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Ethnobotany and its implications of thar desert

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Abstract: ***An ethnobotanist studies how indigenous (native) plants provide food, medicine, shelter, dyes, fibers, oils, resins, gums, soaps, waxes, latex, tannins, and even contribute to the atmosphere. Some of these crops are cultivated for generations, so they represent a distinct genetic stock adapted to the local climate, which can be better understood through ethnobotany. A medical ethnobotanist studies Indian medicinal plants and their traditional uses. Indians have used plants for thousands of years to treat diseases and maintain their health, and they continue to be an important staple of folk medicine and health care. The Thar bio-region is renowned for its remarkable and tenacious vegetation, which has unerringly adapted to the hostile land. It is also celebrated for revealing a wide variety of robust desert plants once one delves into its apparent uniformity. Moreover, this flora is closely intertwined with the lives of the locals in terms of customs, traditional attire, practices of faith, and old tales.***

Keywords: Hydro Politics, Water Problem India Pakistan, Indus, Jhelum, Chenab Conflict.

I. INTRODUCTION

In ethnobotany, plants are examined to determine their utility by indigenous people, thus combining botany and anthropology, thus making it an interdisciplinary field. The botanical knowledge of an ethnic people can be useful in many aspects, which is why it is referred to as a "multidisciplinary science." In recent years, several disciplines have come to be used in connection with ethnic people and their knowledge, namely ethnomedicine, ethnotaxonomy, ethnotoxicology, ethnoecology, ethnogynaecology, ethnopharmacology, ethnopediatrics, ethnoforestry, etc.[1]

An ethnobotanist studies the relationship between people and plants, such as their use for medicines, food, shelter, clothing, fuel, fodder, and other household purposes. It deals with the interaction between indigenous plants and local inhabitants. The aim of ethnobotanists is to discover how these plants are used as food, clothing, shelter, fodder, fuel, furniture and how their medicinal use is related to other characteristics of the plants. Through anthropological methods, they understand and collect the knowledge of valuable plants. It is a multidisciplinary science that studies "the relationship between a society and its environment, and particularly its plants".[2]

70 percent of the world population still relies on medicinal plants for their primary healthcare needs. By preserving and enhancing indigenous plant knowledge, we are actually rescuing a global heritage. In most parts of the world, the importance of traditional ethnobotanical knowledge has been recognized and documented due to advances in ethnobotany. The understanding of this fact must be matured in developing countries where populations rely more on traditional ethnobotanical knowledge.[3]

Due to their immobility and massive cellulose production, plants are a more efficient and reliable source of building materials and food than animals. Plants' biochemical diversity, which contributes to their many medicinal and culinary benefits, may be related to their immobility. The chemicals plants produce interact with other species in their environment either for mutual benefit (such as delivering pollen or seeds) or for defense (such as repelling or poisoning predators or parasites). Almost all recreational chemicals, such as caffeine in coffee, nicotine in tobacco, and theophylline in tea, are derived from plants.[4]

Ethnobotany types

The ethnobotanist conducts research on a wide range of topics and techniques that are difficult to categorize. However, the subfields below describe some of the most important applications of ethnobotany today.

- Ethnomedicine: Medical Ethnomedicine studies traditional medicines-not only those with sources (such as traditional Chinese medicine and ayurveda) but also those whose knowledge and practices are passed down orally.[5]
- Archaeoethnobotany: Paleoethnobotany (or archaeoethnobotany) is the study of ancient ethnobotany. Understanding the ecology of present habitats is difficult without understanding the history of the environment, which often involves prehistoric human interventions, which is closely related to ethnobotany. It is called folk categorization when members of a language group name and categorize plants and animals. This form of ethnobotanical study employs an emic method, which involves describing actions in words that are meaningful (consciously or unconsciously) to the speaker. It is called folk categorization when members of a language group name and categorize plants and animals. This form of

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Applications:

