



(RESEARCH ARTICLE)



## Diversity of grass flora of Shivpuri district with special references to their utility

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### Abstract

Grass range research turned into finished in Shivpuri district of Madhya Pradesh to gather the information about grass sources used by tribal network of Shivpuri of their environment. The range of grass flora with unique reference to their utility turned into performed from Nov. 2021 to Sept. 2022. Grass is located on anywhere and its miles belong to Poaceae family. It plays essential role in human in addition to animals existence as meals, remedy, fiber and plenty of different things got here from them. This newsletter offers with 65 grasses belonging to seven subfamilies and 11 tribe. Gift examine well-known shows that Oil is gain by means of one species specifically *Vetiveria zizanioides* (L.) Nash and 4 species have used for decorative reason three are food and 16 species are used for Medicinal cause and 49 species is used for fodder cause. Panicoideae sub households showcase maximum illustration with 32 species followed by using Chloridoideae (25), Arundinoideae, Bambusoideae & Pooideae (2), and Ehrhartoideae & Micrairoideae (1) species. These sixty five plant life encompass 35 annual species and 30 species are perennial species. Some species particularly *Avena sterilis* L.; *Bambusa arundinaceae* Wil.; *Dendrocalamus strictus* (Roxb.) Nees.; *Polytrias indica* (Hout.) Veld.; *Pennisetum pedicellatum* Trin. ; *Phragmites karka* (Retz.) trin ex. Steud.; *Tripogon lisboae* Stapf. are not often observed in the Shivpuri district of Madhya Pradesh, India

**Keywords:** Shivpuri; Grass diversity; Ethno-botany; Poaceae; Vindhyan plateau; Malwa plateau

### 1. Introduction

The grass own family is one of the most widely distributed and ample economic critical groups of plant life on the planet. With round 780 genera and around 12,000 species are located of grass in the Poaceae. It is the 5<sup>th</sup> biggest plant circle of relatives in flowering plants. Grass is treasured present of nature. Its miles constitute one of the critical components of each and each terrestrial ecosystem (Seth, 2004). Grass maintains natural ecosystem in addition to water quality and preventing floods, erosion, and drought. It is essential sources of pleasure, undertaking and subsistence like meals, medication and so forth. It plays critical role in pleasure of human's desires. consequently, the desires of humans are unlimited. A few grasses are directly or indirectly associated with ascend of economic system of local humans (Ray & Sainkhediya 2012). Primitive societies were the repository of good-sized understanding of flora and their houses. The know-how approximately vegetation has exceeded over thorough generation to era (Sainkhediya 2016). Flowers are most essential method to observe herbal assets control of indigenous human beings (Sainkhediya & Patil 2019). The richness of flowering flora makes India one of the mega range international locations inside the global with four biodiversity hotspots and 3 mega facilities of endemism (Pachaya & Sainkhediya 2014). Grasses are rich assets of animal diets in addition to fodder industries. India is bestowed with precise range ode skinny lifestyle, herbal sources and bioedaphic and topographical capabilities. India ranks one of the few countries inside the worlds which utilizing the full-size indigenous medicinal wealth in a large manner on accounts that Vedic technology (Billore 2013).

