



ETHNOBOTANICAL PLANTS IN MANIPUR: BRIDGING TRADITIONAL PRACTICES AND MODERN SCIENCE

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Abstract

Ethnobotanical plants in Manipur, northeastern India, possess significant cultural and medicinal value. This interaction between local traditions and global culture can be examined through traditional practices, modern science, and cultural exchange. Traditionally, plants like *Aegle marmelos* (Harikhagok), *Cynodon dactylon* (Ting-thou), and *Toona ciliata* (Tairen) are used for their medicinal properties, playing crucial roles in local rituals and ceremonies. Modern scientific interest has spurred pharmaceutical research into bioactive compounds found in these plants, such as *Centella asiatica* (peruk), for potential treatments in skin diseases and cognitive function enhancement. The global fascination with Ayurveda and traditional medicine has led to a broader appreciation of Manipur's ethnobotanical knowledge. Cultural diffusion has popularized herbal teas and holistic wellness routines incorporating these plants worldwide. Economically, the export of these plants has opened new avenues.

Key words: Ethnobotany, Manipur, Traditional medicine, Pharmaceutical research, Cultural diffusion, Local rituals, Ceremonies.

Introduction

Ethnobotany, the study of the relationship between people and plants, is a field of significant cultural and medicinal relevance, particularly in regions rich in biodiversity such as Manipur, a state in northeastern India. This region is home to a plethora of ethnobotanical plants that hold substantial value in traditional practices, modern scientific research, and cultural exchange. The interplay between local traditions and global culture in the context of these plants offers a unique perspective on the preservation and evolution of indigenous knowledge.

Traditional Practices and Cultural Significance

Medicinal Uses: In Manipur, traditional medicine is an integral part of the local culture, with various plants being used for their therapeutic properties. For instance, *Aegle marmelos* (Harikhagok) is extensively used in traditional Manipuri medicine to address digestive issues like diarrhea, dysentery, and constipation, with the unripe fruit being particularly effective (Devi & Devi, 2013). The leaves are beneficial for managing blood sugar levels, making them useful for diabetics, and are consumed fresh or as a decoction (Singh & Singh, 2015). Additionally, the plant's anti-inflammatory properties make it useful for treating inflammations, ulcers, and skin infections (Devi & Devi, 2013). *Cynodon dactylon* is valued for its wound-healing properties, with its fresh juice applied to cuts to promote healing and prevent infections (Singh & Devi, 2010). It also serves as an anti-pyretic, with decoctions used to reduce fever (Singh & Singh, 2015). Additionally, it is believed to have detoxifying effects, and in Manipur, it is used in herbal teas and decoctions for body cleansing (Devi & Devi, 2013). *Toona ciliata* is traditionally used in Manipuri medicine to treat respiratory issues like asthma and bronchitis. A decoction from the bark helps clear respiratory pathways and relieve symptoms (Singh & Devi, 2010). The bark and leaves are also believed to have anti-cancer properties and are sometimes used in herbal treatments for cancer patients in Manipur (Singh & Singh, 2015). Additionally, the plant is known for its antimicrobial properties, with bark extracts used to treat bacterial and fungal skin infections (Singh & Devi, 2010).

Cultural Practices: Ethnobotanical plants also play a crucial role in the cultural practices of Manipur. Many of these plants are integral to local rituals, ceremonies, and festivals. For example, Sacred Basil (*Ocimum tenuiflorum*) is used in religious ceremonies due to its spiritual significance, symbolizing purity and protection (Sharma & Devi, 2021). These cultural practices underscore the deep-rooted connection between the people of Manipur and their natural environment.

Modern Scientific Interest

Pharmaceutical Research: The bioactive compounds found in ethnobotanical plants of Manipur have attracted global pharmaceutical companies. Research on plants like *Centella asiatica* (peruk) has shown promising results in treating skin diseases and improving cognitive function (Patra *et al.*, 2022). This growing interest in traditional medicinal plants is driving significant scientific inquiries aimed at developing new drugs.



Agricultural and Horticultural Interest

In addition to pharmaceutical research, there is a burgeoning interest in the agricultural and horticultural potential of these plants. Efforts are being made to cultivate these plants outside Manipur, promoting sustainable harvesting and conservation practices to ensure their availability for future generations (Singh & Singh, 2018).

Cultural Exchange and Global Influence

Cultural Diffusion: The global fascination with Ayurveda and traditional medicine has led to increased awareness and appreciation of Manipur's ethnobotanical heritage. Practices such as herbal teas and holistic wellness routines incorporating these plants are becoming popular worldwide, demonstrating the diffusion of cultural knowledge (Mishra *et al.*, 2020).

