

Phytogeographical distribution of *asparagus racemosus* in Shekhawati region, Rajasthan

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Abstract- The present paper discusses the potentiality of natural vegetation i.e. *Asparagus racemosus*. 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

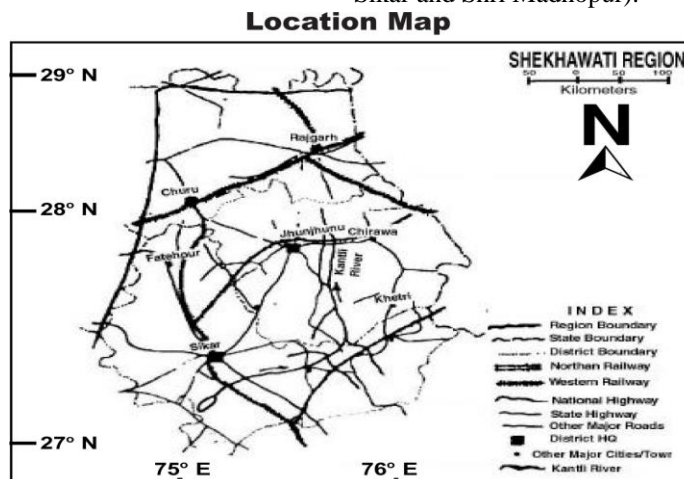
domestic animals are termed as useful plant species - at the part of his knowledge.

By thus, one can visualize Multi-purpose Medicinal Plant Species (MPMPS) i.e. *Asparagus racemosus* 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.

The area under study covers fully or partly three districts, namely Churu, Jhunjhunun 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 it's six tehsils (Data Ramgarh, Fatehpur, Laxmangarh, Neem ka Thana, Sikar and Shri Madhopur).



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 Ajit Sagar dam by Nair and Kanodia (1959); Nair, Kanodia 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*.

IV 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 phytogeographic sense.

VII OBSERVATIONS

BOTANICAL NAME : *Asparagus racemosus*

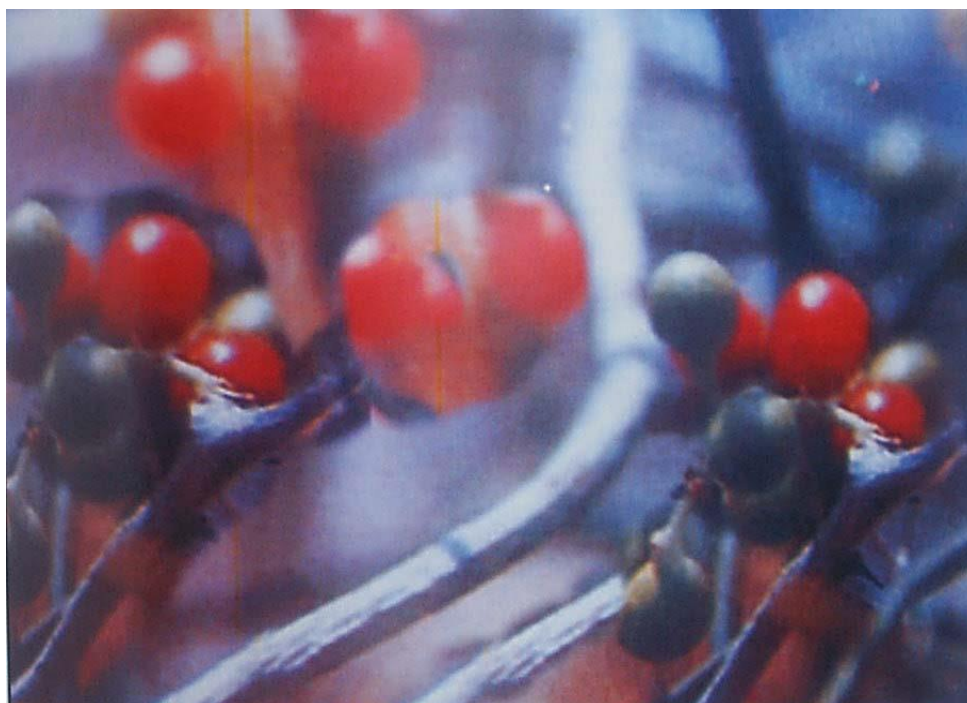
LOCAL NAME : Satavari, Satawar, Narkanto, Bhuttani
(Plate 1.1).

(A) VEGETATIONAL CHARACTERISTICS :

The plant belongs to the family-*Liliaceae*. It is a perennial foliage plant, it is an extensively scandent, much branched under shrub with spines. It's roots are tuberous and many in numbers. In nature, mostly it is observed as herb but at

favourable habitat conditions - the plant may be observed as "under shrub" stage from vegetational group point of view. From leaf-class classification point of view, the plant belongs to the "nanophylls" leaf-class. From xerophytic categorization point of view- the plant falls under the category of "spiny and thorny". It bears white flowers, it's fruit's are as globose berry and show red colour when ripe. The plants have their propagation by seeds. The flowers are very fragrant. The parienth lobes are white but change to copper tinge at length. Anthers are red.

