

## Ethnomedicinal plants from agroforestry systems and home gardens of Mizoram, North East India

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### Summary

Safe, effective and inexpensive indigenous remedies are gaining popularity among the people of both urban and rural areas of India. The present paper provides first-hand information on ethnomedicinal plants recorded from agro-forestry systems and home gardens from Mizoram (an Indo-Burma hotspot region). Medicinal uses of plants were assessed on the basis of exhaustive interviews with local physicians practising indigenous system of medicine, home garden owners and various tribal groups relying on agroforestry systems of Mizoram, North East (NE) India. The survey results into the uses of 54 ethnomedicinal plant species belonging to 52 genera and 35 families of flowering plants.

*Key words:* Ethnomedicines, home garden, landscape, conservation, threatened

### INTRODUCTION

World Health Organization (WHO) estimated that nowadays as many as 80% of world's population depends on traditional medicine for their primary health care needs [1]. Ethnomedicines, derived from plants, attained an important position, especially in the countries like India, where modern health service is limited. [2-5]. Of the 20,000 angiosperm species in India, approximately 3000 species are used medicinally [3]; The North Eastern (NE) Himalayan States of India comprising 8 states harbour more than 180 major tribal communities of the total 427 tribal

communities found in India [5, 6]. A large part of the NE India is botanically under-explored or even unexplored [6].

Mizoram is an important state of NE India and also is a part of the 25 megabiodiversity hotspots of the world. It is extended between latitude 21° 58'–24° 45' and 24° 35' N and between 92° 15' and 93° 29' E longitude [6] at an elevation of 850 m above mean sea level (fig. 1). The altitude ranges from 500 to 2157 m. Temperature varies from 18 to 29°C in summer and from 11 to 24°C in winter.

The general impact of unregulated shifting cultivation in Mizoram has altered the landscapes that were once large tracts of evergreen dense primary forests into fragmented mosaics of agroforestry systems [6]. However, there is a great paucity of documentation of medicinal plants existing in agroforestry systems and home gardens which may also be promoted as a conservational reservoir.

Moreover, in Mizoram the number of doctors and other medical staff is very low in comparison to the total population [7]. Furthermore, the topography of Mizoram is responsible for the underdeveloped communication system in the state. Thus, the people of the rural areas cannot avail of modern methods of treatment and they search the remedies from nature. In the light of these facts, the present work aims to investigate the ethnomedicinal plants in agroforestry systems (wild growing/synanthropic) and home gardens (cultivated) of Mizoram. Hence the purpose of present study was to identify wild growing ethnomedicinal plants in agroforestry systems in integration with those cultivated in home gardens.

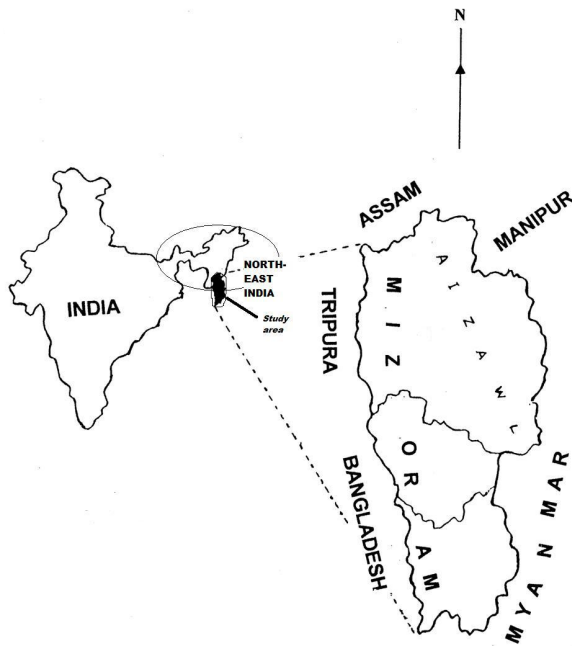


Figure 1. Location of study area and study site (Mizoram)

## MATERIALS AND METHODS

In 2007–2008, the indigenous people belonging to different tribes were interviewed quarterly pertaining to mode of use and identification in local name as per [7]. Medicinal uses of plants were assessed on the basis of exhaustive interviews with local physicians practising indigenous system of medicine, home garden/herbal garden owners and various tribal groups relying on agroforestry systems. Agroforestry systems were screened for ethnomedicinal plants particularly at Tanhril, Chaltlang and Ramluhn region of Aizawl, Mizoram. Medical applications of plants from aforesaid systems were noted through random interviews with villagers. Age groups ranging from 35 to 65 were being the most frequent during the interview, however, people of age 50-65 years were found to be most informative, probably due to their gathered experience of age old traditional knowledge. Eight garden owners were consulted for collecting the ethnobotanical information. Herbal garden inside Mizoram University campus was also selected for ethnobotanical exploration. Further, conservation status plants were marked as per IUCN [8].

