

Folklore Ethno-Medicinal Plants Used by the Manger Tribe from Gangtok District of Sikkim-India

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ABSTRACT

The Manger community, one of the indigenous communities living in Sikkim's Gangtok district since ages, has ethnomedical practices that are examined and documented in this study. Important information on 40 medicinal plant species used to cure a variety of illnesses was gathered through field surveys and interviews with five identified traditional healers. Quantitative analysis was employed using the Informant Consensus Factor (ICF) and Use Value (UV). These plants—mostly herbs (70%)—are used as decoctions, pastes, powders, and liquids. The most commonly used portion is the leaf (27.1%). Asteraceae (11.6%), Apiaceae, and Fabaceae (8.6%) are the most frequently used families. The highest ICF was for respiratory conditions (0.556), and plants like *Mentha sylvestris* and *Costus speciosus* (UV=1.0) are highly significant. The findings show how deeply the Manger traditional healers have preserved their cultural knowledge and how urgently thorough recording is needed, especially in light of urbanization and the loss of generational expertise.

Keywords: Folk Medicinal Plants, Gangtok, Manger Tribes, Sikkim, Traditional healers.

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INTRODUCTION

In ethnobotanical studies, the major contribution has been in the field of medicine. The ethnic and rural people of India have preserved a large bulk of traditional knowledge of medicinal uses of plants growing around them. This knowledge is handed down to generations through word of mouth and is extensively used for the treatment of common diseases and conditions.^[1] The indigenous people of India use a wide range of herbal remedies to effectively treat a number of illnesses. The components of plants used, how they are prepared, and how they are administered differ depending on the location.^[2] With Charak Samhita (700 B.C.) and Sushruta Samhita (200 B.C.) serving as the standard databases, the Rigveda (67 medicinal plants), Yajurveda (81 medicinal plants), and Atharvaveda (290 medicinal plant species) contain the oldest references to medicinal plants.^[3]

Medicinal plants should be designated as "National Importance" since their continued availability is crucial to the continuation

of one of India's oldest medical traditions in the world. One of the twelve mega diversity centers in the globe is recognized to be India. Sikkim is one of the Eastern Himalayas' biodiversity hotspots, although making up only 0.2% of the nation's total land area.^[4] In the Himalayan region, traditional knowledge about plants and how they are used in local medicine is drastically declining; it is crucial to record this knowledge before it vanishes forever. With the exception of a little bit of information there is very little specific literature from Sikkim about ethnomedicinal plants.^[5] In order to facilitate the development of medications that would benefit humanity, it has been deemed imperative to document traditional knowledge regarding the ethnomedical usage of plants.^[6]

Sikkim is a small Indian state, which is surrounded by the Himalayas, is home to a variety of ethnic tribes and cultures, including three main groups: the Lepcha, Bhutia, and Nepali. There are 23 sub-communities within the Nepali group, and each has its own customs, rituals, dietary preferences, and ethnomedical practices. Sikkim's ethnic population is diverse, yet there is very little systematic research on traditional medicines, with the majority of attention focused on plant-based therapy.^[7] Sikkim has a strong cultural history of using traditional remedies. The incredibly abundant Sikkim flora contains several raw medications that are mentioned in Ayurvedic scriptures. In the



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Sikkim Himalayan region, the tribal people employ roughly 420 plants to treat a variety of illnesses.^[8]

In various literary works, the term Magar is also referred to as Magari, Manger, and Mangar. It is both an ethnonym and a glottonym. One of the Mongoloid communities in South East Asia's Himalayan range speaks the language. Mostly located in Nepal, the Magar people are hardly in Myanmar, Bhutan, and India. They are particularly found in the Indian states of West Bengal and Sikkim. Sikkim's historical literature and artifacts from other parts of the state attest to the fact that the Magars, like Lephas, are among the Sikkim's indigenous communities.^[9] The Manger community, which is one of Sikkim's Most Backward Classes, has a long history of living in wooded areas and is frequently said to have originated in eastern Asia. They honor the natural world and the ancestral spirits known as Kul Pitra by offering them a variety of natural offerings. The Manger group does not eat Jal Kapur Macha, a type of fish, because they are known as Macheý Gotra, a Hindu clan that can trace its paternal heritage back to a common ancestor, typically a saint or sage. It is discovered that the Manger Community mostly use indigenous medicine to treat illnesses in relation to their ecopedagogical activities. In the framework of nature conservation and protection, the existence of diverse techniques and practices within the Manger community has a significant position. Indigenous medicine that prioritizes the use of ecologically friendly tools, socially conscious attitudes and practices, culturally significant dietary habits that are in harmony with the natural world, and nature.^[10]

METHODOLOGY

Study Area

The study area selected was Gangtok district of Sikkim, Gangtok is also the capital of Sikkim and an "Urbanization hub".

Topographical location -Latitude - 27° 25' North to 27°11' North and Longitude - 88° 53' East to 88°26' 10" East. Gangtok district's climate can be broadly classified into three zones: alpine, tropical, and temperature. Because there is rainfall every month, the climate is cold and humid for the most of the year. Sitting at a topological elevation of roughly 5500 feet above sea level. Gangtok has a religion abundance where Hindu being the highest followed by Buddhist and Christianity at third. This study area was selected as to find the sources of ethnomedicine practitioners still existing in this rapid urbanising area.

