



RESEARCH ARTICLE

ETHNO-MEDICINAL PLANTS OF MANIPUR USED FOR THE TREATMENT OF
INFLAMMATORY DISEASES

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ABSTRACT

Traditional medicine has always played a key role in the health systems of different ethnic groups living in remote areas of North East India. For the documentation of ethno-medicinal information, a survey was conducted in Thoubal district of Manipur comprising of three villages *Ningombam*, *Sabantongba*, *Leisangthem* to collect the information on ethno-medicinal plants of Manipur through household survey by using a standard questionnaire. The information on medicinal plants were collected and documented which were most frequently used by the local healers *Maibas* and *Maibis* for the treatment of different inflammatory diseases like diabetes, cardiovascular diseases, rheumatic arthritis, gout, cancer, liver problems, urinary tract infections, respiratory disorders, different skin diseases etc. The present paper reports the some common plant species and their scientific name, family, local names, part used and medicinal used for curing diseases.

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INTRODUCTION

Since time immemorial medicinal plants has been used as healthcare and plays a significant role both in developed and developing countries in providing health benefits to the human beings. In a survey by WHO indicated that non conventional medicine derived from herbal sources is used by 70-80% of world population particularly in developing countries and is recognized as a part of integrated system of medicine (Devi, 2014). The practice of ethno medicine is an important vehicle for understanding indigenous societies and their relationship with nature. History revealed that in the beginning of 14th century there has a good description of medicinal plants and herbal treatment for diseases in Manipur (Singh, 1986). Indigenous medicine of Manipur started developing during the then king, *Meidunga senbi Kiyamba* (1467-1508) who use *Ponheiton* (Guava) as a medicine for treatment of diarrhoea (Kumar, 1990). Since then people of Manipur started using large number of medicinal plant species in the treatment for different health related problems such as diabetes, cardiovascular diseases, respiratory tract infections, skin disorders etc. either in the form of extracts, pulp, decoction, paste, juice and leaves, flowers, fruits, tubers, roots, rhizomes and bulbs are made into medicine for treatment of the common health related problems (Singh et al, 1996).

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Since the last two decades, there has been rise in the incidence of inflammatory diseases like diabetes, cancers, coronary heart diseases, arthritis, Alzheimer's disease, neurodegenerative disorders, atherosclerosis etc. due to changes in food habits, life style changes, exposure to chemicals, pollution, ultraviolet light or heat, against innocuous foreign substances (Gulcin et al., 2005). Many research studies have revealed that medicinal plants contain several bioactive compounds or phytochemicals which helps in the prevention of oxidative stress or free radical chain reaction. Free radicals can initiate the oxidation of bio molecules, such as protein, lipid, amino acids and DNA which will lead to cell injury and can induce numerous diseases (Chen et al., 2003). An imbalance between antioxidants and reactive oxygen species results in oxidative stress, leading to cellular damage and oxidative stress is the main cause of several diseases: cancer, cataracts, age related diseases and Parkinson's disease. Plants being rich sources of bioactive compounds such as phenolic compounds, flavonoids, carotenoids, tannins, quinines, coumarins, alkaloids, amines, betalains and other metabolites (Aiyegroro, 2010). There has been revival of interest in knowing about many medicinal plants and their by- products which are inherently safer and more efficacious than the modern, potent synthetic drugs which very often produce undesirable side effects. This prompted the people to return to the ancient and traditional system of phyto-medicines or herbal medicines. With the result, the use of natural medicines or herbal drugs has gained

momentum and the demand for herbal raw drugs and other products is increasing many folds.

MATERIALS AND METHODS

Ethno-botanical survey

Study Area

Manipur is centrally located on the eastern part of the Himalaya lies between 23.80°N-25.68°N latitude and between 93.03°E-94.78°E longitude (Statistical Bulletin, 1999-2000) in the north eastern border of India separating India from Myanmar (Devi, *et al*, 2014), covering an area of about 22,327sq.km. Out of which 17,418 sq.km accounts 78% of the total geographical area covered by the forests (Economic survey of Manipur, 2002-03).

aquatic etc. Forests are mainly confined in the hilly regions of the district (Singh, 2008).