## RESULTS AND DISCUSSION

A total of 54 ethnomedicinal medicinal plant species from agroforestry systems and home gardens were recorded which were belonging to 52 genera and 35 families (table 1). The family Euphorbiaceae was represented by a maximum of five ethnomedicinal plants immediately followed by Asteraceae. Rest of the families were represented by either one or two medicinal plants only. Nine plants from home gardens and agroforestry systems were identified as new from the region. Out of 54 plants recorded, 14 (7 as Nearly Threatened; 3 as Vulnerable; 3 as Critically Endangered and 1 as Endangered) were of threatened status [7, 8].

*Aeschynanthus sikkimensis*, *Melia azedarach* and *Artemisia indica* were used in fever while *Andrographis paniculata*, *Asparagus racemosus*, *Aquilaria malaccensis*, *Curcuma caesia*, *Emblica officinalis*, *Garcinia cowa*, *Jasminum nervosum*, *Mesua ferrea*, *Oroxylum indicum* and *Terminalia chebula* in diarrhoea and digestive system problems. *Blumea lanceolaria* was recorded as anticancerous while *Catharanthus roseus* was used in high blood pressure. *Clerodendrum colebrookiamum* was used in hypertension while *Elaeagnus caudate* and *Saraca asoca* have got gynaecological applications. *Catharanthus roseus* and *Cinnamomum tamala* were used against the diabetes by tribal people.

Under the existing scenario of land use change, in the present study it can be recommended that more ethnomedicinal plants should be cultivated in herbal gardens, agroforestry systems and home gardens in order to encourage their sustainable utilization and hence conservation. While bioprospecting (exploring biodiversity for new sources of natural products) is still the objective of some

pharmacologists, the field of ethnobotany is generally more concerned about the cultural meaning of the relationships between humans and plants than in mining for plant pharmaceuticals and information on plants. The assessment of the populations of threatened species with adequate caution at regional scale, development of an appropriate strategy, action plan for the conservation and sustainable utilization of such components of plant diversity are required at a larger scale for this region of extreme ecological relevance [9–11].

Table 1.

Ethnomedicinal plants recorded in home gardens and agroforestry systems of Mizoram

No.	scientific name and voucher specimen number	local/Mizoram name	family	habitat: locality of collection: altitude [m]	status	part used	mode of utilization/ uses
1.	<i>Aeschynanthus sikkimensis</i> (C.B. Clarke) Stapf. LR 08186	Bawltehlantai	Gesneriaceae	An epiphytic undershrub: Rescue Centre, Siphir; RIPANS, Zembawk: Above 900m	LR	Root-stock leaves and flowers	fever and pain; juice of crushed leaves is applied for inflammatory glands; infusion of flowers is taken against tonsilitis
2.	<i>Andrographis paniculata</i> (Burm.f.) Wall. Ex.Nees LR 08188	Hnahkhpui	Acanthaceae	herb: Vanaspati Van Nursery, Chalfilh: 1,200 m-1,800 m.	NT	leaf, stem and whole plant	Leaf is antispasmodic; in case of loss of appetite in infants; diarrhoea; root and leaf used as febrifuge; in stomachache; antihelminthic; whole plant in jaundice
3.	<i>Artemisia indica</i> Wild.* LR 08189	Sai	Asteraceae	herb: agroforestry system (Durtlang, Siphir): Up to about 1,500 m	VU	leaf	Infusion of leaves taken internally at the rate of 50 ml and twice/day against fever, stomachache, whooping cough, bleeding from the nose and gum; used in agro-farming systems as manure
4.	<i>Aporusa octandra</i> (Buch.-Ham. Ex D. Don) A. R. Vickery ex M. J. Short and A. R. Vickery.* LR 00081	Chhawntual	Euphorbiaceae	Small tree: Agroforestry system (Mizoram University campus): Up to 1,500 m	LR	Bark	Decoction of bark taken at the rate of 50 ml twice or thrice daily in case of stomachache and stomach ulcer

