TRADITIONAL KNOWLEDGE AND MEDICINAL PLANT DIVERSITY: AN ETHNOBOTANICAL STUDY IN SEHORE DISTRICT, MADHYA PRADESH

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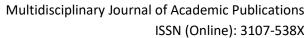
Abstract

Traditional knowledge systems have been fundamental to human healthcare for millennia, particularly in indigenous communities of central India. This ethnobotanical study was conducted in Sehore district, Madhya Pradesh, to document and analyze the diversity of medicinal plants and associated traditional knowledge among local communities. The research objectives were to inventory medicinal plants used by tribal populations, document traditional preparation methods, evaluate conservation status, and assess knowledge transmission patterns. A cross-sectional research design was employed using semi-structured interviews, field observations, and focus group discussions with 150 informants including traditional healers and community members. The study documented 89 medicinal plant species belonging to 82 genera and 44 families used for treating various human ailments. Trees constituted the highest proportion (43%) followed by herbs (33%) and shrubs (24%). Fabaceae, Asteraceae, and Lamiaceae were the most represented families. Results revealed that traditional knowledge is concentrated among elderly populations (65+ years) with limited transmission to younger generations. Statistical analysis showed high informant consensus factor (ICF) values ranging from 0.68 to 0.92 for different ailment categories. The study identified significant threats including habitat destruction, deforestation, and knowledge erosion. Conservation strategies and community-based documentation programs are urgently needed to preserve this invaluable traditional knowledge system for future generations and potential pharmaceutical applications.

Keywords*: Traditional knowledge[1], Medicinal Plants[2], Ethnobotany[3], Sehore district[4], tribal communities[5].*

1. Introduction

Traditional medicine systems represent one of humanity's oldest and most enduring healthcare approaches, with ethnobotanical knowledge serving as the foundation for understanding plant-human relationships across diverse cultural contexts. In India, approximately 70% of the rural population continues to rely on traditional medicinal practices, utilizing an estimated 6,000-7,000 plant species for therapeutic purposes with significant cultural and medicinal importance. Central India, particularly Madhya Pradesh, harbors exceptional botanical diversity within its diverse ecological zones, supporting numerous indigenous communities with rich ethnomedicinal traditions that have evolved over centuries of interaction with local flora. The state is home to various tribal groups including Baiga, Gond, Bhariya, Bhil, and Korku communities who possess extensive knowledge of medicinal plant applications for treating diverse ailments and maintaining community health. Sehore district, located in central Madhya Pradesh, represents a significant region for ethnobotanical research due to its diverse forest ecosystems and substantial tribal populations who maintain strong connections to traditional healing

practices. The district encompasses varied habitats including dry deciduous forests, grasslands, and agricultural areas that support diverse medicinal flora utilized by local communities for centuries. However, rapid socio-economic changes, modernization, deforestation, and urbanization pose significant threats to both medicinal plant resources and associated traditional knowledge systems leading to gradual erosion of this invaluable cultural heritage. The younger generation's declining interest in traditional practices, coupled with inadequate documentation, has created an urgent need for comprehensive ethnobotanical research to preserve this knowledge before it disappears entirely. Previous studies in Madhya Pradesh have documented medicinal plant usage among various tribal communities revealing the rich diversity of ethnomedicinal practices across the region. Research in neighboring districts has identified numerous species with therapeutic potential demonstrating the significant contribution of traditional knowledge to modern pharmacological research. However, comprehensive ethnobotanical documentation specific to Sehore district remains limited, creating a knowledge gap that this study aims to address.

