



## Medicinal plants used by the Bodo community of Chakrashila Wildlife Sanctuary, Assam, India

## KEYWORDS

Bodo tribe, Ethnomedicine, Chakrashila Wild Life Sanctuary, Traditional healers

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**ABSTRACT** Medicinal use of plants among the Bodo community of Chakrashila Wild Life Sanctuary (WLS) was documented in the present study. This WLS is located in the Kokrajhar and Dhubri districts of Bodoland Territorial Council (BTC) in the western part of Assam. The methodology adopted for conducting this study comprised interviews of traditional healers and knowledgeable elderly persons, focal group discussions with both young and elder persons and women. Also plants were collected from wild habitats and home gardens with the help of local practitioners. A total of 29 plant species belonging to 22 families were found to be used in treatment of different diseases. Herbs, shrubs and trees were the dominant category of plants used. Comparisons of the use pattern of medicinal plants by the Bodos of Chakrashila WLS with other Bodo groups from Goalpara, Kokrajhar (Ultapani), Kamrup and Sonitpur districts revealed partial overlap with 16 plants used by the studied community not being used by the other groups.

## INTRODUCTION

The Bodos comprise one of the major and oldest tribal communities of Assam. They are categorized as a plains tribe in the sixth schedule of the Indian Constitution. These early settlers of Assam in northeast India have a population of around two million according to the 2011 census. They are mostly residing in the north bank areas of R. Brahmaputra along the southern foothills of Bhutan and Arunachal Pradesh, where a Bodoland Territorial Council (BTC) comprising the districts of Kokrajhar, Chirang, Baksa and Udalguri was formed in 2003. The total area of the council is 8,970 km<sup>2</sup>, of which 2,562 km<sup>2</sup> (28.6 %) is delineated as forest area with Kokrajhar district having the highest (40%) followed by Chirang (28.2%), Baksa (23.3%) and Udalguri (8.5%) (Sarma, Hilaluddin, and Tiwari, 2008). The present study area of Chakrashila Wildlife Sanctuary is located at the boundary of Kokrajhar and Dhubri districts. It is believed by many that the name Chakrashila is loosely derived from the Bodo word 'Sikrisila' which means a fairy with butterfly wings. Communities living in forty-one villages around the sanctuary include Bodo, Garo, Adivasi, Rajbongshi, Nepali, Rabha, Assamese Hindu and Muslims, of which Bodos are dominant in seventeen villages. Large sections of this tribe are economically under-developed and reside in relatively remote areas where medical facilities and other basic social amenities are not available. They are, therefore, heavily dependent on their traditional ethnic knowledge of using wild resources for food, medicine and other purposes. Several studies have been conducted on the ethnomedicine of Bodo communities inhabiting different areas of Assam (Basumotary, Ahmed, and Deka, 2004; Das, Saikia, Sarkar, and Devi, 2006; Saikia, Borthakur, and Saikia, 2010; Paul, Devi, and Sarma, 2011a; Paul, Devi, and Sarma, 2011b). However, it has been shown that in spite of similarities in overall plant use, considerable differences in the use of plants of medicinal and ritualistic use could exist even among communities living in contiguous areas (Terashima & Ichikawa, 2003). This paper, therefore, aims to enlist the plants used in ethnomedicine by the Bodo inhabitants near the Chakrashila Wildlife Sanctuary, Assam, and compare the use pattern with those by the Bodo communities in other parts of the state as available in published literature (Basumotary et al., 2004; Das et al., 2006; Saikia et al., 2010; Paul et al., 2011a; Paul et al., 2011b).

