

# Traditional knowledge on medicinal plants

**R.K. Brojen Singh**

School of Computational and Integrative Sciences  
Jawaharlal Nehru University, New Delhi-110067, India.

# Traditional knowledge and protection

## “Traditional knowledge” :

- Its knowledge possessed by indigenous people, in one or more societies
- It could be in one or more forms, including, but not limited to, art, dance and music, medicines and folk remedies, folk culture, biodiversity, knowledge
- Protection of plant varieties, handicrafts, designs, literature.

## “Indigenous people” :

- Refers to people who characteristically exist under conditions of severe disadvantage relative to others within the states constructed around them.

**Traditional knowledge in the form of art, music, or folklore, can be developed into certain form that can be understandable to the rest of the world.**

- These traditional intellectual property needed to be recognized internationally.
- It can be done via patents; copyrights; trademarks; geographical indications; protection of undisclosed information; layout designs of integrated circuits; industrial designs.

# Traditional knowledge in North-East India: Medicinal plants



Average height from sea level: 7000 metres

North-East India possesses around 50% of India's biodiversity

NE-India has around 130 ethnic groups which have different cultures, languages, food habits and traditional knowledge of different medicinal plants

Harbored more than 7500 plant species in this region

The traditional practices in these regions correlate not only medicinal practices but also with food habits, rituals etc.

# *Justicia adhatoda*:

## Scientific details:

**Species:** Justicia adhatoda

**Genus:** Justicia

**Family:** Acanthaceae

## Structure details:

- Tall green thick shrub
- Leaves oppositely arranged (9-17 cm long and 3-10 cm wide)
- Inflorescence 3-7 cm long with 4-9 cm long peduncle.

## Traditional practice:

- **Local name:** Nongmangkha
- **Indigenous people using the plant as medicine:**  
Meitei, Meitei-Pangal (Manipur, India)
- **The plant is used traditionally by local Maiba/Maibis to cure:**  
Cold and cough, fever, asthma and dysentery.
- **For medicine:** Leaves
- **For food:** Leaves and young inflorescence





# Indigenous practices of *Justicia adhatoda*

## Steps of preparing medicine: Part: Leaves

**Step 1:** Fresh leaves are plucked, cleaned and dried on a banana leave



**Step 2:** Boil on a earthen pot for 20 minutes



**Step 3:** Remove the banana leave and inhale the steam 2-3 times for five minutes by the patient



Kanghou



Bora



Shuktani

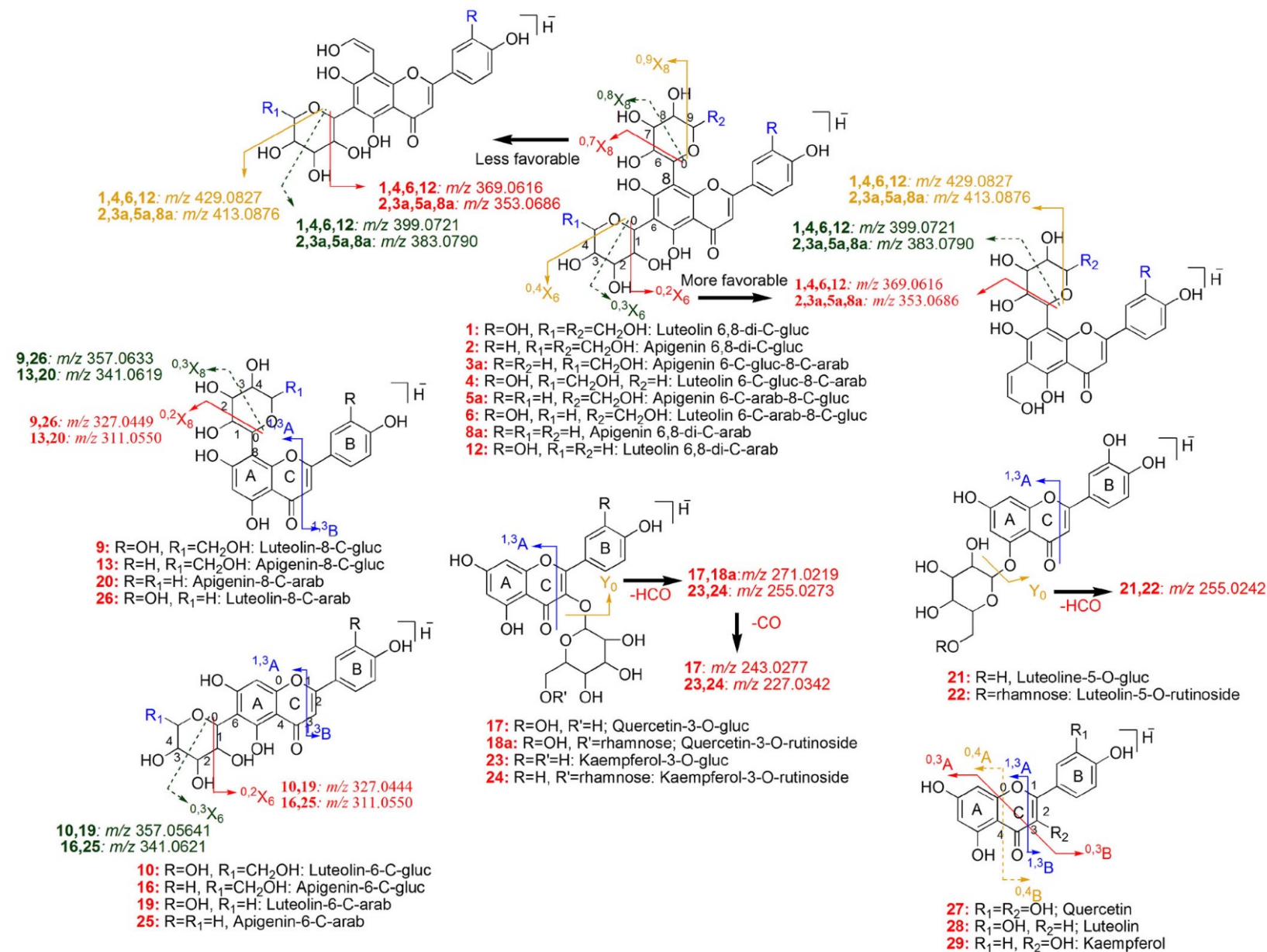


Nongmangkha-mapan Kanghou



A total of 29 compounds were found in the *Justicia adhatoda* or *Adhatoda vasica*:

- Seventeen C-
- Nine O-glycosides
- Three flavonoids



Singh, A.; Kumar, S.; Bajpai, V.; Reddy, T.J.; Rameshkumar, K.B.; Kumar, B. Structural characterization of flavonoid C- and O-glycosides in an extract of *Adhatoda vasica* leaves by liquid chromatography with quadrupole time-of-flight mass spectrometry. *Rapid Commun. Mass Spectrom.* 2015, 29, 1095–1106.



