



Research article

Analysis of medicinal and economic important plant species of Hollongapar Gibbon wildlife sanctuary, Assam, northeast India

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Abstract: An investigation has been made to recognise the medicinal and economic potential of plant species occurred in the semi-evergreen forest of Hollongapar Gibbon wildlife sanctuary, Assam using semi-structured questionnaire. In the present study, the importance of plant species recorded in this semi-evergreen forest is analysed and assessed in terms of their medicinal and economic values. A total of 157 plant species belonging to 136 genera and 78 families were having medicinal and economic values. These include 69 trees (55 genera and 39 families), 17 shrubs (15 genera and 14 families), 58 herbs (57 genera and 37 families), 5 lianas (5 genera and 5 families) and 8 bamboo/cane/palm (5 genera and 2 families). The study revealed 78% of plant species were having significant values either in terms of medicinal or economic and both which make the plant diversity of the sanctuary a vital source for resource supply. Majority of the recorded medicinal plants were used for the treatment of some common health problems such as fever, cough, cold, skin diseases, jaundice, dysentery, etc. Non Timber Forest products consist of wild edible vegetables, resins, gums, fire woods, fodder, wild edible fruits, bamboo, canes, etc.

Keywords: Plant diversity - Economic plants - Medicinal plants - Anthropogenic activities - Conservation.

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INTRODUCTION

Tropical forests are rich centres of species diversity having high productivity which results in a great supply of resources to mankind. The services provided by tropical forests are numerous and taken as granted. Contribution to human welfare with their distinctive medicinally and economically important plants is worth mentioning. In general, forests provide a variety of resources which may be of direct or indirect use to human life and regarded as a vital source of livelihood. The fundamental social, ethical, cultural and economic values of humans have directly or indirectly revolved around biological resources since the earliest date of historical record (Ramesh 2003, Pandey & Pandey 2016). People have traditionally and substantially depended upon the resources in the wild for their sustenance (Gadgil 1989, Mehra *et al.* 2014, Bajpai *et al.* 2016).

The northeast region of India is a centre of rich biodiversity in the Indian sub-continent with a significant proportion of flora and fauna having medicinal and economic values. Assam a state of northeast India is a constituent unit of the Eastern Himalayan Biodiversity Region which is one of the three biodiversity hotspots in the country. In Assam, there are 23 protected areas represented by 5 national parks and 18 wildlife sanctuaries. The total area under national parks and wildlife sanctuaries in 2012 is 3925 Km². contributing 5% of state's geographical area (PCCF 2012). Several studies have been undertaken in different protected areas likewise in the Hollongapar Gibbon wildlife sanctuary, Assam. However, most of the study undertaken in the sanctuary was found to primarily focus on the primate species (Tilson 1979, Chetry 2001, Hazarika & Gupta 2005, Chetry *et al.* 2007, Chetia & Kalita 2012). Bujarbarua (2002) carried out an ecological study of the sanctuary. A study on Poaceae family of the sanctuary was done by Bujarbarua & Sarma (2006) where a total number of 37 species belonging to 22 genera were collected. Verma *et al.* (2012) enumerated liverwort and hornwort flora of the sanctuary. An analysis of tree species diversity, population dynamics and assessment of their regeneration

pattern was studied by Sarkar & Devi (2014a) while, Borah & Devi (2014) carried out the ecological study on a critically endangered tree species (*Vatica lanceaefolia* Bl.) in the sanctuary. However, there is no record of assessment of the potential value of plant species diversity occurred in the sanctuary in terms of medicinal and economic importance and their subsequent utilization. Therefore, an attempt has been made to investigate the potential value of plant species diversity occurred in Hollongapar Gibbon wildlife sanctuary, Assam.

MATERIALS AND METHODS

The Hollongapar Gibbon wildlife sanctuary (HGWS), popularly known as Gibbon wildlife sanctuary, is an isolated forest patch surrounded by human population and tea gardens from all sides. It is located at N 26°40'–26°45' and E 94°20'–94°25' at an altitudinal range of 100–120 m amsl, in Mariani, Jorhat district of upper Assam. It covers an area of 20.98 Km² and the sanctuary has been divided into five compartments. The HGWS falls under “North East Biogeographic Zone (9)” and “N.E. Brahmaputra Valley Biogeographic Province (9A)” as per Rodgers & Panwar (1988) and the forest type is “Eastern Alluvial Secondary Semi-Evergreen Forest (1/2/2B/2S2)” under Moist Tropical Forests of India (Champion & Seth 1968). The climate in the region may be classified as sub-tropical humid type (monsoonal climate) having four seasons in a year: pre-monsoon (March to May), monsoon (June to September), post-monsoon (October to November) and winter (December to February). The location of this sanctuary and accessibility by the local inhabitants of the fringe area for resource utilization has made this site important for ecological studies.

