compressed; ligules membranous; blades 5–33 × 0.3–1 cm, linear-lanceolate or filiform, base narrowed, petiolate,

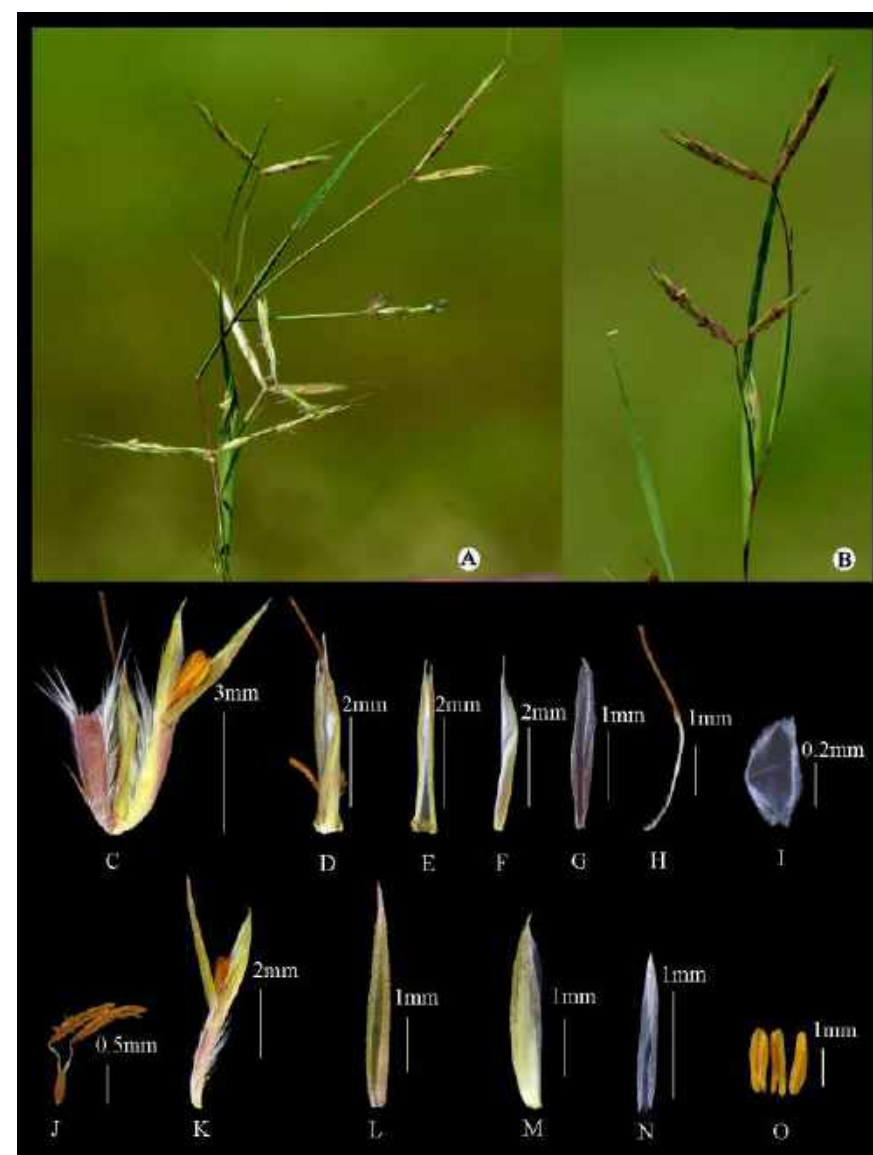


Plate 118. *Andropogon pumilus* Roxb.: A&B. Inflorescence; C. Spikelet; D. Sessile spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Upper lemma; I. Upper palea; J. Pistil; K. Pedicelled spikelet; L. Lower glume; M. Upper glume; N. Lemma; O. Anthers.

nerves hirsute, apex attenuate-acuminate. Panicle 5–38 cm long, solitary, spathes cymbiform. Spikelets 3, one sessile and two pedicelled. Sessile spikelets 5–6 mm long, laterally compressed, awned, bisexual. Lower glume 5–6.5 mm long, linear, up to 13-nerved, 2-keeled, apex bifid. Upper glume 5–6 mm long, boat shaped, 5–13-nerved. Lower florets male, upper bisexual. Lower lemma 2–2.5 mm long, membranous, hyaline. Palea hyaline. Upper lemma 4–5 mm long, linear-lanceolate, 3-nerved, apex notched, awn 6–18 mm long, geniculate. Palea

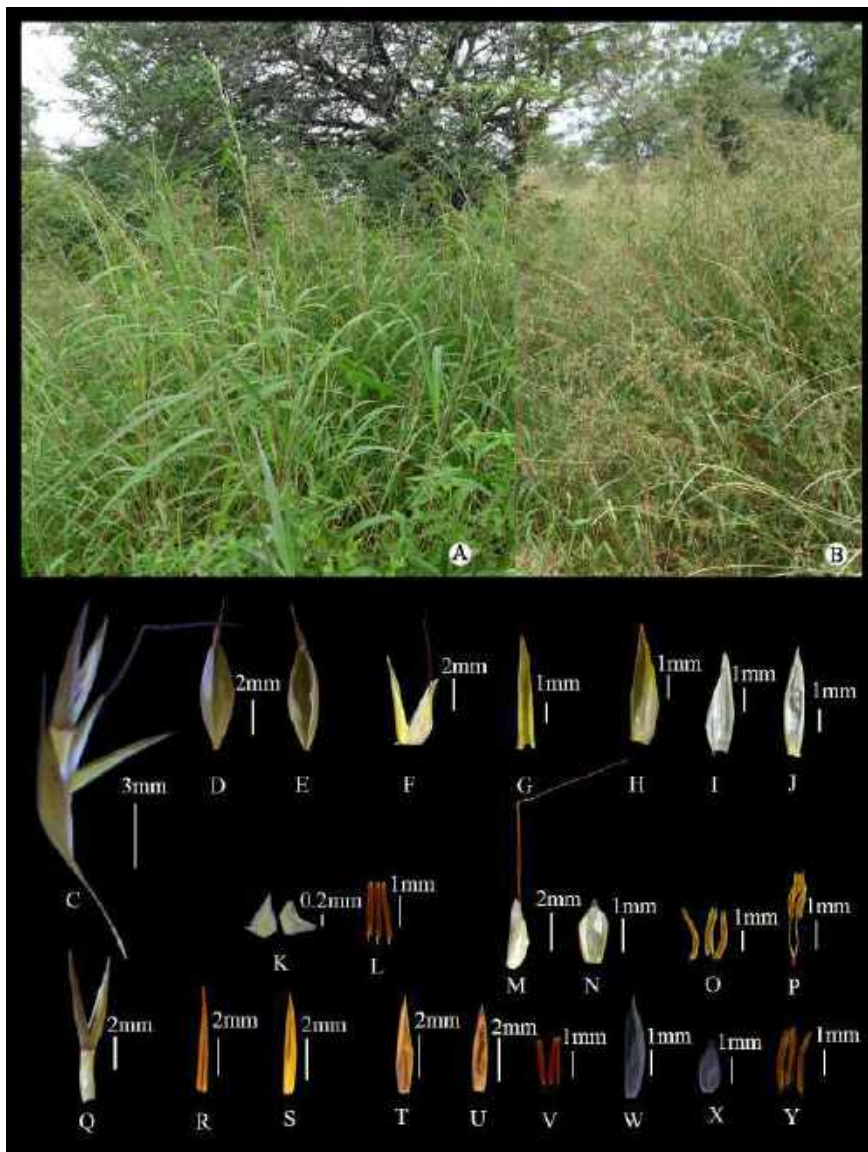


Plate 119. *Apluda mutica* L.: A&B. Habitat; C. Spikelet; D&E. Abaxial and adaxial view of spathe; F. Spikelet; G. Lower glume; H. Upper glume; I. Lower lemma; J. Upper lemma; K. Lodicules; L. Stamens; M. Upper lemma; N. Upper palea; O. Stamens; P. Pistil; Q. Pedicelled spikelet; R. Lower glume; S. Upper glume; T. Lower lemma; U. Lower palea; V. Stamens; W. Upper lemma; X. Upper palea; Y. Stamens.

2–3 mm long, 2-keeled, chartaceous, hyaline, bisexual. Caryopsis 2–2.5 mm long, oblong. Pedicelled spikelets 4–5.5 mm long, falcate, margin ciliate. Pedicels c. 1.8 mm long. Lower glume 4–5 mm long, lanceolate, 7–13-nerved. Upper glume similar to lower glume, 4–11-nerved. Florets similar to sessile spikelets. Upper spikelets reduced to a broad pedicel.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common throughout the state. Fodder grass.

Exsicc.: Rangareddy District: CU, MSM 12739 (SKU); Hyderabad: MVR 02102 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8720, 8726 (BSID); Warangal District: Regional Agricultural Research Station-Warangal, 28.03.2021, SNR 012018 (BSID).

Note: Highly polymorphic species with creeping and erect habit with slender and stout culms.

Arthraxon P. Beauv.

World: c. 23 spp.; India: 9 spp., 6 var.; Telangana: 5 spp., 2 var.

Key to the species

- | | | |
|-----|--|------------------------------|
| 1a. | Lower glume of sessile spikelets rounded on back; stamens 2 | ... 2 |
| 1b. | Lower glume of sessile spikelets flat on back; stamens 3 | ... 4 |
| 2a. | Pedicelled spikelets well developed | ... 5. <i>A. lancifolius</i> |
| 2b. | Pedicelled spikelets reduced | ... 3 |
| 3a. | Margins of lemma smooth | ... 3. <i>A. hispidus</i> |
| 3b. | Margins of lemma pilose | ... 1. <i>A. castratus</i> |
| 4a. | Lower glume of sessile spikelets smooth, keels spinulosly hispid | ... 2. <i>A. depressus</i> |
| 4b. | Lower glume of sessile spikelets spiculate, keels tubercled | ... 4. <i>A. lanceolatus</i> |

1. *Arthraxon castratus* (Griff.) V. Naray. ex Bor, Fl. Assam 5: 376. 1940; Bor, Grasses Burma, Ceylon, India & Pakistan 99. 1960; Welzen in Blumea 27 (1): 263. 1981; Pull., Fl. Telangana 3: 1072. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 322. 2020. *Andropogon castratus* Griff., Not. Pl. Asiat. 3:89. 1851. *Arthraxon rudis* (Steud.) Hochst. in flora 39: 188. 1856; C.E.C. Fisch. in Gamble, Fl. Madras 1728. 1934.

Caespitose perennials. Culms 40–55 cm high; decumbent; nodes glabrous, lower nodes rooting. Leaves basal and cauline; sheaths 2–3.5 cm long, pilose-hirsute, tubercle based hairs, margin ciliate; ligules hairy; blades 2–8 × 0.5–1.5 cm, ovate-lanceolate, margins bulbous based hairy, sparsely pilose on surfaces, apex acuminate. Racemes 5–6.5 cm long. Spikelets paired. Sessile spikelets 5.5–6.5 × 1.5–1.7 mm, ovate, appressed pubescent; callus bearded. Lower glume 5.5–6 × 1–1.2 mm, lanceolate, subcoriaceous, rounded on back, apex acute, 7-nerved, 2-keeled; keels spinulose. Upper glume 5.5–6.2 × 1–1.2 mm, oblong-cymbiform, 3-nerved, apex erose, keeled; keels spinulose. Florets 2; lower neuter, upper bisexual. Lower lemma 4–4.5 × 0.8–1 mm, oblong, membranous, margins pilose, apex acute. Lower palea absent. Upper lemma 3–5 × 0.6–0.8 mm, lanceolate, membranous, 3-nerved, margins pilose, apex acute; awn from back near basal, 10–14 mm long, geniculate, barbellate. Palea 1.5–2 × 0.6–0.8 mm, oblong, membranous, margins pilose, apex acute. Anthers 3. Caryopsis 1.8–2 mm long. Pedicelled spikelets reduced to a stipe, 1.5–3 mm long, at times well developed.

Fl. & Fr.: Nov.–Mar.

Distrib.: Occasional on higher elevations.

Exsicc.: Vikarabad: Anathagiri hills, 2.12.2019, SNR 12058 (BSID).

Note: It can be identified by pedicelled spikelets reduced and lower glume speculate.

2. *Arthraxon depressus* Stapf ex C.E.C.Fisch. in Bull. Misc. Inform. Kew 1933: 349. 1933 & in Gamble, Fl. Madras 3: 1728. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 99. 1960; Pull., Fl. Telangana 3: 1072. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 322. 2020.

Perennials. Culms 60–90 cm high, geniculate; nodes glabrous. Leaves cauline; sheaths 2–2.5 cm, long, terete; ligules scarious, sparsely hairy; blades 2–5 × 1–2.5 cm, ovate or oblong-lanceolate, margins tuberculate, pilose, base amplexicaul. Racemes 2–4; 4–6 cm long. Joints densely ciliate, compressed. Sessile spikelets 6.5–7 × 1.5–1.8 mm, callus bearded. Lower glume 5–6 × 1–1.3 mm, linear-lanceolate, coriaceous, 7-nerved, keeled; keels spinulose, hispid. Upper glume 5–6.1 × 1–1.5 mm, lanceolate, 3-nerved, keeled, apex acuminate. Florets 2; lower neuter, upper hermaphrodite. Lower lemma 4.5–5 × 0.4–0.5 mm, lanceolate, hyaline. Lower palea absent. Upper lemma 4–4.3 mm long, apex bifid, awned; awn from back near the base, 5–8 mm long, geniculate. Upper palea 2–3 × 0.1–0.2 mm, oblong, hyaline. Anthers 3. Caryopsis ovoid-ellipsoid. Pedicelled spikelet reduced to a stipe, 2–3 mm long, ciliate.

Fl. & Fr.: Sep.–Dec.

Distrib.: Occasionally in Karimnagar.

Exsicc.: Karimnagar District: Shanigaram, *AHN* 960955 (KU).

Note: It is closely similar to *A. castratus* but differs by its smooth lemma.

3. *Arthraxon hispidus* (Thumb.) Makino, Bot. Mag. (Tokyo) 26: 214. 1912; C.E.C.Fisch. in Gamble, Fl. Madras 1728. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 99. 1960; Welzen in Blumea 27 (1): 266. 1981; Pull., Fl. Telangana 3: 1072. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 681. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 322. 2020. *Phalaris hispida* Thumb., Fl. Jap. 44. 1784. *Arthraxon quartinianus* (A. Rich.) Nash, N. Amer. Fl. 17(2): 99. 1912; C.E.C.Fisch. in Gamble, Fl. Madras 1728. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 102. 1960. *Alectoridia quartinianus* A. Rich., Tent. Fl. Abyss. 2: 448. t. 102. 1851.

Plate 120

Mat-forming, annuals. Culms 10–50 cm high, erect or prostrate, slender; nodes thickened, lower nodes rooting. Leaves cauline; sheaths 1–2.5 cm long, keeled, glabrous-hispid, terete, base margins ciliate; ligules membranous, apex fimbriate; blades 1–4.5 × 0.4–0.5 cm, ovate-lanceolate, margins tubercle based hairy, glabrous or hairy, apex acute. Racemes 1.5–3 cm long, joints ciliate. Spikelets paired, 3.5–4 × 0.5–0.6 mm, solitary. Lower glume 3–4 × c. 0.5 mm, ovate, scabrid on back, 7–9-nerved, margins minutely toothed, apex acuminate. Upper glume 2.8–3 × 0.4–0.5 mm, ovate, chartaceous, hispid on back, apex acuminate, 3-nerved, 1-keeled; keels scabrid. Florets 2; lower neuter; upper hermaphrodite. Lower lemma 2–3 × 0.5–0.6 mm, lanceolate, membranous, hyaline, apex acute. Lower palea absent. Upper lemma 1.8–3 × 0.4–0.5 mm, lanceolate, chartaceous, awned; awn basifixed, 7–10 mm long, geniculate, barbellate. Upper palea absent.



Plate 120. *Arthraxon hispidus* (Thunb.) Makino: A. Habitat; B. Inflorescence; C. Spikelets; D. Lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Caryopsis.

Anthers 2. Caryopsis 1.5–2 mm long, linear-oblong, Pedicelled spikelet absent.

Fl. & Fr.: Sep.–Dec.

Distrib.: Commonly found in shady habitats in forests, fallow lands and along banks of streams.

Exsicc.: Adilabad District: Birsaijet-Range, Rampur-Beat, *APS* 4010 (BSID); Vikarabad District: Ananthagiri hills, 30.11.2019, *SNR* 8785, 8786 (BSID); Damagundam, 02.12.2019, *SNR* 8911 (BSID).

Note: It can be easily identified by the absence of pedicelled spikelets.

4. *Arthraxon lanceolatus* (Roxb.) Hochst., *Flora* 39: 188. 1856; Hook.f., *Fl. Brit. India* 7: 143. 1896; C.E.C.Fisch. in Gamble, *Fl. Madras* 1728. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 100. 1960; Welzen in *Blumea* 27 (1): 281. 1981; Pull., *Fl. Telangana* 3: 1073. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 683. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 322. 2020. *Andropogon lanceolatus* Roxb., *Fl. Ind.* 1: 262. 1820. *Arthraxon prionodes* (Steud.) Dandy, *Fl. Pl. Sudan* 399. 1956*.

***Note:** *Arthraxon prionodes* was treated as valid species by World Grass Data Base (2020) & POWO (2020) but, while revising the genus *Arthraxon*, Welzen (1981) treated it under the var. *lanceolatus* as synonym, present work followed the same.

Key to the varieties

- | | | |
|-----|---|---------------------------------|
| 1a. | Broad based spicules on marginal and submarginal nerves | ... 4a. var. <i>lanceolatus</i> |
| 1b. | Broad based spicules on all nerves | ... 4b. var. <i>echinatus</i> |

4a. var. *lanceolatus*

Plate 121

Caespitose perennials. Culms 55–70 cm high, geniculate; nodes pubescent, lower nodes rooting. Leaves cauline; sheaths 1–3.5 cm, ribbed, bulbous based hairy, margin ciliate; ligules hairy; blades 1–4.5 × 0.3–1.3 cm, ovate-lanceolate, puberulous, margins bulbous based hairy. Racemes 2.5–6 cm long, branched. Spikelets binate. Sessile spikelets 4–6 × 0.5–0.6 mm, lanceolate; callus bearded. Lower glume 4–5 × 0.5–0.6 mm, oblong-lanceolate, subcoriaceous, margins inflexed, 5–7-nerved, 2-keeled; marginal and submarginal nerves with broad based (pectinate) spicules. Upper glume 4–4.5 × 0.6–0.8 mm, elliptic, chartaceous, obscurely nerved, apex acute-obtuse. Florets 2; lower neuter, upper hermaphrodite. Lower lemma 4 × 0.4–0.6 mm, linear, chartaceous, apex acute. Lower palea absent. Upper lemma 3–3.3 × 0.5–0.6 mm, linear, membranous, apex bifid, awned; awn from just below the base, 8–12 mm long, geniculate, smooth. Upper palea absent. Anthers 3. Caryopsis 2.5–3 × 0.5 mm, oblong. Pedicelled spikelets 4.5–5 × 0.6–0.8 mm, linear-lanceolate. Lower glume 3.5–4 × 0.4–0.7 mm, oblong, chartaceous, apex acuminate. Upper glume 3–3.5 × 0.6–0.8 mm, oblong, margin ciliate, apex acute. Florets 2, lower barren, upper hermaphrodite. Lower lemma c. 4 mm long, oblong, hyaline, apex acute. Lower palea absent. Upper lemma 1.5–2 × 0.2–0.5 mm, oblong, apex acute. Upper palea absent.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in forests, rocky crevices and in grassy, patches.

Exsicc.: Adilabad District: Kunthala way to Nirmal, *MHR* 13263 (SKU); Khammam District: Yenkun, *RR* 108571 (BSID); Mahabubnagar District: Appapur, *AMSR* 25693 (SKU); Suryapeta District: Undrugonda, 27.10.2019, *SNR* 8754 (BSID); Rangareddy District: Hyderabad, *MVR* 02107 (HY), Manasa hills-Rajendranagar, 24.10.2019, *SNR* 8697 (BSID), Palugutta, 30.11.2019, *SNR* 8777 (BSID).

4b. var. *echinatus* Hochst., *Flora* 39: 188. 1856; C.E.C.Fisch. in Gamble, *Fl. Madras* 1728. 1934; Bor, *Grass. Burma Ceylon India Pakistan* 100. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 322. 2020. *Arthraxon spathaceus* Hook.f., *Fl. Brit. India* 7: 145. 1896.

Plate 122

Sessile spikelets 5–6.8 × 1–1.8 mm; lower glume 5–7-nerved, broad based

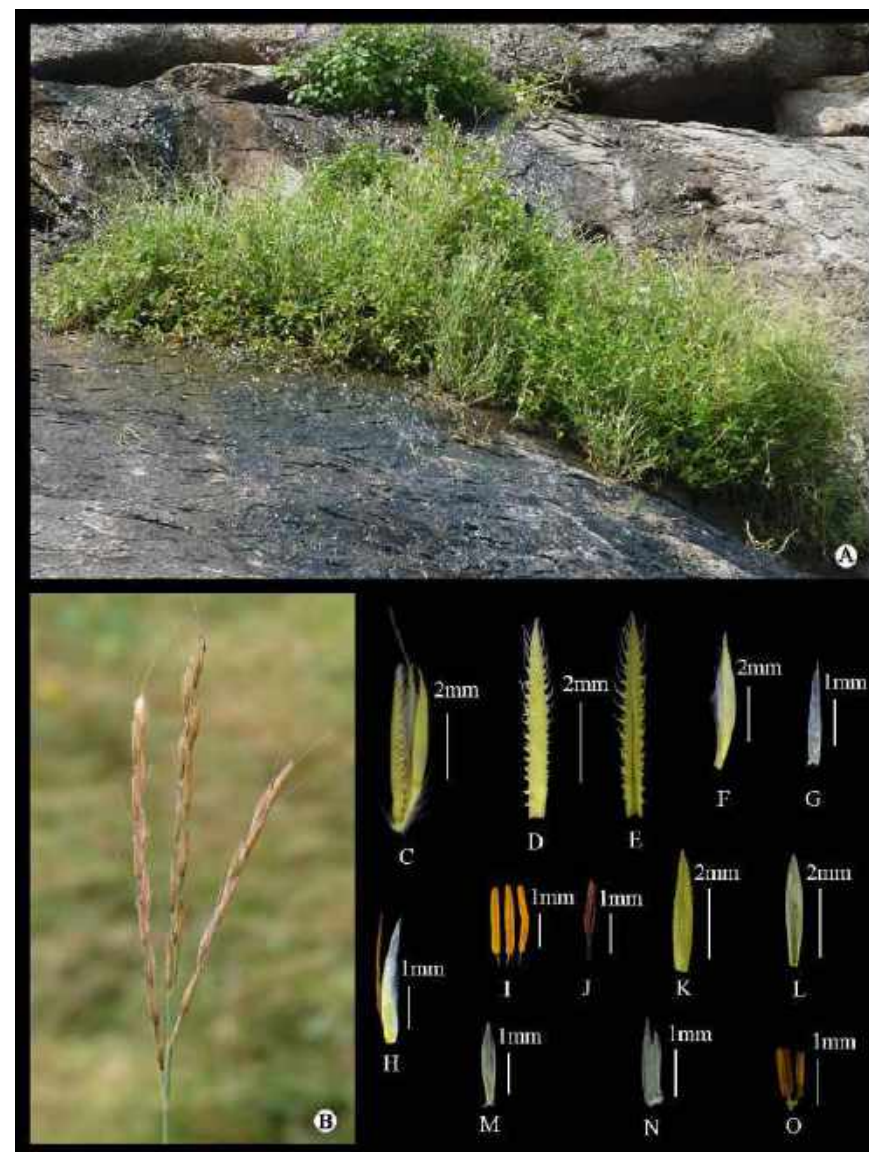


Plate 121. *Arthraxon lanceolatus* var. *lanceolatus* (Roxb.) Hochst.: A. Habitat; B. Inflorescence; C. Spikelets; D&E. Abaxial and adaxial view of lower glume; F. Upper glume; G. Lower lemma; H. Upper lemma; I. Stamens; J. Pistil; K–O. Pedicelled spikelet; K. Lower glume; L. Upper glume; M. Lemma; N. Palea; O. Stamens.

spicules on all nerves, margins glabrous; anthers 3.

Fl. & Fr.: Jun.– Aug.

Distrib.: Occasionally in Vikarabad District.

Exsicc.: Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8721 (BSID).

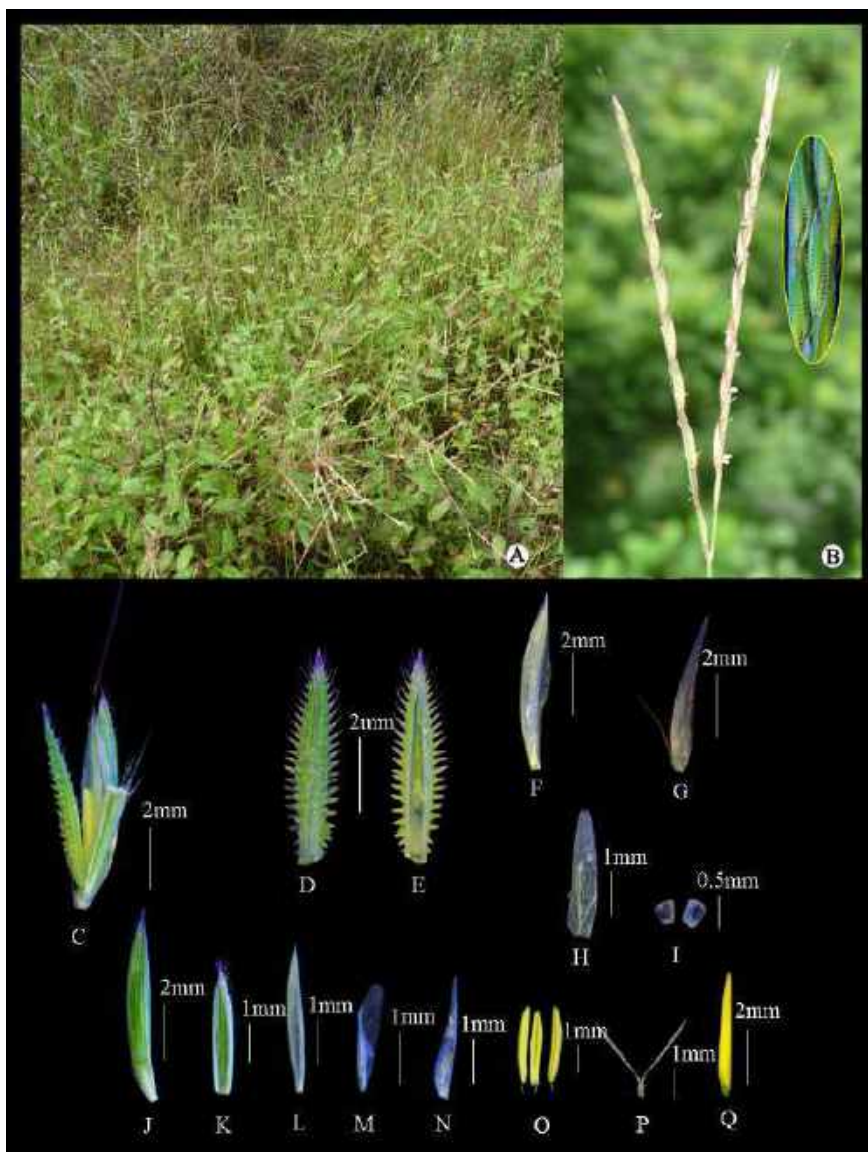


Plate 122. *Arthraxon lanceolatus* var. *echinatus* (Nees) Hack.: A. Habitat; B. Inflorescence; C. Sessile spikelet; D&E Abaxial and adaxial view of lower glume; F. Upper glume; G. Lemma; H. Palea; I. Lodicules; J–Q. Pedicelled spikelet; J. Spikelet; K. Lower glume; L. Upper glume; M. Lemma; N. Palea; O. Stamens; P. Pistil; Q. Caryopsis.

5. *Arthraxon lancifolius* (Trin.) Hochst., Flora 39: 188. 1856; C.E.C.Fisch. in Gamble, Fl. Madras 1729. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 100. 1960; Welzen in Blumea 27 (1): 288. 1981; Pull., Fl. Telangana 3: 1073. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 323. 2020. *Andropogon lancifolius* Trin., Mem. Acad. Imp. Sci. St.-Petersbourg, Ser. 6, Sci, Math. 2(4): 271. 1832. **Plate 123**



Plate 123. *Arthraxon lancifolius* (Trin.) Hochst.: A&B. Basal sheath with habit; C. Inflorescence; D. Sessile and pedicelled spikelets; E. Lower glume of sessile spikelet; F. Upper glume of sessile spikelet.

Mat-forming; annuals. Culms 10–45 cm high, creeping; nodes softly villous, lower nodes rooting. Leaves cauline; sheaths 1–1.3 cm long, margin ciliate, keeled; ligules membranous; blades 0.5–3.5 × 0.2–0.8 cm, ovate-lanceolate, villous, base rounded, margins hairy, apex acuminate. Racemes 2.5–3 cm long. Joints c. 1 cm long, densely hairy. Sessile spikelets 2–2.9 × 0.4–0.5 mm, linear, apex acuminate; callus hairy. Lower glume 2–3 × 0.4–0.5 mm, lanceolate, chartaceous, back rounded, margin flat, apex shortly aristate, 5-nerved, 2-keeled; keels scabrid.

Upper glume 2–3 × 0.3–0.4 mm, lanceolate, chartaceous, 1-keeled, apex aristate. Florets 2; lower neuter, upper hermaphrodite. Lower lemma 0.6–0.8 × 0.2–0.3 mm, lanceolate, membranous, hyaline, apex acuminate. Lower palea absent. Upper lemma 1–1.3 × 0.2–0.4 mm, lanceolate, apex notched, awned; awn from just above base, 4.5–6 mm long, geniculate, barbellate. Anthers 2. Caryopsis 1–2.5 mm long, terete. Pedicelled 1.5–2.5 × 0.3–0.4 mm, lanceolate. Lower glume c. 1.5 × 0.5 mm, lanceolate-oblong, chartaceous, apex acuminate, 2-lobed. Lower palea absent. Upper glume reduced, c. 1 mm long.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in rocky crevices and moist habitats.

Exsicc.: Adilabad District: Sattennapally, *TP & PVP* s.n. (SKU); Thadlapet-Range, Mallayal-Beat, *APS* 3968 (BSID); Khammam District: Yenkun, *RR* 108572 (BSID); Mahabubnagar District: Appapur, *BSS & SKB* 32222 (SKU); Rangareddy District: Hyderabad, *MVR* 02108 (HY); Vikarabad District: Naskal, 1.12.2019, *SNR* 8793, 8794 (BSID).

Bothriochloa Kuntze

World: c. 37 spp.; India: 13 spp.; Telangana: 7 spp.

Key to the species

- | | | |
|-----|--|-----------------------------------|
| 1a. | Lower racemes longer than the rachis | ... 2 |
| 1b. | Lower racemes shorter than the rachis | ... 1. <i>B. bladhii</i> |
| 2a. | Lower glume of sessile spikelet hairy below the middle | ... 3 |
| 2b. | Lower glume of sessile spikelet glabrous | ... 2. <i>B. insculpta</i> |
| 3a. | Lower glume of sessile spikelet with 1 or more pits | ... 4 |
| 3b. | Lower glume of sessile without pits | ... 5 |
| 4a. | Racemes 9–15, up to 8 cm long | ... 4. <i>B. kuntzeana</i> |
| 4b. | Racemes 2–8, up to 5 cm long | ... 5. <i>B. pertusa</i> |
| 5a. | Leaf sheath terete | ... 6. <i>B. pseudoishchaemum</i> |
| 5b. | Leaf sheath keeled | ... 6 |
| 6a. | Leaves mostly at base, lower glume of sessile spikelet, 5–7 nerved | ... 3. <i>B. ischaemum</i> |
| 6b. | Leaves cauline, lower glume of sessile spikelet 8–12 nerved | ... 7. <i>B. woodrowii</i> |

1. *Bothriochloa bladhii* (Retz.) S.T. Blake in Proc. Roy. Soc. Queensland 80: 62. 1969; Pull., Fl. Telangana 3: 1078. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 327. 2020. *Andropogon bladhii* Retz., Observ. Bot. 2: 27. 1781. *Dichanthium bladhii* (Retz.) Calyton in Kew Bull. 32: 3. 1977; Bor, Grasses Burma, Ceylon, India & Pakistan 107. 1960. *Bothriochloa glabra* (Roxb.) A.Camus, Ann. Soc. Linn. Lyon sér. 2, 76: 164. 1931.

Plate 124(A)

Caespitose, perennials, rhizomatous. Culms 45–200 cm high; nodes hairy. Leaves basal and cauline; sheaths glabrous; ligules membranous; blades 12–70 × 0.2–0.9 cm, linear-lanceolate, sparsely hairy, apex acute. Panicles 4.5–18 cm long, pyramidal, branched, whorled racemes; callus bearded. Sessile spikelets 4–4.5 mm long, elliptic. Lower glume 3.5–4.6 × 1–1.3 mm, ovate-lanceolate, chartaceous, hairy in the lower half, faintly 9-nerved, pitted or not. Upper glume 3–3.5 × 1.3 mm, lanceolate, 3–5-nerved. Lower florets neuter, upper bisexual.

Lower lemma 3–4 mm long, lanceolate, membranous, hyaline. Lower palea absent. Upper lemma 1–2.5 mm long, stipitate, awn 11–18 mm long. Upper palea absent. Stamens 3. Caryopsis oblong. Pedicelled spikelets 3–4 mm long, elliptic-lanceolate. Lower glume 3.5–4 mm long, elliptic-lanceolate. Lower glume 3.5–4 mm long, elliptic-lanceolate, 9-nerved, pitted or not, margins inflexed. Upper glume 3–3.6 mm long, lanceolate, chartaceous, villous, 3–5-nerved, margins hairy. Lower florets neuter. Upper florets male or neuter similar to sessile spikelet. Upper lemma c. 2.5 mm long.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasional in river beds, roadsides and in deciduous forests.

Exsicc.: Adilabad District: Alampalli, *TP & PVP* 4169 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8573, 9593 (BSID); Mulugu District: Eturunagam, 24.03.2021, *SNR* 8963 (BSID); Rangareddy District: Manasahills-Rajendranagar, 24.08.2016, *SNR* 8523 (BSID); Suryapet District: Undrugonda, 27.10.2019, *SNR* 8761 (BSID); Vikarabad District: Damagundam, 02.12.2019, *SNR* 8904 (BSID).

2. *Bothriochloa insculpta* (Hochst. ex A. Rich.) A. Camus in Ann. Soc. Linn.

Lyon 76: 165. 1931; Bor, Grasses Burma, Ceylon, India & Pakistan 107. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 327. 2020. *Andropogon insculptus* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 458. 1850. *Dichanthium insculptum* (Hochst. ex A. Rich.) Clayton in Kew Bull. 32: 3. 1977; Deshp., Fasc. Fl. India 15: 15. 1984.

Caespitose perennials. Culms 12–50 cm high, erect-decumbent; nodes bearded, whitish. Leaves mostly basal; sheaths 3.5–5 cm long, terete-keeled, sparsely tuberculate hairy, mouth bearded; ligules c. 1 mm long, membranous, apex fimbriate; blades 2.5–55 × c. 0.3 cm, linear-lanceolate, margins serrulate, midnerve prominent, tuberculate hairy, apex acuminate-attenuate. Inflorescence 2–6 digitate; racemes 3–7 cm long; peduncle 4.5–22 cm long, smooth. Spikelets 2; sessile, pedicelled; pedicels 1.5–2.5 mm long, solid, with median translucent furrow, margins hairy; callus bearded. Sessile spikelet 3–4 × c. 1 mm, ovate-lanceolate, acuminate, awned. Lower glume 2–3.5 × c. 1 mm, oblong-lanceolate, chartaceous, apex acute-acuminate, 9–11-nerved, 2-keeled; keels pectinate-scabrid; pit absent or 1-pitted. Upper glume 2.8–4 × c. 1 mm, ovate-lanceolate, acuminate, margins infolded and ciliate above middle, chartaceous, 3-nerved. Florets 2, both epaleate; lower barren, upper bisexual. Lower lemma 2–3 × c. 0.6 mm, oblong, membranous, apex acute. Upper lemma reduced to hyaline base of awn, 1–1.5 × c. 0.2 mm; awn geniculate; column 5–6 mm long, twisted, ciliate, rufous; bristle 3–7 mm long, barbellate. Lodicules 0.3–0.5 mm long. Stamens 3. Ovary oblong. Caryopsis 1.5–2 × c. 0.6 mm, oblanceolate. Pedicelled spikelet 3–5 × c. 1 mm, ovate-lanceolate, apex acuminate, unawned, 2-pitted. Lower glume 3.5–5 × 1 mm, lanceolate, chartaceous, many nerved, 2-keeled, keels serrate, winged, 1–4-pitted, apex acute-acuminate. Upper glume 3–4.5 × 0.6 mm, oblong-lanceolate, chartaceous, 3–5-nerved, margins infolded, apex acuminate. Florets 2; lower male, epaleate; upper obscure. Lower lemma similar to sessile spikelet.

Fl. & Fr.: Jul.–Mar.

Distrib.: Occasionally in Khammam.

Exsicc.: Bhadradi-Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 9574 (BSID).

Note: It can be distinguishable by 2–3 pits on glumes.

3. *Bothriochloa ischaemum* (L.) Keng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 10: 201.1936. *Andropogon ischaemum* L., Sp. Pl. 2: 1047. 1753. Bor, Grasses Burma, Ceylon, India & Pakistan 108. 1960; Pull., Fl. Telangana 3: 1078. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 701. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 327. 2020.

Caespitose, perennials. Culms 20–75 cm high, erect-geniculate. Leaves mostly basal; sheath round-compressed; ligule membranous, apex ciliate; blades 2.5–14 × 0.2–0.35 cm, glaucous, surface scaberulous, margins tuberculate-ciliate, hairy at base. Racemes 5–15; digitate; 4–6 cm long; rhachis villous on margins. Pedicels linear, flattened, with a translucent median line, villous. Spikelet 3–5 mm long, lanceolate, callus pilose, base obtuse. Glumes dissimilar. Lower glume elliptic, chartaceous, flat, without pits, pilose, hairy below, apex acute. Upper glume lanceolate, 1-keeled. Florets 2, basal floret sterile-barren, without significant palea. Lower lemma oblong; hyaline. Upper lemma linear, hyaline, apex entire, awned, geniculate, 10–14 mm long, column twisted, glabrous. Palea absent or minute. Anthers 3.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in hilltops.

Exsicc.: Wanaparthi District: Thirumalayyagutta, 07.08.2019, SNR 8639 (BSID).

4. *Bothriochloa kuntzeana* (Hack.) Henrard in Blumea 3: 456. 1940; Bor, Grasses Burma, Ceylon, India & Pakistan 108. 1960; Pull., Fl. Telangana 3: 1078. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 701. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 327. 2020. *Andropogon kuntzeanus* Hack. in A. DC. & C. DC., Monogr. Phan. 6: 478. 1889; Hook.f., Fl. Brit. India 7: 175. 1896.

Plate 124(C-Q)

Caespitose perennials. Culms 95–140 cm high, geniculate, nodes bearded. Leaves basal and cauline; sheaths glabrous; ligules membranous; blades 12–35 × 0.3–0.6 cm, narrowly linear, margins scabrid, apex hairy. Racemes about 16, fascicled, joints and pedicels with translucent grooved, densely ciliate. Sessile spikelets 4–5.5 mm long, linear-lanceolate, callus bearded. Lower glume 4–4.5 mm long, lanceolate, chartaceous-membranous, ciliate, apex acute-bifid. Florets 2, lower neuter, upper bisexual. Lower lemma 3.5–4 mm long, linear-lanceolate, hyaline. Upper lemma linear-lanceolate, stipitate; awn c. 14 mm long, geniculate, twisted. Pedicelled spikelets 4–4.5 mm long; pedicels narrowly linear with translucent furrow. Lower glume 4–4.5 mm long, apex acute, 9–11-nerved. Upper glume 4–4.5 mm long, 5-nerved, ciliate. Florets 2, lower neuter, upper male. Lower lemma 4–4.5 mm long, linear, ciliate, hyaline. Upper lemma 1.5 mm long, narrowly linear.

Fl. & Fr.: Aug.–Dec.

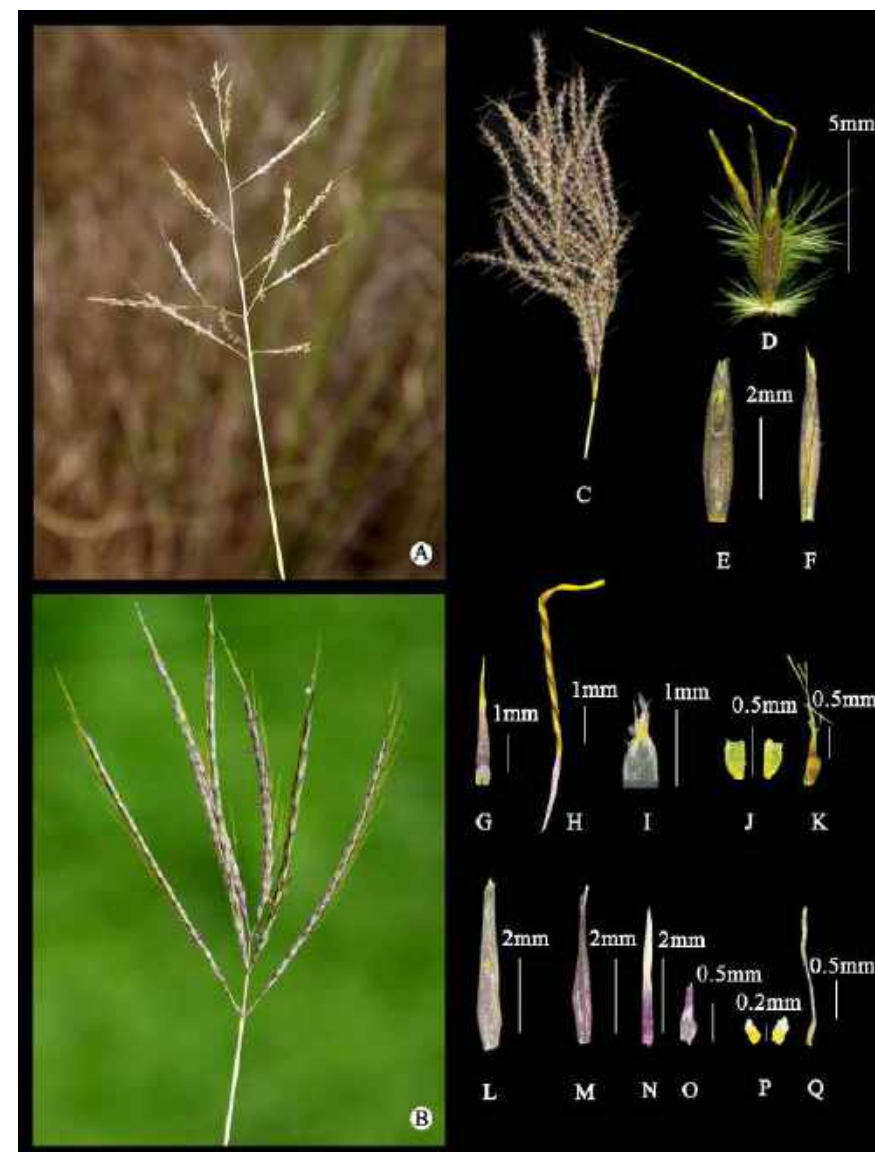


Plate 124. A. *Bothriochloa bladhii* (Retz.) S. T. Blake; B. *Bothriochloa pertusa* (L.) A. Camus; C–Q. *Bothriochloa kuntzeana* (Hack.) Henrard: C. Inflorescence; D. Paired spikelets; E–K. Sessile spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Upper lemma; I. Palea; J. Lodicules; K. Pistil; L–Q. Pedicelled spikelet; L. Lower glume; M. Upper glume; N. Lemma; O. Palea; P. Lodicules; Q. Pistil.

Distrib.: Occasionally in Vikarabad.

Exsicc.: Vikarabad District: Damagundam, 21.09.2019, SNR 8942 (BSID).

