



Full Length Research Article

MEDICINAL AND AROMATIC PLANTS OF NORTH EAST INDIA

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ABSTRACT

North-East India is comprised of eight states namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim and supports 50% of India's biodiversity. Meghalaya is endowed with 850 medicinal plants, of which 377 species are used by majority of people for their primary health care needs. In Assam, herbal plants are used at the household level in a self-help mode by the rural community. Arunachal Pradesh, the treasure house of biological and socio-cultural diversity in the Eastern Himalayan Region of India. The state has 26 major tribes and over 110 sub-tribes who maintain a close relationship with the nature. A number of underutilized minor edible fruits have been identified in the Imphal valley (excluding Jiribam sub-division, Imphal East) of Manipur. The therapeutic application of 39 plant representing 29 genera and 23 families used as medicine by the *Meitei* community. The rich flora of Sikkim has a number of raw drugs described in Ayurvedic texts. There are about 420 plants are used by the tribal people for various diseases in Sikkim Himalayas region. A total of 25 of such plants were recorded from the medicine men and aged villagers of various villages from Tripura. Some important plants include *Oroxylum indicum*, *Euphorbia nerifolia*, *Scoparia dulcis*, *Jatropha curcas* and *Kaempferia rotunda*.

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INTRODUCTION

India is rich in its biological resources and considered as one of 17 mega biodiversity countries of the world. The Eastern Himalayas, Western Ghats and Indo-Burma Region are the concentrated hotspots of India. Presently, it has rich vegetation of more than 45,000 plant species of which 15,000-20,000 plants have medicinal values. Out of these only 7000-7500 plants are used for medicinal purpose by traditional communities. The report of World Health Organization shows that 80% of world population still depend on traditional medicines as they are efficient, safe, cost effective, affordable and easily accessible by the poor. North-East India is comprised of eight states namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim and supports 50% of India's biodiversity. In addition, this region is also a home of 130 major tribal communities. Meghalaya, the abode of clouds, is one of eight sister states of NE India. It is bounded by Assam on north and north-east and Bangladesh on south and south-west. It has geographical area of 22,429 km² with 9,496 km² as recorded forest area.

Traditional Medicinal Plant Species of Meghalaya

Meghalaya is rich in its floral diversity and contributes about 18% of total flora of country. There are about 3128 species of flowering plants in the state of which 40% of total flora of state is endemic. Meghalaya is endowed with 850 medicinal plants, of which 377 species are used by majority of people for their primary health care needs. The indigenous people have vast knowledge of their plant resources as medicines and have been using over the years.

Traditional Medicinal Plant Species of Assam

Assam, one of the biodiversity hotspots, occupies a special place in Northeastern India located between 24°44' N to 27°45' N latitude and 89°04' E to 96°02' E longitude, covering 2.4% of the geographical area of the country, i.e. 78,438 sq. km. The annual rainfall ranges between 305 cm. max. to 178 cm. min. with an average of 211.76 cm. The temperature recorded in summer is 37°C max. and 18°C min. and 26°C max. and 7°C min. in winter, with an average humidity of 83.00%. These types of climatic factors of Assam provide a congenial environment for growing diverse medicinal plants.

Table 1. Medicinal plant species used by tribal people of Meghalaya

| 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 clematitidis</i> L. | Esamul | Aristolochiaceae | Leaves and roots | Snakebite |
| <i>Artocarpus gomezianus</i> Wall. Ex. Trecul | Armum | 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 |
| <i>Dillenia indica</i> Linn. | Tedike | Dilleniaceae | Bark, leaves | Diarrhoea |
| <i>Dillenia scabrella</i> Roxb. | Agatchi | Dilleniaceae | Bark | Snakebite |
| <i>Drimycarpus racemosus</i> (Roxb.) Hk. f. | Babari | Anacardiaceae | Bark, leaves | Skin diseases |
| <i>Duabanga grandiflora</i> (Roxb.ex DC) Walp. | Bolchim | Lythraceae | Bark, leaves, root and flower | Headache, epilepsy |
| <i>Erythrina stricta</i> Linn. | Mandal | Fabaceae | Leaves, root | Asthma, epilepsy |
| <i>Ficus hispida</i> L | Thiwek | Moraceae | Root | Dysentery |
| <i>Firminia colorata</i> (Roxb.)R. Br. | Walgem | Sterculiaceae | Bark, leaves | Wound healing |
| <i>Gmelina arborea</i> Roxb. | Gambal | Verbanaceae | Bark, leaves | Cough, snakebite |
| <i>Grevillea robusta</i> A. Cunn, | Silver oak | Proteaceae | Bark, Leaves | Headache, dizziness |
| <i>Hibiscus rosa-sinensis</i> word L | Jova | Malvaceae | Flower | Headache, abortion |
| <i>Jatropha curcas</i> L. | Banglagash | Euphorbiaceae | Stem | Burn |
| <i>Jatropha gossypifolia</i> L. | Banglagash | Euphorbiaceae | Latex | Dysentery |
| <i>Justicia gendarussa</i> Linn. | Dojagipe | Acanthaceae | Whole Plant | Cough,throat infection and sprain |
| <i>Lagerstroemia parviflora</i> Roxb. | Sidai | Lythraceae | Bark, Leaves | Skin diseases |
| <i>Lagerstroemia speciosa</i> L. Pers. | Asari | Lythraceae | Bark, root | Dysentery, jaundice |
| <i>Litchi chinensis</i> Sonn. T | Letchu | Sapindaceae | Bark, Root, Seed | Stomach and throat pain |
| <i>Lygodium japonium</i> Thunb. Ex Murr. | Ruatip | Lygodiaceae | Whole Plant | Wound healing |
| <i>Mangifera indica</i> L. Tree | Tekatchu | Anacardiaceae | Bark, seed | Jaundice and itching |
| <i>Macropanax undulatus</i> (Wall ex D. Don) | Sambrong | Araliaceae | Leaves | Headache |
| <i>Melia azedarach</i> L. | Neem | Meliaceae | Leaves | Fever and stomach pain |
| <i>Mikania micrantha</i> H. B. K | .Sampangguri | Asteraceae | Leaves | Wound healing |
| <i>Mussaenda glabra</i> Vahl. | Sonarupa | Rubiaceae | Flower, Leaves, Root | Jaundice, leprosy and fever |
| <i>Oryza sativa</i> L. | Minil | Poaceae | Stem | Gall bladder stone and urinary disorder |
| <i>Oroxylum indicum</i> (Linn.) Vent. B Tree | Khiring | Bignoniaceae | Bark, Flower, Root, leaves and seed | Fever and jaundice |

