FLORAL DIVERSITY OF A GRASSLAND COMMUNITY OF BANGIRIPOSI IN ODISHA

Prabir Kumar Rout[1] & Kamal L. Barik [2]

[1]Lecturer in Botany, L.K. College, Bangiriposi, Mayurbhanj, Odisha
[2]Lecturer in Botany, North Orissa University, Takatpur, Baripada -757003, Odisha, India

ABSTRACT

The floral diversity of a grassland community of Bangiriposi ($86^0 32'30'' E$; $22^0 08'30'' N$) in the district of Mayurbhanj, Odisha was extensively studied. The community comprised of 32 species (8 species were grasses and 24 were non-grasses). They belongs to 15 families i.e. Acanthaceae, Asteraceae, Commelinaceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Linderniaceae, Lythraceae, Molluginaceae, Phyllanthaceae, Poaceae, Rubiaceae, Scrophulariaceae and Violaceae. Among them, the members of the family Poaceae showed high percentage contribution (25%) followed by Linderniaceae (15.6%). The family Asteraceae, Cyperaceae, Fabaceae and Phyllanthaceae shared 6.3% each, whereas rest of the 8 family shared 3.1% each during the study period. The topography, climatic conditions, geography and the biotic interference might be responsible for variation in floral diversity in the experimental site.

Keywords : Floral diversity, grassland, community.

I. INTRODUCTION

Grassland plays a vital role for the survival of living being. Grassland flora controls soil erosion, absorbs rainfall, restores soil fertility and is regarded as the cheapest sources of nutrients for livestock. Some of the plant species are used as fodder for grasshoppers, domestic animals and many other herbivores. Various species of grasses are being used for paper and pulp making industries. A number of species are used to produce aromatic oil. Some of the species are used as herbal medicines also. Human activities have chiefly affected the grasslands, as a result much of the area has been converted into agriculture land and it is hard to locate virgin grassland in thickly populated regions like India. The scientists and technologists are increasingly being engaged now-a-day in the research projects relating to conservation and management of grasslands. Several organizations in both developed and developing countries are also actively engaged in research through International Biological Program (IBP), Man and Biosphere (MAB), Grassland Foundation (GF), World Wildlife Fund (WWF) and such others to conserve and manage the grasslands for the betterment of living being.

1.1 Review of Literature

Literature review revels a lot of information on study of grassland communities by Raunkiaer [1], Tisdale [2], Odum [3], Ovington **et al**. [4], Golley [5], Whittaker [6], Sims & Singh [7], Redmann [8], Singh & Ambasht [9], Rath & Misra [10], Malana & Misra [11], Misra & Misra [12], Mishra [13], Noy-Meir **et al**. [14], Ram & Arya [15], Diaz **et al**. [16], Hussain **et al**. [17], Ejrnaes & Bruun [18], Batalha & Martins [19], Nazir & Malik [20], Ghani & Khalik [21], Misra [22], Barik [23], Kar **et al.** [24], Pandey **et al**. [25], Nair [26], and many others. The study of floral diversity provides necessary data and information to the observers, researchers and planner to build up a correct ecological picture of an area. Literature study revealed a lot of information's on various aspects of grassland communities in India and abroad. However, very little work has been made so far especially in the north - east belt of the state. Keeping all these fact in view, an attempt has been made to study the phytodiversity of a grassland community of this region.

1.2 Aim of the Study :

The aim and objective of this investigation is to assess the floral diversity of a grassland community of Bangiriposi in the district of Mayurbhanj, Odisha.

1.3 Study Site and Environment :

The experimental grassland community was selected at Silpunji ($86^0$32'30'' E ; $22^0$08'30'' N) Bangiriposi, in the district of Mayurbhanj, Odisha (Fig.-1 & 2). The site is situated at a distance of 40 kms. away from North Orissa University and 36 kms. from Baripada, the district head quarter of Mayurbhanj in the state of Odisha. The attitude of the site is above 104.6m.