Data Collection

A field survey was conducted after locating the traditional healer belonging to the specific community (Manger). Locating the healer was done by purposive sampling in the district. Raw data was collected using pre-structured questionnaires and face-to-face open-ended interview from, summarized in Table 1. The

duration of the process of data collection and analysing was five (5) months, i.e. from February 2025 to June 2025.

The informants were included on the basis of their expertise, experience and popularity, due to the declining rate of folk healing practitioners of the community (Manger), [reason being various like urbanisation, loss of belief on folk-healing leading to less practitioners, loss of interest of newer generation in learning and utilisation of traditional folk knowledge] in the Gangtok area 5 informants (traditional healers) were located and questions were asked accordingly in local Nepali language using the pre-structured questionnaire. The data regarding local names of plant, the parts used, doses, method of preparation, administration route, were collected.

The data of plants were validated using websites (Plant of world online, JSTOR, Tropicos, IKDL, IMPB, Plantnet). The data collected was with the verbal consent of the informant and the data collected is solely for education purpose.

Data Analysis

The raw ethnomedical data collected were quantitatively analyzed to access the relative importance and healing potential of the mentioned medicinal plants the following statistical methods were employed:

Use value: It measure the relative importance of each plant species based on the number of uses mentioned by informant.

$$UV = \frac{\sum U}{n}$$

Where:

U=the number of use reports cited by the informant for a given plant species.

N=total number of informants interviewed.

Greater ethnomedicinal significance and broader community use of the herb are indicated by a higher UV.^[11]

Informant Consensus Factor (ICF): The ICF evaluates the level of agreement among informants regarding plant use for treating specific ailment categories.

$$ICF = \frac{Nur - N_{taxa}}{(Nur - 1)}$$

Where:

N_{taxa}= number of taxa (species) used for a particular ailment category.

Nur = total number of use reports in that category.

Higher ICF scores (which range from 0 to 1) show that informants are more in agreement about particular plant species for particular illnesses.^[12]

RESULTS AND DISCUSSION

Field survey was conducted in the urban area of Gangtok (Figure 1) and total of 5 informants were located and interviewed during the survey. All informants were identified as folk healers of the manger community and all of them were males of different age categories.

Out of five (5), three (3) were illiterate, one had completed education only till primary and one was a graduate as illustrated in Table 2. The knowledge of different medicinal plants was a family/cultural treasure and were passed down through the family elders, two of them having a same guru (Teacher). As belonging to the same tribe, the medicinal plants used and the treatments were very similar varying only in their techniques of utilisation.

Parts of the plant used

According to the survey, different plant parts are used medicinally; the most commonly used portion is the leaf, which accounts for about 27.1% of all uses. While seeds and the entire plant are used in roughly 11.8% of cases, roots come in second with 14.1%. 10.6% of the entries use rhizomes, while 9.4% use fruits. In 5.9% of cases, bark is used, and in 4.7%, flowers. Less frequently, gum and pods are mentioned in just 1.2% of the uses, whilst stems are utilized in 2.4% of cases illustrated in Figure 2. This distribution shows a strong dependence on vegetative parts, especially leaves, which may indicate that they are used extensively in traditional medicine.

Common family of used plants

Although a number of plant families are covered, some are more common than others. With about 11.4% of all entries, the Asteraceae family is the most frequently utilized, which reflects its importance in traditional medicine due to its wide range of pharmacological characteristics. Apiaceae and Fabaceae, which together account for about 8.6% of the listed plants, come next. About 5.7% of the entries belong to the Poaceae, Rosaceae, and Zingiberaceae families, which are also commonly seen information is illustrated in Figure 3.

Life form frequency

The vast majority of recorded therapeutic plants are herbs, accounting for over 70% of all entries. This suggests that traditional medical practices strongly favor herbaceous species. Next in line are trees, which make up around 16% of the plants used, and shrubs, which make up about 9%. About 5% of the entries are grasses, and one herbaceous climber is included as mentioned in Figure 4.

Availability and vulnerability status

Important information about the ecological and conservation state of the 40 medicinal plant species used by the Manger community in Gangtok, Sikkim, can be gleaned from their

availability and vulnerability status. 15 out of 40 species (37.5%) are categorized as "Common," meaning that they are widely available and frequently used in the local environment. Furthermore, five species (12.5%) are classified as "Cultivated," indicating that members of the community are actively cultivating these plants for either traditional or regular access. "Cultivated/Available," "Invasive/Common," "Common/Commercially Available," "Common/Monitored for Overuse," "Very Common," and "Rare/Endemic" are other classes with a single occurrence (each representing 2.5%). These imply either distinctiveness with possible conservation value or local adaptability. The availability and vulnerability status of the 40 medicinal plant species used by the Manger community in Gangtok, Sikkim, provide important information on their ecology and conservation status. "Common," which denotes that they are readily accessible and commonly utilized in the local environment, applies to 15 out of 40 species (37.5%) illustrated in Figure 5.

Additionally, five species (12.5%) are categorized as "Cultivated," meaning that community members are actively growing these

Table 1: Pre-Structured Questionnaires.

