Original Research Paper BOTANY

FLORISTIC COMPOSITION OF A GRASSLAND COMMUNITY OF UDALA SUBDIVISION IN THE DISTRICT OF MAYURBHANJ, ODISHA

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ABSTRACT The floristic composition of a grassland community of Udala Subdivision (86o 33' E ; 21o 35' N) in the district of Mayurbhanj, Odisha was studied during January 2016 to December 2016 following standard methodology proposed by Jain and Rao (1977) and in consultation with various regional and national floras. The community comprised of 33 species belonging to 28 genera and was grouped under 9 families. Out of 33 species, 18 species belong to grass family (Poaceae) whereas the rest 15 species to the non-grass family i.e. one species each from the family Amaranthaceae, Asteraceae, Euphorbiaceae, Fabaceae and Scrophulariaceae; two species each from Commelinaceae and Rubiaceae and six species from the family Cyperaceae. This variation in species composition might be due to the topography, climatic conditions and biotic interference of the locality.

KEYWORDS : Floristic composition, Grassland community Udala Subdivision, Mayurbhanj

Introduction

Grassland is a land in which the vegetation is mainly dominated by grasses, legumes and composites. According to Risser (1995), grassland is a typical biological community dominated by grasses and contains few trees or shrub. Grasses have a great importance on the living world. The human being along with animals and insects are directly or indirectly depends upon the grassland flora. They provide food to grasshopper and other herbivorous animals. Most of the World's population depends on rice (*Oryza sativa*), wheat (*Triticum aestivum*) and maize (*Zea maize*) as their food. Some of the grassland floras are used as unani medicine, decorative material in lawns and gardens, thatching purposes, rope making, rosary and ornaments. Grasses have a great value to prevent soil erosion because of fibrous root system that adheres tightly to the soil (Bhuyan & Barik, 2017). Recently, grassland researches have been given a prominent place in various government and nongovernment planning to conserve and manage grassland in both developed and developing countries.

Literature Review

The population growth followed by human demand and applied technology have chiefly affected the grasslands all over the world. Humans turn the grassland into their agricultural land for the cultivation of various crops. Punjab is one of those areas which are mostly cleared for the agricultural purpose. Not only the grasslands, but also some forests are being cleared up day by day for this reason. Literature reviewed reveals a lot of work on grassland community in India and Abroad. Odum (1960) studied on grassland in temperate region. Sant (1962 & 1965), Choudhury (1964), Singh (1967), Ambasht and Maurya (1970 a & b) and Singh and Ambasht (1980) studied the phytosociology, reproductive capacity and productivity in relation to ecological factor especially on grazing.

Redmann (1975) studied the productivity and distribution of grassland in West North Dakota. Misra and Misra (1984, 1986) analyzed the biomass, primary productivity and energetic of an Indian grassland. Tripathy (1989) studied the effect of chipping and fertilization on the structure and function of a grassland community. Barik and Misra (1998) studied the biological spectrum of grassland ecosystem of South Orissa. Ejrnaes and Bruun (2000) analyzed the grassland vegetation in Denmark. Batalha and Martins (2004) studied the floristic composition and vegetation spectra of a Cerrado site.

Ghani and Khalik (2006) studied the floristic diversity and phyto geography of the Gebel Elba National park of South-East Egypt. Patel and Patel (2010) have reviewed folklore value of weeds grown in the wasteland of Kadi, Gujarat. They studied on the weed plants and their medicinal uses. Kar **et al.** (2010) worked on the floristic composition and biological spectrum of a grassland community of Rangamatia in the distirct of Mayurbhanj. Rahim **et al.**(2011) analysed the phytosociology aspects of saline area of Tehsil Ferozewala, Pakistan. Pandey **et al**.(2011) studied phytosociology of grassland in the vicinity of Pataratu Thermal Power, Hazaribagh, Jharkhand. The floristic study of Dadra and Nagar Haveli was carried out by Nair (2011).

The primary productivity on grassland of Bilaspur distirct was studied by Baldau and Jaiswal (2014). Dash and Barik (2015a,b) analyzed the standing crop biomass and net primary production of a grassland community of Mayurbhanj distirct. Barik **et al.** (2015) analyzed the floral diversity of a grassland community of Similpal Biosphere Reserve. Rout and Barik (2016) studied the above ground biomass of a grassland community of Bangriposi. Bhuyan and Barik (2017) assess the floral diversity of a grassland community of Kaptipada forest range where as Sahu and Barik (2017) studied the life forms and biological spectrum of a grassland community of Similpal Biosphere Reserve in Odisha. However, very little work has been done so far on the floral diversity of grassland community, especially in the North – East region of the state, Odisha. Keeping all these facts in view, an attempt has been made to study the floristic composition of a grassland community in this region.

