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RESEARCH ARTICLE

ETHNO-MEDICINAL STUDY ON THE TRADITIONAL HERBAL KNOWLEDGE OF THE TIWA TRIBE OF MORIGAON DISTRICT OF ASSAM, INDIA

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ABSTRACT

An ethnomedicinal survey was conducted on Tiwa Tribe of Morigaon district of Assam, India during 2015 to 2017 in the villages of Borchila, Ga-khujuwa, Kahua-ati, Gokhai-khonda and Dalang-ghat of Morigaon district of Assam, India. During this survey, it was found that this community used 45 valuable plant species of 31 different families to cure various diseases and ailments. They use these plants to cure the diseases like skin disease, eye infection, diarrhoea, rheumatism, tooth problems, stomach ache, hair fall problems, fertility problems, cuts and wounds etc. The plant parts were applied as paste, boiled decoction, juice extract from the fresh plant parts, powder made from the dried plant parts etc. The study also revealed that family Verbenaceae and Lamiaceae were represented by 03 plant species; Araceae, Acanthaceae, Rutaceae, Amaranthaceae, Solanaceae, Apiaceae, Rubiaceae, Zingiberaceae, Cyperaceae and Polygonaceae were represented by 02 plant species each whereas the rest of the families were represented by 01 species each.

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INTRODUCTION

Plants are the richest source of drugs of traditional systems of medicine, modern medicines, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs (Hammer *et al.*, 1999). The use of plants and plant products as medicines could be traced as far back as the beginning of human civilization. The earliest mention of medicinal use of plants in Hindu culture is found in Rigveda, which is said to have been written between 4500 –1600 B.C. and is supposed to be the oldest repository of human knowledge. Ayurveda, the basis of the medicinal science of Hindu culture, in its eighth division deals with specific properties of drugs and various aspects of science of life and the art of healing (Rastogi and Mehrotra, 2002). Medicinal plant products have been used as folk remedies for different kinds of ailments including viral diseases. Traditional plant extracts having anti-infective properties, have been screened for their antiviral activity (Verma *et al.*, 2008). Numerous wild plants growing in the forests are extensively used as folklore medicines to prevent or cure several diseases. These plants are well known to local inhabitants who are still resorting to folk remedies for their primary health care as well as for certain health remedies of their cattle.

Medicinal plants are thus used for treatment of various ailments in India, and these are considered to have advantages over the conventionally used drugs that are expensive and known to have harmful side effects (Deb *et al.*, 1990; Mukhopadhyay and Sur, 1996). Herbal medicine has long been recognized as one of the oldest forms of remedies used by humans (Eisenberg *et al.*, 1998). Many people in developing countries still rely on traditional healing practices and medicinal plants for their daily healthcare needs, in spite of the advancement in modern medicine (Ojewole, 2004). There is abundant undocumented traditional knowledge of herbal remedies used to treat diseases in most cultures (Raul *et al.*, 1990). Different traditional healing practices worldwide are designed for either therapeutic or prophylactic use in human or animal diseases (McCorkle, 1986). Ethnobotany deals with the study of relationship between the people and plants for their uses as medicine, food, shelter clothing, fuel, fodder and other household purposes (Balick, 1996). The ethnomedicinal system and herbal medicine as therapeutic agent of a paramount importance in addressing health care problem of traditional communities (Ayyanar and Ignacimuthu, 2009). People of traditional communities are very knowledgeable about the use of plants against the various diseases. The tribal people use the plants in a different effective and novel manner. About 75,000 plants are being used in different systems of medicine of which more than 20,000 of higher plants are used in the traditional treatment

