

Ethnobotanical Study of Traditional Medicinal Plants in Sapotra Tehsil, Karauli District, Rajasthan

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ABSTRACT

This study documents the ethnobotanical knowledge and medicinal applications of plant species traditionally used by the rural and tribal communities of Sapotra Tehsil, Karauli District, Rajasthan. Through field surveys, interviews with local healers (Vaidyas), and semi-structured questionnaires, a total of 50 medicinal plant species belonging to 29 families were identified. The study highlights the significant role of plants in treating a variety of health conditions, including respiratory, gastrointestinal, dermatological, and musculoskeletal disorders. The findings demonstrate the strong dependency of local communities on plant-based remedies, with leaves (38%), roots (24%), and fruits (18%) being the most commonly used plant parts. The most common preparation methods include decoctions, juices, pastes, and powders. This ethnobotanical knowledge is vital for the conservation of plant species and the sustainable use of natural resources. Furthermore, documenting these practices offers valuable insights for future pharmacological research and the potential development of herbal medicines. The preservation of this traditional knowledge is essential, as it faces significant threats from modernization and the erosion of intergenerational transmission. This study emphasizes the importance of safeguarding both the plants and the cultural heritage associated with their use.

Keywords: Ethnobotany, Medicinal Plants, Traditional Knowledge, Conservation.

Introduction

Ethnobotany provides valuable insights into the traditional knowledge systems through which human societies utilize plant resources for food, medicine, and cultural practices. In many parts of India, especially in rural and tribal regions, medicinal plants continue to serve as the primary source of healthcare due to limited access to modern medical facilities and the high cost of allopathic medicines (Jain, 1991; WHO, 2013). Rajasthan, despite its arid and semi-arid climate, supports a wide diversity of medicinal plants that have been traditionally used by indigenous communities for treating various ailments (Jain and Jain, 2016; Katewa and Galav, 2005). The persistence of these practices reflects a deep ecological understanding developed over generations.

Sapotra Tehsil of Karauli District is inhabited largely by tribal and rural populations who possess rich indigenous knowledge of medicinal plants found in surrounding forests, scrublands, and agricultural fields. These plants are commonly used to manage common health problems such as digestive disorders, respiratory infections, skin diseases, fever, and musculoskeletal complaints. However, rapid socio-economic changes, habitat degradation, and declining interest among younger generations threaten the survival of this traditional knowledge (Kala, 2005; Sharma and Kumar, 2007). Although several ethnobotanical studies have been conducted in different parts of Rajasthan, scientific documentation of traditional medicinal practices in Sapotra Tehsil remains limited. Consequently, the current investigation

seeks to meticulously catalogue the ethnobotanical species utilized by the indigenous populations in Sapotra Tehsil, encompassing their local nomenclature, the specific anatomical sections employed, and the methodologies of preparation, with the objective of safeguarding traditional knowledge and establishing a basis for forthcoming pharmacological and conservation-focused inquiries.

Study Area

The study was conducted in Sapotra Tehsil, located in Karauli District in the eastern part of Rajasthan, India. This region is characterized by its semi-arid climate and hilly terrain, which is interspersed with scrub forests and vegetation. The area lies close to the Kailadevi Wildlife Sanctuary buffer zone, making it a region of ecological importance with rich biodiversity. The vegetation is predominantly composed of species from families such as Fabaceae, Moraceae, Combretaceae, and Euphorbiaceae, which thrive in the region's dry, undulating terrain. Sapotra Tehsil is home to rural and tribal communities, primarily Meena and Gurjar tribes, who rely heavily on traditional plant-based remedies for healthcare. These communities are spread across remote forested pockets, where access to modern healthcare services is limited, thus making ethnobotanical knowledge crucial for their well-being.

The geographical location of Sapotra Tehsil is approximately between 26.0°–26.5° N latitude and 76.8°–77.1° E longitude, and it includes several villages, such as Sapotra, Mandrayal, and Barbasan, among others. These areas are characterized by a combination of forested land and open fields, with diverse plant species that are used by the local communities for various medicinal purposes. The study area offers an ideal setting for documenting the traditional uses of local plants, especially due to its rich plant diversity and the continued reliance on plant-based healthcare practices among the inhabitants.

Methodology

This study was conducted in Sapotra Tehsil, Karauli District, Rajasthan, between 2023 and 2025, to document the medicinal plants used by local Meena and Gurjar communities. The research involved field surveys, semi-structured interviews, and direct observations to gather ethnobotanical data.

