

Ethnobotanical Study on the Medicinal Plants Used by the Karbi Tribe in Gohpur Sub-division, Biswanath District, Assam

¹Juli Bairagi, ²Freeman Boro, ³Purbajyoti Saikia, ⁴Ajit Hazarika
¹JRF, AILBH; ²SRF, AILBH; ³RA, AILBH; ⁴Principal, THB College, Jamugurihat
Advanced Institutional Level Biotech Hub,
Chaiduar College, Gohpur, India

Abstract: The use of plants as medicines to cure different types of diseases has been carried on since time immemorial. It is a common practice among the tribal populations in every nook and corner of the globe. The northeastern part of India is one of the major biodiversity hotspots of the world and Assam, one of the 8 states of Northeast India, is regarded as a hub of medicinal plants. Moreover, this state is the abode of a good number of indigenous tribes like Karbi, Bodo, Rabha, Mishing, Deori, Dimasa, Tiwa, etc., who retain an excellent knowledge of herbal medicines inherited through many generations. Though the traditional practices on herbal medicines of different tribes in various locations are studied by many authors, no information on that of the Karbi tribe in Gohpur subdivision is found till date. In the present investigation, informations were collected from the traditional healers of Karbi community in Gohpur area based on personal interview. A total number of 60 species were found which are used for various types of diseases. Most of the plants were known for their medicinal properties as supported by earlier data. However, a detailed study of the phytochemicals of these medicinal plants and their validation in animal models is necessary for further action.

Keywords: Ethnobotany, Traditional Medicine, Karbi Tribe, Gohpur sub- division

I. INTRODUCTION

Ethnobotany includes the scientific study of the relationships between the human folks with the plant resources (Ayam *et al.*, 2017). Importance of the ethnomedicines for the treatment of various ailments has been well- recognized among various ethnic groups (Tamuli and Ghosal, 2017). There are diverse medical traditions found in the traditional medicine systems in terms of their historical background, theoretical logic and practices, their contemporary social realities and their dynamics (Bhasin, 2007). Northeast India geographically lies at the juxtaposition of Indo- Malaya, Indo- China, Indo- Myanmar and Indo- Bangladesh regions and joins the foothill of Himalayan Mountains. The climatic, edaphic and altitudinal variations in this region give to a great range of ecological habitats for this region (Tripathi *et al.*, 2016). Due to the majestic diversity of the flora and fauna, this region is recognized as a mega biodiverse region, comprising of the Eastern Himalayas biodiversity hotspot, which is now upscaled to Indo- Burma hotspot. This region is the abode of several endemic flora and fauna (Myers *et al.*, 2000).

The population structure of Northeast India is unique, comprising of 30% tribal population (Tripathi *et al.*, 2016). These people rely on medicinal plants because of their effectiveness, lack of modern healthcare alternatives and cultural preferences (Caniago and Siebert, 1998). Assam, a state of northeast India, is the home of more than 23 tribes, such as Boro, Mishing, Karbi, Rabha, Dimasa, Tiwa, Deori, Sonowal Kachari, Garo, Hajong, Hmar, Naga, Barman, Kuki, Rengma, Mishimi, Koch- Rajbanshi, etc. (Saikia *et al.*, 2012). Among them, Karbis are mongoloid tribes, belonging to the Tibeto- Burman and more particularly to the Kuki- Chin sub- group of languages. They are mainly agriculturists (Teron and Borthakur, 2013). The population of Karbi tribe is mainly concentrated in Karbi Anglong district and the foothill areas of Nagaon and Kamrup (Saikia *et al.*, 2012). Gohpur, a subdivision of northeastern Assam, is the home of a small number of Karbi populations. These people mainly live by agriculture. However, the traditional practices of this small patch of population are very much understudied. Therefore, the present study was designed to investigate the ethnobotanical practices of this tribe as remedies for the treatment of various diseases.

II. RESEARCH METHODOLOGY

2.1 Study Area:

Gohpur is a subdivision of Biswanath, a district of eastern Assam and is situated at the north bank of the mighty Brahmaputra. This subdivision is located at 93.6058⁰E longitude and 26.8790⁰N latitude. The northern boundary of the subdivision is surrounded by the blue hills of Arunachal Pradesh and the Brahmaputra flows by the southern boundary. Lakhimpur district is situated at the east while the Biswanath Chariali subdivision lies at the west.

