International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Floristic Diversity of the Family Poaceae in Ranchi City, Jharkhand, India

Dr. Satyendra Kumar Gupta

HOD, Dept. of Botany, MSM Samta Mahavidyalaya (BRABU, Muzaffarpur), Jandaha, Vaishali, Bihar.844505
Email: *sksatyendragupta[at]gmail.com*

Abstract: ***An account of the members of the family Poaceae in Ranchi City, Jharkhand. Field surveys conducted during 2022-2025 resulted in the collection of 93 species belonging to 55 genera, while more than 5 species remain unidentified. The taxa are found to be distributed in open fields, Roadside area, rail track side area, agricultural lands, and nearby waterbodies. Members of Poaceae were observed to be economically important as staple food, cattle feed, soil binders, and in various ecological roles. The study indicates a decline in grass diversity due to rapid urbanization that emphasizes the need for documentation and conservation.***

Keywords: Floristic diversity, Poaceae, Ranchi City, Urbanization

1. Introduction

In the present era of biodiversity degradation, the documentation of regional flora is considered essential. Grasses (Poaceae) constitute one of the most economically important groups; however, there is increasingly threatened by urbanization. The documentation and utilization of grasses have been hindered by the lack of user-friendly taxonomic literature and the shortage of trained taxonomists.

Ranchi, the capital city of Jharkhand, is located between 23° 14′ 11″ – 23° 27′ 00″ N latitude and 85° 12′ 59″ – 85° 26′ 08″ E longitude, covering an area of 175.12 sq. km. The city lies in the southern part of the Chotanagpur plateau and has an average elevation of 651 m. Rapid urbanization following the formation of Jharkhand in 2000 has led to significant ecological changes. More than 300 water bodies reported earlier, of which over 100 have been lost in recent decades due to encroachment and infrastructure development.

The family Poaceae is the fifth largest among angiosperms after Asteraceae, Orchidaceae, Fabaceae, and Rubiaceae (Hodkinson, 2018). It comprises 1100–1200 species in 750–777 genera worldwide (Kellogg, 2015), while in India, it is represented by 1506 species under 266 genera (Elizabeth et al. 2020). Earlier, 122 species belonging to 63 genera were reported from Ranchi district (Ghosh, 1972). The present study aims to reassess the floristic diversity of Poaceae in Ranchi City.

2. Material and Method

The present study was carried out in Ranchi City by dividing the area into different zones. Periodic surveys were conducted from January 2022 to December 2025 in various localities including Kamre, Pandra, Gutua, Pundag, Jagannathpur, Dhurwa, Hatia, Balalong, Sidroll, Tatisiwai, Dumardaga, Mahilong, Buti, Boreya, HEC area, MECON colony.

Plant specimens were collected and preserved on the standard herbarium sheets following established methods (Jain & Rao, 1960; Rao & Sharma, 1990). These specimens were identified with the help of regional floras, reference books checklists and research papers (Ghosh, 1972; Haines, 1921-24; Hooker, 1892-97; Jain & Rao, 1960; Kellogg, 2015; Barik, 2017; Naik, 1981; Potdar, 2012; Sinha & Shukla, 2009; Soreng, 2017; etc.). All possible ecological and distributional data were recorded during the study period.

