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Ethnobotanical Investigation of Traditional Plant Species and Their Therapeutic Applications in the Machkund Region of Dholpur District of Rajasthan (India)

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Abstract
The present ethnobotanical investigation was conducted in the Machkund region of Dholpur District, Rajasthan (India) to document medicinally important plant species and evaluate their traditional therapeutic significance. A systematic field survey conducted during 2024–2026 recorded total 61 medicinal plant species belonging to diverse angiospermic families. Ethnomedicinal information was collected through extensive field observations and interactions with local communities possessing traditional knowledge of medicinal plants. The documented species exhibited considerable ethnopharmacological importance and were traditionally utilized for the treatment and management of various ailments, including respiratory disorders, gastrointestinal diseases, dermatological infections, wound healing, inflammatory conditions, pyrexia and cardiovascular complications. The findings of the present study provide valuable baseline data on the medicinal plant diversity of the region and emphasize the necessity for conservation of medicinal flora, sustainable utilization of plant resources and preservation of indigenous ethnobotanical knowledge for future pharmacological and phytochemical investigations.

Keywords: Ethnobotany, Medicinal Plants, Traditional Knowledge, Machkund Region, Therapeutic Uses.

Introduction

Ethnobotany examines the relationship between people and plants, particularly their use in medicine, culture and daily life. Medicinal plants have served as a major source of traditional healthcare in India for centuries. The Machkund area of Dholpur district supports a rich diversity of medicinal plant species adapted to the semi-arid environment. Indigenous communities of the region rely on these plants for treating various ailments and maintaining primary healthcare. The documentation of such traditional knowledge is important for the conservation and sustainable utilization of medicinal plant resources.
Ethnobotanical investigation was conducted in the Mania region of Dholpur district (Rajasthan) documenting 27 plant species belonging to 23 genera and 17 families of angiosperms. The study recorded local names, medicinal uses and active constituents of the plants. Moraceae and Euphorbiaceae were

identified as the dominant families. The importance of conserving traditional ethnomedicinal knowledge was emphasized (Bhadauria and Sharma, 2011).

The arid region of Rajasthan is characterized by rich floristic diversity, comprising approximately 628 plant species distributed across 352 genera and 87 families, a considerable proportion of which possess notable ethnomedicinal importance. It has further been reported that nearly one-fourth of the desert vegetation is traditionally utilized by local communities for various purposes, including food, fodder, fuel and medicinal applications, reflecting their strong dependence on plant resources for livelihood and primary healthcare needs (Kapoor and Lakhera, 2013).

Singh and Kumar (2019) conducted a floristic survey in Nagaur district of Rajasthan and recorded 61 plant species belonging to 54 genera and 36 families. The study identified Poaceae and Fabaceae as the dominant families and highlighted the rich plant diversity of the region. The documented flora included several medicinally important species utilized by local communities for traditional healthcare practices.

Tomar, (2019) carried out an ethnomedicinal investigation in Dholpur district of Rajasthan to document the plant species traditionally utilized by rural and tribal communities for treating various health disorders. The study compiled detailed information on local plant names, botanical families, plant parts used and their medicinal applications through field surveys and interviews with indigenous informants. The findings revealed a strong dependence of local communities on plant-based traditional remedies for primary healthcare and emphasized the need for conserving this valuable ethnomedicinal knowledge.

Singh (2023) carried out an ethnobotanical survey in Nagaur district of Rajasthan and documented the medicinal uses of plants among tribal communities. The study revealed that various plant species were traditionally used for treating gastrointestinal disorders, skin infections, respiratory problems, fever and inflammatory conditions. The findings highlighted the continued dependence of tribal populations on herbal medicines and stressed the need for preserving indigenous knowledge.

Justicia adhatoda has been widely recognized as an important medicinal plant in traditional healthcare systems due to its extensive therapeutic applications. It is commonly used for the management of respiratory disorders such as asthma, bronchitis, cough, cold and tuberculosis. The pharmacological activity of this species is mainly attributed to the presence of bioactive compounds like vasicine and vasicinone which exhibit expectorant, antimicrobial, anti-inflammatory and bronchodilatory properties. The study emphasized its medicinal significance and its potential for development of plant-based pharmaceutical formulations (Wangujare *et al*., 2023).

