



Wild edible plant species in patch vegetations of Jorhat district, Assam, India

Dandeswar Dutta, Protul Hazarika and P. Hazarika*

Rain Forest Research Institute, Jorhat-785001, Post Box No-136, Assam, India
hazarikapaug08@gmail.com

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Abstract

Wild edible plant species and their traditional uses were studied in 32 numbers of patch vegetation of Jorhat district, Assam. A total of 119 wild edible plant species were recorded under 57 families, which includes tree, shrubs, climbers and herbs. Among them 18 and 95 plant species comes under monocots and dicots respectively. Four (4) species were recorded under Pteridophytes, whereas Gymnosperm was represented by *Gnetum genemon* only. Of the total 119 edibles plants species recorded for human consumption, 44 were trees, 19 shrubs, 12 climbers and 43 herbs. Moreover, 41 plants species were identified as birds food plant and 38 plant species for animals food and fodder. The villagers of the district use to collect the wild edible plant species from their nearest patch vegetations traditionally, among them 73 species were eaten as vegetables, 41 species as fruits, 2 species as edible seeds and nuts. Barks of 2 species were used as substitute of beetle nuts. Among these wild edibles 56 plant species were recorded for traditional medicine against different ailment.

Keywords: Patch vegetation, Wild edible plants, Medicinal plants, Birds food and fodder.

Introduction

Plant species of a particular landmass play significant role to shape the life, culture and wellbeing of human societies and prime representatives of the environment and biodiversity through ages. The different types of plants like herbs, shrubs and trees are used by human society as food, fiber, medicine, timber, construction materials, and fuel wood and also for many other socio-cultural uses. Apart from this, the plant species of the patch vegetation have a key role in maintaining biodiversity providing food, fodder and shelter to animals, bird etc. This vegetation may be considered as luxurious habitat for rare, endangered, threatened and endemic species. They also play essential role in carbon sequestration. Wild edibles are locally available plant species used by the societies based on their traditional ecological knowledge¹.

The vulnerable populations of wild edible plant species are more significantly and adversely affected by climate events². Several reports depicted that tribal communities often use wild edibles as food supplement or alternative food source during their food deficient periods of the year³⁻⁵. The wild edibles are also reported as rich sources of vitamins, enzymes, minerals and medicine for the stock of compounds in different parts of the plant^{6,7}. In a compilation published 350 species of Angiosperms and 12 species of Pteridophytes from different localities of Assam⁸. Many other researchers reported use of available resources of wild edible plants from different states of the country including the Northeast India⁹⁻¹¹.

In Assam, wide varieties of genetic resources from wild plants to cultivated crops covering most areas of the Brahmaputra

valley is a rich area of plant biodiversity. Most of the villages have some small fragmented forest area ranging from 0.3 to 0.5 hectare under personal land holdings locally called the *kathonibari* (woodland). *Kathonibari* are unique land use of the villagers and can be termed as 'patch vegetation'. These forest areas are part of original natural forests being fragmented and transformed by the villagers to homesteads.

These patch vegetations are still shelter many valuable trees, shrubs, climbers and epiphytes including a wide variety of food plants. A reasonable numbers of species are used by the people as wild food plants available in their surrounding patch vegetation. There are several reports that villagers of different communities are normally used these wild food plants, available in the forest areas, crop lands, patch vegetations, and wetlands as seasonal or traditional food^{12,13}. These wild edible plants available in the patch vegetations play a significant role in restoring health and nutritional requirements of rural community.

The villagers use the different parts of these locally available wild edible plants on basis of their indigenous knowledge and recorded 373 plant species of 109 families of 27 villages of Assam which were being domesticated from the natural forests and utilized for food, fodder, medicinal, spices, aromatic and essential oil, fibers, dyes, beverage, pesticides yielding species, timber, fuel wood, handicraft items, ornamental and aesthetic etc¹⁴.

Moreover, the nature and ecology of such patches with multi-species composition are not only unique to scenic beauty of villages but also considered as the repository of rich biodiversity

with variety of wild animals, birds, insects, soil microbial flora and fauna. Due to increase of population in rural area land use pattern found to be changed and in this context the patch vegetations are now under threat. Many of the valuable plant species of this vegetation type are disappearing with time. Therefore, it has become necessary to focus the contribution of wild edible plants of patch vegetations for health and nutrition of rural communities.

Conservation such vegetation as bioresources for the human as well as birds and other animals may also be an important area of study. Keeping in view of the role of the patch vegetation which may be an ideal habitat of wild edible plant species, this study was carried out to survey and documentation of edible plant species available in patch vegetations of Jorhat District, Assam.

Materials and methods

Study area: The study areas belong to Jorhat district, Assam and is situated between latitude 25°49' and 27°17'N and longitude 93°18' and 95°26' E in the bank of river Brahmaputra. Total area of the district is 2851 sq. km with a population of 354 persons/sq km. The dominant livelihood option of the district is agriculture with about 84.7 per cent of rural population.

The district is surrounded by Lakhimpur district towards north, Sivasagar district towards east, the state Nagaland towards south and Golaghat district towards west. The south-west monsoon is prevailing climate of the district with minimum annual temperature 9°C and maximum up to 40°C. The district is experienced with an average rainfall 2244 mm. The seasonal calendar is divided into four seasons - cold winter, pre-monsoon summer, rainy and post monsoon season. The summer temperature of the district ranges from 15°C to 28°C and the range of winter temperature is from 7°C to 18°C. The types of vegetation of the district are the tropical moist deciduous, tropical semi evergreen and a small area of tropical wet evergreen in the eastern side. The river Brahmaputra controls the watershed system of the district with some other tributaries flowing throughout its middle position and also created the River Island Majuli.

