

Ethnobotanical Survey and Medicinal Flora of Churu District, Rajasthan (India)

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Abstract: Churu district, situated in the arid zone of Rajasthan, features a harsh climatic profile characterized by extreme temperatures and low rainfall. Despite these hostile environmental conditions, the region harbors a rich diversity of resilient medicinal plants deeply embedded in local traditional healthcare systems. This paper documents the prominent medicinal flora of Churu, exploring their taxonomic classification, therapeutic uses, and chemical constituents. Traditional knowledge held by local communities underscores the potential for modern pharmacological validation, emphasizing the urgent need for sustainable conservation strategies in the face of escalating desertification.

Keywords: Ethnobotanical, Churu District, Arid Zone Flora, Medicinal Plants, Traditional Knowledge.

I. INTRODUCTION

The district of Churu is situated within the northeastern margins of India's Thar Desert. This territory is characterized by shifting sand dunes, severe diurnal and seasonal temperature variations—dropping below 0°C during winter nights and soaring past 50°C at the height of summer—alongside highly erratic and minimal precipitation. To survive these rigorous hyper-arid circumstances, indigenous plant species have developed specialized physiological mechanisms and morphological attributes. For generations, the pastoral, rural, and nomadic societies residing in Churu have utilized this local vegetation to counteract various medical disorders in both humans and livestock. Systematically archiving this ethnomedicinal heritage is of paramount importance before such orally transmitted traditional wisdom is permanently lost to rapid modernization and regional biodiversity decline.

II. METHODOLOGY

Study Area: The geographical boundaries of Churu District, located in Rajasthan, India.

Data Collection: Information was accumulated via structured literature evaluations of regional floristic records, localized ethnobotanical field surveys, and standard taxonomic validation protocols.

Analysis: The cataloged plant species were organized and evaluated systematically based on their botanical families, vernacular names, specific anatomical parts utilized, and explicit therapeutic properties.

III. SYSTEMATIC INVENTORY OF KEY MEDICINAL PLANTS

The table below highlights the botanical species found in the Churu territory that hold the highest ecological relevance and therapeutic value:

Botanical Name	Family	Local Name	Plant Part Used	Primary Medicinal Uses
<i>Calotropis procera</i>	Apocynaceae	Aak	Foliage, root exudate/latex, and inflorescence	Administered to manage respiratory issues like asthma, cutaneous disorders,

Botanical Name	Family	Local Name	Plant Part Used	Primary Medicinal Uses
				rheumatism, and serves as an anti-inflammatory remedy.
<i>Prosopis cineraria</i>	Fabaceae	Khejri	Cortical bark, foliage, and seed pods	The bark is applied to alleviate joint rheumatism and neutralize scorpion envenomation; nutrient-dense pods are used to soothe respiratory tracts.
<i>Tecomella undulata</i>	Bignoniaceae	Rohida	Cortical bark	Critically recognized as "Desert Teak"; its bark preparations are used to treat chronic dermatological issues like eczema, syphilis, and hepatic-splenic disorders.
<i>Capparis decidua</i>	Capparaceae	Kair	Mature fruits and young shoots	Fruit extracts are utilized for managing cardiovascular irregularities and asthma; the root bark functions as a natural laxative and anthelmintic agent.
<i>Withania somnifera</i>	Solanaceae	Ashwagandha	Root systems and foliage	Operates as a potent natural adaptogen and immune system enhancer; extensively used to mitigate mental stress and arthritic inflammation.
<i>Ziziphus nummularia</i>	Rhamnaceae	Jharber	Foliage and roots	Leaf pastes are topically applied to resolve scabies and subcutaneous boils, while root decoctions are effective against acute diarrhea.
<i>Convolvulus pluricaulis</i>	Convolvulaceae	Shankpushpi	Entire plant body	Esteemed as an exceptional neurological tonic; widely prescribed for memory augmentation, epilepsy control, and anxiety reduction.
<i>Citrus colocynthis</i>	Cucurbitaceae	Tumba	Root structures and fruits	Exhibits powerful purgative qualities; actively integrated into traditional treatments for

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				diabetes, hepatic jaundice, and localized joint rheumatism.

IV. PHYTOCHEMICAL AND ADAPTOGENIC CHARACTERISTICS

Vegetation native to the Churu ecosystem synthesizes highly concentrated matrices of secondary metabolites as an adaptive defense mechanism against severe thermal fluctuations and moisture deprivation. These biosynthesized active agents supply the foundational chemical architecture that drives their clinical success within traditional Ayurvedic frameworks and indigenous folk remedies.

Alkaloids and Glycosides: These therapeutic compounds are particularly abundant in species like *Withania somnifera* and *Calotropis procera*, imbuing them with profound anti-inflammatory properties.

Flavonoids and Phenols: These chemical groups are highly prevalent within the tissues of *Prosopis cineraria* and *Tecomella undulata*, rendering substantial antioxidant profiles and antimicrobial protection.

V. DISCUSSION AND THREATS

Although the indigenous medicinal flora of Churu holds significant value for modern pharmaceutical discovery, these fragile resources are currently facing severe ecological pressures. The most prominent destructive drivers include:

Over-exploitation: The deployment of highly destructive wild-harvesting approaches, such as uprooting entire herb structures to retrieve root tissues, decimates local populations.

Climate Change: The worsening intensity and frequency of desert drought cycles severely inhibit native seedling establishment and survival rates.

Grazing Pressure: Elevated livestock densities subject vulnerable, low-lying herbs like *Convolvulus pluricaulis* to unsustainable overgrazing.

VI. CONCLUSION & FUTURE PROSPECTS

The challenging arid landscapes of Churu function as a vital sanctuary for structurally resilient and medicinally indispensable plant species. It is increasingly urgent to transition away from unregulated wild foraging practices toward systematic, community-led sustainable cultivation models. Harmonizing the long-standing ethnomedicinal insights of Churu's indigenous populations with rigorous modern phytochemical profiling can accelerate the discovery of novel bioactive molecules for global medicine.

Strategic Recommendations:

Setting up strictly monitored *in-situ* conservation reserves within Churu's natural habitats.

Providing incentives and training to local agriculturalists to cultivate high-demand, drought-adapted medicinal crops such as Ashwagandha and Tumba to improve rural economic security.

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