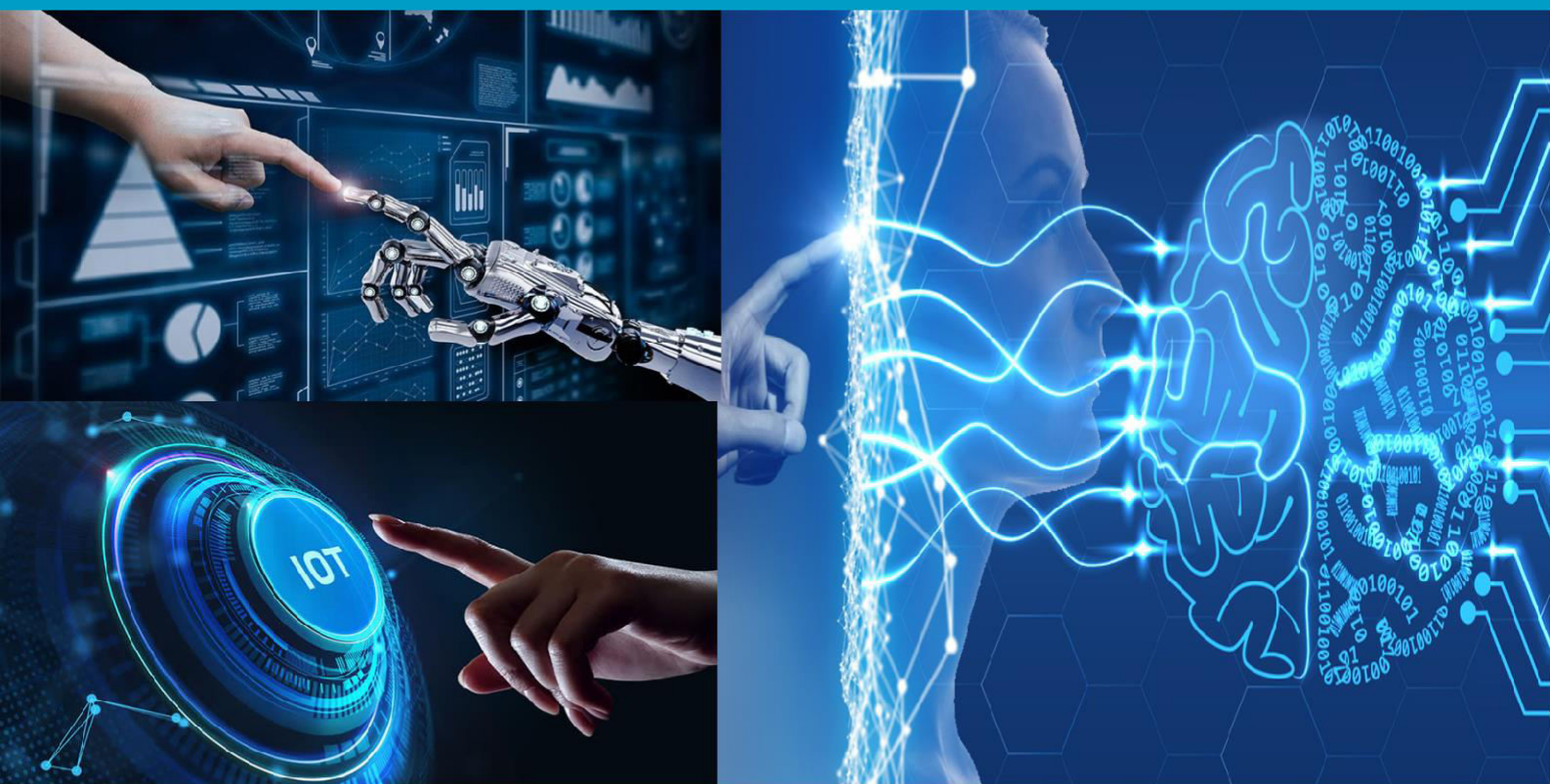




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Flora of Western Rajasthan

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ABSTRACT: Western Rajasthan has been blessed with varied flora even when majority of its area is desert. The forest cover is also quite limited, despite these adversities, some unique flora can be witnessed. Western Desert Thorn Forest type natural vegetation is found in this state. This vegetation is found in form of small clumps which are scattered in the state in open forms. As rainfall increases when we move towards west, the size and density of these patches increases. Desert ecosystem is prominently seen in Rajasthan and one of the best examples to witness the same is the Desert National Park located in Jaisalmer. This park is sprawled in an area of 3162 square km. One can see diverse flora in this ecosystem. The desert's geological history can be traced back to its origin through the massive tree trunks and sea shells that have been fossilized here. Many resident as well as migratory birds have made this region their home.