Collection on ethno-medicinal information

Ethno-botanical survey was conducted in the three villages i.e. *Ningombam*, *Leisangthem* and *Sabantongba* of Thoubal districts of Manipur during the month of December in the year 2013 and January, June and July, 2014 for better understanding of local beliefs, habits regarding the use of medicinal plants for the treatment of different diseases. Standard questionnaire was developed for the collection of ethno-medicinal information. Different categories of people like heads of the family, local healers/maibas or maibis, experienced and knowledgeable aged persons were interviewed using standard questionnaires and also by visiting local vegetable market (shown in plate 1).



Plate 1. Collection of ethno-medicinal information during household survey and from nearby local market of study area

The state is divided into 9 districts, *viz.*, (1) Senapati, (2) Tamenglong, (3) Churachandpur, (4) Chandel, (5) Urkhul, (6) Imphal east, (7) Imphal west, (8) Thoubal, (9) Bishnupur. The first five districts are located on hills and the remaining four are in the valley. Thoubal is one of four valley districts of Manipur. It occupies the bigger portion of the eastern half of the Manipur valley and takes the shape of an irregular triangle with its base facing north. It lies between 23°45' N and 24°45' N latitudes and 93°45'E and 94°14'E longitudes. It has an area of 514 sq. km. Its average elevation is not very much different from the rest of the Manipur valley, which is about 790 meters on an average above the sea level. The vegetation type is of natural one, consists of small trees, shrubs, bamboos, herbs,

Altogether 90 respondents (Thirty (30) respondents) in the aged group of 45-70 years from each village were selected randomly. During the intensive period locally well known local herbal medicine practitioners called as '*Maiba*' or '*Maibi*' were contacted and ethno-medicinal information were gathered. At the same time, rapport establishment was done with local informants and social workers for their suggestion and advice. The information such as local name of the plant, plant parts used, mode of usage, method of preparation, dosage etc. for the treatment of different disease conditions were collected. The information collected from the 90 respondents were again cross checked and authenticated with the help of local healers '*Maibas*' and '*Maibis*' and aged person who

practice folklore medicines in these villages. During the survey, 25 medicinal plants were collected, and were identified with the help of taxonomist from Department of life science, Manipur University and Department of Agronomy, Assam Agricultural University, Jorhat.

RESULTS AND DISCUSSION

During the survey, information on 25 medicinal plants were collected and documented (plate 2) as frequently used by the local healers *Maibas* and *Maibis* for the treatment of different diseases like diabetes, cardiovascular diseases, rheumatic arthritis, gout, cancer, liver problems, urinary tract infections, respiratory disorders, different skin diseases etc.

The details of the ethno-botanical knowledge of medicinal plants used by the respondents as well as traditional healers are presented in the Table 1. The local communities collect these plants directly from the natural habitats and few of them are now raised in kitchen gardens as well. Most of the medicines are used in the form of extract, decoction, juice, powder form for external application. The rural folks are well versed about the medicinal utility of these plants and therefore consumption of these plants in daily diets may be considered strongly scientific. Ethno-botanical studies are important in revealing locally important plant species for the discovery of important drugs (Balick and Cox, 1996). This traditional knowledge accumulated over the years is improved upon and disseminated orally from one generation to another in the form of folklore



a) *Achyranthus aspera* L., b) *Aegle marmelos* L. correa ex Roxb., c) *Allium hookerii* Thw., d) *Allium ramosam* L., e) *Alpinia galangal* Willd., f) *Amaranthus spinosus* L., g) *Artocarpus lacucha* Bush.-Ham., h) *Clerodendrum glandulodum* Lindl., i) *Rothea serrata* (L.) Steane & Mabb., j) *Clerodendrum indicum* (L.) Kantze, k) *Colocasia gigantea* (Blume) Hook. f., l) *Debregeasia longifolia* (Burm.f.) Wedd, m) *Eupatorium birmanicum* DC., n) *Houttuynia cordata* Thunb., o) *Justicia adhatoda* L., p) *Parkia timoriana* (DC.) Merr., q) *Phlogacanthus thyrsiflorus* Nees., r) *Plantago asiatica* subsp. *Erosa* (Wall.) Z.Y.Li, s) *Polygonum posumba* Bush.-Ham.ex D.Don, t) *Scutellaria discolor* Colebr., u) *Sesbania sesban* (L.) Mirr., v) *Solanum virginianum* L., w) *Terminalia cuneata* Roth., x) *Vitex trifolia* L.f., y) *Zanthoxylum acanthopodium* DC.