- Agribusiness is the process of selecting plants that have specific genetic characteristics that humans want to develop into domesticated crops or plants.In two ways, ethnobotany contributes to agricultural understanding:
- Providing methods for creating genetically modified plants for human consumption.
- It explains and clarifies the various ways crops are cultivated, whether for economic advantage, long-term production, or cultural reasons.
- Entheogens are psychoactive substances (usually plant matter with hallucinogenic effects) that induce spiritual or mystical experiences. Native American societies have long relied upon entheogens for their spiritual practices.
- Additionally, ethnobotany has medicinal, culinary, and veterinary applications.[6]

II. THAR DESERT AREA

An arid region in the north-west of the Indian subcontinent, the Thar Desert, also known as the Great Indian Desert, covers 205,000 km2 (79,000 sq mi) in both India and Pakistan. In the world, it is the 20th largest desert, and the ninth largest hot subtropical desert. There are about 90% of the Thar Desert in India and 10% in Pakistan. The Thar Desert occupies about 5.12% of India's total land area. In addition to Rajasthan, Gujarat, Punjab, and Haryana make up the Indian portion of the desert. In Pakistan, this portion extends into Sindh and Punjab (the portion of the latter province is known as Cholistan Desert). There is the Indo-Gangetic Plain to the north, west, and northeast of the Thar Desert, the Rann of Kutch to the south, and the Aravali Range to the east. The Thar Desert lies between the Aravalli Hills in its northeastern part. It extends from Punjab and Haryana in the north to the Great Rann of Kutch along the coast, and into the alluvial plains of the Indus River in the northwest and west. There is large, shifting sand dunes that cover much of the desert area. They receive sediments from the coast and alluvial plains. Rainfall ranges from 100 to 500 millimeters (4 to 20 inches) per year, almost all of it between June and September. The Luni River is the only river in the desert.[7]

There are some wildlife species in the Rann of Kutch that are fast disappearing in other parts of India, including the blackbuck (Antilope cervicapra), chinkara (Gazella bennettii), and Indian wild ass (Equus hemionus khur).This may be partly because they are well adapted to this

environment: they are smaller than similar animals that live in other environments, and they are mainly nocturnal. Additionally, the Bishnois local community has taken special measures to protect the grasslands in this region, which have not been converted into cropland as quickly as those in other regions. There are also a number of reptiles and mammals living in the Thar Desert, including a subspecies of red fox (Vulpes vulpes pusilla) and the caracal.There are 141 species of migratory and resident desert birds in the area, including harriers, falcons, buzzards, kestrels, vultures, short-toed eagles (Circaetus gallicus), tawny eagles (Aquila rapax), greater spotted eagles (Aquila clanga), and laggar falcons (Falco jugger).Indian peafowl are resident breeders in the Thar region. The peacock is the national bird of India and the provincial bird of Punjab (Pakistan). They can be seen on khejri trees and pipal trees in villages.[8]

This dry area is characterized by a northwestern thorn scrub forest that occurs in small clumps scattered more or less openly. As rainfall increases, patch density and size increase. These tree, shrub, and herb species are found in the Thar Desert natural vegetation. The following herbs and grasses grow in the area: “Ochthochloa compressa, Dactyloctenium scindicum, Cenchrus biflorus, Cenchrus setiger, Lasiurus scindicus, Cynodon dactylon, Panicum turgidum, Panicum antidotale, Dichanthium annulatum, Sporobolus marginatus, Saccharum spontaneum, Cenchrus ciliaris, Desmostachya bipinnata, Eragrostis species, Ergamopagan species, Phragmites species, Tribulus terrestris species, Typha species, Sorghum halepense, Citrullus colocynthis species”.

III. ETHNOBOTANY OF THAR DESERT

Its characteristics are characterized by low rainfall (less than 60 cm), high evapo- transpiration rate, aridity, and a lack of vegetation. The western Rajasthan region has a sandy warm desert known as the Great Indian Thar.It extends into the southern portion of Haryana and Punjab and into the northern portion of Gujarat state. Located between 24° to 28° N latitude and 68° to 71° E longitude, the Thar desert covers about 2,00,000 km2 of the western Indian subcontinent.9 It is the ninth largest desert in the world, but it has very fair biodiversity. There

are 83 people per square kilometer in the Thar desert, compared to a population density of only 7 people per square kilometer in other deserts. In India, more than 60% of the Thar Desert lies within the Rajasthan state. In the Thar Desert, there are 628 species of plants, 352 genera, and 87 families. It is mainly dominated by dry grassland or by grassland interspersed with trees and thorny shrubs. Some ephemeral rivers in the Thar desert are important geological features, including Luni, Sookdi, Ghagghar,