***Melia azederach* Linn:**

**Vernacular name:** Siikhasii

**Family:** Meliaceae

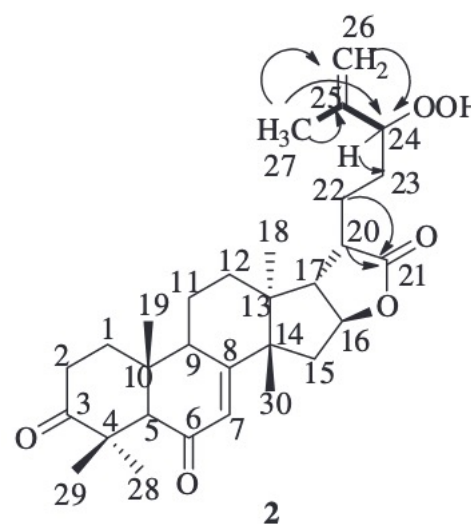
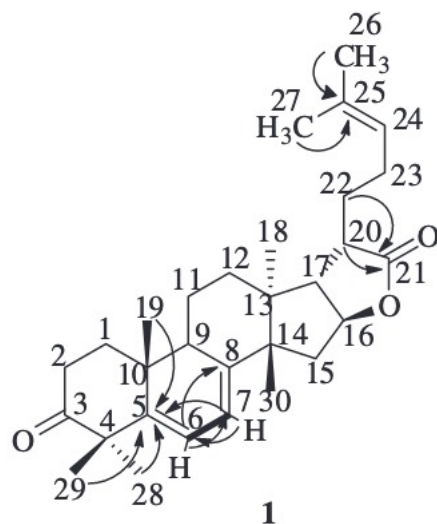
**Part used:** Barks

**Treatment:** Blood pressure, Acidity, Ringworm infection, Diabetes

**Mode of utilization:** A handful of fresh peelings of the endoderm of the bark is crush or grounded and boiled with water and the decoction is taken for treating blood pressure and acidity. The paste of the bark is applied on the skin for ring worm.



HMBC ( $^1\text{H} \rightarrow ^{13}\text{C}$ ) and  $^1\text{H}$ - $^1\text{H}$  COSY



Compounds against Diabetes

## *Viscum articulatum* Burm:

**Vernacular name:** Otsiibu (Manipur),

**Family:** Viscaceae

**Part used:** Root

**Treatment:** Bone fracture and Sprained

**Mode of utilization:** The peelings of the epidermal layer of the root are crushed into a paste and apply to the affected part of the body from sprain and bone fracture.





Manipur :

- 1535 species plants
- 400 species are used by majority of people for their primary health care needs.



Lokendrajit, N.; Swapana, N.; Singh, C.D.; Singh, C. Herbal folk medicines used for urinary and calculi/stone cases complaints in Manipur. Int. J. Environ. Biodivers. 2011, 2, 1–5.

Deb D.B. 1961. Dicotyledonous plants of Manipur Territory. Bulletin of the Botanical Survey of India 3 (3): 253–350.

