



Wild Ethnomedicinal Plants At Rhimona National Park Of Kokrajhar District Of Bodoland Territorial Region In Assam: A Survey-Based Study And Review

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<p>CC License CC-BY-NC-SA 4.0</p>	<p style="text-align: center;">Abstract</p> <p>The research endeavor delved into the exploration of wild ethnomedicinal plants situated within Rhimona National Park, nestled in the Kokrajhar district of the Bodoland Territorial Region (BTR) in Assam, North East India. These plants, endowed with ethnomedicinal qualities, hold significant importance for the bodo tribal communities residing in the district, serving as invaluable sources of herbal medicines. To comprehensively document the ethnomedicinal knowledge embedded within these biodiverse landscapes, the study employed a methodical approach. Through interviews and detailed questioning, information was meticulously gathered to unveil the traditional uses of various plants as medicinal resources within the expansive expanse of Rhimona National Park. The findings of the investigation revealed a rich tapestry of biodiversity, identifying a total of 51 plant species belonging to 36 families. These botanical entities play a dual role, not only serving as sources of local vegetables but also contributing to the traditional pharmacopeia for the treatment of a myriad of ailments. The survey brought to light a diverse array of plant forms, encompassing herbs, shrubs, climbers, and a few towering trees, collectively underscoring the dynamic relationship between the indigenous communities and the wealth of ethnomedicinal flora flourishing in this unique natural habitat. This research contributes valuable insights into the intertwined dynamics of cultural practices, traditional knowledge, and the rich botanical heritage existing within the confines of Rhimona National Park.</p> <p>Keywords: <i>Ethnomedicine, biodiverse landscapes, kokrajhar district, local vegetables, bodo tribal communities</i></p>
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INTRODUCTION

The Bodos Community are considered as a Largest tribal community of Northeast India. this tribe settlers mostly in Assam, Meghalaya, Tripura, Bangladesh, Nepal and Some parts of Northeast India and West Bengal. The total Population are 12-14 million. They highly live in North Bank area of Brahmaputra River. The Bodoland Territorial Region has total 4 (four) districts Namely- Kokrajhar, Udalguri, Baksa, and Chirang. The

district is demographically inhabited by Bodos, Rava, Muslim and Nepali etc. and the Bodo tribals are the most dominant tribe of this district. This Rhimona National Park is located under Sub-Division of Gossaigaon and International Border with Bhutan and Western state border with West Bengal. It is under Bodoland Territorial Region in the western park of Assam. Rhimona National Park Declared on 9th, June, 2021, from the Government of Assam and Government of India. Kokrajhar is the having highest forest located District of BTR. which is 2,562km² its (28.6%) area and Chirang is total (28.2%), and Baksa is (23.3%) area, and Udalguri total area is (8.5%). . The Area of Rhimona National Park is 422km² (163sqm). This Park is also known as an area of largest Sal trees of Asia. Community having above 30-40 villages around the sanctuary includes Bodo, Rabha, and the religions- Bathowsms and Christian.

MATERIAL AND METHOD

STUDY AREA

For the present investigation, we created a standardized survey to assist us in determining the herbal plants used as medicines for several diseases. During survey in the villages and we discussed with the elder person and young person of 30-40 villagers, which are economically not developed. Some villages are under the remote area without any medical facilities, institutions, and social amenities. The residents of these villages relied on traditional indigenous wisdom, drawing upon wild resources for sustenance, medicinal purposes, and various other needs from the forest.

DATA COLLECTION

There are above 30-40 Villages of this study area near by Rimona National Park of Kokrajhar District, BTR(Assam).The tribes were fully depending on this national park for medicinal purpose traditionally since a long year. Some of the village names are- Dwhnguri, Thaisuguri, Dumbruguri, Barlingbari, Bwrimaka, Bwrsingjhora, Langdangpara, Brahmapur, Mainaopur, Swmlibagan, Araisopara, Bohornwgwr, Rhimona. A field trip was conducted on December, 2022 to March 2023 and gathering information about the ethno-medicinal practices, how Bodo people of this area used traditional medicinal plants. Leveraging their well-established reputation for holding extensive expertise in traditional medicine, information on the local names of medicinal plants, the specific plant parts used for medicinal purposes, and the procedural details of their application were sought. Following group discussions in each village, a thorough cross-verification process was undertaken. Supplementary information gathered was meticulously scrutinized through collaboration with local traditional practitioners and knowledgeable individuals, often referred to as "baidya," hailing from both wild habitats and home gardens. Every identified plant species utilized for the treatment of various diseases was duly recorded and documented through this collaborative and cross-referenced approach.