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practices of indigenous culture living around the world (Prakash, 1998; Kuddus, 2016). In the North Eastern region of India, several workers have contributed significantly towards unraveling the ethno-medicinal practices of various tribal clans of the region. Major works in the field of ethnobotany of North east India includes several reports on Mao Naga tribes of Manipur (Lokho, 2012). Other major and worth mentioning works on the ethnobotany of North Eastern India include comprehensive report on ethnobotany of plant wealth of North East India (Mao, 2009), Tai Khamjangs of Assam (Sonowal and Baruah, 2011) and Zeme tribe North Cachar hill district of Assam (Sanjem Albert *et al.*, 2008). No significant works has been conducted on the ethno-medicinal practices of the Tiwa tribe of Morigaon district of Assam. The ethnobotanical investigation of Assam is found to be very insignificant till today in comparison to the number of tribes inhabiting the state. Valuable information on ethnobotanical aspects of few tribe of Assam have been known through work of Jain and Borthakur (1980) on Mikirs, Bhattacharjee *et al.* (1980) on folklore medicine, Baruah and Sharma(1984) on Bodos. Thus in recent years, information on the use of plants by different communities of the Northeast India has been compiled (Dam and Hajra, 1981; Jain and Borthakur, 1980; Mahanta and Gogoi, 1988; Majumdar *et al.*, 1978). This area has been inhabited by several tribal communities from times immemorial. Taking this into consideration, a massive survey work has been conducted in some of the native Tiwa villages of the Morigaon district of Assam to prepare a written documentation on ethno-medicinal use of some plants by the Tiwa tribe of Morigaon district of Assam. Evidences state that Ahoms entered Assam in 1228 A.D. and according to the literary evidence the Lalungs or the Tiwas inhabited Assam much before the advent of the Ahoms. The Assam census of 1881, reported that the Lalungs got mixed up with the Garos and Mikirs and they have numerous exogamous clans (Deuri, 2008). The majority of the Tiwa people in the villages of the area of study are still dependent on the traditional medicine for their primary health care as well as treat their household animals with various plant products to cure various ailments. They have gathered excellent knowledge through experience and prefer natural methods of treating diseases with various plant resources.

MATERIALS AND METHODS

Description of the study area

The study was conducted in the Morigaon district of Assam, India during the year 2015 to 2017 in the villages, Borchila, Ga-khujua, Kahua-ati, Gokhai-khonda and Dalang-ghat of Morigaon district of Assam bordering Nagaon district. Morigaon district is an administrative district in the state of Assam, India. It is situated between 26.15 degrees North and 26.5 degrees North latitude and between 92 degrees East and 95.5 degrees East longitude. The district occupies an area of 1550 km² and has a population of 957,853 (as of 2011 census) of which males and females are 485,328 and 472,525 respectively. The district is bounded by the mighty Brahmaputra on the North, Karbi Anglong district on the South, Nagaon District on the East and Kamrup District on the West. The greater part of the district is an alluvial plain, criss-crossed with numerous rivers and water ways and dotted with many beels and marshes. The mighty Brahmaputra flows along with the northern boundary of the district. Killing, Kolong and

Kopili rivers flow through the southern part of the district. The Killing meets the Kopili at Matiparbat where from Kopili moves westward. The Kolong joins Kopili at the Jagi Dui Khuti Mukh and from here they jointly fall into the Brahmaputra. There are three Reserved Forest in the district constituted under Assam Forest Regulation Act, 1891, these are Sunaikuchi, Khulahat, and Bura Mayong. There is also one Wildlife Sanctuary, named Pabitora, which is famous for the Indian one horned rhinoceros. The climatic condition is basically sub-tropical with semi dry hot in summer and cold in winter. Average annual rainfall ranges between 1500 mm. to 2600 mm, while the average humidity is 75%. Maximum temperature ranges from 37-39°C whereas the minimum temperature ranges from 10-15°C.