Table 1. Dicotyledonous plants of Manipur for stone cases.			
Botanical Name with voucher No.	Family	Vernacular name	Uses
<i>Bonnaya reptans</i> Spreng/ LK 4301	Scrophalariaceae	Lamkihoh (M)	The boiled decoction is prescribed by the medicine man in the valley for the kidney and urinary complaints due to stone.
<i>Centela asiatica</i> (Linn) Urban /LK 4501	Umbelliferae	Peruk(M); Khulakhudi (H) Tholkhuri (B)	The plant juice along with honey is prescribed in urinary trouble.
<i>Cyperus rotundus</i> Linn/LK 2501	Cyperaceae	Shembang Kaothum (M)	The decoction of the plant is prescribed in urinary trouble.
<i>Desmodium microphyllum</i> Mic/LK 3601	Papilionaceae	Nuggai Yensil (M)	The decoction of the plant is prescribed by the Chiru tribes for urinary complaints due to stone.
<i>Fragaria indica</i> Andr/LK 4001	Rosaceae	Kakyen khujin laba (M)	The decoction of plant along with sugar is prescribed in urinary complaint by the people in the valley.
<i>Helianthus annus</i> Linn/LK 1201	Asteraceae.	Numitlei (M) Surajmukhi (H&B)	The juice of the fresh leaves is used in urinary trouble and diseases of kidney.
<i>Polygoatum multiflorum</i> Allioni/LK 3001	Liliaceae	Kundalei Agouba Thondaba (M)	The decoction of root is prescribed by local medicine man in kidney and urinary troubles.
<i>Rhus succedanea</i> Linn./LK 1301	Anacardiaceae	Heimang ( M ) Tammu (Rongmei)	The powders of the fruits mixed with egg are given in kidney trouble, urinary complaint due to the stone.
<i>Rotala baccifera</i> Linn/LK 3101	Lythraceae	Ishingkundo (M) Dad-mari (H&B)	The plant is prescribed in urinary trouble by the people in the valley.
<i>Rubus niveus</i> Thumb/LK 4002	Rosaceae	Heijampat (M)	The decoction of the leaves is useful in urinary complaints, for relaxing uterus muscles.
<i>Solanum nigrum</i> Linn/LK 4301	Solanaceae	Leipungkhanga (M)	The seed is also used in urinary stones.
<i>Stephania hernandifolia</i> Walf/LK 3301	Menispermaceae	Thangga Uriangagangba (M)	The juice of the leaves is given in skin diseases and mixed with honey is good in diarrhoea and urinary trouble by the people in the hills and rural areas.
<i>Tagetes erecta</i> Linn/LK 1202	Asteraceae	Sanalei (M)	The extract of leaves is prescribed in kidney troubles by the local medicine man.
<i>Xanthium strumarium</i> Linn/LK 1203	Asteraceae	Hameng Sampakpi (M)	The root decoction is also useful in cancer, urinary stone and purple pains.
<i>Actinodaphne angustifolia</i> Nees/LK 2801	Lauraceae	Takara (M); Petarichawa (A)	The decoction of the plant is used in kidney diseases due to stone.
<i>Cissus javana</i> DC./LK 4601	Vitaceae	Kongouyen Laba (M)	Boiled extract of leaves is considered tonic for curing urinary trouble due to stone and to cure the burning sensation during urination.
<i>Cordia grandis</i> Roxb./LK 1801	Boragineae	Lamuk (M)	Fruits are considered medicine for urinary trouble due to stone.
<i>Cuminum cyminum</i> Linn/LK 4502	Umbelliferae	Jeera (M)	The boiled decoction of the fruits is used in urinary trouble
<i>Homoioia riparia</i> Lour/LK 2701	Euphorbiaceae	Wangchu in Kuki Tuipui-sulhla (A)	The decoction of the root is given in piles, stone in the urinary bladder,gonorrhoea, syphilis and chest pain by the tribal in the hills.
<i>Pratia nummularia</i> Kurz/LK 2401	Companulaceae	Kihomman (M) ; Chaokathi (Mizo)	The plants are boiled along with water and the decoction is prescribed in kidney trouble due to stones.
<i>Wedelia chinensis</i> (Osb.) Merril/LK 1204	Asteraceae	Chinlengbi (M)	The decoction of the plant is used as a medicine for curing urinary trouble due to stone.
<i>Cissus adnata</i> Roxb/LK 4702	Vitaceae	Kongouyen –laba ( M )	Boil decoction of the leaves and roots is given in kidney problem due to stone.
<i>Aeschynomene indica</i> Linn./LK 3602	Papilionaceae	Chigonglei (M); Laugauni (H);	The young tender leaves taken as salad cures stone at urinary tract. The boil extract of the leaves with black pepper is prescribed in painful urination
<i>Ananas comosus</i> (Linn.) Merril/LK 1901	Bromeliaceae	Kihom (M)	Extract of the ripe fruit with that of <i>Averrhoa carambola</i> in equal proportion mixed with common salt is kept overnight and prescribed against bronchitis, asthma and urinary trouble due to stone.
<i>Cinnamomum glaucescens</i> Habd- Mazz./LK 2802	Lauraceae	Vahmin (Kuki)	The powder of the bark is used in kidney trouble.
<i>Averrhoa caramola</i> Linn./LK 1401	Averrhoaceae	Heinou-Jom ( M ) Kamranga ( B)	The extract of the fruit mixed with the extract of <i>Ananas comosus</i> along with a little common salt is prescribed after a fortnight in asthma, bronchitis, and urinary trouble due to stone. Also the juice of the fruit mixed with the fruit juice of <i>Citrus latipes</i> along with a little salt honey is prescribed as an excellent remedy from stone problem in the urinary tract.
<i>Berberis aristata</i> DC /LK 2001	Berberidaceae	Pambi napu (M)	The boiled decoction of the leaves is prescribed in urinary tract infection and kidney troubles
<i>Celosia argentea</i> Linn /LK 1301	Amaranthaceae	Haorei-agouba ( M )	Boiled extract of the root with sugar is given in urinary tract and kidney stone.
<i>Celtis australis</i> Linn./LK 4601	Urticaceae	Heikreng (M)	Boiled decoction of the leaves is given against stone in the urinary tract, in high blood pressure, jaundice, stomach complaints, liver and lugs problem. Boiled extract of the leaves with that of <i>Plantago erosa</i> is given in difficult urination and the same with <i>Fragaria indica</i> is also given in stone cases.
<i>Hibiscus sabdariffa</i> Linn/LK 3201	Malvaceae	Silot sougri (M) Lal-ambari (H) Chukar (B)	Decoction of leaves in used in urinary troubles, especially due to stone in kidney. The boiled extract of the leaves along with crab is given to the patients having stone in urinary bladder or kidney. <i>Upupaepops longirostris</i> (Sangairaba is prescribed in urinary bladder or kidney stones.
<i>Allium odorosum</i> Linn/LK 3001	Liliaceae	Maroi nakuppi (M)	Boil – extract of leaves is given in painful urination especially urinary tract infections due to stone.
<i>Citrus latipes</i> ( Swingle ) Tanaka/LK 4101	Rutaceae	Heiribob ( M )	The fruit extract mixed with that of <i>Averrhoa carambola</i> and a pinch of salt and honey is prescribed in urinary tract and kidney stone
<i>Abbus precatorius</i> / LK 3202 Linn.(Jequerity)	Malvaceae	Chaning angouba(M) Gunchi(H); Kunch(B)	Aqueous extract is used for treatment of kidney stones
<i>Duchesnea indica</i> (Andr.) Focke /LK 4003	Rosaceae	Heirongkak – laba (M)	Decoction of plants with sugar is used for treatment of stone case and other urinary infection; the same with <i>Centella asiatica</i> is also given in stone cases.
<i>Emblca officinalis</i> Gaertn./LK 2702	Euphorbiaceae	Heikru ( M )	Extract of the fruits with little lime is given against stone in the urinary tract and kidney.
<i>Hedychium coronarium</i> Koenig/LK 4801	Zingiberaceae	Takhellei-anganganba (M)	Boiled extract of rhizome is given in irregular menstruation, pile bleeding and stone in urinary tract.
<i>Mallotus philippensis</i> ( Lan) Muell. Arg /LK 2703	Euphorbiaceae	Ureirrom laba ( M )	Boil decoction of the bark with sugar is given in urinary tract stone problem.
<i>Myriogyne minuta</i> Less /LK	Asteraceae	Hakthi khanbi ( M )	Extract of the plants mixed in equal proportion with the juice of sugarcane is given

## Meghalaya :

- 850 medicinal plants
- 377 species are used by majority of people for their primary health care needs.



