

Ethnobotanical studies on the Khamniungan tribe in Tuensang district of Nagaland, Northeast India: Ethnomedicinal plants

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Abstract

This paper reports an Ethnobotanical study that focused on the traditional medicinal plants used by the Khamniungan tribe living in the Tuensang district of Nagaland. The study was conducted during the period 2017 – 2018 and is reported for the first time. The study design include oral interview, group discussions with village elders, medicine practitioners and personal observation of plants in use. A total of 76 species belonging to 48 families and 68 genera were recorded which were used as medicinal plants by the Khamniungan tribe of Nagaland. According to the study, leaves, barks, seeds, flowers, shoots are some of the important plant parts which were dominantly used as medicine for various sickness and ailments. A brief account of the genera, local name, parts used and mode of uses are presented in this paper in the form of table.

Key words: Ethnobotany, Khamniungan tribe, Nagaland, Northeast India

INTRODUCTION

American botanist John Harshberger first coin the term “ethnobotany” in 1896 as the study of plants used by primitive and aboriginal people. Since then it has been deūned as the traditional knowledge of indigenous communities of the surrounding plant diversity and the study of how the people of a particular culture and region make use of indigenous plants. The deūnition of ethnobotany can be summed up in four words: *people, plants, interactions, and uses* (Abbasi *et al.* 2012). Ethnobotany is the use of plants in material or abstract form among ethnic communities or tribal people. Sometimes, it is regarded as ethnographical or anthropological or tribal botany (Shah 2008). Ethnobotanists explore how plants are used as food, shelter, medicine, and clothing, for hunting, and in religious ceremonies. According to Sofowora (1982), around 60 – 85 % of the population in every developing country is rely only on traditional medicines. As per the analysis by Park *et al.* (2012), the practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka, Thailand, and Korea. In China, traditional medicine accounts for around 40 % of all health care delivered and is used to treat roughly 200 million patients annually (WHO 1999). In Ethiopia, plants are used as a source of medicine and have been in practice from generations to treat different ailments due to its long history (Pankhurst 1965). These traditional medical practices and remedies are recorded in oral tradition and in early medico-religious manuscripts and traditional pharmacopoeias, which, according to the estimates of some historians, date back to the 15th century A.D. (WHO 2001).

India is a vast country with a variety of topographies, climates, vegetation, and people. Forests, grasslands, wetlands, coastal and marine and deserts form the major

ecosystems in India. The country constitutes about 21.05% (692,027 km²) of its total geographical area (FSI 2011). When it comes to ethnobotanical practices in India, we can consider two groups of people, those living in small cities or rural villages and tribal peoples who live in remote villages. India has about 563 tribal communities having age-old traditional knowledge through their long association with the forests (BSI 2019) with 50 million people belongs to 550 tribal communities (Shah 2008). They have accumulated valuable knowledge the use of wild plants and have been practicing since time-immemorial, to satisfy their everyday needs to sustain. The Indian subcontinent, which records one of the oldest civilizations, harbor many traditional health care systems. Besides Ayurveda, other traditional methods and folklore systems of health care were developed in the different time periods in the subcontinent, where more than 7500 plant species were used for medicinal purposes (Pandey & Tripathi 2017).

The state of Nagaland lies between 25°10'2" N and 27°42' N latitude and between 93°15'2" E and 95°20'2" E longitudes covering an area of 16,579 sq km in northern extension of Arakan Yoma Ranges with altitude ranges from 194–3048 m AMSL. It shares international boundary with Myanmar to the east, state of Assam to the west, Arunachal Pradesh and parts of Assam to the north and Manipur to the south. Noklak sub-division of Tuensang district is the homeland of Khamniungan tribe that lies between 26°14'2" N latitude and 94°49'2" E longitude with total area of 2,536 sq km or 15.3% of the state's area. It is the largest district and located in the easternmost part of Nagaland and is home to Tuensang: Chang, Khamniungan, Sangtam and Yimchungru tribes and a sub-tribe Tikhir of Yimchungru. Each of these tribes has its own rich culture and tradition.

Khamniungan tribe is one of the 16 tribes in Nagaland inhabiting the eastern part of the state and in North-west of Myanmar. Agriculture is the main occupation of the Khamniungan people besides rearing livestock. The area is very rich in floral diversity and many wild plants with medicinal properties those are yet to be explored. They live in clusters in villages and due to inaccessibility and remoteness of the place, people mostly depend on natural resources of the region for their existence. There is an enormous wealth of knowledge of medicinal plants among these people which they have developed through their age long trial and error methods and orally passed information to their younger generations. The aim of the present paper is to highlight some of the important medicinal plants used by the Khamniungan tribe for the treatment of their various diseases and ailments.