- **Field Surveys and Site Selection:** Surveys were conducted in various villages, including Sapotra, Hadoti, Baloti Masawata Aada Dungar, Bharatoon and Barbasan, are chosen for their representative geographical diversity. The primary aim was to identify plant species used in traditional healthcare practices.
- **Data Collection:** Semi-structured interviews were conducted with traditional healers (Vaidyas, Bhopa, Gothiya), herbal practitioners, and knowledgeable villagers to document local plant names, parts used, methods of preparation, and ailments treated. Field walks were carried out using the "Walk-in-the-Woods" method to identify medicinal plants in their natural habitats, with on-site observations and discussions of their traditional uses. Each documented plant was photographed, and herbarium voucher specimens were collected, prepared, and preserved for reference. Plant identification was cross-verified using standard floras and taxonomic literature, along with consultation of botanical experts to ensure accuracy.

The amassed data were meticulously documented, encompassing taxonomic designations, common nomenclature, utilized plant anatomical structures, preparation techniques, and therapeutic applications. This extensive methodological approach facilitated precise recording of the medicinal flora and their conventional applications within the jurisdiction of Sapotra Tehsil.

Results and Discussion

A comprehensive ethnobotanical survey undertaken in Sapotra Tehsil, Karauli District, Rajasthan, resulted in the identification of 50 distinct species of medicinal plants, which are classified into 29 different families. The predominant plant families observed in the study were Fabaceae (6 species), Solanaceae (5 species), Moraceae (4 species), and Euphorbiaceae (4 species). These families, well-known for their therapeutic properties, have been frequently documented in other ethnobotanical surveys across Rajasthan, further highlighting their significance in the region's traditional medicine.

The medicinal plants identified in the survey were used to treat a variety of ailments. Gastrointestinal disorders (27%) were the most commonly treated, followed by respiratory problems (21%) and dermatological conditions (19%). Musculoskeletal ailments accounted for 11% of the conditions treated. Plants such as *Citrullus colocynthis* (Tumba), *Ocimum sanctum* (Tulsi), and *Adhatodavasica* (Vasaka) were among those frequently used for gastrointestinal and respiratory

problems. The use of these plants for such purposes is well-documented in previous studies from Rajasthan, where they are recognized for their anti-inflammatory, antimicrobial, and expectorant properties. The treatment of dermatological conditions, such as skin infections and wounds, was commonly achieved through the use of *Aloe vera* (Gwar Patha), *Azadirachta indica* (Neem), and *Ficus religiosa* (Peepal), which are widely known for their antiseptic and healing properties.

One of the principal findings in this investigation is the pronounced reliance of local communities on phytotherapeutic remedies, which underscores the critical necessity of safeguarding this ethnobotanical wisdom. The cataloged plant species, in conjunction with their respective applications, exemplify the profound interrelationship between local communities and their ecological surroundings. Nonetheless, this indigenous knowledge faces significant jeopardy due to the forces of modernization, urban expansion, and the erosion of intergenerational knowledge transmission.

Table 1: List of Medicinal Plant Species Documented in Sapotra Tehsil, Karauli District, Rajasthan

S. No	Scientific Name	Local Name	Family	Part Used	Traditional Use
1	<i>Acacia nilotica</i> (L.) Delile	Babul	Fabaceae	Bark, Gum	Dental Care, Skin issues, Bark/leaves decoction in Coughs and diarrhea
2	<i>Achyranthes aspera</i> L.	Chirchita	Amaranthaceae	Whole plant	Decoction for inflammation
3	<i>Aegle marmelos</i> (L.) Corrêa	Bel	Rutaceae	Fruit, Leaves	Fruit is used in constipation, bark decoction for diarrhea
4	<i>Albizia lebbek</i> (L.) Benth.	Siris	Fabaceae	Bark, Seeds	Decoction for asthma, powder for wounds
5	<i>Aloe vera</i> (L.) Burm.f.	Gwar Patha	Asphodelaceae	Leaf Gel	Gel for burns
6	<i>Argemone mexicana</i> L.	Pili Kateli	Papaveraceae	Latex	External application for skin problems
7	<i>Argyreia nervosa</i> (Burm.f.) Bojer	Hathi Sunghni	Convolvulaceae	Roots	Diuretic, tea for fever
8	<i>Asparagus racemosus</i> Willd.	Shatavari	Asparagaceae	Roots	Powder with milk for reproductive health
9	<i>Azadirachta indica</i> A.Juss.	Neem	Meliaceae	Leaves, Bark, Seeds	Skin issues; bark decoction for fever
10	<i>Balanites aegyptiaca</i> (L.) Delile	Jaal	Zygophyllaceae	Roots	Pulp for worms
11	<i>Boerhaviadiffusa</i> L.	Punarnava	Nyctaginaceae	Root, Leaves	Juice for kidney disorders
12	<i>Calotropis procera</i> (Aiton) Dryand.	Aak / Madar	Apocynaceae	Leaves, Latex	Warm leaf poultice for swelling
13	<i>Cassia fistula</i> L.	Amaltas	Fabaceae	Fruit pulp	Laxative, powder with milk for digestive issues
14	<i>Catharanthus roseus</i> (L.) G.Don	Sadabahar	Apocynaceae	Leaves	Decoction for anemia, leaf paste for wounds
15	<i>Citrullus colocynthis</i> (L.) Schrad.	Tumba	Cucurbitaceae	Fruit pulp	Dried pulp for constipation
16	<i>Corchorus depressus</i> (L.) Stocks	Mithi Patti	Malvaceae	Whole plant	Decoction for urinary issues
17	<i>Cuscuta reflexa</i> Roxb.	Amarbel	Convolvulaceae	Whole plant	Paste for skin conditions
18	<i>Cymbopogon citratus</i> (DC.) Stapf	Lemon Grass	Poaceae	Leaves	Tea for fever, respiratory ailments
19	<i>Datura metel</i> L.	Dhatura	Solanaceae	Leaves, Seeds	External paste for pain, juice for respiratory issues
20	<i>Euphorbia hirta</i> L.	Dudhi	Euphorbiaceae	Whole plant	Decoction for asthma
21	<i>Euphorbia neriifolia</i> L.	Thhor	Euphorbiaceae	Latex	External use for skin diseases