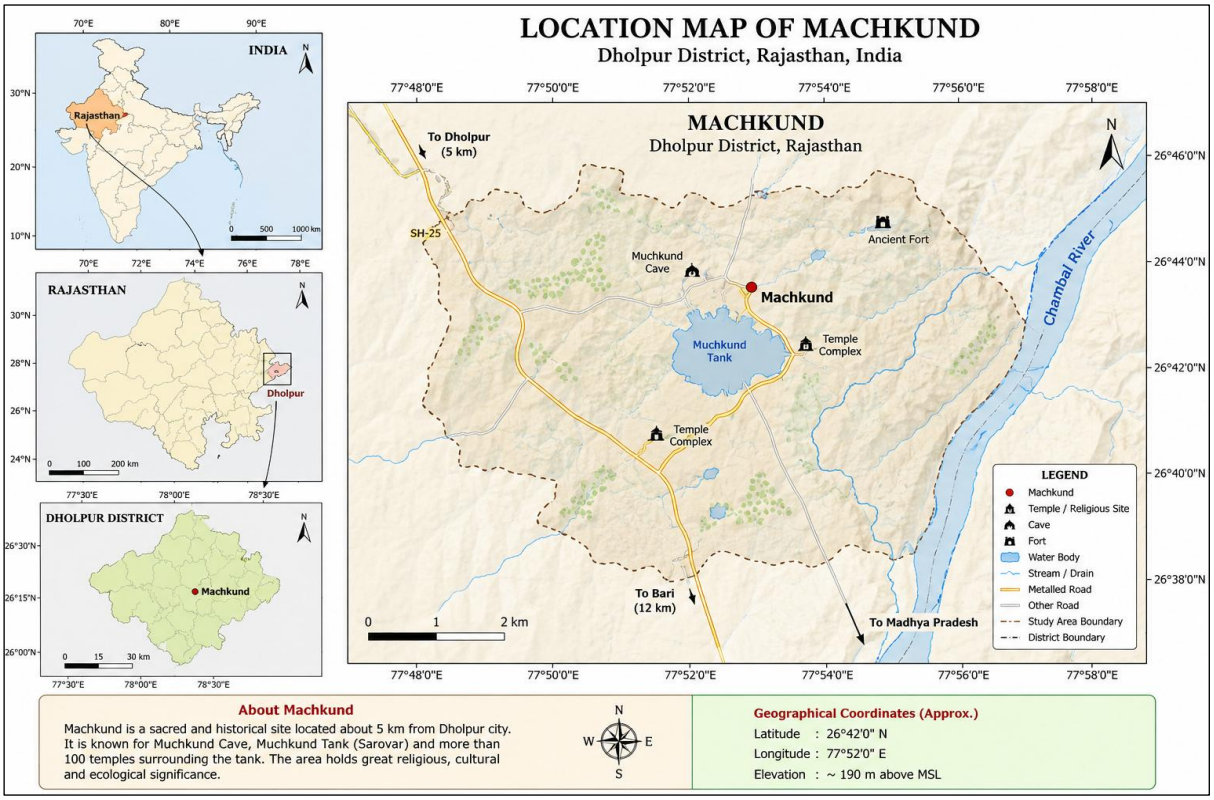
Phytochemicals are broadly categorized into primary and secondary metabolites. Primary metabolites, such as chlorophyll, proteins, carbohydrates and simple sugars, are essential for plant growth and development whereas secondary metabolites, including flavonoids, alkaloids and phenolic compounds, are mainly responsible for a wide range of pharmacological activities. These bioactive constituents exhibit significant biological effects such as anti-inflammatory, anticancer, antiviral, antibacterial and antimalarial properties. These secondary metabolites are distributed in various plant parts, including roots, bark, leaves, stems, flowers, fruits and seeds. In recent years, the demand for herbal medicines has increased significantly due to their safety, effectivenes and affordability compared to synthetic drugs (Meena, 2024).

Kajala *et al*. (2026) conducted an ethnoveterinary survey in the Shakambhari Mata Hills of Sikar district, Rajasthan, recording 15 plant species belonging to 11 families. The study documented the traditional use of medicinal plants for treating livestock diseases and emphasized the importance of indigenous veterinary knowledge in rural animal healthcare systems.