Plate 2. Documentation of ethno-medicinal plants of Manipur

Table 1. Ethno-medicinal uses of medicinal plants of Manipur having anti-inflammatory properties

| Sl. No | Scientific name | Local name | English name | Family | Part(s) used | Preparation & Medicinal use |
|--------|---|------------------------------|----------------------|----------------|---------------------------------|--|
| 1 | <i>Achyranthes aspera</i> L. | Khujumpere | Prickly chaff flower | Amaranthaceae | Whole plant | Boiled extract of the root is applied externally for the treatment of rheumatic pain. Sometime the boiled extract is mixed with sugar and is prescribed for the person having urinary tract infections once in a week. Person with pyorrhea (inflammation of gum and tooth sockets, often leading to loosening of teeth) and other gum complaints often chewed the roots of the plants. One glass of boiled and crushed extract of the leaves mixed with milk is given in case of menstrual disorder, piles. Tender leaves cooked with "lata fish" (<i>Chana orientalis</i>) is consumed during indigestion. The decoction of the plant is also used in the treatment of cutaneous diseases. The crushed fresh leaves are made into paste and applied as poultice in cuts and injuries for blood clotting and quick healing. Boiled extract of leaves and root mixed with sesame oil is applied during scabies, boils, swellings and bruises and 10 ml of boiled juice of the plant is also given in febrile fever every day. The dried powder of the plant with honey is given to persons suffering from cardiovascular diseases. The ash of the plant mixed with honey is prescribed orally against asthma, bronchitis, urinary problem, spleen complaints and constipation. The seeds are prescribed to the persons suffering from piles and inflorescence is given in case of dogs bite. |
| 2 | <i>Aegle marmelos</i> <i>L. Correa ex Roxb</i> | Heirikhagok | Stone apple | Rutaceae | Leaves, fruit and bark | The extract of the leaves are given to the person suffering from diabetes (2-3 spoons/day). Sometimes, 5-10 tender leaves are also eaten raw with milk in case of diabetes, dyspepsia, hepatitis, bronchitis. The bark of the plant juice is also given to diabetic patient. 5 ml of leaves juice extract with honey are given to person suffering from jaundice 3 spoons/day) and also in high fever. The leaves of the plant are slightly burned and applied during boils, swellings. 5 ml of crushed or boiled extract of the leaves mixed with honey is prescribed in case of liver complaints, cough, and high body temperature. Slightly roasted unripe fruit is eaten during stomach disorder, diarrhea, dysentery, impotency, chronic fever and constipation and ripe fruit with elaichi, sugar is given in case of piles 2 times /day). 5-10 ml of boiled juice obtained from bark is given in case of heart problems. The soup obtained from boiled leaves along with <i>Phlogacanthus thyrsiformis</i> in equal proportion is given to the person suffering from piles. |
| 3 | <i>Allium hookerii</i> Thw. | Maroi napakpi | Winter leek | Amaryllidaceae | Rootstock, leaf, seed and fruit | The leaves are cooked with a local fish 'Ngamhai' (<i>Chanda nama</i>) is consumed during jaundice. 2-3 leaves of the plant are consumed for reducing high blood pressure in a day. The crushed juice of fresh plant mixed with common salt is prescribed to the person suffering from stomach ulcer (about a quarter of glass). Grounded leaves made into paste are applied on the forehead, scalp and head during dizziness. |
| 4 | <i>Allium ramosam</i> L. | Maroi nakuppi | Garlic chives | Amaryllidaceae | Whole plant | One glass of boiled extract of the plant is prescribed orally to the person suffering from piles, liver complaints. The plant is crushed along with the leaves of <i>Gynura cusimbua</i> and 5-10 ml extract mixed with fresh milk is prescribed to the person suffering from tuberculosis, febrile fever. 5-10 ml of crushed extract of the plant mixed with honey is given orally in case of asthma, bronchitis and chest congestion. The plant is cooked with a local roasted fish "Ngakichou" (<i>Lepidocephalus guntea</i>) and the prescribed the soup obtained to 6person having urinary tract infections and one glass of boiled leaves juice mixed with sugar is given in stone case problems every day. |
| 5 | <i>Alpinia galanga</i> Willd. | Kang-khu | Greater galangal | Zingiberaceae | Fresh rhizome, seed and flower | The crushed fresh rhizomes of the plant are used for ring worm and skin diseases. Crushed and dried powdered rhizomes are consumed to the person having high blood pressure. The flowers and rhizomes are eaten in curry. Seeds of the plant are given to person having diarrhea and vomiting. 100 ml of boiled rhizome extract is prescribed orally in case of piles, liver complaints, throat pain and swelling. Dried rhizome powder mixed with honey is consumed during tonsillitis, cough. Rhizome of the plant is cooked with a local fish "Ngakra" (<i>Clarias batrachus</i>) and eaten in indigestion. Steam heated packet containing the rhizome along with the rhizome of <i>Zingiber officinale</i> , leaves of <i>Adhatoda vasica</i> and <i>Pogostemon parviflorus</i> is applied as foment during muscular sprain and other rheumatic pains. |
| 6 | <i>Amaranthus spinosus</i> L. | Chengkruk tingkhang panbi | Prickly amaranth | Amaranthaceae | Whole plant | The smashed root is applied as poultice in early symptoms of leprosy, bruises. Steam heated packed containing the plant and <i>Mimosa pudica</i> is applied as foment to the person having rheumatic pain. Boiled extract of the plant is prescribed in case of constipation and extract mixed with sugar is given to the person having leucorrhoea, jaundice, haemorrhoea. Pounded shoot mixed with egg is applied in case of skin burns and crushed shoot mixed with lime is applied in case of skin sores. |