22	<i>Ficus benghalensis</i> L.	Bargad	Moraceae	Aerial Roots	Decoction for dysentery, diabetes
23	<i>Ficus religiosa</i> L.	Peepal	Moraceae	Bark, Leaves	Bark decoction for diabetes, Diarrhea, Women health
24	<i>Heliotropium indicum</i> L.	Hathi Sundi	Boraginaceae	Leaves	Tea for fever, leaf juice for eye infections
25	<i>Justicia adhatoda</i> L.	Vasaka	Acanthaceae	Leaves	Decoction for cough and asthma
26	<i>Lawsonia inermis</i> L.	Mehendi	Lythraceae	Leaves	Paste for fungal infections
27	<i>Mentha longifolia</i> (L.) L.	Pudina	Lamiaceae	Leaves	Juice for stomachache, tonic
28	<i>Moringa oleifera</i> Lam.	Sahjan	Moringaceae	Leaves, Seeds	Leaf juice for stomach issues, seeds for energy
29	<i>Ocimum tenuiflorum</i> L. (syn. <i>Ocimum sanctum</i> L.)	Tulsi	Lamiaceae	Leaves	Leaf juice for respiratory infections
30	<i>Oxalis corniculata</i> L.	Tinpathiya	Oxalidaceae	Whole plant	External application for skin rashes
31	<i>Peganum harmala</i> L.	Harmal	Nitrariaceae	Seeds	Smoke disinfectant, external use for pain
32	<i>Phyllanthus emblica</i> L. (syn. <i>Emblica officinalis</i> Gaertn.)	Amla	Phyllanthaceae	Fruit	Tonic for general health and immunity
33	<i>Phyllanthus niruri</i> L.	Bhui Amla	Phyllanthaceae	Whole plant	Juice for jaundice
34	<i>Psidium guajava</i> L.	Amrood	Myrtaceae	Leaves	Leaf decoction for diarrhea, skin diseases
35	<i>Ricinus communis</i> L.	Castor	Euphorbiaceae	Seeds, Oil	Castor oil for constipation
36	<i>Salvadora oleoides</i> Decne.	Jaal	Salvadoraceae	Leaves, Roots	Bark for fever, immunity
37	<i>Salvadora persica</i> L.	Peelu	Salvadoraceae	Leaves, Root bark	Used as a toothbrush, leaf paste for skin disorders
38	<i>Senna tora</i> (L.) Roxb. (syn. <i>Cassia tora</i> L.)	Panwar	Fabaceae	Seeds	Seed powder for skin diseases
39	<i>Sesbania sesban</i> (L.) Merr.	Jainti	Fabaceae	Leaves	Decoction for fever
40	<i>Solanum nigrum</i> L.	Makoi	Solanaceae	Berries	Leaf juice for ulcers
41	<i>Solanum virginianum</i> L. (syn. <i>Solanum xanthocarpum</i> Schrad. & Wendl.)	Kantkari	Solanaceae	Whole plant	Decoction for cough & asthma
42	<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	Seeds, Bark	Seed powder for diabetes
43	<i>Tephrosia purpurea</i> (L.) Pers.	Sharpunkha	Fabaceae	Whole plant	Decoction for liver ailments
44	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Arjun	Combretaceae	Bark	Heart tonic
45	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Baheda	Combretaceae	Fruit	Digestive powder, cough treatment
46	<i>Terminalia chebula</i> Retz.	Harad	Combretaceae	Fruit	Digestive powder, cough treatment
47	<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson	Giloy	Menispermaceae	Whole plant	Juice for immune support
48	<i>Tribulus terrestris</i> L.	Gokhru	Zygophyllaceae	Fruits, Roots	Decoction for urinary stones