Scientific name	Local name	Family	Parts used	Application
<i>Aegle marmelos</i> (Linn.) Corr	Sempri	Rutaceae	Leaves, Bark	Gastric problem, dysentery
<i>Allbizia odoratissima</i> (Linn. f.) Benth	Siso	Fabaceae	Bark	Headache, dizziness
<i>Alstonia scholaris</i> (Linn.) R. Br.	Sokson	Apocynaceae	Leaves, Bark	Fever, epilepsy and respiratory diseases
<i>Anacardium occidentale</i> Linn.	Cashewnut	Anacardiaceae	Bark, Fruit and Leaves	Inflammation, urinary disorder
<i>Annona squamosa</i> L.	Ata bol	Anonaceae	Bark, Leaves, Roots, Unripe fruits and seed	Indigestion
<i>Antidesma acidum</i> Retz.	Arobakh	Euphorbiaceae	Leaves	Blood pressure
<i>Aristolochia clematitis</i> L.	Esamul	Aristolochiaceae	Leaves and roots	Snake bite
<i>Artocarpus gomezianus</i> Wall. Ex.Trecul	Armud	Moraceae	Bark	Headache, dizziness
<i>Bauhinia variegata</i> L.	Megong	Fabaceae	Leaves	Blood pressure
<i>Bombax ceiba</i> L.	Bolchu	Bombacaceae	Leaves	Diarrhoea
<i>Bridelia retusa</i> Spreng.	Khasi	Euphorbiaceae	Bark, fruit juice	Wound healing, earache
<i>Calotropis procera</i> (Linn.) R. Br.	Memangtebrong	Apocynaceae	Bark, Leaves, Roots, Latex and Flower	Paralysis, leprosy, skin diseases and cough
<i>Carica papaya</i> L.	Modipol	Caricaceae	Root, latex and seed	Dogbite, earache
<i>Cassia fistula</i> L.	Snaru	Fabaceae	Bark	Stomach pain
<i>Cestrum nocturnum</i> L.	Gamini	Solanaceae	Bark, leaves	Toothache, headache
<i>Cinnamomum tamala</i> Fr. Nees	Tejpata	Lauraceae	Bark	Urinary disorder
<i>Cissus quadrangularis</i> L.	Haljora	Vitaceae	Whole plant	Sprain and piles
<i>Clerodendrum glandulosum</i> Coleb.	Dongam	Verbenaceae	Leaves	Blood pressure
<i>Crataeva nurvala</i> Buch. Ham.	Jongchia	Oleaceae	Bark, leaves	Skin diseases, toothache
<i>Cuscuta reflexa</i> Roxb.	Dodimit	Convolvulaceae	Leafless stem	Jaundice, headache
<i>Crypteronia paniculata</i> Blume	Mosuginsep	Crypteroniaceae	Leaves	Snake bite and wound Healing
<i>Derris robusta</i> (Roxb. Ex DC.) Benth.	Kakharu	Fabaceae	Leaves	Headache



# Tripura :

- 379 species plants
- 53 species are medicinal plants which are used by majority of people for their primary health care needs.



Debbarma M, Pala NA, Kumar M, Bussmann RW (2017) Traditional knowledge of medicinal plants in tribes of Tripura in northeast, India. Afr J Tradit Complement Altern Med 14(4):156.

Scientific name	Local name	Family	Parts used	Application
<i>Aegle marmelos</i> Correa	Bael	Rutaceae	Leaves, gum from fruit, ripe fruit	Leaves pounded to paste with equal quantities of leaves of <i>Cajanus cajan</i> and a little water and 1 cupful extract taken in the morning in empty stomach in combination with molasses in jaundice. Fruit pulp as medicine and for prevention of dysentery.
<i>Ageratum conyzoides</i> Linn.	Shyamtulsi	Asteraceae	Leaves and twigs	Fresh leaf extract used as anti hemorrhagic. Juice used as an expectorant.
<i>Ananas comosus</i> (L.) Merrill	Gihom	Bromeliaceae	Leaves	Leaf extract with milk and sugar candy in rheumatic swellings. Extract of leaf base is taken 1 teaspoon thrice daily in diarrhoea.
<i>Azadirachta indica</i> A. Juss.	Neem	Meliaceae	Leaves and stem bark	Leaves boiled in water to bathe patient with malaria and chicken pox. Smoke produced by burning leaves is used as mosquito repellent.
<i>Cajanus cajan</i> (L.) Millsp.	Arail	Fabaceae	Leaves and twigs	Mature seeds are cooked as a pulse and given in weakness. Leaf and twig paste is applied throughout the body during jaundice.
<i>Carica papaya</i> L.	Paypay	Caricaceae	Root and fruit	Unripe fruits are cooked as a vegetable, ripe fruit, eaten raw. Fruits are considered to be stomachic.
<i>Centella asiatica</i> (Linn.) Urban	Thunmankuni	Apiaceae	Leaves and entire shoot	Eaten either as paste or cooked as a vegetable for dysentery and diarrhea.
<i>Clerodendrum viscosum</i> Vent.	Bhati pataa	Verbenaceae	Leaves and root	Extract is used as expectorant. Decoction of the leaves is used to check high blood pressure. Root extract is as febrifuge.
<i>Cynodon dactylon</i> (L.) Persoon	Doob pataa	Poaceae	Shoot and roots	Shoot extract is anti-haemorrhagic.
<i>Euphorbia nerifolia</i> Linn.	Sairapal	Euphorbiaceae	Leaves	Vapour is inhaled as medicine during fever. Oven heated leaves are placed on the chest to control cough
<i>Jatropha curcas</i> Linn.	Girogaachh	Euphorbiaceae	Branches	The sap is applied locally in gum infections. Raw leaves are used in high blood pressure.
<i>Kaempferia rotunda</i> Linn.	Bhojoraphul	Zingiberaceae	Flower and rhizome	Flower decoction is used to bathe patient with skin infections. Aqueous decoction of rhizome used in jaundice.
<i>Kalanchoe pinnata</i> Pers.	Khurajot	Crassulaceae	Leaves	Chewed raw with sugar to control dysentery and diarrhoea. Juice is administered in jaundice. Leaf paste is applied on skin infections and pimples.
<i>Leucas aspera</i> Spreng.	Doron pushpa	Laminaceae	Leaves and twigs	Extract is taken for cough and jaundice.
<i>Marsilea quadrifolia</i> Linn.	Susni	Marsileaceae	Leaves	Used in jaundice, brain tonic
<i>Mimosa pudica</i> Linn.	Dugjat lajari	Mimosaceae	Entire plant	Leaf paste is applied on the acne and pimples. Extract is used in equal proportion by weight along with bark extract of <i>Urena lobata</i> as a combination medicine against jaundice.
<i>Momordica charantia</i> Linn	Gangrauk	Cucurbitaceae	Fruits and twigs	Fruits is cooked as a vegetable and considered to be anthelmintic. Extract of twigs is used against dyspepsia.
<i>Musa paradisiaca</i> Roxb	Mot	Musaceae	Flower and stolon	Juice of flowers is used in dysmenorrhoea and menorrhagia. Extract of the stolon is administered in dysentery and diarrhoea.
<i>Oroxylum indicum</i> (L.) Vent.	Taukharun	Bignoniaceae	Stem bark and immature fruits	Soup is used as stomachic and anthelmintic.
<i>Ocimum sanctum</i> L.	Tulsi	Laminaceae	Leaves	Extract is used as expectorant and jaundice
<i>Phlogacanthus thyrsiflorus</i>	Basokpata	Acanthaceae	Leaves	Leaf juice is used as an expectorant.
<i>Psidium guajava</i> L.	Sapri	Myrtaceae	Fruits and twigs	Young twigs is chewed in empty stomach every morning in dysentery and diarrhoea. Fruit is used in anaemia.
<i>Scoparia dulcis</i> L.	Naipungchewk	Scrophulariaceae	Leaves and twigs	Anthelmintic and used in jaundice.
<i>Spilanthes paniculata</i> Wallich ex. DC.	Ansha	Asteraceae	Leaves	Boiled leaves are used with rice in stomach troubles and liver problems.
<i>Terminalia chebula</i> Retzius	Bukhala buthai	Combretaceae	Dried fruit	Extract is used in stomachic and jaundice