Importance of plant species occurred in HGWS was investigated by collecting relevant data using informal semi-structured questionnaire from the people in terms of medicinal and economic importance. The local people inhabited in and around the sanctuary were interviewed through informal conversation and any information on uses of the plant in different proposes was recorded using the questionnaire and other relevant information were also noted. Prior Information Consent (PIC) was taken before the conversation/interview. Literature like ‘Flora of Assam’ (Kanjilal & Bor 2005) was also consulted for any relevant information to be incorporated.

RESULTS

A total of 100 individuals/villagers inhabited in and around the sanctuary, belonging to the age group of 30–80, were interviewed for collecting the information on the importance of plant species. Analysing the collected data it was found that several plant species having medicinal and economic values were collected from the sanctuary by the villagers for their subsistence. A total of 157 species belonging to 136 genera and 78 families were found having ethnobotanical values which includes 69 trees (55 genera and 39 families), 5 lianas (5 genera and 5 families), 17 shrubs (15 genera and 14 families), 58 herbs (57 genera and 37 families), and 8 species under bamboo, cane and palm (5 genera and 2 families). Detail of these recorded ethnobotanical important plant species in terms of medicinal and economic values is given in table 1. It was estimated that 78% of plant species were having certain significant values either medicinal or economic or both which make the plant diversity of the sanctuary a vital source of resource supply to the nearby inhabitants. Out of the 157 species, 52 species were exclusively used for a medicinal purpose which belonged to 51 genera and 34 families. Out of these 52 species, 3 species were trees (2 genera and 2 families), 9 species were shrubs (9 genera and 8 families) and 40 species were herbs (40 genera and 25 families). These plants like *Dillenia indica*, *Macaranga denticulata*, *Terminalia chebula*, *Clerodendrum infortunatum*, *Phlogacanthus thyriformis*, *Cheilocostus speciosus*, *Cissampelos pareira*, *Commelina benghalensis*, *Paederia scandens*, *Phyllanthus fraternus*, etc. are widely used for the treatment of some common health problems such as fever, cough, cold, skin diseases, jaundice, dysentery, etc. While, 36 species belonging to 33 genera and 23 families were having economic values. Among the 36 species, 21 species were trees (20 genera and 19 families), 1 species was shrub, 3 species were herbs (3 genera and 3 families), 4 species were lianas (4 genera and 4 families), 3 species were bamboo (3 genera and 1 family), 3 species were cane (1 genus and 1 family) and 1 species was palm. 15 species were found to be used exclusively for timber. These plants are important and found to be used extensively as wild edible vegetables, resins, gums, fire woods, fodder, wild edible fruits, etc. by the local people inhabited in and around the sanctuary to meet their economic subsistence.

DISCUSSION AND CONCLUSION

The sanctuary harbours a rich diversity of medicinal and economic important plants which adds the potential value of the sanctuary. The commercially important plant species enumerated in the study area supports

Table 1. List of medicinal and economically important plant species recorded in Hollongapar Gibbon wildlife sanctuary.