KEYWORDS: Western, Rajasthan, Flora, Forest, Desert, Park, Ecosystem

I. INTRODUCTION

Another worth visiting place is the Ranthambore National Park. It is located in Sawai Madhopur and is considered to be a prominent Tiger Reserves in India. In 1973, this National Park became an integral part of Project Tiger.[1,2,3]

Rare and unique herbs are found grown in Dhosi Hill area. It is situated in Jhunjhunu region. This place is also famous as Chyawan Rishi's Ashram" and this is where Chayawanprash was first formulated. This formulation is considered to be good for health. In Alwar district, another popular reserve is located, namely Sariska Tiger Reserve. About 107 km from Jaipur and 200 km away from Delhi, this reserve is famous among wild life lovers. This reserve is sprawled in about 800 square km area. In 1979, Tiger Reserve was declared as a National Park.

Located in Churu district, in Sujangarh another sanctuary is located. It is famous as Tal Chhapar Sanctuary. Nestled amidst Shekhawati region, this sanctuary houses a large populace of desert foxes and blackbuck. A popular predator, caracal, also referred to as the desert lynx can also be seen here. Prominent birds found in this region are sand grouse[7,5,8] and partridge. Locally known as Godavan, the Great Indian Bustard is the state bird of Rajasthan. Since 2011, it has been declared as an endangered species.

Flora

On the eastern side of Aravali range, a sparse forest cover can be seen. It is just nine percent of the total state area. Thus, limited vegetation can be witnessed in the desert area. Here, trees with stunted growth, some grasses and thorny shrubs can be seen. Besides Northern Desert Thorn Forest type natural vegetation, another vegetation type seen here is ephemeral. It is seen only during monsoon season.

The most prolific vegetation seen in this state is Kejri or *Prosopis cineraria*. This is found majorly in arid zone. Its shape is bean like and is known as sangria. It is not only used as fodder but also consumed as vegetable. It is considered as a delicacy in Rajasthan. Another popular desert vegetable is ker. Variety of shrubs and akaro (scientific name- *Calotropis procera*) are also found in abundance. Since this is desert vegetation, the shrubs have a lot of thorns. Other plants growing here are thor (Scientific name- *Euphorbia caduca*), babul (Scientific name- *Acacia nilotica*), bordi (Scientific name- *Sisyrinchium nummularia*) and anwal (Scientific name- *Cassia aureiculata*). Some perennial grass species seen here is dhaman (Scientific name- *Cenchrus ciliaris*), sewan (Scientific name- *Lasiurus sindicus*), bharut (Scientific name- *Cenchrus catharticus*) and boor (Scientific name- *Cenchrus jwarancusa*). These species not only help in binding the soil together but are also good fodder for cattle.[7,8,9]

Creepers, shrubs, herbs and bushes dot the shallow wetland landscape in Western Rajasthan. Kejri (Scientific name- *Prosopis cineraria*) and babul (Scientific name- *Acacia nilotica*) are seen. More than seventy species of trees can be seen. Some prominent species are peepal (Scientific Name- *Ficus religiosa*), Dhak (Scientific Name- *Butea monosperma*), ber (Scientific Name- *Zizyphus mauritiana*), banyan (Scientific Name- *Ficus benghalensis*) and khajur (Scientific Name- *Phoenix sylvestris*). 13 shrub varieties, 30 grass species and more than 100 medicinal species can be seen here. In Mount Abu which is a hill area, species like bamboo (Scientific name- *Dendrocalamus strictus*), salar (Scientific

name- *Bowellia sericata*), dhav (Scientific name- *Anogeisrus pendula*) and jamun (Scientific name- *Syzygium cumini*) are found. Rare species of wild roses, ferns and orchids can also be seen here.

In neighboring areas of Jaipur, dhav can be found in abundance. Other plant species see here are thor, solar, guggal, godal, shatawari, brahmi and adusa.

