

Phytogeographical Distribution of *tribulus terrestris* in Shekhawati Region, Rajasthan

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Abstract- The present paper discusses the potentiality of natural vegetation i.e. *Tribulus terrestris*. The area under investigation i.e. Shekhawati region, popularly known as historical heritage, geographical and cultural zone in Jaipur division of Rajasthan state, India. Besides this zone has unique combination of beautiful ecosystems viz; riverine ecosystem, sandy plain ecosystem, sand dunes ecosystem and stony and rocky ecosystem. In these ecosystem, the sand dunes is the heart of Churu. The Shekhawati zone has a great variety of climates (semi-arid and arid) biotic and edafic conditions, physiography and diversity of natural vegetations which has on a wide range of natural ecosystem.

I INTRODUCTION

Actually, there is no plant species on this planet which may be termed as useless indeed, whether it is another matter that mankind have acquire knowledge of the uses or applications of the particular plant species. One can visualize very well the uncountable uses at the part of applied aspect of plant kingdom which left no activity of daily life of human beings requirements without any sort of their impact of usefulness by quantitative or qualitative point of view. The green cover on the earth surface whatever in the form of vegetation or forest wealth is an essential component as well as part and portion of the surrounding complex of the nature of which man is an important biological elements. Hence, generally the plant species whose uses are known to the human beings in applied sense for the mankind welfare as well as for

domestic animals are termed as useful plant species - at the part of his knowledge.

By thus, one can visualize Multi-purpose Medicinal Plant Species (MPMPS) i.e. *Tribulus terrestris* has their varied applied values in the cure of different kind of diseases for the welfare of human beings which naturally show their importance that MPMPS is really may be termed as "Medicinal Plant Wealth" of Shekhawati Region, Rajasthan.

II INTRODUCTION OF THE RESEARCH AREA

Shekhawati region is located in the north-eastern part of Rajasthan state and the region has geographical extension from 26°26' to 29°20' north latitude and 74° 44' to 76°34' east longitude on the map of Rajasthan (**Fig.-1.1**).

The area under study covers fully or partly three districts, namely Churu, Jhunjhunu and Sikar. Churu district's out of 7, only 3 tehsils fall under Shekhawati region (Churu, Rajgarh and Taranagar) whereas Jhunjhunu district as a whole with its six tehsils (Buhana, Chirawa, Khetri, Jhunjhunu, Nawalgarh and Udaipurwati) in which Buhana tehsil emerged out as a new tehsil on the map of Jhunjhunu district (2001), it was no more existence in the year of 1991 and Sikar district also covered fully with its six tehsils (Data Ramgarh, Fatehpur, Laxmangarh, Neem ka Thana, Sikar and Shri Madhopur).

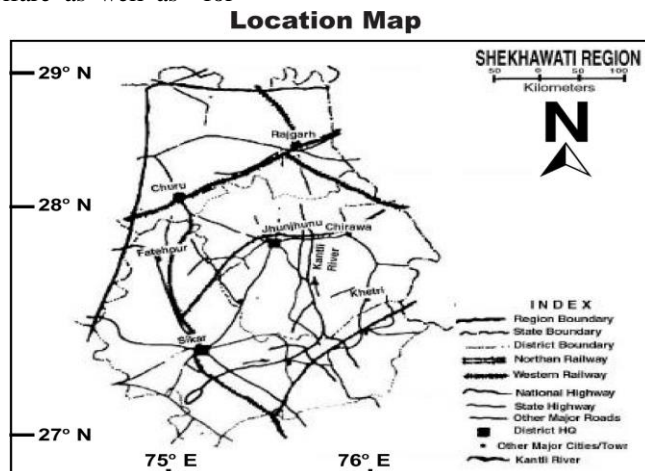


FIG.-1.1 LOCATION MAP OF SHEKHAWATI REGION

The region has 23 Panchayat Samitis in all. Thus, the region under study has 15 tehsils in total with its total 15343 sq. km. geographical area which makes 5.6% of the state's total. At the part of district-wise contribution by area point of view in Shekhawati region it is observed that part and portion of Churu district contributes 29%, Jhunjhunu district contributes 31% and Sikar by 40%, respectively. Among these tehsils area point of view, the tehsil of Churu is largest one and Buhana smallest, respectively. District-wise area point of view Sikar stands at first position which is followed by Jhunjhunu and lowest contribution is made by Churu i.e. 1683 sq. km. only.

III REVIEW OF LITERATURE

The area under research work was studied by following botanists and time to time viz; first of all the Shekhawati region was touched from vegetational study point of view by Mulay and Ratnam (1950), Bikaner and pilani neighbourhood areas by Joshi (1956 and 1958), vegetation of Chirawa by Nair (1956), again Nair and Joshi for Pilani and neighbourhood areas (1957), vegetation of Harsh Nath in Aravalli's hills was studied by Nair and Nathawat (1957), vegetation of Jhunjhunu, Manderella and neighbourhood by Nair (1961), vegetation of Aji Sagar dam by Nair and Kanodia (1959); Nair, Kandodia and Thomas (1961) studied the vegetation of Khetri town and neighbourhood areas and vegetation of Lohargal and its neighbourhood areas of Sikar district by Nair and Malhotra (1961). After the work of Nair and Malhotra (1961), i.e. four decades ago, the area was again left for any sort of further research work in the field of applied Botany.