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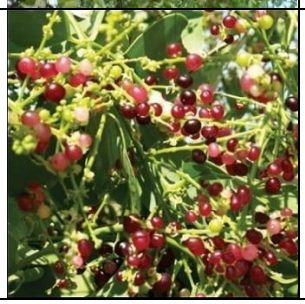
Bandi and Jojri rivers, which have a significant impact on the microclimatic conditions of the regions through which they pass, and thus, affect the vegetation of these areas. According to the report of the task force on grasslands and deserts (2006), about 45% of the total geographical area in the Thar region is protected. In the Thar desert, which covers 16076 km2, there is only one national park and five wildlife sanctuaries. Indira Gandhi Canal Project (IGCP) in western Rajasthan has significantly affected the desert ecosystem by changing the crop pattern, changing the grazing regime, and introducing alien species.

The canal project has led to immigration of new people from different parts of India, who lack the conservation values of the Thar desert inhabitants. The IGNP has accelerated the overexploitation of Thar desert for agricultural activities, which simultaneously enhanced the cattle population in the region. In the Thar region, buffaloes, goats, and other ruminants have increased in number. Rangeland vegetation is under 3.2 ACU/Ha of grazing pressure when compared to its carrying capacity (0.3 to 0.5 ACU/Ha), resulting in a decline in floral diversity.[10]

Table 1. Thar Desert Plants

Name	Photo	Features	Uses
Khejri (Prosopis cineraria)		• "Medium sized, deciduous • Small leaves, thorny branches • Deep root system penetrating up to 30 metres • Tiny yellow flowers in spikes • Bunches of slender fruit pods"	• "State tree of Rajasthan • Pods gathered as vegetable when green • Provides timber • Range of traditional medicine • Fodder for livestock"
Rohira (Tecomella undulata)		• "Small to medium deciduous tree • Trumpet-shaped flowers in red, yellow or orange clusters • Seed pods are long and thin, gently curved"	• "State flower of Rajasthan • Excellent wood used to make furniture, tools and printing blocks • Traditional medicine"
Kumatiyo (Acacia Senegal)		• "Small deciduous tree • Shiny dark red spines in sets of three, with one thorn hooked like a parrot's beak • Creamy white flowers in cylindrical spikes • Flat brown seed pods, gently curved or straight • Uses/Significance to Community"	• "Source of the true gum arabic, once used in the printing industry as an adhesive • Also used in processed food • Seeds collected when green to make a traditional Marwari vegetable dish"
Hingot (Balanites roxburghii)		• "Small tree or deciduous bush with thin branches • Small leaves • Long green thorns • Egg-shaped woody fruit"	• "Seeds, fruit, leaves and bark have medicinal and detergent use • Fruit is a natural dewormer eaten by pigs, porcupines, ruminants and jackals"
Jaal (Salvadora persica)		• "Resilient tree with evergreen foliage of fleshy leaves • Knobbly trunk • Tiny white flowers in branching clusters • Small translucent berries in red or cream"	• "Many traditional medicines • Small creatures like rodents and birds nest in the trunk"

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Ethnobotany, the study of the relationship between plants and people, is particularly fascinating in the Thar Desert, as the local communities have a deep reliance on the desert's plant species for various purposes. Here are some notable aspects of the ethnobotany of the Thar Desert:[11]