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|---|----------------|----------------|-------------------------|--|
| <i>Phlogacanthus thyrsoiflorus</i> (Roxb.) Nees | Ellot | Acanthaceae | Bark and Leaves | Cough, fever, jaundice and gastric problem |
| <i>Piper betel</i> Linn. | Pan | Piperaceae | Leaves | Dysentery |
| <i>Piper longum</i> L. | Golmoris | Piperaceae | Fruit | Fever and cough |
| <i>Plumbago indica</i> L. | Achitragitchak | Plumbaginaceae | Leaves, Root | Headache |
| <i>Premna latifolia</i> Roxb. | Dukhemi | Verbinaceae | Leaves, Bark | Diabetes |
| <i>Prunus persica</i> Linn. | Biispol | Rosaceae | Leaves | Skin diseases |
| <i>Sabia lanceolata</i> Colebr. | Madri | Sabiaceae | Bark, leaves, root | Epilepsy |
| <i>Sida acuta</i> Burm. | Chirotha | Malvaceae | Bark, Leaves | Malaria |
| <i>Spilanthes acmella</i> Murr. | Sonapul | Asteraceae | Stem, leaves, flower | Toothache |
| <i>Spondias pinnata</i> (L.F.) Kurz | Ambarerongtong | Anacardiaceae | Bark | Nasal bleeding |
| <i>Sterculia villosa</i> Roxb. | Olmak | Sterculiaceae | Bark | Throat pain |
| <i>Tamarindus indica</i> L. | Cheeng | Fabaceae | Leaves, Roots | Skin diseases |
| <i>Thevetia peruviana</i> (Pers.) K. Schum. | Ceiling bol | Apocynaceae | Latex | Cough |
| <i>Terminalia bellerica</i> (Gaerth.) Roxb. | Chirore | Combretaceae | Bark, Fruit, Root, Seed | Headache, Jaundice and gastric problem |
| <i>Terminalia chebula</i> Retz. | Arithak | Combretaceae | Bark, Fruit | Dysentery |
| <i>Terminalia myriocarpa</i> Heurck. And Muell. | Rakseng | Combretaceae | Bark, Root | Urinary disorder, heart problem |
| <i>Tinospora cordifolia</i> (Willd.) Miers | Dumandal | Menispermaceae | Stem | Urinary disorder |
| <i>Vitex glabrata</i> R. Br. | Bandi-kuri | Verbanaceae | Bark, Leaves | Inflammation |
| <i>Ziziphus jujuba</i> Lam. | Kangkil | Rhamnaceae | Bark | Cough, tuberculosis |

Table 2. Medicinal plant species used by rural people of Assam

| Scientific name | Local name | Family | Parts used | Application |
|--|---------------------------------------|------------------|--------------------------|--|
| <i>Adhatoda zeylanica</i> Medic. | <i>Bahak tita</i> | Acanthaceae | Leaves | Cough, diarrhoea, dysentery and grandular tumours. |
| <i>Ageratum conyzoides</i> Linn. | <i>Gondhuabon</i> | Compositae | Leaves / Roots | Cut or injuries |
| <i>Alternanthera sessilis</i> R.Br. | <i>Matikaduri</i> | Amaranthaceae | Leaves | Growth of hair and stomach disorders, increase in milk flow |
| <i>Amaranthus spinosus</i> Linn. | <i>Hatikhutora</i> | Amaranthaceae | Roots / Stems | Snakebite, menorrhagia, gonorrhoea and to increase milk flow |
| <i>Amaranthus viridis</i> Linn. | <i>Khutora</i> | Amaranthaceae | Stem/ Leaves | Stem is used as antidote against snakebite. Leaves are good against scorpion sting. |
| <i>Argemone maxicana</i> Linn. | <i>Sialkatahi</i> | Papaveraceae | Roots/ Seeds | Used in leprosy, scabies, and syphilis and gonorrhoea; used as antidote against snakebite. |
| <i>Argyrea speciosa</i> Sweet. | <i>Takoria alu</i> | Convolvulaceae | Leaves/ Tuber | Paste of the leaves, latex is used to suppress small boils. The tuber is used as a contraceptive and also used in skin diseases. |
| <i>Ardisia humilis</i> Vahl | <i>Talotha poka</i> | Myrsinaceae | Leaves, fruits and roots | It is used as a stimulant and a carminative. |
| <i>Artemisia vulgaris</i> Linn. | <i>Chirota</i> | Compositae | Leaves | The juice is used as a blood purifier. Used against worm troubles, asthma, brain disorder and nervous problems |
| <i>Asparagus racemosus</i> Willd. | <i>Satamul</i> | Liliaceae | Roots | Roots are used as demulcents; diuretics, prepared medicated oil is good for rheumatic pain, nervous disorders. Also useful in dyspepsia, diarrhoea and dysentery |
| <i>Bonnaya reptans</i> Spreng | <i>Kasidoria</i> | Scrophulariaceae | Leaves | Roasted leaves in banana leaves are used for cold bite and cut injuries. |
| <i>Bryophyllum pinnatum</i> Kuntz. | <i>Dupartenga</i> | Crassulaceae | Leaves | Leaves are useful in wounds, bruises, boils, jaundice, snakebite, dysentery, urinary trouble and for quick healing of wounds. |
| <i>Calotropis gigantea</i> (L) R.Br. | <i>Akon</i> | Asclepidaceae | Roots/ leaves/ flower | Leaves are used in sprain and pain. Flowers are used as digestive remedy and for cough, asthma, and cold. Root bark is used in dysentery; cough, skin disease, cutaneous disease, and elephantiasis. |
| <i>Cannabis sativa</i> Linn. | <i>Bhang</i> | Cannabinaceae | Leaves/ flower | Dried flower is used medicinally as sedative, analgesic, narcotic. |
| <i>Cardiospermum halicacabum</i> Linn. | <i>Lota kopalphuta</i> | Sapindaceae | Whole plant | Paste made with water is useful in pain, stiff-neck, rheumatism, fever, piles. Leaves mixed with castor oil are used in lumbago, nervous disorder. |
| <i>Cassia occidentalis</i> Linn. | <i>Charudoi ghiga/ Bonoria daldol</i> | Caesalpiniceae | Roots/ leaves/ seeds | Used as remedy in skin disease, leprosy, psoriasis, ulcers, etc. |
| <i>Cassia tora</i> Linn. | <i>Bon medelua</i> | Caesalpiniceae | Roots/ leaves/seeds | Leaf paste is used against skin diseases and leprosy. Roots are an antidote against snakebite, ring worm, psoriasis and eczema. |

