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Traditional and Indigenous uses of Medicinal Plants by Tribes of Assam, India

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ABSTRACT: The present paper deals with the enumeration of 45 ethnobotanically important plant species used by the Khamti and Deori tribes of Lakhimpur, Assam. Both the tribes possess immense wealth of knowledge in the field of ethnomedicinal practices and healing methods. The plants are locally found in wild condition or are grown by professional healers in their household premises. Medicinal preparations were given by the local practitioners in the form of powder, paste and extracts. It was found that leaves of the plants were mostly used for making various formulations. There remained yet a number of lesser known plants to be studied at taxonomical and pharmacological level for database and clinical validity. These practices demand proper documentation and sharing or it may soon become a thing of the past. This study was conducted recognizing the urgent need to conserve these assets that might provide a new platform for pharmacological screening programmes that will lead to natural drug discovery in the future. Thus, this study is the collected data of rare knowledge confined to the North Eastern region only and it will further contribute to the awakening of conscious realization of the rich resources that we possess and their need for conservation, documentation and publication.

Keywords: Ethnobotany, Herbal, Indigenous, Medicinal plants, Traditional knowledge.

INTRODUCTION

Primitive people have used plants to cure a variety of ailments but they did not keep record for such information and the knowledge was passed on verbally from one generation to the next. However, in the modern world such information is being documented and thereby creates a branch of medicinal study. Traditional herbal therapy is an age old practice (Rawat and Choudhury 1998) as these practices are proved to cure variety of diseases in the past and it is still a favorable way out for the indigenous tribes. Herbal medicine is a major component in all traditional medicine systems. These methods of traditional disease curing earn fame from various ethnic tribes all across the globe. North East India is a region of rich biodiversity with abundant plant resources (many of which are endemic to the region) that serve a variety of purposes. There are several earlier reports on the medicinal plants used to heal a number of ailments by different ethnic groups of North East India (Das and Tag 2006; Das *et al.*, 2007; Deorani and Sharma 2007; Sen *et al.*, 2008; Sarkar and Das 2012; Singh and Teron 2015; Teronpi *et al.*, 2015; Borgohain *et al.*, 2016). These tribes believe that their traditional treatments are far more useful and capable of curing diseases as compared to modern methods. As for example, the accumulated wealth of plant based medicinal knowledge among the Khamti tribe has mostly passed through *Thai* Buddhist literature from one generation to the next accompanied by various religious practices (Tag *et al.*, 2007), hence they are sacredly believed in and implemented throughout. The plants used by the healers are often found in their herb gardens or nearby forest areas. Rarely found species used in traditional healing practices are grown and conserved by the local healers. In fact, the traditional healing practices are arousing curiosity among various researchers from all around the profession to go in depth in this subject (Tag *et al.*, 2005). From the classical point of view, ethnomedicine refers to the explanation of different illness and ailments (Bhasin, 2007). Ethnomedicinal plants have enormously contributed in developing novel drugs for many centuries and may also prove worthy for modern medicinal practices (Heinrich and Gibbons 2001; Pandey and Tripathy 2017). Proper exploration of the knowledge on ethnomedicinal plants can help in formulation of cheaper and safer modern herbal drugs (Manna and Mishra 2018). Ethnobotanical studies have significantly impacted the lives of the tribal people in India (Raghuvanshi *et al.*, 2021). In the recent years, herbal products have gained a new platform both nationally and internationally. According to WHO (2002), approximately 80% of rural people are dependent on traditional phytotherapies to meet their basic needs of healthcare. Tribal communities utilize ethnomedicinal plants for the treatment of cardiovascular, dermatological, gastrointestinal, gynaecological, musculoskeletal, odontological, orthaepaedic, respiratory, urological and several general health disorders (Bushi *et al.*, 2021).

