

Wild Plants of Chirang Reserve Forest Used as vegetables by the local fringe communities



Botany

KEYWORDS : Wild vegetables, Chirang Reserve Forest, Assam, Traditional knowledge, Local communities, Medicinal value

Uzzal Dutta

Department of Botany Gauhati University, Guwahati-14 Assam, India

Dr. G.C. Sarma

Department of Botany Gauhati University, Guwahati-14 Assam, India

ABSTRACT

The present paper deals with the study of plants of 83 plant species belonging to 46 families and 65 genera that have been using as vegetables by the local fringe communities of Chirang Reserve Forest. The plants are consumed either cooked or raw. The scientific names, local names, family, part used and method of use of the plants are listed in the paper.

Introduction :

The state of Assam is an integral part of Northeast India and is one of the most important biodiversity hotspots of the world. The land and the climatic conditions of the state are suitable for propagation, growth as well as survival of numerous plant species in the region [8]. The region is one of the richest reservoirs of wild edible plants. A large number of wild plants are used by various communities of the region as vegetables since the time unknown. Many of these plants have been stabilized by natural propagation and growth while some are cultivated. The indigenous people of the region have discovered and developed the traditional use of many wild plants found within their environment as food sources over ages of time. Yet many of these foods remain virtually unknown outside their land [5].

The objective of the present study is an attempt to document the plant species used as wild vegetables by the local people. This type of study will also help in protection of their traditional knowledge from extinction. Documenting the indigenous knowledge through ethno-botanical studies is important for conservation of biological resources as well as their sustainable utilization. The present study will also help in finding new vegetables to meet the challenging requirement of ever increasing vegetable demand [1].

Study Area :

The Chirang Reserve Forest falls under the Haltugaon Forest Division of the Western Assam Circle Conservancy. The RF lies in between 26° 06' 56.05" N to 26° 54' 1.95" N latitude and 90°12'03.76"E to 90°29'07.02"E longitude covering an area of 592.54 sq kms [11]. The Chirang Reserve forest is located within the Assam-Duars in the western Assam region. It can be considered a plateau, rising gently towards the north where it meets the Bhutan Hills. The elevation reaches as high as 500 m in the north. The plateau merges with the cultivated lands in the south and drains towards the River Brahmaputra [4,11]. From the north, and for a few kilometers to the south, the tract is composed of rocks and pebbles, and remains waterless for most of the year, representing a typical Bhabar characteristic. The major forest type of the region is characterized by natural regeneration of Bhabar and Terai sal forests [3]. Located adjacent to lower central Bhutan, the RF falls within the Assam Plain Endemic Bird Area and a marginal part of the Eastern Himalaya Endemic Bird area with a significant avian diversity. The Reserve Forest is a part of the Ripu-Chirang elephant corridor and shares its eastern boundary with Manas Tiger Reserve as a potential Mammalian Habitat [2].

Due to its unique geographic location Chirang Reserve Forest is rich in floral diversity and one of the richest reservoirs of wild edible plants. A large number of wild plants are used by various communities of the region since the time unknown.

The main inhabitants of the area are mainly Bodo, Rajbanshis, Nepali, SC, etc. Among them the Bodos are the most prominent tribal group of the area [7, 12]. These community groups have an intricate relationship with plants. They know a lot about plants and their utilizations for various purposes. Numbers of wild veg-

etables are being used by the local communities in their regular diet. These plant sources are very rich in various minerals, vitamins and other source of nutrients. These indigenous population inhabiting the region have discovered and developed indigenous use of many wild plants found within their environment as food sources perhaps after a good deal of trial and error.

Materials and Method :

Numbers of field visits were undertaken during the period of 2010-12. Ethno-botanical studies were carried out using standard methods [10]. Survey was carried with the help of the people having the knowledge of wild vegetables. Specimens were collected from various parts of the study area. Local markets were also surveyed and plant sample were collected along with the other information like place of harvesting, time of harvesting, market demand, market price etc. Herbariums were prepared from the collected specimens [6] and these herbariums were identified with the help of herbarium specimens of Botany Dept. Gauhati University.

Observation :

The present study could document a total of 83 plant species belonging to 46 families and 65 genera that have been using by the local communities as vegetables.

Out of the plant documented 77 species belongs to angiosperm, 1 is gymnosperm and other 4 species are pteridophytes. Of the angiosperms 14 species belongs to monocotyledons and 63 species belong to dicotyledons. The table - 1 is the alphabetical enumeration of recorded species together with botanical name, family, local name(s), mode of use, and self life after harvest.

Majority of the vegetable are eaten fresh. Out of the documented plant species, leaves or young shoot of 52 species, fruits of 7, flowers of 6, seeds of 5 and roots of 3 species are used as vegetables. While more than one part of 13 species and the whole plant parts of 4 species are used.

Most of the vegetables used are collected from Chirang Reserve Forest. These are used either consumed raw or cooked and help to compensate the day to day calorie requirement. They are rich sources of nutrients, vitamins and minerals. Most of them have high medicinal value.

Conclusion :

The wild edible vegetables need to be popularized as many of them have high nutritive and medicinal value. By growing them the local people can earn remunerative prices for their livelihoods. Collections of wild vegetables are going on their natural habitat. Therefore their populations are decreasing day to day so, immediate attention is needed to protect them. More ethno-botanical and biochemical studies are required to unearth new plants from the area and to find out their nutritional value.

