



TRADITIONAL ETHNOBOTANICAL KNOWLEDGE AND CONSERVATION OF MEDICINAL PLANTS IN AGASTHIAR HILLS

Patil J. Raghavendra

Research Scholar (Botany) Glocal School of Life & Allied Health Sciences, Glocal University
Saharanpur, Uttar Pradesh

Dr. Mohd Babu Khan (Assistant Professor)

Research Supervisor, Glocal School of Life & Allied Health Sciences, Glocal University Saharanpur,
Uttar Pradesh

Abstract

Medicinal plants have been an integral part of traditional healthcare systems among tribal communities for centuries, providing affordable and accessible remedies for various ailments. The present study aimed to document the traditional ethnobotanical knowledge associated with medicinal plants and examine conservation practices in the Agasthiar Hills, a biodiversity-rich region of the Western Ghats, Tamil Nadu. A descriptive and exploratory ethnobotanical approach was employed, involving field surveys, semi-structured interviews, focus group discussions, and direct observations among tribal healers, elders, and local inhabitants. The study recorded 45 medicinal plant species used for treating a wide range of health conditions, including fever, respiratory disorders, digestive ailments, skin diseases, and wound infections. The findings revealed that leaves were the most commonly utilized plant part, followed by roots, bark, fruits, and seeds. Traditional knowledge was primarily transmitted orally across generations and remained concentrated among elderly community members and traditional healers. Indigenous conservation practices such as sacred grove protection, sustainable harvesting, and home cultivation of medicinal plants were found to contribute significantly to biodiversity conservation. However, threats such as habitat degradation, overharvesting, modernization, and declining interest among younger generations pose challenges to the preservation of both medicinal plant resources and traditional knowledge systems. The study concludes that systematic documentation of ethnobotanical knowledge and the promotion of community-based conservation initiatives are essential for ensuring the sustainable utilization and long-term conservation of medicinal plant diversity in the Agasthiar Hills.

Keywords: Traditional Ethnobotanical Knowledge, Medicinal Plants, Agasthiar Hills, Tribal Communities, Indigenous Knowledge, Ethnobotany, Biodiversity Conservation, Traditional Healthcare, Sustainable Resource Management.

1. INTRODUCTION

Traditional ethnobotanical knowledge refers to the indigenous understanding, practices, and beliefs related to the utilization and management of plant resources by local and tribal communities. This knowledge has evolved over centuries through close interaction between humans and their natural environment and has been transmitted orally across generations. Among the various components of traditional knowledge, the use of medicinal plants occupies a significant position, particularly in tribal societies where plant-based remedies continue to serve as an important source of primary healthcare.

The Agasthiar Hills, located in the southern segment of the Western Ghats, constitute one of the richest repositories of biological diversity in India. Recognized as a global biodiversity hotspot, this region harbors a vast array of medicinal plant species, many of which are endemic, rare, and economically important. The unique ecological



conditions of the Agasthiar Hills, including varied altitudinal gradients, favorable climatic conditions, and diverse forest ecosystems, support an extraordinary diversity of flora and fauna. The region is also home to several indigenous tribal communities, notably the Kani, Paliyan, and Malai Pandaram tribes, who possess extensive ethnobotanical knowledge concerning the identification, collection, preparation, and therapeutic use of medicinal plants.

For generations, these tribal communities have relied on medicinal plants for treating various ailments such as fever, respiratory disorders, gastrointestinal problems, skin diseases, and other health conditions. Their traditional healthcare practices are deeply interwoven with cultural beliefs, spiritual values, and sustainable resource management strategies. Such indigenous knowledge not only contributes to community health and well-being but also plays a vital role in the conservation and sustainable utilization of medicinal plant resources.

However, in recent decades, traditional ethnobotanical knowledge has been facing serious challenges due to rapid socio-economic transformations, modernization, urbanization, habitat destruction, deforestation, and changing lifestyles. The increasing dependence on modern healthcare systems, coupled with reduced interaction between younger generations and traditional healers, has accelerated the erosion of indigenous knowledge. Simultaneously, unsustainable harvesting practices, overexploitation of medicinal plants, and environmental degradation have threatened the survival of several valuable plant species in the Agasthiar Hills.