5. *Bothriochloa pertusa* (L.) A. Camus in Ann. Soc. Linn. Lyon ser. 2, 76: 164. 1931; Bor, Grasses Burma, Ceylon, India & Pakistan 109. 1960; Pull., Fl. Telangana

3: 1079. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 701. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 328. 2020. *Holcus pertusus* L., Mant. Pl. Altera 301. 1771. *Amphilophis pertusa* (L.) Nash ex Stapf, Agric. News (Barbados) 15 (368): 179. 1916; C.E.C.Fisch. in Gamble, Fl. Madras 1731. 1934. *Andropogon pertusus* (L.) Willd., Sp. Pl. 4: 922. 1806; Hook.f., Fl. Brit. India 7: 173. 1896. *Dichanthium pertusum* (L.) Claton in Kew Bull. 32(1): 4. 1977. **Plate 124(B)**

Caespitose perennials; stoloniferous. Culms 20–60 cm high; nodes bearded. Leaves basal and cauline; sheaths c. 5 cm long, compressed, mouth bearded; ligules membranous, apex ciliate; blades 2–18 × 0.2–0.4 cm, linear, crowded at base, glabrous-sparsely pilose, apex attenuate-acuminate. Racemes 3–9; c. 6 cm long, digitate, fascicled. Joints and pedicels densely ciliate with silky hairs, median furrowed. Sessile spikelets 3–4.5 mm long, oblong-lanceolate; callus bearded. Lower glume c. 4 mm long, elliptic-lanceolate, hairy above, with 1–2 pit above the middle, 5–9-nerved, margins ciliate, apex truncate-bifid. Upper glume 3–4 mm long, lanceolate, chartaceous-membranous, 3–5-nerved, apex acuminate. Florets 2; lower barren, upper bisexual. Lower lemma 2–3 mm long, linear, ovate, chartaceous, apex acute-acuminate. Upper lemma reduced-stipitate, awn 10–20 mm long. Caryopsis 1–1.5 mm long, oblong. Pedicelled spikelets 3–4 mm long, oblong-linear. Pedicels villous. Lower glume 3–4 mm long, ovate, pits absent, 7–13-nerved, 2-keeled, keels pectinate, margins ciliate, apex acute-bifid. Upper glume 3.5–4 mm long, lanceolate, faintly 5-nerved, apex acuminate. Florets 2; lower neuter, upper male or neuter; both epaleate. Lower lemma 1.5–2 mm long, linear-oblong, hyaline. Upper lemma 3–3.5 mm long, hyaline.

Fl. & Fr.: Aug.–Jun.

Distrib.: Common throughout the state on field bunds, plains and hills.

Exsicc.: Nizamabad District: Manchippa RF, *TP & BRPR* 6040 (SKU); Mulugu District: Chunchuplalli, 24.03.2021, *SNR* 8958 (BSID); Rangareddy District: Hyderabad, *MVR* 02113 (HY), Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8546 (BSID).

6. *Bothriochloa pseudoischaemum* (Nees ex Steud.) Henrard in Blumea 3: 451. 1940; Bor, Grasses Burma, Ceylon India & Pakistan 109. 1960; Pull., Fl. Telangana 3: 1079. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 328. 2020. *Andropogon pseudoischaemum* Nees ex Steud., Syn. Pl. Glumac. 1: 380. 1854; Hook.f., Fl. Brit. India 7: 172. 1896. *Dichanthium pseudoischaemum* (Nees ex Steud.) S.K. Jain & Deshp. in Bull. Bot. Surv. India 20: 134. 1979 (1978); Deshp., Fasc. Fl. India 15: 23. 1984.

Caespitose perennials. Culms 80–110 cm high, stout; nodes bearded. Leaves basal and cauline; sheaths 10–12 cm long, terete; ligules membranous; blades 5–25 × 0.3–0.6 cm, narrowly linear, margins and adaxial surface scabrid, abaxial surface spinose. Racemes 4–6, digitate, c. 10 cm long, joints and pedicels silky hairy; callus bearded. Sessile spikelets 4–5 mm long, lanceolate, callus bearded. Lower glume 4–5 mm long, keels ciliate, flat, silky hairy on back in the lower half, not pitted, 7–9-nerved, apex bidentate. Upper glume 4–5 mm

long, lanceolate, 3-nerved, keeled, apex aristate. Florets 2; lower neuter, upper bisexual. Lower glume c. 5 mm long, 7–9-nerved, keels ciliate, not pitted. Upper glume c. 5 mm long, 5–7-nerved. Lower lemma 2–3 mm long, ovate-oblong. Upper lemma absent. Caryopsis 4–5 mm long, elliptic. Pedicelled spikelets c. 4.5 mm long, linear, with translucent median line, hairy.

Fl. & Fr.: Feb.–Jun.

Distrib.: Occasional on hills and plains.

Exsicc.: Rangareddy District: Hyderabad, *MRS* 247 (DD).

7. *Bothriochloa woodrovii* (Hook.f.) A.Camus, Ann. Soc. Linn. Lyon sér. 2, 76: 165. 1931; Bor, Grasses Burma, Ceylon, India & Pakistan 110.1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 328. 2020. *Andropogon woodrovii* Hook.f., Fl. Brit. India 7: 173. 1896; *Amphilophis woodrovii* (Hook.f.) A.Camus in Rev. Bot. Appl. Agric. Colon. 1: 305. 1921; Blatt. and McCann, Bombay Grasses 84. 1935. *Dichanthium woodrovii* (Hook.f.) S. K. Jain & Deshp. in Bull. Bot. Surv. India 20(1–4): 134. (1978) 1979.

Perennial, aromatic. Culm 50–140 cm high, densely tufted, solid, stout, slight branched, terete, glabrous; nodes pubescent, internodes 10–20 cm long, glabrous, furrowed. Leaves basal and cauline; sheaths 6–14 cm long, keeled, glabrous; ligule c. 2 mm long, membranous, collar glabrous; blade 10–35 cm long, flat, rough, scaberrulous margins, apex acuminate. Racemes 5–6.5 cm long, joint 1.5–3 mm long, slender, groove translucent, long silky hairs on both sides. Spikelets paired, falling entire, sessile is fertile and pedicelled is sterile; callus 0.5–1 mm long. Sessile spikelet 2–4 mm long (without awn). Lower glume 3–4 × 1 mm, lanceolate, coriaceous, 9–12 nerved, margin inflexed, ciliate, apex acute, hairy below the half; hairs c. 2 mm long. Upper glume 3.5–4 × 0.5–1 mm, lanceolate, chartaceous, 3-nerved, margin inflexed, ciliate, keeled, apex acute. Lower lemma 2.5–3.5 × 0.5 mm, oblong, hyaline, membranous, margin inflexed, ciliate, apex acute. Palea absent. Upper lemma 2.5–3 mm long, hyaline, awned, geniculate; awn 2–2.5 cm long. Lodicules 2, c. 0.2 mm long. Stamen 3, another c. 2 mm long. Ovary c. 0.4 mm long. Caryopsis 1.5–2 mm long, ovate-lanceolate, brown. Pedicelled spikelet 3–4 mm long, lanceolate; pedicel c. 3 mm long with translucent groove, hairy. Lower glume 3–4 × 1 mm, lanceolate, inflexed, margin ciliate, apex acute, coriaceous, 11–13 nerved. Upper glume 2–3 × 0.5–1 mm, lanceolate, 3-nerved, glabrous, margin inflexed, ciliate, acute at apex.

Fl. & Fr.: Jul.–Nov.

Distrib.: Gujarat, Maharashtra and Telangana.

Exsicc.: Mahabubnagar District: Amrabad Tiger Reserve, 09.10.2019, *JS, PRM & YV* 9302 (BSID).

Capillipedium Stapf

World: c. 20 spp.; India: 8 spp.; Telangana: 2 spp.

Key to the species

- | | |
|----------------------------|----------------------------|
| 1a. Culms weak, geniculate | ... 1. <i>C. assimile</i> |
| 1b. Culms robust, erect | ... 2. <i>C. filiculme</i> |

1. *Capillipedium assimile* (Steud.) A. Camus, Fl. Indo-Chine 7: 314. 1922; Bor, Grasses Burma, Ceylon, India & Pakistan 111. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 334. 2020. *Andropogon assimilis* Steud. in Zoll., Syst. Verz. 58. 1854; Hook.f., Fl. Brit. India 7: 179. 1896. *Dichanthium assimile* (Steud.) Deshp., Fasc. Fl. India 15: 6. 1984. *Capillipedium huegelii* (Hack.) A. Camus in Rev. Bot. Appl. Agric. Colon. 1: 308. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1730. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 111. 1960.

Caespitose perennials. Culms 20–50 cm high, erect-geniculate, smooth; nodes bearded, lower nodes rooting. Leaves basal and cauline; sheaths 4–6 cm long, keeled, ribbed, collar; ligules 0.3–0.8 mm long, membranous, apex fimbriate; blades 7–16 × 0.4–0.8 cm, lanceolate-ovate, pseudo-petiolate, margins serrulate, apex acuminate. Panicle 6–14 × c. 2.5 cm, branched, capillary, whorled. Peduncle 6–18 cm long. Racemes capillary, nodes ciliate; pedicelled spikelet unawned; joints and pedicels 1.5–2 mm, translucent furrow in middle, apex cupiliform. Sessile spikelet 2.5–3 × 0.4–0.6 mm, oblong, callus bearded. Lower glume 2–2.5 × 0.6 mm, oblong, concave-flat, chartaceous, apex acute, 5–7-nerved, jointed at apex; 2-keeled, keels scabrid. Upper glume 2.5–3 × c. 0.4 mm, elliptic, chartaceous, 1–3-nerved, apex acute. Florets 2; lower barren, upper bisexual; both epaleate. Lower lemma 0.8–1 × c. 0.6 mm, broadly elliptic-ovate, flap like. Upper lemma 1–1.8 mm long, oblong, hyaline; awn 5–6 mm long, twisted, geniculate, arises from base of lemma; bristle 1.5–2 mm long, barbellate. Pedicelled spikelet c. 2.5 × 0.6 mm, ovate-elliptic, chartaceous, apex acute-acuminate. Lower glume oblong-cymbiform, chartaceous, 7–9-nerved, apex acute-acuminate. Upper glume 2–3 × 0.6 mm, ovate-oblong, chartaceous, 5-nerved, apex acuminate. Florets 2, lower male, epaleate. Lower lemma c. 2 × 0.6 mm ovate-oblong, membranous, apex acute-acuminate.

Fl. & Fr.: Oct.–Mar.

Distrib.: Occasionally in Adilabad.

Exsicc.: Adilabad District: Jannaram-Range, Dongapalli-Beat, APS 3989 (BSID).

2. *Capillipedium filiculme* Stapf in Hooker's Icon. Pl. 31: 3085. 1922. C.E.C.Fisch. in Gamble, Fl. Madras 1730. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 111. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 334. 2020. *Andropogon filiculmis* Hook.f., Fl. Brit. India 7: 181. 1896. *Dichanthium filiculme* (Hook.f.) S.K. Jain & Deshp. in Bull. Bot. Surv. India 20: 134. 1979.

Plate 125

Annuals. Culms 30–90 cm long, rambling, slender, filiform; nodes bearded, lower nodes rooting. Leaves mostly cauline; sheaths hairy at apex; ligules membranous, ciliate; blades 1.8–11 × 0.1–0.3 cm, linear-lanceolate, convolute, sparsely hairy below, apex acuminate. Panicles c. 6 cm long, open, branches filiform, joints and pedicels ciliate. Sessile spikelets 2–2.5 mm long, oblong-lanceolate; callus densely bearded. Lower glume 2–3 mm long, 5–7-nerved, villous at lower half, 2-keeled, keels ciliate. Upper glume c. 2.5 mm long, lanceolate, chartaceous, 3-nerved, 1-keeled. Florets 2; lower neuter, upper bisexual. Lower lemma 1–1.5 mm long, ovate-elliptic, hyaline. Upper lemma stipitate; awn 8–18 mm long,



Plate 125. *Capillipedium filiculme* (Hook.f.) Stapf: A. Habitat; B. Inflorescence; C. Paired spikelets; D. Lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Lodicules; I. Stamens with pistil; J–M. Pedicelled spikelet; J. Lower glume; K. Upper glume; L. Palea; M. Stamens.

twisted. Palea absent. Pedicelled spikelets 2.8–3.5 mm long, lanceolate, narrow. Lower glume 2–3.3 mm long, lanceolate, 7–9-nerved, ciliate. Upper glume 2–2.5 mm long, 5-nerved. Lower lemma 1 mm long, oblong, hyaline. Upper lemma absent.

Fl. & Fr.: Oct.–Dec.

Distrib.: Occasional in rocky crevices, old compound walls and old forts.

Exsicc.: Adilabad District: Sattennapalli beat, TP & PVP 4082 (SKU); Medak District: Pocharam Wildlife Sanctuary, 16.10.2013, Alok Chorghe 10282 (BSID); Rangareddy District: MD lines, Tolichowk, 22.08.2019, SNR 8679 (BSID); Vikarabad District: Ananthagiri hills, 30.11.2019, SNR 8779 (BSID).

Note: It can be identified by its aromatic inflorescence.

Chrysopogon Trin.

World: c. 51 spp.; India: 20 spp., 1 subsp.; Telangana: 10 spp.

Key to the species

- | | | |
|-----|---|--------------------------------|
| 1a. | Glumes villous or pubescent on back or margins | ... 2 |
| 1b. | Glumes muricate | ... 9 |
| 2a. | Pedicels half the length of sessile spikelets or longer | ... 3 |
| 2b. | Pedicels shorter than half the length of sessile spikelets | ... 6 |
| 3a. | Pedicels glabrous or nearly so | ... 1. <i>C. aciculatus</i> |
| 3b. | Pedicels villous with rusty or pale hairs | ... 4 |
| 4a. | Leaves conspicuously distichous, often plicate, sheath compressed | ... 2. <i>C. asper</i> |
| 4b. | Leaves not as above, sheath rounded on back | ... 5 |
| 5a. | Leaves linear with long hairs, racemes verticillate | ... 9. <i>C. verticillatus</i> |
| 5b. | Leaves long, glabrous | ... 5. <i>C. hamiltonii</i> |
| 6a. | Leaves puberulous | ... 8. <i>C. velutinosus</i> |
| 6b. | Leaves glabrous | ... 7 |
| 7a. | Leaves conspicuously distichous | ... 6. <i>C. ployphyllus</i> |
| 7b. | Leaves not as above | ... 8 |
| 8a. | Upper glume of the sessile spikelet keeled, pectinate | ... 3. <i>C. fulvus</i> |
| 8b. | Upper glume of the sessile spikelet rounded, glabrous | ... 7. <i>C. serrulatus</i> |
| 9a. | Lower glume muriculate; joints and pedicels glabrous | ... 10. <i>C. zizanioides</i> |
| 9b. | Lower glume with a row of marginal tubercles-spinulose | ... 4. <i>C. lawsonii</i> |

1. *Chrysopogon aciculatus* (Retz.) Trin., Fund. Agrost. 188. 1820; C.E.C.Fisch. in Gamble, Fl. Madras 1738. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 115. 1960; Pull., Fl. Telangana 3: 1089. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 690. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 340. 2020. *Andropogon aciculatus* Retz., Observ. Bot. 5: 22. 1788 (as "*aciculatum*") ; Hook.f., Fl. Brit. India 7: 188. 1896. **Plate 126(A-B)**

Caespitose perennials; rhizomatous. Culms 30–80 cm long, erect or ascending; nodes glabrous. Leaves mostly basal; sheaths 1–6 cm long, keeled, mouth hairy; ligules membranous; blades 2–9 × 0.2–0.4 cm, linear, densely tufted, margins distantly spinulose, apex acute-acuminate. Panicles 4–9 cm long, narrowly oblong, contracted, branches capillary. Sessile spikelets c. 3.5 mm long, lanceolate, dorsally compressed, awned; callus bearded. Lower glume c. 3 mm long, oblong-lanceolate, chartaceous, 2-keeled, apex acuminate-2-lobed or aristate. Upper glume c. 3.5 mm long, ovate-lanceolate, 1–3-nerved, keels setose; apex acuminate-aristate, c. 1 mm long. Florets 2; lower barren, upper bisexual. Lower lemma c. 3.5 mm long, neuter, linear, keeled, 2-nerved, apex acuminate. Lower palea absent. Upper lemma 2.5–3 mm long, lanceolate, membranous, 1-nerved; awned 3–5 mm long, straight, barbellate. Upper palea 1.5–2 mm long, membranous, hyaline, apex obtuse. Pedicelled spikelets c. 5.5 mm long, lanceolate, apex acuminate, pedicels glabrous, unawned. Lower glume c. 5 mm long, lanceolate, chartaceous, 3–5-nerved, apex acuminate-aristate, barbellate.



Plate 126. A–B. *Chrysopogon aciculatus* (Retz.) Trin.: A. Habitat; B. Inflorescence; C–L. *Chrysopogon fulvus* (Spreng.) Chiov.: C. Habitat; D. Sessile and pedicelled spikelets; E. Sessile spikelet; F. Lower glume; G. Upper glume; H–L. Pedicelled spikelet; H. Spikelet; I. Lower glume; J. Upper glume; K. Lemma; L. Palea.

Upper glume 4–5 mm long, 3-nerved, margin ciliate, apex acuminate. Lower lemma neuter, 2.5–3 mm long, lanceolate, hyaline, apex acuminate. Lower palea absent. Upper lemma c. 3 mm long, ovate-lanceolate, 3-nerved, ciliate along margins, apex obtuse. Upper palea 1.5 mm long, oblong, membranous, apex obtuse.

Fl. & Fr.: Apr.–Nov.

Distrib.: Occasionally growing along canals and on banks of water courses.

Exsicc.: Adilabad District: Sirpur water lake, GO 4417 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8950 (BSID).

2. *Chrysopogon asper* Blatt. & McCann in J. Bombay Nat. Hist. Soc. 32(3): 412. 1928; C.E.C.Fisch. in Gamble, Fl. Madras 3: 1738. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 116. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 340. 2020. *Andropogon asper* B.Heyne ex Hook.f., Fl. Brit. India 7: 189. 1896, nom. illeg., non (Thunb.) Kunth 1829.

Tufted perennials, rhizomatous. Culms 25–85 high, erect-geniculate; rooting at lower nodes. Leaves mostly basal; sheaths 2–5.5 cm long, keeled-terete, tightly enclosing culm; ligule membranous; blades 4–12 × 0.3–1 cm long, linear-lanceolate, flat-infolded, base subcordate-rounded or truncate-semiamplexicaul, apex acute-acuminate or blunt, margins tuberculate hairy at base and serrate towards apex. Panicle 5–14 cm long, 6–10 racemes, branches verticillate; peduncle c. 18 cm long. Racemes c. 3 cm, with capillary branches. Spikelets triads, one sessile, two pedicelled, callus oblique, rufous hairy. Sessile spikelet 4.5–5.5 × 0.8–1.3 mm, oblong-lanceolate, apex acuminate, hairy and scabrid towards apex, awned. Lower glume c. 4.5 × 0.5 mm, oblong-lanceolate, boat shaped, apex acute-obtuse, aristate, subcoriaceous-coriaceous, shiny to granulate, faintly 5-nerved, keeled towards apex, pectinate hispid hairy near keel and above middle, margins winged towards apex. Upper glume 4–6 × c. 0.8 mm, similar to the lower in shape and texture, apex acute, awned, ciliate- hispid dorsally, margins broadly winged and ciliate towards base; awn 10–14 mm long, finely ciliolate. Florets 2, lower male or barren, upper bisexual. Lower lemma 3.5–4 × c. 0.4 mm, oblong-oblancheolate, acute- acuminate, membranous, hyaline, margins inrolled, ciliate. Palea absent. Upper lemma 2–4 × c. 0.6 mm, oblong, membranous, faintly 1–3 -nerved; awn geniculate, column 2–3.5 cm, twisted; bristle 2.5–3.5 cm, barbellate towards apex. Lodicules 2, broadly truncate. Stamens 3. Ovary oblong. Pedicelled spikelet 8.5–10 × c. 1 mm, oblong-lanceolate, narrowly acuminate, awned, hairy dorsally and along margins; pedicels flat, 3–5 × c. 0.5 mm, thickening towards apex, rufous hairy along margins. Lower glume 8.3–10 × c. 0.8 mm, oblong-linear, elliptic-lanceolate, apex acuminate, chartaceous, awned, 5–7 -nerved, 2-keeled near margins, sparsely ciliate dorsally and on keel, margins infolded, greenish yellow; awns straight-curved, 6–10 mm long, ciliate towards base and barbellate above. Upper glume 7.5–9 × c. 0.7 mm, lanceolate, membranous-chartaceous, hyaline, margins infolded, ciliate, apex acuminate-aristate. Florets 2, both epaleate; lower empty, upper male. Lower lemma 6.5–7 × 0.6–1.3 mm, narrowly elliptic, oblong-lanceolate, membranous, hyaline, margins ciliate, apex acute-acuminate. Upper lemma 3.5–4.5 × 0.4–0.6 mm, elliptic-lanceolate, membranous, hyaline, margins ciliate towards above, apex acute. Lodicules as in sessile spikelet. Stamens 3.

Fl. & Fr.: Jul.–Jan.

Distrib.: Slopes. **Endemic**-India (Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu).

Exsicc.: Mahabubnagar District: Mallaiah loddi, Mannanur Range,

01.10.2014, ARK & BSS 1769 (Telangana State Herbarium, Dr. BRR Govt. College, Jedcherla).

3. *Chrysopogon fulvus* (Spreng.) Chiov., Fl. Somalia 1: 327. 1929; Bor, Grasses Burma, Ceylon, India & Pakistan 116. 1960; Pull., Fl. Telangana 3: 1090. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 690. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 340. 2020. *Pollinia fulva* Spreng., Pl. Min. Cogn. Pug. 2: 10. 1815. *Chrysopogon montanus* Trin. ex Spreng., Neue Entd. 2: 93. 1821; C.E.C.Fisch. in Gamble, Fl. Madras 1739. 1934. **Plate 126(C-L)**

Caespitose perennials. Culms about 140 cm high, erect or geniculately ascending; nodes glabrous. Leaves mostly basal; sheaths compressed, keeled, glabrous; ligules membranous; blades 4–18 × 0.3–0.5 cm, linear-oblong, margins serrulately scabrid, apex acute-blunt. Panicles 5–10 × 2.5–4 cm long, capillary branches, golden yellow-purplish coloured. Racemes c. 2.5 cm long; spikelets triads; 1-sessile, 2-pedicelled. Sessile spikelets 4–6 mm long, oblong, laterally compressed; callus densely bearded with golden brown hairs. Lower glume 5–7 mm long, 2–4-nerved, keeled, rufous hairy above. Upper glume 6–6.5 mm long, oblong, 3-nerved, coriaceous, keeled, hispidly ciliate above, awn 3–9 mm long. Florets 2; lower bisexual, upper empty. Lower lemma neuter, 3–4.5 mm long, oblancheolate-linear, hyaline, ciliate, apex acute. Upper lemma c. 3 mm long, oblong, chartaceous, hyaline, 3-nerved, stipitate; awn 15–22 mm long, geniculate. Palea c. 2 mm long, linear. Caryopsis 2–2.5 mm long, elliptic-oblong. Pedicelled spikelets 4–7 mm long, lanceolate; pedicels densely rufous hairy, awned. Lower glume 3.5–4 mm long, lanceolate, 5–7-nerved, pubescent above, apex acuminate. Upper glume c. 4 mm long, lanceolate, 3-nerved, margins ciliate, apex mucronate. Florets 2; lower male, upper empty; both epaleate. Lower lemma c. 3.5 mm long, linear-oblancheolate, hyaline. Upper lemma c. 3 mm long, similar to the lower lemma, awned, 3.5 mm long, hyaline, 1–3-nerved.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common in dry areas, rocky habitats and in sandy areas.

Exsicc.: Adilabad District: Sattennapalli beat, TP & PVP 4096 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 9614 (BSID); Mahabubnagar District: Mayur Eco Park, 09.08.2019, SNR 8661 (BSID); Rangareddy District: Hyderabad, MVR 02123 (HY); Suryapet District: Nakrekal, 27.10.2019, SNR 8744 (BSID); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8703 (BSID); 30.11.2019, SNR 8782 (BSID).

4. *Chrysopogon hamiltonii* (Hook.f.) Haines, Bot. Bihar & Orissa Pt. 5, 1036. 1924; Bor, Grasses Burma, Ceylon, India & Pakistan 116. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 440. 2020. *Andropogon hamiltonii* Hook.f., Fl. Brit. India 7: 190. 1896.

Caespitose, perennials. Culms robust, erect; nodes glabrous. Leaves basal and cauline; sheaths 1.5–12 cm, rounded, glabrous; ligules c. 0.25 mm long, a fringe of hairs, membranous, ciliate; blades 8–40 × 0.5–1 cm, linear-lanceolate, abaxial surface scaberulous, margins scabrous, apex acuminate-acute. Inflorescence (panicle) 10–30 cm long, contracted, whorled; panicle branches

capillary; peduncle pubescent above. Racemes bearing triads of spikelets; one sessile and two pedicelled; callus 0.8–1 mm long, cuneate, hairs dark brown. Sessile spikelet c. 5.5 × 1.3 mm, lanceolate, awned; awn c. 8 cm long. Lower glume c. 4.5 × 1.4 mm, lanceolate. Upper glume c. 6 × 1.5 mm, lanceolate-oblong, 3-nerved, awned; awn c. 5.7 mm long. Lower lemma c. 5.6 mm, lanceolate, hyaline, 2-nerved, ciliate. Upper lemma c. 5.5 × 0.7 mm, lanceolate, hyaline, 3-nerved, awned, awn c. 7.5 cm. Palea absent. Lodicules 2. Stamens 3. Ovary c. 0.5 × 0.4 mm, oblong. Pedicelled spikelet c. 11 × 1.5 mm, lanceolate, awned, awn c. 10 cm long, pedicel 4–5 mm long. Lower glume c. 8.5 × 1.5 mm, lanceolate, awned, awn c. 10 cm long, 7-nerved, keeled, scabrid. Upper glume c. 7.3 × 1.5 mm, lanceolate, 3-nerved, keeled, ciliate. Lower lemma c. 8.5 × 1.5 mm, 2-nerved, keeled, ciliate, hyaline. Upper lemma c. 6 × 1 mm, keeled, ciliate, hyaline. Palea absent. Lodicules 2. Stamens 3.

Fl. & Fr.: Oct.-Dec.

Distrib.: Common hill tops. **Endemic-India** (Andhra Pradesh, Bihar, Karnataka & Telangana).

Exsicc.: Nagar-Kurnool District: Kollapur Range, Pedduti, 15.10.2018, *BSS* & *ARK* 3774 (TBGH).

5. *Chrysopogon lawsonii* (Hook.f.) Veldkamp in *Austrobaileya* 5(3): 515. 1999. *Vetiveria lawsonii* (Hook.f.) Blatt. & McCann in *J. Bombay Nat. Hist. Soc.* 32: 409. 1928; C.E.C.Fisch. in Gamble, *Fl. Madras* 1733. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 258. 1960; Pull., *Fl. Telangana* 3: 1188. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 759. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 441. 2020. *Andropogon lawsonii* Hook.f., *Fl. Brit. India* 7: 187. 1896.

Plate 127(A-P)

Caespitose perennials; rhizomatous. Culms 35–200 cm high; nodes glabrous. Leaves mostly basal; sheaths 3–8 cm long, compressed, keeled; ligules a rim of hairs; blades 8–55 × 0.2–0.5 cm, linear-lanceolate, flat, margins ciliate, rigid, apex acute-blunt. Panicles c. 28 cm long, narrow, joints and pedicels hairy. Spikelets 4–6 pairs; triads, 1-sessile, 2-pedicelled. Sessile spikelets 4–5 mm long, laterally compressed, callus bearded. Lower glume 4–5 mm long, lanceolate, coriaceous, keeled, keel scabrid, tuberculate hairy on sides, dorsally granulate, apex obtuse-acute. Upper glume 4–5 mm long, lanceolate-cymbiform, subcoriaceous, apex notched, awned. Florets 2; lower barren, upper bisexual. Lower lemma 4–5 mm long, membranous, apex 2-lobed. Lower palea absent. Upper lemma 4–4.5 mm long, reduced to hyaline, awn 20–35 mm long, geniculate, barbellate. Upper palea c. 2 mm long, oblong. Caryopsis c. 1 mm long, elliptic. Pedicelled spikelets 5.5–7 mm long, linear-lanceolate. Lower glume 6.5–7.5 mm long, linear-lanceolate, chartaceous, hispidulous, apex acuminate. Upper glume 6–7.3 mm long, lanceolate-cymbiform, 3-nerved, margins ciliate, apex acuminate. Florets 2; lower barren, upper male. Lower lemma 4.5–5 mm long, elliptic, 2-nerved, margins ciliate, apex acute, male. Lower palea absent. Upper lemma c. 5 mm long, oblong, membranous, apex acute-obtuse. Upper palea c. 3 mm long oblong, apex acute.

Fl. & Fr.: Sep.–Jan.

Distrib.: Occasionally in moist habitats

Exsicc.: Nizamabad District: Ghanapur, *BRPR & KH* 7112 (SKU), Jalalpur RF,

BRPR & KH 9564 (SKU).

Note: It can be distinguishable by its lower glumes having tubercle based hairs on margins.

6. *Chrysopogon polyphyllus* Blatt. & McCann, *J. Bombay Nat. Hist. Soc.* 32: 416. 1928. Bor, *Grasses Burma, Ceylon, India & Pakistan* 118. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 341. 2020. *Andropogon polyphyllus* Hack. ex Hook.f., *Fl. Brit. India* 7: 194. 1896.

Perennials. Culms 50–80 cm high. Leaves mostly basal, sheaths compressed; ligule a ciliate membrane; blade 5–30 × 0.2–0.4 cm, distichous, subcoriaceous, stiff, glaucous, apex acuminate. Inflorescence open panicle. Panicle 8–15 cm long, oblong, branches whorled at most nodes. Spikelets triads; one sessile and two pedicelled; pedicels 0.5–1.5 mm long, linear, 0.3–0.4 the length of fertile spikelet, villous, long hairy at tip, hairs yellowish. Spikelets c. 4 mm long, oblong, falling entire; callus c. 1.5 mm long, cuneate, pilose, yellowish hairy below, base obtuse. Lower glume elliptic, as long as spikelet, cartilaginous, purplish green, midnerve ciliate above, apex acute. Upper glume lanceolate, apex mucronate, 1-keeled, keel ciliate. Florets 2; lower barren, upper bisexual. Lower lemma lanceolate, hyaline, 2-nerved. Upper lemma oblong, apex bifid, hyaline, awned from sinus, 3–8 mm long, awn flexuous or geniculate, column straight or twisted, pubescent. Palea absent or minute. Pedicelled spikelets c. 4.8 mm long, male, lanceolate, longer than fertile. Glumes chartaceous, 7-nerved, pilose on midnerve, apex acuminate at apex.

Fl. & Fr.: Aug.-Dec.

Distrib.: In moist places

Exsicc.: Adilabad District: Near Kadam vaagu, 30.01.1987, *TRS* 85155 (BSID).

7. *Chrysopogon serrulatus* Trin. in *Mem. Acad. Sci. Petersb.* 6, 2: 318. 1832; Bor, *Grasses Burma, Ceylon, India & Pakistan* 118. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 341. 2020. *Andropogon monticola* var. *trinii* Hook.f., *Fl. Brit. India* 7: 193. 1896.

Plate 127(Q-Y)

Caespitose perennial. Culms 20–100 cm high, terete, branched; nodes glabrous. Leaves basal and cauline; sheaths compressed; ligules of ciliate hairs; blades 4–18 × 0.2–0.6 cm, rigid, glabrous, margins scaberulous, apex acute. Panicle 2.5–13 cm long, rachis glabrous, scaberulous. Sessile spikelet 6.5–7.5 mm long, awned. Lower glume 5.8–6 mm long, membranous-chartaceous, 5–7-nerved, 1-keeled, glabrous, apex aristate. Upper glume 5–5.5 mm long, ovate-cymbiform, apex 2-toothed. Lower lemma 4.5–5.5 mm long, linear, hyaline, nerveless. Palea absent. Upper lemma stipitate, with geniculate awn. Palea hyaline, linear. Pedicelled spikelet 6–7.5 mm long. Lower glume lanceolate, chartaceous-membranous. Upper glume 5.8–6.5 mm long, elliptic, chartaceous-membranous, 7-nerved, apex acute. Lower and upper lemma similar, hyaline, nerveless.

Fl. & Fr.: Jul.–Dec.



Plate 127. A–P. *Chrysopogon lawsonii* (Hook.f.) Veldkamp: A. Habitat; B. Paired spikelets; C&D. Abaxial and adaxial view of lower glume; E&F. Abaxial and adaxial view of upper glume; G. Lower lemma; H. Upper lemma; I. Palea; J. Lodicules; K. Caryopsis; L–P. Pedicelled spikelet; L. Lower glume; M. Upper glume; N. Lower lemma; O. Upper lemma; P. Palea; Q–Y. *Chrysopogon serrulatus* Trin.: Q. Habitat; R. Inflorescence; S. Paired spikelets; T. Lower glume; U. Upper glume; V–Y. Pedicelled spikelet; V. Lower glume; W. Upper glume; X. Lemma; Y. Palea.

Distrib.: Occasionally in Nizamabad.

Exsicc.: Nizamabad District: Sriramsagar, BRPR 7297 (SKU); Vikarabad District, Ananthagiri hills, 30.11.2019, SNR 008937 (BSID).

8. *Chrysopogon velutinus* (Hook.f.) Bor, Grasses Burma, Ceylon, India & Pakistan 119. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 341. 2020. *Andropogon velutinus* Hook.f., Fl. Brit. India 7: 194. 1896.

Caespitose annuals. Culms 30–90 cm high, erect or ascending; nodes glabrous. Leaves basal and cauline; sheaths 3–12 cm long, keeled, pubescent; ligules fringed; blades 12–45 × 0.2–1.4 cm, flat, pubescent, 1-keeled, apex acuminate. Panicles 8–22 cm long. Sessile spikelet 5–6.5 × 1–1.5 mm, lanceolate-elliptic, awned, callus bearded with brown coloured hairs. Lower glume c. 6 mm long, linear-lanceolate, coriaceous, puberulous, 4-nerved, 1-keeled, apex acute. Upper glume c. 7 mm long, coriaceous, elliptic, puberulous, 3-nerved; awn straight, c. 10 mm long; 1-keeled, keel covered with dense brown coloured hairs. Lower lemma 4.5–7 mm long, linear, margins ciliate, 1-nerved, 1-keeled, apex acute. Palea absent. Upper lemma 4.5–5 mm long, hyaline to a base of awn; awn 4–5 cm long, geniculate. Palea absent. Caryopsis 5–6 mm long, compressed. Pedicel 1–1.5 mm, margins densely brown hairs. Pedicelled spikelet 5–6 mm long, ovate, unawned. Lower glume 5–6 mm long, ovate, membranous, dorsal puberulous, brown coloured hairs lower half, 5–7-nerved, apex acute. Upper glume 5–6 mm, ovate, glabrous, margins ciliate, 3–5-nerved, apex acute. Lower lemma 3–4 mm long, ovate, margins ciliate, hyaline, 2-nerved, apex acute. Palea absent. Upper lemma 3–4 mm long, linear, apex cleft-2-lobed. Palea 2–3 mm long, linear, apex acute.

Fl. & Fr.: Sep.–Nov.

Distrib.: Open rocky slopes and crevice. **Endemic**-India (Andhra Pradesh, Karnataka, Maharashtra, Telangana).

Exsicc.: Nagarkurnool District: Pilligundlu, Maddimadugu Range, 8.09.2015, BSS 2218; Nalgonda District: Mailapuram, BRA 5065 (BSID); Devarakonda Fort, 10.12.2015, ARK & BSS 2283(TBGH); Wanaparthy District: Thirumalaiah Gutta, 7.10.2012, BSS 43880 (TBGH).

Note: Distinguishable by its puberulous leaves.

9. *Chrysopogon verticillatus* (Roxb.) Trin. ex Steud., Nomencl. Bot. ed. 2. 1: 360. 1840; C.E.C.Fisch. in Gamble, Fl. Madras 1739. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 119. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 341. 2020. *Andropogon verticillatus* Roxb., Fl. Ind. 1: 267. 1820.

Plate 128(A-B)

Caespitose perennials; rhizomatous. Culms 65–110 cm high, geniculate; nodes dark. Leaves basal and cauline; sheaths keeled, pubescent; ligules membranous; blades 7–10 × 0.2–0.5 cm, lanceolate-linear, pubescent, margins long haired, base rounded, apex acute. Panicle effuse, 18–25 cm long; peduncle 25–38 cm, pubescent below inflorescence. Racemes 3–4 cm long, verticillate, pedicelled, axis hairy; triads, 2-pedicelled, 1-sessile; callus 2.5–3 mm long, pointed, rufous brown hairy. Sessile spikelet 5–6.5 mm long, oblanceolate, awned, hairy at base. Lower glume 6–8 mm long, oblong-lanceolate, apex acute, 2-lobed, aristate, 3-nerved, scabrid above middle, margins broadly winged, ciliate; arista 9–13 mm

long. Upper glume 5.5–6 mm, oblong-lanceolate, cymbiform, margin winged, apex acute. Florets 2; lower empty, upper bisexual. Lower lemma 5–5.5 mm long, delicate, oblong-lanceolate, apex acute. Upper lemma 4–7 mm long, oblong-lanceolate, apex 2-lobed-emarginate; awn 2–4 cm long, straight-geniculate, barbellate. Caryopsis 4–5 mm long, oblong-elliptic. Pedicelled spikelets 8–12 mm long, oblong-lanceolate, margins rufous brown hairy, apex acute. Lower glume 7–10 mm long, lanceolate, 7-nerved, apex acute-acuminate; awn c. 7–9 mm long. Upper glume c. 9 × 1 mm, lanceolate, 3-nerved, apex acuminate. Florets 2; lower empty, upper male. Lower lemma 6–7.3 mm long, elliptic, apex acute. Upper lemma 4–4.5 mm long, elliptic, apex acute.

Fl. & Fr.: Sept.–Mar.

Distrib.: **Endemic**-India. (Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Odisha, Tamil Nadu).

Exsicc.: Rangareddy District: Rajendranagar-Manasa hills, 10.10.2019, *SNR* 8735 (BSID).

Note: It can be identified by its robust habit and verticillatus inflorescence.

10. *Chrysopogon zizanioides* (L.) Roberty in Bull. Inst. Franç. Afrique Noire, A. 22: 106. 1960. *Vetiveria zizanioides* (L.) Nash, Fl. S.E.U.S. 67. 1903; C.E.C.Fisch. in Gamble, Fl. Madras 1733. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan: 258. 1960; Pull., Fl. Telangana 3: 1188. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 759. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 441. 2020. *Phalaris zizanioides* L., Mant. Pl.: 183. 1771. '*Vattiverlu*', '*Wuttai Gaddi*'

Plate 128(C-Q)

Caespitose perennials. Culms 100–210 cm high; nodes glabrous. Leaves mostly basal; sheaths glabrous, keeled; ligules membranous; blades 15–95 × 0.2–1 cm, linear-lanceolate, convolute, sparsely tubercle based hairy. Panicles 20–45 cm long, branched. Sessile spikelets 3.5–5 mm long, lanceolate-oblong; callus bearded. Lower glume 3.5–5 mm long, lanceolate-oblong, coriaceous, 3–5-nerved, dorsal muricate. Upper glume 4.5–5 mm long, lanceolate, coriaceous 3-nerved, keels spinulose. Florets 2; lower neuter; upper bisexual. Lower lemma 3.5–4 mm long, elliptic-ovate, margins ciliate, 3–5-nerved. Upper lemma 3–3.5 mm long, oblong, coriaceous, 3-nerved, apex notched, mucro 1.5–2.5 mm long. Palea 1–2 mm long, oblong, 3-nerved. Pedicelled spikelets male, 3.5–4 mm long, lanceolate. Pedicels 3.5–4 mm long, turbinate. Lower glume 3–3.5 mm long, lanceolate, sparsely spinulose. Upper glume c. 3 mm long, lanceolate, coriaceous-membranous, keels spinulose. Florets 2; lower barren, upper male. Lower lemma 3–4 mm long, lanceolate, 3-nerved, margins ciliate. Upper lemma 3–3.5 mm long, elliptic-lanceolate, coriaceous, hyaline, faintly 3-nerved. Palea 1–1.5 mm long, elliptic-oblong.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional on field bunds and on banks of streams.

Exsicc.: Adilabad District: Sarvaipet, *GO* 4512 (SKU); Jayashankar

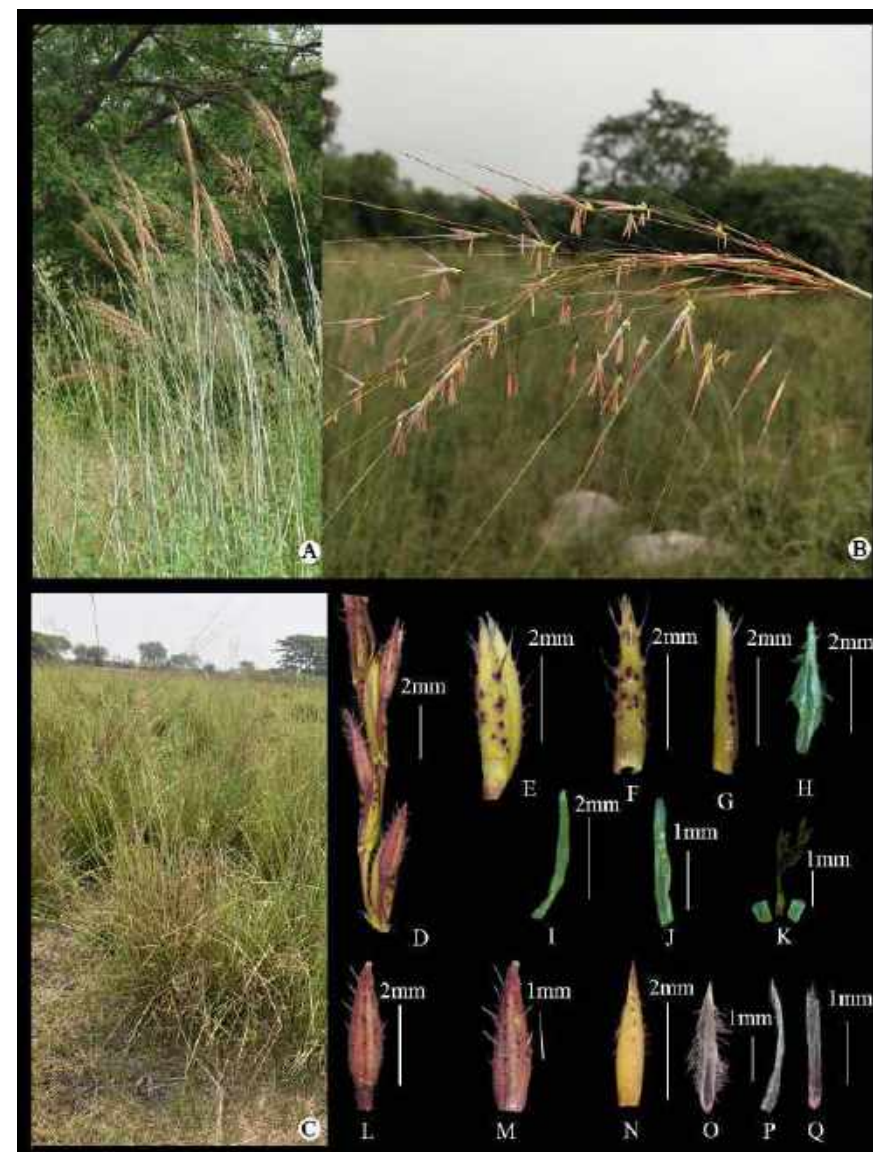


Plate 128. A–B. *Chrysopogon verticillatus* (Roxb.) Trin. ex Steud.: A. Habitat; B. Inflorescence; C–Q. *Chrysopogon zizanioides* (L.) Roberty: C. Habitat; D. Enlarged view of raceme; E–K. Sessile spikelet; E. Spikelet; F. Lower glume; G. Upper glume; H. Lower lemma; I. Palea; J. Upper lemma; K. Lodicules with pistil; L–Q. Pedicelled spikelet; L. Spikelet; M. Lower glume; N. Upper glume; O. Lower lemma; P. Palea; Q. Upper lemma.

