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Conservation Status and Threats to Medicinal Plant Diversity in Semi-Arid Rajasthan: A Case Study of Shekhawati

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Abstract: **The Shekhawati region, part of semi-arid Rajasthan, exhibits significant botanical diversity, especially concerning ethnomedicinal plant species relied upon by local communities for healthcare. This paper assesses the conservation status, patterns of species distribution, and critical threats facing medicinal plant diversity in Shekhawati before 2014. Comprehensive surveys and secondary literature analysis indicate that habitat loss, overharvesting, lack of awareness, and inadequate policy enforcement have led to the depletion of rare and commercially valuable species. Emphasis is placed on the urgent need for in-situ and ex-situ conservation strategies, along with community-driven conservation models, to safeguard traditional knowledge and biodiversity for future generations**

Keywords: Shekhawati, ethnomedicinal plants, conservation, habitat loss, traditional knowledge, Rajasthan, biodiversity, threats, overharvesting

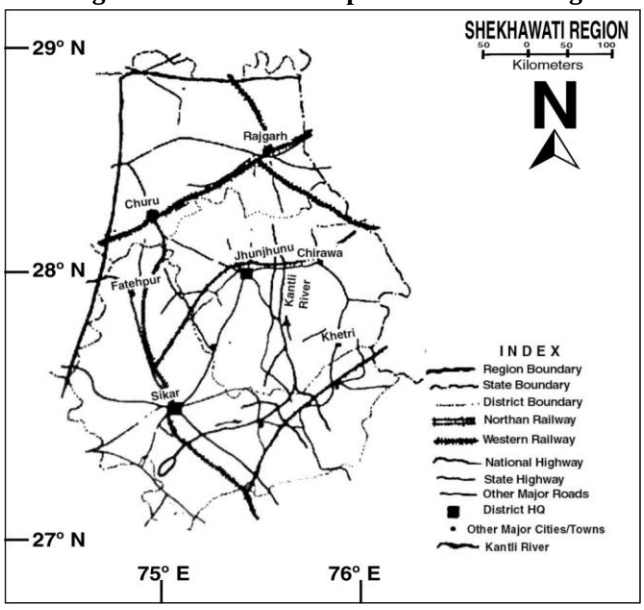
1.Introduction

Medicinal plants play an integral role in healthcare systems and cultural traditions across the Indian subcontinent, especially in rural and semi-arid regions where modern healthcare access is limited. Rajasthan, and particularly the Shekhawati region, harbors a wealth of ethnomedicinal knowledge and plant diversity, shaped by centuries of indigenous use, agro-climatic variations, and unique floristic elements. However, development pressures, land use change, and unsustainable exploitation threaten this fragile herbal heritage.

2. Study Area

Figure-1.1 shows the area under study i.e. Shekhawati region which is located in the north-eastern part of Rajasthan state and the region has geographical extension from 26°26' to 29°20' N latitude and 74° 44' to 76°34' E longitude on the map of Rajasthan. The area under study covers fully or partly three districts, namely Churu, Jhujhunun 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 it's 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.

Figure- 1.1 Location Map of Shekhawati Region



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.

At the part of population, Shekhawati region contributes 8.7 percent of the state's total in which sex-ratio is 948 females per thousand males in Total Population whereas it is very low i.e.

887 in Child Population for the area under study. The region obtains high Literacy rate which is about 10% more than that

of the state's average. Among tehsils, Buhana ranks at first position while as Neem ka Thana contributes lowest in this aspect. The region obtains high density (244) i.e. 50 percent more than that of state's average which is 165 persons per sq. area 2001. The region has also Slum population but it is very low or to say negligible i.e. 2.5% only of the urban area's total. The whole region has distribution of two types of soils; Sandy soil and Red Loamy soil. The former soil type has obvious distribution in Churu district, the areas of sand dunes topography; the later soil group is mostly distributed over the districts of Jhunjhunu and Sikar (classification based on dominancy, availability and agricultural productivity). The distribution of soil type and it's physical as well as chemical nature is a significant aspect from vegetation as well as plant species distribution point of view.

On the basis of another type of soil type classification according Prof. Thorpe and Smith based on the origin of the soil, the observations revealed in this direction that Remosols type of soil has distribution in the areas of sand dunes topography; all three tehsils of Churu districts have, Red sandy soil which is more alkaline in nature. Hilly topography soil and Riverine soil have their distribution according the distribution of habitat of study area.