The district can be divided into three regions - the northern flood prone area widespread throughout the river bank of the Brahmaputra, the southern highland area along the foothills of Naga-patkai range and in middle the central zone. The numbers wetlands with area between 50 to 200 ha are 10 and below 50 ha are 100. The district has about 25000 ha of land under tea cultivation. Field visits were carried out to different areas of Jorhat district during April, 2014 to February 2015. Edible plant species from 32 patch vegetations in village area of the district namely Shyamdeuri, Gayangaon, Garurajbari, Karatipar, Nikinikhwa, Mekhali, Upper deuri, Nam deuri, Namgorumora, Kakolimukh, Tamulichiga, Rajabari, Jhangimukh, Sotai, Meleng, Hatigarh, Kakojan, Hologapara, Borbamchungi, Jalukoni, Balijan, Rangajan, Thangalgaon, Lahing, Boloma,

Selenghat, Pokamura, Charaibahi, Dhalajan and Chalikhowa were studied. The communities near the study patch vegetations were Ahom, Adibashi, Brahman, Chutia, Deauri, Kalita, Keot, Koch, Kaibarta, Mishing, Muslim, Thangal Kachari and some other castes. Peoples such as with cultivators and house wives and other elderly persons of each villages of the study sites were interviewed through standard questionnaire and information on the availability and conventional uses of wild edible plant resources were collected. The vernacular names of the food plants, the parts used and methods of preparation of food items were also recorded. The edible plant species were collected for preparation of herbarium and consulted the local floras for their identification^{15,16}. The collected herbaria were deposited at herbarium collection of Rain Forest Research Institute, Sotai, Jorhat, Assam.

Results and discussion

The wild edible plants recorded from patch vegetations of the district come under the broad groups Angiosperms, Gymnosperms and Pteridophytes. The data collected from different area of the district showed that all together 119 plants under 57 families were used by the villagers of different communities as wild edibles (Table-1).

The different parts of the food plants like the tender shoots, leaves, flowers, fruits, tubers and barks are widely used for edible purpose. Out of the total 119 wild edible species recorded 73 were eaten as vegetables mainly as curry or in fried form, fruits of 41 species eaten as raw or ripe, seeds of 2 species were eaten as nuts and barks of 2 species used as substitute of beetle nuts. Euphorbiaceae family showed highest edible species (7) followed by Moraceae with 6 species among the angiosperms. The families Ameranthaceae, Cluciceae and Rubiaceae have 5 edible species. Likewise, the families Arecaceae, Asteraceae, Rosaceae, Verbenaceae had 4 species and Araceae, Myrtaceae, Polygonaceae, Piperaceae, Solanaceae had 3 species. Four (4) species of pteridophytes under 3 families Blechnaceae, Marseliaceae and Woodsiaceae were recorded as edible (Table-1). The Monocotyledons and Dicotyledons were represented by 18 and 95 species respectively. The only edible gymnosperm recorded was *Gnetum gnemon*.

The vernacular names for the species, its edible parts and the other information were recorded and mentioned in the Table-1. Of the total edibles plants recorded, 44 were trees, 19 shrubs, 12 climbers and 43 herbs were found. Among the herbs, 7 species were aquatic in nature and distributed in the marshy areas of patch vegetation. In another study reported 244 species of wild edibles from different areas of Assam¹⁷. In an extensive study of published literatures it was reported that of the total plant species of the state nearly 7.34 percent are wild edibles⁴. Similar study was conducted and recorded for 101 species of edible plants of different area of Assam that have been used in *Rangali Bihu* festival¹⁸.

Table-1: Wild edible plants recorded from patch vegetations of Jorhat district, Assam.