Bhupalpally District: Chennapur-Regondi, 29.03.2021, *SNR* 012037 (BSID); Mulugu District: Euturunagaram, 24.03.2021, *SNR* 8962 (BSID); Rangareddy District: Hyderabad, *MVR* 02124 (HY); Suryapet District: Nayakangudem, 27.10.2019, *SNR* 8751 (BSID); Warangal District: Thupakulagudem, *PVSK & NRR* 76993 (BSID).

Note: Distinguishable by its muriculate nature on lower glume.

Coix L.

World: c. 3 spp.; India: 4 spp., 2 var.; Telangana: 2 spp.

Key to the species

- | | |
|--|-------------------------------|
| 1a. Lower glume of male spikelet broadly winged | ... 1. <i>C. aquatica</i> |
| 1b. Lower glume of male spikelet narrowly winged | ... 2. <i>C. lacryma-jobi</i> |

1. *Coix aquatica* Roxb., Fl. Ind. 3: 571. 1832; Hook.f., Fl. Brit. India 7: 100. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 264. 1960; Pull., Fl. Telangana 3: 1093. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 691. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 343. 2020.

Caespitose perennials. Culms 55–135 cm high, smooth, spongy; nodes glabrous, lower nodes rooting. Leaves cauline; sheaths 3.5–6.5 cm long, compressed; ligules c. 1 mm long, membranous; blades 25–80 × 2–2.5 cm, linear-lanceolate, adaxial surface densely tuberculate hairy and glands below, margins hispid, apex acuminate. Synflorescence; basal female spikelets, upper male spikelets; peduncle 3.5–6 cm long. Male spikelets 1-pedicelled, 2-sessile, imbricate, apex muticous. Lower glume c. 1 cm long, lanceolate-elliptic, chartaceous, many nerved, keels broadly winged, margins inflexed, apex acute. Upper glume similar, without wings, 6–9-nerved. Florets 2. Lower lemma as long as upper glume, oblong-lanceolate, hyaline, 3–5-nerved. Lower palea similar, 2-nerved, 2-keeled. Lodicules 2. Stamens 3. Upper lemma lanceolate, chartaceous, hyaline, 3-nerved. Upper palea similar, nerveless. Female spikelet, solitary near base, ovate, whitish-yellow, completely enclosed by bract forming a bony involucre. Lower glume 6–7.5 mm long, oblong-lanceolate, apex acuminate-beak c. 2.5 mm long. Upper glume narrowly oblong, chartaceous, hyaline, keeled, margins inrolled. Florets 2; lower empty, upper female. Lower lemma 6–7.5 mm long, lanceolate-oblong, 5-nerved, apex acuminate. Palea absent. Ovary elliptic. Involucre turbinate (top-shaped), perforated, apex ciliate. Ripened involucre-beak like structure.

Fl. & Fr.: Sept.–Mar.

Distrib.: Occasionally along stream banks, margins of ponds and moist places.

Exsicc.: Adilabad District: Kunthala way, *MHR* 13267 (SKU); Karimnagar District: Rangapur, 10.11.2019, *SNR* 8764 (BSID).

Note: It can be easily identifiable by spongy culms.

2. *Coix lacryma-jobi* L., Sp. Pl. 2: 972. 1753; Hook.f., Fl. Brit. India 7: 100. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1705. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 264. 1960; Pull., Fl. Telangana 3: 1094. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 692. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 343. 2020. '*Culbay Gaddi*' **Plate 129**

Annuals. Culms 150–200 cm high; nodes glabrous. Leaves basal and cauline; sheaths compressed, glabrous; ligules membranous; blades 12–60 × 1.5–5 cm, linear-lanceolate, midrib stout, sparsely tubercle based hairy. Racemes 6–12 cm long, flexuous from long peduncle. Male spikelets 7–16 mm long, lanceolate-elliptic. Lower glume 7–11 mm long, oblong-lanceolate, coriaceous, margins winged, ciliate, apex acute. Upper glume 4.5–12 mm long, elliptic-lanceolate,

coriaceous, 6–8-nerved, apex acute. Lower lemma 5.5–11 mm long, lanceolate-oblong, coriaceous, hyaline, 5-nerved. Palea male, 15–11 mm long, elliptic-lanceolate, chartaceous, hyaline, 2-nerved. Upper lemma 4–12 mm long, elliptic-lanceolate, chartaceous-membranous, hyaline. Palea 6–7 mm long, elliptic-lanceolate, membranous-chartaceous, hyaline, 2-nerved. Female spikelets 6–16 mm long, ovoid shining. Both lower and upper glumes similar, 10–15 mm long, chartaceous. Lower lemma empty, 4–8 mm long, oblong. Upper lemma female, 5.5–12 mm long, oblong. Palea 7–10 mm long, ovate-oblong, hyaline. Caryopsis 8–10 mm long, globose or ovoid.

Fl. & Fr.: Aug.–Mar.

Distrib.: Occasional in marshy habitats, stagnant waters and paddy fields.

Exsicc.: Medak District: Gangapur Peppallevagu, *TP & MSG* 12087 (SKU); Sone, *TP & PVP* 4012 (SKU); Rangareddy District: Hyderabad, *MVR* 02125 (HY); Warangal District: Chennrao Pet-Narsampet, 30.03.2021, *SNR* 012042 (BSID).

Cymbopogon Spreng.

World: 53 spp.; India: 22 spp., 1 subsp., 2 var.; Telangana: 8 spp.

Key to the species

- | | |
|--|------------------------------|
| 1a. Sessile spikelets without an awn or reduced | ... 2 |
| 1b. Sessile spikelets awned | ... 3 |
| 2a. Lower glume shallowly concave in the lower half | ... 2. <i>C. citratus</i> |
| 2b. Lower glume flat on the back | ... 8. <i>C. winterianus</i> |
| 3a. Lower glume of the sessile spikelets with a deep slot-like depression occupying most of its length | ... 5. <i>C. gidarba</i> |
| 3b. Lower glume without a slot, either flat, convex, shallowly concave or with deep narrow slit in the lower half | ... 4 |
| 4a. Lower glume of the sessile spikelet with narrow slit like groove in the lower half which appears as a rib on the inner surface | ... 5 |
| 4b. Lower glume of the sessile spikelet flat, convex-concave, wrinkled, shallow depressions | ... 6 |
| 5a. Leaves cordate and amplexicaul at base | ... 6. <i>C. martinii</i> |
| 5b. Leaves rounded at base | ... 1. <i>C. caesius</i> |
| 6a. Pedicel of the lowest pedicelled spikelet in the sessile in the sessile raceme grotesquely swollen | ... 3. <i>C. coloratus</i> |
| 6b. Pedicel of the lowest pedicelled spikelet in the sessile raceme not swollen | ... 7 |
| 7a. Inflorescence very congested | ... 7. <i>C. nardus</i> |
| 7b. Inflorescence lax and loose | ... 4. <i>C. flexuosus</i> |

1. *Cymbopogon caesius* (Hook. & Arn.) Stapf in Bull. Misc. Inform. Kew 1906: 360 & 361. 1906; C.E.C.Fisch. in Gamble, Fl. Madras 1757. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 125. 1960; Pull., Fl. Telangana 3: 1096. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 693. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 344. 2020. '*Kasi Gaddi*' **Plate 130**

Caespitose perennials, rhizomatous. Culms 100–180 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 4–6 cm long, glabrous; ligules membranous, apex fimbriate; blades 8–24 × 0.2–0.6 cm, linear-lanceolate, glabrous, base truncate, apex attenuate-acuminate. Panicles 11–35 cm long. Racemes 2, c. 14 mm long, sessile and pedicelled, divergent; spatheole



Plate 130. *Cymbopogon caesius* (Hook. & Arn.) Stapf: A. Habitat; B. Enlarged view of inflorescence; C. Paired spikelets; D. Lower glume of sessile spikelet; E. Upper glume of sessile spikelet.

c. 17 mm long, pedicels of lower racemes swollen. Sessile spikelets $3.5-4 \times 0.8-1$ mm, linear, callus densely villous, apex acuminate, awned. Lower glumes $3.5-4 \times 0.4-0.6$ mm, oblong, coriaceous, depression below the half, 3-5-nerved, 2-keeled, keels broadly winged, apex acuminate-notched. Upper glume $3-4 \times 0.5-0.7$ mm, lanceolate-oblong, chartaceous-coriaceous, 3-nerved, keeled, margins ciliate, apex acuminate. Florets 2, lower neuter, upper bisexual. Lower lemma $3 \times 0.3-0.5$ mm, oblong, membranous, hyaline, margins ciliate, apex acuminate. Lower palea

reduced, $1-1.3 \times 0.5$ mm, lanceolate, membranous, apex acuminate, 2-lobed. Upper lemma $1-2 \times 0.2-0.4$ mm, oblong, membranous, apex deeply bifid, lobes acuminate; awn from sinus, 11-14 mm long, geniculate, barbellate. Caryopsis $1-1.5 \times 0.3-0.5$ mm, oblong. Pedicelled spikelets $3-4 \times 0.7$ mm, margins ciliate, unawned. Lower glume $3-3.8 \times 0.7$ mm, oblong, chartaceous, margins ciliate, apex acuminate. Upper glume $3-3.7 \times 0.7$ mm, oblong, apex acuminate. Lower lemma $2.5-3.5 \times 0.6$ mm, oblong, membranous, hyaline, margins ciliate, apex acute. Lower palea c. 1 mm long, reduced.

Fl. & Fr.: Aug.-Feb.

Distrib.: Common throughout state in grasslands and forest areas.

Exsicc.: Adilabad District: Amrabad, BSS, SKB & BRPR 32207 (SKU); Karimnagar District: Shanigaram, 10.11.2019, SNR 8765 (BSID); Nagarkurnool District: Teegalapalli Koderu, 07.08.2019, SNR 8641 (BSID); Rangareddy District: Hyderabad, MVR 02126 (HY); Vikarabad District: Ananthagiri Hills, 30.11.2019, SNR 8783 (BSID); Warangal District: Nadikudi-Parakala, 29.03.2021, SNR 012035 (BSID); Regional Agricultural Research Station, 26.03.2021, SNR 8981 (BSID).

Note: It can be easily recognizable by its swollen pedicels of lower racemes.

2. *Cymbopogon citratus* (DC.) Stapf in Bull. Misc. Inform. Kew 1906: 322, 357. 1906; C.E.C.Fisch. in Gamble, Fl. Madras 1756. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 126. 1960; Pull., Fl. Telangana 3:1096. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 693. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 345. 2020. *Andropogon citratus* DC., Cat. Pl. Horti Monsp. 78. 1813 (as '*citratum*'). '*Lemon grass*', '*Vaasana Gaddi*'

Caespitose perennials, rhizomatous. Culms 150-180 cm high. Leaves basal and cauline; ligules membranous; blades 50-100 cm long, lanceolate, base narrowed, glaucous, aromatic. Panicles 35-55 cm long, compound, lax; racemes, terminal and axillary, subtended by spatheole. Racemes 2, deflexed, 1.5-2.5 cm long; rachis linear, apex cupuliform, fragile, margins villous, hairy 2-2.5 mm long. Raceme flattened, subequal. Spikelets paired, sessile and pedicelled. Sessile spikelets $5.5-6 \times 0.5$ mm, linear-lanceolate, unawned; callus bearded. Glumes unequal; exceeding apex of florets. Lower glume 5-6 mm long, lanceolate-oblong, chartaceous-coriaceous, flat-concave dorsally, 2-keeled, apex emarginate. Upper glume lanceolate, membranous, 1-keeled apex acute. Florets 2; lower neuter-barren, epaleate, upper bisexual. Lower lemma lanceolate, chartaceous, hyaline. Upper lemma lanceolate, chartaceous, hyaline, apex 2-fid. Upper palea absent or reduced. Stamens 3. Pedicelled spikelets 2, well developed. Pedicelled spikelets male, 4-5 mm long, elliptic, deciduous with sessile spikelets; pedicels linear, villous, hairs 2-3.5 mm long. Glumes chartaceous, apex acute-muticous. Lemma subtended by glumes.

Fl. & Fr.: Throughout the year.

Distrib.: Cultivated.

Exsicc.: Nalgonda District: Bothya Thanda, 11.12.2011, BRA 001138 (BSID); Rangareddy District: Hyderabad, MVR 02127 (HY); Warangal District: Hanumakonda, CSR 914 (KU).

3. *Cymbopogon coloratus* (Nees ex Hook.f.) Stapf in Bull. Misc. Inform. Kew 1906: 321. 1906; C.E.C.Fisch. in Gamble, Fl. Madras 1756. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 126. 1960; Pull., Fl. Telangana 3: 1097. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 693. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 345. 2020. *Andropogon nardus* L. var. *coloratus* Nees ex Hook.f., Fl. Brit. India 7: 206. 1896. 'Bodha Gaddi' **Plate 131**

Caespitose perennials, rhizomatous. Culms 100–200 cm high, erect; nodes bearded. Leaves aromatic, basal and cauline; sheaths 10–15 cm long, margin pubescence, base fastigate; ligules membranous, apex fimbriate; blades 22–55 × 0.4–0.9 cm, linear, base rounded, apex attenuated. Panicles 20–45 cm long, interrupted, decompound. Spathes 2–2.5 cm long; spatheoles 1–1.6 cm long. Racemes 2, divergent, 1.5–2.5 cm long, base margins of the racemes pilose, swollen. Sessile spikelets 5–6 × 0.5–0.6 mm, oblong. Lower glume 4–6 × 0.6–0.8 mm, lanceolate, chartaceous, flat, apex bidentate, 2-nerved, 2-keeled; keels winged and serrulate. Upper glume 4–4.5 × 0.5–0.6 mm, lanceolate-cymbiform, chartaceous, apex acuminate, 3-nerved, 1-keeled; keel scabrid. Florets 2, epaleate. Lower lemma 3.5–4 × 0.5 mm, oblong, membranous, apex acute-retuse. Upper lemma c. 3.5 × 0.3 mm, narrowly oblong, apex bifid, lobes ciliate; awn from sinus 8–16 mm long, geniculate, barbellate. Lodicules 2. Stamens 3. Pedicelled spikelets male or neuter, 5.5 × 1 mm, lanceolate. Lower glume 0.4–0.6 × 1 mm, lanceolate-oblong, chartaceous, apex acuminate, 10–11-nerved, 2-keeled; keels scabrid. Upper 4–4.2 × 0.4–0.5 mm, oblong, chartaceous, margin incurved, 3-nerved, apex acuminate. Florets 2, epaleate. Lower lemma 3.8–4 × 0.4–0.6 mm, oblong, membranous, margins inflexed, apex acuminate. Upper lemma 2 × 0.2 mm, elliptic, membranous, apex acuminate.

Fl. & Fr.: Aug.–Feb.

Distrib.: Common in plains and Ghats.

Exsicc.: Bhadrachal Kotahgudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 9592 (BSID); Mahabubnagar District: Manyamkonda, 06.08.2019, SNR 8617 (BSID); Medak District: Sivampet beet, Narasapur, 15.03.2003, RG 116473 (BSID); Narasapur tank, TP & MSG 12017 (SKU); Mulugu District: Eturunagaram, 24.03.2021, SNR 8965 (BSID); Rangareddy District: Hyderabad, MVR 02128 (HY); Manasa hills-Rajender Nagar, 10.10.2019, SNR 8734 (BSID); Warangal District: Jangaon, CSR 657 (KU); Pakhal, KMS 11642 (MH).

4. *Cymbopogon flexuosus* (Nees ex Steud.) Will. Watson, Bot. Himalayan Distr. N. W. Prov. 392. 1982; C.E.C.Fisch. in Gamble, Fl. Madras 1756. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 127. 1960; Pull., Fl. Telangana 3: 1097. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 694. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 345. 2020. *Andropogon flexuosus* Nees ex Steud., Syn. Pl. Glumac. 1: 388. 1854. *Andropogon nardus* L. var. *flexuosus* (Nees ex Steud.) Hack., Monor. Phan. 6: 603. 1889; Hook.f., Fl. Brit. India 7: 207. 1896.

Caespitose perennials, rhizomatous. Culms 100–260 cm high, erect, reddish; nodes glabrous. Leaves basal and cauline; sheaths 7–9 cm long, terete,

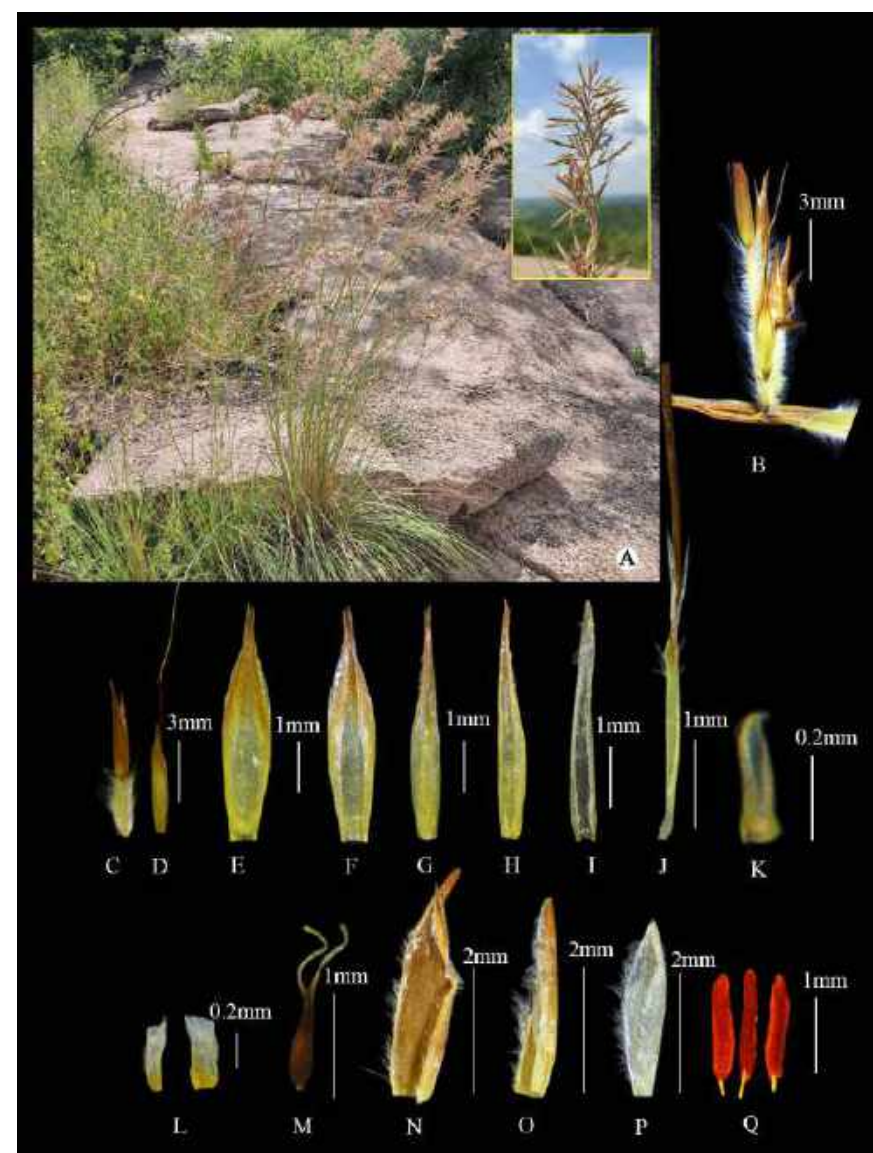


Plate 131. *Cymbopogon coloratus* (Hook.f.) Stapf: A. Habitat (Inset: Closed view of inflorescence); B. Closed view of a raceme; C. Pedicelled spikelet; D–M. Sessile spikelet; D. Spikelet; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I. Lower lemma; J. Upper lemma; K. Palea; L. Lodicules; M. Pistil; N–Q. Pedicelled spikelet; N. Lower glume; O. Upper glume; P. Lemma; Q. Stamens.

glabrous; ligules membranous; blades 20–80 × 1–1.5 cm, linear, scabrid, apex attenuate. Panicles 60–70 cm long, decompound, flexuous. Racemes 15–18 mm long, joints densely villous, spatheole 16–20 mm long, glabrous. Spikelets 3; 1-sessile, awned; 2-pedicelled, unawned, pedicel not swollen. Sessile spikelets 4.5–5 × 0.6–0.7 mm, lanceolate, apex acuminate. Lower glume 3–4 × 0.5–0.6

mm, elliptic-lanceolate, chartaceous, apex acuminate; 2-keeled, 3-nerved with 2–3 wrinkles-depressions or folds, narrowly winged, wings serrulate. Upper glume 4–4.5 × 0.4–0.6 mm, lanceolate, chartaceous, 3-nerved, margins inflexed and ciliate, 1-keeled, keels winged and serrulate, apex acuminate. Florets 2; lower neuter, upper florets bisexual, both epaleate. Lower lemma 3.5–4 × 0.5 mm, lanceolate, hyaline, apex acute. Upper lemma 2–3 × 0.2–0.4 mm, oblong, hyaline, apex deeply bifid; awn from sinus 6–14 mm long, geniculate, barbellate. Caryopsis c. 2 mm long, elliptic. Pedicelled spikelets 4–4.5 × 0.4–0.6 mm, narrowly lanceolate. Pedicels densely villous, abscission zone cupuliform. Lower glume 3.5–4 × 0.4–0.6 mm, ovate, chartaceous, 9-nerved, margins ciliate, apex acuminate. Upper glume 3–3.5 × 0.4–0.6 mm, lanceolate, 3-nerved, margins ciliate, apex obtuse. Florets 2; lower male, upper reduced. Lower lemma 2–2.5 × 0.2–0.4 mm, lanceolate, margin ciliate.

Fl. & Fr.: Jul.–Dec.

Distrib.: Common in all districts. This grass is used for lemon-oil extraction.

Exsicc.: Nalgonda District: Nagarjunakonda Valley, *KT* 9800 (CAL); Rangareddy District: Mekavaripalli, *MSM* 11052 (SKU); Rangareddy District: Hyderabad, *MVR* 02129 (HY); Warangal District: Hanumakonda, *CSR* 425 (KU), (HYD).

Note: It can be identified by its lax and effuse inflorescence.

5. *Cymbopogon gidarba* (Buch.-Ham. ex Steud) Haines, Bot. Bihar & Orissa 1098. 1924; C.E.C.Fisch. in Gamble, Fl. Madras 1757. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 128. 1960; Pull., Fl. Telangana 3: 1098. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 694. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 345. 2020. *Andropogon gidarba* Buch.-Ham. ex Steud., Syn. Pl. Glumac. 1: 387. 1854; Hook.f., Fl. Brit. India 7: 208. 1896.

Plate 132(A-C)

Caespitose perennial, rhizomatous. Culms 60–90 cm high, slender; nodes glabrous. Leaves basal and cauline; sheaths 3–5 cm long, glabrous; ligules membranous, truncate; blades 5–18 × 0.1–0.4 cm, linear-lanceolate, lanceolate-ovate, flat, base cordate, apex acuminate. Panicles 4–25 cm long, narrow, joints and pedicels clavate, callus short. Racemes 1.5–2 cm long, lower raceme base swollen, spathes 2–2.7 cm long, narrowly lanceolate. Sessile spikelets 4–4.5 × 0.5–0.6 mm, linear-lanceolate. Lower glume 3.5–4 mm long, linear, chartaceous, back deeply concave with a bump near base, 2-keeled, margin inflexed, apex 2-toothed. Upper glume 3.5–4 mm long, ovate-cymbiform, membranous, margin inflexed, 1-nerved, apex acuminate. Lower lemma 2.5–3 mm long, lanceolate, membranous-chartaceous, 2-nerved, apex acute-obtuse. Lower palea absent. Upper lemma 2.5–3.2 mm long, narrowly lanceolate, apex bifid; awn from sinus, 10–15 mm long. Upper palea c. 1 mm long, ovate, hyaline, apex obtuse. Pedicelled spikelets male, 3.5–5 mm long, lanceolate. Lower glume 4.5–5 mm long, ovate-lanceolate, chartaceous, 7-nerved, apex acute. Upper glume 4–4.5 mm long, lanceolate, membranous, 3-nerved, apex acute. Lemma 3–3.5 mm long, ovate, 2-nerved, apex acute. Upper palea c. 1 mm long, ovate, apex obtuse.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in grassy slopes.

Exsicc.: Wanaparthy District: Thirumalayagutta, 07.08.2019, *SNR* 8638 (BSID).

Note: It can be identified by its lower glume having a deep slit in lower half.

6. *Cymbopogon martinii* (Roxb.) Will. Watson, Bot. Himalayan Distr. N.W. Prov. 392. 1882 (as “*martini*”); C.E.C.Fisch. in Gamble, Fl. Madras 1756. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 129. 1960; Pull., Fl. Telangana 3: 1098. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 695. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 346. 2020. *Andropogon martinii* Roxb., Fl. Ind. 1: 280–281. 1820.

Plate 132(D-F)

Caespitose perennials, rhizomatous. Culms 100–145 cm high, erect, aromatic; nodes glabrous. Leaves basal and cauline; sheaths 2.5–12 cm long, glabrous; ligules membranous; blades 15–45 × 0.8–1.5 cm, lanceolate, base cordate-amplexicaul, margins scabrid, apex acuminate. Panicles c. 48 cm long, contracted. Racemes binate, 1–1.8 cm long, spathes 4.5–5 cm long, spatheole 1–2 cm long, joints densely villous. Lowest raceme base swollen. Sessile spikelets 3.5–4 × 1–1.3 mm, elliptic-oblong, callus bearded. Lower glume 3.5 × 1–1.3 mm, oblong, chartaceous, deeply (slit) grooved near base dorsally, narrowly winged above, apex 2-dentate-muticous. Upper glume 3–3.5 × 0.6–0.7 mm, elliptic-boat shaped, chartaceous, broadly winged, 3-nerved, apex aristate. Florets 2, lower neuter, upper bisexual. Lower lemma 2–3 × 0.4–1.5 mm, ovate-oblong, 2-nerved, 2-keeled, apex acute. Lower palea absent. Upper lemma 2–2.5 × 0.1–0.3 mm, oblong, hyaline, apex bifid; awn from sinus, 11–18 mm long, geniculate, barbellate. Upper palea c. 1 mm long, linear. Pedicelled spikelets 3.5–4 × 0.6–1 mm, lanceolate. Pedicels densely villous. Lower glume 3.8–4 × 0.6–0.8 mm, elliptic, membranous, 11-nerved, apex acute. Upper glume 3.5–4 × 0.6–0.7 mm, lanceolate, 3-nerved, margins ciliate, apex acute. Lower florets neuter. Upper florets male. Lower lemma 2.5–3 × 0.5–0.6 mm, oblong, hyaline, faintly 2-nerved, margins ciliate, apex acute. Palea absent.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state.

Exsicc.: Medak District: Choutkoor, *TP & MSG* 11924 (SKU); Rangareddy District: Hyderabad, *MVR* 02 130 (HY); Manasa Hills-Rajendranagar, 22.08.2019, *SNR* 8673 (BSID); Vikarabad District: Ananthagiri Hills-Damagundam, 02.12.2019, *SNR* 8905 (BSID); Warangal District: Cherial, *CSR* 389 (KU); *KMS* 15972 (MH).

7. *Cymbopogon nardus* (L.) Rendle, Cat. Afr. Pl. 2(1): 55. 1899; C.E.C.Fisch. in Gamble, Fl. Madras 1756. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 130. 1960; Pull., Fl. Telangana 3: 1099. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 695. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 346. 2020. *Andropogon nardus* L., Sp. Pl. 2: 1046. 1753.

‘Kashay, Kacheri Gaddi’



Plate 132. A–C. *Cymbopogon gidarba* (Steud.) A. Camus: A. Habitat; B. Inflorescence; C. Sessile and pedicelled spikelets; D–F. *Cymbopogon martini* (Roxb.) W. Watson: D. Habitat; E. Inflorescence; F. Sessile and pedicelled spikelets.

Caespitose perennials. Culms 100–260 cm long, high; nodes glabrous. Leaves basal and cauline; sheaths 11–12 cm long, ribbed, glabrous; ligules chartaceous, apex lacerate; blades 25–50 × 0.8–1.5 cm, broadly linear, abaxial and margins surface rough. Panicles 30–55 cm long, pyramidal, interrupted. Racemes 10–15 mm long, pedicels and internodes pilose, spathes 8–20 mm long, closely imbricate, pedicels not swollen. Sessile spikelets paired, 3.5–4 mm long,

elliptic-oblong. Lower glume 3–3.5 × 0.6–0.8 mm, ovate-lanceolate, chartaceous, flat-concave on back or 1–3 shallow transverse depressions below, apex 2-lobed. Upper glume 3.5–4 × 0.3–0.5 mm, oblong, chartaceous, 3-nerved, 1-keeled, apex acuminate-retuse. Florets 2; lower neuter, upper bisexual. Lower lemma 3–4 × 0.4–0.6 mm, oblong, chartaceous, 3-nerved, apex acuminate-rounded. Lower palea absent. Upper lemma c. 1.5 mm long, oblong, hyaline, apex bifid; awn from sinus, 3–5 mm long, geniculate, barbellate. Upper palea 0.4–0.5 mm long, oblong, apex acute. Caryopsis 0.5–0.6 × 0.2 mm, lanceolate, apex acute-acuminate. Pedicelled spikelets 4–5 mm long, oblong, apex acute, awned. Lower glume c. 5 mm long, lanceolate, 10–11-nerved, 2-keeled, keel winged, apex acute-retuse. Upper glume c. 4.5 mm long, oblong, 3-nerved, apex acuminate. Florets 2, lower neuter, upper bisexual; both epaleate. Lower lemma 3–4 × 0.4–0.5 mm, oblong, apex acute. Upper lemma c. 1 mm long, oblong or reduce.

Fl. & Fr.: Dec.

Distrib.: Cultivated and also found occasionally in wild state.

Exsicc.: Karimnagar District: Aklasapur, *GVSR & TRK* 22517 (CAL).

8. *Cymbopogon winterianus* Jowitt ex Bor in Oesterr. Bot. Z. 112(1-2): 185. 1965; Bor, Grasses Burma, Ceylon, India & Pakistan 132. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 347. 2020.

Caespitose perennials. Culms 150–200 cm high, erect, glabrous, glaucous. Leaves mostly basal and cauline; sheaths smooth, glabrous, yellow or purplish-red; blades 10–17 cm long, linear, base cordate, apex acuminate. Panicles lax, decompound, spreading, loose, 25–33 cm long, drooping; spathes 10–13 mm long, narrow, dull-reddish, margins membranous. Sessile and pedicelled spikelets 0.4–0.5 cm long.

Fl. & Fr.: Dec.–Mar.

Distrib.: Cultivated.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02131 (HY).

Dichanthium Willemet

World: 19 spp.; India: 10 spp., 1 var.; Telangana: 5 spp.

Key to the species

- | | |
|---|-----------------------------|
| 1a. Racemes solitary | ... 4. <i>D. foveolatum</i> |
| 1b. Racemes 2-many | ... 2 |
| 2a. Peduncle of the racemes hairy | ... 2. <i>D. aristatum</i> |
| 2b. Peduncle of the racemes glabrous | ... 3 |
| 3a. Lower glumes of the pedicelled spikelets armed with marginal bulbous based bristles | ... 5. <i>D. mccannii</i> |
| 3b. Lower glumes of the pedicelled spikelets entire | ... 3 |
| 4a. Lower glume of the sessile spikelet without median nerve | ... 3. <i>D. caricosum</i> |
| 4b. Lower glume of the sessile spikelet with median nerve | ... 1. <i>D. annulatum</i> |

1. *Dichanthium annulatum* (Forssk.) Stapf, Fl. Trop. Afr. 9: 178. 1917; C.E.C.Fisch. in Gamble, Fl. Madras 1741. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 133. 1960; Pull., Fl. Telangana 3: 1104. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 698. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 350. 2020. *Andropogon annulatus* Forssk., Fl. Aegypt.-Arab. 173. 1775 (as “*annulatum*”); Hook.f., Fl. Brit. India 7: 196. 1896. **Plate 133(A)**

Caespitose perennials. Culms 50–110 cm high, geniculate; nodes hairy. Leaves basal and cauline; sheaths compressed, mouth bearded; ligules membranous; blades 4.5–28 × 0.2–0.5 cm, linear, sparsely hairy, margins scabrid. Racemes 2–6; 6.5–7 cm long, digitate-fascicled. Joints hairy. Sessile spikelets 3–4 mm long, elliptic; callus bearded. Lower glume 3–3.5 mm long, 7–9-nerved, cartilaginous, tubercle based hairy. Upper glume 2.5–3 mm long, lanceolate, coriaceous, ciliolate, 3-nerved. Florets 2; lower neuter, upper bisexual. Lower lemma 1.5–2.8 mm long, linear, chartaceous, hyaline. Upper lemma stipitiform, awn 15–25 mm long. Pedicelled spikelets male or barren, 3–3.5 mm long, oblong; pedicel margins long hairy. Lower glume 3.5–4 mm long, oblong, 8–10-nerved, keel bristly. Upper glume 2.5–3 mm long, softly villous, 3-nerved. Lower lemma 1.5–2 mm long, ciliate. Upper lemma rudimentary.

Fl. & Fr.: Jul.–Dec.

Distrib.: Common throughout the State.

Exsicc.: Medak District: Narsapuram RF, *TP & MSG* 11993 (SKU); Hanumakonda district: Seetharampuram-Parakala, 29.03.2021, *SNR* 012032 (BSID); Mulugu District: Medaram, 29.03.2021, *SNR* 012032 (BSID); Rangareddy District: Hyderabad, *MVR* 02137 (HY).

2. *Dichanthium aristatum* (Poir.) C.E. Hubb. in Bull. Misc. Inform. Kew 10: 654. 1940; Bor, Grasses Burma, Ceylon, India & Pakistan 134. 1960. *Andropogon aristatus* Poir., Encycl. Suppl. 1: 585. 1810. *Dichanthium nodosum* Willemet in Ann. Bot. (Usteri) 18: 11. 1796; C.E.C.Fisch. in Gamble, Fl. Madras 1741. 1934. **Plate 133(B-N)**

Caespitose perennials. Culms 15–90 cm high, erect or geniculate. Leaves basal and cauline; sheaths compressed-terete; blades 2.5–20 × 0.2–0.4 mm, linear, apex acute. Racemes 1–6, digitate, pubescent near the base of the inflorescence, base 1–6 male spikelets. Sessile spikelets 2.5–4.5 mm long, obovate-elliptic, chartaceous, convex, pilose, margins ciliate, apex obtuse; awn 8–18 mm long. Pedicelled spikelets similar to sessile spikelets.

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasionally in Medak.

Exsicc.: Medak District: Choutukur fields, *TP & MSG* 11909 (SKU), Patanchervu, 12086 *TP & MSG* (SKU); Vikarabad District: Ananthagiri hills, 30.11.2019, *SNR* 8787 (BSID), Damagundam, 02.12.2019, *SNR* 8903 (BSID).

3. *Dichanthium caricosum* (L.) A. Camus in Bull. Mus. Natl. Hist. Nat. 27: 549. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1741. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 139. 1960; Pull., Fl. Telangana 3: 1105. 2015; K.N.Reddy



Plate 133. A. *Dichanthium annulatum* (Forssk.) Stapf; B–N. *Dichanthium aristatum* (Poir.) C.E.Hubb.: B. Inflorescence; C. Sessile spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Palea; H. Lodicules; I. Stamens; J. Pistil; K. Pedicelled spikelet; L. Lower glume; M. Upper glume; N. Lower lemma.

& C.S.Reddy, Fl. Telangana 699. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 350. 2020. *Andropogon caricosus* L. Sp. Pl. 2: 1480. 1763 (as “*caricosum*”); Hook.f., Fl. Brit. India 7: 196. 1896. **Plate 134(A-B)**

Caespitose perennials. Culms 50–110 cm high, geniculate; nodes appressed hairy-glabrous. Leaves basal and cauline; sheaths glabrous; ligules membranous, ciliate; blades 4–22 × 0.2–0.4 cm, linear, sparsely hairy. Racemes

1–4; 6–8 cm long, digitate. Joints and pedicels hairy. Sessile spikelets 3.5–4 mm long, obovate, callus bearded. Lower glume 3–3.5 mm long, obovate-elliptic, coriaceous, 5–7-nerved, keels winged, margins setose. Upper glume 3–3.5 mm long, ovate-lanceolate, coriaceous-membranous, 3-nerved. Florets 2; lower neuter, upper bisexual. Lower lemma 2–2.5 mm long, chartaceous, hyaline. Upper lemma stipitate; awn 10–22 mm long. Pedicelled spikelets male or barren, 2–4 mm long, obovate. Lower glume 3–3.5 mm long, 10–12-nerved, winged towards apex. Upper glume 3.5–4 mm long, lanceolate, 3-nerved. Lower lemma 2.5–3 mm long, ovate-oblong, hyaline. Upper lemma 2.5–3 mm long, oblong, hyaline.

Fl. & Fr.: July–Dec.

Distrib.: Common throughout the state in arid habitats and grassy patches.

Exsicc.: Adilabad District: Sone, *TP & PVP* 4011 (SKU); BirsaiPET, *GO & PVP* 4618 (SKU); Bhadradi Kothagudem District: Sambaigudem-Manugur, 24.03.2021, *SNR* 8955 (BSID); Karimnagar District: Shanigaram, 10.11.2019, *SNR* 8767 (BSID); Rangareddy District: Hyderabad, *MVR* 02138 (HY); Manasa Hills-Rajendra Nagar, 10.10.2019, *SNR* 8737 (BSID); Vikarabad District: Damagundam, *SNR* 8903 (BSID); Warangal District: Gudeppad Lake-Ramappa lake, 29.03.2021, *SNR* 012040 (BSID); Regional Agricultural Research Station, 26.03.2021, *SNR* 8984 (BSID).

4. *Dichanthium foveolatum* (Delile) Roberty, Boissiera 9: 170. 1960. *Eremopogon foveolatus* (Delile) Stapf, Fl. Trop. Afr.9: 983. 1917; Bor, Grasses Burma, Ceylon, India & Pakistan 148. 1960; Pull., Fl. Telangana 3: 1105. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 369. 2020. *Andropogon foveolatus* Delile, Descr. Egypte Hist. Nat.: 16. t. 8. f. 2. 1812; Hook.f., Fl. Brit. India 7: 168. 1896. **Plate 134(C-H)**

Caespitose perennials. Culms 40–70 cm high, erect or geniculate, slender branches terminated by solitary racemes; nodes bearded. Leaves basal and cauline; sheaths terete-compressed, mouth ciliate; ligules truncate, apex ciliate; blades 5–20 × 0.1–0.2 cm, narrowly linear, abaxial surface scabrid. Racemes 3.5–4 cm long, solitary, peduncles exerted from the spathe; joints and pedicels silky villous. Spikelets 3–4.5 mm long, elliptic-lanceolate, binate, purple; callus bearded. Lower glume 3–4 mm long, lanceolate, chartaceous-membranous, 4-nerved, pit upper half. Upper glume 3–4.5 mm long, lanceolate-elliptic, chartaceous, faintly 3-nerved. Lower lemma 0.5–1 mm long, lanceolate, chartaceous. Upper lemma reduced to awn, 12–18 mm long. Pedicelled spikelets similar to sessile, unawned. Lower glume without or with a pit.

Fl. & Fr.: Sep.–Jan.

Distrib.: Common throughout the State.

Exsicc.: Adilabad District: Sarvaipet, *GO & PVP* 4821 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 08.01.2019, *SNR* 9578 (BSID); Nagarkarnool District: Kollapur-Choutabetla, 08.08.2019, *SNR* 8650 (BSID); Mahabubnagar District: Venkatapuram-Koyalakonda, 06.08.2019, *SNR* 8609 (BSID); Rangareddy District: Hyderabad, *MVR* 02139 (HY); Manasa hills,



Plate 134. A–B. *Dichanthium caricosum* (L.) A. Camus: A. Habitat; B. Inflorescence; C–H. *Dichanthium foveolatum* (Delile) Roberty: C. Habit; D. Paired spikelets; E. Sessile spikelet; F. Pedicelled spikelet; H. Stamens with pistil.

24.08.2016, *SNR* 8547 (BSID); 10.10.2019, *SNR* 8732 (BSID); Wanaparthy District: Amadabakula, 09.08.2019, *SNR* 8653 (BSID).

Note: Distinguishable by its purplish inflorescence, each branch ends with spike and pitted glumes.

5. *Dichanthium mccannii* Blatt. in J. Bombay Nat. Hist. Soc. 32: 357. 1927; Bor, Grasses Burma, Ceylon, India & Pakistan 135. 1960; Pull., Fl. Telangana 3:

1106. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 351. 2020.

Caespitose annuals. Culms 8–40 cm high, slender, glabrous, nodes bearded. Leaves basal and cauline; sheaths terete, bulbous based hairs; ligules hairy; blades 1.5–8 × 0.2–0.4 mm, linear-ovate, bulbous based bristles. Racemes 1–2; 3–3.5 cm long, lower 3–4 pairs male spikelets, joints and pedicels one side ciliate hairs. Sessile spikelets 3–4 mm long, ovate-elliptic, awned, callus bearded. Lower glume 3.5–4 mm long, narrowly ovate-oblong, membranous, margins inrolled, 7-nerved, apex obtuse. Upper glume 3.5–4.5 mm long, narrowly ovate, chartaceous-membranous, apex acuminate. Lower lemma 3–3.5 mm long, narrowly oblong, coriaceous, hyaline, nerveless, apex obtuse. Palea absent. Upper lemma stipitate, awn geniculate, 25–28 mm long, 1-nerved. Palea absent. Pedicelled spikelet 4–4.5 mm long, narrowly obovate-elliptic. Lower glume 4.5–5 mm long, membranous, obovate, dorsal submarginal bulbous based bristles, 10-nerved, apex obtuse. Upper glume 4–5.5 mm long, ovate-elliptic, chartaceous-membranous, margins inflexed, ciliate, 3-nerved, apex acute. Lower lemma oblong-lanceolate, chartaceous, hyaline, margins ciliate, apex rounded. Palea narrowly ovate, membranous, hyaline, apex acute.

Fl. & Fr.: Aug.-Nov.

Distrib.: Occasionally in Nagarkurnool.

Exsicc.: Nagarkurnool District: Kollapur, 08.08.2019, SNR 8651 (BSID); Warangal District: Regional Agricultural Research Station, 26.03.2021, SNR 8993 (BSID).

Note: It can be identifiable by long bristles on glumes.

Diectomis P. Beauv.

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

Diectomis fastigiata P. Beauv., Ess. Agrostogr. 160. 1812. *Andropogon fastigiatus* Sw., Prodr. 26. 1788.; Hook.f., Fl. Brit. India 7: 170. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1753. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 135. 1960; Pull., Fl. Telangana 3: 1062. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 702. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 351. 2020.