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### 1.1. Study area

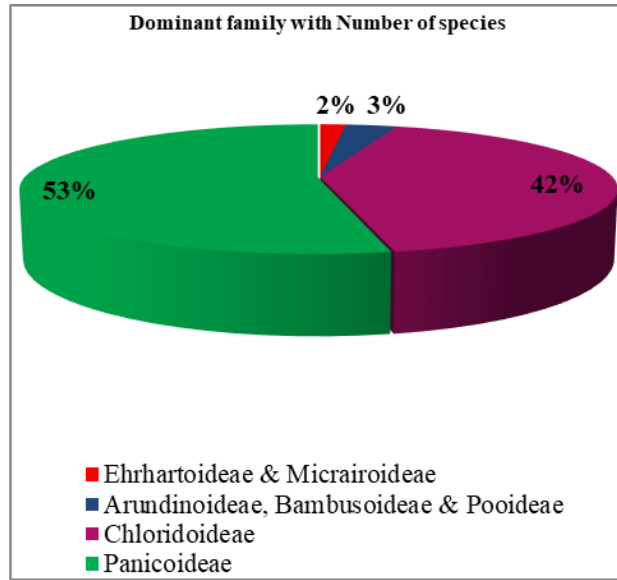
Geographically Shivpuri lies among parallel of range 24°51'16" and 25°55'15" North range and 77°00'25" and 78°28'10" East longitude. Shivpuri overall place is 10666 km<sup>2</sup> and out of this forest vicinity are 3149.16 sq. km. The district is bounded via at the south by way of Ashok Nagar and Guna district, at the north with the aid of Morena, Gwalior and Datia district, on the east through Jhansi district of Uttar Pradesh and on the west with the aid of Kota district of Rajasthan nation. Shivpuri district is laying on northern part of Vindhyan plateau which western element is extension of Malwa plateau and its miles sits on the Malwa plateau of the Deccan traps with many small hill tops at the start protected with deciduous forests. In Shivpuri northern tropical dry deciduous forest is discovered (Champion and Seth 1964). Pohari, Satanwara, Kolarus, Badarwas, Pichore, and Karera have dense wooded area is located. The huge bodies of water within the district are the Madikheda reservoir and the Mohini pickup reservoir close to Narwar. The principle river is the Sind River which arises in southern badarwas tehsil, flows north –northeastwards via the important and northeastern elements of the district and enters the Yamuna at Kanjousa. The Shivpuri district drainage is all in the huge Yamuna basin, but falls into four sub basins tired respectively by way of tributaries of 1. The Parwati river which waft west to east and forms part of the northern boundary of the district being dammed for the Kaketo reservoir and Harsi reservoir and flowing into the Sind just upstream of the mouth of the Mahuar 2. The Kuno River flows from southeast to northwest of Chambal River and forms part of the western boundary of the district. 3. The Betwa River which flows from southwest to northeast and forms part of the eastern boundary of the district. 4. The Mahuar River itself with its important tributary the Paroch River which get up in Pichor tehsil, flows from south to north, enters Karera tehsil on the village of bardi, crosses Narwar tehsil and enters the Sind simply northeast of Senhra khurd. The land surface attains a most altitude of 468 m (1,535 toes) above suggest sea stage. Demographically Shivpuri had a populace of 179977 (Census 2011) and population density is sixteen/km<sup>2</sup>. Shivpuri consists of many lakes some of them are Chndpatha Jheel, Jadhav Sagar Jheel and different small lakes. The city is understood for its greenery, and additionally former summer season capital of the scindia family. Shivpuri is going thru a subtropical climate like most if the northern areas of India that feathers three principal seasons particularly, a warm summer time, a monsoon and bloodless iciness. In summer season temperature is going up to 26-40°C. In monsoon season common temperature is 20-34°C and in iciness 6-14°C. Shivpuri district average rainfall is 861 mm. Shivpuri has an average literacy fee of 63.73%.

### 2. Methodology

Intensive and extensive survey was carried out during Nov. 2021 to Sept. 2022. The plant exploration work was carried in different seasons. All habitats of the study area surveyed carefully. The vegetation and distribution pattern of the plants were studied. Plant collection and herbarium preparation was carried out by standard method (Jain and Rao, 1977). Plant specimens were preserved by dipping the whole specimens in saturated solution of Mercuric chloride and alcohol. Dry and preserved plants mounted on herbarium sheets by adhesive glue and fevicols. Identification of plants done with the help of flora (Verma et al., 1993; Sing et al., 2001; Mudgal et al., 1997; Khanna et al., 2001; Shah, 1978; Duthi, 1960; Hains, 1921-1924; Cook, 1903; Hooker, 1872-1897; Naik, 1998) and other taxonomic literature.