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| 7 | <i>Artocarpus lacucha</i> Bush.-Ham. | Hari-kokthong | Monkey jack tree | Moraceae | The bark and fruit | Boiled extract of the bark mixed with common salt is used as gargle in case of toothaches, gum diseases. Sometimes it is also prescribed orally in diabetes one glass once in a week. The fruit of the plant is applied externally in case of scabies and other skin infections. The latex of the plant is applied in the treatment of inflammation of skin, scabies and other skin diseases. The extract of fresh fruit is applied externally to the person having burns and inflammation. The paste made by crushing the bark is applied as poultice in case of boils for early healing. Fruit is used in the treatment of stomach disorder. Powdered bark is used as antiseptic and applied in case of pimples, cracked skin. Fruit is also given to the person having constipation. |
| 8 | <i>Clerodendrum glasdulodum</i> Lindl. | Kuthap | Turk's turban | Lamiaceae | Leaf, Root | One glass of boiled extract of the leaves is prescribed orally to lower blood pressure, fever and also in diabetes every day. The steam heated packet containing the leaves is applied externally as foment in case of paralysis and also with other ingredients like roots of <i>Alangium chinense</i> and <i>Mimosa pudica</i> , rhizome of <i>Imperata cylindrica</i> , barks of <i>Oroxylum indicum</i> to the person suffering from muscular pain, sprain and other body aches. The smashed leaves are applied externally as poultice at the toes inflammation, rheumatic pain. The leaves of the plant are boiled with local dry fish (<i>Puntius tictoticto</i>) and the extract soup is prescribed against diarrhea. Leave juice is also used to eradicate threadworm. The root with bark extract is given to the person having bronchitis, cough and asthma. Persons suffering from piles and worm infections are made to sit in the hot decoction of the leaves for 10 to 15 minutes to reduce irritation. |
| 9 | <i>Rothea serrata</i> (L.) Steane & Mabb. | Moirang khanam | Bleeding-heart | Verbenaceae | Whole plant | 4-5 young leaves are given to the person having severe cough and fever. Sometimes, 4-5 Fresh leaves are also consumed in case of stomach disorders. Half glass of boiled extract of both young shoots and inflorescence are consumed in controlling diabetes every day. 1/3 rd glass of boiled extract of root is prescribed to the person having fever, malaria, chest congestion, piles. The crushed extract of fresh root mixed with common salt is applied externally on muscular sprain, rheumatism and dyspepsia. Sometimes the root is also boiled along with the roots of <i>Calotropis gigantean</i> and the extract obtained is used as massage in sciatica and body pain. The root of the plant is boiled along with the fruits of <i>Sapindus mukrosii</i> and decoction obtained is applied over fractured bone for early healing. |