MATERIALS AND METHOD

Extensive Ethnobotanical survey was carried out among the Khamniungan tribe of Nagaland under Tuensang hill district and gathered information about the medicinal plants, those that are traditionally used by the local peoples for the treatment of various sickness and ailments. Informations through oral interviews were gathered in the study site with local medicine practitioners, spiritual healers, village elders, group discussions and personal observations of plants in use were undertaken. The plants named by the participants were recorded. Informations included vernacular names in different tribal languages as for some species vernacular name was not available in Khamniungan language. Habit, parts used and modes of uses were also collected. Proper written consent, PIC was also taken from the local councils of the village where the data was collected after explaining the purpose of the work. The recorded specimens were processed into mounted herbarium sheets following Jain & Rao (1977) and were identified using various literatures which includes Kanjilal *et al.* (1934 - 1940), Prain (1903), Hooker (1872–1897) Hara & Williams (1979), Hara *et al.* (1978, 1982), Grierson & Long (1983,1987) and Noltie (1994, 2000). The

specimens collected were submitted to Nagaland university herbarium for future studies. For correct nomenclature and family delimitations, www.theplantlist.org has been largely consulted for the recorded plant species.

RESULTS

A total of 76 species of plants were recorded during the present survey which was used as medicinal plants by the Khamniungan tribe of Nagaland. These are enumerated below alphabetically in **Table 1** along with their scientific names, family, local names, parts used and mode of uses. Most of the Local names are inscribed using Ao tribal language along with some addition of Angami and Sumi tribal language of Nagaland.

