

Morphotaxonomic studies of diversity of genus *Panicum* L. of family Poaceae of Amravati District, Maharashtra, India

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ABSTRACT

Amravati is one of the 11 districts of vidarbha. It includes 14 talukas. Flora of Amravati district has been already studied by Dhore (2002) reported 84 species of grasses, during last 16 years no survey was conducted of the area. Survey of grasses conducted during 2014-2018 revealed 117 species belonging to 60 genera. *Panicum* L. is a forth largest genus of study area It has 4 species which belong to subfamily panicoideae and tribe paniaceae. The aim of our investigation is to study morphotaxonomic revision of family poaceae. It focuses on details of macro and micro morphology of some important grasses.

Key words : Amravati, Flora, Survey, morphology.

INTRODUCTION

Grasses are most beautiful group of monocotyledonous plants. They occur on every soil, in all kind of situations and under all climatic conditions. As grasses do not like shade, they are not usually abundant within the forest. But in open places they grow very well and sometimes whole tracts become grasslands.

Grasses are important for entire ecosystem. Tiger is the king of forest ecosystem. If we want to save tiger, we have to save the grasses because tigers are indirectly dependent on grasses for their food. Robinson writes "Grass is king" it rules and governs the world, without it the earth would be a barren waste.

In the early days when the population was much limited and when limited land was under cultivation much of it was covered with plenty of green grasses. So, the farmers paid no attention to the grasses. But now population has increased, open land is decreased very much and cattles have increased in number hence farmers have to pay more attention to grasses. The present destruction of grasses is mainly due to overgrazing, increasing agricultural practices, over use of herbicides, formation of big dams, road widening, clean agricultural practices and trampling by men and cattles. Grazing needs to be inhibited in certain areas and also reduce the use of herbicides. Tender

shoots of Bamboo are used as vegetables and also as pickle by locals. The grains of grasses certainly provide a staple food supply for the human beings *Oryza sativa*, *Triticum aestivum*, *Zea mays*, *Avena sativa*, *Setaria italica*, *Eleusine coracana*, *Echinochloa colonum*, *Sorghum* species and rice feeds more human beings than any other plant product. Sugarcane is main source of sugar. A high proportion of the most fertile and productive soil were developed under a vegetative cover of grasses. Root, rhizome and other part of grasses are good soil builders and effective soil stabilizers. Most of the birds and animals depend upon grassland habitat for food, shelter and normal completion of their life cycles Gould (1968).

Despite utmost importance of grasses to human beings, the study on grasses continues to be a neglected subject. This is mainly because of the feeling that it is a difficult group for identification, the leaves and branches of grasses are very much similar, Small floral organs, special terminology and variation in the structure of spikelet and inflorescence. "*Grasses of Burma, Ceylon, India and Pakistan*" studied by Bor (1960) is the main standard reference work on Indian grasses.

Study Area

Amravati district is located in the state of Maharashtra-India. It is at 20°55' and 20.93 North latitude 77°45' and 77.75 East longitudes. It has an average elevation of 343 meters (1125 feet). Total area of the district is 12210 sq. km. Amravati district has tropical wet and dry climate with hot, dry summer from April to June. The annual average rainfall in the district is 852.1 mm and the temperature has recorded between 18°C to 46°C (Falling rain Genomics, inc. 2010).

Apart from this, Amravati is one of the largest district of Maharashtra states. It includes fourteen (14) taluka namely Amravati, Achalpur, Warud, Chandurbazar, Dharni, Morshi, Daryapur, Anjangaon Surji, Chandur Railway, Dhamangaon Railway, Teosa, Nandgaon-Khandeshwar, Bhatkuli, and Chikhaldara. Chikhaldara is the largest talukas of Amravati district and Bhatkuli is the smallest one.

Though botanical exploration of India has long history, Vidarbha and Marathwada regions remained somewhat neglected. A thorough exploration of Marathwada has been done by Naik and his students for nearly 30 years. Outcome of this work is "*Flora of Marathwada*" by Naik (1998) which a wonderful survey and reference flora.

The monumental work of Bor (1953) on "*Grasses of Burma, Ceylon, India and Pakistan*" (excluding Bambusiae) published about 50 years ago has changed this scenario and created interest on the study of grasses. This resulted in publication of several books on grasses and the latest addition is "*Flora of Tamil Nadu-Grasses*" by Altaf and Nair (2009) that deals with 447 species (excluding Bamboos).

Patunkar(1980) studied "*Grasses of Marathwada*" region has also published a book "*Grasses of Marathwada*". Recently, Potdar (2012) has published "*Grasses of Maharashtra*", the book is an outcome of exploration and detailed studies conducted on documents of grass diversity of Maharashtra for last 20 years. During this period 415 species belonging to 125 genera have been described. There are above 10,000-11,000 species belonging to 700 genera in the world (Clayton and Renvoize, 1989 and Watson and Dallwitz, 1992) in India there are more than 1200 species belonging to 268 genera (Karthikeyan *et al.*, 1989, and Moulk 1997). Kamble and Pradhan (1988) reported 87 species belonging to 49 genera from Akola district. Acharya (1985) reported 100 species belonging to 57 genera from Wardha district. Deore (2010) reported 65 species of grasses from Washim district. Karthikeyan (1993) reported 81 species from Yavatmal district and Diwakar (2000) reported 60 species from Buldhana district.