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| <i>Catharanthus roseus</i> (Linn.) G. Don. | <i>Nayantara</i> | Apocynaceae | Roots/ leaves | The parts of the plant are used as an anticarcinogenic agent. |
| <i>Centella asiatica</i> (Linn.) Urban. | <i>Bor manimuni</i> | Apiaceae | Whole plant | Used in dysentery, liver trouble, nerve disorder, and stomach problems. It stimulates appetite, taken with milk to improve memory, good for skin disease and a blood purifier, given to women after childbirth. |
| <i>Cissus quadrangularis</i> L. | <i>Hasjora/ Harbhanga</i> | Vitaceae | Leaves/stems | It is used for muscular-skeletal disorders. It is considered as a tonic and analgesic, and is believed to help heal broken bones. |
| <i>Citrus macroptora</i> var <i>assamensis</i> D. et Bhat. | <i>Satkora</i> | Rutaceae | Fruits | For digestion, rheumatic pains, colic. |
| <i>Clerodendrum colebrookianum</i> Walp. | Nefafu | Verbenaceae | Bud / leaf | For the control of high blood pressure. |
| <i>Clerodendrum infortunatum</i> Gaertn. | <i>Dhopat tita</i> | Verbenaceae | Roots/ leaves | Leaves can be used against malarial fever. Roots are used externally against tumours and skin disease. |
| <i>Clitoria ternatea</i> Linn. | <i>Aparajita</i> | Fabaceae | Leaves | Juice of leaves mixed with salt applied around ears in earache and swelling of adjacent glands to relieve pain. The juice is also an antidote against snake poison. |
| <i>Coccinia grandis</i> (L.) J. Voigt | <i>Belipoka</i> | Cucurbitaceae | Fruits | It is useful for treating diabetes, leprosy, fever, asthma, bronchitis and jaundice. |
| <i>Coffea bengalensis</i> Roxb. ex Schult. | <i>Kothona phool</i> | Rubiaceae | Leaves/Flowers | Young shoots and leaves used as medicine for cattle eye boil. |
| <i>Colocasia esculenta</i> (Linn.) Schott. | <i>Kola Kachu</i> | Araceae | Whole plant | Leaves used for blood coagulation in small injuries, roots used in pharyngitis. |
| <i>Commelina bengalensis</i> Linn. | <i>Kana simolu</i> | Commelinaceae | Branch/roots | Root juice is applied in eye-lid sore. Roots are useful in fever, bilious disease, snakebite and leprosy |
| <i>Datura stramonium</i> Linn. | <i>Boga dhotura</i> | Solanaceae | Whole plant | Smoke of leaves is used medicinally for asthma. A seed causes sleepiness. Poisonous and necrotic. Roots are good for toothache. |
| <i>Diplazium esculentum</i> (Retz.) Sw. | Dhekia | Athyriaceae | Leaves | Used in urinal complaints and to enhance sexual power. |
| <i>Drymaria cordata</i> Willd. | <i>Lai jabori</i> | Caryophyllaceae | Whole plant | Juice of the plant is laxative and anti febrile. The plant has cooling properties. |
| <i>Eclipta alba</i> (Linn.) Hassk. | <i>Kehraj</i> | Compositae | Entire plant | Fresh leaves are used in elephantiasis, liver disease and dropsy. Juice is also used for jaundice and fever. |
| <i>Enhydra fluctuans</i> Lour. | Helosi sak | Asteraceae | Leaves | Leaves are useful for cough, skin diseases, nervous disease, gonorrhoea, etc. |
| <i>Erechthites valerianaefolia</i> DC. | <i>Bon kopah</i> | Compositae | Leaves | Juice of the leaves is used in cut wounds for quick healing. |
| <i>Eryngium foetidum</i> Linn. | <i>Man dhania</i> | Apiaceae | Leaves/roots | An aromatic herb used as a condiments in soups, meat etc. |
| <i>Eupatorium odoratum</i> Linn. | <i>Naga bon</i> | Asteraceae | Leaves/ flowers | Leaves and flower tops are used medicinally as emetic, cathartic, in cut wounds. |
| <i>Euphorbia hirta</i> Linn. | <i>Dudh bon /Gakhiroti bon</i> | Euphorbiaceae | Whole plant | The entire plant is considered as sedative, haemostatic, soporific, used medicinally in asthma, chronic bronchitis. The milky juice is useful in destroying warts. |
| <i>Garcinia cowa</i> Roxb. Ex D.C. | <i>Kau-thejera</i> | Clusiaceae | Fruits/ stems/ resin / latex | Used in dysentery, diarrhoea and in stomach pain. |
| <i>Garcinia laneaefolia</i> | <i>Rupohi-thejera</i> | Clusiaceae | Leaves/fruits | Used in treatment of dysentery. |
| <i>Garcinia pedunculata</i> Roxb. | <i>Bor-thejera</i> | Clusiaceae | Fruits | Used in dysentery and diarrhoea. |
| <i>Garcinia xanthochymus</i> Hook. f. | <i>Tepor tenga</i> | Clusiaceae | Fruits, leaves | Used in dysentery, diarrhoea and, skin disease, diabetes etc. |
| <i>Gnetum gnemon</i> Linn. | <i>Mejherguti, Letera</i> | Gnetaceae | Leaves/fruits | Used to purify blood, stimulates urination |
| <i>Gymnopetalum cochinchinensis</i> (Lour.) Kurz. | <i>Kauri kerala</i> | Cucurbitaceae | Leaves/Roots | Roots made into paste and rubbed on body in body pain, pneumonia. |
| <i>Heliotropium indicum</i> Linn. | <i>Hatisuriya</i> | Boraginaceae | Whole plant | The juice of the plant is used in ulcers, wounds and local inflammation. Leaf paste is used against insect bite and boils. |
| <i>Hibiscus subdariffa</i> Linn. | <i>Mesta tenga</i> | Malvaceae | Leaves/fruits/ Seeds | It is used for dysentery, fever, dyspepsia, general debility, etc. |
| <i>Houttynia cordata</i> Thunb. | <i>Masandari</i> | Saururaceae | Whole plant | Used in stomach complaint and anaemia and in burn injuries. |
| <i>Hydrocotyle rotundifolia</i> Roxb. | <i>Soru manimuni</i> | Apiaceae | Whole plant | Used in dysentery, liver trouble, nerve disorder, and stomach problems. It induces appetite, taken with milk to improve memory, good for skin disease and is also a blood purifier. |
| <i>Impatiens roylei</i> Walp. | <i>Bijolkoria</i> | Balsaminaceae | Leaves/ fruits | Leaf and fruit paste is used on the head as a remedy in high fever. |
| <i>Ipomoea aquatica</i> Forsk. | <i>Pani kolmou</i> | Convolvulaceae | Leaves | Leaf juice is used in jaundice and also in urinary trouble and nervous disorders. |
| <i>Ipomoea quamoclit</i> Linn. | <i>Kunjalata</i> | Covolvulaceae | Leaves | Pounded leaves are used in piles. |
| <i>Justicia japonica</i> Linn. | <i>Jooron</i> | Acanthaceae | Leaves | Leaves are used in ophthalmia. |
| <i>Jussiaea suffruticosa</i> Linn. | <i>Bon jolokia</i> | Onagraceae | Whole plant | Used in dysentery and fever. |