## Sikkim :

- 420 species plants
- 51 species are medicinal plants which are used by majority of people for their primary health care needs.



U. Chettri and S. Kumari. A list of medicinally important plants of Sikkim Himalayan region, India. J. Med. Plants Stud. 9(4):24-27 (2021)

S. No.	Botanical Name (Family)	Local name	Parts Used	Ethnomedicinal uses
1.	<i>Abrus Precatorius</i>	Lalgeri	Fruits and Roots	Leaves used for cough, cold and fever. Roots used for jaundice, abdominal pain and also for snake bite remedy <sup>[8]</sup> .
2.	<i>Acorus calamus</i>	Bojho	Roots and Rhizome	Rhizome used for epilepsy, memory disorders, chronic diarrhea and flatulent colic <sup>[9]</sup> .
3.	<i>Hymenodictyon sp.</i>	Latikaran	Bark	Bark used for fever, tumors <sup>[10]</sup> and Hemorrhoids (Piles) <sup>[11]</sup>
4.	<i>Hypericum sp.</i>	Urila	Seed	Act as antidepressant <sup>[12]</sup> anti-cancer <sup>[13]</sup> anti-viral <sup>[14]</sup>
5.	<i>Kaempferia rotunda</i>	Bhui champa	Tubers	Act as bone settlers <sup>[15]</sup>
6.	<i>Leea macrophylla</i>	Bulyettra	Seed, Root and Leaves	Leaves used for gastric tumor, body ache and sexual disability <sup>[16]</sup>
7.	<i>Litsea citrate</i>	Siltimur	Fruits	Used for stomachache, gastroenteritis, diabetes and traumatic injury <sup>[17]</sup>
8.	<i>Lycopodium clavatum</i>	Nagbeli	Roots and Leaves	Used against kidney stones and urinary tract infections <sup>[18]</sup>
9.	<i>Melia azadirach</i>	Bakaina	Root	Used against malaria <sup>[19]</sup> and thypoid fever <sup>[20]</sup>
10.	<i>Mesua ferrea</i>	Nageeswari	Bark	Used as antipyretic, cardiotoxic and diuretic agent <sup>[21]</sup>
11.	<i>Marsdenia roylei</i>	Baahuni Lahara	Entire plant	Stem juice for peptic and gastric ulcers <sup>[22]</sup>
12.	<i>Myrica esculenta</i>	Katusi	Bark	Paste of bark used for paralysis, joint pains and for wound healing <sup>[23]</sup>
13.	<i>Nardostachys jatamansi</i> DC.	Jatamansi	Whole plant including roots	Used to treat hysteria, seizures and epilepsy <sup>[24]</sup>
14.	<i>Podophyllum hexandrum</i>	Bankankari	Fruit, Root, whole plants	Used for jaundice, liver disorders, syphilis <sup>[25]</sup>
15.	<i>Panax pseudoginseng</i>	Mangan	Roots	Used against Dyspepsia, asthma and palpitation <sup>[26]</sup>
16.	<i>Pteri biaurita</i>	Thado unew	Stem	Used against Dysentery and body pain <sup>[27]</sup>
17.	<i>Polygonum viviparum</i>	Ratnala	Root	Used as antidiabetic, anti-inflammatory, and antitumor agent <sup>[28]</sup>
18.	<i>Rubus ellipticus</i>	Aiselu	Fruit and Roots	Used for bacterial infection, fracture bones, stomachache etc <sup>[29]</sup>
19.	<i>Rumex nepallensis</i>	Halhaley	Root	Used for treating syphilis, colic ulcer and skin sores <sup>[30]</sup>
20.	<i>Rhus semialata</i>	Bhakimlo	Fruits	Used for gastrointestinal and urinary related problems <sup>[31]</sup>
21.	<i>Rubia cordifolia</i>	Majito	Fruits and Root	Used to treat inflammation, Haematuria and ulcers related problems <sup>[32]</sup>
22.	<i>Rhododendron anthopogon</i>	Sunpati	Whole plant	Used to treat Headache, Rheumatism and Inflammation <sup>[33]</sup>
23.	<i>Rhododendron arboreum</i>	Laligurans	Flowers and young leaves	Used to cure heart problems and stomach ache <sup>[34]</sup>
24.	<i>Rauwolfia serpentina</i>	Sarganha	Roots	Used to cure high blood pressure, sleep disorder and mental agitation <sup>[35]</sup>
25.	<i>Selinum tenuifolium</i>	Bhut Kesh	Leaves and Fruit	Act as antibacterial, antispasmodic, Insect repellent <sup>[36]</sup>
26.	<i>Swertia chiraita</i>	Chiraita	Whole plant	Used for liver disorders, gastrointestinal infections and intestinal worms <sup>[37]</sup>
27.	<i>Sapindus mukrossii</i>	Ritha	Fruits	Used for excessive salivation, migranes and chlorosis <sup>[38]</sup>
28.	<i>Saussurea costus</i>	Kapisful, Kuth	Fruit, Leaves and Root	Used as anti- cancer, anti-ulcer and hepatoprotective activities <sup>[39]</sup>
29.	<i>Solanum nigrum</i>	Kalobehi	Fruit, Root and Leaves	Used as anti convulsant and Hepatoprotective problems <sup>[40]</sup>
30.	<i>Stephania glabra</i>	Taubarkey	Root Bulb	Used against asthma, analgesia and arthritis <sup>[41]</sup>
31.	<i>Xanthoxylum acanthopodium</i>	Bokey timbur	Fruit	Used against bleeding of gums and toothache <sup>[42]</sup>
32.	<i>Terminalia bellerica</i>	Barra	Fruit Bark	Used in hepatitis, piles, bronchitis, asthma and cough <sup>[43]</sup>
33.	<i>Toona ciliata</i>	Tooni	Flower Bark	Used in leprosy, blood infections and used as cardiotoxic <sup>[44]</sup>
34.	<i>Trichosanthes bracteata</i>	Indreyni	Fruit root	Used in wounds, boils and ulcers <sup>[45]</sup>
35.	<i>Tupistra nutans</i>	Nakima	Flower	Used as Anti- diabetic and also prevents anemia and osteoporosis <sup>[46]</sup>
36.	<i>Nephrolepis cordifolia</i>	Pani-amla	Tubers	Used as Hepatoprotective and natural contraceptive agent <sup>[47]</sup>
37.	<i>Urtica dioica</i>	Sisnu	Whole plant	Used as blood builder, anti-hemorrhagic and diuretic agent <sup>[48]</sup>
38.	<i>Viscum articulatum</i>	Harchur	Whole plant	Used against arteriosclerosis, arthritis and settling of fracture bones <sup>[49]</sup>
39.	<i>Valeriana jatamansi</i>	Nakali jatamansi	Root	Used in blackening of hairs and to remove foul smell due to toothache <sup>[50]</sup>
40.	<i>Woodfordia fruticosa</i>	Dhayeroo	Flower, Bark	Used against dysentery, bowel complaints and haematuria <sup>[51]</sup>
41.	<i>Xanthoxylum allatum</i>	Bokey timbur	Fruits	Used as anti-diabetic agent <sup>[52]</sup>
42.	<i>Taxus baccata</i>	Dhengre salla	Leaf and Bark	Used for cold cough and hypertension <sup>[53]</sup>
43.	<i>Picrorhiza kurooa</i>	Kutki	Roots	Used to cure cough, fever, bile flow related problems <sup>[54]</sup>
44.	<i>Abies wabbiana</i>	Gobre salla	Leaves and Gum	Used against cough, Indigestion and tuberculosis <sup>[55]</sup>
45.	<i>Asparagus racemosus</i>	Kurilo	Tuberos	Used in Indigestion, tumor and bronchitis <sup>[56]</sup>
46.	<i>Astilbe rivularis</i>	Buriokathi	Leaves, Root and Rhizome	Used against inflammation and peptic ulcer <sup>[57]</sup>
47.	<i>Adatoda vasica</i>	Asuru	Bark, Flower and Root	Used in scabies, upper respiratory tract infections and rheumatic fever <sup>[58]</sup>
48.	<i>Aesandra butyraceae</i>	Chewri	Fruits	Used for liver protection, gastritis and urination tract infection <sup>[59]</sup>
49.	<i>Alstonia scholaris</i>	Chatiwan	Bark, Flower and Latex	Used for malarial fever, urticaria and skin disorders <sup>[60]</sup>
50.	<i>Berginia ciliata</i>	Pakharbed	Root and Rhizome	Used to treat pulmonary infections, piles and dissolving stones in kidney and bladder <sup>[61]</sup>
51.	<i>Artemisia vulgaris</i>	Titaypati	Leaves	Used as antiseptic, stops nose bleeding, and also used as liver and spleen protective agent <sup>[62]</sup>