Plate 135

Caespitose annuals. Culms about 110 cm high, erect or geniculate; nodes glabrous. Leaves mostly basal; sheaths 1.5–5.5 cm long, terete, glabrous; ligules 3–4.2 mm long, membranous; blades 2–22 × 0.2 cm, linear, glabrous, setaceous. Racemes 2.5–4 cm long, solitary, joints turbinate, compressed; callus bearded. Sessile spikelets 3–4.5 × 0.3–0.4 mm, linear-lanceolate, coriaceous. Lower glume 3–3.8 × 0.3–0.4 mm, linear, coriaceous, 6-nerved, deeply grooved dorsally, 2-keeled, apex 2-toothed. Upper glume 2.8–3 × 0.6–0.8 mm, coriaceous, cymbiform, 3-nerved, 1-keeled, keels ciliate, awned; awn 10–12 mm long, apex 2-toothed. Lower lemma 2.5–3 × 0.3–0.4 mm, ovate-lanceolate, membranous, 2-keeled, 2-nerved, deeply grooved on the back, apex obtuse. Palea absent. Upper lemma 2–2.5 × 0.4–0.5 mm, membranous, boat shaped, apex 2-fid, awned; awn from the sinus, 20–25 mm long, scaberulous. Palea 1.5–2 × 0.3–0.4 mm, oblong-

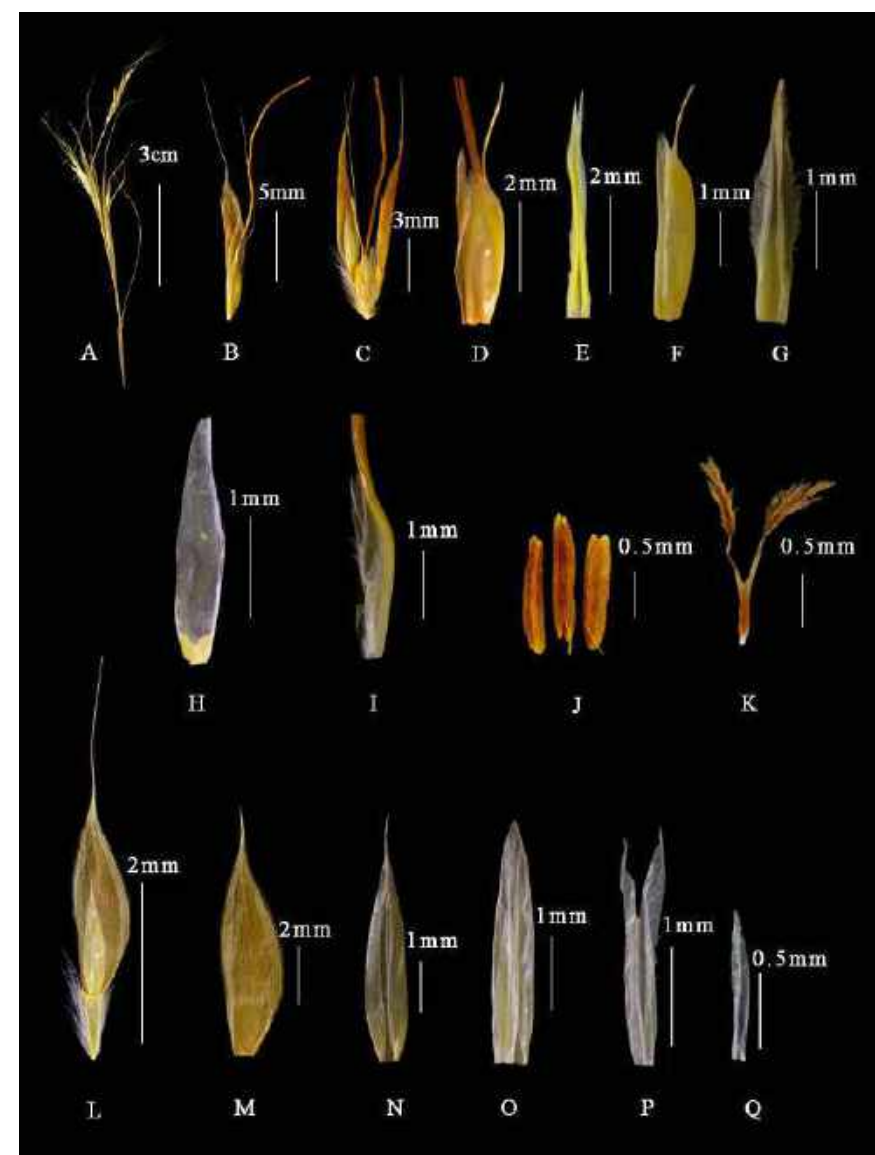


Plate 135. *Diectomis fastigiata* P.Beauv. A. Inflorescence; B&C. Spikelets; D–K. Sessile spikelet; D. Spikelet; E. Lower glume; F. Upper glume; G. Lower lemma; H. Palea; I. Upper lemma; J. Stamens; K. Pistil; L–Q. Pedicelled spikelet; L. Spikelet; M. Lower glume; N. Upper glume; O. Lower lemma; P. Upper lemma; Q. Palea.

elliptic, hyaline, nerveless, obtuse. Stamens 3. Caryopsis 1–1.5 × 0.3–0.4 mm, elliptic-obovate. Pedicel 2–2.5 mm long, turbinate, compressed, margins densely ciliate. Pedicelled spikelet c. 7 mm long, ovate-lanceolate. Lower glume c. 7 mm long, lanceolate, membranous, 15-nerved, 2-keeled, keels winged, scabrid, apex bifid, median awn 5 mm long. Upper glume c. 3.5 mm long, ovate-lanceolate, membranous, 5-nerved, 1-keeled, apex 2-toothed, awned, awn c. 3 mm long.

Lemma c. 2 mm long, ovate-lanceolate, membranous. Palea absent.

Fl. & Fr.: Sep.–Nov.

Distrib.: Occasional in sandy soils and on rocky slopes.

Exsicc.: Medak District: Pocharam tank, *TP & MSG* 12052 (SKU); Rangareddy District: Hyderabad, *MRS* 246 (DD).

Note: It can be easily recognized by its 15-nerved lower glume of pedicelled spikelet.

Dimeria R. Br.

World: 57 spp.; India: 47 spp., 3 subsp., 4 var.; Telangana: 7 spp.

Key to the species

- | | | |
|-----|--|-----------------------------------|
| 1a. | Upper glume awned | ... 1. <i>D. avenacea</i> |
| 1b. | Upper glume unawned, sometimes mucronate | ... 2 |
| 2a. | Upper glume winged all along or at least at the tip | ... 3 |
| 2b. | Upper glume not winged | ... 7. <i>D. ornithopoda</i> |
| 3a. | Upper glume narrowly winged all along the keel | ... 4 |
| 3b. | Upper glume winged just below the tip | ... 5 |
| 4a. | Upper glume narrowly winged all along the keel | ... 3. <i>D. connivens</i> |
| 4b. | Upper glume broadly winged on the keel | ... 2. <i>D. bialata</i> |
| 5a. | Rachis margins broadly winged | ... 6 |
| 5b. | Rachis margins narrowly winged or wingless | ... 5. <i>D. kanjirapallilana</i> |
| 6a. | Spikelets 4-4.3 mm long, tip of the upper glume pappery wing | ... 6. <i>D. orissae</i> |
| 6b. | Spikelets 3.5 mm long, tip of the upper glume minute | ... 4. <i>D. deccanensis</i> |

1. *Dimeria avenacea* (Retz.) C.E.C.Fisch. in Misc. Inform. Kew 1932: 72. 1932 & in Gamble, Fl. Madras 1741. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 139. 1960; Pull., Fl. Telangana 3: 1112. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 355. 2020. *Anthoxanthum avenaceum* Retz., Observ. Bot. 3:8. 1783 (as "*avenaceum*"). *Dimeria acutipes* Bor in Kew Bull. 1952: 560. 953 & Grasses Burma, Ceylon, India & Pakistan 138. 1960.

Caespitose annuals. Culm 5–28 cm long, slender. Leaves mostly basal; sheath compressed; ligules membranous; blades 0.5–8 cm long. Racemes 1; 0.5–4.5 cm long, rachis angular. Spikelets 3.5–6 mm long, oblong, appressed, solitary. Pedicel narrow, flattened. Callus 1.5 mm long, scaberulous-pubescent. Lower glume elliptic, coriaceous-chartaceous, glabrous-pilose, 1-keeled, 3-nerved, apex acute-acuminate. Upper glume lanceolate-elliptic, chartaceous-coriaceous, 1-keeled, winged all along from base to tip, 3-nerved, apex acuminate-acute, awned; awn 1–3.5 mm long. Florets 2, lower barren, upper fertile; both epaleate. Lower lemma lanceolate. Upper lemma elliptic-lanceolate, chartaceous-coriaceous, apex bifid, awned; awn from sinus, geniculate, 8–14 mm long, column twisted, glabrous.

Fl. & Fr.: Aug.–Oct.

Distrib.: Occasionally in Rangareddy and Vikarabad.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02142 (HY).

2. *Dimeria bialata* C.E.C.Fisch. in Bull. Misc. Inform. Kew 1933(7): 351.

1933; Bor, Grasses Burma, Ceylon, India & Pakistan 140. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 355. 2020.

Caespitose annuals. Culms 10–50 cm long; nodes bearded. Leaves mostly basal; sheaths keeled, pilose, tubercle base hairs; ligules ciliate; blades 3–7.5 cm long, pilose, tubercle based hairs, margins scabrous, apex acute. Racemes 2; paired; 3–3.5 cm long, divergent. Rachis flattened, 1–1.5 mm wide, margins glabrous. Pedicels reduced. Spikelets 3–4 mm long, elliptic. Callus 0.2–0.3 mm long, base obtuse. Lower glume 3–3.5 mm long, linear-lanceolate, coriaceous, keeled, winged, apex acute-acuminate. Upper glume 3–3.6 mm long, coriaceous, 1-keeled, winged, all along, apex acute-acuminate. Florets 2; lower barren, epaleate, upper bisexual. Lower lemma oblong, margin ciliate. Palea absent. Upper lemma 2–2.5 mm long, elliptic-lanceolate, coriaceous, 1-nerved, apex bifid, awned; awn arise from sinus, column twisted, 5–10 mm long, geniculate. Upper palea absent.

Fl. & Fr.: Aug.–Oct.

Distrib.: **Endemic**-India (Karnataka, Kerala, Telangana).

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, Regalla, 30.01.2020, *JS* 10715 (BSID); Medak District: Pocharam, 12.11.1992, *TP & MSG* 12024 (SKU).

3. *Dimeria connivens* Hack, Monogr. Phan. 6: 689. 1889; Hook.f., Fl. Brit. India 7: 104, 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 140. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 355. 2020. **Plate 136(A-K)**

Caespitose annuals. Culms 11–35 cm high, slender ascending; nodes bearded. Leaves mostly basal; sheaths 1–7 mm long, terete, glabrous; ligules apex fimbriate; blades 0.5–8 cm long, linear-ovate, margins tubercled based hairs, apex acuminate. Racemes 2; 3–3.5 cm long, erect. Spikelets 3–5 mm long, awned. Lower glume 3–4 mm long, narrowly ovate, subcoriaceous, 2-keeled, keels hairy, apex acuminate-acute. Upper glume 3–4.5 mm long, oblong, subcoriaceous, 1-keeled, keel winged, with long hairs, 1-nerved. Lower lemma 1.5–2 mm long, narrowly obovate, margins ciliate, nerveless, apex acute. Palea absent. Upper lemma membranous, elliptic, apex two toothed, awned; awn from sinus, 6–9 mm long, geniculate. Palea 0.5–1 mm long, hyaline, narrowly ovate, apex acute. Lodicules 2. Stamens 2. Caryopsis 2–2.5 mm long, ovate.

Fl. & Fr.: Aug.–Oct.

Distrib.: **Endemic**-India (Andhra Pradesh, Chhattisgarh, Jharkhand, Kerala, Maharashtra, Odisha, Rajasthan, Uttar Pradesh, West Bengal).

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, *SNR* 9624 (BSID); Rangareddy District: Manasa Hills-Rajendranagar, 26.10.2019, *SNR* 8698, 8944, 8945 (BSID).

Note: It can be identifiable by corky wings on spikelets.

4. *Dimeria deccanensis* Bor, Kew Bull. 7(4): 578. 1953; Bor, Grasses Burma, Ceylon, India & Pakistan 140. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 355. 2020.

Annuals. Culms 20–65 cm high, erect or geniculate; nodes bearded. Leaves mostly basal; leaf sheath pilose with tubercle based hairs; ligule 0.3–0.7 mm long, ciliolate membrane; blade 2.5–5.5 × 0.2–0.3 cm, scabrous, pilose-sparsely tubercle based hairy, margins tuberculate hairy, apex acuminate. Racemes 3.5–6.5 cm long, paired; rachis flattened, c. 0.65 mm wide, margins ciliate. Spikelets crowded, 2-rowed, appressed, solitary; pedicelled c. 3.5 mm long, elliptic, falling entire; flattened; callus c. 0.4 mm long, bearded, base obtuse. Lower glume c. 3.2 mm long, oblong, chartaceous with thin margins, 1-keeled, keel ciliate, scabrous and rough above, pilose hairy below, apex acute. Upper glume elliptic, as long as spikelet, apex acute; subcoriaceous with hyaline margins, 1-keeled, winged all along on keel, keel ciliate, pilose dorsally. Florets 2; lower barren, upper bisexual. Lower lemma lanceolate, hyaline, margins ciliate. Upper lemma 1.5–2 mm long, elliptic, apex 2-fid, awned from sinus, hyaline, 1-nerved; awn geniculate, c. 7 mm long, twisted. Palea absent or minute. Stamens 2; anthers c. 1 mm long.

Fl. & Fr.: Oct.–Dec.

Distrib.: Open grasslands. **Endemic**-India (Karnataka, Kerala, Maharashtra, Tamil Nadu).

Exsicc.: Wanaparthi District: Thirumalayya gutta, 07.08.2019, SNR 8700 (BSID).

5. *Dimeria kanjirapallilana* K.C. Jacob in J. Bombay Nat. Hist. Soc. 47(1): 48. 1947; Sreek. & V.J. Nair, Fl. Kerala-Grass. 91. 1991; Manilal & Raveendr. in Rheede 8(2): 201. 1998; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 356. 2020.

Caespitose annuals. Culms 20–40 cm high, geniculate-erect; nodes bearded. Leaves mostly basal; sheaths keeled, fastigiate; ligules c. 1 mm long, membranous, apex fimbriate; blades 3–6 cm long, linear-lanceolate, margins sparsely tuberculate hairy, base truncate, apex acuminate. Racemes 1 or 2; 3–4.5 cm long, divaricate; peduncle 12–15 cm long; rachis narrowly winged, flat dorsally, 0.5–1 mm wide, margins scabrid. Spikelets 3–3.5 mm long, oblong, apex acuminate, pedicels 0.1–0.3 mm, cup shaped, oblong, scabrid, callus bearded, hairs 0.2–0.6 mm. Lower glume 2–3.2 mm long, oblong-linear, chartaceous, brownish, 1-nerved, 1-keeled, keel and dorsal surface scabrid, apex acuminate. Upper glume 3–3.5 mm, oblong-lanceolate, cymbiform, chartaceous, keeled, narrowly winged towards apex, sparsely ciliate, apex acuminate. Florets 2, both epaleate; lower barren, upper bisexual. Lower lemma 1–1.5 mm long, oblong, membranous, faintly 1-nerved, apex ciliolate. Upper lemma 1.5–2.2 mm long, oblong, membranous, 2-lobed, awned from sinus; awn geniculate, column c. 2.5 mm long, twisted, bristle 4–5.5 mm long, barbellate. Stamens 2.

Fl. & Fr.: Oct.–Nov.

Distrib.: **Endemic**-India (Andhra Pradesh, Kerala, Tamil Nadu, Telangana).

Exsicc.: Medak District: Pocharam, TP & MSG 12024 (BSID).

6. *Dimeria orissae* Bor in Kew Bull. 1952: 579. 1953 & Grasses Burma, Ceylon, India & Pakistan 142. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl.

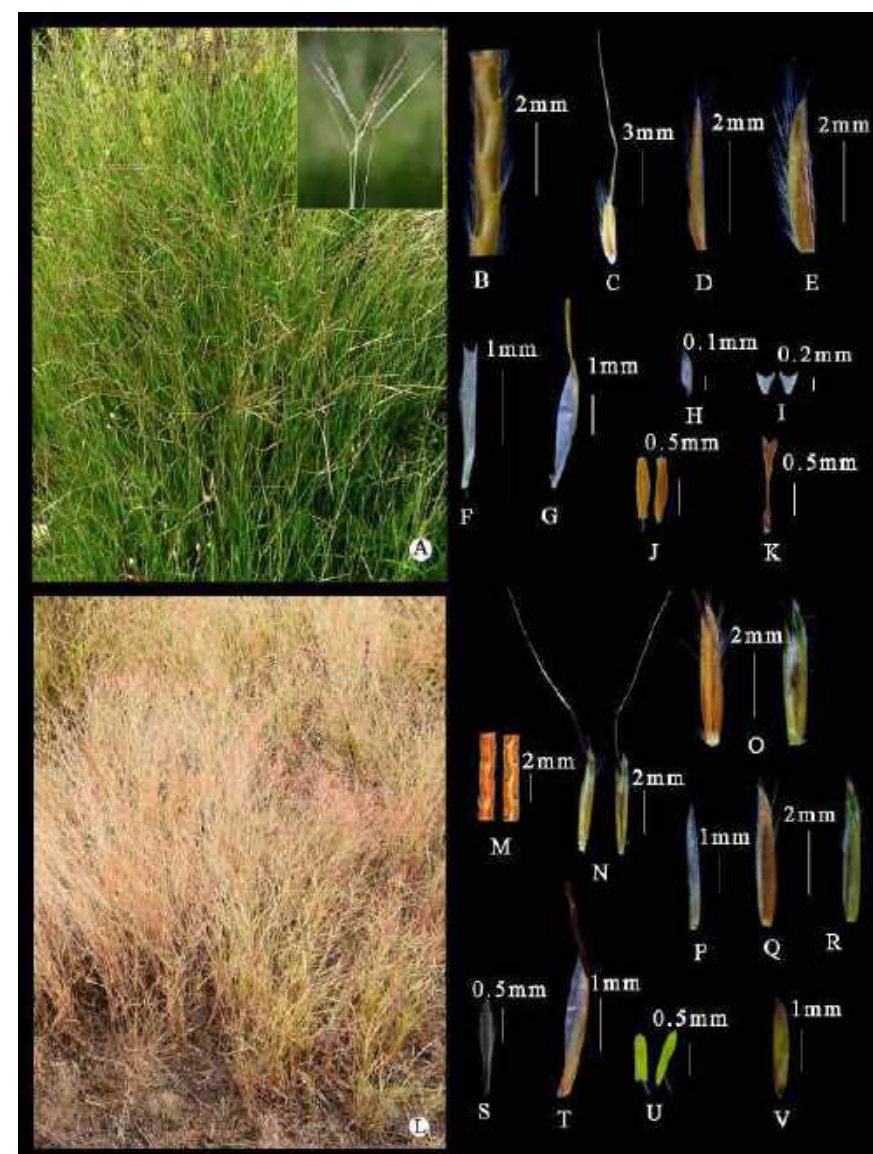


Plate 136. A–K. *Dimeria connivens* Hack.: A. Habitat ((Inset: Inflorescence); B. Rachis; C. Spikelet; D. Lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Palea; I. Lodicules; J. Stamens; K. Pistil; L–V. *Dimeria orissae* Bor; L. Habitat; M. Rachis; N. Abaxial and adaxial view of spikelets; O. Enlarged view of spikelets; P. Lower glume; Q&R. Upper glume; S. Lower lemma; T. Upper lemma; U. Stamens; V. Caryopsis.

India Annot. Checkl. Monocot. 3: 357. 2020.

Plate 136(L–V)

Caespitose annuals. Culms 5–20 cm high, slender, unbranched, glabrous. Leaves mostly basal; sheaths 1.5–2.5 cm long, keeled towards apex; ligules c. 0.5 mm long, lacerate; blades 1.5–7 × 0.2–0.4 cm, lanceolate-linear, flat, scabrid, margins tuberculate hairy, apex acuminate. Racemes 2 or 3; 3–5 cm long,

divergent, rachis 0.5–1 mm wide, broadly winged, wavy, margin scabrid. Spikelets 4–4.5 mm long, oblong, compressed, awned; pedicels concealed, c. 0.7 mm long, apex truncate-cuneate; callus bearded. Glumes linear, scabrellate dorsally. Lower glume 3.8–4 mm long, chartaceous, keel scabrid, apex acute-mucronate. Upper glume c. 4 mm long, keeled almost from base to apex, keel scabrid, winged just below tip, scabrid, few long hairs back, apex mucronate. Florets 2; lower barren, upper bisexual. Lower lemma reduced, at times c. 2 mm long, oblanceolate, margins ciliate, apex acute. Palea absent. Upper lemma 2–2.5 mm long, elliptic-lanceolate, coriaceous, apex acute, 2-lobed; awn from sinus, 1–1.5 cm long, column twisted, 0.3–0.5 cm long, bristles barbellate. Stamens 2. Caryopsis 1.5–2 mm long, elliptic.

Fl. & Fr.: Oct. – Nov.

Distrib.: **Endemic**-India (Karnataka, Odisha, Tamil Nadu, Telangana).

Exsicc.: Adilabad District: Indanapally Range, Kawal Tiger Reserve, 26.10.2013, *APS, ALC & KCM* 3933 (BSID); Wanaparthy District: Thirumalayya gutta, 07.08.2019, *SNR* 8943 (BSID).

7. *Dimeria ornithopoda* Trin., Fund. Agrost. 167. t. 14. 1820; Hook.f., Fl. Brit. India 7: 104. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1713. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 142. 1960; Pull., Fl. Telangana 3: 1114. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 707. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 357. 2020. *Dimeria tenera* Trin., Mem. Acad. Imp. Sci. St.-Petersbourg, Ser. 6, Sci. Math. 2: 335. 1833. **Plate 137**

Caespitose annuals. Culms 10–35 cm high; nodes bearded. Leaves mostly basal; sheaths, 1.5–3 cm long, keeled, tuberculate; ligules 0.2–0.4 mm long, apex fimbriate; blades 3–9 × c. 0.3 cm, lanceolate, densely tuberculate hairy, apex acuminate. Racemes usually 2–4; 4–4.5 cm long, digitate, divergent; peduncle 7–20 cm long, filiform; rachis 0.3–0.4 mm wide, triquetrous-winged, margins scabrid. Spikelets 1.5–2.5 mm long, oblong, awned; pedicels oblong, margins smooth-scabrid; callus bearded, hairs 0.2–0.4 mm long. Lower glume 1.5–2 mm long, oblong-linear, subcoriaceous, apex acute, 1-nerved, 1-keeled; keel and dorsal surface scabrellate. Upper glume 1.5–2.5 mm long, oblong-lanceolate, subcoriaceous, apex acute-acuminate, 1-nerved, 1-keeled; keel and dorsal surface scabrellate and few long hispid hairs. Florets 2; lower barren, upper bisexual. Lower lemma 1–1.5 mm long, oblanceolate, delicate, hyaline, apex ciliate. Upper lemma 1–1.8 mm long, elliptic, membranous, 1-nerved, apex 2-lobed; awn from sinus, geniculate, column 1–2.5 mm long, twisted, bristle 2.5–4.5 mm long, barbellate. Stamens 2. Caryopsis 1–1.5 mm long, oblong.

Fl. & Fr.: Sep.–Jan.

Distrib.: Common in moist habitats and also on rocky substratum.

Exsicc.: Bhadrachal Kothagudem District: Kinnerasani Wildlife Sanctuary, *JS & SNR* 9998 (BSID); Warangal District: Pakhal Wildlife Sanctuary-Ashok Nagar Beat, 30.03.2021, *SNR* 012049 (BSID).

Note: Distinguishable by its filiform peduncles.

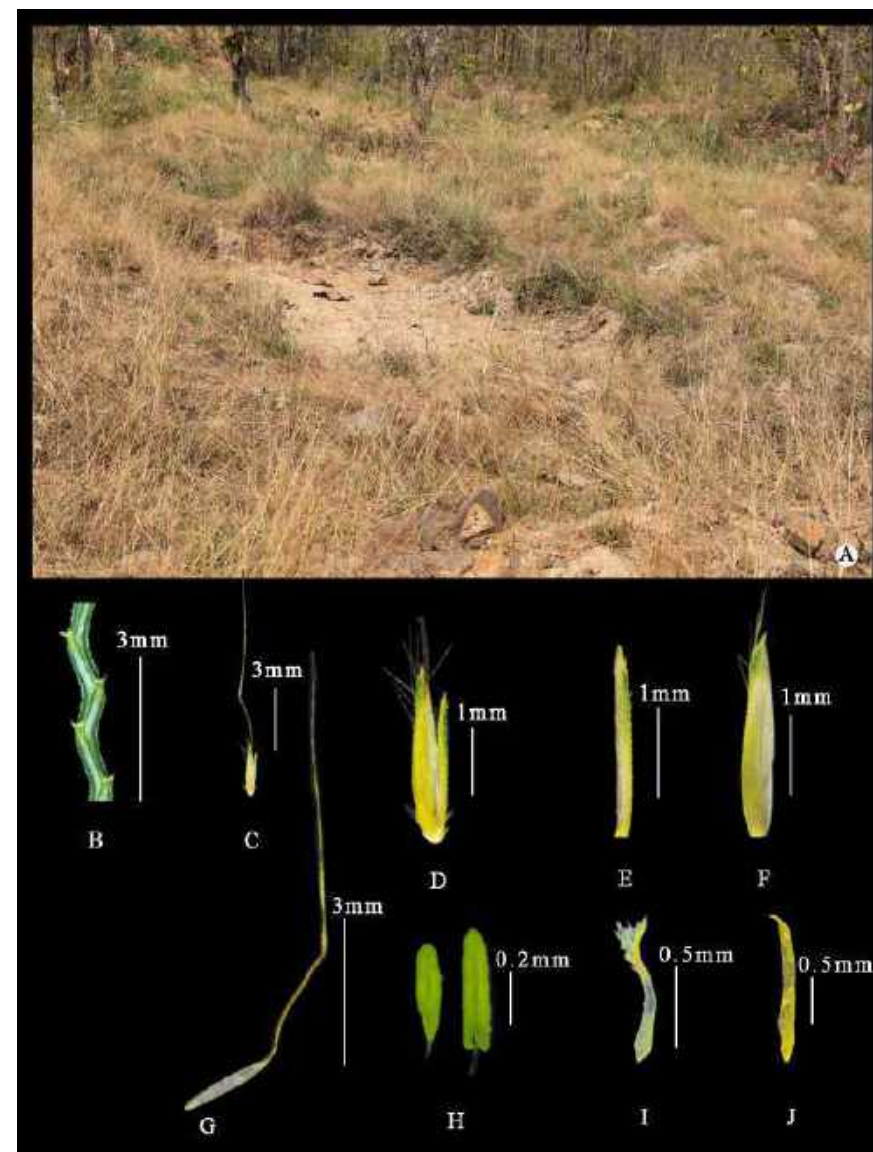


Plate 137. *Dimeria ornithopoda* Trin.: A. Habitat; B. Rachis; C. Spikelet; D. Enlarged view of spikelet; E. Lower glume; F. Upper glume; H. Stamens; I. Pistil; J. Caryopsis.

Eulalia Kunth

World: c. 31 spp.; India: 17 spp., 1 var.; Telangana: 2 spp.

Key to the species

- | | |
|---|-----------------------------|
| 1a. Dense chocolate brown woolly hairs on basal sheaths | ... 1. <i>E. phaeothrix</i> |
| 1b. No woolly hairs on basal sheaths | ... 2. <i>E. trispicata</i> |

1. *Eulalia phaeothrix* (Hack.) Kuntze, Revis. Gen. Pl. 2: 775. 1891; C.E.C.Fisch. in Gamble, Fl. Mannanur Range, Devunisari, 3388. Madras 3:1715. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 156. 1960. *Pollinia phaeothrix* Hack., Mongr. Phan. 6: 168. 1889; Hook.f., Fl. Brit. India 7: 112. 1896. **Plate 138(A-B)**

Perennials. Culms up to 2 m high, tufted, wooly at base with dark chocolate brownish hairs. Leaves mostly basal; sheaths rusty, reddish-brown; blades 8–45 × 0.5–1.7 cm, linear-lanceolate, flat-inrolled, scabrid-glabrous. Racemes 2–10, digitate. Spikelets 4–6.5 × 0.6–1mm elliptic-lanceolate, binate. Sessile spikelets lanceolate-oblong. Lower glume oblong-lanceolate. Upper glume boat-shaped, chartaceous, depressed between keels, base villous, 3-nerved, ciliate. Floret 2, lower barren and epaleate, upper hermaphrodite. Lower lemma oblong, chartaceous, 2-nerved, apex acuminate.

Upper lemma oblong-lanceolate, membranous, deeply 2-lobed, 3-nerved, awned. Upper palea ovate-lanceolate, reduced, membranous. Stamens 3. Caryopsis oblong. Pedicelled spikelets similar to sessile spikelet.

Fl. & Fr.: Sept.–Dec.

Distrib.: Scarce in forest slopes along with other grasses.

Exsicc.: Nagarkurnool District: Devunisari, Mannanur range, BK & BSS 3372 (TBGH); Pedduty, Kollapur range, 27.10.2018, ARK & BSS 3835 (TBGH).

2. *Eulalia trispicata* (Schult.) Henrard in Blumea 3: 453. 1940; Bor, Grasses Burma, Ceylon, India & Pakistan 157. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 371. 2020. *Andropogon trispicatus* Schult., Mant. 2: 452. 1824. *Eulalia tristachya* Kuntze, Revis. Gen. Pl. 2: 775. 1891; C.E.C.Fisch. in Gamble, Fl. Madras 1715. 1934. **Plate 138(C-P)**

Caespitose perennials. Culms 100–150 high; geniculate, nodes bearded. Leaves basal and cauline; sheaths 4–6 cm long, keeled towards apex, ribbed, mouth bearded; ligules membranous, apex fimbriate; blades 15–40 × 0.3–0.5 cm linear, glabrous-sparsely hairy, apex attenuate. Inflorescence of 2–6 digitate, racemes, 4–15 cm long. Racemes spikelets paired and similar; joints triquetrous, margin hairy. Spikelets 4–4.5 mm long, lanceolate, apex acute; disarticulate; callus bearded. Lower glume 3.5–4 mm long, oblong-cymbiform, subcoriaceous, 2-nerved, 2-keeled, keels scabrellate, hairs whitish, c. 3 mm long, margins incurved, apex retuse. Upper glume 3.5–4 mm, elliptic-boat shaped, subcoriaceous, sparsely white hairy or golden hairy, 1–3-nerved, 1-keeled, apex acuminate. Florets 2, lower barren, upper bisexual. Lower lemma 3.5–4 × c. 0.6 mm, oblong-lanceolate, subcoriaceous, margins and dorsal surface golden brown hairy, apex acuminate. Palea absent. Upper lemma 2.5–3 mm long, oblong, 1-nerved, apex deeply 2-lobed; awn c. 20 mm long, column twisted, c. 12 mm long, barbellate. Palea absent. Pedicelled spikelets similar to sessile spikelet.

Fl. & Fr.: Sep.–Dec.



Plate 138. A–B. *Eulalia phaeothrix* (Hack.) Kuntze: A. Habitat (Inset: Basal sheath); B. Inflorescence; C–P. *Eulalia trispicata* (Schult.) Henrard: C. Habitat (Inset: Inflorescence); D. Paired spikelets; E–K. Pedicelled spikelet; E. Spikelet; F. Lower glume; G. Upper glume; H. Lemma; I. Palea; J. Stamens; K. Pistil; L–P. Sessile spikelet; L. Spikelet; M. Lower glume; N. Upper glume; O. Lemma; P. Palea.

Distrib.: Occasional in near river banks.

Exsicc.: Badradri Kothagudem District: Kinnerasani Wildlife Sanctuary, 08.01.2019, SNR & JS 9581 (BSID); Warangal District: Cherial, CSR 381 (KU).

Eulaliopsis Honda

World: 2 spp.; India: 2 spp.; Telangana: 1 sp.

Eulaliopsis binata (Retz.) C.E. Hubb. in Hook. Icon. Pl. sub t. 3262, 1935; Bor, Grasses Burma, Ceylon, India & Pakistan 158. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 372. 2020. *Andropogon binatus* Retz., Observ. Bot. 5: 21. 1788. *Ischaemum angustifolium* (Trin.) Hack, Mongor. Phan. 6: 24. 1889; Hook.f., Fl. Brit. India 7: 129. 1896. *Pollinidium binatum* (Retz.) C.E. Hubb. in Bull. Misc. Inform. Kew 1932 (2): 72. 1932. **Plate 139**

Caespitose perennials. Culms 35–130 cm high, erect; base woolly; nodes glabrous. Leaves basal and cauline; basal sheaths woolly; sheaths terete; blades 25–98 × 0.3–0.7 cm, linear, flat, apex acuminate. Racemes 2–4, axillary-terminal. Sessile spikelet 3.9–4.5 × 1.3–1.5 mm, oblong- obovate, villous. Lower glume 2.5–3.2 × 0.6–0.8 mm, narrowly ovate, membranous, margins ciliate hairy, 7–9-nerved, apex 3-toothed. Upper glume 3.5–4.0 × 0.6–0.8 mm, narrowly ovate, membranous, 5-nerved, 1-keeled, apex mucronate. Lower lemma 2.5–3.6 × 0.8–1.3 mm, ovate-elliptic, hyaline, margins, apex 3-toothed. Palea 2.8–3.35 × 0.4–0.5 mm, narrowly ovate, hyaline, margins inflexed, apex acute-acuminate. Upper lemma 2.7–3.5 × 0.3–0.4 mm, narrowly ovate, membranous, 1-nerve, margins hairy, apex awned; awn 4.5–5 mm long. Palea 1.8–2.2 × 1–1.5 mm, broadly ovate, hyaline, margins inflexed, apex three lobed. Pedicelled spikelet similar to sessile spikelet.

Fl. & Fr.: Dec.–Feb.

Distrib.: Occasionally in moist habitats of perennial streams

Exsicc.: Bhadradi-Kothagudem District: Kinnerasani Wildlife Sanctuary, 08.01.2018, SNR 9584 (BSID).

Note: It can be identified by its long linear leaves and yellowish-brown coloured hairs on spikelets.

Mnesithea Kunth

World: 7 spp.; India: 2 spp., 1 var.; Telangana: 1 sp.

Mnesithea granularis (L.) de Koning & Sosef in Blumea 31: 295. 1986; Veldkamp & al. in Blumea 58: 282. 2013. *Hackelochloa granularis* (L.) Kuntze, Revis. Gen. Pl. 2: 776. 1891; Fischer in Gamble, Fl. Madras 1758. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 159. 1960; Pull., Fl. Telangana 3: 1134. 2015; Arthan & al., in Bot. J. Linn. Soc. 181: 240. 2016; K.N.Reddy & C.S.Reddy, Fl. Telangana 728. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 378. 2020. *Cenchrus granularis* L., Mant. Pl. 2: 575. 1771. *Manisuris granularis* (L.) L. f., Amoen. Acad. Schreb. ed. 10: 40. 1790; Hook.f., Fl. Brit. India 7: 159. 1896. '*Nalakacherla Gaddi*' **Plate 140**

Annuals. Culms about 50 cm high; nodes villous. Leaf sheaths hispid, keeled; ligules membranous, ciliate; leaf blades 3–12 × 0.2–1.0 cm, linear-lanceolate, margins hairy. Racemes c. 3 cm long. Sessile spikelets 1.5–2 mm long, globose. Lower glume c. 2 mm long, hemispherical, crustaceous, 7-nerved, tubercled. Upper glume c. 1.5 mm long, ovate, coriaceous, narrowly crested at apex, faintly 3-nerved. Lower florets neuter. Upper florets bisexual. Lower lemma



Plate 139. *Eulaliopsis binata* (Retz.) C.E.Hubb.: A. Habitat; B. Inflorescence; C. Paired spikelets; D&E. Abaxial and adaxial view of lower glume; F. Upper glume; H. Lower lemma; I. Lower palea; J. Upper lemma; K. Upper palea; L. Pistil.

c. 1 mm long, broadly ovate, hyaline. Upper Lemma c. 1 mm long, ovate, hyaline. Palea c. 1 mm long, hyaline. Pedicelled spikelets 1.5–2 mm long, ovate-lanceolate. Pedicels fused with rachis. Lower glume c. 2 mm long, broadly ovate, 5–7-nerved, keeled, winged on one side, keels ciliate. Upper glume c. 2 mm long, boat shaped, 5–7-nerved, keels winged, ciliate. Lower florets neuter. Upper florets male or neuter.

Fl. & Fr.: Aug.–Jan.

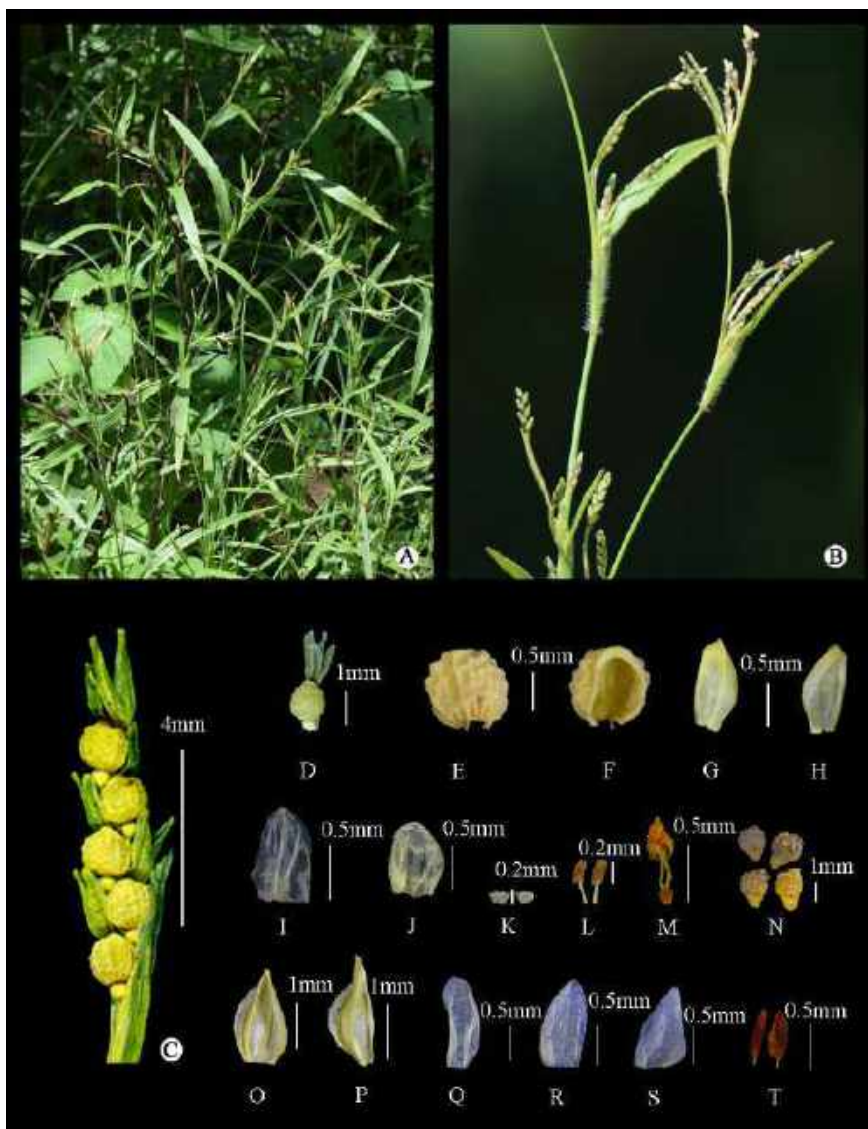


Plate 140. *Mnesithea granularis* (L.) de Koning & Sosef: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D. Paired spikelets; E–N. Sessile spikelet; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I. Lemma; J. Palea; K. Lodicules; L. Stamens; M. Pistil; N. Caryopsis; O–T. Pedicelled spikelet; O. Lower glume; P. Upper glume; Q. Lower lemma; R. Upper lemma; S. Palea; T. Stamens.

Distrib.: Common on wet rocky habitats and along the bunds of cultivated fields.

Exsicc.: Adilabad District: Wankidi RF, PVP 9479 (SKU); Kamareddy District, BRPR & KH 7141 (SKU); Mahabubnagar District: Appapur, AMSR 25690 (SKU); Medak District: Narasapur, TP & CPB 14017 (SKU); Nizamabad District: Ghanapur, BRPR & KH 7103 (SKU), Bheemnagar, TP & BRPR 6215 (SKU); Rangareddy District:

Hyderabad, MVR 02164 (HY); Velutla RF, BRPR 9531 (SKU); Tandur, MSM & TP 12706 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8702, 8939 (BSID).

Note: It can be easily recognizable by globose spikelets. Veldkamp & al., (2013) treated this species under *Mnesithea granularis* (L.) de Koning & Sosef, whereas Arthan & al., (2016) based on molecular work placed as given above. The pygmy (dwarf) form of this grass is common in India (Nagaraju & Kabeer, 2021).

Hemarthria R.Br.

World: c. 12 spp.; India: 5 spp.; Telangana: 1 sp.

Hemarthria compressa (L.f.) R.Br., Prodr. Fl. Nov. Holland.: 207. 1810; C.E.C.Fisch. in Gamble, Fl. Madras 3: 1762. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 161. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 379. 2020. *Rottboellia compressa* L.f., Suppl. Pl.: 114. 1782 (1781); Hook.f., Fl. Brit. India 7: 153. 1896. *Hemarthria altissima* (Poir.) Stapf & C.E.Hubb. in Bull. Misc. Inform. Kew 1934: 109. 1934 syn. nov.; Bor, Grasses Burma, Ceylon, India & Pakistan 160. 1960. *Rottboellia altissima* Poir., Voy. Barb. 2: 105. 1789.

Plate 141

Rhizomatous perennials. Culms up to 1 m high, decumbent; lower nodes rooting. Leaf sheath c. 2 cm long, usually keeled, mouth bearded; ligule c. 0.3 mm long, membranous, ciliate; blades 3–6 × 0.2–0.4 cm, linear, infolded, margins serrulate, apex acute. Inflorescence solitary, spiciform; peduncle 1–2.5 cm long. Raceme 4.5–5 cm long; rachis tough with fused joints and pedicels; joints 2–4 × 1.2 mm, flat, clavate to 3 -angled; pedicels broadly oblong, similar to joints. Spikelets paired, one sessile, other pedicelled. Sessile spikelet 2.5–4 × 0.8–1 mm narrowly oblong-elliptic, sunk in cavity of joints. Lower glume 2.5–4 × 0.8–1 mm, oblong-elliptic, flat to boat shaped, subcoriaceous, margins narrowly inflexed, 5-nerved, 2-keeled towards apex, keels winged, apex acute to retuse. Upper glume 3.5–4 × 1–1.2 mm, oblong-elliptic, boat shaped, chartaceous to subcoriaceous, apex acute to acuminate, 1-keeled. Florets 2; lower barren, epaleate; upper bisexual, paleate. Lower lemma 3–3.5 × 0.8–1.2 mm, oblong, flat, membranous to chartaceous, 2 -nerved, apex acute. Upper lemma 3 × 0.8–1 mm, oblong-elliptic, boat shaped, membranous to chartaceous, apex acute. Upper palea 2 × 0.5 mm, narrowly oblong, flat, membranous, apex acute. Lodicules 2, truncate. Stamens 3. Ovary ovate-lanceolate, stigma plumose. Pedicelled spikelet 4–4.3 × 0.5–1 mm. Lower glume 3–4.2 × 0.8–1 mm, oblong-elliptic, apex acute to acuminate. Upper glume 3.5–4.3 × 1 mm, boat shaped, subcoriaceous, margins inflexed, 2 -keeled, apex slightly apiculate. Lower and upper florets similar to sessile spikelet.

Fl. & Fr.: July – Feb.

Distrib.: Rare, along riverbanks.

Exsicc.: Bhadradi Kothagudem District: Mupparapukotta-Yellandu, 31.03.2021, SNR 172057 (BSID).

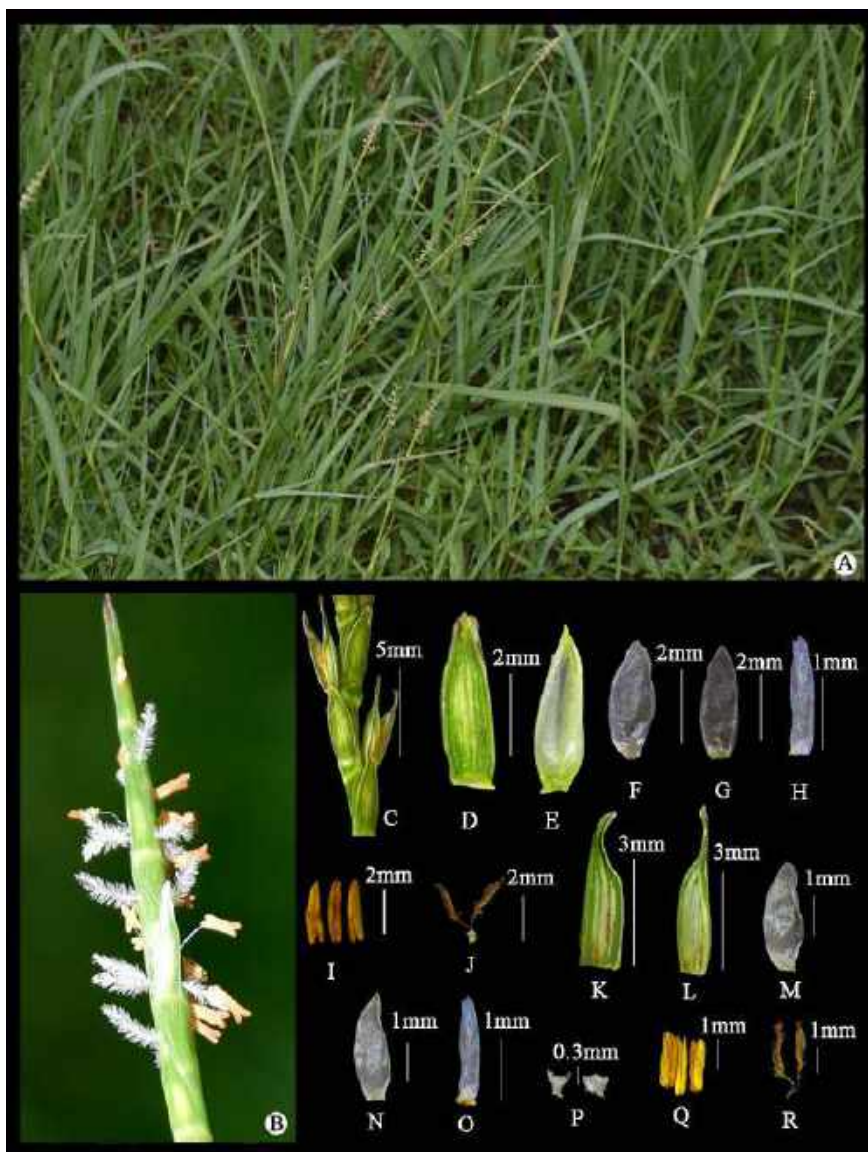


Plate 141. *Hemarthria compressa* R.Br.: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D. Lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Palea; I. Anthers; J. Pistil; K–R. Pedicelled spikelet; K. Lower glume; L. Upper glume; M. Lower lemma; N. Upper lemma; O. Palea; P. Lodicules; Q. Anthers; R. Pistil.

