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MEDICINAL TREES OF SARDARSHAHR IN CHURU: THE RAJASTHAN THAR DESERT REGION

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ABSTRACT: The Thar Desert is a vital repository of medicinal trees that play a significant role in the traditional healthcare practices of local communities. This study was conducted in the Sardarshahar tehsil of Churu district, located in the Thar Desert, to document and analyse the uses of medicinal tree species. Data were gathered through a review of relevant literature and field observations. A total of 20 medicinal tree species from 11 families were identified and analysed for their medicinal applications. Among these, 65% trees were used for their bark, 40% each for leaves, root, and seed, 15% for flower, 10% for stem and 5% for gum, fruit/pod and whole plant by the local people. The findings highlight the extensive traditional knowledge associated with the utilization of these trees and underscore their significance in local healthcare practices. This study serves as a baseline for understanding the medicinal flora of the region, emphasizing the need for conservation efforts to protect these valuable natural resources and preserve indigenous knowledge for future generations.

INTRODUCTION: The Thar Desert, known for its arid climate and unique biodiversity, is home to a diverse array of plant species that have adapted to the harsh environment. Among these, medicinal trees hold a special place due to their extensive use in traditional healthcare systems. These trees provide various provisioning services to the indigenous communities [1]. Indigenous communities in the region have relied on these trees for generations to treat various ailments, showcasing a rich repository of ethnobotanical knowledge. The forest of India has been the source of traditional medicines for millennia.

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Out of 17000 species of higher plants described in India, 7500 are known for their medicinal uses [2]. Many plants from the wild/cultivated are widely used in traditional systems of medicine. A large amount of traditional knowledge about the use of medicinal plant species is still carried and orally transmitted by indigenous people and a few of them having trade values [3]. Sardarshahar tehsil in Churu district, situated in the heart of the Thar Desert, provides a significant habitat for medicinal tree species.

The region's extreme climatic conditions have led to the evolution of resilient flora, many of which possess medicinal properties. Despite their importance, these medicinal trees face threats from overharvesting, habitat loss, and climate change. This study focuses on documenting the traditional uses of medicinal trees in Sardarshahar tehsil. By analysing 20 medicinal tree species, the research aims to provide a comprehensive understanding of

their applications in local healthcare practices. The findings not only highlight the cultural significance of these species but also emphasize the need for their conservation to sustain biodiversity and preserve traditional knowledge systems along for the development of green economy [4].

Study Area: Sardarshahr Tehsil, located in the Churu district of Rajasthan, India, forms a part of the vast and arid Thar Desert. Known for its harsh climatic conditions, including extreme temperatures and scarce rainfall, the region presents a unique ecosystem that has fostered the growth of diverse xerophytic plant species adapted to survive in arid conditions.

This ehsil is geographically situated at coordinates approximately 28.44° N latitude and 74.49° E longitude, with an average elevation of 312 meters above sea level ((Wikipedia contributors, 2024).

The Thar Desert, often referred to as the "Great Indian Desert," is characterized by sandy terrain, sparse vegetation, and a semi-arid climate. The annual rainfall in the region averages between 100 to 500 millimetres, most of which occurs during the monsoon season [5]. Temperatures can soar as high as 50°C in summer and drop to near freezing in winter. Despite these challenging conditions, the region supports a wealth of flora, much of which is deeply integrated into the traditional knowledge systems and daily lives of the local communities.

Vegetation and Biodiversity: The vegetation in Sardarshahr primarily consists of thorny scrub and drought-resistant trees, many of which have significant ethnobotanical and medicinal importance. Key species include *Prosopis cineraria* (Khejri), *Acacia nilotica* (Babool), *Salvadora persica* (Pilu), and *Tecomella undulata* (Rohida). These trees not only provide ecological stability but are also integral to the traditional medicinal practices of the local communities.

Socio-Cultural Context: Sardarshahr is inhabited by communities that have a long history of coexisting with the desert environment. These communities, including the pastoral and agricultural groups, possess a rich repository of ethnobotanical knowledge passed down through generations. Traditional medicine plays a vital role in their healthcare systems, particularly due to limited access to modern medical facilities in remote areas.