North East India with diverse ethnic groups and rich biodiversity has a century old heritage of medicinal

phytotherapy. Different tribal communities use about 1963 species of medicinal plants for ethnomedicinal purposes (Sajem and Gosai 2006). Over the past few decades, a significant number of ethno-medicinal studies have been conducted among different regions of North East, especially in Assam. The branch of ethnobotany has attracted much attention due to its many cultural and economical applications but studies on them cover only 5%-8% (Hazarika and Dutta 2016). These areas with such rich flora and indigenous knowledge need to be extensively studied because they provide better scope for ethnobotanical works. Due to loss of preserved data which were mainly transmitted vocally through generations and the reluctance of tribal elders to share the knowledge that they consider sacred is a reason why the percentage of studies carried out is so less. Khamtis constitute a minority tribe inhabiting in only six villages in Lakhimpur district and with a total population of approximately thousand in Assam (Mantche, 2020). Deoris also form one of distinct tribal communities having significant contribution in herbal medicine practices. Both possess vast unique sets of traditional knowledge related to their faith, belief system and ethnomedicinal practices. Through this study, an attempt has been made to identify and properly document the traditional knowledge system, healing practices, conservation value of the potential ethnobotanically important plants used by Khamti and Deori tribes. These two tribes were selected for their seclusion from the urban population and their strong connection with nature. They commute less in terms of gaining healthcare facilities from the town area and believe in their own ethnomedicinal practices.

MATERIAL AND METHODS

The present study was conducted in Khamti and Deori villages of Narayanpur sub division, located to the west of Lakhimpur district, Assam (Fig. 1). Data was collected by surveys conducted during 2017-18 through field visits, informal discussions, open ended interviews with informed and knowledgeable persons of the villages and concrete case study method. Several field trips were conducted and data was collected by thorough interaction and observations with the elderly persons, village heads and the local herbal practitioners of the respective communities. Information regarding the locally found plants, their applications and formulations was also collected from the local herbal practitioners and the information gathered was cross verified with reliable local literature. All the essential data about the names of the ethnomedicinal plants, used parts, their mode of use against particular diseases and ailments were recorded. Various sources of standard literatures on local flora were used to identify and verify the documented plant species. The specimens of the ethnomedicinally important plants were dried and pressed following the techniques of Jain and Rao (1977) and were identified with the help of relevant literatures (Kanjilal *et al.*, 1934-1940; Chopra *et al.*, 1956; Islam, 1989; Prajapati *et al.*, 2003). The name of the plants was further verified following the website http://www.theplantlist.org/

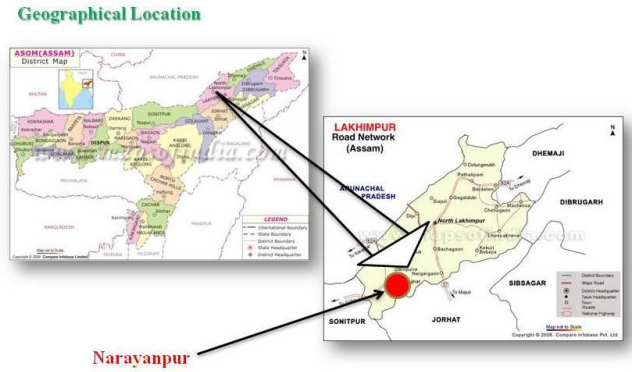

Fig. 1. Map showing the study sites.