Pre-Structured Questionnaires
1. Demographic details of the healer (age, education, occupation).
2. For how many years have you been practicing traditional healing?
3. For how many generations has your family been practicing traditional healing and which generation healer you fall in?
4. Can you give me the local names, portions and parts of the plants you use for the treating patients?
5. What is the most common ailment you are approached by the people for cure?
6. How often do you get repeated visitors?
7. From where do source your herbs/ medicinal plants from?
8. In which dosage form do you give out the durgs to you visitors/patients?
9. Is there any disease or ailment that you have high success in treating it? (Expertise).
10. Can you list out the procedure for preparation of the medication?
11. Can you provide the proper dose, frequency and administration route for using the herbal medicine you provide?

Table 2: Table depicting the informants' educational background.

Education Level	Number of Informants	Percent (%)
Illiterate	3	60.0%
Primary Education	1	20.0%
Graduate	1	20.0%

Table 3: List of folklore medicines used by the Manger Tribe from Gangtok district-Sikkim.

Biological name, family, authority name	Local name	Parts used	Growth Habit	Mode of utilization and uses	Mode of administration	Availability/vulnerability	Use Value (UV)
1. <i>Elusine coracana</i> L. Family: <i>Poaceae</i>	Kodo	Seeds	Grass	The seeds are dried and grounded to flour, the flour is then mixed with water and little amount of sugar, the solution is then drinking three times a day to cure any kind of body pains and it is also used as an immunobooster by mixing some yellow mustard and an egg to it.	Oral	Common/ Cultivated	0.4
2. <i>Litsea citrata</i> Bl. Family: <i>Lauraceae</i>	Siltimur	Seed and fruit	Tree	Decoction of leaves is consumed orally to relieve from bloating, stomach cramps, and improves digestion. Leaves and seed are boiled and inhaled as steam or taken as tea to treat sore throat, chronic cough and headache. Essential oil from fruits is mixed with mustard oil and applied topically provides relief from joint pain and inflammation.	Oral and topical	Common	0.6
3. <i>Lepidium sativum</i> L. Family: <i>Lauraceae</i>	Chamsur	Seed	Herb	Paste of crushed seeds mixed with mustard oil is applied externally to cure bone fracture and reduce joint pain.	Topical	Cultivated/ Available	0.2
4. <i>Eupatorium adenophora</i> Spreng. Family: <i>Asteraceae</i>	Ban mara	Leaves	Herb	Decoction of leaves use to treat for jaundice and liver detoxification. Crushed leaves or paste is applied to Cuts, bleeding and wounds. Whole plant poultice is applied to swollen joints and pain. Stem inhalation of leaves is used to treat chronic cough.	Oral and topical	Invasive/ Common	0.8
5. <i>Coix lacryma</i> L. Family: <i>Poaceae</i>	Bajanti	Leaves and roots	Grass	The leaves or the roots are made into a paste and applied to the cut area or wound to stop bleeding, heal the wound.	Topical	Common	0.2
6. <i>Selinum vaginatum</i> (Edgew.) C.B.Clarke Family: <i>Apiaceae</i>	Bhootkosh	Roots and rhizome	Herb	The roots are powdered and half a teaspoon is given in case of convulsions (administration tenure may vary), its powder is also given with water or milk to cure menstrual cramps, irregular menstruation.	Oral	Locally Common	0.4
7. <i>Swertia chirata</i> (Roxb. ex-Fleming) H. Karst. Family: <i>Gentianaceae</i>	Chirauto	Whole plant	Herb	Dried plant decoction is consumed orally to treat Malarial fevers, liver disorders, chronic fever and bronchial asthma, loss of appetite and intestinal worms. Powdered herb is taken with warm water used to treats jaundice, indigestion, and constipation. Whole plant decoction consumed orally to regulate blood sugar level and also regulate bold pressure.	Oral	Threatened/ Vulnerable	0.6

Biological name, family, authority name	Local name	Parts used	Growth Habit	Mode of utilization and uses	Mode of administration	Availability/vulnerability	Use Value (UV)
8. <i>Rubus ellipticus</i> Sm. Family: <i>Rosaceae</i>	Aaiselo	Roots and fruit	Shrub	Root decoction and berry juice are given in treat diarrhea, and stomachache, gastric ulcers and indigestion. Root decoction is used to treat sore throat, cough and fever.	Oral	Common	0.4
9. <i>Crisum verutum</i> (D. Don) Spreng. Family: <i>Asteraceae</i>	Thakailo	Roots, leaves	Herb	Root is made into juice and given for treating fevers and leaf extracts are given in order to treat diarrhoea.	Oral	Data Deficient	0.4
10. <i>Artemisia vulgaris</i> L. Family: <i>Asteraceae</i>	Titay pati	Whole plant	Shrub	The leaves are crushed and made into a paste to treat wounds. The leaves are also used to stop nosebleeds. Dried and powdered form is also used in skin ailments.	Topical	Common	0.6
11. <i>Woodfordia fruticosa</i> (L.) Kurz Family: <i>Lythraceae</i>	Dhairi	Flowers, leaves	Shrub	The dried flowers are used to treat dysentery and work as anthelmintic, while pastes of leaves are used for treating wounds and to stop bleeding.	Oral and topical	Common	0.4
12. <i>Potentilla fulgens</i> Wall ex Hook. Family: <i>Rosaceae</i>	Bajradanta	Whole plant		The plant is made into juice to treat cough, cold and stomach problems, the root powder is used to treat toothaches.		Locally Common	0.4
13. <i>Centella asiatica</i> (L.) Urb. Family: <i>Apiaceae</i>	Ghol topre	Whole plant	Herb	Crushed into paste and applied topically for wounds, burns, and skin diseases. Leaves decoction is taken for fever, colds, and urinary infection.	Topical and oral	Common/ Commercially Available	0.4
14. <i>Bombax ceiba</i> L. Family: <i>Bombaceae</i>	Simali	Root	Herb	Decoction is used to treat diarrhoea and dysentery.	Oral	Common	0.2
15. <i>Bergenia ciliate</i> (Haw.) Sternb. Family: <i>Saxifragaceae</i>	Pakanbhed	Roots, rhizome and leaves	Herb	Rhizome paste is applied topically to alleviate body aches, joint pain, and inflammation. The rhizome powder is taken with milk and honey to cure gastritis, constipation, diarrhea and dysentery. Fresh leaf or rhizome paste is applied to wounds, ulcers, and infections for its antimicrobial properties. Rhizome paste applied in bone fracture and dislocation of joints.	Oral and topical	Near Threatened	0.8
16. <i>Zanthoxylum acanthopodium</i> DC. Family: <i>Rutaceae</i>	Timbur	Leaves and fruit	Tree	Fruit paste applied directly to tooth and gum pain. Dried fruit powder mixed with warm water or honey stimulates digestion and relieves bloating. Seed oil massaged onto painful joints reduces inflammation and pain in arthritis. Fruit infusion with honey.	Oral, topical	Common	0.6

