

Research Article

AN ETHNOBOTANICAL SURVEY OF PLANTS USED BY THE PEOPLE OF THE HMAR TRIBE OF DIMA HASAO DISTRICT, ASSAM, NORTH EAST INDIA

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ABSTRACT: The present ethnobotanical study was undertaken to assess the uses of the local plants of Dima Hasao district, diversity, and conservation concerns of medicinal plants used in the traditional herbal care system of *Hmar* tribes in Dima Hasao district of Assam in northeastern India. Since ancient times, *Hmar* tribes have used local plants as medicines to treat many human diseases. Such information has a lot of potential for developing new medications and managing future healthcare.

Key words: *Hmar* tribe, Ethnomedicine, Dima Hasao, Northeastern India.

INTRODUCTION

The term ethno derives from the Greek word ethnos, which means nation, tribe, or race. The qualities and functions of the plants in their environment are well known to the native population. People depend on forest resources for a variety of things, such as food, medicine, wood, and non-timber forest products (Pushpangadan 1995). Different plant parts are used to solve health-related issues from some ancient days and the ethnic people living in remote areas are still practicing many of such uses (Abu-Rabia 2005, Pattanayak 2021a, Pradhan *et al.* 2021). Documentation of such uses, validation of their reported efficacies, and efforts to use them in mankind is a continuous process (Patel *et al.* 2022, Paul and Sujatha 2022). It has been observed that the treatment cost of modern medicine is becoming very high and due to various reasons, even the availability of laboratory derived effective antimicrobial medicines is decreasing rapidly (Pattanayak 2022a, Srinivas *et al.* 2023, Mondal *et al.* 2023). So, the importance of evaluation and use of cheap herb-derived medicines is increasing.

In many parts of the developing world, traditional medicine has maintained its appeal, and its usage is expanding quickly in developed nations. According to the World Health Organization, traditional medicine and healing methods represent the major source of care for almost 80% of people worldwide. Approximately 6500 plant species are utilized as DIY

(do it yourself) treatments in Asia (Karki and Williams 1999). Plants have long been used by humans as a source of medicine and for many other purposes.

India is a large country with many different landscapes, weather, plant communities, and human populations. Small-town and rural-area residents, on the one hand, and tribal residents of far-flung villages make up the bulk of India's ethnobotanical samples. More than 130 of India's 427 tribal clans are based in the region's eight northeastern states. Assam is home to 14 distinct hill tribes or 12.8% of India's total tribal population. Among these are the Khasi, Jaintia, Garo, Naga, and a scattering of Mizo and related peoples. The Lushais, Pawis, Paithes, Raltes, Pang, Hmars, Kukis, Lakhers, and others are all members of the Mizo people. An indigenous people known as the Lushai migrated to India around the turn of the nineteenth century. The Lushai tribe accounts for the vast majority of Mizos (the Lushai hills are a southern extension of the Himalayas, hence the name of the region). They have learned a great deal over time about how to employ plants and plant products to treat a wide range of illnesses. They put a lot of faith in the treatments of their indigenous folklore medicine and use only their herbal therapy. Even though there is a plethora of published information from throughout India detailing how various indigenous communities employ various medicinal herbs (Abu-Rabia 2005, Albert and Gosai 2006).

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STUDY AREA

Dima Hasao district is the third largest after KarbiAnglong and Sonitpur district in Assam. Towards the north-east, it shares a border with Karbi Anglong district and Nagaland; to the east, it borders Manipur; to the north, Hojai district; to the west, Meghalaya; and to the south, it shares a border with the Cachar district. The quiet, peaceful towns provide a haven for the locals, who live in homes as charming and unique as the region itself. Kachari, Zeme Naga, Hmar, Kuki, Biata, and Hrangkhoh are some of the local peoples (Fig. 1).