The subdivision is blessed with people from a good number of communities like Ahom, Bodo, Brahmin, Chutiya, Kalita, Koch, Karbi, Mishng, Nepali, Tea tribe, etc. Every community practices their own traditional methods of treatments.

2.2 Collection of Data:

The investigation was carried out in the Karbi inhabited villages of Gohpur. Informations were collected from the traditional healers irrespective of age and sex. A total of 6 field surveys were carried out from January, 2018 to March, 2019 in the Karbi inhabited villages of Gohpur. A total of 5 traditional healers were selected and informations were collected on the basis of oral conversation. A field datasheet was prepared to record the plants and their traditional use. Herbaria were prepared based on the informations and the specimens were identified by the taxonomists of Department of Botany, Chaiduar College, Gohpur, Assam.

III. RESULT

The present study reveals 60 species of medicinal plants, used by the Karbi community of Gohpur, Assam. All these species belong to 58 genera and 41 families, being traditionally used for 17 different types of ailments. A list of the medicinal plants with their uses is given in Table 1.

Table- 1: Traditional medicinal plants used by the Karbi tribe of Gohpur, Assam

Sl. No.	Scientific Name	Local Name	Family	Parts Used	Uses
1	<i>Acacia farnesiana</i>	Tarua Kadam	Fabaceae	Leaf	Leaf juice is used in cough and cold.
2	<i>Acorus calamus</i>	Bos	Acoraceae	Root	Pieces of roots are used to cure common cold in children.
3	<i>Adhatoda vasica</i>	Titaphul	Acanthaceae	Leaf	Leaf extracts are used in bronchitis and bronchial asthma, cough and breathlessness.
4	<i>Aegle marmelos</i>	Bel	Rutaceae	Fruit	Ripe fruit is used in stomach troubles.
5	<i>Aleo barbadensis</i>	Salkuwari	Asphodelaceae	Leaf	It is used for dermatitis and other skin disorders.
6	<i>Allium sativum</i>	Naharu	Amaryllidaceae	Leaf	Leaf paste is applied on affected area in spider bite.
7	<i>Alpinia nigra</i>	Tora	Zingiberaceae	Seed	Seeds are used to treat cough.
8	<i>Alstonia scholaris</i>	Sotiyana	Apocynaceae	Latex, Leaf	Latex is used to treat asthma. Leaves are used to treat malaria and fever.
9	<i>Alternanthera sessilis</i>	Matikaduri	Amaranthaceae	Leaf	The juice of the leaves is used to treat stomach trouble.
10	<i>Ananas comosus</i>	Matikathal	Bromeliaceae	Leaf	Tender leaves are used to treat intestinal worms.
11	<i>Averrhoa carambola</i>	Kordoi	Oxalidaceae	Root	The bark of the root is used to treat jaundice.
12	<i>Azadiracta indica</i>	Neem	Meliaceae	Leaf, Bark	Bark is used for malaria. Leaves are used to cure stomach and intestinal worms and skin diseases.
13	<i>Bambusa balcooa</i>	Bhaluka Bah	Poaceae	Leaf	Leaves are used to prevent nasal bleeding.
14	<i>Bryophyllum pinnatum</i>	Dupor Tenga	Crassulaceae	Leaf	Leaf juice is used in kidney stone.
15	<i>Calotropis gigantea</i>	Akon	Apocynaceae	Leaf	Heated leaves are applied on body parts to cure pain.
16	<i>Carica papaya</i>	Amita	Caricaceae	Fruit	Ripe fruit paste is applied on the pimple affected area. Raw fruit is an abortifacient.

