



## RESEARCH ARTICLE

### DOCUMENTATION OF WILD GRASSES IN KUVEMPU UNIVERSITY CAMPUS, CENTRAL WESTERN GHATS OF KARNATAKA

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#### ARTICLE INFO

##### Article History:

Received 05<sup>th</sup> January, 2016

Received in revised form

28<sup>th</sup> February, 2016

Accepted 05<sup>th</sup> March, 2016

Published online 26<sup>th</sup> April, 2016

##### Key words:

Grasses, *Eragrostis*,  
Kuvempu University,  
Central Western Ghats.

#### ABSTRACT

Kuvempu University Campus exactly located in the part of buffer zone of Bhadra wildlife Sanctuary, Karnataka. Forty five species of wild grasses belongs to 32 genera and nine tribes were documented in the present study. Tribe Andropogoneae, consisted of 17 species of 11 genera, followed by Paniceae 12 species of 10 genera and seven species of three genera. The genus *Eragrostis* has highest species (05), followed by *Dichanthium* and *Ischaemum* have three species each. Grasses are fast vanishing sensitive plants from their natural habitats. So, there is urgent need of studies and scientifically catalogue of grass flora of regional, national and global level, before they are destroyed.

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Citation: Abhijit, H.U., Aruna, K.B., Malammanavar, S.G. and Udupa, E.S.K. 2016. "Documentation of wild grasses in Kuvempu University Campus, Central Western Ghats of Karnataka", *International Journal of Current Research*, 8, (04), 29220-29223.

## INTRODUCTION

Grasses are the important flowering plants; it comes under the family Poaceae. The size of the grasses is ranges from one inch to the giant bamboos that grow up to 130 feet tall. Grasses are the fourth largest groups of flowering plants, but its minute characters, difficulties in identification, and a lack of financial encouragements have hindered efforts to study of this novel group. In the globe, grasses are represented by 10,550 species under 715 genera, whereas, India is showing valuable grass diversity, 1200 species belonging to 240 genera (Ashwini et al., 2014). Grasses and bamboos are of great economic potential and practically it is difficult to live without them. They play an important role in food, building material, raw material for paper and furniture. More than 3000 uses have been listed for bamboos in Japan (Guala, 2007). Grasses are good soil binders and moisture conservers and make good turfs and lawns. Some grasses yield medicines and essential oils. They are also used for thatching, matting ropes, stuffing for pillows, brooms, cigarette and also cherrot wrappers, Hindu rituals and musical instruments (Yadav, 2010). Grassland provide food, shelters and breeding places for numerous insects, frogs, birds, lizards, snakes, etc.

The Western Ghats of India is identified as one of 35 biodiversity hotspots of the world (Anon., 2005). The present study area comes under central part of the Western Ghats and also the university campus found in buffer zone of Bhadra Wildlife sanctuary of Karnataka. The sanctuary is the biological paradise for a variety of plant and animal species. Most literature focus the documentation, diversity and taxonomic studies of dicotyledonous plants (tree species) in the sanctuary and in the Western Ghats as compared to some study on monocotyledonous plants. Kuvempu University campus has dry deciduous forests and grasses predominantly grow in the vegetation. Literature on grasses of the Sanctuary is limited to their documentation for example Yoganarasimhan et al., 1982, Ramaswamy et al., 2001, Vasanthakumari et al., 2010 and Ashwini et al., 2014. There are no reports on the documentation of grass species of Kuvempu University Campus, part of buffer zone of Bhadra wildlife Sanctuary of the Western Ghats. Therefore, the present study was undertaken to document grasses in the campus.

## MATERIALS AND METHODS

### Study area

Kuvempu University Campus (Fig. 1) is located 24 km South-East of Shivamogga city and 2 km North of Bhadra Reservoir

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and exactly located in the part of buffer zone of Bhadra wildlife Sanctuary. The elevation ranges from 400 – 700 MSL. Which is extended between 13° 25' and 13° 50' N latitude to 75° 15' and 75° 50' E longitude. Annual rainfall range is 1200 – 2600mm. The climate of the campus is warm and humid. The temperature ranges from 15°C during winter to above 38°C in summer. The area shows dry deciduous type of vegetation and the *Tectona grandis*, *Terminalia paniculata*, *Dalbergia latifolia* and *Santalum album* are the common tree species. The university campus encompasses 290 acre of land with varied habitats, from undulating hilly terrain to man-made wet lands. Campus is in the lap of lush picturesque locale. Before the inception and establishment of the university in this land scape, the area was a barren hill slope without any prominent vegetation. But in the past 20 years after the establishment of university, there is considerable secondary vegetation of many tree species establishing gradually. As of now, pre dominating vegetation is typically dry deciduous with considerable similarities with wildlife sanctuary. The campus is good for growth of many grass species.

