



Traditional medicinal flora utilized by Chakpa People in Tairenpokpi Village, Manipur, North-East India

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Research

Abstract

Background: Ethnomedicine is the study of indigenous healing traditions and plant-based remedies practiced to address primary health concerns. This study investigates the ethnomedicinal knowledge of the Chakpa, a Meitei Scheduled Caste community residing in Tairenpokpi village, Imphal West District, Manipur. The village sustains a rich biodiversity and a distinctive traditional healthcare system.

Methods: Fieldwork was conducted between March 2023 and May 2025 using semi-structured questionnaires from 46 informants, with 19 men and 27 women, respectively. The informants include herbal healers, elders, and women folks having ethnomedicinal knowledge. Data were analyzed quantitatively using ethnobotanical indices, including use value, fidelity level, and informant consensus factor.

Results: Overall, 51 ethnomedicinal plant species belonging to 36 families were documented, with Lamiaceae, Rubiaceae, and Solanaceae being the most common families with 3 species each. Herbs accounted for 40% of the species, followed by shrubs with 24%, and leaves were the most used plant part. Decoction was the predominant preparation method, while oral administration was most common (63%), followed by poultices (11%). The highest use value was observed in *O indicum* with 2.59. Fidelity level of 100% were obtained in 3 plant species, i.e., *Plumbago zeylanica*, *Celtis timorensis*, and *Litsea glutinosa*, highlighting their use for a particular disease in the community. The highest informant consensus factor value was recorded for Digestive diseases (ICF = 0.95).

Conclusions: The findings underscore the critical role of ethnomedicinal knowledge in community health and emphasize the need for systematic documentation and conservation of indigenous plant resources in Tairenpokpi village.

Keywords: Chakpa, decoction, diversity, ethnomedicinal, poultice, traditional healers

Background

Ethnobotany studies the relationship between human beings and plants, incorporating perspectives on gender roles, cultural values, and other related factors. Interactions and relationships between people and plants vary across different places due to differences in the significance of plants, different ways of utilization, sociocultural, ethnic, and demographic factors. Plant

populations identified through exploration hold substantial value for pharmaceutical and nutritional industries (Torres-Avilez *et al.* 2019, Siraj 2022). Medicinal plants serve widespread applications, addressing the needs for daily life through folk remedies while also supplying novel bioactive compounds for modern medicines alongside the traditional ones (Hazrat *et al.* 2011, Yuan *et al.* 2016, Ssenku *et al.* 2022). Since time immemorial, human beings have been looking for medicines and have been accumulating knowledge on medicinal plants as a result of centuries of fighting ailments and learning to extract drugs from various medicinal plants (Zemede *et al.* 2024). Traditional medical knowledge of ethnomedicinal plants and their applications by the people is not only useful for conserving heritage and biodiversity but also for community healthcare and pharmaceutical development in the present and future (Pei 2001). Although modern pharmaceuticals continue to grow and advance, traditional ethnomedicine remains widely practiced across the globe for managing everyday health conditions (Khan *et al.* 2018). Traditional knowledge is primarily transmitted orally, and practitioners play a critical role in disseminating traditional medicinal knowledge (Ales 2012).

Since ancient times, traditional medicine has served as a vital component of India's healthcare system. More than 88% of Indians turn to traditional medicine for healthcare needs (Ralte *et al.* 2024). The reason for such widespread use can be attributed to its easy access, cheapness, and cultural acceptability. In addition, limited access to contemporary medical facilities among rural populations nationwide makes traditional medicine the primary option for healthcare. In India, traditional medicinal plants have been serving as a primary source for treating various ailments affecting humans and livestock. Around 2500 plant species, predominantly angiosperms, were used by traditional healers as sources of medicine for fundamental preventive and curative healthcare (Boomibalagan *et al.* 2013). A diverse array of plant species is employed to treat a broad spectrum of health conditions, ranging from neurological and musculoskeletal ailments to respiratory, digestive, and skin-related disorders (Yumnam *et al.* 2012; Yuhlung & Bhattacharyya. 2016). Ethnobotanical investigations are thus essential, as they document traditional medicinal practices and help uncovering potential sources of novel therapeutic compounds, while also aiding biodiversity conservation (Heinrich 2000; Sahoo *et al.* 2020, Alpuerto *et al.* 2010).

India's North-Eastern Region (NER), comprising the Eastern Himalayas, the North-Eastern hill ranges, and the Brahmaputra and Barak valleys is widely acknowledged as a hotspot for its outstanding biological and cultural diversity (Chatterjee *et al.* 2006). Inhabitants of northeastern India, including the eastern Himalayas, rely fully or partially on wild forest resources, using nearly 1,350 plant species for traditional herbal medicine (Dutta & Dutta 2005), and the state of Manipur alone has more than 4000 angiosperms, including 430 medicinal plant species (Sharma *et al.* 2003b). This region not only sustains a diverse array of ecosystems but also supports numerous indigenous communities, each with unique traditional knowledge systems. Within this region, Manipur stands out for its exceptional plant diversity and a highly heterogeneous population structure (Ansari *et al.* 2021). Widespread use of traditional medicinal plants for various ailments is still prevalent in Northeast India, leading to the quest for documentation of new ethnomedicinal species and their applications based on the phytochemical and pharmacological studies with potential for novel drug development (Ralte & Singh 2024). Traditional knowledge of medicinal plant applications and healthcare practices among the various communities of Northeast India remains poorly documented, even though there is a very large cultural diversity and a huge resource of medicinal plants. Such exceptional biological richness underpins the extensive use of medicinal plants in indigenous healthcare practices.

In Manipur, traditional medicinal knowledge is predominantly transmitted orally, with information flowing across generations within families and local communities (Singh 2020). Local healers, traditionally called Maiba or Maibee, occupy a pivotal position in diagnosing diseases and recommending herbal treatments, practices that are also attested in historical sources such as the Cheitharol Kumbaba (Sharma *et al.* 2003a). The population of Manipur is marked by a complex social fabric, forged through historical migration and diverse cultural interactions. The Meiteis predominantly occupy the valley region, while the encircling hill areas are inhabited by numerous tribal communities. Furthermore, smaller yet socially significant groups, including Scheduled Castes, are predominantly found within the valley regions (Sharma *et al.* 2003a; Sharma & Devi 2004). Over the past two decades, a substantial number of ethnobotanical studies have been undertaken in Manipur; however, these studies have been largely confined to dominant ethnic groups, such as the Meiteis, Meitei-Muslims, and Zeliangrong communities (Choudhury *et al.* 2010). Accordingly, the traditional medicinal practices of Scheduled Caste communities, especially those in rural parts of the Imphal Valley remains poorly documented. Given the communities heavy reliance on locally available plant resources for healthcare, their associated knowledge systems represent an important yet largely underexplored resource (Sharma *et al.* 2003a; Sharma & Devi, 2004). Loi is the largest scheduled caste community in Manipur, living in various areas of Imphal Valley, namely Sekmai, Phayeng, Andro, and in the southern part of Manipur, Chairel, Kakching Khunou, Thongjao, Kakching, and Pallel under Kakching District (Hodson 1908). The Chakpas of Manipur are an important constituent of the Larger Loi group. At present, the Chakpas are found in nine villages across five different districts. They are: the Awang Sekmai, Khurkhul, Koutruk, Phayeng, and Tairenpokpi villages (Imphal West District); the Andro village (Imphal East District), the Leimaram village (Bishnupur District), the Nongpok Sekmai village (Thoubal District), and

the Thongjao village (Kakching District). The Loi were identified as Scheduled Caste by the Government under the Scheduled Caste and Scheduled Tribes Order Amendment Act, 1956.

There is no comprehensive, documented account of the ethnomedicinal practices of the Meitei Scheduled Caste Chakpa community in Tairenpokpi. The community has a unique culture and lifestyle. In addition, the community still focuses on the ethnic traditional practices for living and possesses a rich ethnomedicinal knowledge system that warrants investigation and proper documentation. Therefore, the present study attempts to properly document the ethnomedicinal uses of the Chakpa community of Tairenpokpi village in detail. Furthermore, quantitative ethnobotanical indices namely Use Value (UV), Informant Consensus Factor (ICF), and Fidelity Level (FL), were employed to assess the cultural significance, use patterns, and therapeutic reliability of the documented medicinal plants. Collectively, these findings are anticipated to support the conservation of traditional knowledge systems, generate baseline evidence for further pharmacological and phytochemical exploration, and facilitate the development of sustainable, community-based approaches to conservation and local healthcare.

Materials and Methods

Study area

Tairenpokpi village is located in the foothills of the Kangchup Hills, 19 km from the capital city of Manipur, Imphal. Tairenpokpi covers about 432 hectares and is characterized by fertile paddy fields, wetlands, and a physiographic setting of low hillocks and valley plains. The village borders Atong Khuman village (east), Chakpa Phayeng village (north), Sangaithe village (south), and Kangchup Hills (west).

Demography

The community residing in the village is the Chakpa scheduled cast which is one of the oldest indigenous communities of Manipur, traditionally regarded as custodians of ancient Meitei culture and rituals (Thokchom *et al.* 2015). They are closely associated with the forest and preserve distinctive practices, ritual dances, and oral traditions that narrate creation myths and ancestral worship. Moreover, the Chakpa have profound ethnomedicinal knowledge for the treatment of certain primary health ailments and sustain ecological wisdom through community practices. While often considered a sub-group of the Meitei, they maintain a distinct identity rooted in ritual, folklore, and heritage, making them a vital link between Manipur's past and its living cultural landscape.