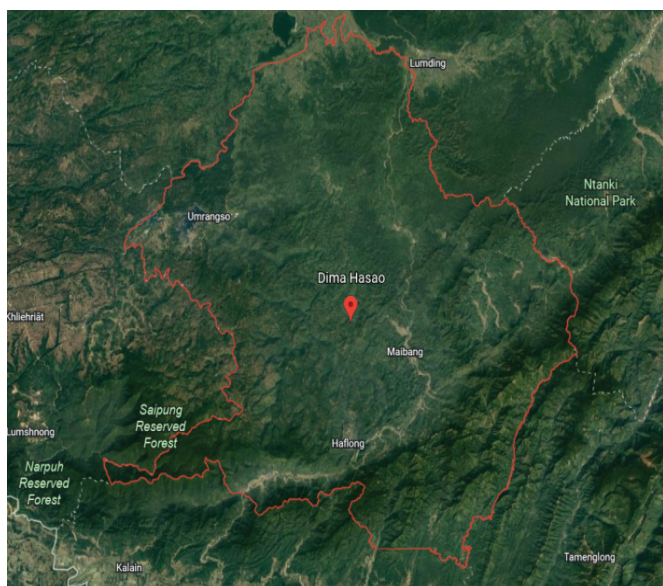


Fig. 1. Map Showing the study area Dima Hasao district, Assam, India.

THE FIELD SURVEY

From January 2020 to November 2021 researchers visited a variety of communities in the Mahur subdistrict of Assam's Dima Hasao district. The Hmar people were interviewed to compile basic information about native flora and their usage. These plants were gathered with the help of neighborhood experts and afterward photographed and identified in the herbarium. Saron, Suongbung, Garden, Khawlzang, Daudung, Gaidain Raji, Baozen, Chotorongmailai, Zoar, and Mahur market were the locations that were analyzed.

RESULTS AND DISCUSSION

There has been research done on the significant ethnobotanical plants used by the Hmar tribe in the Dima Hasao district. During the present observation and interaction with villagers, the herbal medicines practitioners, and other traditional healers of Hmar tribes, Dima Hasao. 22 species of vegetables, 22 species of edible fruits, and 61 species of medicinal

plants have been collected and listed with their correct names, vernacular names, parts used, and uses.

During a field survey, it was discovered that the Hmar population frequently suffers from many diseases, like piles, high blood pressure, cancer, dysentery, high blood sugar, jaundice, skin conditions, asthma, rheumatism, and more. Out of the 61 plants found, one plant is used to treat piles and cancer, three plants are used to treat blood sugar, five plants are used to treat skin conditions, two plants are used to treat asthma and rheumatism, eight plants are used to treat diarrhea, etc. It has been noted that they use most of the medicinal plants directly or get extracts of their succulent parts. But during validation of such ancient wisdom, this point is not given proper importance and generally only extracts of the dry plant parts are considered for all related research, though the succulent parts of the plants contain the highest number and quantity of phytoconstituents (Pattanayak *et al.* 2016, Pattanayak 2020).

The Hmar tribe uses four different species from the major families Solanaceae and Euphorbiaceae as medicine. It is interesting to note that different diseases have been treated using 48% of leaf samples, 16% of seeds, and 7% of bark. The Hmar tribe consumes 22 species of 15 family vegetables and 22 species of 17 family fruits. Alagesaboopathi (2009), Hossan *et al.* (2012) and Ojha *et al.* (2020) noted various important ethnomedicinal uses of plants of different tribal communities.

It is stressed that the flora should be encouraged to grow these ethnobotanical plants on a wide scale to optimize the economic situation. There are some reports of the use of such plants directly as some effective

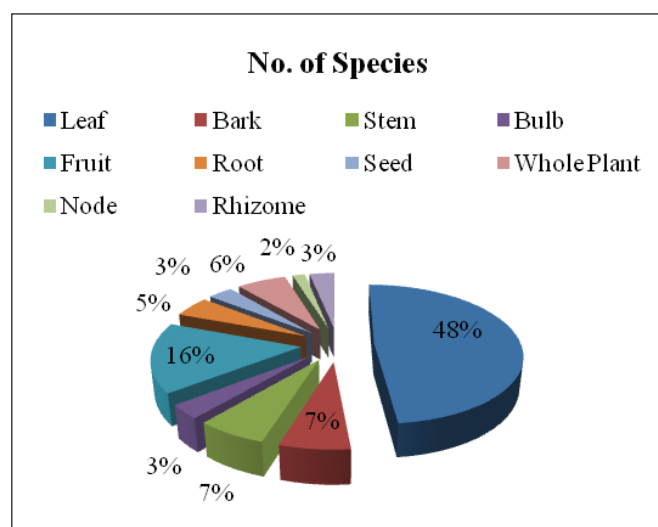


Fig. 2. Plant parts contributing no. of medicinal plant species.