## METHODS

Field survey carried out randomly by different sites of Kuvempu University campus viz, Pampavana, Smruthivana, Teak forest, Shankar matt and cover entire places of the campus. The study area was visited regularly from February 2015 to January 2016 and grasses were collected. The collected grass species are pressed in papers and prepare a herbaria by standard method (Jain and Rao, 1977). The grass species were identified with the help of regional floras (Gamble, 1935; Yoganarasimhan *et al.*, 1982; Ramaswamy *et al.*, 2001; Bhat and Nagendran, 2001; Yadav, 2010) and voucher specimens are deposited at herbaria of Department of Applied Botany, Kuvempu University, Shankaraghatta, Shivamoga – Karnataka.

## RESULTS AND DISCUSSION

A total of 45 species of wild grasses belongs to 32 genera and nine tribes were documented in Kuvempu University Campus, Shivamogga, the Western Ghats (Table 1).

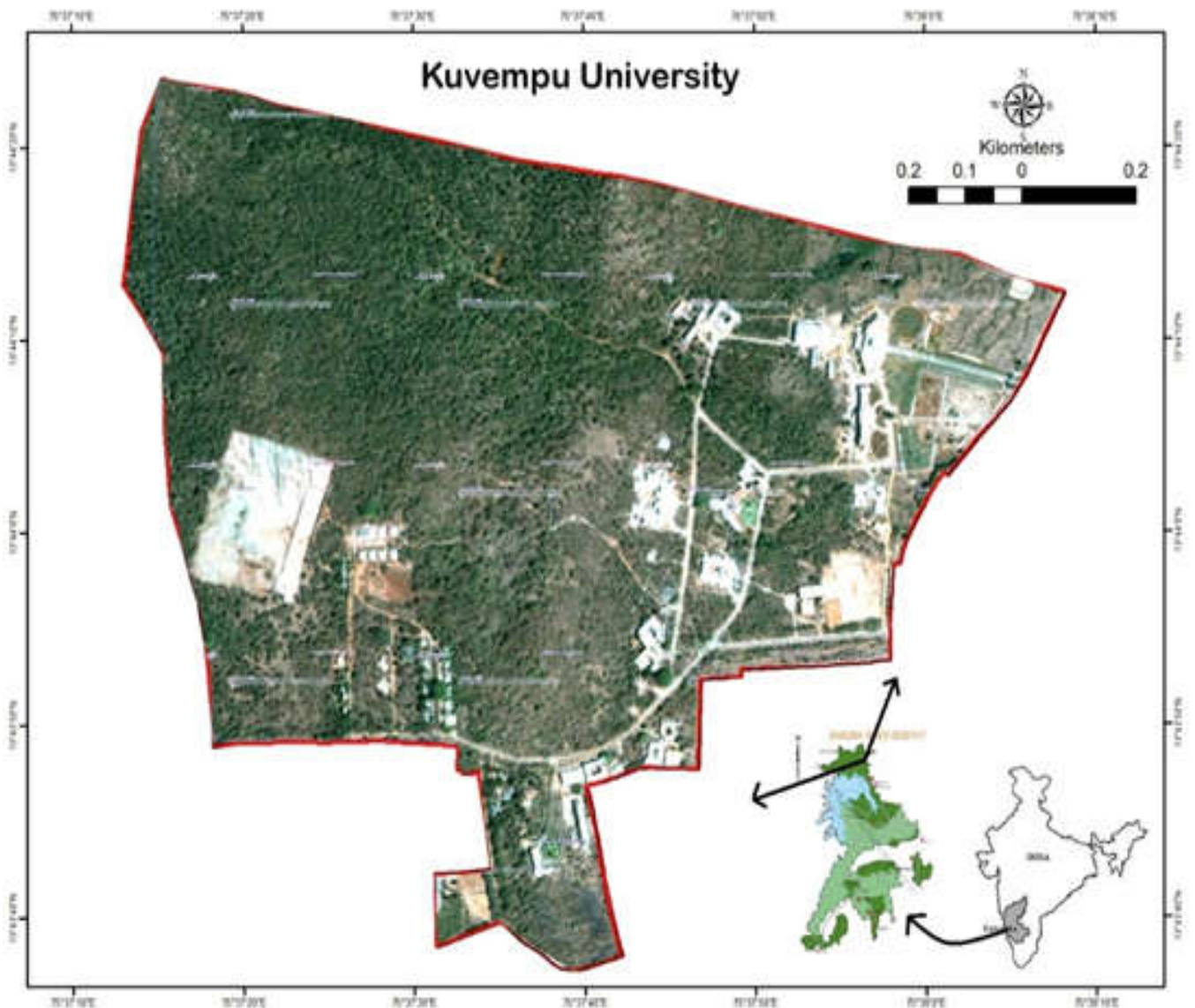


Fig. 1. Map showing the location of the study area.

Table 1. List of grass species in Kuvempu University Campus, Shivamogga, the Western Ghats

Sl. No	Species name	Tribe
1	<i>Alloteropsis cimicina</i> Stapf.	Paniceae
2	<i>Apluda mutica</i> L.	Andropogoneae
3	<i>Aristida adscensionis</i> L.	Aristideae
4	<i>Aristida setacea</i> Ritz.	Aristideae
5	<i>Arthraxon hispidus</i> (Thunb.) Makino	Andropogoneae
6	<i>Arthraxon lancifolius</i> (Trin.) Hochst.	Andropogoneae
7	<i>Bambusa arundinacea</i> Retz.	Bambuseae
8	<i>Brachiaria eruciformis</i> (Sm.) Griseb.	Paniceae
9	<i>Capillipedium huegelii</i> (Hack.) A.Camus	Andropogoneae
10	<i>Chloris barbata</i> Sw.	Chlorideae
11	<i>Chrysopogon lawsonii</i> (Hook.f.) Blatt & MC Cann	Andropogoneae
12	<i>Cyanodon dactylon</i> (L.) Pers	Chlorideae
13	<i>Cynodon intermedius</i> Rang. & Tadulingham	Chlorideae