5.	<i>Asparagus racemosus</i> Willd. LR 08079	Arkebawk	Asparagaceae	Herb: Vanaspati Van, Chalfilh; A home garden in Aizawl: 1,400m	NT	Root and leaf	Its roots are refrigerant, demulcent, diuretic, aphrodisiac, antiseptic, alternative, anti-diarrhoeal, antidiarrhoeal and used in fever, rheumatism and as sexual tonic; a decoction of its roots is given for fever and their extract is antifungal; boiled leaves are applied on boils and small pox
6.	<i>Aquilaria malaccensis</i> Lam. LR 08160	Thingrai	Thymeleaceae	Small Tree: Ramthar Veng, Vanaspati Van, Chalfilh : Up to about 1,000 m	CR: Endemic to NE India:	Agar/re-sinous substance and wood	Wood as stimulant, antiasthmatic, anti-diarrhoea, anti-rheumatism, astringent, carminative stomach problems, diuretic, brain tonic, leucoderma, disease of eye, ear and skin
7.	<i>Blumea lanceolaria</i> (Roxb.) Druce.* LR 08035	Buarze	Asteraceae	Shrub: Personal home garden at Ramhlun North and Zemabawk Up to 700 m	VU	Leaf	Anti-cancer agent, pressed juice of leaves is applied on wounds and chronic ulcers, infusion of leaves is taken against dysentery
8.	<i>Canavalis ensiformis</i> Baker LR 08041	Fangra	Fabaceae	Climber: Private gardens, Mission vengthlang 500-1,000 m	LR	Seed	The sliced seed is applied to snake bite to suck out the poison
9.	<i>Cassia alata</i> Linn. LR 08042	Tuihlo	Caesalpinaceae	Shrub: Agroforestry system (Luangmual, Chawlhmun): Up to about 1,000 m	LR	Leaf	The leaves are bruised and applied to earthworm, ringworm infection as well as to other skin infections
10.	<i>Catharanthus roseus</i> Linn. LR 08044	Kumtluang	Apocynaceae	Herb: common in home gardens, school institutions, Vanaspati Van, Chalfilh: Up to 1,200 m	LR (introduced and naturalized)	Leaf, root and stem	The raw leaves are taken for the remedy of high blood pressure; also leaves are anti-cancerous agent ; decoction of roots, stem and leaves is useful in diabetes, diarrhoea, dysentery, cholera

11.	<i>Centella asiatica</i> (L.) Urb. LR 08045	Lambak/Hna-hbial	Apiaceae	Herb: Vanaspati Van, Chalfilh and Local market: 1,200m-1,800m	LR	Leaf	Popularly used as memory stimulator. The leaves are boiled and the water is taken for the remedy of asthma and eye problems ; used also in hypertension
12.	<i>Cinnamomum tamala</i> (Buch-Ham.) Sweet LR 08040	Tejpatta	Lauraceae	Medium sized tree: Forest training school, Vanaspati Van, Bethlehem and Chalfilh: 1,200 m-1,800 m.	LR	Leaf and bark	Leaf is used as stimulant, carminative, antirheumatic, antidiarrhoeal; bark is used in treating gonorrhoea; bark is grinded and in combination used in hepatomegaly and in treatment of diabetes
13.	<i>Cinnamomum verum</i> (Buch-Ham.) Sweet LR 08038	Thakthing	Lauraceae	Tree : Vanaspati Van, Bethlehem and Chalfilh: 1,200 m-1,800 m	LR	Bark and leaf	Bark is carminative, antispasmodic, haemostatic, astringent, antiseptic; leaf antidiabetic
14.	<i>Cissus discolor</i> Blume LR 08024	Sangharhmai	Vitaceae	Climber: home gardens at Ramlhun, Aizawl: Up to 1,200 m	NT	Root, stem and leaf	Decoction of the roots, stems and leaves used for inflamed kidneys
15.	<i>Clerodendrum colebrookiamum</i> Walp. LR 08120	Phuihnam	Verbenaceae	Small tree: Vanaspati Van, Tanhril and Chalfilh: 1,200 m-1,800 m	VU	Leaf	Decoction of leaves taken at the rate of 50 ml twice daily in case of hypertension; used locally as summer vegetable
16.	<i>Costus speciosus</i> (Koeing) Smith. LR 08111	Sumbul	Zingiberaceae	Herb: Home garden at Ramlhun N and Herbal Garden, University campus: Up to about 1,300 m	LR	Whole plant	Cold infusion of the rhizome is taken orally for kidney trouble and leprosy; crushed juice of roots is taken internally for the removal of stones in the kidney/gall bladder; the leaves are boiled and the water is taken for the remedy of tonsillitis
17.	<i>Curcuma longa</i> Linn. LR 08189	Aieng	Zingiberaceae	Herb: Vanaspati Van, Chalfilh, Herbal Garden-MZU Campus: 1,200 m-1,800 m	LR (cultivated)	Rhizome	Rhizome is crushed and the juice is used for antiseptic