Table 1. List of plants used as traditional medicines by Khamniungan tribe of Tuensang Hill District of Nagaland.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Abelmoschus moschatus</i> Medic. [Malvaceae]; <i>Mein sentsurep</i> (Ao)	Seeds	Young leaves are used as vegetables. Barks are used in making ropes. Leaves sometimes used as wrappers to cover food items. Powdered seeds are applied on wound and bites of venomous reptiles.
<i>Acacia pennata</i> (L.) Willd. [Leguminosae]; <i>Chakrang-aing</i> (Ao)	Bark, leaves	Bark is made into paste and applied to snake bite and scorpion sting; leaves juice extract is mixed with milk and served to infants during indigestion; leaves paste is used as haemostatic.
<i>Aconitum ferox</i> Wall. ex Ser. [Ranunculaceae]; <i>Meri-mezem</i> (Ao)	Whole plant	Arrows are dip into concentrated juice extraction of the plant is used in hunting to hunt wild animals.
<i>Justicia adhatoda</i> L. [Acanthaceae]; <i>Septsunaro</i> (Ao)	Whole plant	The extraction by boiling plant material is used for treatment of respiratory ailments such as cold and fever. Leave decoction is consumed orally for the treatment of constipation and stomachache. It is used as Antispasmodic and diuretic.
<i>Ageratum conyzoides</i> (L.) L. [Compositae]; <i>Imchenriza</i> (Ao)	Leaves and roots	Leaves are crush and the paste is applied to cure cuts and sores. Root extract is taken orally as anthelmintic. It is anti-inflammatory and anti-allergic.
<i>Albizia chinensis</i> (Osbeck) Merr. [Leguminosae]; <i>Mokok</i> (Ao)	Bark and leaves	The gum is applied on the forehead to cure headache. Infusion of the bark and leaf extract is used as lotion for skin burn and scabby. Bark is use as anthelmintic.
<i>Allium sativum</i> L. [Amaryllidaceae]; <i>Lasung</i> (Ao)	Bulb	It is used as a best medicine for hypertension and also used to reduce or eliminate fever. It is used to kill worms from the body, stimulate flow of saliva and helps in digestion. It is also used to prevent ticks and other insect bites.
<i>Allium chinense</i> G.Don [Amaryllidaceae]; <i>Tejanglasung</i> (Ao)	Bulbs and leaves	The juice extracted from the plant is used as moths and other insect repellent. Bulbs and leaves are either consumed raw or cooked and is used for the treatment of fever, stomachache, sore throat and cough. It is also used for the treatment of diarrhoea, dysentery and chest pain.
<i>Alstonia scholaris</i> (L.) R.Br. [Apocynaceae]; <i>Lazarongpang</i> (Ao)	Leaves and bark	Juice extracted from the leaves and barks are mixed with sugarcane and consume for treating ulcers in the stomach and gastric disorders. Latex is also used for ceremonial inscription and the wood is used for carving effigies kept in the grave of a rich man or warrior.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Amblovenatum opulentum</i> J.P. Roux [Thelypteridaceae]; <i>Maachai</i> (Ao)	Leaves	Leaves paste mixed with <i>Hypericum japonicum</i> is applied on toothache to relieve pain and kill the maggot in the teeth. They are also used for the treatment of other oral ailments.
<i>Aristolochia indica</i> L. [Aristolochiaceae]; <i>Antsüknü</i> (Ao)	Leaves and tender shoots.	Paste of tender shoots applied in bone fractures. The paste is also applied on wound and bites of venomous reptiles specially scorpion and snake bites. It is also used for the treatment of respiratory ailments such as cold and cough.
<i>Artemisia nilagirica</i> (C.B. Clarke) Pamp. [Compositae]; <i>Antsüksüba</i> (Ao)	Aerial parts	Plant extract mixed with decoction of <i>Camellia sinensis</i> is given for treatment of malaria. Plant is also used as insecticides. Used in asthma, antispasmodic, aphrodisiac, expectorant and febrifuge. Leaves are used as haemostatic.
<i>Artocarpus lacucha</i> Buch.-Ham. [Moraceae]; <i>Sungkepsali</i> (Ao)	Barks and seeds	Seeds have a purgative effect, powdered bark is applied in wounds. Barks mixed with barks of <i>Ficus semicordata</i> with lime are eaten as “pan” stimulant.
<i>Asparagus officinalis</i> L. [Asparagaceae]; <i>Asangshi</i> (Ao)	Root stock	Juice extract of roots is taken orally as blood purifier, diuretic and tonic. Tubers and young shoots are used as vegetables.
<i>Asparagus racemosus</i> Willd. [Asparagaceae]; <i>Aspregos</i> (Ao)	Tubers	It is Antidiarrhic, antiseptic, diuretic, nutritive and tonic. The decoction of the whole plant is consumed for treating diarrhea, dysentery with blood, epilepsy and haemophilic disorder.
<i>Bauhinia variegata</i> L. [Leguminosae]; <i>Noksangstüben/ Purnoklu</i> (Ao)	Bark, flowers and roots	The juice extracted from the bark and flower is used for the treatment of diarrhea, dysentery and other stomach disorders the paste of the bark is used for treating cuts and wounds and other related skin diseases. Traditionally root is used as an antidote to snake poisoning and other insect bites. Sometimes flower and flower buds is boiled and eaten as vegetables.
<i>Begonia flaviflora</i> H.Hara [Begoniaceae]; <i>Kokralik</i> (Ao)	Whole plant	Paste of the leaves is warmed and applied to treat mouth ulcer, bristle in the tongue; juice extract is drunk as astringent, to cure diarrhea and dysentery; leaves are also eaten as vegetable.
<i>Betula alnoides</i> Buch.-Ham. ex D.Don [Betulaceae]; <i>Entsung/ Ongpangselum</i> (Ao)	Bark	Bark is aromatic, chewed for digestion, crushed and soaked in water overnight to bath during body-ache and fever.
<i>Bidens biternata</i> (Lour) Merr. & Sherff. [Compositae]; <i>Mesakra-moli</i> (Ao)	Aerial parts	Aerial parts of plant is boiled and taken orally for diarrhea and dysentery.
<i>Bidens pilosa</i> L. [Compositae]; <i>Mesakra-moli</i> (Ao)	Aerial parts	Plant is used for the treatment of leprosy and various skin diseases. Seeds are anthelmintic. It is diuretic and is used in kidney problems.
<i>Bryophyllum pinnata</i> (Lam.) Oken [Crassulaceae]; <i>Nokchamoli</i> (Ao)	Aerial parts.	The juice extracted from the plant is used for the treatment of dysentery, gastric trouble, cuts and wounds, insect bites, headache, influenza, and skin diseases of dog.
<i>Callicarpa arborea</i> Roxb. [Lamiaceae]; <i>Kachet/ Pajat</i> (Ao)	Bark and twig	Bark of this plant is chewed with the bark of <i>Ficus silhetensis</i> as stimulant and also the juice extract is used as red dye. Bark paste is applied as poultice to treat headache. The juice extract of the young twigs is used for the treatment of gastric problems.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Chloranthus elatior</i> Link [Chloranthaceae]; <i>Ongchinaro</i> (Ao)	Leaves	Paste extracted from the leaves is applied in the wound of tiger and dog bites as antidote.
<i>Clerodendrum infortunatum</i> L. [Lamiaceae]; <i>Shatimanajay</i> (Ao)	Leaves	Leaf paste is used in rheumatism, ulcer and skin diseases. Decoction of leaves is used in malaria. Fresh leaves are consumed directly for the treatment of diarrhea and headache. Leave paste is used for the treatment of snake and dog bites. Juice extracts are applied to kill lice in heads.