### 3. Results and discussion

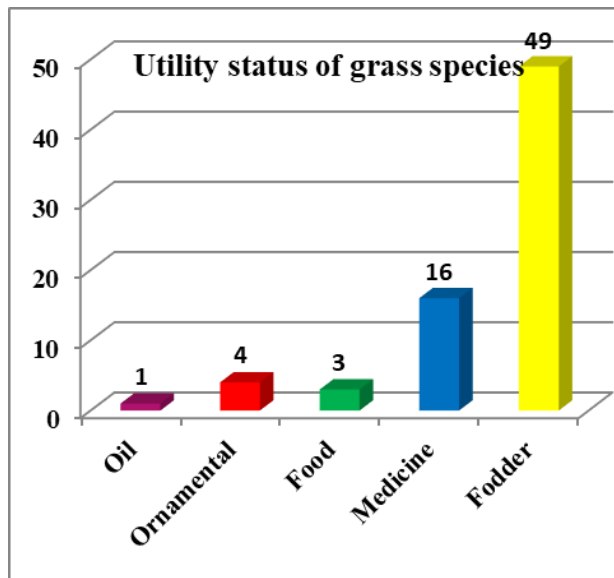
Regular field survey was carried out from Nov. 2021 to Sept. 2022 and visited different forest areas. During the field plant survey more than 100 plants were collected from the study area. Among then 65 plants have been identified. These 65 plants consist of 35 annual species and 30 species are perennial species which is further divided into dominant categories and data are presented into table-1 & Fig.-1. Present study reveals that Oil is obtain by one species namely *Vetiveria zizanioides* (L.) Nash and four species have used for Ornamental purpose three are food and 16 species are used for Medicinal purpose and 49 species is used for fodder purpose (table-2 & Fig.-2). Out of 65 species 50 genera and 7 subfamilies along with 11 tribe are recorded in the study area (Table-3 & Fig.-3) Dominant tribes of the study area are shown in Table-4 & Fig.-4. The present study revealed 65 grass species which are divided into 7 sub families namely Ehrhartoideae & Micrairoideae (1), Arundinoideae, Bambusoideae & Pooideae (2), Chloridoideae (25), and Panicoideae (32) respectively. A botanical name, subfamilies, tribes, Status, Utility, Life trend and Phenology is given in table-5 & Fig.-5. Some species namely *Avena sterilis* L.; *Bambusa arundinaceae* Wil.; *Dendrocalamus strictus* (Roxb.) Nees.; *Polytrias indica* (Hout.) Veld.; *Pennisetum pedicellatum* Trin.; *Phalaris minor* Retz.; *Phragmites karka* (Retz.) trin ex. Steud.; *Tripogon lisboae* Stapf. are rarely observed in the Shivpuri district of Madhya Pradesh, India.



**Figure 1** Dominant family with Number of species

**Table 1** Dominant family with Number of species

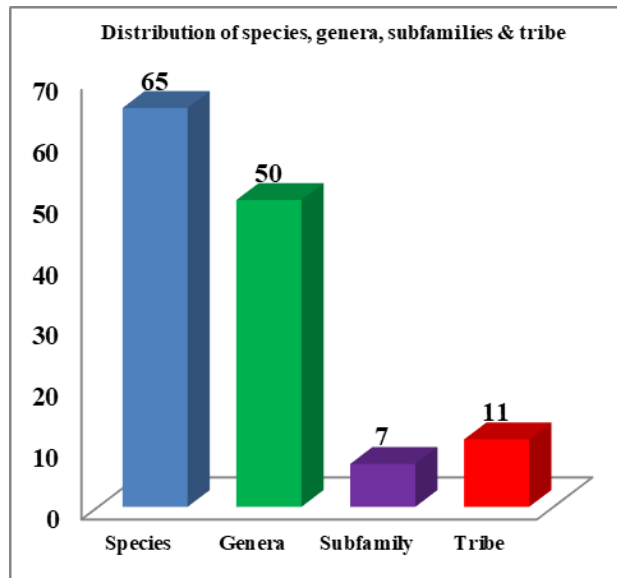
Sn.	Families	Number of species	-
1.	Ehrhartoideae & Micrairoideae	1	-
2.	Arundinoideae, Bambusoideae & Pooideae	2	-
3.	Chloridoideae	25	-
4.	Panicoideae	32	-