18.	<i>Curcuma caesia</i> Roxb. LR 08183	Ailaidum	Zingiberaceae	Herb: One home garden at Ramlhun N Aizawl: Up to about 1,000 m	NT (cultivated in kitchen gardens)	Rhizome	Rhizome is crushed and the juice is used for the treatment of diarrhoea and stomach pain
19.	<i>Cynodon dactylon</i> (Linn.) Pers. LR 08133	Phaitual	Poaceae	Perennial grass: Republic High School: Up to about 1,800 m	LR	Whole plant	Bruised plant is inhaled against tooth-ache
20.	<i>Datura suaveolens</i> Hamb. and Brugh LR 08222	Tawtawrawt par	Solanaceae	Shrub: Agroforestry system (Tlangnuam, Tanhril): Up to about 1,500 m	LR	Leaf	Leaves are dried and smoked as tobacco for chest complaints, asthma while roasted leaf is applied on breast lump/stony hard breast
21.	<i>Drymaria cordata</i> (L.) Willd. LR 08001	Changkalrit	Caryophyllaceae	Herb: Agroforestry system (Damp places near Chite lui): up to about 2,000 m	LR (grows in waste ground)	Whole plant	Whole plant is boiled and steam is inhaled to cure sinus, cough while bruised leaves are used as lotion against joint pain and muscle strain
22.	<i>Dysoxylum gobara</i> (Buch.-Ham.) Merr.* LR 08112	Thingthupui	Meliaceae	Tree: Ramlhun N. near District Industry Office, Vanaspati Van, Chalfilh: 900-1,800 m	LR	Leaf and Bud	Decoction of leaves and buds is used as against in diarrhoea and dysentery
23.	<i>Elaeagnus caudata</i> Schlect. LR 08021	Sarzukpui	Elaeagnaceae	Scandent herb: Agroforestry system (Tanhril, Ramlhun), Vanaspati Van, Chalfilh: Up to about 1,500 m	LR	Root and leaf	In ethno-gynaecology: The root is boiled and the water is taken orally for the remedy against retained placenta, juice of crushed root is taken for easy labour and as a cure after child birth; Infusion of leaves is taken orally for strengthening the function of uterus after child birth
24.	<i>Emblica officinalis</i> L. LR 08089	Sunhlu	Euphorbiaceae	Tree: Agroforestry system (Tanhril); AICS Complex, Tanhril; Vanaspati Van, Chalfilh: Up to about 1,300 m	LR	Fruit	The raw fruit is taken for the remedy of stomach problem