S.N.	Name of Species	Family	Ver. name	Importance		Uses
Tree						
1	<i>Aglaia spectabilis</i> (Miq.) S.S. Jain & Bennet	Meliaceae	Amari	-	E	Timber
2	<i>Ailanthus integrifolia</i> Lam.	Simaroubaceae	Borpaat	-	E	Timber
3	<i>Albizia lebbek</i> (L.) Benth.	Mimosaceae	Shirish	-	E	Timber
4	<i>Alseodaphne petiolaris</i> Hook. f.	Lauraceae	Gojua	M	-	Jaundice
5	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Sotiona	M	E	Timber
6	<i>Altingia excelsa</i> Noronha	Altingiaceae	Jutuli	M	E	Headache, allergy, boils; timber
7	<i>Aquilaria malaccensis</i> Lam.	Thymelaeaceae	Agaru	M	E	Skin diseases; resin, oil, highly scented wood
8	<i>Artocarpus chaplasha</i> Roxb.	Moraceae	Samkothal	M	E	Diarrhoea, sores; timber, fruit edible
9	<i>Artocarpus lakoocha</i> Roxb.	Moraceae	Bohot	M	E	Skin diseases; fruit and flower head edible, dye
10	<i>Baccaurea ramiflora</i> Lour.	Phyllanthaceae	Leteku	M	E	Stomach ache, toothache; fruit edible, fish farming
11	<i>Balakata baccata</i> (Roxb.) Esser	Euphorbiaceae	Seleng	-	E	Timber, wood
12	<i>Barringtonia acutangula</i> (L.) Gaertn.	Lecythidaceae	Paani amara	M	E	Diarrhoea, syphilis, leprosy; timber, bark for intoxicating fish
13	<i>Canarium bengalense</i> Roxb.	Burseraceae	Dhuna	M	E	Rashes, snake bite; resin, air purifier
14	<i>Carallia brachiata</i> (Lour.) Merr.	Rhizophoraceae	Maahithekera	M	E	Stomach disorder; Timber, fruit edible
15	<i>Castanopsis indica</i> (Roxb. ex Lindl.) A.DC.	Fagaceae	Hingori	-	E	Leaves used for cigarettes, fruit edible, timber
16	<i>Castanopsis tribuloides</i> (Sm.) A.DC.	Fagaceae	Phoolhingori	M	E	Cough, goitre, indigestion; Timber, fruit edible
17	<i>Chukrasia tabularis</i> A.Juss.	Meliaceae	Bogapoma	M	E	Stomach ache, diarrhoea, dysentery; timber
18	<i>Cinnamomum glaucescens</i> (Nees) Hand.-Mazz.	Lauraceae	Gonsoroi	-	E	Timber
19	<i>Cyathea gigantea</i> (Wall. ex Hook.) Holtt.	Cyatheaceae	Tree fern	M	E	Anti-inflammatory; stem edible
20	<i>Dillenia indica</i> L.	Dilleniaceae	Outenga	M	E	Stomach ache, jaundice, diarrhoea, dysentery, dandruff; timber, fruit edible
21	<i>Dipterocarpus retusus</i> Bl.	Dipterocarpaceae	Holong	-	E	Timber
22	<i>Drimycarpus racemosus</i> (Roxb.) Hook.f. ex Marchand.	Anacardiaceae	Aamsia	-	E	Timber
23	<i>Duabanga grandiflora</i> (DC.) Walp.	Lythraceae	Khakan	-	E	Timber
24	<i>Dysoxylum gotadhora</i> (Buch.-Ham.) Mabb.	Meliaceae	Bandardima	M	E	Diarrhoea, dysentery; timber
25	<i>Elaeocarpus serratus</i> L.	Elaeocarpaceae	Rudraksh	-	E	Cultural and religious use
26	<i>Eurya acuminata</i> DC.	Pentaphylacaceae	Murmura	M	E	Diarrhoea; fuelwood, dye
27	<i>Evodia meliaefolia</i> Benth.	Rutaceae	Maiphak	-	E	Timber