The present research was conducted in four different villages namely, Borchila, Ga-khujua, Kahua-ati, Gokhai-khonda and Dalang-ghat of Morigaon district of Assam during the year from July, 2015 to July, 2017. Several visits were made to different villages of the VDCs (village development committees) at monthly intervals. The rural inhabitants are dependent on forests and natural vegetation for their day to day requirements. The study was concentrated in different villages of the VDCs and the information regarding the usage of plants for animal and human healings available in the local areas were collected by directly interviewing elderly knowledgeable and experienced persons of local people, who have traditional knowledge of ethno-veterinary plants in the villages. In each village, three rural communities that were still relatively far from urban influence were selected. In each community, ten respondents were randomly selected and interviewed. The interviewed were conducted with a fairly open framework that allowed for focused, conversational and two-way communication. Information on plants and other traditional methods used for healthcare were documented. Also information on their preparation and administration were sought. A previously prepared questionnaire was used to collect ethno-botanical information from the herbal practitioners of tribal medicine called Bez and knowledgeable elders in the study area, and information on the plant species and their parts used for the formulation of medicine (Sinha, 1996). Information on the habitat of the plants, their local names and seasonal availability were also collected. Plants were identified with the help of published regional flora and by comparing voucher specimens with identified herbarium collections (Yoganarasimhan *et al.*, 1981; Gamble, 1995). Voucher specimens have been deposited in the Department of Botany, Darrang College, Tezpur, Assam, India.

Enumeration

Plant species that are known and highly regarded in ethno-veterinary practices are enumerated with botanical name, vernacular name in Assamese, family name and parts used for the treatment of various ailments.

RESULTS AND DISCUSSION

The present study reveals the ethno-medicinal use of 45 plant species belonging to 31 different families that are used for various purposes by traditional healers of Tiwa tribe in the Morigaon district of Assam. The tribal people are highly dependent on the herbal remedies and the disease concepts and treatments differ in different tribal communities.

Table 1. Ethno-medicinal plants with their local name, family name, plant part used and disease classification used by the Tiwa tribe in the Morigaon district of Assam, India

