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ETHNOBOTANICAL STUDIES OF MEDICINAL PLANTS IN TRIBAL COMMUNITIES OF MANIPUR

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ABSTRACT

This study delves into the ethnobotanical knowledge of the tribal communities of Manipur, focusing on the medicinal plants used by these indigenous groups. Manipur, with its rich biodiversity, is home to several tribal communities that have long relied on local flora for medicinal purposes. The study explores the significance of these plants, their medicinal uses, and the role of traditional knowledge in sustaining tribal healthcare practices. The research highlights the potential of ethnobotany in contributing to modern pharmacology and the need for conservation of both plant species and indigenous knowledge.

KEYWORDS: Ethnobotany, Medicinal Plants, Tribal Communities, Manipur, Indigenous Knowledge, Conservation.

INTRODUCTION

Ethnobotany is the scientific study of the relationship between people and plants, specifically how human cultures use and perceive flora for various purposes such as medicine, food, and rituals. This interdisciplinary field explores traditional botanical knowledge passed down through generations, particularly in indigenous and tribal communities. In India, with its rich biodiversity and cultural diversity, ethnobotanical studies play a crucial role in understanding and preserving the traditional knowledge of plant resources, which is especially relevant in states like Manipur. This North-eastern state, nestled in the foothills of the Himalayas, is home to diverse tribal communities, each with its unique cultural practices and medicinal plant usage.

Manipur's ethnic diversity is reflected in its multiple indigenous groups, including the Meitei, Naga, Kuki, and Hmar, who have developed extensive knowledge of their environment over centuries. For these communities, plants are more than just resources; they form an integral part of their daily life, spirituality, and health care systems. This indigenous knowledge, known as traditional ecological knowledge (TEK), is essential for understanding how tribal communities in Manipur utilize medicinal plants to treat various ailments.

Manipur is situated in the Indo-Burma biodiversity hotspot, which is recognized for its high species diversity and endemic flora and fauna. This geographical setting provides a rich repository of medicinal plants, many of which have been used by tribal communities for generations. The unique climate and topography of the state, ranging from tropical forests in the valley to alpine vegetation in the hills, make it a treasure trove for botanists and researchers interested in ethnobotany.

The tribal communities in Manipur possess a deep knowledge of the medicinal properties of various plants, often using them to cure diseases, treat wounds, and improve general health. These medicinal practices are not only an essential part of health care in rural and isolated communities but also contribute to the sustainability of their environment, as the people rely on their surrounding ecosystems to obtain resources for survival. Ethnobotanical studies in the region have recorded a wide range of plants that are used for treating common ailments like fever, cough, skin diseases, digestive disorders, and more serious conditions like diabetes and hypertension.

Ethnobotanical practices in Manipur's tribal communities are deeply embedded in their culture, rituals, and oral traditions. Medicinal knowledge is often passed down through generations by word of mouth and is preserved in folklore, songs, and community practices. This traditional knowledge system plays an essential role in maintaining health care in these remote areas, where access to modern medical facilities is limited.

For example, plants like *Centella asiatica* (Known locally as Peruk) are used as a remedy for memory enhancement and to treat wounds. *Cinnamomum tamala* (Tejpata) is used for digestive ailments, while *Zanthoxylum armatum* (Mukthrubi) is known for its anti-inflammatory properties and is commonly used in traditional healing practices. These plants and their uses are not only vital to the health of the community but are also closely linked to

their religious and spiritual beliefs. Plants are often considered sacred, with certain rituals conducted to harvest them, ensuring sustainability and respect for nature.

The importance of ethnobotanical studies lies in the preservation of traditional knowledge and the potential for discovering new medicinal plants that could contribute to modern medicine. The tribal communities of Manipur, with their rich botanical knowledge, offer invaluable insights into sustainable health care practices that have been refined over centuries. As modern medicine looks for alternatives and supplements to synthetic drugs, the role of medicinal plants in traditional healing systems is gaining renewed attention.

Moreover, ethnobotanical research can contribute to biodiversity conservation by documenting indigenous knowledge systems that emphasize sustainable practices. In Manipur, the cultural and spiritual significance of plants reinforces the idea of environmental stewardship, where the community acts as the guardian of local biodiversity. Documenting this knowledge not only helps preserve it for future generations but also provides a foundation for integrating traditional and modern medicinal practices.

Ethnobotanical studies in the tribal communities of Manipur are crucial for preserving the region's rich cultural heritage and biodiversity. By documenting and studying the traditional medicinal plant usage of indigenous communities, researchers can uncover valuable insights that may contribute to the development of new medicines, sustainable healthcare practices, and conservation efforts. In the face of globalization and rapid environmental change, preserving the ethnobotanical knowledge of these tribal communities is essential for maintaining the balance between cultural preservation and scientific progress.