2. Literature Review

Ethnobotanical research in India has gained significant momentum over the past decades, with numerous studies documenting the medicinal plant knowledge of various indigenous communities. Ethnobotany, as a research field, has been widely used for documentation of indigenous knowledge on plant use and providing inventories of useful plants from local flora in Asian countries. Traditional medicinal systems have been recognized as valuable sources for drug discovery and development, with many modern pharmaceuticals having their origins in traditional plant-based remedies. Research conducted in Madhya Pradesh has revealed extensive use of medicinal plants among tribal communities. Studies in the tribal population of Madhya Pradesh have documented valuable information about medicinal use of plant species against various diseases among tribal women. The state's diverse ecological zones support a rich variety of medicinal flora, with 114 plant species from 103 genera and 59 families identified in Anuppur district alone for treating different diseases. Documentation efforts in various districts of Madhya Pradesh have revealed significant patterns in medicinal plant usage. Extensive surveys in districts including Sehore, Chhindwara, Betul, Seoni, Mandla, Dindori and Hoshangabad resulted in recording ethno-medicinal uses of 40 plant species by tribal communities. These studies have consistently identified certain plant families, particularly Fabaceae, Asteraceae, and Lamiaceae, as being highly represented in traditional medicinal practices.

Previous research in Sehore district has provided preliminary insights into the region's medicinal plant diversity. A preliminary ethnobotanical survey revealed 41 taxa belonging to 40 genera and 30 angiospermic families used by tribal people to cure various human diseases. Additionally, 12 ethno-medicinal plants of Sehore district have been documented for wound healing and other diseases, with species like Mimosa pudica, Aloe vera, and Vitex nigundo showing particularly effective healing properties. The methodology employed in ethnobotanical studies has evolved significantly, with researchers increasingly utilizing quantitative indices to assess the cultural significance and therapeutic potential of medicinal plants. Cross-sectional research designs involving focus group discussions and semi-structured questionnaires have become standard approaches for collecting ethnobotanical data. Various quantitative tools including Informant Consensus Factor (ICF), Use Value (UV), Fidelity Level (FL), and Relative Frequency of Citation (RFC) are now commonly employed to analyze traditional knowledge systems. Contemporary ethnobotanical research emphasizes the urgent need for documentation due to rapid loss of traditional knowledge. The primary aim of ethnobiological research is now to document disappearing traditional knowledge, as biocultural biodiversity worldwide is disappearing at an unprecedented rate. This urgency is particularly relevant in regions like central India, where traditional communities face increasing pressure from modernization and environmental degradation.

3. Objectives

The present study was designed with four primary objectives to comprehensively document and analyze the ethnobotanical knowledge in Sehore district:

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1. To inventory and document medicinal plant species used by traditional healers and local communities in Sehore district, including their botanical identification, local names, and habitat preferences.
2. To analyze traditional knowledge systems including preparation methods, dosage patterns, administration routes, and therapeutic applications of documented medicinal plants across different ailment categories.
3. To evaluate the conservation status and threats facing medicinal plant resources and assess the current state of traditional knowledge transmission among different age groups and community sectors.
4. To recommend conservation strategies and document quantitative ethnobotanical indices to support evidence-based approaches for preserving both medicinal plant diversity and associated traditional knowledge systems.

4. Methodology

The research was conducted in Sehore district of Madhya Pradesh, India, which covers an area of 6,579 km² and lies between North Latitudes 22°33'30" to 22°40'25" and East Longitudes 78°26'00" to 78°02'00" with normal annual rainfall of 1,217.7 mm. The district is characterized by diverse vegetation types including dry deciduous forests, grasslands, and agricultural areas that support rich medicinal plant diversity. This study employed a cross-sectional ethnobotanical survey design utilizing both qualitative and quantitative methodological approaches combining semi-structured interviews, field observations, and focus group discussions. The research was conducted over a period of 12 months from January to December 2023 to capture seasonal variations in plant availability and usage patterns. A total of 150 informants were selected using purposive and random sampling techniques from 12 villages across Sehore district. The sample included 25 key informants (traditional healers, village elders, and herbalists) selected purposively based on their recognized expertise in medicinal plants, and 125 general informants selected randomly from the community representing diverse age groups, genders, and occupational backgrounds. Key informants were identified through recommendations from local authorities, health workers, and community leaders.