Tairenpokpi village has a total population of 892, which includes 440 males and 452 females, which gives a sex ratio of 1027 females per 1000 males (Census 2011). In total, there are around 218 households in Tairenpokpi village. The community continues to depend significantly on forest and wetland resources, integrating traditional practices into daily life.

Data collection

Extensive field survey and data collection were conducted at Tairenpokpi village between March 2023 and May 2025. Data were collected through semi-structured questionnaires and interviews with community members, herbal healers, vegetable vendors, and other key informants, following Free, Prior, and Informed Consent (FPIC) protocols to maintain ethical standards in ethnobotanical research (Martin 1995, Simpson 2006). In total, 46 informants (19 male, 27 female) between the ages of 35 and 86 in the village were interviewed. Among them were 12 herbal healers, 9 vegetable vendors, 8 housewives, and 17 knowledgeable informants interviewed. The survey focused on the investigation of the local names of the species, parts used, ailments the plant is used for, the dosage or amount, mode of preparation, mode of administration, etc. Particular questions were asked based on the type of informants and were recorded.

Plants were identified using standard floras and published works (Deb 1961a, b; Mao & Gogoi 2010, Agrawala *et al.* 2023). Taxonomic verification and documentation were carried out using Plants of the World Online (POWO 2026). Voucher specimens were prepared in accordance with established herbarium protocols (Jain & Rao 1977, Das 2021) and deposited in the Herbarium of Bir Tikendrajit University, Canchipur, for permanent record and future consultation.

Data Analysis

Traditional knowledge of ethnomedicinal plants was assessed quantitatively by applying several ethnobotanical indices, described below:

Use Value (UV)

Use Value (UV), expressing the relative importance of each locally used medicinal plant, was calculated following the formula of Barnert & Messmann 2008.

$$UV = \sum U / n$$

Where UV is the use value of species, U denotes the number of use-reports provided by an individual informant for a given species, and n is the total number of informants interviewed about that species. The UV identifies the plant species most frequently used to treat ailments. So a plant cited by many informants and reported for multiple uses will have a higher UV. A high UV denotes a large number of use reports for a plant, highlighting its importance (Xavier *et al.* 2014).

Fidelity Level (FL)

Fidelity Level (FL) was used to calculate the percentage of the most valued medicinal plant for each ailment category by using the formula:

$$FL (\%) = Np/Nt \times 100$$

Np denotes the percentage of informants who reported or mentioned using a plant for a specific disease category, while N is the total number of informants who reported for any other use or purpose (Friedman *et al.* 1986). A high-value medicinal plant will likely be the most frequently used species for treating a particular ailment and will receive many citations. The ICD-11 (International Classification of Diseases) for mortality and morbidity statistics was revised and adapted to include 10 specific use or disease categories in this ethnobotanical documentation (WHO 2022).

Informant Consensus Factor (ICF)

Quantitative data analysis was conducted using use-reports (number of citations/mentions) and the informant consensus factor (ICF). The Informant Consensus Factor (ICF) is a quantitative ethnobotanical index that measures the degree of agreement among informants regarding which plants are used to treat particular disease or ailment categories. The ICF was calculated according to the formula:

$$ICF = Nur - Nt / Nur - 1$$

Where ICF is the informant consensus factor; Nur represents the number of species used for each category, and Nt is the number of species used for all ailments. The ICF values range from 0 to 1, with values close to 1 indicating strong agreement among informants about the plant species to treat a specific disease category, while values near 0 indicate the opposite (Ralte *et al.* 2024).

Results and Discussion

Socio-Demographic Profile of Respondents

In the current study a total of 46 informants between the ages of 35 and 86 were interviewed from the village. Among the participants, 19 (41%) were male and 27 (59%) were female. The higher proportion of female participants reflects their traditional role as main caregivers within the household, with responsibility for overseeing the health of children and other family members. As a result, women frequently serve as the primary custodians and transmitters of ethnobotanical knowledge (Mantuan & Sannomiya 2024). The survey revealed that ethnomedicinal knowledge is more prevalent among older participants, indicating a pattern that suggests a steady decline in knowledge across generations. These findings align with recent studies in which modernization and socio-cultural shifts are identified as major factors of the decline in indigenous knowledge systems (Ralte & Singh, 2024). Among them were 12 herbal healers, 9 vegetable vendors, 8 housewives, and 17 knowledgeable informants interviewed. The occupational profile of the informants included 12 herbal healers, 9 vegetable vendors, 8 housewives, and 17 knowledgeable community members.

Ethnomedicinal Plant Profile

A total of 51 ethnomedicinal plants belonging to 36 different families, along with their ethnomedicinal uses by the Chakpa community of Tairenpokpi village, were documented during the study (Table 1). The plants are systematically arranged in alphabetical order by botanical name, with accompanying details on local Manipuri names, their assigned voucher number, habit (herb, shrub, tree, small tree, climber, creeper, fern), plant parts utilized (such as leaves, roots, bark, etc.) and specific ethnomedicinal preparation methods and applications (including decoctions, poultices, and oral administrations). This structured compilation facilitates easy reference, quantitative analysis, and comparison with other indigenous knowledge systems.

Table 1. Ethnomedicinal plants used by the Chakpa community of Tairenpokpi village

Botanical Name [Family]	Vernacular Name	Voucher Specimen No.	Habit	Part Used	Ethnomedicinal Uses
<i>Acorus calamus</i> L. [Acoraceae]	Ok hidak	BTUH-041	Herb	Rhizome	The rhizome extract is mixed with water containing honey, and a tablespoon (5ml) (half a teaspoon for kids) of the filtrate is taken orally daily for 3-4 days for treating fever A necklace made of fresh rhizome is tied around the neck of children to prevent a dry cough
<i>Alangium chinense</i> (Lour.) Harms [Cornaceae]	Kokan	BTUH-1141	Small Tree	Leaf	A tablespoon of leaf juice extract taken orally without breathing for treating high fever
<i>Alocasia macrorrhizos</i> (L.) G.Don [Araceae]	Honghoo	BTUH-181	Herb	Rhizome	A poultice made of the rhizome with a little amount of salt is applied for treating skin infections
<i>Brassaiopsis bodinieri</i> (H.Lév.) J.Wen & Lowry [Araliaceae]	Chom	BTUH-201	Small Tree	Leaf	A handful (100g) of leaf is boiled in half a liter of water, and a tablespoon of the decoction is taken daily as a liver tonic
<i>Celtis timorensis</i> Span. [Cannabaceae]	Heikreng	BTUH-321	Tree	Leaf	A bunch (500g) of fresh leaves boiled with 3 liters of water and 1 liter of the filtrate is drunk daily till urinary stone cases are cured
<i>Centella asiatica</i> (L.) Urb. [Apiaceae]	Peruk	BTUH-141	Herb	Whole Plant	A handful of whole plant is boiled in a liter of water, and half a glass of the filtrate is taken daily as a health tonic
<i>Cissus adnata</i> Roxb. [Vitaceae]	Kongouyen	BTUH-1081	Climber	Leaf	A handful of fresh leaves is boiled with Chongalaba (<i>Upupa epops</i>), and the soup is taken to cure cases of kidney stones.
<i>Cuscutam reflexa</i> Roxb. [Convolvulaceae]	Urihangamapal	BTUH-401	Climber	Whole plant	100g of the plant is boiled in 1 liter of water, and 100ml of the filtrate is taken daily for 3-4 days for treating jaundice
<i>Cynodon dactylon</i> (L.) Pers. [Poaceae]	Tingthou	BTUH-801	Herb	Whole plant	A handful of the whole plant is boiled in 2 glasses of water, and half a glass of the filtrate is taken with a tablespoon of honey daily for 3-4 days for treating stomach complaints.
<i>Dactyloctenium aegyptium</i> (L.) Willd. [Poaceae]	Pungphai	BTUH-802	Herb	Leaf	A handful of whole plant is boiled in a liter of water for a while (20 min), and half a glass of the filtrate is taken daily for 3-4 days to cure typhoid
<i>Diplazium esculentum</i> (Retz.) Sw [Aspleniaceae]	Laichangkhrang	BTUH-1161	Fern	Fronds	A handful of whole plant is boiled in 2 glasses of water, and the decoction is used in taking bath for children for 1 week to treat measles
<i>Drymaria cordata</i> (L.) Willd. ex Schult. [Caryophyllaceae]	Tandan manna	BTUH-361	Herb	Whole plant	Dried plant is burned in charcoal, and the smoke is inhaled for the treatment of sinus for 5 min daily for treating sinusitis problems
<i>Eclipta prostrata</i> (L.) L. [Asteraceae]	Uchi sumbal	BTUH-221	Herb	Young Shoot	2-3 leaves and a fresh shoot of the plant are eaten fresh to treat fever