Objectives of the study

1. To document the medicinal plants used by the tribal communities of Manipur.
2. To analyse the ethnobotanical knowledge and its application in healthcare.
3. To explore the conservation status of these medicinal plants.
4. To examine the potential of ethnobotany in contributing to modern pharmacology.

METHODOLOGY

Ethnobotanical studies aim to document and analyse the intricate relationships between people and plants, particularly the traditional uses of flora for medicinal purposes. In the case of Manipur, a state known for its rich cultural diversity and ecological significance, studying

medicinal plants in tribal communities requires a careful and systematic approach. The methodology for conducting ethnobotanical research in this context combines fieldwork, participatory engagement, data collection, and analysis, ensuring that traditional knowledge is accurately recorded and preserved while respecting the cultural sensitivities of the local communities.

1. Selection of study area

Manipur, with its diverse tribal populations and rich biodiversity, offers multiple potential research sites. The specific regions chosen for this study depend on several factors, including:

i) **Geographical diversity:** Manipur's hills and valleys house different ecosystems. Selecting multiple regions, such as the hilly districts of Chandel, Ukhrul, and Tamenglong, allows researchers to capture a wide range of plant species and practices.

ii) **Tribal representation:** The choice of communities is vital. Manipur is home to several indigenous groups, including the Meitei, Naga, Kuki, and Hmar, each with distinct ethnobotanical knowledge. Selecting a sample that represents these major tribal communities ensures diversity in the data collected.

iii) **Accessibility:** Remote areas of Manipur have logistical challenges, but they are often rich in traditional knowledge. A balance access was carried out with the need to document information from less-studied, isolated groups.

2. Field Visits and Community engagement

After identifying the study area, the next step is conducting field visits and engaging with local communities. Ethnobotanical studies emphasize participatory methods, where the local community plays an active role in the research process. This involves:

i) **Consent and Trust-Building:** Gaining the trust of the community is essential. A prior consent was sought from tribal leaders and healers before conducting studies. Building a relationship based on mutual respect ensures better cooperation and more accurate data.

ii) **Involvement of traditional healers:** Traditional healers, often referred to as "Maibas" (male) or "Maibis" (female) in Manipur, are custodians of plant-based knowledge. They serve as key informants and guides, offering insights into the medicinal plants used in their practices.

iii) **Focus Group Discussions (FGD):** Group discussions with community members, including healers, elders, and women, are conducted for capturing collective knowledge. Women, in particular, often play an important role in the preparation and use of medicinal plants, and their contributions are valuable to the study.

3. Plant Collection and Identification

Plant collection is a critical component of ethnobotanical research. During field visits, specimens of plants identified by the community as having medicinal value are collected systematically. Key aspects of plant collection include:

i) **In situ observations:** Observing the natural habitat of the plant, including the surrounding vegetation, soil type, and climatic conditions, helps understanding the ecological context of its use.

ii) **Collection of voucher specimens:** Voucher specimens (pressed plant samples) are collected to ensure proper identification. These specimens are preserved, labelled with essential data such as the local name, the plant part used, and its medicinal application, and later verified through botanical taxonomists.

iii) **Herbarium development:** Collected plants are prepared for herbarium documentation, where they are dried, mounted, and stored for future reference. A well-curated herbarium is critical for cross-referencing plant species and confirming their botanical identity.

4. Ethnobotanical data collection

Data collection focuses on understanding the local knowledge of medicinal plants. This process typically involves interviews and structured questionnaires:

i) **Semi-Structured interviews:** Interviews are conducted with traditional healers and community elders, using open-ended questions to gather detailed information about the medicinal use of plants. Key questions include plant names, preparation methods, dosage, and the ailments treated.

ii) **Participant observation:** This involves observing the preparation and use of medicinal plants in real-time, documenting the processes as they occur. It is also witness rituals or ceremonies associated with the harvest and use of medicinal plants.

iii) **Photo documentation:** To support data collection, photograph of the plants are taken in their natural environment, as well as their preparation and application. This provides visual evidence that complements written records.

iv) **Local taxonomy:** Documenting the local names of plants is essential. Tribal communities often classify plants differently from scientific taxonomy, with their own nomenclature and categorizations. This local knowledge must be recorded to understand how communities perceive and utilize plant resources.

5. Data Analysis and Documentation

After collecting ethnobotanical data, findings are analysed and documented:

i) **Quantitative analysis:** Methods such as frequency indices and relative importance values help quantify the significance of each plant in the local medicinal system. The number of citations or uses of a plant can provide insights into its cultural and medicinal importance.

ii) **Qualitative analysis:** Narrative data, including interviews and oral histories, are analysed for recurring themes, such as healing practices or cultural rituals surrounding plant use.

iii) **Cross-Verification:** Comparing local plant knowledge with existing scientific literature helps validate the medicinal properties of plants. This can also reveal plants with potential for further pharmacological research.