# Arunachal Pradesh:

- 500 species plants
- 101 species are medicinal plants which are used by majority of people for their primary health care needs.



Perme, N.; Choudhury, S.N.; Choudhury, R.; Natung, T.; De, B. Medicinal plants in traditional use at Arunachal Pradesh, India. Int. J. Phytopharm. 2015, 5, 86–98.

Sl No	Scientific name of the plant	Family	Local name of plant	Habit	Ethno-medicinal uses	Plant parts used	Phytochemicals reported	Ref.
1	<i>Ageratum conyzoides</i>	Asteraceae	Pashpaya	Weed	Wound healing, antihelmintic	Leaf, stem	Chromene, chromone, monoterpenes( $\beta$ -pinene, linalools, sabinene), sesquiterpene, flavonoides, alkaloids	[5] [6]
2	<i>Alstonia scholaris</i>	Apocynaceae	Tayesangne	tree	Treatment of ulcer, swelling, latex is given during abdominal pain after delivery	Leaves, root, bark, latex	Flavonoids, alkaloids, proanthocyanidines, echitenine and echitamine	[5]
3	<i>Artemesia nilagirica</i>	Asteraceae	Tipintarin	Shrub	In headache and stomach pain, used as vegetable, to get relief from asthma	Leaves	Glycosides, tannins, phenols, terpenoides, saponins, amino acids, alkaloids, essential oil	[5]
4	<i>Cassia alata</i>	Fabaceae	Kra-pat	Shrub	Leaf juice is applied in eczema and itching	Leaves and roots	Alkaloids, tannins, anthraquinone, cardiacglycoside, phenols, diterpene, flavonoides	[5]
5	<i>Centella asiatica</i>	Apiaceae	Barang	herb	Fresh plant juice with honey is given in stomach ulcer, leprosy	Whole plant	Pentacyclitriterpenoids, asiaticoside, brahmoside, Asiatic acid, brahmic acid etc	[5], [7]
6	<i>Clerodendron glandulosum</i>	Lamiaceae	Pattoi	Shrub	For treatment of high blood pressure and bowel troubles, obesity	Fruits and leaves	Ascorbic acid, polyphenols, steroids, saponin, flavonoids etc	[5]
7	<i>Colocasia esculenta</i>	Araceae	Yaksar	aquatic tropical Plant	Fever and cough, petiole juice is used as styptic and stimulant	Leaves, stem and rhizome	Apigenin, luteolin, anthocyanin, minerals, steroids, sitosterol, starch	[5]
8	<i>Curcuma longa</i>	Zingiberaceae	Longobom	Herb	Used in bone fracture, anti tumour, in cardiovascular disease, anti bacterial	Leave, rhizome	Curcuminoides which includes curcumin, demethoxy-curcumin, resin, atlantone, turmerone, bisdemethoxycurcumin, sugars	[5], [8]
9	<i>Dillenia indica</i>	Dilliniaceae	Ahutenga	large shrub/ medium tree	Fruit decoction is applied to scalp for curing dandruff, wound healing, bone fracture, anti	Fruit pulp and leaves	Diterpene namely dipoloicacid, kaempferol, quercetin, betulin, betulinic acid, mallicacid, free amino	[5]



## Nagaland:

- 241 species plants
- 142 species are medicinal plants which are used by majority of people for their primary health care needs.