An ethnobotanical survey of plants used by the people of the hmar tribe of dima hasao district ...

medicines to control many important diseases after their cultivation and encapsulation for global use (Pattanayak 2018, 2021b, 2022b) Thus, these

ethnobotanical plants may supply crude pharmaceuticals of economic importance for which they may become a very good economic source of the tribal people.

Table 1. List of ethnomedicinal plants by the Hmar tribes of Dima Hasao, Assam, India.

Plant name (Family)	Vernacular name	Parts used	Purpose of use	Mode of use
<i>Adhatoda vasica</i> Nees. [Acanthaceae]	Basok	Leaf	M	Drinking leaf juice can treat dysentery and cough.
<i>Aegle marmelos</i> L. [Rutaceae]	Belthei	Fruit	F, M	Drinking fruit juice to treat dysentery.
<i>Albizia lebbek</i> (L.) Benth [Meliaceae]	Kamatrak	Bark	M	Bark powder is strewn across the still stream as fish poison to catch fish.
<i>Allium cepa</i> L. [Liliaceae]	Purunsen	Bulb	V, M	Warm bulb juice is administered twice daily to treat menstrual irregularities.
<i>Allium sativum</i> L. [Liliaceae]	Purunvar	Bulb	V, M	One bulb piece is taken for getting relief from gastrointestinal issues.
<i>Aloe vera</i> (L.) Burm. [Liliaceae]	Elongera	Leaf	M	For relief from stomach pain and to treat black spots on the face, leaf juice is applied mixed with cow's milk and alcohol: leaf paste is used to cure wounds and reduce itching.
<i>Alstonia scholaris</i> (L.) R.Br. [Apocynaceae]	Chawngpereng	Stem	M	Localized applications of stem latex are made over the affected area of the skin as well as on all sides of the boils. To treat snakebites, the body is injected with leaf juice.
<i>Ananas comosus</i> L. [Bromeliaceae]	Rengtheite dawng	Fruit	M	Unripe fruit juice is used to induce abortions and regular menstruation.
<i>Andrographis paniculata</i> (Burm.f.) Wall. [Gentianaceae]	Chirata hna	Leaf	M	To treat stomachaches and fever, a leaf is soaked in water overnight and then taken the next morning. It is also used to eliminate tapeworms.
<i>Averrhoa carambola</i> L. [Oxalidaceae]	Thaiherot	Fruit	M	Fruit juice is consumed to treat liver issues. To treat redness or other issues with the eyes, a few drops of fruit juice are applied. Jaundice is treated with ripe fruit juice.
<i>Azadirachta indica</i> A. Juss [Meliaceae]	Neem	Leaf	M	To treat Pox, consumption of leaves or application of leaf juice and bathing in a solution made from boiled leaves.
<i>Cajanus cajan</i> L. [Leguminaceae]	Betlineng	Leaf	V,M	Jaundice is treated with leaf juice.
<i>Calotropis procera</i> (Air.) R. Br. [Asclepiadaceae]	Akanhna	Stem	M	The stem's latex is applied to the abscess.
<i>Cannabis sativa</i> L. [Cannabinaceae]	Nganja	Leaf	M	Hens and dogs are given leaf juice to treat weakness.
<i>Carica papaya</i> L. [Caricaceae]	Thingfenghna	Fruit	F, M	Dog bites can be treated using fruit sap. Jaundice is treated with leaf juice.
<i>Centella asiatica</i> L. [Apiaceae]	Lambak	Leaf	M	Dysentery can be treated with leaf juice.
<i>Chromolaena odorata</i> (L.) R.King. [Asteraceae]	Thlobuong	Leaf	M	Applying leaf juice to the area to be cut
<i>Cinnamomum tamala</i> (Buch-Ham) [Lauraceae]	Tejpata	Leaf	S, M	To control blood sugar, leaves are soaked in water overnight and then consumed the next morning.