Rationale for Selection: The selection of Sardarshahr Tehsil as the study area for this research is based on several factors:

Rich Ethnobotanical Knowledge: The region is home to indigenous communities with extensive knowledge of the medicinal properties of local trees.

Ecological Importance: The Thar Desert's unique flora contributes to its ecological balance, providing a critical habitat for wildlife and serving as a source of livelihood for humans.

Underexplored Area: Despite its ecological and cultural significance, the ethnobotanical potential of Sardarshahr has not been organised studied, making it a promising area for research.

This study aims to document the traditional knowledge associated with medicinal trees in Sardarshahr, explore their therapeutic uses, and assess their potential for sustainable utilization in the context of environmental and socio-economic challenges

METHODOLOGY: Information on traditional uses of trees found in Sardarshahar was collected through formal and informal interviews, literature, and from local people [6]. The Inhabitants of the study area have agropastoral lifestyle and partially depend on agricultural practices. Most of the people of study area have some traditional knowledge of medicinal plants and they make use of this knowledge as primary healthcare.

RESULTS AND DISCUSSION: Medicinal remedies of 20 tree species were recorded **Table 1** with tree botanical name, local name, part use and folk medicinal use.

Usually, all parts of the tree such as bark, fruits, leaves, root, seeds, and flowers are utilized by local people. Among different parts the bark is commonly used (65%) followed by seed (40%), leaves (40%), roots (40%), flowers (15%) and whole tree is not commonly used due to big size of tree as only 5% **Fig. 1.**

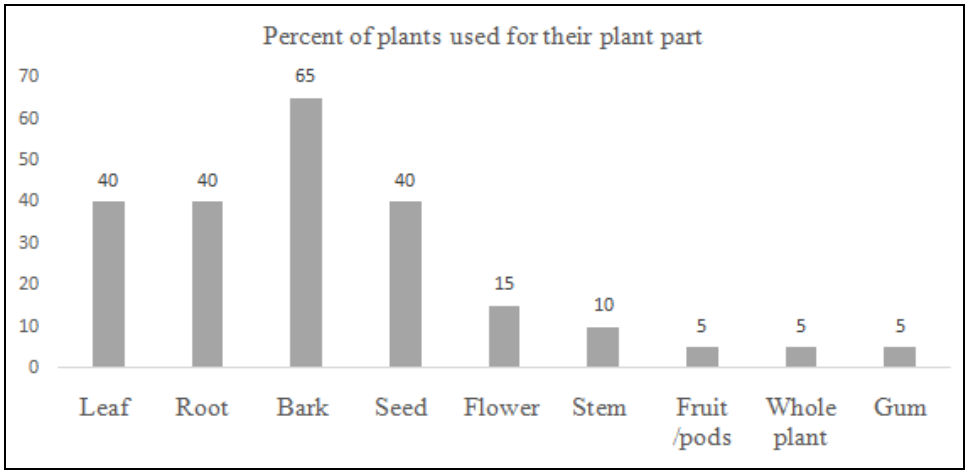

FIG. 1: PERCENTAGE OF PLANT PARTS USED IN PREPARING MEDICINES FOR VARIOUS AILMENTS

The documented 20 medicinal tree species belong from 11 different families **Fig. 2**. Among the most represented were Fabaceae (35%), Rutaceae (10%), Salvadoraceae (10%), and Moraceceae (10%) family-that is, species which are well adapted to arid conditions. Some of the important medicinal tree species occur are those of *Prosopis cineraria* (Khejri), *Salvadora persica* (Pilu), *Acacia nilotica* (Babool), and *Tecomella undulata* (Rohida).Many of these species were obviously crucial for local medicinally, ecologically, and culturally.