25. <i>Eucalyptus globules</i> Labill LR 08125	Eucalyptus	Myrtaceae	Tree: Forest training School, Bethlehem: About 1,200 to 2,000 m	LR	Leaves	Infusion of leaves is taken against pneumonia; Charcoal is grinded to powder or made into paste and taken for stomach ulcer; decoction of leaves is used for diabetes
26. <i>Euphorbia royleana</i> Boiss LR 08320	Chawng	Euphorbiaceae	Shrub: Herbal Garden, Mizoram University Campus; Vanaspati Van, Chalfilh: 1500 m	LR	Pith and leaf	Pith and unripe fruit of papaya is cooked with chicken and the water is taken against diseases of the liver and chronic fever; milky juice is used externally for ring worm, rheumatism, boils, warts, etc.; Juice of heated leaves is applied to earache
27. <i>Garcinia cowa</i> Roxb. LR 08194a	Chengkek	Clusiaceae	Tree: Agroforestry system (Near Chite lui, Mualpui): Up to 800 m	LR	Leaf and bark	Bark is antidiarrhoeal, antileprotic and also used in ulcer
28. <i>Hedyotes scandens</i> Roxb. LR 08625	Laikingtuibur	Rubiaceae	Climber: Herbal Garden, Mizoram University Campus; Vanaspati Van, Chalfilh: 1400 m	LR	Whole plant	The whole plant is boiled and the water is taken for the remedy against swelling, malaria and kidney problem
29. <i>Jasminum nervosum</i> Lou.* LR 08109	Hrurkha	Oleaceae	Shrub: (Agroforestry system) Muthi, Sihphir, Durtlang: 1400 m	LR	Leaf	Stomachache and fever
30. <i>Lantana camara</i> Linn. PKR 00023	Hlingpangpar	Verbenaceae	Shrub (frequent in agroforestry systems): 1400 m to 2000 m	LR	Leaves	Antirheumatic, antimalarial, in tetanus, diaphoretic, carminative and antispasmodic
31. <i>Lepionurus sylvestris</i> Bl.* LR 08168	Anpangthuam	Opiliaceae	Shrub: Ripans, Zemabawk: 500 m	NT	Leaf	Decoction of leaves is taken for diabetes
32. <i>Lindernia ruelloides</i> Pennell* LR 08169	Thasuih	Scrophulariaceae	Herb: Tlangnuam (Agroforestry system): 600 m	LR	Whole plant	Externally used for rheumatism, sciatica, skin worms, wounds and also internally for eye problems



33.	<i>Mallotus roxburghianus</i> Muell.-Arg.* LR 08116	Zawngtenawhlung	Euphorbiaceae	Small tree: Mizoram University Campus, Tanhril; Sihphir (Agroforestry system): 50-500 m	LR	Twigs	In jaundice and hepatomegaly- twigs are boiled and the soup is taken daily/drunk 1 cup (100ml) twice daily
34.	<i>Mallotus philippensis</i> LR 08116a	Barikhei	Euphorbiaceae	Tree: Forest Training School, Bethlehem; Sihphir: Up to about 1,500 m	LR	Fruit	Fruits are antihelminthic, styptic, used in scabies, also in ring-worm and herpes
35.	<i>Melia azedarach</i> Linn. LR 08114	Nim-suak	Meliaceae	Tree: On roadsides within Aizawl city: Up to about 1,500 m	NT: Introduced and naturalized	Leaf	Decoction of leaves is taken orally against fever and hypertension
36.	<i>Mesua ferrea</i> Linn. LR 08003	Herhse	Clusiaceae	Tree: Agroforestry systems (Tanhril); Vanaspati Van, Chalfil: 1,500 m	LR	Flower, bark and leaf	Flower is used as astringent, stomachache. Flowers and leaves are also used against snakebite and scorpion sting
37.	<i>Mikania micrantha</i> Kunth. WI PKR 0024	Japan-hlo	Asteraceae	Climber: Agroforestry systems (Tanhril): Up to about 2,100 m	LR	Leaf	The leaf juice is a good haemostatic. The leaves boiled in combination with that of <i>Vitex penduncularis</i> leaves is taken against fever. Also the leaf juice is good for dysentery
38.	<i>Millettia pachycarpa</i> Benth.* LR 08179a	Rulei	Fabaceae	Shrub/climber: Agroforestry systems (Tanhril): 500-1,400 m	LR	Root	Infusion of root is used as lotion for wounds, swellings, toothache and sprains; decoction of the root is used for washing scabies and itches
39.	<i>Musa reticulata</i> Linn. LR 08054	Changel	Musaceae	Pseudo-tree: Agroforestry systems (Ramlhun South, Turial): 1,500 m	LR	Sap juice	Stem sap in combination with the blood of chicken is given to person suffering from epilepsy; sap juice is also used for snake bite

