



## Diversity of grass flora of Moradabad district with special reference to their utility

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### Abstract

Within the wide diversity of flowering plants 'Grasses' are the one which can be found anywhere with great abundance. Grasses are the members of Poaceae (Gramineae) family which are the most vital part in our life as food, medicine, cattle-fodder and many different things. The rural people of Moradabad district use different parts of grasses in crude form as cure for many diseases. This paper deals with 62 grasses belonging to seven subfamilies and thirteen tribes. Sub-family Panicoideae exhibits maximum representation with 34 species followed by Chloridoideae with 14 species. *Bambusa arundinacea* Willd., *Dendrocalamus strictus* (roxb.) Nees., *Leersia hexandra* Sw., *Thysanolaena maxima* (roxb.) O. Kuntze are rare grasses of the study area.

**Keywords:** grasses, medicinal value, food, fodder, Moradabad district

### Introduction

Poaceae is a large and nearly ubiquitous family of monocotyledonous flowering plants known as grasses. Poaceae includes the cereal grasses, bamboos and the grasses of natural grassland and cultivated lawns and pasture. The grass family is one of the most widely distributed and abundant groups of plants on Earth. Grasses are found on almost every continent and are absent only from Antarctica. According to different authors there may be 780 genera and about 12,000 species of grasses in the world and occupies the fifth-largest plant family, following the Asteraceae, Orchidaceae, Fabaceae and Rubiaceae (Jain, 1986: Clayton *et al.*, 2012) <sup>[14, 7]</sup>. *A Handbook of some South Indian Grasses* (Achariyar and Tadulinga, 1921) <sup>[1]</sup>, *The Bombay Grasses* (Blatter, 1935) <sup>[4]</sup>, *The Grasses of Burma, Ceylon, India and Pakistan* (Bor, 1960) <sup>[5]</sup>, *A list of the grasses of N. W. India, indigenous and cultivated* (Duthie, 1883) <sup>[10]</sup>, *The Grass Cover of India* (Dabadghao & Shankarnarayan, 1973), *Grasses of Bihar, Orissa and West Bengal* (Jain *et al.*, 1975) <sup>[13]</sup>, *Grasses of Madhya Pradesh* (Roy, 1984) <sup>[22]</sup>, *The Grass flora of India* (Jain, 1986) <sup>[14]</sup>, *Grasses of North-Eastern India* (Shukla, 1996), *Important grasses of Eastern ghats* (Moulik, 2000) <sup>[18]</sup>, *Grasses and its diversity in Gujarat state* (Parmar *et al.*, 2012) <sup>[20]</sup> and *Grasses and their Varieties in Indian Literature* (Sheshadri, 2013) <sup>[23]</sup> are notable work on Indian grasses. Besides these, Srivastava (2011) <sup>[28]</sup> recorded 110 genera and 301 species under Poaceae family from Uttar Pradesh and

previously Raizada & Jain (1961 & 1966) <sup>[14, 15]</sup>, Singh (1971) <sup>[24]</sup>, Vedprakash *et al.* (1978) <sup>[30]</sup>, Uniyal *et al.* (1994) <sup>[29]</sup>, Singh (2007) <sup>[25]</sup>, Chaudhary *et al.* (2012) <sup>[6]</sup> and Malik (2015) <sup>[16]</sup> did comprehensive work on grasses of Uttar Pradesh.

Moradabad district (28° -21' to 28° -16' N latitude and 78° -4' to 79° E longitude) is a part of the Ganga-Ramganga doab of Rohilkhand region in U.P. It covers an area of 3493 sq. km. with the elevation of 186 meters above the sea level. The maximum and minimum atmospheric temperatures are 42.2°C and 4°C respectively. The average rainfall varies between 800 to 1000 mm. The relative humidity is up to 90% in monsoon season and in drier part of the year it decreases to less than 20%. The soil of Moradabad is clayey loam and silty loam. Khadar and Bhabhar tracts are also present in the area. There are a few sporadic references of the collections of grasses from Moradabad by T. Thomson and H. B. Naithani in the *Flora of Upper Gangetic Plain and the adjacent Siwalik and sub Himalayan tracts* (Duthie, 1903-1929) <sup>[11]</sup> and *Supplement to the Flora of Upper Gangetic Plain* (Raizada, 1966) <sup>[14]</sup> respectively. Thereafter Paliwal and Singh (1982) <sup>[6]</sup> recorded 47 species under 38 genera and Beena (2015) <sup>[13]</sup> added nine genera and 15 grass species to the of flora of Moradabad District. But no work has been done on economic value of grasses of the area. For the first time, an attempt has been made to document diversity of grasses along with their utility in Moradabad district (Fig 1.) of Rohilkhand region of Uttar Pradesh.