Biological name, family, authority name	Local name	Parts used	Growth Habit	Mode of utilization and uses	Mode of administration	Availability/vulnerability	Use Value (UV)
17. <i>Piper nigrum</i> L. Family: <i>Piperaceae</i>	Marich	Seed	Herb	Powdered seeds are consumed to treat GI ailments.	Oral	Cultivated	0.2
18. <i>Trigonella foenum graecum</i> L. Family: <i>Fabaceae</i>	Methi	Seed	Herb	Powdered seeds are consumed to lower blood sugar levels, and treat coughs.	oral	Cultivated	0.4
19. <i>Myrica esculenta</i> Buch.-Ham. ex D. Don. Family: <i>Myricaceae</i>	Kaphal	Bark, roots and fruits	Tree	Bark decoction is used as anti-diarrheal, anti-inflammatory. Fruits are used for various ailments and have a strong antioxidant property.	Oral	Near Threatened	0.4
20. <i>Heracleum wallichii</i> DC. Family: <i>Apiaceae</i>	Chimphing	Roots, seeds, leaves	Herb	Seed powder uses as a carminative. Dry roots and seed decoction are used to treat Gastritis, intestinal worm sore throat cough and cold, and indigestion. Root poultice for arthritis and swollen joints. Seed inhalation uses to treat sinusitis.	Inhalation, oral	Data Deficient	0.8
21. <i>Platyclusus orientalis</i> L. Family: <i>Cupressaceae</i>	Pankhi	Leaves	Herb	Decoction of the leaves is used to treat cough.	Oral	Cultivated/Ornamental	0.2
22. <i>Rhuem australe</i> D. Don Family: <i>Polygonaceae</i>	Padamchal	Rhizome	Herb	Dried rhizome is consumed as tonic for stomach aches.	Oral	Endangered	0.2
23. <i>Costus speciosus</i> Smith. Family: <i>Zingiberaceae</i>	Betlauree	Herb	Rhizome, leaves, root and stem	Powdered rhizome taken with warm water to treat Diabetes. Decoction made by boiling rhizome with water, taken to treat fever. Crushed leaves applied as a paste on boils or affected skin. Dried and powdered rhizome mixed with honey or warm water re given in intestinal worm and constipations. Poultice of boiled rhizome applied to inflamed areas.	Oral, topical	Common	1.0
24. <i>Oxalis corniculata</i> Linn. Family: <i>Oxalidaceae</i>	Chari amilo	Whole plants	Herb	A paste is prepared to apply to wounds, cuts etc. Decoctions of roots and leaves are used for treating digestive ailments.	Oral and topical	Common	0.4
25. <i>Paris polyphylla</i> Sm. Family: <i>Melanthiaceae</i>	Satuwa	Rhizome	Herb	Dried rhizome or decoction of rhizome works as an antidote to treat poisoning. Paste of rhizome is used to treat wounds.	Oral and topical	Endangered	0.4
26. <i>Senegalia catechu</i> (L.f.) Willd Family: <i>Fabaceae</i>	Bhoteykhayar	Bark, roots	Tree	Bark extracts are used to treat throat pain.	Oral	Common	0.2