Data collection was carried out using standardized semi-structured questionnaires designed in English and translated into local languages (Hindi and tribal dialects) to facilitate effective communication with informants. The questionnaire covered informant demographics, medicinal plant knowledge, preparation methods, administration routes, treated ailments, conservation practices, and knowledge sources.

- **Semi-structured Interviews:** Individual interviews were conducted with each informant lasting 45-90 minutes, focusing on their knowledge of medicinal plants, usage patterns, and traditional practices following standard ethnobotanical methodologies.
- **Focus Group Discussions:** Eight focus group discussions were organized with 8-12 participants each, segregated by gender and age groups to encourage open dialogue and capture diverse perspectives on traditional medicinal practices.
- **Guided Field Walks:** Botanical surveys were conducted with key informants to document medicinal plants in their natural habitats, collect voucher specimens, and verify traditional ecological knowledge about plant distribution and harvesting practices.
- **Participant Observation:** Direct observation of medicinal plant preparation and administration was conducted during community healing sessions to document traditional techniques and cultural practices.

Prior informed consent was obtained from all participants before data collection ensuring voluntary participation and confidentiality of informants. The study adhered to ethical guidelines established by the International Society of Ethnobiology and received approval from local authorities and community leaders.

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5. Results

Medicinal Plant Diversity

The ethnobotanical survey documented a total of 89 medicinal plant species belonging to 82 genera and 44 families used by the communities of Sehore district for treating various ailments. The documented species represent significant botanical diversity, with 60 species (67.4%) used exclusively for human ailments, 10 species (11.2%) for livestock diseases, and 19 species (21.3%) for treating both human and animal conditions.

Table 1: Plant Habit Distribution of Documented Medicinal Species

Plant Habit	Number of Species	Percentage
Trees	38	42.7%
Herbs	29	32.6%
Shrubs	22	24.7%
Total	89	100%

The analysis revealed that trees constituted the largest proportion of medicinal plants (42.7%), followed by herbs (32.6%) and shrubs (24.7%). This distribution pattern reflects the predominance of woody species in the dry deciduous forest ecosystem of Sehore district and indicates the community's preference for perennial plants that provide consistent availability of medicinal resources throughout the year.

Table 2: Most Represented Plant Families in Traditional Medicine

Family	Number of Species	Percentage	Key Species
Fabaceae	12	13.5%	Cassia fistula, Acacia nilotica, Butea monosperma
Asteraceae	9	10.1%	Eclipta prostrata, Tridax procumbens, Parthenium hysterophorus
Lamiaceae	8	9.0%	Ocimum sanctum, Leucas aspera, Mentha arvensis
Euphorbiaceae	7	7.9%	Euphorbia hirta, Jatropha curcas, Ricinus communis
Rubiaceae	6	6.7%	Morinda citrifolia, Mitragyna parviflora, Ixora coccinea
Others	47	52.8%	Various families with 1-5 species each

Fabaceae emerged as the most represented family with 12 species (13.5%), followed by Asteraceae with 9 species (10.1%) and Lamiaceae with 8 species (9.0%). This pattern is consistent with ethnobotanical studies conducted in other regions of Madhya Pradesh and reflects the wide distribution and therapeutic significance of these plant families in traditional medicine systems.

Table 3: Plant Parts Used and Preparation Methods

Plant Part	Frequency of Use	Percentage	Common Preparation Methods
Leaves	156	35.1%	Decoction, paste, powder, juice
Roots	89	20.0%	Decoction, powder, paste
Bark	67	15.1%	Decoction, powder
Fruits	43	9.7%	Raw consumption, juice, powder
Seeds	38	8.6%	Powder, oil extraction
Whole plant	32	7.2%	Decoction, paste
Flowers	19	4.3%	Decoction, paste, oil

Leaves were the most frequently used plant parts (35.1%), followed by roots (20.0%) and bark (15.1%). Decoction was the most common preparation method (68%), followed by paste preparation (23%) and powder form (9%). This preference for leaves reflects their easy accessibility, renewable nature, and concentration of bioactive compounds in foliar tissues.