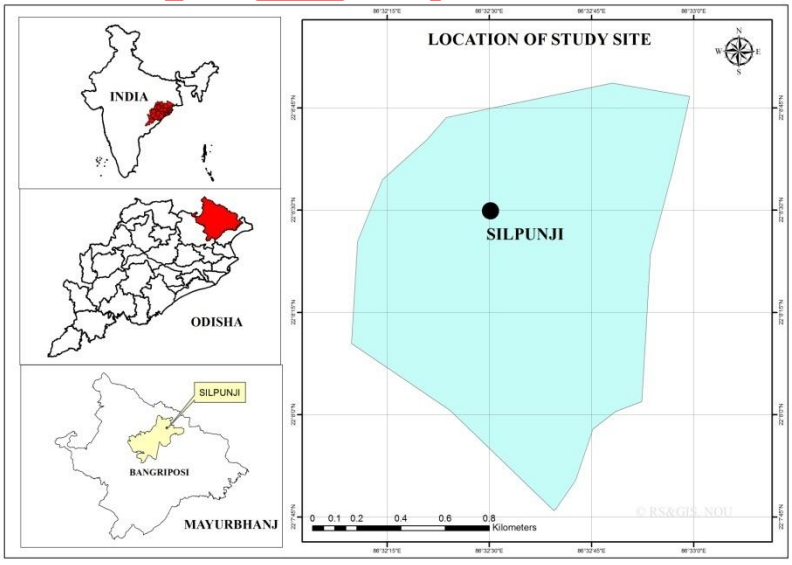

Fig. -1 Map showing the location of Experimental site

Fig. -2 Photograph showing the Experimental site

The climatic condition of the locality is monsoonal with three distinct seasons i.e. rainy (July to October), winter (November to February) and summer (March to June). The seasons are classified basing upon the amount of rainfall and also to the prevailing atmospheric temperature. The total rainfall during the study period was found to be 2537.1 mm of which a maximum of 634.6 mm was recorded during July. No rainfall was observed in the month of December. Total number of rainy days was found to be 114 days. The mean minimum and mean maximum atmospheric temperature recorded during the study period was found to be normal. December showed the lowest temperature (11.53^{0}C) whereas May experienced the highest temperature (37.35^{0}C) during the study period (Table - 1).

Table – 1 Monthly rainfall, mean minimum and mean maximum atmospheric temperature of the experimental site during the study period.

Month (s)	Rainfall (mm)	No. of rainy days	Atmospheric temperature (^{0}C)	
			Mean minimum	Mean Maximum
Jan. 2007	2.6	01	11.97	26.63
Feb. 2007	66.6	03	16.55	28.66
Mar. 2007	43.4	04	19.57	33.18
Apr. 2007	91.6	05	23.65	37.28
May. 2007	52.7	06	25.09	37.35
June. 2007	351.0	29	25.21	34.60
July. 2007	634.6	19	24.7	32.37
Aug. 2007	483.8	15	24.4	31.88
Sept. 2007	607.2	24	23.86	30.43
Oct. 2007	33.0	02	20.55	31.46
Nov. 2007	68.6	03	17.40	28.13
Dec. 2007	-	-	11.53	25.97
Jan. 2008	102.0	03	11.75	26.38
Total	2537.1	114	-	-

The soil of the experimental site (Table -2) was found to be strongly acidic (pH < 5.0). The available phosphorus and potassium content of the soil was found to be very low. The organic carbon (%) as well showed very low in concentration (0.38% to 0.47%).

Table - 2 The pH, conductivity, organic carbon (%), available phosphorus and potassium content of the soil of the study site (values are in mean ±SD, n=5 each)

Surface depth in cm	pH	Conductivity	Organic carbon (%)	Available phosphorus (ppm)	Available potassium (ppm)
0 to 10	4.7±0.24	0.5±0.00	0.38±0.12	0.2±0.17	20.4±11.8
10 to 20	4.62±0.16	0.5±0.00	0.47±0.19	0.24±0.31	24.7±25.97
20 to 30	4.74±0.18	0.54±0.09	0.44±0.10	0.18±0.13	15.9±6.26

II. MATERIALS AND METHODS

All the plant specimens encountered from the experimental grassland community were collected in quadruplicates either in flowering or fruiting stage and identified taxonomically with the help of various regional and national flora books (Hooker, [27] ; Haines, [28] ; Mooney, [29] ; Saxena & Brahmam, [30] ; Panigrahi & Murti, [31] ; Murti & Panigrahi, [32] ; Verma **et al.,** [33] ; Mudgal **et al.,** [34] and Singh **et al.,** [35]). The herbarium specimens were prepared following standard methodology as described by Jain & Rao [36]. The voucher specimens were housed in Herbarium, P.G. Department of Botany, North Orissa University, Baripada, Odisha for future use and reference.

III. RESULTS AND DISCUSSION

A complete floristic list along with their families of the experimental site was presented in Table-3. The community comprised of 32 species. Out of which 8 species were grasses and 24 were non-grasses. All grasses and non-grasses belonged to 15 familes i.e. Acanthaceae (*Justicia diffusa),* Asteraceae (*Elephantopus scaber*, *Vernonia cinerea*), Commelinaceae (*Murdannia nudiflora*), Convolvulaceae (*Evolvulus nummularius),* Cyperaceae (*Fimbristylis acuminata*, *Fimbristylis dichotoma),* Euphorbiaceae (*Euphorbia hirta),* Fabaceae *(Desmodium triflorum*, *Indigofera linnaei*), Linderniaceae (*Lindernia anagallis*, *Lindernia antipoda*, *Lindernia multiflora*, *Lindernia nummulariifolia*, *Lindernia parviflora*), Lythraceae (*Rotala indica),* Molluginaceae (*Mollugo pentaphylla),* Phyllanthaceae (*Phyllanthus amarus*, *Phyllanthus virgatus*), Poaceae (*Chrysopogon aciculatus* , *Cynodon dactylon*, *Eragrostis tenella*, *Eragrostis unioloides*, *Heteropogon contortus*, *Peroties indica*, *Sacciolepis indica*, *Sporobolus indicus*), Rubiaceae (*Hedyotis herbacea*, *Hedyotis pinifolia*, *Spermacoce ramanii*), Scrophulariaceae (*Centranthera indica*) and Violaceae (*Hybanthus enneaspermus*).