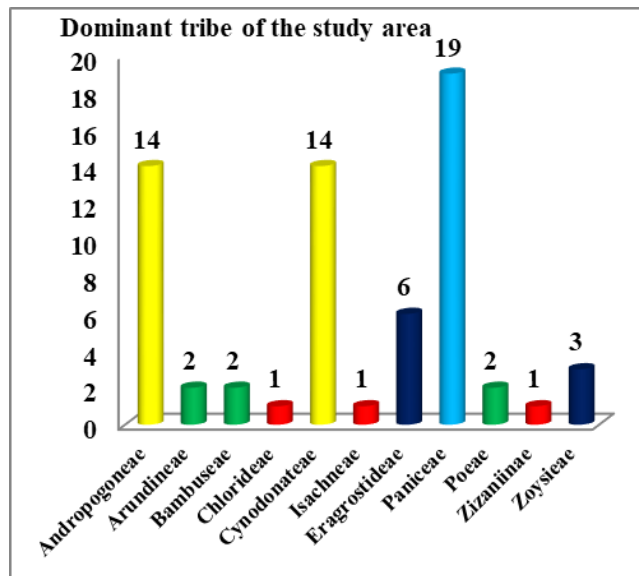
**Figure 2** Utility status of grass species

**Table 2** Utility status of grass species

sn	Categories	Number of species	-
1.	Oil	1	-
2.	Ornamental	4	-
3.	Food	3	-
4.	Medicine	16	-
5.	Fodder	49	-



**Figure 3** Distribution of species, genera, subfamilies & tribe



**Figure 4** Dominant tribe of the area

**Table 3** Distribution of species, genera and subfamilies along with tribe

Species	Genera	Subfamily	Tribe
65	50	7	11

**Table 4** Dominant tribe of the study area

sn	Dominant tribe	Number of species	-
1.	Andropogoneae	14	-
2.	Arundineae	2	-
3.	Bambuseae	2	-
4.	Chloridoae	1	-
5.	Cynodonteae	14	-
6.	Isachneae	1	-
7.	Eragrostideae	6	-
8.	Paniceae	19	-
9.	Poeae	2	-
10.	Zizaniinae	1	-
11.	Zoysieae	3	-

**Table 5** Diversity of grass flora of Shivpuri district with their utility

sn	Botanical name	Subfamily	Tribe	Status	Utility	Life trend	Phenology
1.	<i>Arachne racemosa (Hey.) Ohw.</i>	Chloridoideae	Eragrostideae	F	FO	A	July-Oct.
2.	<i>Apluda mutica L.</i>	Panicoideae	Andropogoneae	F	M	P	Sept.-Feb.
3.	<i>Arundo donex L.</i>	Arundinoideae	Arundineae	C	FO	P	Sept.-Mar.
4.	<i>Avena sterilis L.</i>	Pooideae	Poeae	R	M/FO	A	Jan.-April
5.	<i>Bambusa arundinaceae Wil.</i>	Bambusoideae	Bambuseae	R	O	P	Not seen
6.	<i>Bothriochloa pertusa (L.) Cam.</i>	Panicoideae	Andropogoneae	AB	M	P	July-Oct.
7.	<i>Brachiaria ramosa (L.) Stap.</i>	Panicoideae	Paniceae	F	FO	A	June-Oct.
8.	<i>Brachiaria reptans (L.) Gar. &amp;Hub.</i>	Panicoideae	Paniceae	C	M	A	July-Sept.
9.	<i>Cenchrus ciliaris L.</i>	Panicoideae	Paniceae	VC	M	A	All year
10.	<i>Cenchrus setigerous Vah.</i>	Chloridoideae	Paniceae	VC	FO	A	April-Dec.
11.	<i>Choris barbata Sw.</i>	Chloridoideae	Cynodonteae	F	FO	P	Aug.-Dec.
12.	<i>Coix lacryma jobi L.</i>	Panicoideae	Andropogoneae	F	M	P	Aug.-Dec.
13.	<i>Cymbopogon martini (Roxb.) Wats.</i>	Panicoideae	Andropogoneae	O	M/ O	P	Jan.-Mar.
14.	<i>Cynodon dactylon Pers.</i>	Chloridoideae	Cynodonteae	C	M/ FO	P	All year
15.	<i>Dactyloctenium aegyptium (L.) Wil.</i>	Chloridoideae	Cynodonteae	C	FO	P	July-Sept.
16.	<i>Dendrocalamus strictus (Roxb.) Nees.</i>	Bambusoideae	Bambuseae	R	M/ O	P	Not seen