Heteropogon Pers.

World: c. 4 spp.; India: 6 spp.; Telangana: 4 spp.

Key to the species

- | | |
|---|-------------------------------|
| 1a. Annuals | ... 3. <i>H. polystachion</i> |
| 1b. Perennials | ... 2 |
| 2a. Giant glabrous grass; 12-15 pairs of homogamous spikelets | ... 4. <i>H. triticeus</i> |
| 2b. Not giant grass, hairy; 2-6 pairs of homogamous spikelets | ... 3 |

- | | |
|----------------------------|-------------------------------|
| 3a. Racemes bristly- hairy | ... 1. <i>H. contortus</i> |
| 3b. Racemes glabrous | ... 2. <i>H. fischerianus</i> |

1. *Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 15, 2: 836. 1817; C.E.C.Fisch. in Gamble, Fl. Madras 1743. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 163. 1960; Pull., Fl. Telangana 3: 1135. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 721. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 379. 2020. *Andropogon contortus* L., Sp. Pl. 2: 1045. 1753 (as "*contortum*"); Hook.f., Fl. Brit. India 7: 199. 1896. 'Kesara Gaddi', 'Vayyari Gaddi'
Plate 142

Caespitose perennials; culms 30–100 cm high, erect, terete-compressed, branched, base geniculate, nodes glabrous. Leaves basal and cauline; sheaths 4–8 cm long, compressed, keeled, glabrous; ligules 0.6–0.9 mm long, rounded-truncate, apex ciliate; blades 5–25 cm long, linear, flat, distichous, glabrous, margins cartilaginous, apex obtuse-acuminate. Racemes 2–4.5 cm long, terminal, solitary, hairy; lower 2–5 pairs of homogamous (male or barren), unawned spikelets; upper heterogamous (bisexual) spikelets. Hermaphrodite (sessile) spikelets 4.5–5.9 mm long, linear-elliptic, dressed with reddish-brown hairs, awned, callus 3–3.9 mm long, pointed. Lower glume 4–5.8 × 0.4–0.7 mm, oblong-linear, coriaceous, dark brown, dorsally terete, hispidulous, margins strongly incurved (not winged), apex rounded-truncate. Upper glume 4.5–5.8 × 0.3–0.5 mm, linear, rigidly coriaceous, dark brown hispidulous, sigmoidal incurved, apex obtuse. Lower lemma 2–3 × 0.6 mm, oblong, hyaline, apex truncate. Upper lemma flattened, hyaline, reduced to a base of awn; awn 7–8 cm long, densely hirsute. Lodicules 2. Pedicelled spikelets 8.5–9 × 1.5–2 mm, narrowly ovate, unawned. Lower glume 6–8 × 1.5–2 mm, lanceolate, margins infolded, 2-keeled, apex acute; keels narrowly winged, 0.3–0.5 mm long. Upper glume 8–10 × 1–1.5 mm, elliptic, margins ciliate towards apex, apex acute. Lower lemma 7.5–8 × 1 mm, elliptic, hyaline, margins ciliate. Palea 2–2.5 × 0.5 mm, oblong-lanceolate, hyaline, apex ciliate. Upper lemma 5.5–6.5 mm long, lanceolate, hyaline, margins ciliate, apex acute.

Fl. & Fr.: Jul.–Nov.

Distrib.: Throughout the state on hill slopes, fallow lands and grasslands.

Exsicc.: Adilabad District: Ankusapuram, GO 4351 (SKU); Sone, TP & PVP 4056 (SKU); Mahabubnagar District: Mayur Eco Park, 09.08.2019, SNR 8663, 8665 (BSID); Medak District: Ramayampet, BRPR & CPB 11541 (SKU); Rangareddy District: Hyderabad, MVR 02165 (HY); Manasa hills-Rajendranagar, 24.08.2016, SNR 8512 (BSID); 10.10.2019, SNR 8733, 8739 (BSID) Pedda kunta, MSM & KH 10571 (SKU)!; Wanaparthy District: Thirumalayyagutta, 07.08.2019, SNR 8637 (BSID) Warangal District: Seetharampuram-Parakala, 29.03.2021, SNR 012031 (BSID).

2. *Heteropogon fischerianus* Bor in Kew Bull. 6: 170. 1951 & Grasses Burma, Ceylon, India & Pakistan 165. 1960; Nagaraju & al., NeBio. 11(1): 2. 2020; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 379. 2020. *Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult. var. *distichus* C.E.C.Fisch. in Gamble, Fl. Madras 1743. 1934.



Plate 142. *Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.: A. Habitat; B. Inflorescence; C. Sessile spikelet with callus; D-I. Sessile (female) spikelet; D&E. Abaxial and adaxial view of lower glume; F&G. Abaxial and adaxial view of upper glume; H. Lower lemma; I. Upper lemma; J-S. Pedicelled spikelet; J. Spikelet; K&L. Abaxial view of lower glume; M. Adaxial view of lower glume; N&O. Abaxial and adaxial view of upper glume; P. Lodicules; Q. Lower lemma; R. Palea; S. Upper lemma.

Caespitose perennials. Culms 40–120 cm high, erect, compressed, branched, glabrous; nodes glabrous. Leaves basal and cauline; sheaths 5–7.5 cm long, compressed, keeled, glabrous, distichous; ligules 0.8–1 mm long, rounded, densely ciliate; blades 35–40 cm long, linear, distichous, glabrous, margins cartilaginous, apex acuminate. Racemes 3–5 cm long, terminal, solitary, 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, but lower glume of pedicelled spikelets broadly winged. Hermaphrodite (sessile) spikelets 7.5–8 mm long, elliptic, awned; callus 3.2–3.5 mm long, clothed with dark brownish hairs, pointed. Lower glume 4.5–5.5 × 0.5–0.8 mm, oblong, coriaceous, grooved dorsally, puberulous, brownish, apex truncate. Upper glume 4.5–5 × 0.5–0.7 mm, linear-oblong, coriaceous, dorsally grooved, pale, sigmoidal incurved, apex truncate-minutely 3-toothed. Lower lemma 2.8–3 × 0.5 mm, linear-lanceolate, hyaline, apex truncate. Upper lemma flattened, hyaline, reduced to a base of awn; awn 8–10 cm long, scaberulous. Upper palea 4.3–4.5 mm long, oblong, membranous, apex acute-erose. Pedicelled spikelets 7–9 × 1.5–2 mm, narrowly ovate, unawned. Lower glume 6.5–7 × 1.5–2 mm, lanceolate, margins infolded, apex acute; 2-keeled, keels narrowly winged, 0.5–0.6 mm long. Upper glume 7.5–8 × 1 mm, elliptic, margins ciliate towards tip, apex acute. Lower lemma 5.3–5.5 mm long, elliptic, hyaline, margins ciliate. Upper lemma 4.3–4.5 mm long, lanceolate, hyaline.

Fl. & Fr.: Jul.–Nov.

Distrib.: Occasionally in grasslands, plains, and rocky slopes in dry deciduous forests. **Endemic**-India (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu).

Exsicc.: Vikarabad District: Damagundam-Ananthagiri hills, 02.12.2019, SNR 8912 (BSID).

Note: It can be identified by its glabrous racemes.

3. *Heteropogon polystachyos* (Roxb.) Schult., Syst. Veg. 2, Mant. 460. 1824; Bor, Grasses Burma, Ceylon, India & Pakistan 165. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 379. 2020. *Andropogon polystachyos* Roxb., Fl. Ind. 1: 265. 1820; Hook.f., Fl. Brit. India 7: 202. 1896.

Plate 143

Caespitose annuals. Culms 10–50 cm high, erect, terete-compressed, branched, glabrous; nodes glabrous, brownish in colour. Leaves basal and cauline; sheaths 2–5.5 cm long, compressed, keeled, glabrous, distichous; ligules 0.4–0.9 mm long, rounded, ciliate; blades 5–12 cm long, linear, distichous, puberulous and sparsely long hairy, apex acuminate. Racemes terminal, solitary, 2–4 cm long (excluding awn), glabrous; lower 2–7 pairs of homogamous (male or barren) unawned spikelets. Upper heterogamous (bisexual) spikelets; joints scabrous. Hermaphrodite (sessile) spikelets, 3.5–6 mm long, elliptic, awned; callus 3–3.9 mm long, clothed with dark brownish hairs, pointed. Lower glume 3.2–5.5 × 0.4–0.7 mm, oblong, coriaceous, rounded dorsally, puberulous, brownish, apex truncate. Upper glume 4.5–5 × 0.5–0.7 mm, linear-oblong, coriaceous, dorsally grooved, pale, sigmoidal incurved, apex truncate or minutely 3-toothed. Upper lemma flattened, hyaline, reduced to a base of awn; awn 7–9 cm long, densely scaberulous. Caryopsis 3.5–5 × 0.2–0.5 mm, oblong-cylindric. Pedicelled spikelets 6–8 × 0.9–1.5 mm, narrowly ovate, unawned. Lower glume 5.5–7.5 × 1–1.8 mm, lanceolate, margins infolded, apex obtuse-truncate, 2-keeled; keels narrowly winged, 0.3–0.5

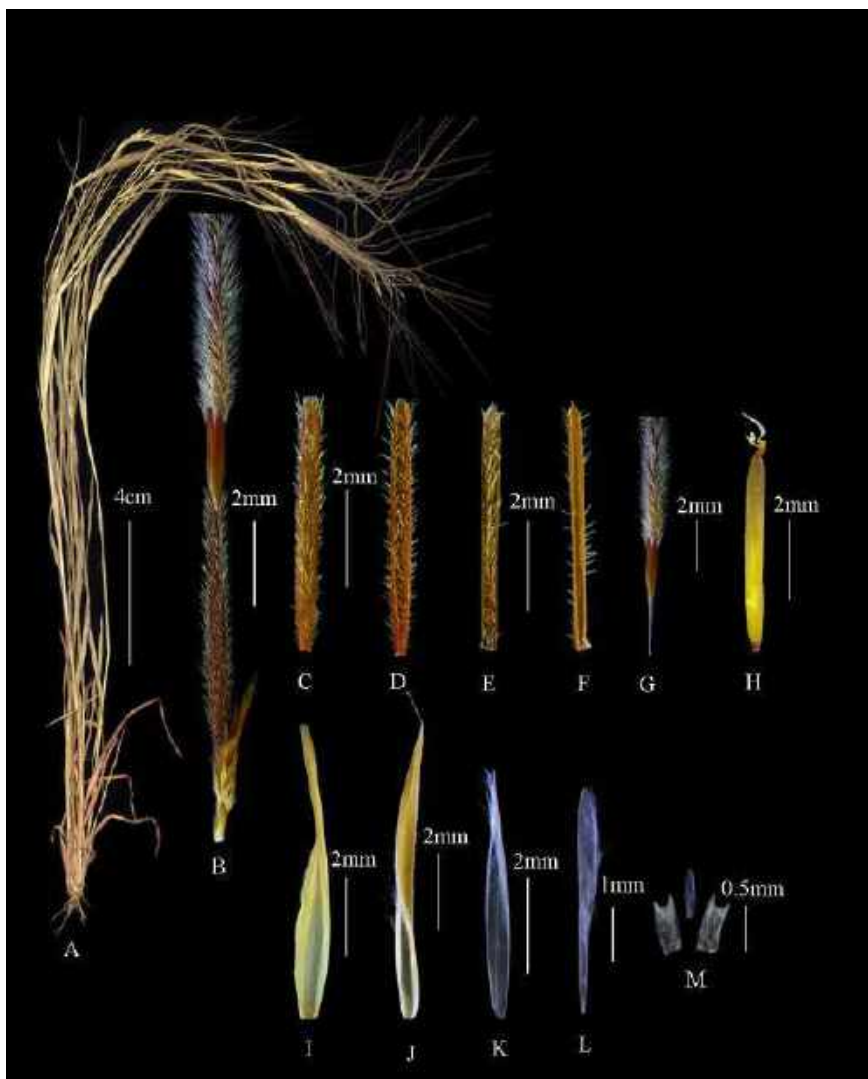


Plate 143. *Heteropogon polystachyos* Blatt. & McCann: A. Habit; B. Spikelet; C&D. Abaxial and adaxial view of lower glume; E&F. Abaxial and adaxial view of lower glume; G. Caryopsis; I-M. Pedicelled spikelet; I. Lower glume; J. Upper glume; K. Lower lemma; L. Upper lemma; M. Palea with lodicules.

mm long. Upper glume 6.5–8 × 0.9 mm, elliptic, margins ciliate towards above, apex acuminate. Lower lemma 5.1–5.6 mm long, elliptic, hyaline, margins ciliate. Upper lemma 4.1–4.4 mm long, lanceolate, hyaline. Palea 0.4–0.53 × 0.1–0.2 mm, elliptic-oblong, margins ciliate, apex truncate-minutely 3-toothed.

Fl. & Fr.: Jul.–Nov.

Distrib.: Occasionally grown in grasslands, plains, and rocky slopes.

Endemic-India (Andaman & Nicobar Islands, Jharkhand, Maharashtra).

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary,

Chatakonda, 15.11.2020, JS 10868 (BSID); Suryapet District: Undrugonda, 27.10.2019, SNR 8762 (BSID).

Note: It can be identified by its dwarf habit, glabrous and shorter racemes.

4. *Heteropogon triticeus* (R. Br.) Stapf ex Craib in Bull. Misc. Inform. Kew 1912(10): 432. 1912; Bor, Grasses Burma, Ceylon, India & Pakistan 165. 1960; Deshp. in Bull. Bot. Surv. India 30: 124. 1990; Nagaraju & al., NeBio. 11(1): 2. 2020; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 380. 2020. *Andropogon triticeus* R. Br., Prodr. Fl. Nov. Holland. 201. 1810; Hook.f., Fl. Brit. India 7: 200. 1896.

Plate 144

Caespitose perennials. Culms 100–300 cm high, terete, erect, branched, glabrous; nodes glabrous. Leaves basal and cauline; sheaths 6–20 cm long, terete or compressed, keeled, glabrous; blades 25–75 × 1–1.8 cm, linear, flat, glabrous or sparsely pilose, apex acuminate; ligules 1.5–2 mm long, membranous. 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 8–11 × 2.7–3 mm, narrowly ovate-elliptic, awned; callus pungent, bearded with rufous hairy. Lower glume 8–10.5 × 1.5–3 mm, narrowly ovate, coriaceous, 5-nerved, hirsute on dorsal side, slit like groove from base to apex, apex truncate. Upper glume 9–10.6 × 1.1–1.3 mm, narrowly ovate-oblong, coriaceous, 3-nerved, margins ciliate, densely hirsute on dorsal side, apex acute. Lower lemma 3.5–3.7 × 0.8–0.9 mm, narrowly ovate, hyaline, nerveless, apex acute. Palea absent. Upper lemma hyaline, passing into a geniculate awn, 10–18 cm long, hairy. Palea 1.6–1.8 × 1–1.2 mm, ovate-oblong, hyaline, 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. Homogamous spikelets 15–18 × 3.5–4 mm, narrowly ovate, unawned. Lower glume 14–16 × 3–4.5 mm, narrowly ovate, chartaceous, glabrous, 2-keeled; keel winged on one margin, inflexed, ciliate, 1-nerved, apex acuminate. Upper glume 13–15 × 1.4–2 mm, linear, margins ciliate, 1-nerved, apex acuminate. Lower lemma 10–15 × 0.9–1.8 mm, linear, margins ciliate, 1-nerved, apex acuminate. Upper lemma 8–14 × 0.9–1.3 mm, linear, hyaline, margins ciliate, 1-nerved, apex acuminate. Palea 1.6–1.8 × 0.7–0.8 mm, narrowly ovate, hyaline, margins ciliate, apex acute. Caryopsis 2.2–2.4 × 6–6.5 mm, oblong-cylindric.

Fl. & Fr.: Sep.–Dec.

Distrib.: Occasionally in grassland patches of dry deciduous forests.

Exsicc.: Rangareddy District: Palgutta, 30.11.2019, SNR & ARK 8773 (BSID).

Imperata Cirillo

World: 11 spp.; India: 1 sp., 1 var.; Telangana: 1 sp.

Imperata cylindrica (L.) P. Beauv., Ess. Agrostogr. 165, 166. 1812; C.E.C.Fisch. in Gamble, Fl. Madras 1707. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 169. 1960; Pull., Fl. Telangana 3: 1136. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 722. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 383. 2020. *Lagurus cylindricus* L., Syst. Nat., ed. 10. 2: 878. 1759. '*Dabba Gaddi*'

Plate 145

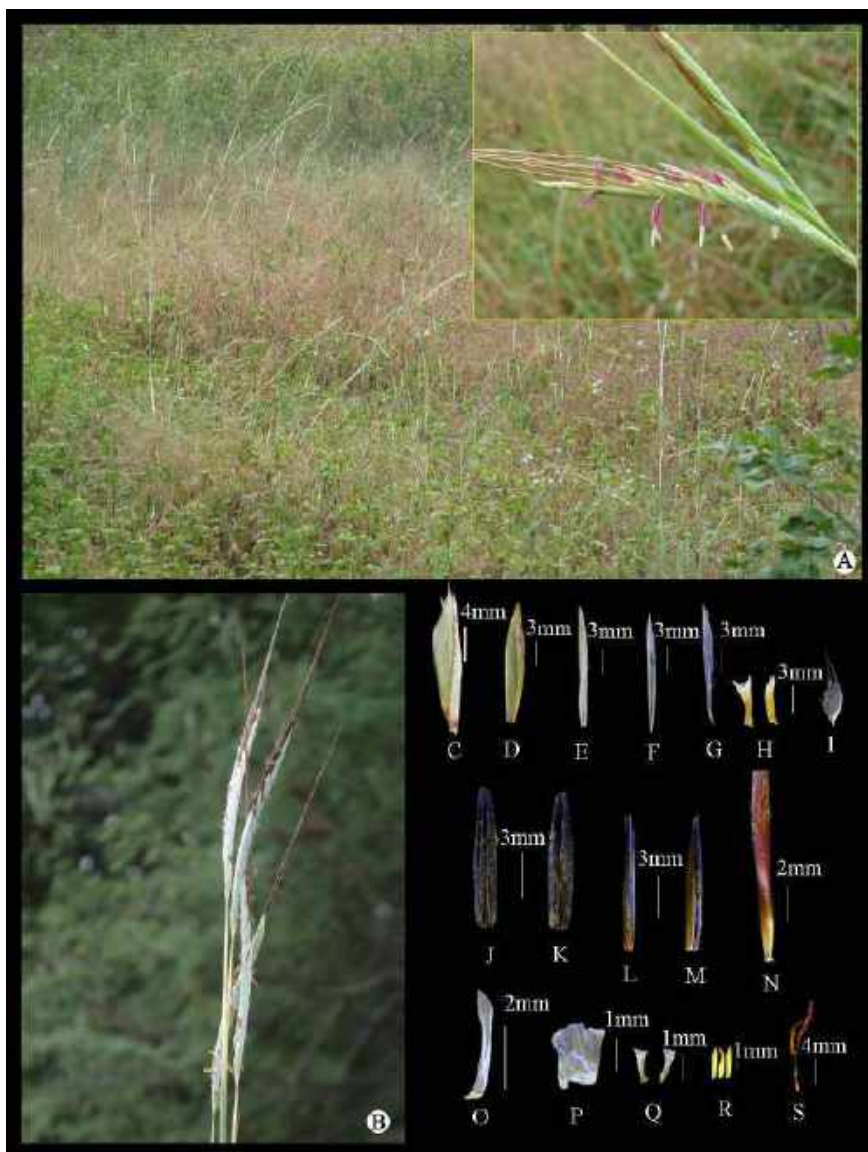


Plate 144. *Heteropogon triticeus* (R.Br.) Stapf ex Craib: A. Habitat (Inset: Inflorescence); B. Inflorescence; C. Homogenous spikelets; D. Lower glume; E. Upper glume; F. Lower lemma; G. Upper lemma; H. Lodicules; I. Palea; J-S. Sessile spikelet; J&K. Abaxial and adaxial view of lower glume; L&M. Abaxial and adaxial view of upper glume; N. Upper lemma; O. Lower lemma; P. Palea; Q. Lodicules; R. Anthers; S. Pistil.

Perennials. Culms about 100 cm high, rhizomatous; nodes densely hairy. Leaf sheaths hairy at mouth; ligules membranous; leaf blades 5–30 × 0.3–1.2 cm, linear-lanceolate, crowded at base, midrib distinct. Panicles 5–15 cm long, cylindric, spiciform, white, silky villous. Spikelets 3–4 mm long, linear-lanceolate, pedicelled, encircled by silky hairs. Lower glume 2–3 mm long, lanceolate, 5-nerved, hairy in the lower half. Upper glume 3–3.5 mm long, lanceolate,



Plate 145. *Imperata cylindrica* (L.) P.Beauv.: A. Habitat; B. Enlarged view of inflorescence; C. Spikelet; D. Lower glume; E. Upper glume; F. Lower lemma; G. Palea; H. Upper lemma; I. Pistil.

5-nerved, hairy below, keeled. Lower florets neuter. Upper florets bisexual. Lower Lemma c. 2 mm long, lanceolate, 3-lobed, hairy at apex. Upper lemma c. 2 mm long, elliptic-lanceolate, 3-lobed, hairy at apex and along margins. Palea 1–1.5 mm long, elliptic, hyaline. Caryopsis 0.8–1.2 mm long, oblong.

Fl. & Fr.: Throughout the year.

Distrib.: Common along field bunds, dry lands and along river sides.

Exsicc.: Nizamabad District: Sarvapuri, TP & BRPR 6377 (SKU); Suryapet

District: Nayakangudem, 27.10.2019, SNR 8924 (BSID); Warangal District: Chilakammanagar-Pakhal Lake, 31.03.2021, SNR 012053 (BSID).

Note: It is an aggressive rhizomatous weed.

Ischaemum L.

World: 89 spp.; India: 56 spp., 6 var., 2 subvar.; Telangana: 4 spp.

Key to the species

- 1a. Margins of the lower glume of sessile spikelets expanded below the middle ... 2. *I. ciliare*
- 1b. Margins of the lower glume of sessile spikelets narrowly and evenly inturned from base to apex ... 2
- 2a. Pedicels of the pedicelled spikelets more than one-third the length of the sessile spikelet ... 1. *I. afrum*
- 2b. Pedicels of the pedicelled spikelets less than one-third the length of the sessile spikelets ... 3
- 3a. Lower glume of sessile spikelets with 3-6 deep, stout, transverse ridges and furrows ... 3. *I. rugosum*
- 3b. Lower glume of sessile spikelets with shallow ridges ... 4. *I. semisagittatum*

1. *Ischaemum afrum* (J.F. Gmel.) Dandy, Fl. Pl. Sudan 3: 476. 1956. *Andropogon afer* J.F. Gmel., Syst. Nat. 2: 166. 1791. *Ischaemum pilosum* Wight in Madras J. Lit. Sci. 2: 139. 1835; Hack., Monogr. Phan. 6: 240. 1889; Hook.f., Fl. Brit. India 7: 130. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1723. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 183. 1960; Pull., Fl. Telangana 3: 1138. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 723. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 388. 2020. '*Kundaranattu Gaddi*'

Plate 146(A)

Caespitose perennials; rhizomatous. Culms 100–150 cm high; nodes glabrous. Leaves basal and cauline; sheaths glabrous; ligules membranous; blades 8–28 × 0.3–0.6 cm, linear, glabrous, apex acuminate. Racemes 3–6; 5–15 cm long, fascicled, densely pilose. Joints and pedicels clavate, pilose. Spikelets 2, sessile and pedicelled. Sessile spikelet 4–5.5 mm long, lanceolate; callus bearded. Lower glume 4.5 × 0.9 mm, lanceolate, membranous-chartaceous, hairy on dorsal side, margin inflexed, 7-nerved, anastomosing, apex acute. Upper glume 5–5.5 × 1.4 mm, lanceolate, chartaceous-membranous, 5-nerved, apex acuminate. Florets 2, lower male, upper bisexual. Lower lemma 4–5 mm long, linear, chartaceous, apex acuminate. Lower palea 5 × 1.3 mm, elliptic, membranous, 3-nerved, ciliate, apex acuminate. Upper lemma 4–5 × 0.8–1 mm, elliptic, membranous, 2-lobed, lobes ciliate; awn from sinus, 6–8 mm long, geniculate. Upper palea 4–4.5 × 0.5–0.8 mm, lanceolate, membranous, 2-nerved, 2-keeled, apex acuminate. Pedicelled spikelets c. 5 mm long, lanceolate. Lower glume 4–5 mm long, lanceolate, membranous-chartaceous, dorsally hairy, margins involute, 5–7-nerved. Upper glume c. 5 mm long, lanceolate, membranous-chartaceous, apex shortly acuminate. Florets more or less similar to sessile.

Fl. & Fr.: Aug.–Dec.

Distrib.: Very common throughout the state on bunds of cultivated fields.



Plate 146. A. *Ischaemum afrum* (J.F.Gmel.) Dandy: Habitat (Inset: Inflorescence); B–X. *Ischaemum ciliare* Retz.: B. Habit; C. Inflorescence; D&E. Abaxial and adaxial view of paired spikelets (sessile & pedicelled); F–P. Sessile spikelet; F&G. Abaxial and adaxial view of lower glume; H. Upper glume; I. Lower lemma; J&K. Adaxial and side view of lower palea; L. Upper lemma; M. Enlarged view of upper lemma; N. Upper palea; O. Lodicules; P. Pistil; Q–X. Pedicelled spikelet; Q. Lower glume; R. Upper glume; S. Lower lemma; T. Lower palea; U. Upper lemma; V. Upper palea; W. Stamens; X. Pistil.

Exsicc.: Adilabad District: Keslapur, GO & PVP 4558 (SKU); Rangareddy District: Mekavaripalli, TP & MSM 11051 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, SNR 8723 (BSID); Warangal District: Regional Agricultural Research Station, 28.03.2021, SNR 012016 (BSID).

Notes: It can be identified by its long silky white racemes.

2. *Ischaemum ciliare* Retz., Obs. Bot. 6: 36. 1791; Hook.f., Fl. Brit. India 7: 133. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 184. 1960; Pull., Fl. Telangana 3: 1139. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 723. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 386. 2020.

Plate 146(B-X)

Mat-forming perennial, stoloniferous. Culms 15–75 cm high, terete, decumbent; nodes glabrous-villous, lower nodes rooting. Leaves basal and cauline; sheaths 1–4.5 cm long, subcompressed, glabrous-sparsely hairy; ligules membranous; blades 1–6 × 0.2–0.6 cm, oblong-ovate, hirsute, base rounded, apex acute. Racemes 2, 1.5–8 cm long, appressed. Joints triquetrous-turbinate. Sessile spikelets 5–6.5 × 1.5–2.2 mm, ovate, awned, callus bearded. Lower glume 5–6 × 1–1.6 mm, ovate-elliptic, coriaceous, broadly winged upper half only, 5–7-nerved, 2-keeled, apex acuminate. Upper glume 5–6 × 1.3–1.6 mm, boat shaped, coriaceous, 3–5-nerved, keeled, winged, ciliate, apex aristate. Lower lemma 3.5–5 × 1.2–1.4 mm, narrowly ovate, 3-nerved, apex subacute. Lower palea 3.5–4 × 0.8–1 mm, elliptic, chartaceous, 2-nerved, apex acuminate. Upper lemma 3–3.3 × 0.4–0.6 mm, ovate, membranous, apex cleft into 2-lobes; awn from sinus, 10–13 mm long, geniculate, barbellate. Upper palea 3–3.6 × 0.5–0.6 mm, elliptic-ovate, membranous, apex acute. Pedicels 1.5–2 mm long, densely ciliate. Caryopsis c. 1.5 mm long, oblong. Pedicelled spikelet 4–5 × 1–1.5 mm, elliptic-ovate, awned. Lower glume 3.5–4 × 1–1.5 mm, ovate, coriaceous, apex acuminate-aristate. Upper glume florets and palea similar to the sessile spikelet.

Fl. & Fr.: Aug.–Jan.

Distrib.: Throughout the state on bunds of cultivated fields. Used as fodder grass.

Exsicc.: Adilabad District: Indhanpalli-Range, Narlapur-Beat, APS 3917 (BSID); Bhadrachari Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 9511 (BSID); Warangal District: Pakhal Wildlife Sanctuary, Ashoknagar Beat, 30.03.2021, SNR 012050 (BSID).

Notes: It can be distinguished by its lower glume of the sessile spikelet winged above. Earlier *Ischaemum ciliare* Retz. is treated as synonym of *I. indicum* (Houtt.) Merr. in many workers, but now *I. indicum* is a synonym of *Polytrias indica* (Houtt.) Veldkamp.

3. *Ischaemum rugosum* Salisb., Icon. Stirp. Rar. 1, t. 1. 1791; Hook.f., Fl. Brit. India 7: 127. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 184. 1960; Pull., Fl. Telangana 3: 1139. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 723. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 388. 2020.

Plate 147

Caespitose annuals. Culms 8–70 cm high, erect or geniculate; nodes bearded. Leaves basal and cauline; sheaths 3–12 cm long, glabrous, loose; ligules membranous; blades 5–16 × 0.5–1 cm, linear-lanceolate, sparsely hairy-glabrous, margin scabrid, apex attenuate-acuminate. Racemes 2, 4–10 cm long. Joints and pedicels densely ciliate. Sessile spikelets 5–5.5 mm long, oblong-lanceolate, awned; callus bearded. Lower glume 4–5 mm long, oblong, membranous, 3–6-indurated ridges and furrows, 10-nerved, 2-keeled, winged, apex obliquely acute. Upper glume 5–6 mm long, oblong-lanceolate, boat shaped, chartaceous, keeled, winged, ciliate, apex acute. Florets 2,



Plate 147. *Ischaemum rugosum* Salisb.: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D&E. Abaxial and adaxial view of lower glume; F. Upper glume; G. Lemma; H. Palea; I. Pistil; J. Pedicelled spikelet.

lower male, upper bisexual. Lower lemma 4–4.5 × 1–1.4 mm, lanceolate, chartaceous, 3-nerved, apex acute. Lower palea 4–4.4 × 0.8–1.2 mm, oblong-lanceolate, 2-nerved, apex acute. Upper lemma 3–4 × 0.8–1 mm, ovate, membranous, 3-nerved, apex cleft into 2-lobes; awn from sinus, 12–16 mm long, geniculate, barbellate. Upper palea 3–3.3 × 1–2 mm, linear-lanceolate, hyaline, 2-keeled, 2-nerved, apex acute. Caryopsis c. 2 mm long, oblong. Pedicelled spikelets 4–5 mm long, oblong, unawned. Pedicels one side ciliate. Lower glume 4–4.5 mm long, oblong, coriaceous, faint transverse ridges, 10-nerved, narrowly winged on one margin, ciliate, apex acute. Upper glume

4.5–5 mm long, oblong-lanceolate, apex acute. Lower and upper florets more or less similar to sessile spikelets.

Fl. & Fr.: Oct.–Jan.

Distrib.: Common in marshy habitats and near cultivated fields.

Exsicc.: Adilabad District: Kunthala way to Nirmal, *MHR* 13254 (SKU); Sarvaipet, *GO* 4502 (SKU); Sone, *TP & PVP* 4059 (SKU)!; Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 09.01.2019, *SNR* 8585 (BSID); Medak District: Gangapur RF, *TP & MSG* 12071 (SKU); Nizamabad District: Mandora village, *TP & BRPR* 6225 (SKU); Rangareddy District: Hyderabad, *MVR* 02166 (HY); Warangal District: Medaram, 24.03.2021, *SNR* 8968 (BSID).

Notes: It can be differentiated by its deep ridges on lower glume of sessile spikelets.

4. *Ischaemum semisagittatum* Roxb., *Fl. Ind.* 1: 322. 1820; Hook.f., *Fl. Brit. India* 7: 130. 1896; Bor, *Grasses Burma, Ceylon, India & Pakistan* 185. 1960; Pull., *Fl. Telangana* 3: 1139. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 723. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 389. 2020.

Annuals. Culms 20–60 cm high, erect or geniculate, slender, nodes glabrous-villous. Leaves basal and cauline; sheaths c. 9 mm long, glabrous, margin hairy; ligules c. 3 mm long, oblong, pilose; blades 3–14 × 0.3–1.8 cm, oblong-lanceolate, base cordate-sagittate, apex acuminate. Racemes 2, 2–5.5 cm long, villous. Joints turbinate-clavate, trigonous, villous. Sessile spikelets 4.5–6 mm long, ovate-lanceolate or oblong; callus c. 1 mm long, bearded. Lower glume 5–6 mm long, ovate, cartilaginous below, 2–4 transverse ridges, margin ciliolate, apex slightly bifid. Upper glume 4.5–6 mm long, cymbiform, coriaceous, apex acuminate. Florets 2, lower male, upper bisexual. Lower lemma 4.5–5 mm long, oblong-lanceolate, 3-nerved, apex acuminate. Lower palea 5 mm long, oblong, hyaline, 2-nerved, apex acuminate. Upper lemma 3–4.5 mm long; deeply cleft, lobes acute, glabrous; awn from the cleft, 11–18 mm long. Upper palea 3–4 mm long, linear hyaline, apex obtuse. Pedicelled spikelets 4–5 × 1.5 mm, narrowly oblong-lanceolate, closely appressed to sessile spikelets. Lower glume 4–5 × 1.5 mm, oblong, obscurely ridged, apex obtuse. Upper glume 4–4.5 × 1.2 mm, oblong, coriaceous, apex obtuse. Lower lemma 3.5–4.5 × 1 mm long, lanceolate, 3-nerved. Lower palea c. 3.5 mm long, linear-oblong, hyaline, 2-nerved. Upper lemma c. 5 mm long, narrowly oblong, apex 2-toothed; awn 10–20 mm long. Upper palea 3–4 mm long, linear-oblong.

Fl. & Fr.: Sep.–Dec.

Distrib.: Occasionally on forest hill slopes.

Exsicc.: Medak District: Rusthumpet, *KMS* 6797 (SKU).

Notes: It can be identified by its cordate or sagittate petioled leaves.

***Iseilema* Andersson**

World: 26 spp.; India: 8 spp.; Telangana: 4 spp.

Key to the species

- | | |
|---|---------------------------------|
| 1a. Pedicels of involucre spikelets as broad as long | ... 1. <i>I. anthephoroides</i> |
| 1b. Pedicels of involucre spikelets longer than broad | ... 2 |
| 2a. Tuberculate hairs absent on spathe and involucre spikelets | ... 3. <i>I. jainiana</i> |
| 2b. Tuberculate hairs present on spathe and involucre spikelets | ... 3 |
| 3a. Robust grass; clusters of spikelets dense fascicles | ... 2. <i>I. holei</i> |
| 3b. Slender grass; clusters of spikelets not dense fascicles | ... 4. <i>I. prostratum</i> |

1. *Iseilema anthephoroides* Hack., *Monogr. Phan.* 6: 683. 1889; Hook.f., *Fl. Brit. India* 7: 219. 1896; C.E.C.Fisch. in Gamble, *Fl. Madras* 1748. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 187. 1960; Pull., *Fl. Telangana* 3: 1140. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 724. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 389. 2020.

Caespitose perennials. Culms 30–85 cm high, erect or geniculate; nodes glabrous. Leaves basal and cauline; sheaths 1.5–5 cm long, compressed, glabrous; ligules hairy; blades 4.5–9 × 0.1–0.4 cm, linear-oblong, sparsely tubercle based hairy, apex acute. Racemes cluster of spikelets, 4-male involucre, 1-hermaphrodite sessile and 2-male pedicelled; spathaceous, spathes c. 12 mm long, margins glabrous-tubercle based hairy. Involucre spikelets 4–4.5 mm long, broadly oblong; pedicelled, as long as broad. Lower glume 3.5–4 × 1–1.5 mm, oblong-elliptic, membranous, 2-nerved, 2-keeled, tubercle based hairs on keel, apex acute. Upper glume 3.5–4 × 1–1.5 mm, elliptic, 3-nerved, apex acute. Lemma absent. Hermaphrodite spikelets 3.5 × 1 mm, lanceolate, apex acuminate. Lower glume 3–3.5 mm long, ovate, coriaceous, 4-nerved, margin hairy, beak 3–3.5 mm long, apex bifid. Upper glume 3–3.5 mm long, lanceolate, 3-nerved, ciliate on keels, apex acuminate. Lower lemma 2–2.5 mm long, narrowly linear, hyaline, apex muticous. Lower palea absent. Upper lemma reduced to the base of awn, hyaline; awn 12–18 mm long, geniculate. Upper palea absent. Caryopsis c. 2.5 mm long, ellipsoid. Pedicelled spikelets reduced to a delicate 3–3.5 mm long pedicels.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasional in moist habitats. Relished by cattle.

Exsicc.: Adilabad District: Bellampally & Tiryani RF, *PVP & TP* 9466, 9499 (SKU); Khammam District: Koriguttalu, *RR* 106034 (BSID); Mahabubnagar District: Thumukunta, *BRPR & MVS* 40726 (SKU); Rangareddy District: Hyderabad, *MVR* 02167 (HY); Warangal District: Regional Agricultural Research Station, 26.03.2021, *SNR* 8983 (BSID).

Notes: It can be easily identifiable by pedicels of involucre spikelets as broad as long.

2. *Iseilema holei* Haines, *Bot. Bihar & Orissa* 1055. 1924; Bor, *Grasses Burma Ceylon, India & Pakistan* 188. 1960; Pull., *Fl. Telangana* 3: 1140. 2015; Prasanna & al. in A.A. Mao & S.S. Dash (eds.), *Fl. Pl. India Annot. Checkl. Monocot.* 3: 390. 2020.

Caespitose annual. Culms 50–110 cm high, compressed; nodes glabrous-bearded. Leaves basal and cauline; sheaths 3–9 cm long; ligules membranous; blades 18–58 × 0.2–0.4 cm, linear-lanceolate, apex acute-acuminate. Racemes cluster of spikelets, 4-male involucre, 1-hermaphrodite sessile and 2-male, pedicel filiform, c. 2 mm long. Involucral spikelets c. 5 mm long, oblong-lanceolate, apex obtuse. Lower glume c. 4 mm long, oblong-elliptic, membranous, 2-nerved, 2-keeled, tubercle based hairs on keel, apex acute. Upper glume c. 4 mm long, elliptic, 3-nerved, apex acute. Lemma absent. Hermaphrodite spikelet 4–6 × c. 1 mm, elliptic, awned. Lower glume 3.5–5.5 × c. 1 mm, ovate-lanceolate, 5-nerved, 2-keeled, apex acuminate, 2-fid. Upper glume 3.5–5 × c. 1 mm, lanceolate, 3-nerved, apex mucronate. Florets 2, both epaleate. Lower lemma 1.8–2 × 0.2 mm, oblong, apex acute-obtuse. Upper lemma c. 2 × 0.2 mm, oblong, membranous; awn c. 1.5 cm long, geniculate, barbellate. Pedicelled spikelets much reduced; hermaphrodite spikelets 0.45–0.5 cm long, linear or lanceolate, apex acuminate. Caryopsis ellipsoid.

Fl. & Fr.: Oct.–Feb.

Distrib.: Occasionally in forest hills slopes.

Exsicc.: Adilabad District: Indhanpalli-Range, Jannaram- Forest Division, 26.10.2013, APS 3937 (BSID).

Notes: It can be identified by robust growth and dense fascicles.

3. *Iseilema jainiana* P. Umam. & P. Daniel in J. Bombay Nat. Hist. Soc. 98: 425. 2001; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 390. 2020. *Iseilema hackelii* U.B.Shrestha & Gandhi, Harvard Pap. Bot. 13(2): 296.2008.

Caespitose perennials. Culms 20–35 cm high, geniculate, woody. Leaves basal and cauline; sheaths c. 3.5 cm long, keeled; ligules membranous, apex ciliate; blades 4.5–14 × c. 0.4 cm, lanceolate, apex acute. Racemes cluster of spikelets, 4-male involucre, 1-hermaphrodite sessile and 2-male pedicelled; spathaceous, spathes c. 15 mm long, margin glabrous-tubercle based hairy. Involucral spikelets 4.5–5.2 × c. 1 mm, oblong; pedicelled, longer than broad, margin hairy. Lower glume 4–4.5 × c. 1 mm, lanceolate, hispid, 5-nerved, 2-keeled, apex acuminate. Upper glume 3.5–4 × c. 0.6 mm, lanceolate, 3-nerved, 2-keeled, apex acuminate. Floret one, staminate, palea absent. Lemma 3–3.5 × c. 0.5 mm, oblong, apex acute-lobed. Hermaphrodite spikelet 4–6 × c. 1 mm, elliptic, awned. Lower glume, 3.5–5.5 × c. 1 mm, ovate-lanceolate, 2-nerved, 2-keeled, apex acuminate, 2-lobed. Upper glume 3.5–5 × c. 1 mm, lanceolate, 1-nerved, apex mucronate. Florets 2, both epaleate. Lower lemma 1.8–2 × c. 0.2 mm, oblong, apex acute-obtuse. Upper lemma c. 2 × 0.2 mm, oblong, base of the awn membranous; awn c. 1.5 cm long, geniculate, barbellate. Upper palea c. 2 mm long, oblong, apex obtuse-rounded. Caryopsis c. 1.5 mm long, ellipsoid. Pedicelled spikelet c. 5.5 mm long, staminate. Lower glume 5–7-nerved, 2-keeled above. Upper glume c. 4 × 0.5 mm, oblong-lanceolate. Lower lemma c. 2.5 × 0.5 mm, 2-lobed. Upper floret similar to sessile spikelet.

Fl. & Fr.: Jun.–Mar.

Distrib.: Occasionally in forest hill slopes.

Exsicc.: Adilabad District: Indhanpalli-Range, Jannaram-Forest Division, APS 3960 (BSID); Mahabubnagar District: Bhavani Sagar, 06.08.2019, SNR 8615 (BSID); Suryapeta District: Mangal Thanda-Kodada Road, 27.10.2019, SNR 8756 (BSID); Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8703, 8707 (BSID). Warangal District: Kothagadda, 25.03.2021, SNR 8974 (BSID).

Notes: It can be identified by the absence of tubercle hairs on spathe and involucre spikelets

4. *Iseilema prostratum* (L.) Andersson, Nova Acta Regiae Soc. Sci. Upsal. 2: 250. 1856 (as "*prostrate*"); C.E.C.Fisch. in Gamble, Fl. Madras 1748. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 188. 1960; Pull., Fl. Telangana 3: 1142. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 390. 2020. *Andropogon prostratus* L., Mant. Pl. Altera 304. 1771 (as "*prostratum*"). *Iseilema laxum* Hack. Monogr. Androp. 6: 682. 1889.