Table 1: Grass diversity of Ranchi City, Jharkhand

SN	Taxon	Subfamily	Locality	Habitat & Ecology	Economic uses
1	*Aristida setacea* Retz.	Aristidoideae	Near Soso Bridge	R, RAA	Fodder
2	*Arundo donax* L.	Arundinoideae	Near Gutua	R, WA	Fodder
3	*Elytrophorus spicatus* (Willd.) A.Camus	Arundinoideae	Near Vidhan Sabha	C, WA	Fodder
4	*Phragmites karka* (Retz.) Trin. ex Steud.	Arundinoideae	Sirkha Toli	R, FA	Fodder
5	*Leersia hexandra* Sw.	Oryzoideae	HEC Colony	C, WA	Fodder
6	*Oryza rufipogon* Griff.	Oryzoideae	Jagannath Mandir	C, WA	Fodder
7	*Oryza sativa* L.	Oryzoideae	Crop field	C, CP	Crop
8	*Bambusa balcooa* Roxb.	Bambusoideae	Bajara	R, P	Ornamental
9	*Bambusa bambos* (L.) Voss.	Bambusoideae	Raj Bhawan	C, P	Ornamental
10	*Bambusa polymorpha* Munro	Bambusoideae	Raj Bhawan	C, P	Ornamental
11	*Dendrocalamus strictus* (Roxb.) Nees	Bambusoideae	Raj Bhawan	R, P	Ornamental
12	*Alopecurus aequalis* Sobol.	Pooideae	Kanke	C, WA	Fodder
13	*Avena sativa* L.	Pooideae	Crop field	C, P	Crop
14	*Hordeum vulgare* L.	Pooideae	Kanke	C, P	Crop
15	*Phalaris minor* Retz.	Pooideae	Kanke	C, CFA, WE	Fodder

