

Traditional knowledge of herbal medicines practiced by *Ao-Naga* tribe in Nagaland, India

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[Received 23.03.2018; Revised 09.06.2018; Accepted 24.06.2018; Published 30.06.2018]

Abstract

The paper deals with the first hand investigation of 51 species of herbal medicinal plants used by *Ao-Naga* tribes of Mokokchung district in Nagaland for treatment of various diseases and ailments. The paper includes the plants' scientific name, local name and diseases treated by the plants reported from the district.

Key words: Herbal medicine, *Ao-Naga*, Nagaland

INTRODUCTION

Mokokchung district is the homeland of the *Ao-Nagas* in the state of Nagaland, India. The district lies between 26.12° and 26.45° North Latitude and 94.18° and 94.50° East Longitude and covers an area of 1,615 sq km. It is bounded by the state of Assam to its north, Wokha district to its west, Tuensang district to its east and Zunheboto district to its south. Agriculturally and industrially the district is most progressive in the state. Major agricultural regions of the district are Changki-Longnak, Tzurang, Milak and Dikhu valley regions (NER 2012).

The major rivers of Mokokchung district are Milak, Dikhu, Tzurang, etc. and the main agricultural products are rice, maize, orange, tomato and passion fruit. Topographically, the area is mainly mountainous except some areas bordering the Assam valley. The major festivals of *Ao-Nagas* are *Moatsü* and *Tsüngremong*. Majority of the population in the district is concentrated in villages situated at hill-tops surrounded by natural forests. Thus, naturally, the *Ao-Nagas* have close proximity with nature as that helped them to practice traditional medicine since for generations to treat and cure their various ailments (Mills 1921).

The people of *Ao-Nagas* prefers to dwell mostly in hill-tops and slopes which are preferably surrounded by dense natural forests. The traditional knowledge on medicinal plants is generally confined with the local medicine men (*Kobiraz*). However, some secrets of these knowledge can be obtained from them through close contacts and interaction (Jamir 1997).

A good number of research works have been contributed on medicinal plants during the last two decades from the North-eastern region of India (Tiwari *et al* 1979; Bhattacharjee *et al* 1980; Borthakur 1981a; Gogoi & Boissya 1984; Borthakur & Goswami 1995; Jamir &

Upadhyay 1998; Bora 1999; Devi *et al.* 2011; Rajkumari *et al.* 2013; Zorinpuii & Lalramnghinglova 2017). However, except a few valuable accounts contributed from the state of Nagaland, (Rao & Jamir 1982a; Jamir & Rao 1990; Jamir 1997, 2006; Jamir *et al.* 2008; Sumitra & Jamir 2009; Lanusunep & Jamir 2010; Imchen & Jamir 2011; Jamir *et al.* 2011, 2016, Rongsensashi *et al.* 2013), yet exhaustive studies on ethnomedicinal aspects covering a vast area of the district of Mokokchung have hardly been conducted.

METHODOLOGY

The information, regarding the uses of herbal medicine for the treatment of various diseases and ailments were collected from the local medicine men or folk healers, village elders, etc. during field trips to different places of the state. The plants were identified with the help of literature, flora works and taxonomists from Nagaland University. All the collected specimens were mounted into herbarium sheets by following the standard technique (Rao & Jain 1977) and deposited in the Department of Botany, Nagaland University, Lumami.

Before the start of the work mandatory PIC was taken from the healers. For this the purpose of the collection and its scientific utilization was explained to them in local language. The information was collected through open and face to face discussion.

Voucher specimens were processed into mounted herbarium sheets following Jain & Rao (1977). Plants were identified using floras including *The Flora of British India* (Hooker 1872 - 1897), *Flora of Assam* (Kanjalal *et al.* 1934 – 1940), and *Materials for the Flora of Arunachal Pradesh* (Hajra *et al.* 1996; Giri *et al.* 2008; Chowdhery *et al.* 2009). The identity of the plants were confirmed by matching with the pre-identified specimens at the Herbarium of the Department of Botany, Nagaland University.

For updated nomenclature and for family delimitation www.theplantlist.org was extensively consulted.