## MATERIALS AND METHODS

## Study area

Chakrashila Wildlife Sanctuary (26°15'–26°26'N, 90°15'–

90°20'E), has an area of about 46 sq. km and is located in the Kokrajhar and Dhubri districts of Bodoland Territorial Council (BTC) in the western part of Assam (Fig 1). This hill forest was under the ownership of the Bijni Estate till its acquisition by the government during 1956-57. It was subsequently notified as a hill reserve forest, in 1966. Discovery of the rare and endangered Golden langur (*Trachypitecus geei*) led to its upgradation to the status of wildlife sanctuary in 1994. It has hilly terrain with semi-evergreen and moist deciduous forest, patches of grassland and scattered bushes. It is one of the largest isolated hill areas along the northern bank of Brahmaputra in Lower Assam. The climate is hot humid and carries the characteristics of a semi-evergreen tropical zone. Tarang River and Jonri Nala are the most important lotic systems originating from the Chakrashila hill range, while Dheer beel (c 750 ha) and Diplai beel (c 375 ha) are the major wetlands in the sanctuary area. These hill ranges are considered as an extension of the Meghalaya plateau that was formed during the movement of the tectonic plates and the formation of the Himalaya (Brahma, 2011).

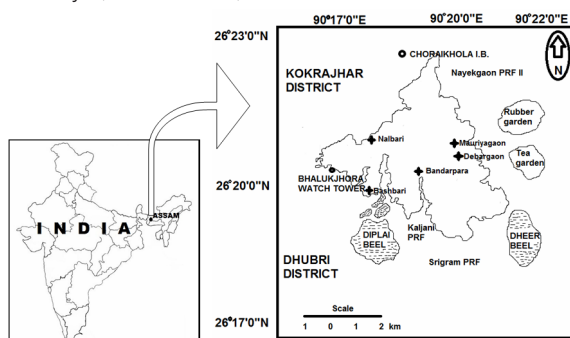


Fig.1 Map of Chakrashila Wild Life Sanctuary of Kokrajhar and Dhubri districts, Assam, India

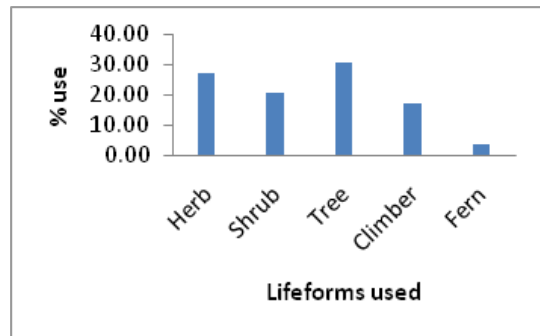
## Data collection

Five villages (approx. 30 % of the 17 Bodo-dominant villages of the study area), viz., Bandarpara, Bashbari, Debagaoon, Mauriagaon-1 and Nalbari, were selected for the present study. Field trips were conducted during 2011-2012 in these villages to gather information about the ethnomedicinal practices of the Bodos of this area. Traditional healers, village headmen and knowledgeable elderly persons belonging to the Bodo community from different villagers were selected

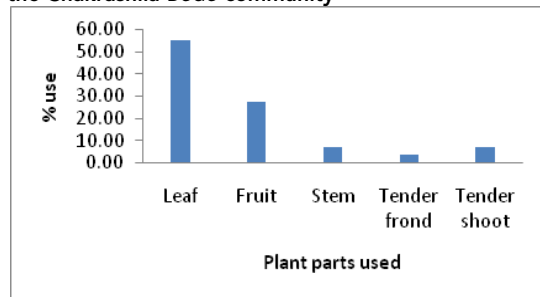
on the basis of their reputation of possessing considerable knowledge in traditional medicine. Information on the local names of plants, use of plant parts, and procedure for use, etc. were collected from these respondents. A focus group discussion (FGD) was held in each village for cross-verification and collection of supplementary information, if any, on medicinal plant use. Prior Informed Consent was taken from the traditional healers and the other interviewees and participants in the FGD. Plant species were collected along with local traditional practitioners and knowledgeable persons from wild habitats and home gardens, and their uses were recorded. Identification of plant species was done with the help of experts from the Department of Botany, Birjhora Mahavidyalaya, Bongaigaon, Assam.