16	*Polypogon monspeliensis* (L.) Desf.	Pooideae	Hatia	C, CFA, WE	Fodder
17	*Triticum aestivum* L.	Pooideae	Crop field	C, P	Crop
18	*Chloris barbata* Sw.	Chloridoideae	Dibadih	C, RDA	Fodder
19	*Cynodon dactylon* (L.) Pers.	Chloridoideae	Open field	C, P	Lawn grass
20	*Dactyloctenium aegyptium* (L.) Willd.	Chloridoideae	Dibadih	C, RTA, RDA	Fodder
21	*Dactyloctenium aristatum* Link	Chloridoideae	Field margins	R, RTA	Fodder
22	*Desmostachya bipinnata* (L.) Stapf	Chloridoideae	Biodiversity Park	R, OFA	Fodder
23	*Dinebra panicea* (Retz.) P.M.Peterson & N.Snow	Chloridoideae	Indrapuri	C, RDA, CFA, WE	Fodder
24	*Eleusine coracana* (L.) Gaertn.	Chloridoideae	Crop field	C, P	Crop
25	*Eleusine indica* (L.) Gaertn.	Chloridoideae	Common weed	A, CFA, RDA, RTA, WE	Fodder
26	*Eragrostiella bifaria* (Vahl) Bor	Chloridoideae	Kamre	R, FA	Fodder
27	*Eragrostiella brachyphylla* (Stapf) Bor	Chloridoideae	Boreya	R, FA	Fodder
28	*Eragrostis curvula* (Schrad.) Nees	Chloridoideae	Common weed	R, RDA	Fodder
29	*Eragrostis pectinacea* (Michx.) Nees	Chloridoideae	Gutua	C, RDA	Fodder
30	*Eragrostis pilosa* (L.) P.Beauv.	Chloridoideae	MECON Colony	C, OFA	Fodder
31	*Eragrostis tenella* (L.) P.Beauv.	Chloridoideae	Dibadih	C, CFA, WE	Fodder
32	*Eragrostis tenellula* (Kunth) Steud.	Chloridoideae	Dibadih	C, RDA	Fodder
33	*Eragrostis tenuifolia* (A.Rich.) Hochst. ex Steud.	Chloridoideae	Dibadih	C, RDA	Fodder
34	*Eragrostis unioloides* (Retz.) Nees ex Steud.	Chloridoideae	Dibadih	C, RDA, OFA	Fodder
35	*Eragrostis ciliaris* (L.) R.Br.	Chloridoideae	Roadside weed	C, RDA	Fodder
36	*Eragrostis japonica* (Thunb.) Trin.	Chloridoideae	Common weed	R, RDA	Fodder
37	*Perotis indica* (L.) Kuntze	Chloridoideae	Vidhan Sabha	R, RAA	Rare
38	*Sporobolus indicus* (L.) R.Br.	Chloridoideae	Pundag	R, OFA	Fodder
39	*Zoysia japonica* Steud.	Chloridoideae	Planted	R, P	Lawn grass
40	*Alloteropsis cimicina* (L.) Stapf	Panicoideae	Dibadih	R, RTA	Fodder
41	*Arthraxon hispidus* (Thunb.) Makino	Panicoideae	MECON Colony	C, WLA	Fodder
42	*Arthraxon lancifolius* (Trin.) Hochst.	Panicoideae	HEC Colony	R, WLA, RAA	Fodder
43	*Arundinella pumila* (Hochst. ex A.Rich.) Steud.	Panicoideae	MECON Colony	R, CFA, WE	Fodder
44	*Axonopus compressus* (Sw.) P.Beauv.	Panicoideae	MECON Colony	R, P	Carpet grass
45	*Bothriochloa bladhii* (Retz.) S.T.Blake	Panicoideae	Banhaura	C, RDA	Fodder
46	*Bothriochloa ischaemum* (L.) Keng	Panicoideae	Banhaura	C, RDA	Fodder
47	*Bothriochloa pertusa* (L.) A. Camus	Panicoideae	Bariyatu	C, RDA	Fodder
48	*Cenchrus americanus* (L.) Morrone	Panicoideae	Boreya	R, P	Crop
49	*Cenchrus orientalis* (Rich.) Morrone	Panicoideae	MECON Colony	R, OFA	Fodder
50	*Cenchrus pedicellatus* (Trin.) Morrone	Panicoideae	MECON Colony	C, OFA	Fodder
51	*Cenchrus purpureus* (Schumach.) Morrone	Panicoideae	MECON Colony	R, OFA	Fodder
52	*Cenchrus setaceus* (Forssk.) Morrone	Panicoideae	MECON Colony	R, RAA	Fodder
53	*Chrysopogon aciculatus* (Retz.) Trin.	Panicoideae	Bariyatu	C, OFA	Fodder
54	*Chrysopogon hackelii* (Hook.f.) C.E.C.Fisch.	Panicoideae	Boreya	R, FA	Foder
55	*Coix lacryma-jobi* L.	Panicoideae	Dibadih	C, RDA	Fodder
56	*Cymbopogon martini* (Roxb.) Will.Watson	Panicoideae	JVM, Shyamali	R, P	Industrial
57	*Dichanthium annulatum* (Forssk.) Stapf	Panicoideae	Dibadih	C, RDA	Fodder
58	*Digitaria bicornis* (Lam.) Roem. & Schult.	Panicoideae	MECON Colony	C, OFA, RDA, CFA, WE	Fodder
59	*Digitaria ciliaris* (Retz.) Koeler	Panicoideae	MECON Colony	C, OFA, RDA, CFA, WE	Fodder
60	*Digitaria sanguinalis* (L.) Scop.	Panicoideae	Boreya	C, CFA, WE	Fodder
61	*Digitaria setigera* Roth	Panicoideae	HEC Colony	C, RDA, CFA, WE	Fodder
62	*Dimeria ornithopoda* Trin.	Panicoideae	Boreya	R, OFA	Fodder
63	*Echinochloa colona* (L.) Link	Panicoideae	Dibadih	C, CFA, WE	Fodder
64	*Echinochloa crus-galli* (L.) P.Beauv.	Panicoideae	Dibadih	C, CFA, WE	Fodder, grain
65	*Hackelochloa granularis* (L.) Kuntze	Panicoideae	Field margins	R, OFA	Fodder
66	*Hemarthria compressa* (L.f.) R.Br.	Panicoideae	Samlong	R, FA	Fodder
67	*Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.	Panicoideae	Common weed	C, OFA, RDA, FA	Fodder
68	*Imperata cylindrica* (L.) Raeusch.	Panicoideae	MECON Colony	C, OFA	Fodder
69	*Ischaemum aristatum* L.	Panicoideae	Dibadih	C, CFA, OFA, WE	Fodder
70	*Ischaemum ciliare* Retz.	Panicoideae	Mahilong	C, CFA, OFA, WE	Fodder
71	*Ischaemum polystachyum* J.Presl	Panicoideae	Boreya	C, RDA	Fodder
72	*Oplismenus burmanni* (Retz.) P.Beauv.	Panicoideae	MECON Colony	C, RDA	Fodder
73	*Panicum repens* L.	Panicoideae	Mahilong	C, WA	Fodder
74	*Paspalum distichum* L.	Panicoideae	Dibadih	C	Fodder