RESULTS

A. Taxonomic and Ethnobotanic evaluation

The taxonomic details of the collected plants along with their family name, parts used and its mode of utilization is depicted (Table 1 and 2). In the present study, a total of 45 plant species belonging to 41 genera under 30 taxonomic families was reported. Plants belonging to the families Euphorbiaceae and Lamiaceae are more frequently used in both the tribes with six and four species respectively, Combretaceae and Zingiberaceae consists of three species each while Poaceae, Meliaceae, Dilleniaceae, Rutaceae, Verbinaceae, Apiaceae, Moraceae and Rubiaceae have two species each and the rest of the families are represented by one species only. Depending upon their habit groups, approximately 35% of the plants (15 species) recorded are herbs, 31% of the plants (14 species) are shrubs, 26% plants (12 species) are trees while only 8% plants (4 species) are climbers (Fig. 2). In the study area, mostly herbaceous plants are frequently used; this can be due to the abundance of herbaceous species like *Leucas aspera*, *Ocimum sanctum*, *Oxalis corniculata*, *Centella asiatica*, *Curcuma longa* etc. Trees like *Phyllanthus emblica*, *Terminalia arjuna* are commonly found in households. In fact in the formulations of these medicines, various parts of the plant body are utilized but it is seen that leaves are the most widely used plant part by both these tribes (Fig. 3). In this study, the Khamti tribe uses leaves of the plants in 16 formulations while the Deori tribe uses leaves for 14 formulations.

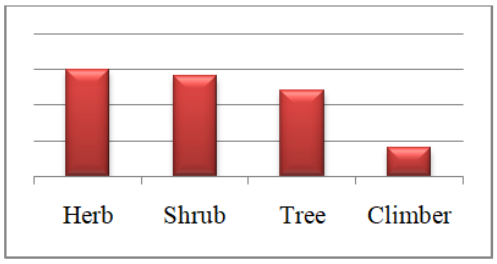

Fig. 2. Distribution of habit groups in the study sites.

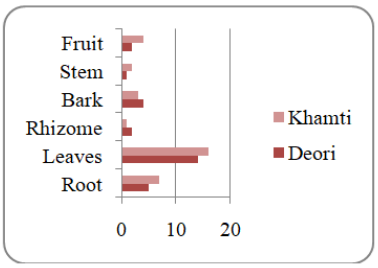

Fig. 3. Comparison between the plant parts used by Khamti and Deori tribe.

Table 1: Enumeration of ethnomedicinal plants used by the people of Khamti community.

Sr. No.	Scientific name	Family	Parts used	Mode of use
1.	*Aloe vera* (L.) Burm. f.	Xanthorrhoeaceae	Leaves	Paste is applied instantly on burnt areas.
2.	*Alpinia nigra* (Gaertn.) Burtt.	Zingiberaceae	Leaves	Paste of leaves is used in treatment of chicken pox.
3.	*Azadirachta indica* A. Juss.	Meliaceae	Leaves, bark	Leaves are used in the treatment of chicken pox. Bark juice with lime water is taken orally for dysentery.
4.	*Bonnaya brachiata* Link & Otto	Linderniaceae	Leaves, roots	Boiled leaves are consumed in empty stomach in the morning to cure painful urination.
5.	*Centella asiatica* (L.) Urb.	Apiaceae	Leaves	Leaf extracts are used in wounds and stomach trouble.
6.	*Curcuma longa* L.	Zingiberaceae	Rhizome	Juice is taken orally for stomach ache. Paste applied on wounds or skin blisters.
7.	*Cyperus flabelliformis* Rottb.	Cyperaceae	Roots	Application of root paste of the plant on fractured areas of bones heals within one week.
8.	*Dillenia indica* L.	Dilleniaceae	Bark of root	Juice of bark of root is taken orally for treatment of dysentery.
9.	*Euphorbia hirta* L.	Euphorbiaceae	Leaves, roots	Leaf powder mixed with other plants taken orally for anemia.
10.	*Euphorbia ligularia* Roxb.	Euphorbiaceae	Leaves, stem	Used to overcome difficulties during delivery.
11.	*Ficus hispida* L.f.	Moraceae	Bark, roots	Powdered form of roots is taken orally for tuberculosis.
12.	*Ipomoea aquatica* Forssk.	Convolvulaceae	Leaves	Leaf extract is consumed to cure asthma. Consumption of leaves with cooked rice enhances appetite.
13.	*Ixora coccinea* L.	Rubiaceae	Leaves	Leaf extract is taken orally for menstrual problems.
14.	*Jatropha curcus* L.	Euphorbiaceae	Leaves, stems	Used for better teeth.
15.	*Leucas aspera* (Willd.) Link	Lamiaceae	Leaves	Juice of leaves is used for the treatment of sinus.
16.	*Ocimum sanctum* L.	Lamiaceae	Leaves	Used in treatment of ear ache, cough and eye infection.
17.	*Oxalis corniculate* L.	Oxalidaceae	Leaves	Leaves are used for head ache and indigestion.
18.	*Paederia foetida* L.	Rubiaceae	Leaves	Taken orally for better blood supply. Used for betterment of postpartum mothers.
19.	*Phyllanthus emblica* L.	Phyllanthaceae	Fruit	Fruit is taken orally for proper digestion, good skin etc. Juice or paste of fruit is applied on hair.
20.	*Sida acuta* Burm.f.	Malvaceae	Roots	Juices of roots are taken orally for the treatment of pneumonia.
21.	*Solanum surattense* Burm.f.	Solanaceae	Seeds, fruit	Powdered seeds are mixed with banana and other plant parts for the treatment of Rabies.
22.	*Stephania japonica* (Thunb.) Miers.	Menispermaceae	Tubers	Tubers of the plant are used in the treatment of malaria, fever and pain.
23.	*Streblus asper* Lour.	Moraceae	Leaves	Applied on cuts or infected areas.
24.	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Fruit	Taken orally for better digestion and good for stomach problems.
25.	*Terminalia chebula* Retz.	Combretaceae	Fruit	Consumed orally for better digestion and gastric problems.
26.	*Zanthoxylum nitidum* (Roxb.) DC.	Rutaceae	Leaves, roots	Rubbed on gums to cure tooth ache.