Biological name, family, authority name	Local name	Parts used	Growth Habit	Mode of utilization and uses	Mode of administration	Availability/vulnerability	Use Value (UV)
27. <i>Curcuma longa</i> L. Family: Zingiberaceae	Besar	Rhizome	Herb	A decoction made by boiling turmeric rhizomes in water is consumed to alleviate throat pain, cough, acidity and ulcer, cold, and fever. A paste of fresh turmeric rhizomes is applied to cuts and wounds, joints pain and skin care, to promote healing. Consuming a solution of turmeric extract with water after meals help in digestion and alleviate stomach disorders.	Oral solution and topical	Cultivated	0.6
28. <i>Sinapsis Alba</i> L. Family: Brassicaceae	Tori	Seeds and leaves	Herb	Paste of seeds are made and applied to the chest to treat cough and cold. Seeds can be used as emetic.	Oral and topical	Cultivated	0.4
29. <i>Psidium guajava</i> L. Family: Myrtaceae	Belauti	Fruit, seeds and bark	Herb	Leaves are consumed to treat GI issues, diarrhoea.	Oral	Common	0.2
30. <i>Cynodon dactylon</i> (L.) Pers. Family: Poaceae	Dubo	Whole plant	Herb	Fresh juice or paste is applied to wounds to stop bleeding and promote healing. Root decoctions are given to treat Diarrhoea, dysentery, piles and stomach ulcers. Paste of fresh leaves applied to swelling and joints pain.	Oral solution and topical	Very Common	0.6
31. <i>Mentha Sylvestris</i> L. Family: Lamiaceae	Padina	Herb	Whole plant	Fresh leaves are chewed directly to relieve gas, nausea, stomach cramps, indigestion and bloating. Leaf decoction is drunk with honey, or leaves are inhaled as steam to treat cough and cold, clears congestion, soothes sore throat, and acts as an expectorant. Crushed leaves are applied to the forehead or temples to provide cooling relief from headaches and mild fevers. Leaves are chewed in toothache, bad breath and gum infection.	Inhalation, oral and topical	Common	1.0
32. <i>Cyamopsis tetragonoloba</i> (L.) Taub. Family: Fabaceae	Gujur	Pods, leaves	Herb	Gum is extracted from the pods and used in diabetes and diarrhoea.	Oral	Cultivated	0.4
33. <i>Tagetes erecta</i> L. Family: Asteraceae	Gaada	Flowers, leaves		Extract of flowers is given to cure fever, stomach irritation, while leaves extracts are used to cure piles, and treat boils.	Oral	Cultivated/Ornamental	0.4

Biological name, family, authority name	Local name	Parts used	Growth Habit	Mode of utilization and uses	Mode of administration	Availability/ vulnerability	Use Value (UV)
34. <i>Drymaria cordata</i> Wild Family: <i>Caryophyllaceae</i>	Abijalo	Whole plant	Herb	Leaf juice or decoction is used to treat cough and cold, fever and respiratory infection. Leaf paste is applied topically to reduce joint pain and inflammation. Leaf decoction is consumed to treat diarrhea and stomach ailments. Leaf decoction or juice also treats pneumonia. Stem inhalation of whole plant applied to treat sinusitis.	Topical, inhalation, oral	Common	0.8
35. <i>Dioscorea bulbifera</i> L. Family: <i>Dioscoreaceae</i>	Bhui tarul	Leaves	Herb/ climber	Juice is extracted from the leaves and administered orally for treating diarrhoea and in some cases rectal bleeding.	Oral	Common/ Monitored for overuse	0.2
36. <i>Oxalis corniculata</i> Linn. Family: <i>Oxalidaceae</i>	Chari amilo	Whole plant	Herb	Fresh leaves are chewed directly to treat indigestion, bloating, and loss of appetite. Crushed leaves are applied as a poultice applied on cuts, burns, boils, ringworm and snake bites. Leaf extract is taken with warm water help in reducing dysentery, stomach-ache, fever indigestions and diarrhoea.	Oral	Common	0.6
37. <i>Phytolacca acinose</i> Roxb. Family: <i>Phytolaccaceae</i>	Jarango	Rhizome, root and leaves	Herb	Fresh rhizome and leaf are crushed into a paste and applied topically to treat body ache, joints pain, swelling, boils, eczema, and fungal infections. A very diluted root extract is used to treat constipation and intestinal worms.	Oral, topical	Common	0.4
38. <i>Pouzolzia hirta</i> Blume ex. Hassk. Family: <i>Urticaceae</i>	Chipley Jhar	Roots and leaves	Herb	Leaf and root paste are directly applied topically to treat cuts, burns and skin inflammation. Warm root poultice applied to treat in bone fracture and joint pain.	Topical	Data Deficient	0.4
39. <i>Schima wallichii</i> (DC.) Kort. Family: <i>Theaceae</i>	Chilaune	Bark, leaves	Tree	Bark paste is applied topically to treat arthritis, sprains, and muscle pain. Leaves paste and bark extract prevent infection in cuts and skin ulcers, boils and eczema. Twigs are used as natural toothbrushes. Bark paste is also used to treat bone fracture.	Topical	Common	0.6
40. <i>Tupistra nutans</i> Wall. Family: <i>Liliaceae</i>	Nakima	Leaves and rhizome	Herb	Paste of rhizome and leaf poultice are used to treat joint pain and inflammation. Crushed leaves are applied directly to cuts or boils. Diabetes, stomach ulcers, indigestion, and acidity, fever, joint pain and inflammation. Rhizome extract helps in relieving gastrointestinal issues. Inflorescence are cooked and consumed to regulate blood sugar level.	Oral, topical	Rare/ Endemic	0.8