17	<i>Catharanthus rosesus</i>	Nayantora	Apocynaceae	Whole plant	This plant is used to treat cancer.
18	<i>Centella asiatica</i>	Bormanimuni	Apiaceae	Leaf	Leaves are used in gastric trouble. It is a good appetizer.
19	<i>Christella parasitica</i>	Bihlogoni	Thelypteridaceae	Leaf	Leaves are used to treat rheumatism.
20	<i>Citrus aurantiifolia</i>	Gol nemu	Rutaceae	Fruit	Salt- preserved fruit is used in dysentery.
21	<i>Clerodendrum colebrookianum</i>	Nephaphu	Lamiaceae	Leaf	Leaves are used to control hypertension.
22	<i>Commelina benghalensis</i>	Kanai simala	Commelinaceae	Shoot	Shoot juice is used to suppress newly formed boil.
23	<i>Costus speciosus</i>	Jamlakhuti	Costaceae	Root	Juice of the roots is used in strangury.
24	<i>Curcuma caesia</i>	Kola Haladhi	Zingiberaceae	Rhizome, whole plant	It is used to cure toothache and reptile bite. Rhizome is used for asthma, piles and toothache.
25	<i>Curcuma longa</i>	Haladhi	Zingiberaceae	Rhizome	Rhizome juice is used to treat intestinal worms and to relieve pain.
26	<i>Cynodon dactylon</i>	Dubori Bon	Poaceae	Leaf	Leaf juice is used to prevent excessive menstrual bleeding.
27	<i>Datura stramonium</i>	Dhatura	Solanaceae	Seed	Seed paste is used to cure skin infection.
28	<i>Dendrocnide sinuata</i>	Chorat	Urticaceae	Root	Root poultice is applied on mumps.
29	<i>Drymaria cordata</i>	Laijabori	Caryophyllaceae	Leaf	Leaf juice is used to treat sinusitis.
30	<i>Eclipta prostrata</i>	Keharaj	Asteraceae	Leaf	Leaf juice is applied to prevent greying of hair.
31	<i>Emblica officinalis</i>	Amlakhi	Phyllanthaceae	Fruit	It is used in treatment of jaundice. It helps to control blood pressure.
32	<i>Entada gigas</i>	Ghilaguti	Fabaceae	Seed, Leaf	It is used to cure pneumonia.
33	<i>Euphorbia hirta</i>	Gakhiroti Bon	Euphorbiaceae	Whole plant	It helps in stimulation of milk for the lactating mother.
34	<i>Garcinia cowa</i>	Kuji Thekera	Clusiaceae	Fruit	Fruits are used to treat dysentery.
35	<i>Garcinia indica</i>	Thekera	Clusiaceae	Fruit	Sundried slices of the fruits are used to cure dysentery.
36	<i>Houttuynia cordata</i>	Masandari	Saururaceae	Leaf	Leaves are used in stomach disorders.
37	<i>Hydrocotyl rotundifolia</i>	Sorumanimuni	Araliaceae	Leaf, Stem	This plant is used to treat stomach problems.
38	<i>Lawsonia inermis</i>	Jetuka	Lythraceae	Leaf	Leaf paste is applied in skin infection.
39	<i>Leucas aspera</i>	Doron	Lamiaceae	Leaf	Leaf juice is used in sinusitis, pneumonia and menstrual disorder.
40	<i>Mentha viridis</i>	Podina	Lamiaceae	Leaf	Leaves are used to treat indigestion.
41	<i>Michelia champaca</i>	Titasopa	Magnoliaceae	Bark	Powdered bark is used in malaria.
42	<i>Mimosa pudica</i>	Nilajibon	Fabaceae	Leaf	Leaves are used to heal wounds.
43	<i>Moringa oleifera</i>	Sojina	Moringaceae	Leaf	Tender leaves are used to relieve body pain.