Table 2: Enumeration of ethnomedicinal plants used by the people of Deori community.

Sr. No.	Scientific name	Family	Parts used	Mode of use
1.	*Abrus precatorius* L.	Fabaceae	Root	Paste is used in the treatment of diarrhoea, dysentery, tonsillitis.
2.	*Acacia farnesiana* (L.) Willd.	Mimosaceae	Bark	Used in diarrhoea, dysentery.
3.	*Adhatoda vasica* Nees.	Acanthaceae	Leaves	Cough and asthma can be cured using paste or juice of the leaves.
4.	*Ageratum conyzoides* (L.) L.	Asteraceae	Leaves	Paste applied on cuts and injuries to stop bleeding.
5.	*Ananas comosus* (L.) Merr.	Bromeliaceae	Leaves	Tender leaves are used as vermicide for children.
6.	*Azadirachta indica* A. Juss.	Meliaceae	Leaves, bark	Juice of leaves or bark is used to control intestinal worms, scabies etc. Leaves used for small pox.
7.	*Bambusa balcooa* Roxb.	Poaceae	Sucker	Used as an antiseptic and for healing insect bites.
8.	*Bryophyllum calycinum* Salisb.	Crassulaceae	Leaves	Concoction used to cure urinary troubles and stomach illness.
9.	*Caesalpinia bonducella* (L.) Fleming.	Caesalpinaceae	Fruit	Seed coat extract used in treatment of pneumonia and cough.
10.	*Centella asiatica* (L.) Urb.	Apiaceae	Leaves, stem	Consumption of concoction of leaves help in blood purification.
11.	*Clerodendrum colebrookianum*Walp.	Lamiaceae	Leaves	Leaves often consumed to regulate high blood pressure.
12.	*Coixlacryma-jobi* L.	Poaceae	Root, seeds	Consumption of plant parts helps in healing of waist pain.
13.	*Curcuma longa* L.	Zingiberaceae	Rhizome	Paste applied on cuts, injury and wounds. Consumption cures acidity, chest pain etc.
14.	*Dioscorea alata* L.	Dioscoreaceae	Root, leaves, fruit	Used as hair lotion and in treatment of chest pain and fever.
15.	*Euphorbia neriifolia* L.	Euphorbiaceae	Root, stem	Antidote to snake poison and used to remove warts.
16.	*Heteropanax fragrans* (Roxb.) Seem.	Araliaceae	Bark	Used to cure blood dysentery.
17.	*Houttuynia cordata* Thunb.	Saururaceae	Leaves	Helps in treatment of dysentery.
18.	*Jatropha curcus* L.	Euphorbiaceae	Leaves, seed	Tumor, wounds, skin diseases, ulcers can be cured.
19.	*Leucas aspera* (Willd.) Link.	Lamiaceae	Leaves	Leaf extract is used to cure pneumonia.
20.	*Litsea monopetala* (Roxb.) Pers.	Lauraceae	Root, Bark	Used to cure ulcer and gastric troubles.
21.	*Murraya koenigii (*L.) Spreng.	Rutaceae	Leaves	Abdominal gripe and intestinal troubles can be healed.
22.	*Ocimum sanctum* L.	Lamiaceae	Leaves	Leaves help in relieving congestion of lungs and cold.
23.	*Paederia foetida* L.	Rubiaceae	Leaves	Used to cure dysentery, diarrhoea, indigestion and anemia.
24.	*Terminalia arjuna* (Roxb. ex DC.) Wright &Arn.	Combretaceae	Bark	Juice extracted from bark given to those suffering from heart troubles.
25.	*Vitex negundo* L.	Lamiaceae	Leaves	Rheumatic pain can be cured using the leaves.
26.	*Zingiber officinale* Roscoe.	Zingiberaceae	Rhizome	Consumption helps in curing stomach disorders, dyspepsia, vomiting etc.