Table – 3 Floristic list of experimental grassland community showing their respective families.

Sl. No.	Name of the Species	Family
	Grasses	
1	*Chrysopogon aciculatus* (Retz.) Trin.	Poaceae
2	*Cynodon dactylon* (L.) Pers.	Poaceae
3	*Eragrostis tenella* (L.) P .Beauv. ex Roem. & Schult.	Poaceae
4	*Eragrostis unioloides* (Retz.) Nees ex Steud.	Poaceae
5	*Heteropogon contortus* (L.) P .Beauv. ex Roem. & Schult.	Poaceae
6	*Peroties indica* (L.) Kuntze	Poaceae
7	*Sacciolepis indica* (L.) Chase	Poaceae
8	*Sporobolus indicus* (L.) R.Br.	Poaceae
	Non-Grasses	
1	*Centranthera indica* (L.) Gamble	Scrophulariaceae
2	*Desmodium triflorum* (L.) DC.	Fabaceae
3	*Elephantopus scaber* L.	Asteraceae
4	*Euphorbia hirta* L.	Euphorbiaceae
5	*Evolvulus nummularius* (L.) L	Convolvulaceae
6	*Fimbristylis acuminata* Vahl	Cyperaceae
7	*Fimbristylis dichotoma* (L.) Vahl	Cyperaceae
8	*Hedyotis herbacea* L.	Rubiaceae
9	*Hedyotis pinifolia* Wall. ex G. Don	Rubiaceae
10	*Hybanthus enneaspermus* (L.) F. Muell.	Violaceae
11	*Indigofera linnaei* Ali	Fabaceae
12	*Justicia diffusa* Willd.	Acanthaceae
13	*Lindernia anagallis* (Burm.f.) Pennell	Linderniaceae
14	*Lindernia antipoda* (L.) Alston	Linderniaceae
15	*Lindernia multiflora* (Roxb.) Mukerjee	Linderniaceae
16	*Lindernia nummulariifolia* (D.Don) Wettst.	Linderniaceae
17	*Lindernia parviflora* (Roxb.) Haines	Linderniaceae
18	*Mollugo pentaphylla* L.	Molluginaceae
19	*Murdannia nudiflora* (L.) Brenan	Commelinaceae
20	*Phyllanthus amarus* Schumach. & Thonn.	Phyllanthaceae
21	*Phyllanthus virgatus* G. Forst.	Phyllanthaceae
22	*Rotala indica* (willd.) Koehne	Lythraceae
23	*Spermacoce ramanii* Sivar & Nair	Rubiaceae
24	*Vernonia cinerea* (L.) Less.	Asteraceae

The Community was mostly dominated by the members of the family Poaceae (25%) followed by Linderniaceae (15.6%), Asteraceae, Cyperaceae, Fabaceae and Phyllanthaceae (6.3% each) whereas the members of rest of the family i.e. Acanthaceae, Commelinaceae, Convolvulaceae, Euphorbiaceae, Lythraceae, Molluginaceae, Scrophulariaceae and Violaceae shared 3.1% each in the community (Table-4).

Table- 4 Percentage contribution of various families in respect to their number of species occurring in the experimental grassland community.

Sl. No.	Name of the family	No of species	Percentage contribution
1	Acanthaceae	1	3.1
2	Asteraceae	2	6.3
3	Commelinaceae	1	3.1
4	Convolvulaceae	1	3.1
5	Cyperaceae	2	6.3
6	Euphorbiaceae	1	3.1
7	Fabaceae	2	6.3
8	Linderniaceae	5	15.6
9	Lythraceae	1	3.1
10	Molluginaceae	1	3.1
11	Phyllanthaceae	2	6.3
12	Poaceae	8	25.0
13	Rubiaceae	3	9.4
14	Scrophulariaceae	1	3.1
15	Violaceae	1	3.1
Total		32	100

IV. CONCLUSION

The experimental grassland community of Bangiriposi in the district of Mayurbhanj Odisha was rich in grasses, sedges and other associated herbs and shrubs. The taxa in the grassland community vary from place to place and from time to time depending upon the topography, climatic conditions and biotic interference of the locality.

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