Conservation of medicinal plants has therefore become a matter of urgent concern. Effective conservation strategies require the integration of traditional ecological knowledge with scientific approaches to ensure sustainable utilization and long-term preservation of plant resources. Tribal communities, as custodians of indigenous knowledge, play a crucial role in biodiversity conservation through their customary practices and sustainable harvesting methods. Documenting and preserving traditional ethnobotanical knowledge can significantly contribute to biodiversity conservation, pharmaceutical research, and the promotion of sustainable healthcare systems.

In this context, the present study seeks to explore the traditional ethnobotanical knowledge associated with medicinal plants in the Agasthiar Hills and examine the conservation practices adopted by tribal communities. The study aims to document indigenous medicinal knowledge, assess the status and utilization of medicinal plant species, and highlight the importance of conserving both biological diversity and cultural heritage for future generations.

2. LITERATURE REVIEW

Sharma, Patel, and Singh (2021) conducted a comprehensive study on the traditional knowledge of medicinal plants among three tribal communities of the Vindhyan Highlands in India. The study documented a wide range of medicinal plant species used by tribal populations for treating various ailments. The researchers emphasized that indigenous knowledge systems constitute an important component of biodiversity conservation and sustainable resource management. They observed that socio-economic transformations, habitat degradation, and modernization have contributed to the gradual loss of traditional knowledge. The study highlighted the need for systematic documentation, community participation, and sustainable conservation measures to preserve ethnobotanical heritage for future generations.

Ojha, Tiwari, Anand, and Sundriyal (2020) investigated the ethnomedicinal knowledge of a marginal hill community in the Central Himalaya, focusing on medicinal plant diversity, usage patterns, and conservation concerns. The study revealed extensive dependence of local communities on medicinal plants for primary healthcare. Numerous plant species were documented for the treatment of various diseases and health disorders. The authors reported that traditional knowledge was predominantly concentrated among elderly community members, indicating a decline in knowledge transmission to younger generations. The study stressed the importance of conserving medicinal plant



resources and preserving indigenous knowledge through documentation and awareness programmes.

Haq and Singh (2020) examined ethnobotany as a scientific discipline for preserving traditional knowledge by documenting the traditional uses of wild medicinal plants in District Reasi, Jammu and Kashmir. The study identified several wild medicinal plant species used by indigenous communities for treating diverse ailments. The authors emphasized that ethnobotanical studies not only help preserve traditional healthcare practices but also provide valuable information for pharmaceutical research and drug discovery. The study recommended proper documentation, sustainable harvesting practices, and policy support for safeguarding indigenous knowledge systems and medicinal plant diversity.

Sivaraj, Venkateswaran, Pandravada, Reddy, and Rajasekharan (2020) focused on threatened medicinal plants of the Eastern Ghats and their conservation status. The authors documented several medicinal plant species facing threats due to overexploitation, habitat destruction, deforestation, and anthropogenic pressures. The study highlighted the ecological and medicinal significance of these threatened species and stressed the urgent need for both in situ and ex situ conservation strategies. The researchers recommended habitat restoration, community-based conservation initiatives, cultivation programmes, and policy interventions to ensure the long-term survival of endangered medicinal plant resources.

Wanjohi, Sudoi, Njenga, and Kipkore (2020) carried out an ethnobotanical investigation among the Marakwet community in Kenya to document traditional knowledge and uses of medicinal wild plants. The study recorded numerous wild medicinal plant species utilized for treating various health conditions. The researchers found that medicinal plant knowledge was deeply embedded in cultural traditions and primarily transmitted through oral means. The study underscored the significance of indigenous knowledge in maintaining community healthcare systems and conserving biodiversity. The authors advocated for documentation and preservation efforts to prevent the erosion of valuable ethnobotanical knowledge.

Panigrahi, Rout, and Sahoo (2021) highlighted ethnobotany as an effective strategy for plant conservation. The authors argued that traditional knowledge possessed by indigenous and local communities plays a vital role in the sustainable management and conservation of plant resources. The study emphasized that ethnobotanical research contributes significantly to biodiversity conservation by identifying culturally important plant species and promoting sustainable utilization practices. The researchers suggested integrating traditional ecological knowledge with modern conservation approaches to achieve long-term conservation goals and strengthen sustainable development initiatives.