Study area

The present ethnobotanical study was conducted in the Machkund region of Dholpur district, Rajasthan (India). Machkund is situated approximately 5 km from Dholpur city and lies between 26°40′–26°45′ N latitude and 77°50′–77°55′ E longitude. The area falls within the semi-arid zone of eastern Rajasthan and forms part of the Chambal river basin. The sacred complex of Machkund covers nearly 41 acres and is characterized by rocky outcrops, ravines and undulating terrain typical of the Chambal badland ecosystem. The climate is generally hot and dry, with high summer temperatures, low and irregular rainfall and prolonged dry periods. The vegetation of the Machkund region is predominantly xerophytic and adapted to semi-arid environmental conditions. The flora mainly consists of thorny shrubs, herbs, grasses and drought-tolerant trees. Commonly occurring plant species belong to genera such as *Acacia, Prosopis, Calotropis, Azadirachta* and *Ziziphus.* These species are well adapted to limited water availability and poor soil conditions and contribute to the ecological stability of the ravine landscape. The presence of the sacred tank, rocky slopes, temple surroundings and ravine habitats creates favorable microenvironments for the growth of diverse medicinal plants. Local inhabitants possess rich traditional knowledge regarding the use of these plants for the treatment of various human and livestock ailments. This indigenous knowledge has been transmitted orally through generations and continues to play a significant role in primary healthcare practices.

Owing to its unique combination of cultural heritage, ecological diversity and medicinal plant wealth, the Machkund region represents an ideal site for ethnobotanical investigations. The area provides valuable opportunities for documenting traditional plant-based knowledge and assessing the diversity and utilization of medicinal plant resources in the semi-arid ecosystem of eastern Rajasthan.



Material and Methods

The ethnobotanical survey was conducted in the Machkund area of Dholpur district, Rajasthan, during the year 2024–2026. Periodic field visits were undertaken to record medicinal plant species and their traditional applications. Information regarding plant uses was gathered through personal interviews and interactions with local residents, traditional practitioners and elderly informants. Plant samples were collected from different locations within the study area and identified with the help of standard floras and taxonomic references. The obtained ethnobotanical information was carefully compiled, authenticated and analyzed for documentation.

Medicinal Plant Index

S.No.	Botanical Name (with Author)	Family	Common Name	Monocot/ Dicot	Part Used	Medicinal Uses
1	*Abutilon indicum (L.) Sweet*	Malvaceae	Atibala	Dicot	Root, leaves, seeds	Fever, cough, urinary disorders, wound healing, inflammation
2	*Acacia nilotica (L.) Delile*	Fabaceae	Babool	Dicot	Bark, gum, pods	Diarrhea, dysentery, wound healing, dental disorders, sore throat
3	*Acacia senegal (L.) Willd.*	Fabaceae	Kumta / Gum Arabic Tree	Dicot	Gum/ bark	Cough, bronchitis, sore throat, digestive disorders, wound healing
4	*Acalypha indica L.*	Euphorbiaceae	Kuppi	Dicot	Leaves, roots	Skin disease, cough, wounds, constipation, fever
5	*Achyranthes aspera L.*	Amaranthaceae	Chirchita	Dicot	Root, seeds, leaves	Inflammation, kidney disorders, cough, wounds, fever
6	*Adansonia digitata L.*	Malvaceae	Gorakh Imli	Dicot	Fruit, leaves, bark	Diarrhea, fever, nutritional supplement, inflammation, digestive disorders
7	*Aegle marmelos (L.) Corrêa*	Rutaceae	Bel	Dicot	Fruit, leaves, bark	Diarrhea, dysentery, constipation, peptic ulcer, digestive disorders
8	*Aloe vera (L.) Burm.f.*	Asphodelaceae	Ghritkumari	Monocot	Leaf gel	Burns, skin diseases, wound healing, constipation, anti-inflammatory activity
9	*Amaranthus spinosus L.*	Amaranthaceae	Kanteli chaulai	Dicot	Leaves, roots, seeds	Anemia, digestive disorders, inflammation, wounds, fever
10	*Argemoen mexicana L.*	Papaveraceae	Satyanashi	Dicot	Seeds, Latex, leaves	Skin diseases, malaria, wounds, inflammation, fever

