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Wild edible and Fodders plants of Hojai, Hawaipur and Komorakata reserve forest of Hojai District, Assam, India.

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Abstract

Anthropogenic pressure and urbanization are leading to decline in forest cover, biodiversity and biological sustainability. Present study was conducted in Hojai, Hawaipur and Komorakata Reserve Forests of Hojai vicinity. Present study indicates the wild edible plants (WEP) and its diversity through ethnobotanical study among different local ethnic peoples. Data was collected through field visit and information gathered from the ethnic groups of nearby areas. The study recorded 72 wild food plants belonging to 58 genera and 43 families including two fern species. The plants exhibited diverse habit-groups with herbs 43 %, trees 24 %, climbers 3 %, shrubs 19% and aquatic herbs 8 %. The study area is contiguous and falling under the elephant reserves. It will contribute towards biodiversity food source of wild animals also. Ethnobotanical study of wild food plants can lead to the conservation status and importance.

Keywords: Hojai, Hawaipur, Komorakata, Reserve Forest, wild food plants, Wild Edible Plants (WEP).

Introduction

Forest food plants is the of virgin source of nutrition for man and animal both. From time immemorial, people depend upon forest products to meet their household and domestic purposes. From the knowledges of ethnobotany of various ethnic groups, importance of various plant species can be evaluated. This study area is also connected with few ethnic groups and other people in nearby areas. Since the area is within the elephant reserve, it is very much important to conserve the wild edible plants for all.

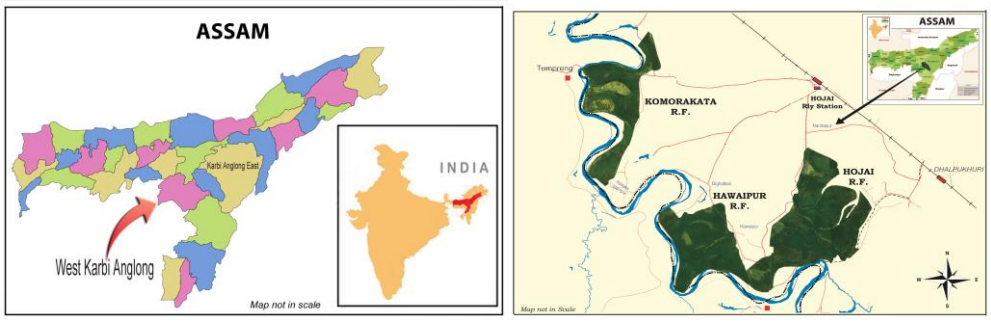

Figure 1 : Location Map of Study Area in Hojai District of Assam.

Present study area consists of three reserve forests and they are continuous along a major river Kopili and intersected by few revenue villages. The three R.F. are Hojai (H. RF), Hawaipur (HW R.F.) and Komorakata reserve forest (K. RF) located in the middle of Hojai district of Assam (**Figure 1**). Hojai & Hawaipur R.F. are continuous and Komorakata R.F. is

located apart from other two. These reserve forests are situated between the geographical limit of longitude 92^0452 - 93^0152 E and latitude 25^0452 -26^0152 N. The total area covered by three RF are 948.2 hac. at 76 m msl and 496.29 hac at 65 m msl, respectively. Climatic condition of the study sites is broadly characterized in three seasons: cool-dry winter (November to February), dry-summer period (March to April) and hot-rainy summer (May to October).

About 20 villages belonging to five ethnic groups namely Karbi, Dimasa, Manipuri, Nepali, Adivasi and others are located alongthe fringe areas. Floristic information of this area has not been assessed earlier. Therefore, the documentation of dietary uses of wild plants among different ethnic groups is attempted. The present study will also contributes the biodiversity status of the area.

The forest is mainly mixed semievergreen type. A large area is planted with monotype *Shorea robusta* L. and *Tectona grandis* L. *Trewia nudiflora* L. Some areas are affected with seasonal flood. Few permanent water bodies are also found inside the forest in which aquatic flora found frequently.

Methodology

Field study was undertaken during April 2023 to February 2024 to find all the plant habits of herb, shrub and trees along with climbers. Specimens are collected during field study with its flowering & fruiting stages. Herbarium specimens are prepared by standard methods (Jain & Rao, 1977). Then, herbarium specimens are kept in the departmental herbarium. Specimens are identified through proper observation and consulting the literature of Flora of Assam (Kanjilal et.al, 1940), Flora of British India (Hooker, 1897) and few notable literatures. Virtual herbarium of BSI, Shillong, CNH, Kolkata and POWO, Kew were checked for correct identification and proper nomenclature.