<i>Eupatorium cannabinum</i> L. [Asteraceae]	Langthrei	BTUH-222	Herb	Leaf	2-3 fresh leaves are eaten. 2 tablespoons of leaf juice extract are mixed with honey and used for treating stomach inflammation and ulcers
<i>Ficus hispida</i> L.f. [Moraceae]	Ashi heibong	BTUH-621	Small Tree	Fruit	2-3 unripe fruits are eaten with common salt for treating dysentery and diarrhea
<i>Ficus racemosa</i> L. [Moraceae]	Lai heibong	BTUH-622	Tree	Fruit	A tablespoon of unripe fruit decoction is taken for treating diabetes Unripe fruits are also eaten for stomach complaints
<i>Guilandina bonduc</i> L. [Fabaceae]	Tinshibi	BTUH-481	Climber	Leaf & Seed	A handful of leaves is boiled in half a liter of water, and a tablespoon of the decoction is taken twice a day for 2-3 days and used as a wormicide Half a tablespoon of powdered seed and seed kernel is added to half a glass(100ml) of water, and the concoction is taken daily for 2-3 days for treating worms
<i>Hydrocotyle sibthorpioides</i> Lam. [Araliaceae]	Lai peruk	BTUH-202	Creeper	Whole plant	A handful of whole plant is boiled in a liter of water for a while, and half a glass of the filtrate is taken daily for treating irregular menstrual problems
<i>Jatropha gossypifolia</i> L. [Euphorbiaceae]	Kege angangba	BTUH-461	Shrub	Stem	Latex extracted from the stem is used in the treatment of boils
<i>Knoxia roxburghii</i> (Spreng.) M.A.Rau [Rubiaceae]	Meitei lebum	BTUH-901	Herb	Leaf	Leaf poultice is applied for treating cuts and bruises as it promotes healing and reduces inflammation
<i>Litsea glutinosa</i> (Lour.) C.B.Rob. [Lauraceae]	Thanghidak	BTUH-521	Tree	Leaf	Leaf poultice is applied to cuts and wounds as first aid
<i>Machilus gamblei</i> King ex Hook.f. [Lauraceae]	Nongangkori	BTUH-522	Tree	Leaf	A handful of leaves is boiled in a liter of water, and half a glass of decoction is taken daily to treat asthma and relieve respiratory tract blockages.
<i>Melia azedarach</i> L. [Meliaceae]	Seizrak	BTUH-581	Tree	Leaf	A tablespoon of leaf juice extract is taken daily used for treating cough and cold
<i>Mimosa pudica</i> L. [Fabaceae]	Lam ekaithabi	BTUH-482	Herb	Whole plant	A handful of young twigs is boiled in 1 liter of water, and half a glass of the filtrate, added with 2 tablespoons of cane sugar, is taken daily to cure jaundice
<i>Mukia maderaspatana</i> (L.) M.Roem. [Cucurbitaceae]	Lam thabi	BTUH-421	Climber	Whole plant	2 tablespoons of whole plant decoction are taken daily until the jaundice is cured
<i>Oreocnide integrifolia</i> (Gaudich.) Miq. [Urticaceae]	U khazing	BTUH-1001	Small Tree	Leaf	A handful of whole plant is boiled in a liter of water, and half a glass of decoction is taken daily for treating diabetes
<i>Oroxylum indicum</i> (L.) Kurz [Bignoniaceae]	Shamba	BTUH-261	Tree	Bark & fruit	Half a tablespoon of dried powdered bark is mixed in half a glass of water and taken twice daily for 2-3 days to reduce fever A handful of the powdered bark is boiled in 1 litre of water, and half a glass of the soup is taken once daily for treating hypertension.

<i>Paederia foetida</i> L. [Rubiaceae]	Uri oinam	BTUH-902	Climber	Leaf, Whole Plant	A roasted leaf poultice is applied to enhance bone setting
					A handful of the whole plant, along with a small amount of salt, is boiled in a glass of water, and the poultice is applied to the affected areas for 3-4 days.
<i>Pavetta indica</i> L. [Rubiaceae]	Nongmangkha ashinba	BTUH-903	Shrub	Leaf	Leaf poultice is applied to the forehead to reduce fever
					Half a tablespoon of leaf extract is taken daily as a liver tonic
<i>Perilla frutescens</i> (L.) Britton [Lamiaceae]	Chinglembi	BTUH-501	Herb	Inflorescence	Inflorescence is roasted, and the poultice is applied for the treatment of a toothache
<i>Phlogacanthus thyrsoformis</i> (Roxb. ex Hardw.) Mabb. [Acanthaceae]	Nongmangkha	BTUH-021	Shrub	Leaf	A handful of leaves is boiled, and the steam is inhaled to control cough, cold, and nasal congestion
<i>Phyllanthus emblica</i> L. [Phyllanthaceae]	Heikru	BTUH-741	Tree	Fruit	Fruits are consumed both fresh and dried with salt for indigestion and gastrointestinal problems
<i>Plantago asiatica</i> L. [Plantaginaceae]	Yempat	BTUH-761	Herb	Leaf	Leaves are slightly crushed, and the poultice is applied for the treatment of boils, replacing daily till cured
<i>Plumbago zeylanica</i> L. [Plumbaginaceae]	Tilhidak	BTUH-781	Shrub	Leaf	A handful of roots is boiled in a liter of water, and 4-5 tablespoons of the decoction is taken daily as a wormicide
<i>Persicaria posumbu</i> (Buch.-Ham. ex D.Don) H.Gross [Polygonaceae]	Phakpai	BTUH-821	Herb	Leaf	A handful of roots is boiled in a half a liter of water and half a glass of decoction, along with 2-3 tablespoons of honey, is taken for 2-3 days to treat typhoid
<i>Portulaca oleracea</i> L. [Portulacaceae]	Leibakkundo	BTUH-841	Herb	Fruit	Fresh fruit is eaten for treating stomach complaints
<i>Rhus chinensis</i> Mill. [Anacardiaceae]	Heimang	BTUH-121	Small Tree	Fruit	A handful of whole plant is boiled with a liter of water, and half a glass of the filtrate is taken daily for urinary problems
<i>Rumex maritimus</i> L. [Polygonaceae]	Torongkhongchak	BTUH-822	Herb	Leaf	Leaf juice extract is used for dermatological problems
<i>Rungia pectinata</i> (L.) Nees [Acanthaceae]	Warak chamubi	BTUH-022	Herb	Whole Plant	The whole plant is pounded and mixed with rice flour, and the poultice is applied to a snake bite
<i>Scutellaria discolor</i> Wall. ex Benth. [Lamiaceae]	Yenakhut	BTUH-502	Herb	Whole plant	A handful of whole plant is boiled with a liter of water, and the decoction is used as a lotion for the postpartum mother
<i>Solanum americanum</i> Mill. [Solanaceae]	Morokmana	BTUH-981	Herb	Leaf	Leaf is boiled with dry fish for treating jaundice in children
<i>Solanum anguivi</i> Lam. [Solanaceae]	Leipungkhanga	BTUH-982	Shrub	Fruit	A spoonful of the fruit extract with a little amount of honey is taken twice daily for a cough and sore throat

<i>Solanum viarum</i> Dunal [Solanaceae]	Singkhanga achouba	BTUH-983	Shrub	Fruit	Dried fruit is burned, and the smoke is used for the treatment of a toothache
<i>Stachytarpheta cayennensis</i> (Rich.) Vahl [Verbenaceae]	Tharoi phijub	BTUH-1021	Herb	Leaf	Leaf juice used for skin inflammation and irritation
<i>Terminalia chebula</i> Retz. [Combretaceae]	Manahee	BTUH-381	Tree	Fruit	Dried fruit is eaten or chewed as a mouth freshener
<i>Tinospora sinensis</i> (Lour.) Merr. [Menispermaceae]	Ningthoukhongli	BTUH-601	Climber	Stem	A handful of stems and leaves is boiled in a liter of water, and half a small glass of the decoction with honey is used for the treatment of diabetes
<i>Toona ciliata</i> M.Roem. [Meliaceae]	Tairel	BTUH-582	Tree	Leaf	Leaf decoction is used for skin diseases
<i>Urena lobata</i> L. [Malvaceae]	Ashikhangla	BTUH-561	Shrub	Root	Root is used for treating bladder complaints and urinary tract infections
<i>Vitex negundo</i> L. [Lamiaceae]	Urisibee	BTUH-503	Shrub	Leaf	A handful of young twigs is boiled, and the poultice is applied to the joints to reduce pain
<i>Xylosma longifolia</i> Clos [Salicaceae]	Nongleishung	BTUH-941	Small Tree	Leaf	A bunch of leaves is boiled in 10 liters of water, and the solution is used to take a bath to cure skin itching
<i>Zanthoxylum acanthopodium</i> DC. [Rutaceae]	Mukthrubu	BTUH-921	Small Tree	Leaf	A handful of young fruit & leaf is boiled in a liter of water, and half a glass of decoction is taken twice a day for 2-3 days for treating gastric problems

