



ORIGINAL RESEARCH PAPER

Botany

FLORAL DIVERSITY OF A GRASSLAND COMMUNITY OF BARGARH DISTRICT IN ODISHA, INDIA

KEY WORDS: Flora, diversity, grassland, community.

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ABSTRACT

The floral diversity of a grassland community of Bhotli (21°27'30"N ; 83°32'20"E) in the district of Bargarh, Odisha was extensively studied during 2015. The community comprised of 27 species (9 species were grasses and 18 were non-grasses). They belongs to 16 families i.e. Amaranthaceae, Asteraceae, Caesalpinaceae, Capparaceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Malvaceae, Mimosaceae, Nyctaginaceae, Poaceae, Rubiaceae, Scrophulariaceae, Verbenaceae and Violaceae. Among them, the members of the family Poaceae showed high percentage contribution (33.3%) followed by Amaranthaceae, Asteraceae and Verbenaceae (7.4% each) whereas rest of the 12 family shared 3.7% each during the study period. The topography, climatic conditions, geography and the biotic interference might be responsible for variation in floral diversity of the experimental site.

Introduction

Grasslands are anomalies in the context of world vegetation units. Based on the ecological and economical point of view, grassland plays a vital role for the survival of living being. Grasslands controls soil erosion, absorbs rainfall, restores soil fertility and is regarded as the cheapest sources of nutrients for livestock. They are rich in proteins, vitamins and minerals. Some of the plant species are used as fodder for grasshoppers, domestic animals and many other herbivores. Various species of grasses i.e. *Heteropogon*, *Saccharum* etc. are being used for paper and pulp making industries. A number of species belonging to the genera *Cymbopogon*, *Vetiveria* etc. are used to produce aromatic oil. Some of the species are used as herbal medicines also. *Vetiveria* roots are used to prepare curtains which are used during summer months to cool down room temperature. *Phragmites*, *Sacharum*, *Imperata* etc. are used to make roof thatching in rural areas. Grasses have the ability to increase the water holding capacity of the soil and to control the runoff especially in arid and semiarid regions.

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 human being.

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 characteristic features pertaining to structural and functional aspects of a community are essential for any in-depth studies relating to ecology of a place. It provides the knowledge to interpret the ecological imbalance and builds up a picture of the type of vegetation of an area. Although such studies seem to be classical yet, it forms the core of ecological research pertaining to conservation of phytodiversity.

Review of Literature

Literature review reveals a lot of information on grassland community by Raunkiaer (1934), Tisdale (1947), Odum (1960), Ovington et al. (1963), Golley (1965), Whittaker (1970), Sims & Singh (1971), Redmann (1975), Singh & Ambasht (1980), Rath & Misra (1980), Malana & Misra (1980), Misra & Misra (1981), Mishra (1983), Noy-Meir et al. (1989), Ram & Arya (1991), Diaz et al. (1994), Hussain et al. (1997), Ejrnaes & Bruun (2000), Batalha & Martins (2004), Nazir & Malik (2006), Ghani & Khalik (2006), Misra

(1992), Barik (2006), Kar et al. (2010), Pandey et al.(2011), Nair (2011), Baldau & Jaiswal (2014), Dash & Barik (2015), Barik et al. (2015), Rout & Barik (2016), Bhuyan & Barik (2017), Sahu & Barik (2017) 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 review revealed a lot of information's in the structural and functional aspects of various grassland communities in India and abroad. In Odisha some work has been done particularly in the southern and eastern regions. However, a very little/no work has been made so far especially in the western 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.

Aim of the Study

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

Study Site and Environment:

The experimental Grassland Community was selected at Bhatli (21°27'30"N ; 83°32'20"E) in the district of Bargarh, Odisha (Fig- 1 & 2). The total geographical area of Bargarh district is 5834 Sq Km. Out of which 269.329 Sq km of the area is covered with forest. The district falls under tropical monsoon climate. The climate of the district is generally warm and receives rainfall mostly from southwest monsoon and rarely from northeast retreating monsoons. The rainy season starts from early part of the second week of June and continues till September. The total annual rainfall during 2015 in Bargarh district was found to be 1500mm.

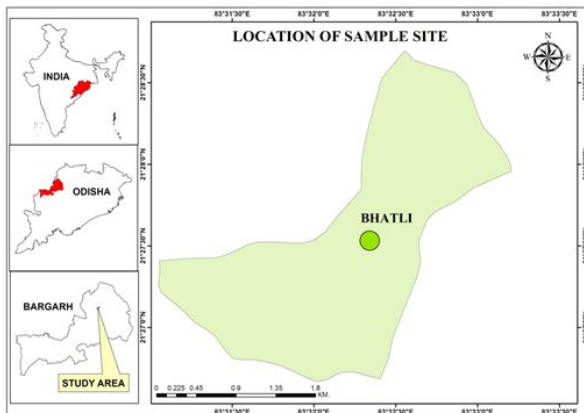


Fig. 1 : Location of the experimental site.



Fig.2 Photograph showing the experimental site at Bhatli

The district is characterized by an extreme climate with very hot dry summer and considerably cold winter. The winter season commences from November and lasts till the end of February. Generally the temperature increase steadily from early March till the end of May and continues till early June. The temperature is as high as 47° C during peak summer and falls to 8°C during winter. Mean daily temperature in summer is 35° C.