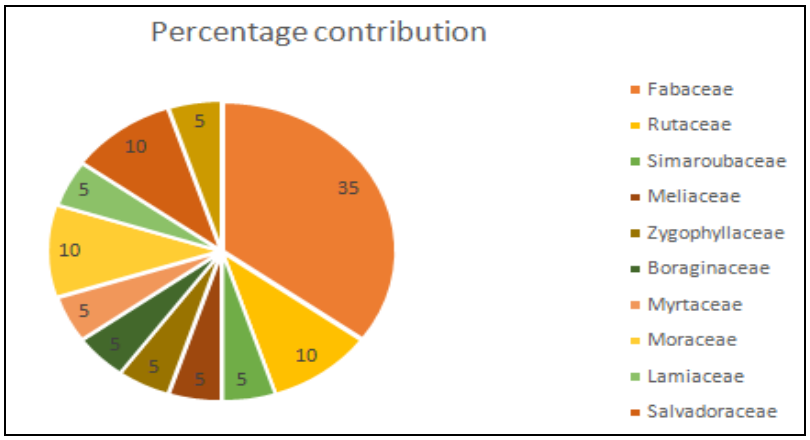

FIG. 2: PERCENTAGE CONTRIBUTION OF FAMILY IN TRADITIONAL MEDICINE

These tree species have proven to be useful in antiseptic, anti-inflammatory, and anti-diabetic forms of medical treatment, and hence reflect their large medicinal potential. The local healers created remedies with decoctions, poultices, powders, and infusions. In the same way, medicinal trees also have cultural and spiritual importance. Some of these are revered and preserved near homes and temples; for example, Prosopis cineraria, or Khejri. Such cultural practices have helped to conserve the species even under high environmental pressure.

TABLE 1: INFORMATION ON THE MEDICINAL TREES OF THE STUDY AREA

Sr. no.	Botanical name	Common name	Family	Plant part used	Ethnobotanical uses
1	*Acacia nilotica* L.	Babool	Fabaceae	Bark, gum and pods	Anti-cancer, vasoconstrictor, anti-asthmatic, cytotoxic, anti-diabetic, anti-platelet, anti-plasmodial, anti-fungal, antioxidant activities, and anti-bacterial [7]
2	*Acacia senegal* (L.) Willd	Kumta/ kumat	Fabaceae	Root, stem, leaves, fruit, and seed	Paste use in burns as well as the wounds in the leprosy, cold, cough, diarrhea, dysentery, expectorant, gonorrhea, hemorrhage, sore throat and the disorders of the urinary tract [8]

3	*Aegle marmelos* (L.) Correa.	Beal	Rutaceae	Leaves, stem, and fruit	Abdominal Pain, Heart palpitation, Urinary troubles, Hypochondriasis, Laxative, Febrifuge, Ophthalmic, and Deafness [9]
4	*Ailanthus excelsa* Roxb.	Ardu	Simaroubaceae	Bark	Asthma, dysentery, pile, antifertility, antioxidant, antimicrobial and leucorrhea [10]
5	*Albizia lebbeck* (L.) Benth.	Shirish	Fabaceae	Bark, leaves, seed, and flower	Leaf paste, bark and latex are used for treating eczema, acne and conjunctivitis respectively [11]
6	*Azadirachta indica* A. Juss.	Neem	Meliaceae	Whole plant	Malaria, cancer, asthma, Anti-bacterial, antifungal, intestinal worm, skin ulcer, diabetes, and potential for the COVID-19 virus [12]
7	*Balanites aegyptiaca*(L.) Delile.	Hingota	Zygophyllaceae	Fruit, Seed, and bark	Used in jaundice, intestinal worm infection, wounds, malaria, syphilis, epilepsy, dysentery, constipation, diarrhea, hemorrhoid, stomach aches, asthma, and fever [13]
8	*Cassia fistula* L.	Amaltas	Fabaceae	Root, leaves, flower, fruit, and seed	The plant has been approved for medications for Jaundice, Gout, Fatty Liver, Liver Disorder, Bronchitis, Fever, Skin disease, Migraine, Joint pain, Cancer, and tumor [14]
9	*Cordia myxa*L.	Lasura	Boraginaceae	Fruit and leaves	Used for chest, throat and urinary infections. Used in traditional medicine as remedies for osteoarticular diseases and antibacterial activity present [15]
10	*Dalbergia sissoo* Roxb.	Shisham	Fabaceae	Leaves and Bark	Seed oil treats skin burning, and scabies. Leaf extract treats sore throats, heart problems, diarrhea, syphilis, and gonorrhea. leaf juice treats eye and sinus problems. It treats scabies, body blistering, scalding urine, syphilis, and digestion. Wood treats leprosy, sores, and vomiting. Roots treat diarrhoea and dysentery [16]
11	*Eucalyptus oblique* L'Her.	Safeda	Myrtaceae	Leaves and bark	Leaf oil use in antimicrobial, antiseptic, antioxidant, chemotherapeutic, respiratory, and gastrointestinal disorder treatment, wound healing, and insecticidal/insect repellent, and perfumes, soap making and grease remover [17]
12	*Ficus religiosa* L.	Peepal	Moraceae	Whole plant, root, bark, seed, leaves, and fruit	In fruit anti-fertility activity, in bark anti-inflammatory, anti-ulcer, anti-diabetic, and in leaves anti-asthmatic, wound healing activity [18]
13	*Ficus benghalensis* L.	Bargad/ Banyan tree	Moraceae	Leaves, bark, seed, arial root, fruit and root	Antioxidant, anticancer, antitumor, antimicrobial, and wound healing, antistress [19]
14	*Moringa oleifera* Lam.	Sahjan	Fabaceae	Whole plant	Leaves extract has antioxidant property. Seed has antidiabetic property. Leaf, seed, root, and bark has antibacterial property [20]
15	*Murrayakoenigi i* (L.)	Meetha neem/ Curry tree	Rutaceae	Leaves, bark, and root	Antioxidant, antibacterial, antidiabetic, anti-inflammatory, antihypertensive, antifungal, antiprotozoal, anti hypercholesterolemic, antiulcer, antidiarrheal, neuroprotective, and antitumor activities [21]
16	*Prosopis cineraria* (L.) Druce	Khejri	Fabaceae	Bark and pod	Leprosy, Asthma, Leucoderma and [22]
17	*Salvadora oleoides* Decne	Jaal	Salvadoraceae	Root bark, leaves, and fruit	Cosmetic development, enhancing skin health, protecting against oxidative-stress-induced damage, digestive disorders, wounds, dermatitis, oral hygiene, tooth decay, mycosis and other microbial infections and inflammations [23]
18	*Salvadora*	Pilau/ jaal	Salvadoraceae	Leaves,	Decoctions of leaves are used as a mouthwash, and