Data of plants and parts uses is collected through interactions and household surveys in the fringe villages. Random visit was made to the 20 villages around the study area to obtain the information by using structured questionnaire, personal interactions upon focused group. The dietary application of plants is recorded from the focused group. In this case, elderly people and women are more knowledgeable. During the study, distribution and community forest of plant is also observed. Digital photographs of important species are taken by using Digital Camera (Nikon D8300 Make: Nikon Corp. Japan).

Result and Discussion

The present study has revealed rich diversity of the WEPs and associated traditional knowledge of the villagers. Study recorded a total of 72 species belonging to 58 genera and 43 plant families along with 2 fern species *Amblovenatum opulentum* (Kaulf.) Fosberg and *Diplazium esculentum* (Retz.) SW used as food plants and others uses (**Table 1**). The family Rutaceae (6) had the highest representation of edible plants followed by Solanaceae & Caesalpinaceae (4), Acanthaceae, Asteraceae, Rubiaceae & Zingiberaceae (3). Other families were represented by 2 or 1 plants each. Most of the WEPs are herbaceous 43% followed by trees 24%, shrub 19%, aquatic herbs 8% and climbers and fern 2% each. The species

recorded from present study area were also seems to reported to used by other ethnic communities as various purposes in their own locations (Kar and Borthakur, 2007; Medhi and Borthakur, 2014; Mipun et al., 2019; Patiri et al., 2007).

Table – 1 Wild Edible and Fodder plants and their uses of Hojai, Hawaipur and Komorakata Reserve Forest of Assam

Botanical Name With family	Habit	Local Name	Parts used	Common uses	Other uses
Acalypha indica L. [Euphorbiaceae]	Herb	Bisohori (As.)	leaves, juice		medicinal
Adhatoda vasica Nees. [Acanthaceae]	Shrub	Bahak Tita (As.)	flowers		
Aegle marmelos (L.) Correa [Rutaceae]	Tree	Bel (As.)	Fruit Juice	used for stomach problems	worshiping
Alpinia nigra (Gaertner) Burtt [Zingiberaceae]	Aq. Herb		tender shoot	vegetables	wrapping of foods
Alternanthera philoxeroides (Martius) Grisebach [Amaranthaceae]	Herb	Helosi (As.)	tender shoots, leaf		ethnoveterinary medicinal
Alternanthera sessiles (L.) R.Br. [Amaranthaceae]	Herb	Khutura (As.)	tender shoots, leaf		medicinal
Amorphophallus paeoniifolius Dennst. [Araceae]	Herb	Ol kochu (As.)	Corm, peduncle and inflorescence	eaten cooked as vegetable.	
Andrographis paniculata (Burm.f.) Wall. Ex Nees [Acanthaceae]	Herb	Chirota (As.)	whole plant		medicinal
*Argemone maxicana*Linn. [Fumariaceae]	Herb	Sial kata (As.)	latex, fruit		medicinal
*Artocarpus chaplasha*Roxb [Moraceae].	Tree	Sam Kothal (As.)	fruit		
*Axonopus compressus*Sw. [Poaceae]	Herb		leaves		fodder grass
Azadirachta indica A. Juss [Meliaceae].	Tree	Neem (As.)	leaves	vegetable	medicinal
*Bauhinia variegata*L. [Caesalpinaceae]	Tree	Kanchan (As.)	flower petals		fodder, fuel
Calotropis gigantia (L.) Dryander. [Asclepiadaceae]	Shrub	Akon (As.)	leaves		medicinal
Cassia occidentalis L. [Caesalpiniaceae]	Herb	Medeluwa (As.)	leaves, root, bark		medicinal
Cassia sophera Linn. [Caesalpiniaceae]	Herb	Medeluwa (As.)	leaves, root, bark		medicinal
Cassia tora Linn. [Caesalpiniaceae]	Herb	Bilokhoni (As.)	leaves, root		medicinal
Centella asiatica L. [Apiaceae]	Herb	Manimuni (As.)	leaves	vegetable	medicinal
Cissampelos pareira L. [Menispermaceae]	Herb	Goria lota (As.)	root		medicinal
Citrus maxima Linn. [Rutaceae]	Tree	Tenga (As.)	fruit		medicinal
*Citrus medica*Linn. [Rutaceae]	Shrub	Jora tenga (As.)	fruit		medicinal
Clerodendrum	Shrub	Nephaphoo	young shoot		medicinal