| Sl. No. | Botanical name and vernacular name | Family | Plant part/parts used | Disease classification (where applied) |
|---------|--|----------------|------------------------|---|
| 1 | <i>Acorus calamus</i> L. Ver. Bos | Araceae | Root | Roots used as garland to cure children fever, cough and vomiting |
| 2 | <i>Adhatoda vasica</i> Nees. Ver. Bahaka | Acanthaceae | Leaf | Tender leaf extract is taken orally to cure cough/cold and worms |
| 3 | <i>Aegle marmelos</i> (L.) correa. Ver. Bel | Rutaceae | Leaf and pulp of fruit | Leaf paste is used orally for nausea, heal wounds and pulp of fruits taken orally to cure acute dysentery and heart disease |
| 4 | <i>Alocasia indica</i> (lour.) Koch Ver. Mankochu | Araceae | Leaf and shoot | Used as vegetable for blood purification |
| 5 | <i>Andrographis paniculata</i> Wall.ex.Nees Ver. Kalpateeta | Acanthaceae | Leaf and stem | Leaf and stem extract is taken orally to cure fever, jaundice, worm, cold, liver disease and asthma |
| 6 | <i>Alternanthera colla</i> Ver. Bikhalyakoroni | Amaranthaceae | Leaf | Paste of leaves is used to cure cuts and wounds |
| 7 | <i>Averrhoa corambola</i> L. Ver. Kordoï | Averrhoaceae | Fruit | Fruit juice is taken orally to cure cough and cold |
| 8 | <i>Alternanthera sessilis</i> Ver. Matikaduri | Amaranthaceae | Whole plant | Plant extract is taken orally to cure blood dysentery and stomach pain |
| 9 | <i>Boerhavia repens</i> . Ver. Purnanova | Nyctaginaceae | Aerial part | Pain relief |
| 10 | <i>Bryophyllum pinnatum</i> Roxb. Ver. Duportenga | Crassulaceae | Leaf | Leaves juice used against urinary problems and anti-inflammatory |
| 11 | <i>Caesalpinia bonduc</i> L. Ver. Latai teeta | Caesalpinaceae | Dry seed | Dry seed powder dissolved in water and take few drops of it to cure cough and cold |
| 12 | <i>Capsicum frutescens</i> L. Ver. Firingi jolokia | Solanaceae | Fruit | Taken orally to cure tonsillitis |
| 13 | <i>Centella asiatica</i> L. Ver. Bor manimuni | Apiaceae | Whole plant | Extract of whole plant taken orally in empty stomach to cure skin disorder, respiratory problem, gastro-intestinal diseases |
| 14 | <i>Cissus repens</i> . Lank. Ver. Harjurabon | Vitaceae | Whole plant | Paste of leaves used in bone fracture |
| 15 | <i>Citrus paradisi</i> . Macfad. Ver. Golemu | Rutaceae | Fruit | Roasted fruits is used in diarrhoeal disease |
| 16 | <i>Clerodendrum glandulosum</i> .Coleb.exWall. Ver. Nephaphu | Verbanaceae | Leaf | Leaves are used in blood pressure |
| 17 | <i>Coffea benghalensis</i> Wall. Ver. Kothona | Rubiaceae | Flower | Used to cure eye disease |
| 18 | <i>Commelina diffusa</i> Burm. Ver. Kona simolu | Commelinaceae | Leaf juice | Crused plant is used on boils |
| 19 | <i>Corchorus capsularis</i> L. Ver. Morapaat | Tiliaceae | Dry leaf | Dry leaves dissolved in water and taken orally to cure stomach problems |
| 20 | <i>Costus speciosus</i> L. Ver. Jomlakhuti | Zingiberaceae | Rhizome | Extraction of rhizome is taken orally to cure blood sugar |
| 21 | <i>Curcuma longa</i> Ver. Halodhi | Zingiberaceae | Rhizome | Indigestion, throat infection, skin diseases and in pains |
| 22 | <i>Cyperus brevifolius</i> . Rottb Ver. Keyabon | Cyperaceae | Tuber | Paste of tuber is applied on hair to cure hair fall |
| 23 | <i>Cyperus rotundus</i> . Ver. Muthabon | Cyperaceae | Tuber | Paste of tuber is applied for healthy hair an used to increase lactation |
| 24 | <i>Dillenia indica</i> . L Ver. Outenga | Dilleniaceae | Fruits | Gummy substances from fruits used in hair fall, abdominal pain |
| 25 | <i>Eclipta prostrata</i> . Ver. Kehraj | Asteraceae | Leaves | Leaves taken orally to cure stomach, lever asthma and kidney problems |
| 26 | <i>Erythrina indica</i> Ver. Moder | Fabaceae | Leaf | Tender leaf extract used against worms and cough |
| 27 | <i>Houttuynia cordata</i> Thunb. Ver. Mosondori | Saururaceae | Leaf | Stomach pain and dysentery |
| 28 | <i>Hydrocotyle sibthorpioidis</i> Lan. Ver. Horumanimuni | Apiaceae | Whole plant | Plant extract is used as diuretic, antihelminthic, Antidiarrheal |
| 29 | <i>Hyptis suaveolens</i> . Ver. Tukmateeta | Lamiaceae | Leaf | Used in urinary tract infection |
| 30 | <i>Leucus aspera</i> L. Ver. Durum. | Lamiaceae | Leaf | Leaf extract is applied to cure headache, eye disease, skin disease and fever |
| 31 | <i>Lippia javanica</i> . Burm.f. Ver. Pohukatabon | Verbenaceae | Leaf | Respiratory disorder, bronchitis, cough, asthma |
| 32 | <i>Mimosa pudica</i> L. Ver. Nilajibon | Mimosaceae | Root | Root extract is applied to releave gum problems and menstrual problems |

