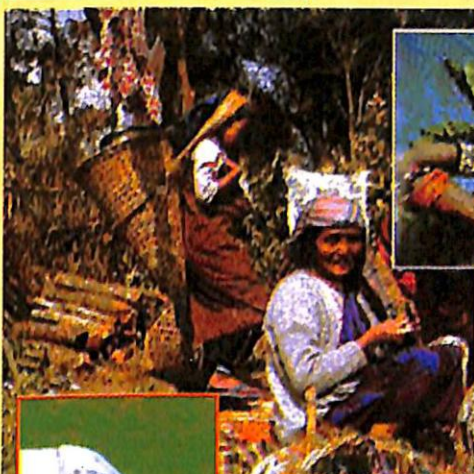


ETHNOMEDICINE OF NORTH-EAST INDIA



Proceedings of
NATIONAL SEMINAR ON
**TRADITIONAL
KNOWLEDGE
BASE ON
HERBAL MEDICINES AND
PLANT RESOURCES OF
NORTH-EAST
INDIA**
PROTECTION,
UTILIZATION
AND
CONSERVATION

MARCH 13-15, 2001
GUWAHATI (ASSAM)

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ETHNOMEDICINE OF NORTH-EAST INDIA

*Proceedings of National Seminar on Traditional Knowledge
Base on Herbal Medicines and Plant Resources of
North-East India – Protection, Utilization and Conservation
13-15 March 2001, Guwahati, Assam*

Editors

Dr. Gian Singh
Dr. H.B. Singh
Dr. T.K. Mukherjee



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FOREWORD

India, the land of Ayurveda, is recognized the world over as a rich source of medicinal and aromatic plants. North-East (NE) region of India is very rich in plant biodiversity as well as in ethnic diversity. The characteristic of the NE region is its tribal population which accounts for 57.15 per cent of the total population of this area. The tribal population varies from 12.83 per cent in Assam to 94.75 per cent in Mizoram. The ethnic communities of the area still maintained a great traditional knowledge base in herbal medicines. However, this valuable information lying scattered with different communities is under threat of modernization. Overexploitation and the destruction of forest wealth are leading to depletion of these herbal drugs from their natural habitat and many may be at brink of extinction. Eroding social structure and the desire for the modern are also contributing to the disappearance of this traditional knowledge. The only way to protect, conserve and use this heritage knowledge for the well-being of humanity is to create social awareness about the traditional knowledge as well as resources.

This seminar organized by NISCAIR is an attempt in this direction. It is the first serious attempt to identify the groups engaged in research on ethnomedicine in this region. Various research workers and experts who have participated in the seminar discussed their own work and created a social awareness about this valuable resource. This resource has a potential of acting as a medium of social and economic transformation in this part of India. Key papers presented about the state-of-the-art of information on ethnomedicine of each state in this area and the individual papers will play an important role in documentation of still unknown aspects of ethnomedicine of the region. Social awareness about the threat of extinction and overexploitation of these herbal resources by unscrupulous elements will pave the way to effectively counter any attempt of bio-piracy and patenting of the information from these sources. The attempt to identify and document information on ethnic medicine is the beginning of an important era to protect and utilize our ethnic information. Implementation of the recommendations made during the seminar will play a significant role in economic growth of the area.

V.K. Gupta

Director

National Institute of Science Communication
and Information Resources, New Delhi

PREFACE

Situated as it is, in the tropical belt of the world, India is a trough of rich vegetation. North-East (NE) India comprising the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim is very rich in plant biodiversity as well as in ethnic diversity and has a great traditional knowledge base in plant resources. The flora and fauna of this region is numerous and varied. The region accounts for 7.8% of the total land space of the country.

North-East India with its rich floristic diversity is also inhabited by the largest number of tribes and they lead an intricate life totally dependent on the forest plants. Virtually their requirements ranging from food, fuel, fodder, medicine, cordage and various other domestic needs are met from the local vegetation. Overall tribal population of this region accounts for more than 57 per cent of the total population. However, Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Nagaland comprise more than 73 per cent tribal population of the total population, thus imparting a predominantly tribal character to the region.

So far, information on ethnobotanical knowledge of this region is available only for 372 plant species in published literature. Considering the richness of plant diversity of the region, the actual documented information is too meagre leaving a yawning gap in so far as untapped knowledge is concerned, which needs to be bridged. It is imperative to study the traditional herbal medicine being practiced in the region and document the same for proper sustained utilization. There is a need to set up a People's Biodiversity Register, a programme to involve people in documenting biodiversity on which they have sovereignty leading to protection of their Intellectual Property Rights (IPRs).

The objective of this Seminar was to bridge the information gap of the untapped resources by interacting with the tribal people of the region, the holders of traditional knowledge. It was at the behest of the Govt. of India and Council of Scientific & Industrial Research (CSIR), the National Institute of Science Communication and Information Resources (NISCAIR), formerly known as NISCOM, organized this seminar in Guwahati during March 2001; aimed at developing the NE region. It was felt that it could be possible by taking an initiative in sensitizing the people and creating awareness in local people about the importance of medicinal plants of the

area. Today's patent regime can be made an instrument of economic growth of the traditional knowledge on plant resources is documented properly.