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Alternanthera sessilis</i> (L.) R Br.	Amaranthaceae	Matikaduri	Herb	Whole plant as vegetables.	As medicine for stomach trouble	C
<i>Alternanthera philoxeroides</i> (Mart)Griseb.	Amaranthaceae	Panikaduri	Herb	Whole plant as vegetables	As fodder for cattle.	C
<i>Alpinia nigra</i> (Gaertn.) Burtt.	Zingiberaceae	Tora	Shrub	Tender leaves as vegetables.	Fruits, rhizome as medicine, leaf sheath for making ropes for cattle.	2, 5, 10, 12
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Hati khutora	Herb	Tender shoots as vegetables	As antidote to snake bite, as fodder to milk giving cows.	C
<i>Amaranthus viridis</i> L.	Amaranthaceae	Khutora	Herb	Tender shoots as vegetables.	As antidote to snake bite.	C
<i>Amorphophallus paeoniifolius</i> (Dennst) Nicolson	Araceae	Ol kachu	Herb	Corm, peduncle and inflorescence as vegetables.	The corm as medicine against piles.	C
<i>Antidesma acidum</i> Retz.	Euphorbiaceae	Abutenga	Tree	Ripe fruits as raw, tender leaves, shoot as vegetables	Leaves as medicine against snake bite.	C
<i>Antidesma bunias</i> (Linn.) Spreng.	Euphorbiaceae	Pani helos	Tree	Ripe fruits as raw.	Leaves as medicine against snake bite.	C
<i>Antidesma ghaesembilla</i> Gaertn.	Euphorbiaceae	Helos	Tree	Ripe fruits as raw.	-	C
<i>Ardisia thyrsoiflora</i> D. Don.	Myrsinaceae	Tolotha poka	Shrub	Ripe fruits as raw.	Bark as antidote to snake bite.	C
<i>Artocarpus chama</i> Buch.-Ham.	Moraceae	Sam kothal	Tree	Ripe fruits as raw.	Wood as timber for house , furniture, agricultural implements	C
<i>Artocarpus heterophyllus</i> Lamk.	Moraceae	Kothal	Tree	Ripe fruit as raw, young fruits as vegetables.	Wood as timber for furniture, house, musical instruments; leaves as fodder	C
<i>Artocarpus lacucha</i> Buch.-Ham.	Moraceae	Bohot	Tree	Bark is chewed with betel nut.	Wood as timber for house and furniture making	C
<i>Baccaurea ramiflora</i> Lour.	Euphorbiaceae	Letekoo	Tree	Ripe fruit as raw	Wood as timber for making traditional rice husking device	C
<i>Bambusa balcooa</i> Roxb.	Poaceae	Bholuka bah	Tree	Tender shoots as vegetables, pickle	Stem in house making, furniture, fencing, fire wood	C
<i>Bischofia javanica</i> Bl.	Euphorbiaceae	Uriam	Tree	Tender shoots as vegetables	Wood as timber for house making, fuel wood, bark as dye	5,10
<i>Bombex ceiba</i> L .	Bombaceae	Simalu	Tree	Flowers and unripe fruits as vegetables	Cotton from mature fruits for making mattress and pillow, wood as timber, bark as medicine, flowers as fodder, wood as minor timber.	5, 9, 10
<i>Calamus tenuis</i> Roxb.	Arecaceae	Jati bet	Climber	Tender shoots as vegetables	Stem for making furniture, household articles. Tender	C

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
					shoots as medicine for worms.	
<i>Callicarpa arborea</i> Roxb.	Verbenaceae	Bonmola	Tree	Bark as substitute of betel nut	Leaves, barks as medicine against mouth diseases.	2,12
<i>Carallia lucida</i> Roxb.	Rhizophoraceae	Mahithekara	Tree	Ripe fruits as raw	Wood as timber for making traditional rice husking implement, house making, fire-wood.	C
<i>Caryata urens</i> L.	Arecaceae	Sewa	Tree	Seeds as raw	Stem as water channels in traditional houses. Seed pericarp is use for asthma	C
<i>Cassia fistula</i> L.	Caesalpiniaceae	Sonaru	Tree	Pulp of fruit as raw	Wood as timber in house construction; pulp from fruit medicine for liver trouble, piles.	C
<i>Centella asiatica</i> (L.) Urban.	Apiaceae	Manimuni	Herb	Leaves, young shoots as vegetables	Whole plant as medicine for stomach trouble.	C
<i>Chrysophyllum lanceolatum</i> (Bl.) DC.	Sapotaceae	Bonpitha	Tree	Ripe fruits as raw	Wood as timber for house construction, furniture making.	C
<i>Citrus medica</i> L.	Rutaceae	Joratenga	Shrub	Mesocarp, juice of fruit as raw	-	C
<i>Clerodendrum glandulosum</i> Coleb.ex Wall.	Verbenaceae	Nefafoo	Shrub	Tender leaves, shoots as vegetables.	Leaves as medicine against blood pressure.	C
<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Belipoka	Climber	Fruits as raw or ripe	-	C
<i>Colocasia esculanta</i> (L.) Schoot.	Araceae	Panikachu	Herb	Tender leaves, petiole as vegetables	Whole plant as fodder.	C
<i>Commelina benghalensis</i> L.	Commelinaceae	Konasimolu	Herb	Tender shoots as vegetables	Latex from stem applied in eye disease.	C
<i>Costus speciosus</i> (Koen ex Retz.) Sm.	Costaceae	Jomlakhuti	Herb	Young shoots as vegetables, stem as raw	Rhizome as medicine against jaundice.	2
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	Astereceae	Bon kopahi	Herb	Leaves, tender shoot as vegetables	-	C
<i>Deeringia amaranthiodes</i> (Lamk) Meer.	Amaranthaceae	Methokthoka	Climber	Tender leaves, twigs as vegetables	-	C
<i>Dendrocalamus hamiltonii</i> Nee and Arn.	Poaceae	Kakobah	Tree	Young shoots as vegetables	Stem in house making, furniture, fencing and fire wood.	C
<i>Dillenia indica</i> L.	Dilleniaceae	Outenga	Tree	Fleshy sepals as vegetables, pickles	Fire wood, pulp of fruits in hair wash.	C
<i>Dioscorea bulbifera</i> L.	Dioscoriaceae	Gothia alu	Climber	Tubers as vegetables	Tuber as medicine for piles, dysentery.	C
<i>Dioscorea pentaphylla</i> L.	Dioscoriaceae	Pasoptia alu	Climber	Tuber as vegetables	Tuber as medicine for piles, dysentery.	C