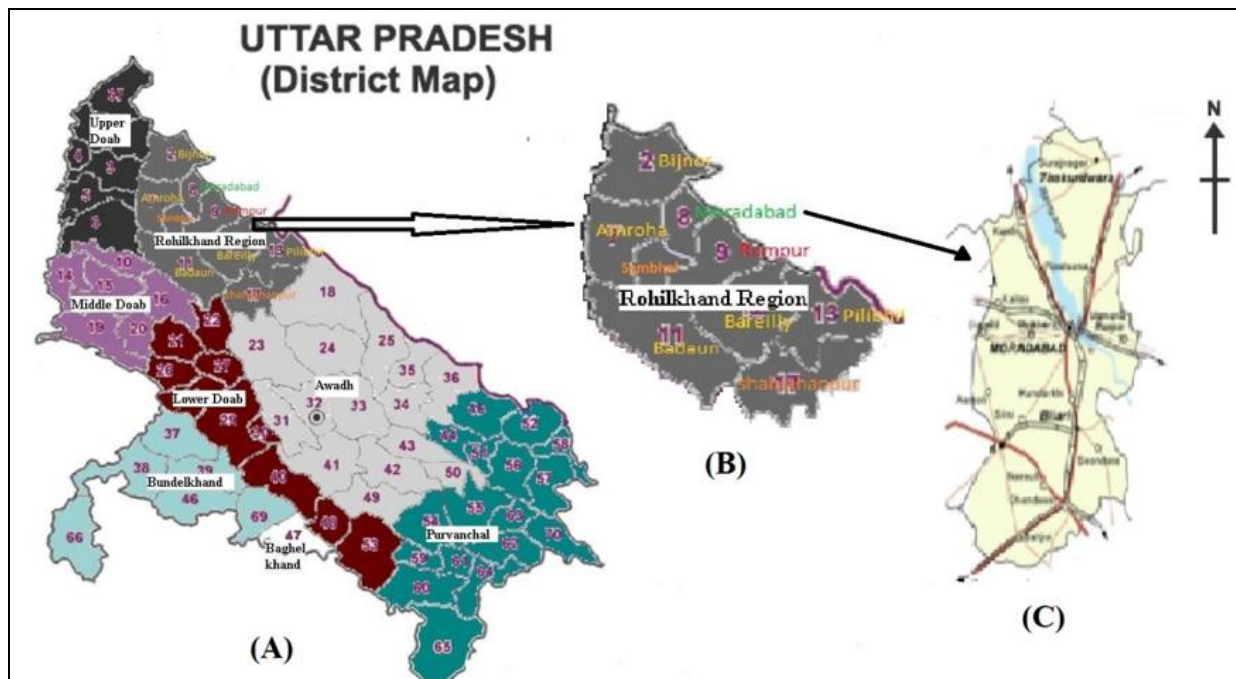


Fig 1: Map of Moradabad district (C).

**Materials and Methods**

Fields trips were made in Moradabad district during 2016 to collect grass specimens and available literature by Clifford and Watson (1977) [8], Jain (1986) [14], Gould and Shaw (1988), Uniyal *et al.* (1994) [29], Anonymous (2007) [2] and Singh (2007) [25] have been consulted for identification of grass species. All specimens were dried, preserved and deposited in the Herbarium, Department of Botany, Hindu College, Moradabad (U.P.). In all cases, however the identification of grasses was finally confirmed by matching them in the herbarium of the FRI Dehradun and BSI Allahabad. Valuable information regarding medicinal uses were collected on the basis of interviews with experienced people of various communities, local medicine men (Vaidya

and old ladies (Midwife) and also consulting available literature by Mitra and Mukherjee (2005) [17], Srivastava (2006) [27] and Kavya *et al.* (2013) [15].

**Results and Discussion**

The present investigation revealed 62 grass species which are divided into 7 sub families namely Panicoideae (34), Chloridoideae (14), Pooideae (7), Ehrhartoideae (3), Bambusoideae (2), Centothecoideae (1) and Arundinoideae (1) respectively. Botanical names, subfamilies, tribes, phenology and their utility is given in table- 1. *Bambusa arundinacea* Willd., *Dendrocalamus strictus* (roxb.) Nees., *Leersia hexandra* Sw., *Thysanolaena maxima* (roxb.) O. Kuntze are rarely seen in the study area.