44	<i>Murraya koenigii</i>	Narasingha	Rutaceae	Leaf	Leaf juice is used in indigestion.
45	<i>Musa paradisiaca</i>	Kach Kol	Musaceae	Sheath	Sheath is burnt and fresh ashes are used in abortion.
46	<i>Ocimum sanctum</i>	Kola Tulosi	Lamiaceae	Leaf	Leaves are used in cough and cold.
47	<i>Oldenlandia corymbosa</i>	Bon Jaluk	Rubiaceae	Leaf	Leaves are given to the mothers after delivery.
48	<i>Oroxylum indicum</i>	Bhatghila	Bignoniaceae	Bark	Powdered bark is used to treat malaria.
49	<i>Paederia fotida</i>	Bhedailota	Rubiaceae	Leaf	It is used to cure stomach problems. It increases appetite. Leaf paste is applied on wounds.
50	<i>Peperomia pelludica</i>	Ponounowa	Piperaceae	Leaf	Leaf juice is used in the eye infection.
51	<i>Piper nigrum</i>	Kola Jaluk	Piperaceae	Fruit	Fruit is used to cure body pain, cough and cold.
52	<i>Pogostemon benghalensis</i>	Sukloti	Lamiaceae	Leaf	Fried leaves are given to the mothers after delivery.
53	<i>Ricinus communis</i>	Erapat	Euphorbiaceae	Root, Leaf	Roots are used in urinary trouble. Leaves are used in muscle pain.
54	<i>Solanum indicum</i>	Tita Bhekuri	Solanaceae	Fruit, Root	Fruits and root juice is used to cure cough and pneumonia.
55	<i>Sonchus oleraceus</i>	Monisal	Asteraceae	Bark	Powdered bark is used to treat liver disorders.
56	<i>Spondias pinnata</i>	Amora	Anacardiaceae	Fruit	Fruits are used in dysentery and other digestive problems.
57	<i>Swertia chirata</i>	Chirata	Gentianaceae	Stem	Stems are soaked in water overnight and that water is used to treat cough and intestinal worms.
58	<i>Syzygium cumini</i>	Kala Jamu	Myrtaceae	Fruit, Seed	Fruits and seeds are used in liver problems and diabetes.
59	<i>Terminalia chebula</i>	Hilikha	Combretaceae	Fruit	It is used in digestive diseases, urinary diseases, diabetes, skin disease and constipation.
60	<i>Vitex negundo</i>	Posotiya	Lamiaceae	Leaf	Leaves are used for relieving pain.

In this study, different recorded families are- Fabaceae, Acoraceae, Acanthaceae, Rutaceae, Asphodelaceae, Amaryllidaceae, Zingiberaceae, Apocynaceae, Amaranthaceae, Bromeliaceae, Oxalidaceae, Meliaceae, Poaceae, Crassulaceae, Caricaceae, Apiaceae, Thelypteridaceae, Commelinaceae, Costaceae, Solanaceae, Urticaceae, Caryophyllaceae, Asteraceae, Phyllanthaceae, Euphorbiaceae, Clausiaceae, Sauraceae, Araliaceae, Lythraceae, Lamiaceae, Magnoliaceae, Moringaceae, Musaceae, Rubiaceae, Bignoniaceae, Piperaceae, Asteraceae, Anacardiaceae, Gentianaceae, Myrtaceae and Combretaceae. Among all these families, the most widely used family is Lamiaceae. A bar diagram of different plant families used for medicinal purpose is shown in Fig.1.