28	<i>Ficus benghalensis</i> L.	Moraceae	Borgoch	M	E	Rheumatism, diarrhoea, dysentery, diabetes; timber, fodder
29	<i>Ficus benjamina</i> L.	Moraceae	Jorigoch	M	-	Stomach disorder
30	<i>Ficus fistulosa</i> Reinw. ex Bl.	Moraceae	Kathiadimoru	M	E	Post-natal treatment, diaphoretic; firewood
31	<i>Ficus lamponga</i> Miq.	Moraceae	Dimoru	M	-	Jaundice
32	<i>Ficus racemosa</i> L.	Moraceae	Jagya Dimoru	M	E	Diabetes, liver disorders, diarrhoea, urinary diseases; fruit edible
33	<i>Ficus religiosa</i> L.	Moraceae	Ahot	M	E	Dysentery, fever, scabies, piles, skin diseases, gonorrhoea; religious, cultural, Timber, fodder, fruit edible
34	<i>Garcinia morella</i> (Gaertn.) Desr.	Clusiaceae	Kujithekera	M	E	Diarrhoea, leprosy, ulcers; resin, oil, dye, fruit edible
35	<i>Garcinia pedunculata</i> Roxb. ex Buch.-Ham.	Clusiaceae	Borthekera	M	E	Diarrhoea, dysentery, jaundice; fruit edible
36	<i>Gmelina arborea</i> Roxb.	Lamiaceae	Gamari	M	E	Stomach disorder; timber, fruit and flower edible
37	<i>Hydnocarpus kurzii</i> (King) Warb.	Achariaceae	Saalmugura	M	E	Leprosy; oil
38	<i>Ilex godajam</i> Coleb. ex Hook.f.	Aquifoliaceae	Haatikerepa	-	E	Firewood
39	<i>Kydia calycina</i> Roxb.	Malvaceae	Pisola	M	E	Skin diseases, wounds, cuts, boils, veterinary medicine; timber, fibrous bark
40	<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae	Azar	M	E	Diarrhoea, dysentery, jaundice; timber, cultivated for flowers
41	<i>Litsea monopetala</i> (Roxb.) Pres.	Lauraceae	Sualu	M	E	Stomach ache; mugasilk worm reared on leaves
42	<i>Macaranga denticulata</i> (Blume) Müll.Arg.	Euphorbiaceae	Moralia	M	E	Skin diseases, cuts, wounds; firewood, fodder
43	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae	Titasopa	M	E	Chronic gastritis, cough, fever; timber
44	<i>Magnolia hodgsonii</i> (Hook. f. & Th.) H. Keng	Magnoliaceae	Borhomothuri	M	E	Tooth and gum; firewood, dye, timber
45	<i>Magnolia hookeri</i> (Cubitt & Smith) Raju & Nayar	Magnoliaceae	Paansopa	-	E	Timber
46	<i>Magnolia oblonga</i> (Wall. ex Hook.f. & Thomson) Figlar	Magnoliaceae	Borsopa	-	E	Timber
47	<i>Mallotus nudiflorus</i> (L.) Kulju & Welzen	Euphorbiaceae	Bhelkar	-	E	Timber
48	<i>Mangifera sylvatica</i> Roxb.	Anacardiaceae	Bon-aam	M	E	Gastrointestinal disorder; unripe fruit for pickles, jelly and tarts
49	<i>Mesua ferrea</i> L.	Calophyllaceae	Nahor	M	E	Fever, vomiting, urinary tract disorders, migraine; oil, timber
50	<i>Morinda angustifolia</i> Roxb.	Rubiaceae	Aasugoch	M	E	Body pain, cough, cracked feet; dye
51	<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Rubiaceae	Kadam	M	E	Blood purifier, antidiuretic, abortifacient; timber, fruit edible
52	<i>Olea dioica</i> Roxb.	Oleaceae	Poreng	M	E	Skin diseases, fever; fuelwood, charcoal
53	<i>Palaquium obovatum</i> (Griff.) Engl.	Sapotaceae	Kotholua	-	E	Yields an inferior kind of Gutta percha