- **Medicinal Plants:** The Thar Desert is rich in medicinal plants that have been traditionally used by the local communities for centuries. Many plants possess therapeutic properties and are used to treat ailments such as skin diseases, digestive disorders, respiratory problems, and more. Examples include Aloe vera, Prosopis cineraria (Khejri), Calotropis procera (Sodom's milkweed), and Salvadora persica (Toothbrush tree).
- **Food and Nutrition:** The desert plants provide important sources of food for the local inhabitants. Crops such as pearl millet (Bajra), sorghum (Jowar), and pulses like moong and moth beans are cultivated in the Thar Desert. These crops are highly adapted to the arid conditions and provide sustenance to the people. Additionally, several wild plant species, including certain desert fruits, roots, and seeds, are consumed as food.[12]
- **Livestock Feed:** The Thar Desert is predominantly a pastoral region, and the plant species play a crucial role in feeding livestock. Thorny shrubs like Acacia senegal (Gum arabic), Cenchrus ciliaris (Buffel grass), and various grasses are valuable fodder resources for camels, goats, and sheep. These plants have adapted to the arid environment and are well-suited for grazing animals.
- **Fiber and Craftsmanship:** The desert plants contribute to the local economy through the production of fibers and materials used in traditional crafts. The fibers from plants like Agave, Calotropis procera, and Crotalaria burhia are utilized in the production of ropes, baskets, mats, and other handicrafts. These products have cultural significance and are often traded or sold for income generation.
- **Fuel and Construction:** In the absence of abundant timber resources, the people of the Thar Desert rely on plant species as a source of fuel and construction material. Prosopis cineraria, a drought-resistant tree, is highly valued for its fuelwood, which provides heat and energy for cooking. Additionally, various thorny shrubs and cacti are used for making fences, huts, and other structures.
- **Traditional Knowledge:** The local communities living in the Thar Desert possess a wealth of traditional knowledge about the uses and properties of different plants. This knowledge is passed down through generations and plays a vital role in sustainable resource management and conservation. Traditional healers, known as vaidyas or hakims, have a deep understanding of the medicinal properties of desert plants and are highly respected within the community.

The ethnobotany of the Thar Desert highlights the intricate relationship between the local people and the plant species that have adapted to survive in the arid conditions. The knowledge and utilization of these plants not only meet the subsistence needs of the inhabitants but also contribute to their cultural identity and socioeconomic well-being

Related Research in Ethnobotany of Thar Desert

Upadhyay, B., Roy, S., & Kumar, A. (2007) The significance of traditional medicinal plant uses in healthcare practices is widely acknowledged as they provide valuable insights for new areas of research. However, documentation of indigenous plant uses for medicinal purposes remains limited in many rural regions of Rajasthan, including Churu district. This study aimed to explore the diversity of plant resources utilized by local communities for treating various ailments. Questionnaire surveys, participatory observations, and field visits were conducted to gather information on plant uses. The findings revealed that 68 plant species were commonly employed by the locals to address different diseases, with leaves being the most frequently utilized plant part (31%). The interviewees shared a total of 188 plant uses, with the highest frequency reported for therapeutic purposes such as fever, rheumatism, diarrhea, asthma, and piles. Interestingly, the knowledge of the available medicinal plants and their uses among interviewees showed a positive correlation with their age, indicating the gradual disappearance of this ancient knowledge in younger generations.

Choudhary, K., Singh, M., & Shekhawat, N. S. (2009) The present ethnobotanical investigation presents a comprehensive account of the traditional knowledge surrounding the utilization of Acacia jacquemontii and its derived products among tribes and communities residing in the Thar Desert of Rajasthan, India. Acacia jacquemontii, a versatile tree suitable for afforestation, social integration, and agroforestry, offers more than just wood production, soil enhancement, and nitrogen fixation. It also provides various other valuable resources such as fodder, fruits, gums, fibers, and roofing materials. During the survey, it was observed that the tribal population commonly employed tree parts like bark, roots, and gum for treating diverse ailments and disorders. These indigenous healthcare practices serve as cost-effective alternatives in situations where modern healthcare services are either unavailable or prohibitively expensive. This preliminary study sheds light on the unexplored potential of this tree and its significance as a valuable resource for humanity.

