

Original Article

FROM ETHNOPHARMACOLOGICAL KNOWLEDGE TO EXPERIMENTAL VALIDATION: THERAPEUTIC PROFILING OF INDIAN MEDICINAL PLANTS

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ABSTRACT

Ethnopharmacological studies play a vital role in documenting traditional medicinal knowledge and identifying plant-based therapeutic resources. The present study aimed to document selected medicinal plants traditionally used by indigenous communities in India and to evaluate their therapeutic applications. Ethnopharmacological data were collected through field surveys and interactions with knowledgeable local informants. A total of five medicinal plant species belonging to five different botanical families were documented. Leaves were the most frequently used plant part, followed by roots, rhizomes, and stems. The recorded plants were traditionally employed for the treatment of skin disorders, respiratory ailments, stress-related conditions, wound healing, and immune enhancement. A comparison of traditional claims with existing scientific literature revealed a strong correlation between ethnomedicinal uses and reported pharmacological activities. The findings highlight the importance of ethnopharmacological documentation in preserving indigenous knowledge, promoting sustainable utilization of medicinal plants, and providing a scientific basis for future phytochemical and pharmacological investigations.

Keywords: Ethnopharmacology, Indian Medicinal Plants, Traditional Knowledge, Ayurveda, Bioactive Compounds, Drug Discovery.

INTRODUCTION

India is one of the world's richest centers of medicinal plant diversity, with over 7,000 plant species reported to possess therapeutic properties [Fabricant and Farnsworth \(2001\)](#), [Kala et al. \(2004\)](#). This extensive botanical wealth, combined with long-standing indigenous knowledge systems, has supported the widespread use of plant-based remedies across diverse cultural and ecological regions. In rural and tribal communities, traditional medicines continue to play a crucial role in primary healthcare due to their accessibility, affordability, and cultural relevance.

Ethnopharmacology is an interdisciplinary field that investigates traditional medicinal practices by integrating ethnobotanical knowledge with pharmacological and phytochemical evaluation [Heinrich et al. \(2009\)](#). The discipline focuses on documenting indigenous plant use while scientifically validating their safety, efficacy, and therapeutic potential. Indian traditional medical systems such as Ayurveda, Siddha, Unani, and folk medicine have systematically preserved extensive knowledge of herbal formulations for preventive and therapeutic purposes [Patwardhan et al. \(2004\)](#).

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In recent years, growing concerns over adverse effects of synthetic drugs and the rise of drug-resistant pathogens have intensified interest in plant-derived therapeutics [Newman and Cragg \(2020\)](#). Ethnopharmacological research thus serves as a critical link between traditional knowledge and modern drug discovery, contributing to sustainable healthcare development and biodiversity conservation.

MATERIALS AND METHODS

Study Area

The ethnopharmacological survey was conducted in selected rural and tribal regions of India, characterized by rich floral diversity and a strong dependence on traditional healthcare practices. These regions represent varied ecological conditions and cultural backgrounds, allowing comprehensive documentation of indigenous medicinal knowledge.

Ethnopharmacological Data Collection

Primary data were collected through field surveys, semi-structured interviews, and group discussions with traditional healers, herbal practitioners, elderly villagers, and knowledgeable community members. Information was gathered on local plant names, parts used, preparation methods, modes of administration, dosage, and ailments treated. Prior informed consent was obtained from all participants, and ethical guidelines for ethnobotanical research were strictly followed.

Plant Collection and Identification

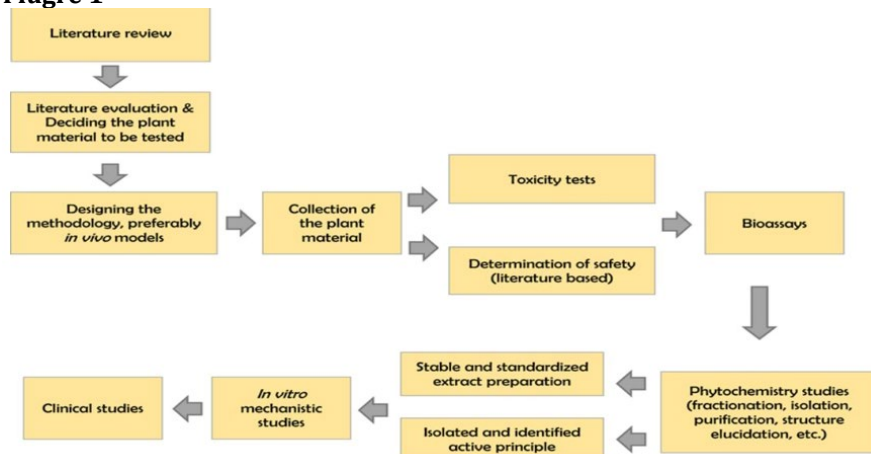
Medicinal plant specimens reported during the survey were collected from their natural habitats. The plants were identified using standard taxonomic keys and floras, and authentication was confirmed by botanists. Voucher specimens were prepared and deposited in a recognized herbarium for future reference.