RESULT

In the present paper, botanical names of plants are arranged alphabetically along with Family and local name followed by parts used and uses are presented in Table 1. In the table, recorded plants are enumerated alphabetically.

Table 1. Medicinal plants used by *Ao-Naga* tribe living in the Mokokchung district of Nagaland

Botanical name [Family]; Voucher specimen	Local name	Parts used	Diseases treated
<i>Acacia pennata</i> (L.) Willd. [Fabaceae]; LS – 69	<i>Mezümtong</i>	Bark, leaves, inflorescence	Paste of the bark is applied as antidote for snake-bite; paste of leaves and inflorescence is applied on bodyache and headache.
<i>Adenia hondala</i> (Gaertn.) W.J.de Wilde [Passifloraceae]; LS – 89	<i>Ayo moli</i>	Whole plant	Whole plant is crushed and paste is applied on snake-bite.
<i>Amaranthus tricolor</i> L. [Amaranthaceae]; LS – 33	<i>Ruatong</i>	Whole plant	Plant extract is applied on leucorrhoea and haemorrhage; leaf paste is applied as haemostatic
<i>Aralia armata</i> (Wall. ex G.Don) Seem. [Araliaceae]; LS – 91	<i>Mayang-toklo</i>	Stem, leaves	Bark is pounded into paste and applied on any kind of skin diseases. Leaf extract is also drunk along with water for cough and asthma problems.
<i>Artemisia nilagirica</i> (C.B.Clarke) Pamp. [Asteraceae]; LS – 53	<i>Entsüksübatong</i>	Leaves	Leaf extract is applied on allergy, itching, burns, sores and wounds; decoction is taken orally for chronic cough, asthma and fever.

Botanical name [Family]; Voucher specimen	Local name	Parts used	Diseases treated
<i>Asclepias curassavica</i> L. [Apocynaceae]; LS – 02	Noklangsang naro	Root, leaves, latex	Root extract is applied for piles; leaf extract is used for gonorrhoea and for dysentery; latex of the plant is used for removing warts and corns
<i>Bambusa tulda</i> Roxb. [Poaceae]; LS – 67	Longmi	Rhizome, leaves	Decoction of rhizome is taken for urinary disorder; leaves are also given to cows for release of placenta after parturition
<i>Catharanthus roseus</i> (L.) G.Don [Apocynaceae]; LS – 10	Tsüenlari naró	Leaves	The decoction of the fresh leaves is taken for high blood pressure, asthma and diabetes.
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai [Cucurbitaceae]; LS – 88	Abangmatsü	Fruits, seeds	Fruit is eaten for joint pain, urinary problem, indigestion and high blood pressure; seeds powder is taken orally for inflammation of urinary tract prostrate and hypertension
<i>Plectranthus amboinicus</i> (Lour.) Spreng. [Lamiaceae]; LS – 38	Kolius naró	Leaves	Decoction of leaves is taken for urinary problems, cough, chest pain and vaginal discharges
<i>Crateva nurvala</i> Buch-Ham. [Capparaceae]; LS – 72	Enka tong	Bark, leaves	Paste of the bark is taken orally for stomachache, as laxative and kidney problems; fresh leaves is cooked and eaten as tonic and appetizer
<i>Picria fel-terrae</i> Lour. [Linderniaceae]; LS – 81	Longritong	Leaves	Dried leaves and inflorescence are pounded into powder and eaten orally along with common salt for chronic dysentery and stomachache.
<i>Datura stramonium</i> L. [Solanaceae]; LS – 14	Metoksuben	Leaves, flowers	Extract of leaves and flowers are applied on boil, sores, ear-ache and body pain. Fruit is poisonous; sedative, intoxicating and its extract is applied as hair tonic and for dandruff
<i>Diplazium esculentum</i> (Retz.) Sw. [Athyriaceae]; LS – 15	Enchen	Leaves	Young tender leaves is used as vegetable and as tonic
<i>Distemon indicum</i> Wedd. [Urticaceae]; LS – 44	Aokzaklo	Roots	Bark is pounded into paste and plastered on dog and snake-bite
<i>Equisetum arvense</i> L. [Equisetaceae]; LS – 30	Ring mezoba	Whole plant	Paste of the whole plant is used as haemostatic
<i>Ficus racemosa</i> L [Moraceae]; LS – 75	Mentsusu	Bark, fruit, latex	Bark is taken orally for diabetes, liver problems, excessive bleeding during menstruation, nose bleeding and as germicide; fruit is eaten for dry cough, spleen and kidney problem; white latex is applied on boils, piles and tumours
<i>Galium elegans</i> Wall. ex Roxb. [Rubiaceae]; LS – 101	Teret-mozü	Whole plant	Whole plant is crushed into paste and plastered on bone fractures, sprains and body swellings; it is also applied on chest pain and throat pain
<i>Gnetum gnemon</i> L. [Gnetaceae]; LS – 35	Milemoa	Leaves, seeds	The leaves and seeds are used as vegetable and as diuretic
<i>Hedyotis scandens</i> Roxb. [Rubiaceae] LS – 40	Chepra molitong	Root bark, leaves, flower	Root bark is crushed into paste and decoction is taken orally for dysentery, cholera, jaundice, germicide and as fortificant agent; leaf extract is applied on boil and warts; flower is pounded with <i>Piper nigrum</i> and taken for treatment of piles.
<i>Hibiscus sabdariffa</i> L. [Malvaceae]; LS – 109	Entsürep	Leaves, calyx	Decoction of leaves and calyx is taken for indigestion, jaundice, gall bladder stones and kidney problems