| 10 | <i>Clerodendrum indicum</i> (L.) kantzé | Charoidong | Turk's turban | Verbenaceae | Whole plant | 5-10 ml of boiled extract of the stem mixed with honey is prescribed to the person having asthma, cough, and bronchitis. The extract obtained by crushing the root on stone with water is applied externally on neck swelling. Half glass boiled extract of the plant is mixed with sugar is prescribed to the person having jaundice. Sometimes the roasted leaves made into paste with local fermented fish 'Ngari' is eaten in jaundice. Boiled extract of leaves along with the leaves of <i>Adhatoda vasica</i> in equal quantity is given to the person suffering from diabetes, high blood pressure. The extract obtained by boiling the root along with the rhizome of <i>Zingiber officinale</i> is prescribed in severe cough. Fresh extract of the leaves is also applied externally on skin diseases. Stem heated packet containing the leaves is applied as foment on body aching and fever. Decoction obtained by boiling the plant mixed with honey is orally prescribed in menstrual disorder. The decoction of the root is also given to the person having bronchitis. The powder of the bark mixed with the honey is given in case of asthma. Leaf juice is useful for eradication of threadworms. |
| 11 | <i>Colocasia gigantea</i> (Blume) Hook. f. | Yendem | Indian taro | Araceae | Whole plant | The petiole cooked with a local fish "Ngakra" (<i>Clarias batrachus</i>) is consumed in arthritis, rheumatic pain. The petiole with leave is boiled and applied externally on muscle pain. Slice of the rhizome is applied on the forehead in dizziness. The tender leaves (1-2) after slight roasting is applied over boils for early suppuration. The petiole is cooked singly and eaten to purify blood by the womenfolk. During pregnancy it is eaten as boiled curry with any dry fish for normal blood circulation and to lower high blood pressure. The ash obtained by burning the petiole mixed with honey is prescribed against unproductive cough. |
| 12 | <i>Debregeasia longifolia</i> (Burm.f.) Wedd. | U- Khajing | Orange Wild Rhea | Urticaceae | Root, leaves, flower, seed | Half glass of boiled extract of the leaves and root mixed with sugar is prescribed to the person suffering from diabetes every day. Both the flower and leaves of the plant is consumed as raw to lower blood pressure. Half glass of boiled extract of the leaves is given in colic and for normal blood circulation twice in a week. 5 g of root is crushed with ginger and taken to cure rashes and skin infections. |
| 13 | <i>Eupatorium birmanicum</i> DC. | Langthrei | Nagal Camphor | Asteraceae | Whole plant | Fresh tender leaves are eaten as raw in colic and abdominal inflammation. Sometimes tender shoot also cooked along with fresh prawn (<i>Palaemon malcolmsonii</i>), bulbs of <i>Allium sativum</i> and <i>Allium ascalonicum</i> is consumed for the treatment of piles, diarrhea and dysentery. The steam heated packet containing the leaves along with the leaves of <i>Lantana camara</i> and <i>Paederia foetida</i> is applied as foment on rheumatic pain. About half glass of leaves juice (obtained after crushing the leaves) is consumed for acidity problem. The extract obtained by crushing the plant along with <i>Eclipta alba</i> mixed with honey is prescribed to the person having typhoid. Two teaspoons of leaves juice mixed with one glass of water with a little "Meitei thum" (local salt) is given for treatment of stone formation. Leaves juice extract is also consumed to lower blood pressure, to prevent dilation of blood vessels. The juice of the plant mixed with honey is recommended for the person having stomach ulcer. The crushed leaves or juice with or without honey is applied externally on the body to cure burning sensation. |