<i>Cheilocostus speciosus</i> (J.Koenig) C.D. Specht [Costaceae]; <i>Alar naro</i> (Ao)	Root stock	Plant paste is used as anti-maggot in animals, as anthelmintic and ophthalmic. It is also used in fever, anaemia, rheumatism, skin diseases and urinary troubles. Rhizome juice is given traditionally with sugar to treat leprosy and to relief headache.
<i>Commelina benghalensis</i> L. [Commelinaceae]; <i>Akhovepü</i> (Sumi)	Leaves	Decoction of leaf is used in boils, burns, cough, used against muscular pain and in tonsillities. The plant is bitter, emollient, refrigerant and laxative, used in leprosy. It is also used in sores and snake bites.
<i>Dicranopteris linearis</i> (Burm.f.) Underw. [Gleicheniaceae]; <i>Kajangtong</i> (Ao)	Whole plant	Decoction of plant is used during fever and epilepsy. It is used in asthma, to increase fertility in women and as anthelmintic.
<i>Dioscorea bulbifera</i> L. [Dioscoreaceae]; <i>Ninangcha/ Sureshe</i> (Ao)	Tuber and leaves	Tubers are used for the treatment of jaundice and head-ache. It is diuretic and anthelmintic. Occasionally, leaves are often used by steam distillation for the treatment of conjunctivitis
<i>Dioscorea pentaphylla</i> L. [Dioscoreaceae]; <i>Atsüng</i> (Ao)	Tuber	Tubers are edibles and tonic. The decoction of the whole plant is applied to swellings and boils
<i>Elsholtzia communis</i> Colt. & Hems. [Lamiaceae]; <i>Napa</i> (Ao)	Whole plant	Whole plant is consumed directly for the treatment of hypertension and the extracted paste are applied in cuts and wounds. The plant and flowers are used for flavoring curry. Plant extracts are applied on heads to drive out fleas.
<i>Erythrina arborescens</i> Roxb. [Leguminosae]; <i>Mangkotsürong/ Tzüpentong</i> (Ao)	Bark	Bark is powdered and are used for the treatment of biliousness, itch, fever, rheumatism, asthma and leprosy. In ancient times, tribal hang the skull after head hunting in this tree. Alters are erected under this tree where the community priest perform their rituals.
<i>Eurya acuminata</i> DC. [Pentaphylacaceae]; <i>Alumeset</i> (Ao)	Leaves and bark	Juice extract of tender leaves is used to relieve dysentery and diarrhea. Leaves are also eaten as vegetables. Bark and leaves are crushed and soaked in water overnight and used as green-yellow dye. It is also mixed with juice extract of <i>Rubia sikkimensis</i> to yield an excellent red dye.
<i>Ficus hispida</i> L.f. [Moraceae]; <i>Poksok</i> (Ao)	Leaves, bark, root and fruit	Fresh leaves are consumed directly for the treatment of dysentery and intestinal worm infection. Leave paste are applied skin diseases, vitiligo, cuts and wounds. Occasionally green fruits are taken as vegetable.
<i>Ficus semicordata</i> Buch.-Ham ex Sm. [Moraceae]; <i>Koronem</i> (Ao)	Leaves, roots and bark	Decoction of leaves is used for the treatment of jaundice. The juice extracted from the roots is applied to treat headaches, sometimes fevers and menstrual disorders. The bark, combined with young leaves of <i>Schima wallichii</i> , is used to treat gastric problems.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Gmelina arborea</i> Roxb. [Lamiaceae]; <i>Ikongtong/ Zukong</i> (Ao)	Leaves, bark and root	Leave paste is applied to relieve from headache. The decoction of the root is used for the treatment of snake bite and scorpion sting. Leaf and bark are used for stomach trouble and root decoction as blood purifier.
<i>Gynocardia odorata</i> R. Br. [Achariaceae]; <i>Satsüing</i> (Ao)	Seeds	Powdered seeds mixed with oil are used to treat skin diseases.
<i>Gynura nepalensis</i> DC. [Compositae]; <i>Yiatsuyi</i> (Ao)	Whole plant	Plant paste are applied on cuts and wounds to stop bleeding.
<i>Hodgsonia macrocarpa</i> (Blume.) Cogn. [Cucurbitaceae]; <i>Assa</i> (Ao)	Fruits	The bulb of the fruits is applied to cure bacterial infection and bulb juice is drunk to cure malarial infections. Cotyledons of seeds is a delicacy eaten after roasting and made into various curry. Leaves are used to feed silk worms.
<i>Holboellia latifolia</i> Wall. [Berberidaceae]; <i>Shingo mongo</i> (Ao)	Fruits	Fruits are eaten to treat stomach ailments and as tonic.
<i>Houttuynia cordata</i> Thunb. [Saururaceae]; <i>Alimoli/ Nokna</i> (Ao)	Whole plant	Juice extract of the plant is taken for the treatment of ulcer, dysentery, diarrhea, as blood purifier and skin diseases. Plants are crushed and spread in chicken coop to keep away fleas. The whole plant is eaten as vegetable.
<i>Hydnocarpus kurzii</i> (King) Warb. [Achariaceae]; <i>Yimsungjang</i> (Ao)	Bark and seeds	Paste of the seeds is used to treat leprosy and other skin diseases. Juice of bark is taken during malaria fever
<i>Hypericum japonicum</i> Thunb. [Hypericaceae]; <i>Ao-chani</i> (Ao)	Whole plant	Juice extracted from the plant are astringent, alternative and vulnerary. They are also used to treat asthma, dysentery and skin diseases. It is believed that, stacking of plants in the door ways drive away evil spirits. Paste extracted from the plant is mixed with <i>Amphineuron opulentum</i> are applied for toothaches.
<i>Juglans regia</i> L. [Juglandaceae]; <i>Aka tong</i> (Ao)	Leaves, bark and fruit.	Fruit used as tonic and in rheumatism. Leaves and bark are anthelmintic.
<i>Justicia thyrsoformis</i> Hardw. [<i>Phlogacanthus thyrsoiflorus</i> Roxb. ex Hardw. Mabb.], [Acanthaceae]; <i>Meteciise</i> (Angami)	Leaves	Decoction of leaves is used for the treatment of bronchial diseases, fever, diarrhea, dysentery and stomach trouble. It is used as diuretic, expectorant, in whooping cough and sedative.
<i>Leucosceptrum canum</i> Sm. [Lamiaceae]; <i>Anuzamechepea</i> (Ao)	Leaves and inflorescence	The white cottony tomentum scraped from the leaves are applied as haemostatic. Inflorescence are soaked in water and is taken as astringent, stimulant and tonic.
<i>Mahonia pycnophylla</i> (Fedde) Takeda [Berberidaceae]; <i>Sungnenra</i> (Ao)	Bark and fruits	A decoction of the bark is used as eye drops to treat inflammations of the eyes. Fruits are taken for the treatment of dysentery.
<i>Molineria capitulata</i> (Lour.) Kuntz. [Hypoxidaceae]; <i>Koritong</i> (Ao)	Roots	It is used as a remedy during dilation of pupils and ophthalmia. Root stock is soaked overnight and the liquid is applied to treat conjunctivitis and ear ache. Paste of the plant is used as poultices, haemostatic and also used as antiseptics. Traditionally leaves are torn into strips, used for stitching wounds after the castration in domestic animals.
<i>Morus macroura</i> Miq. [Moraceae]; <i>Tangko sung</i> (Ao)	Latex and fruits	The fruit juice is used in the treatment of febrile disease. Milky juice used in sores and wounds. Juice extracts mixed with ash is used in inscription in traditional clothes and woods.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Mussaenda macrophylla</i> Wall. [Rubiaceae]; <i>Sapaklarinaro</i> (Ao)	Leaves	The paste of the leaves is haemostatic, aqueous extract of the plant is used to cure mouth ulcer and as appetizer.