6. Ethical considerations

Ethnobotanical studies must be conducted with respect for the intellectual property rights of indigenous communities. Ethical guidelines include:

i) **Informed consent:** Researchers must obtain informed consent before documenting any knowledge. Communities should be made aware of how their knowledge will be used and the potential benefits or risks involved.

ii) **Benefit-Sharing:** If research leads to the commercialization of a medicinal plant or new discovery, the community should receive a share of the benefits, ensuring that their contributions are recognized and rewarded.

iii) **Cultural sensitivity:** Researchers must respect the cultural beliefs and practices of the community, especially when dealing with sacred plants or rituals.

The methodology of ethnobotanical studies in Manipur's tribal communities involves a holistic and participatory approach, combining field research, traditional knowledge, and scientific analysis. Through plant collection, community engagement, and ethical research practices, this methodology provides a framework for documenting and preserving the rich botanical heritage of the region. These studies not only contribute to the conservation of biodiversity but also help in recognizing and integrating indigenous knowledge into modern medical research.

RESULTS AND DISCUSSION

1. Diversity of medicinal plants

The study identified over 185 medicinal plant species used by the tribal communities of Manipur. These plants belong to various families, including Asteraceae, Lamiaceae, Zingiberaceae, Acanthaceae, Asparagaceae, Piperaceae, Araceae, Acoraceae, Apocynaceae, Malvaceae, Fabaceae etc. Some commonly used species include *Centella asiatica* (Peruk), *Zingiber officinale* (Ginger), *Ocimum sanctum* (Holy Basil), *Cuminum cyminum* L.*(* Cumin*), Cinnamomum tamala (*Tejpata*), Trigonella foemum-graecum* Linn. (Methi), *Azadirachta indica (*Neem*), Alpinia galangal (*Kanghoo*), Benincosa hispida (*Torbot*), Citrus limon* Linn. (Champra), *Acorus calamus (*Ok Hidak*), Adhatoda vasica (*Nongmangkha*), Artemisia nilagirica (*Laibak- ngou*)* and *Curcuma longa* (Turmeric). Each plant is associated with specific medicinal uses, such as treating digestive disorders, respiratory ailments, skin diseases, and fevers.

Table 1: Plant species, their local name, parts Used and Ailment treated.

Plant Species	Local Name	Form	Plant Part	Ailment treated
Blumea balsamifera	Langthrei	Shrub	Leaves	Ritual, stomach, Piles, Kidney & stone cases
Tamarindus indica L.	Mange Hei	Tree	Fruit, Leaf	Dyspepsia, cough and cold, rheumatic pain, laxative and carminative.
Oxalis corniculata l.	Yensil	Herb	Whole Plant	Neurological disorder like epilepsy, depression, dementia etc.
Allium odorosum L.	Yennam Nakuppi	Herb	Whole plant	Urinary disorder, nourishing scalp and hair growth/ Spice
Piper nigrum L.	Gul	Herb	Fruits	Increased appetite, cough, cold dysentery, fever, stomach ache/ Spices
Fragaria indica	Heirongkak	Tree	Root	Lungs, Stone problems
Centella asiatica	Peruk	Herb	Leaves	Cardiovascular, Indigestion

				and Cough & fever
Averrhoea carambola L.	Heinoujom	Tree	Fruit & root	Jaundice, bleeding piles, chicken pox, ring worm, scabies and antidote for poisoning.
Allium hookeri Thw.	Maroi napakpi	Herb	Whole plant	Hair scalp & infection originating in a hair follicle
Mentha arvensis	Nungsi hidak	Herb	Leaves	Liver disease, spleen, asthma and jaundice.
Desmodium microphyllum	Nungai Yensil	Herb	Leaves	Fever, Neutralize toxins, improves blood circulation, suppress cough and alleviate dyspnoea.
Rhus succedanea L.	Heimang	Tree	Fruit	Asthma, cough and colicky pains.
Ocimum sanctum	Tulsi	Shrub	Leaves	Ritual/ Medicine
Rubus niveus	Heijampet	Shrub	Leaves	Diarrhoea, dysentery and abortificient
Phyllanthus emblica	Heikru	Tree	Fruit	Reduce cholesterol level, Gastrointestinal issues, antioxidant, anti-inflammatory and anti-cancer.
Solanum nigrum	Leipung Ngangkha	Shrub	Fruit	Cancer, inflammation, pain, urinary tract issues, fever, wounds and rheumatism.
Cuminum cyminum L.	Jeera	Herb	Fruit	Stone and Spice
Aeschynomene indica	Chigonglei	Tree	Young tender Leaves	Wound healing, urinary tract infection, dysentery.
Trigonella foemum-graecum Linn.	Methi	Shrub	Leaf, seed	Antidiabetic, anticancer, anti-inflammatory, laxative, stomachic.
Celtis australis Linn.	Heikreng	Tree	Leaves	Heavy menstrual bleeding, colic, diarrhoea, dysentery, peptic ulcer, stomachic.
Hibiscus sabdariffa Linn.	Silot Sougri	Shrub	Leaves	Blood pressure, Blood sugar, inflammation, Cholesterol, urinary tract infection, antibiotics.
Abbus precatorius Linn.	Chaning Angouba	Shrub	Fruit	Anti-inflammatory, anti-diabetic, anti-parasitic, anti-allergic, anti- arthritic.
Duchesnea indica	Heirungkak laba	Herb	Whole Plant	Ringworm, stomatitis, acute tonsillitis, insect bite, swellings, anti-inflammatory.
Hedychium coronarium	Takhellei angangba	Shrub	Rhizome	Lungs and Ulcer
Myriogyne minuta	Hakthi khanbi	Herb	Whole plant	Urinary disorder and stone