II.DISCUSSION

Biodiversity means the ecological diversity that exists in a particular area. Rajasthan boasts rich, diverse flora and fauna in [10,11,12] west. Due to its topography major part of Rajasthan is arid, and the forest cover is also very scanty. The flora that grows here is called a Desert Thorn Forest. The biodiversity of the state of Rajasthan changes due to rainfall, another physical feature. Rain in Rajasthan has a direct impact on biodiversity in different areas. The amount of water present decides the density of plants and animals in a particular region. Rajasthan is a very diverse state, and you will find Thorn scrub in the middle of Aravali and the Thar desert. Rajasthan is blessed in terms of natural wood. It has tropical dry, broadleaf forests that can be easily found in the region. The desert region of western Rajasthan is home to many plant species. Almost 2000 plants are found here. western part of the state which includes the desert part has been thoroughly studied floristically its South and South eastern part has remained neglected and except for a few stray reports no systematic work on the floristics of this comparatively moist and floristically rich part of the state has ever been attempted before. The treatise includes a systematic and up to date presentation of 1378 plant species (including cultivated as well as ornamental) covering 126 families growing in this part of Rajasthan [13,15,17] (Mewar region). Some characteristic associations such as Flora of Ancient Monuments and walls lithophytes weeds flora of wastelands aquatic vegetation specialized Angiosperms cultivated plants ornamentals rare vulnerable and endangered plants exotic plants and sanctuaries have been described. The system of Bentham and Hooker has been followed except at certain places where the circumscription of the families follows that of Hutchinson's Families of Flowering Plants. The treatise also contains illustrations of some important plants as well as distributional maps of the plant communities and geographical maps of the area.

III.RESULTS

There are natural fields of *Lasiurus indicus* grass, which was dominated grass of the Thar region. It is therefore, the need of the time to conserve natural resources of the desert ecosystem. Many workers have done a remarkable work on the floral diversity of the Western Thar desert. Vegetation diversity plays a vital role in maintaining ecological balance in any natural ecosystem. Therefore, ecological studies and systemic floristic inventory must be carried out on regular interval to assess changes in diversity due to natural as well as anthropogenic factors [16]. Keeping in view of the importance of ecological study to considerate the mutual relationship between nature and inhabitants, the information on floral diversity was collected in relation to different habitats of the Western Thar desert of Rajasthan. The floristic survey of western Rajasthan was carried out. A total of 62 families, 157 genera and 206 species were documented from the area. Among the existing families, Fabaceae is the largest family with 29 species followed by Poaceae (26 species) and Asteraceae (15 species), Amaranthaceae (10 species), [18,19,20] Cucurbitaceae (9 species), Convolvulaceae (6 species), Boraginaceae, Euphorbiaceae and Lamiaceae (5 species each), Acanthaceae, Brassicaceae, Capparidaceae, and Zygophyllaceae (4 species each), Solanaceae, Apocynaceae, Asclepiadaceae, Menispermaceae, Tiliaceae Malvaceae and Chenopodiaceae (3 species each), Aizoaceae, Casalpiniaceae, Cleomaceae, Cyperaceae, Hydrocharitaceae, Moraceae, Nymphaeaceae, Molluginaceae, Pedaliaceae, Plantaginaceae, Rhamnaceae, Salvedoraceae and Tamaricaceae (2 species each), while rest of 29 families are represented with one species. The habit wise analysis of the study shows that herbaceous vegetation (60.10%) were highest prevailing vegetation in Thar desert followed by shrubs (16.26%), trees (14.29%) and climber (9.36%).

The most common halophytes of the western Rajasthan are *Tamarix aphylla*, *Tamarix dioica*, *Trianthema triquetra*, *Cressa cretica*, *Portulaca oleracea*, *Portulaca meridiana*, *Haloxylon recurvum*, *Haloxylon salicornicum*, *Suaeda fruticosa*, *Sesuvium sesuvioides*, *Salsola baryosma*, *Zaleya redimita*, & *Zygophyllum simplex*. Vegetation on western Rajasthan including *Aerva persica*, *Aerva pseudotomentosa*, *Aerva javanica*, *Acacia jacquemontii*, *Boerhavia diffusa*, *Calligonum polygonoides*, *Cenchrus setigerus*, *Cenchrus ciliaris*, *Crotalaria burhia*, *Cyperus rotundus*, *Gisekia pharnaceoides*, *Mollugo cerviana*, *Lasiurus indicus*, *Panicum turgidum*, *Pedaliium murex*, *Tephrosia purpurea* can be observed during Monsoon period

The dominant vegetation of west Rajasthan are *Aristida funiculata*, *Arnebia hispidissima*, *Aerva javanica*, *Aerva persica*, *Aerva pseudotomentosa*, *Convolvulus deserti*, *Crotalaria burhia*, *Capparis decidua*, *Calotropis procera*, *Cymbopogon jawarncusa*, *Dactyloctenium indicum*, *Eragrostis ciliaris*, *Eragrostis minor*, *Eragrostis pilosa*, *Evolvulus alsinoides*, *Fagonia cretica*, *Farsetia hamiltonii*, *Heliotropium bacciferum*, *Indigofera cordifolia*, *Indigofera linnaei*,