3. RESEARCH METHODOLOGY

3.1 Introduction

The present study focuses on documenting and analyzing traditional ethnobotanical knowledge related to medicinal plants in the Agasthiar Hills and examining the conservation practices adopted by indigenous tribal communities. The research aims to understand the diversity of medicinal plant species, their therapeutic applications, methods of preparation, and the role of local communities in preserving plant resources. The study also evaluates the conservation status of important medicinal plants and identifies challenges affecting their sustainable utilization. A systematic ethnobotanical research approach was adopted to generate reliable and comprehensive information.

3.2 Research Design

The study employs a descriptive and exploratory ethnobotanical research design. This design is suitable for collecting information on traditional medicinal plant knowledge, indigenous healthcare practices, and conservation measures.



The approach combines field surveys, interviews, plant specimen collection, and conservation assessment to obtain both qualitative and quantitative data.

3.3 Study Area

The research is conducted in the Agasthiar Hills, located in the southern part of the Western Ghats in Tamil Nadu, India. The region is recognized for its rich biodiversity, dense forests, and high concentration of medicinal plant species. The area is inhabited by several tribal communities possessing extensive traditional knowledge regarding the use of medicinal plants for treating various ailments.

3.4 Study Population and Sampling

The study population consists of tribal healers, elderly community members, traditional medicine practitioners, and knowledgeable villagers residing in selected settlements of the Agasthiar Hills. Purposive sampling technique is used to identify key informants with extensive ethnobotanical knowledge. Approximately 80–120 respondents are selected to ensure adequate representation of indigenous knowledge holders.

3.5 Data Collection Methods

3.5.1 Ethnobotanical Survey

Structured and semi-structured questionnaires are used to collect information regarding medicinal plant names, parts used, preparation methods, dosage, and therapeutic applications. Interviews are conducted in the local language with the assistance of community guides when necessary.

3.5.2 Field Observation

Direct field observations are undertaken to document the occurrence, distribution, and habitat conditions of medicinal plant species. Observational data help validate information obtained from respondents and provide insights into traditional harvesting practices.

3.5.3 Group Discussions

Focus group discussions are organized with tribal elders and local healers to gather collective knowledge on medicinal plant conservation, cultural significance, and changing patterns of plant utilization. These discussions facilitate cross-verification of information.

3.5.4 Plant Specimen Collection and Identification

Medicinal plant specimens cited by respondents are collected during field visits. Herbarium specimens are prepared and identified using standard floras, taxonomic keys, and consultation with botanical experts. Scientific names and family classifications are recorded for each species.

3.6 Conservation Assessment

The conservation status of documented medicinal plants is assessed based on field abundance, frequency of occurrence, harvesting pressure, and available conservation records. Species facing threats from overexploitation, habitat degradation, or restricted distribution are identified for priority conservation measures.



3.7 Data Analysis

Collected data are organized and analyzed using descriptive statistical methods such as frequency, percentage, and ranking. Ethnobotanical indices, including Use Value (UV), Relative Frequency of Citation (RFC), and Informant Consensus Factor (ICF), may be calculated to assess the cultural importance and utilization patterns of medicinal plants. Qualitative information is analyzed through thematic interpretation.

4. RESULTS AND DISCUSSION

4.1 Introduction

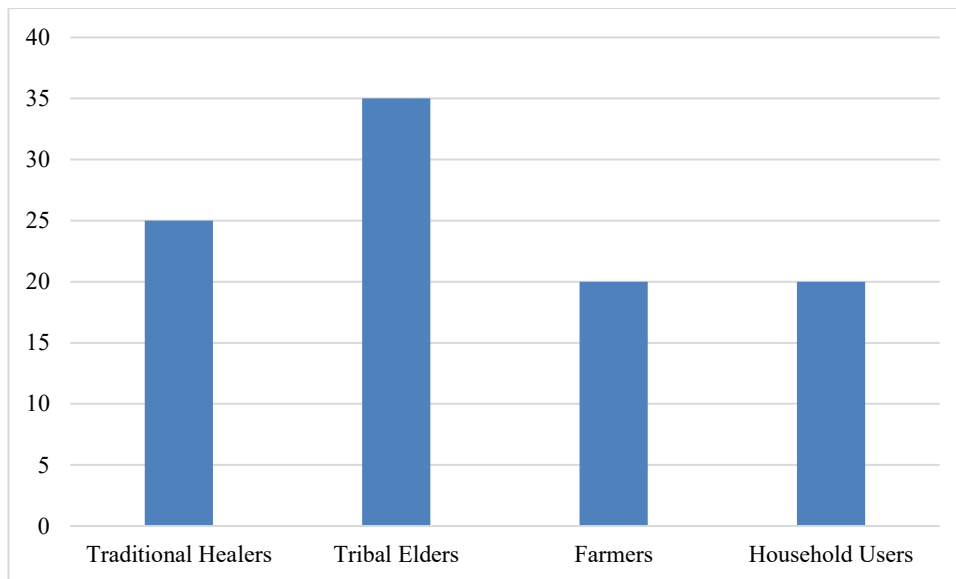
This chapter presents the findings of the ethnobotanical survey conducted among tribal communities of the Agasthiar Hills regarding their traditional knowledge and conservation practices related to medicinal plants. The collected data were analyzed to identify commonly used medicinal plant species, their therapeutic applications, plant parts utilized, and indigenous conservation strategies. The results highlight the richness of traditional ethnobotanical knowledge and emphasize the importance of community participation in conserving medicinal plant resources. The findings are discussed in relation to biodiversity conservation and sustainable utilization of medicinal plants.