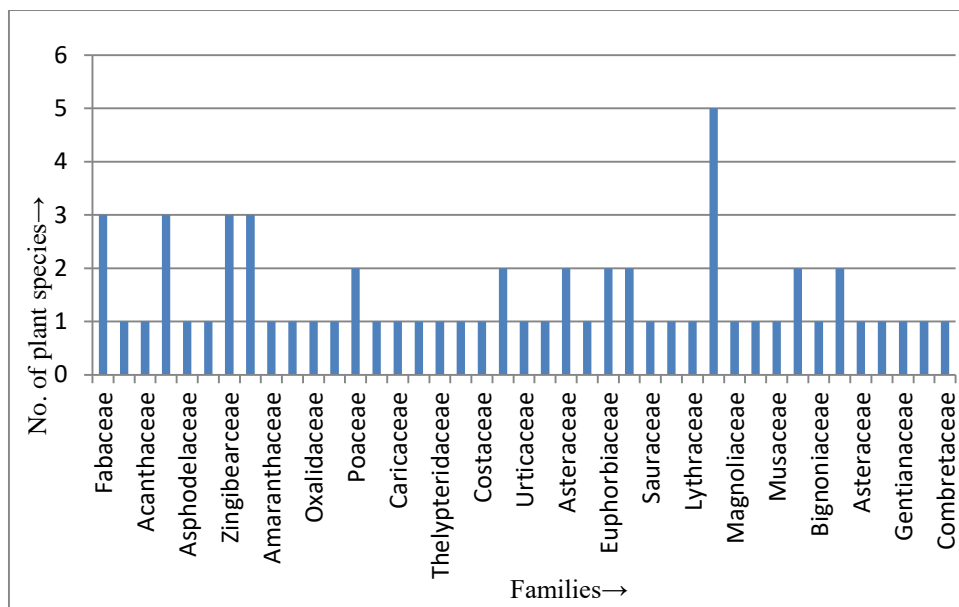


Figure-1: Comparative presentation of different plant families used for traditional medicine by the Karbi tribe of Gohpur, Assam

A total of 8 parts of various medicinal plants are recorded to be used. The most widely used plant part is leaf (55%), followed by fruit (18.33%), root (10%), seed (6.67%), bark (6.67%), whole plant (5%), rhizome (3.33%), stem (3.33%), latex (1.67%), shoot (1.67%) and sheath (1.67%). A bar diagram showing the percentage use of different plant parts are given in Fig. 2.

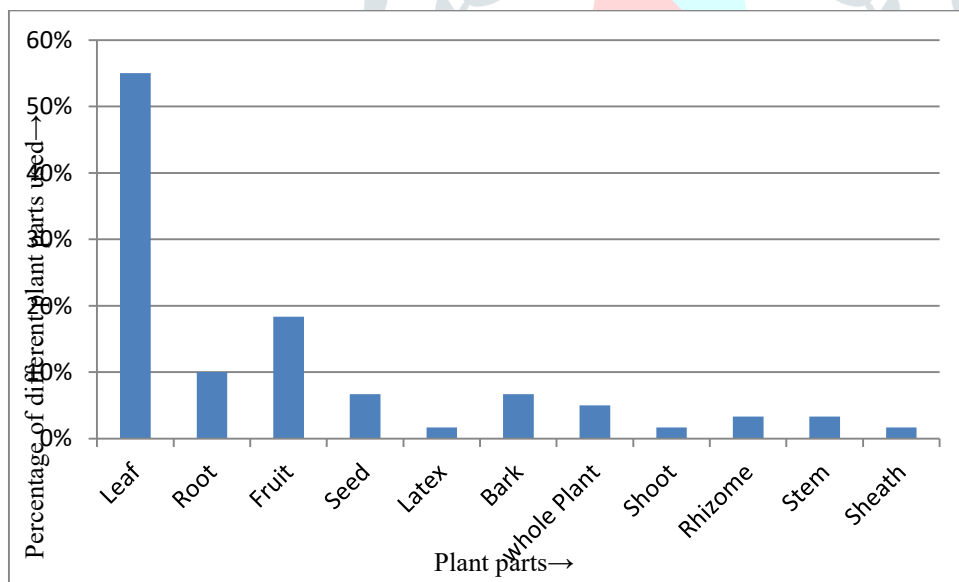


Figure-2: Comparative use of different plant parts for traditional medicine by the Karbi tribe of Gohpur, Assam

IV. DISCUSSION

Traditional healthcare systems are known to strengthen the local health and most of the commercially proven drugs were first tried in their crude form, based on the traditional knowledge (Sasil- Lagoudakis *et al.*, 2012; Fabricant and Farnsworth, 2001). Natural products are the raw material for a large number of clinical drugs, because of which, now- a- a- days, there is a growing interest for such plant- based sources. Informations regarding the plant parts used for a particular disease, processing of the plant material, route of administration, etc. helps in enhancing the healthcare and reduces the costs of unnecessary trials (Panda *et al.*, 2018).

Different tribes inhabiting various parts of Assam are practising use of herbal medicines to treat common diseases since time immemorial. Knowledge of such types of ethnomedicines may lead to new drug development (Kalita and Kalita, 2014).