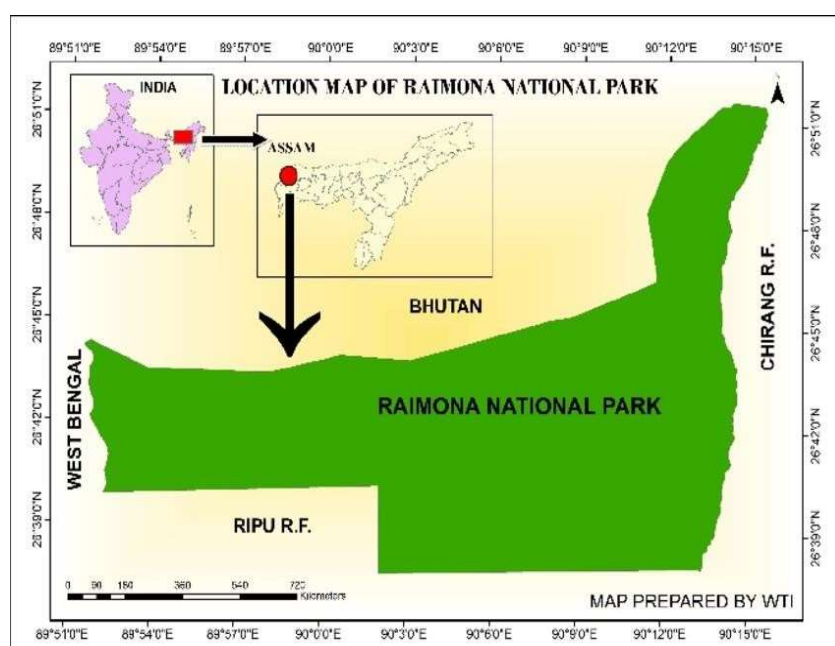


Fig.1 Location Map of Rhimona National Park

RESULT AND DISCUSION

Ethnomedicinal plants are used by traditional or indigenous groups for medicinal purposes. The use of ethnomedicinal plants is deeply rooted in the cultural and traditional knowledge of specific communities. Local healers or traditional medicine practitioners often possess unique insights into the properties and uses of these plants. Many ethnomedicinal plants are found in biodiversity hotspots around the world. These areas often coincide with regions that are rich in plant species diversity. While traditional knowledge plays a crucial role, there is also growing interest in scientifically validating the medicinal properties of ethnomedicinal plants. Researchers explore the active compounds within these plants and their potential applications in modern medicine. Ethnomedicinal knowledge is not limited to a specific region or culture; it is a global phenomenon. During this comprehensive investigation, a total of 51 plant species, spanning 36 families, were meticulously documented. These diverse plant varieties serve dual purposes, functioning not only as valuable sources of vegetables but also as potent agents for the treatment of various diseases. The specific details regarding the utilization of these plants for both culinary and medicinal applications are delineated in table-1, providing a nuanced understanding of their multifaceted contributions to human well-being.



Sign board

Butterflies

Rhynchosyris retusa



Herbs (Medicinal)

Pepsu (River)

Herbs (Hills)

Fig.2 Views and sceneries of Rhimona National Park, BTR

Table 1. List of Ethnomedicinal plants of Rhimona National Park along with their use among Bodo Ethnomedicine.

Botanical Name	Family	Local Name (Bodo)	Part used	Preparation	Habit	Ethnomedicinal used	Reference
Adhatoda Vasica	Acanthaceae	Barsikha Bibargwja	flowers	Decoction	Shrub	Treating cold, cough, chronic bronchitis, and asthma.	1
Aegle Marmelos	Rutaceae	Bel	Fruit	Boil	Tree	Diarrhea, dysentery, and peptic ulcers	2
Alocasia Acuminata	Araceae	Thaso	shoot	Boil	Herb	Jaundice, snake bite, boils, and diabetes.	3
Alstonia Scholaris	Apocynaceae	Sithaona	Bark	Infusion	Tree	Fever, pain, inflammation, cancer, respiratory, and skin disorders.	4
Amorphophallus sylvaticus	Araceae	Olodor	Petioles	cooked	Herb	Piles, urinary troubles, arthritis, inflammation, and liver diseases.	5