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| 14 | <i>Houttuynia cordata</i> Thunb. | Toningkhok | Lizard tail | Saururaceae | Whole plant | 5-10 ml of crushed leaves extract is prescribed to the person having diarrhea and dysentery. The rhizome is given in case of stomach ulcers and skin diseases. 1/4 th of glass of boiled extract of rhizome and leaves are consumed orally in case of muscular pain due to over strains. 4-5 fresh leaves are consumed for the treatment of measles, dysentery, and gonorrhoea, hemorrhoids, eye and skin troubles. 4-5 smashed leaves are applied externally as poultice on boils and skin sores. 5-10 ml of leaves decoction obtained from boiling is used internally in the treatment of many ailments including cancer, coughs, dysentery, enteritis and fever. It is consumed as raw to strengthen the immune system. Externally, it is used in the treatment of snake bites and skin disorders. |
| 15 | <i>Justicia adhatoda</i> L. | Nongmangkha angouba | Malabar nut | Acanthaceae | Whole plant | Fresh leaves made into paste is mixed with glycerine and applied as poultice to the person suffering from bone cancer. The extract obtained by boiling the leaves of the plant along with the fruits of <i>Embllica officinalis</i> is mixed with honey and prescribed during asthma and chronic bronchitis. 5-10 ml leave juice is consumed to the person suffering from diarrhea, dysentery and glandular tumors. The dried leaves are burnt and inhaled to get relief during asthma. 10 ml of boiled extract of the leaves is prescribed orally against febrile fever, menstrual disorder. The decoction obtained by boiling the root along with <i>Tinospora cordifolia</i> and fruits of <i>Solanum xanthocarpum</i> is given in fever and cold. The leaves are boiled along with the leaves of <i>Clerodendrum siphonanthus</i> taken in equal proportion and extract obtained is given to the person suffering from diabetes. Sometimes the extract obtained by boiling the leaves along with the leaves of the <i>Azadirachta indica</i> in equal proportion is also given in diabetes. The leaves are boiled in water and decoction is applied externally to cure muscular and other rheumatic pains. The vapor of the plant is inhaled to get relieves from bronchial congestion and common cold. The boiled decoction is given to the person suffering from jaundice. Powdered leaves are applied externally during skin infections. Fried whole mature leaves in mustard oil are consumed during indigestion and are also given to those person having cold and cough. |
| 16 | <i>Parkia timoriana</i> (DC.) Merr. | Yongchak | Tree bean | Mimosaceae | Bark and Fruit | The bark of the plant or the cuticular covering of the pod is boiled and prescribed the extract to the person having severe diarrhea and dysentery. The fruits are given to the person to cure bleeding piles. The bark of the plant is boiled along with <i>Centella asiatica</i> , fruits of <i>Ficus glomerata</i> and extract obtained is prescribed for the treatment of diabetes. Bark and leaves extract is used to applied on skin infections and sores. |
| 17 | <i>Phlogacanthus thyrsoiflorus</i> Nees. | Nongmangkha | Malabar nut | Acanthaceae | Leaves, flowers and inflorescence | The crushed extract of the leaves is applied externally on scabies and other skin infections. The leaves decoction is used to take bath for 4 days for the treatment of small pox. The extract obtained by boiling the bark along with the rhizome of zinger is given to the person suffering from diabetes. The boiled extract along with the bark of cinnamon is prescribed to reduce fever. The soup obtained by boiling the leaves of the plant is prescribed for the patient who is suffering from cough and muscle pain. Leaves juice is given to the person having severe cough, asthma, rheumatism. For high blood pressure, 250 ml of the plants decoction obtained from leaves is taken orally for 3 days daily. Flower is consumed as "singju" (local salad with fermented fish) or 2-3 leaves are eaten daily or boiled extract of leaves with flower is mixed with honey is consumed 2-3 spoons in a day to reduce fever. Boiled leaves / decoction mixed in 2:1 with honey is inhaled twice daily for 5 days/50 ml three times daily for 3 days in cold and cough. 30 grams of dry leaves powdered is dissolved in 100 ml of water is taken orally thrice in a day for 7 days in case of malaria. Leaves crushed mixed with smashed rhizome of zinger with little salt is dissolved in water and 100 ml of the mixture is orally taken twice daily in diarrhoea, dysentery and cholera. |
| 18 | <i>Plantago asiatica</i> subsp. <i>Erosa</i> (Wall.) Z.Y.Li | Yempat | Great plaintains | Plantaginaceae | whole plant | The leaves after slight warming are applied externally over boils and wounds for early suppuration and healing. The boiled extract of the leaves and root with sugar is given to the person for proper flow of urine, elimination of stones in the kidney and gall bladder, inflammation of kidney and urinary bladder, colic, cough, fever and constipation. Leaves and roots are given to the person having chronic fever. The leaves extract is used for eye wash. The paste made by crushing the root along with the bulbs of <i>Allium sativum</i> , <i>Allium ascalonicum</i> and <i>Eryngium foetidum</i> is used as massage in muscular sprain, body pain and also in rheumatism. Extract of the leaves mixed with honey is prescribed orally to relieve high body temperature, stomach ulcer and other stomach complaint. Seed is given to the person suffering from dysentery, diarrhea, and constipation, genito-urinary tract complaints. |
| 19 | <i>Polygonum posumba</i> Bush.-Ham.ex D.Don | Phakpai | Knotgrass | Polygonaceae | Whole plant | The crushed extract of the plant is applied externally to cure skin allergy. The leave cooked with a local fish 'Ngakha meingangbi' (<i>Puntius phutunio</i>) is consumed for the treatment of diarrhea and other stomach complaints. The extract obtained by crushing the plant along with <i>Eryngium foetidum</i> and <i>Leucas aspera</i> is prescribed orally as well as applied externally in muscle weakness and paralysis. Young shoots are given to the person to control hypertension. Crushed leaves of plants juice is dissolved in a glass of warm water and is consumed for the treatment of gastric problems (once or twice a day). |