54	<i>Premna bengalensis</i> Cl.	Lamiaceae	Gohora	-	E	Timber
55	<i>Pterospermum acerifolium</i> (L.) Willd.	Malvaceae	Mota-marulia	M	E	Glandular swelling of neck and ears; fodder, roofing material
56	<i>Saurauia roxburghii</i> Wall.	Saurauiaceae	Bonposola	M	E	Constipation; fruit edible, fodder, country liquor
57	<i>Spondias mombin</i> L.	Anacardiaceae	Khamolimola	-	E	Bark chewed as substitute for areca nut, fruit edible
58	<i>Spondias pinnata</i> (L.f.) Kurz.	Anacardiaceae	Amara	M	E	Dysentery; fruits and flower buds edible
59	<i>Sterculia villosa</i> Roxb.	Malvaceae	Udal	M	E	Dysentery; timber, fibrous bark, seeds edible
60	<i>Stereospermum chelonoides</i> (L.f.) DC.	Bignoniaceae	Paroli	M	E	Skin diseases, cough, arthritis; timber
61	<i>Symplocos ferruginea</i> Roxb.	Symplocaceae	Motabhomloti	-	E	Fruits used for rosaries
62	<i>Syzygium kurzii</i> (Duthie) Balakr.	Myrtaceae	Bogijamuk	M	E	Stomach trouble; timber
63	<i>Terminalia catappa</i> L.	Combretaceae	Kaathbadam	-	E	Kernel edible, cultivated for fruits, dye
64	<i>Terminalia chebula</i> Retz.	Combretaceae	Hilikha	M	E	Diarrhoea, dysentery, bleeding gums, conjunctivitis, appetizer; timber, tanning
65	<i>Terminalia myriocarpa</i> Van Heurck & Müll. Arg.	Combretaceae	Halakh	M	E	Urinary disorder; Timber, charcoal
66	<i>Tetrameles nudiflora</i> R. Br.	Tetramelaceae	Bheleu	-	E	Timber
67	<i>Vatica lanceaefolia</i> Bl.	Dipterocarpaceae	Morsal	M	E	Dysentery; firewood, resin, oil
68	<i>Vernonia arborea</i> Buch.-Ham.	Asteraceae	Maskoita	-	E	Bark chewed as substitute for betel leaf
69	<i>Walsura robusta</i> Roxb.	Meliaceae	Lali	M	E	Antibacterial, antioxidant; timber
Shrub						
70	<i>Clerodendrum glandulosum</i> Lindl.	Lamiaceae	Nephaphu	M	-	High blood pressure, hypertension
71	<i>Clerodendrum infortunatum</i> L.	Lamiaceae	Dhapatphool	M	E	Skin diseases, bee's sting; roots used for fermenting liquor
72	<i>Clerodendrum japonicum</i> (Thunb.) Sweet	Lamiaceae	Dhapattita	M	E	Febrile and catarrhal affection; leaves edible
73	<i>Croton joufra</i> Roxb.	Euphorbiaceae	Mahudi	M	-	Skin diseases, anticancer, antioxidant
74	<i>Dendrocnide sinuata</i> (Blume) Chew	Urticaceae	Churaat	M	-	Jaundice, urogenital disorder, toothache, dysentery
75	<i>Grewia multiflora</i> Juss.	Malvaceae	Kukurhuta	M	E	Dysentery, fruit edible, lac insect reared on this plant
76	<i>Ixora acuminata</i> Roxb.	Rubiaceae	Borpotia	M	-	Jaundice
77	<i>Lantana camara</i> L. var. <i>aculeata</i> (L.) Mold.	Verbenaceae	Bon baahaar	M	E	Tetanus; insect repellent
78	<i>Leea indica</i> (Burm.f.) Merr.	Vitaceae	Kukurathengia	M	E	Digestive disorders; fruit edible, dye
79	<i>Melastoma malabathricum</i> L.	Melastomataceae	Phutuka	M	E	Cuts, wounds, tooth and gum diseases; fruit edible, stem used as toothbrush
80	<i>Mussaenda frondosa</i> L.	Rubiaceae	Chubaiata	M	-	Jaundice, ulcer, fever, wounds, asthma
81	<i>Pandanus odorifer</i> (Forssk.) Kuntze	Pandanaceae	Keyakothal	M	-	Pneumonia