<i>Paederia foetida</i> L. [Rubiaceae]; <i>Sunemli</i> (Ao)	Whole plant	It is Aphrodisiac, astringent, emetic, laxative and tonic. Used in treatment of diarrhea, rheumatic pain, toothache and inflammation of spleen. Leaves are used for the treatment of digestive problems. Leaves are also consumed as vegetables.
<i>Panax psuedoginseng</i> Wall. [Araliaceae]; <i>Takumtsu mozu</i> (Ao)	Roots	Roots dried and made into powder is taken orally for the treatment of headache and convulsions. The plant paste is applied to stop or slow down bleeding. Sometimes its taken directly in nosebleeds, vomiting, cough with blood or find blood in their urines.
<i>Papaver somniferum</i> L. [Papaveraceae]; <i>Kanitong</i> (Ao)	Fruits	Decoction of the fruit is used as an appetizer, sedative, digestant, tonic, analgesic and used against cough, dysentery, fever and anaemia.
<i>Phlogacanthus pubinervius</i> T. Anderson. [Acanthaceae]; <i>Metecūse</i> (Angami)	Shoot and leaves	Decoction of fresh shoot and leaves is taken orally for the treatment of cough, cold and fever. Young shoots and inflorescences are consumed as vegetables and are also sold in markets.
<i>Plantago asiatica</i> subsp. <i>erosa</i> (Wall.) Z.Yu Li [Plantaginaceae]; <i>Jangremriza/ Akaba</i> (Ao)	Whole plant	Leave paste applied on burns and in cuts. Whole plant is astringent, cooling, febrifuge, diuretic and tonic. Used in toothache and pile problem, eaten as vegetable and sold in local market. Seeds are crushed and made into paste is applied in sprain. The plant also consumed as vegetables.
<i>Persicaria chinensis</i> (L.) H. Gross [Polygonaceae]; <i>Masu malang</i> (Ao)	Aerial parts	The decoction of the whole plant is used as depurative. The decoction is also used for the treatment of eczema of the ears. The juice extracted from the plant is used for the treatment of eye diseases.
<i>Rhus chinensis</i> Mill. [Anacardiaceae]; <i>Tangmu</i> (Ao)	Fruit	Tusks of fruits mixed with water is used for bathing to relieve from measles and prickly heat, it is also mixed with chicken droppings and is drunk for the treatment of food poisoning. Decoction of the fruit tusk is used in indigestion, stomachache, allergy and gastric troubles.
<i>Ricinus communis</i> L. [Euphorbiaceae]; <i>Phakowa/ Yaklomala</i> (Ao)	Root, leaves and seed oil	Leave is warmed in the fire and applied to forehead to relief from headache; paste applied as poultice in boils and pimples. Seeds are roasted and eaten mixed with husk of the <i>Rhus simialata</i> seed as purgative and as antidote. The whole plant is used as fertilizer.
<i>Rubia sikkimensis</i> Kurz. [Rubiaceae]; <i>Awali/ Wailuk</i> (Ao)	Roots	Root paste is applied in snake bites as antidote. Root extract mixed with plant extract of <i>Eurya accuminata</i> gives brilliant red dye.
<i>Saurauia napaulensis</i> DC. [Actinidiaceae]; <i>Achijila</i> (Ao)	Leaves and barks	The plant <i>Lecanthus peduncularis</i> is mixed with the bark of <i>Saurauia napaulensis</i> is crushed and the resultant juice is consumed for the treatment of fever and viral diseases. Leaves are eaten as vegetable. Fruits are also eaten.
<i>Senna alata</i> (L.) Roxb. [Leguminosae]; <i>Aoktsü naro</i> (Ao)	Leaves, seeds and roots	Leaf juice is applied for allergic and skin diseases. Useful in asthma, bronchitis, rheumatism and stomatitis.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Smilax glabra</i> Roxb. [Smilacaceae]; <i>Mangkokangli</i> (Ao)	Leaves	Leaf is consumed directly for the treatment against venereal diseases and the leave paste is used to treat skin rashes. The dendrils with spines are layed for trapping wild boars and deers. After the injury the animals cannot run for long and are ultimately killed by the tribal hunters.
<i>Smilax ovalifolia</i> Roxb.ex D.Don [Smilacaceae]; <i>Mangkokangli</i> (Ao)	Roots and leaves	A decoction of Leave and root is used for the treatment of diarrhea and dysentery.
<i>Solanum indicum</i> L. [Solanaceae]; <i>Akho-longkok</i> (Ao)	Roots and fruits	Root paste is applied in skin diseases, leprosy, toothache, asthma and bronchitis. Fruit is consumed directly for the treatment of stomach ailments, fever, and to lower blood pressure.
<i>Solanum americanum</i> Mill. [Solanaceae]; <i>Kumbo-wa</i> (Ao)	Whole plant	Plant paste is used in skin diseases, cough and to achieve conception. Aqueous extract of the plant is used to relieve muscular pain and the paste applied to neutralize toxic substance of bee sting. Leaves and fruits are used to treat Malaria, blood pressure and bladder infections and eaten as vegetable.
<i>Spermacoce neohispida</i> Govaerts [Rubiaceae]; <i>Sunumra</i> (Ao)	Whole plant	The aerial parts of the plant is taken as febrifuge. It is stimulant and tonic. The decoction of the root is taken as mouthwash for toothache. Plant is made into paste and applied to cuts as haemostatic. Sometimes leaves are eaten as vegetables along with other plant.
<i>Spilanthes acmella</i> (L.) L. [Compositae]; <i>Tefu mozitong</i> (Ao)	Whole plant	The decoction of the roots is used as purgative. It is used for sore mouth and in toothache. Flowers are crushed and consumed to treat in throat infection and paralysis of tongue, for stammering in children. Flowers increases the flow of saliva and useful in fever.
<i>Stephania glabra</i> (Roxb.) Miers (<i>S. glandulifera</i> Miers., <i>S. rotunda</i> Lour.) [Menispermaceae]; <i>Ketcha moli</i> (Ao)	Tuber	Tubers are edible and is used to treat in fevers, diarrhea, dyspepsia and as sedative. Plant paste is applied to bone fracture and sprains. Leaves are fed to cattle and goats.
<i>Stereospermum chelonoides</i> (L.f.) DC. [Bignoniaceae]; <i>Mesung</i> (Ao)	Root, bark, leaves and flowers.	Plant extracted to juice is consumed to cure dysentery, cholera and malarial fever.
<i>Terminalia chebula</i> Retz. [Combretaceae]; <i>Lingkatong</i> (Ao)	Fruits	The fruit is considered to have anti-bacterial and anti-inflammatory properties. Fruit is usually dried and taken which helps in digestion, improves appetite and believed to improve memory as well. It is also used during gastro-intestinal ailments, eye disease, skin disease and weak eye sight.
<i>Thysanolaena latifolia</i> (Roxb.ex Hornem.) Honda [Poaceae]; <i>Laptü/ Atsüng-tong</i> (Ao)	Roots	Decoction of root is drunk during fever.
<i>Tinospora sinensis</i> (Lour.) Merr. [Menispermaceae]; <i>Tsungrembang mozu</i> (Ao)	Stem	Stem is crushed and the juice obtained is used by the tribe to cure various ailments such as malarial fever, indigestion, skin diseases, piles, bronchitis, impotency, jaundice, diarrhea, leprosy, acidity, eruptive boils and cough. It is a diuretic, tonic and acts as blood purifier. The leaves of the plant are carried by tribal during hunting to drive away evil spirits.