Economic Impact

The export of these plants and their derivatives has opened new economic opportunities for local communities. Collaborations between local cultivators and international markets are not only fostering economic growth but also preserving traditional knowledge (Devi & Sharma, 2019).

Educational Exchange

Collaborations between universities and research institutions on ethnobotanical studies are fostering a deeper understanding of these plants' properties and potential applications. Cultural exchange programs are facilitating the sharing of knowledge between Manipur's traditional healers and global herbal medicine practitioners, further enriching the field (Khuraijam & Sharma, 2018).

Conservation Efforts

Sustainable Practices: To prevent the over-exploitation of these valuable resources, emphasis is being placed on sustainable harvesting and community-based conservation initiatives. These efforts are crucial for maintaining the biodiversity of the region (Singh & Singh, 2018).

Legal and Ethical Considerations

Ensuring that local communities benefit from the commercialization of ethnobotanical plants is a key concern. Implementing policies to protect the intellectual property rights of indigenous knowledge is essential for ethical and equitable development (Sharma & Devi, 2021).

The interaction of global culture with the ethnobotanical plants of Manipur is a dynamic and enriching process. It highlights the importance of preserving biodiversity, respecting cultural heritage, and fostering sustainable development. This interplay not only enhances local traditions but also contributes to global knowledge, underscoring the significance of ethnobotany in the modern world.

Materials and methodology

Material and Methodology for Ethnobotanical Study in Four Valley Districts of Manipur: Imphal West, Imphal East, Bishnupur, and Thoubal

Study Area

The study was conducted in the four valley districts of Manipur: Imphal West, Imphal East, Bishnupur, and Thoubal. These districts are characterized by diverse flora, rich cultural heritage, and a strong tradition of using plants for medicinal and other ethnobotanical purposes. Each district was selected based on its unique geographical features, traditional practices, and accessibility for conducting the study.

Materials

1. Ethnobotanical Survey Forms: Structured questionnaires to gather data on plant species, local names, parts used, and traditional uses.

Questionnaire for Ethnobotanical Field Study
(Information provided by informants will be used for research purposes only)

DETAILS OF INFORMATION

DATE.

Name of informant:

Tribe/Community Name:

Gender(Male/Female):Age: Occupation:

Education:Location:

DATA ABOUT THE MEDICINAL PLANT

1. Local or Common Name of the plant:



- 2.Habit(tree/herb/shrub/climber/runner/rhizome/tuber/bulb/corn):
 - 3.Plants part(s) used:
 - 4.Cultivated/Wild:
 - 5.If wild, availability in natural resources (easy/difficult):
 6. Conservation needs (Yes/No):
.....
 7. Conservation efforts made by government and Local residents:
.....
 8. Method of Collection and storage:
.....
 9. Name of Disease(s) treated:
.....
 10. Method(s) of crude drug preparation:
.....
 11. Mode(s) of administration:
.....
 12. Dosage:
.....
 13. Other uses (if any):
.....
 14. Any
Compilation:.....
...
- Remarks:
1. Plant indentified as (Botanical Name):
 2. Family:.....

2. For accurately recording the geographical locations of plant collections and study sites.

District	Latitude	Longitude
Imphal West	24.8081° N	93.9380° E
Imphal East	24.8002° N	93.9582° E
Thoubal	24.6312° N	94.0087° E
Bishnupur	24.6290° N	93.7593° E

3. To capture images of plants and associated practices



Musa paradisiaca (Laphu)



Ficus religiosa (Sana khongnang)



Oryza sativa (Phou)



Santalum album (Cha-chandal)



Curcuma longa (Yaingang)



Cynodon dactylon (Ting – thou)

Aegle marmelos (Harikhagok)



Toona ciliata (Tairen)



Piper betle (Kwa-mana)

Ocimum sanctum (Tulsi)

Areca catchu (Kwa)

Nelumbo nucifera (Thambal)

4. Map of Study Area: Detailed maps of Imphal West, Imphal East, Bishnupur, and Thoubal for planning and tracking survey routes.

Methodology

1. Study Sites:

Imphal West: Urban and peri-urban areas, focusing on both household gardens and market surveys.



Imphal East: Rural and semi-rural areas, emphasizing forest fringe villages.

Bishnupur: Areas surrounding Loktak Lake and its associated wetlands.

Thoubal: Areas with traditional agricultural practices and community-managed forests.

