

A STUDY OF VEGETATION OF TAL CHHAPAR WILDLIFE SANCTUARY, CHURU DISTRICT, RAJASTHAN

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ABSTRACT

Spending time in natural environments as part of a vacation is the foundation of the ecotourism industry, which is seeing explosive growth. The activity of ecotourism contributes to the conservation of natural places by heightening people's awareness of the natural and cultural history of the region through which they are traveling. This, in turn, encourages people to take better care of such areas. In spite of the fact that it generates work possibilities that are to the benefit of the people who currently reside in the region, it makes an effort to preserve the natural equilibrium of the delicate ecological system. The section of Rajasthan that is located in the northeastern part of the state and is frequently referred to as the Tal Chhapar sanctuary may be found there. This region of the state has a climate that is often defined as being arid.

Key Word: *Tal Chhapar sanctuary, wildlife.*

INTRODUCTION

The Rajasthan desert is fairly rich in wildlife diversity. While work on invertebrates is still in progress, intensive studies have been carried out on the vertebrates, which show predominant "Shaharo-Iranian" affinities and are found on a variety of desert habitats, but a few exhibit habitat specificity. The earlier flocks of sand grouse were of the order of 3000 to 4000 birds. Now, they fly in few hundred only. Their population in Barmer, Jaisalmer and Bikaner districts has also been adversely affected due to prolonged droughts which drastically reduced the availability of seeds for them. The tale of the artiodactyles is not much different. During 1890- 1900 periods, the herds of black buck in the desert were very large. Now the black buck has almost vanished from the scene except in sanctuaries and around villages of the Bishnoi community. The Indian gazelle or chinkara, which were found in herds of 50 to 100 heads till 1947, are now rarely seen. The major reason of depletion in their number is the paucity of grazing lands in the desert.

Rajasthan

Rajasthan- the desert State of India has widely contrasting geography. It is immensely rich in natural resources as well as famous for its cultural diversity. Geographically, no other region can claim greater diversity than Rajasthan - a region of rolling sand dunes and lofty hills, freezing cold and scorching heat, fertile plains in east and sparsely populated areas in the west.

Rajasthan with a geographical area of 3,42,239 sq. km. (132139 sq. miles) is the largest state in the country. It is situated in the north-western part of India. According to the location on the globe, Rajasthan is located in the northern and western hemisphere, most of which is in the north of the tropic of cancer. The Tropic of Cancer passes through the south of Banswara town. The state's expansion is between 23°3' to 30°12' North latitude and 69°30' to 78°17' East longitude. Presenting an irregular rhomboid shape (heterogeneous quadrilateral), the state has a maximum length of 826 km. from north to south (Kona village of Sriganganagar district in the north to Borkund village in Banswara district in the south) and 869 km from west to east (Katra village in Jaisalmer district in the west to Silana village of Dhaulpur district in the east)

Churu District

Churu is a city in the desert region of Rajasthan state of India. It is known as the gateway to the Thar Desert of Rajasthan. It is the administrative headquarter of Churu District. It lies in the Thar Desert on the National Highway 52 connecting Sangrur to Ankola and is a junction station on the railway line to Bikaner. It is near the shifting sand dunes of the Thar Desert and has grand havelis with marvelous fresco paintings, namely Kanhaiya Lal Bagla Ki Haweli and Surana Haweli, with hundreds of small windows. It also has some fine Chhatris. Near the town is a religious seat of the Nath sect of Sadhus where there are life-size marble statues of their deities and a place for prayers. At the center of the town is a fort built about 500 years ago.

Churu, itself as the district's headquarter, is situated in the north eastern part of Rajasthan where mostly arid conditions prevailed. This district falls in the desert tract known as 'Thar'. The Tal Chhappar sanctuary is located in the Sujangarh tehsil of the district at the intersection of 27° 42' North latitude and 74° 20' East longitude. The sanctuary is located at about 286.6 meters from the Mean Sea Level. It covers an area of 6.94 square kms. The sanctuary lies on Nokha-Sujangarh state highways at a distance of 85 kms from Churu, 160 kms from Bikaner and 200 kms from Jaipur, the state's Capital city. Tal Chhappar Sanctuary lies in the Shekhawati region Rajasthan. The sanctuary nestles a unique refuge of the most elegant antelopes encountered in India, "the black buck". Tal Chhappar sanctuary, with almost flat tract and interspersed shallow low lying areas, has open grassland with scattered Acacia trees which give it an appearance of a typical Savannah. The word "Tal" means plane land. The rain water flows through shallow low lying areas and collect in the small seasonal water ponds. It lies on the way of the passage of many migratory birds such as harriers. These birds pass through this area during September. Birds commonly seen in the sanctuary are harriers, eastern imperial eagle, tawny eagle, short-toed eagle, sparrow, and little green bee-eaters, black ibis and demoiselle cranes, which stay there till the month of March. On the other hand, skylark, crested lark, ring dove, brown dove and blue jay are seen throughout the year.