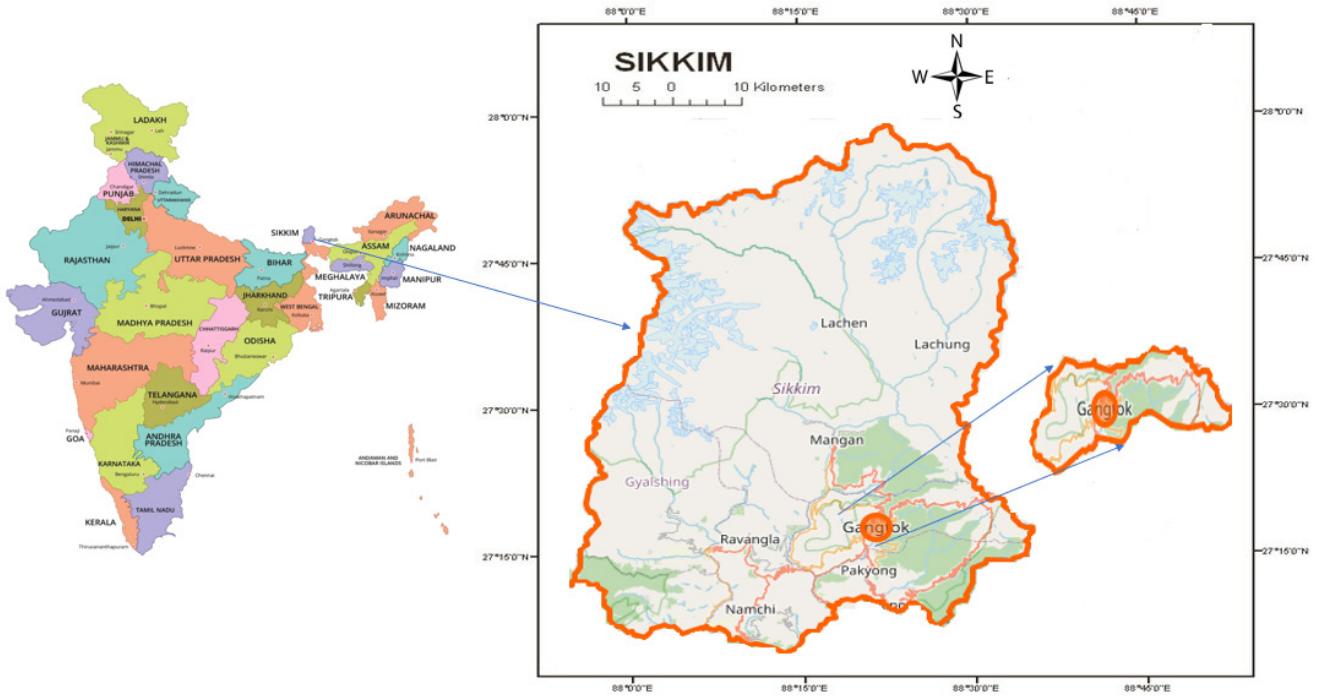


Figure 1: Study area: Medicinal plants used by the Manger tribe from Gangtok District of Sikkim-India.