2. Ethnobotanical Survey:

Participant Selection: Local healers (maibas and maibis), elders, farmers, and women knowledgeable in traditional plant use were identified as key informants.

Interview Process: Semi-structured interviews were conducted using the prepared questionnaires to gather data on the ethnobotanical uses of plants. Informants were asked about the plants they use, the parts utilized, methods of preparation, and the ailments treated.

Field Walks and Plant Collection: Guided field walks with informants were carried out to identify and collect plant specimens in their natural habitats. Plant parts such as leaves, roots, bark, flowers, and seeds were collected for herbarium preparation.

3. Data Documentation:

Geographical Recording: The location of each collected plant was recorded using GPS for future reference and



mapping of plant distribution.

Photography: Each plant species was photographed in its natural environment, with close-up images of diagnostic features such as leaves, flowers, and fruits.

Herbarium Preparation: Collected plant specimens were pressed, dried, and mounted on herbarium sheets with detailed labels including the plant's local name, date of collection, location, and informant details.

4. Data Analysis:

Identification and Classification: Plant species were identified using reference books and confirmed by local botanists. Classification was done according to their family, genus, and species.

5. Ethical Considerations:

Informed Consent: Prior informed consent was obtained from all participants. They were made aware of the study's purpose, and their contributions were respected.

Benefit Sharing: Knowledge sharing sessions were conducted with communities to ensure that the benefits of the study were reciprocated, and any potential commercialization of findings was discussed transparently.

6. Data Synthesis and Reporting:

Compilation of Ethnobotanical Data: The collected data were compiled into a database, categorizing plants by their uses (medicinal, edible, ritualistic, etc.).

Comparison with Modern Science: The traditional uses of plants were compared with existing scientific literature to assess the validity and potential for further research.

Report Preparation: A comprehensive report was prepared, detailing the ethnobotanical knowledge of the communities, the methodology used, and the findings of the study. The report was shared with local authorities, academic institutions, and the participating communities.

This methodology ensures a thorough and respectful documentation of the ethnobotanical knowledge present in the four valley districts of Manipur, bridging the gap between traditional practices and modern scientific approaches.

Results and Discussion

30 ethnobotanical plants from the valley districts of Manipur that bridge traditional practices, cultural rituals, and modern scientific research:

Sl. No.	Scientific name	Family	Local name	Traditional use	Modern science	Citation
1	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Thambal	In religious rituals and traditional medicine for purification and offerings.	Its antioxidant and hepatoprotective properties may aid in treating liver disorders.	Singh, (2013).
2	<i>Rubia cordifolia</i> L.	Rubiaceae	Indian madder	In rituals for its red dye, associated with vitality and life, and as a blood purifier in traditional medicine.	Its anticancer & anti-inflammatory properties, particularly in skin health.	Devi, & Singh, (2019).
3	<i>Hemidesmus indicus</i> (L.) R. Br.	Apocynaceae	Anantamul	In ceremonial offerings & believed to have cooling effects in summer.	Its anti-diabetic and anti-inflammatory activities	Sharma, (2020).



4	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	Worshipped in households for protection and used in purification rituals.	Its adaptogenic, anti-stress, and immune-boosting properties.	Singh, (2015).
5	<i>Murraya koenigii</i> (L.) Spreng.	Rutacea	Cury-patta	In traditional cuisine and as a protective charm in rituals, symbolizing prosperity.	Rich in antioxidants and potentially beneficial for glucose metabolism.	Sharma, (2020).
6	<i>Colocasia esculenta</i> (L.) Schott.	Areceae	Lam-pan	In cultural feasts and offerings during rituals, especially in agricultural festivals.	Its nutritional value, high in fiber& vitamins, and its anti-inflammatory properties.	Singh, (2013).
7	<i>Piper betle</i> L.	Piperacea	Kwa-mana	Essential in marriage rituals and religious ceremonies, often symbolizing hospitality.	Its antimicrobial, antioxidant, and stimulant properties.	Devi, & Singh, (2019).
8	<i>Areca catechu</i> L.	Arecacea	Supari	Chewed during rituals and used in traditional social gatherings for its psychoactive effects.	Stimulant and addictive properties due to the presence of alkaloids.	Sharma, (2020).
9	<i>Swertia chirayita</i> (Roxb.) Buch.-Ham.ex C.B.Clark	Gentianaceae	Chirata	Used in purification rituals, known for its bitter taste and medicinal properties.	Its hepatoprotective and anti-inflammatory properties.	Singh, (2015).
10	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Kehom	Offered in religious ceremonies and used in community feasts.	Contains bromelain, studied for its anti-inflammatory and digestive benefits.	Sharma, (2020).