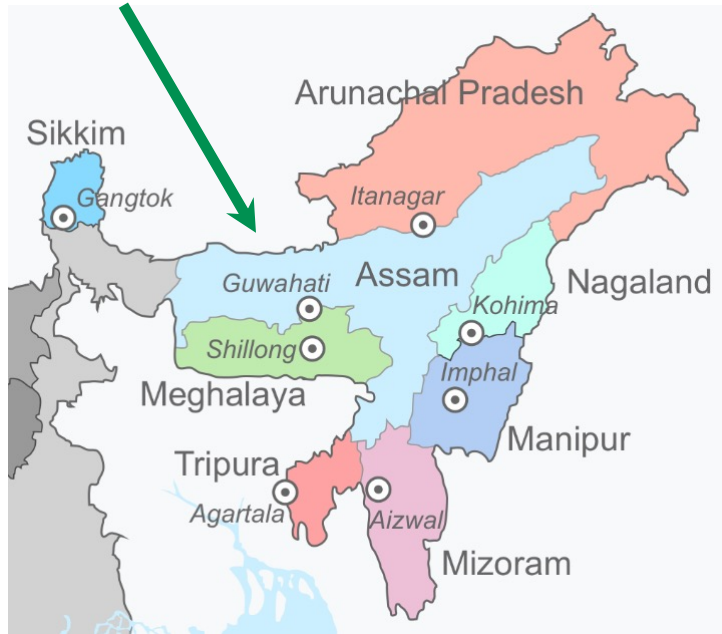
Zhasa, N. N., Hazarika, P., & Tripathi, Y. C. (2015). Indigenous knowledge on utilization of biodiversity for treatment and cure of disease of human beings in Nagaland, India: A case study. *International Research Journal of Biological Sciences.*, 4(4), 89–106.

S.N.	Scientific Name	Local Name	Uses
1	<i>Adhatoda vasica</i> Nees.	Mhejung Malabar nut	Leaves, barks and fruits are used Ao and Lotha tribes for curing bronchitis, fever, asthma and bleeding gums. Flowers and roots are used as an antiseptic.
2	<i>Andrographis paniculata</i> (Burm.f.) Wall.ex.Nees	Kalmegh	All Naga tribes use this whole plant in dysentery, diarrhoea, stomach skin diseases and fever, malaria, jaundice, liver trouble, diabetes and stomach ailment
3	<i>Phlogacanthus thryrsiflorus</i> (Roxb.) Nees.	Tita Phul Metecüse	Leaves and flowers are used for Fever, asthma and chronic bronchitis.
4	<i>Thunbergia grandiflora</i>	Sky flower, Nulidongmoli	Fruits used as vegetable. Roots are used as an aphrodisiac
5	<i>Adiantum philippense</i> L.	Maiden hair fern	Leaves are used to treat cough and throat infections. Rhizomes used as an antipyretic.
6	<i>Adiantum raddianum</i> C. Presl	Delta maiden hair fern	The whole plant is used to improve flow of urine, cure pulmonary, cough and respiratory problems and relieve muscle pains and inflammation of joints.
7	<i>Viburnum foetidum</i> Wall	Tsiekha	Leaves and roots are used for Anti-spasmodic and asthma.
8	<i>Agave Americana</i> L.	Century Plant	Whole plant used as blood purifier, diuretic and prevents formation of pus
9	<i>Sesuvium portulacastrum</i> L.	Shoreline purselane	Water extract of whole plant is used for scurvy and fever.
10	<i>Achyranthes aspera</i> L.	Pickles chaff flower, Aok rhua	The decoction of the herb is used for Pneumonia, toothache, abdominal tumours, diabetes, rheumatic pain, dysentery and piles. Root paste is used as anti-fertility drug Flowering spikes or seeds paste is used as an external application for poisonous insect bites and snake bites
11	<i>Amaranthus gangeticus</i> L.	Elephant-head amaranth	Roots used in treating abdominal pain and stomachache. Paste of whole plant used in inflammation of skin. Used in treating boils and burns and as laxative.
12	<i>Deeringia amaranthoides</i> Merr.	Mathukthuka	Tender leaves are used to heal fresh cuts by Ao community.
13	<i>Hippeastrum puniceum</i> (Lam.) Kuntze	Barbados lily	Bulb extract is used in allergy and rheumatism by the Sangtam and Khiamniungam tribes
14	<i>Rhus semialata</i> Murr.	Naga tenga Tangma-tong, Tanmo	Fruits edible, used for treatment of dysentery, diarrhoea and food poisoning
15	<i>Annona reticulata</i> L.	Bullock's heart	Used for remedy of jaundice, liver disorders, skin diseases, dropsy and as a diuretic. Also used as condiments
17	<i>Cathranthus roseus</i> (L.) G. Don	Periwinkle	Leaves used by the Sangtam Konyak and Chakhesang tribes for leukaemia, hypertension, diabetes and kidney problems.
18	<i>Gomphocarpus physocarpus</i> E. Mey	Baloon plant yongpi	Leaves and seeds are used by Chakhesang and Sangtam tribes in gastro-intestinal problems but can be fatal
19	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Serpent wood	Roots used as remedy for insomnia and high blood pressure
20	<i>Tabernaemontana divaricata</i> L	Crepe gardenia	Leaves, seeds and roots used in anti-inflammatory, syphilis, leprosy, gonorrhoea, dysentery, diarrhoea, malaria and fever.
21	<i>Ilex pernyi</i> Franch.	Perny holly	Tannin and bitter substances derived from leaves are used to treat bronchitis and rheumatic ailments.
22	<i>Acorus calamus</i> L.	Sweet Flag, Calamus,	Oil extract from the dried rhizome is used for coughs, influenza and tuberculosis. It is also used to enhance memory function of brain
23	<i>Colocasia esculenta</i> (L.) Schott	Arum/Banu, Manü	Corms edible, used by the Sangtam Angami, Zeliang tribes in insect stings, cuts, burns, injuries and internal hemorrhages.