17.	<i>Desmostachya bipinnata</i> Stapf.	Chloridoideae	Chlorideae	F	M	P	Jun. – Nov.
18.	<i>Dichanthium annulatus</i> Stapf.	Panicoideae	Andropogoneae	F	FO	A	Aug.-Jan.
19.	<i>Digitaria ciliaris</i> (Retz.) Koel.	Panicoideae	Paniceae	C	FO	A	July –Oct.
20.	<i>Digitaria erientha</i> Steud.	Paincoideae	Paniceae	F	FO	A	July –Nov.
21.	<i>Echinochloa colona</i> (L.) Link.	Panicoideae	Paniceae	F	FO	A	June-Nov.
22.	<i>Eragrostis japonica</i> (Thun.) Trin.	Chloridoideae	Eragrostideae	C	FO	A	Oct.-Mar.
23.	<i>Eragrostis cilianensis</i> (All.) Jan.	Chloridoideae	Eragrostideae	VC	FO	A	May –Oct.
24.	<i>Eragrostis pilosa</i> (L.) Beauv.	Chloridoideae	Eragrostideae	VC	FO	A	May –Dec.
25.	<i>Eragrostis tenella</i> (L.) Beauv.	Chloridoideae	Eragrostideae	AB	FO	A	June- Dec.
26.	<i>Eragrostis tremula</i> Hoch.	Chloridoideae	Eragrostideae	AB	FO	A	Aug.- Nov.
27.	<i>Hemarthria compressa</i> (L.) R.Br.	Panicoideae	Andropogoneae	O	FD/M	P	Jul.-Dec
28.	<i>Heteropogon contortus</i> L.	Panicoideae	Andropogoneae	C	FO	P	Oct.-Mar.
29.	<i>Hygroryza aristata</i> (Ratz.)Nees.	Ehrhartoideae	Zizaniinae	O	M	P	Oct.-April
30.	<i>Imperata cylindrical</i> (L.) Raeus .	Panicoideae	Andropogoneae	F	FO	P	June-Oct.
31.	<i>Polytrias indica</i> (Hout.) Veld.	Panicoideae	Andropogoneae	R	FO	P	Aug.-Dec.
32.	<i>Iseilema laxum</i> Hack.	Panicoideae	Andropogoneae	O	FO	A	Aug.-Nov.
33.	<i>Isachne globosa</i> (Thunb.) Kuntze	Micrairoideae	Isachneae	F	FO	A	Aug.- Sept.
34.	<i>Leptochloa panicea</i> (Retz.)Ohwi	Chloridoideae	Cynodonteae	C	FO	A	July- Oct.
35.	<i>Lophopogon tridentatus</i> (Roxb.) Hack.	Panicoideae	andropogoneae	C	FO	A	Aug.-Nov.
36.	<i>Melanocenchris jacquemontii</i> Jaub & spa.	Chloridoideae	Cynodonteae	VC	FO	P	Aug.-Nov.
37.	<i>Microchloa indica</i> (L.) Beauv.	Chloridoideae	Cynodonteae	F	FO	P	Aug.-Dec.
38.	<i>Ophismenus burmannii</i> (Retz.) Beauv.	Panicoideae	Paniceae	F	FD/M	A	July-Dec.
39.	<i>Oplishmenus composites</i> (L.)Beauv.	Panicoideae	Paniceae	F	FO	A	Aug.-Dec.
40.	<i>Oropetium roxburghianum</i> (Steud.) Phil.	Chloridoideae	Cynodonteae	C	FO	P	July-Sept.
41.	<i>Oropetuim villisulum</i> Stapf. Ex.Bor.	Chloridoideae	Cynodonteae	F	FO	P	July- Sept.
42.	<i>Panicum walens</i> Mez.	Panicoideae	Paniceae	VC	FO	A	Mar.- Oct.
43.	<i>Panicum brevifolium</i> L.	Panicoideae	Paniceae	O	FO	A	Sept.-Feb.
44.	<i>Paspalidum geminatum</i> (For.) Stapf.	Panicoideae	Paniceae	VC	FO	A	Sept.-Oct.
45.	<i>Paspalum scrobiculatum</i> L.	Panicoideae	Paniceae	VC	FO	A	Sept.-Feb.
46.	<i>Pennisetum pedicellatum</i> Trin .	Panicoideae	Paniceae	R	O	P	Sept.-Oct.
47.	<i>Pennisetum typoide</i> Rich.	Panicoideae	Paniceae	C	FO	P	Aug.-Dec.
48.	<i>Phalaris minor</i> Retz.	Pooideae	Poeae	R	FO/ M	A	Jan.-March
49.	<i>Phragmites karka</i> (Ret.)Trin ex. Ste.	Arundinoideae	Arundineae	R	FO/ M	P	Sept.-Nov.
50.	<i>Schoenefeldia gracilis</i> Kunth.	Chloridoideae	Cynodonteae	F	FO	A	Aug.-Oct.
51.	<i>Seteria verticillata</i> (L.) Beauv.	Panicoideae	Paniceae	VC	FD	A	Aug.-Oct.
52.	<i>Seteria intermedia</i> Roem. & sch.	Panicoideae	Paniceae	VC	FO	A	July –Dec.
53.	<i>Sehima nervosum</i> (Rot.) Stapf.	Panicoideae	Andropogoneae	F	FO	A	Sept.-Jan.
54.	<i>Spodiopogon rhizophorus</i> (Steud.) Pil.	Panicoideae	Andropogoneae	O	FO	A	Aug.-Dec.