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| <i>Lawsonia inermis</i> Linn. | <i>Jetuka</i> | Lythraceae | Leaves | It is astringent, sedative, detergent and is used as a prophylactic against skin diseases. |
| <i>Leucas aspera</i> Spreng. | <i>Duron bon</i> | Labiatae | Whole plant | Used against rabies; leaf juice mixed with garlic is good for the stomach, liver and spleen. |
| <i>Melastoma malabathricum</i> Linn. | <i>Phut kola</i> | Melastomaceae | Leaves | Leaf powder is used in wounds to prevent marks on the skin; wood tar is used in for blackening teeth. |
| <i>Mikania micrantha</i> Linn. | <i>Japanihabi</i> | Asteraceae | Leaves/ roots | Juice is useful in insect bite and scorpion sting |
| <i>Mimosa pudica</i> Linn. | <i>Lajuki lata</i> | Mimosaceae | Leaves | Leaf juice with milk is used as a good remedy for piles. |
| <i>Mirabilis jalapa</i> Linn. | <i>Godhuli gopal</i> | Nyctaginaceae | Roots | Roots are used in dropsy. |
| <i>Momordica charantia</i> Linn. | <i>Tita kerela</i> | Cucurbitaceae | Leaves/fruits/seeds | Useful remedy for diabetes, rheumatism, night blindness, and dysmenorrhea. |
| <i>Murraya koenigii</i> (Linn.) Spreng. | <i>Narasingha</i> | Rutaceae | Leaves | Leaves are used in diarrhoea, dysentery, digestion problems, as memory enhancer and for curing vomiting. |
| <i>Nasturtium indicum</i> (Linn.) D.C. | <i>Bonhariyah</i> | Brassicaceae | Seed | Seed juice is used in kidney trouble. |
| <i>Ocimum canum</i> Sims. | <i>Bon tulsi</i> | Labiatae | Leaves | Leaves made into paste applied to the fingers to relieve from fever. Seeds are used as remedy for dysentery. Leaves are used in skin disease. |
| <i>Ocimum gratissimum</i> Linn. | <i>Ram tulsi</i> | Labiatae | Whole plant | Plant juice is used as insect repellent. Seeds are used in headache. Leaves are used in for gonorrhoea, rheumatism and paralysis. |
| <i>Oldenlandia corymbosa</i> Linn. | <i>Bon jaluk</i> | Rubiaceae | Whole plant | Juice is applied in burning sensation of palms; it is also good for liver trouble, urinary disorder in children, jaundice, fever and bilious infection. |
| <i>Oxalis corniculata</i> Linn. | <i>Soru tengesi</i> | Oxalidaceae | Whole plant | Juice is used in stomach problems, wine intoxication and dysentery. |
| <i>Paederia foetida</i> Linn. | <i>Bhebeli lata</i> | Rubiaceae | Leaves | The plant is very good in stomach, kidney and liver problems. Decoction of leaves increases appetite. |
| <i>Peperomia pellucida</i> (L) H.B. and K | <i>Ponownoa</i> | Piperaceae | Leaves/ roots | Plant paste is used on the head to reduce temperature. |
| <i>Phlogacanthus thyrsoiflorus</i> Nees. | <i>Tita phool</i> | Acanthaceae | Flower/fruits | Useful in chronic bronchitis, asthma and phthisis, dysentery, neuralgia, scabies and malarial fever. |
| <i>Phyllanthus niruri</i> Linn. | <i>Bon amlokhi</i> | Euphorbiaceae | Whole plant | The whole plant is used in jaundice. Young leaves are good for dysentery. Root juice is used in urogenital troubles and gonorrhoea |
| <i>Polygonum microcephalum</i> D. Don. | <i>Madhu holeng</i> | Polygonaceae | Whole plant | It is useful in female weakness, bruises, piles and inflammation. |
| <i>Pouzolzia indica</i> Gaud. | <i>Dudhmo goch</i> | Urticaceae | Whole plant | Used against snakebite, syphilis, gonorrhoea. It is also used to heal children. |
| <i>Rhynchotechum ellipticum</i> A. DC. | | Gesneriaceae | Leaves | Useful in cough. |
| <i>Ricinus communis</i> Linn. | <i>Era</i> | Euphorbiaceae | Leaves/ roots | Roots are used in urinary trouble; juice with lime is used to suppress newly formed boils. |
| <i>Siegesbekia orientalis</i> Linn. | <i>Katampam</i> | Compositae | Whole plant | Used in healing gangrenous ulcers and skin disease. Useful against worms. |
| <i>Solanum indicum</i> Linn. | <i>Tita bhekuri</i> | Solanaceae | Roots/ leaves | Roots are used to cure toothache, asthma and in cough. |
| <i>Solanum nigrum</i> Linn. | <i>Pokmou</i> | Solanaceae | Roots | Root juice is used against asthma and whooping cough. |
| <i>Solanum spirale</i> Roxb. | <i>Tita kuchi</i> | Solanaceae | Whole plant | It is used against worms. The root is narcotic and diuretic. |
| <i>Solanum xanthocarpum</i> Schrad. & Wendl. | <i>Kanta kori</i> | Solanaceae | Roots/ leaves | Roots are used in asthma and in chest pain. Leaf juice with black pepper is used in rheumatic pain. |
| <i>Spilanthes paniculata</i> Wall. Ex. D.C. | <i>Huhoni bon</i> | Asteraceae | Whole plant | Used in toothache, sore mouth |
| <i>Urena lobata</i> Linn. | <i>Bor sonborial</i> | Malvaceae | Roots/ leaves | Roots are diuretic, good in rheumatic pain. |
| <i>Xanthium strumarium</i> Linn. | <i>Ogaro</i> | Compositae | Roots/ leaves | Used against chronic malarial fever, urinary trouble. |
| <i>Zanthoxylum oxyphyllum</i> Edgew. | <i>Mejenga</i> | Rutaceae | Tender shoots | For deworming of tapeworms |

In Assam, herbal plants are used at the household level in a self-help mode by the rural community. The rural people of Assam also consume many herbs as nutritional diet used in Indian system of medicine viz. *Bacopa monnieri* (L.) Penn., *Centella asiatica* (L), *Dioscorea bulbifera* Linn., *Emblica officinalis* Gaertn, *Eryngium foetidum* Linn., *Terminalia chebula* Retz., *Zanthoxylum alatum* Roxb., *Mentha spicata* Linn., *Ocimum sanctum* Linn., *Terminalia bellirica* (Gaertn.) Roxb., *Paederia foetida* Linn., *Euryale ferox* Salisb., *Solanum nigrum* Linn., *Piper longum* Linn., *Garcinia cowa* Roxb. Ex D.C., *Garcinia Morella* (Gaertn.) Desr., *Garcinia pedunculata* Roxb., *Dillenia indica* Linn., *Calamus rotang* Linn., *Parkia roxburghii* G. Don., *Alpinia allughas* Rosc., *Clerodendrum glandulosum* Lindl., etc.

This shows that people in this region are adopting the use of herbal plants in their day to day life which help in keeping their body healthy preventing ailments. With its vast hills and forests, Assam is the home to a variety of medicinal herbs and plants such as eg. Sarpagandha (*Rauvolfia serpentina* (Benth) ex.Kurz.), Pippali (*Piper longum* Linn), Amlakhi (*Emblica officinalis* Gaertn), Hilikha (*Terminalia chebula* Retz.), Bhomora (*Terminalia belerica* (Gaertn.) Roxb.), Arjuna (*Terminalia arjuna* Wight & Arn.), Vaividang (*Embelia ribes* Burm.f.), Chaulmoogra (*Hydnocarpus kurzii* King.), Mezankori (*Litsea citrate* Blume.), etc. About 900 species of medicinal herbs and plants are known to exist in abundance in the forest area of the state with the Brahmaputra valley itself having 50 species of herbs and plants of commercial value.