Botanical name [Family]; Voucher specimen	Local name	Parts used	Diseases treated
<i>Imperata cylindrica</i> (L.) Raeusch. [Poaceae]; LS – 25	<i>Aitong</i>	Roots	Roots are chewed for chronic dysentery, piles, haemostatic and intestinal parasites like round-worms, hook-worms and other amoebic germs
<i>Jatropha curcas</i> L. [Euphorbiaceae]; LS – 05	<i>Rujenjang</i>	Latex, stem bark, seed oil	Latex is applied on scabies, boils and rheumatism. Stem bark and leaves is crushed into paste and taken orally for dysentery, toothache and lactation. Seeds oil is used as purgative, anthelmintic and abortifacient.
<i>Lagerstroemia speciosa</i> (L.) Pers. [Lythraceae]; LS – 23	<i>Arongtsüba sung</i>	Stem bark, fruit	Stem bark and leaf is pounded into paste and taken orally for diabetes, diarrhea, fever and as laxative; paste of the fruit is applied on mouth ulcers
<i>Litsea cubeba</i> (Lour.) Pers. [Lauraceae]; LS – 55	<i>Anget</i>	Leaves, fruit	Leaf paste is applied on allergy, skin diseases and as haemostatic; fruit is taken orally for hysteria, dizziness and paralysis
<i>Lygodium flexuosum</i> (L.) Sw. [Lygodiaceae]; LS – 27	<i>Inchen-yangla</i>	Root	Decoction of the crushed root is applied as massaging oil in joint pains, rheumatism and sprains
<i>Melastoma malabathricum</i> L. [Melastomataceae]; LS – 41	<i>Imlaklasü- tepetiba</i>	Bark, leaves	Paste of the bark and leaves is applied on skin diseases and also taken orally for dysentery and diarrhea
<i>Mesua ferrea</i> L. [Calophyllaceae]; LS – 36	<i>Mangitong</i>	Flower, seed oil	Flower is pounded into paste and taken orally for chronic dysentery, piles and leucorrhoea; oil extract from seeds is used for skin diseases and body pain
<i>Mimosa pudica</i> L. [Fabaceae]; LS – 07	<i>Mayak naro</i>	Leaves, root	Leaf paste is applied on boils, sores, ulcers and mumps; root and leaf paste is applied on abdominal pain after child-delivery
<i>Mussaenda roxburghii</i> Hook.f. [Rubiaceae]; LS – 18	<i>Lenpinaro</i>	Bark, root, leaves	Paste of bark and root is taken orally along with a teaspoon of honey for cough, fever and as appetizer; leaf paste is applied as haemostatic
<i>Oroxylum indicum</i> (L.) Kurz. [Bignoniaceae]; LS – 49	<i>Mesütong</i>	Stem, root, leaves	Stem and root is made to paste and taken orally for asthma and dysentery; leaf extract is used for epilepsy, rheumatism and liver problems
<i>Leptochilus decurrens</i> Blume [Polypodiaceae]; LS – 59	<i>Enchen yangliwaba</i>	Rhizome	Rhizome is crushed to powder and taken for impotency
<i>Pteridium aquilinum</i> (L.) Kuhn. [Dennstaedtiaceae]; LS – 80	<i>Asang</i>	Rhizome, Leaf	Rhizome and leaf is crushed into paste and its decoction is taken for chronic spleen and to expel intestinal worms
<i>Punica granatum</i> L. [Lythraceae]; LS – 99]	<i>Talimjang</i>	Leaf, root, fruit	Tender leaf is taken orally for dysentery, cholera and stomachache; root bark is crushed to paste and its decoction is taken as anthelmintic like tape worms, hook worms; fruit juice is used as tonic and laxative
<i>Rhus chinensis</i> Mill. [Anacardiaceae]; LS – 96	<i>Tangma-tong</i>	Seed	The powdered seeds mixed with common salt is a common remedy for cholera, dysentery and diarrhoea; also used as an anti-allergy.
<i>Rubia cordifolia</i> L. [Rubiaceae]; LS – 09	<i>Temerem-juba</i>	Stem, leaf	Stem and leaf is crushed into paste and its decoction is used as tonic and vermifuge
<i>Saccharum officinarum</i> L. [Poaceae]; LS – 06	<i>Motsütong</i>	Culm	Culm is chewed for jaundice and tonic; root is taken orally for low blood pressure, bronchitis and anaemia