82	<i>Phlogacanthus thyrsoformis</i> (Roxb. ex Hardw.) Mabb.	Acanthaceae	Titaphool	M	E	Cough, fever, abdominal pain; flowers edible
83	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Sarpagandha	M	-	Snake bite, insomnia, stomach ache
84	<i>Syzygium fruticosum</i> DC.	Myrtaceae	Katahijamuk	M	-	Blood dysentery
85	<i>Viburnum colebrookeanum</i> Wall.	Caprifoliaceae	Mezenga	M	-	Sores
86	<i>Ziziphus funiculosa</i> Buch.-Ham.	Rhamnaceae	Bonbogori	-	E	Fruits edible
Herb						
87	<i>Abrus precatorius</i> L.	Papilionaceae	Latumoni	M	-	Abortifacient, induce sterility in women
88	<i>Ageratum conyzoides</i> L.	Asteraceae	Gendheli bon	M	-	Cuts, wounds, jaundice
89	<i>Alocasia forniculata</i> (Roxb.) Schott.	Araceae	Adoliakochu	M	-	Crack of heels
90	<i>Alpinia nigra</i> (Gaertn.) Burt.	Zingiberaceae	Tora/Bogitora	M	-	Bone weakness, irregular menstruation
91	<i>Begonia roxburghii</i> A. DC.	Begoniaceae	Begonia tenga	M	-	Skin diseases
92	<i>Cheilocostus speciosus</i> (J.König) C.Specht	Costaceae	Jamlakhuti	M	-	Jaundice, insect bite
93	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.	Asteraceae	Germany bon	M	-	Cuts, wounds
94	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Poaceae	Bonguti	M	-	Arthritis, rheumatism,antidote (sting)
95	<i>Cissampelos pareira</i> L.	Menispermaceae	Tubukilata	M	-	Fever, headache
96	<i>Commelina benghalensis</i> L.	Commelinaceae	Kanasimolu	M	E	Snake bite, leprosy, skin inflammations; fodder
97	<i>Curcuma aromatica</i> Salisb.	Zingiberaceae	Bonhaladi	M	-	Blood purification, constipation
98	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Raghumala	M	-	Induce sterility in women, purgative, veterinary medicine
99	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Dubori bon	M	-	Headache, irregular menstruation, tonic
100	<i>Cyperus rotundus</i> L.	Cyperaceae	Keyabon	M	-	Stomach ache, purgative
101	<i>Dicranopteris linearis</i> (Burm.f.) Underw.	Gleicheniaceae	Kap-dhekia	M	E	Indigestion, asthma, women's sterility, fever, anticancer; vascular bundles from the stalks woven to make products
102	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Aalulata	M	-	Dysentery, indigestion
103	<i>Diplazium esculentum</i> (Retz.) Sw.	Woodsiaceae	Dhekiasak	M	E	Constipation, young fronds edible
104	<i>Eleusine indica</i> Gaertn.	Poaceae	Bobosabon	M	-	Post partum aidto mother, effective in fracture of bones of hen and duck
105	<i>Emilia sonchifolia</i> DC.	Asteraceae	Bonkopahua	M	-	Eye inflammation, febrifuge
106	<i>Eragrostis unioides</i> Nees ex Steud.	Poaceae	-	M	-	Asthma, wounds
107	<i>Evolvulus nummularius</i> L.	Convolvulaceae	-	M	-	Burns, cuts, wounds
108	<i>Floscopa scandens</i> Lour.	Commelinaceae	-	M	-	Sore eyes, fractured bone
109	<i>Gonostegia hirta</i> (Blume ex Hassk.) Miq.	Urticaceae	Sialkotahi	-	E	Roots are used as hair wash, stem and leaves edible