Community Structure

Plants growing together make mutual relationship among themselves and with the environment. Thus a group of plants in one area forms a stand and several similar stands represent a community. The community is a part of ecological system in which transformation, accumulation and flow of energy are involved. The

functioning of this system is intimately related with the components of community. The components vary in quality as well as in quantity, imparting a structure to the community.

Community structure (or phytosociological analysis) of any vegetation forms an important part of ecological study as it provides a clear understanding of the community function. Further, such studies are necessary for an adequate characterization of a community. Phytosociological methods are useful in experimental studies of communities, for comparing one community with

another, for showing change in a community from year to year and in-fact, providing information needed about community structure and the role contributed by various species. Practical applications of this knowledge are almost unlimited and used in diverse problems, such as correlating the progressive changes of vegetation and soil on abandoned fields.

Phytodiversity

Phytodiversity is a concept, which refers to the range of variation or differences among some set of entities; thus refers to variety within the plant kingdom. Phytodiversity is thus commonly used to describe the number, variety and variability in plants. Phytodiversity can also be defined in terms of genes, species and ecosystems, corresponding to three fundamental and hierarchically related levels of biological organization that is species, diversity, genetic diversity and ecosystem diversity.

Phytodiversity, commonly used as a synonym of species diversity in particular of 'species richness', which is the number of species in a site or habitat. Available plant species of today are contribution of ancient Raja-Maharaja and flora loving people.

Amrita Devi of "Khejadli" near Jodhpur was one of the struggled lady who served her total life to save plants of Rajasthan. Her proverb as -

"Sir Satte Roonkh

To bhi Sasto Jaan".

Means that if the cost of a plant is equal to a head of individual than it is very cheap.

The Tal chappar Sanctuary area shows a great phytodiversity which includes different types of terrestrial as well as aquatic plants. The ecology of this area may be very interesting as the plant growing have been facing some climatic, edaphic and biotic conditions different from extreme desert to some extent.

The forest area dealt within sanctuary management plan falls under major group "Tropical Forest" as per classifications of Indian forest by Champion and Seth. The forest of sanctuary area again falls under group "Tropical Thorn Forest" and sub group 6B/C "Desert Thorn Forests".

Status of Wildlife

In May, 2006, over 1763 Blackbucks were found in almost tree less saline flat land of Talchhappar sanctuary. This is a natural home of Blackbucks.

There are indications that Blackbuck population is on the increase at Talchhapar. Here one can enjoy the beauty of the Blackbuck from very close quarters, at times even from a distance of merely 100 feet.

The ground flora Dab, Lana, Ghora doob, Moth and Loong are consumed by wildlife. Food and water become a limiting factor during summer and sometimes even in late winters. The sanctuary has four water holes at different locations in and around its periphery. Live stock and Blackbuck make use of these water sources. Here animals get sufficient salt by eating various grasses rich in salt contents.

Besides the blackbucks, foxes, hares, jackals, hedgehogs and varieties of colourful birds also visit the sanctuary every year. In Tal Chhapar sanctuary animals live in a complete harmony with nature, man and domestic animals.

Though, presently Blackbuck population seems fairly stocked but food, water and shelter facilities need to be further improved, so that the area can support a larger number and more wildlife species with better health of wildlife and can encourage more ecologically viable species.

Primary Metabolites

Plant body is composed primarily of carbohydrates, proteins, amino acids, nucleotides, lipids and porphyrins. The plant parts, used by desert dwellers, have not been analysed fully from nutritive value point of view. Life can not be sustained without adequate nourishment. Man needs adequate food for growth, development and to lead an active and healthy life. Plant can manufacture the food they need, from simple chemicals derived from the soil, water and carbon dioxide of the air. Higher organisms, on the other hand, do not possess this capacity to manufacture food from simple chemicals and hence they depend on plants or other animals for obtaining the food they need. Procuring enough food, for its survival, is the main aim of life's struggle in all the higher organisms.

Dietary habits of populations in different regions of the world have been determined mainly by the availability of foods locally and local practices. Man has evolved his habitual dietary pattern to maintain good health, perhaps after a good deal of trial and error. Satisfaction of hunger is usually the primary criteria for adequate food intake. But satisfaction of hunger itself is not a safe guide for the selection of proper foods. For sustaining healthy and active life, diet should be planned on sound nutritional principles.