	persica L.			seed, seed oil, flower, and shoot	masticated leaves for tooth and gum problems. Decoction of the root is used to treat gonorrhea, spleen trouble, epilepsy, and skin diseases, general stomach-ache, and stomach ulcers [24]
19	*Tamarixaphylla* (L.), Karst.	Faras	Tamaricaceae	Root, bark, and leaf	Roots used for leprosy, tuberculosis, and smallpox. Bark use for skin disease, syphilis, and hepatitis. Leaf use for headache, jaundice, fever, and tetanus (Alshehri *et al.*, 2021).
20	*Tecomella undulata* (Sm.) Seem.	Rohida	Bignoniaceae	Leaves, seed, and bark	Powder of bark recommended in ascites with hepatosplenomegaly, blood purifier, and hepatitis. Leaves use in HIV infection [26]

Despite the robustness of ethnobotanical knowledge about the medicinal trees, the study did identify problems due to unsustainable use of roots for traditional medicine, including Over-exploitation for timber and fuel wood of desert tree species and overgrazing. Along this there is a major concern of deterioration the habitat by global warming, overgrazing and Loss of traditional knowledge among the youth due to adoption of conventional medicine resources by considering local community cultural traditions.

CONCLUSION: Recognizing the vital medicinal value of key tree species, it is crucial to develop targeted strategies for their conservation and propagation. Medicinal harvesting must follow sustainable and science-based practices to safeguard these natural assets for future generations. A deeper understanding of these species' ecological roles and population dynamics is necessary, which can be achieved through standardized research methods. Conservation efforts should combine *in-situ* and *ex-situ* approaches, ensuring the survival and restoration of these species. Empowering local communities to cultivate these trees and implementing measures to regulate overgrazing can significantly contribute to their preservation. At the same time, increased exposure to modern markets has drawn younger generations away from traditional practices, posing challenges for retaining this knowledge. By documenting traditional wisdom from regions rich in untapped insights, we can preserve this invaluable resource. Such efforts not only honour and protect cultural heritage but also open doors to new pharmacological discoveries, benefiting society and bolstering local livelihoods.

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