In this seminar, more than fifty research workers participated and thirty research papers were presented. The seminar being first of the kind provided an excellent opportunity to deliberate on the relevant topics and developmental issues to foster networking and partnership between specialists of diverse background.

We are thankful to the Govt. of India and CSIR for funding this programme. We are grateful to Dr. H.L. Duorah, the Vice-Chancellor of Guwahati University for not only his help and cooperation but also for chairing the Valedictory Function of the Seminar. Our thanks are due to Dr. S. Borthakur, Professor, Department of Botany, Guwahati University, and his colleagues for their excellent logistic support extended to the organizers. We are thankful to director, Indian Institute of Entrepreneurship (IIE), Guwahati for hosting the Seminar and providing accommodation and other facilities, which enabled us to conduct the seminar smoothly.

We wish to record our sincere thanks to Shri Ajay Kumar, Development Commissioner, Arunachal Pradesh, not only for consenting to inaugurate the Seminar but also for the keen interest evinced by him in the Seminar. We are extremely thankful to all the Coordinators from the different states of NE region for their unflinching support and cooperation in making the Seminar a success.

Editors

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Recommendations of the Seminar

The following recommendations emanated from the deliberations of this Seminar :

1. It is the general opinion that this type of Seminars should be organized in each state of the North-East Region, starting with the one that needs immediate attention. Participation of local communities in such Seminars should be encouraged.
2. A society for Indigenous Knowledge base of Bioresources of North-East India should be set up. Steps taken up in this direction by Dr S K Borthakur of Gauhati University, should be strengthened.
3. Establishment of Bioresource Centre in this region for bioresource prospecting is recommended taking in consideration existing Bioresource Centre in North Eastern Region.
4. Inventorisation and documentation of bioresources of North-East India should be taken up in the light of Intellectual Property Right regime towards compilation of encyclopaedia for the North Eastern Region.
5. Training programmes should be arranged to the local communities in the methods of collection, cultivation, preservation, storage and processing techniques of medicinal/economic plants.
6. Incentives for cultivation of medicinal plants on benefit sharing basis should be encouraged.
7. A network of herbal gardens may be established at suitable ecological agroclimatic zones.
8. Infrastructure for marketing the produce of the local communities, like establishing linkages with the market would boost cultivation and conservation of medicinal plants/bioresources.

9. Research & development work, especially in the field of clinical and pharmacological evaluation of traditional drugs used in North-East India, should be encouraged by making available plant materials for the same. The marker compounds of the drugs should be identified. The formulations and the marker compounds should be patented towards eventual protection of IPR and marketing of the drugs.
10. Due recognition should be given to local community healers.
11. Increase in grants to encourage and implement the above recommendations from agencies like CSIR, ISM&H, ICAR, NEC and other funding agencies is suggested.

ETHNOMEDICINE OF NORTH-EAST INDIA

State-of-the-Art Report on Ethnomedicines and their Plant Resources in Mizoram

H. LALRAMNGHINGLOVA

Research Development Circle, Environment & Forest Department,
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Abstract

Mizoram, formerly known as 'Lushai Hills', became Mizo District in 1952, Union Territory in 1972 and a full-fledged State in 1987. The State ranks highest in tribal concentration (94.8%) and literacy rate (96%). Fifteen ethnic groups, viz., *Lusei, Paite, Hmar, Hualngo, Tlau, Thado, Ralte, Mara, Lai, Bawm, Pang, Chakma, Riang, Biate* and *Mog* have been recognized in the State. The tribes like *Hmar, Paite, Mara, Lai, Bawm, Pang, Chakma, Bru (Riang), Mog* and also *Rakhai* retained their own ethnic identity – dialects, dresses and ethnocultures, whereas others preferred to call themselves 'Mizo' which is a generic name in which all tribes and sub-tribes are included. The common language is Mizo and English. Distinct tribes mentioned above practice traditional herbal medicines in their own communities for their primary healthcare needs since a long time. The practice of indigenous medicines has descended through generations by way of mouth or inheritance or training. Certain number of plants were used in combination for specific diseases. Almost the entire population in the interior rural areas (>95%) relies on herbal medicines and nearly 98% raw materials are harvested from the wild plant resources. Out of about 400 medicinal plants reported so far from the state, more than 200 ethnomedicinal plants are enumerated in this paper alongwith the ones used in combination, ethnoveterinary plants; 65 threatened plants and 62 new ethnomedicinal plants recorded from Mizoram.

Introduction

Mizoram lies in the extreme southern part of North Eastern India bordering Myanmar in the East and South and Bangladesh in the West. It is located between latitudes 21°15' -24°35' N and longitudes 92°15' -93°29' E, and its geographical area is 21,081 sq km (Anonymous, 1998).

The terrain is mostly mountainous blue-green variegated undulating topography with highest peak at 2,157 m in the Blue Mountains and lowest at 20 m in Tlabung and the average height is 1000 MSL. The Tropic of Cancer passes through Aizawl city at 23.30'N latitude. The climatic condition in the state ranges from the lower moist tropical to the middle moist sub-tropical and the higher temperate in the eastern fringes. Temperature varies from 10°C-24°C during winter and 21°C-30°C during summer with heavy rainfall from 2,000 mm-3,500 mm per annum. Administratively, the state is divided into eight districts (Fig.1).