S.No.	Botanical Name (with Author)	Family	Common Name	Monocot/ Dicot	Part Used	Medicinal Uses
11	*Azadirachta indica A.Juss.*	Meliaceae	Neem	Dicot	Leaves, bark, seeds	Skin diseases, diabetes, fever, wound healing, antimicrobial activity
12	*Barleria prionitis L.*	Acanthaceae	Vajradanti	Dicot	Leaves, roots	Toothache, gum diseases, cough, wounds, Inflammation
13	*Bauhinia variegata L.*	Fabaceae	Kachnar	Dicot	Bark, flowers, buds	Goiter, ulcers, diarrhea, skin diseases, inflammation
14	*Boerhavia diffusa L.*	Nyctaginaceae	Punarnava	Dicot	Roots	Kidney disorders, Liver diseases, edema, fever, inflammation
15	*Butea monosperma (Lam.) Taub.*	Fabaceae	Palash	Dicot	Flowers, seeds, bark	Worm infestation, skin disorders, diarrhea, inflammation, wound healing
16	*Calotropis gigantea (L.) W.T.Aiton*	Apocynaceae	Madar	Dicot	Latex, root, leaves	Rheumatism, cough, skin diseases, wounds, digestive disorders
17	*Calotropis procera (Aiton) Dryand.*	Apocynaceae	Aak	Dicot	Latex, root, leaves	Asthma, joint pain, skin diseases, fever, wound healing
18	*Capparis sepiaria L.*	Capparaceae	Hingar	Dicot	Bark, leaves, roots	Rheumatism, cough, fever, digestive disorders, wound healing
19	*Cassia fistula L.*	Fabaceae	Amaltas	Dicot	Fruit pulp, bark, leaves	Constipation, fever, skin diseases, digestive disorders, liver ailments
20	*Catharanthus roseus (L.) G.Don*	Apocynaceae	Sadabahar	Dicot	Leaves, roots	Diabetes, hypertension, wound healing, antimicrobial, anticancer properties
21	*Centella asiatica (L.) Urb.*	Apiaceae	Brahmi	Dicot	Leaves	Memory enhancement, anxiety, wound healing, skin disorders, digestive problems
22	*Chenopodium album L.*	Amaranthaceae	Bathua	Dicot	Leaves, seeds	Anemia, constipation, digestive disorders, liver health, nutritional supplement
23	*Citrus reticulata Blanco*	Rutaceae	Orange/ Santara	Dicot	Fruit, peel, leaves	Vitamin C deficiency, cough, indigestion, immunity enhancement, skin health