Plate 148

Caespitose perennials. Culms 20–60 cm long, procumbent; nodes bearded, lower nodes rooting. Leaves basal and cauline; sheaths 2.5–3 cm long, keeled, tuberculate, mouth bearded; ligules 1–2 mm long, membranous, ciliate; blades 5–12 × 0.2–0.5 cm, linear, apex acute-acuminate. Panicles c. 20 cm long. Racemes 5–7 per spathe, spathe 1–1.6 cm long; cluster of spikelets, 4-male involucre, 1-hermaphrodite sessile and 2-male; callus bearded. Involucral spikelets male or neuter, 4–4.5 × 1 mm, oblong-lanceolate; pedicels 0.5–1 mm long. Lower glume 4–4.5 × 0.6 mm, lanceolate, herbaceous, 5-nerved, margin tuberculate, apex acuminate-mucronate. Upper glume 4–4.5 × 0.6 mm, lanceolate-elliptic, chartaceous, 3-nerved, apex acuminate. Floret 1. Lemma 3–3.5 mm long, lanceolate, 1-nerved, epaleate. Hermaphrodite spikelets 3.5–4 × 0.6–0.8 mm, oblong-lanceolate. Lower glume 3.5–4 mm long, lanceolate, 4-nerved, beak 1–2 mm long, apex bifid. Upper glume 3.5–4 mm long, lanceolate, 3-nerved, apex mucronate. Lower lemma 2.5–3 mm long, linear-lanceolate, hyaline, apex acute, epaleate. Upper lemma c. 1 mm long, oblong, reduced to a base of awn, c. 18 mm long; awn from cleft, geniculate, barbellate; epaleate. Caryopsis 2 × 0.5 mm, elliptic. Pedicelled spikelets 2–2.5 × 0.6 mm, lanceolate, male or neuter, similar to involucre spikelets.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in moist habitats. Best fodder grass.

Exsicc.: Khammam District: RR 106049 (BSID); Bhadrachalam District: Kinnerasani Wildlife Sanctuary, SNR 9588 (BSID); Mahabubnagar District: Mayur Eco, 09.08.2019, SNR 8664 (BSID); Karkalapaadu Beat, Amangal R.F., SRS 104549 (BSID); Saleswaram, BSS & SKB 30586 (SKU); Rangareddy District: Hyderabad, MVR 02168, 02169 (HY); Manasa Hills-Rajendranagar, 10.10.2019, SNR 8738 (BSID).

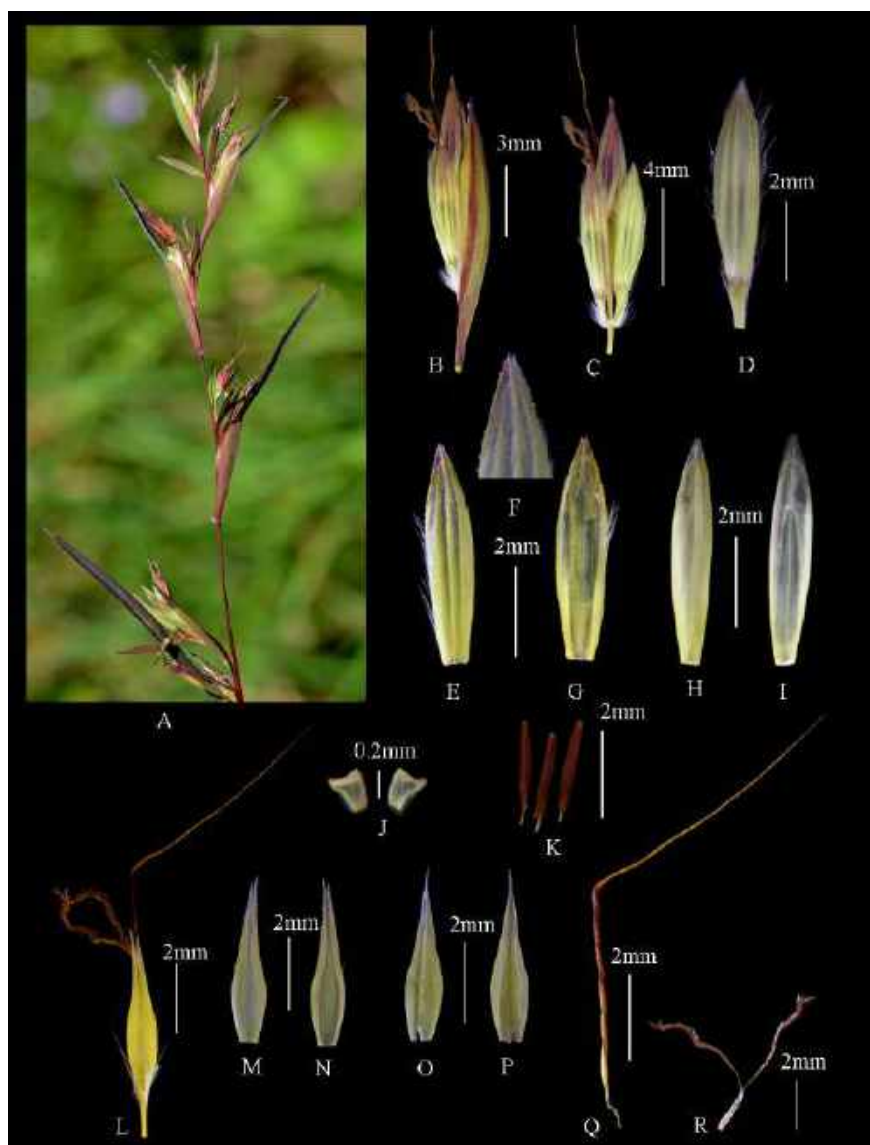


Plate 148. *Isellema prostratum* (L.) Andersson: A. Inflorescence; B&C. Cluster of spikelets; D. Involucre spikelet; E–G. Abaxial and adaxial view of lower glume; H&I. Abaxial and adaxial view of upper glume; J. Lodicules; K. Stamens; L–R. Hermaphrodite spikelet; L. Spikelet; M&N. Abaxial and adaxial view of lower glume; O&P. Abaxial and adaxial view of upper glume; Q. Lemma; R. Pistil.

Note: It can be identified by prostrate habit and shorter spikelets.

Lophopogon Hack.

World: 3 spp.; India: 3 spp.; Telangana: 1 sp.

Lophopogon tridentatus Hack., Monogr. Phan. 6: 254. 1889; Hook.f., Fl. Brit. India 7: 149. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1724. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 190. 1960; Pull., Fl. Telangana 3: 1144.

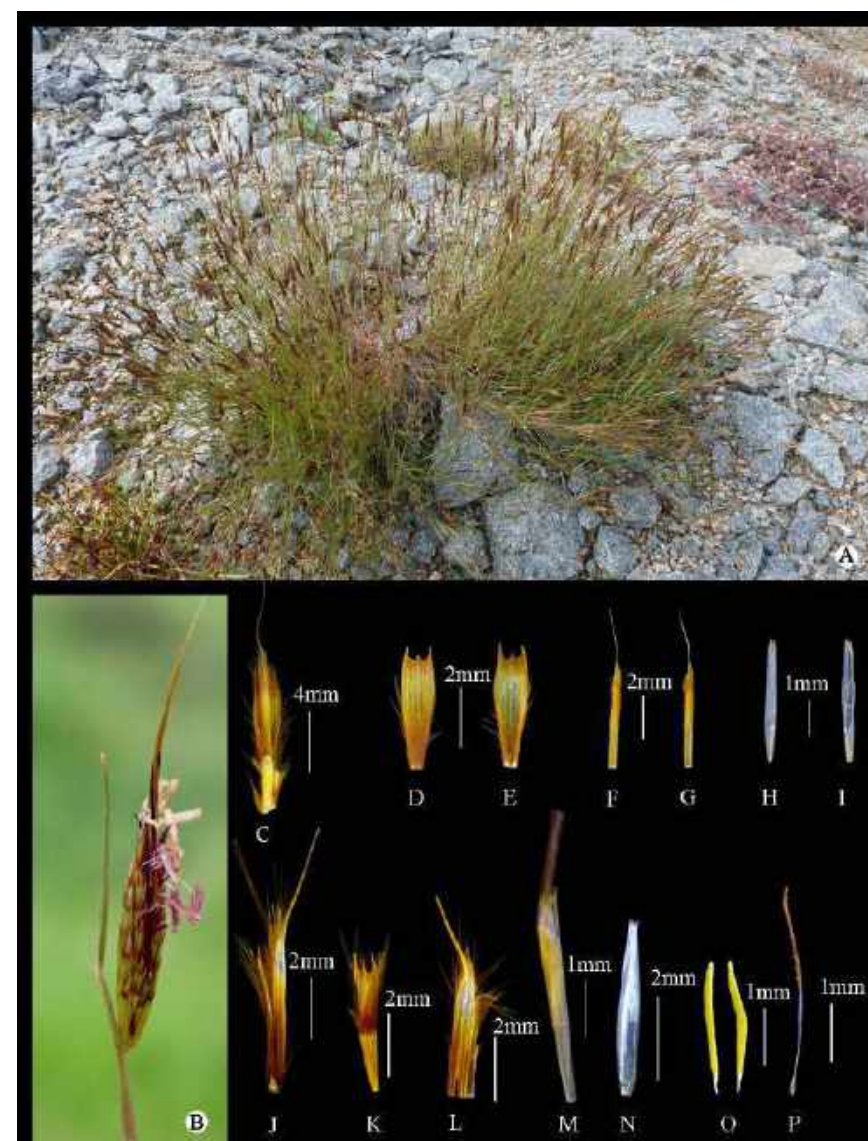


Plate 149. *Lophopogon tridentatus* (Roxb.) Hack.: A. Habitat; B. Inflorescence; C. Spikelet; D&E. Abaxial and adaxial view of lower glume; F&G. Abaxial and adaxial view of upper glume; H&I. Abaxial and adaxial view of lemma; J–P. Pedicelled spikelet; J. Spikelet; K. Lower glume; L. Upper glume; M. Lemma; N. Palea; O. Stamens; P. Pistil.

2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 726. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 394. 2020. *Andropogon tridentatus* Roxb., Fl. Ind. 1: 261. 1820.

Plate 149

Caespitose perennials. Culms 8–20 cm high, slender, tomentose. Leaves mostly basal and cauline; sheaths 1.5–2 cm long, margin ciliate, mouth bearded; ligules ciliate; blades 4–14 × 0.1–0.2 cm, linear, apex acuminate. Racemes c. 3 cm long, compressed, pilose. Spikelets 4–5.5 mm long, obovate, imbricate; callus

bearded. Lower glume 4–4.5 long, oblong, 5-nerved, apex 3-dentate, hairy. Upper glume 4–4.5 × 1 mm, lanceolate, 3-nerved, apex bidentate, hairy. Florets 2. Lower lemma 3–4 mm long, linear-lanceolate, hyaline, apex subacute, epaleate. Upper lemma c. 3.5 mm long, lanceolate, hyaline, apex bifid; lower spikelets unawned, upper spikelets awned, 10–18 mm long, barbellate. Upper palea 2–2.3 × 1 mm, oblong, membranous-chartaceous, margin infolded, apex obtuse-lobed. Caryopsis 1–1.6 mm long, linear. Pedicelled spikelet c. 5 mm long. Lower glume 4.5 × 0.4–0.6 mm, oblong, apex 3-toothed. Upper glume 4.5–5 × 0.8 mm, elliptic, coriaceous, densely hairy, apex awned; awn c. 5.5 mm long. Lower lemma 3–4 × 0.5 mm, apex acute; epaleate. Upper lemma 3 × 0.5 mm, ovate, apex 2-lobed; awn from sinus, 12–19 mm long, geniculate. Palea c. 3 mm long, obovate, apex rounded. Caryopsis oblong.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the state in fallow lands.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02172 (HY); Lingampally, *MSM* 12754 (SKU); Manasa hills-Rajendranagar, 24.08.2016, *SNR* 8534 (BSID); 22.08.2019, *SNR* 8668 (BSID); 04.09.2019, *SNR* 8687 (BSID); Mahabubnagar District: Appapur, *MSM* 26801 (SKU).

Ophiuros C.F. Gaertn.

World: 3 spp.; India: 3 spp.; Telangana: 1 sp.

Ophiuros exaltatus (L.) Kuntze, Revis. Gen. Pl. 2: 780. 1891; C.E.C.Fisch. in Gamble, Fl. Madras 1758. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 199. 1960; Pull., Fl. Telangana 3: 1146. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 728. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 398. 2020. *Aegilops exaltata* L., Mant. Pl. 2: 575. 1771. *Ophiuros corymbosus* C.F. Gaertn., Suppl. Carp. Fruct. 3: 4. t. 181. 1805; Hook.f., Fl. Brit. India 7: 160. 1896. '*Peddapanuku Gaddi*'

Plate 150

Caespitose perennials; rhizomatous. Culms 100–170 cm high, erect; nodes glabrous. Leaves basal and cauline; sheaths 5–10 cm long, scabrid; ligules membranous, truncate; blades 10–45 × 1–2.5 cm, linear-lanceolate, tubercle based hairy, apex acute-attenuate. Spikes 10–18 cm long, fascicled, terminal, slender. Spikelets 2.5–3.5 mm long, oblong, sunken in the rachis. Lower glume c. 3 mm long, lanceolate-oblong, subcoriaceous, cartilaginous, 5–7-nerved, foveolate (pit) on back, margins incurved, apex acute. Upper glume 2–3 mm long, oblong, chartaceous-membranous, margins inflexed, obscurely 3-nerved. Florets 2, lower male, upper bisexual. Lower lemma c. 3 mm long, elliptic-oblong, hyaline, apex obtuse. Lower palea male, 1–2 mm long, oblong, hyaline. Upper lemma 1.5–2 mm long, oblong, membranous, apex acute. Upper palea c. 1.5 mm long, oblong, hyaline. Caryopsis 0.5–0.8 mm long, oblong, compressed.



Plate 150. *Ophiuros exaltatus* (L.) Kuntze: A&B. Inflorescence; C. Enlarged view of spike; D. Rachis; E. Spikelet; F&G. Abaxial and adaxial view of lower glume; H. Upper glume; I. Floret; J. Lower lemma; K. Palea; L. Lodicules; M. Stamens; N. Upper lemma; O. Upper palea; P. Lodicules; Q. Stigma; R. Stamens.

Fl. & Fr.: Sep.–Feb.

Distrib.: Occasionally forest grass.

Exsicc.: Rangareddy District: Chevella, 30.11.2019, *SNR* 8778 (BSID); Vikarabad District: Ananthagiri Hills, 21.09.2019, *SNR* 8708 (BSID).

Pogonatherum P. Beauv.

World: 4 spp.; India: 4 spp.; Telangana: 2 spp.

Key to the species

- 1a. Callus hairs longer than spikelet; awns up to 25 mm long;
anthers minute c. 0.5 mm long ...1. *P. crinitum*
- 1b. Callus hairs definitely shorter than spikelet; awns up to 15 mm long;
anthers 1–1.5 mm long ... 2. *P. paniceum*

1. *Pogonatherum crinitum* (Thunb.) Kunth, Enum. Pl. 1: 478. 1833; Hook.f., Fl. Brit. India 7: 141. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 200. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 412. 2020. *Andropogon crinitus* Thunb., Syst. Veg. ed. 14: 903. 1784. *Pogonatherum paniceum* sensu C.E.C.Fisch. in Gmable, Fl. Madras 1714. 1934. **Plate 151**

Caespitose annuals. Culms 15–25 cm high, erect or geniculate; nodes bearded. Leaves basal and cauline; sheaths 1.5–2 cm long, ribbed, mouth bearded; ligules c. 0.3 mm long, membranous; blades 2–4 × 0.1–0.2 cm, linear-lanceolate, scabrid, apex acuminate. Raceme 1.5–2 cm long, terminal. Spikelets paired, similar, 1.16–1.22 × c. 0.6 mm, ovate-lanceolate, awned; callus 1.16–2.90 mm long, bearded. Lower glume 0.77–0.85 × c. 0.25 mm, oblong-lanceolate, chartaceous, 1–3-nerved, 1-keeled, apex acute. Upper glume 0.9–1.2 × c. 0.5 mm, ovate-oblong, lanceolate, chartaceous, yellowish, 1-nerved, 1-keeled, keel scabrid, margins ciliate, apex acute, slightly 2-lobed, apex long awned; awn 11–13 mm long, capillary, barbellate, golden brown. Florets 2; lower barren, upper bisexual. Lower lemma linear, membranous, hyaline, nerveless, apex acute. Upper lemma 0.55–0.7 × 0.3 mm, oblong-lanceolate, membranous, hyaline, 1-nerved; 2-lobed; awn from sinus, 11–13 mm long, curved-geniculate, barbellate. Palea c. 0.46 × 0.28 mm, broadly ovate, chartaceous, hyaline, apex ciliate. Stamen 1. Ovary 0.16 mm long, narrowly elliptic. Caryopsis 0.76 × 0.18 mm, elliptic-oblong, wrinkled.

Fl. & Fr.: May–Mar.

Distrib.: Occasionally in rocky crevices.

Exsicc.: Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, 05.01.2018, SNR & JS 9522 (BSID).

Note: It can be easily identified by its less than 2 mm long spikelets and long callus.

2. *Pogonatherum paniceum* Hack., Allg. Bot. Z. Syst. 12: 178. 1906; Bor, Grasses Burma, Ceylon, India & Pakistan 202. 1960; Pull., Fl. Telangana 3: 1164. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 742. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 412. 2020. *Saccharum paniceum* Lam., Encycl. 1: 595. 1785.

Mat-forming perennials. Culms 14–60 cm high, prostrate, wiry, nodes sparsely hairy or glabrous. Leaves basal and cauline; sheaths c. 3 cm long, keeled, villous; ligules fimbriate; blades 1–6 × 0.1–0.4 cm, linear-lanceolate, margin smooth, apex acute-acuminate. Racemes 2–3.5 cm long, solitary, capillary

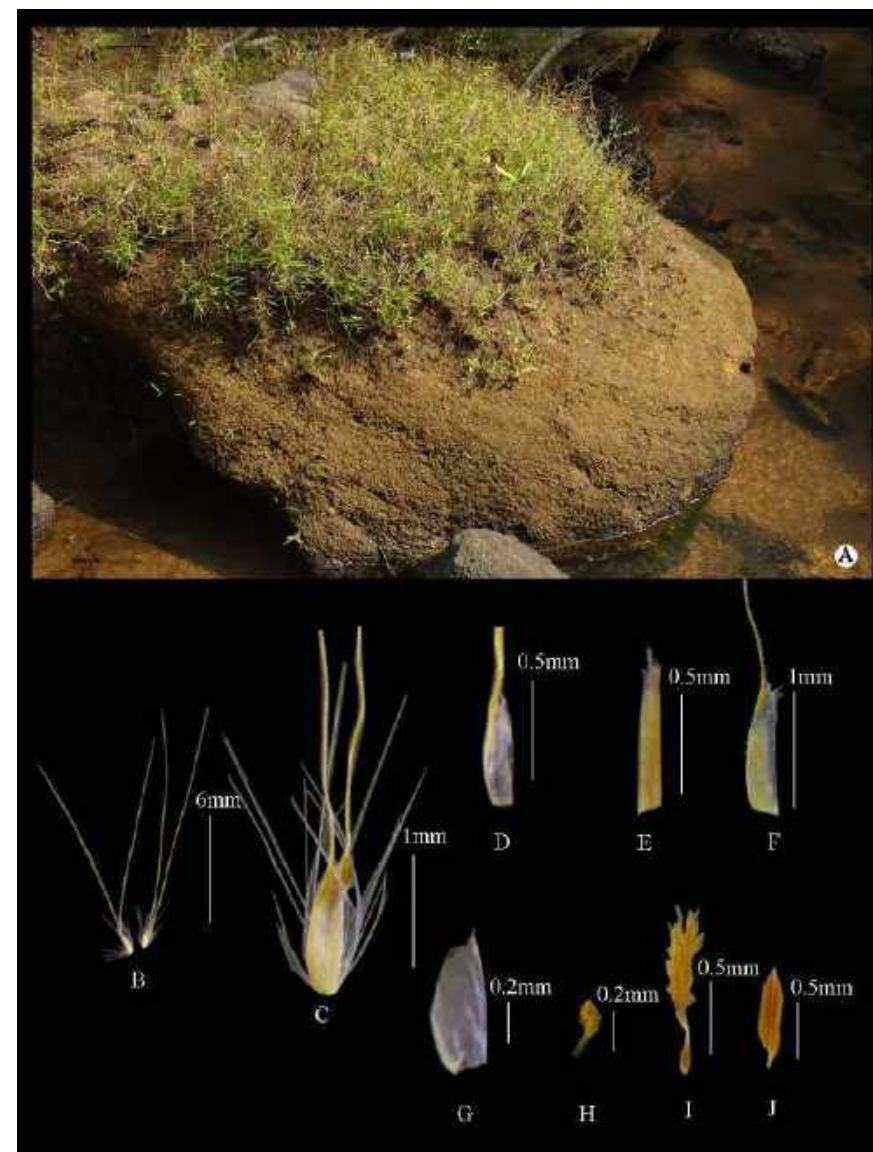


Plate 151. *Pogonatherum crinitum* (Thunb.) Kunth: Habitat; B. Spikelets; C. Enlarged view of spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Palea; H. Stamen; I. Pistil; J. Caryopsis.

peduncle; joint ciliate on margins. Spikelets binate. Sessile spikelets 2.5–3 mm long, elliptic, oblong-lanceolate; callus densely hairy. Lower glume 1.5–2 mm long, oblong, chartaceous, 2-nerved, 2-keeled, apex obtuse-truncate, densely ciliate. Upper glume 2.5–3 mm long, lanceolate, chartaceous; awn 10–15 mm long. Lower florets male. Upper florets bisexual. Lower lemma 1.5–2 mm long, elliptic-oblong, 2-nerved, apex ciliate. Palea c. 1.5 mm long, oblong, hyaline. Upper lemma 2–2.5 mm long, linear-oblong, hyaline, apex notched; awns 10–15

mm long. Upper palea 1.5–2 mm long, chartaceous, 2-nerved, apex fimbriate. Stamens 2. Caryopsis obovate, compressed. Pedicelled spikelets 2–3 mm long, lanceolate, similar to sessile spikelet; turbinate pedicels and margins ciliate.

Fl. & Fr.: Jul.–Nov.

Distrib.: Occasionally in rocky crevices near water sources.

Exsicc.: Mahabubnagar District: Mallela Theertham, SRS 110703 (BSID).

Polytoca R. Br.

World: c. 11 spp.; India: 3 spp.; Telangana: 1 sp.

Polytoca gigantea (J. Koenig) Mabb., Mabblerley's Pl.-Book 1102. 2017. *Coix gigantea* J. Koenig in Naturforscher (Halle) 23: 211. 1788; C.E.C.Fisch. in Gamble, Fl. Madras 1705. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 264. 1960; Pull., Fl. Telangana 3: 1093. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 692. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 343. 2020. *Chionachne koenigii* (Spreng.) Thwaites, Enum. Pl. Zeyl. 357. 1864; *Chionachne gigantea* (J. Koenig) Veldkamp in Blumea 47: 559. 2002. 'Kashay Gaddi'

Plate 152

Caespitose perennials (Reed like). Culms 110–180 cm high, tuberculate hairs; nodes bearded, lower nodes rooting (silt roots). Leaves basal and cauline; sheaths 60–11 cm long, ribbed; ligules 1.5–2 mm long, membranous, apex hairy; blades 30–75 × 1.5–2 cm, linear-lanceolate, base amplexicaul-subcordate, apex acuminate. Panicle 20–25 cm long, spiciform, monoecious, clustered, spathaceous; spathe c. 3 cm, oblanceolate, spatheole 1–1.5 cm long, oblanceolate. Racemes 2 or 3 per spatheole, c. 2.5 cm long. Male spikelets solitary, 6–12 × 1.5–3 mm, lanceolate. Lower glume 5.5–10 × 0.6–1.5 mm, lanceolate, membranous, 6–9-nerved, 2-keeled, keels winged, apex acuminate. Upper glume 5–8.5 × 0.8–1 mm, similar to lower glume. Florets 2, both male. Lemmas 5–8 × c. 1, ovate-lanceolate. Palea 4–7 × c. 0.6 mm, oblong-lanceolate, apex acute. Female spikelet 5–7 × 2–2.5 mm, globular, apex acute, shiny, enclosed by an involucre; involucre hard, shiny, bony. Lower glume c. 5 × 10 mm, oblong-oblong, coriaceous, apex acute-retuse; attached to involucre. Upper glume c. 6 × 0.7 mm, oblong-cymbiform, apex acute-beaked. Florets 2; lower empty, upper female. Lemmas 3–4 mm long, similar, broadly ovate-lanceolate, apex obtuse. Palea 3–4.5 mm long, similar ovate-lanceolate, apex acuminate. Ovary oblong. Caryopsis c. 2 mm long, ovate.

Fl. & Fr.: Aug.–Jan.

Distrib.: Common throughout the state.

Exsicc.: Adilabad District: Sone, TP & PVP 4013, 4019 (SKU); Mulugu District: Medaram, 24.03.2021, SNR 8966 (BSID); Vikarabad District: Damagundam, 02.12.2019, SNR 8901 (BSID); Warangal District: Pakhal Lake-Chilakamma nagar, 31.03.2021, SNR 012054 (BSID).

Pseudosorghum A. Camus

World: c. 2 spp.; India: 1 sp.; Telangana: 1sp.



Plate 152. *Polytoca gigantea* (J.Koenig) Mabb.: A. Habita; B. Raceme; C. Spathe; D. Female and male spikelets; E&F. Female spikelets; G. Male spikelets; H. Lower glume; I. Upper glume; J. Lower lemma; K. Lower palea; L. Stamens; M. Upper lemma; N. Palea; O. Stamens; P. Metamorphose sheath.

Pseudosorghum fasciculare (Roxb.) A. Camus in Bull. Mus. Natl. Hist. Nat. 26: 662. 1920; C.E.C.Fisch. in Gamble, Fl. Madras 1734. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 205. 1960; Pull., Fl. Telangana 3: 1165. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 743. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 414. 2020. *Andropogon fascicularis* Roxb., Fl. Ind. 1: 269. 1820; Hook.f., Fl. Brit. India 7: 177. 1896.

Caespitose perennials. Culms 70–120 cm high, erect; nodes glabrous or sparsely hairy. Leaves basal and cauline; sheaths 6–10 cm long, keeled, tuberculate hairy above; ligules membranous; blades 10–30 × 0.3–0.7 cm, linear-lanceolate, apex acuminate. Panicles c. 18 cm long. Joints hirsute. Sessile spikelets 4–6 cm long, lanceolate; callus hairy. Lower glume 4–5 mm long, lanceolate-ovate, coriaceous, ciliate, 8–10-nerved, 2-keeled, apex acute. Upper glume c. 5 mm long, lanceolate-cymbiform, 5–7-nerved, coriaceous, margins incurved, apex acute. Florets 2; lower neuter, upper bisexual. Lower lemma c. 5 mm long, lanceolate, margins ciliate, 3-nerved, apex obtuse. Upper lemma 3–4 mm long, elliptic-lanceolate; awns 15–20 mm long, barbellate. Caryopsis c. 1.5 mm long, elliptic. Pedicelled spikelets 4–6 mm long, narrowly linear. Pedicels slender. Lower glume 4–4.5 mm long, ovate-linear, coriaceous, 10–11-nerved, 2-keeled, ciliate, apex acute. Upper glume 4–5 mm long, linear, coriaceous, scabrid, 7–9-nerved, apex acute-obtuse. Florets 2; lower neuter, upper male. Lower lemma 4.5–5 mm long, linear, 3-nerved, apex acuminate. Upper lemma 4–5 mm long, linear, chartaceous. Upper palea c. 3 mm long, oblong, membranous.

Fl. & Fr.: Oct.–Dec.

Distrib.: Occasionally on banks of streams and forest margins.

Exsicc.: Bhadrachalam District: Kinnerasani Wildlife Sanctuary, Sandralagudem, JS 10835 (BSID).

***Rottboellia* L. f.**

World: 24 spp.; India: 1 sp.; Telangana: 1 sp.

Rottboellia cochinchinensis (Lour.) Clayton in Kew Bull. 35: 817. 1981; Pull., Fl. Telangana 3: 1167. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 744. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 416. 2020. *Stegosia cochinchinensis* Lour., Fl. Cochinch. 1: 51. 1790. *Rottboellia exaltata* L. f., Suppl. Pl. 114. (1781) 1782; Hook.f., Fl. Brit. India 7: 156. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1759. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 206. 1960.

Plate 153

Caespitose perennials. Culms 100–350 cm high; nodes glabrous. Leaves basal and cauline; sheaths 4–8 cm long, keeled, hirsute; ligules membranous, ciliate; blades 18–70 × 0.5–4 cm, linear-lanceolate, midnerve prominent, scabrid, apex acuminate. Spikes c. 15 cm long, cylindrical. Joints 5–5.5 mm long, sunken-hollow, crustaceous. Sessile spikelets 6–7.5 mm long, ovate. Lower glume 4–5 mm long, broadly ovate, coriaceous-crustaceous, faintly 8–10-nerved. Upper glume 4–5.5 mm long, broadly ovate, gibbous, 8–10-nerved. Florets 2; lower male, upper bisexual. Lower lemma 5–5.5 mm long, ovate-lanceolate, coriaceous. Palea 5–5.5 mm long, elliptic or ovate-lanceolate, hyaline. Upper lemma 3–4.5 mm long, broadly ovate, hyaline. Palea 3.5–4.5 mm long, elliptic-broadly ovate, hyaline. Caryopsis 4–5.5 mm long, ovate, compressed. Pedicelled spikelets 3–5.5 mm long, ovate-lanceolate. Pedicels 3–3.5 mm long, clavate, crustaceous. Lower glume 3–5.5 mm long, elliptic-ovate, chartaceous. Upper glume 4–5 mm long, broadly ovate, crustaceous. Lemma 4–5.5 mm long, elliptic-ovate, hyaline.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in waterlogged habitats, along



Plate 153. *Rottboellia cochinchinensis* (Lour.) Clayton: A. Habitat; B. Inflorescence; C. Enlarged view of inflorescence; D–M. Sessile spikelet; D. Spikelet; E&F. Abaxial and adaxial view of lower glume; G. Upper glume; H. Lower lemma; I. Lower palea; J. Upper lemma; K. Upper palea; L. Stamens; M. Pistil; N–U. Pedicelled spikelet; O&P. Abaxial and adaxial view of lower glume; Q. Upper glume; R. Lower lemma; S. Palea; U. Palea.

bank of rivers and cultivated fields.

Exsicc.: Khammam District: Mupparapukotta-Yellandu, 31.03.2021, SNR 012056 (BSID); Rangareddy District: Hyderabad, MVR 02196 (HY); PISTAU-Rajendranagar, 10.10.2019, SNR 8742; Mahabubnagar District: Appapur, BSS, SKB & VSR 32226 (SKU); Suryapeta District: Tekumatla, 27.10.2019, SNR 8749 (BSID);

Vikarabad District: Ananthagiri Hills, 21.09.2019, SNR 8729 (BSID); Warangal District: Mupparapukota-Yellandu, 31.03.2021, SNR 012056 (BSID).

Saccharum L.

World: c. 17 spp.; India: 15 spp., 1 var.; Telangana: 2 spp.

Key to the species

- 1a. Peduncle hairy below the panicle, rachis very fragile ... 1. *S. officinarum*
 1b. Peduncle not hairy; rachis less fragile ... 2. *S. spontaneum*

1. *Saccharum officinarum* L., Sp. Pl. 1: 54. 1753; Hook.f., Fl. Brit. India 7: 118. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1709. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 212. 1960; Pull., Fl. Telangana 3: 1168. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 745. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 417. 2020. '*Cheraku*'

Annuals. Culms about 600 cm high, thick; internodes waxy; lower nodes rooting. Leaves basal and cauline; sheaths glabrous, keeled; ligules ciliate; blades 90–155 × 5–6.5 cm, linear-lanceolate, margins scabrid. Panicles pyramidal, terminal, silvery.

Fl. & Fr.: Oct.–Jan.

Distrib.: Cultivated.

Exsicc.: Rangareddy District: Hyderabad, MVR 02197 (HY).

2. *Saccharum spontaneum* L., Mant. Pl. Altera 183. 1771; Hook.f., Fl. Brit. India 7: 118. 1896; C.E.C.Fisch. in Gamble, Fl. Madras 1709. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 214. 1960; Pull., Fl. Telangana 3: 1168. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 745. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 417. 2020. '*Rellu Gaddi*' **Plate 154**

Caespitose, perennials, rhizomatous. Culms about 450 cm high, erect; nodes glabrous- sparsely hairy. Leaves basal and cauline; sheaths terete-keeled, mouth silky villous; ligules membranous; blades 25–110 × 0.5–1.5 cm, linear-lanceolate, margins scabrid, apex acuminate. Panicles c. 65 cm long, densely silky villous. Peduncles appressed silky hairy below, rachis capillary, less fragile, main rachis persistent. Spikelets binate, similar, 3–4.5 mm long, lanceolate; callus silky villous. Lower glume 3–5 mm long, lanceolate-linear, abaxial surface coriaceous, adaxial surface chartaceous, 2-nerved, apex acuminate. Upper glume 2.5–4.5 mm long, lanceolate, chartaceous, 1-nerved, margins ciliate, apex acuminate. Florets 2; lower neuter, upper florets bisexual. Lower lemma 2.5–3.5 mm long, elliptic-ovate, lanceolate, hyaline, margins ciliate. Upper lemma 2.5–3.5 mm long, linear-lanceolate, hyaline. Palea 1–2 mm long, ciliate. Pedicelled spikelets are similar to sessile spikelets. Pedicels 1–2 mm long, densely silky villous.

Fl. & Fr.: Sep.–Mar.

Sarga Ewart

World: 9 spp.; India: 2 spp.; Telangana: 1 spp.

***Sarga purpureosericea* (Hochst. ex A.Rich.) Spangler, Austral. Syst. Bot. 16(3): 291. 2003. *Sorghum purpureosericeum* (Hochst. ex A.Rich.) Asch. &**

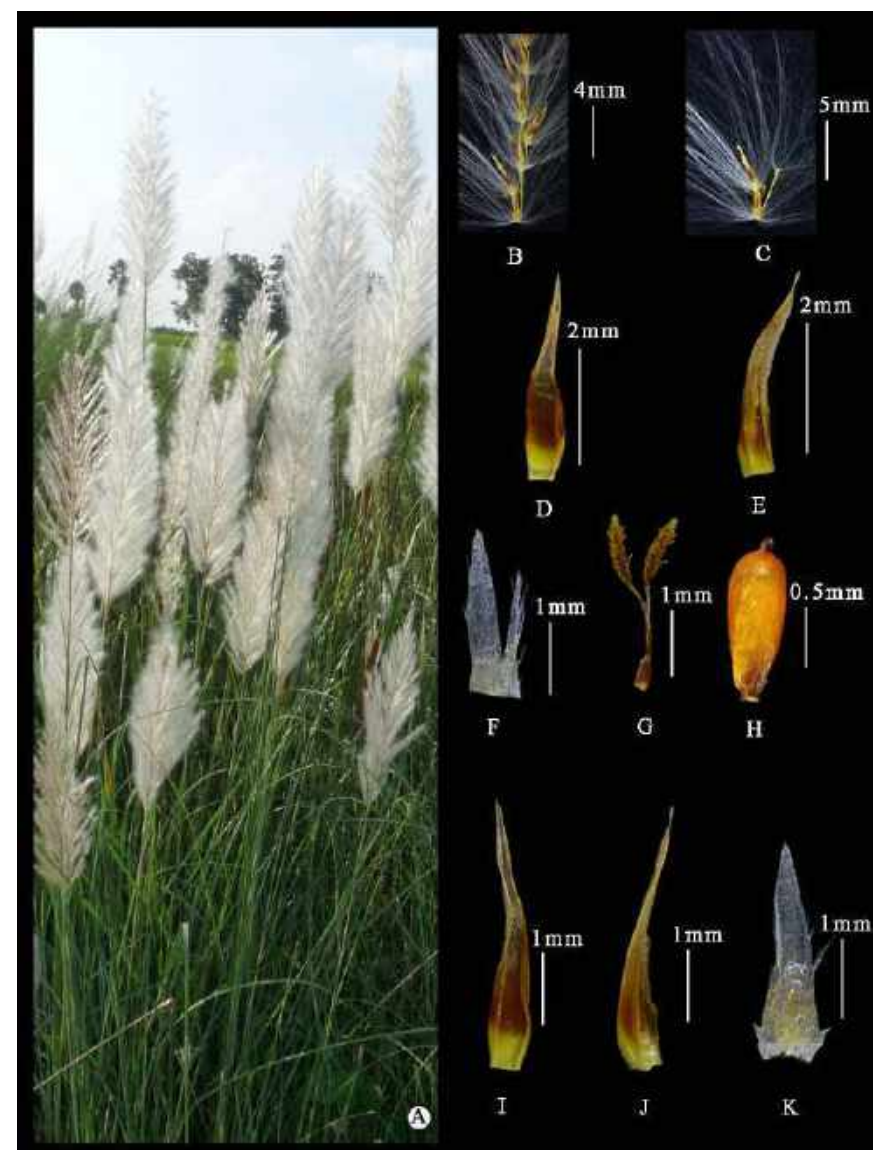


Plate 154. *Saccharum spontaneum* L.: A Habitat; B. Enlarged view of inflorescence; C. Paired spikelet; D–H. Sessile spikelet; D. Lower glume; E. Upper glume; F. Lemma; G. Pistil; H. Caryopsis.; I–K. Pedicelled spikelet; I. Lower glume; J. Upper glume; K. Lower lemma.

Schweinf. in Schweinf., Beitr. Fl. Aethiop.: 310. 1867; Bor, Grasses Burma, Ceylon, India & Pakistan 246. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 425. 2020. *Andropogon purpureo-sericeus* Hochst. ex A.Rich., Tent. Fl. Abyss. 2: 469. 1850; Hook.f., Fl. Brit. India 7: 185. 1896. *Sorghum deccanense* Stapf; Bor, Grasses Burma, Ceylon, India & Pakistan 245. 1960; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 423. 2020. *S. deccanense* Stapf ex Raizada, Indian Forester 80: 43. 1954. **Plate 155**

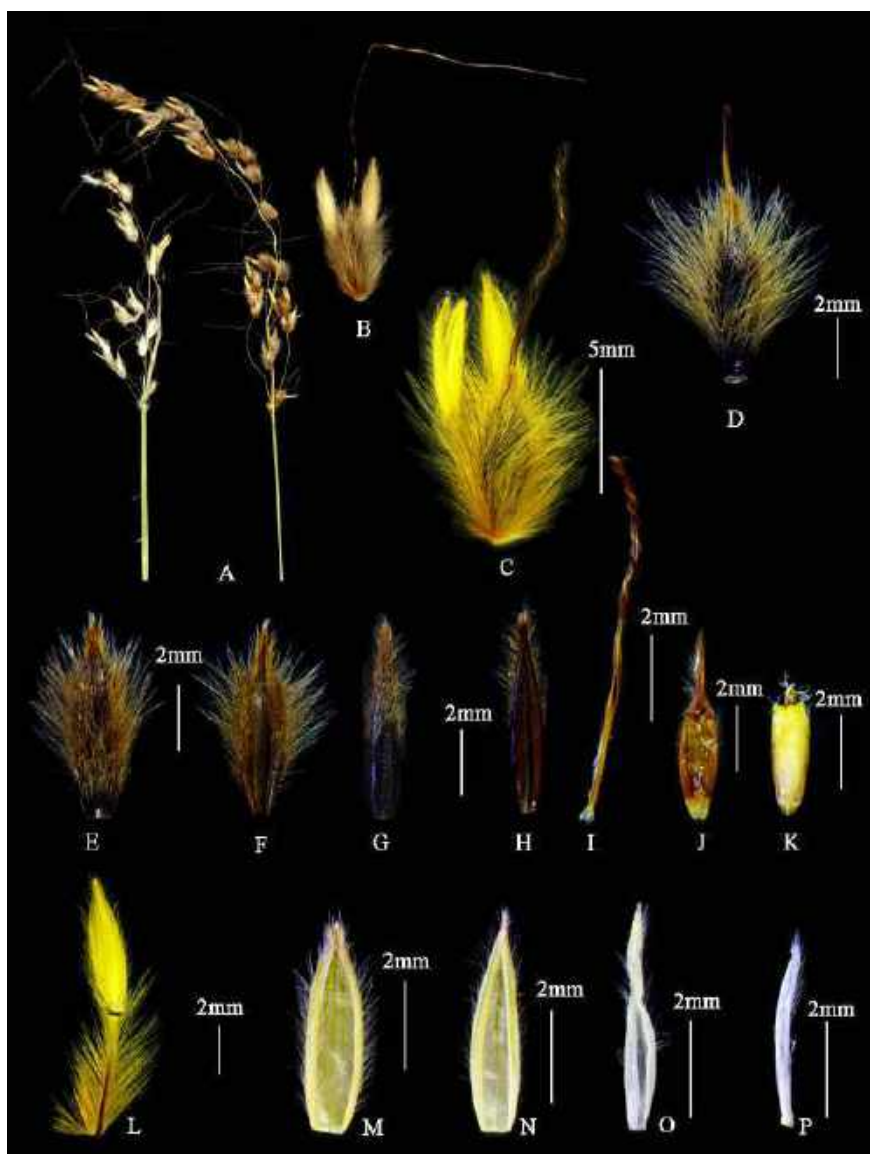


Plate 155. *Sarga purpureosericea* (Hochst. ex A.Rich.) Spangler: A. Inflorescence; B. Spikelets (One sessile and two pedicelled); C. Enlarged view of spikelet; D-K. Sessile spikelet; D. Spikelet; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I. Lemma; J. Palea; K. Caryopsis; L-P. Pedicelled spikelet; L. Spikelet; M. Lower glume; N. Upper glume; O. Lemma; P. Palea.

Annual. Culms c. 1–1.5 m high, erect; nodes densely bearded. Leaves basal and cauline; leaf sheaths 08–14 cm long; ligule c. 0.9 mm long, membranous; blades 19–55.5 × 0.2–1.2 cm, linear-lanceolate, apex acuminate. Panicle 08–27 × 4–8.5 cm, effuse; branches filiform, 3–7 cm long, whorled. Racemes 1.5–2.3 cm long, nodes hairy; joints and pedicels terete. Spikelets 3 (one sessile and two pedicelled); disarticulating from callus; callus bearded with brown hairs.

Sessile spikelet 6–7 × 1–2.3 mm, lanceolate, dark brown, hairy on dorsal surface and callus. Lower glume 5.5–7 × 1–2 mm, ovate-lanceolate, coriaceous, dark brown, 7–10-nerved, dorsally compressed, densely rufous brown hairy on upper surface, apex two toothed. Upper glume 5.5–6.5 × 1–1.2 mm, lanceolate-oblong, 6–7-nerved coriaceous, upper half part with 0.5–1.3 mm long hairs, margins incurved, ciliate above the middle, apex acute. Florets 2, lower floret epaleate, sterile; bisexual. Lower lemma 5.5–6.5 × 0.6–0.7 mm, lanceolate-elliptic, membranous, hyaline, apex obtuse, awnless. Palea absent. Upper lemma c. 4 mm long, lanceolate-oblong, 2-lobed, awned from sinus; awn c. 5 cm long, geniculate, twisted, ciliolate. Anthers 1.5–2.5 × 0.6 mm. Caryopsis 3–3.5 × 0.5–0.9 mm. Pedicelled spikelet 5–7 × 0.5–1.5 mm, elliptic-lanceolate, apex acute. Two florets neuter. Lower glume 4–5 × 0.6–1.5 mm, oblong-lanceolate, boat shaped, sub-coriaceous, 7-nerved, dorsal surface hairy, margins incurved, apex acute. Upper glume 4.5–5.5 × 0.5–1.3 mm, oblong-lanceolate, boat shaped, 5-nerved, sparsely hairy on upper surface, apex acute. Lower lemma 4.5–5 × 0.7 mm, oblong-lanceolate, membranous-chartaceous, hyaline, apex acute. Upper lemma 4–4.5 × 0.6 mm, oblong-lanceolate, hyaline, margins ciliate apex acute, membranous.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally in cultivation fields.

Exsicc.: Vikarabad District: Ananthagiri Hills, 21.09.2021, SNR & PL 8941 (BSID).

Schizachyrium Nees

World: c. 59 spp.; India: 6 spp.; Telangana: 2 spp.