Socio-economic Status

Shifting agriculture is the mainstream agrarian economy in the state. There is no major wood-based industry. Small scale industries under KVI, Agriculture, Forestry and Animal Husbandry have footing ground in the state economy. The farmers group form the largest occupation with low income in the rural economy; the trade groups form the riches group, and the salaried group the second. The percentage of people living under poverty line in 1992 was 56%, 25.6% in 1994 and sharply rises up to 80% in 2000 as per the records obtained from State Level Monitoring Cell (SLMC); District Rural Development Agency (DRDA) and Local Administrative Department (LAD), Govt. of Mizoram, Aizawl. The per capita income in 1997-98 was Rs. 11,667.00. The infrastructural facilities like road communication, hydro-power generation and supply of drinking water are poor and insufficient, but recently setup airport at Lengpui and Information Technology may change the scenario at rapid pace.

Demography and Health Status

Mizos are mongoloid racial stock and speak Mizo language which belongs to the Sino-Tibet-Burman group. Population in 1991 was 6.9 lakhs with 54% rural population and 66% workforce in the primary sector. The projected population in 2001 is 9.6 lakhs. Tribal population (94.8%) and literacy rate (96%) are highest in the country and the exponential growth rate is 35.8% (Anonymous, 2000). Medical facility available in the state is given in (Table 1).

Table 1 shows that only half the population is covered with the smallest Sub-Centre facilities which, in some areas remain without medical personnel, and even if there are health workers, there is no medicine. The rural people cannot but rely on traditional herbal medicines for their primary healthcare systems. They will approach hospital facilities as their last resort for want of travel expenses, hospital fees and the costs of medicines.

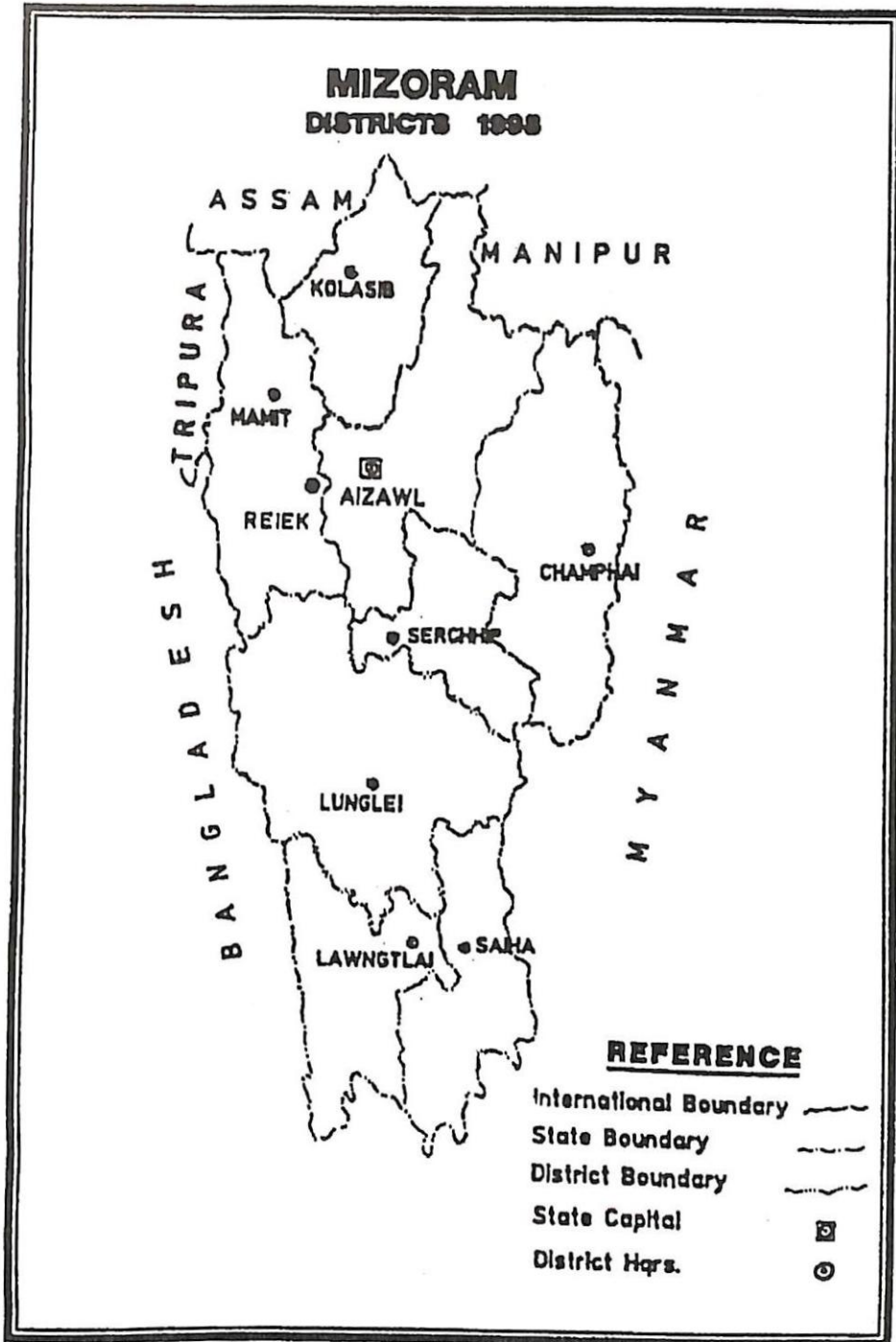


Fig. 1 – Map showing Districts of Mizoram

Table 1: Medical facilities available in Mizoram

Referral Hospital under construction	Govt. Hospital	Non-Govt. Hospital	CHC	PHC	SHC	SC	Inhabited villages	Doctor population ratio
1	7	4	7	56	13	346	699	1:3550

