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INDIGENOUS KNOWLEDGE SYSTEMS: AN ETHNOBOTANICAL ANALYSIS OF THE MANNAN TRIBE, KERALA

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Abstract:
Indigenous Knowledge Systems (IKS) represent cumulative, dynamic bodies of knowledge, practice and belief evolved through generations by indigenous communities in direct interaction with their local environments. These systems are not merely collections of data but are holistic worldviews that integrate cultural, spiritual, and ecological understanding. The present study is an attempt to document the ethnobotanical knowledge of the Mannan tribe for medicinal, nutritional and cultural purposes, a knowledge system increasingly threatened by modernization and ecological change. The Mannan tribe possesses an extensive and sophisticated body of ethnobotanical knowledge, a critical component of their cultural heritage and a testament to their sustainable coexistence with their ecosystem. This knowledge system holds immense value not only for cultural preservation but also for bioprospecting and the development of future pharmacopeias. However, it is highly vulnerable. Altogether, a diverse and significant repository of ethnobotanical knowledge, documenting 54 distinct plant species from various families and their specific therapeutic applications are documented. The study underscores the critical importance of continued documentation and the development of ethical, participatory conservation strategies to safeguard this invaluable intellectual heritage for future generations.

Keywords: Mannan Tribe, Ethnobotany, Indigenous Knowledge Systems, Kerala.

Introduction

Indigenous knowledge systems represent the cumulative wisdom, practices and beliefs developed by communities through generations of interaction with their natural environment. These systems play a crucial role in preserving biodiversity, fostering sustainable practices and maintaining cultural heritage (Tharakan, 2015). Ethnobotany, the study of the relationships between people and plants, offers profound insights into how indigenous communities use plant resources for food, medicine and ritualistic purposes (Kumar and Bharati, 2014; Soladoye *et al.*, 2014). The Mannan tribe, residing primarily in the Idukki district, Kerala, exemplifies a community deeply connected to its surrounding ecosystem. The tribe's traditional knowledge encompasses a rich array of botanical uses critical for their health, livelihood and spiritual life. Despite increasing external influences and environmental changes, the Mannan continue to preserve this knowledge through oral traditions and practical applications. The Mannan lifestyle is intricately tied to nature, revolving around subsistence agriculture, hunting, gathering and the sustainable use of forest resources. Culturally, the Mannan tribe maintains unique traditions, language dialects and social structures that distinguish them from neighbouring communities. Leadership within the tribe is often hereditary, with the 'Raja Mannan' serving as the traditional chieftain

who plays a pivotal role in preserving customs and resolving conflicts (Suresh, 2008). Their rich folklore, music and ritualistic practices emphasize their reverence for nature and its resources.

Indigenous knowledge systems

Indigenous knowledge systems encompass the complex, culturally rooted understandings and practices developed by indigenous peoples to manage their natural and social environments. These systems are dynamic, passed down through generations *via* oral tradition, observation and communal participation. Indigenous knowledge often integrates ecological, spiritual and practical wisdom, offering holistic approaches to resource management and conservation (Carm, 2014). In the context of ethnobotany, indigenous knowledge involves the detailed understanding of plant properties, classifications, uses and harvesting methods that reflect a community's interaction with its environment. These systems are not merely repositories of data but frameworks that guide sustainable living, health practices, and cultural rituals. For tribes like the Mannan in Kerala, indigenous knowledge systems are vital in maintaining biodiversity and ecological balance. Their intimate knowledge of local flora serves both utilitarian and spiritual needs, shaping their identity and resilience. Documentation and respect for these knowledge systems are crucial for fostering sustainable development and protecting indigenous rights in a rapidly changing world.

Ethnobotanical Practices of the Mannan Tribe

The Mannan tribe exhibits a deep-rooted knowledge of ethnobotany that manifests in their daily practices of identifying, utilizing and conserving plants. They employ traditional methods to classify plants based on morphology, utility, habitat and seasonality, often relying on vernacular nomenclature that reflects the plant's characteristics or usage. This classification system is an essential part of their cultural heritage, ensuring precise knowledge transfer across generations. The use of plants by the Mannan spans multiple domains including food, medicine, construction and rituals. Edible plants form a vital part of their sustenance, supplemented by hunting and gathering activities. Medicinal plants are carefully selected and processed according to traditional recipes passed down by community healers or elders, who possess specialized knowledge in herbal therapeutics. The Mannan also integrate plants into their spiritual and ritualistic life, using specific species for ceremonies, offerings and protective amulets. Knowledge transfer is predominantly oral, where elders educate the youth through participatory learning, storytelling and direct involvement in plant gathering and preparation. This intergenerational transmission is crucial for the survival of their ethnobotanical knowledge amid external pressures.

