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Assessment of Ethnomedicinal Plant Diversity and Traditional Medicinal Practices in Baran District, Rajasthan

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ABSTRACT: The present study assesses ethnomedicinal plant diversity and traditional medicinal practices in Baran district, located in southeastern Rajasthan. Field surveys were conducted to document plant-based remedies. A total of 47 medicinal plant species were recorded, with Fabaceae as the dominant family. Various plant parts such as leaves, roots, bark, seeds, and whole plants are used to treat metabolic, respiratory, gastrointestinal, skin, reproductive, and neurological disorders. Frequently used species include Terminalia arjuna, Tinospora cordifolia, Adhatoda vasica, and Withania somnifera. The study highlights strong regional continuity in traditional knowledge and emphasizes the need for conservation and scientific validation of these valuable plant resources.

KEYWORDS: Ethnomedicinal plants; Diversity; Tribal; Conservation; Baran district.

I. INTRODUCTION

Plants constitute one of the most essential components of the ecosystem and serve as a fundamental resource for the survival of living organisms. They contribute significantly to maintaining ecological balance, conserving biodiversity, and supporting natural processes. However, rapid industrialization, technological advancement, population expansion, and various anthropogenic pressures have placed increasing stress on natural resources. These changes have led to serious environmental concerns, particularly the degradation and depletion of plant diversity. It is estimated that nearly ten percent of herbaceous and tree species worldwide are currently threatened with extinction to varying degrees. In recent decades, biodiversity loss and climate change have emerged as two major global challenges influencing environmental sustainability and human well-being. Addressing these issues requires a clear understanding of ecosystem components, including the identification of species and an assessment of their ecological requirements and socio-environmental relationships. Recognizing and documenting plant diversity is therefore a fundamental step in ecosystem conservation and sustainable resource management. Therefore, the aim of this paper is to assess the diversity and traditional uses of ethnomedicinal plants in Baran district of Rajasthan.

II. RESEARCH METHODOLOGY

Study Area: The study is based in Baran district, Rajasthan (figure 1). Baran district is located along the south-eastern boundary of Rajasthan. Geographically, it lies between 22°24' to 25°26' North latitude and 76°12' to 77°26' East longitude. The district shares its boundaries with the state of Madhya Pradesh on the eastern, southern, south-eastern and northern sides.

Fig 1: Map of study area

Survey: Field surveys were carried out in selected tribal and rural areas to document ethnomedicinal plant resources and traditional healing practices. Information was collected through interactions with tribal communities, villagers, elderly persons, and traditional healers to record plant-based remedies.

Plant Identification and Medicinal Uses: Collected specimens were identified using regional floras, standard taxonomic keys, and herbarium references, including authentication from the Botanical Survey of India, Jodhpur. Morphological characters were recorded, and each species was documented with its botanical name, family, and vernacular name. Data on therapeutic applications, plant parts used (leaves, roots, bark, seeds, flowers, fruits, or whole plant), and preparation methods of herbal remedies were systematically recorded.

III. RESULT AND DISCUSSION

Table 1 documents the medicinal uses of 47 plant species from Baran district, highlighting the region's rich ethnomedicinal heritage. Local communities utilize diverse plant species to treat metabolic, respiratory, gastrointestinal, skin, reproductive, neurological, inflammatory, and infectious disorders, reflecting both biodiversity and strong traditional knowledge. Different plant parts are used according to therapeutic need; in species such as Acalypha indica, Launaea procumbens, and Tephrosia purpurea, the whole plant is employed, whereas Adhatoda vasica, Terminalia arjuna, and Moringa oleifera provide multiple useful parts. Antidiabetic plants include Amaranthus hybridus, Solanum xanthocarpum, and Tinospora cordifolia, while Terminalia arjuna and Moringa oleifera are used for cardiovascular conditions. Respiratory ailments are treated with Adhatoda vasica and Ocimum species; digestive disorders with Aegle marmelos and Chenopodium album; and skin diseases with Ageratum conyzoides and Wrightia tinctoria. Reproductive and neurological disorders are managed using species such as Chlorophytum borivilianum and Withania somnifera. Several plants show polyvalent use and potential immunomodulatory or anticancer properties.

Table 1: Medicinal uses of recorded plant species in Baran district

S. No.	Botanical Name	Family	Plant Part Used	Medicinal Value
1	Acalypha indica	Euphorbiaceae	Whole plant	Used in managing diabetes, hypertension and dysentery.
2	Adhatoda vasica	Acanthaceae	Seeds, whole plant, leaves, roots, young shoots	Used in the treatment of diarrhoea, cough, asthma, allergic bronchitis, wound healing, as a cholagogue, abortifacient, for cardiovascular ailments and tuberculosis.