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| 20 | <i>Scutellaria discolor</i> Colebr. | Yenakhat | Skullcap | Lamiaceae | Whole plant | Boiled extract of the plant is applied externally to lower blood pressure. Sometimes the boiled extract of the plant is also given orally to control fever, colic, typhoid, menstrual disorders and painful urination. The plant is boiled with the fruits of <i>Garcinia xanthochymus</i> and the extract obtained is applied externally on body pain, inflammation. The plant extract obtained by boiling along with the bark of <i>Terminalia arjuna</i> and roots of <i>Rubia cordifolia</i> is prescribed to the person having muscular and rheumatic pain. The plant is boiled and given to the person having abdominal pain and inflammation. Smashed leaves are applied externally to fresh or old wounds for healing purposes. The leaves decoction is given for the treatment of flatulence, constipation and indigestion. |
| 21 | <i>Sesbania sesban</i> (L.) Mirr. | Chuchurangmei | Common sesban | Fabaceae | leaf and tender shoot | Boiled extract of the leaves or tender shoot is prescribed to the person to relieve severe cough, fever, abdominal pain. Fresh bark and seeds are crushed together and the juice obtained is given to the person suffering from diabetes. The plant is consumed as local salad or <i>Singju</i> and also as " <i>Eromba</i> " (local chutney) for the treatment of diabetes. The paste made from leaves is applied externally as poultice on boils for early healing. |
| 22 | <i>Solanum virginianum</i> L. | Leipung-khanga | Yellow berried nightshade | Solanaceae | Whole plant | 5-10 numbers of ripe fruit is eaten raw to lower blood pressure every day. Half glass of boiled extract of the fruit is used to wash the mouth in toothaches due to germs. 1/3 rd of glass of leave extract mixed with honey is prescribed orally to the person having piles, bronchitis, acidity, asthma, fever and typhoid. The fresh leaves and fruits are crushed with the rhizome of <i>Curcuma longa</i> and 5-10 ml extract obtained mixed with honey is prescribed to cure severe cough and worm infection of children. The stem of the plant is burnt along with the leaves of <i>Datura metel</i> and smoke emitted is inhaled in nasal infection. Juice of berries is used for sore throat, cough and asthma. Stem, flowers and fruits paste (5-10 g) are used in burning sensation in the feet accompanied by vesicular watery eruptions. The boiled extract of the bark is prescribed to the person having hemorrhoids, dysentery, fever, colic. The decoction obtained by boiling the bark along with <i>Scutellaria discolor</i> and roots of <i>Rubia cordifolia</i> is given to the person having rheumatic pain and bone problem. The powder of the bark along with milk is given to the person for the treatment of hypertension and heart complaints. Bark of plant with water extract is mixed along with honey and prescribed for atleast 10 days (6 spoons in a day) for body pain, headache, cardiovascular diseases and liver complaints. The boiled extract of the leaves is prescribed in case of skin diseases. The leaves juice is used in earache around 6 days 2-3 times in a day. |
| 23 | <i>Terminalia cuneata</i> Roth. | Maiyokpha | Arjun tree | Combretaceae | Bark, leaves | Boiled extract of the leaves is applied externally to the person having rheumatic pain, sinus and throat swelling and also given orally 2-3 spoon 3 times in a day. Decoction of the bark, root and leaves are used to wash the mouth in toothaches. Crushed extract of the leaves mixed with honey is also prescribed mostly in piles and tuberculosis. It is also practiced by dipping the affected parts in a tumbler containing lukewarm water with leaves extract. The extract obtained by boiling the leaves along with the leaves of <i>Azadirachta indica</i> , <i>Datura stramonium</i> is prescribed to the person in stomach complaints of elders. Oil extracted from leaves is given in sinus and hydrocele. Smashed seed made into paste is applied externally on painful swelling, scabies and other skin infections. Flowers are prescribed with honey for the treatment of diarrhea, fever accompanied by vomiting, severe thirst and liver complaints. |
| 24 | <i>Vitex trifolia</i> L.f. | Urikshibi | Simple chaste tree | Lamiaceae | Whole plant | Crushed extract of the leaves with honey is prescribed in typhoid and unconsciousness. The boiled extract of the root and seed is prescribed to the person having diabetes. Sometimes boiled extract of seeds and leaves are consumed in indigestion, cough and bronchitis and stomach complaints 3-4 spoons in a day and 5-6 leaves are consumed with vegetables in a day in chronic fever. The seed of the plant is often chewed to relieve throat pain. The extract obtained by boiling the leaves along with the petioles of the <i>Amorphophallus companulatus</i> is prescribed in case of tuberculosis and blood vomiting. The decoction obtained by boiling the leaves along with the leaves of <i>Azadirachta indica</i> and <i>Adhatoda vasica</i> taken in equal proportion is prescribed for the treatment of diabetes. The boiled extract of the leaves are also applied externally on scabies and other skin infections. |
| 25 | <i>Zanthoxylum acanthopodium</i> DC. | Mukthubi tingkhang panbi | Prickly ash | Rutaceae | Whole plant | |