Methodology

The ethnobotanical study of the Mannan tribe was conducted through a systematic combination of qualitative research methods designed to document traditional knowledge comprehensively. Regular field visits and data collection are carried out across the Mannan Hamlets in Idukki region. Primary data collection involved semi-structured interviews with tribal elders, traditional healers and community members who possess detailed botanical knowledge. Data analysis entailed cross-verifying information gathered from multiple sources to ensure accuracy and authenticity. A participatory approach was employed to involve the community in documenting their knowledge, where the ultimate goal of the documentation is for conserving the Mannan tribe's ethnobotanical heritage.

Results and Discussion

Altogether, a diverse and significant repository of ethnobotanical knowledge, documenting 54 distinct plant species from various families and their specific therapeutic applications was given in Table 1. The primary uses of these plants are vast, covering treatments for dermatological, reproductive, gastrointestinal, respiratory and systemic conditions, demonstrating a deep understanding of natural

remedies within the documented tradition. For skin ailments, a substantial number of plants are utilized. Species such as *Acacia caesia*, *Alstonia venenata*, *Barleria cristata*, and *Wrightia tinctoria* are directly employed for skin diseases, while *Ageratina adenophora* and *Oldenlandia umbellata* are applied to wounds. *Aloe vera* is noted for its general use for hair and skin. The respiratory system is another major area of treatment, with plants like *Adhatoda beddomei*, *Cirsium wallichii*, *Cymbopogon travancorensis*, and *Ocimum kilmandscharium* being used to manage cough, cold, and fever. *Bacopa monnieri* is specifically identified as a bronchodilator. The table also reveals several plants dedicated to women's health and reproductive issues. *Abrus precatorius* is used as an antifertility agent, *Albizzia lebbeck* for leucorrhea, and *Clitoria ternatea* and *Pongamia pinnata* for postpartum care. *Saraca asoca* is applied for menstrual problems and piles. For digestive and abdominal complaints, plants like *Centella asiatica* and *Cinnamomum malabathrum* address stomach disorders, *Aerva lanata* is for abdominal worms and *Ficus racemosa* and *Ipomoea obscura* are for diarrhoea and dysentery.

Systemic and internal conditions are also well-represented. Jaundice is treated with *Curculigo orchioides*, *Phyllanthus niruri*, and *Physalis peruviana*. *Gymnema sylvestre* is used for diabetes, while *Mucuna pruriens* is for osteoporosis. Pain management is addressed by *Plumbago indica* for body pain and *Piper* species for headaches and stomach aches. Furthermore, several plants serve as antidotes and treatments for bites and poisons; *Alstonia venenata* and *Coscinium fenestratum* are used for snake bites, *Aristolochia indica* for various poisonous bites and *Phollidota pallida* for spider bites. Other notable applications include the use of *Desmodium gangeticum* and *Scoparia dulcis* for urinary stones and kidney issues, *Balanophora fungosa* and *Mimosa pudica* for piles, and *Sida acuta* for rheumatism. The data also includes non-medicinal uses, such as the employment of *Gnidia glauca* as a fish poison and pest repellent, and the mention of *Aerva lanata* and *Barleria cristata* being used in Pooja, indicating their cultural and ritual significance alongside their therapeutic value. This collection underscores the immense value of traditional plant knowledge in providing healthcare solutions across a wide spectrum of human ailments.

Sl. No.	Binomial name	Family	Application
1.	*Abrus precatorius*	Papilionoideae	One or two seeds are powdered and mixed with honey taken orally during the first 5 days of menstrual period for antifertility
2.	*Acacia caesia*	Mimosaceae	Bark for skin diseases
3.	*Achyranthes aspera*	Amaranthaceae	Leave jioce for renal complications
4.	*Adhatoda beddomei*	Acanthaceae	Leaves for fever, cough
5.	*Aerva lanata*	Amaranthaceae	Whole plant crushed and used for abdominal worms; Pooja
6.	*Ageratina adenophora*	Asteraceae	Crushed leaves are applied on fresh wounds
7.	*Albizzia lebbeck*	Mimosoideae	Seed oil mixed with honey, two teaspoon daily for one week before menses for leucorrhea