Sources

- 1) Hand book of Health & Family Welfare Dept., Govt. of Mizoram 1998.
CHC = Community Health Centre; PHC = Primary Health Centre; SHC = Subsidiary Health Centre; SC = Sub-Centre.
- 2) Status overview of various health programmes implemented in Mizoram, H & FW Dept, Govt. of Mizoram, 2000.

The common diseases prevailing in the state are malaria, cancer, skin diseases, diabetes, gastroenteritis, stomach ulcer, tonsils, adenoids, respiratory tracts, bronchitis, influenza, asthma, otitis and mastoiditis (Anonymous, 2000).

Forest Resources

The recorded forest area is 15,935 km² (75.59%) of the geographical area (21,081 km²) and the actual forest cover is 86.9%. The total forest reserved constitutes 30% of the total forest cover (5,622.3 km²) and 26.6% of the total geographical area. The forest cover statistics 1995, 1997 & 1999 are as shown below (Table 2).

Table 2: Forest cover statistics of Mizoram (in km²)

Year	Dense forest (40%)	Open forest (10-40%)	Scrub forest (10%)	Non-forests	Total	% Forest cover	Net change
1995	4,281	14,295	1,070	1,435	18,576	88.1	-156
1997	4,348	14,427	937	1,369	18,775	89.1	+199
1999	3,786	14,552	212	2,531	18,338	86.9	-437

Source : State of Forest Report, 1995, 1997 & 1999.

The net change of -156 km² in 1995 and -437 km² in 1999 were mainly due to shifting cultivation and a net gain of +199 km² in 1997 was due to natural and artificial regenerations. Protected Area Network (Dampa Tiger Reserves - 500 km²; Murlen National Park - 200 km²; Phawngpui National Park - 50 km²; Ngengpuri Wildlife Sanctuary 410 km² and Khawnglung Wildlife Sanctuary 41 km²) constitutes 4.27% of the geographical area. Apart from the PAN, the 'hot-spots' of Lungkulh virgin

forest, Tawi and Lengteng proposed sanctuaries, Palak biodiversity etc. act as great emporia of medicinal plants (Fig. 2).

Three kinds of forest classification have been recognized in Mizoram and they are as follows:

1. *Champion of Seth 1968*

- i. Tropical Wet Evergreen Forests
- ii. Tropical Semi-evergreen Forests
- iii. Montane Sub-tropical Pine Forest

2. *National Remote Sensing Agency, Secunderabad 1979*

- i. Sub-tropical Evergreen Forests
- ii. Tropical Evergreen Forests
- iii. Tropical Moist Deciduous Forests
- iv. Bamboo Forests
- v. Quercus Forests
- vi. Jhum land
 - a) Current, b) Old and c) Abandoned

3. *Forest Survey of India 1992*

- i. Eastern Himalayan Wet Temperate Forests
- ii. Cachar Tropical Semi-evergreen Forests
- iii. Assam Sub-tropical Pine Forests
- iv. Secondary Moist Bamboo Forests
- v. Montane Sub-tropical Forests

Study on Medicinal Plants Diversity and Utilisation in Mizoram

Medicinal plants diversity occupies a wide range of distribution from narrow ecological niches to diverse ecological systems. Exploration survey of taxonomical plant wealth in Mizoram has certain drawbacks as evidenced by lack of medicinal information through botanical collections conducted by Gage 1889, Parry 1932, Fischer 1938 and Botanical Survey of India till 1989. Lack of scientific investigation on botanical medicines imbalances the rich heritage of ethno-biodiversity of the state. Documentation of local health traditions published by Zoram Upa Pawl 1984 (Mizo version) can be considered as the milestone secondary source of information in Mizoram. Local botanical collection was held by the author since 1990 onwards and an actual ethnobotanical study was conducted since 1994