A significant, very authentic taxonomic work was contributed in the field of botany by Bhandari with the publication of a book *Flora of the Indian desert* (1990). From the field of applied phytogeography point of view, Charan gave a valuable contribution with a publication of a book on *Plant Geography* (1992). Bhattacharjee (2000) gave a very valuable authentic contribution through the publication of a book on *Handbook of Medicinal Plants* in which he presented the medicinal plants of Indian Sub-continental background with their coloured photographs also and Sharma (2007) gave a very valuable authentic contribution through the publication of a book on *Medical Plant Geography*.

VI OBJECTIVES

As the nature of the research work, it becomes the prime most duty of a phytogeographer to trace out to identify the

plants and then their geographic interpretation from their origin point of view, their cartographic presentation from spatial distribution point of view and lastly also to prepare their layout planning map for on going plantation programme at least for the applied plant species for the area under study.

V HYPOTHESIS

Naturally, the present study will cover the present position of phytogeographic pattern of spatial distribution of applied plant species, so a phytogeographer can propose their allocation of sites of coinciding habitats from their conservation point of view for the welfare of future generation of the area under study.

We can conserve those plant species which have their applied values for the welfare of human beings inhabiting in that particular area or the area under study. For this purpose, a phytogeographer has to give an account of the layout maps of that area under study which covers the allocation of the sites with favourable habitats according to the nature of the existing applied plant species for the area under investigation.

VI METHODOLOGY

The present study has been substantiated by extensive field work. The essential data have been collected from a wide range of sources. The remote sensing available data have been used. Survey of India topo-sheets for the entire region and a bioclimatic map, have been used as base maps. Additionally, data from reports, maps, pamphlets, research papers, books, monographs, soil survey data, forest survey data from published and unpublished materials have been collected from different agencies. After examining the remote sensing and other data related to physical (climate, soil, land forms and water) biological (flora and fauna) and social (population dynamics, economic activities land use and productivity) indicators, a few survey sites were located. The sites were visited during field survey.

To illustrate the frequency of distribution of particular plant species the prescribed method of Raunkier's will be exercised to show whether the particular plant species is rare, frequent, common or abundant for the area under investigation. The nature of habitats and the eco-climatic conditions will be dealt as a part and portion of the study to support the phyto-climatic account of the research problem for the area under study.

From phytogeographic study point of view, a cartographic interpretation of the multi-purpose plant

species will be dealt at two levels i.e. at macro-level and at microlevel, basically it may be dealt phyto-geographic sense.

VII OBSERVATIONS

BOTANICAL NAME : *Tribulus terrestris*

LOCAL NAME : Chhota Gokhru, Kanti, Bhankri (**Plate-1.1**)

(A) VEGETATIONAL CHARACTERISTICS :

The plant belongs to the family of *Zygophyllaceae*. It is an annual herb, by thus, belongs to the 'Herb' group from

vegetational group classification point of view. It is a trailing and spreading herb, the plant is densely covered by trichomes with minute hairs. Leaves are compound, in opposite pairs, by thus, from leaf-class classification point of view, the plant belongs to the 'Leptophylls.' It's flowers are usually silky, mostly yellow in colour. Fruit's are globose, spinous, each with two pairs of hard sharp spines, in which one pair of spines is longer than another pair. Thus, from xerophytic categorization point of view, the herb falls under the category of 'spiny and thorny.'

PLATE -1.1 *TRIBULUS TERRESTRIS*



(B) ECO-CLIMATIC CONDITIONS AND HABITAT :

The herb species is very common on the habitats of loose sandy plains and also on compact as well as gravel formations, it has also occurrence on sand dunes habitat but comparatively show less occurrence than loose sandy plains areas. It is also found on stony and rocky areas but show, rare or frequent, occurrence. By thus, it is a herb species may be termed as multi habitat species.

Plant is widely distributed in different parts in India as well as Rajasthan up to three thousand meters altitude. It is a xerophytic species which has wide tolerance

limit's of eco-climatic conditions. The plant bears 50°C temperatures as mean maximum temperatures conditions and survives very well in the total annual rain fall below ten inches. By thus, it is a drought bearing plant species of western Rajasthan which requires no moisture conditions.

(C) PHYTO-CHEMICALS OF APPLIED PARTS AND PORTIONS :

Plant as a whole is important for the resin steroidal saponin and diosgenin is isolated from this plant. It is very rich in proteins and calcium. Dried fruit contain

semi-drying oil, peroxides, diastose, traces of glucosides, resin, protein and large amount of inorganic matters. From the roots, stem and leaves, sitosterol and stigmasterol were also isolated.

Chopra et. al. (1929) also studied the biologically active principles of this herb species, which are - (a) Alkaloides - Harman and Harmine, (b) Misc. compounds- Resin, fixed oils, tannins, reducing sugars, pero-xidase diastase enzymes and nitrates etc. and (d) Saponin - Sapogenin, Chiorogenin, Ruscogenin.