				cases
Actinodaphne angustifolia	Takara	Tree	Leave/ Fruit	Urinary disorders and diabetes.
Benincosa hispida	Torbot	Climber	Fruit	Anti-diarrheal, anti-obesity, anti-ulcer, fever, cough, asthma, epilepsy etc.
Asparagus racemosus Wild	Nunggarei angouba	Shrub	Root	Diarrhoea, dysentery, dyspepsia, menopausal symptoms, and alcohol withdrawal symptoms.
Cinnamomum tamala	Tejpata	Tree	Tree	Antioxidant, antimicrobial, anti-diabetic, anti-fungal, anti-termitic./Spice
Citrus latipes	Heiri-bob	Tree	Tree	Indigestion and Lungs
Citrus limon Linn.	Champra	Tree	Tree	Scurvy, common cold and flu, digestion, pain and swelling.
Linaria ramosissima Linn.	Nungai-Peruk	Herb	Herb	Diuretic, purgative, blood disorder.
Piper longam Linn.	Taboppi	Shrub	Leaves	Asthma, bronchitis, cholera, diarrhoea, gonorrhoea, malaria, paralysis of the tongue, respiratory infections, stomachache, and tuberculosis./Spice
Abutilon indicum Linn.	Kanghi	Herb	Whole plant	Inflammation, ulcers, and wounds, Fever and cough, Paralysis.
Sida acuta	Uhal	Shrub	Root	Blood disorder, Liver, snake bite, Malaria, rheumatic problem, anti-aging.
Acorus calamus	Ok Hidak	Herb	Root	Cough, Fever, Skin & Hair problem
Adhatoda vasica	Nongmangkha	Shrub	Leaves & Flower	Cough, Fever, Skin & Hair problem
Aegle marmelos	Hei-khagok	Tree	Fruit	Indigestion, Diabetes, Nerve and Menstrual/ reproduction
Alocasia marcorrhiza	Hong-ngoo	Herb	Leaves, stem and rhizome	Pain, bleeding from cuts and wounds.
Aloe barbadensis	Ghritakumar	Herb	Leaves	Antiseptic, Indigestion, skin treatment and Hair problem
Alpinia galangal	Kanghoo	Herb	Rhizomes & Flower	Antiseptic, Worm, Cardiovascular, Cough, fever and Skin
Alpinia allughas	Pullei	Herb	Rhizomes & Flower	Antiseptic, Poison & others
Aphanamixix polystachya	Heirangoi	Tree	Fruit	Liver and Indigestion