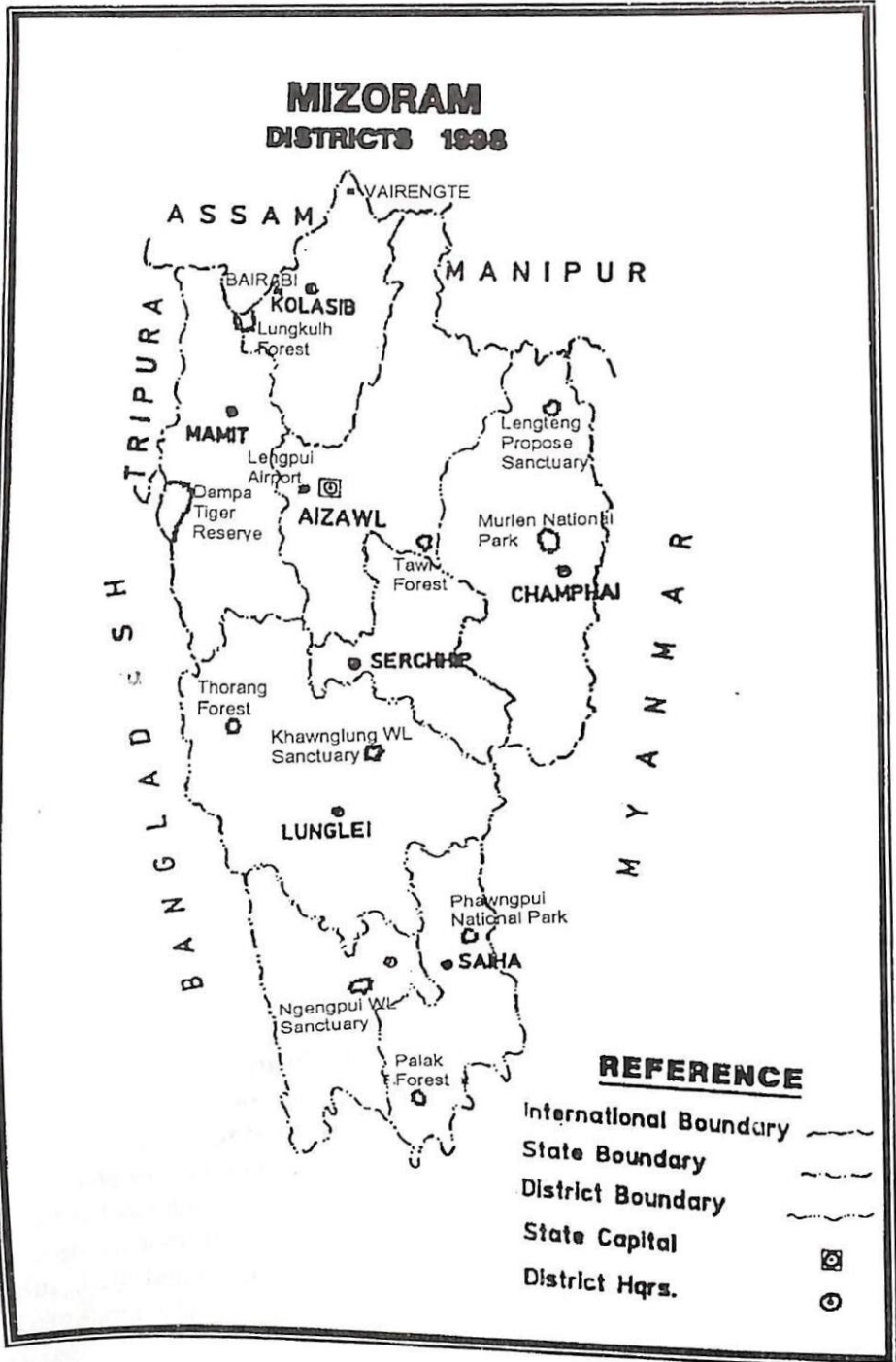


Fig. 2 – Map showing National Parks, Wild life Sanctuaries and Hot Spot.

basically in the tropical wet evergreen forests and extended to the tropical moist deciduous forests, sub-tropical evergreen forests and partly wet temperate forests. Lalnundanga also worked on the medicinal plants in the tropical semi-evergreen and sub-tropical pine forests. Detailed study on high hill medicinal plants in the montane wet temperate forests in the eastern part of Mizoram is yet to be covered ethnobotanically. So far, about 400 medicinal plants have been reported from Mizoram and the author has also first reported some animals which were used as folkfore-medico-zoology-animals used as indigenous medicines (Lalraminghinglova 2000).

Many species belonging to *Asteraceae*, *Menispermaceae*, *Apiaceae*, *Lamiaceae*, etc. exhibit open habitats as well as secondary formations. The species like *Lasia spinosa*, *Lasianthus wallichii*, *Anacolossa cressipes*, *Homalomena aromatica*, etc. grow under dense forests; *Bergenia ciliata*, *Trapa natans*, *Pseudodrynaria coronans*, *Rhododendron arboreum*, etc. are habitat-specific or under restricted distribution, whereas the species like *Picrasma javanica*, *Dillenia pentagyna*, *Callicarpa arborea* etc. are distributed in different eco-climatic conditions. Herbaceous plants like *Scoparia dulcis*, *Centella asiatica*, *Achyranthus aspera*, *Chromolaena odorata*, *Cassia tora*, *Eupatorium glandulosum* etc. grow near human settlements and in damp and waste places. Some valuable medicinal plants survive in cultivation only, e.g., *Curcumorpha longiflora*, *Kaempferitarotunda*, *Catharanthus roseus*, *Aloe barbadensis* etc. Majority of individual plants are used as herbal medicines for various purposes (Table 3), some species are used in combination with others (Table 4), and other plants are being used as ethnoveterinary plants, snake-bite, etc. (Table 5).