**Table 1:** Diversity of Grass Flora of Moradabad District with special reference to their Utility

S. No	Botanical Name	Subfamily	Tribe	Utility	Life Trend	Phenology	Abundance
1	<i>Arachne racemosa</i> (Heyne) Ohwi	Chloridoideae	Eragrostideae	Fo.	A	Jul – Oct	Frequent
2	<i>Apluda mutica</i> L.	Panicoideae	Andropogoneae	M.	P	Sep – Feb	Frequent
3	<i>Arundo donax</i> L.	Arundinoideae	Arundineae	O	P	Sep – Mar	Common
4	<i>Avena sterilis</i> L. var. <i>cultra</i>	Pooideae	Poeae	M	A	Jan – Apr	Common
5	<i>Bambusa arundinacea</i> Willd.	Bambusoideae	Bambuseae	M&O	P	Not seen	Rare
6	<i>Bothriochloa pertusa</i> (Linn.) A. camus	Panicoideae	Andropogoneae	M	P	Jul – Oct	Abundant
7	<i>Brachiaria ramosa</i> (L.) Stapf.	Panicoideae	Paniceae	Fo	A	Jun – Oct	Frequent
8	<i>Brachiaria reptans</i> (Linn.) Garden & Hubb	Panicoideae	Paniceae	M & Fo	A	Jul – Sep	Common
9	<i>Cenchrus ciliaris</i> L.	Panicoideae	Paniceae	M	P	Throughout the year	V. Common
10	<i>Cenchrus setigerous</i> Vahl	Chloridoideae	Cynodonteae	Fd	P	Apr – Dec	V. Common
11	<i>Chloris inflata</i> Link.	Chloridoideae	Cynodonteae	Fo	P	Aug – Oct	Common
12	<i>Coix lacryma-jobi</i> L.	Panicoideae	Andropogoneae	M&O	P	Aug – Dec	Frequent
13	<i>Cymbopogon citratus</i> Stapf	Panicoideae	Andropogoneae	M&O	P	Jan – Mar	Occasional
14	<i>Cynodon dactylon</i> Pers.	Chloridoideae	Cynodonteae	M & Fo	P	All the year round	Frequent
15	<i>Dactyloctenium indicum</i> Boiss.	Chloridoideae	Cynodonteae	M&Fo	P	Jul – Sep	Common
16	<i>Dendrocalamus strictus</i> (roxb.) Nees.	Bambusoideae	Bambuseae	M&O	P	Not seen	Rare
17	<i>Desmostachya bipinnata</i> Stapf	Chloridoideae	Chlorideae	M&R	P	Jun – Nov	Frequent
18	<i>Dichanthium annulatus</i> Stapf	Panicoideae	Andropogoneae	M&Fo	P	Aug – Jan	Frequent
19	<i>Digitaria adscendens</i> (H.B.&K.) Henr.	Panicoideae	Paniceae	Not known	A	Jul – Nov	Common
20	<i>Digitaria setigera</i> Roth.	Panicoideae	Paniceae	Fo	A	Jul – Oct	Frequent