Aim of the Study

The aim and objectives of this investigation is to find out the floristic composition of a grassland community of Udala subdivision in the district of Mayurbhanj.

Study site and Environmental

The experimental site was selected at Udala subdivision (86°33'E ; 21°35'IN) in the district of Mayurbhanj, Odisha (Fig. 1 & 2). The site is about 5 kms from Udala and 53 kms from Baripada, the district head quarter of Mayurbhanj, Odisha.

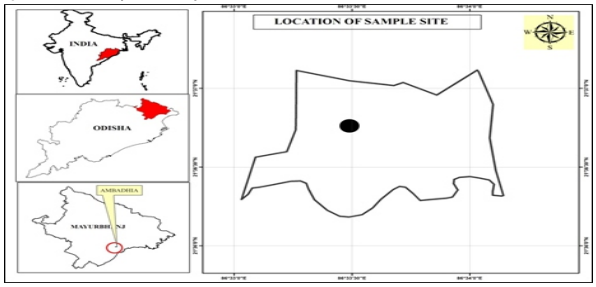

Fig. 1 : Location of the study site.

Fig. 2 : Photograph showing the experimental site

The climatic condition of the experimental site was monsoonal with three distinct seasons i.e. summer (March to June), rainy (July to October) and winter (November to February). The total rainfall during the study period was found to be 1594.8 mm, of which a maximum of 379.4mm was recorded during August. The mean minimum and mean maximum atmospheric temperature recorded during the study period were found to be normal throughout the year. January showed the minimum temperature (8.6oC) whereas April exhibited the maximum temperature (45.3oC). Table-1, reveals the monthly mean minimum and mean maximum atmospheric temperature, rainfall and number of rainy days of the experimental site during the study period i.e. January 2016 to December 2016.

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

Month		Atmospheric temperature (°C)		Number of rainy days	Rainfall (mm)
		Mean minimum	Mean maximum		
Jan.	2016	8.6	30.5	1	1.8
Feb.	2016	12.0	37.5	4	30.8
Mar.	2016	19.6	37.6	3	13.2
Apr.	2016	22.0	45.3	2	31.2
May	2016	20.5	44.0	13	107.0
Jun.	2016	22.4	40.4	15	274.0
Jul.	2016	23.0	34.6	15	272.0
Aug.	2016	21.6	34.5	20	379.4
Sep.	2016	20.0	33.6	20	326.2
Oct.	2016	18.6	34.8	7	152.6
Nov.	2016	14.0	31.0	1	6.6
Dec.	2016	11.0	28.4	-	-
	TOTAL			101	1594.8

The soil of the experimental site was found to be highly acidic (pH range varies from 5.12 to 5.38). The percentage of organic carbon, available phosphorus and potassium contents in the soil were found to be low in proportion. The available phosphorus and potassium contents in the soil were found minimum at upper surface and gradually increased with the increase in soil depth (Table-2).

Table-2 The pH, conductivity, organic carbon (%), available phosphorus and potassium content of the soil of the study site (n=5 each).

Surface depth in cm	pH	Conductivity	Organic carbon (%)	Available phosphorus (ppm)	Available potassium (ppm)
0-10	5.12	0.4	0.39	5.8	46
10-20	5.22	0.4	0.34	5.96	60.8
20-30	5.38	0.44	0.24	6.76	93.2

Materials and Methods

The plant specimens preferably along with reproductive parts were collected from the experimental grassland and brought to the laboratory for identification (Muller Dombois and Ellenberg, 1974). Identification of all the species were made in consultation with various regional and national floras i.e. The Botany of Bihar and Orissa (Haines, 1921-25), Supplement to the Botany of Bihar and Orissa (Mooney, 1950), Flora of Madras Presidency (Gamble,1915-36), Flora of Similipal (Saxsena and Brahmam, 1989), Flora of Bilaspur District (Panigrahi and Murti, 1989), Flora of Orissa (Saxena and Brahmam, 1994-96), Flora of Madhya Pradesh (Verma **et al**. 1993, Mudgal **et al**.1997 and Singh **et al**. 2001. The herbarium specimens were prepared following standard methodology as proposed by Jain and Rao (1977). The voucher specimens were preserved and housed in the Herbarium, P.G. Department of Botany, North Orissa University, Baripada, Odisha for future use and reference.