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Diplazium asperum</i> Bl.	Woodsiaceae	Dhekiasak	Herb	Tender leaves as vegetables	-	C
<i>Diplazium esculentum</i> (Retz.) Sw.	Woodsiaceae	Dhekiasak	Herb	Tender leaves as vegetables	-	C
<i>Duchesnea indica</i> (Andr.) Focke.	Rosaceae	Goru khis	Herb	Ripe fruits are eaten as raw	Fodder for cattle.	C
<i>Drymaria diandra</i> Bl.	Caryophyllaceae	Laijabori	Herb	Tender leaves, shoots as vegetables	The whole plant as medicine for stomach, nasal problems.	C
<i>Eclipta alba</i> L.	Asteraceae	Kehraj	Herb	Tender leaves as vegetables	The inflorescence as medicine for wounds inside mouth, liver.	C
<i>Elaeocarpus floribundus</i> Bl.	Elaeocarpaceae	Jalpai	Tree	Ripe fruits as jams, pickles	Fire wood.	C
<i>Ficus auriculata</i> Lour.	Moraceae	Mou dimoru	Tree	Ripe fruits as raw	Fire wood.	5, 10
<i>Ficus hispida</i> Vahl	Moraceae	Katjia dimoru	Tree	Tender leaves and shoots as vegetable	Fire wood, Leaves as fodder for cattle.	5,10
<i>Ficus racemosa</i> L.	Moraceae	Mou dimoru	Tree	Ripe fruits as raw	Fire wood.	C
<i>Flacourtia jangomas</i> (Lour.) Raeusch.	Flacourtiaceae	Ponial	Tree	Ripe fruits as jams and pickles	Wood for making handles for household and agricultural implements.	C
<i>Garcinia pedunculata</i> Roxb.	Cluciaceae	Borthekara	Large tree	Flashy fruits as raw, acidifying agent for curry, pickles	As timber for house making, traditional rice husking implements, fire wood.	C
<i>Garcinia cowa</i> Roxb.	Cluciaceae	Kuji thekara	Tree	Ripe fruits as raw and dry	Wood as timber for making traditional houses, sliced dry fruits as medicine for stomach trouble.	C
<i>Garcinia kydia</i> Roxb.	Cluciaceae	Kuji thekara	Tree	Ripe fruits as raw and dry	Wood as timber for making traditional houses, sliced dry fruits as medicine for stomach trouble.	C
<i>Garcinia sopsopia</i> (Buch.-Ham.) Mabblerley.	Cluciaceae	Sosopatenga	Tree	Ripe fruits as raw or unripe fruits as pickles	Wood as timber for making traditional houses	C
<i>Garcinia xanthochymus</i> Hk.f.	Cluciaceae	Teportenga	Tree	Ripe fruits as raw or cooked with other vegetables.	Wood as timber for making traditional rice husking implement, latex from bark for preparation of dye	C
<i>Glycosmis arborea</i> (Roxb.) Corr.	Rutaceae	Sauldhua	Shrub	Ripe fruits as raw.	Bark as medicine in pneumonia	C
<i>Gnetum gnemon</i> L.	Gnetaceae	Majarguti	Shrub	Tender leaves shoots as vegetables, ripe fruits as raw	-	12
<i>Grewia sapida</i> Roxb.	Tiliaceae	Soura	Shrub	Ripe fruit as raw.	Extract from fruits for hair wash, leaves as fodder	2

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Hedyotis diffusa</i> Willd.	Rubiaceae	Bonjaluk	Herb	Leaves, tender shoots, flowers as vegetables	The whole plant as medicine for stomach trouble	C
<i>Houttuynia cordata</i> Thunb.	Saururaceae	Moshundari	Herb	Young plant as vegetables.	The whole plant as medicine for stomach trouble, Dysentery	C
<i>Hydrocotyle sibthorpioides</i> Lamk.	Apiaceae	Soru manimuni	Herb	Young plant as vegetables.	The whole plant as medicine for stomach trouble	C
<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Kalmou	Herb	Tender shoots as vegetables.	Juice made from the plant as medicine for jaundice, urinary trouble	C
<i>Kaempferia galanga</i> L.	Zingiberaceae	Gathion	Shrub	Leaves as raw vegetables.	Rhizome in marriage functions	4
<i>Lasia spinosa</i> (L.) Thw.	Araceae	Sengmora	Herb	Tender leaves with petiole as vegetables.	Leaves and roots as medicine for piles, menstrual problems	C
<i>Leucas plukenetii</i> (Roth.) Spreng.	Lamiaceae	Durun	Herb	Tender shoots and leaves as vegetables.	Leaves as appetizer, stomach trouble, flower with honey to cure cough	C
<i>Licuala peltata</i> Roxb.	Arecaceae	Jengu	Herb	Fruits as raw.	Leaves in making traditional umbrella (<i>japi</i>)	C
<i>Livistonia jenkinsiana</i> Griff	Arecaceae	Tokow	Tree	Seed as raw.	Leaves as material for roofing, making traditional umbrella (<i>Japi</i>), fans. Stem in house making	C
<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Tree	Ripe fruits as raw, premature fruits as pickle	Wood for house making, furniture, other parts as fuel wood	C
<i>Marselia quadrifolia</i> L.	Marseliaceae	Pani tengeshi	Herb	Tender shoot, leaves as vegetable	-	9,10
<i>Melastoma malabathricum</i> L.	Melastomaceae	Phutkala	Shrub	Ripe fruits as raw	As fire wood	C
<i>Meyna spinosa</i> Roxb.	Rubiaceae	Kotkora	Tree	Ripe fruits as raw	Young shoots as medicine for amoebic dysentery	C
<i>Monochoria hastata</i> (L.) Solms.	Pontederiaceae	Sorumetaka	Herb	Inflorescence as vegetable	Roots as medicine for stomach trouble, toothache	C
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Norosingho	Shrub	Leaves as vegetable	Leaves as medicine for stomach trouble, vomiting	C
<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Podum	Herb	Root stock as vegetable, young seed as raw	Leaves as medicine in fever, roots for stomach trouble	C
<i>Neolamerckia cadamba</i> (Roxb) Bosser	Rubiaceae	Kadam	Tree	Recepticular head as vegetable	Wood as timber	C
<i>Nymphaea nouchali</i> Burm. f.	Nympheaceae	Bhat	Herb	Root stock, pedicle as vegetable, seed as raw	Powdered roots as medicine for diarrhea, piles and skin diseases	C