Botanical name [Family]; Voucher specimen	Local name	Parts used	Diseases treated
<i>Saccharum officinarum</i> L. [Poaceae]; LS – 06	Motsütong	Culm	Culm is chewed for jaundice and tonic; root is taken orally for low blood pressure, bronchitis and anaemia
<i>Sansevieria roxburghiana</i> Schult. & Schult. f. [Asparagaceae]; LS – 119]	Ayu naro	Rhizome, leaf	Rhizome extract is taken orally for cough and throat problems; leaf paste is plastered in bone fractures and sprains
<i>Sida rhombifolia</i> L. [Malvaceae]; LS – 84	Sangkang	Whole plant	Plant extract is taken orally for tuberculosis, urinary problems and rheumatism; infusion of leaf is used for pulmonary and heart problems
<i>Smilax glabra</i> Roxb. [Smilacaceae]; LS – 77]	Mangko- kangling	Seed	Seed is eaten for dysentery, diarrhea and also used as appetizer
<i>Solanum virginianum</i> L. [Solanaceae]; LS – 19]	Entsü longok	Whole plant	Paste of the whole plant is applied for cough, asthma and liver disorders; flowers and fruits are taken as laxative and diuretic
<i>Stachytarpheta jamaicensis</i> (L.) Vahl [Verbenaceae]; LS – 21	Longri-tong	Leaf	Decoction of the leaves is used for cholera and stomach problems.
<i>Stevia rebaudiana</i> (Bertoni) Bertoni [Asteraceae]; LS – 120	Jenitong	Leaf	Fresh leaf or dried powder is taken orally for weight loss, reduce hunger sensation, diabetes and as tonic
<i>Tectaria macrodonta</i> (Fée) C. Chr. [Dryopteridaceae]; LS – 113	Enjen	Fronds	Paste of the fronds is taken orally for asthma, bronchitis and as anthelmintic
<i>Terminalia myriocarpa</i> Van Heurck & Mull. Arg. [Combretaceae]; LS – 94	Awasüng	Bark	Bark extract is taken for chest pain, wounds, injury, diuretic and cardiac stimulant
<i>Trema orientalis</i> (L.) Blume [Cannabaceae]; LS – 110	Topi-tong	Roots, leaves	Root bark and fresh leaf is crushed into paste and taken orally for chronic dysentery, diarrhea, urinary disorders and epilepsy
<i>Viola patrinii</i> Ging. [Violaceae]; LS – 63	Chumi naro	Whole plant	Decoction of the whole plant is taken for malaria, stomach ulcers and syphilis; powder of the dried flower is taken for cough, fever and as purgative
<i>Vittaria elongata</i> Sw. [Pteridaceae]; LS – 46	Aok enjen	Fronds	Paste of the fronds is used as massaging for rheumatism
<i>Zanthoxylum oxyphyllum</i> Edgew. [Rutaceae]; LS – 105	Monga	Leaf, stem	Tender leaf is used as vegetable; bark of stem is used as stimulant, colic and digestive
<i>Zea mays</i> L. [Poaceae]; LS – 111	Ajangtangba	Grains	Grains are nutritive and digestive
<i>Ziziphus jujuba</i> Mill. [Rhamnaceae]; LS – 117	Bokore	Fruit, seed, bark	Fruits taken as appetizer; seed powder is used as poultice to boils, diarrhea and for abdominal pain during pregnancy; pasted bark is drank along with water for chronic dysentery