3. Methodology

- **Secondary Data Review:** Extensive review of published ethnobotanical, ecological, and conservation literature relevant to Shekhawati and adjacent zones up to 2014.
- **Field Surveys:** Historical survey records from studies in Lohargal, Khetri, Sakambari, Beer Jhunjhunu, and related microhabitats.
- **Interviews:** Compilation of historical knowledge from older ethnobotanical surveys and accounts.

4. Plant Identification and Conservation Status

Medicinal species identification was cross-verified with botanical monographs and conservation assessments documented in the period before 2014. Phytogeographical distinctions and habitat-specific status were noted.

5. Results

5.1. Diversity and Distribution of Medicinal Plants

- Over 48 key ethnomedicinal species recorded in Shekhawati, spanning diverse botanical families such as Fabaceae, Solanaceae, and Asclepiadaceae.
- Notable species: Withania somnifera (Ashwagandha), Citrullus colocynthis, Sarcostemma viminale, Calotropis procera, Asparagus racemosus, Salvadora persica, and others were widely used but variably threatened.
- Riverine, xeric, and ephemeral pond habitats each sustain different plant assemblages; herbs dominate (38% of taxa in select habitats), followed by trees and shrubs.

6. Conservation Status

- Several species classified as locally rare (R), frequent (F), common (C), or abundant (A).
- Threatened categories: Withania somnifera (declining), Sarcostemma viminale (rare), Salvadora persica (exploited for miswak), Ceropegia bulbosa, and others.
- Documented loss: Commercial exploitation and uprooting for roots are key drivers of local extinction in Jhunjhunu and adjoining reserves.

7. Discussion

Major Threats to Medicinal Plant Diversity

- **Overharvesting and Destructive Collection:** Roots and whole-plant uprooting, especially for market-driven species, greatly reduce natural regeneration.
- **Habitat Loss and Fragmentation:** Agricultural expansion, urbanization, and mining result in habitat fragmentation and edge effects, leading to local species extirpation.
- **Grazing Pressure:** Livestock overgrazing, particularly in open field and dune habitats, impedes seedling survival.
- **Ignorance and Erosion of Traditional Knowledge:** Intergenerational knowledge transfer is weakening, and formal documentation remains sparse, increasing risks of knowledge and genetic erosion.
- **Low Regeneration and Reproductive Success:** Many medicinal plants have low seed set, poor dispersal, and specific ecological requirements, making recovery difficult.

Conservation Challenges

- **Inadequate Legal and Policy Framework:** Weak enforcement of protection and conservation policies in local governance.
- **Ex-situ Conservation Lag:** Botanical gardens and seed banks are either absent or not tailored to the region's unique flora.
- **Community Involvement:** There is a limited role for local communities in formal conservation, although informal traditions persist.

8. Recommendations

1. **Community-Based Conservation:** Empower local users through participatory approaches and benefit-sharing mechanisms.
2. **Habitat Protection and Restoration:** Legal protection of key habitats (sacred groves, remnant woodlands, ponds) is crucial.

3. **In-situ and Ex-situ Strategies:** Encourage on-farm and garden cultivation of threatened medicinal species, as well as seed banking of rare taxa.
4. **Educational Outreach:** Promote awareness among younger generations about the value and sustainable management of native plant resources.
5. **Policy Strengthening:** Integrate ethnomedicinal plant conservation into broader environmental and rural development policies.

9. Conclusion

Medicinal plant diversity in Shekhawati, Rajasthan, is central to both the environmental resilience and cultural identity of the region. Without concerted conservation action, habitat loss and overexploitation threaten not only local health traditions but also broader ecological stability. Integrated, community-driven, and scientifically-informed approaches must underpin any successful conservation strategy for the semi-arid landscapes of Rajasthan.

References

[1.] Katewa, S.S. & Galav, P.K. (2005). Traditional herbal medicines from Shekhawati region of Rajasthan. Indian Journal of Traditional Knowledge, 4(3), 237–245.
[2.] Sharma, M.K. (2007). Medical Plant Geography, Rachna Publication, Jaipur.
[3.] Charan, A.K. (1992) Plant Geography, Rawat Publication, Jaipur
[4.] A survey report on ethnomedicinal plants of Shakambhari hills of Shekhawati region
[5.] Some Threatened Medicinal Plants of Beer Jhunjhunu Conservation Reserve of Rajasthan
[6.] Ethno-Medicinal uses of Some Plants of Shekhawati region
[7.] An ethno-botanical survey of important medicinal plants in the Shekhawati region