11	<i>Oryza sativa</i> L.	Paoceae	Phou	Central to rituals, especially in harvest festivals like NingolChakouba and Lai Haraoba.	Its nutritional value, being a staple food globally.	Devi, & Singh, (2019).
12	<i>Musa paradisiaca</i> L.	Musaceae	Laphu	Leaves and fruits are used in rituals and as offerings in cultural festivals.	Rich in potassium, studied for its cardiovascular and digestive health benefits.	Singh, (2015).
13	<i>Curcuma longa</i> L.	Zingiberaceae	Yaingang	Used in rituals for purification, symbolic of prosperity, and in traditional medicine.	Its anti-inflammatory, antioxidant, and anticancer properties.	Sharma, (2020).
14	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Shing	Used in traditional medicine, especially for digestion, and in rituals for protection.	Its digestive, anti-nausea, and anti-inflammatory properties.	Singh, (2013).
15	<i>Cymbopogon citratus</i> (DC.) Stapf.	Paoceae	Lemon grass	Used in purification rituals and as a medicinal tea for fevers.	its antimicrobial, anti-inflammatory, and antioxidant properties.	Devi, & Singh, (2019).
16	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Heikru	Integral in traditional diets and rituals for health, especially in promoting longevity.	Its high vitamin C content and powerful antioxidant properties.	Singh, (2015).
17	<i>Santalum album</i> L.	Santalaceae	Cha-chandal	Used in religious ceremonies for its aromatic wood and in anointing sacred objects.	its anti-inflammatory, antimicrobial, and aromatic properties.	Sharma, (2020).
18	<i>Azadirachta indica</i> L.	Meliaceae	Neem	Used in rituals for purification and protection,	Its antimicrobial, antiparasitic, and anti-inflammatory properties.	Singh, (2013).

				and in traditional medicine.		
19	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Sissu	Wood used in traditional artifacts, furniture, and rituals.	its wood quality and potential therapeutic properties, including anti-inflammatory effects.	Devi, & Singh, (2019).
20	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Harikhagok	Extensively used in medicine, the unripe fruit effectively treats digestive issues like diarrhea, dysentery, and constipation.	The leaves are beneficial for managing blood sugar levels, making them useful for diabetics, and are consumed fresh or as a decoction	Devi & Devi, (2013). Singh & Singh, 2015.
21	<i>Ficus religiosa</i> L.	Moraceae	Sana Khongnang	Sacred tree in rituals, especially in Buddhism and Hinduism.	its therapeutic properties, including anti-inflammatory effects.	Singh, & Kumar, (2019). Singh, et al. (2021).
22	<i>Centella asiatica</i> L.	Apiaceae	Peruk	Used in religious offerings and as a memory enhancer in traditional medicine.	Its neuroprotective and wound-healing properties.	Chopra, et al. (1956). Wang, et al. (2020).
23	<i>Bambusa tulda</i> Roxb.	Paoceae	Saneibi	Used in the construction of sacred spaces and in rituals.	its potential in sustainable construction and its nutritional shoots.	Kumar, et al. (2019). Singh, et al. (2020).
24	<i>Artocarpus heterophyllus</i> (Lank) (Cult.)	Moraceae	Theibong	Used in cultural festivals and religious feasts.	its rich nutritional content and potential as a meat substitute.	Sarkar, et al. (2018). Rao, et al. (2021).
25	<i>Piper nigrum</i> L.	Piperaceae	Gulmorok	Used in traditional cuisine and as a sacred offering.	Rich in piperine, studied for its digestive and antioxidant properties.	Nair, et al. (2018). Borah, et al. (2020).
26	<i>Moringa oleifera</i> Lam.	Moringaceae	Sajana	Leaves used in rituals and for their health benefits in traditional diets.	Its high nutritional value and medicinal properties.	Fahey, (2005). Olson, et al. (2020).