(D) MEDICINAL APPLIED ASPECT :

This plant is a most important ingredient of an Ayurvedic preparation. The drug is diuretic, tonic, aphrodisiac. The decoction of leaves is useful as a gargle for mouth trouble, painful gum and to reduce inflammation. The leaves increase the menstrual flow, cure, gonorrhoea. The fruit's are useful in urinary complaints painful micturition and impotence. Fruit's are also used to treat coughs, scabies and

anexemia. The roots are said to be stomachic, appetiser, diuretic and carminative.

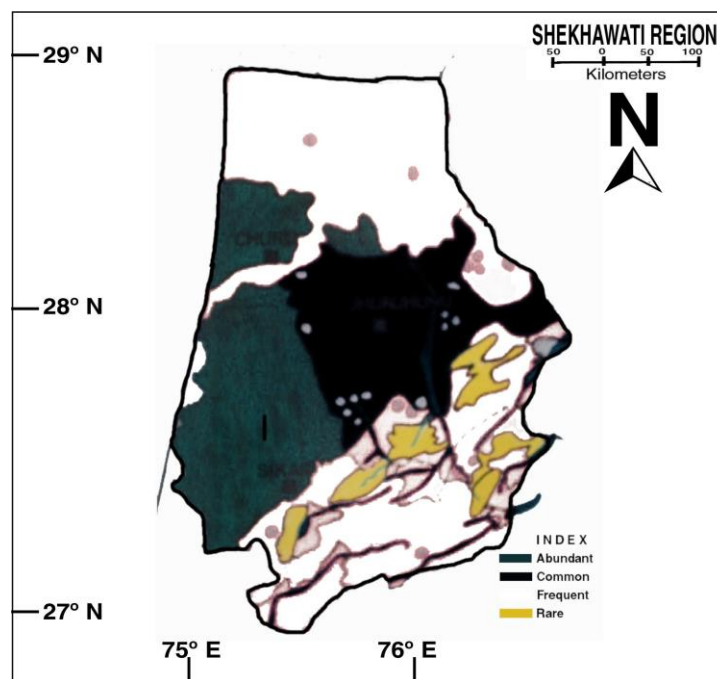
Besides this some researchers also stated that the plant is very common herbal drug and is a drug of choice for the treatment of urinary diseases specially Haematuria, for which they assert that it is a boon. It has great cooling effect and are also used for promotion of urination and as a nervine tonic.

(E) PHYTO-GEOGRAPHICAL DISTRIBUTION :

A. At Global Level :

It is a cosmopolitan herb species as a weed which is more or less found through out the countries which fall under the tropical belt. It is also observed from it's occurrence point of view that it is found throughout the Indian sub-continent by excluding the Himalayan Region.

FIG.-1.2 PHYTO-GEOGRAPHICAL DISTRIBUTION OF TRIBULUS TERRESTRIS



B. At Regional Level :

It has abundant occurrence from phyto-geographic pattern of distribution in following tehsils of Shekhawati Region - Churu tehsil (Churu district; northern part of Jhunjhunu tehsil (Jhunjhunu district; Fatehpur, Lachhamangarh, Sikar tehsils (Sikar ditrict). It is common more or less through out the northern Jhunjhunu district by leaving the northern part of Chirawa and Jhunjhunu tehsils as shown in **Figure-1.2**.

The herb has frequent occurrence from phyto-geographic distribution point of view among following tehsils - Taranagar and Rajgarh (Churu district), Danta Ramgarh, Shri Madhopur and Neem ka thana (Sikar district), and Khetri as well as Udaipurwati tehsil in the district of Jhunjhunu, respectively.

The herb species is rarely observed on stony and rocky habitat of Shekhawati Region; and also within the

habitat of riverine and aquatic areas the herb species again shows its rare occurrence, respectively.

VIII RESULTS

Being a phyto-geographer, the best efforts has been made in this research paper to conserve and analyse of decrease of natural vegetation and associated factors in Shekhawati region, Rajasthan. Further in this aspect, one can visualise very well the results of any sort of contribution of the efforts made by Department of Forest and public awareness in this aspect, in enhancement of the land under green coverage through implementation of successful afforestation and plantation programmes.

Natural vegetation i.e. *Tribulus terrestris* degradation is taking place in shekhawati region through irregular rainfall, public interfere, wind erosion, water erosion, high temperature, storms and soil erosion. These processes have been accelerated by increasing technogenic and human activities it has resulted in the degradation of *Tribulus terrestris* of the region due to in irregular rainfall and wind erosion and high temperature are more serious and widespread. Overgrazing and indiscriminate felling of under shrubs resulted in the degradation of vegetation cover and decrease in biomass production. In case these problems continue uncontrolled, large acreage of forest area will be affected in future.

The results suggest to take up immediate steps to adopt the improved forest management technologies with people's participation to lack of effects of decrease of natural vegetation in the region but it is not possible to conserve completely. Further the results of the study could be fruitfully utilized by the planners bio-scientists, botanists, phytogeographers, naturalists and policy makers to evolve suitable forest management technologies and strategies commensurate to the bio-conditions of the region.

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