Key to the species

- | | |
|---|------------------------------|
| 1a. Slender grass; leaves oblong, apex rounded | ... 1. <i>S. brevifolium</i> |
| 1b. Robust grass; leaves linear, apex acuminate | ... 2. <i>S. exile</i> |

1. *Schizachyrium brevifolium* (Sw.) Nees ex Buse in Miq., Pl. Jungh. 359. 1854; C.E.C.Fisch. in Gamble, Fl. Madras 1752. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 215. 1960; Pull., Fl. Telangana 3: 1168. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 745. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 418. 2020. *Andropogon brevifolius* Sw., Prodr. Veg. Ind. Occ. 26. 1788; Hook.f., Fl. Brit. India 7: 165. 1896. Plate 156(A&B)

Caespitose annuals; culms 9–65 cm long, delicate, erect or scrambling and decumbent, branched, glabrous; nodes glabrous. Leaves basal and cauline; sheaths 1.5–3.5 cm long, keeled, scabrid; ligules 0.7–1.1 mm long, membranous, lacerate; blades 2–4 × 0.3–0.7 cm, oblong-lanceolate, scabrid, flat-folded, base truncate-subrounded, margins serrulate, apex obtuse- mucronulate. Racemes axillary, solitary, 1.8–2.6 cm long, spatheate; rachis fragile; joints triquetrous, 2–2.2 mm long, apex bidentate; callus 0.7–0.9 mm long, bearded. Spikelets paired, dissimilar. Sessile spikelet 2.1–2.8 × 0.5–0.7 mm, oblong-linear, apex acute, awned. Lower glume 2.6–2.9 × 0.9–1 mm, linear-lanceolate, 5-nerved, flanks keeled toward apex, keels wingless, apex 2-toothed. Upper glume 2.2–2.5 × 0.3–0.4 mm, linear-lanceolate, cymbiform, chartaceous, 3-nerved, 1-keeled, keel serrulate, apex acuminate-aristae, c. 0.2 mm long. Florets 2; lower fertile,



Plate 156. A&B. *Schizachyrium brevifolium* (Sw.) Nees ex Buse: A. Habit; B. Paired spikelet; C–P. *Schizachyrium exile* (Hochst.) Pilg.: C. Habit; D. Portion of the inflorescence; E. Paired spikelet; F. Pedicel; G. Pedicelled spikelet; H–P. Sessile spikelet; H. Spikelet; J. Lower glume; J. Upper glume; K. Lemma; L. Palea; M. Lodicules; N. Stamens; O. Pistil; P. Caryopsis.

bisexual, epaleate; upper barren, epaleate. Lower lemma 1.2–1.5 × 0.4–0.5 mm, oblong-lanceolate, membranous-chartaceous, apex bifid-emarginate. Upper lemma 1.8–2.5 × 0.3–0.4 mm, oblong-lanceolate, apex deeply 2-lobed; awn from sinus, 6–7 mm long, geniculate, column twisted, barbellate. Caryopsis 0.9–1.5 × 0.2 mm, oblong-linear. Pedicelled spikelet represented by aristulate glumes.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasional in grassy patches.

Exsicc.: Mancherial District: Jannaram Forest Division, BirsaiPET Range, Rampur Beat, 29.10.2013, APS 004006 (BSID).

2. *Schizachyrium exile* (Hochst.) Pilg., Bot. Jahrb. Syst. 54: 284. 1917; C.E.C.Fisch. in Gamble, Fl. Madras 1752. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 216. 1960; Pull., Fl. Telangana 3: 1170. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 747. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 418. 2020. *Andropogon exilis* Hochst., Flora 27: 241. 1844. Hook.f., Fl. Brit. India 7: 166. 1896.

Plate 156(C-P)

Caespitose annuals. Culms 15–90 cm high, erect-geniculate; nodes glabrous. Leaves mostly basal; sheaths 1.5–3 cm long, terete, glabrous; ligules membranous; blades 2–13 × 0.1–0.4 cm, linear, base rounded-cordate, apex acute-acuminate. Inflorescence compound, terminal and axillary racemes, subtended and enclosed by spatheole or hardly extended from spatheole. Raceme 3–6 cm long, solitary; rachis fragile, 4–5 mm long, margins villous. Spikelets paired, sessile, pedicelled, disarticulating; pedicels cuneate, villous. Sessile spikelets 5–8 mm long, linear-lanceolate, falling entire; callus pilose, obtuse. Glumes dissimilar. Lower glume lanceolate, as long as spikelet, apex 2-toothed, subcoriaceous, glabrous-villous dorsally, faintly 3–5-nerved, 2-keeled. Upper glume 5–5.6 mm long, lanceolate, boat shaped, 3-nerved, 1-keeled, margins hyaline, apex acuminate-shortly aristate. Florets 2; lower barren, upper bisexual. Lower lemma oblong, hyaline, nerveless or 3-nerved, margins ciliolate. Lower palea absent. Upper lemma oblong, apex 2-lobed, lobes acuminate; awn from sinus, 7–25 mm long, geniculate, column twisted. Upper palea absent or minute, narrowly linear, 2-keeled. Lodicules 2. Stamens 2 or 3. Ovary c. 0.5 mm long, oblong. Caryopsis narrowly oblong. Pedicelled spikelets rudimentary, 1–2 mm long, lanceolate, represented by only glumes. Glumes chartaceous, brownish, one glume with 3–10 mm long awn.

Fl. & Fr.: Aug.–Dec.

Distrib.: Occasionally grown on wet rocky patches.

Exsicc.: Bhadrachalam District: Kinnerasani Wildlife Sanctuary, 09.01.2019, SNR 8560 (BSID); Rangareddy District: Manasa Hills-Rajendra Nagar, 10.10.2019, SNR 8730 (BSID).

Sehima Forssk.

World: c. 5 spp.; India: 4 spp.; Telangana: 3 spp.

Key to the species

- 1a. Lower glume of sessile spikelets rounded on the back, with slit-like groove ... 3. *S. sulcatum*
- 1b. Lower glume of sessile spikelets without a slit but more or less deeply grooved ... 2
- 2a. Perennial; awn very minutely ciliate along spiral ... 2. *S. nervosum*
- 2b. Annual; awn distinctly ciliate along spiral ... 1. *S. ischaemoides*

1. *Sehima ischaemoides* Forssk., Fl. Aegypt-Arab. 178. 1775; Bor, Grasses Burma, Ceylon, India & Pakistan 218. 1960; Kellong. & al., Checklist of the grasses of India 429. 2020; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot.

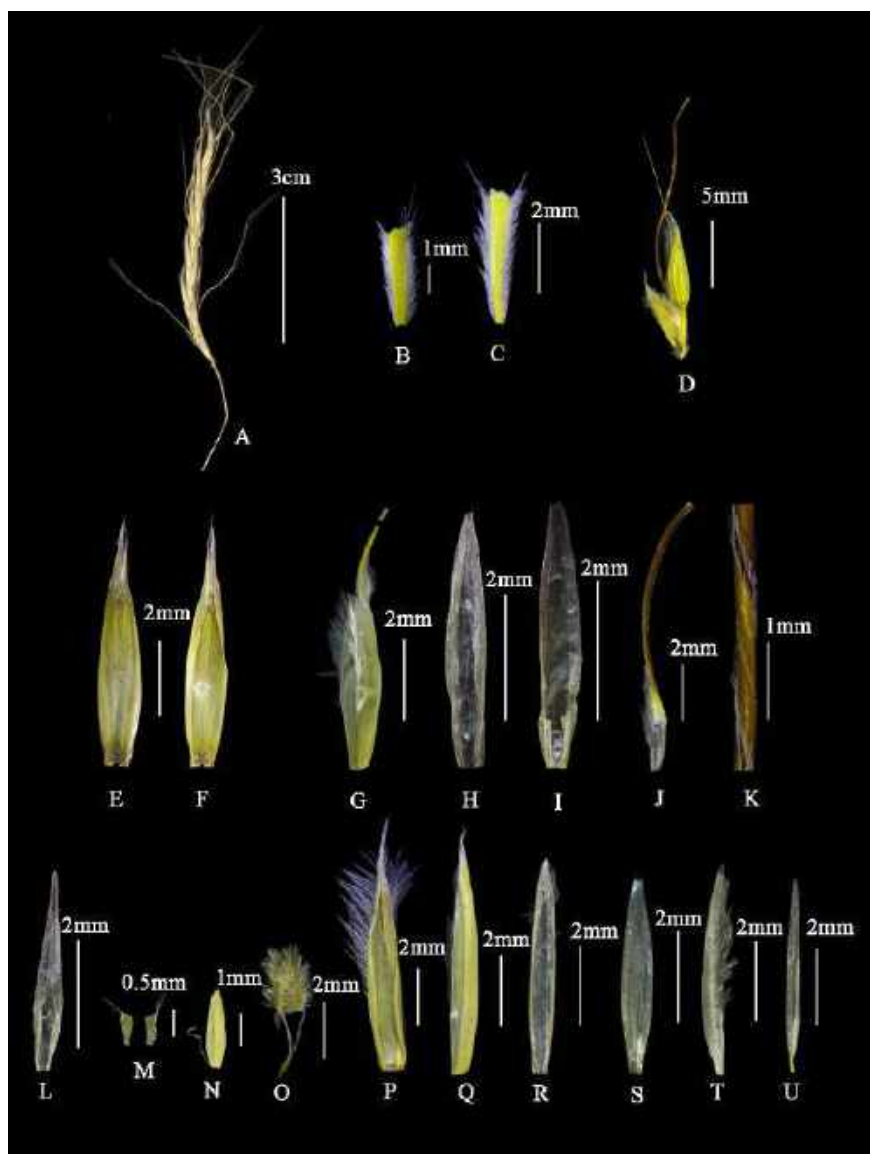


Plate 157. *Sehima ischaemoides* Forssk.: A. Inflorescence; B. Joint; C. Pedicel; D–O. Sessile spikelet; D. Sessile and pedicelled spikelet; E&F. Abaxial and adaxial view of lower glume; G. Upper glume; H. Lower lemma; I. Lower palea; J. Upper lemma; K. Awn spiral margins ciliate; L. Upper palea; M. Lodicules; N. Stamen; O. Pistil; P–U. Pedicelled spikelet; P. Lower glume; Q. Upper glume; R. Lower lemma; S. Lower palea; T. Upper palea; U. Upper palea.

Checkl. Monocot. 3: 419. 2020. *Ischaemum inscalptum* Hochst. ex A.Rich., Tent. Fl. Abyss. 2: 472.1850. **Plate 157**

Annual, tufted. Culms 8–85 cm high, terete, erect; internodes 10–15 cm long; nodes glabrous. Leaves, basal and cauline; sheath 3–5.6 cm long, terete, glabrous; ligule rim of hairs, 0.6–0.8 mm long; blade 10–32 × 0.2–0.5 cm, linear,

flat, glabrous, margins entire-serrulate, base truncate, apex acuminate (slender tail-like). Racemes 2–4.5 cm long, solitary. Joints 3–3.8 mm long, compressed, densely silky. Sessile spikelet 5–7 × 0.7–1 mm, linear-ovate, awned, callus short, bearded. Lower glume, 5.5–7 × 0.8–1.3 mm, linear-ovate, coriaceous glabrous, 5–6-nerved, 2-keeled, margins inflexed, apex 2-toothed. Upper glume 4–5 × 0.6–0.8 mm, cymbiform, subcoriaceous, glabrous, 3-nerved, 1-keeled, keel winged, awned, slender, and straight up to 2.5 cm long. Lower lemma 3.5–4.5 × 0.4–0.6 mm, elliptic-narrowly ovate, hyaline, 2-nerved, 2-keeled, retrorsely barbed on keels, margins hairy, apex 2-toothed-lacerate. Lower palea 3.5–4 × 0.5–0.6 mm, linear-ovate, hyaline, glabrous, margins inflexed, 2-keeled, apex bifid. Upper lemma 3.5–4 × 0.6–0.8 mm, narrowly ovate, membranous, hyaline, 3-nerved, 2-toothed, awned from sinus, awn 3–3.5 cm long, geniculate, distinctly ciliate along the spiral. Upper palea 3–3.8 × 0.5–0.6 mm, lanceolate-elliptic, linear, chartaceous, hyaline, margins inflexed, 2-nerved, 2-keeled, apex lacerate. Lodicules 2, 0.2–0.5 mm long. Stamens 1–3, anthers 2–2.7 mm long. Ovary 0.5–0.8 mm long, oblong, stigma, densely plumose. Caryopsis oblong-ellipsoid. Pedicel up to 4 mm long, compressed; margins densely silky hairy (1–1.2 mm long). Pedicelled spikelet 8–12 × 1–1.2 mm, lanceolate, unawned. Lower glume 9–13 × 0.8–1.5 mm, linear-ovate, coriaceous-membranous, glabrous, margins inflexed, 5–6-nerved, 2-keeled, keels winged and densely hairy, apex with two setaceous teeth. Upper glume 5–7.5 × 0.6–1 mm, linear-ovate, boat-shaped, coriaceous-membranous, glabrous, margins inflexed, ciliate, 3-nerved, apex acuminate. Florets 2; both florets empty. Lower lemma 5–5.8 × 0.4–0.8 mm, linear, lanceolate-elliptic, hyaline, colorless dots below the apex on the dorsal side, glabrous towards base, margins inflexed, ciliate, 2-nerved; 2-keeled, retrorsely barbed on keel; apex lacerate. Lower palea 3.5–4.5 × 0.2–0.6 mm, linear-elliptic, chartaceous, hyaline, 2-nerved; 2-keeled, retrorsely barbed on keel; apex 2-toothed-lacerate. Upper lemma 4–5.2 × 0.3–0.4 mm, lanceolate-elliptic, chartaceous, hyaline margins inflexed, ciliate, 3-nerved, apex acute-lacerate. Upper palea 4–5.1 × 0.2–0.4 mm, lanceolate-elliptic, chartaceous, hyaline, 2-nerved, apex acute-lacerate.

Fl. Fr.: Sep.–Dec.

Distrib.: Open grasslands.

Exsicc.: Vikarabad district: Naskal Range, Parigi RF, 01.12.2019, SNR 008795 (BSID).

2. *Sehima nervosum* (Rottler ex Willd.) Stapf, Fl. Trop. Afr. 9 (1): 36. 1917; C.E.C.Fisch. in Gamble, Fl. Madras 1724. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 218. 1960; Pull., Fl. Telangana 3: 1172. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 747. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 419. 2020. *Andropogon nervosus* Rottler ex Willd., Ges. Naturf. Freunde Berlin Neue Schriften 4: 218. 1806. **Plate 158(A–N)**

Caespitose perennials. Culms 80–110 cm high; nodes glabrous. Leaves basal and cauline; sheaths sparsely hairy or glabrous; ligules membranous, hairy; blades 10–20 × 0.1–0.3 cm, linear-lanceolate, flat, midnerve distinct. Racemes c. 12 cm long, slightly curved, solitary. Joints 2–3.5 mm long, densely ciliate, clavate. Sessile spikelets 8.5–13 mm long, linear-oblong; callus bearded. Lower glume

6–6.5 mm long, linear, chartaceous, deeply grooved on back, margins scabrid, 5–9-nerved. Upper glume 7–7.5 mm long, linear-lanceolate or cymbiform, apex notched, awn c. 15 mm long. Florets 2; lower male, florets bisexual. Lower lemma 5–6 mm long, linear-lanceolate, chartaceous-membranous, hyaline. Upper lemma 5–5.5 mm long, oblong, 3-nerved, apex notched; awn 25–30 mm long, geniculate. Palea 4–4.5 mm long, lanceolate, hyaline, 2-nerved. Pedicelled spikelets 7–14 mm long, ovoid-lanceolate; pedicels 4–5.5 mm long, linear, densely ciliate. Lower glume 7–8.5 mm long, lanceolate, 7–9-nerved, villous above. Upper glume 5.5–6.5 mm long, lanceolate, 3-nerved, margins hairy above. Florets 2; lower male-neuter, upper male. Both lower lemma and upper lemma similar sessile spikelet. Upper lemma entire, unawned.

Fl. Fr.: Sept.–Dec.

Distrib.: Occasional on hill slopes and plains.

Exsicc.: Rangareddy District: Hyderabad, MVR 02199 (HY); Palgutta, 30.11.2019, SNR & ARK 8776 (BSID); Suryapeta District: Nakrekal village, 27.10.2019, SNR 8747 (BSID); Undrugonda, SNR 8755 (BSID); Wanaparthy District: Thirumalayyagutta, 07.08.2019, SNR 8640 (BSID).

Note: It can be easily recognizable by the absence of a slit but deeply or shallowly grooved lower glume.

3. *Sehima sulcatum* (Hack.) A. Camus in Bull. Mus. Natl. Hist. Nat. 27: 373. 1921; C.E.C.Fisch. in Gamble, Fl. Madras 1724. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 219. 1960; Pull., Fl. Telangana 3: 1164. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 419. 2020. *Ischaemum sulcatum* Hack., Monogr. Phan. 6: 248. 1889; Hook.f., Fl. Brit. India 7: 137. 1896. **Plate 158(O–Q)**

Caespitose annuals. Culms about 58 cm high, geniculately ascending, nodes glabrous. Leaves basal and cauline; sheaths glabrous, loose; ligules ciliate; blades 5–35 × 0.2–0.4 cm, linear, margins scabrid. Racemes 6–7.5 cm long, solitary, terminal joints and pedicels ciliate. Sessile spikelets 6–8.5 mm long, lanceolate; callus hairy at base. Lower glume c. 11 mm long, chartaceous-coriaceous, scabrid, with a slit like groove in the middle, apex bidentate. Upper glume 5–6.5 mm long, lanceolate, 3–5-nerved, ciliate, apex shortly bidentate; awn c. 11.5 mm long. Lower lemma 5–6.5 mm long, linear, membranous-chartaceous, hyaline. Palea 5–5.5 mm long, linear-oblong. Upper lemma 5–6.5 mm long, lanceolate, apex bilobed; awn 20–30 mm long, geniculate, scabrid above. Palea 4–5 mm long, lanceolate. Pedicelled spikelets 5–6 mm long, linear-lanceolate. Lower glume c. 5.5 mm long, lanceolate, apex bidentate. Upper glume 4–4.5 mm long, lanceolate. Lower lemma 3–3.5 mm long, linear, hyaline. Palea 2.5–3 mm long, lanceolate. Upper lemma unawned, 4–4.5 mm long, lanceolate. Palea 2.5–3 mm long, lanceolate.

Fl. & Fr.: Sept.–Jan.

Distrib.: Occasional on the bunds of cultivated fields and on hills.



Plate 158. A–N. *Sehima nervosum* (Rottler) Stapf: A. Habitat (Inset: Portion of the inflorescence); B–H. Sessile spikelet; B. Spikelet; C. Lower glume; D. Upper glume; E. Lemma; F. Palea; G. Lodicules with pistil; H. Stamens; I–Q. Pedicelled spikelet; I. Spikelet; J. Lower glume; K. Upper glume; L. Lemma; M. Palea; N. Stamens; O–Q. *Sehima sulcatum* (Hack.) A. Camus: O. Sessile and pedicelled spikelet; P. Lower glume of sessile spikelet; Q. Upper glume of sessile spikelet.

Exsicc.: Vikarabad District: Ananthagiri Hills-Damagundam, 21.09.2019, SNR 8940 (BSID).

Note: It can be identified by a slit-like groove on lower glume of sessile spikelet.

Sorghum Moench

World: c. 17 spp.; India: 20 spp., 45 var.; Telangana: 3 spp.

Key to the species

- | | |
|---|-------------------------------|
| 1a. Cultivated | ... 2. <i>S. bicolor</i> |
| 1b. Wild | ... 2 |
| 2a. Culm nodes densely bearded | ... 4. <i>S. nitidum</i> |
| 2b. Culm nodes glabrous to pubescent | ... 3 |
| 3a. Perennials without rhizomatous base | ... 1. <i>S. arundinaceum</i> |
| 3b. Perennials with definite rhizomatous base | ... 3. <i>S. halepense</i> |

1. *Sorghum arundinaceum* (Desv.) Stapf in Prain, Fl. Trop. Africa 9: 114. 1917; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 422. 2020. *Raphis arundinacea* Desv., Opusc. Sci. Phys. Nat.: 693. 1831. *Sorghum stapfii* (Hook.f.) C.E.C.Fisch. in Gamble, Fl. Madras 3: 1735. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 246. 1960. *Andropogon stapfii* Hook.f., Fl. Brit. India 7: 184. 1896. *Sorghum verticilliflorum* (Steud.) Stapf in Prain, Fl. Trop. Africa 9: 116. 1917; Bor, Grasses Burma, Ceylon, India & Pakistan 223. t. 14. 1960. *Andropogon verticilliflorus* Steud., Syn. Pl. Glumac. 1: 393. 1854. *Sorghum pugionifolium* Snowden in J. Linn. Soc., Bot. 55: 240. 1955; Bor, Grasses Burma, Ceylon, India & Pakistan 223. 1960.

Tufted perennials. Culms 20–55 cm high, slender-stout; nodes glabrous to pubescent. Leaves basal and cauline; sheath 5–20 cm long; ligule a ciliate membrane; blade 10–25 cm long, elliptic, ovate-lanceolate, narrowed at base, margins scabrid, apex acute-acuminate. Panicle 10–20 cm long, ovate-lanceolate, loose-contracted; primary panicle branches whorled, flexuous, scabrellate, subdivided, pubescent in axils. Spikelets appressed in pairs, sessile and pedicelled, ovate, villous. Sessile spikelet ovate-lanceolate, oblong, dorsally compressed, apex acute, densely white strigose hairy dorsally-glabrescent. Lower glume ovate-lanceolate, subcoriaceous, whitish or yellowish pubescent dorsally. Upper glume ovate, chartaceous-subcoriaceous, apex acute, pubescent dorsally. Florets 2; lower barren or male, upper bisexual. Lower lemma ovate-lanceolate, membranous, acute, 2-nerved, margins ciliate. Upper lemma membranous, 2-toothed at apex, awned from sinus, 1-nerved, margins ciliate; awn geniculate, c. 25 mm long, column twisted. Upper palea absent or minute. Lodicules oblong, apex ciliate. Caryopsis obovate to oblong-lanceolate. Pedicelled spikelet smaller than sessile, linear-lanceolate, dorsally compressed, usually reduced to glumes; pedicels filiform, ciliate. Glumes subequal, linear to ovate-lanceolate, chartaceous, acute to mucicous at apex. Lemmas reduced, barren or male.

Fl. & Fr.: Dec.

Distrib.: Cultivated

Exsicc.: Karimnagar District: Rechapalli, GVSRR & TRK 22242 (CAL).

2. *Sorghum bicolor* (L.) Monech, Methodus 207. 1794; Bor, Grasses Burma, Ceylon, India & Pakistan 227. 1960; Pull., Fl. Telangana 3: 1175. 2015; K.N.Reddy



Plate 159. A&B. *Sorghum bicolor* (L.) Moench: A. Habitat; B. Inflorescence; C. *Sorghum halepense* (L.) Pers.: Inflorescence (Inset: Inflorescence & Spikelet)

& C.S.Reddy, Fl. Telangana 750. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 422. 2020. *Holcus bicolor* L., Mat. Pl. Altera 301. 1771. 'Jonnalu'

Plate 159(A&B)

Annuals. Culms 150–300 cm high, erect, robust; nodes glabrous. Leaves cauline; sheaths compressed, more or less terete; ligules membranous; blades 4–5.5 cm long, lanceolate, margins wavy, midrib prominent, apex acuminate. Inflorescence 8–35 × 5–15 cm, open panicle. Spikelets paired; sessile, pedicelled;

pedicels filiform, margins ciliate. Sessile spikelets 4.8–10 mm long, lanceolate-oblong; callus pilose. Lower glume 4.5–8.5 mm long, ovate, chartaceous, 2-keeled, glabrous, apex obtuse. Upper glume 4.5–9 mm long, ovate, chartaceous, 5–7-nerved, 1-keeled, glabrous, margins ciliate. Florets 2; lower barren, upper bisexual. Lower lemma 3.5–5.5 mm long, elliptic, chartaceous, hyaline, 5-nerved, margins ciliate, apex acute. Lower palea absent. Upper lemma 1.5–2.5 mm long, elliptic-obovate, chartaceous, hyaline, 3-nerved, margins ciliate, apex 2-fid, awned; awn from a sinus, geniculate. Pedicelled spikelets similar to sessile spikelet, male.

Fl. & Fr.: Aug.–Dec.

Distrib.: Cultivated

Exsicc.: Adilabad District: Indervalli, *GO & PVP* 4528 (SKU); Warangal District: Kadipikonda-Kazipet, 27.03.2021, *SNR* 012008 (BSID); Battupally, *SNR* 012010 (BSID); Regional Agricultural Research Station-Warangal, 28.03.2021, *SNR* 012019 (BSID).

3. *Sorghum halepense* (L.) Pers., Syn. Pl. 1: 101. 1805; C.E.C.Fisch. in Gamble, Fl. Madras 1735. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 222. 1960; Pull., Fl. Telangana 3: 1175. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 750. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 424. 2020. *Holcus halepensis* L., Sp. Pl. 2: 1047. 1753. 'Gaddi Jonna' 'Plate 159(C)

Caespitose perennials; rhizomatous. Culms about 300 cm high, erect; nodes glabrous. Leaves basal and cauline; sheaths striate; ligules membranous, ciliate; blades 8–55 × 0.5–2 cm, linear-lanceolate, base cordate, margins serrulate. Panicles c. 45 cm long, pyramidal. Sessile spikelets 4–5.5 mm long, ovate-lanceolate, densely hairy. Lower glume 4–5.5 mm long, lanceolate-elliptic, faintly nerved, apex toothed. Upper glume 4–5.5 mm long, ovate-lanceolate, crustaceous, sparsely hairy. Florets 2; lower neuter, upper bisexual. Lower lemma 3–3.5 mm long, ovate-lanceolate, margins ciliate, faintly 5-nerved. Lower palea absent. Upper lemma 3–3.5 mm long, ovate, coriaceous, margins ciliate, awned, apex bifid-notched, awn 10–17 mm long. Pedicelled spikelets 4–5.5 mm long, lanceolate. Pedicels 3–3.5 mm long, densely ciliate. Lower glume 4–5.5 mm long, lanceolate, chartaceous. Upper glume 5–5.5 mm long, lanceolate, 5-nerved, ciliate. Lower lemma 3–4 mm long, ovate, margins ciliate, 3-nerved, epaleate. Upper lemma 3–4 mm long, elliptic, hyaline. Palea 2–2.5 mm long, elliptic-lanceolate.

Fl. & Fr.: Oct.–Jan.

Distrib.: Occasionally found as a weed in cultivated fields.

Exsicc.: Adilabad District: Penganga, *GO & PVP* 4280 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, *SNR* 9533 (BSID); Rangareddy District: Hyderabad, *MVR* 02204 (HY); Warangal District: Regional Agricultural Research Station-Warangal, 28.03.2021, *SNR* 012015 (BSID).

4. *Sorghum nitidum* (Vahl) Pers., Syn. Pl. 1: 101. 1805; C.E.C.Fisch. in Gamble, Fl. Madras 1735. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 245. 1960; Pull., Fl. Telangana 3: 1176. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 750. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 425. 2020. *Holcus nitidus* Vahl, Symb. Bot. 2: 102. 1791.

Caespitose perennials. Culms 80–150 cm high; nodes bearded. Leaves basal and cauline; sheaths 2–16 cm long, terete, mouth hairy; ligules membranous; blades 8–55 × 0.8–1.1 cm, linear-lanceolate, sparsely hairy, apex acuminate-tip. Panicles 10–20 cm long, pyramidal, branches whorled. Sessile spikelets 4–4.5 mm long, elliptic-ovate; callus densely golden brown hairy. Lower glume 4–4.5 mm long, ovate, crustaceous, densely hairy, faintly 5-nerved, margins inflexed, apex truncate. Upper glume 4–4.5 mm long, ovate, coriaceous, 5-nerved, margins inflexed, ciliate, apex obtuse. Florets 2; lower neuter, upper bisexual. Lower lemma 2–3.5 mm long, ovate, 3-nerved, ciliate, apex truncate. Palea absent. Upper lemma 3–3.5 mm long, ovate-lanceolate, margins ciliate, awn 9–20 mm long. Palea hyaline. Pedicelled spikelets 4–5.5 mm long, elliptic-lanceolate. Pedicels covered with golden brown hairy. Lower glume 4–4.5 mm long, lanceolate, chartaceous, hairy. Upper glume 5–5.5 mm long, elliptic, chartaceous, hairy towards apex. Florets similar to sessile spikelets, male, unawned.

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasional on hill slopes.

Exsicc.: Mahabubnagar District: Farahabad, *MVS & MBL* 38025 (SKU); Vikarabad District: Ananthagiri Hills, 21.09.2021, *SNR* 8941 (BSID).

***Spodiopogon* Trin.**

World: 15 spp.; India: 6 spp.; Telangana: 1 sp.

Spodiopogon rhizophorus* (Steud.) Pilger, Nat. Pflanzenfam. ed. 2. 14e: 119. 1940; Bor, Grasses Burma, Ceylon, India & Pakistan 246. 1960; Pull., Fl. Telangana 3: 1176. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 427. 2020. *Andropogon rhizophorus* Steud., Syn. Pl. Glumac. 1: 381. 1854. *Spodiopogon albidus* Benth. in J. Linn. Soc., Bot. 19: 66. 1881; Hook.f., Fl. Brit. India 7: 108. 1896. C.E.C.Fisch. in Gamble, Fl. Madras 1710. 1934. **Plate 160*

Caespitose annuals. Culms 25–120 cm high, tufted geniculate or trailing, stilt roots; nodes glabrous. Leaves basal and cauline; sheaths 2–13 cm long, margins ciliate; ligules 4–5 mm long, membranous; blades 5–28 × 1–2 cm, oblong-lanceolate, petiolate, flat, hispid. Panicles c. 18 cm long, pyramidal, spathaceous, villous. Joints ciliate along margins. Sessile spikelets 7–10 mm long, lanceolate, densely hairy, awned. Lower glume 6–7 mm long, ovate-lanceolate, membranous, densely villous, 7-nerved, 2-keeled, apex truncate. Upper glume 5–5.5 mm long, cymbiform-lanceolate, membranous, 7–9-nerved, apex arista 2–5 mm long. Florets 2; lower male, upper bisexual. Lower lemma 3.5–4 mm long, lanceolate, 3-nerved, apex acuminate-truncate. Palea 4–5 mm long, lanceolate, 2-nerved. Upper lemma 4–5 mm long, oblong, notched, lobes acuminate; awn 10–30 mm long, geniculate. Palea 3–3.5 mm long, lanceolate, fimbriate. Pedicelled spikelets 6–6.5 mm long, linear-lanceolate, awned. Pedicels 2–2.5 mm long, ciliate along margins. Glume and lemma similar to sessile spikelets.

Fl. & Fr.: Oct.–Dec.

Distrib.: Common under the shade of trees in forests.

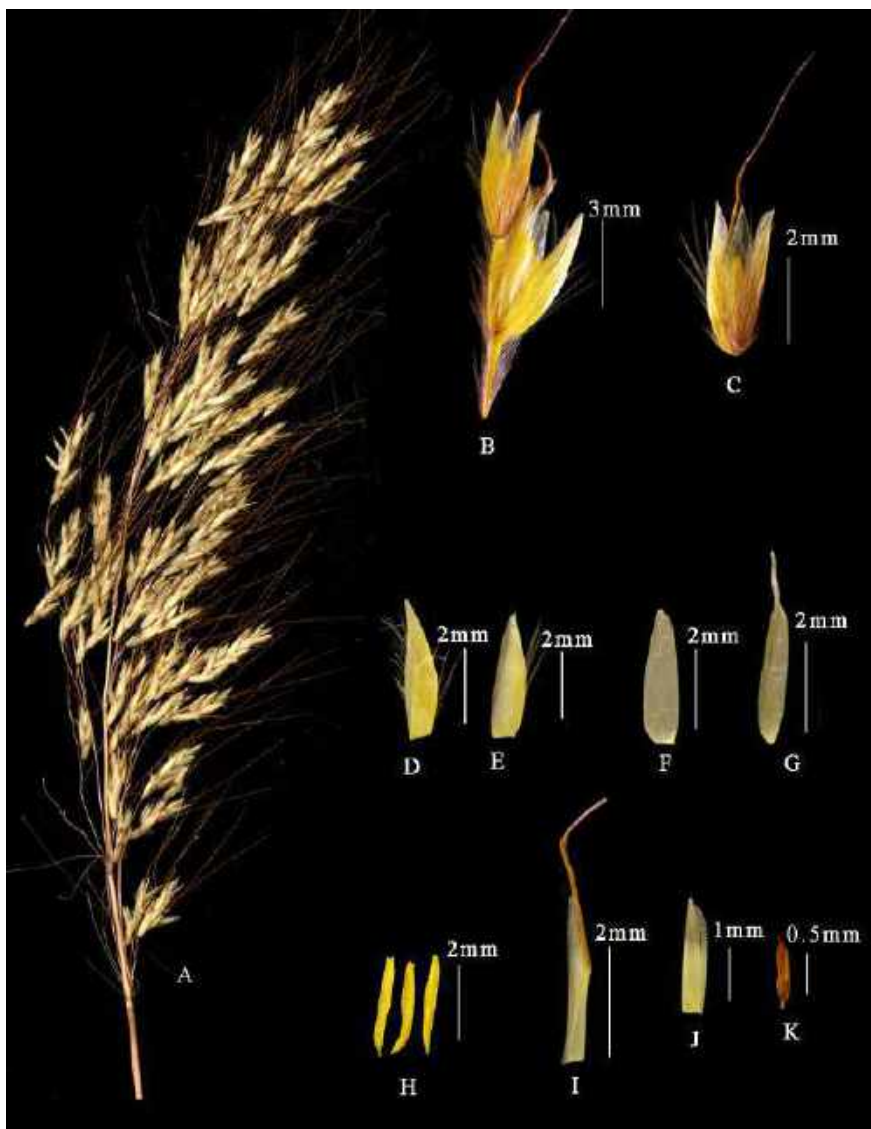


Plate 160. *Spodiopogon rhizophorus* (Steud.) Pilg.: A. Inflorescence; B. Sessile and pedicelled spikelets; C. Spikelet; D. Lower glume; E. Upper glume; F. Lower lemma; G. Palea; H. Stamens; I. Upper lemma; J. Palea; K. Caryopsis.

Exsicc.: Adilabad District: Jannaram Range, Kawal Tiger Reserve, 28.10.2013, APS, ALC & KCM 3987 (BSID).

***Thelepogon* Roth**

World: 1 sp.; India: 1 sp.; Telangana: 1 sp.

***Thelepogon elegans* Roth ex Roem. & Schult., Syst. Veg. 2: 788. 1817; Hook.f., Fl. Brit. India 7: 148. 1896; Bor, Grasses Burma, Ceylon, India & Pakistan 247. 1960; Pull., Fl. Telangana 3: 1181. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana**



Plate 161. *Thelepogon elegans* Roth: A. Habit; B&C. Inflorescence; D. Spikelet; E&F. Abaxial and adaxial view of lower glume; G&H. Abaxial and adaxial view of upper glume; I. Lemma; J. Palea; K. Anthers; L. Upper lemma; M. Lemma; N. Stamens; O. Pistil; P. Pedicelled spikelet.

754. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 432. 2020.

Plate 161

Annuls. Culms 25–75 cm high, erect-geniculate ascending. Leaves basal and cauline; sheaths 2.5–4.5 cm long, loose, hirsute, margins ciliate; ligules membranous; blades 5–22 × 0.5–1.5 cm, linear-lanceolate, base amplexicaul, hairy, margins undulate, apex acute. Racemes c. 13 cm long. Sessile spikelets

5–6.5 mm long, ovoid. Lower glume 4–5 mm long, ovate, coriaceous, transversely rugose, 7–9-nerved, apex 2-toothed. Upper glume c. 7.5 mm long, ovate-cymbiform, coriaceous, rugose, 1–3-nerved, apex acuminate. Lower lemma 3–4.5 mm long, lanceolate, chartaceous, 2-nerved, hyaline, apex acute. Palea 2–3 mm long, lanceolate, margins inflexed, hyaline, apex acute. Upper lemma 3–4.5 mm long, ovate-lanceolate, hyaline; awn from sinus, c. 30 mm long. Palea 3.5–4 mm long, lanceolate, apex acuminate. Caryopsis 2.5–3 mm long, elliptic-oblong. Pedicelled spikelets c. 8 mm long, linear, reduced to pedicel.

Fl. & Fr.: Aug.–Jan.

Distrib.: Occasionally in bunds of cultivated fields.

Exsicc.: Nizamabad District: Gandhari, *BRPR & CPR* 7231 (SKU); Vikarabad District: Anathagiri Hills, 30.11.2019, *SNR* 8781 (BSID), Naskal Range, Parigi RF, 01.12.2019, *SNR* 8792 (BSID); Damagundam, 02.12.2019, *SNR* 8910 (BSID).

Note: It can be easily distinguishable by transverse warty ridges on lower glume of sessile spikelets.

Themeda Forssk.

World: c. 29 spp.; India: 19 spp., 3 var.; Telangana: 3 spp.

Key to the species

- | | | |
|-----|----------------------------------|-------------------------------|
| 1a. | Involucral spikelets > 6 mm long | ... 2. <i>T. triandra</i> |
| 1b. | Involucral spikelets < 6 mm long | ... 2 |
| 2a. | Panicles very loose, leafy | ... 1. <i>T. laxa</i> |
| 2b. | Panicles contracted | ... 3. <i>T. quadrivalvis</i> |

1. Themeda laxa (Andersson) A. Camus in Bull. Mus. Hist. Nat. (Paris) 26: 423. 1920; C.E.C.Fisch. in Gamble, Fl. Madras 1746. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 251. 1960; Pull., Fl. Telangana 3: 1182. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 725. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 433. 2020. *Anthistiria laxa* Andersson, Nov. Act. Nat. Soc. Sc. Upsal. ser. 3. 2: 243. 1856; Hook.f., Fl. Brit. India 7: 213. 1896.

Caespitose perennials; rhizomatous. Culms 50–80 cm high, tufted, erect-geniculate. Leaves basal and cauline; sheaths 5–6.5 cm long, compressed; eligulate; blades 5–21 × 0.2–1 cm, linear-lanceolate, apex truncate. Spathe cymbiform; spathes 2–4.5 cm long. Involucral spikelets 4.5–5.5 mm long, male or neuter. Lower glume 4–5 mm long, oblong, chartaceous, 9–10-nerved, keeled, tubercle based hairy, apex acute. Upper glume 4–5 mm long, oblong-elliptic, chartaceous, apex truncate, apex acute. Florets 2; lower barren, upper male. Lower lemma 4–5.5 mm long, oblong-elliptic, membranous. Lower palea absent. Upper lemma reduced, epaleate. Sessile spikelets 4–5.5 mm long, oblong, scabrid; callus pungent. Lower glume 4–4.5 mm long, elliptic, 9–10-nerved, apex emarginate-truncate. Upper glume 4–4.5 mm long, oblong, coriaceous, apex truncate. Florets 2; lower barren, upper bisexual. Lower lemma 3–4.5 mm long, linear-oblong, membranous, apex obtuse. Upper lemma reduced to awn, 40–50 mm long, barbellate. Pedicelled spikelets 3–4.5 mm long. Caryopsis 3–3.5 mm long.

Fl. & Fr.: Aug.–Nov.

Distrib.: Occasionally in Medak, Rangareddy & Vikarabad.

Exsicc.: Medak District: Medak, *RG* 104016 (BSID).



Plate 162. *Themeda quadrivalvis* (L.) Kuntze: A. Habitat; B. Enlarged view inflorescence; C. Raceme; D. Involucre with spikelets; E&F. Abaxial and adaxial view of glume; G. Upper glume; H. Lower lemma; I–R. Pedicelled spikelet; I&J. Spikelet; K. Lower glume; L. Upper glume; M. Lower lemma; N–R. Sessile spikelet; N. Spikelet; O. Lower glume; P. Upper glume; Q. Lemma; R. Palea; S. Pistil.

2. Themeda quadrivalvis (L.) Kuntze, Revis. Gen. Pl. 2: 794. 1891; C.E.C.Fisch. in Gamble, Fl. Madras 1746. 1934; Bor, Grasses Burma, Ceylon, India & Pakistan 252. 1960; Pull., Fl. Telangana 3: 1182. 2015; K.N.Reddy & C.S.Reddy, Fl. Telangana 754. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, Fl. Pl. India Annot. Checkl. Monocot. 3: 433. 2020. *Andropogon quadrivalvis* L., Syst. Veg. 1: 758. 1774. '*Gaddi Mulava*'

Plate 162

Caespitose perennials. Culms 50–200 cm high, geniculate; nodes glabrous. Leaves basal and cauline; sheaths glabrous, compressed; ligules membranous; blades 5–30 × 0.1–0.4 cm, linear, margins scabrid, sparsely pilose or glabrous. Fascicled racemes terminate the upper branches. Spathes 1–3 cm long, subulate, tubercle based hairy along margins. Involucral spikelets 4–5.5 mm long, lanceolate. Lower glume 4.5–6 mm long, lanceolate, bristly. Upper glume 3.5–5.5 mm long, oblong-lanceolate, chartaceous, margins inflexed, 3-nerved, apex acute. Lemma 4–5.5 mm long, linear-lanceolate, chartaceous-membranous, hyaline, 1-nerved, epaleate. Lower glume of bisexual spikelets 3.5–4.5 mm long, lanceolate, adaxial surface bristly, obscurely nerved, apex acute. Upper glume 3.8–4 mm long, lanceolate, 3-nerved. Lower lemma 2–2.5 mm long, lanceolate, chartaceous, 1-nerved, epaleate. Upper lemma reduced to awn, 35–40 mm long. Upper palea absent. Caryopsis 1–2.3 mm long. Pedicelled spikelets 3.5–7 mm long, lanceolate. Glume and lemma similar to involucral spikelets.

Fl. & Fr.: Aug.–Dec.

Distrib.: Common throughout the state in grassy patches and near water sources.

Exsicc.: Adilabad District: Sone, *TP & PVP* 4052 (SKU); Bhadradi Kothagudem District: Kinnerasani Wildlife Sanctuary, *SNR* 9597 (BSID); Mahabubnagar District: Farahabad, *MVS & MBL* 38019 (SKU); Medak District: Narsapur, *TP & MSG* 11996 (SKU); Rangareddy District: Palgutta, 30.11.2019, *SNR* 8775 (BSID); Patancheru industrial area, *BRPR* 11315 (SKU); Vikarabad District: Ananthagiri hills, 21.09.2019, *SNR* 8716 (BSID).

3. *Themeda triandra* Forssk., *Fl. Aegypt.-Arab.* 178. 1775; C.E.C.Fisch. in Gamble, *Fl. Madras* 1746. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 254. 1960; Pull., *Fl. Telangana* 3: 1183. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 755. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 434. 2020. *Anthistiria imberbis* Retz., *Observ. Bot.* 3: 11. 1783; Hook.f., *Fl. Brit. India* 7: 211. 1896.

Caespitose perennials. Culms 100–250 cm high, erect or geniculate, glabrous; nodes glabrous. Leaves basal and cauline; sheaths hairy or glabrous, compressed; ligules ciliate; blades 20–55 × 0.2–1.6 cm, linear-lanceolate, scabrid, apex acuminate. Panicles 50–55 cm long, racemes drooping, lax, flabelliform. Spathes 2–5.5 cm long, tubercle based hairy. Involucral spikelets 7–15 mm long, oblong-lanceolate, hairy. Lower glume 8–13 mm long, lanceolate, sparsely tubercle based hairy, apex acute. Upper glume 6.5–13 mm long, apex ciliate. Lower florets neuter. Upper florets male. Lower lemma 5.5–7.5 mm long, lanceolate, chartaceous-membranous, hyaline, 1-nerved, margins ciliate. Upper lemma 1–2.5 mm long, stipitate; awn 40–50 mm long, column hispid, stout. Pedicelled spikelets 5–7.5 mm long, linear-lanceolate. Glumes and lemma similar to involucral spikelets.

Fl. & Fr.: Sep.–Dec.

Distrib.: Common in grassy patches on hill slopes and in wet habitats.

Exsicc.: Rangareddy District: Hyderabad, *MVR* 02209 (HY).



Plate 163. *Zea mays* L: A. Habitat; B. Inflorescence.

***Zea* L.**

World: 6 spp.; India: 2 sp.; Telangana: 1 sp.