Table 3. Medicinal plant species used by tribal people of Arunachal Pradesh

| Scientific name | Local name | Family | Parts used | Application |
|--|----------------------------|----------------|--------------------------|--|
| <i>Acorus calamus</i> Linn. | <i>Kiile tolyo</i> | Acoraceae | Rhizome | A paste of rhizome is applied to cure headache, joint pain, wounds and skin rashes. Juice is also taken for stomachache |
| <i>Ageratum conyzoides</i> Linn. | <i>Borbe tami</i> | Asteraceae | Leaves | Paste of leaves is applied to stop bleeding in minor cuts. |
| <i>Allium cepa</i> Linn. | <i>Byaku</i> | Amaryllidaceae | Leaves | Leaf juice is taken orally for cold and cough. |
| <i>Allium hookeri</i> Thwaites | <i>Lepi</i> | Amaryllidaceae | Leaves | Pounded leaves mixed with oil iswarmed and massaged on body to get relief from body ache. It is also used against cold and cough. |
| <i>Artemisia indica</i> Willd. (Wild) | <i>Kukulyu</i> | Asteraceae | Leaves | Leaf decoction is used to get relief from stomachache and loose motion. Paste is applied to stop bleeding in minor cuts. It also has an anthelmintic property. |
| <i>Berberis wallichiana</i> DC. | <i>Tiipe tiire</i> | Berberidaceae | Leaves | Leaves are boiled in oil and oil is applied against joint pain and swells |
| <i>Cardamine hirsuta</i> Linn. | <i>Padii hamang</i> | Brassicaceae | Whole plant | Whole plant is consumed raw for indigestion, cold and cough. |
| <i>Centella asiatica</i> Linn. | <i>Ngilyan akho hamang</i> | Apiaceae | Leaves | Leaf juice is taken against gastric, jaundice and stomach ache. Raw leaves or juice is also taken for diarrhea and dysentery. |
| <i>Clerodendrum colebrookianum</i> Walp. | <i>Pato hamang</i> | Lamiaceae | Leaves | Boiled or steamed leaves are taken to control high blood pressure. |
| <i>Crassocephalum crepidioides</i> (Benth.) S. Moore | <i>Genda hamang</i> | Asteraceae | Leaves | Grinded leaves paste is applied on minor cuts to stop bleeding. |
| <i>Eleusine coracana</i> (Linn.) Gaertn. | <i>Sarse</i> (Cultivated) | Poaceae | Grains | Powdered grains are boiled and taken orally to reduce cholesterol and raise blood percentage. |
| <i>Gynostemma pedata</i> Blume. | <i>Riikoh</i> (Wild) | Cucurbitaceae | Stem and tuber | Grinded powder of stem or tuber mixed with salt is used to get relief from throat pain and cough. Powder mixed with water is taken against dysentery, gastric, loose motion and stomachache. |
| <i>Gynura cusimbua</i> (D. Don) S. Moore Herb | <i>Kochi hamang</i> | Asteraceae | Leaves | Raw juice is taken against stomachache and worms. It is also used as blood purifier and is applied against allergy. |
| <i>Houttuynia cordata</i> Thunb. | <i>Siyam hamang</i> | Saururaceae | Tender leaves and stem | Juice is extracted and taken to get relief from dysentery, indigestion, loose motion, and stomach ache. It is also known to provide sound sleep. |
| <i>Hydrocotyle javanica</i> Thunb. | <i>Subu tute</i> (Wild) | Apiaceae | Whole plant | Raw juice is taken for dysentery and stomachache. |
| <i>Litsea cubeba</i> (Lour.) Pers. | <i>Santero</i> (Wild) | Lauraceae | Tender leaves and fruits | Pounded tender leaves and fruits mixed with water are taken for dysentery, indigestion, stomachache, cold and cough. It also provides sound sleep. |
| <i>Mahonia napaulensis</i> DC. | <i>Taming</i> | Berberidaceae | Bark | Bark juice is applied against boils in lips, itching, wounds and skin rashes. Juice is also used for preparation of dye. |
| <i>Michelia champaca</i> Linn. | <i>Salyo sanii</i> (Wild) | Magnoliaceae | Pericarp and Seeds | Dried and grinded or boiled pericarps and seeds are taken for stomach ache and as an appetizer. |
| <i>Mikania micrantha</i> Kunth | <i>Mantami</i> (Wild) | Asteraceae | Tender leaves and stem | Tender leaves and stem are grinded into paste and applied on cuts and wounds to stop bleeding. Juice is also taken orally to cure nosebleeding. |
| <i>Molineria recurvata</i> (Dryand.) Herb. | <i>Loli</i> (Wild) | Hypoxidaceae | Leaves and roots | Grinded paste of leaves is applied against body pain. Paste of roots is used against cuts and wounds for fast healing. |

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|---|---|-------------------------|---------------------------------|--|
| <i>Oenanthe javanica</i> (Blume) DC. <i>Oxalis corniculata</i> Linn. | <i>Hugu hamang</i> (Wild) <i>O- khui hamang</i> (Wild) | Apiaceae Oxalidaceae | Tender leaves and tem Leaves | Raw tender leaves and stem is taken against stomach ache. Leaves are grinded into paste and are applied in cuts and wounds. Raw leaves are used as an appetizer. Leaves are also chewed for foul smell of mouth. |
| <i>Paederia foetida</i> Linn. | <i>Gandhali</i> (Wild) | Rubiaceae | Leaves and stem | Juice of leaves and stem is used to cure dysentery, diarrhea, gastric, indigestion and stomach ache. |
| <i>Plantago erosa</i> Wall. ex Roxb. Herb | <i>Mepi hamang</i> (Wild) | Plantaginaceae | Leaves | Boiled leaves are taken to get relief from constipation and indigestion. Paste of raw leaves is applied on cuts to stop blood flow. |
| <i>Plectranthus japonicus</i> (Burm.f.) Koidz. | <i>Yode</i> (Wild) | Lamiaceae | Leaves | Leaves are grinded into paste and are applied on swells, wounds and on cuts to stop bleeding. |
| <i>Pteridium revolutum</i> (Blume) Nakai | <i>Taree</i> (Wild) | Dennstaedtiaceae | Leaves | Juice of young or tender leaves is used to stop bleeding in minor cuts. |
| <i>Rhus javanica</i> Linn. | <i>Tamo sanii</i> (Wild) | Anacardiaceae | Fruits | Water of boiled or soaked fruits is taken to cure dysentery, gastric and stomach pain. |
| <i>Solanum nigrum</i> Linn. | <i>Hiuro hamang</i> (Cultivated) | Solanaceae | Leaves and tender shoots | Fresh leaves are chewed to cure boils in mouth and tongue. Boiled leaves and tender shoots are taken to cure high blood pressure and stomach ache. |
| <i>Solanum xanthocarpum</i> Schrad. & Wendl. | <i>Siitii byako</i> (Wild) | Solanaceae | Seeds | Dried seeds are wrapped with clean cloth, burned and fumes are allowed to enter into teeth cavity to get relief from toothache. |
| <i>Spilanthes paniculata</i> Wall. Ex DC. | <i>Yorkhun</i> (Cultivated) | Asteraceae | Flowers and leaves | Leaves are taken as raw for indigestion, stomach ache and throat pain. Flowers are chewed for toothache. |
| <i>Swertia chirayita</i> (Roxb. ex Fleming) Karsten | | Gentianaceae | Whole plant | Decoction of the dried plant is taken in malarial fever and cold. It is also used as anthelmintic. |
| <i>Taxus wallichiana</i> Zucc. | <i>Talley Noori</i> | Taxaceae | Bark | Oil is extracted from bark and is used in the treatment of cancer. |
| <i>Valeriana jatamonsii</i> Jones | | Valerianaceae | Roots | Grinded paste of roots is applied for fast healing of boils and wounds. |
| <i>Zingiber officinale</i> Roscoe | <i>Taki</i> | Zingiberaceae | Rhizome | Juice mixed with honey is taken for cold and cough. It is also taken with hot water against asthma and indigestion. Raw rhizome is chewed to cure tooth ache. |

