

## Morphotaxonomic Studies of Diversity of Genus *Panicum* of Family Poaceae of Nagpur Division, Maharashtra

Dr. Swati Tathod<sup>1</sup>

<sup>1</sup>Assistant Professor & Head, Department of Botany, Shri Vitthal Rukhamini Arts, Commerce & Science College, Sawana, Yavatmal, Maharashtra, India

### ABSTRACT

Nagpur division is the part of vidarbha it includes about 6 districts. Survey of grasses biodiversity of study area conducted during 2014-2018, reported 168 species belonging to 70 genera. *Panicum* is the second largest genus of study area. It has 9 species which belong to subfamily panicoideae. The aim of our study is morphotaxonomic revision of family poaceae and details of macro and micro morphology of some important grasses.

**Key words** – Vidharba, Biodiversity, Grasses, Morphology

### I. INTRODUCTION

Grasses are most beautiful group of monocotyledonous plants. 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 dependents 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, open coal field mines, 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. Sugarcane is main source of sugar. A high proportion of the most fertile and productive soil were developed under a vegetative covers 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.

## II. STUDY AREA

Nagpur division is the largest part of eastern Vidarbha includes about 6 districts i.e. Nagpur, Wardha, Gondiya, Bhandara, Chandrapur and Gadchiroli. It is the eastern part of Vidarbha and has an expanse of 51,336 sq.km. It is surrounded by Madhya Pradesh to its north, Andhra Pradesh to its south, Chattisgarh to the east side, and Yavatmal and Amravati to its west. There are many rivers and their tributaries crisscrossing the entire area. Major rivers in Nagpur division are Wainganga, Godavari, Indravati, Pranhita, Wardha, Sipna, Kanhan, PENCH, Bor, Vena, etc. Tippiagarh hills in Gadchiroli, Ramtek hills in Nagpur are some of hilly regions of Nagpur division. Bor, Navegaonbandh, Itiyadoh, Gosikhurda are some of the major dams in the region. Whereas Bhandara district is fondly called as ‘district of lakes’. Chandrapur is the most polluted city in study area. Adjoining areas of Chandrapur, Wani and Warora has become barren wasteland because of open coal mines; these are amongst highly polluted areas in the country, soil of these areas has become compact, hard and saline, it has lost its fertility. Gadchiroli district has highest forest i.e. 78% in Maharashtra.

## III. REVIEW OF EARLIER WORK

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). Nagpur division of Vidarbha represents the area that is rich in forest cover, Purekar (1985) reported 188 species belonging to 82 genera from Nagpur District, while 100 species belonging to 57 genera from Wardha district were reported by Acharya (1985), 130 species were reported from Gadchiroli and Chandrapur district Patil (1991), 118 species from Gondia district Kahalkar (2009) and 220 species belonging 94 genera from Gadchiroli district by Govekar.

## IV. MATERIAL AND METHODS

### Plan of Work

#### 1. 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, and bunds of field, bank of rivers, wastelands, rice fields and rocky places.

**2. 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.

**3. 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 Marathawada (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.InnaniMahavidyalaya, Karanja(Lad), Dist-Washim.(M.S.)

**4. Observations**

**Species of *Panicum* and habitat,**

**Distribution: A=Abundant, C=Common, F=Frequent, O=Occasional, R=Rare.**

1.	<i>Panicum antidotale</i> Retz.	Shade	O	SST209
2.	<i>Panicum miliaceum</i> L.	Bunds of Paddy fields	O	SST147
3.	<i>Panicum notatum</i> Retz.	Hill slope	O	SST602
4.	<i>Panicum paspaloides</i> Pers.	Fields	O	SST407
5	<i>Panicum phoinicladon</i> Naik & Patunkar	Paddy fields	O	SST90
6	<i>Panicum psilopodium</i> Trin. Var. <i>coloratum</i> Hook.f.	Open Forest	C	SST176
7	<i>Panicum repens</i> L.	Open places	C	SST359
8	<i>Panicum trypheron</i> Schult.	Open places	C	SST217
9.	<i>Panicum walense</i> Mez	Fields	O	SST21