Family distribution

The 51 ethnomedicinal plant species, distributed across 36 families, reveal remarkable taxonomic diversity within the Chakpa pharmacopeia (Fig. 1). All recorded species are angiosperms except for *Diplazium esculentum*, a pteridophyte (fern). Of these angiosperms, four species are monocots— *Acorus calamus*, *Alocasia macrorrhizos*, *Cynodon dactylon*, and *Dactyloctenium aegyptium*, and the remaining 46 are dicots. Lamiaceae, Rubiaceae, and Solanaceae were the most represented families, each comprising three species. These were followed by 9 families with two species each, while the remaining 24 families were each represented by a single species. Recent works also confirm that families such as Asteraceae and Lamiaceae are frequently predominant in ethnobotanical surveys, owing to their rich phytochemical composition and significant medicinal value (Cherneva *et al.* 2025). This pattern of dominance by plants of the family Lamiaceae underscores the application of the plants of this family for management of a wide range of ailments, such as gastrointestinal, respiratory, and pain and inflammation. Lamiaceae, formerly known as Labiatae, is among the largest angiosperm families including a diverse assemblage of species that serve as spices, vegetables, and medicinal plants, owing to their substantial health-promoting properties (Das *et al.* 2023). The frequent utilization of families such as Lamiaceae, Zingiberaceae, Asteraceae, Fabaceae, and Poaceae is consistent with prior ethnobotanical studies from Manipur (Singh 2000; Singh *et al.* 2018). The Rubiaceae family holds significant implications that reflect its prevalence in lowland forests of Manipur, underpinning its anti-malarial and anti-inflammatory properties among its many other uses. On the other hand, the family Solanaceae underscores the prevalence of plants with antimicrobial properties and various other uses. Such family-level significance indicates evolutionary adaptations to local ecosystems and underscores conservation priorities of the diverse floras found in the Tairenpokpi village. Novel drug discovery requires systematic in-depth studies, encompassing phytochemical isolation and detailed species characterization, within these notable families.

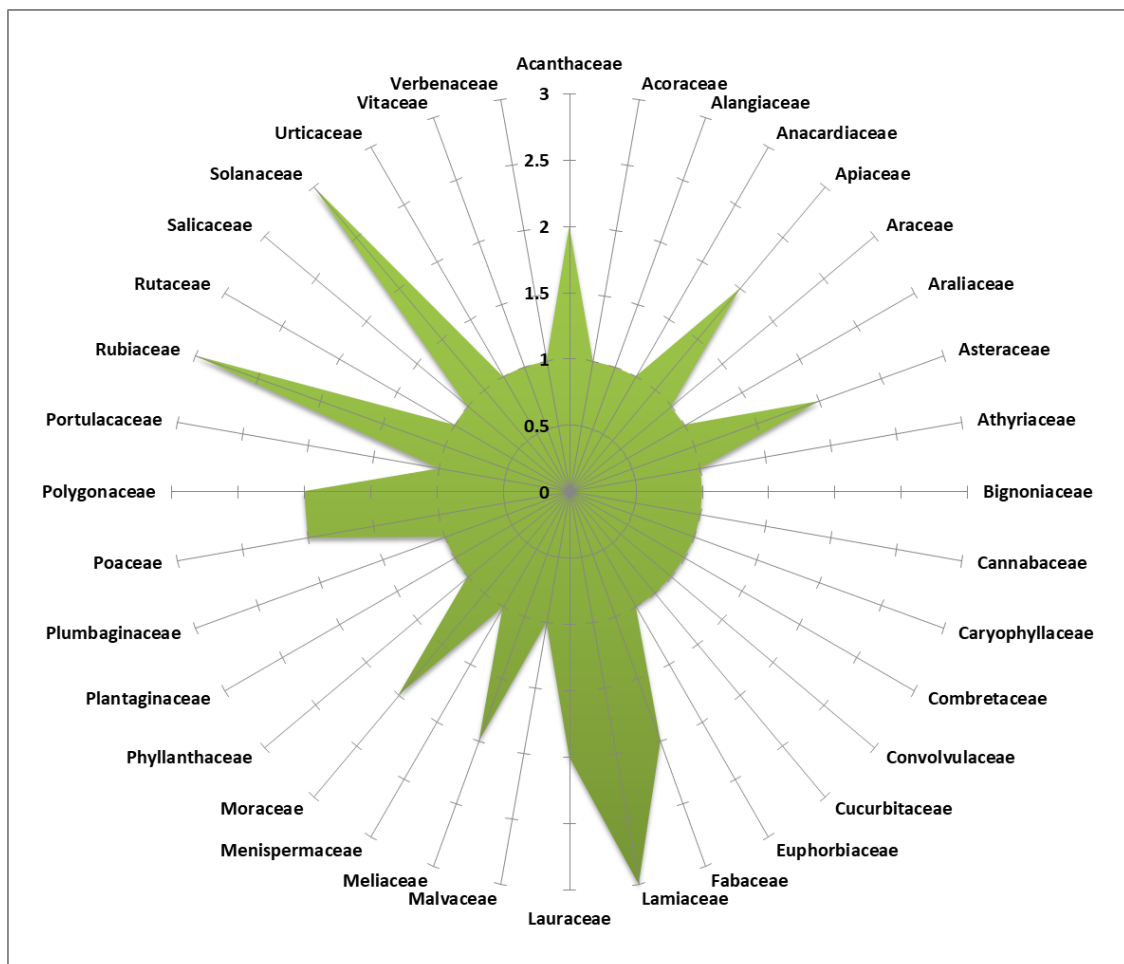


Figure 1. Distribution of ethnomedicinal plants used by the Chakpa community of Tairenpokpi village across various families

Habit and plant part used

The ethnomedicinal plants were classified by growth habit into herb, shrub, creeper, climber, fern, small tree and tree as shown in Fig. 2(B). Herb predominated at 37%, followed by tree at 18%. Shrub, small tree and climber accounted for 16%, 14%, and 12% respectively, while creeper and fern were least represented at 2% each [Fig. 2(A)]. As in the present study,

herbal remedies remain the predominant traditional treatment among communities in other northeastern Indian regions including Manipur (Panmei *et al.* 2019; Meitei *et al.* 2022).

Leaf emerged as the most frequently used plant part, reflecting their abundance and regenerative capacity [Fig. 2(A)]. The predominance of leaf use in this study corroborates with other ethnobotanical studies, where leaves are preferred owing to the easy accessibility rich bioactive content, and minimal impact on plant survival (Robinson *et al.* 2021; Franco & Narasimhan 2012). Similarly multiple studies consistently identify leaves as the most common medicinal plant part employed in ethnopharmacological applications (Ralte *et al.* 2022; Thangliankhup *et al.* 2022). In addition to leaves, informants employed a diverse array of plant parts in their ethnomedicinal preparations, such as flowers, bark, stems, fronds, shoots, tubers, rhizomes, whole plants, roots, and seeds. A similar finding was reported by informants from the Thadou, Meitei, and Maring communities in the Yangoupoki area (Meitei *et al.* 2022) highlighting the ethnolinguistic interactions across communities and suggests that the widespread use of leaves and seeds is due to their elevated levels of bioactive compounds. The ethnomedicinal plants are harvested judiciously from abundant habitats by the community to prevent overexploitation and preserve population viability. The details of the part used are shown in Fig. 2(B).

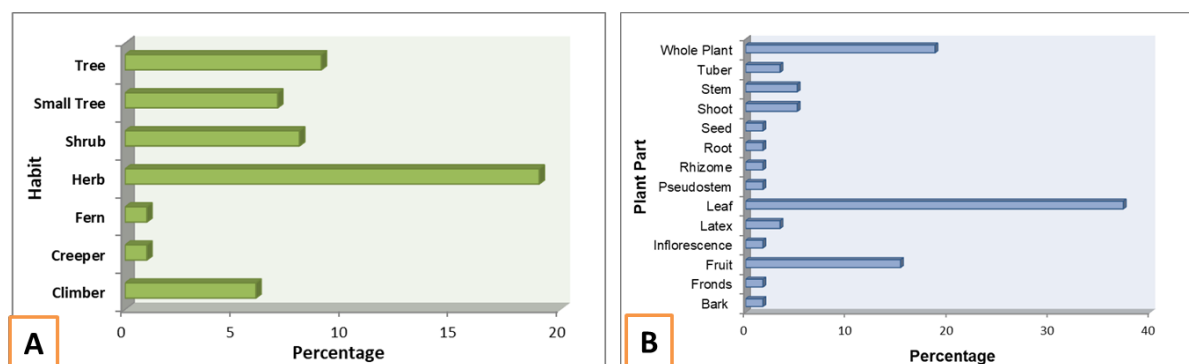


Figure 2. (A) Percentage of the habit of used plant species, (B) Percentage distribution of plant parts used by the Chakpa community of Tairenpokpi village

Mode of preparation and administration

Among the documented preparation methods, as shown in Fig.3 (A), decoction accounted for the highest proportion (48%), involving boiling plant parts to extract water-soluble bioactive compounds effective against systemic ailments. The predominance of decoction as a preparation method corroborates earlier ethnobotanical reports from Manipur and other regions (Malik *et al.* 2018; Shaheen *et al.* 2017; Ahmed 2016). Similar observations have been documented in prior ethnobotanical investigations of the Kuki-Chin tribes within the Kaihlam Wildlife Sanctuary of Manipur (Thangliankhup *et al.* 2022). The boiling of plant materials promotes the efficient extraction of active compounds while improving therapeutic outcomes and a concomitant reduction in toxicity (Okoye *et al.* 2014). Crushing or pounding represented 18%, producing fresh pastes for topical use with rapid anti-inflammatory and antiseptic effects. Fresh consumption comprised 11%, typically involving edible herbs and fruits rich in vitamins and minerals, reflecting nutritional awareness in rural contexts. Other methods included juice extraction (9%), burning (6%), latex extraction, and roasting (4%). The predominance of simple, resource-efficient techniques highlights the community's adaptive ingenuity, utilizing locally available tools and knowledge to maximize efficacy, safety, and shelf-life under resource-limited conditions.