14	<i>Cyrtococcum deccanense</i> Bor.	Paniceae
15	<i>Dactyloctenium aegyptium</i> (L.) Willd	Eragrosteae
16	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Bambuseae
17	<i>Dichanthium annulatum</i> (Forsk.) Stapf	Andropogoneae
18	<i>Dichanthium aristatum</i> (Poir.) C.E.Hubb.	Andropogoneae
19	<i>Dichanthium pertusum</i> (L.) Clayton	Andropogoneae
20	<i>Digitaria bicornis</i> (Lam.) Roemer & J.A Sschultes	Paniceae
21	<i>Digitaria stricta</i> Roth.	Paniceae
22	<i>Dimeria ornithopoda</i> Trin.	Andropogoneae
23	<i>Eleusine indica</i> (L.) Gaertn.	Eragrosteae
24	<i>Eragrostis nutans</i> (Retz.) Nees ex Steud	Eragrosteae
25	<i>Eragrostis tenella</i> (L.) P Beauv	Eragrosteae
26	<i>Eragrostis tenuifolia</i> (A.Rich.) Hochst ex stlend	Eragrosteae
27	<i>Eragrostis unioides</i> (Retz.) Nees ex Steud	Eragrosteae
28	<i>Eragrostis viscosa</i> (Retz.) Trin	Eragrosteae
29	<i>Garnotia stricta</i> Brongn.	Garnotieae
30	<i>Heteropogon contortus</i> (L.) P Beauv	Andropogoneae
31	<i>Isachne globosa</i> (Thunb.) Kuntze	Isachneae
32	<i>Ischaemum indicum</i> (Houtt.) Merr	Andropogoneae
33	<i>Ischaemum thomsonianum</i> Stapf.	Andropogoneae
34	<i>Ischaemum zeylanicum</i> Bor.	Andropogoneae
35	<i>Oplismenus compositus</i> (L.) P.Beauv	Paniceae
36	<i>Panicum repens</i> L.	Paniceae
37	<i>Paspalidium flavidum</i> (Ritz.) A.Camus	Paniceae
38	<i>Pennisetum pedicellatum</i> Trin.	Paniceae
39	<i>Pennisetum polystachyum</i> (L.) Schult.	Paniceae
40	<i>Pseudanthistiria umbellata</i> (Hack.) Hook.f.	Andropogoneae
41	<i>Rhynchelytrum repens</i> (Willd.) C.E.Hubb	Paniceae
42	<i>Saccharum spontaneum</i> L.	Andropogoneae
43	<i>Sacciolepis indica</i> Chase.	Paniceae
44	<i>Sporobolus diander</i> (Retz.) Beauv.	Sporoboleae
45	<i>Themida trindra</i> Forssk.	Andropogoneae