***Zea mays* L.**, *Sp. Pl.* 2: 971. 1753; C.E.C.Fisch. in Gamble, *Fl. Madras* 1704. 1934; Bor, *Grasses Burma, Ceylon, India & Pakistan* 270. 1960; Pull., *Fl. Telangana* 3: 1189. 2015; K.N.Reddy & C.S.Reddy, *Fl. Telangana* 759. 2016; Prasanna & al. in A.A.Mao & S.S.Dash, *Fl. Pl. India Annot. Checkl. Monocot.* 3: 441. 2020. '*Mokka Jonnalu*'

Plate 163

Annuals. Culms 200–300 cm high, stout, lower nodes with brace roots. Leaves basal and cauline; sheaths thick; blades linear-lanceolate, midnerve very distinct. Monoecious. Male spikelets in terminal panicles. Female spikelets in longitudinal rows on a thickened axis in axillary sheaths. Caryopsis globose-flattened, surrounded by dried up glumes and paleas.

Fl. & Fr.: Throughout the year.

Distrib.: Cultivated.

Exsicc.: Adilabad District: Bellampally, *PVP & TP* 9442 (SKU); Indenapally fields, *GO & DAM* 5411 (SKU); Rangareddy District: Hyderabad, *MVR* 02217 (HY); Warangal District: Seetharampuram-Parakala, 29.03.2021, *SNR* 012034 (BSID).

Note: Commonly cultivated for grains and fodder.

LIST OF ABBREVIATIONS USED IN THIS WORK

auct. – of author

cm – Centimeter

Distrib.–Distribution

Exsicc.–Exsiccata

Fl.– Flowering

Fr.– Fruiting

i.e. – That is

km – Kilometer

l. c. (loco citato) – at the place cited

m – Meter

mm – Millimeter

nom.– Name

Nom. cons. (nomina conservanda) -

Conserved Name

op. cit. – Work cited

p.p.–Partly

s.coll.– Without collector name

s. l. (Sensu lato) – In broad sense

s. n. (Sine numero) – Without number

sp. – Species

ssp. – Subspecies

var. – Variety

viz.– Namely

HERBARIA ACRONYMS

BSID: BSI, Deccan Regional Centre,
Hyderabad

CAL: Central National Herbarium, Howrah

HY: Osmania University, Hyderabad

K: Kew Herbarium, UK

KU: Kakatiya University, Warangal

MH: BSI, Southern Regional Centre,
Coimbatore

TBGH: Telangana Botanical Garden
Herbarium, Jedcherla

SKU: Sri Krishnadevaraya University,
Ananthapuramu

ABBREVIATED AUTHOR NAMES

AC –Alok Chorghe

AHN–A.H. Naqvi

APS –Annamma P.S.

ARK–A. Ravi Kiran

AR- A. Ramakrishna

BRA–A. Baleswara Reddy

BRPR–B. Ravi Prasad Rao

BSS–B. SadaSivaiah

CSR–C. Sudhakar Reddy

JS–J. Swamy

KCS–K. Chandra Shekhar

KP–Kothreddy Prasad

LPMS–L. Paramesh

LR–L. Rasingam

MSG–M.S.Gayathri

MSR–MudadlaSankara Rao

MVR–M. Ramana

NRR–N. Rama Rao

PVP –P. V. Prasanna

RG–R. Gopalan

RKP–R. K. Premanath

RR–R. Rajan

SKB–S. Khadar Bhasha

SNR–Nagaraju Siddabathula

SRS–S. R. Srinivasan

TP–T. Pullaiah

TRS–T. Ravi Shankar

VSK–V. Sampath Kumar

VBH–V. B. Hosagoudar

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INDEX

A

<i>Acrachne racemosa</i> (B. Heyne ex Roem. & Schult.) Ohwi	86	<i>Andropogon lancifolius</i> Trin.	262
<i>Acrachne</i> Wight & Arn. ex Chiov.	86	<i>Andropogon lawsonii</i> Hook.f.	276
<i>Acratherum pumilum</i> Hochst. ex A. Rich.	248	<i>Andropogon martinii</i> Roxb.	222
<i>Aegilops exaltata</i> L.	328	<i>Andropogon monticola</i> var. <i>trinii</i> Hook.f.	277
<i>Agrostis coromandeliana</i> Retz.	129	<i>Andropogon nardus</i> L.	286
<i>Agrostis diandra</i> Retz.	130	<i>Andropogon nardus</i> L. var. <i>coloratus</i> Nees ex Hook.f.	286
<i>Agrostis indica</i> L.	130	<i>Andropogon nardus</i> L. var. <i>flexuosus</i> (Nees ex Steud.) Hack.	286
<i>Agrostis matrella</i> L.	167	<i>Andropogon nervosus</i> Rottler ex Willd.	343
<i>Agrostis maxima</i> Roxb.	82	<i>Andropogon pertusus</i> (L.) Willd.	268
<i>Agrostis procera</i> Retz.	196	<i>Andropogon polyphyllus</i> Hack. ex Hook.f.	277
<i>Agrostis spicata</i> Vahl	133	<i>Andropogon polystachyos</i> Roxb.	313
<i>Agrostis virginica</i> L.	135	<i>Andropogon prostratus</i> L.	325
<i>Aira indica</i> L.	219	<i>Andropogon pseudoischaemum</i> Nees ex Steud.	268
<i>Alectoridia quartinianus</i> A. Rich.	258	<i>Andropogon pumilus</i> Roxb.	254
<i>Alloteropsis cimicina</i> (L.) Stapf	169	<i>Andropogon purpureo-sericeus</i> Hochst. ex A. Rich.	337
<i>Alloteropsis</i> J. Presl	169	<i>Andropogon quadrivalvis</i> L.	353
<i>Alloteropsis semialata</i> (R. Br.) Hitchc.	170	<i>Andropogon rhizophorus</i> Steud.	359
<i>Amphilophis pertusa</i> (L.) Nash ex Stapf	265	<i>Andropogon stapfii</i> Hook.f.	346
<i>Amphilophis woodrowii</i> (Hook.f.) A. Camus	200	<i>Andropogon tridentatus</i> Roxb.	327
<i>Andropogon aciculatus</i> Retz.	272	<i>Andropogon trispicatus</i> Schult.	304
<i>Andropogon afer</i> J.F. Gmel.	318	<i>Andropogon triticeus</i> R. Br.	315
<i>Andropogon annulatus</i> Forssk.	292	<i>Andropogon velutinus</i> Hook.f.	279
<i>Andropogon aristatus</i> Poir.	292	<i>Andropogon verticillatus</i> Roxb.	279
<i>Andropogon asper</i> B. Heyne ex Hook.f.	274	<i>Andropogon verticilliflorus</i> Steud.	346
<i>Andropogon assimilis</i> Steud.	270	<i>Andropogon woodrowii</i> Hook.f.	269
<i>Andropogon barbatus</i> L.	144	<i>Anthistiria imberbis</i> Retz.	354
<i>Andropogon binatus</i> Retz.	306	<i>Anthistiria laxa</i> Andersson	352
<i>Andropogon bladhii</i> Retz.	264	<i>Anthoxanthium indicum</i> L.	160
<i>Andropogon brevifolius</i> Sw.	339	<i>Anthoxanthum avenaceum</i> Retz.	298
<i>Andropogon caesius</i> Hook. & Arn.	217	<i>Apluda</i> L.	254
<i>Andropogon caricosus</i> L.	293	<i>Apluda mutica</i> L.	254
<i>Andropogon castratus</i> Griff.	257	<i>Apluda varia</i> subsp. <i>aristata</i> (L.) Hack.	254
<i>Andropogon citratus</i> DC.	285	<i>Aristida adscensionis</i> L.	69
<i>Andropogon contortus</i> L.	311	<i>Aristida funiculata</i> Trin. & Rupr.	69
<i>Andropogon crinitus</i> Thunb.	330	<i>Aristida hystrix</i> L.f.	72
<i>Andropogon exilis</i> Hochst.	341	<i>Aristida</i> L.	68
<i>Andropogon fascicularis</i> Roxb.	333	<i>Aristida mutabilis</i> Trin. & Rupr.	72
<i>Andropogon fastigiatus</i> Sw.	229	<i>Aristida redacta</i> Stapf	74
<i>Andropogon filiculmis</i> Hook.f.	270	<i>Aristida setacea</i> Retz.	74
<i>Andropogon foveolatus</i> Delile	294	<i>Aristida stocksii</i> (Hook.f.) Domin	75
<i>Andropogon gidarba</i> Buch.-Ham. ex Steud.	288	<i>Arthraxon castratus</i> (Griff.) V. Naray. ex Bor	257
<i>Andropogon insculptus</i> Hochst. ex A. Rich.	265	<i>Arthraxon depressus</i> Stapf ex C.E.C. Fisch.	258
<i>Andropogon ischaemum</i> L.	266	<i>Arthraxon hispidus</i> (Thumb.) Makino	258
<i>Andropogon kuntzeanus</i> Hack.	198	<i>Arthraxon lanceolatus</i> (Roxb.) Hochst.	260
<i>Andropogon</i> L.	254	var. <i>lanceolatus</i>	260
<i>Andropogon lanceolatus</i> Roxb.	260	var. <i>echinatus</i> Hochst.	260

<i>Arthraxon lancifolius</i> (Trin.) Hochst.	262
<i>Arthraxon</i> P. Beauv.	257
<i>Arthraxon prionodes</i> (Steud.) Dandy	260
<i>Arthraxon quartinianus</i> (A. Rich.) Nash	258
<i>Arthraxon rudis</i> (Steud.) Hochst.	257
<i>Arundinella ciliata</i> (Roxb.) Nees ex Miq.	246
<i>Arundinella nervosa</i> (Roxb.) Nees ex Hook. & Arn.	246
<i>Arundinella pumila</i> (Hochst. ex A. Rich.) Steud.	248
<i>Arundinella Raddi</i>	246
<i>Arundinella setosa</i> Trin., Gram.	248
<i>Arundinella tenella</i> Ness ex Steud.	248
<i>Arundinella tuberculata</i> Munro ex Lisboa	250
<i>Arundo bambos</i> L.	57
<i>Arundo donax</i> L.	78
<i>Arundo karka</i> Retz.	81
<i>Arundo</i> L.	78
<i>Arundo vallatoria</i> Pluk. ex L.	81
<i>Axonopus compressus</i> (Sw.) P. Beauv.	170
<i>Axonopus</i> P. Beauv.	170
<i>Axonopus semialatus</i> (R. Br.) Hook.f.	170

B

<i>Bambos arundinacea</i> Retz.	57
<i>Bambos stricta</i> Roxb.	58
<i>Bambusa arundinacea</i> (Retz.) Willd.	57
<i>Bambusa bambos</i> (L.) Voss	57
<i>Bambusa Schreb</i>	57
<i>Berghausia tenella</i> Arn. ex Miq.	250
<i>Bothriochloa bladhii</i> (Retz.) S.T. Blake	264
<i>Bothriochloa glabra</i> (Roxb.) A. Camus	264
<i>Bothriochloa insculpta</i> (Hochst. ex A. Rich.) A. Camus	265
<i>Bothriochloa ischaemum</i> (L.) Keng	266
<i>Bothriochloa Kuntze</i>	264
<i>Bothriochloa kuntzeana</i> (Hack.) Henrard	266
<i>Bothriochloa pertusa</i> (L.) A. Camus	267
<i>Bothriochloa pseudoischaemum</i> (Nees ex Steud.) Henrard	268
<i>Bothriochloa woodrovii</i> (Hook.f.) A. Camus	269
<i>Brachiaria deflexa</i> (Schumach.) C.E. Hubb. & Robyns	235
<i>Brachiaria distachya</i> (L.) Staf	235
<i>Brachiaria eruciformis</i> (Sm.) Griseb.	201
<i>Brachiaria kurzii</i> (Hook.f.) E.G. Camus & A. Camus	237
<i>Brachiaria mutica</i> (Forssk.) Stapf	237
<i>Brachiaria ramosa</i> (L.) Stapf	239
<i>Brachiaria remota</i> (Retz.) Haines	240
<i>Brachiaria reptans</i> (L.) C.A. Gardner & C.E. Hubb.	240
<i>Brachiaria setigera</i> (Retz.) C.E. Hubb.	241

<i>Brachiaria stolonifera</i> Gooss.	242
<i>Briza bipinnata</i> L.	92

C

<i>Capillipedium assimile</i> (Steud.) A. Camus	270
<i>Capillipedium filiculme</i> Stapf	270
<i>Capillipedium huegelii</i> (Hack.) A. Camus	270
<i>Capillipedium</i> Stapf	269
<i>Cenchrus americanus</i> (L.) Morrone	173
<i>Cenchrus barbatus</i> Schumach.	173
<i>Cenchrus biflorus</i> Roxb.	173
<i>Cenchrus catharticus</i> Delile	173
<i>Cenchrus ciliaris</i> L.	175
<i>Cenchrus granularis</i> L.	306
<i>Cenchrus hohenackeri</i> (Hochst. ex Steud.) Morrone	175
<i>Cenchrus</i> L.	173
<i>Cenchrus lappaceus</i> L.	67
<i>Cenchrus pedicellatus</i> (Trin.) Morrone	178
<i>Cenchrus purpureus</i> (Schumach.) Morrone	178
<i>Cenchrus setosus</i> Sw.	180
<i>Cenchrus muricatus</i> L.	233
<i>Cenchrus</i> Desv.	67
<i>Cenchrus lappacea</i> (L.) Desv.	67
<i>Cenchrus latifolia</i> Trin.	67
<i>Chamaeraphis spinescens</i> Poir.	217
<i>Chionachne gigantea</i> (J. Koenig) Veldkamp	332
<i>Chionachne koenigii</i> (Spreng.) Thwaites	332
<i>Chloris barbata</i> Sw.	144
<i>Chloris bournei</i> Rang. & Tadul.	144
<i>Chloris dolichostachya</i> Lag.	153
<i>Chloris gayana</i> Kunth	146
<i>Chloris montana</i> Roxb.	146
<i>Chloris myosuroides</i> Hook.f.	162
<i>Chloris pallida</i> Hook.f.	162
<i>Chloris polystachya</i> Roxb.	162
<i>Chloris quinquesetica</i> Bhide	147
<i>Chloris roxburghiana</i> Schult.	162
<i>Chloris</i> Sw.	143
<i>Chloris telanganae</i> Nagaraju, Prasanna, Y.V. Rao & S.B. Padal	147
<i>Chloris tenella</i> Roxb.	164
<i>Chloris virgata</i> Sw.	150
<i>Chrysopogon aciculatus</i> (Retz.) Trin.	272
<i>Chrysopogon asper</i> Blatt. & McCann	274
<i>Chrysopogon fulvus</i> (Spreng.) Chiov.	275
<i>Chrysopogon hamiltonii</i> (Hook.f.) Haines	275
<i>Chrysopogon lawsonii</i> (Hook.f.) Veldkamp	276
<i>Chrysopogon polyphyllus</i> Blatt. & McCann	277
<i>Chrysopogon serrulatus</i> Trin.	277
<i>Chrysopogon</i> Trin.	272
<i>Chrysopogon velutinus</i> (Hook.f.) Bor	279

Chrysopogon verticillatus (Roxb.) Trin. ex Steud.	279	Dichanthium annulatum (Forssk.) Stapf	292	Dinebra retroflexa (Vahl) Panz.	95	Eragrostis nilgiriensis Vivek, G.V.S. Murthy & V.J. Nair	112
Chrysopogon zizanioides (L.) Roberty	280	Dichanthium aristatum (Poir.) C.E. Hubb.	292	Diplachne fusca (L.) P. Beauv. ex Roem. & Schult.	95	Eragrostis nutans (Retz.) Nees ex Steud.	113
Coelachyropsis lagopoides (Burm.f.) Bor	88	Dichanthium assimile (Steud.) Deshp.	270	Diplachne P. Beauv.	95	Eragrostis pappiana (Chiov.) Chiov.	112
Coelachyrum Hochst. & Nees	88	Dichanthium bladhii (Retz.) Calyton	264	E			
Coelachyrum lagopoides (Burm. f.) Senaratna	88	Dichanthium caricosum (L.) A. Camus	292	Echinochloa colona (L.) Link	189	Eragrostis papposa (Roem. & Schult.) Duf. ex Steud.	114
Coix aquatica Roxb.	282	Dichanthium filiculme (Hook.f.) S.K. Jain & Deshp.	270	Echinochloa crus-galli (L.) P. Beauv.	191	Eragrostis pilosa (L.) P. Beauv.	114
Coix gigantea J. Koenig	232	Dichanthium foveolatum (Delile) Roberty	294	Echinochloa frumentacea Link	192	Eragrostis pooides var. barrieli (Daveau) Fiori	105
Coix L.	282	Dichanthium insculptum (Hochst. ex A. Rich.) Clayton	265	Echinochloa oryzoides (Ard.) Fritsch.	192	Eragrostis riparia (Willd.) Nees	116
Coix lacryma-jobi L.	282	Dichanthium mccannii Blatt.	295	Echinochloa P. Beauv.	189	Eragrostis stenophylla Hochst. ex Miq.	109
Cymbopogon caesius (Hook. & Arn.) Stapf	283	Dichanthium nodosum Willemet	292	Echinochloa picta (J. Koenig) P.W. Michael	193	Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	104
Cymbopogon citratus (DC.) Stapf	285	Dichanthium pertusum (L.) Claton	268	Echinochloa stagnina (Retz.) P. Beauv.	193	Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult.	104
Cymbopogon coloratus (Nees ex Hook.f.) Stapf	286	Dichanthium pseudoischaemum (Nees ex Steud.) S.K. Jain & Deshp.	268	Eleusine brevifolia (Willd.) R. Br. ex Hook.f.	88	Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult. var. riparia (Willd.) Stapf	116
Cymbopogon flexuosus (Nees ex Steud.) Will. Watson	286	Dichanthium Willemet	291	Eleusine coracana (L.) Gaertn.	98	Eragrostis tenuifolia (A. Rich.) Hochst. ex Steud.	116
Cymbopogon gidarba (Buch.-Ham. ex Steud.) Haines	288	Dichanthium woodrovii (Hook.f.) S. K. Jain & Deshp.	269	Eleusine Gaertn.	98	Eragrostis tremula (Lam.) Hochst. ex Steud.	117
Cymbopogon martinii (Roxb.) Will. Watson	288	Diectomis fastigiata P. Beauv.	296	Eleusine indica (L.) Gaertn.	98	Eragrostis unioloides (Retz.) Nees ex Steud.	117
Cymbopogon nardus (L.) Rendle	289	Diectomis P. Beauv.	296	Eleusine lagopoides (Burm. f.) Merr.	88	Eragrostis viscosa (Retz.) Trin.	119
Cymbopogon Spreng.	283	Digitaria abludens (Roem. & Schult.) Veldkamp	182	Eleusine racemosa B. Heyne ex Roem.	86	Eragrostis vulgaris subsp. barrieli (Daveau) Douin	105
Cymbopogon winterianus Jowitt ex Bor	291	Digitaria adscendens (Kunth) Henrard	184	Eleusine verticillata Roxb.	86	Eragrostis walkeri Stapf	101
Cynodon arcuatus J. Presl	153	Digitaria bicornis (Lam.) Roem. & Schult.	182	Elytrophorus articulatus P. Beauv.	79	Eragrostis Wolf	103
Cynodon barberi Rang. & Tadul.	150	Digitaria biformis Willd.	183	Elytrophorus P. Beauv.	78	Eremopogon foveolatus (Delile) Stapf	294
Cynodon dactylon (L.) Pers.	151	Digitaria ciliaris (Retz.) Koeler	184	Elytrophorus spicatus (Willd.) E.G. Camus & A. Camus	78	Eriochloa barbatus (Trin.) S. Yadav & M.R. Almeida	195
Cynodon dactylon var. intermedius (Rang. & Tadul.) C.E.C.Fisch.	153	Digitaria haller	182	Enneapogon Desv. ex P. Beauv.	84	Eriochloa fatmensis (Hochst. & Steud.) Clayton	195
Cynodon radiatus Roth ex Roem. & Schult.	152	Digitaria longiflora (Retz.) Pers.	185	Enneapogon persicus Boiss.	84	Eriochloa Kunth	195
Cynodon Rich.	150	Digitaria marginata Link	184	Enneapogon schimperianus (Hochst. ex A. Rich.) Renvoize	84	Eriochloa nubica (Steud.) Hack. & Stapf ex Thell.	196
Cynodon ternatus A. Rich.	188	Digitaria paspalodes Michx.	215	Enteropogon dolichostachyus (Lag.) Keng	153	Eriochloa procera (Retz.) C.E. Hubb.	196
Cynosurus aegyptius L.	88	Digitaria radicata (C. Presl) Miq.	185	Enteropogon monostachyos (Vahl) Schum.	155	Eriochloa trichopus Hochst. ex Benth.	242
Cynosurus coracanus L.	98	Digitaria radicata (C. Presl) Miq.	185	Enteropogon Nees	153	Eulalia Kunth	303
Cynosurus indicus L.	98	Digitaria royleana (Nees ex Hook.f.) Prain	186	Eragrostiella bifaria (Vahl) Bor	100	Eulalia phaeothrix (Hack.) Kuntze	304
Cynosurus lagopoides Burm. f.	88	Digitaria setigera Roth ex Roem. & Schult.	186	Eragrostiella bifaria (Vahl) Bor	100	Eulalia trispicata (Schult.) Henrard	304
Cynosurus monostachyos Vahl	155	Digitaria stricta Roth in Roem. & Schult.	186	Eragrostiella brachyphylla (Stapf) Bor	101	Eulalia tristachya Kuntze	304
Cynosurus retroflexus Vahl	51	Digitaria ternata (A. Rich.) Stapf	188	Eragrostiella walker (Stapf) Bor	101	Eulaliopsis binata (Retz.) C.E. Hubb.	306
Cyrtococcum sparsicomum (Nees ex Steud.) A. Camus	213	Digitaria timorensis (Kunth) Balansa	185	Eragrostis amabilis (L.) Wight & Arn.	104	Eulaliopsis Honda	306
Cyrtococcum Stapf	180	Digitaria tomentosa (J. Koenig ex Willd.) Henrard	188	Eragrostis aspera (Jacq.) Nees	104	Eutriana abyssinica R. Br.	155
Cyrtococcum trigonum (Retz.) A. Camus	180	Dimeria acutipes Bor	298	Eragrostis atrovirens (Desf.) Trin.	105	F	
D		Dimeria avenacea (Retz.) C.E.C.Fisch.	298	Eragrostis barrelieri Daveau	105	Festuca fusca L.	95
Dactylis brevifolia Willd.	88	Dimeria bialata C.E.C.Fisch.	298	Eragrostis bifaria (Vahl) Steud.	100	G	
Dactylis spicata Willd.	78	Dimeria connivens Hack	299	Eragrostis brachyphylla Stapf	101	Garnotia Brongn.	250
Dactyloctenium aegyptium (L.) Willd.	88	Dimeria deccanensis Bor	299	Eragrostis cilianensis (All.) Vignolo ex Lutati	107	Garnotia stricta sensu Hook.f.	250
Dactyloctenium aristatum Link	90	Dimeria kanjirapallilana K.C. Jacob	300	Eragrostis ciliaris (L.) R. Br.	108	Garnotia tenella (Arn. ex Miq.) Janowski	250
Dactyloctenium australe Steud.	92	Dimeria orissae Bor	300	Eragrostis ciliata (Roxb.) Nees ex Steud.	108	Gracilea nutans Koenig ex Rottler	157
Dactyloctenium Willd.	88	Dimeria ornithopoda Trin.	302	Eragrostis coarctata Stapf	109	Gracilea royleana (Nees ex Steud.) Hook.f.	156
Dendrocalamus Nees	58	Dimeria R. Br.	298	Eragrostis cynosuroides (Retz.) P. Beauv.	92	Gracilea royleana Hook.f. var. plumosa (Jaub. & Spach) Hook.f.	155
Dendrocalamus strictus (Roxb.) Nees	58	Dimeria tenera Trin.	302	Eragrostis diarrhena (Schult.) Steud.	110		
Desmostachya (Stapf) Stapf	92	Dinebra arabica Jacq.	95	Eragrostis gangetica (Roxb.) Steud.	109		
Desmostachya bipinnata (L.) Stapf	92	Dinebra Jacq.	95	Eragrostis japonica (Thumb.) Trin.	110		
		Dinebra panicea (Retz.) P.M. Peterson & N. Snow	121	Eragrostis macilentia (A. Rich.) Steud.	111		
				Eragrostis minor Host	112		

H

<i>Hackelochloa granularis</i> (L.) Kuntze	306	<i>Lappago biflora</i> Roxb.	164
<i>Helopus nubicus</i> Steud.	195	<i>Leersia hexandra</i> Sw.	58
<i>Hemarthria altissima</i> (Poir.) Stapf & C.E.Hubb.	309	<i>Leersia</i> Sw.	58
<i>Hemarthria compressa</i> (L.f.) R.Br.	309	<i>Leptochloa chinensis</i> (L.) Nees	121
<i>Hemarthria</i> R.Br.	309	<i>Leptochloa fusca</i> (L.) Kunth	95
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	311	<i>Leptochloa P.</i> Beauv.	120
<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult. var. <i>distichus</i> C.E.C.Fisch.	311	<i>Leptochloa panicea</i> (Retz.) Ohwi	121
<i>Heteropogon fischerianus</i> Bor	311	<i>Leptochloa uniflora</i> Hochst. ex A. Rich.	136
<i>Heteropogon Pers.</i>	310	<i>Lepturus roxburgianus</i> Steud.	123
<i>Heteropogon polystachyos</i> (Roxb.) Schult.	313	<i>Lophopogon</i> Hack.	326
<i>Heteropogon triticeus</i> (R. Br.) Stapf ex Craib	315	<i>Lophopogon tridentatus</i> Hack.	326
<i>Holcus bicolor</i> L.	347		
<i>Holcus ciliatus</i> Roxb.	246		
<i>Holcus halepensis</i> L.	348		
<i>Holcus latifolius</i> Osbeck	67		
<i>Holcus nervosus</i> Roxb.	246		
<i>Holcus nitidus</i> Vahl	348		
<i>Hymenachne amplexicaulis</i> (Rudge) Nees	198		
<i>Hymenachne indica</i> (L.) Buse	198		
<i>Hymenachne myosuroides</i> (R. Br.) Balansa	198		
<i>Hymenachne P.</i> Beauv.	198		
<i>Hymenachne pseudointerrupta</i> Mull.	198		

I

<i>Imperata Cirillo</i>	315		
<i>Imperata cylindrica</i> (L.) P. Beauv.	315		
<i>Isachne australis</i> R. Br.	244		
<i>Isachne globosa</i> (Thunb.) Kuntze	244		
<i>Isachne pulchella</i> Roth ex Roem. & Schult.	244		
<i>Isachne</i> R. Br.	244		
<i>Ischaemum afrum</i> (J.F. Gmel.) Dandy	318		
<i>Ischaemum angustifolium</i> (Trin.) Hack	306		
<i>Ischaemum ciliare</i> Retz.	320		
<i>Ischaemum insculptum</i> Hochst. ex A. Rich.	342		
<i>Ischaemum L.</i>	318		
<i>Ischaemum pilosum</i> Wight	318		
<i>Ischaemum rugosum</i> Salisb.	320		
<i>Ischaemum semisagittatum</i> Roxb.	322		
<i>Ischaemum sulcatum</i> Hack.	344		
<i>Iseilema Andersson</i>	323		
<i>Iseilema anthephoroides</i> Hack.	323		
<i>Iseilema holei</i> Haines	323		
<i>Iseilema jainiana</i> P. Umam. & P. Daniel	324		
<i>Iseilema laxum</i> Hack.	325		
<i>Iseilema prostratum</i> (L.) Andersson	325		

L

<i>Lagurus cylindricus</i> L.	315		
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M

<i>Manisuris granularis</i> (L.) L. f.	306		
<i>Megastachya papposa</i> Roem. & Schult.	114		
<i>Megathyrus</i> (Pilg.) B.K.Simon & S.W.L.Jacobs	198		
<i>Megathyrus maximus</i> (Jacq.) B.K.Simon & S.W.L.Jacobs	198		
<i>Melanocenchris abyssinica</i> (R. Br. ex Fresen.) Hochst.	155		
<i>Melanocenchris jacquemontii</i> Jaub. & Spach	156		
<i>Melanocenchris Nees</i>	155		
<i>Melanocenchris monoica</i> (Rottler) C.E.C.Fisch.	156		
<i>Melanocenchris plumosa</i> Jaub. & Spach	155		
<i>Melanocenchris rothiana</i> Nees	156		
<i>Melanocenchris royleana</i> Nees ex Steud.	156		
<i>Melica latifolia</i> Roxb. ex Hornem.	81		
<i>Melinis P.</i> Beauv.	201		
<i>Melinis repens</i> (Willd.) Zizka	201		
<i>Microchloa indica</i> (L. f.) P. Beauv.	158		
<i>Microchloa R. Br.</i>	158		
<i>Milium ciminum</i> L.	169		
<i>Milium compressum</i> Sw.	170		
<i>Milium globosum</i> Thunb.	244		
<i>Milium tomentosum</i> J. Koenig ex Willd.	188		
<i>Mnesithea granularis</i> (L.) de Koning & Sosef	306		
<i>Mnesithea Kunth</i>	306		
<i>Moorochloa eruciformis</i> (Sm.) Veldkamp	201		
<i>Moorochloa Veldkamp</i>	201		

N

<i>Nardus indica</i> L.	158		
<i>Nardus thomaea</i> L. f.	123		

O

<i>Ophiuros C.F. Gaertn.</i>	328		
<i>Ophiuros corymbosus</i> C.F. Gaertn.	328		
<i>Ophiuros exaltatus</i> (L.) Kuntze	328		
<i>Oplismenus burmanni</i> (Retz.) P. Beauv.	204		
<i>Oplismenus compositus</i> (L.) P. Beauv.	204		
<i>Oplismenus P.</i> Beauv.	204		

<i>Oropetium roxburghianum</i> (Steud.) S.M.		<i>Panicum oryzoides</i> Ard.	192
Phillips	123	<i>Panicum pallid-fusum</i> Schumach., Beskr.	228
<i>Oropetium thomaeum</i> (L. f.) Trin.	123	<i>Panicum paludosum</i> Roxb.	210
<i>Oropetium Trin.</i>	123	<i>Panicum paspaloides</i> Pers.	223
<i>Oropetium villosulum</i> Stapf ex Bor	126	<i>Panicum pictum</i> J. Koenig	193
<i>Oryza granulata</i> Nees & Arn. ex Watt	61	<i>Panicum prostratum</i> Lam.	241
<i>Oryza L.</i>	61	<i>Panicum psilopodium</i> Trin.	213
<i>Oryza meyeriana</i> (Zoll. & Moritz) Baill.	61	<i>Panicum pumilum</i> Poir.	227
<i>Oryza meyeriana</i> var. <i>granulata</i> (Nees & Arn. ex Watt) Duist.	61	<i>Panicum punctatum</i> Burm. f.	228
<i>Oryza officinalis</i> Wall. ex Watt. Dict.	61	<i>Panicum radicosum</i> C. Presl	185
<i>O. officinalis</i> sub sp. <i>malampuzhaensis</i> (Krishnasw & Chandras.) Tateoka	62	<i>Panicum ramosum</i> L.	239
<i>O. malampuzhaensis</i> Krishnasw. & Chandras.	62	<i>Panicum remotum</i> Retz.	239
<i>Oryza rufipogon</i> Griff.	63	<i>Panicum repens</i> L.	210
<i>Oryza sativa</i> L.	63	<i>Panicum reptans</i> L.	241
		<i>Panicum semilatum</i> R. Br.	170
		<i>Panicum setigerum</i> Retz.	241
		<i>Panicum sparsicomum</i> Nees ex Steud.	213
		<i>Panicum spinescens</i> R. Br.	217
		<i>Panicum stagninum</i> Retz.	193, 194
		<i>Panicum subeglume</i> Trin.	188
		<i>Panicum sumatrense</i> Roth ex Roem. & Schult.	213
		<i>Panicum tenuissimum</i> Schrank	133
		<i>Panicum timorense</i> Kunth	185
		<i>Panicum trichopus</i> Hochst.	242
		<i>Panicum trigonum</i> Retz.	180
		<i>Panicum trypheron</i> Schult.	206
		<i>Panicum verticillatum</i> L.	231
		<i>Panicum walense</i> Mez	208
		<i>Paspalidium flavidum</i> (Retz.) A. Camus	223
		<i>Paspalidium geminatum</i> (Forssk.) Stapf	223
		<i>Paspalidium punctatum</i> (Burm. f.) A. Camus	228
		<i>Paspalum bicornis</i> Lam.	183
		<i>Paspalum distichum</i> L.	215
		<i>Paspalum L.</i>	215
		<i>Paspalum longiflorum</i> (Retz.) J.E. Gmel.	185
		<i>Paspalum longiflorum</i> Retz.	185
		<i>Paspalum orbiculare</i> G. Forst.	216
		<i>Paspalum paspalodes</i> (Michx.) Scribn.	215
		<i>Paspalum sanguinale</i> Lam. var. <i>debile</i> Hook.f.	185
		<i>Paspalum scrobiculatum</i> L.	215
		<i>Paspalum ternatum</i> (A. Rich.) Hook.f.	188
		<i>Pennisetum alopecuroides</i> Steud.	175
		<i>Pennisetum americanum</i> (L.) Leeke	173
		<i>Pennisetum cenchroides</i> Rich.	175
		<i>Pennisetum ciliare</i> var. <i>ciliare</i> (L.) Link	175
		<i>Pennisetum hohenackeri</i> Hochst. ex Steud.	175
		<i>Pennisetum interrupta</i> (Willd.) Buse	219
		<i>Pennisetum pedicellatum</i> Trin.	178

<i>Pennisetum polystachion</i> (L.) Schult.	227	R	
<i>Pennisetum polystachyon</i> L.	227	<i>Raphis arundinacea</i> Desv.	346
<i>Pennisetum purpureum</i> Schumach.	178	<i>Rhynchelytrum repens</i> (Willd.) C.E. Hubb.	201
<i>Pennisetum tomentosum</i> Roxb.	226	<i>Rottboellia altissima</i> Poir.	309
<i>Perotis Aiton</i>	159	<i>Rottboellia cochinchinensis</i> (Lour.) Clayton	334
<i>Perotis indica</i> (L.) Kuntze	159	<i>Rottboellia compressa</i> L.f.	309
<i>Phalaris hispida</i> Thumb.	258	<i>Rottboellia exaltata</i> L. f.	334
<i>Phalaris L.</i>	126	<i>Rottboellia L. f.</i>	334
<i>Phalaris minor</i> Retz.	126	S	
<i>Phalaris zizanioides</i> L.	280	<i>Saccharum L.</i>	336
<i>Phragmites Adans.</i>	81	<i>Saccharum officinarum</i> L.	336
<i>Phragmites karka</i> (Retz.) Trin. ex Steud.	81	<i>Saccharum paniceum</i> Lam.	330
<i>Phragmites vallatoria</i> (Pluk. ex L.)		<i>Saccharum spontaneum</i> L.	336
Veldkamp	81	<i>Sacciolepis indica</i> (L.) Chase	219
<i>Poa amabilis</i> L.	104	<i>Sacciolepis interrupta</i> (Willd.) Stapf	219
<i>Poa aspera</i> Jacq.	104	<i>Sacciolepis myosuroides</i> (R. Br.) A. Camus	222
<i>Poa atrovirens</i> Desf.	105	<i>Sacciolepis Nash</i>	219
<i>Poa chinensis</i> L.	121	<i>Sarga Ewart</i>	336
<i>Poa cilianensis</i> All.	107	<i>Sarga purpureosericea</i> (Hochst. ex A.Rich.)	
<i>Poa ciliaris</i> L.	108	<i>Spangler</i>	336
<i>Poa ciliata</i> Roxb.	108	<i>Schizachyrium brevifolium</i> (Sw.) Nees ex	
<i>Poa cynosuroides</i> Retz.	92	<i>Buse</i>	339
<i>Poa diarrhea</i> Schult.	110	<i>Schizachyrium exile</i> (Hochst.) Pilg.	341
<i>Poa gangetica</i> Roxb.	109	<i>Schizachyrium Nees</i>	339
<i>Poa japonica</i> Thunb.	110	<i>Schoenefeldia gracilis</i> Kunth	162
<i>Poa macilenta</i> A. Rich.	111	<i>Schoenefeldia Kunth</i>	162
<i>Poa nutans</i> Retz.	112	<i>Schoenefeldia pallida</i> Edgew	162
<i>Poa panicea</i> Retz.	121	<i>Sehima Forssk.</i>	341
<i>Poa papposa</i> Duf. ex Roem. & Schult.	114	<i>Sehima ischaemoides</i> Forssk.	341
<i>Poa riparia</i> Willd.	116	<i>Sehima nervosum</i> (Rottler ex Willd.) Stapf	343
<i>Poa tenuifolia</i> A. Rich.	116	<i>Sehima sulcatum</i> (Hack.) A. Camus	344
<i>Poa tremula</i> Lam.	117	<i>Setaria flavida</i> (Retz.) Veldkamp	223
<i>Poa unioloides</i> Retz.	117	<i>Setaria geminata</i> (Forssk.) Veldkamp	223
<i>Poa viscosa</i> Retz.	119	<i>Setaria homonyma</i> (Steud.) Chiov.	225
<i>Pogonatherum crinitum</i> (Thunb.) Kunth	330	<i>Setaria intermedia</i> Roem. & Schult.	226
<i>Pogonatherum P. Beauv.</i>	330	<i>Setaria italica</i> (L.) P. Beauv.	226
<i>Pogonatherum paniceum</i> Hack.	330	<i>Setaria P. Beauv.</i>	222
<i>Pollinia fulva</i> Spreng.	275	<i>Setaria pallid-fusca</i> (Schumach.) Stapf &	
<i>Pollinia phaeothrix</i> Hack.	304	C.E. Hubb.	227
<i>Pollinidium binatum</i> (Retz.) C.E. Hubb.	306	<i>Setaria parviflora</i> (Poir.) Kerguelen	227
<i>Polytoca gigantea</i> (J. Koenig) Mabb.	332	<i>Setaria pumila</i> Roem. & Schult.	227
<i>Polytoca R. Br.</i>	332	<i>Setaria punctata</i> (Burm. f.) Veldkamp	228
<i>Pommereulla cornucopiae</i> L.f.	160	<i>Setaria rhachitricha</i> Cooke	225
<i>Pommereulla L.f.</i>	160	<i>Setaria tomentos</i> (Roxb.) Kunth	226
<i>Pommereulla monocia</i> Rottler	157	<i>Setaria verticillata</i> (L.) P. Beauv.	230
<i>Pseudobrachiaria deflexa</i> (Schumach.)		<i>Sorghum arundinaceum</i> (Desv.) Stapf	346
Launert	235	<i>Sorghum bicolor</i> (L.) Monech	346
<i>Pseudoraphis Griff. ex Pilg.</i>	217	<i>Sorghum deccanense</i> Stapf	337
<i>Pseudoraphis spinescens</i> (R. Br.) Vickery	217	<i>Sorghum halepense</i> (L.) Pers.	348
<i>Pseudosorghum A. Camus</i>	332	<i>Sorghum Moench</i>	346
<i>Pseudosorghum fasciculare</i> (Roxb.) A.		<i>Sorghum nitidum</i> (Vahl) Pers.	348
Camus	333	<i>Sorghum pugionifolium</i> Snowden	346

<i>Sorghum purpureosericeum</i> (Hochst. ex	
A.Rich.) Asch. & Schweinf.	336
<i>Sorghum stapfii</i> (Hook.f.) C.E.C.Fisch.	346
<i>Sorghum verticilliflorum</i> (Steud.) Stapf	346
<i>Spodiopogon albidus</i> Benth.	349
<i>Spodiopogon rhizophorus</i> (Steud.) Pilger	349
<i>Spodiopogon Trin.</i>	349
<i>Sporobolus coromandelianus</i> (Retz.) Kunth	129
<i>Sporobolus diandrus</i> (Retz.) P. Beauv.	130
<i>Sporobolus indicus</i> (L.) R. Br.	130
<i>Sporobolus ioclados</i> (Nees ex Trin.) Nees	131
<i>Sporobolus maderaspatnus</i> Bor	132
<i>Sporobolus marginatus</i> Hochst. ex A.Rich.	132
<i>Sporobolus minutiflorus</i> (Trin.) Link	133
<i>Sporobolus R. Br.</i>	129
<i>Sporobolus spicatus</i> (Vahl) Kunth	133
<i>Sporobolus tenuissimus</i> (Schrank) Kuntze	133
<i>Sporobolus tetragonus</i> Bor	135
<i>Sporobolus virginicus</i> (L.) Kunth	135
<i>Sporobolus wallichii</i> Munro ex Trimen	136
<i>Stegosia cochinchinensis</i> Lour.	334
<i>Stenotaphrum dimidiatum</i> (L.) Brongn.	231
<i>Stenotaphrum glabrum</i> Trin.	231
<i>Stenotaphrum Trin.</i>	231

T

<i>Tetrapogon Desf.</i>	162
<i>Tetrapogon roxburghiana</i> (Schult.) P.M.	
Peterson	162
<i>Tetrapogon tenellus</i> (Roxb.) Chiov.	164
<i>Thelepogon elegans</i> Roth ex Roem. &	
Schult.	350
<i>Thelepogon Roth ex Roem. & Schult.</i>	350
<i>Themeda Forssk.</i>	352
<i>Themeda laxa</i> (Andersson) A. Camus	352
<i>Themeda quadrivalvis</i> (L.) Kuntze	353
<i>Themeda triandra</i> Forssk.	354
<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.)	
Honda	81
<i>Thysanolaena maxima</i> (Roxb.) Kuntze	82
<i>Thysanolaena Nees</i>	81
<i>Trachys muricata</i> (L.) Pers.	233
<i>Trachys Pers.</i>	233
<i>Tragus biflorus</i> Schult.	164
<i>Tragus Haller</i>	164
<i>Tragus mongolorum</i> Ohwi	164
<i>Tragus roxburghii</i> Panigrahi	164
<i>Trigonochloa P.M. Peterson & N. Snow.</i>	136
<i>Trigonochloa uniflora</i> (Hochst. ex A.Rich.)	
P.M.Peterson & N.Snow	136

<i>Tripogon anantaswamianus</i> Sreek., V.J.	
Nair & N.C. Nair	137
<i>Tripogon bromoides</i> Roem. & Schult.	137
var. <i>anantaswamianus</i> (Sreek., V.J.Nair &	
N.C.Nair) Sang.Dey & Prasanna	137
var. <i>bromoides</i>	138
<i>Tripogon filiformis</i> Nees ex Steud.	139
<i>Tripogon jacquemontii</i> Stapf	140
<i>Tripogon purpurascens</i> Duthie	141
<i>Tripogon Roem. & Schult.</i>	137
<i>T. nallamalayanus</i> Rasingam & J. Swamy	142
<i>T. sivarajanii</i> Sunil	142
<i>Tripogon roxburghianus</i> (Steud.) Bhide	123
<i>Tripogon trifidus</i> Munro ex Stapf	142
var. <i>sivarajanii</i> (Sunil) Sang.Dey & Prasanna	142
<i>Triticum aestivum</i> L.	65
<i>Triticum diocccum</i> Schuebl.	65
<i>Triticum L.</i>	65
<i>Triticum sativum</i> Lam.	65
<i>Triticum turgidum</i> subsp. <i>dicocum</i>	
(Schrank ex Schübl.) Thell.	65
<i>Triticum vulgare</i> Vill.	65

U

<i>Urochloa deflexa</i> (Schumach.) H. Scholz	235
<i>Urochloa distachyos</i> (L.) T.Q. Nguyen	235
<i>Urochloa kurzii</i> (Hook.f.) T.Q. Nguyen	235
<i>Urochloa mosambicensis</i> (Hack.) Dandy	242
<i>Urochloa mutica</i> (Forssk.) T.Q. Nguyen	237
<i>Urochloa P. Beauv.</i>	233
<i>Urochloa panicoides</i> P. Beauv.	239
<i>Urochloa ramosa</i> (L.) T.Q. Nguyen	239
<i>Urochloa remota</i> (Retz.) Ashalatha & V.J.	
Nair	240
<i>Urochloa reptans</i> Stapf	240
<i>Urochloa setigera</i> (Retz.) Stapf	241
<i>Urochloa trichopus</i> Stapf	242

V

<i>Vetiveria lawsonii</i> (Hook.f.) Blatt. &	
McCann	276
<i>Vetiveria zizanioides</i> (L.) Nash	280
<i>Vilfa ioclados</i> Nees ex Trin.	131

Z

<i>Zea L.</i>	355
<i>Zea mays</i> L.	355
<i>Zoysia matrella</i> (L.) Merr.	167
<i>Zoysia pungens</i> Willd.	167
<i>Zoysia Willd.</i>	167



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