Oral administration accounted for the majority of remedies (63%) [Fig.3(B)], underscoring the community's reliance on ingesting plant-based preparations as the primary treatment method. This reflects both cultural familiarity and trust in local ethnomedicinal knowledge maintained by Chakpa healers. The observed preparation and administration patterns are similar to those reported across other indigenous communities (Rajkumari *et al.* 2014; El Amri *et al.* 2014). Poultices (topical applications) and fresh consumption ranked second and third, respectively, typically addressing localized ailments such as wounds, skin infections, minor injuries, or providing nutritional support. The predominance of oral and topical routes highlights the community's preference for simple, practical treatments that can be prepared at home using locally available plants and basic materials. A degree of consensus on modes of use among other communities (Thangliankhup *et al.* 2022) of Manipur. Traditional healers rely on simple, often traditional methods (Ningthoujam *et al.* 2013). For instance, healers in certain communities determine dosage using conventional household measures such as a handful (approximately 100 g), a bunch (approximately 500 g), glasses, teacups, and teaspoons adjusted according to the patient's age and gender.

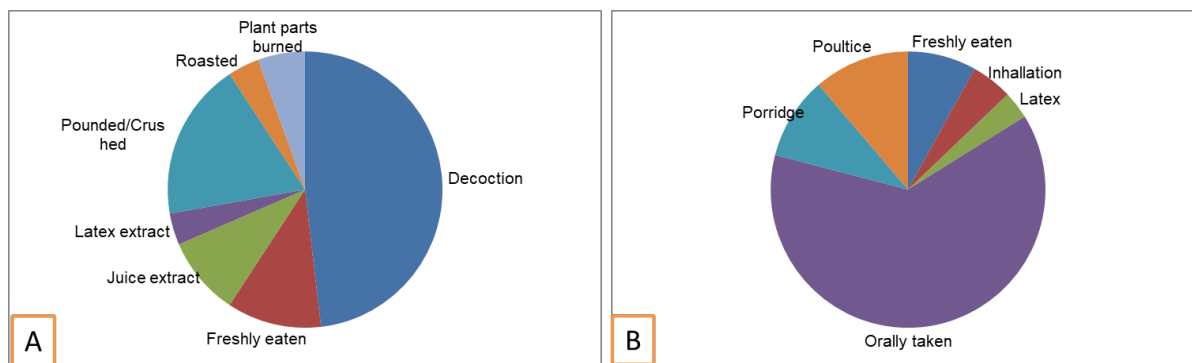


Figure 3. (A) Mode of preparation and (B) Mode of administration of ethnomedicinal plants used by the Chakpa community of Tairenpokpi village

Traditional healers and elders in the village possess detailed knowledge of which plants to use for specific diseases, including appropriate doses, preparation methods, and combinations. Several key ethnomedicinal plants are employed for more than one type of illness, suggesting that these species may contain a broad spectrum of bioactive compounds. In addition, the community has also developed an exceptional understanding of symptom-based treatment through generations. The broad disease coverage and the reliance on a few multipurpose plants underscore the importance of preserving both the biological resources and the associated knowledge, as they support primary healthcare in a rural setting where access to modern medical facilities is limited.



Figure 4. Documentation of ethnomedicinal plants used by the Chakpa community of Tairenpokpi village. [A] Interaction with a key informant [B] *Alangium chinense* [C] *Cissus adnate* [D] *Oroxyllum indicum* [E] *Eupatorium cannabinum* [F] *Litsea glutinosa* [G] *Machilus gamblei* [H] *Tinospora sinensis*

Use Value (UV)

The highest Use Value was reported in *Oroxyllum indicum*, with a Use Value (UV) of 2.59, was reported by 29 informants with a total Use Report (UR) of 75 (Table 2). The decoction of the leaf and bark is used for treating muscular pains, stomach-ache, piles, and rheumatism. The bark extract is tonic and astringent, used in diarrhoea and dysentery. Tender fruits are stomachic, and leaves are externally used for an enlarged spleen. Some of the other high UV plants are *Eupatorium cannabinum* (UV 2.47), *Centella asiatica* (UV 2.23), *Pavetta indica* (UV 2.15), and *Solanum anguivi* (UV 2.15). The high UV of these plants shows the large-scale applications of these plants for managing various ailments in the community. It shows the close association of these plants with the traditional healthcare and daily lifestyles of the people of the community.

The lowest UV was recorded in *Urena lobata* (UV 0.64). The root is diuretic and is used for treating urinary ailments. *Knoxia roxburghii* (UV 0.67) is also one of the lowest UV plants. The pounded leaf extract is applied to bruises, and the leaf juice is also used for urinary troubles. A low UV indicates that the plant is used for minor or highly specialized purposes, or perhaps for a single use for a specific disease only.

Out of the total 51 plants documented, 36 were recorded to have a UV of >1, showing that a large majority of these plants were key medicinal plants with a wide variety of uses in the community. 9 species were documented as moderate UV plants (UV 0.8-1). 6 species were classified as minor or specialized uses (<0.8).

The plant with the highest Use Report (UR) was documented to be *Eupatorium cannabinum*, with an UR of 89 reported by 36 informants. It is followed closely by *Centella asiatica* (UR 85) was reported by 38 informants. *Phlogacanthus thyrsoformis* (UR 81), *Oroxylum indicum* (75), *Solanum anguivi* (UR 71), *Pavetta indica* (UR 69), and *Mukia maderaspatana* (UR 69) is one of the high UR plants.

Table 2. Use Value of documented medicinal plants used by the Chakpa community of Tairenpokpi Village

Botanical Name	Informants (N)	Use Report (U)	Use Value (UV)
<i>Acorus calamus</i>	23	49	2.13
<i>Alangium chinense</i>	14	19	1.36
<i>Alocasia macrorrhizos</i>	9	7	0.78
<i>Brassaiopsis bodinieri</i>	12	17	1.41
<i>Caesalpinia bonduc</i>	7	6	0.86
<i>Celtis timorensis</i>	30	46	1.53
<i>Centella asiatica</i>	38	85	2.23
<i>Cissus adnate</i>	32	56	1.75
<i>Cuscuta reflexa</i>	16	17	1.06
<i>Cynodon dactylon</i>	21	24	1.14
<i>Dactyloctenium aegyptium</i>	14	12	0.86
<i>Diplazium esculentum</i>	22	32	1.45
<i>Drymaria cordata</i>	25	28	1.12
<i>Eclipta prostrata</i>	13	16	1.23
<i>Eupatorium cannabinum</i>	36	89	2.47
<i>Ficus hispida</i>	13	12	0.92
<i>Ficus racemosa</i>	11	9	0.82
<i>Hydrocotyle sibthorpioides</i>	9	9	1
<i>Jatropha gossypifolia</i>	11	14	1.27
<i>Knoxia roxburghii</i>	9	6	0.67
<i>Litsea glutinosa</i>	14	17	1.21
<i>Machilus gamblei</i>	15	21	1.4
<i>Melia azedarach</i>	27	51	1.88
<i>Mimosa pudica</i>	23	27	1.17
<i>Mukia maderaspatana</i>	34	69	2.03
<i>Oreocnide integrifolia</i>	13	17	1.31
<i>Oroxylum indicum</i>	29	75	2.59
<i>Paederia foetida</i>	17	35	2.06
<i>Pavetta indica</i>	32	69	2.15
<i>Perilla frutescens</i>	12	10	0.83
<i>Phlogacanthus thyrsoformis</i>	38	81	2.13
<i>Phyllanthus emblica</i>	27	53	1.96
<i>Plantago asiatica</i>	14	19	1.36
<i>Plumbago zeylanica</i>	19	22	1.16
<i>Persicaria posumbu</i>	10	8	0.8
<i>Portulaca oleracea</i>	28	30	1.07
<i>Rhus chinensis</i>	19	22	1.16

<i>Rumex maritimus</i>	8	6	0.75
<i>Rungia pectinata</i>	9	7	0.78
<i>Scutellaria discolor</i>	13	21	1.62
<i>Solanum americanum</i>	25	24	0.96
<i>Solanum anguivi</i>	33	71	2.15
<i>Solanum viarum</i>	29	35	1.21
<i>Stachytarpheta cayennensis</i>	15	11	0.73
<i>Terminalia chebula</i>	22	39	1.77
<i>Tinospora sinensis</i>	23	45	1.96
<i>Toona ciliata</i>	13	11	0.85
<i>Urena lobata</i>	11	7	0.64
<i>Vitex negundo</i>	27	33	1.22
<i>Xylosma longifolia</i>	28	51	1.82
<i>Zanthoxylum acanthopodium</i>	26	29	1.14

Fidelity Level (FL)

High Fidelity Levels (FLs) occur when multiple use reports for a plant species converge on the same ailment (Heinrich *et al.* 1998). Similarly, low FLs show diverse uses across different ailment reports for that species. In this study, 3 plant species, *Plumbago zeylanica*, *Celtis timorensis*, and *Litsea glutinosa* obtained an FL of 100%, showing that these plants were used for a particular disease in the community (Table 3). *Plumbago zeylanica* root decoction is used as a wormicide for children. Leaf decoction of *Celtis timorensis* was used for treating stone cases. Pounded leaf of *Litsea glutinosa* was used for the treatment of cuts or wounds. These plants are therefore deemed faithful to their respective diseases and therefore warrant as a strong candidate for phytochemical or pharmacological testing for further confirmation. Species with high FL values represent promising model plants, suitable for traditional pharmacological investigations (Ralte *et al.* 2024; Friedman *et al.* 1986).