Table 4. Underutilized minor fruits as medicine in Manipur

| Scientific name | Common name | Local name | Family | Parts used | Application |
|---------------------------------|------------------------|---------------|---------------|------------------------|---|
| <i>Aegle marmelos</i> | Bael | Heiri- khagok | Rutaceae | Fruit | Mature fruit as against diarrhea and dysentery and ripe fruit as tonic, laxative and good for heart |
| <i>Annona reticulata</i> | Bullock's heart | Ramphal | Annonaceae | Fruit, leaves | Seed powdered paste are applied to the head to kill lice and leaves boil juice to reduce high blood pressure |
| <i>Aphanamixis polystachya</i> | Pithraj tree | Hei-ranggoi | Meliaceae | Fruit | Liver constipation and leucorrhoea |
| <i>Artocarpus lakoocha</i> | Monkey jack | Heiri kothong | Moraceae | Fruit | Ripe fruit pulp is taken in constipation and in fever and also as anthelmintic |
| <i>Artocarpus heterophyllus</i> | Jackfruit | Theibong | Moraceae | Root, seed, ripe fruit | Treatment of diarrhoea from root and seed extract. Ripe fruit as laxative and gum exude from unripe fruit is burnt and the ash powder is applied in skin disease. |
| <i>Averrhoa carambola</i> | Carambola | Heinoujom | Oxalidaceae | Fruit, root | Ripe fruit pulp along with little common salt is eaten against jaundice, bleeding piles and for washing utensil. Besides, the crushed leaves for curing chicken pox, ring worm and scabies and its root extract is used as an antidote for poisoning. |
| <i>Baccaurea ramiflora</i> | Burmese grape | Moktok hei | Euphorbiaceae | Fruit, bark | Fruit as a digestive and bark for skin disease |
| <i>Calamus tenuis</i> | Rattans (Canes) | Heiri | Arecaceae | Fruit | Highly acidic fruit which use as digestive after meal; stem are used for handicraft and furniture work |
| <i>Celtis timorensis</i> | Stinkwood | Hei- kreng | Cannabinaceae | Leaf | Dysentery and jaundice |
| <i>Citrus grandis</i> | Pommelo | Nobab | Rutaceae | Fruit juice | Fruit juice as febrifuge, seed against dyspepsia and its dry pill to repel the mosquito |
| <i>Citrus macroptera</i> | Hatkora | Heiribob | Rutaceae | Fruit, peel | Fruit juice is used for stomach ailment, fruit pill as spice and in dyspepsia |
| <i>Dillenia indica</i> | Chulta/ Elephant apple | Heigri | Dilleniaceae | Fruit | As a digestive and pickle preparation |
| <i>Duchesnea indica</i> | Mock strawberry | Heirong-kak | Rosaceae | Whole plant | Against stone formation in urinary tracts and kidney |
| <i>Elaeagnus umbellata</i> | Japanese silvery | Heiyai | Eleagnaceae | Fruit, seed | Fruit as a digestive and seed for curing cough |

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|---|---------------------------|-----------------|----------------|-------------------------|---|
| <i>Euphoria longan</i> | Longan | Nongang hei | Sapindaceae | Fruit | Relaxation and stomachic from fresh fruit |
| <i>Ficus auriculata</i> | Elephant ear Fig | Heirit | Moraceae | Fruit and Bark | Used against dysentery, diabetes and lungs disease |
| <i>Ficus palmata</i> | Bedu | Heibala | Moraceae | Fruit | Prevent oxidative stress |
| <i>Ficus glomerata</i> | Cluster fig tree/Gooleer | Heibong | Moraceae | Fruit, root | Fruit are used against dysentery, diabetes and lung disease and bark are used on skin having boil or insect bite |
| <i>Ficus hispida</i> Linn. | Gobla | Asiheibong | Moraceae | Fruit, bark, leaves | Dysentery, ringworm and intestinal worm infection. Leaves are used in preparation of fermented soyabean locally called "hawaizar" |
| <i>Flacourtia jangomas</i> | Indian plum / Coffee plum | Heitroi | Flacourtiaceae | Fruit | Used for bleeding gum and toothache and diabetes |
| <i>Gardenia campanulata</i> | Boilem | Lam-Heibi | Rubiaceae | Young leaves, fruit | Leave paste are applied on the skin of boil for removing pus and diabetes |
| <i>Garcinia pedunculata</i> | Sani | Heibung | Guttiferae | Fruit | Fruit as a digestive and stomach disorder |
| <i>Glycosmis arborea</i> | Chauldhua | Yong komla | Rutaceae | Fruit, leaves | Fever liver complaints, jaundice and hair lotion |
| <i>Juglans regia</i> | Walnut | Heijuga | Juglandaceae | Fruit, leaves | Fruit use for curing heart diseases and leaves are use as traditional medicine to reduce swell on joint, fever and antidiarrhoeal |
| <i>Litsea glutinosa</i> | Medasaka | Thang-hidak | Lauraceae | Leaves and bark | Cut and injuries for early blood clotting and muscular sprain |
| <i>Litsea monopetala</i> | Meda | Tumid-la | Lauraceae | Leaves seed and bark | Diarrhoea and rheumatism of body pain |
| <i>Malus baccata</i> | Crab apple | Heitup | Rosaceae | Fruit | As a digestive but not recommended to eat during cold fever |
| <i>Meyna laxiflora</i> | Moyna | Heibi | Rubiaceae | Young leaves, fruit | Intestinal worm and hoarseness |
| <i>Musa paradisiaca</i> | Hill banana | Ching laphu | Musaceae | Pseudostem, male flower | Pseudostem for better breast milk for newly born child mother and male flower for blood purification |
| <i>Olea ferruginea</i> | Indian olive | Chorphon | Oleaceae | Leaves, fruit | Leaves are used for pile treatment and fruit as a digestive |
| <i>Phyllanthus acidulous</i> | Star gooseberry | Kihori | Euphorbiaceae | Fruit | Blood enhancer for the lungs and root as a purgative |
| <i>Phyllanthus fraternus</i> | Bhumyamalki | Chakpa-heikru | Euphorbiaceae | Whole plant | Leucoderma |
| <i>Prunus domestica</i> ssp. <i>Syrica</i> | Mirabelles plum | Kalen Heikha | Rosaceae | Fruit | Laxative |
| <i>Prunus domestica</i> ssp. <i>Insitiita</i> | Damsons plum | Heikha | Rosaceae | Fruit | Laxative |
| <i>Rhus chinensis</i> | Nutgall tree | Heimang | Anacardiaceae | Young shoot, fruit | Antiviral, antibacterial, anti-diarrhea, antioxidant activities and as a digestive |
| <i>Rubus elliptens</i> | Yellow Raspberry | Heijampet | Rosaceae | Fruit, leaves & root | Fruit against diarrhea and root for dysentery and leaves for abortifacient |
| <i>Rubus moluccanus</i> | Ceylon blackberry | Heijampet amuba | Rosaceae | Fruit, leaves & root | Fruit against diarrhea and root for dysentery and leaves for abortifacient |
| <i>Spondias pinnata</i> | Indian hog plum | Heining | Anacardiaceae | Fruit, leaves | Leaves are used as an ingredient for making herbal hair lotion "Chinghi", fruit are use against dysentery and dyspepsia |
| <i>Terminalia chebula</i> | Yellow myrobalan | Manahi | Combretaceae | Fruit | Anti-inflammatory, cough and colds, pile, ulcer and mild purgative |