Andrographis Paniculata	Acanthaceae	Kalmith	Leaves	Decoction	Herb	Cold, diarrhoea, fever, jaundice.	6
Antidesma acidum	Phyllanthaceae	Lapasaiko	Leaves	Cooked	Shrub	Anti-fungal,anti-bacterial, catalytic.	7
Averrhoa carambola	Averrhoaceae	Khambrenga	Fruit	Raw	Tree	Anti-oxidant, hypoglycemic, hypotensive,anti-inflammatory, anti-infective, anti-tumor, and immune-boosting effects.	8
Azadirachta indica	Meliaceae	Neem	Leaves	Cooked	Tree	Antinflammatory,antiarthritic,anti-pyretic,hypoglycemic, anti-gastric ulcer, anti-fungal, anti-bacterial.	9
Bidens Pilosa	Asteraceae	Daomeoai	Leaves	Cooked	Herb	Anti-malarial,anti-allergy, anti-diabetic,anti-microbial.	10
Boerhavia diffusa	Nyctaginaceae	Laije	Young shoot	Cooked	Herb	Anti-bacterial,liverprotection,anti-proliferative,asthma, cough.	11
Casearia glomerata	Flacourtiaceae	Daopenda	Leaves	Cooked	Herb	Cancer, sepsis, fever, and blood cleansing	12
Catharanthus roseus	Apocynaceae	Pool daodwi	Flowers	Decoction	Herb	Anti-fungal, anti-diabetic, and anti-cancer.	13
Centella asiatica	Apiaceae	Manimuniger	Leaves	Decoction	Herb	Treating high blood pressure, memory enhancement.	14
Christella parasitica	Thelypteridaceae	Sal Daokumwi	Tender	Decoction	Pteridophyte	Gout, and rheumatism	15
Chromolaena odorata	Asteraceae	Bangrilewa	Leaves	Decoction	Shrub	Wound, burns, and skin infections.	16
Cissus quadrangularis	Vitaceae	Harjuralewa	Stem	Paste	Climber	Stem paste used to heal wounds and bone fracture	17
Clerodendrum colebrookianum	Verbenaceae	Lwkwna	Tender leaves	Cooked	Shrub	Dizziness, swelling (gland), sore tongue in children, skin disease, cough, and dysentery.	18,19
Clitonia ternatea	Papilionaceae	NilkanthaBibar	Leaves	Decoction	Climber	Two teaspoon of leaf juice given in cut, wounds and pneumonia	20
Costus speciosus	Costaceae	Buri thokon	Young shoot	Cooked	Plant	Pneumonia, constipation, skin diseases, fever, asthma, bronchitis, anaemia, cough, jaundice.	21
Dillenia indica	Dilleniaceae	Thaigir	Fruit	Raw	Tree	mucilage used for hair growth	22
Emblica officinalis	Euphorbiaceae	Amlai	Fruit	Raw & Decoction	Tree	Two teaspoon fruit extract given twice daily for five days in indigestion; also consumed for hair growth	23
Euphorbia ligularia	Euphorbiaceae	Sijwo	Leaves	Raw	Shrub	Against cough and body ache	24
Ficus racemosa	Moraceae	Dumbru	Tender leaves	Decoction	Tree	Urinary disease, respiratory, haemorrhoids, inflammatory conditions, diarrhea, liver disorders and diabetes	25
Ficus religiosa	Moraceae	Phakri	Leaves	Decoction	Tree	Antiulcer, antibacterial, antidiabetic, in the treatment of gonorrhoea and skin diseases	26
Garcinia morella	Clusiaceae	Thaika	Fruit	Dry	Tree	Dry fruit curry consumed in dysentery	27
Glycyrrhiza glabra	Fabaceae	Jestamadhu	Stem	Decoction	Shrub	Stem juice with honey cure cough	28
Gmelina arborea	Lamiaceae	Gambari	Flower	Cooked	Tree	Improves digestion, memory useful in burning sensation, fever, thirst, emaciation, heart diseases, nervous disorders and piles.	29
Hedyotis corymbosa	Rubiaceae	Daoshriathing	Leaves	Decoction	Climber	Against body ache and peptic ulcer	30
Hibiscus sabdariffa	Malvaceae	Mwita gwja	Leaves & Fruits	Raw	Shrub	in dysentery	31
Houttuynia cordata	Saururiaceae	Maisundri	Leaves	Decoction	Herb	in constipation	32