**RESULTS AND DISCUSSION**

Twenty nine plant species belonging to 22 families (Table 1) found to be used by the Chakrashila Bodos for medicinal purposes were collected and identified. Among the collected plant species 8 (28%) were herbs, 6 (21%) were shrubs, 5 (17%) were climber, 9 (31%) were trees and 1 (3%) was fern (Fig. 2). These plants were used for the treatment of approximately 23 human diseases. Sixteen plants were used for their leaves, eight plants were used for their fruit and two were used for their stem, two for its shoot and one for its tender frond (Fig 3).



**Fig. 2 Different life forms used in traditional medicine by the Chakrashila Bodo community**



**Fig. 3 Plant parts used in curing different diseases by the Chakrashila Bodo community.**

Comparisons with ethnomedicinal studies on Bodos from other parts of Assam reveals that of the 29 plants used by the

Bodos of Chakrashila, 13 plants are also used by one or more of the Bodo communities from the other parts of Assam. Of these, the medicinal use of nine species is totally or partially identical with that of at least one of the other Bodo groups whose ethnomedicinal plants were inventoried (Basumotary et al., 2004; Das et al., 2006; Saikia et al., 2010; Paul et al., 2011a; Paul et al., 2011b)(Table 1). The remaining four species are used differently by the Chakrashila Bodo community: for example, frond paste of *Chrystella parasitica* is applied on boils as found in the present study, while it is applied on limbs lacking sensation by the Bodos from Gohpur in the Sonitpur district of Assam (Saikia et al, 2010); *Houttuynia cordata* leaf extract is used to treat constipation by the Chakrashila Bodos, and body ache by Bodos from North Kamrup (Das et al., 2006); *Nyctanthes arbortristis* as vermifuge in the present study, and in cough and gastritis by Gohpur Bodos; and *Paederia foetida* in constipation at Chakrashila, but in Diarrhoea and Dysentery by Bodos from Goalpara (Basumotary et al., 2004). Besides, 16 plants used by the Chakrasila Bodos are not used at all by Bodos from other places of Assam (Basumotary et al., 2004; Das et al., 2006; Saikia et al., 2010; Paul et al., 2011a; Paul et al., 2011b). It may also be noted that most of these plants such as *Adhatoda vasica*, *Aegle marmalos*, *Averrhoa carambola*, *Celastrus paniculatus*, *Cissus quadrangularis*, *Clitonia ternatea*, *Hibiscus sabdariffa*, *Spondia spinnata*, *Terminalia bellirica*, etc., are extensively used in Ayurveda and by the Assamese and Bengali Hindu communities. It is possible that the Bodos of Chakrashila had more active interactions with the non-tribal communities and their traditional healers because this area was a part of the Bijni Kingdom since the 17<sup>th</sup> century. Besides, some of these plants that were not recorded to be used by the Bodo groups from the other parts of the state were nevertheless found to be used by several other ethnic communities in Assam. For example, *Aegle marmalos* is used for curing asthma, constipation, dysentery, jaundice and fever among the Dimasakachari tribe of North Cachar hills and for dysentery in Golaghat district (Tamuli & Sharma, 2010; Barukial & Sharma, 2011). *Andrographis paniculata*, which is used by the Bodos of Chakrashila as well as Manas BR (Paul et al., 2011a) is also used by the Zeme tribe (Tamuli & Saikia, 2004) in North Cachar Hills, and Hmar (Nath & Choudhury, 2010) tribe in Cachar in fever and stomachache, and for killing tapeworms. Hmars of Cachar also use *Averrhoa carambola* to treat liver and eye disorders and jaundice, while *Chromolaena odorata* is used on cuts and wounds (Nath & Choudhury, 2010). *Murraya koenigii* is used for abdominal pain by the Assamese people of in Lakhimpur (Kalita & Deb, 2006); *Nyctanthes arbortristis* is used for malaria, diabetes and measles by the ethnic communities in Tinsukia (Buragohain, 2011); Zeme tribe of North Cachar hills using *Ocimum basilicum* for chronic diarrhoea and ring worm (Tamuli & Saikia, 2004), while Dimasakachari of same district using it for cough, dysentery and piles (Tamuli & Sharma, 2010); *Paederia foetida* is used by the Tai-Ahom community of Dibrugarh district for abdominal pain (Kalita & Phukan, 2010); *Spondias pinnata* is used by the Tai-Khamyangs community of Sivasagar district for piles (Sonowal & Barua, 2011) and ethnic people of Golaghat and Tinsukia district used this for dysentery and fungal infections (Barukial & Sharma, 2011; Buragohain, 2011).