Artemisia nilagirica	Laibak-ngou	Shrub	Root, Leaf and Flower	Antiseptic, Diabetes and skin disorder
Azadirachta indica	Neem	Tree	Leaves	Menstrual/reproduction, Antiseptic, worm, liver, Diabetes, Lung, Hair Problem, Cough, Skin, Piles, Ulcer & others
Bixa Orellana	Urei-rom	Tree	Leaves	Antiseptic, indigestion, sore throat and bronchitis
Blumea hieracifoliav	Ching terapaibi	Herb	Leaves	Antiseptic
Blumeopsis flava	Hao-chak	Herb	Leaf/Shoot	Lungs, Cough & fever, joints
Cajanus cajan	Mairongbi	Shrub	Seed	Liver, Poison & others
Cannabis sativa	Ganja	Shrub	Leaves and Flower	Cardiovascular, menstrual/ reproduction, Piles
Cassia fistula	Chou-hui	Tree	Leaves & root	Liver, Skin, Joints and others
Cedrela toona	Tairen	Tree	Leaf	Indigestion and skin
Cyphomandra betacea	U-Khamen ashinba	Shrub	Fruit	Stomach trouble
Dillenia indica Linn.	Heigri	Small Tree	Tender shoot	Liver, Lungs, Hair fall and dandruff
Drymaria cordata	Tandal pambi	Herb	Leaves	Jaundice, Scabies, Pneumonia, Tonsilitis, Indigestion, Cough, fever, sinusitis
Enydra fluctuans	Komprek tujombi	Herb	Stem	Urinary tract infection
Erythrina variegate	Kurao angouba	Tree	Wood	Skin diseases
Euphorbia hirta	Pakhang-leiton	Herb	Whole plant	Indigestion, Lungs and Skin
Ficus auriculata	Heirit	Tree	Fruit	Liver, indigestion, Diabetes, Lungs and Skin
Ficus glomerata	Heibong	Tree	Fruit	Diabetes and Dysentery
Fragaria nilgerrensis	Heirongkak mana ahum panbi	Herb	Leaves and fruit	Kidney, Stone problems and others
Glycosmis arborea	Yong Komla	Shrub	Stems and leaves	Antiseptic, Liver, Hair, Cough, Skin, Poison
Hedychium coronarium	Takhellei angouba	Herb	Rhizome	Cough and fever
Hedychium spicatum	Takhellei hangamapal	Herb	Rhizome	Liver, indigestion, Cough, fever and Poison
Hedyotis auricularia	Langban koukha	Herb	Rhizome	Liver, indigestion, Cough, fever and Poison
Hibiscus sabdariffa	Shilosougri	Shrub	Leaves, Flower Petal	Indigestion and Stone problem
Asparagus officinalis Linn.	Nungarei	Herb	Young shoots	Jaundice, cardiac dropsy, dysentery, epilepsy, chronic

				gout
Juglans regia	Heijuga	Tree	Seed	Poison and others
Kalanchoe pinnata	Mana-hidak	Shrub	Leaves	Antiseptic, Indigestion, Lungs and Skin
Leucas lavandulaefolia	Mayang lemboom	Herb	Leaves & Flower	Indigestion, Cough Fever and skin
Litsea cubeba	Ngairong	Tree	Fruit	Psychosomatic disorder, Sore throat and spices
Lysimachia candida	Kengoi	Herb	Whole plant	Diabetes, Piles and intestinal disorder
Marsilea minuta	Eesing Yensil	Herb	Whole plant	Wounds
Mentha spicata	Nungshi hidak	Herb	Leaves	Indigestion
Melothria purpusilla	Lamthabi	Climber	Whole plant	Liver/Jaundice, Indigestion, Cough, fever and Kidney
Nelumbo nucifera	Thambal	Herb	Flower & root	Diabetes and tonsillitis
Nicotiana tobacum	Hidak mana	Herb	Leaves and stem	Leech wounds
Ocimum basilicum	Naoseklei	Shrub	Leaves	Piles
Oroxylum indicum	Shamba	Small Tree	Bark	Muscle, Lungs and others
Oryza sativa	Phou	Herb	Seed	Quick healing for Fracture bones
Oxalis corniculata	Yensil	Herb	Leaves	Gastric and Indigestion
Passiflora edulis	Sitaphal	Climber	Fruit	Clotting of blood
Phlogacanthus jenkinsii	Nongmangkha Ashinba	Shrub	Leaves and Flower	Liver, Indigestion, Cough and fever
Phoenix sylvestris	Thangtup	Tree	Seed	Diarrhoea and Dysentery
Phyllanthus amarus	Heigru	Tree	Fruit	Diabetes
Piper longum	Uchi-thi	Climber	Fruit	Stomach disorder, Piles
Polygonum posumbaa	Phakphai	Herb	Leaves	Hypertension
Pratia nummularia	Nungai Peruk	Herb	Whole plant	Kidney stone
Portulaka oleracea	Leibak Kundo	Herb	Whole plant	Stomach disorder
Sapondius pinnata	Heining	Tree	Fruit	Swelling
Solanum anguivi	Leibung Khanga	Shrub	Fruit	Cough, Cold and fever
Solanum myriacanthum	Lam Khamen	Shrub	Fruit	Toothache , intestinal worm
Solanum nigrum	Leipung Khanga	Shrub	Fruit	Indigestion, Lungs , Cough and fever
Tamarindus indica	Mange	Tree	Fruit	Stone case & Dog bite
Tetrastigma bracteolatum	Monja-mahei	Herb	Leaves	Indigestion and stomach disorder
Wendlandia paniculata	Pheija	Shrub	Roots	Dysentery
Rosa chinesis Jacq.	Ador Gulap	Shrub	Flower petals	Laxative, wounds, sprains
Aquilaria agallocha	Agor	Tree	Wood	Digestive, deodorant, cardio tonic, dizziness etc.
Lannea	Aman	Tree	Leaf	Muscular pain, gout, tooth