Hydrocotylesibt horpioides	Apiaceae	ManimuniFi sa	Leaves	Decoction	Herb	Two teaspoon of raw leaf extract in empty stomach for curing loss of appetite.	33
Leucas plukenetii	Lamiaceae	Khangsia	Leaves	Decoction	Herb	10 ml of leaf juice per day given for five days in indigestion, rheumatic pain; as nasal drop in sinusitis	34,35
Momordica Charantia	Cucurbitaceae	Udasi	Lender Leaf & Fruit	Decoction	Climber	Antidiabetic, Anticancer, anti Inflammation, Antivirus and Cholesterol lowering effects.	36,37
Monochorea vaginalis	Pontederiaceae	Ajinai	Flowers	Cooked	Herb	Treat liver problems, also used as analgesic and antipyretic agent	38
Murrya koenigii	Rutaceae	Nwrsing	Leaves	Raw	Shrub	Raw or cooked leaf extract given in indigestion	39,40,41
Nyctanthes arbortristis	Oleaceae	Sephali	Leaves & Flower	Decoction	Shrub	One teaspoon of leaf or flower juice for three days is given to children in empty stomach to expel common worms	42,43
Ocimum sanctum	Lamiaceae	Tulshi	Leaves	Decoction	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	44,45
Oroxylum Indicum	Bignoniaceae	Kharo Kandai	Bark	Decoction	Tree	Jaundice, Arthritic, Rheumatic Problems, Gastric Ulcers, Tumors, Respiratory Diseases, Diabetes, Diarrhea, and Dysentary.	46,47,48
Paederia foetida	Rubiaceae	Kipi bendwng	Leaves	Decoction	Climber	Two teaspoon leaf extract with a little salt to cure constipation	49,50
Paspalum Fimbriatum	Poaceae	Dapsa	Whole Plant	Decoction	Herb	Remediation	51,52
Piper Longum	Piperaceae	Simfri	Fruit	Raw	Climber	Tumors, Cough, bronchitis, Stomachach, respiratory infections, viral hepatitis. Chronic malaria, cholera, diarrhea, paralysis of tongue, gonorrhoea, constipation asthma chronic bronchitis	53,54
Rauvolfia tetraphylla	Apocynaceae	Kharwkha	Root	Decoction	Shrub	Antimicrobial, Antioxidant, Anti-inflammatory, Cytotoxic, Cardioprotective, Anti- hypertensive, Insecticidal, and Antiparasitic Activities.	55.56
Solanum khasianum	Solanaceae	Kuntainara	Fruit	Cooked	Shrub	anti-inflammatory, antioxidant and antidiabetic activities	57
Spilanthes paniculata	Asteraceae	Usumwi	Leaves	Cooked	Herb	anti-inflammatory, diuretic, aphrodisiac and pain- relieving effects, treat dysentery and rheumatism	58
Spondias pinnata	Anacardiaceae	Taishri	Fruit	Raw	Tree	Leaves and dry bark used for gastric ulcer	59,60
Syzygium Jambos	Myrtaceae	Korjam	Tender leaves	Raw	tree	Hemorrhages, Syphilis, leprosy, wounds, Ulcers, lung diseases, fever and pains	61,62,63
Terminalia bellirica	Combretaceae	Baokra	Fruit	Raw	Tree	Fruit in gastric ulcer	64,65
Terminalia Chebula	Combretaceae	Silikha	Fruit	Raw	Tree	Constipation and loss of Appetite	66
Tinospora Cordifolia	Menispermaceae	Amor Latha	Stem & Leaves	Decoction	Climber	Snake bite, eye disorders, poisonous insect,skin disease, asthma, pain, fracture, bone, cancer, dysentery, chronic diarrhea, jaundice, fever	67,68
Vitex negundo	Lamiaceae	Nisinda	Leaves	Cooked	Tree	anti-inflammatory, antioxidant, antidiabetic, anticancer, antimicrobial	69



(Alstonia Scholaris) (Antidesma Acidum) (Aegle Marmelos) (Alocasia Acuminata)



(Andrographis Paniculate) (Averrhoa Carambola) (Azadirachta Indica) (Amorphophallus sylvaticus)



(Bidens Pilosa) (Costus Speciosus) (Centella Asiatica) (Chromolaena Odorata)



(Christella Parasitica) (Casearia Glomerata) (Clerodendrum Colebrookianum) (Dillenia Indica)



(Emblica Officinalis) (Euphorbia Ligularia) (Ficus Racemose) (Ficus Religiosa)



(Gmelina Arborea) (Hibiscus Sabdariffa) (Leucas Plukenetii) (Momordica Charantia)