27	<i>Momordica charantia</i> L.	Cucurbitaceae	Karol-akhabi	Used in traditional medicine and as a protective charm in rituals.	Its anti-diabetic properties.	Rao, et al. (2016). Kumar, et al. (2021).
28	<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae	Snake gourd	Used in traditional diets and medicinal preparations.	Its anti-inflammatory and detoxifying properties.	Sinha, et al. (2017). Mishra, et al. (2020).
29	<i>Elaeocarpus serratus</i> L.	Elaeocarpaceae	Chorphon	Fruit used in traditional ceremonies and as a sacred offering.	Its nutritional and therapeutic properties.	Kumar, et al. (2018). Reddy, et al. (2021).
30	<i>Piper longum</i> L.	Piperaceae	Uchithi	Used in traditional medicine and religious offerings.	Its stimulant and digestive properties.	Das, et al. (2020). Gupta, et al. (2021).
31	<i>Toona ciliata</i> M. Roem.	Mileaceae	Taire	A bark decoction helps treat respiratory issues like asthma and bronchitis by clearing pathways and relieving symptoms.	Its antimicrobial properties make bark extracts effective in treating bacterial and fungal skin infections.	Singh & Devi, 2010. Singh & Devi, 2010.
32	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Ting-thou	Valued for wound healing, its fresh juice is applied to cuts to promote healing and prevent infections.	It serves as an anti-pyretic, with decoctions used to reduce fever.	Singh & Devi, 2010. Singh & Singh, 2015.

The study conducted in the four valley districts of Manipur—Imphal West, Imphal East, Bishnupur, and Thoubal—yielded comprehensive insights into the ethnobotanical knowledge and practices within the local communities. The data collection focused on identifying plant species with significant cultural, medicinal, and scientific relevance. This discussion will explore key findings regarding the traditional uses of these plants, their scientific validation, and their role in modern research.

Integration of Traditional Practices and Modern Science

The ethnobotanical plants identified in this study highlight the profound connection between traditional practices and modern scientific research. For example, *Nelumbo nucifera* (Thambal), traditionally used in religious rituals, has been validated by modern science for its antioxidant and hepatoprotective properties, suggesting its



potential use in treating liver disorders. Similarly, *Rubia cordifolia* (Indian madder), used for its dye in rituals, has shown promising anticancer and anti-inflammatory properties, particularly in dermatological applications.

Cultural Significance and Ritualistic Uses

Many plants in the study hold deep cultural significance, being central to local rituals, ceremonies, and festivals. For instance, *Ocimum sanctum* (Tulsi) is revered in households and used in purification rituals, reflecting its spiritual importance. Its adaptogenic and immune-boosting properties further enhance its value in both traditional and modern contexts.

Another example is *Oryza sativa* (Phou), which is central to Manipur's cultural rituals, especially during harvest festivals. Its importance as a staple food underscores the integration of cultural and dietary practices in the region.

Medicinal Applications and Health Benefits

Traditional knowledge has long recognized the medicinal properties of these plants, often aligning with modern pharmacological findings. *Centella asiatica* (Peruk), used in religious offerings and traditional medicine for enhancing memory, is now known for its neuroprotective and wound-healing properties, making it a subject of interest in modern pharmacological studies.

Curcuma longa (Yaingang), used in purification rituals and traditional medicine, has been extensively studied for its anti-inflammatory, antioxidant, and anticancer properties, demonstrating how traditional uses are often grounded in scientifically validated benefits.

Economic and Environmental Impact

The cultivation and use of these plants are not only crucial for maintaining cultural heritage but also have significant economic implications. The growing interest in ethnobotanical plants for pharmaceutical and nutritional purposes presents opportunities for economic development in Manipur. For instance, the export of *Moringa oleifera* (Sajana) and its derivatives has become a source of income for local communities, contributing to sustainable development while preserving traditional knowledge.

Conservation and Sustainability

The study underscores the importance of conservation efforts to ensure the sustainable use of these plants. Overharvesting and environmental degradation pose significant threats to the availability of these valuable resources. Therefore, community-based conservation initiatives and sustainable harvesting practices are essential to protect these plants for future generations.

Ethical Considerations and Intellectual Property Rights

The commercialization of ethnobotanical plants raises ethical concerns, particularly regarding the protection of indigenous knowledge. Ensuring that local communities benefit from the commercialization of these plants is crucial. Implementing policies that protect intellectual property rights and promote fair benefit-sharing are essential for the ethical development of the ethnobotanical industry.

Conclusion

This study highlights the rich ethnobotanical heritage of Manipur's valley districts, emphasizing the interplay between traditional practices, cultural rituals, and modern scientific research. The findings demonstrate the importance of preserving indigenous knowledge, fostering sustainable development, and promoting ethical practices in the commercialization of ethnobotanical plants. The integration of traditional and modern knowledge systems can lead to new opportunities in pharmaceutical research, economic development, and cultural preservation, benefiting both local communities and the global scientific community.

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