Scientific Name [Family]/ Local name	Parts used	Mode of Uses
<i>Viscum articulatum</i> Burm.f. [Santalaceae]; <i>Teretzanglubawa</i> (Ao)	Aerial parts	Plant is made into paste and is applied to set the bone fractures and sprains.
<i>Wrightia tinctoria</i> R. Br. [Apocynaceae]; <i>Sapanpou</i> (Ao)	Bark and seeds	Bark paste is applied on skin diseases, ring worms, leprosy. Decoction of bark is used to treat dysentery, cholera abdominal pains, wounds, fever, piles, gout and haemorrhage. Seed is roasted and eaten as carminative and as laxative.
<i>Zanthoxylum rhetsa</i> (Roxb.) DC. [Rutaceae]; <i>Mongret/ Mong Mong</i> (Ao)	Bark, leaves and seeds	Leave and bark paste used as febrifuge and poultice; used in rheumatism, asthma, bronchitis, malarial fever. Dry seeds are taken to relieve from indigestion. Fruits used as condiment and leaves as vegetables. Crushed bark and fruits used for fish poisoning.
<i>Zingiber officinale</i> Roscoe [Zingiberaceae]; <i>Sungmok</i> (Ao)	Rhizome	Ginger is extensively used by the Nagas as flavouring agents, condiments, medicinal, and in various ceremonial and ritual performances. Paste of the corms is applied for the treatment of bone fracture and sprains; juice extract used as expectorant, stimulant, carminatives, dyspepsia and tonic etc.