3	Aegle marmelos	Rutaceae	Leaves, roots, fruit, flowers	Effective in fever, inflammation, heart palpitations, anorexia, dysentery, diabetes, brain tonic, rectal inflammation, cholera and intestinal worms.
4	Ageratum conyzoides	Asteraceae	Roots, leaves	Applied in wound healing and exhibits antimicrobial effects.
5	Alternanthera pungens	Amaranthaceae	Roots, leaves, shoots	Employed in the treatment of hepatitis, bronchitis and asthma.
6	Amaranthus hybridus	Amaranthaceae	Seeds, leaves	Possesses antidiabetic, antimalarial and anticancer properties.
7	Amaranthus spinosus	Amaranthaceae	Leaves, roots, seeds	Traditionally used for ulcers and diarrhoeal conditions.
8	Argemone mexicana L.	Papaveraceae	Latex, roots, seeds	Used in tumors, warts, jaundice and leprosy.
9	Asparagus racemosus Willd.	Asparagaceae	Root	Used in high fever, as an antioxidant and to manage sexual debility.
10	Barleria prionitis Linn.	Acanthaceae	Aerial parts, bark, roots, leaves, flowers	Applied in managing fever, toothache, inflammatory conditions, gastrointestinal disorders; acts as an expectorant, general tonic and analgesic agent.
11	Chenopodium album	Chenopodiaceae	Whole plant	Acts as an anthelmintic, carminative, digestive aid and diuretic.
12	Chlorophytum borivilianum	Asparagaceae	Tubers, leaves, seeds	Prescribed for rheumatism, male infertility, oligospermia, anti-ageing, enhancing lactation, diabetes, as an expectorant and for urinary obstruction.
13	Convolvulus arvensis	Convolvulaceae	Vegetative parts	Used as an herbal remedy with antiepileptic properties.
14	Convolvulus microphyllus	Convolvulaceae	Whole plant	Functions as a laxative and brain tonic.
15	Curculigo orchioides Gaertn.	Hypoxidaceae	Roots, rhizome, leaves	Known as an aphrodisiac; improves sperm count; used in jaundice, joint pain, cancer, diabetes, tissue regeneration, physical debility, respiratory and skin disorders.
16	Datura innoxia Mill	Solanaceae	Seeds, leaves	Employed for inducing sleep and relieving pain.
17	Euphorbia hirta	Euphorbiaceae	Fresh latex	Utilized in female reproductive disorders and respiratory complaints.

18	Euphorbia pulcherrima	Euphorbiaceae	Latex	Applied in skin conditions, toothache and infections.
19	Evolvulus alsinoides	Convolvulaceae	Whole plant	Employed in dementia, depression and as a cognitive enhancer.
20	Feronia lemonia	Rutaceae	Roots, leaves, stem bark, fruits, gum	Used for sore throat, insect stings, dysentery, snakebite and menorrhagia.
21	Gomphrena celosioides	Amaranthaceae	Leaves, twigs, flowers	Utilized as a natural pain reliever and in rheumatic disorders.
22	Indigofera cordifolia	Fabaceae	Leafy twigs	Employed in epilepsy, nervous disorders and gastrointestinal and respiratory ailments.
23	Indigofera linifolia	Fabaceae	Leafy twigs	Used in epilepsy, neurological disorders, asthma, fever and abdominal pain.
24	Ipomoea spp.	Convolvulaceae	Leaves	Applied externally for treating skin rashes.
25	Lantana camara L.	Verbenaceae	Leaves	Used in cancer, chickenpox, eczema and rheumatism.
26	Launaea procumbens	Asteraceae	Whole plant	Recognized for its antidiabetic potential.
27	Malvastrum coromandelianum	Malvaceae	Leaves	Demonstrates anti-inflammatory, analgesic and antibacterial properties.
28	Moringa oleifera	Moringaceae	Leaves, flowers, pods, roots, gum, seeds	Used as a cardiac tonic; beneficial in paralysis, rheumatism, kidney disorders, piles, sore throat, scurvy, glandular swelling, earache, dental issues and splenic enlargement.
29	Ocimum americanum	Lamiaceae	Leaves	Exhibits analgesic and anti-inflammatory properties; used in cough and respiratory ailments.
30	Ocimum basilicum	Lamiaceae	Leaves	Possesses antiviral and antibacterial activities; effective in bronchitis and asthma.
31	Oxalis corniculata	Oxalidaceae	Leaves, flowers	Known for anti-inflammatory and antifungal activity.
32	Peristrophe paniculata	Acanthaceae	Entire plant	Exhibits antibacterial properties and is traditionally used in cases of snake envenomation.