Data Analysis

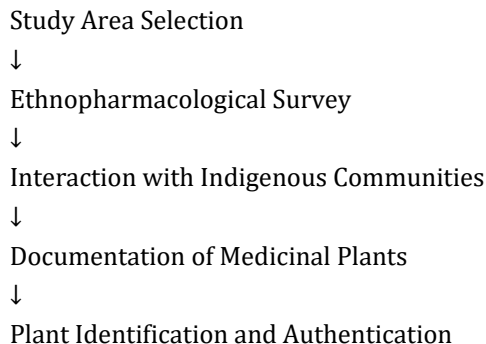
The collected ethnopharmacological data were systematically organized and analyzed to determine the frequency of plant use, commonly treated ailments, and frequently utilized plant parts. Traditional claims were compared with available pharmacological and phytochemical literature to assess scientific relevance and therapeutic potential.

SCHEMATIC REPRESENTATION OF THE METHODOLOGY ADOPTED IN THE PRESENT STUDY

Figure 1



FLOW DIAGRAM OF ETHNOPHARMACOLOGICAL STUDY



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Data Analysis

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Ethnomedicinal Applications

RESULTS

The ethnopharmacological survey documented five medicinal plant species belonging to five different botanical families, indicating a wide taxonomic diversity in traditional healthcare practices. The recorded plants included *Azadirachta indica* (Meliaceae), *Ocimum tenuiflorum* (Lamiaceae), *Withania somnifera* (Solanaceae), *Curcuma longa* (Zingiberaceae), and *Tinospora cordifolia* (Menispermaceae).

Leaves were the most frequently used plant part, accounting for two of the five documented species (*Azadirachta indica* and *Ocimum tenuiflorum*). Other plant parts utilized included roots (*Withania somnifera*), rhizomes (*Curcuma longa*), and stems (*Tinospora cordifolia*), demonstrating diverse harvesting practices depending on therapeutic application.

The documented plants were traditionally used for the management of skin disorders, respiratory ailments, stress-related conditions, wound healing, and immune enhancement. Skin-related disorders and respiratory ailments were commonly treated using leaf-based preparations, while roots and rhizomes were primarily associated with stress relief and wound healing, respectively. Stem-based remedies were mainly employed for enhancing immunity.

Overall, the results highlight the extensive use of locally available medicinal plants in treating common health ailments and emphasize the reliance of indigenous communities on plant-based therapies for primary healthcare.

Table 1

Table 1 Ethnopharmacological Uses of Selected Medicinal Plants				
Plant Species	Plant Family	Plant Part Used	Traditional Use (General)	Traditional Use (Specific)
<i>Azadirachta indica</i>	Meliaceae	Leaves	Skin disorders	Skin disorders
<i>Ocimum tenuiflorum</i>	Lamiaceae	Leaves	Leaves	Respiratory ailments
<i>Withania somnifera</i>	Solanaceae	Roots	Roots	Stress relief
<i>Curcuma longa</i>	Zingiberaceae	Rhizome	Rhizome	Wound healing
<i>Tinospora cordifolia</i>	Menispermaceae	Stem	Stem	Immunity enhancement

DISCUSSION

The present ethnopharmacological documentation highlights the continued reliance of indigenous communities on medicinal plants for the management of common health ailments. The recorded use of five plant species belonging to different botanical families reflects a broad traditional knowledge base and supports earlier reports that emphasize the richness of India's ethnomedicinal heritage. The dominance of leaf usage observed in the study aligns with previous ethnopharmacological findings, as leaves are easily accessible, renewable, and often rich in bioactive compounds.

The traditional application of *Azadirachta indica* for skin disorders and infections is well supported by its documented antimicrobial and anti-inflammatory properties. Similarly, *Ocimum tenuiflorum* is widely recognized for its therapeutic role in respiratory ailments due to its expectorant and immunomodulatory effects. The use of *Withania somnifera* roots for stress relief corresponds with its established adaptogenic and anti-stress activity, while *Curcuma longa* rhizome use for wound healing reflects its known antioxidant and anti-inflammatory potential. The inclusion of *Tinospora cordifolia* for immunity enhancement further demonstrates the empirical understanding of immunostimulatory plants in traditional medicine.

The strong correlation between traditional claims and scientifically reported pharmacological activities underscores the relevance of ethnopharmacological studies in identifying potential plant-based therapeutic agents. Such documentation not only aids drug discovery efforts but also plays a crucial role in preserving indigenous knowledge systems that are increasingly threatened by modernization and habitat loss.

CONCLUSION

The study documents selected medicinal plants commonly used by indigenous communities and highlights their therapeutic relevance in traditional healthcare practices. The findings demonstrate that ethnopharmacological knowledge is closely aligned with scientifically validated medicinal properties, emphasizing the credibility of traditional medicine. The frequent use of easily available plant parts, particularly leaves, reflects sustainable utilization practices. Overall, the study reinforces the importance of

ethnopharmacological research in conserving traditional knowledge, promoting biodiversity, and providing valuable leads for future pharmacological and phytochemical investigations.

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