**Table 1. List of medicinal plants used by the Bodos from Chakrasila WLS along with their use pattern in other studies on Bodo ethnomedicine**

Botanical name (Bodo name)	Family (Life form)	Use recorded in this study	Use reported in other studies on Bodoethnomedicine
<i>Adhatoda vasica</i> Nees. (Barsikhe)	Acanthaceae (Shrub)	Leaf ground with water and extract mixed with honey given in cough	NR
<i>Aegle marmelos</i> Correa (Bel)	Rutaceae (Tree)	Unripe fruit boiled and ground with water given in indigestion, constipation and diarrhoea	NR
<i>Alocasia acuminata</i> Schott. (Thaso)	Araceae (Herb)	Tender shoots, flower and tubers consumed as vegetable and for blood purification	NR
<i>Andrographis paniculata</i> (Burm.f.) Wall. Ex Nees. (Nagadona)	Acanthaceae (Herb)	Leaf extract taken in empty stomach in worm infection of the gastrointestinal (G.I.) tract in children	Dysentery, diarrhoea, malarial fever, various disorders and worm infections of the G.I. tract (Paul et al., 2011a)

<i>Averrhoa carambola</i> L.(Khamrenga)	Averrhoaceae (Tree)	Raw or cooked fruit given in jaundice and kidney diseases	NR
<i>Azadirachta indica</i> A. Juss. (Neem)	Meliaceae (Tree)	Fried or cooked leaf is used for curing worm infections of the G.I. tract, skin diseases, and chicken pox	Juice as vermifuge (Basumotary et al., 2004); Jaundice (Paul et al., 2011a; Paul et al., 2011b)
<i>Centella asiatica</i> (L.) Urban (Manimungeder)	Apiaceae (Herb)	One cup of raw or cooked leaf juice is used in loss of appetite, dysentery	Dysentery (Das et al., 2006); Dysentery; liver, nerve and skin diseases; loss of appetite; blood purifier; given to women after childbirth (Paul et al., 2011a)
<i>Chromolaena odorata</i> (L.) Voigt. (Bangrilewa)	Asteraceae (Shrub)	Ground leaves applied on cut and wounds; two teaspoon leaf juice a day given in dysentery	NR
<i>Chrystella parasitica</i> (L.) Lev (Sal Daokhumwi)	Thelypteridaceae (Pteridophyte)	Tender fronds are crushed and applied on boil	Frond paste applied on limbs lacking sensation (Saikia et al., 2010)
<i>Cissus quadrangularis</i> Linn. (Harjuralewa)	Vitaceae (Climber)	Stem paste is applied on wounds and bone fracture	NR
<i>Clitonia ternatea</i> L. (Nilkanthabiber)	Papilionaceae (Climber)	Two teaspoon of leaf juice given in cut, wounds and pneumonia	NR
<i>Dillenia indica</i> L. (Thaigir)	Dilleniaceae (Tree)	Hair washed with mucilage for hair growth	NR
<i>Emblia officinalis</i> Gaertn. (Amlai)	Euphorbiaceae (Tree)	Two teaspoon fruit extract given twice daily for five days in indigestion; also consumed for hair growth	NR
<i>Euphorbia ligularia</i> Roxb. (Siju)	Euphorbiaceae (Shrub)	Leaf given in cough and body ache	Body ache and boil (Basumotary et al., 2004)
<i>Garcinia morella</i> (Gaertn.) Desv. (Thaika)	Clusiaceae (Tree)	Dry fruit curry consumed in dysentery	NR
<i>Glycyrrhiza glabra</i> L. (Jestamadhru)	Fabaceae (shrub)	Stem juice mixed with honey to cure cough	NR