The traditional health care system of 80% of the population in the rural areas of this region is still dependent on their surrounding vegetation / forests and pastures. They rely on medicinal plants because of their effectiveness, lack of modern healthcare alternatives and socio-cultural preferences. The forest of Assam, which is known for its rich bioresearches and ethno cultural diversity, is also a source of various medicinal plants to various ethnic communities. It has been found that the people apply their traditional knowledge of different medicinal plants to cure simple and common diseases as cold and fever but also deadly ones, as complicated as cancer. It is interesting to note that the roots and leaves of *Catharanthus roseus* are used as ant carcinogenic medicine. Other major ailments for which there are trade of medicinal plants include *leprosy*, *jaundice*, *dropsy*, *pneumonia*, *asthma*, *elephantiasis*, *piles*, *hysteria*, *malaria*, *calculi* both *gall-bladder* and *kidney*, *bronchitis*, *pharyngitis* and *rheumatism*. Highest numbers of plants are found to be used against snakebite. Several parts of a plant such as roots, leaves, flowers, seeds, tubers, stems, fruits are used as medicine. Different parts of plants used by the community according to their preference are being presented in the Table-2. Among the different parts of the documented plants they utilise the leaves mostly (43%), followed by roots (28%), sometimes the whole plant (17%), seeds (4%), flowers (4%), stems (2%), tubers (1%) and fruits (1%).

Traditional Medicinal Plant Species of Arunachal Pradesh

Arunachal Pradesh, the treasure house of biological and socio-cultural diversity in the Eastern Himalayan Region of India. The state has 26 major tribes and over 110 sub-tribes who maintain a close relationship with the nature. The local inhabitants of the state have their own customs, tradition and medicinal system who mainly depended on forests and forest products for their day to day lives (Table 3).

Traditional medicinal knowledge of underutilized minor fruits as medicine in Manipur

The state has a central valley (Imphal Valley) inhabited by the *Meitei* and *Meitei pangal* whereas the hilly areas are inhabited by 30 different tribes of *Naga* and *kuki* tribes. The North – Eastern region of India including Manipur is part of both Himalaya as well as Indo-Burma biodiversity hotspots in the world supporting about 50% of the total India's biodiversity but represent only 8% of the total geographical area of India. A number of underutilized minor edible fruits have been identified during the methodical field survey conducted during the year 2012-2013 in the Imphal valley (excluding Jiribam sub-division, Imphal East) of Manipur.

Table 5. Medicinal plant species used by indigenous people of Sikkim

| Scientific name | Local name | Family | Parts used | Application |
|--|-----------------------------|----------------|---------------------|--|
| <i>Abies forrestii</i> C.C Rogers | Bobresall | Pinaceae | Leaf | Used for bronchitis, cough, hiccup, vomiting, dyspepsia, anorexia, indigestion etc. |
| <i>Abies webiana</i> Linn.F | Sala | Pinaceae | Leaf | Used for bronchitis, cough, hiccup, vomiting, dyspepsia, anorexia, indigestion etc. |
| <i>Aconitum ferox</i> wall. | Bikh, Bikhma | Ranunculaceae | Whole plant | It is used in Ayurveda in pain condition, fever, Inflammatory conditions ,diabetes, bronchitis and skin disorders |
| <i>Aconitum hetrophyllum</i> | Bikh, Paunkar | Ranunculaceae | Root | The root is bitter in taste and <i>Tridosagna</i> (maintain the body humors). It is the best drug for child's all types of problems like- Infant diarrhea, cough , cold, fever etc . |
| <i>Acorus calamus</i> | Bajao | Acoraceae | Rhizome | The rhizomes give a bitter tasting tonic which is much used against fever, cough, pharyngitis, bronchitis, rheumatism, diarrhea, dyspepsia and colic condition by the tribal. In |
| <i>Aloe barbadensis</i> Mill | Ghewkumari | Asphodelaceae | Leaf | Fresh leaf juice is used as purgative, carminative, digestive, helpful in ophthalmia, piles, muscular pain and inflammation. It is also used as a nourishment for growth of hair. It is also used in skin ailments, arthritis, burn, etc. |
| <i>Angelica archangelica</i> Linn | Khomog | Apiaceae | Root | Root is bitter in taste and exclusively used in Mental diseases particularly epilepsy and Insanity with emetic drugs. It is also used in itching, skin diseases, ulcer, infection and toxic condition. |
| <i>Artemisia vulgaris</i> L | Tetaypati | Asteraceae | Whole plant | Used in Ayurveda in skin diseases,irritable bowel syndrome, bleeding, various toxic condition and to maintain the body humors(<i>Tridosaghna</i>). |
| <i>Asparagus recemosus</i> Willd | Satmuli | Asparagaceae | Whole plant | It is also a Rasayana drug and good for pregnant women. It increase the semen , milk, memory and used in abdominal discomfort, dysentery, inflammation and all vata pitta condition. |
| <i>Bergenia lingulata</i> (Har.) | Pakhanbheda | Saxifragaceae | Root and rhizome | Local people used in only diarrhoea and dysentery but Ayurveda used in poor appetite, renal calculi, abdominal abscess, infectious abscess, old goiter and gland, blood purifier and to maintain the body humors(<i>Tridosaghna</i>). |
| <i>Callicarpa macrophylla</i> Vahl. | Patharwar | Verbenaceae | Bark | It is bitter in taste and useful in blood dysentery, sweating, burning sensation and fever due to its cold potency. This is the best medicine for bleeding disorders and it reduces the bad smell from body. |
| <i>Celastrus paniculatus</i> Willd | Runglim | Celastraceae | | The herb mainly used in vata-kapha disorders and it increase the <i>Medha</i> (memory), <i>buddhi</i> (judgment) and <i>pragyna</i> (Intelligence). |
| <i>Cinnamomum tamala</i> Nees & Eberm | Choti, Sinkoli | Lauraceae | Bark and leaves | It is a used in kapha-pitta disorders like-cough, rhinitis, piles, worm infestation of children. It is used in convulsion and vomiting. |
| <i>Costus speciosus</i> | Betlaure | Costaceae | Root | The root is pungent and bitter and used in cough, bronchitis, fever, rheumatism, urinary disorders, loss o appetite, loose motion and skin diseases. These underground tubers are considered now as source of Diosgenin, the precursor of steroid, including sex hormones and oral contraceptives. |
| <i>Dendrobium nobile</i> Lindl. | Sonakhiri | Orchidaceae | Leaf and pseudobulb | This herb juices is redness of eyes, for increase strength, vigor and vitality and <i>Rasayana</i> . |
| <i>Eupatorium cannabinum</i> L | Banmara | Asteraceae | Leaf and stem | It is important medicinal plant in Ayurveda to stop the bleeding and protect the wound from infection. |
| <i>Hedychium spicatum</i> Ham Ex. Smith | Kapur kacheri | Zingiberaceae | Root | Root is pungent and bitter in taste mostly used in tooth powder. It is used in cough, Bronchitis, ulcers , inflammation, pain etc. |
| <i>Mallotus philippinensis</i> Muell | Sinduria,Puroa,Safedmallata | Euphorbiaceae | Fruit | Fruit <i>remu</i> is used as purgative and used kapha pitta disease like- worm constipation, infestation and abdominal diseases. |
| <i>Nardostachya jatamansi</i> DC | Japoy | Caprifoliaceae | Root | The dried root is used in epileptic bits, cholera, palpitation and also during hair loss. |
| <i>Oroxylum indicum</i> Vent. | Totola, Shivnak | Bignoniaceae | Bark | Bark is one of ingredient in <i>dosamula</i> and bitter in taste and used in <i>kaphapitta</i> and <i>ama</i> disorders. It is best medicine for urinary bladder problems and used in stones, diarrhea and anorexia |
| <i>Paederia foetida</i> | Biri, Berihara | Rubiaceae | Leaves | In Ayurvedic preparation, it is considered alterative, anti-arthritic, antispasmodic cardiac, diaphoretic, expectorant and stomachic. It is also used in asthma, bowel complaints, diarrhoea, diabetes, rheumatism, seminal weakness etc. |
| <i>Picrorhiza kurroa</i> Royle ex. Benth | Kutki | Plantaginaceae | Root | The roots of the plant is bitter in taste and the dried roots are used orally in malaria. The roots are used as bitter tonic, cathartic, stomachic, given in fever, dyspepsia, as strong purgative and also applied in scorpion and other insect bites. |