8.	*Aloe vera*	Liliaceae	Hair, skin
9.	*Alstonia venenata*	Apocynaceae	Roots used for skin diseases, antidote for cobra bites
10.	*Andrographis paniculata*	Acanthaceae	Whole plant crushed and used for fever, malaria
11.	*Aristolochia indica*	Aristolochiaceae	Roots are used against poisonous bites and stings and skin diseases
12.	*Asparagus racemosus*	Liliaceae	Crushed tubers applied over oedematous swellings
13.	*Azadirachta indica*	Meliaceae	Antiseptic uses
14.	*Bacopa monnieri*	Scrophulariaceae	Whole plant-bronchodilator
15.	*Balanophora fungosa*	Balanophoraceae	Whole plant grind into paste and used against piles
16.	*Barleria cristata*	Acanthaceae	Leaf juice for skin diseases and urinary infection; Pooja
17.	*Centella asiatica*	Apiaceae	Stomach disorders; Crushed leaves used against boils and skin diseases
18.	*Cinnamomum malabathrum*	Lauraceae	Flowers are used for stomach pain, ulcer
19.	*Cirsium wallichii*	Asteraceae	Young shoots cooked and given to children to cure coughs and cold
20.	*Clitoria ternatea*	Papilionoideae	About 5ml of flower juice with honey of *Apis dorsata* is given orally in empty stomach to clean the uterus after delivery
21.	*Coscinium fenestratum*	Menispermaceae	Skin diseases, snake bites
22.	*Curculigo orchioides*	Amaryllidaceae	Cough, jaundice; Roots used as a purgative
23.	*Cyanotis pilosa*	Commelinaceae	Whole plant given as a laxative to cattle
24.	Cyclea peltata	Menispermaceae	Whole plant for gastritis
25.	*Cymbopogon travancorensis*	Poaceae	Distilled oil of leaf is used against pains, cough and cold
26.	*Desmodium gangeticum*	Papilionaceae	Whole plant for urinary stones
27.	*Drosera peltata*	Droseraceae.	Whole plant is crushed and applied over corns on feet to remove them
28.	*Emilia scabra*	Asteraceae	Leaves made into a paste and

			used against sprains and muscle spasms
29.	*Emilia sonchifolia*	Asteraceae	Tonsil
30.	*Ficus racemosa L.*	Moraceae	Diarrhoea
31.	*Gnidia glauca*	Thymeleaceae	Stem crushed along with the bark of *Syzygium cumini* and used as fish poison; Crushed stems are used to repel pests
32.	*Gymnema sylvestre*	Asclepiadaceae	Diabetes
33.	*Hemigraphis colorata*	Acanthaceae	Wound
34.	*Ipomoea obscura*	Convolvulaceae	Dysentery
35.	*Mimosa pudica*	Mimosaceae	Roots for piles
36.	*Mucuna pruriens*	Papilionaceae	Seed s for osteoporosis
37.	*Ocimum kilmandscharium*	Lamiaceae	Cold, cough
38.	*Oldenlandia umbellata*	Rubiaceae	Whole plant for cuts, wounds
39.	*Ophiorrhiza mungos*	Rubiaceae	Roots juice is anthelmintic and useful for gastritis
40.	*Phollidota pallida*	Orchidaceae	Whole plant as antidote to bites of spider
41.	*Phyllanthus niruri*	Euphorbiaceae	Jaundice
42.	*Physalis peruviana*	Solanaceae	Concentrated leaf decoction is used against jaundice
43.	*Piper mullesua*	Piperaceae	Fruit decoction is used against headaches, stomach aches and cold
44.	*Piper wightii*	Piperaceae	Decoction of fruits used against headaches and stomach aches
45.	*Plumbago indica*	Plumbaginaceae	Roots for body pain
46.	*Pongamia pinnata*	Papilionoideae	Bark and heart wood boiled in water and used for bathing immediately after delivery to reduce body pain
47.	*Ruta graveolens var. angustifolia*	Rutaceae	Cold, cough, breathing issues
48.	*Saprosma foetens*	Rubiaceae	Wood smoke is used to cure vomiting and diarrhoea in children
49.	*Sida acuta*	Malvaceae	Roots and leaves crushed and juice is used for rheumatism
50.	*Saraca asoca*	Caesalpiniaceae	Whole plant is used against piles, menstrual problems
51.	*Scoparia dulcis L.*	Scrophulariaceae	Kidney stone
52.	*Thespesia populnea*	Malvaceae	Leaf juice for hepatic

			disorders
53.	*Toddalia asiatica*	Rutaceae	Leaves and buds are ground with rice flour and used against cough and cold in children.
54.	*Wrightia tinctoria*	Apocynaceae	Toothache, skin problems

Table 1: Major medicinal plants used by the Mannans in Idukki

The ethnobotanical knowledge among the Mannan tribe extends beyond utilitarian purposes to encompass deep cultural and spiritual meanings. Plants serve as integral elements of festivals, rituals and ceremonies, symbolizing the tribe's connection to nature and ancestral heritage. Certain species are considered sacred and their use is often governed by ritualistic protocols that reinforce social cohesion and cultural identity. The Mannan employ various plants in rites of passage, healing ceremonies and protective rituals, underscoring the inseparability of health, spirituality and the environment in their worldview. This knowledge is preserved not only through ritual practice but also through oral narratives, songs and folklore, which serve as mediums of cultural transmission. Maintaining ethnobotanical knowledge is, therefore, crucial not only for the tribe's physical well-being but also for the preservation of their intangible cultural heritage and communal identity.