Floristic surveys of different area of Maharashtra have been compiled and published by Botanical Survey of India such as "*Flora of Maharashtra state, Monocotyledon*", Sharma *et al.*, (1996), "*Flora of Maharashtra state, Dicotyledon*" vol. I Singh *et al.*, (2000), vol.II Singh *et al.*, (2001).

MATERIALS AND METHODS

Study of Habitat

In every season the selected areas were explored systematically. Grass covered sites were targeted for study. Grasses were collected from different habitats like irrigated fields, unirrigated fields, open grasslands, forest, bunds of field, bank of rivers, wastelands, rice fields and rocky places.

Sample collection and preservation-

During excursion specimens of grasses were collected and field number is given to each specimen. Field observations were noted down in field diary. After collection the samples are critically studied in

laboratory. Then it is dried properly, poisoned by using 2% Mercury Chloride and mounted using conventional methods. For critical cases BSI (Pune) was consulted to match the specimens.

Identification-

The identification was confirmed by using floras like flora of British India (Hooker 1872-1897), Flora of Bombay Presidency (Cook 1958), Flora of Marathwada (Naik 1998), Flora of Maharashtra (Almeida, 1990), Grasses of Maharashtra (Potdar, Salunkhe and Yadav, 2012) Grasses of Marathwada (Patunkar, 1980). Specimens were observed under Sterioscopic binocular microscope.

Artificial keys were provided for genera and species. Population variations are critically studied. Latest nomenclature are given in detail for proper taxonomic level. Each grass specimen description was supported by a note on distribution and herbarium specimen number. Genera and species are arranged alphabetically. Floristic analysis was done to get clear picture of grass biodiversity. Grass species are arranged according to N.L. Bor. All the specimens were deposited in the herbarium of S.S.S.K.R. Innani Mahavidyalaya, Karanja (Lad), Dist-Washim. (M.S.)

RESULT AND CONCLUSION

Present study is the outcome of exploration tours conducted to document the grass diversity of study area from 2014-2018 and visited different areas of Amravati district in different seasons. During this period over 600

specimens were collected from the study area. During the study 117 species belonging to 60 genera were collected.

Out of 60 genera *Eragrostis* is the largest genus belonging to sub-family pooideae. The 35 species collected from study area were found to be monotypic. In Amravati district pure patches of *Aristada*, *Ischaemum*, *Themeda*, *Andropogon*, *Heteropogon*, *Dicanthium*, *Cynodon* and *Saccharum* were observed. Though grasses are herbaceous in nature, but are tough in texture so it is easy to prepare herbarium specimen. Some of the beautiful grasses are *Thelepogon elegans*, *Mnesithea granularis*, *Chrysopogon fulvus*, *Ischaemum rugosum* and *Dichanthium species*.

Some dominant genera are *Apluda*, *Aristada*, *Dicanthium*, *Cynodon*, *Dinebra*, *Eragrostis*, *Ischaemum*, *Rottboellia*, *Heteropogon*, *Ophiuros*, *Setaria*. Some grasses have underground rhizomes i.e. *Ischaemum pilosum*, *Cynodon dactylon*, *Saccharum spontaneum* which can not be eradicated hence the productivity of crops decreases. *Cynodon* is the first class fodder grass present throughout study area. It is palatable and resistant to grazing and trampling because of underground rhizomes. *Dactyloctenium aegyptium*, *Chrysopogon fulvus* are other palatable species of grasses. *Cymbopogon martini*, *Vetiveria zizanioides*, *Saccharum spontaneum* and *Cynodon dactylon* are the medicinal grasses. Hollow internodes of *Arundo donax* are used for making pens and musical pipes by locals. The forest areas of Melghat (Chikhaldara and Dharni) are of mixed dry deciduous type with teak as dominant species.

Species of *Panicum* and habitat.

Sr. No.	Specimen No.	Name of Species	Habitat
1	PAM 67	<i>Panicum phoinicladus</i> Naik & Patunkar	Rice fields
2	PAM 36	<i>Panicum Psilopodium</i> Trin.	Open grasslands
3	PAM 47	<i>Panicum repens</i> L.	Paddy fields
4	PAM 130	<i>Panicum trypheron</i> Schult.	Open grasslands

Key for the species of *Panicum*

1a -	Lower glume orbicular, rounded or truncate	2
1b -	Lower glume acute, acuminate or cuspidate	3
2a -	Rhizome present, spikelets ovate to narrowly elliptic	<i>P. repens</i>
2b -	Rhizome absent, spikelets green or greenish- purple deciduous	<i>p. psilopodium</i>
3a -	Plants rhizomatous or with creeping root stock	<i>P. phoinicladus</i>
3b -	Plants without rhizomes or creeping root stock	<i>P. trypheron</i>

Saccharum spontaneum, *Vetiveria zizanioides*, *Arundo donax* present along the sides of rivers and stream which reduce the pressure of flood. The dominant tribes of Melghat are Gond, Korku and Gawali. Gond, and Gawali are the tribal residents of Melghat forest range are the consumers as they feed their livestock mainly by grazing of grasses. Efforts are required to prevent free grazing as once vegetation is lost, it is very difficult to restore.

Conflicts of interest: The authors stated that no conflicts of interest.

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