40.	<i>Oroxylum indicum</i> Linn.	Archangkawn	Bignoniaceae	Small tree: Agroforestry systems (Luangmual, on roadside of Mizoram University campus): 1,000 m	LR	Root-bark, bark and seed	Root bark is used as tonic, antidiarrhoeal; bark antirheumatic; tender fruit is carminative, used in stomachache; seed purgative; stem is antidote for scorpion sting
41.	<i>Osbeckia sikkimensis</i> Craib. LR 07773	Builukhampa	Melastomata-ceae	Shrub: Agroforestry systems (Sihphir): 900-1,800 m	LR	Root	Steamed roots and extracted solution is taken internally for renal disorder and genitor-urinary problems; decoction of roots is taken for kidney trouble and stomachache
42.	<i>Paedaria foetida</i> Linn. LR 08133	Vawihuihruui	Rubiaceae	Climber: Agroforestry systems (On roadside to Mel- thum; Tanhril): 1,500 m	LR	Root and leaf	Plant-antirheumatic; root and leaf as tonic; root in piles, pain in chest and liver; leaf carminative, astringent, diuretic, in herpes
43.	<i>Phyllanthus fraternus</i> Webster. LR 08663	Mitthi sunhlu	Euphorbiaceae	Herb: Agroforestry systems (Samtlang and Seling road): 1,200 m	LR	Whole plant	Infusion of plant at the rate of 50 ml twice daily for diabetes; juice of whole plant is used for liver problems and jaundice; fruits and the plant parts are useful in thirst, bronchitis, leprosy, anaemia, urinary discharges, anuria and asthma
44.	<i>Piper betel</i> Linn. LR 08043a	Pandawng	Piperaceae	Climber: Agroforestry systems (Sihphir, Turiial): 900 m	LR	Leaf; root	Leaf is carminative, stimulant, in stomachache, as antidote for snake bite, in eye pain, night blindness; oil as antiseptic, antispasmodic, in diphtheria; root as contraceptive in women; fruit-bechic
45.	<i>Pratia begonifolia</i> Lindl. LR 08147	Choak-thi	Campanulaceae	Herb: Agroforestry systems (On roadside to Mizoram University campus, Ramhlun North): 1500 m	LR	Leaf	The leaves are crushed and the juice is taken for the remedy of dysentery and vomiting

46.	<i>Ricinus communis</i> Linn. LR 07091	Mutih	Euphorbiaceae	Shrub or small tree: Agroforestry systems (Sihphir): 1,000 m	NT	Leaf and stalk	Young leaves after heating are used in ulcer, sciatica and paralysis while crushed leaves are applied as bandage against urinary problems
47.	<i>Saraca asoca</i> Roxb. LR 08044	Mualhawih	Caesalpiniaceae	Tree: Dinthar; Vanaspati Van, Chalfilh; Herbal Garden Mizoram University campus: 1,500 m	EN/VU	Bark	In ethnogynaecology: bark is astringent, used in uterine inflation, in gonorrhoea and scorpion sting
48.	<i>Senecio scandens</i> Buch.-Ham. LR 07324	Sai-ek-hlo	Asteraceae	Climber: a home garden of Ramlhun N; Sihphir; Melthum: 1,000-1,400 m	CR	Leaf/aerial parts	Boiled leaves/aerial parts are used for ulcerated cancer/ulcers
49.	<i>Sida acuta</i> Burm. F. LR 07745	Khingkhieh	Malvaceae	Shrub: Agroforestry systems (frequent in Chaltlang area): 1050 m	LR	Root	Crushed root applied on boils to suck out the pus. Also used in nervous, urinary and stomach/gastric diseases
50.	<i>Solanum nigrum</i> Linn.* LR 04551	Anhling	Solanaceae	Herb: Agroforestry systems (Sihphir): 1,600 m	LR	Whole plant	Infusion of the plant is prescribed for liver problem and dropsy
51.	<i>Stereopermum colais</i> Mabb. LR 07831	Zihngal	Bignoniaceae	Tree: Agroforestry systems (Mizoram University campus): 1,200 m	LR	Leaf	Decoction of leaves is used as febrifuge and leaf juice is applied on itch.
52.	<i>Terminalia chebula</i> Retz. LR 06023	Reraw	Combretaceae	Tree: Vanaspati Van nursery, Chalfilh: 1,500 m	LR	Fruit and bark	The fruit is taken against stomach problem, purgative, febrifuge, antiasthmatic, antidiarrhoeal, antisyndromal, antiparalytic, enriches blood, antiparalytic, in piles, cold, ophthalmia, sore throat, dental caries, bleeding and ulceration of gums, burns etc.; bark is diuretic and cardiotonic

53.	<i>Urena lobata</i> Linn. LR 06024	Sehnap	Malvaceae	Shrub: Agroforestry systems (Mizoram University Campus, Tanhril): 1,500 m	LR	Root and leaf	Crushed root mixed with water as aphrodisiac; juice of leaves is used against rheumatism
54.	<i>Woodfordia fruticosa</i> Kurz. LR 08027	Ainawn	Lythraceae	Shrub: A home garden at Ramlhun N, Tuikhuahtlang : 1050 m	CR/VU	Flower	The powdered flower is used externally on sores and ulcers

Abbreviations used: **IUCN Red List Categories Used: CR** – critically endangered, **EN** – endangered, **VU** – vulnerable, **LR**– lower risk, **NT** – near threatened

\*Those marked by asterisk represent the plants which were recorded for the first time.