Leptedenia pyrotechnica, *Ochocloa compressa*, *Pulicaria crispa*, *Tribulus terrestris*, *Tephrosia purpurea*, *Zizyphus nummularia*. The dominant tree of western Rajasthan is *Prosopis cineraria*. However, in some areas of the desert, other tree flora including *Salvedora oleoides*, *Salvedora persica*, *Zizyphus mauritiana*, *Tecomella undulata*, *Balanites aegyptiaca*, *Acacia senegal*, *Acacia nilotica*, *Acacia tortilis* etc are in co-existence with *Prosopis cineraria* [13- 15]. Some climbers including *Asparagus racemosus*, *Citrullus colocynthis*, *Cucumis callosus*, *Cucumis profetorum*, *Ipomoea pestigridis*, *Ipomoea eriocarpa*, *Mukia maderaspatana* and *Pergularia daemia* can be observed in western Rajasthan. [21,22,23]

Prosopis chilensis is the most abundant alien species in western Rajasthan, which is rapidly spreading in the region and is highly adopted to survive almost in any condition.. The common invasive flora reported from the Thar desert are *Prosopis chilensis*, *Acanthospermum hispidum*, *Ageratum conyzoides*, *Alternanthera pungens*, *Argemone Mexicana*, *Calotropis gigantea*, *Calotropis procera*, *Cassia obtusifolia*, *Cassia occidentalis*, *Cassia tora*, *Chloris barbata*, *Cleome viscosa*, *Echinops echinatus*, *Ipomoea eriocarpa*, *Ipomoea pestigridis*, *Lantana camara*, *Parthenium hysterophorus*, *Prosopis juliflora* / *Prosopis chilensis*, *Solanum surattense*, *Typha angustata* and *Xanthium strumarium*.

Regular assessment of biological diversity in any ecosystem is very necessary for collecting valuable information on current status of species for frequency, density, abundance, distribution, environmental stress on them, results of conservational efforts etc. Some natural causes that affect the innate distribution of floral species must be recognised. [25,27,28] It is also required that along with the anthropogenic activities, some natural aspect responsible for the loss of biological diversity should also be identified and mitigated to conserve the biological diversity of the in western Rajasthan. Infestation by insects on flowers, fruits and seeds may causes deformities in them and anomalous physiological changes in the plants, which are responsible for less and immature seed production. Therefore, efforts to study the seed physiology and reproductive biology of threatened and endangered plants are the need of the time to select and propagate resistant plants. Application of biotechnology and bio-engineering are playing a vital role in conserve and preserve the germplasm of threatened and endangered flora. Some conventional methods (preservation of seeds and pollens) and nonconventional methods (Cryo-preservation of embryo, callus, shoot tips) must be used to preserve and conserve the germplasm of endangered and threatened species. [29]

IV.CONCLUSION

In western Rajasthan, an exhaustive survey of all pteridophytic localities during different seasons of the year during the past decade has revealed the occurrence of many species belonging different genera. Thus, *Athyrium hohenuckerianum*, *Asplenium lanulatum*, *Cheilanthes belangeri*, *Botrychium lanuginosum*, *Dryopteris parasitica*, *Pityrogramma calomelanos*, *Pteris cretica* and *Athyrium parasnathense* are seen. This may be regarded as a clear indication that these taxa have recently been lost/eradicated from western Rajasthan due to one factor or the other. It has also been regularly observed that the population densities of many of the present day. Western Rajasthan pteridophytes have been decreasing at an alarming rate specially in respect to such restricted taxa as *Asplenium pumilum* var. *hymenophylloides*, *Selaginella rajasthanensis*, *Isoetes reticulata*, *I. rajasthanensis* and *Marsilea aegyptiaca*. Similarly, populations of some ferns growing in western Rajasthan like *Ophioglossum gramineum*, *Araioestegia pseudocystopteris*, *Pteris vittata*, *Dryopteris cochleata* and *Nephrolepis cordifolia* are also becoming thin and localised and reported as "seriously rare" taxa of western Rajasthan. Seriousness and severity of the threat to pteridophytic flora of this region is emphasized specially because of the scantier floristic resources of the state. *Adiantum recurvatum* (D.Don) Fras. –Jenk is a new record to the pteridophytic flora of western Rajasthan. [30]

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