- 1a. Lower glume upto 1.5mm long. *P. walense*
- 1b. Lower glume more than 1.5mm long 2
- 2a. Lower glume orbicular or rounded 3
- 2b. Lower glume acute, acuminate or cuspidate 5
- 3a. Panicle compact *P. notatum*
- 3b. Panicle effuse 4
- 4a. Spikelets greenish *P. psilopodium*
- 4b. Spikelets whitish *P. repens*
- 5a. Spikelets 4-6mm long *P. miliaceum*
- 5b. Spikelets 1-3mm long 6
- 6a. Culms greenish *P. antidotale*

6b. Culms not greenish	7
7a. Lower glume acute	<i>P. phoinicladus</i>
7b. Lower glume acuminate	<i>P. trypheron</i>

## V. CONCLUSION

Present survey is the outcome of exploration tours conducted to document the grass diversity of study area from 2014-2018 and visited different areas of Nagpur division in different seasons. During this period over 900 specimens were collected from the study area. During the study 168 species belonging to 70 genera were collected.

Out of 70 genera *Eragrostis* the largest genus belonging to sub-family pooideae. The 45 species collected from study area were found to be monotypic whereas 17 species were bitypic. In Nagpur pure patches of *Aristida*, *Chrysopogon*, *Apluda*, *Ischaemum*, *Dinebra*, *Themeda*, *Andropogon*, *Ophiuros*, *Rottboellia*, *Heteropogon*, *Dicanthium*, *Cynodon*, *Saccharum*, *Vetiveria* 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 *Paspalum scorbiculatum*, *Thelepogonelegans*, *Mnesithea laevis*, *Mnesitheagranularis*, *Chrysopogon fulvus*, *Ischaemum rugosum*, *Vetiveriazizanioids*.

Nagpur division being the area of wildlife sanctuaries grasses has vital importance in maintaining the diversity of animals in this area. In remote areas undisturbed grasslands are observed. Some dominant genera are *Apluda*, *Aristida*, *Dicanthium*, *Cynodon*, *Dinebra*, *Eragrostis*, *Ischaemum*, *Rottboellia*, *Heteropogon*, *Ophiuros*, *Setaria*. In Bhandara districts *Arundodonax* and *Vetiveriazizanioides* are found frequently. The wild species of *Sorghum* are frequent in Nagpur district. *Dicanthium filiculme* is found restricted to Chargaon and Nagpur forest area whereas *Coix* is found abundant in Gadchiroli.

Some grasses have underground rhizomes i.e. *Ischaemum pilosum*, *Cynodondactylon*, *Saccharum spontaneum* which cannot 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*, *Vetiveriazizanioides*, *Saccharum spontaneum* and *Cynodondactylon* are the medicinal grasses. Hollow internodes of *Arundodonax* are used for making pens and musical pipes by locals. The forest areas shortlisted for the study are of mixed dry deciduous type with teak as dominant species.

*Saccharum spontaneum*, *Vetiveriazizanioides*, *Phragmites vallatorius*, *Arundodonax* present along the sides of rivers and stream which reduce the pressure of flood.

## VI. REFERENCES

- [1]. Acharya, R.M. 1985. Flora of Wardha district. Ph.D. Thesis unpublished, Nagpur University, Nagpur.
- [2]. Altaf K. and V.J.Nair, 2009. Flora of Tamil Nadu- Grasses, Botanical Survey of India. Calcutta.
- [3]. Gould, F.W. 1968. Grass systematic. McGraw-Hill. New York.
- [4]. Kahalkar, V.I. 2009. Floristic studies on Gondia district of Maharashtra state, Ph.D thesis Nagpur University, Nagpur.
- [5]. Patil, B. M. 1991. Floristic and palynological investigations in the Monocot flora of Chandrapur and Gadchiroli district, of Vidarbha region, of Maharashtra State. Ph.D thesis, Nagpur University Nagpur.

- [6] . Patunkar, B.W.1980. Grasses of Marathwada. Scientific Publisher, Jodhpur.
- [7] . Potdar, G.G., Salunkhe C.B., and S.R. Yadav, 2012. Grasses of Maharashtra, Shivaji University, Kolhapur.
- [8] . Purekar, P.N. 1885. Grasses of Nagpur District-Taxonomy and Palynology. Ph.D thesis Nagpur University, Nagpur.
- [9] . Yadav, S.R. and M.M. Sardesai, 2002. Flora of Kolhapur District Shivaji University,