Lowest FL was observed in *Phlogacanthus thyrsoformis* (FL 15%), followed by *Machilu sgamblei* (FL 16%), *Brassaiopsis bodinieri* (FL 19%), *Eupatorium cannabinum* (FL 20%), and *Centella asiatica* (22%). This low fidelity level arises due to the plants' frequent citations across numerous ailments, rather than a single primary ailment. Low FLs may also relate to these plants' occurrence in underrepresented families in the region, implying insufficient documentation or inconsistent application reports in the community.

Informant Consensus Factor (ICF)

A total of 51 plants were documented from Tairenpokpi village belonging to 36 different families, producing a total of 869 use reports distributed across 10 major ailment categories (Table 3). Since a single plant may be used for treating more than one disease category, the ICF was evaluated by using disease categories as the unit of analysis. High ICF values indicate strong reliance on medicinal plants by the local population, whereas low ICF values indicate less consistent informant knowledge. The high level of consensus indicates culturally validated, widely trusted, and long-term effectiveness of the documented remedies (Sharma *et al.* 2014). High ICF values also serve as an effective screening tool for plant species that warrant further pharmacological and toxicological investigation (Weckerle *et al.* 2018; Kumar *et al.* 2015). The ICF value ranges from 0.79 to 0.96, demonstrating a strong level of agreement among informants' plant selection for particular health conditions. The highest ICF value was observed for digestive diseases (ICF = 0.95), represented by 19 plant species with 336 URs, which is also the highest number of UR among all the categories. The highest ICF for digestive diseases was also observed in the Tamenglong district of Manipur, among Kuki-Chin ethnolinguistic communities (Panmei *et al.* 2019; Ong *et al.* 2020), and a high ICF for cardiovascular diseases was reported among the Thadou-Kuki tribe of the Churachandpur district, Manipur (Haokip & Duany 2021), all of whom contributed valuable support to the completion of this study. It is followed by connective tissue diseases (ICF = 0.94; UR = 19; 2 species), genitourinary diseases (ICF = 0.93; UR = 107; 7 species), respiratory diseases (ICF = 0.93; UR = 113; 9 species). General symptoms, gynecological problems, and skin diseases all have an ICF value of 0.92 based on 54, 24, and 104 URs, respectively. Metabolic diseases, particularly diabetes, have an ICF of 0.91 reported by 6 informants with a total UR of 54. Infectious diseases and injury-related ailments showed comparatively lower ICF values of 0.88 and 0.79, respectively. These values indicate differing levels of informant consensus among the ailment categories. Comparative analyses of peer-reviewed ethnobotanical studies from Manipur, employing indices such as the Informant Consensus Factor (ICF), valley communities (e.g., Meitei and Lois) show higher species richness and wider therapeutic applications, whereas hill-dwelling communities (e.g., Zeliangrong and Tangkhul) exhibit more specialized medicinal plant repertoires, reflecting the influence of forest ecosystems and altitudinal variation (Rajkumari *et al.* 2014; Panmei *et al.* 2019;

Yuhlung & Bhattacharyya, 2016; Singh *et al.* 2025). The ICF results demonstrate that the Chakpa community utilizes a wide range of plant species to address specific diseases, reflecting the ecological diversity of the area.

Table 3. Fidelity Level and Informant Consensus Factor of documented medicinal plants used by the Chakpa community of Tairenpokpi Village

Ailment Category	Disease under each category	Plants	Fidelity Level (%)	Informant consensus factor (ICF)
Connective diseases	Muscle swelling, rheumatoid arthritis, sciatica	<i>Vitex negundo</i>	73	0.96
		<i>Paederia foetida</i>	39	
Digestive diseases	Abdominal pain, stomachache, constipation, diarrhoea, gall bladder problem, hepatitis, indigestion, liver disease, stomach ulcer, toothache, jaundice	<i>Brassaiopsis bodinieri</i>	19	0.95
		<i>Caesalpinia bonduc</i>	89	
		<i>Centella asiatica</i>	22	
		<i>Cuscuta reflexa</i>	70	
		<i>Cynodon dactylon</i>	38	
		<i>Eupatorium cannabinum</i>	20	
		<i>Ficus racemosa</i>	37	
		<i>Mimosa pudica</i>	44	
		<i>Mukia maderaspatana</i>	62	
		<i>Pavetta indica</i>	44	
		<i>Perilla frutescens</i>	64	
		<i>Phyllanthus emblica</i>	24	
		<i>Plumbago zeylanica</i>	100	
		<i>Portulaca oleracea</i>	71	
		<i>Solanum americanum</i>	42	
		<i>Solanum anguivi</i>	56	
		<i>Solanum viarum</i>	44	
		<i>Tinospora sinensis</i>	56	
		<i>Vitex negundo</i>	39	
General symptoms	Body pain, hemorrhoids, fever, piles	<i>Alangium chinense</i>	66	0.92
		<i>Eclipta prostrata</i>	78	
		<i>Oroxylum indicum</i>	57	
		<i>Pavetta indica</i>	41	
		<i>Xylosma longifolia</i>	44	
Genitourinary diseases	Kidney stone, urinary tract problem	<i>Brassaiopsis bodinieri</i>	38	0.93
		<i>Celtis timorensis</i>	100	
		<i>Cissus adnate</i>	80	
		<i>Machilus gamblei</i>	63	
		<i>Mimosa pudica</i>	45	
		<i>Rhus chinensis</i>	53	
		<i>Urena lobata</i>	77	
Gynaecological problems	Menstrual problem, Lactation problem, Leucorrhoea	<i>Hydrocotyle sibthorpioides</i>	48	0.92
		<i>Oroxylum indicum</i>	27	
		<i>Scutellaria discolor</i>	36	
Infectious diseases	Amoebiasis, chicken pox, measles, mumps, tetanus, tuberculosis, typhoid, rabies, dysentery, inflammation Cholera, Dengue, Boils	<i>Dactyloctenium aegyptium</i>	59	0.88
		<i>Jatropha gossypifolia</i>	82	
		<i>Persicaria posumbu</i>	41	
Injury	Burns, cuts, wounds, insect bites, bone fractures, and snake bites	<i>Knoxia roxburghii</i>	75	0.79
		<i>Litsea glutinosa</i>	100	
		<i>Paederia foetida</i>	61	
		<i>Rungia pectinata</i>	64	

Metabolic diseases	Diabetes	<i>Brassaiopsis bodinieri</i>	34	0.91
		<i>Ficus hispida</i>	64	
		<i>Ficus racemosa</i>	36	
		<i>Oreocnide integrifolia</i>	65	
		<i>Terminalia chebula</i>	76	
		<i>Tinospora sinensis</i>	43	
Respiratory diseases	Asthma, cough, lung problems, pneumonia, tonsillitis, bronchitis	<i>Acorus calamus</i>	83	0.93
		<i>Dactyloctenium aegyptium</i>	29	
		<i>Drymaria cordata</i>	54	
		<i>Machilus gamblei</i>	16	
		<i>Melia azedarach</i>	62	
		<i>Pavetta indica</i>	34	
		<i>Phlogacanthus thyrsoformis</i>	15	
		<i>Scutellaria discolor</i>	32	
		<i>Zanthoxylum acanthopodium</i>	38	
Skin Diseases	Rash, eczema, skin problem	<i>Alocasia macrorrhizos</i>	56	0.92
		<i>Diplazium esculentum</i>	47	
		<i>Phyllanthus emblica</i>	35	
		<i>Plantago asiatica</i>	58	
		<i>Rumex maritimus</i>	67	
		<i>Scutellaria discolor</i>	27	
		<i>Stachytarpheta cayennensis</i>	55	
		<i>Toona ciliata</i>	70	
		<i>Xylosma longifolia</i>	43	

Conclusion

The present study represents the first-ever documentation of ethnomedicinal plants utilized by the Chakpa community of Tairenpokpi village, Imphal West district, Manipur. Traditional healers and village elders possess extensive knowledge of medicinal plants used to treat specific primary health ailments, including their appropriate dosages and methods of preparation. The findings reveal that herbs constitute the majority of documented plants, while leaves emerge as the most frequently used plant part, primarily administered orally. These patterns of medicinal plant use reflect a substantial level of ethnobotanical knowledge within the community, enabling community members to identify appropriate plant species, determine their safe use, and apply traditional knowledge regarding dosage and other relevant therapeutic practices. Quantitative analyses, including use value (UV), fidelity level (FL), and informant consensus factor (ICF), identified several culturally important and frequently used species, such as *Eupatorium cannabinum*, *Oroxylum indicum*, *Plumbago zeylanica*, *Celtis timorensis*, and *Litsea glutinosa*. The high level of consensus observed for common disease categories, particularly digestive diseases, which were associated with 19 plant species and 336 use reports, indicates a strong degree of agreement among informants regarding the therapeutic use of these plants. The sustainability of these knowledge systems is increasingly threatened by reduced intergenerational transfer of plant knowledge, declining interest among younger generations and lack of adequate scientific documentation. Furthermore, changes in land use, population decline, and unsustainable collection methods pose serious threats to the conservation and sustainable use of these ethnomedicinal plant species. Comprehensive documentation of this kind can contribute to the safeguarding of indigenous medical knowledge, sustainable utilization and identification of potential resources for future drug discovery. The efficacy and safety of the documented remedies need scientific validation.