The main soil groups found in Bargarh district are red and black, red and yellow and alluvial and sandy type. Red and black type of soil is found in the blocks of Bargarh, Barpali, Bheden, Attabira, Bhatil, Bijepur, Gaisilt and paikmal. The soil in Ambabhona block is red and yellow, alluvial type. In Sohela and Jharbandh block the soils are of lateritic type.

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 floras (Hooker, 1872-1897; Haines, 1921-25; Mooney, 1950; Saxena & Brahmam, 1994-96; Panigrahi & Murti, 1989; Murti & Panigrahi, 1999; Verma et al., 1993; Mudgal et al., 1997 & Singh et al., 2001) and herbarium specimens were prepared with standard methodology (Jain & Rao, 1977). The voucher specimens were housed in Herbarium, P.G. Department of Botany, North Orissa University, Baripada, Odisha

Results and Discussion

A complete floristic list along with their families of the experimental site was presented in Table-1. The community comprised of 27 species. Out of which 9 species were grasses and 18 were non-grasses. All grasses and non-grasses belonged to 16 families i.e. Amaranthaceae (*Achyranthes aspera* and *Celosia argentea*), Asteraceae (*Ageratum conyzoides* and *Tridax procumbens*), Caesalpinaceae (*Senna tora*), Capparaceae (*Cleome rutidosperma*), Mimosaceae (*Mimosa pudica*), Nyctaginaceae (*Boerhavia diffusa*), Poaceae (*Chrysopogon verticillatus*, *Cloris barbata*, *Cynodon dactylon*, *Eleusine indica*, *Eragrostis ciliata*, *Heteropogon contortus*, *Pennisetum pedicellatum*, *Perotis indica* and *Sporobolus indicus*), Rubiaceae (*Hedyotis corymbosa*), Scrophulariaceae (*Lindernia anagallis*), Verbenaceae (*Lantana camara* and *Vitex negundo*) and Violaceae (*Hybanthus enneaspermus*).

Table – 1 : Floristic list along with their families of the study site

Sl. No.	Name of the Species	Family
Grasses		
1	<i>Chrysopogon verticillatus</i> (Roxb.) Trin.	Poaceae
2	<i>Cloris barbata</i> Sw.	Poaceae
3	<i>Cynodon dactylon</i> L. Pers.	Poaceae
4	<i>Eleusine indica</i> (L.) Gartn.	Poaceae
5	<i>Eragrostis ciliata</i> (Roxb.) Nees	Poaceae
6	<i>Heteropogon contortus</i> (L.) P.Beauv. ex Roem. & Schult.	Poaceae
7	<i>Pennisetum pedicellatum</i> Trin.	Poaceae
8	<i>Perotis indica</i> (L.) Kuntze	Poaceae
9	<i>Sporobolus indicus</i> (L.) R. Br.	Poaceae

Non Grasses		
10	<i>Achyranthes aspera</i> L.	Amaranthaceae
11	<i>Ageratum conyzoides</i> L.	Asteraceae
12	<i>Boerhavia diffusa</i> L.	Nyctaginaceae
13	<i>Senna tora</i> (L.) Roxb.	Caesalpinaceae
14	<i>Celosia argentea</i> L.	Amaranthaceae
15	<i>Cleome rutidosperma</i> DC.	Capparaceae
16	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae
17	<i>Cyperus iria</i> L.	Cyperaceae
18	<i>Evolvulus nummularius</i> (L.) L.	Convolvulaceae
19	<i>Hedyotis corymbosa</i> (L.)	Rubiaceae
20	<i>Hybanthus enneaspermus</i> (L.) F.v. Muell.	Violaceae
21	<i>Lantana camara</i> L.	Verbenaceae
22	<i>Lindernia anagallis</i> (Burm.f.) Pennell	Scrophulariaceae
23	<i>Mimosa pudica</i> L.	Mimosaceae
24	<i>Sida acuta</i> L.f.	Malvaceae
25	<i>Tephrosia purpurea</i> (L.) Pers	Fabaceae
26	<i>Tridax procumbens</i> L.	Asteraceae
27	<i>Vitex negundo</i> L.	Verbenaceae

The Community was mostly dominated by the members of the family Poaceae (33.3%) followed by Amaranthaceae, Asteraceae and Verbinaceae (7.4% each) whereas the members of rest of the family i.e. Caesalpinaceae, Capparaceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Malvaceae, Mimosaceae, Nyctaginaceae, Rubiaceae, Scrophulariaceae and Violaceae shared 3.7% each in the community (Table-2).

Table- 2 Percentage contribution of various families in respect to their number of species occurring in the experimental site.

Sl No	Name of the family	No of species	Percentage contribution
1	Amaranthaceae	2	7.4
2	Asteraceae	2	7.4
3	Caesalpinaceae	1	3.7
4	Capparaceae	1	3.7
5	Convolvulaceae	1	3.7
6	Cyperaceae	1	3.7
7	Euphorbiaceae	1	3.7
8	Fabaceae	1	3.7
9	Malvaceae	1	3.7
10	Mimosaceae	1	3.7
11	Nyctaginaceae	1	3.7
12	Poaceae	9	33.3
13	Rubiaceae	1	3.7
14	Scrophulariaceae	1	3.7
15	Verbinaceae	2	7.4
16	Violaceae	1	3.7
Total		27	99.9

Conclusion

The experimental grassland community of Bargarh district in Odisha was rich in grasses, sedges and other associated herbs and shrubs. The tax in the grassland community varies 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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