(*Murrya Koenigii*) (*Monochorea Vaginalis*) (*Oroxylum indicum*) (*Ocimum Sanctum*)



(*Piper Longum*) (*Paederia Foetida*) (*Spondia Spinnata*) (*Solanum Khasianum*)



(*Spilanthes Paniculate*) (*Terminalia Bellirica*)

Fig.3 Thirty six ethnomedicinal plants of Rhimona National Park, BTR

The study identified and documented a diverse array of plant species, comprising 17 trees, 15 herbs, 11 shrubs, 7 climbers, and 1 pteridophyte (refer to Fig. 4). These medicinal plants are representative of 36 different species, encompassing 4 species from Lamiaceae, 3 species each from Apocynaceae and Asteraceae, 2 species from Acanthaceae, Rutaceae, Araceae, Apiaceae, Moraceae, Euphorbiaceae, Combretaceae, Rubiaceae, and singular species from Phyllanthaceae, Avertroaceae, Meliaceae, Nyctaginaceae, Costaceae, Thelypteridaceae, Flacourtiaceae, Vitaceae, Papilionaceae, Verbenaceae, Dilleniaceae, Clusiaceae, Fabaceae, Malvaceae, Saururiaceae, Cucurbitaceae, Pontederiaceae, Oleaceae, Bignoniaceae, Poaceae, Piperaceae, Myrtaceae, Anacardiaceae, Solanaceae, and Menispermaceae (see Fig. 5). Within these ethnomedicinal plants, the study noted the utilization of various plant parts for the treatment of diseases. These included 24 species employing leaves, 11 species utilizing fruits, 5 species using flowers, 3 species relying on shoots, 2 species making use of bark, 2 species utilizing stems, and one each from root tender, petiole, and the entire plant (as illustrated in Fig. 6).