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Nymphaea pubescens</i> Willd.	Nymphaeaceae	Bhat	Herb	Root stock, pedicle as vegetable, seed as raw	Powdered roots as medicine for diarrhea, piles and skin diseases	C
<i>Hedyotis diffusa</i> Willd.	Rubiaceae	Bonjaluk	Herb	Leaves, tender shoots, flowers as vegetable	The whole plant as medicine for stomach trouble	C
<i>Oroxylum indicum</i> (L.) Vent.	Bignoniaceae	Bhatghila	Tree	Tender leaves, shoot, flowers as vegetable	Bark as medicine for stomach trouble, dysentery	C
<i>Oxalis corniculata</i> L.	Oxalidaceae	Sorutengacha	Herb	Whole plant as acidifying agent	Extract from the plant as medicine for dysentery, appetizer	C
<i>Paederia foetida</i> L.	Rubiaceae	Bhadai lota	Climber	Tender shoots, leaves as vegetable	Leaves as medicine for stomach trouble, kidney, appetizer	C
<i>Paederia scandens</i> (Lour.) Merr.	Rubiaceae	Bhadai lota	Climber	Tender shoots, leaves as vegetable	Leaves as medicine for stomach trouble, kidney, appetizer	C
<i>Phlogocanthus thyriformis</i> (Hardow.) Mabb.	Acanthaceae	Titaphul	Shrub	Flower as vegetable	Flowers and leaves as medicine for worm, cough, asthma.	C
<i>Phlogocanthus tubiflorus</i> Nees.	Acanthaceae	Titaphul	Shrub	Flower as vegetable	Flowers and leaves as medicine for worm, cough, asthma.	C
<i>Phyllanthus fraternus</i> Webster.	Euphorbiaceae	Bonamlakhi	Herb	Whole plant as vegetable	Juice of young shoots as medicine for dysentery, jaundice.	C
<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	Matiamlakhi	Herb	Whole plant as vegetable	Juice of young shoots as medicine for dysentery, jaundice and urinary trouble.	C
<i>Polygonum chinense</i> L.	Polygonaceae	Modhu suleng	Herb	Leaves, tender stem as acidifying agent	-	C
<i>Polygonum microcephalum</i> D. Don	Polygonaceae	Modhu suleng	Herb	Leaves, tender stem as acidifying agent	-	C
<i>Polygonum perfoliatum</i> L.	Polygonaceae	Bagh achur	Herb	Leaves, tender stem as acidifying agent	-	C
<i>Portulaca oleracea</i> L.	Portulacaceae	Malbhug khutora	Herb	Shoots as vegetables	-	C
<i>Premna latifolia</i> Roxb.	Verbenaceae	Gohora	Tree	Tender shoots and leaves as vegetables with pork.	As fire-wood	10
<i>Prunus jenkinsii</i> Hk.f. and Th.	Rosaceae	Thereju	Tree	Ripe fruit as raw.	Wood for making handles for household implements.	C
<i>Piper sylvaticum</i> Roxb.	Piperaceae	Auni pan	herb	Leaves with betel nut	Mature influences as medicine for liver and urinary trouble.	5,10