coromandelica				ache, emetic.
Vitis vinifera	Angur	Tendril climber	Fruit & root	Nutritive, appetizer, blood purifier, skin affection, excessive bleeding etc.
Clitoria ternatea	Aparajita	Climber	Leaves	Fever, snake-bite, swollen glands
Ficus hispida	Ashi Heibong	Tree	Fruit, bark	Dysentery, intestinal worm infection, ring worm.
Jatropa curcas	Awa Kege	Tree	Leaves, Stems, Seed	Tooth-ache, Promotion of lactation, Ulcer and rheumatism.
Eryngium foetidum Linn.	Awaphadigom	Herb	Leaves	Paralysis and epilepsy.
Carica papaya Linn.	Awathabi	Small Tree	Fruit and root	Anthelmintic, Dog-bite, rheumatism and urinary problems.
Stephania rotunda Lour.	Ayang lei	Creeper	Whole Plant	Muscular sprain, tuberculosis, asthma and intestinal complaints
Abelmoschus esculentus Linn.	Bhelendri	Shrub	Fruit	Eye-ache, pneumonia, bronchitis and heart diseases.
Andrographis paniculata Wall.	Bhupati	Shrub	Leaves, Shoot and Seed	Chronic fever, jaundice, diabetes, piles, dysentery.
Betula alnoides Buch.-Ham.	Bhuja patra	Tree	Bark, Leaf	Snake bite and bacterial skin infection.
Mimusops elengi	Bokul	Tree	Whole plant	Snake bite, sore-throat, headache, pain, tooth ache.
Ziziphus mauritiana Lam.	Boroi	Tree	Bark, Fruit and Leaf	Dysentery, excessive menstrual discharge.
Santalum album L.	Cha chandan	Tree	Bark/Wood	Scabies, pimples and other skin diseases, headache, fever etc.
Alocasia indica Schott	Yendem	Herb	Petiole	For rejuvenating women after child birth
Phyllanthus urinaria Linn.	Chakpa heikru	Herb	Leaf, shoot	Leucoderma, appetizer for children.
Vigna umbellata	Chakwai	Herb	Seed	Good protein source.
Cicer arietinum	Chana	Herb	Seed	High in fibre and potassium which lower cholesterol and regulate blood pressure.
Allium sativum Linn.	Chanam	Herb	Bulb and Leaf	Ear ache, bronchitis, asthma, snake bite and skin diseases.
Coixlacryma-jobi Linn.	Chaning	Herb	Root	Menstrual disorders and as blood purifier
Capsella bursapastoris	Chantruk	Herb	Whole plant	Urinary problem
Cardamine hirsuta Linn.	Chantrukman	Herb	Leaf & Shoot	To enhance urination.

Z. acanthopodium (D.C.)	Mukthrubi	Shrub	Fruits & Young leaves	Fever, cough, bronchitis
Polygonum orientale Linn.	Chaokhong angouba	Herb	Leaf	Better urination.
Polygonum minus Huds.	Chaokhong macha	Herb	Leaf	Better urination and given for indigestion after parturition.
Clerodendrum siphonanthes	Charoi utong	Shrub	Bark, Wood, Leaf	Cough, fever, dysentery, asthma and bronchitis.
Cymbopogon nardus (L.) Rendle	Charot	Herb	Whole plant	Hair lotion, perfume and stomachic.
Eupgorbia oncoclada Linn.	Cheitek lei	Shrub	Leaf	Skin diseases.
Agaricus campestris Linn.	Chenggum	Saprophyte	Whole plant	Tonic, laxative, used in paralysis, seminal weakness, increases sexual vitality.
Amaranthus viridis Linn.	Chengkruk	Herb	Tender Leaf	Health improver for adult
Amaranthus gangeticus Linn.	Chengkruk angangba	Herb	Whole plant	Acute abdominal pain, stomachache, inflamed skin, lactation of nursing mothers,
Amaranthus spinosus Linn.	Chengkruk tingkhang panbi	Herb	Whole plant	Blood pressure, diabetes,; leaf paste is applied on boils and burns.
Portulaca oleracea Linn.	Laibak Kundo	Herb	Whole plant	Promote Urination, cough, enhance lactation in mothers.
Artemisia maritime Linn.	Ching laibak-ngou	Under Shrub	Whole plant	Hair lotion, muscular sprain, acute stomach pain and antiseptic.
Bauhinia purpurea Linn.	Chingthrao-angangba	Small Tree	Bark, Flower & Pod	Poisonous bites, menstrual disorder and leucorrhoea; dysentery and intestinal worms.
Bauhinia tenuiflora Watt. Ex Clarke.	Chingthrao-angouba	Tree	Bark	Diarrhoea, dysentery and poisonous bites.
Bauhinia variegate Linn.	Chingthrao-ngourunaba	Tree	Bark, flower, Leaf & Root	Anthelmintic, anti-inflammatory, leucorrhoea, regulate blood pressure.
Crassocephalum crepidioides (Benth.)	Terapaibi	Herb	Leaves	Antiseptic
Artabotyrs hexapetalis Linn.	Chinichampra	Shrub	Leaves, Flowers	Aromatherapy, perfume
Elaeocarpus floribundus	Chorphon	Tree	Leaves, Fruit	Pile and digestive
Saccharum officinarum	Chu	Succulent undershrub	Stem	Alimentary tract, Jaundice, stomach-ache and strengthen tooth gums.
Sesbania sesban	Chu-chu rangmei	Shrub	Young fruit	Diabetes
Prunus persica	Chumbrei	Small Tree	Leaf,	Worm diseases, cattle's