and folk sayings and contributed to the accumulation of a complex wealth of knowledge and skills. The Meitei and tribal people of Manipur and also local healers possess rich traditional knowledge which has been passed on to them by their ancestors based on locally available plants as medicine in the management of many diseases or disorders (Devi, 2014). Rajkumari *et al.* (2013) reported that 69 medicinal plants used by the Chiru tribe of Manipur for the treatment of common diseases like cough, cold, diarrhea, dysentery, diabetes, jaundice etc. and are mostly consume as decoction. Singh and Huidrom (2013) found that leaves of *Justicia adhatoda* locally known as *Nongmangkha-Angouba* were used in the form of decoction, extracts, boiling to cure many ailments like cough, fever, asthma

and dysentery. Similarly, Ringmichon *et al.* (2013) also revealed that *Rubus ellipticus* Smith. is one of the important ethno-medicinal plants of Manipur used for curing fever since ancient times by the Naga tribe of Manipur and stated that root bark is also used in diarrhoea, dysentery and in fractured bones. And Phurailatpam *et al.* (2014) also reported that another medicinal plants of Manipur *Phlogacanthus thyrsoformis* locally known as *Nongmangkha* is used in the form of decoction, paste, juice and eaten as raw in the treatment of cold, cough, influenza, irregular menstruation, diarrhoea, dysentery, cholera, high blood pressure, boils, small pox, skin problems, sprains, body ache, constipation and burns.

Therefore, documentation of indigenous knowledge of medicinal plants is important for preserving the local traditional knowledge before it diminishes with the knowledgeable people. In view of the rapid loss of such knowledge, its documentation as well as a better understanding of its botanico historical roots has become an essential task of ethno-allied disciplines (Leonti *et al.*, 2003). There is a need to make further studies on standardization of cultivation and consumption techniques of these plants so that their natural populations are conserved and at the same time they may also provide health benefit to the rural population.

Conclusion

The present study focused on the need of proper documentation of the medicinally used plants by the Manipuri people. The traditional knowledge system is restricted to few identified persons in the community and this knowledge generally inherited through the oral transfer and that generally in family lineage as there is no written document. But, the present generation people are least interested to practice the traditional medicines. Due to over exploitation and deforestation many plant species are threatened. Hence, documentation and conservation of such plant species should be done by the concern authorities, if essential, in collaboration with different NGOs. It should be realised that conservation and management of potential species are of utmost importance.

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