Threat Status of Rare and Record of New Ethnomedicinal Plants

Factors leading to rarity of species rate is about 1/yr¹². The factors effecting rarity are *deterministic* or man-made activities, such as deforestation, habitat destruction, road construction, fire, commercial exploitation etc. and *stochastic* or chance events, such as natural catastrophes (flood, storm, landslides, earthquakes etc.), demographic variation in individual births and deaths, loss of genetic diversity and heterosis (Given, 1996). Shifting cultivation is the single largest factor affecting bio-environmental degradation in the northeast India and Mizoram, in particular. Deforestation due to shifting cultivation during 1987-1997 was recorded as 3,800 km² or 38,000 ha (Anonymous, 1999).

Table 3: List of plants used as ethnomedicine in Mizoram

Sl. No.	Scientific name & family	Local name	Habit	Part(s) used	Mode of preparation	Ailments/diseases	Ecology/distribution location
1	2	3	4	5	6	7	8
1	<i>Abelmoschus moschatus</i> Medic (<i>Malvaceae</i>)	Uichhuhlo, Bawrthsaiabe suak (Lalram.)	H	seeds	powdered seeds mixed with water taken orally.	headache, carminative & stomachic.	frequent in semi-open areas and jhumlands: Durtlang road.
2.	<i>Acalypha indica</i> L. (<i>Euphorbiaceae</i>)	<i>Chhawntan</i>	H	leaves	juice of leaves applied externally; paste of leaves applied externally.	scabies, itches, rash, syphilis, snake-bite & centipede bites.	scarce; secondary forest, Tanhril.
3	<i>Achyranthes aspera</i> L. (<i>Amaranthaceae</i>)	<i>Buchhawl</i>	H	w.p., leaves	crushed juice taken orally.	dysentery, piles & skin eruptions, wounds, ulcer, sore-worms.	common in waste places, Bethlehem, Aizawl.
4	<i>Acorus calamus</i> L. (<i>Araceae</i>)	<i>Hnim-rimtui</i> (Lalram.)	H	root	infusion of root taken orally.	bronchitis, cough, asthma, diarrhoea, dysentery, snake-bites.	rare; waste marshy places near Teirei river.
5	<i>Actephila excelsa</i> (Dalz.) Muell. Arg. (<i>Euphorbiaceae</i>)	<i>Moiteleng</i>	Sh	leaves	juice of bruised leaves applied externally.	tonsillitis, throat-pain.	rare; in dense forest, Perhsang.
6	<i>Ageratum conyzoides</i> L. (<i>Asteraceae</i>)	<i>Voilenhlo</i>	H	leaves, roots	crushed juice applied externally.	cuts, haemostatics, antilithic.	very common in waste places throughout Mizoram.

Sl. No.	Scientific name & family	Local name	Habit	Part(s) used	Mode of preparation	Ailments/diseases	Ecology/distribution location
1	2	3	4	5	6	7	8
7	<i>Aginala indica</i> L. (<i>Orobanchaceae</i>)	<i>Sangharvaibel</i>	Eph.	rh.	crushed juice applied externally.	mumps, inflammatory	rare; seasonal; dense forest of Dampa, Chhingchhip.
8	<i>Aegle marmelos</i> (L.) Corr.ex Roxb. (<i>Rutaceae</i>)	<i>Belthei</i>	T	fruit	seeds eaten; pulp mixed with water taken orally.	dysentery, scorbutic, cooling, alleya, antigonorrhoea, stomachic.	Introduced; Zawlnuam.
9	<i>Albizia chinensis</i> (Osborne) Merr. (<i>Mimosaceae</i>)	<i>Vang</i>	T	stb.	juice applied externally.	as lotion for cuts, scabies, skin diseases.	common throughout Mizoram.
10	<i>Albizia procera</i> (Roxb.) Benth. (<i>Mimosaceae</i>)	<i>Kangteknu</i>	T	leaves	poultice applied externally.	ulcers.	very frequent in dry sandy secondary forests, West Phaileng.
11	<i>Albizia odoratissima</i> (L.f.) Benth. (<i>Mimosaceae</i>)	<i>Kangtekpa</i>	T	stb.	juice applied externally.	ulcers, leprosy.	less frequent; Rawpuichhip.
12	<i>Alpina galanga</i> Willd. (<i>Zingiberaceae</i>)	<i>Aichol</i>	H	rh.	infusion taken orally	stomachic, febrifuge, diuretic, bronchitis.	rare; mixed forest of Tlabung.
13	<i>Alstonia scholaris</i> R.Br. (<i>Apocyanaceae</i>)	<i>Thumriat</i>	T	stb & rtb.	decoction taken internally.	hypertension, stomach ulcer, fever.	very frequent, scattered; tropical forest, Tlabung.

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Table 3 - Contd.