75	*Rottboellia cochinchinensis* (Lour.) Clayton	Panicoideae	Mahilong	R, FA	Fodder
76	*Saccharum officinarum* L.	Panicoideae	Boreya	C, P	Crop
77	*Saccharum spontaneum* L.	Panicoideae	Roadside	A, RDA, RTA	Industrial
78	*Sacciolepis indica* (L.) Chase	Panicoideae	HEC Colony	C, OFA	Fodder
79	*Sacciolepis myosuroides* (R.Br.) Chase ex E.G.Camus & A.Camus	Panicoideae	Mahilong	C, OFA, WA	Fodder
80	*Setaria flavida* (Retz.) Veldkamp	Panicoideae	Dibadih	C, RDA, TRA, OFA	Fodder
81	*Setaria intermedia* Roem. & Schult.	Panicoideae	MECON Colony	C, CFA, WE	Fodder
82	*Setaria parviflora* (Poir.) Kerguélen	Panicoideae	Bariyatu	R, FA	Fodder
83	*Setaria pumila* (Poir.) Roem. & Schult.	Panicoideae	Common weed	C, CFA, OFA, WE	Fodder
84	*Setaria verticillata* (L.) P.Beauv.	Panicoideae	Common weed	C, CFA, WE	Weed
85	*Setaria viridis* (L.) P.Beauv.	Panicoideae	Kanke	C, OFA, WA	Fodder
86	*Sorghum bicolor* (L.) Moench	Panicoideae	Crop field	R, P	Crop
87	*Sorghum halepense* (L.) Pers.	Panicoideae	MECON Colony	R, WA	Fodder
88	*Themeda triandra* Forssk.	Panicoideae	Mahilong	R, RDA	Fodder
89	*Thysanolaena latifolia* (Roxb. ex Hornem.) Honda	Panicoideae	MECON Colony	R, RAA	Industrial
90	*Urochloa distachyos* (L.) T.Q.Nguyen	Panicoideae	Mahilong	C, CFA, WA	Fodder
91	*Urochloa panicoides* P.Beauv.	Panicoideae	MECON Colony	C, CFA, WA	Fodder
92	*Urochloa ramosa* (L.) T.Q.Nguyen	Panicoideae	MECON Colony	C, CFA, WE	Fodder
93	Zea mays L.	Panicoideae	Crop field	C, P	Crop

Abbreviations:	
Occurrence	R = Rare; C = Common; A = Abundant;
Vegetation	P= planted; CP= crop; WE= weed;
Association	FA=forest associated; WA= wall associated; CFA= crop field associated; OFA= open field associated; RAA= rocky area associated; RDA=road side associated; RTA= rail track associated.

3. Result and Discussion

The present investigation on the grass flora of Ranchi city, Jharkhand, revealed a considerable diversity of the family Poaceae, which is comparable to similar studies conducted in other regions of India (Barik, 2017; Dhatchanamoorthy et al., 2021; Ray & Sainkhediya, 2012).

Table 2: Species Diversity of different Subfamilies

Subfamilies	Genera	Species	Dominance	Indication
Aristidoideae	1	1	Least Represented	
Arundinoideae	3	3	Least Represented	
Oryzoideae	2	3	Least Represented	
Bambusoideae	2	4	Less represented	
Pooideae	6	6	Moderate	Cooler microhabitats
Chloridoideae	11	22	Second Dominant	Dry and disturbed habitat
Panicoideae	30	54	Highly dominant	Tropical climatic condition
Family Poaceae	55	93		

The variation in species composition may be attributed to differences in ecological conditions, anthropogenic disturbance and habitat types. The findings are in agreement with earlier floristic records of the region (Ghosh, 1972) and broader regional floras (Haines, 1921-1924; Hooker, 1892-1897).

