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Phytogeographical Distribution and Ethnobotanical Applications of Medicinal Flora in Churu District, Rajasthan

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***Abstract:** This paper compiles and synthesizes published phytogeographical and ethnobotanical research on the medicinal flora of Churu district (Shekhawati/Thar Desert region), Rajasthan. Published field surveys and floristic inventories report between 56 and 68 medicinal species (representing ~26–28 families) used by rural, tribal and nomadic communities across Churu's tehsils (e.g., Sujangarh, Taranagar, Sardarshahar). Leaves are the most frequently used plant part and common therapeutic categories include treatments for fever, wounds, skin diseases, digestive disorders and respiratory ailments. The district's xerophytic phytogeography favors drought-tolerant taxa (e.g., Acacia spp., Maytenus emarginata, Salvadora spp.), and traditional knowledge remains an important reservoir for primary healthcare — but faces threats from habitat degradation and overharvesting. This paper presents a consolidated overview of species records, phytogeographical notes, ethnobotanical uses, and conservation recommendations based on existing studies.*

Keywords: Phytogeographical Distribution, Ethnobotanical Applications, Medicinal Flora, Churu District, Rajasthan

1. Introduction

Churu district lies in the north-east of Rajasthan, forming part of the Thar Desert with typical arid to semi-arid climatic conditions; its vegetation is adapted to low rainfall, high temperature ranges and sandy soils. The region supports a distinct desert flora with many medicinal species that are integral to local healthcare and livelihoods. Documenting the phytogeographical distribution and traditional uses of these plants is essential for biodiversity conservation, sustainable use, and potential bioprospecting. Several recent and earlier surveys have recorded dozens of ethnomedicinal species from different parts of Churu district.

1.1 Objectives

1. Compile published records of medicinal plant species reported from Churu district.
2. Summarize phytogeographical patterns and dominant taxa in the district.
3. Present the major ethnobotanical applications and plant parts used.
4. Identify conservation concerns and propose management recommendations.

2. Materials and Methods

This study is a synthesis of published literature and floristic surveys from Churu district. Major data sources included peer-reviewed articles, conference/journal PDFs, regional floristic inventories and ethnobotanical surveys that explicitly sampled Churu (Sujangarh, Taranagar, Sardarshahar, and surrounding areas). Key studies and reports used for compilation are listed in References. Data extraction focused on: species name, family, locality/tehsil, habitat (xeric/sandy plains/patchy scrub), plant part used, and reported ethnomedical application. Where multiple studies reported the same species, occurrences were merged to produce a consolidated species list and use-frequency summary. Methodological approaches in the underlying studies typically combined field visits, semi-structured questionnaires with traditional healers and elders, participatory observation, and herbarium confirmation of specimens.

3. Results

3.1 Species richness and family composition

Across surveyed literature the number of ethnomedicinal species reported for Churu district ranges from **56 to 68 species**, belonging to between **26 and 28 families** (variation reflects different sampling locations and study scopes). Several studies specifically document 56 species used locally, while other inventories report up to 68 species in broader surveys of the district. Commonly represented families include Fabaceae, Poaceae, Acanthaceae, Solanaceae and Euphorbiaceae (family dominance varies by study and site).

3.2 Phytogeographical patterns

Churu's flora is dominated by xerophytic and drought-tolerant taxa adapted to sandy soils and scavenged moisture. Studies on species such as *Acacia senegal* and *Maytenus emarginata* document their distribution across Churu tehsils and note their ecological importance in stabilizing sand dunes and as multipurpose (fuel, fodder, medicinal) species. Sacred groves and reserve patches (e.g., around Taranagar) harbor higher medicinal plant richness and are important microrefugia.

3.3 Plant parts used & modes of preparation

Across studies, **leaves** are the most frequently used plant part (reports indicate ≈30% or more of uses), followed by roots,

bark, whole plant, and seeds. Common preparation methods include decoctions, pastes, poultices, direct application of sap, and infusions. The selection of part and preparation closely matches the ailment treated (e.g., leaf decoctions for fever, poultices for wounds).

3.4 Major therapeutic categories

Local uses reported repeatedly include treatment for:

- Fever, cough and respiratory complaints
- Skin diseases, wounds and burns
- Digestive disorders (diarrhea, colic)
- Musculoskeletal pain and body ache
- Urological complaints and kidney stones (local remedies reported in Taranagar/Sujangarh studies) Species reported as frequently used for these ailments include *Aloe vera*, *Ocimum sanctum* (Tulsi), *Azadirachta indica* (Neem), *Cissus quadrangularis*, *Tribulus terrestris* (Gokhru) and several local shrubs/herbs recorded in multiple surveys.

4. Discussion

4.1 Ethnobotanical knowledge persistence and erosion

The studies show a still-active traditional knowledge system: healers (Bhopas), older villagers and pastoralists retain extensive plant-use knowledge. However, younger generations show declining transmission, and commercialization / agricultural expansion threatens wild populations. Maintaining knowledge requires documentation, community engagement, and integrating local custodians in conservation planning.

4.2 Conservation concerns

Primary threats identified across the literature are:

- Overharvesting of roots and whole plants for medicinal use.
- Habitat loss from land conversion and fuelwood extraction.
- Diminished recruitment due to grazing and altered fire regimes.
  Sacred groves and protected patches act as important reservoirs; promoting their formal protection and sustainable harvesting guidelines is critical.

4.3 Research and development opportunities

- Detailed phytochemical screening of high-use species reported from Churu could validate traditional claims and identify lead compounds.
- Participatory domestication and agro-cultivation trials (e.g., for *Aloe*, *Ocimum*, *Withania* if present) to relieve pressure on wild stocks.
- GIS-based mapping of species distributions across tehsils to identify hotspots for in-situ conservation and sustainable harvest zones.

5. Conclusion

Churu district hosts a significant number of medicinal plant species adapted to arid conditions and forming an essential part of local healthcare. Published surveys consistently report **56–68 ethnomedicinal species** used by rural communities across the district. Conservation action (community protection of sacred groves, sustainable harvest protocols) combined with scientific validation (phytochemistry, propagation trials) can help preserve both biodiversity and traditional knowledge. Future work should prioritize exhaustive inventories across unsampled tehsils, herbarium vouchering, and GIS mapping to guide conservation planning.

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