DISCUSSION

From the present Ethnobotanical study on Khamniungan tribe of Tuensang Hill District of Nagaland, a total of 76 plant species were identified belonging to 48 families and 68 genera was recorded for the treatment of various diseases suffered by them. Plant family with the highest medicinal plants in the study area used for various diseases treatment was Compositae (Asteraceae) with a total of 6 species, followed by Leguminosae and Lamiaceae each with five species. Again, Moraceae and Rubiaceae with 4 species each, Acanthaceae with 3 species, Apocynaceae, Dioscoreaceae, Flacourtiaceae, Menispermaceae, Saurauriaceae, Smilacaceae, Solanaceae and Zingiberaceae with 2 species each and the rest 29 families represented by single species. The distribution of habit groups for these plants has been presented in Figure 1. The plant parts which were mostly used as medicine were leaves, barks, roots, and whole plants followed by flowers, seeds, tender shoots, bulbs and fruits. Various plant parts collected from species like *Abelmoschus moschatus*, *Allium sativum*, *Aristolochia indica*, *Acacia pennata*, *Bauhinia variegata*, *Clerodendrum infortunatum*, *Commelina benghalensis* and *Rubia sikkimensis* were used as antidote to cure snake bite and scorpion stings. Paste made of leaves of *Chloranthus elatior* were applied in the wounds of Tiger attacks and dog bites as antidote. *Asparagus racemosus*, *Begonia flaviflora*, *Bidens biternata*, *Persicaria chinensis*, *Tinospora cordifolia*, *Paederia foetida* and *Papaver somniferum* are used for curing diarrhea and dysentery. Species such as *Asparagus officinalis*, *Bauhinia variegata*, *Begonia flaviflora*, *Spermacoce neohispida*, *Curculigo capitulate*, *Ficus hispida*, *Houttuynia cordata*, *Paederia foetida*, *Plantago major*, *Saurauia napaulensis* and *Solanum nigrum* are consumed as vegetables. Species like *Acacia pinnata*, *Artemesia nilagirica*, *Borreria hispida*, *Molineria capitulata* and *Leucosceptrum canum* are used as haemostat. Crushed Barks and fruits of *Zanthoxylum rhetsa* is used for fish poisoning is also another indigenous practice of the tribe. Interestingly, latex of *Alstonia scholaris* is used by *Khamniungan tribe* for ceremonial inscription and the wood is used for carving effigies kept in the grave of a rich man or warrior in the village. In ancient times when head hunting was