21	<i>Echinochloa colonam.</i>	Panicoideae	Paniceae	Fo	A	Jun – Nov	Frequent
22	<i>Eragrostis japonica</i> (Thunb.) Trin.	Chloridoideae	Eragrostideae	Fd	A	Oct – Mar	Common
23	<i>Eragrostis cilianensis</i> (All.) Janch.	Chloridoideae	Eragrostideae	Fo & M	A	May – Oct.	Occasional
24	<i>Eragrostis pilosa</i> (L.) P. Beauv.	Chloridoideae	Eragrostideae	Fo	A	May – Dec	V. Common
25	<i>Eragrostis tenella</i> (L.) P. Beauv.	Chloridoideae	Eragrostideae	Fo	A	Jun – Dec	Abundant
26	<i>Eragrostis tremula</i> Hochst.	Chloridoideae	Eragrostideae	Fd	A	Aug – Nov	Abundant
27	<i>Hemarthria compressa</i> (L. f.) R. Br.	Panicoideae	Andropogoneae	Fd & M	P	Jul – Dec	Occasional
28	<i>Heteropogon contortus</i> L.	Panicoideae	Andropogoneae	Fo	P	Oct – Mar	Common
29	<i>Hordium vulgare</i> L.	Pooideae	Triticeae	Fd & Fo	A	Jan – Mar	Common
30	<i>Hygroryza aristata</i> (Retz.) Nees	Ehrhartoideae	Zizaniinae	M	P	Oct – Apr	Occasional
31	<i>Imperata cylindrica</i> (L.) Raeuschel	Panicoideae	Andropogoneae	Fo	P	Jun – Oct	Frequent
32	<i>Iseilema laxum</i> Hack.	Panicoideae	Andropogoneae	Fd	P	Sep – Dec	Occasional
33	<i>Leersia hexandra</i> Sw.	Ehrhartoideae	Oryzae	Fd			Rare
34	<i>Lolium temulentum</i> L.	Pooideae	Poeae	M	A	Dec – Mar	Common
35	<i>Miscanthus nepalensis</i> (Trin.) Hack.	Panicoideae	Andropogoneae	O	P	May – Jul	Occasional
36	<i>Oplismenus burmanii</i> (Retz.) P. Beauv.	Panicoideae	Paniceae	Fd & M	A	Jun – Dec	Common
37	<i>Oryza sativa</i> L.	Ehrhartoideae	Oryzae	Fd & Fo	A	Sep – Nov	Common
38	<i>Panicum miliare</i> Lamk.	Panicoideae	Paniceae	Fd	A	Jul – Dec	Frequent
39	<i>Panicum typheron</i> Schult	Panicoideae	Paniceae	M	A	Jul – Dec	Common
40	<i>Panicum antidotale</i> Retz.	Panicoideae	Paniceae	Fo	P	Jun – Nov	Common
41	<i>Paspalidium flavidum</i> (Retz.) A. Camus	Panicoideae	Paniceae	Fo & Fd	A	Jul – Nov	Abundant
42	<i>Paspalum paspaloides</i> (Michx.) Scribner	Panicoideae	Paniceae	Fo	A	Jun – Sep	Abundant
43	<i>Pennisetum americanum</i> (Linn.) Leeke Zeitschr	Panicoideae	Paniceae	M, Fd & Fo	A	Sep – Nov	Common
44	<i>Phalaris minor</i> (L.) Retz.	Pooideae	Poeae	M & Fo	A	Feb – Apr	Common
45	<i>Poa annua</i> L.	Pooideae	Poeae	Fo	A	Dec – Mar	Frequent
46	<i>Polypogon monspeliensis</i> (L.) Desf.	Pooideae	Poeae	Fd	A	Jan – May	Abundant
47	<i>Sachharum benghalense</i> Retz.	Panicoideae	Andropogoneae	M & D	P	Oct – Mar	Frequent
48	<i>Sachharum officinarum</i> L.	Panicoideae	Andropogoneae	M, Fd & Fo	P	Oct – Feb	Common
49	<i>Saccharum spontaneum</i> L.	Panicoideae	Andropogoneae	D	P	Sep – Jan	Common
50	<i>Setaria glauca</i> L.	Panicoideae	Paniceae	M & Fo	A	Jun – Dec	Common
51	<i>Setaria intermedia</i> R&S. Syst.	Panicoideae	Paniceae	M & Fd	A	Jul – Feb	Abundant
52	<i>Setaria verticellata</i> (L.) P. Beauv	Panicoideae	Paniceae	M & Fo	A	Aug – Dec	Frequent
53	<i>Sorghum vulgare</i> Pers.	Panicoideae	Andropogoneae	Fd & Fo	P	Sep – Oct	Common
54	<i>Sorghum halepense</i> (L.) Pers	Panicoideae	Andropogoneae	M & Fo	A	Jul – Nov	Common
55	<i>Sporobolus indicus</i> (L.) R. Br.	Chloridoideae	Eragrostideae	M	P	May – Oct	Frequent
56	<i>Sporobolus marginatus</i> Hochst. ex A. Rich.	Chloridoideae	Zoysieae	D	P	Nov – Feb	Common
57	<i>Thysanolaena maxima</i> (roxb.) O. Kuntze	Centothecoideae	Thysanolaeneae	M & O	P	Nov.- March	Rare
58	<i>Tragus roxburghii</i> Panigrahi	Chloridoideae	Cynodonteae	M & Fd	A	Jul – Oct	V. Common
59	<i>Triticum aestivum</i> L.	Pooideae	Triticeae	Fd & Fo	A	Feb – Apr	Common
60	<i>Urochloa panicoides</i> Beauv	Panicoideae	Paniceae	Fo	A	Aug – Nov	Abundant
61	<i>Vetiveria zizanioides</i> (L.) Nash	Panicoideae	Andropogoneae	Oil	P	Jul – Nov	Occasional
62	<i>Zea mays</i> L.	Panicoideae	Andropogoneae	Fd & Fo	A	Sep – Oct	Common

Abr: Fo = Fodder, Fd = Food, M = Medicine, O = Ornamental, D = Domestic

Life trends: A=Annual, P=Perennial.

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