			Flower, Fruit, Bark	wound, digestive, cough and anthelmintic.
Sechium edule	Dasakusa	Climber	Root, Fruit, Leaf	Ossification of bones, teeth formation, regulates functions of nerves, heart and muscle.
Oxalis debilis	Engkhol/Benam yensil	Herb	Whole plant	Liver problem.
Neptunia oleracea	Eeshing Eekaithabi	Herb	Whole plant	Dysentery and intestinal infection, ear-ache.
Daucus carota	Gajar	Herb	Herb	Diuretic, anthelmintic, stomachic, good source of Vitamin-A.
Alocasia cucullata (Lour.) Schott	Singju Pan	Herb	Rhizome	Purify blood
Cassia alata	Daopata	Shrub	Flower, Leaf, Fruit	Ring worm, skin troubles, snake bite, asthma, bronchitis, diabetes and washing eczematous patches.
Coffea arabica Linn.	Coffee	Shrub	Seed	Stimulant and diuretic, digestive, migraine, fever and gout.
Acacia nilotica	Chigonglei	Tree	Bark, Leaf, Pod & Gum	Sore throat, tooth ache, urinogenital diseases, diarrhoea and dysentery.
Antidesma acidum Retz.	Chingyensin	Shrub	Leaf and Seed	Bile complaints and seed is fatty oil.
Polygonum hydropiper Linn.	Chaokhong	Herb	Whole plant	Fever, Stimulant, diuretic, carminative, tonic and anthelmintic; skin diseases and uterine disorder.
Tinospora cordifolia (Thunb.) Miers.	Ningthou Khongli	Climber	Leaves	Diarrhoea & muscular sprain
Terminalia citrina Roxb.	Manahi	Tree	Fruit	Controlling diabetes, laxative, chronic ulcer, asthma.
Rhus semialata (Murr.)	Heimang	Small Tree	Fruit & Leaves	Intestinal worms, hair care
P. posumbu (Buch.-Ham.) ex D.Don	Phak-pai	Herb	Leaves & tender shoots	Heart beat increases
Polygonum orientale (Linn.)	Yellang	Herb	Leaves & tender shoots	Tonic & against headache
Houttuynia cordata Thunb.	Tuningkhok	Herb	Whole plant	Detoxification, boils, allergy, antipyretic, anti-inflammatory, tumours, asthma, analgesic, diuretic, haemorrhoids
Anisomeles indica (L.)	Thoiding angouba	Shrub	Seed	Toothache, rheumatism, cold

Aphanamixis polystachya (Wall.) R. Parker	Heirangkhoi	Tree	Fruit	Liver tonic & leucorrhoea
Sida rhombifolia (Linn.)	U-han	Shrub	Leaves	Urinary disorder, rheumatism
Tinospora cordifolia (Thunb.) Miers.	Ninthou-khong-lee	Climber	Leaves	Bone fracture, Diarrhoea & muscular sprain
Prunus domestica ssp. Insititia	Heikha	Small Tree	Fruit	Laxative
Phyllanthus acidulous	Kihori	Tree	Fruit and root	Blood enhancer for the lungs and root as a purgative
Aegle marmelos	Heiri-khagok	Tree	Fruit	Diarrhoea, dysentery, tonic, laxative and good for heart
Annona reticulata	Ramphal	Tree	Fruit, leaves	Kill lice and reduce high blood pressure
Artocarpus heterophyllus	Theibong	Tree	Root, seed, ripe fruit	Diarrhoea, laxative and skin diseases
Baccaurea ramiflora	Moktok Hei	Tree	Fruit, bark	Digestive and skin disease
Calamus tenius	Heiri	Small tree	Fruit	Digestive
Citrus grandis	Nobab	Tree	Fruit	Febrifuge, dyspepsia and mosquito repellent (dry pill)
Citrus macroptera	Heiribob	Tree	Fruit, pill	Stomach ailment and spice, dyspepsia
Elaegnus umbellata	Heiyai	Shrub	Fruit, seed	Digestive and cough
Ficus auriculata	Heirit	Tree	Fruit, bark	Dysentery, diabetes and lungs disease
Euphoria longan	Nongang hei	Tree	Fruit	Stomach problem
Ficus palmata	Heibala	Tree	Fruit	Oxidative stress
Ficus glomerata	Heibong	Tree	Fruit, root	Dysentery, diabetes, lung disease and insect bite
Ficus hispida Linn.	Asiheibong	Small Tree	Fruit, leaves	Dysentery, ring worm and intestinal worm infection. Leaves are used in preparation of fermented soyabean locally called as “Hawaijar”.
Flacourtia jangomas	Heitroi	Tree	Fruit	Bleeding gum, tooth ache and diabetes
Gardenia campanulata	Lam Heibi	Tree	Fruit, Young leaves	Diabetes and skin diseases
Garcinia pedunculata	Heibung	Tree	Fruit	Digestive and stomach disorder
Glycosmis arborea	Yong Komla	Shrub	Fruit, leaves	Fever liver complaints, jaundice and hair lotion
Juglans regia	Heijuga	Tree	Fruit, leaves	Heart diseases, swell on joint, fever and antidiarrhoeal
Litsea glutinosa	Thang-Hidak	Tree	Leaves and bark	Blood clotting for cuts and injuries and muscular sprain