colebrookeanum Walp. [Verbenaceae]		(As.)			
Clerodendrum infortunatum L. [Verbenaceae]	Shrub	Bhet tita (As.)	young shoot		medicinal
Colocasia esculenta Linn. [Araceae]	Herb	Kochu (As.)	whole plant	vegetable	pig food
Commelina benghalensis Linn. [Commelinaceae]	Herb	Kona simolu (As.)	tender shoot		fodder
*Curcuma amada*Roxb. [Zingiberaceae]	Herb	Am ada (As.)	rhizome	eaten cooked or raw	
Curcuma aromatica Salisb. [Zingiberaceae]	Herb	Keturi (As.)	rhizome		medicinal
Datura fastuosa L [Solanaceae]	Shrub	Kola Dhatura (As.)	fruit	edible	medicinal
Datura stromonium L [Solanaceae]	Shrub	Boga Dhatura (As.)	fruit	edible	medicinal
*Dillenia indica*Linn. [Dilleniaceae]	Tree	Outenga (As.), Pumplung (Karbi)		vegetable	medicinal
*Dillenia pentagyna*Roxb . [Dilleniaceae]	Tree	Okshi, Chirimpi (Karbi)	flowers, fruit and fleshy calyx are eaten as vegetables.		
Dioscorea alata L. [Dioscoreaceae]	Climber	Kath alu (As.)	tuber, leaves	fodder	
Dioscorea bulbifera L.[Dioscoreaceae]	Climber	Goch alu (As.)	tuber	edible	
Diplazium esculantum (Retz.) SW. [Dryopteridaceae]	Fern	Dhekia (As.)	leaves	vegetable	
Eclipta prostrata (L.) L. [Asteraceae]	Herb	Kehraj (As.)	young shoot	vegetable	
Enhydra fluctuans Lour. [Asteraceae]	Aq. Herb	Helosi (As.)	tender leaves and shoots	vegetable	
Euphorbia hirta Linn. [Euphorbiaceae]	Herb	Gakhiroti bon	leaves	mixed with other vegetables	
Ficus glomerata Roxb. [Moraceae]	Tree	Dimoru (As.)	ripen fruits	edible	
Glycomis pentaphylla Corr. [Rutaceae]	Shrub	Tolotha poka (As.)	ripen fruits	edible	
Hellenia speciosa (J.Koenig) S.R.Dutta [Costaceae]	Herbs	Jom lakhuti	tender shoot	vegetable	
Ipomoea aquatica Forssk. [Convolvulaceae]	Aq. Herb	Kalmou (AS.)	tender leaves	vegetable	
Lassia spinosa (L.) Thwaites [Aeaceae]	Herb		leaves	vegetable	
Leucas aspera Link. [Lamiaceae]	Herb	Doron (As.)	leaves		medicinal
Melastoma malabathricum L. [Melastomaceae]	Shrub	Phutukola (As.)	leaves		medicinal
*Mimosa pudica*Linn.	Herb	Lajuki bon	leaves		medicinal

[Mimosaceae]		(As.)			
Monochoria hastata (L.) Solm. [Pontedariaceae]	Aq. Herb	Pani meteka (As.)	young shoots	vegetable	fodder
Moringa oleifera Lamk [Moringaceae]	Tree	Sojina (As.)	leaves, fruit	vegetable	
Murraya koenigii Spreng. [Rutaceae]	Shrub	Narasingha (As,)	leaves	vegetable	
Nymphaeae nouchali Burm. F [Nymphaeaceae]	Aq. Herb	Boga Bhet, Seluk (As.)	young shoots		medicinal
Nymphaeae rubra Burm. F [Nymphaeaceae]	Aq. Herb	Ronga bhet (As.)	root stock, seed	edible	
Oldenlandia corymbosa L. [Rubiaceae]	Herb	Bon jalik (As.)	juice of young shoots		medicinal
*Oroxylum indicum*Vent. [Bignoniaceae]	Tree	Bhatghila (As.)	fruit, bark		medicine in stomack problem
Oxalis corniculate Linn. [Oxalidaceae]	Herb	Tengesi (As.)	whole plant	vegetable	fodder
Paederia foetida Linn. [Rubiaceae]	Herb	Bhedeli lota (As.)	leaves	vegetable	medicinal
Persicaria chinensis (L.) H. Gross [Polygonaceae]	Herb	Modhu Soleng (As.)	young shoots	vegetable	
Persicaria hydropiper (L.) Delarbre [Polygonaceae]	Herb	Pothoruwa bihlongoni (As.)	whole plant		medicine in stomach problem
Phlogacanthus thyrsiflorus Nees. [Acanthaceae]	Shrub	Bahak Tita (As.)	inflorescence	vegetable	medicinal
Phyllanthus emblica L. [Euphorbiaceae]	Tree	Amlokhi (As.)	fruit		medicinal
Piper longum L. [Piperaceae]	Herb	Pipoli (As.)	fruir		medicinal
Smilax macrophylla Linn. [Smilaceae]	Herb	Hostikornala ta (As.)	leaves juice		medicine in rheumatic pain
*Solanum nigrum*Linn. [Solanaceae]	Herb	Pokmou (As.)	young shoots		medicinal
*Solanum torvum*Swart z. [Solanaceae]	Shrub	Hati bhekuri (As.)	fruit	vegetable	
Spilanthus acmella (L.) L [Asteraceae]	Herb	Piraza (As.)	young shoots	vegetable	medicinal
Syzygium cumini (L.)Skeels [Myrtaceae]	Tree	Kola Jamu (As.)	fruits	edible	
Tabernaemontana divaricata (L.) R. Br. [Apocynaceae]	Shrub	Togor (As.)	fruit pulp		dye
Tamarindus indica L. [Fabaceae]	Tree	Teteli (As.)	fruit	edible	Ayurvedic medicine
Terminalia belerica Roxb. [Combretaceae]	Tree	Bhomra (As.)	fruit	edible	Ayurvedic medicine
Terminalia chebula Retz. [Combretaceae]	Tree	Hilikha (As.)	fruit	edible	Ayurvedic medicine
Thelypteris opulenta (Kaulf.) Fosberg [Thelypteridaceae]	Fern	Bihlongoni (As.)	leaves		Insecticides
Vangueria spinosa Roxb. [Rubiaceae]	Tree	Ketkora goch (As.)	fruit, young shoot	edible	medicinal
Ziziphus jujuba Lamk. [Rhamnaceae]	Tree	Jati Bogori (As.)	berry	edible	
Ziziphus mauritiana L.	Shrub	Bogori (As.)	berry	edible	