In nutritive contents proteins are the vital to any living organism. Proteins are important constituents of tissues and cells of the body. They form the important component of muscle and other tissue and vital body fluids like blood. The proteins in the form of enzymes and hormones are concerned with a wide range of vital metabolic process in the body. Fat is also an important.

component of diet and serves a number of functions in the body. Fat is a concentrated source of energy and it supplies per unit weight more than twice the energy furnished by either protein or carbohydrate. Minerals are also a type of nutritive contents. Macronutrients are required in large quantities (more than 100 mg/ltr of water) to the plant and usually participate in body construction (C, H, O, N, S, P, K, Mg, Ca, Fe). Micronutrients are required in smaller quantities (100 or less mg/ltr of water) and usually participate in various metabolic activities. These minerals constitute major part of the animal diet. Some of these are important in various metabolic activities also.

These nutritive contents are found in all green plants. The primary productivity of the green autotrophic plants is the main base for the present existence of entire biosphere. It determines the carry capacity of earth for human beings. Great importance is being laid on the rate of energy storage in diverse ecosystem by green plants. Primary productivity is the gain in the weight of organic matter generated by photosynthesis in a given period of time.

Net production is that part of gross photosynthetic production, which is accumulated in plant after metabolic activities and hence becomes available for utilization as food.

With the increasing demand for the natural drug and to fill the void in our knowledge regarding the chemistry of famine foods and plants of desert origin, there is urgent need to undertake a full scale phytochemical survey of our indigenous plant to locate the potential sources of pharmacologically active chemical compounds of alkaloid nature like tannin etc.

Amino acids in plants are found in the free and bound state. All amino acids are made up of C, H, O and N. However, few possess sulfur also (cystein and methionine). The general formula for amino acids is $R.CH(NH_2)COOH$. The group R may either a simplest hydrogen atom (as in glycine) or a complex organic group. The group R may also show neutral, basic or acidic character and includes a hydroxyl, aromatic or sulfur containing substitutes. An amino acids may be cyclic (aromatic), non cyclic (aliphatic) or heterocyclic. Due to the presence of at least one acid or carboxylic group (-COOH) and one or more basic or amino (-NH₂) group, these acids can behave as acids towards basic and as basic towards acids, there by they are amphoteric compounds. The compounds generally exist in two stereo isomeric form, L-forms and D-forms.

The asymmetry exists at α -carbon atom (except in glycine where R=H) only L-forms of amino acids are encountered in plant protein. However, the D-forms of many amino acids are found in cell wall.

Ascorbic acid (Vitamin C), called anti-scorbutic vitamin, is an important primary plant product in plant metabolism. It is well known for its property as an electron donor in photosynthetic photophosphorylation. It is important regulator of oxidation and plays significant role in germination, growth, metabolism and flowering of plants. It stimulates amylase, protease, RNA

activity and RNA content in various crops. Ascorbic acid is a strong reducing agent. It is involved in collagen synthesis, bone and teeth calcification and many other reactions as a reducing agent. It also helps absorption of dietary Iron by keeping it in the reduced form, that is, in ferrous form. One of the characteristic properties of this vitamin is its intense reducing action and hence it is iodized rapidly in air. It is for this reason that when vegetables become dry and stale, or cut and exposed to air most of the vitamin C originally present is destroyed.

OBJECTIVE OF THE STUDY

1. Study of topography, soil and climate of Tal Chapper.
2. To the study of vegetation.

RESEARCH METHODOLOGY

A rain gauge was used to determine the amount of precipitation. The temperature has been measured with a thermometer that records the highest and lowest readings. For the purpose of determining the relative humidity, a psychrometer that combines both a wet and dry bulb thermometer has been utilized.

DATA ANALYSIS

Rainfall

This is the study area. It is only until the westward moving monsoon depression gets in Rajasthan that a big volume of deep and moist monsoonal air is brought in. This allows for the development of weather, which in turn allows for properly distributed rain to take place.

Table - 1 Rainfall totals broken out each month from January 2005 through December 2006.

Month	Year 2005	Year 2006
January	0.0	0.0
February	0.0	2.6
March	0.0	0.8
April	0.0	0.0
May	36.6	14.0
June	35.8	30.4
July	85.1	92.1
August	78.9	82.2
September	5.4	10.0
October	0.0	2.4
November	0.0	2.3
December	0.7	4.2

Table - 2 Temperatures, broken down by month, from January 2005 through December 2006 (in %)

Month	Year 2005		Year 2006	
	Average	Average	Average	Average

	maximum	minimum	maximum	minimum
January	23.2	1.3	21.4	1.7
Febraary	26.0	3.2	23.8	3.3
March	32.2	8.5	35.2	7.5
April	35.2	22.0	42.2	13.2
May	45.3	26.6	45.3	18.3
June	48.9	28.9	46.1	22.7
July	38.0	27.9	43.3	22.7
August	36.9	27.0	40.7	23.1
September	37.0	25.1	39.7	19.9
October	36.3	19.1	35.4	13.0
November	30.9	6.5	33.7	6.5
December	25.1	1.8	27.7	2.1