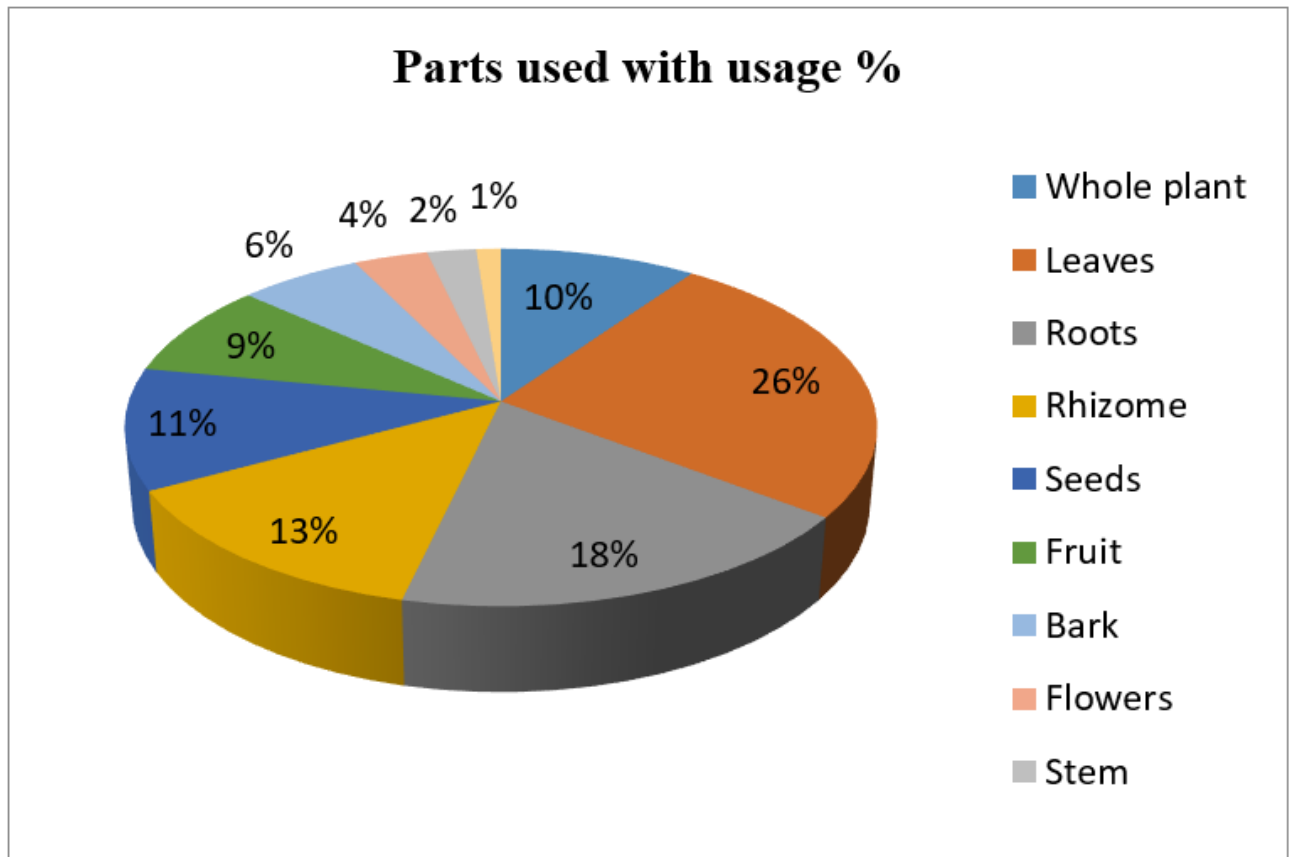


Figure 2: Parts used of plants in folk ethno-medical plants.

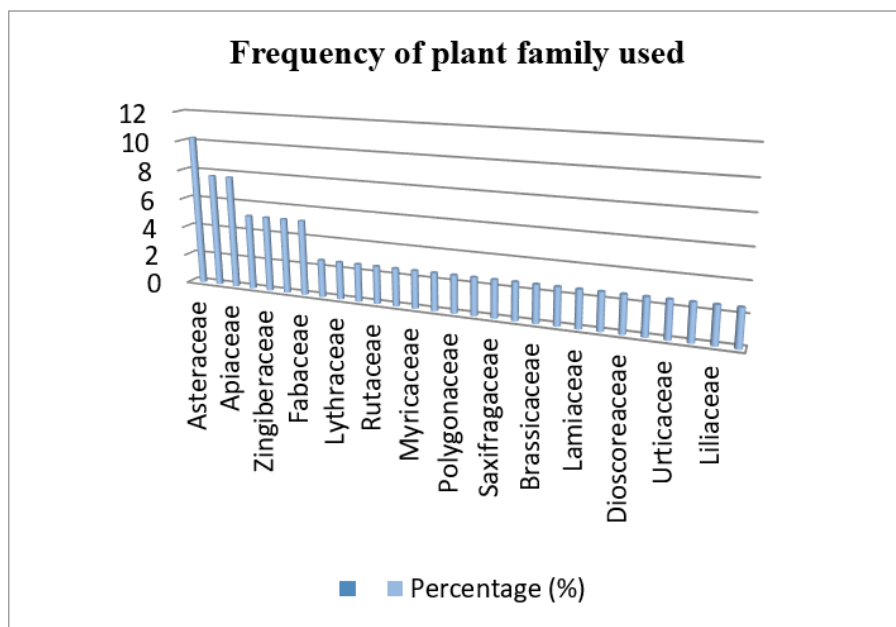


Figure 3: Frequency of family of plants used in folk medicines.

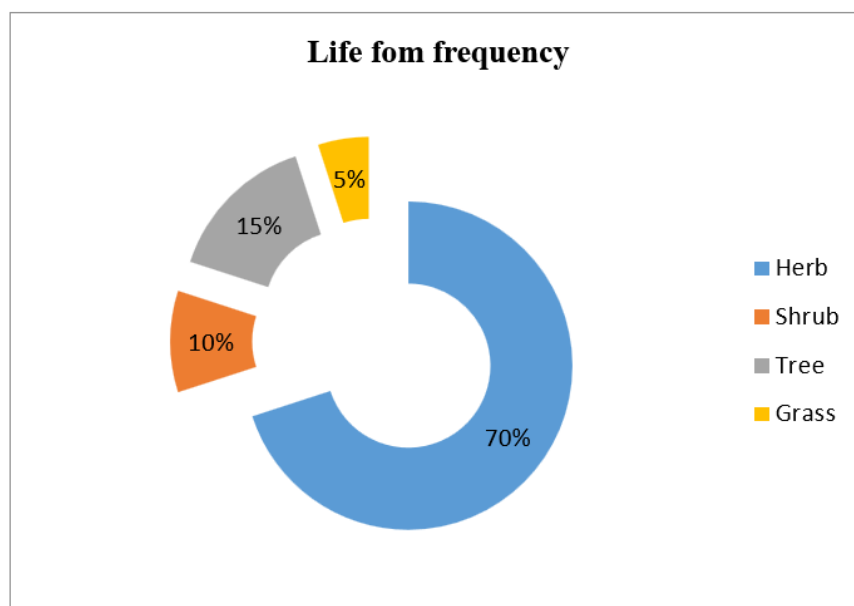


Figure 4: Life form of the plants used.

plants for regular or customary access. Other groups with a single occurrence (each representing 2.5%) include "Cultivated/Available," "Invasive/Common," "Common/Commercially Available," "Common/Monitored for Overuse," "Very Common," and "Rare/Endemic." These suggest either local adaptation or uniqueness with potential conservation significance.

Five traditional healers from the Manger community were the focus of an ethnomedical assessment carried out in the Gangtok, Sikkim, metropolitan region. Each of the five informants represented a different age range and was male. One healer had finished primary school, one had a degree, and the majority (60%) was illiterate. Most of their medical knowledge was passed down through family members; some even had the same guru or mentor.

