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BIOLOGICAL SPECTRUM OF VEGETATION OF JHUNJHUNU DISTRICT, RAJASTHAN

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ABSTRACT

During field surveys, 432 species of vascular plants were recorded from Jhunjhunu district. The percentage contribution of these plant species to various life forms of biological spectrum were; Phanerophytes (11.28%), nanophanerophytes (10.21%), Chamaephytes (12.58%), hemicryptophytes (7.35%), geophytes (9.34%), hydrophytes (3.38%), therophytes (44.35%) and parasites (1.51%). The percentage of phanerophytes and hemicryptophytes was much less than that in normal biological spectrum whereas of therophytes was about two and half to three times higher than those of same life-form in the normal biological spectrum. The data suggest that phytoclimate of Jhunjhunu district is therophytic because of their higher percentage.

INTRODUCTION

India covers about 2% of the earth's land; and nearly 10% of its flora and fauna are threatened species, many of them near extinction (Kaushik 1996). The enormous natural diversity of India extends from mangrove forests of the Sunderbans, rain forest of Western Ghats, coral reefs of Lakshadweep and wetlands of Bharatpur to the Great Thar desert in Rajasthan. Continuing loss of our biological capital is undoubtedly one of the most important human problem today.

The flora of western Rajasthan and north eastern Rajasthan has been worked out in details (Bhandari 1978, Shama and Tiagi 1979) while of Jhunjhunu district has not been described except its sporadic mention in the flora of Rajasthan (Shety and Singh 1987-1993). The present survey was thus taken up to evaluate the floristic composition of Jhunjhunu, which topographically comprises of sand-dunes, sandy plains and cultivated fields. The vegetation which is edaphically controlled show much variations from the view point of species composition, density and frequency at various habitats. Biological spectrum of plant species growing in Jhunjhunu district has been reported in this communication.

STUDY AREA

Jhunjhunu district of Rajasthan state lies between 27^{0}38' to 28^{0}31' north latitudes and 75^{0}02' to 76^{0}06' east longitudes. This district covers 5928 Sq.Km. geographical area. The district is irregular hexagon in shape and forms the north eastern part of Rajasthan. It is surrounded by Churu district in the north-west; Hissar and Mahendragarh districts of Haryana state in the north east and Sikar district in south, south east and west directions. Its general, elevation above mean sea level is between 300 to 450 meters. The highest peak is in the south of Lohagarh village (1051 meters). Most part of the district is covered by sandy soil. Forest cover in Jhunjhunu district is reported to be 39680hectares, which is 6.65% of the total geographical area of the district.

Jhunjhunu district has a hot and dry climate. Summer season beings in mid-March and extends up to first fortnight of July. During this period temperature reaches ut po 46^{0}C in the months of May and June. Sand storms are quite common in April, May and June months. Rainy season is of comparatively shorter duration ranging from July to mid-September with 40 to 50 cm rainfall. Monsoon is highly erratic and uneven in different years. Winter season begins by mid-November and continues up to beginning of March. Winters are quite cold and the minimum temperature touches freezing point quite often. The annual average relative humidity is 56%. However, it varies from 78% in rainy season to as low as 15 to 20% in the summers.

MATERIALS AND METHODS

The present report is based on the floral surveys of more than five year of Jhunjhunu district. Field excursions were undertaken two to three times in a month. Filed trips were arranged in such a way as to cover all the localities at more

or less regular intervals and to collect most of the plants in flowering and fruiting stages. Efforts were made to identify the plants from the fresh materials; those which could not be satisfactorily identified in the field or in the laboratory at Jhunjhunu were preserved and later checked and authenticated at Jaipur and Jodhpur herbaria.

RESULTS AND DISCUSSION

The life-form of the plant is the physiognomic form produced in union with the environment. Raunkiaer (1934) has given an account of the life-form system in which the position of bud or plant propagule has been considered as the most important criterion for classification of plants into different life-forms. A biological spectrum is formed when all the species of higher plants of a community are classified into life-forms and their ratio expressed on numbers or percentage.

Based on the percentage distribution of species of the flora of the Jhunjhunu district among the life-forms (i.e., Biological Spectrum), is grouped into the following categories:

A. Perennial plants

Bud bearing shoot

I.	**In air**			
	1. (a) Trees	-	Phanerophytes	Ph.
	(b) Shurbs	-	Nanophanerophytes	N.
	2. Up to 25 cm. High	-	Chamaephytes	Ch.
	3. On ground level	-	Hemicryptophytes	H.
II.	**Beneath the soil**	-	Geophytes	Ge.
III.	**Under water or beneath the soil in water**	-	Hydrophytes	HH.
B.	**Annual plants**			
	Perennating by seed	-	Therophytes	Th.
C.	**Parasitic plants**	-	Parasites	P.

Of these categories, geophytes (Ge.), hydrophytes (HH.) and halophytes (Ha.) are termed as Cryptophytes (Cr.) as these perenate by means of subterranean buds. Hydrophytes (HH.) are further classified into: aquatic plant (Hy.) submerged or free floating in water, and marshy plants (He.) where the buds perennate in soil under water.

On analysis, the biological spectrum of flora of Jhunjhunu district works out as under.

In all 423 species of angiospermic plants were recorded from Jhunjhunu district. The percentage contribution of phanerophytes (11.28%), nanophanerophytes (10.21%) and chamaephytes (12.58%) to the biological spectrum was almost similar while that of hemicryptophytes (7.35%), geophytes (9.34%) and hydrophytes (3.38%) was relatively low. Therophytes however, formed the major segment of this vegetation (44.35%) while parasites were only 1.51% of the total species.

A comparison of biological spectrum of Jhunjhunu district with that of normal spectrum of Raunkiaer's (1934) revealed lesser percentage of phanerophytes and hemicryptophytes (Table 1) whereas of therophytes was about two and half to three times higher than those of same life-form in the normal biological spectrum. Based on these findings, phytoclimate of this district is therophytic.

Table 1. Comparison of biological spectrum of Jhunjhunu district with that of normal biological spectrum

Life forms / Locality	Ph.	N.	Ch.	H.	Ge.	HH.	Th.	P.
Jhunjhunu district	11.28	10.21	12.58	7.35	9.34	3.38	44.35	1.51
Normal spectrum	28.01	5.0	9.0	26.0	4.0	2.0	13.0	8.0

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