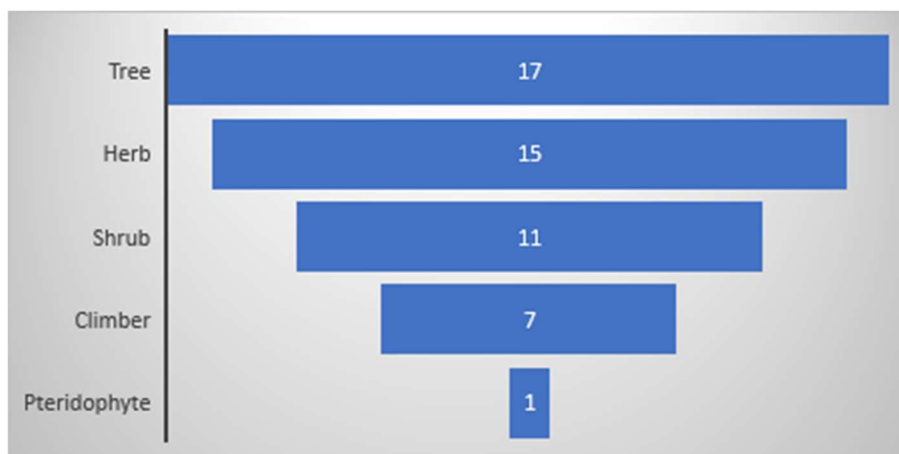


Figure-4. Different types of Plants used by Bodo Tribe of BTR

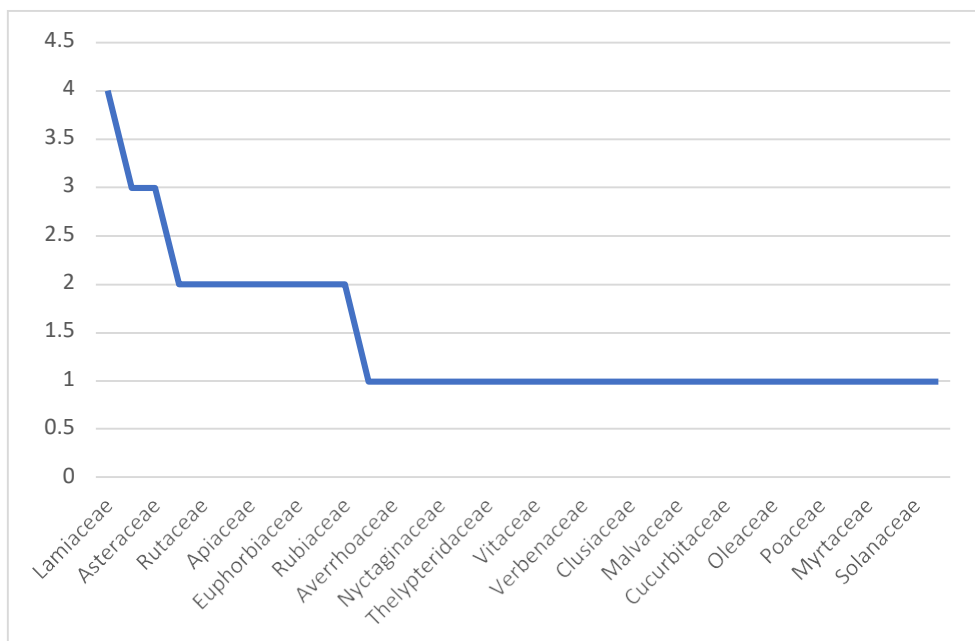


Fig.5 Different families of ethnomedicinal plant used by Bodo Tribes of BTR

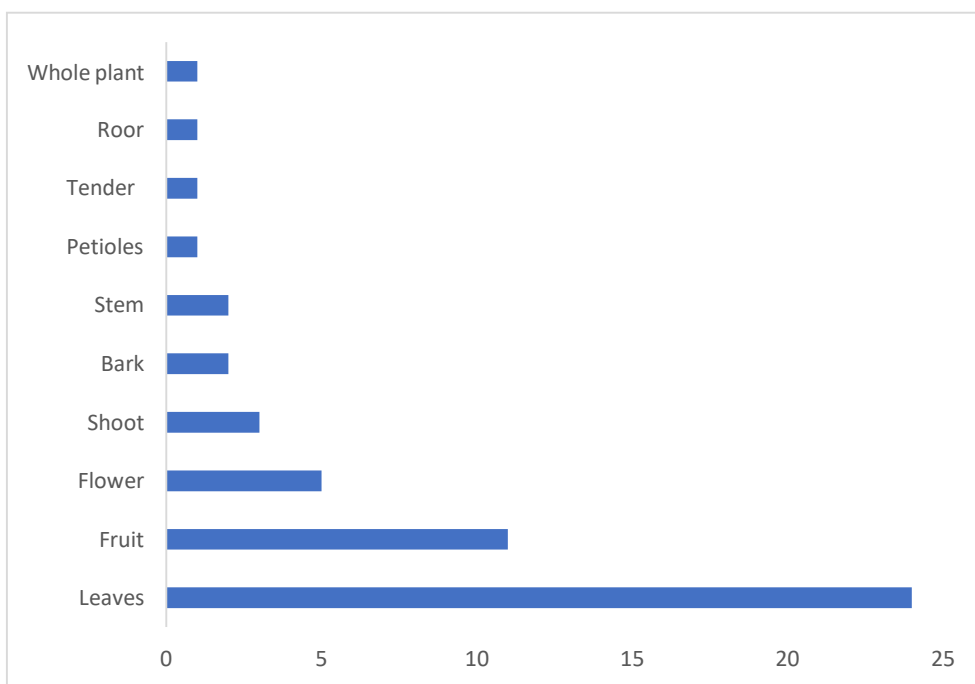


Fig.6 Different parts of plant used in Traditional Medicine by Bodo Tribes of BTR

CONCLUSION

Ethnomedicinal plants play a crucial role in addressing diverse health concerns within the Bodo community residing in proximity to Rimona National Park, located in the Kokrajhar District of the Bodoland Territorial Region (BTR), Assam. A comprehensive collection of 51 ethnomedicinal plants has been amassed, encompassing 17 trees, 15 herbs, 11 shrubs, 7 climbers, and one pteridophyte. Despite the absence of scientific experimental methodologies among traditional healers, their empirical approaches demonstrate a noteworthy efficacy in utilizing medicinal plants for treating various ailments. However, the escalating process of urbanization in the vicinity of Rimona National Park, coupled with extensive deforestation, poses a significant threat to the abundance of vital medicinal plants. The surge in modern healthcare facilities has cast a shadow on the practice of ethnomedicine, leading to a decline in traditional knowledge.

The current study serves as a vital initiative to safeguard the ancient and traditional ethnomedicinal knowledge prevalent among the Bodo community near Rimona National Park. Furthermore, it aims to preserve and transfer this invaluable knowledge to succeeding generations, fostering continued development and

effectiveness in healthcare practices. By doing so, the study endeavors to contribute to the conservation of ethnomedicinal wisdom amid the evolving landscape of the region.

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