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| <i>Podophyllum hexandrum</i> Royal | Panchpatey | Berberidaceae | Root | The roots are used as emetic, cholagogue, blood purifier, purgative and alterative. It is considered as a cardiac tonic in small doses. It also finds use as a stimulant in peristalsis, allergy and skin inflammations. |
| <i>Rubia cordifolia</i> Linn | Manjitho | Rubiaceae | Fruits and roots | Root is bitter and used in Kaphapitta disorders. It has analgesic and inflammatory properties. It is used in the diseases of the uterus, pains in the joint, rheumatic conditions, leucorrhoea, etc. Also used as febrifuge and against blood disorders in Ayurveda. |
| <i>Swertia chirata</i> Buch.-Ham. | Chirato | Gentianaceae | Whole plant | Due to its bitter taste, it is considered as tonic, astringent, stomachic, improves eye sight, pain in the joints, scabies |
| <i>Saussuria lappa</i> C.B.Cl | Asolow, Brahma kamal | Asteraceae | Fruits, roots and leaves | Ayurvedic physician used in cough, cold, bronchitis, hiccup, skin diseases and fever. |
| <i>Smilax lanceifolia</i> roxb. | Kukur, Ramdatun | Smilacaceae | Rhizome | Used in Ayurvedic medicine for sexual transmitted diseases, neurological problems and psychiatric problems. It is also used in epilepsy and purification of urine and stool. |
| <i>Texus baccata</i> Linn. | Dhengresalla | Taxaceae | Bark and leaves | Taxol is isolated from the bark and leaf of the tree which is effective against certain forms of cancers, particularly breast, ovarian and lung cancer. young shoots has long been in use for the treatment of headache, giddiness, feeble and falling pulse, diarrhoea and severe biliousness. |
| <i>Valeriana hardwickii</i> Wall. | Chammaha | Caprifoliaceae | Root | This plant is used in kapha vatta diseases and the drug of choice in neuro- psychiatric problems like vertigo, drug dependence, epilepsy and other mental diseases. |
| <i>Zanthoxylum alatum</i> Roxb | Tumuru | Rutaceae | Fruits and barks | Used in kapha vata disorders, mostly in skin diseases, abdominal pain, anorexia, warm infestation and ataxia in Ayurvedic practice. |

Table 6. Medicinal plant species used by village people of Tripura

| 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 is 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 | Vapor 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. |

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|--|----------------|------------------|-------------------------------|--|
| <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>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 is 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 |
| <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 |

The therapeutic application of 39 plant representing 29 genera and 23 families used as medicine by the Meitei community (Table 4). Tree species contributed in maximum having 76 % while shrubs 10% and herbs recorded 7 % of the total underutilized fruits as medicine. These plants are used for a wide range of common ailments like diuretic, laxative, jaundice, diabetes, diarrhoea, dysentery etc. Fruits and leaves are the major plant parts used for the preparation of medicine having 52 % and 22%.

Traditional Medicinal Plant Species of Sikkim

The unique geographical position and wide range of topography, high fertile soil, sufficient rainfall and presence of large number of perennial stream makes the state of Sikkim one of the treasure house of bio-diversity in the country. Sikkim has vast reserve of medicinal plants and rich culture of folk medicine. The rich flora of Sikkim has a number of raw drugs described in Ayurvedic texts. There are about 420 plants are used by the tribal people for various diseases in Sikkim Himalayas region, out of which few are in utilized on commercial basis (Table 5).

Traditional Medicinal Plant Species of Tripura

The tribal people of Tripura are accustomed to a wide variety of medicinal plants used in their herbal medicinal practices (Table 6). A total of 25 of such plants were recorded from the medicine men and aged villagers of various villages. Some important plants include *Oroxylum indicum*, *Euphorbia nerifolia*, *Scoparia dulcis*, *Jatropha curcas* and *Kaempferia rotunda*.

REFERENCES

- Baishya, R.A., Sarma, J. and Begum, Ajima. 2013. Forest based medicinal plants rendering their services to the rural community of Assam, India. *International Journal of Applied Biology and Pharmaceutical Technology*, 4(4): 10-20.
- Das, Sudipta and Choudhury Dutta Manabendra. 2012. Ethnomedicinal uses of some traditional medicinal plants found in Tripura, India, *Journal of Medicinal Plants Research*, Vol. 6(35), pp. 4908-4914.
- Sharma M., Sharma C.L. and Marak, P.N. 2014. Indigenous uses of medicinal plants in North Garo Hills, Meghalaya, NE India. *Research Journal of Recent Sciences*, Vol. 3(ISC-2013), 137-146.
- Singh, S. R., Phurailatpam, Wangchu, L., Ngangbam, P. and Chanu, T.M. 2014. Traditional medicinal knowledge of underutilized minor fruits as medicine in Manipur. *International Journal of Agricultural Sciences* ISSN: 2167-0447 Vol. 4 (8), pp. 241-247.
- Tilling, Rupa, Bharali, PankajI, Dutta, Priyanka, Gogoi, Gaottham, Paul, Ashish and Das, Arup Kumar. 2015. Ethnomedicinal plants used by Apatani tribe of Ziro Valley of Arunachal Pradesh. *International Journal of Conservation Science*, Volume 6, Issue 3, July-September 2015: 411-418.