## ACKNOWLEDGEMENTS

The authors are thankful to University Grants Commission (UGC) and Department of Science and Technology, Government of Mizoram for financial assistance to HLR. Also, HLR is thankful to Environment and Forest Department, Government of Mizoram and Professor L.K. Jha for providing all sorts of cooperation during his work as Forest Botanist. The authors also extend their regard to Professor A.N. Rai, Vice Chancellor, Mizoram University, for his kind cooperation and support.

## REFERENCES

1. Azaizeh H, Fulder S, Khalil K, Said O. Ethnomedicinal knowledge of local Arab practitioners in the Middle East Region. *Fitoterapia* 2003; 74:98-108.
2. Rout GR, Das P. In vitro organogenesis in ginger (*Zingiber officinale* Rosc.). *J. Herbs Spices Med Plants* 1997; 4(4):41-51.
3. Rajendran SM, Agarwal SC, Sundaresan V. Lesser known ethnomedicinal plants of the Ayyarkarkoil Forest Province of Southwestern Ghats, Tamil Nadu, India. Part I. *J Herbs Spices Med Plants* 2004; 10 (4):103-12.
4. Pattanaik C, Reddy CS. Medicinal Plant Wealth of local communities in Kuldiha Wildlife Sanctuary, Orissa, India. *J. Herbs Spices Med Plants* 2008; 14 (3):175-84.
5. Chhetri D R, Parajuli S, Adhikari J. Antihepatopathic Plants Used by the Lepcha Tribe of the Sikkim and Darjeeling Himalayan Region of India. *J Herbs Spices Med Plants* 2008; 13 (3):27-35.
6. Rai PK. Comparative Assessment of Soil Properties after Bamboo Flowering and Death in a Tropical Forest of Indo-Burma Hot spot. *Ambio* 2009; 38(2):118-20.
7. Lalramnghinglova H. Ethnomedicinal plants of Mizoram. Bishen Singh Mahendra Pal Singh, Dehra Dun, India 2003:1-47.
8. IUCN. Guidelines for Application of IUCN Criteria at Regional Levels, 2003: Version 3.0. IUCN.
9. Rai PK, Lalramnghinglova H. Ethnomedicinal Plant Resources of Mizoram, India: Implication of Traditional Knowledge in Health Care System. *Ethnobot Leaflets* 2010a; 14:274-305.

10. Rai PK, Lalramnghinglova H. Lesser known ethnomedicinal plants of Mizoram, North East India: An Indo-Burma hotspot region. *J Med Plants Res* 2010b; 4 (13):1301-1307.
11. Rai PK, Lalramnghinglova H. Ethnomedicinal plants of India with special reference to an Indo-Burma hotspot region: An overview. *Ethnobot Res Appl* 2010c; in press.

## ROŚLINY WYKORZYSTYWANE W MEDYCYNIE LUDOWEJ WYSTĘPUJĄCE W LASACH ORAZ PRZYDOMOWYCH OGRODACH W REJONIE MIZORAM, PÓŁNOCNO-WSCHODNIE INDIE

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### Streszczenie

Bezpieczeństwo, skuteczność oraz niska cena rodzimych surowców roślinnych sprawia, że są one coraz popularniejsze wśród mieszkańców obszarów miejskich i wiejskich. Niniejsza praca stanowi źródło informacji na temat lokalnych roślin stosowanych w medycynie ludowej, a spotykanych na obszarach rolno-leśnych oraz w przydomowych ogrodach w rejonie Mizoram (Indo-Burma hotspot region). Lecznicze właściwości roślin oceniono na podstawie wywiadów przeprowadzonych z lekarzami stosującymi miejscowe surowce, właścicielami przydomowych ogrodów oraz członkami różnych grup plemiennych korzystających z obszarów rolno-leśnych w Mizoram w północno-wschodnich Indiach. Wyniki badań obejmują 54 gatunki roślin stosowanych w medycynie ludowej, należących do 52 rodzajów i 35 rodzin roślin kwiatowych.

**Słowa kluczowe:** medycyna ludowa, przydomowe ogrody, ochrona roślin, zagrożenia.