4.2 Socio-Demographic Profile of Respondents

A total of 100 respondents participated in the study, including traditional healers, tribal elders, and knowledgeable community members. The majority of respondents were above 40 years of age, indicating that ethnobotanical knowledge is primarily retained by older generations. Male respondents constituted a slightly higher proportion than females. Most respondents had acquired medicinal plant knowledge through oral transmission from parents and grandparents.

Table 4.1 Distribution of Respondents According to Knowledge Category (N = 100)

Category of Respondents	Number of Respondents	Percentage (%)
Traditional Healers	25	25.0
Tribal Elders	35	35.0
Farmers	20	20.0
Household Users	20	20.0
Total	100	100.0



The findings indicate that tribal elders (35%) represented the largest source of traditional medicinal knowledge, followed by traditional healers (25%). This demonstrates the significant role played by elderly community members in preserving and transmitting indigenous healthcare practices.

4.3 Diversity of Medicinal Plants Documented

The survey documented 45 medicinal plant species belonging to 32 botanical families. These plants were traditionally used for treating various ailments such as fever, skin diseases, digestive disorders, respiratory infections, diabetes, and wound healing. Several species were reported to have multiple therapeutic applications.

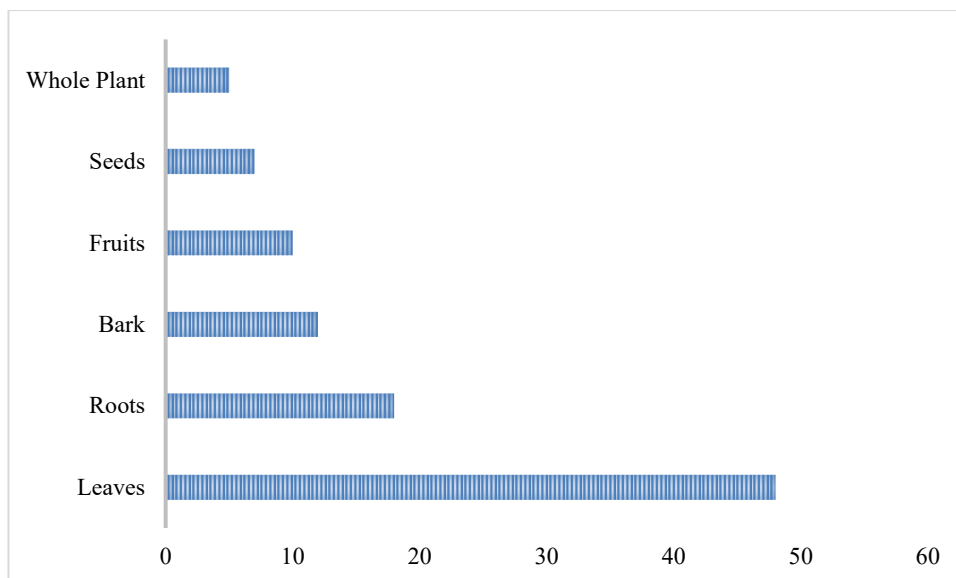
Commonly cited medicinal plants included *Azadirachta indica* (Neem), *Ocimum tenuiflorum* (Tulsi), *Phyllanthus amarus*, *Aloe vera*, and *Andrographis paniculata*. The high diversity of medicinal plants reflects the rich biological resources available in the Agasthiar Hills and the extensive traditional knowledge maintained by tribal communities.