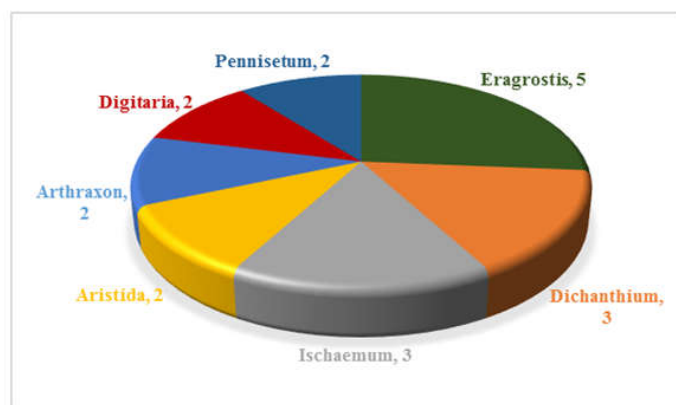


Fig. 2. Top seven genera of grasses in Kuvempu University Campus

Out of nine tribes, Andropogoneae, consists highest number of species, 17 species of 11 genera, followed by Paniceae has 12 species of 10 genera and Eragrosteae has seven species of three genera. The number of species under other tribes are less in number.

The genus *Eragrostis* has highest species (05), followed by *Dichanthium* and *Ischaemum* have three species each. Genera such as *Arthraxon*, *Aristida*, *Digitaria* and *Pennisetum* have two species each, rest of the genera have single species (Fig. 2). Present study area comes under buffer zone of Bhadra Wildlife sanctuary, the sanctuary also known as 'valley of bamboos', harbours of bamboo (Vasanthakumari *et al.*, 2010). Big bamboo (*Bambusa arundinacea*) was found commonly throughout the Bhadra Tiger reserve (Anon., 2002), but it found least in the campus. We can observed regeneration of this species throughout the campus. Compare to other grasses, *Heteropogon contortus* and *Eragrostis* species are cosmopolitan species in the campus. Ashwini *et al.* (2014) reported 73 species of grasses under 43 genera from Bababudangiri and Kemmannugundi montane of Karnataka. Vasanthakumari *et al.* (2010) reported 67 species of grasses with 48 genera belonging to nine tribes and six subfamilies from Bhadra Wildlife Sanctuary of Karnataka. Compared to above works, our study is significant, because, from smaller study area reports higher species documentation.

Among four study sites of the campus, Smruthi vana has been found to be the paradise for 27 grass species followed by Pampavana (19 species), Shankar matt (11 species) and Teak forests (06). Tree snakes, Chameleon, grass hopper, rabbit found commonly in Smruthi vana, due to thick grass diversity. Deer, sambar deer and rabbit are found oftenly in pampavana during night time. According to our observation, regular weeding process is big threat to grass diversity in the campus. In the present study, nearly 15 species of grasses are used for fodder, such as, *Alloteropsis cimicina*, *Apluda mutica*, *Aristida adscensionis*, *Arthraxon hispidus*, *A. lancifolius*, *Brachiaria eruciformis*, *Capillipedium huegelii*, *Cyanodon dactylon*, *Dactyloctenium aegyptium*, *Eragrostis* spp., *Paspalidium flavidum*, *Pennisetum* spp., and *Saccharum spontaneum*, similar observation also found in Vasanthakumari et al. (2010) and Ray and Sainkhediya (2012). Grasses like *Bambusa arundinacea*, *Dactyloctenium aegyptium*, *Paspalidium flavidum* and *Themida trindra* are known for their food value and have been used at times of food scarcity (Srivastava, 2002; Vasanthakumari et al., 2010). Grasses play a prominent role in ecosystem, used as fodder and forage for domesticated animal and soil conservation (Ahmed et al., 2009). Many of the literature suggested that grasses are very useful to man as food and forage. Hence there is an urgent need for conservation. They are fast vanishing sensitive plants form their natural habitats. So, there is urgent need of studies and scientifically catalogue of grass flora of regional, national and global level, before they are destroyed.

#### Acknowledgements

Authors are grateful to Dr. K. Gopalkrishna Bhat, Poorna Prajna College, Udipi, Karnataka who have helped identification of grass species. Authors are thankful to Chairman and all staff members, Department of Applied Botany, Kuvempu University for providing facilities to conduct project work.

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