DISCUSSION

The North East Region of India is considered as one of the mega biodiversity hotspot of the world and a treasure house of diverse floral diversity. Different ethnic communities inhabit this region, enhancing its culturally diverse identity and their ethnic traditions of utilizing plants as a potent source of medicine to cure various ailments is quite intriguing. Since ancient times, the use of plants in the formulation has a significant place in different cultures as the primary and cheapest form of cure. Knowledge of traditional utilization of plants has contributed in drug discovery efforts. Apart from its utility as medicine, a number of plants are also consumed as food, spice, fruits and thereby contribute to provide income and livelihood to these tribal communities who mainly inhabit the forests and hilly terrains. Both the Khamti and Deori tribes are prosperous in medicinal plant wealth and herbal medicines were provided in the form of decoctions, paste and juice. Mostly herbaceous plants are commonly used as ethnomedicinal sources and the preference of leaves have been also indicated by studies conducted by earlier workers (Ayyanar and Ignacimuthu 2005; Bhattarai *et al.*, 2010). Even though the fast paced world of ours is all about instant healing and commercially available medicines; such tribal communities have been able to preserve and carry on their century old practices to cure ailments like wounds, skin diseases, ulcers, blood pressure, dysentery, pneumonia, pox, fever, common cold, eye infections, anemia, body pain etc. The traditional wisdom however is limited to the old generation practitioners and the younger generations seemed least concerned. This is a matter of concern as loss of such potent indigenous knowledge might be threatening to the discipline of ethnobotany.

CONCLUSIONS

Tribal communities possess a rich heritage of ethnomedicinal practices and this study enabled to

catch only a glimpse of their vast wealth of knowledge and information. Ethnomedicinal studies can redefine modern pharmaceutical products with comparatively lesser side effects. People should be made aware about these traditional healing methods and various studies and researches should be encouraged to preserve these resources, or else they may one day become extinct with time. The present work has highlighted on the potential medicinal plants used by both the Khamti and Deori tribes of Lakhimpur district. This documented knowledge can significantly contribute to the discovery of newer drugs in future therefore, it is crucial to create awareness on conservation strategies of these bioresources for a sustainable development.

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Conflict of Interest. None.

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