Sl. No.	Scientific name & family	Local name	Habitt	Part(s) used	Mode of preparation	Ailments/diseases	Ecology/distribution location
1	2	3	4	5	6	7	8
14	<i>Amorphophallus poeniiifolius</i> (Bennst) Nichol. (Araceae)	Telhawng	H	tu./rh.	powdered rhizomes mixed with water taken orally crushed fresh tuber applied externally.	piles, dysentery. rheumatism.	frequent in moist shady places; Kolasib, Kawnpui.
15	<i>Andrographis paniculata</i> (Burm.f.) Wall. Ex Nees. (Acanthaceae)	Hlochangvawm/khatual	H	w.p.	decoction taken internally.	anti-spasmodic, diarrhoea, fever, dyspepsia, jaundice.	frequent in waste places and jhumlands Seling.
16	<i>Anogeisus acuminata</i> (Roxb.) Wall. (Combretaceae)	Zairum	T	stb.	decoction applied externally.	burns, sprains, cuts & wounds, hoemostatics.	common ; Zoo Aizawal
17	<i>Aporusa octandra</i> (Buch. Ham.ex Don) Vick. (Euphorbiaceae)	Chhawntual	T	stb.	Decoction taken orally.	gout & rheumatism.	very common in sandy to loam soil in secondary forests; FTS complex, Bethlehem, Saiphai.
18	<i>Arenga saccharifera</i> Labill. (Aracaceae)	Thangtung	Palm.	rt. fl. fr.	decoction taken orally. fibre string. crushed juice.	bronchitis, stomachic; fiddle strings & trap, fish-poison	less frequent sparse; on cliff rocks, Lungdai.

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1	2	3	4	5	6	7	8
19	<i>Anthocephalus chinensis</i> (Lamk.) A. Rich. ex. Walp. (Rubiaceae)	Banphar	T	stb.	decoction taken internally.	febrifuge, uterine complaints.	common scattered; Kawrthah.
20	<i>Artocarpus lakoocha</i> Roxb. (Moraceae)	Theitat	T	stb.	juice of crushed bark applied externally.	pimples, pustules on face, acne, crack skin, draw out purulent matter.	frequent; Tawipui.
21	<i>Arisaema tortuosum</i> (Wall.) Schott. (Araceae)	Mitthi vaimim	H	tu.	pounded poultice applied externally.	inflammation, skin eruptions.	frequent in damp humus soil, Tanhril.
22	<i>Artemisia indica</i> Willd. (Asteraceae)	Sai	H	leaves	crushed juice applied externally, infusion taken orally.	stop bleeding from the nose, haemorrhage, skin diseases; internal bleeding.	very frequent in semi-open areas; Mualpheng, Siphir.
23	<i>Averrhoa carambola</i> L. (Rutaceae)	Theiherawt.	ST (Cult.)	fr. leaves	eaten raw. decoction taken daily.	bleeding piles. fever ailments.	cultivated in private gardens, Biakhawthlir.
24	<i>Baccaurea ramniflora</i> Lour. (Euphorbiaceae)	Pangkai	ST	stb.	juice/infusion taken orally.	stomachache, purgative, food allergy.	common in tropical forests; Ngengpui.

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Sl. No.	Scientific name & family	Local name	Habit	Part(s) used	Mode of preparation	Ailments/diseases	Ecology/distribution location
1	2	3	4	5	6	7	8
25	<i>Bauhinia variegata</i> L. (<i>Caesalpinaceae</i>)	Vaube	ST	stb.	decoction taken orally.	diarrhoea.	common in dry locations; Mamit, Dainpui
26	<i>Bergeria ciliata</i> (Haw.) Sternb. (<i>Saxifragaceae</i>)	Khamdamdawi	H	rt.	crushed juice applied externally. decoction taken orally.	boils, diarrhoea. dysentery, colic.	sparse; specific-habitat on rocky crevices, Towi, Maite.
27	<i>Bidens biternata</i> (Lour.) Merr. & Sheriff. (<i>Asteraceae</i>)	Vawkpuihal	H	leaves	juice of leaves applied externally.	swollen glands & as eye-drop.	forest roadside clearance, Zamuang.
28	<i>Bischofia javanica</i> Bl. (<i>Bischofiaceae</i>)	Khuangthli	T	leaves	juice of young leaves taken orally. decoction taken orally.	tonsilitis. cholera.	frequent in tropical forests; Thingfal.
29	<i>Boehmeria malabarica</i> Wedd. (<i>Urticaceae</i>)	Khupnal	sh.	st.	peeled off stem contains juice applied externally.	swellings, pain, sciatica.	scattered in waste places; Aizawl.
30	<i>Bombax ceiba</i> L. (<i>Bombacaceae</i>)	Phunchawng	T	stb.	bark chewed and juice swallowed internally.	tonsilitis.	infrequent, Lengpui.
31	<i>Buddleja asiatica</i> Lour. (<i>Buddlejaceae</i>)	Serial	sh.	fl.	powdered flower made into paste applied externally.	Skin diseases.	Luangmual roadside, Aizawl.