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|----|--|------------------|----------------|--|
| 33 | <i>Moringa oleifera</i> Lamr. Ver. Sojina | Moringaceae | Leaf and fruit | The leaves and fruits are cooked and eaten to increase fertility and to cure indigestion |
| 34 | <i>Oxalis corniculata</i> L. Ver. Sangoitenga | Oxalidaceae | Leaf | Juice of leaves is used to cure eye diseases and stomach pain |
| 35 | <i>Paederia foetida</i> L. Ver. Bhedailata | Rubiaceae | Leaf | Diarrhoea, dysentery and infertility |
| 36 | <i>Peperomia pellucida</i> L. Ver. Ponounoua | Piperaceae | Aerial part | Stomach pain, joint pain and headache |
| 37 | <i>Pogostemon benghalensis</i> Burms. Ver. Hukloti | Lamiaceae | Leaf | Fever, stomach trouble |
| 38 | <i>Polygonum glabrum</i> Wild Ver. Bihlongoni | Polygonaceae | Tender leaf | Used in joint pain |
| 39 | <i>Polygonum microcephalum</i> . D. Don. Ver. Modhuhuleng | Polygonaceae | Leaf | Dysentery and stomach pain |
| 40 | <i>Psidium guajava</i> Linn. Ver. Modhuriam | Myrtaceae | Leaves | Dysentery , diarrhea and tootheache |
| 41 | <i>Saccharum officinarum</i> L. Ver. Kuhiyar | Poaceae | Stem and leaf | Juice of stem is used to cure jaundice and leaf is used against leech |
| 42 | <i>Sesbania grandiflora</i> L. Ver. Bokphool | Papilionaceae | flower | Used in blood sugar and high blood pressure |
| 43 | <i>Solanum khasianum</i> . Cl. Ver. Bhekuriteeta | Solanaceae | Fruit | Used as antimalarial drug |
| 44 | <i>Scoparia dulcis</i> Linn. Ver. Bondhonia | Scrophulariaceae | Leaves | Used to relief pain, stomach pain , urinary infection ,menstrual disorder |
| 45 | <i>Vitex negundo</i> L. Ver. Posotia | Verbanaceae | Leaf | Leaf paste used in body pain ,stomach disease and menstrual problems |