## Assam:

- 3854 species plants
- More than 300 species are medicinal plants which are used by majority of people for their primary health care needs.

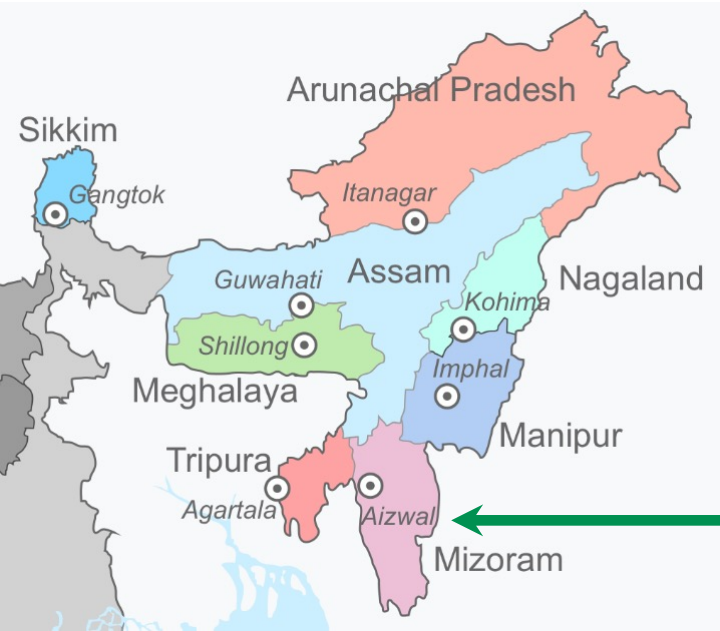


S. no.	Scientific Name	Common Name	Medicinal Use
1.	<i>Abelmoschus manihot</i>	Usipak, Aibika	Flowers used to treat chronic bronchitis and toothache <sup>14</sup>
2.	<i>Abrus precatorius</i>	Latumoni	Helps in hair growth, leaves are used in fever and cough & cold <sup>15</sup>
3.	<i>Desmodium laxiflorum</i>	Bhuter chira	Leaves and stem are used to treat amenorrhoea and uterine infection <sup>16</sup>
4.	<i>Thunbergia coccinea</i>	Changalota, Nil-lata, Nilakontho	Root juice is used to treat stomach infection and sterility <sup>16</sup>
5.	<i>Spilenthesis acmella</i>	Suho nibon	Leaves are used to treat mouth ulcers <sup>17</sup>
6.	<i>Colocasia esculenta</i>	Kola kochu	Corms and runners are consumed and are believed to treat piles and tonsillitis <sup>17</sup>
7.	<i>Alocasia macrorrhiza</i>	Bar-kachu	Used to treat knee joint pain and headache <sup>18</sup>
8.	<i>Enydra fluctuans</i>	Helechi	Leaves are used to treat ring worm <sup>17</sup>
9.	<i>Blechnum orientale</i>	Dhekia	Used to treat stomachache, urinary bladder infection and skin diseases <sup>19</sup>
10.	<i>Nymphoides indica</i>	Tal japori	The plant juice is consumed for treating jaundice <sup>17</sup>

Ghosh D & Parida P, Medicinal plants of Assam, India: A Mini Review, Int J Pharm Pharma Sci, 2 (6) (2015) 5-10.

# Mizoram:

- More than 400 species plants
- 207 species are medicinal plants which are used by majority of people for their primary health care needs.



Sl. No	Scientific name & family	Local name	Habit	Part(s) used	Mode of preparation	Ailments/ diseases	Ecological distribution & location
1.	<i>Abelmoschus moschatus</i> Medic ( <i>Malvaceae</i> )	Uichhuhlo, Bawrh Saiab e 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> )	Chhawntan	H	Leaves	Juice of leaves applied externally; paste of leaves applied externally.	Scabies, itches, rash, syphilis, snake-bite & centipede bites.	Scare; secondary forest, Tanhril
3.	<i>Achyranthes aspera</i> L. ( <i>Amaranthaceae</i> )	Buchhawl	H	w.p., leaves	Crushed juice taken orally	Dysentery, piles & skin eruptions, wounds, ulcer, soreworms.	Common in waste places, Bethlehem, Aizawl.
4.	<i>Acorus calamus</i> L. ( <i>Araceae</i> )	Hnim-rimtui (Lalram)	H	Root	Infusion of root taken orally	Bronchitis, cough, asthma, diarrhea, dysentery, snake-bites.	Rare; waste marshy places near Teirei river.
5.	<i>Actephila excels</i> (Dalz.) Muell. Arg. ( <i>Euphorbiaceae</i> )	Moiteleng	Sh	Leave	Juice of bruised leaves applied externally.	Tonsillitis, throat-pain.	Rare; in dense forest, Perhsang.
6.	<i>Ageratum conyzoides</i> L. ( <i>Asteraceae</i> )	Vailenhlo	H	Leaves, roots	Crushed juice applied externally	Cuts, haemostatics, antilithic.	Very common in waste places throughout Mizoram.
7.	<i>Aginata indica</i> L. ( <i>Orobanchaceae</i> )	Sangharvai bel	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> )	Belthei	T	fruit	Seeds eaten; pulp mixed with water taken orally.	Dysentery, scorbutic, cooling, alleya, antigonorrhoea, stomachic.	Introduced; Zawnuam.
9.	<i>Albizia chinensis</i> (Os.) Merr. ( <i>Mimosaceae</i> )	Vang	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> )	Kangteknu	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> )	Kangtekpa	T	stb.	juice applied externally.	Ulcers, leprosy.	Less frequent; Rawpuichhip
12.	<i>Alpina galanga</i> Willd. ( <i>Zingiberaceae</i> )	Aichal	H	rh	Infusion taken orally	Stomachic, febrifuge, diuretic, bronchitis.	Rare; mixed forest of Tlabung.

Lalramnghinglova H. 2016. Documentation of medicinal plants based on traditional practices in the Indo-Burma hotspots region of Mizoram, north east India. Emer Life Sci Res. 2:10–45.

# Conclusion

- **Need to collect various traditional practices of medicinal plants with well documentation.**
- **These traditional knowledge could help in the scientific discovery of important drugs to cure long standing diseases.**
- **Policies for the conservation of some of the endangered medicinal plants needed to be taken up seriously.**
- **Need to share these traditional practices across the world.**
- **Large scale fundings should be provided to the studies of traditional medicines.**