Declarations

List of abbreviations: UV- Use Value; FL - Fidelity Level; ICF - Informant Consensus Factor; FPIC - Free, Prior and Informed Consent; ICD-International Classification of Diseases; WHO - World Health Organization

Ethics approval and consent to participate: Information was collected from the informants using the following Free, Prior, and Informed Consent (FPIC) protocols, maintaining ethical standards. All participants provided informed verbal consent before data collection and participated voluntarily. Anonymity and confidentiality were strictly maintained throughout the study.

Consent for publication: Before publication, informed consent was obtained from all participants for the use of their data and/or images in this study.

Availability of data and materials: All relevant data are included within the article. Additional data can be accessed by contacting the first author.

Competing interests: The authors declare no competing interests.

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Author contributions: Yumnam Marconi Meitei conceptualized and designed the study, conducted data collection, data analysis, and drafted the original manuscript. Seram Devika Devi contributed to study design and was involved in manuscript preparation and editing. Deshworjit Singh Ningombam assisted in data analysis and participated in manuscript revision. Thoithoiba Oinamcha participated in the survey and data collection. Roshipriya Madingbam contributed to data preparation. All authors read, reviewed, and approved the final version of the manuscript.

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Literature Cited

- Agrawala DK, Gogoi R, Dash SS, Jalal JS, Krishna G, Kumar A, Odyuo N, Sharma HN, Bhardwaj PK, Hepuni L, Kar A, Tham BBT, Meitei LR. 2023. Flora of Manipur: A Pictorial Guide. In: Mao AA, Mukharjee PK. (eds). Botanical Survey of India, Kolkata, India & Institute of Bioresources and Sustainable Development, Imphal, India.
- Ahmed HM. 2016. Ethnopharmacobotanical study on the medicinal plants used by herbalists in Sulaymaniyah province, Kurdistan, Iraq. *Journal of Ethnobiology Ethnomedicine* 12(1):8. doi: 10.1186/s13002-016-0081-3.
- Ales A. 2012. Therapeutic uses of *Musa paradisiaca* L. in traditional medicine. *Indian Journal of Traditional Knowledge* 11(3):532-535.
- Alpuerto A, Bangaysiso FT, Galang A, Maquiling V, Taylor L, Ugat GJ. 2010. Level of awareness and extent of utilization of the ten medicinal plants approved by the Department of Health. *Advancing Nursing Research* 2(1):73-92. doi: 10.7828/anrj.v2i1.283.
- Ansari MA, Sharma SK, Roy SS, Ramakrishna Y, Datt S, Ningombam A, Singh NA, Luiram S, Prakash N. 2021. Documenting the agriculture based indigenous traditional knowledge in Manipur State of North Eastern India. *Indian Journal of Traditional Knowledge* 20(4):1065-1074. doi: 10.56042/ijtk.v20i4.32549.
- Barnert J, Messmann H. 2008. Management of lower gastrointestinal tract bleeding. *Best Practice & Research Clinical Gastroenterology* 22(2):295-312. doi: 10.1016/j.bpg.2007.10.024.
- Boomibalagan B, Eswaran S, Rathinavel. 2013. Traditional uses of medicinal plants of Asclepiadaceae by rural people in Madurai District, Tamil Nadu, India. *International Journal of Botany* 9(3):133-139. doi: 10.3923/ijb.2013.133.139.
- Census of India. 2011. Manipur, Series 15, Parts I-A & I-B. Office of the Registrar General & Census Commissioner, Government of India, Ministry of Home Affairs, New Delhi, India. <https://censusindia.gov.in> (Accessed 23/09/2026).
- Chatterjee S, Saikia A, Dutta P, Ghosh D, Pangging G, Goswami AK. 2006. Biodiversity Significance of North East India. WWF-India, New Delhi, India, P. 71.
- Cherneva D, Nikolova N, Dimitrova T, Ivanov D, Iliev I, Georgieva S, Yaneva G. 2025. Traditional use of medicinal plants for symptom relief during the COVID-19 pandemic in Bulgaria. *Plants* 14(23):3692. doi: 10.3390/plants14233692.
- Choudhury MD, Bawari M, Singha LS. 2010. Some antipyretic ethno-medicinal plants of Manipuri community of Barak Valley, Assam, India. *Ethnobotanical Leaflets* 14:21-28.
- Das AP. 2021. Herbarium techniques. In: Bhandari JB, Gurung C (eds). *Instrumentation Manual*. Narosa Publishing House, New Delhi, India, Pp. 78-94.
- Das S, Sultana KW, Chandra I. 2023. In vitro propagation, phytochemistry and pharmacology of *Basilicum polystachyon* (L.) Moench (Lamiaceae): A short review. *South African Journal of Botany* 155:178-186. doi: 10.1016/j.sajb.2023.02.009.
- Deb DB. 1961a. Dicotyledonous plants of Manipur territory. *Bulletin of the Botanical Survey of India* 3(3):253-350.
- Deb DB. 1961b. Monocotyledonous plants of Manipur territory. *Bulletin of the Botanical Survey of India* 3(2):115-138.
- Dutta BK, Dutta PK. 2005. Potential of ethnobotanical studies in North East India: An overview. *Indian Journal of Traditional Knowledge* 4(1):7-14.
- El Amri J, El Badaoui K, Zair T, Bouharb H, Chakir S, Alaoui TEM. 2014. Ethnobotanical study of medicinal plants in the region El Hajeb (Central Morocco). *Journal of Research in Biology* 4(8):1568-1580.

- Franco FM, Narasimhan D. 2012. Ethnobotany of the Kondh, Poraja, Gadaba and Bonda of the Koraput Region of Odisha. DK Printworld, New Delhi, India.
- Friedman J, Yaniv Z, Dafni A, Palewitch D. 1986. A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. *Journal of Ethnopharmacology* 16(2-3):275-287. doi: 10.1016/0378-8741(86)90095-9.
- Haokip N, Duary RK. 2021. Traditionally used unexplored ethnomedicinal plants by Thadou-Kuki tribe of Churachandpur District, Manipur, India. *Journal of Complementary Medicine Research* 12(2):2146-8397.
- Hazrat A, Shah J, Nisar M. 2011. Medicinal plants of Sheringal Valley, Dir Upper, KPK, Pakistan. *FUUAST Journal of Biology* 1(2):131-133.
- Heinrich M, Ankli A, Frei B, Weimann C, Sticher O. 1998. Medicinal plants in Mexico: Healers' consensus and cultural importance. *Social Science & Medicine* 47(11):1859-1871. doi: 10.1016/S0277-9536(98)00181-6.
- Heinrich M. 2000. Ethnobotany and its role in drug development. *Phytotherapy Research* 14(7):479-488. doi: 10.1002/1099-1573(200011)14:7<479::AID-PTR958>3.0.CO;2-2.
- Hodson TC. 1908. *The Meitheis*. D. Nutt Publication, London, U.K.
- Jain SK, Rao RR. 1977. *A Handbook of Field and Herbarium Methods*. Today & Tomorrow's Printers and Publishers, New Delhi, India, Pp. 1-157.
- Khan MT, Ahmad L, Rashid W. 2018. Ethnobotanical documentation of traditional knowledge about medicinal plants used by indigenous people in Talash Valley of Dir Lower, Northern Pakistan. *Journal of Intercultural Ethnopharmacology* 7(1):8-24. doi: 10.5455/jice.20171226090420.
- Kumar K, Sharma YP, Manhas RK, Bhatia H. 2015. Ethnomedicinal plants of Shankaracharya hill, Srinagar, J&K, India. *Journal of Ethnopharmacology* 170:255-274. doi: 10.1016/j.jep.2015.05.021.
- Malik K, Ahmad M, Bussmann RW, Tariq A, Ullah R, Alqahtani AS, Shahat AA, Rashid N, Zafar M, Sultana S, Shah SN. 2018. Ethnobotany of anti-hypertensive plants used in Northern Pakistan. *Frontiers in Pharmacology* 9:789. doi: 10.3389/fphar.2018.00789.
- Mantuan V, Sannomiya M. 2024. Women and medicinal plants: A systematic review in the field of ethnobotany. *Acta*
- Mao AA, Gogoi R. 2010. Floristic study of Dzukou Valley and surrounding hills, Manipur and Nagaland, India. *Indian Forester* 136(1):57-68. doi: 10.5555/20103130751.
- Martin GJ. 1995. *Ethnobotany: A Methods Manual*. Chapman & Hall, U.K. People and Plants Conservation Manual No. 1. 268 pp.
- Meitei LR, De A, Mao AA. 2022. An ethnobotanical study on the wild edible plants used by forest dwellers in Yangoupoki Lokchao Wildlife Sanctuary, Manipur, India. *Ethnobotany Research and Applications* 23:15.
- Ningthoujam SS, Talukdar AD, Potsangbam KS, Choudhury MD. 2013. Traditional uses of herbal vapour therapy in Manipur, North East India: An ethnobotanical survey. *Journal of Ethnopharmacology* 147:136-147. doi: 10.1016/j.jep.2013.03.013.
- Okoye TC, Uzor PF, Onyeto CA, Okereke EK. 2014. Safe African medicinal plants for clinical studies. In: Kuete V. (ed.). *Toxicological Survey of African Medicinal Plants*. Elsevier, Amsterdam, The Netherlands, Pp. 535-555.
- Ong HG, Kim YD. 2020. Medicinal plants for gastrointestinal diseases among the Kuki-Chin ethnolinguistic groups across Bangladesh, India, and Myanmar: A comparative and network analysis study. *Journal of Ethnopharmacology* 251:112415. doi: 10.1016/j.jep.2019.112415.
- Panmei R, Gajurel PR, Singh B. 2019. Ethnobotany of medicinal plants used by the Zeliangrong ethnic group of Manipur, northeast India. *Journal of Ethnopharmacology* 235:164-182. doi: 10.1016/j.jep.2019.01.009.
- Plants of the World Online. 2026. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. <http://www.plantsoftheworldonline.org> (Accessed 23/09/2026).
- Rahman SU, Khan S, Sayed U, Ali H, Ullah K, Khan H. 2024. Importance of traditional knowledge in modern drug discovery. In: Rahman SU. (eds). *Traditional Resources and Tools for Modern Drug Discovery: Ethnomedicine and Pharmacology*. Springer Nature Singapore, Singapore, Pp. 77-89.
- Rajkumari R, Nirmala RK, Singh PK, Das AK, Dutta BK, Pinokiyo A. 2014. Ethnoveterinary plants used by the Chiru tribes of Manipur, Northeast India. *Indian Journal of Traditional Knowledge* 13(2):368-376.
- Ralte L, Khiangte L, Thangjam NM, Kumar A, Singh YT. 2022. GC-MS and molecular docking analyses of phytochemicals from the underutilized plant, *Parkia timoriana* revealed candidate anti-cancerous and anti-inflammatory agents. *Scientific Reports* 12(1):3395. doi: 10.1038/s41598-022-07320-2.