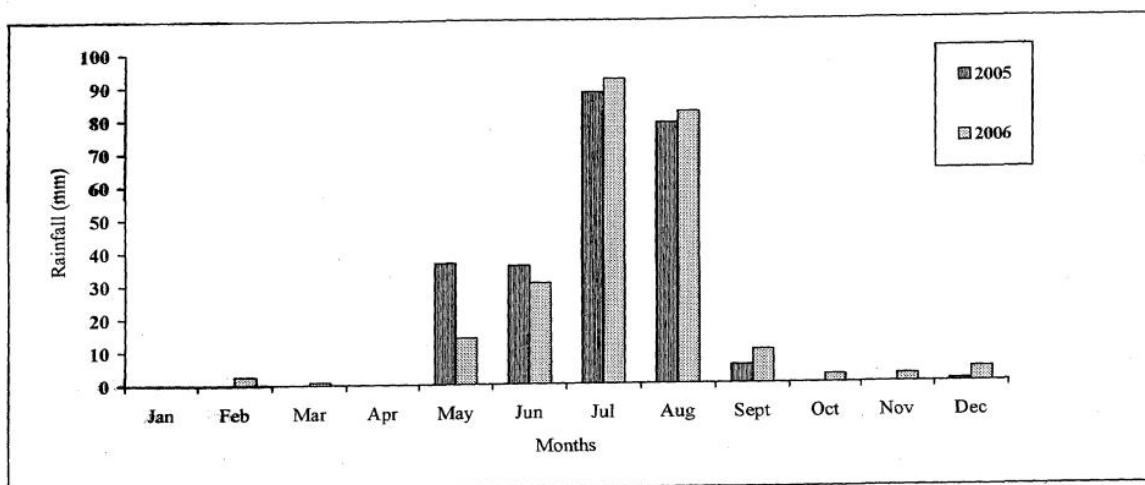


Fig. 1 The amount of precipitation that fell during each month from January 2005 to December 2006

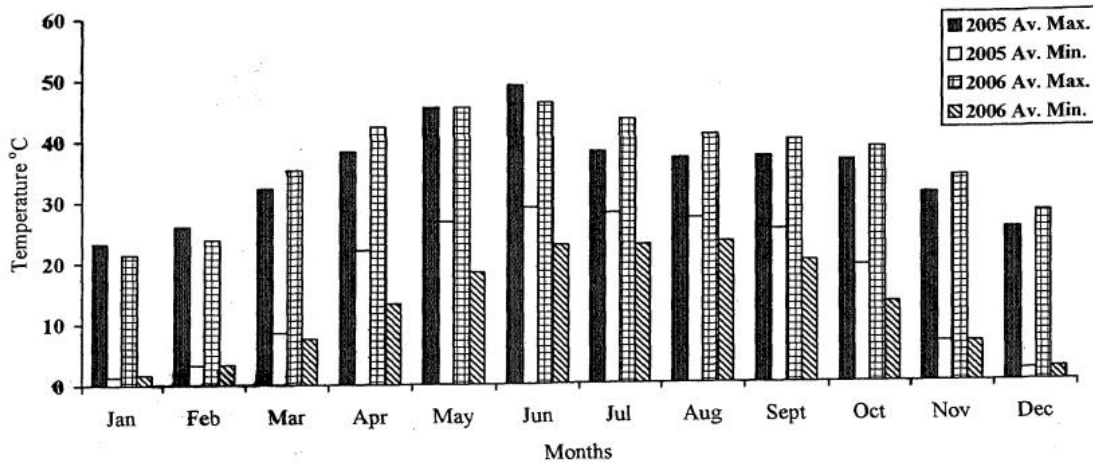


Fig. 2 The average temperatures from January 2005 to December 2006, broken down by month

CONCLUSION

The territory that makes up the Tal Chhappar Wildlife Sanctuary may be found in the Churu district of Rajasthan's north-eastern corner. It demonstrates a high level of phytodiversity, which contains the plants that are important for food, fodder, and medical purposes. This region is characterized by dry climate, extremes in temperature, and average annual precipitation. This demonstrates that these plants are able to adapt to such an environment, and the fact that they have the potential to be used as fodder has a favorable influence on the synthesis of primary metabolites. Studies on the Variety of Plants The region under investigation is home to a wide variety of plant life, including species that thrive in xerophytic, mesophytic, halophytic, hydrophytic, and parasitic environments. The plant species *Aerva persica*, *Salsola baryosma*, *Suaeda fruticosa*, and *Tephrosia purpurea* were selected for the purpose of conducting phytochemical research, which included qualitative and quantitative estimations of the nutritive contents, amino acid contents, mineral content, and ascorbic acid content, respectively. For the purposes of phytochemical research, various sections of plants, including roots, shoots, and fruits, were sampled from various plant species.

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