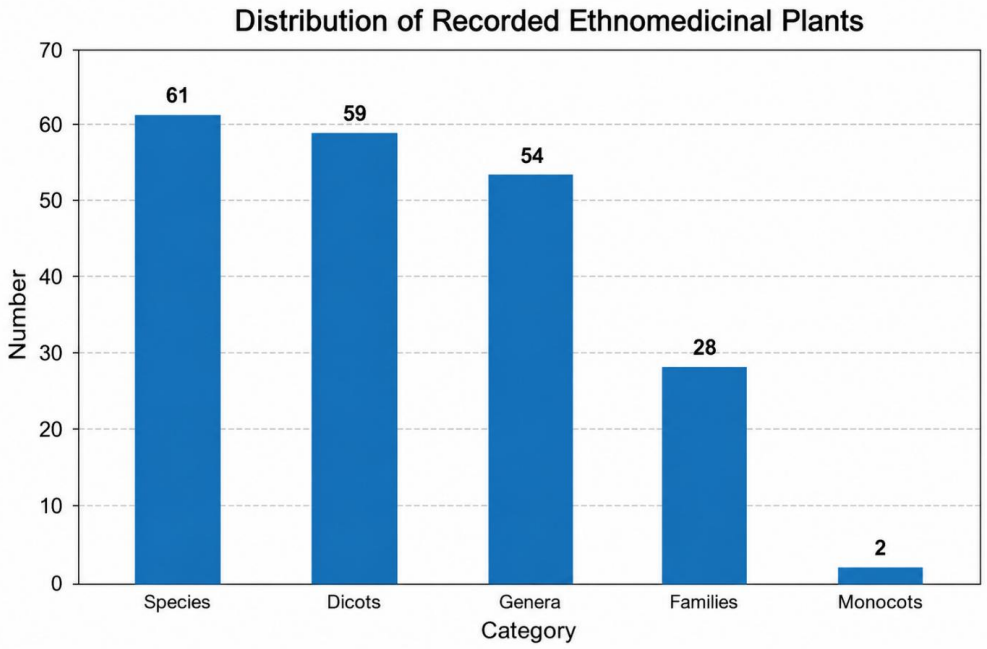
S.No.	Botanical Name (with Author)	Family	Common Name	Monocot/ Dicot	Part Used	Medicinal Uses
24	*Clitoria ternatea L.*	Fabaceae	Aparajita	Dicot	Flowers, leaves, roots	Memory improvement, anxiety, epilepsy, inflammation, fever
25	*Cocculus orbiculatus (L.) DC.*	Menispermaceae	Jaljamni	Dicot	Leaves, roots, bark	Fever, rheumatism, skin diseases, wounds, digestive disorders
26	*Cynodon dactylon (L.) Pers.*	Poaceae	Doob Grass	Monocot	Whole plant	Wound healing, bleeding disorders, urinary problems, fever, skin diseases
27	*Datura wrightii Regel*	Solanaceae	Dhatura	Dicot	Leaves, seeds, roots	Asthma, cough, pain relief, rheumatism, muscle spasms
28	*Echinops spinosissimus Turra*	Asteraceae	Oontkatara	Dicot	Roots, leaves	Fever, inflammation, urinary disorders, wound healing, pain relief
29	*Eucalyptus globulus Labill.*	Myrtaceae	Eucalyptus	Dicot	Leaves, oil	Cold, cough, bronchitis, fever, respiratory infections
30	*Ficus racemosa L.*	Moraceae	Gular	Dicot	Bark, fruits, latex	Diarrhea, dysentery, diabetes, wound healing, urinary disorders
31	*Ficus religiosa L.*	Moraceae	Peepal	Dicot	Bark, leaves, roots	Asthma, diabetes, diarrhea, skin diseases, wound healing
32	*Heliotropium europaeum L.*	Boraginaceae	Hathi Sundi	Dicot	Leaves, roots	Skin disorders, wound healing, fever, inflammation, cough
33	*Hibiscus cannabinus L.*	Malvaceae	Kenaf / Mesta	Dicot	Leaves, seeds, fibers	Fever, digestive disorders, cough, inflammation, wound healing
34	*Jasminum sambac (L.) Aiton*	Oleaceae	Mogra	Dicot	Flowers, leaves	Headache, skin disorders, stress relief, fever, eye ailments
35	*Justicia adhatoda L.*	Acanthaceae	Adusa / Vasaka	Dicot	Leaves	Cough, bronchitis, asthma, tuberculosis, respiratory disorders
36	*Lantana camara L.*	Verbenaceae	Raimuniya	Dicot	Leaves, flowers, roots	Wound healing, skin diseases, fever, cough, inflammation
37	*Lawsonia inermis L.*	Lythraceae	Mehndi	Dicot	Leaves	Burns, skin infections, headache, wounds, fever

S.No.	Botanical Name (with Author)	Family	Common Name	Monocot/ Dicot	Part Used	Medicinal Uses
38	*Madhuca longifolia (J.Koenig ex L.) J.F.Macbr.*	Sapotaceae	Mahua	Dicot	Flowers, seeds, bark	Rheumatism, skin diseases, cough, weakness, digestive disorders
39	*Mangifera indica L.*	Anacardiaceae	Mango	Dicot	Leaves, bark, fruit, seeds	Diarrhea, indigestion, anemia, respiratory ailments, wound healing
40	*Mentha spicata L.*	Lamiaceae	Pudina	Dicot	Leaves	Indigestion, nausea, stomach pain, cold, headache
41	*Moringa oleifera Lam.*	Moringaceae	Sehjan / Drumstick	Dicot	Leaves, pods, bark, seeds	Anemia, malnutrition, diabetes, hypertension, immunity enhancement
42	*Nyctanthes arbor-tristis L.*	Oleaceae	Harsingar / Parijat	Dicot	Leaves, flowers	Fever, arthritis, sciatica, cough, skin diseases
43	*Ocimum tenuiflorum L.*	Lamiaceae	Tulsi	Dicot	Leaves, seeds, stem	Cold, cough, fever, asthma, immunity enhancement
44	*Partheni um hysterophorus L.*	Asteraceae	Congress Grass / Gajar Ghas	Dicot	Leaves, whole plant	Wound healing, fever, skin disorders, inflammation, antimicrobial activity
45	*Passiflora caerulea L.*	Passifloraceae	Passion Flower	Dicot	Leaves, flowers	Anxiety, insomnia, stress, nervous disorders, hypertension
46	*Phyllanthus emblica L.*	Phyllanthaceae	Amla	Dicot	Fruit	Immunity enhancement, cough, digestive disorders, anemia, diabetes
47	*Phyllanth us niruri L.*	Phyllanthaceae	Bhui Amla	Dicot	Whole plant	Liver disorders, kidney stones, jaundice, urinary infections, diabetes
48	*Pongamia pinnata (L.) Pierre*	Fabaceae	Karanj	Dicot	Seeds, oil, leaves, bark	Skin diseases, rheumatism, wounds, ulcers, inflammation
49	*Portulaca oleracea L.*	Portulacaceae	Kulfa	Dicot	Leaves, stems	Diarrhea, fever, urinary disorders, inflammation, nutritional supplement
50	*Ricinus communis L.*	Euphorbiaceae	Arandi/ Castor	Dicot	Seeds, leaves, oil	Constipation, joint pain, skin diseases, inflammation, wound healing