For the analysis of soil, soil samples were collected from three different depths i.e.0 to10, 10 to 20 and 20 to 30 cm with the help of a soil corer. Five samples were taken from each depth, labeled and were mixed thoroughly in order to make a composite soil sample. The samples were dried in the open, rolled and sent to the soil testing laboratory, Department of Agriculture, Government of Odisha, District headquarter branch, Mayurbhanj, Baripada for the determination of soil pH, organic carbon, available phosphorus and potassium content of the experimental site.

The meteorological data i.e. rainfall, number of rainy days and atmospheric temperature were collected from District Agriculture Office, Mayurbhanj, Baripada and are incorporated in this investigation.

Results and Discussion

Table – 3, reveals the list of species and their families occurring in the experimental grassland community during the study period. The community comprised with 33 species, of which 18 species were grasses and 15 species were non grasses. The taxa in the community belong to 28 genera and are grouped under 9 families. The non-grass family comprised of Amaranthaceae (singles pecies), Commelinaceae (two species), Cyperaceae (six species), Asteraceae (single species), Euphorbiaceae (single species), Fabaceae (single species), Rubiaceae (swo species) and Scrophulariaceae (single species). The topography, climalic conditions and biotic interference might be responsible for variation in species composition in the grassland community.

Table 3. List of species and their families occurring in the experimental grassland community during the study period.

Sl.no	Name of the species	Family
	Grasses	
1	*Alloteropsis cimicina* (L.) Stapf	Poaceae
2	*Bothriochloa pertusa* (L.) A. camus	Poaceae
3	*Brachiaria ramosa* (L.) Stapf	Poaceae
4	*Brachiaria reptans* (L.)	Poaceae
5	*Chrysopogon aciculatus* (Retz.) Trin.	Poaceae
6	*Cynodon dactylon* (L.) Pers.	Poaceae
7	*Dactyloctenium aegyptium* (L.) P. Beauv.	Poaceae
8	*Eragrostis gangetica (*Roxb.) Steud.	Poaceae
9	*Eragrostis unioloides* (Retz.) Nees ex Steud.	Poaceae
10	*Ischaemum indicum* (Houtt.)	Poaceae
11	*Ischaemum rugosum* Salisb.	Poaceae
12	*Oplismenus burmannii* (Retz.)P.Beauv.	Poaceae
13	*Panicum walense* Mez.	Poaceae
14	*Paspalidium flavidum* (Retz.) A. Camus.	Poaceae
15	*Paspalum scrobiculatum* L.	Poaceae

16	*Sacciolepsis indica* (L.)	Poaceae
17	*Setaria pumila* Roem.& Schult.	Poaceae
18	*Sporobolus indicus* (var.-diander) (L.) R. Br.	Poaceae
	Non-grasses	
1	*Alternanthera sessilis* (L.) R. Br. ex DC.	Amaranthaceae
2	*Commelina paludosa* Bl. Enum.	Commelinaceae
3	*Cyperus pumilus* L.	Cyperaceae
4	*Cyperus rotundus* L.	Cyperaceae
5	*Cyperus triceps* Endl.	Cyperaceae
6	*Eclipta prostrate* (L.) L.	Asteraceae
7	*Euphorbia rosea* Retz.	Euphorbiaceae
8	*Fimbristylis dichotoma* (L.) Vahl	Cyperaceae
9	*Fimbristylis ovata* (Burm.f.) Kern	Cyperaceae
10	*Fuirena ciliaris* (L.) Roxb.	Cyperaceae
11	*Hedyotis herbacea* L.	Rubiaceae
12	*Lindernia crustacea* (L.) F.v. Muell	Scrophulariaceae
13	*Smithia conferta* J.E.Sm.	Fabaceae
14	*Spermacoce raminii* Sivar & Nair	Rubiaceae
15	*Tonningia axillaris* (L.) Kuntze.	Commelinaceae

Conclusion

The floristic composition of a grassland community in Udala Subdivision comprised of 33 species and is grouped under 28 genera and 9 families. Among them 54.54% of species belongs to grass family i.e. Poaceae and the rest 45.45% of species to the non-grass family. The family Cyperaceae shared second highest (18.18%) followed by Commelinaceae and Rubiaceae (6.06% each) whereas the family Amaranthaceae, Asteraceae, Euphorbiaceae, Fabaceae Scropulariaceae and Leguminoceae exhibited 3.03% of species each in the community. The taxon 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.

Acknowledgements:

The authors are thankful to the District Agriculture Officer, Mayurbhanj, Baripada for providing necessary meteorological data and the Soil Chemist, District Soil Testing Laboratory, Mayurbhanj, Baripada, Government of Odisha for analysis of soil samples of the experimental site. Financial assistance extended by National Remote Sensing Centre (NRSC), ISRO, Govt. of India, Hyderabad in the form of National Carbon Project is highly acknowledged.

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