In the present study, 60 different species of medicinal plants are recorded for treating 17 types of ailments. The ailments are categorized into respiratory problems, digestive problems, dermatological problems, reproductive problems, dental care, cancer, pain, poisonous bites, eye troubles, urinary problems, hypertension, mumps, hair care, ENT problems, malaria and fever, piles and wounds. For respiratory problems, *Acorus calamus*, *Adhatoda vasica*, *Entada gigas*, *Leucas aspera*, *Solanum indicum*, *Drymaria cordata*, *Ocimum sanctum*, *Acacia farnesiana*, *Alstonia scholaris*, *Alpinia nigra*, *Swertia chirata*, *Curcuma caesia* and *Piper nigrum* are used by the Karbi people of Gohpur. The use of some of these plants in respiratory disorders is recorded by some other authors also. *Acorus calamus* is recorded to be a remedy for cough, bronchitis and pneumonia (Shankar *et al.*, 2012; Kalita and Kalita, 2014). Likewise, fruits and leaves of *Adhatoda vasica* are used in pneumonia (Kalita and Kalita, 2014). *Ocimum sanctum* is a well-known medicine for bronchitis, cold, cough and congestion of lungs (Hazarika *et al.*, 2012; Bailung and Puzari, 2016). *Swertia chirata* and *Piper nigrum* is anti-asthmatic (Hazarika *et al.*, 2012). *Piper nigrum* is used to cure cough and bronchitis by the Kani tribe of south India (Ayyanar and Ignacimuthu, 2011). *Leucas aspera* is used in sinusitis (Bailung and Puzari, 2016; Bhuyan and Chetia, 2018; Hazarika *et al.*, 2012) and nasal congestion (Das, 2016) by Ahom and some other communities of Assam. *Swertia chirata* is used in cough, fever (Das, 2016) and asthma (Hazarika *et al.*, 2012). *Drymaria cordata* is used in sinusitis (Das, 2016) and nasal blockage (Hazarika *et al.*, 2012). *Acacia farnesiana* is used in cough by the traditional healers of Gohpur, Assam. Latex of *Alstonia scholaris* is mixed with sugar and water and is used to treat asthma (Saikia, 2006). Kalita and Kalita (2014) also reported the use of *Alstonia scholaris* in bronchitis and pneumonia. Seeds of *Alpinia nigra* are reported to be used in cough and bronchitis (Das, 2016).

For skin diseases, 7 plant species were recorded. We recorded *Azadiracta indica* as a medicine for skin diseases. This species is a well-known medicine for skin infection (Tamuli and Ghosal, 2017; Das, 2016; Das *et al.*, 2008; Hazarika *et al.*, 2012). Likewise, the use of *Carica papaya* in pimple-affected areas is recorded by Tamuli and Ghosal (2017), which is similar to our finding. *Lawsonia inermis* is used in fungal infections by the Ahom people of upper Assam and the Karbi tribe (Bailung and Puzari, 2016; Tamuli and Ghosal, 2017). Traditional folks of Gohpur subdivision of Assam use *Commelina benghalensis* on sty (Saikia, 2006). The present investigation reveals the use of this species to suppress newly formed boil.

21 plant species are recorded as remedies for digestive problems, many of which are recorded by many other investigators also for similar purposes. *Alternanthera sessilis* is used as a medicine for dysentery as well as constipation by the Ahom community of Upper Assam, especially in Dibrugarh and Tinsukia district (Bailung and Puzari, 2016; Bhuyan and Chetia, 2018). *Averrhoa carambola* is used in jaundice, diarrhea, dysentery and other digestive problems (Bailung and Puzari, 2016; Bhuyan and Chetia, 2018; Hazarika *et al.*, 2012). *Centella asiatica*, *Hydrocotyl rotundifolia*, *Paederia foetida*, *Murraya koenigii*, *Mentha viridis*, *Spondias pinnata*, etc. are recorded to be used for various digestive problems (Bailung and Puzari, 2016; Bhuyan and Chetia, 2018; Das, 2016; Hazarika *et al.*, 2012; Shankar *et al.*, 2012). *Garcinia indica*, *Garcinia cowa* and *Citrus aurantiifolia* is extensively used to cure dysentery by different communities of Assam (Bailung and Puzari, 2016; Das, 2016; Saikia, 2006).