33	Pithecellobium dulce	Fabaceae	Bark, leaves, seeds	Used for gum diseases, toothache, chronic diarrhoea, tuberculosis, wounds, ulcers, leprosy, diabetes and cancer.
34	Rhynchosia minima	Fabaceae	Roots, seeds, leaves	Used for itching, swelling and as a bio-herbicidal agent.
35	Saccharum bengalense Retz.	Poaceae	Stem	Applied to relieve burning sensations.
36	Sida acuta	Malvaceae	Root	Used in neurological disorders, leucorrhoea, tuberculosis and rheumatic conditions.
37	Solanum nigrum	Solanaceae	Leaves, fruits	Applied in fever, diarrhoea and eye disorders.
38	Solanum xanthocarpum	Solanaceae	Fruit	Used for hair loss, diabetes, inflammatory conditions and cancer.
39	Sonchus asper	Asteraceae	Leaves	Used in the treatment of menstrual irregularities.
40	Tephrosia purpurea	Fabaceae	Whole plant	Traditionally prescribed for jaundice and kidney-related disorders.
41	Terminalia arjuna	Combretaceae	Stem bark, root bark, fruits, leaves	Beneficial in stress-related cardiac disorders, respiratory issues, urinary infections, high LDL cholesterol, bone fractures, hormonal imbalance, obesity; also acts as a rejuvenating tonic and remedy for earache.
42	Tinospora cordifolia	Menispermaceae	Shoots, roots, whole plant	Utilized in diabetes, fever, liver disorders, amoebiasis, respiratory infections, radiation side effects, AIDS, cancer, ulcers, rheumatoid arthritis, mental and neurological disorders.
43	Tribulus terrestris	Zygophyllaceae	Fruits, seeds	Traditionally administered in female infertility.
44	Tridax procumbens L.	Asteraceae	Entire aerial portion	Known for antifungal activity; used in diarrhoea and to promote blood coagulation.
45	Withania somnifera (L.)	Solanaceae	Whole plant, roots	Leaves relieve body ache; seeds help joint pain; used in anxiety, depression, chronic stress, Parkinson's disease, inflammation and immune modulation.

46	Wrightia tinctoria	Apocynaceae	Leaves, stem bark, seeds	Used in jaundice, malaria, psoriasis, various skin ailments, digestive disorders; also valued as an aphrodisiac and antidote for snakebite, and for epilepsy, piles and diabetes.
47	Ziziphus jujube	Rhamnaceae	Roots, fruits	Used as an appetite stimulant and digestive aid.

The present study recorded 47 medicinal plant species belonging to 23 families from Baran district, indicating moderate but ecologically meaningful diversity. Compared with higher species counts reported by Malav et al. (2023) (60 species, 26 families) and Khandelwal et al. (2023) (64 species, 30 families), the difference may reflect variation in study area size, sampling intensity, and research focus. While earlier studies emphasized extensive field documentation or participatory observation, the present research integrates diversity and medicinal uses within a single framework, thereby strengthening its analytical depth. Compared to smaller studies such as Nawar and Sharma (2012) (18 species), Hada and Katewa (2015) (13 species), Sharma (2023) (42 species from a campus), and Sharma (2021) (medicinal trees), the current documentation shows broader district-level representation, highlighting how ecological scope influences species richness. A common regional trend, consistent with Maheshwari and Sharma (2019), Choudhary et al. (2022), Malav et al. (2023), and Khandelwal et al. (2023), is the dominance of Fabaceae. In the present study, Fabaceae was the most represented family (five species), aligning with Baswal et al. (2022) and other regional works. The ecological success of legumes in semi-arid conditions explains their frequent prominence. Similarly, Asteraceae and Solanaceae were strongly represented, comparable to findings of Baswal et al. (2022), Choudhary et al. (2022), Nawar and Sharma (2012), and Maheshwari and Sharma (2019). The inclusion of species such as Withania somnifera and Datura innoxia reflects advanced ethnopharmacological knowledge within local communities. The occurrence of Acanthaceae members such as Adhatoda vasica and Barleria prionitis corresponds with Mahendra and Kotia (2018), who documented 16 species of Acanthaceae across southern Rajasthan. Therapeutically, the study aligns with Dadhiach and Rathore (2015) and Hada and Katewa (2015), particularly in the frequent use of antidiabetic and gastrointestinal remedies, indicating similar disease prevalence across the Hadoti region. Respiratory treatments reported here also correspond with Mahendra and Kotia (2018) and Nawar and Sharma (2012), confirming the continued importance of plants. Unlike many earlier studies that focused mainly on plant uses, the present research integrates diverse observations, comparable to Sharma (2018) and Rathore et al. (2021). Conservation concerns highlighted by Choudhary et al. (2022), Malav et al. (2023), Sharma (2024), and Maheshwari et al. (2018)-including habitat loss, overexploitation, and erosion of traditional knowledge-are also evident in Baran district. Similar to Baswal et al. (2022), the adaptive use of invasive species reflects community resilience. Socio-cultural continuity described by Maheshwari et al. (2018) and Sharma (2020) is likewise confirmed, as the integration of wild, cultivated, and weedy species demonstrates a holistic relationship between community, environment, and traditional healthcare systems.

IV. CONCLUSION

The present study highlights the rich ethnomedicinal plant diversity of Baran district and demonstrates the strong continuity of traditional medicinal practices among local and tribal communities. The documentation of 47 species belonging to 23 families reflects significant botanical diversity and well-developed indigenous healthcare knowledge. The wide use of different plant parts and the treatment of multiple disease categories indicate a holistic and experience-based medicinal system closely linked with local biodiversity. The findings also emphasize the ecological and cultural importance of these plant resources. However, increasing pressures such as habitat degradation, overexploitation, and gradual erosion of traditional knowledge pose serious challenges. Therefore, systematic documentation, conservation strategies, community awareness, and scientific validation of medicinal plants are essential to preserve this valuable bio-cultural heritage for future generations.

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