DISCUSSION

From the present survey, 51 species of medicinal plants belonging to 51 genera and 40 Families have been recorded. These are represented by just one species of gymnosperm (*Gnetum gnemon* of Gnetaceae), seven species of pteridophytes and 43 species of Angiosperms and that include 6 species of monocotyledons and 37 species of dicotyledons. Considering the parts of plant used for the treatment of various ailments the leaves are used in highest number of 27 specie, followed by root of 10 spp., bark of 9 spp., whole plant for 7 spp., flowers of 5 spp., 4 stem, 3 latex, 4 rhizome, 5 fruits, 7 seeds, 1 culm, 2 fronds and 1 grain. Out of the 51 plants, 14% were found to be of a specific singular use while 86% of the species had multi-purpose value of medicinal properties. Among the dominant families,

Poaceae and Rubiaceae represented the highest number of species with 4 species each; families of Fabaceae, Asteraceae, Solanaceae, Lythraceae and Malvaceae were represented by 2 species each and 33 species were represented by a single family.

The number of plants species for treatment of various diseases and ailments have the maximum remedy for dysentery (14 spp.), asthma (10 spp.), bodyache, cough, urinary problems (8 spp. each), haemostatic, skin diseases (6 spp. each), fever, piles (5 spp. each), female related diseases, diabetes, stomachache (4 spp. each), snake-bite, jaundice, kidney problems (3 spp. each), high blood pressure, warts, fractures and swellings (2 spp. each) are some of the significant ailments being treated using the enumerated plants as source of medicine by the *Ao-Nagas*. Species like *Bambusa tulda*, *Gnetum gnemon*, *Litsea cubeba*, *Oroxylum indicum*, *Rhus chinensis*, *Stevia rebaudiana* and *Zanthoxylum oxyphyllum* have relatively major market demands within the state for purpose of medicinal values. These marketable plants can be cultivated in the district as the climatic condition is ably suitable for cultivation of such medicinal plants.

CONCLUSION

It is evident from the present investigation that the *Ao-Nagas* has deep relationship with the plants of their environment as they still depend on forest resources for healing their ailments and diseases. However, it is unfortunate to note that the younger generations are slowly waning away from this precious knowledge of medicinal plants with the rise of modern medications and technology (Lanusunep 2015).

Moreover, rampant deforestation, 'shifting' or 'jhum' cultivation, coal mining and other socio-economic developments, the rich flora including the wealth of medicinal plants are depleting very fast day by day in the area. Hence, the author(s) stresses upon the urgent documentation, conservation and protection of the medicinal plants from the region. Further phytochemical analysis of these species can provide many interesting and valuable insights on medicinal aspects.

Acknowledgements

The authors are grateful to Nagaland State Medicinal Plants Board and Forest Department, local medicine men, Gaon Bora, village elders and all those who helped us and shared their folk knowledge and information regarding the usage of medicinal plants during field trips to different localities of Mokokchung district in the state of Nagaland. The authors are also thankful to Shantanu Dey for aiding in identification of the plant specimens.

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