110	<i>Hodgsonia macrocarpa</i> (Bl.) Cogn.	Cucurbitaceae	Thebou	M	E	Antifertility; seed kernels edible, silk worms are fed on the leaves
111	<i>Homalomena aromatica</i> (Spreng.) Schott	Araceae	Gankochu	M	E	Liver and kidney disorder; essential oil
112	<i>Impatiens balsamina</i> L.	Balsaminaceae	Demdeuka	M	-	Fever, sterility
113	<i>Lasia spinosa</i> Thw.	Araceae	Chengmora	M	-	Piles, sore throat, irregular menstruation
114	<i>Leuca splukenetii</i> Spreng.	Lamiaceae	Durun	M	E	Piles, tonsillitis, stomach trouble, nasal haemorrhage; young shoots edible
115	<i>Lindernia crustacea</i> (L.) F. Muell.	Linderniaceae	Kaachidoria	M	-	Diabetes, dysentery, boils, ringworm infection
116	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Onagraceae	Longbon	M	-	Fever, dysentery, jaundice, cancer
117	<i>Lygodium microphyllum</i> (Cav.) R.Br.	Schizaeaceae	Kopoudhekia	M	E	Dysentery, skin diseases; basket making and plaiting from old stems, young stems edible
118	<i>Mikania scandens</i> (L.) Willd.	Asteraceae	-	M	-	Antifungal
119	<i>Millettia pachycarpa</i> Benth.	Papilionaceae	Bokolbihlata	M	E	Skin infection; fish poison
120	<i>Mimosa pudica</i> L.	Mimosaceae	Nilajibon	M	-	Toothache, skin diseases, piles, boils
121	<i>Murdannia nudiflora</i> (L.) Brenan	Commelinaceae	-	M	-	Asthma, leprosy, piles
122	<i>Oxalis debilis</i> var. <i>corymbosa</i> (DC.) Lour.	Oxalidaceae	Bor-tengechi	M	-	Dysentery
123	<i>Paederia scandens</i> (Lour.) Merr.	Rubiaceae	Bhedailata	M	-	Diarrhoea, dysentery, rheumatism
124	<i>Persicaria barbata</i> (L.) H. Hara	Polygonaceae	-	M	-	Ulcer, purgative, tonic
125	<i>Phrynium pubinerve</i> Bl.	Marantaceae	Koupat	M	-	Skin diseases, boils, leprosy
126	<i>Phyllanthus fraternus</i> Webster	Phyllanthaceae	Bon aamlokhi	M	-	Dysentery, urinary trouble
127	<i>Piper longum</i> L.	Piperaceae	Pipoli	M	E	Cough, cold, loss of appetite; condiment
128	<i>Piper thomsonii</i> (C. DC.) Hook.f.	Piperaceae	Auni pan	M	E	Cough, cold; leaves chewed raw
129	<i>Polygonum microcephalum</i> D. Don	Polygonaceae	Madhuxuleng	M	-	Dysentery
130	<i>Pteris ensiformis</i> Burm. f.	Pteridaceae	-	M	E	Dysentery; tender frond edible
131	<i>Rhynchochotum ellipticum</i> (Wall. ex D. Dietr.) A. DC.	Gesneriaceae	-	M	E	Cough, boils; edible
132	<i>Scoparia dulcis</i> L.	Plantaginaceae	Bondhania	M	-	Cough, bronchitis, kidney trouble
133	<i>Sida cordifolia</i> L.	Malvaceae	Hunborial	M	E	Post delivery trouble; yields fibre
134	<i>Smilax perfoliata</i> Lour.	Smilacaceae	Baaghaasuralata	M	-	Wounds
135	<i>Solanum ferox</i> L.	Solanaceae	Katahibegena	M	-	Appetizer, antiasthmatic
136	<i>Spilanthes paniculata</i> Wall. ex DC.	Asteraceae	Suhoni	M	-	Cough, toothache, constipation
137	<i>Stenochlaena palustris</i> (Burm. f.) Bedd.	Blechnaceae	Dhekialata	M	E	Fever, skin diseases; tender shoots edible, rhizomes used in binding fish traps, anchor ropes, making baskets

138	<i>Tetracera sarmentosa</i> (L.) Vahl	Dilleniaceae	Oulata	-	E	Leaves used as substitute for sand paper for polishing, stem gives copious and potable water when cut
139	<i>Tetrastigma thomsonianum</i> Planch.	Vitaceae	Naltenga	-	E	Tender stem edible
140	<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Hoguni lot	M	-	Gonorrhoea
141	<i>Uncaria sessilifructus</i> Roxb.	Rubiaceae	Barakhialata	M		Nervous disorder, hypertension
142	<i>Urena lobata</i> L.	Malvaceae	Hunborolua	M	E	Diuretic, dysentery, rheumatism; yields fibre, stem & branches used as tooth brush
143	<i>Vitis planicaulis</i> Hook. f.	Vitaceae	Panilata	M	-	Fever, sore throat
144	<i>Zingiber purpureum</i> Rosc.	Zingiberaceae	Bon aada	M	-	Sprain, inflammation, paralysis
Liana						
145	<i>Byttneria aspera</i> Collebr. ex Wall.	Malvaceae	Tikonibarualata	M	E	Fever; young parts and bark used as hair wash
146	<i>Combretum roxburghii</i> Spreng.	Combretaceae	Lotachali	-	E	Bark chewed with/as betel nut
147	<i>Connarus paniculatus</i> Roxb.	Connaraceae	Makoilata	-	E	Oil (soap making)
148	<i>Dalbergia pinnata</i> (Lour.) Prain	Papilionaceae	Laalengsali	-	E	Bark chewed with betel leaf
149	<i>Uvaria macrophylla</i> Roxb.	Annonaceae	-	-	E	Ripe carpels edible
Bamboo, cane and palm						
150	<i>Bambusa pallida</i> Munro	Poaceae	Bijulibaah	-	E	Edible young shoots, culms for making hut, baskets, mats etc.
151	<i>Calamus erectus</i> Roxb.	Arecaceae	Jeng bet	M	E	Antidiabetic, antioxidant, dyspepsia; leaves for roofing materials, cane, etc.
152	<i>Calamus flagellum</i> Griff. ex Mart.	Arecaceae	Raaidang bet	-	E	Cane is used for various purposes
153	<i>Calamus floribundus</i> var. <i>depauperatus</i> Becc.	Arecaceae	Lejaai bet	-	E	Fruits edible, stem for making basket
154	<i>Calamus tenuis</i> Roxb.	Arecaceae	Jati bet	-	E	Cane is used for various purposes
155	<i>Pinanga gracilis</i> Bl.	Arecaceae	GerukaTamul	-	E	Fruits used as substitute of betel nut
156	<i>Pseudostachyum polymorphum</i> Munro	Poaceae	Bojaalbaah	-	E	The rhizomes are used for weaving sieves for selecting young fish, the culms are split for weaving fences, etc.
157	<i>Schizostachyum dullooa</i> (Gamble) R. B. Majumder	Poaceae	Dolubaah	-	E	Fencing, roofing, making baskets, mats, small boxes, etc.