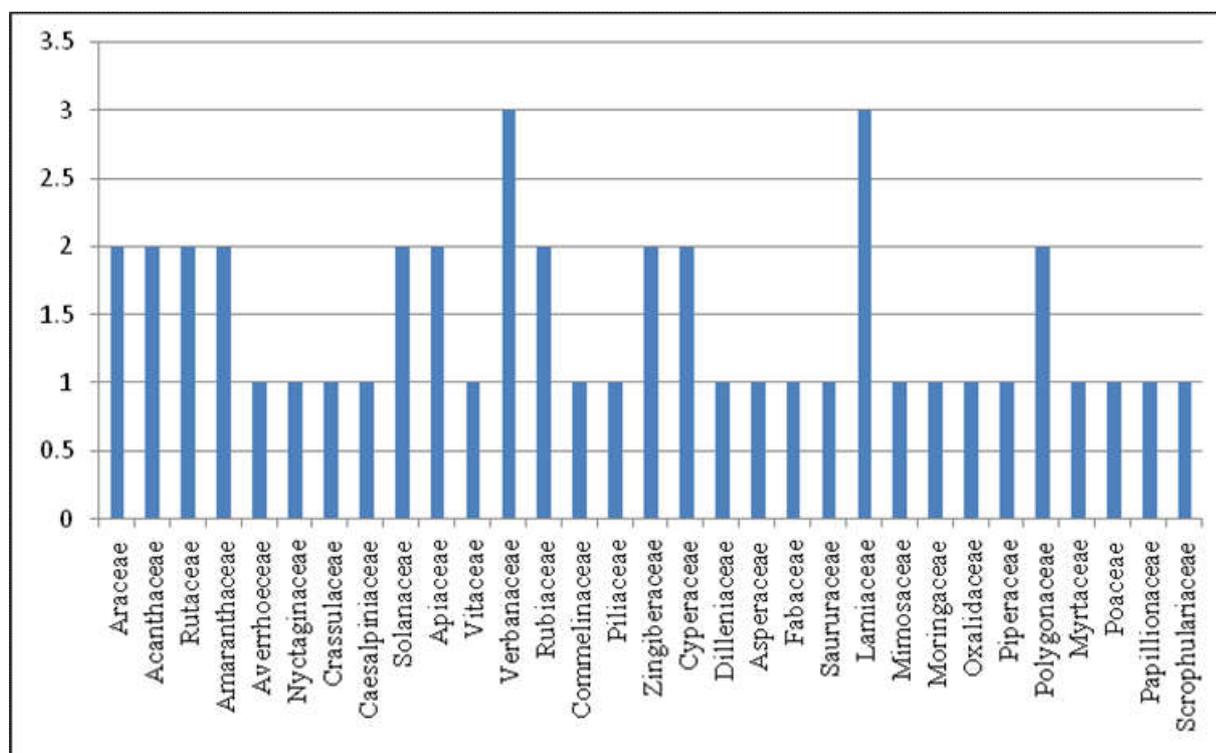


Fig.1. Graph showing the frequency of different families of plants used by the Tiwa tribe of Assam in their ethno-medicinal practice

They use these plants to cure the diseases like skin disease, eye infection, diarrhoea, rheumatism, tooth problems, stomach ache, hair problems, fertility problem, cuts and wounds etc. (Table 1). In the investigation it was found that the plant parts were applied as a paste, boiled decoction, juice extraction from the fresh plant parts, powder made from the dried plant parts etc. (Table 1). Paste and juice are the main methods of preparation for external application and consumption. The Tiwa tribal healers prepared the medicines either from single part of plant species or combinations of different plant parts of different plant species. They believe that combination of several plant parts cure diseases rapidly. It has been found that the leaves, shoots and whole plant were the most frequently used plant parts for the treatment of various ailments by the

Tiwa tribe followed by fruits, rhizomes, roots and bulbs. The study also depicted that family Verbanaceae and Lamiaceae were represented by 03 plant species; Araceae, Acanthaceae, Rutaceae, Amaranthaceae, Solanaceae, Apiaceae, Rubiaceae, Zingiberaceae, Cyperaceae and Polygonaceae were represented by 02 plant species whereas the rest of the families were represented by 01 species each (Fig.1).

Conclusion

This study has clearly shown that there is still more to describe in ethno-medicine. In the light of population explosion and degeneration of the natural habitats, a full picture on the use of plants in traditional practices should be evaluated for better

drug designing of both animals and humans as they are fundamentally linked with nature. Indigenous knowledge and subsequent technology should be considered as part of our modern existence considering the mutual impact. It is therefore, necessary to restore not only the ecology which has been degraded but also address the acculturation that characterise our modern society. It is also necessary to have a sound understanding of the mechanisms of action of the plant secondary metabolites and to better characterise the bioactive compounds associated with their therapeutic properties. A systematic recording of the uses of the biodiversity by different ethnic groups in different countries is therefore required. With the knowledge of the ethno-medicinal use of certain plants being restricted only among certain aged and experienced persons of the area of study a documentation of the process was thought necessary. In the absence of those elderly experienced persons this indigenous traditional knowledge might be lost forever. The information gathered in this survey could therefore be useful for the researchers in the field of Taxonomy, Pharmacology and also help to develop herbal drugs against different diseases. But this traditional practice of medicines has come down through generations due to lack of interest among younger generation. Therefore, it is necessary to preserve this indigenous practice of medicinal through proper documentation before they disappear. This knowledge might prove important for the future generation. The knowledge related to indigenous culture, traditional faith and healthcare system cannot be allowed to get lost because of the absence of a written documentation or scientific study. Therefore, in the present investigation the survey was done to document various plant species used in ethno-medicinal purpose for the treatment of human diseases by the Tiwa tribe of Morigaon district, Assam, India. In future studies, medicinal values of the plant species may be studied at the molecular level so that the efficacy of this indigenous knowledge and social practice may be established more fruitfully.

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