- Ralte L, Sailo H, Singh YT. 2024. Ethnobotanical study of medicinal plants used by the indigenous community of the western region of Mizoram, India. *Journal of Ethnobiology and Ethnomedicine* 20(1):2. doi: 10.1186/s13002-023-00656-6.
- Ralte L, Singh YT. 2024. Ethnobotanical survey of medicinal plants used by various ethnic tribes of Mizoram, India. *PLOS ONE* 19(5):e0302792. doi: 10.1371/journal.pone.0302792.
- Robinson H, Kennedy SK, Manibabu M. 2021. Ethnobotany of therapeutic native plants in Manipur (India): A preliminary survey report. *Aadhunik Sahitya*:275-286.
- Sahoo AK, Behera HC, Behura AK. 2020. Ethnomedicine and traditional health care system of a particular vulnerable tribal group in India: Application of plant extracts. *Research Square* 1-21. doi: 10.21203/rs.3.rs-25202/v1.
- Scientiarum. *Biological Sciences* 46: e70700. doi: 10.4025/actascibiolsci.v46i1.70700.
- Shaheen H, Qaseem MF, Amjad MS, Bruschi P. 2017. Exploration of ethnomedicinal knowledge among rural communities of Pearl Valley, Rawalakot, district Poonch, Azad Jammu and Kashmir. *PLOS ONE* 12(9):e0183956. doi: 10.1371/journal.pone.0183956.
- Sharma BM, Sharma HM, Devi AR. 2003a. Ethnomedicinal uses of plants by the Manipuris (Meiteis) of Manipur. In: Singh VK, Govil JN, Hashmi S, Singh G. (eds). *Recent Progress in Medicinal Plants*. Vol. 7. Ethnomedicine and Pharmacognosy II. Studium Press LLC, Houston, Texas, USA, Pp. 523-541.
- Sharma HM, Devi AR, Sharma BM. 2003b. Ethnomedicinal uses of monocotyledonous plants by the Meiteis of Manipur. In: Singh V, Jain AP. (eds). *Ethnobotany and Medicinal Plants of India and Nepal*. Scientific Publishers, Jodhpur, India, Pp. 473-480.
- Sharma HM, Devi AR. 2004. Ethnomedicinal uses of plants in the treatment of urinary tract diseases by the Meiteis of Manipur. In: *Ethnomedicinal Plants*. Pointer Publishers, Jaipur, India, Pp. 151-160.
- Sharma J, Gairola S, Sharma YP, Gaur RD. 2014. Ethnomedicinal plants used to treat skin diseases by Tharu community of district Udham Singh Nagar, Uttarakhand, India. *Journal of Ethnopharmacology* 158:140-206. doi: 10.1016/j.jep.2014.10.004.
- Simpson MG. 2006. *Plant Systematics*. Elsevier Academic Press, Amsterdam, The Netherlands. ISBN: 0-12-644460-9.
- Singh NP. 2000. *Flora of Manipur*. Botanical Survey of India, Calcutta, India.
- Singh SS, Ralte L, Sailo H, Pinokiyo A, Devi MR, Khomdram SD, Singh YT. 2025. Ethnobotanical study of medicinal plants used by Lois community of Kakching district, Manipur, India. *Trees, Forests and People* 19:100765. doi: 10.1016/j.tfp.2024.100765.
- Singh T, Radhapyari DA, Sharma HM. 2018. Ethnopharmacological survey of medicinal plants in Andro village in Manipur (India). *Research Journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences* 4(5):606.
- Singh YD, Panda MK, Satapathy KB. 2020. Ethnomedicine for drug discovery. In: Patra JK, Shukla AC, Das G. (eds). *Advances in Pharmaceutical Biotechnology: Recent Progress and Future Applications*. Springer Singapore, Singapore, Pp. 15-28. doi: 10.1007/978-981-15-2195-9_2.
- Siraj J. 2022. Ethnobotany. In: *Medicinal Plants*. IntechOpen, London, U.K. <https://www.intechopen.com/chapters/81532> (Accessed 31/05/2026).
- Ssenku JE, Okurut SA, Namuli A, Kudamba A, Tugume P, Matovu P, Wasige G, Kafeero HM, Walusansa A. 2022. Medicinal plant use, conservation, and the associated traditional knowledge in rural communities in Eastern Uganda. *Tropical Medicine and Health* 50(1):39. doi: 10.1186/s41182-022-00429-5.
- Thangliankhup K, Lalfakawma, Gouda S, Sandhyarani KD. 2022. Ethnomedicinal plants of Kuki-Chin tribes in Kaihlam Wildlife Sanctuary of Manipur, India. *Acta Ecologica Sinica*.
- Thokchom S, Ningombam DS, Chanchal CH, Birkumar HS. 2015. Folk-medicare system of Chakpa community of Andro Village of Manipur in Northeast India. *American Journal of Ethnomedicine* 2(4):239-264.
- Torres-Avilez W, Nascimento AL, Santoro FR, Medeiros PM, Albuquerque UP. 2019. Gender and its role in the resilience of local medical systems of the Fulni-ô people in NE Brazil: Effects on structure and functionality. *Evidence-Based Complementary and Alternative Medicine* 2019:8313790. doi: 10.1155/2019/8313790.
- Weckerle CS, de Boer HJ, Puri RK, van Andel T, Bussmann RW, Leonti M. 2018. Recommended standards for conducting and reporting ethnopharmacological field studies. *Journal of Ethnopharmacology* 210:125-132. doi: 10.1016/j.jep.2017.08.018.
- World Health Organization. 2022. ICD-11 for Mortality and Morbidity Statistics (Version 02/2022). <https://icd.who.int/browse11/1-m/en> (Accessed 31/05/2026).
- Xavier TF, Kannan M, Lija L, Auxillia A, Rose AK. 2014. Ethnobotanical study of Kani tribes in Thoduhills of Kerala, South India. *Journal of Ethnopharmacology* 152(1):78-90. doi: 10.1016/j.jep.2014.01.013.

- Yuan H, Ma Q, Ye L, Piao G. 2016. The traditional medicine and modern medicine from natural products. *Molecules* 21(5):559. doi: 10.3390/molecules21050559.
- Yuhlung CC, Bhattacharyya M. 2016. Indigenous medicinal plants used by the Maring tribe of Manipur, Northeast India. *Journal of Ayurvedic and Herbal Medicine* 2(4):146-153.
- Yumnam RS, Devi CO, Abujam SS, Chetia D. 2012. Study on the ethnomedicinal system of Manipur. *International Journal of Pharmaceutical & Biological Archives* 3(3):587-591.
- Zemedu J, Mekuria T, Ochieng CO, Onjalalaina GE, Hu GW. 2024. Ethnobotanical study of traditional medicinal plants used by the local Gamo people in Boreda Abaya District, Gamo Zone, Southern Ethiopia. *Journal of Ethnobiology and Ethnomedicine* 20(1):28. doi: 10.1186/s13002-024-00666-z.