55.	<i>Sporobolus capillaries</i> Miq.	Chloridoideae	Cynodonteae	VC	FO	P	Aug.-Dec.
56.	<i>Sporobolus indicus</i> (L.) R.Br.	Chloridoideae	Zoysieae	VC	FO	P	Sept.-Oct.
57.	<i>Sporobolus tenuissimus</i> (Schr.)Kunt.	Chloridoideae	Zoysieae	F	FO	P	Aug.-Oct.
58.	<i>Sporobolus coromandelianus</i> (Retz.)Kuntz.	Chloridoideae	Zoysieae	C	FO	P	Aug.-Dec.
59.	<i>Tetrapogon tenellus</i> (Roxb.) chiov.	Chloridoideae	Cynodonteae	F	FO	P	July- Nov.
60.	<i>Themeda laxa</i> (Andr.) Cam.	Panicoideae	Panicceae	C	FO	A	July- Nov.
61.	<i>Tripogon lisboae</i> Stapf.	Chloridoideae	Cynodonteae	R	FO	A	Oct.-Dec.
62.	<i>Tripogon jacquemontii</i> Stapf.	Chloridoideae	Cynodonteae	VC	FO	P	Aug.-Dec.
63.	<i>Tragus roxburghii</i> Pani.	Chloridoideae	cynodonteae	C	M	A	July.-Oct.
64.	<i>Urochoa panicoides</i> Beauv.	Panicoideae	Panicceae	AB	FO	A	Aug.-Nov.
65.	<i>Vetiveria zizanioides</i> (L.) Nash.	Panicoideae	Andropogoneae	C	Oil	P	July- -Nov.

Abbreviations: FO = Fodder, FD = Food, M = Medicine, O = Ornamental, A = Annual, P = perennial, AB = Abundant, C = Common, F = Frequent, O = Occasional, R = Rare, VC = Very common

#### 4. Conclusion

The results display that exceptional folk inhabitations of Shivpuri are wealthy in grass variety Grass own family Poaceae is maximum economically essential circle of relatives, imparting staple foods from domesticated cereal plants and millet for meat producing animals and a few individuals of Poaceae households are used as building fabric like thatch and straw and so forth and additionally resources of biofuels. Grasslands consisting of Savannah and prairie where grasses are dominant are estimated to represent 40.5% of the land region of the earth and vital part of the flowers in lots of other habitats including wetlands, forests and tundra. Their economic importance stems from numerous areas, together with food production, enterprise and lawns. Grasses are used inside the manufacture of thatch, paper, gas, clothing, insulation, timber for fencing, furniture, scaffolding, creation material, ground matting, sports tort and baskets and plenty of extra. Even of all vegetation frown, 70% are grasses. Agricultural grasses grown for his or her fit to be eaten seeds are called grains or cereals. Bamboos are utilized in several dishes and broths .many species are grown in pasture for foraging. Detailed studies are required for superb exploitation and wider software of grass utility.

#### Compliance with ethical standards

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##### Disclosure of conflict of interest

There is no Conflict of interest.

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