The obtained results are *at par* with available reports, where Philip *et al.* (2012) documented the use of twelve plant species (*Acacia catechu, Ananas comosus, Annona reticulata, Caesalpinia pulcherrima, Carica papaya, Curculigo orchioides, Dolichos trilobus, Gloriosa superba, Momordica charantia, Plumbago zeylanica, Rhynchosia rufescens, Solanum torvum*) as abortifacients from Mannan tribes of Idukki district, Kerala. In another study, Thomas and George (2014) recorded the medicinal uses of 88 medicinal plant species belonging to 40 angiosperm families besides *Ganoderma offungi* and *Drynaria* of pteridophytes. Ajesh *et al.* (2012) noted the use of 23 plants where 4 species (*Acacia catechu, Caeslpinia pulcherrima, Dolichos trilobus, Rhynchosia rufescens*) are used as abortifacients; three species (*Abrus precatorius, Clitoria ternatea,Cassia fistula*) are used for antifertility, three (*Albizia lebbeck, Acacia nilotica, Dalbegia sissoo*) are used for leucorrhea and three (*Pterocarpus marsupium, Pterolobium hexapetalumn, Pongamia pinnata*) are used to remove body pain after delivery.

The preservation of the Mannan tribe's ethnobotanical knowledge faces significant challenges in the modern era. Rapid socio-economic changes, including urbanization, deforestation and shifts in land use, have severely impacted the availability of medicinal and useful plants in their traditional habitats. Habitat loss reduces access to crucial botanical resources, threatening both biodiversity and cultural practices. Moreover, modernization and increased exposure to mainstream education and healthcare systems have led to a gradual decline in traditional knowledge transmission. Younger generations are increasingly detached from ancestral practices, valuing modern lifestyles over indigenous wisdom. This generational gap risks the erosion of oral traditions and experiential learning essential for sustaining ethnobotanical knowledge. External pressures such as exploitation of forest resources and socio-political marginalization also contribute to the vulnerability of indigenous knowledge systems. Without concerted efforts for conservation and cultural revitalization, the rich ethnobotanical heritage of the Mannan tribe may face irreversible loss.

The conservation of the Mannan tribe's ethnobotanical knowledge and their surrounding biodiversity is critical for sustaining their cultural identity and ecological balance. Recognizing their role as custodians of forest resources, it is essential to promote community-based conservation practices that involve the tribe in managing and protecting their natural environment. Additionally, documenting and integrating

Indigenous Knowledge into mainstream conservation initiatives can foster respect for their practices and rights. Establishing community forest management groups and promoting participatory conservation programs can help ensure access to biological resources while preventing overexploitation. Educational programs aimed at younger generations within the tribe can facilitate the transmission of traditional knowledge, reinforcing its relevance in contemporary contexts. Collaboration between governmental agencies, NGOs, and the Mannan community can develop sustainable agroforestry models and herbal gardens that serve both conservation and livelihood purposes. Sustainable use of medicinal plants, rooted in traditional practices, can serve as a model for balancing ecological health with socio-economic development, ensuring the continuation of the tribe's cultural heritage in the face of external pressures.

Conclusion

The ethnobotanical knowledge of the Mannan tribe in Kerala represents a rich repository of cultural heritage and ecological wisdom. Through their intricate relationship with plants, the Mannan maintain traditional healthcare practices, sustain biodiversity and preserve intangible cultural values. The study highlights the importance of documenting and safeguarding such indigenous knowledge systems, especially in the face of modern challenges like habitat loss, cultural assimilation, and socioeconomic changes. Efforts to conserve the Mannan's botanical heritage must be multifaceted, embracing community participation, sustainable resource management, and policy support. Recognizing the value of indigenous knowledge not only enriches ethnobotanical science but also empowers the tribe to sustain their identity and livelihoods. Altogether, a diverse and significant repository of ethnobotanical knowledge, documenting 54 distinct plant species from various families and their specific therapeutic applications are documented. Integrating indigenous knowledge with modern conservation strategies and promoting awareness to ensure the resilience of these systems for future generations are the need of the hour.

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