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Piper longum</i> L.	Piperaceae	Pipoli	Herb	Inflorescence as spice	Inflorescence as medicine for cough.	5,10
<i>Rubus alceifolius</i> Poir.	Rosaceae	Jatulipoka	Herb	Ripe fruits as raw	-	C
<i>Rubus ellipticus</i> Sm.	Rosaceae	Bor Jatulipoka	Herb	Ripe fruits as raw	Roots as medicine in pneumonia.	C
<i>Sarcochlamys pulcherrima</i> Gaud.	Urticaceae	Mesaki	Shrub	Young shoots, leaves as vegetable	As fire wood.	1, 2, 12
<i>Saurauia roxburghii</i> Wall.	Saurauiaceae	Bon pochala	Tree	Ripe berry as raw	Leaves as fodder.	1, 2,12
<i>Scoparia dulcis</i> L.	Scrophulariaceae	Mithapat	Herb	Tender shoot as vegetable	Whole plant for making vodka, root and leaves as medicine for pneumonia, blood dysentery.	C
<i>Smilex zeylanica</i> L.	Smilacaceae	Tikonibaruah	Climber	Tender shoots as vegetable	Roots as medicine in rheumatic and other pains.	C
<i>Solanum nigrum</i> L.	Solanaceae	Pokmou	Herb	Young shoots as vegetable	Fruits as medicine for fever, eye disease, liver, piles, roots for asthma	C
<i>Solanum torvum</i> Sw.	Solanaceae	Hati bhekuri	Herb	Fruits as vegetable	Seeds as medicine for enlarged spleen.	C
<i>Solanum anguivi</i> Lamk.	Solanaceae	Bhakuri tita	Shrub	Fruits as raw or vegetable	Fruits as appetizer, roots for toothache, asthma, colic pain, cough, skin diseases	C
<i>Spondias pinnata</i> (L.f.) Kurz.	Anacardiaceae	Amora	Tree	Tender leaves, fruit as vegetable	Fruits, barks as medicine for stomach trouble, dysentery.	C
<i>Spilanthes paniculata</i> Wall. ex DC.	Asteraceae	Suhoni	Herb	Tender shoots, flowers as vegetables.	The whole plant as fish poison. Seeds chewed as medicine to relive pain inside mouth	C
<i>Stellaria media</i> (L.) Villars	Caryophyllaceae	Morolia	Herb	Tender shoots and leaves as vegetables.	Tender leaves and shoots are used as medicine for rheumatism	C
<i>Stenochlaena pelustris</i> (Burm.) Bedd.	Blechnaceae	Dhekia lota	Climber	Tender shoots and leaves as vegetables	Stem as fasten material in house constructions, agricultural implements, bamboo crafts etc	C
<i>Sterculia villosa</i> Roxb.	Sterculiaceae	Udal	Tree	Seeds as boiled or baked.	Wood as timber in house making, fire wood, Bark fiber as rope	1,2,12
<i>Stixis suaveolens</i> (Roxb) Pierrie	Capparidaceae	Madhoi maloti	Climber	Ripe fruits as raw.	Stem parts as rope for agricultural implements	C
<i>Syzygium cumini</i> (L.)Skeel.	Myrtaceae	Bor jamu	Tree	Ripe fruits as raw.	Wood as timber in house making, fruits and bark as medicine for dysentery, gastritis, powdered seeds for diabetes	C
<i>Syzygium jambos</i> (L.) Alston.	Myrtaceae	Bogi jamu	Tree	Ripe fruits as raw.	Wood as timber for making of traditional houses. Juice of the bark as medicine for gastritis.	C

Scientific name	Family	Vernacular name	Habit	Parts used as edibles	Other uses	Used by
<i>Syzygium fruticosum</i> DC.	Myrtaceae	Bon Jamu	Tree	Ripe fruits as raw.	Wood as timber for house making, firewood	C
<i>Tetrastigma thomsonianum</i> Planch.	Vitaceae	Noltenga	Climber	Tender branches and leaves as vegetables.	-	C
<i>Terminalia bellerica</i> Roxb.	Combretaceae	Bhumura	Tree	Fruits as raw or dried.	Wood as timber for house making, furniture.	C
<i>Terminalia citrina</i> Roxb.	Combretaceae	Silikha	Tree	Fruits as raw, dry or as curry.	Wood as timber for house making, furniture, <i>Dheki</i> the traditional rice husking	C
<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae	Bon dhunduli	Climber	Young fruits as vegetables.	Juice of leaves as liver tonic, juice from fruit as appetizer.	C
<i>Typha elephantina</i> Roxb.	Typhaceae	Maduribon	Shrub	Tender shoots, rhizomes as vegetables.	Leaves in making of mats.	9
<i>Vernonia cinerea</i> (L) Less	Asteraceae	Sahadevi	Herb	Young shoot as vegetables.	Tender shoots as medicine in fever, root juice in indigestion.	C
<i>Vitex negundo</i> L.	Verbenaceae	Posotia	shrub	Tender leaves and shoots as vegetables.	Leaves as medicine against pain.	c
<i>Xanthium strumarium</i> L.	Asteraceae	Agora	Herb	Young shoots as vegetables.	The whole plant as medicine against malarial fever and urinary trouble.	c
<i>Zanthoxylum oxyphyllum</i> Edgw.	Rutaceae	Mejenga	Shrub	Tender shoots are used for preparation of curry with meat or fish	Barks and seeds as medicine in fever and dyspepsia and cholera.	c
<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Rutaceae	Bazarmoni	Tree	Tender shoots as vegetables by the Mishing people.	Fruits as medicine for rheumatism, diarrhea, and seeds are used for fish poisoning.	9
<i>Zizyphus mauritiana</i> Lamk.	Rhamnaceae	Bogori	Tree	Ripe fruits as raw, powder or as pickles.	Bark as medicine for diarrhea, pain, cut and wounds.	C

The study also revealed that wild edibles were highly valued by the villagers as the special food supplement because of its nutrient as well medicinal values. Among the seasonally available medicinal herbs *Alternanthera sessilis*, *Centella asiatica*, *Drymaria diandra*, *Houttuynia cordata* and *Hydrocotyle sibthorpioides*, *Peperomia pellucida* and *Stellaria media* were commonly eaten by the villagers all communities as the curries. Among the edible fruit giving trees 22 species were recorded for timber used in house making, furniture, agricultural implements and other household articles. Seeds of *Licula*

peltata and *Livistonia jenkinsiana* were eaten but leaves were recorded for use as roofing material for construction of traditional houses and also in making the traditional umbrella (*Japi*). Tendered shoot/ rhizomes of *Bambusa balcooa* and *Dendrocalamus hamiltonii* were recorded edible and the mature culms were used in house and furniture making. It was also found that wild edibles are also source of income to some of the villagers. The tender shoot and leaves of *Alternanthera sessilis*, *A. philoxeroides*, *Calamus tenuis*, *Colocasia esculanta*, *Diplazium esculantum*, *Murraya koenigii*, *Paderia foetida*, *P.*

scandens, *Smilex glabra* *Tetrastigma thomsonianum* and fruits of *Dillenia indica*, *Garcinia pedunculata*, *G. cowa*, *G kydia* and *Spondias pinnata* were collected from wild from patch vegetations and sold in the local markets. It has found from our study that among the phyto-resources of the patch vegetations in rural areas plays an important role in supplying nutritive food to

the poor villagers. But changes in land uses in rural areas bring about the threat these patch vegetation causing loss to the rich biodiversity. Therefore, awareness on the importance and conservation of such patches as the repository of wild edibles urgently required.