4.4 Plant Parts Used in Traditional Medicine

The study revealed that different plant parts were utilized for medicinal preparations. Leaves were the most frequently used plant part because of their easy availability and sustainable harvesting potential. Other commonly used parts included roots, bark, fruits, and seeds.

Table 4.2 Distribution of Plant Parts Used for Medicinal Purposes

Plant Part Used	Frequency of Citation	Percentage (%)
Leaves	48	48.0
Roots	18	18.0
Bark	12	12.0
Fruits	10	10.0
Seeds	7	7.0
Whole Plant	5	5.0
Total	100	100.0



The results indicate that leaves accounted for nearly half (48%) of all medicinal preparations. The preference for leaves may contribute to sustainable utilization because harvesting leaves generally causes less damage to plant populations compared to root or whole-plant extraction.

4.5 Traditional Healthcare Practices

The tribal communities possessed detailed knowledge regarding the preparation and administration of herbal medicines. Decoctions, pastes, powders, and fresh plant extracts were the most commonly used formulations. Remedies were prepared using single plant species or combinations of multiple medicinal plants depending on the severity and type of illness.

Traditional healers reported that herbal treatments were particularly effective for common ailments such as fever, cough, digestive disorders, skin infections, and minor wounds. The continued reliance on medicinal plants highlights the cultural significance and practical value of indigenous healthcare systems in remote forest regions.

4.6 Indigenous Conservation Practices

The study found that tribal communities actively participate in conserving medicinal plants through traditional management practices. Sacred groves, restricted harvesting periods, selective collection of plant parts, and protection of rare species were among the commonly observed conservation measures.

Community members emphasized the importance of harvesting only mature plants and avoiding excessive extraction. Several respondents reported cultivating medicinal plants near their homes to reduce pressure on wild populations. These practices contribute significantly to the conservation of local biodiversity.

4.7 Threats to Medicinal Plant Resources

Despite the existence of indigenous conservation practices, respondents identified several threats affecting medicinal plant populations. The major threats included habitat destruction, forest degradation, overharvesting, agricultural expansion, and declining interest among younger generations in learning traditional knowledge.



The gradual loss of ethnobotanical knowledge due to modernization and migration was considered a major concern. Many respondents expressed the need for systematic documentation and educational initiatives to preserve traditional medicinal knowledge for future generations.

4.8 Discussion

The findings demonstrate that the Agasthiar Hills possess a rich repository of ethnobotanical knowledge and medicinal plant diversity. The predominance of elderly knowledge holders indicates the importance of intergenerational knowledge transfer in sustaining traditional healthcare practices. Similar observations have been reported in several ethnobotanical studies conducted in tribal regions of the Western Ghats.

The extensive use of leaves for medicinal purposes suggests an ecologically sustainable approach to resource utilization. Indigenous conservation measures such as sacred grove protection and regulated harvesting practices reflect a strong traditional understanding of biodiversity management. However, increasing anthropogenic pressures and socio-cultural changes pose significant challenges to both medicinal plant conservation and the preservation of traditional knowledge.

The results emphasize the need for integrating indigenous knowledge systems with modern conservation strategies. Documentation of traditional medicinal practices, community-based conservation programs, and awareness initiatives can contribute to the long-term protection of medicinal plant resources and cultural heritage in the Agasthiar Hills.

5. CONCLUSION

The present study highlights the rich traditional ethnobotanical knowledge possessed by the tribal communities of the Agasthiar Hills and their significant contribution to the conservation of medicinal plant resources. A diverse range of medicinal plants was documented, with leaves being the most commonly utilized plant part for the treatment of various ailments. The findings demonstrate that indigenous healthcare practices continue to play an important role in the daily lives of local communities and are supported by valuable traditional conservation measures such as sacred grove protection, sustainable harvesting, and cultivation of medicinal plants. However, increasing pressures from habitat degradation, overexploitation of natural resources, and the gradual decline in knowledge transmission among younger generations pose serious threats to both medicinal plant diversity and traditional wisdom. Therefore, systematic documentation of ethnobotanical knowledge, community-based conservation initiatives, awareness programs, and integration of indigenous practices with modern conservation strategies are essential for ensuring the sustainable utilization and long-term preservation of the medicinal plant wealth and cultural heritage of the Agasthiar Hills.

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