For various kinds of reproductive problems, 7 medicinal plants are recorded. The use of some of these plants shows similarity with earlier investigations. Sheath ashes of *Musa paradisiaca* is recorded as an abortifacient used by the Karbi community (Terangpi *et al.*, 2014). In our study, it is found that, *Cynodon dactylon* is a herb used in excessive menstrual bleeding. This plant is also used to treat menstrual disorders by the tribal people of Cachar District of Assam (Das *et al.*, 2008). Mishing tribe of Dhemaji district of Assam use this plant to stop menstrual bleeding (Taid *et al.*, 2014) and traditional healers of Nalbari district of Assam use this plant to treat metrorrhagia (Talukdar *et al.*, 2017).

Catheranthus rosesus is a popular plant species used as an anti-carcinogenic agent by various folk healers. It is used by Nath community of Assam as well as certain other traditional communities of Assam and Manipur, as a medicine to treat cancer (Hazarika *et al.*, 2012; Sikdar and Dutta, 2008).

Ricinus communis and *Vitex negundo* are found as remedies for muscle pain in our investigation, which shows similarity with that of Ayyanar and Ignacimuthu (2011) and Bhuyan and Chetia (2018). *Vitex negundo* is used in treatment of rheumatoid arthritis, chest and joint pain also (Bailung and Puzari, 2016; Hazarika *et al.*, 2012). Leaves of *Calotropis gigantea* are recorded earlier as a medicine to relieve pain (Saikia, 2006). *Moringea oleifera* is another recorded plant from the present investigation, which is used in arthritis (Hazarika *et al.*, 2012).

One of the healers so far interviewed informed about the use of *Allium sativum* in spider bite. This finding is similar to the study of Teronpi *et al.* (2015).

For urinary trouble, the most extensively used plant is *Bryophyllum pinnatum*. The use of this plant to treat kidney stone is recorded by many authors (Bailung and Puzari, 2016; Bhuyan and Chetia, 2018; Das, 2016). Root of *Costus speciosus* is used in strangury, which is similar to the investigation of Saikia (2006). Likewise, the use of *Clerodendrum colebrookianum* for

hypertension is found to be similar to that of the investigations of Saikia (2006), Bailung and Puzari (2016) and Bhuyan and Chetia (2018). The use of *Dendrocnide sinuata* for mumps and *Eclipta prostrata* for preventing greying of hair also shows similarity with the results of Saikia (2006). *Bambusa balcooa* is a bamboo species, related intimately with the Assamese culture, society and economy (Sharma, 2012). In our study, leaf of this plant is found effective in nasal bleeding. This result shows similarity with that of Das (2016). The use of *Oroxylum indicum*, *Alstonia scholaris* and *Michelia champaca* for the treatment of malaria also shows similarity with some previous studies (Bailung and Puzari, 2016; Hazarika *et al.*, 2012; Shankar *et al.*, 2012).

Among all the plant part used, leaf is found to be most frequently used part (55%). It is followed by fruit, root, seed, bark, whole plant, stem, rhizome, latex, shoot and sheath. The reason behind the highest use of leaf part is mainly its availability as compared to the other parts (Giday, 2009). Moreover, leaves exhibit active photosynthesis and production of metabolites (Ghorbani, 2005).

V. CONCLUSION

Assam is considered as a hub for biodiversity, containing a large number of endemic plants with medicinal value. Different tribes of this state are carrying on the practice of traditional healing with these plant species. The Gohpur subdivision of Biswanth district of Assam is blessed with a large number of communities having diverse cultural heritages. A small population of Karbi tribe is present in this area and their traditional practices are understudied to some extent. Therefore, the present investigation was designed to study the traditional medicinal practices of this particular community.

Our study was carried on more than for a year and information about 60 plant medicines were recorded, which are used for 17 different types of ailments. The method and purpose of use of most of the plant species showed much similarity with previous investigations by various authors. Some of the plants were found to hold a high use value in different traditional healing systems. However, a detailed analysis of the phytochemicals of these plants and the validation of the medicinal use on animal models is necessary. Further study on these aspects may lead to discovery and formulation of new drugs, which will be proved more beneficial for health care system.

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