S.No.	Botanical Name (with Author)	Family	Common Name	Monocot/ Dicot	Part Used	Medicinal Uses
51	*Sida acuta Burm.f.*	Malvaceae	Bala	Dicot	Roots, leaves	Fever, weakness, urinary disorders, inflammation, wound healing
52	*Solanum nigrum L.*	Solanaceae	Makoi	Dicot	Leaves, berries	Fever, liver disorders, ulcers, skin diseases, inflammation
53	*Solanum virginianum L.*	Solanaceae	Kantakari	Dicot	Roots, fruits, leaves	Asthma, cough, fever, bronchitis, respiratory disorders
54	*Syzygium cumini (L.) Skeels*	Myrtaceae	Jamun	Dicot	Seeds, fruit, bark	Diabetes, diarrhea, digestive disorders, ulcers, wound Healing
55	*Tamarindus indica L.*	Fabaceae	Imli	Dicot	Fruit pulp, leaves, seeds	Indigestion, constipation, fever, digestive disorders, appetite stimulation
56	*Terminalia arjuna (Roxb. ex DC.) Wight & Arn.*	Combretaceae	Arjun	Dicot	Bark	Cardiac disorders, hypertension, wounds, fractures, hypercholesterolemia
57	*Tinospora cordifolia (Willd.) Hook.f. & Thomson*	Menispermaceae	Giloy	Dicot	Stem	Fever, diabetes, Immunity enhancement, arthritis, liver disorders
58	*Tridax procumbens L.*	Asteraceae	Coat Buttons	Dicot	Leaves, whole plant	Wound healing, diarrhea, fever, inflammation, skin diseases
59	*Vachellia farnesiana (L.) Wight & Arn.*	Fabaceae	Gandi Babool	Dicot	Bark, flowers, pods	Skin diseases, diarrhea, wounds, cough, inflammation
60	*Withania somnifera (L.) Dunal*	Solanaceae	Ashwagandha	Dicot	Roots, leaves	Stress, anxiety, weakness, arthritis, insomnia
61	*Ziziphus mauritiana Lam.*	Rhamnaceae	Ber	Dicot	Fruit, leaves, bark	Digestive disorders, cough, fever, wound healing, nutritional supplement

Distribution of Recorded Ethnomedicinal Plants

Category	Number
Families	28
Genera	54
Species	61
Monocots	2
Dicots	59



CONCLUSION

The present ethnobotanical survey of the Machkund region in Dholpur district, Rajasthan, has revealed a considerable diversity of medicinal plant species traditionally employed by local inhabitants for healthcare needs. In total, 61 plant species belonging to 54 genera and 28 families were recorded. Out of these, 59 species were dicotyledons, while only 2 species were monocotyledons. The family Fabaceae was found to be the most dominant in the study area. These plant species are commonly used to manage a wide range of health conditions, including fever, cough, asthma, digestive problems, skin infections, diabetes, wounds, inflammation and cardiovascular ailments. This reflects the strong reliance of rural communities on traditional plant-based remedies, especially in areas where modern healthcare facilities are limited. The findings underline the importance of indigenous ethnomedicinal knowledge in both conservation efforts and sustainable use of plant resources. Systematic documentation of this traditional knowledge is essential for preserving cultural practices and providing a foundation for future pharmacological and conservation research. Overall, the medicinal flora of the Machkund region serves as a significant natural resource with notable ethnobotanical and therapeutic value.

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Temple Site Near Machkund Areas

Machkund sarovar Site

Ethnobotanical Field Investigation

Field Documentation of Flora

Ethnomedicinal sacred Plant

Field Survey Location