Note: M, Medicinal; E, Economical; Ver. name, Vernacular name in Assamese.

economic condition of the local inhabitants residing in and around the sanctuary. Local people utilized various plant resources in terms of medicine, timber and NTFP like, firewood, resin, gum, oil, dye, wild edibles, etc. The ethnobotanical importance of the various plant species enumerated in this sanctuary has been well documented by several workers (Kanjilal & Bor 2005, Purkayastha *et al.* 2005, Purkayastha & Nath 2006, Patiri & Borah 2007, Das *et al.* 2008, Barbhuiya *et al.* 2009, Nath *et al.* 2010, Barukial & Sarmah 2011, Sarkar & Devi 2014b, Dutta *et al.* 2016) from different areas of the state. Plant species like *Dillenia indica*, *Macaranga denticulata*, *Terminalia chebula*, *Clerodendrum infortunatum*, *Phlogacanthus thyrsoformis*, *Cheilocostus speciosus*, *Cissampelos pareira*, *Commelina benghalensis*, *Paederia scandens*, *Phyllanthus fraternus*, etc. are well known to cure common health ailments such as fever, cough, cold, skin diseases and dysentery. Timber yielding species included trees such as *Albizia lebbek*, *Dipterocarpus retusus*, *Magnolia hookeri*, *Premna bengalensis*, etc. Few NTFP yielding species recorded from the study area includes *Aquilaria malaccensis* (resin/oil/highly scented wood), *Canarium bengalense* (resin), *Morinda angustifolia* (dye yielding stem and root), *Melastoma malabathricum* (stem and edible fruits), *Diplazium esculentum* (edible young and tender shoot), *Connarus paniculatus* (oil), *Pinanga gracilis* (edible fruits), *Schizostachyum dullooa* (bamboo), *Calamus floribundus* (cane), etc. A critically endangered and dominant tree of the study site (Sarkar & Devi 2015), *Vatica lanceaefolia*, is a multipurpose plant species and was found to be collected frequently by the fringe people for fuel-wood. This critically endangered multipurpose tree species yields good quality firewood, resin as well as medicine. *Calamus floribundus* var. *depauperatus* is threatened to the northeastern region of India (Basu 1992) which is used for furniture. *Artocarpus chaplasha* and *Ficus lepidosa* are dominant food tree species of the *H. hoolock* inhabited in the sanctuary and contributed about 10–11 % to their annual diet (Borah 2016).

Anthropogenic activities like illegal felling (*personal observation during study period*) can exert disturbance to the survival and existence of these important species, and their structure and composition in the sanctuary. Illegal activities like tree felling have also been reported in the study area by other workers like Chakraborty & Gupta (2005) and Sharma *et al.* (2010). If such interference continues or increases in future, it may pose a serious threat to the existence of the plant species diversity in this region. Nevertheless, quantification of the degree of disturbance exerted by biotic or abiotic factors is always necessary to understand the pressure and consequent effect on plant species richness and diversity of a particular area. Quantification of such parameters is also very essential for wise management of resources and to formulate conservation strategies accordingly.

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