Figure 1: A= *Elytrophorus spicatus* (Willd.) A. Camus, B= *Oryza rufipogon* Griff., C= *Bambusa polymorpha* Munro., D= *Chloris barbata* Sw., E=*Dactyloctenium aegyptium* (L.) Willd., F= *Dinebra panicea* (Retz.) P.M.Peterson & N.Snow, G= *Eleusine coracana* (L.) Gaertn. H= *Eleusine indica* (L.) Gaertn., I= *Eragrostiella bifaria* (Vahl) Bor

Figure 2: J= *Perotis indica* (L.) Kuntze, K=*Alloteropsis cimicina* (L.) Stapf, L= *Axonopus compressus* (Sw.) P.Beauv., M= *Bothriochloa bladhii* (Retz.) S.T.Blake, N= *Cenchrus americanus* (L.) Morrone, O= *Cenchrus orientalis* (Rich.) Morrone, P= *Cenchrus pedicellatus* (Trin.) Morrone, Q= *Coix lacryma-jobi* L. R= *Dichanthium annulatum* (Forssk.) Stapf,

Figure 3: S= *Dimeria ornithopoda* Trin. T= *Echinochloa colona* (L.) Link, U= *Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult., V= *Ischaemum aristatum* L., W= *Oplismenus burmanni* (Retz.) P.Beauv., X= *Paspalum scrobiculatum* L., Y= *Saccharum spontaneum* L., Z= *Sacciolepis indica* (L.) Chase, AA= *Sacciolepis myosuroides* (R.Br.) Chase ex E.G.Camus & A.Camus

Figure 4: AB= *Setaria flavida* (Retz.) Veldkamp, AC= *Setaria intermedia* Roem. & Schult., AD= *Setaria parviflora* (Poir.) Kerguélen, AE= *Setaria pumila* (Poir.) Roem. & Schult., AF & AG= *Setaria verticillata* (L.) P. Beauv.

Family Poaceae comprises 93 species distributed among seven subfamilies. The richness of grasses in the study area reflects the ecological heterogeneity and adaptability of members of Poaceae to a wide range of habitats. Among the recorded taxa, Panicoideae was the most common subfamily among the recorded taxa, with 54 species. Chloridoideae came in second position with 22 species and Pooideae came in third with 6 species. The predominance of the Panicoideae and Chloridoideae is a characteristic feature of the tropical and subtropical regions that have disturbance-adapted grasses, as members of these particular subfamilies are well adapted to high temperatures and seasonal rainfall conditions.

The considerable representation of Chloridoideae indicates the prevalence of xeric and disturbed habitats, as species of this group are known for their tolerance to drought and grazing pressure. In contrast, the relatively low representation of Pooideae, Bambusoideae, Arundinoideae, Oryzoideae, and Aristidoideae suggests their restricted ecological amplitude within the study area.

The distribution pattern of grasses across different habitats revealed that the roadside associated, crop fields associated and open field associated harbour maximum species diversity. Roadside habitats and rail track areas showed a high abundance of grasses, indicating the strong tolerance to anthropogenic disturbances such as trampling, pollution and soil compaction.

Crop field areas also supported a large number of species, many of which are associated weeds that grow alongside cultivated crops. Wetland and water-associated habitats supported comparatively fewer but ecologically significant species such as *Oryza rufipogon* and *Leersia hexandra,* which indicate the presence of moist and semi-aquatic ecosystems. The dominance of genera like *Eragrostis, Digitaria* and *Setaria* further supports adaptation to disturbed environment. Forested areas and rocky habitat showed moderate diversity, reflecting localized ecological niches.