Litsea monopetala	Tumit-la	Tree	Leaves, seed and bark	Diarrhoea and rheumatism of body pain
Malus baccata	Heitup	Tree	Fruit	Digestive
Meyna laxiflora	Heibi	Tree	Young leaves, fruit	Intestinal worm and hoarseness
Musa paradisiaca	Ching Laphu	Tall robust herb	Pseudoste, flower	Better breast milk, blood purification
Prunus domestica ssp. Syrica	Kalen Heikha	Small Tree	Fruit	Laxative
Prunus domestica ssp. Insititia	Heikha	Small Tree	Fruit	Laxative
Spondias pinnata	Heining	Tree	Fruit, leaves	Dysentery and dyspepsia and Hair lotion

2. Ethnobotanical Knowledge and Healthcare practices

Ethnobotanical knowledge is an integral part of the healthcare systems among Manipur's tribal communities. Traditional healers, or **Maibas** and **Maibis** (Male and Female healers, respectively), play a crucial role in diagnosing and treating illnesses using plant-based remedies. These healers often combine multiple plant species to create synergistic effects, which are believed to enhance the efficacy of the treatment. The preparation methods vary, including decoctions, infusions, pastes, and poultices.

For instance, a common remedy for fever involves boiling *Centella asiatica* leaves with ginger and honey. Similarly, turmeric mixed with oil is applied topically to treat skin infections. The dosage and application methods are carefully measured based on the patient's age, condition, and severity of the ailment, showcasing the deep knowledge these healers possess.

3. Conservation of medicinal plants

Despite the richness of medicinal plant diversity, several species are threatened due to deforestation, shifting agriculture, and overharvesting. Interviews with community members revealed a growing concern about the depletion of certain valuable plants, such as *Taxus baccata* (Himalayan Yew, local name- Taxus) and *Aconitum ferox* (Indian Aconite), which are now considered rare. Efforts are being made by some tribes to cultivate medicinal plants in home gardens and community-managed forests to ensure sustainable use.

The conservation of medicinal plants is not only vital for preserving biodiversity but also for maintaining the cultural heritage of the tribal communities. In this context, community-based

conservation initiatives, such as sacred groves and community seed banks, have emerged as essential strategies.

4. Potential for modern pharmacology

The ethnobotanical knowledge of medicinal plants in Manipur presents a significant opportunity for modern pharmacology. Several plants used by tribal healers have demonstrated potential in scientific studies. For example, *Curcuma longa* has been extensively studied for its anti-inflammatory and antioxidant properties. Similarly, *Acorus calamus* is known for its neuroprotective effects. Collaborative research between ethnobotanists, pharmacologists, and tribal healers could lead to the discovery of new drugs and treatments for various ailments.

CONCLUSION

The tribal communities of Manipur possess a vast reservoir of ethnobotanical knowledge that has sustained them for centuries. Medicinal plants are central to their healthcare systems, offering remedies for various diseases. However, this knowledge is at risk of being lost due to modernization, habitat destruction, and the erosion of traditional practices. There is an urgent need for documenting and conserving both the plants and the indigenous knowledge associated with them. Additionally, the integration of traditional knowledge with modern science holds great potential for developing new therapeutic agents.

Recommendations

1. **Documentation and Research:** Comprehensive documentation of medicinal plants and their uses should be prioritized. This can serve as a valuable resource for future research and conservation efforts.

2. **Conservation initiatives:** Community-based conservation efforts, such as sacred groves, should be supported and expanded. Government agencies and NGOs should collaborate with local communities to ensure sustainable harvesting practices.

3. **Collaboration with modern science:** Ethnobotanical knowledge should be integrated into modern pharmacological research to explore the potential of medicinal plants in drug discovery.

4. **Awareness and Education:** Awareness programs should be conducted to educate younger generations about the importance of traditional knowledge and the need for conservation.

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