Plant name (Family)	Vernacular name	Parts used	Purpose of use	Mode of use
<i>Citrus aurantifolia</i> (Christr.) Sw. [Rutaceae]	Serhna hring	Fruit, Leaf	F, M	To stop bleeding, leaf juice is applied inside the nose. Once the boil becomes suppured, prickle is applied.
<i>Clausena heptaphylla</i> (Roxb.) [Rutaceae]	Champara	Fruit	M	Fruit juice is taken to dissolve kidney stones and treat kidney problems.
<i>Clerodendrum viscosum</i> Vent. [Verbenaceae]	Phuibimhna	Leaf	M	Cuts and wounds are treated with leaf paste for quick healing.
<i>Clerodendrum colebrookianum</i> Walp. [Verbenaceae]	Anphui	Leaf	M	After heating, leaf juice is used to treat high blood pressure.
<i>Curcuma domestica</i> Salisb. [Zingiberaceae]	Aieng	Rhizome	M	To treat liver problems, rhizome powder, and water are taken orally.
<i>Cynodon dactylon</i> L. [Graminaceae]	Thlo	Leaf	M	Leaf juice is applied as an antiseptic to cuts.
<i>Datura metel</i> L. [Solanaceae]	Invetpar	Seed , Leaf	M	Joint pain is treated with seed and leaf paste.
<i>Datura stramonium</i> L. [Solanaceae]	Invetpar	Leaf	M	To treat asthma, boiled leaves are smoked. On rheumatism, leaf paste is externally applied.
<i>Dillenia indica</i> L. [Dilleniaceae]	Ailang	Fruit	M	Fruit juice is consumed to treat the dysentery condition.
<i>Emblica officinalis</i> Gaertn. [Euphorbiaceae]	Sunhlu	Fruit	M	To treat digestive issues and a propensity to vomit, one can consume boiling fruit juice. The fruit extract is also used topically to stop hair loss.
<i>Euphorbia niruri</i> (L.) [Euphorbiaceae]	Sunlunoith-um	Whole plant	M	When the liver is extended and in jaundice, whole plant decoction is taken.
<i>Hibiscus rosa-sinensis</i> L. [Malvaceae]	Reibalsen	Leaf	M	Cuts and abscesses are treated externally with leaf juice. To treat scurf, flower paste is applied to the hands.
<i>Jatropha curcas</i> L. [Euphorbiaceae]	Mutmaleng	Stem	M	For treating toothaches, stem latex is applied to the teeth. To relieve burning pain, charred areas are covered with leaf paste.
<i>Justicia gendarussa</i> Burm.f. [Acanthaceae]	Hlothing	Leaf	M	On cuts, leaf paste is externally applied.
<i>Kalanchoe pinnata</i> (Lam.) Pers. [Crassulaceae]	Meikang par	Leaf	M	To treat coughs, the leaves are frequently burned, consumed, and applied to body parts that are burning. Leaf paste is fed to treat diarrhea, and applied on burns.
<i>Lawsonia inermis</i> L. [Lythraceae]	Mehendi	Leaf	M	Leaf juice is used to treat wounds and remove dandruff from the head.
<i>Leucas aspera</i> L. [Lamiaceae]	Sairam	Leaf	M	Dandruff is removed by using leaf paste.
<i>Mangifera indica</i> L. [Anacardiaceae]	Theihai kung	Bark	F, M	Dysentery is treated by taking a decoction of dried bark.
<i>Melastoma malabathrium</i> L. [Melastomaceae]	Hmurkuong	Leaf	M	For diabetes, boiling leaf juice is consumed. Roots, bark, and stem are also edible.
<i>Mentha arvensis</i> L. [Lamiaceae]	Pudina	Leaf	M	Leaf juice is used as an ear drop as well as a remedy for stomachaches.

An ethnobotanical survey of plants used by the people of the hmar tribe of dima hasao district ...