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1	2	3	4	5	6	7	8
32	<i>Butea superba</i> Roxb. (<i>Fabaceae</i>)	Hruichun	C	rt.	juice of root & in combination with <i>Sonchus arvensis</i> , <i>Vitis bifurcata</i> applied externally.	snake-bites, verrucose.	common on roadsides; Tlabung-Marpara.
33	<i>Byttneria aspera</i> Colebr. (<i>Sterculiaceae</i>)	Zuangnuang	C	sap	sap of cut-stem retained in the mouth.	stomatitis (children).	very common in forests throughout Mizoram.
34	<i>Cassia alata</i> L. (<i>Caesalpiniaceae</i>)	Tuihlo	ST	leaves	crushed juice applied externally.	ringworms.	sparse; Chamdur, S. kawnpui.
35	<i>Calotropis gigantea</i> R.Br. (<i>Asclepindaceae</i>)	Vung-damdawi (Lalram.)	sh.	leaves	crushed juice applied externally.	swellings, pain.	rare, introduced; Fangfar, New Kaisi.
36	<i>Camellia kissi</i> Wall. (<i>Theaceae</i>)	Lallai	ST	bark	decoction taken orally.	kidney trouble, sciatica.	very rare, temperate forests, Phawngpui, Kawnpui.
37	<i>Caryota urens</i> L. (<i>Arecaceae</i>)	Tum	tall palm	nut	paste of crushed nuts applied externally.	headache, hemicrania.	rare; evergreen forests, Dampui.
38	<i>Cassia fistula</i> Ham. (<i>Caesalpiniaceae</i>)	Ngaingaw (Lalram.)	T	stb.	decoction mixed with yolk taken orally.	hepatomegaly, hepatitis.	cultivated as ornamental plant.
39	<i>Cassia hirsuta</i> L. (<i>Caesalpiniaceae</i>)	Rulchuk domdawi (Lalram.)	sh.	rt.	infusion of root taken internally.	snake-bite.	rare; Lalmon-II village.

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Sl. No.	Scientific name & family	Local name	Habit	Part(s) used	Mode of preparation	Ailments/diseases	Ecology/distribution location
1	2	3	4	5	6	7	8
40.	<i>Cassia tora</i> L. (<i>Caesalpiniaceae</i>)	Kelbe-on	sh	leaves & seed	decoction applied externally.	cutaneous diseases, ringworms, itches.	sparse in waste places, roadsides; kolasib.
41	<i>Chenopodium ambrosioides</i> (<i>Chenopodiaceae</i>)	Buarchhimtir (Rz.)	H	leaves	bruished leaves applied externally; infusion of leaves taken internally.	itches, skin diseases; intestinal worms.	scattered among weeds in waste places, Aizawl.
42	<i>Cinnamomum glaucascens</i> (Nees) Hand-Mezz. (<i>Lauraceae</i>)	Khiangzo	T	stb.	juice of bark taken orally.	bronchitis, pneumonia, cough.	frequent in subtropical forests; Bethlehem Aizawl, Sairep.
43	<i>Cinnamomum tamala</i> (Buch. Ham.) Nees & Ebern. (<i>Louraceae</i>)	Hnahrimtui	T	stb.	decoction taken orally.	gonorrhoea.	less frequent in subtropical areas; Luangmual.
44	<i>Cinnamomum verum</i> Presl. (<i>Lauraceae</i>)	Thakthing	T	stb.	pawdered bark mixed with water taken orally.	carminative, spasmodic, astringent	frequent in semi-evergreen forests; Lungrang forest.
45	<i>Catharanthus roseus</i> (L.) D. Don (<i>Apocynaceae</i>)	Kumtluang	sh.	leaves & fl.	decoction taken orally.	hypertension, cancer.	cultivated and naturalized.
46	<i>Centella asiatica</i> (L.) Urban (<i>Apiaceae</i>)	Hnahbial, lambak	Twn.	w.p.	infusion taken orally.	gastro-enteritis, hypertension, fever, stomachache, eye-ache, skin diseases.	scattered in moist waste places; Zemabowk.

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1	2	3	4	5	6	7	8
47	<i>Chukrassia tabularis</i> (A.Juss) W. & A. (Meliaceae)	Zawngtei	T	seed coat (sc.)	caten raw or crushed sc.boiled in water taken internally.	diarrhoea, dysentery.	common in tropical evergreen forests; Ngengpui.
48	<i>Chromolaena odorata</i> (L.) King (Asteraceae)	Tlangsam	S sh.	leaves	crushed juice applied externally.	cuts and wounds, haemostatics.	common near villages and in fallow lands, throughout Mizoram.
49	<i>Cordia dichotoma</i> Forst. (Boraginaceae)	Muk	T	stb.	decoction taken internally.	removal of retained placenta in the womb, cholera.	common in semi-evergreen forests; Tuipang.
50	<i>Clerodendrum colebrookianum</i> Walp. (Verbenaceae)	Phuihnam	ST	leaves	decoction taken internally.	hypertention and as vegetable.	wild & cultivated throughout the state.
51.	<i>Clerodendrum viscosum</i> Vent (Verbenaceae)	Phuihnamchhia	Sh	rt. & leaves	infusion taken orally. juice of leaves applied externally.	febrifuge. skin diseases/verbifuse.	very common in waste places, throughout the state.
52	<i>Crotalaria juncea</i> L. (Papiphszionaceae)	Tumthang	sh	leaves	leaves boiled in water taken orally.	purgative, emumengogue; as vegetable.	cultivated.
53	<i>Costus speciosus</i> (Koeing) Sm. (Costaceae)	Sumbul	H	Rh.	decoction taken internally.	removal of stone kidney.	very frequent in damp places throughout Mizoram.

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