Mathur, M. (2012) This article focuses on the application of quantitative ethnobotany to assess the potential and conservation priorities of medicinal plants in the Thar Desert. These plants are believed to have effects on the central nervous system (CNS). The study reveals that so far, 35 plants from the region have been documented for their use in treating nine different CNS-related diseases and 16 diseases related to other body systems. The Relative Importance Value (RIV) of these 35

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medicinal plants ranges from 0.9 to 1.65. Through agglomerative hierarchical clustering, the plants have been categorized into three clusters based on their usage for treating different body systems. Additionally, Principal Component Analysis highlights three plants that are most commonly used for CNS-related diseases. The extensive use of Abutilon indicum, Cocculus pendulus, Sida cordifolia, Abrus precatorious, and Solanum surattense makes them more susceptible to degradation, necessitating urgent conservation measures. This includes the standardization of agro-techniques to incorporate these plants into cropping systems as a means to counter indiscriminate wild harvesting. Such multivariate analyses serve as a foundational step for the development of multi-herb combinations.

IV. CONCLUSION

A medical ethnobotanist studies the traditional uses and medicinal properties of Indian plants. For thousands of years, plants have been used to treat disease and maintain health on the Indian subcontinent, and they remain important staples in health and folk medicine today.The Thar bio- region's vegetation is awe-inspiring, thanks to its resilience amidst the sparse and inhospitable terrain. It encompasses a wonderfully diverse range of desert plants that prosper in the region's arid climate. Such an array of greenery also has strong social ties with the local communities living there, which are seen through daily customs, attires, religions and tales.

References

1. “Choudhary, K., Singh, M., & Shekhawat, N. S. (2009). Ethnobotany of Acacia jacquemontii Benth.-an uncharted tree of Thar Desert, Rajasthan, India. Ethnobotanical leaflets, 2009(6), 1”.
2. “Mathur, M. (2012). Use of quantitative ethnobotany for assessing potential and conservation priorities of the Indian Thar desert medicinal plants claimed for central nervous disorders. Medicinal Plants-International Journal of Phytomedicines and Related Industries, 4(3), 143-153”.
3. “Singh, D., & Singh, R. K. (2011). Kair (Capparis decidua): A potential ethnobotanical weather predictor and livelihood security shrub of the arid zone of Rajasthan and Gujarat”.
4. “Upadhyay, B., Roy, S., & Kumar, A. (2007). Traditional uses of medicinal plants among the rural communities of Churu district in the Thar Desert, India. Journal of ethnopharmacology, 113(3), 387-399.”
5. “Gilani, S. A., Kikuchi, A., Shinwari, Z. K., Khattak, Z. I., & Watanabe, K. N. (2007). Phytochemical, pharmacological and ethnobotanical studies of Rhazya stricta Decne. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 21(4), 301- 307”.
6. “Laurier, E. (2009). Ethnomethodology/Ethnomethodological Geography. In R. Kitchin & N. Thrift (Eds.), International Encyclopedia of Human Geography (pp. 632–637). Elsevier”.
7. “Rathore, M. S., & Shekhawat, N. S. (2011). Ethnobotanical Importance of Orans-As a Means Of Conserving Biodiversity. International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EES), 1(4), 195-200”.
8. “Jain, S. C., Jain, R., & Singh, R. (2009). Ethnobotanical survey of Sariska and Siliserh regions from Alwar district of Rajasthan, India. Ethnobotanical leaflets, 2009(1), 21”.
9. “Dhir, R., & Shekhawat, G. S. (2012). Critical review on Tecomella undulata: a medicinally potent endangered plant species of Indian Thar Desert. Int J Curr Res, 4(6), 36-44”.
10. “Charan, P. D., & Sharma, K. C. (2011). Floral diversity of Thar desert of western Rajasthan, India. Jphytolres.org”.
11. “Kavya, D., Dashora, L. S., & Veena, G. (2010). An annotated inventory of some medicinal plants of Thar Desert having anti-HIV potential. International Journal of Forest Usufructs Management, 11(1), 19-23”.
12. “Hardev, R., Arun, K., Santosh Kumar, S., Archana, O., & Satyawada Rama, R. (2012). Meiotic studies in Withania somnifera (L.) Dunal.: A threatened medicinal herb of Indian Thar Desert. American Journal of Plant Sciences, 2012”.

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