Plant name (Family)	Vernacular name	Parts used	Purpose of use	Mode of use
<i>Mikania micrantha</i> Kunth. [Asteraceae]	Japanrang	Leaf	M	Leaf juice is consumed to treat piles as well as cuts and allergies.
<i>Mimosa pudica</i> L. [Mimosaceae]	Nuorhlo/Hlonuor zung	Root	M	To treat toothaches, root paste is applied to the teeth.
<i>Momordica charantia</i> L. [Cucurbitaceae]	Chankha	Leaf	M	Leaf decoction is fed to lower high blood pressure.
<i>Moringa oleifera</i> Lam. [Moringaceae]	Daingul	Bark	M	To relieve bone pain and fracture, bark paste is put on the affected area of the bone and tightly tied with the aid of a cloth. For stomach aches, a tender stem is used.
<i>Opuntia dillenii</i> Haw. [Cactaceae]	Kata kung	Whole plant	M	Plant aerial parts are warmed to use in bites of insects and snakes.
<i>Oxalis corniculata</i> L. [Oxalidaceae]	Inrainuthei	Root	M	To treat toothaches, powdered root is placed on the teeth.
<i>Piper betle</i> L. [Piperaceae]	Pan	Leaf	M	Leaf juice is applied in cuts to reduce pain due to scorpion stings
<i>Piper nigrum</i> L. [Piperaceae]	Hmarcha-inhlum	Fruit	M	Fruit powder is used for cough, sore throat, and other throat issues.
<i>Polygonum orientale</i> L. [Polygoniaceae]	Mirongru	Whole plant	M	Fish can be caught with ease by sprinkling whole plant powder on water.
<i>Psidium guajava</i> L. [Myrtaceae]	Kawlthuizik	Leaf	M	Dysentery is treated with leaf juice, abdominal pain is treated with tender leaf juice.
<i>Punica granatum</i> L. [Punicaceae]	Thaebufai	Leaf	M	For the treatment of dysentery and gastric issues, leaf twig extract is taken.
<i>Ricinus communis</i> L. [Euphorbiaceae]	Muthi	Leaf	M	Leaf juice is consumed to treat stool issues like constipation.
<i>Saccharum officinarum</i> L. [Poaceae]	Mafu	Stem	M	Jaundice and liver issues are treated with stem juice.
<i>Scoparia dulcis</i> L. [Scrophulariaceae]	Khuongabaihlo	Whole plant	M	In diabetes, extract of the aerial parts is consumed with water.
<i>Solanum indicum</i> L. [Solanaceae]	Tawkrakur	Fruit	M	To treat toothaches, fruit is boiled in mustard oil and tightly tied with a piece of cloth just below the ear or cheek.
<i>Solanum torvum</i> Sw. [Solanaceae]	Samtawkte	Fruit	M	On an abscess, fruit paste is applied locally.
<i>Spilanthes paniculata</i> wall.ex.Dc [Asteraceae]	Ansate	Leaf	M	A leaf decoction is consumed to treat pinworms
<i>Tabernaemontana divaricata</i> (L) Br. [Apocynaceae]	Pararsi	Juice	M	Juice made from leaf twigs is ingested in an early stage of cancer.
<i>Tamarindus indica</i> L. [Ceasalpinaceae]	Simkerlet	Seed & Leaf	M	Half of a warmed seed placed above a fire is applied to the area of snake and dog bites.
<i>Terminalia arjuna</i> (Roxb.) Wight. [Combretaceae]	Arjun	Bark	M	Bark has been soaked in water for one night and extract fed in digestive upset.
<i>Thunbergia grandiflora</i> (Roxb.ex Rottl.) Roxb. [Thunbergiaceae]	Vaakhrui	Node	M	Watery juice made from the node inter-node is applied locally to the eyes in conjunctivitis.

Plant name (Family)	Vernacular name	Parts used	Purpose of use	Mode of use
<i>Urena lobata</i> L. [Malvaceae]	Vawkpuihner-kawl	Root	M	Dysentery and hyperacidity are treated with root powder diluted in rice water or plain water. Also used as a toothbrush is the stem.
<i>Zingiber officinale</i> Rosc. [Zingiberaceae]	Aithing	Rhizome	S, M	Coughs are treated by taking rhizome juice. Inflammation is reduced by applying leaf paste.

[Abbreviation used: F = edible fruit, V = Vegetable, M = Medicinal, S = Spices].

CONCLUSION

This study has uncovered important details on the edible plants, vegetables, and fruit that the Hmar tribe in the area uses for ethnomedicine. It is vital that locals are made aware of the medical benefits of these native plants and properly networked, as well as formulate plans to safeguard and conserve these species. To have such a reliable system, input from diverse societal sectors, professions, and strata will be necessary. However, because ethnic or tribal people used to sell these plants on the market for high rates, many of the ethnomedicinal plants are now becoming scarce. The overuse of many useful therapeutic plants in nature demonstrates how uncommonly they are found in rural areas. To preserve the genetic resources of the plants and their long-term uses, an immediate effort must be made to safeguard these ethnomedicinal plants by mass propagation and the cessation of overexploitation of local medicinal plants from other regions of the Dima Hasao district. Additionally, comparable research must be started in other tribes as well.

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