The study highlights the significant economic value of grasses in the region. A large proportion of the recorded species are used as fodder, forming the backbone of livestock sustenance in rural and pre-urban areas. Important crop species such as *Oryza sativa, Triticum aestivum, Zea mays, Eleusine coracana* and *Sorghum bicolor* emphasize the agricultural importance of Poaceae. Several species also serve industrial and domestic purposes, such as *Thysanolaena latifolia* (broom making) and *Saccharum spontaneum* (mat making). Species like *Cynodon dactylon* and *Imparta cylindrica* play a crucial role in soil binding and erosion control, thereby contributing to ecosystem stability.

A significant proportion of grass recorded in the present study are weed species, including *Echinochloa colona*, *Digitaria ciliaris*, *Setaria viridis* and *Eleusine indica.* Their abundance in crop fields and destroyed habitats reflects the impact of human activities such as agriculture, urbanization and land-use changes. These species exhibit rapid growth, high reproductive capacity and adaptability, making them successful colonizers.

The present study demonstrates that Ranchi City supports a rich and diverse grass flora, largely dominated by tropical elements and disturbance tolerant species. The high diversity in the anthropogenically influenced habitats underscores the adaptive nature of grasses, while their economic and ecological roles highlight their importance in sustaining both natural ecosystems and human livelihoods. Overall, the grass flora of Ranchi represents a mixture of natural and semi-natural vegetation with high ecological and economic significance. The documentation of such diversity provides the valuable baseline for future ecological, taxonomic, and conservation studies.

Acknowledgement
The author is grateful to the Department of Botany, Ranchi University, and Dr. Shyama Prasad Mukherjee University for providing necessary facilities. Thanks, are also due to the staff of the Central Library, Ranchi University, and local inhabitants for their assistance during field survey.

References

[1] Barik, K.L. 2017. Floristic composition of the Grassland community of Odisha, India. *Indian Journal of Applied Research*. 7(2): 682-684.
[2] Dhatchanamoorthy, N. et al. 2021. Studies on the Grass flora of Savandurga forest, Karnataka, India. *Species* 22(70).
[3] Elizabeth, A. Kellogg et al. 2020. Checklist of the Grasses of India. *PhytoKeys* 163: 1–560
[4] Ghosh, T.K. 1972. Studies on Flora of Ranchi District. *Ph. D. Thesis*, Ranchi University, Ranchi.
[5] Haines, H.H. 1921-1924. *The Botany of Bihar and Orissa*, Calcutta: BSI.
[6] Hodkinson, T.R. 2018. Evolution and Taxonomy of the Grasses (Poaceae): *Annual Plant Reviews* (pp. 1-39). doi:10.1002/9781119312994.apr0622
[7] Hooker, J.D. 1892-1897. *Flora of British India*. Calcutta: BSI.
[8] Jain, S.K. and Rao, R.R. 1960. *A handbook of field and Herbarium methods*. New Delhi.
[9] Kellogg, E.A. 2015. *Flowering plants*: Monocots-Poaceae. Springer
[10] Naik, V.N. 1981. A Survey of the Flora of Maharathawada. *Bull. Bot. Surv. India* 23:51-55.
[11] Potdar, G.G. et al. 2012. Grasses of Maharashtra. Kolhapur.
[12] Rao, R.R. and Sharma, B.D. 1990. *Manual for herbarium collection*. Calcutta: BSI.
[13] Ray, S. and Sainkhediya, J. 2012. Diversity of Grasses in Nimar Region. *Indian Journal of Plant Sciences*, 1:144-152.
[14] Sinha, B.K. and Shukla, B.K. 2009. Synoptic flora of Khargone District. *J. Eco. Taxon. Bot*. 31(3).
[15] Soreng, R.J. et al. 2017. Phylogenetic classification of Poaceae. *J. Systematics and Evolution* 55 (4): 259-290. doi:10.1111/jse.12262.
[16] Verma, D.M., Balakrishnan and Dixit, R.D. 1993. *Flora of Madhya Pradesh*. Calcutta: BSI.