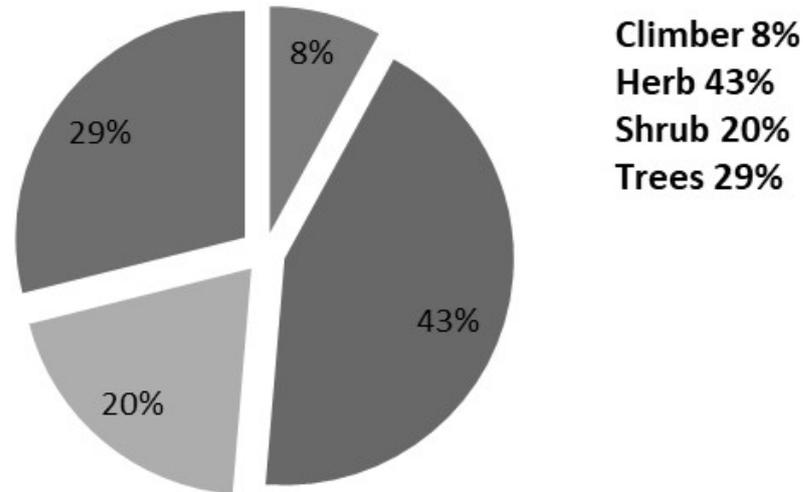


Figure 1. Habit group representation among the recorded ethnomedicinal plants

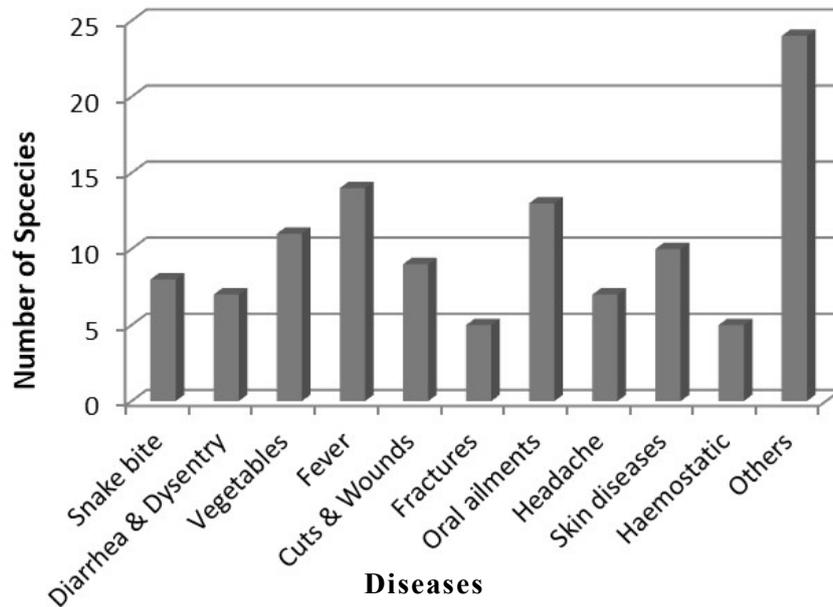


Figure 2. Number of species used by the indigenous people for medical efficacy against different diseases

still prevalent, Tribal peoples hang the skulls under the tree, *Erythrina arborescens* as a trophy. Alders were erected under this tree to perform various rituals by the community priest. Traditionally tribal people used species such as *Hypericum japonicum* and *Tinospora cordifolia* to drive away evil spirits. As from the above study, it is evident that the use of medicinal plants for treatment of various diseases by the Khamniungan tribe has always been known to the tribe and has gained knowledge that were passed from generation to generation through oral tradition and practices. Plant parts obtained from the species like *Plantago asiatic* subsp. *erosa*, *Viscum articulatum* and *Zingiber officinale* are also used for the treatment of bone fracture and sprains. Many of these

plants are also used as vegetable and fruits by the local people. Number of plants used against different diseases has been presented in Figure 2. Due to globalization and industrialization, many young generations has the tendency to migrate to cities and to discard their traditional life style. There is a high risk of losing such valuable traditional knowledge and culture. Therefore, it is very important to protect, conserve and document such valuable information and practices of the indigenous tribe.

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