Table 4: Ailment Categories and Plant Species Distribution

Ailment Category	Number of Species	ICF Value	Most Common Species
Gastrointestinal disorders	34	0.89	Terminalia chebula, Psidium guajava, Aegle marmelos
Respiratory ailments	28	0.84	Adhatoda vasica, Ocimum sanctum, Zingiber officinale
Skin diseases	24	0.92	Azadirachta indica, Curcuma longa, Aloe vera
Musculoskeletal problems	19	0.76	Vitex negundo, Ricinus communis, Calotropis procera
Fever and malaria	17	0.88	Andrographis paniculata, Tinospora cordifolia, Nyctanthes arbor-tristis
Women's health	15	0.72	Saraca asoca, Asparagus racemosus, Aloe vera

Gastrointestinal disorders were treated using the highest number of plant species (34), followed by respiratory ailments (28) and skin diseases (24). The high Informant Consensus Factor (ICF) values across all categories (0.72-0.92) indicate strong agreement among informants regarding the therapeutic applications of documented species.

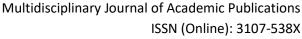**Table 5: Knowledge Distribution Among Age Groups**

Age Group	Number of Informants	Average Species Known	Knowledge Index
60+ years	45	67.3	0.89
45-59 years	52	48.7	0.74
30-44 years	38	29.4	0.52
18-29 years	15	12.8	0.28

The analysis revealed a significant correlation between age and traditional knowledge, with elderly informants (60+ years) possessing the most comprehensive knowledge (average 67.3 species known) and younger participants (18-29 years) showing limited knowledge (average 12.8 species known). This pattern indicates potential knowledge erosion and highlights the urgent need for documentation and transmission programs.

Table 6: Conservation Status and Threats Assessment

Conservation Status	Number of Species	Percentage	Primary Threats
Abundant	32	36.0%	Habitat modification, over-collection
Common	28	31.5%	Agricultural expansion, grazing
Occasional	21	23.6%	Deforestation, urbanization
Rare	8	9.0%	Habitat loss, climate change

The assessment revealed that 32.6% of documented species face some level of conservation concern, with 8 species classified as rare and requiring immediate conservation attention. Major threats identified include habitat destruction (78% of informants), agricultural expansion (65%), overgrazing (52%), and urbanization (41%).

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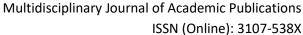www.mjapjournal.com
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6. Discussion

The documentation of 89 medicinal plant species in Sehore district represents a significant contribution to the ethnobotanical knowledge of Madhya Pradesh, revealing the rich traditional wisdom possessed by local communities. This diversity demonstrates that traditional medicines continue to be widely utilized by tribal communities, though detailed knowledge is predominantly held by a limited number of individuals. The predominance of trees in the medicinal plant inventory reflects both ecological availability and community preferences for reliable, perennial sources of therapeutic materials. The strong representation of Fabaceae, Asteraceae, and Lamiaceae families in traditional medicine systems aligns with global patterns of ethnomedicinal plant usage where these families consistently contribute significant numbers of species across different geographical regions. This consistency suggests fundamental biochemical and ecological characteristics that make these plant families particularly suitable for therapeutic applications, including their diverse secondary metabolite profiles and wide ecological distribution. The high Informant Consensus Factor values observed across ailment categories (0.72-0.92) indicate remarkable consistency in traditional knowledge systems and validate the therapeutic significance of documented species. ICF values provide valuable insights into the agreement among informants regarding the medicinal applications of plant species and serve as indicators of the cultural importance of specific therapeutic practices. These high values suggest well-established traditional practices that have been refined through generations of empirical observation and application. The preference for leaves as the primary plant part utilized (35.1%) reflects both practical and scientific considerations. Leaves are easily accessible, renewable when harvested sustainably, and often contain high concentrations of bioactive compounds responsible for therapeutic effects. The predominance of leaf usage in ethnobotanical studies worldwide indicates an intuitive understanding of plant biochemistry among traditional practitioners. The dominance of decoction as a preparation method further demonstrates sophisticated knowledge of extraction techniques that maximize therapeutic compound availability. The dramatic decline in traditional knowledge across age groups represents one of the most concerning findings of this study. The 81% reduction in species knowledge from elderly to younger populations parallels global trends in traditional knowledge erosion where rapid modernization and cultural changes threaten the continuity of indigenous knowledge systems. This pattern emphasizes the critical need for urgent documentation and transmission programs to preserve this invaluable cultural heritage. The identification of habitat destruction as the primary threat to medicinal plant resources (reported by 78% of informants) reflects broader environmental challenges facing central India. Deforestation, agricultural expansion, and urbanization pose significant risks to medicinal plant populations and threaten the sustainability of traditional medicine systems. The classification of 32.6% of documented species as facing conservation concerns underscores the urgent need for integrated conservation strategies that address both ecological and cultural dimensions of traditional knowledge systems.