Figure-1: Few Wild edible plants: 1. *Antidesma bunius*. 2. *Dillenia indica*. 3. *Garcinia cowa*. 4. *Fragaria indica*. 5. *Sarcochlamys pulcherima*. 6. *Smilex zeylanica*. 7. *Flacourtia jangomas* and *Artocarpus chama*

Edible but medicinal: The present study also revealed that out of 119 species of wild edible plant species, different fraction such as the leaves, barks, tuber or roots of 56 plant species were used by the villagers as traditional medicine against different ailments (Table-1). The extract prepared dried pericarps of *Garcinia pedunculata*, *G. cowa* and *G. kydia* and fermented juice prepared from *Syzygium cumini* is widely used as medicine against stomach disorder. The extract prepared from *Centella asiatica* and *Hydrocotyle sibthorpioides* is also used as tonic and medicine against stomach problems. Apart from these *Alternanthera sessilis*, *Hedyotis diffusa*, *Clerodendrum glandulosum*, *Vernonia cinerea*, *Paederia scandens*, *Paederia foetida*, *Oxalis corniculata*, *Hedyotis diffusa*, *Murraya koenigii* and *Leucas plukenetii* are recorded for herbal medicine for stomach troubles use by different communities of the district.

Rhizome of *Costus speciosus*, bark of *Glycosmis arborea*, whole plant of *Phyllanthus urinaria*, *Phyllanthus fraternus* are recorded as medicine given for curing jaundice. The corm of *Amorphophallus paeoniifolius* was recorded for use as medicine against piles. Leaves of *Antidesma bunias*, *Antidesma acidum* and whole plant of *Amaranthus spinosus* and *Amaranthus viridis* and bark of *Ardisia thyrsoiflora* were recorded as antidote use against snake bite. Leaves, tendered shoot of *Eclipta alba* and barks of *Callicarpa arborea* were recorded as medicine against various mouth diseases. Seed pericarp of *Caryota urens* was recorded for treatment of asthma. Whole plant of *Houttuynia cordata*, *Hydrocotyle sibthorpioides*, *Phyllanthus fraternus*, *Phyllanthus urinaria*; bark of *Syzygium cumini* and *Oroxylum indicum* were recorded for use as medicine for dysentery etc. Bark of *Glycosmis arborea*, root of *Rubus ellipticus* and tendered shoots of *Scoparia dulcis* were recorded for utilized as medicine for treatment of pneumonia. Similar investigation was conducted and recorded 241 medicinal plant species used by Naga tribes for traditional medicine¹⁹.

Bird's food: About 41 plant species were recorded for their different parts mainly fruits and seeds are eaten by birds. They are - *Antidesma acidum*, *A. bunias*, *A. ghaesembilla*, *Ardisia thyrsoiflora*, *Artocarpus chama*, *A. heterophyllus*, *A. lacucha*, *Baccaurea ramiflora*, *Bischofia javanica*, *Callicarpa arborea*, *Carallia lucida*, *Cassia fistula*, *Chrysophyllum lanceolatum*, *Clerodendrum glandulosum*, *Coccoloba grandis*, *Deeringia amaranthioides*, *Duchesnea indica*, *Elaeocarpus floribundus*, *Ficus auriculata*, *Ficus hispida*, *Flacourtia jangomas*, *Fragaria* spp, *Glycosmis arborea*, *Grewia sapida*, *Livistonia jenkinsiana*, *Mangifera indica*, *Melastoma malabathricum*, *Murraya koenigii*, *Premna latifolia*, *Prunus jenkinsii*, *Rubus ellipticus*, *Rubus alceifolius*, *Smilax zeylanica*, *Stixis suaveolens*, *Syzygium jambos*, *Syzygium fruticosum*, *Zizyphus mauritiana*, *Zanthoxylum rhetsa* and *Zizyphus mauritiana*.

Animal food and fodder: Approximately 38 plant species were recorded for animal food and fodder. Out of them *Garcinia pedunculata*, *Garcinia cowa*, *G. Kidya*, *Garcinia sopsopia*, *G. xanthochymus*, were recorded for food of monkey and rodents.

Fruit of *Dillenia indica* is favorite food for elephant. Seeds and fruits of *Zizyphus mauritiana*, *Z. nummularia*, *Artocarpus chama*, *Artocarpus heterophyllus*, *Artocarpus lacucha*, *Calamus tenuis*, *Centella asiatica*, *Costus speciosus*, *Bambusa balcooa*, *Dendrocalamus hamiltonii*, *Duchesnea indica*, *Ficus auriculata*, *Ficus hispida*, *Hedyotis diffusa*, *Houttuynia cordata*, *Houttuynia cordata*, *Oroxylum indicum*, *Oxalis corniculata* and *Phyllanthus fraternus* were recorded animal food. *Alternanthera sessilis*, *Alternanthera philoxeroides*, *Alpinia nigra*, *Amaranthus spinosus*, *Commelina benghalensis*, *Ficus hispida*, *Marselia quadrifolia*, *Monochoria hastata*, *Polygonum microcephalum*, *Portulaca oleracea*, *Premna latifolia*, *Solanum nigrum*, *Spondias pinnata* and *Stellaria media* were recorded as fodder for animals.