[Rhamnaceae]					
Calotropis gigantia (L.) Dryander. [Asclepiadaceae]	Shrub	Akon (As.)	leaves		medicinal

Edible plant parts

From present findings edible parts of plant include flower, fruit, leaf, seed, frond, root, rhizome, shoot, stem, tuber or the entire plant (Table 1). It was observed that the most widely consumed part was reported to be fruit & leaf (19 sp.), followed by shoot (14 sp.), root, corm & rhizome (9 sp.), whole plant (4 sp.) flower (2 sp.) and inflorescence (2 sp.). Among all the plant parts reported, highest edible parts are fruit and leaf. Flowers and inflorescence were recorded to be the least consumed.

Mode of traditional uses

Mostly wild plant species selection of uses is almost similar to all ethnic groups. Sometimes it differs from place to place due to differences in their habitat and forest types, their tradition, culture and food habit along with the availability of the plant species in their locality. It is found that, plant parts are consumed either raw or cooked form and sometime mixed with other ingredients.

The common forest types are scrub forest, small patches of grasslands, scattered wetlands, few seasonal wetlands, regenerated forests, monotypic planted forest, natural forests.

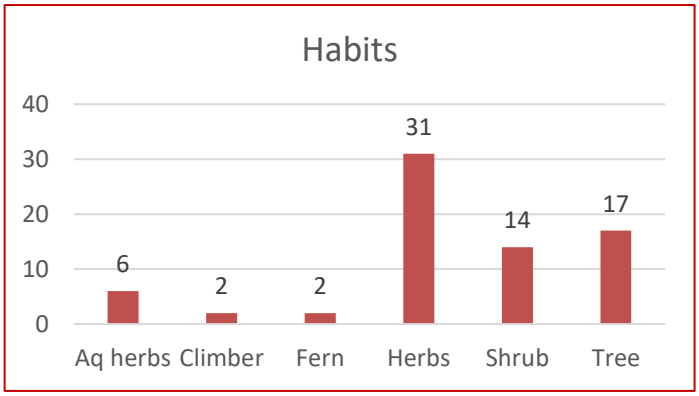

Figure 2 : Representation of Habit of plants consumed as WEP and Fodder in study area.

Conclusion

Plant based traditional knowledge provides the knowledge of wild edible plants and its utilization. It is useful by preparing a documentation of such for future database and management and practice. The ethnic practices and uses may lead to findings of various phytochemical compounds and drug sources. This study may be useful to ethnopharmacology, biotechnology, and also other branches. It also indicate the status and conservation needs of plant resources

Conservation measures

As for conservation measures, socio-economic upliftment, and community participation may be initiated among all the fringe villages. Since the area is under elephant reserve, fodder plant species should be increased by selective afforestation. Anthropogenic pressure be controlled. Restriction to the free extraction of firewood, timber,fishing and cattle rearing inside the forest is to be controlled. Moreover, community awareness and participation may be encouraged.

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