The study's findings contribute significantly to understanding the complex relationships between traditional communities and their plant resources in central India. The documentation of preparation methods, dosage patterns, and administration routes provides valuable insights for potential pharmaceutical applications and validates traditional therapeutic approaches through quantitative analysis. Ethnobotanical research serves as a bridge between traditional knowledge and modern scientific understanding, facilitating the development of evidence-based approaches to natural product research. The conservation implications of this research extend beyond species preservation to encompass cultural heritage protection and community empowerment. Effective conservation strategies must integrate traditional knowledge systems with modern conservation approaches, recognizing the intrinsic value of indigenous practices while addressing contemporary challenges. The establishment of community-based conservation programs, medicinal plant gardens, and knowledge documentation initiatives represents essential steps toward preserving both biological and cultural diversity.

7. Conclusion

This comprehensive ethnobotanical study in Sehore district has successfully documented the rich diversity of medicinal plants and associated traditional knowledge systems maintained by local communities. The
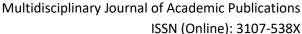
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identification of 89 medicinal plant species representing 82 genera and 44 families demonstrates the significant botanical wealth of the region and validates the sophisticated understanding of plant-human relationships developed through generations of empirical observation and application. The research findings reveal both the strengths and vulnerabilities of traditional knowledge systems in central India. High Informant Consensus Factor values across ailment categories confirm the validity and consistency of traditional therapeutic practices, while the dramatic decline in knowledge among younger generations highlights the urgent need for conservation action. The predominance of trees in medicinal plant usage reflects ecological adaptations and community preferences for reliable therapeutic resources, while the strong representation of specific plant families indicates fundamental biochemical characteristics that support therapeutic applications. The documentation of diverse preparation methods, administration routes, and therapeutic applications provides valuable insights for both cultural preservation and potential pharmaceutical development. The preference for leaf materials and decoction preparation methods demonstrates sophisticated understanding of plant biochemistry and extraction techniques that maximize therapeutic efficacy while ensuring safety.

Conservation challenges identified in this study, particularly habitat destruction and knowledge erosion, require immediate and comprehensive intervention strategies. The classification of one-third of documented species as facing conservation concerns underscores the urgency of implementing integrated approaches that address both ecological and cultural dimensions of traditional knowledge systems. Effective conservation programs must engage local communities as primary stakeholders while providing alternative livelihood options that reduce pressure on natural resources. The research contributes significantly to the growing body of ethnobotanical knowledge from Madhya Pradesh and provides a foundation for future studies in medicinal plant conservation, traditional knowledge preservation, and natural product development. The documentation of quantitative ethnobotanical indices offers evidence-based tools for prioritizing conservation efforts and identifying species with high therapeutic potential for further investigation. Moving forward, urgent action is required to establish community-based conservation programs, implement knowledge transmission initiatives, and develop sustainable harvesting practices that ensure the continuity of both medicinal plant resources and associated traditional knowledge systems. The integration of traditional wisdom with modern scientific approaches offers promising opportunities for advancing healthcare solutions while preserving invaluable cultural heritage for future generations.

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