The investigation found that although individual application and preparation techniques differ, the Manger healers often employ comparable herbs and therapeutic modalities. There are 40 known species of medicinal plants that are used to cure a wide variety of illnesses. Because of their accessibility and high concentration of bioactive substances, herbaceous species were preferred, with the majority of plants being herbs, followed by trees and shrubs. Key findings, Use of Plant Parts: The most commonly used plant part was the leaf (27.1%), which was followed by the roots (14.1%), seeds and entire plants (11.8% each), and rhizomes (10.6%). This pattern indicates a preference for vegetative elements, most likely as a result of their accessibility and ease of preparation. Plant Families: The Asteraceae family, which is renowned for its

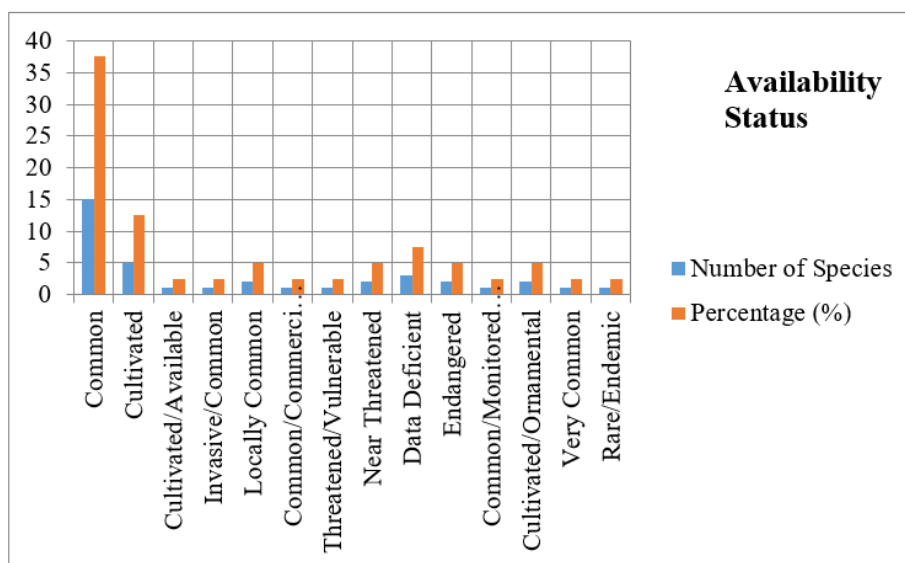


Figure 5: Availability status of the medicinal plants.

Table 4: Informant Consensus Factor (ICF) by ailment categories.

Ailment Category	ICF
Respiratory	0.556
Reproductive	0.500
Pain/Musculoskeletal	0.484
Gastrointestinal	0.417
Skin	0.412
Other	0.346
Wounds	0.333
Fever/Infection	0.267
Neurological	0.0
Diabetes	0.0
Dental	0.0
Poisoning	0.0

medicinal diversity, was the most frequently represented plant family (11.4%). Apiaceae and Fabaceae (8.6% combined) came next in line. There were also notable appearances of families including Zingiberaceae, Rosaceae, and Poaceae. Growth Habit (Life Form): Herbs accounted for 70% of therapeutic plants, with trees (16%), shrubs (9%), and grasses (5%), following closely behind. This demonstrates once more how simple it is to gather and prepare herbs. Availability and Vulnerability, 12.5% of species were categorized as "Cultivated", whereas the majorities (37.5%) were categorized as "Common". The fact that some were classified as "Threatened", "Near Threatened", "Endangered", or "Rare/Endemic" highlights the significance of conservation initiatives. Use Value (UV), A number of plants were highly significant in ethnomedicine. *Mentha sylvestris* and *Costus speciosus*, for instance, both had UV values of 1.0, suggesting that the healers used them frequently and that they were significant to their culture summarized in Table 3. Informant Consensus Factor (ICF), The

categories of musculoskeletal pain (0.484), reproductive pain (0.5), and respiratory discomfort (0.556) showed the highest levels of agreement across informants. This suggests that some plants are commonly used for these circumstances. In the neurological, diabetes, dental, and poisoning categories, there was no unanimity (ICF = 0) mentioned in Table 4.

CONCLUSION

By identifying 40 plant species that are utilized to treat a variety of illnesses, the study effectively documents the traditional medicinal practices of the Manger community in Gangtok, Sikkim-India. For a number of species, the Use Value (U.V) and Informant Consensus Factor (ICF) analyses showed a high level of ethnomedicinal relevance, especially for the treatment of respiratory, reproductive, musculoskeletal and gastrointestinal disorders. This analysis confirms the cultural and therapeutic significance of the folk medicine of the Manger community and lays a crucial basis for future ethnopharmacological research.

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ABBREVIATIONS

GoS: Government of Sikkim; UV: Use Value; ICF: Informant Consensus Factor; B.C.: Before Christ; GI: Gastrointestinal.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICAL STATEMENT

The verbal consent of the informants was taken and mentioned that it was purely for education purpose only.

AUTHORS' CONTRIBUTIONS

RM, and SB, responsible for the selection of the present survey work and major data collection from the field visit and face to face interview. S.B, responsible for the guiding the work till the end and S.B and JMK, contributed for drafting, designing, formatting, referencing of this survey article and communicating with esteemed journal having good reputation in the scientific fields. All authors have read and approved the manuscript.

SUMMARY

The findings show how deeply the Manger traditional healers have preserved their cultural knowledge and how urgently thorough recording is needed, especially in light of urbanization and the loss of generational expertise.

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