Conclusion

It is evident from this survey and documentation work that among the phyto resources of patch vegetations the wild edible plant are also collected and used by the villagers as vegetables or different raw food items with time and as per indigenous knowledge. Though, the wild edible plants available in the patch vegetations plays a significant role in the society as the natural source of nutritive foods, change in land uses in the rural areas now a day's brings about threat for the patches as the habitat for wild edibles. Moreover, patch vegetations have unique importance as they are biodiversity reservoir of rare, endangered and endemic flora. Evidence also recorded for attempting maximum harvests from some biological population by indigenous society; however, risk of its extinction is minimum²⁰. However, due to increase of human population the patch vegetations are being shrinking and established new homesteads there. Therefore, research on the scientific evaluation of these wild edibles and their other important uses including biodiversity and environmental services is an urgent need not only for conservation of the patch vegetation as the repository of wild edible plants but also from bio-prospecting point of view.

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References

1. Arenas P. and Scarpa G.F. (2007). Edible wild plants of the Chorote Indians, Gran Chaco, Argentina. *Botanical Journal of the Linnean Society*, 153(1), 73-85.
2. Eriksen S.H. and O'brien K. (2007). Vulnerability, poverty and the need for sustainable adaptation measures. *Climate Policy*, 7(4), 337-352.
3. Hazarika P., Biswas S.C. and Kalita R.K. (2014). A case study on people's choice conservation of biodiversity in

- homesteads of Assam, India. *Int. Res. J. Biological Sci.*, 3(1), 89-94.
4. Sarma H., Tripathi A.K., Borah S. and Kumar D. (2010). Updated estimates of wild edible and threatened plants of Assam: A Meta-analysis. *International J Botany*, 6(4), 414-423.
 5. Sundriyal M., Sundriyal R.C., Sharma E and Purohit A.N. (1998). Wild edibles and other useful plants from the Sikkim Himalaya, India. *Oecologia Montana*, 7(1-2), 43-54.
 6. Redzic S.J. (2006). Wild edible plants and their traditional use in human nutrition in Bosnia-Herzegovina. *Ecology of Food and Nutrition*, 45(3), 189-232. DOI: 10.1080/03670240600648963.
 7. Mahapatra A.K., Mishra S., Basak U.C. and Panda P.C. (2012). Nutrient analysis of selected wild edible fruits of deciduous forest of India: an explorative study towards non conventional bio-nutrients. *Advance J Food Science and Technology*, 4(1), 15-21.
 8. Patiri B. and Borah A. (2007). Wild edible plants of Assam. Director Forest Communication, Forest Department, Govt. of Assam, 1-169.
 9. Sasi R. and Rajendran A. (2012). Diversity of wild fruits in Nilgiri hills of the Southern Western Ghats - Ethno botanical aspects. *International J. Applied Biology and Pharmaceutical Technology*, 3(1), 82-87.
 10. Rongsensashi, Mozhui R., Changkija S. and Limasenla (2013). Wild edible fruits of Fakim Wildlife Sanctuary Nagaland, North-East India. *Indian Forester*, 139(5), 440-447.
 11. Mudasir Y.M. (2014). Documentation and ethnobotanical survey of wild edible plants used by the tribals of Kupwara, J&K, India. *International J Herbal Medicine*, 2(4), 11-18.
 12. Narzary H., Brahma S. and Basumatary S. (2013). Wild edible fruits of kokrajhar district of assam, north-east india *Asian Journal of Plant Science and Research*, 3(6), 95-100.
 13. Pegu R., Gogoi J., Tamuli A.K. and Teron R. (2013). Ethno botanical study of wild edible plants in Poba Reserve Forest, Assam, India: multiple functions and implication for conservation. *Research Journal of Agriculture and Forestry Sciences*, 1(2), 1-10.
 14. Hazarika P., Kakati N. and Kalita R.K. (2015). Indigenous knowledge in relation to conservation and management of forest biodiversity of Assam. *Life Sciences Leaflets*, 63, 64-93.
 15. Hooker J.D. (1872). *Flora of British India*. Vol-I, L Reeve & Co, 5, Henrietta Street, Covent Garden, London. 1-740.
 16. Kanjilal U.N., Kanjilal P.C., Das A. and De R.N. (1940). *Flora of Assam*. Vol I-IV, Allied Book Centre 15-A, Rajpur Road Dehradun, India.
 17. Choudhury S. (2005). Assam's Flora: Present Status of vascular plants. Assam Science Technology and Environment Council, U.N. Bezbaruah Road, Silpukhuri, Guwahati - 781003, Assam, 1-368. <http://trove.nla.gov.au/version/177684205>.
 18. Begam S.S. and Gogoi R. (2007). Herbal recipe prepared during Bohag or rangali bihu in Assam. *Indian J Traditional Knowledge*, 6(3), 417-422.
 19. Zhasa N.N., Hazarika P. and Tripathi Y.C. (2015). Indigenous knowledge on utilization n of plant biodiversity for treatment and cure of diseases of human beings in Nagaland india: A case study. *Int. Res. J. Biological Sci.* 4(4), 89-106.
 20. Gadgil M., Berkes F. and Folke C. (1993). Indigenous knowledge for biodiversity conservation. *Ambio*, 22(2-3), 151-156. <http://www.jstor.org/stable/4314060>.