PLATE -1.1 ASPARAGUS RACEMOSUS



(B) ECO-CLIMATIC CONDITIONS AND HABITAT :

The plant in nature mostly occurs on stony and rocky habitat i.e. in hilly patches of Shekhawati region, which is it's favourable habitat. The plant bears climatic limitation of rainfall condition in between 30 cm. to 100 cm. average annual rainfall amount but from temperatures variation it experiences 10°C mean monthly maximum, respectively. The plant generally favours shades habitat, in other words to say in open places it is not observed but it shows it's occurrence in the shades of some shrubs on stony and rocky habitat like-Euphorbias, *Rhus coriara* etc. Thus, it prefers somewhat comparatively more moist vegetation cover, in other words to say it avoids direct bright sun-shine insdation. The plant use to disappear from the surface when the relative humidity falls below 30 percent in atmosphere. The plant also prefer sandy-loam soil habitat and it requires

sunny position in initial stage fruit's growth; after full development it requires shade conditions.

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

Dried fleshy roots are the applied parts and portion of the particular perennial herb species. Spindle shaped structures, 5 to 15 cm., thick, cream yellow externally but white internally with longitudinal wrinkles, without any smell. From phyto-chemicals point of view- the biologically active chemicals reported are the saponins- shatavarin I,II,III and IV; the steroids and sitosterol; rich amount of engymes amylase and lipase, some glycosoides and sapogenins are also traced out from this plant. Inamdar and Mahabale in 1980 presented phyto-chemicals comparative study between Shatawar and *Asparagus species*.

(D) MEDICINAL APPLIED ASPECT:

The dried roots about 700 gm. are burnt and fumes are inhaled under a blanket for curing in normal fever. In brief, the plant is reported as tonic, swellings, loss in strength and vigour.

Asparagus racemosus is a very common and popular herbal drug prevailing from centuries back and prescribed by the Vedh's as a traditional medicine. It is used with several combination but primarily for the treatment of sexual impotency and general debility. It is very nutritive and good health tonic with cooling and soothing effects on

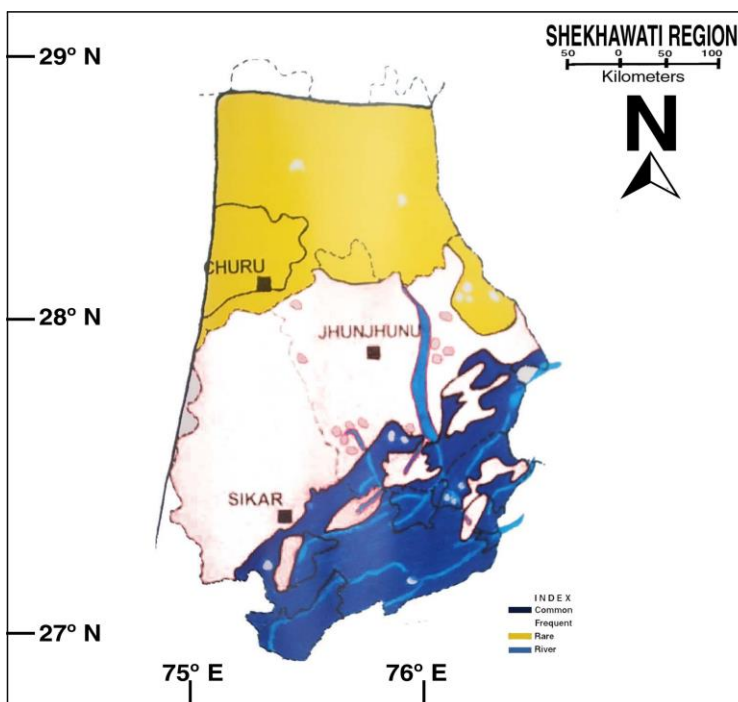
body. They also use it for the promotion of urination. Some of them also indicated about it's possible role in the treatment of epilepsy.

(E) PHYTO-GEOGRAPHICAL DISTRIBUTION :

A. At Global Level :

The plant has wide range of geographical distribution at global level, by thus, it covers - Tropical Africa, Australia, Ceylon, Pakistan (Sind), and in India (throughout the tropical and sub-tropical regions). In India, it has common occurrence in Chhindwara district of Madhya Pradesh.

FIGURE-1.2 PHYTO-GEOGRAPHICAL DISTRIBUTION OF ASPARAGUS RACEMOSUS



B. At Regional Level :

Figure-1.2 shows the phyto-geographic pattern of spatial distribution, which obviously divided the region under study into three distinct parts. It has rare phyto-geographic pattern of distribution by covering 3 tehsils of Churu district and north-eastern part of Malsisar locality of Jhunjhunu district. Most of the part and portion of western Sikar district and north-western portion of Jhunjhunu district show frequent pattern of phyto-geographic distribution of this plant over the sandy-loam formation habitat of Shekhawati region. It has common occurrence in Khetri and Udaipurwati tehsil (Jhunjhunu district) and Neemkathana, eastern part of Danta Ramgarh, Shri Madhopur and Sikar tehsil it'self (Sikar district) over the stony and rocky habitat i.e. hilly patches of the area under study i.e. Shekhawati region, Rajasthan. On riverine and aquatic habitat, the plant shows frequent

occurrence from phyto-geographic spatial distribution pattern point of view. It has rare or no occurrence within human settlements of the area under study as shown in **Figure-1.2**.

VIII RESULTS

Being a phyto-geographer, the best efforts has been made in this research paper to conserve and analyse of decrease-ment 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. *Asparagus racemosus* 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 *Asparagus racemosus* 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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