49	<i>Withaniasomnifera</i> (L.) Dunal	Ashwagandha	Solanaceae	Roots	Root powder with milk for vitality
50	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn.	Jharber	Rhamnaceae	Leaves, Fruit	Skin diseases, diabetes

Results and Discussion

The plant parts most commonly used for medicinal preparations in Sapotra Tehsil were leaves (38%), roots (24%), fruits (18%), and bark (12%). Other parts, such as seeds, latex, and aerial roots, were also used for specific ailments. These findings align with previous ethnobotanical studies conducted in other areas of Rajasthan. For instance, studies in Nawalgarh Tehsil (Kumari & Khah, 2024) and the Mukundara ranges (Sharma, 2024) documented a similar use of leaves and roots for treating respiratory and gastrointestinal disorders. The primary methods of preparation included decoctions (28%), juices (25%), pastes (21%), and powders (16%), which reflect the common traditional practices in Rajasthan, as observed in regions like Pali (Dudi et al., 2018) and Banswara (Rana et al., 2014).

When comparing the findings from Sapotra Tehsil with those from other regions of Rajasthan, a clear consistency emerges in the use of similar plant families and species. For example, in the study conducted by Kumari & Khah (2024) in Nawalgarh, plants like *Adhatodavasica* (Vasaka) and *Moringa oleifera* (Sahjan) were found to be commonly used for treating respiratory problems, which parallels the findings from Sapotra. Similarly, *Azadirachta indica* (Neem) and *Withaniasomnifera* (Ashwagandha) were highlighted for their broad-spectrum medicinal uses in other studies, such as those by Shikha et al. (2011) and Arora & Meena (2011), which confirmed their use for promoting overall health and treating skin diseases in various regions of Rajasthan.

Similar concerns have been raised in ethnobotanical surveys from other parts of Rajasthan, such as those by Katewa et al. (2024) and Quereishi (2024), who emphasize the urgency of documenting and conserving this knowledge before it is lost.

In terms of conservation, there is a need to protect both the plant species and the traditional knowledge associated with them. The overexploitation of medicinal plants and habitat destruction are ongoing threats to biodiversity. Several species identified in this study, such as *Acacia nilotica* (Babul), *Aegle marmelos* (Bel), and *Ficus religiosa* (Peepal), are also documented in other parts of Rajasthan for their therapeutic benefits, but their populations could be at risk due to overharvesting and environmental changes. Therefore, conservation efforts, including sustainable harvesting practices and the establishment of protected areas, are crucial to maintaining the availability of these valuable resources.

This study further supports the idea that traditional medicinal plant knowledge, if properly preserved and passed on, can contribute significantly to sustainable healthcare practices. The pharmacological potential of many of the documented plants warrants further research. Many of these species, such as *Withaniasomnifera* (Ashwagandha) and *Azadirachta indica* (Neem), have already been the subject of pharmacological studies, demonstrating their efficacy in treating a range of ailments. However, more systematic scientific investigations into these plants could lead to the development of new herbal drugs, potentially contributing to both local healthcare systems and the broader field of medicinal plant research.

Conclusion

This ethnobotanical investigation conducted in Sapotra Tehsil, Karauli District, Rajasthan, offers a comprehensive examination of the traditional utilization of medicinal flora by the indigenous Meena and Gurjar populations. The results underscore a significant dependence on phytotherapeutic solutions, with 50 species cataloged, predominantly employed for the treatment of gastrointestinal, respiratory, dermatological, and musculoskeletal disorders. The primary botanical components utilized comprised leaves, roots, and fruits, while prevalent preparation techniques included decoctions, pastes, and juices. These methodologies illustrate the profound interrelationship between the local communities and their natural surroundings, accentuating the critical role of plants within their healthcare frameworks.

However, this traditional knowledge faces significant threats from modernization, urbanization, and the loss of intergenerational knowledge transfer. The overharvesting of medicinal plants and environmental degradation further jeopardize the sustainability of these resources. The study underscores the urgent need to conserve both the plant species and the cultural heritage associated with their use. Sustainable harvesting practices, habitat conservation, and documentation of this knowledge

are essential for preserving the rich ethnobotanical heritage of the region. In addition, the documented plants hold significant pharmacological potential, warranting further scientific research to explore their therapeutic benefits. This study not only contributes to the preservation of traditional knowledge but also lays the groundwork for future studies aimed at developing sustainable healthcare solutions.

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