<i>Hedyotis corymbosa</i> (L.) Lamk (Deushriatheng)	Rubiaceae (Climber)	Juice in body ache and peptic ulcer	NR
<i>Hibiscus sabdariffa</i> L. (Mesta tenga)	Malvaceae (Shrub)	Leaf curry in dysentery	NR
<i>Houttuynia cordata</i> Thunb. (Maisundri)	Saururiaceae (Herb)	Leaf extract in constipation	Reduce body ache (Das et al., 2006)
<i>Hydrocotyle sibthorpioides</i> Lamk. (Manimuni)	Apiaceae (Herb)	Two teaspoon of raw leaf extract in empty stomach for curing loss of appetite.	NR
<i>Leucas plukenetii</i> (Roth) Spreng. (Khangsinsa)	Lamiaceae (Herb)	10 ml of leaf juice per day given for five days in indigestion, rheumatic pain; as nasal drop in sinusitis	Nasal haemorrhage (Basumotary et al., 2004); Sinusitis (Das et al., 2006)
<i>Murraya koenigii</i> (L.) Spreng. (Narashinha)	Rutaceae (Shrub)	Raw or cooked leaf extract given in indigestion	Indigestion (Basumotary et al., 2004)
<i>Nyctanthes arbortristis</i> L. (Sephali)	Oleaceae (Shrub)	One teaspoon of leaf or flower juice for three days is given to children in empty stomach to expel common worms	Cough and Gastritis (Saikia et al., 2010)
<i>Ocimum sanctum</i> Linn. (Tulshi)	Lamiaceae (Herb)	Leaf juice and equal amount of honey is mixed and 10ml twice a day is given in cough. Also leaf extract applied as eye drop in eye irritation	Eye diseases, cough, fever (Basumotary et al., 2004)
<i>Oxalis corniculata</i> L. (Singrigakhwi)	Oxalidaceae (Herb)	Raw or cooked leaf extract or curry given in dysentery and high blood pressure	As eye drop in conjunctivitis (Basumotary et al., 2004); Stomach ache, dysentery, intoxication from wine (Paul et al., 2011a)
<i>Paederia foetida</i> L. (Bhedalilewa)	Rubiaceae (Climber)	Two teaspoon leaf extract with a little salt to cure constipation	Diarrhoea and Dysentery (Basumotary et al., 2004)
<i>Spondiaspinnata</i> (L.f.) Kurz. (Thaishri)	Anacardiaceae (Tree)	Unripe fruit sometimes along with leaves and dry bark ground with water and 50 ml of juice given daily for one month in gastric ulcer	NR
<i>Terminalia bellirica</i> (Gaertn.) Roxb. (Bohera)	Combretaceae (Tree)	Fruit in gastric ulcer	NR
<i>Terminalia chebula</i> Retz. (Silikha)	Combretaceae (Tree)	Dry fruit ground with raw turmeric twice daily in constipation and loss of appetite	Jaundice (Paul et al., 2011a; Paul et al., 2011b)

NR – Not reported

## CONCLUSION

Present study documented 16 new ethno medicinal plants used by the Bodo community of western Assam as home remedies. These newly reported ethno medicinal plants may contribute significantly in new pharmacological drug discovery. Thus on the one hand considerable differences could exist among the members of the same tribe residing in different places, while similar use pattern for a given plant could be encountered among different communities on the other hand.

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