Acknowledgement :

The authors are thankful to the local forest department, village heads, vegetables vendors and informants for their assistance and help in carrying out the field work.

Table 1 : List of the plant species documented with their family name, vernacular name, part used and method of use as vegetables by the local communities in the fringe areas of Chirang Reserve Forest, BTAD, Assam

Sl No	Plant name	Family	Vernacular name	Part used	Uses
1	<i>Alocasia fornicata</i> (Roxb.) Schott.	Araceae	Kochu (As.) Thaso (Bodo)	Young shoot/ tuber	Young shoots, tender leaves and tubers are eaten cooked.
2	<i>Alocasia indica</i> (Lour.) Koch.	Araceae	Man kachu (As.)	Young shoot/ tuber	Tubers, rhizome and shoots are eaten cooked with acidic fruits.
3	<i>Alocasia odora</i> (Roxb.) Koch.	Araceae	Dahi Kochu / Dudh Kochu (As.)	Petioles	Petioles are eaten cooked.
4	<i>Alpinia nigra</i> (Gaertn.) Burt.	Zingiberaceae	Tora (As.) Tharai (Bodo)	Young shoot/ Leaves Rhizome	Young shoots and rhizomes are eaten either raw or cooked. Leaves have aromatic smell, used as wrappers in roasting or boiling of various food items.
5	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Menmeni (As.)	Young shoot/ Leaves	Leaves and tender shoots are eaten as vegetable.
6	<i>Alternanthera sessilis</i> (L.) R. Br. Ex. DC.	Amaranthaceae	Matikaduri (As.)	Young shoot/ Leaves	Tender shoots and leaves are used as vegetable.
7	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Hatikhutura / kata khutura (As.)	Young shoot/ Leaves	Tender shoots, young leaves and mature stems are used as vegetable.
8	<i>Amaranthus polygonoides</i> L.	Amaranthaceae	Khutura Sak (As.)	Young shoot/ Leaves	Tender shoots & leaves are eaten cooked and considered medicinal, mostly prescribed for urinary problem.
9	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Araceae	Ul-kochu (As)	Whole plant	The whole plant or plant parts are eaten cooked as vegetable. It is considered medicinal in curing disease like anemia, constipation etc.
10	<i>Anthocephalus chinensis</i> (Lamk.) Rich. Ex. Walp.	Rubiaceae	Raghu / Kadam (As.)	Fruit	Mild acidic fruit either eaten raw or cooked with fish or as vegetable.
11	<i>Asparagus recemous</i> Wild.	Liliaceae	Satmul (As.)	Young shoot/ Tubers	Young shoots are eaten cooked or raw. Tuberous root has medicinal value.
12	<i>Bambusa balcooa</i> Roxb.	Bhaluka bah (As.)	Poaceae	Young shoot	Young shoots are eaten after slicing, drying and grinding. Pickles are also prepared. A special dish called "kharisa" is also prepared.
13	<i>Bambusa tulda</i> Roxb.	Jati bah (As.)	Poaceae	Young shoot	Young rhizomes are eaten as vegetable.
14	<i>Basella alba</i> L. var. <i>Rubra</i> (L.) Stewart.	Basellaceae	Ronga Puroi (As.) Maifrai (Bodo)	Young shoot/ Leaves Fruits	Leaves stem and fruits are largely used as vegetable, considered idle for anemic patient.
15	<i>Bauhinia variegata</i> L.	Fabaceae	Kanchan, Boga Kotora (As.) Kharmang (Bodo)	Flower/ seed	Flower buds are eaten cooked, seeds are also eaten by roasting.
16	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Purnanava (As.) Laije (Bodo)	Young leaves	Young leaves are eaten cooked as vegetable.
17	<i>Calamus tenuis</i> Roxb.	Arecaceae	Jatibet (As.) Garla bithra (Bodo)	Young shoot/ Seeds	Soft and fleshy inner of the young shoots are eaten as vegetable. Ripe fruits along with seeds are also eaten.
18	<i>Cassia tora</i> L.	Fabaceae	Soru-Medelua (As.) Adi diga (Bodo)	Leaves/ seed/ root	Young leaves are used as vegetables. The leaves, seeds and roots are considered to having medicinal properties for skin diseases.
19	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Bor manimuni (As.)	Leaves/ stem	Leaves, young shoots are eaten as vegetable. It is considered medicinal in stomach complains and usually used locally as liver tonic making curry with small fishes.
20	<i>Cissus quadrangularis</i> L.	Vitaceae	Harjora (As.)	Stem	The young shoots are eaten as curries; also used as medicine in treatment of bone fracture.
21	<i>Colocasia esculenta</i> (L.) Schott	Araceae	Kola Kochu / Kolia Kochu (As.)	Young leaves/ tuber	Tender leaves and tubers are eaten as vegetable.
22	<i>Commelina benghalensis</i> L.	Commelinaceae	Kona Simolu (As.)	Young leaves	Young leaves and young shoots are eaten as vegetable.

23	<i>Costus speciosus</i> (Koen. ex Retz.) Smith	Costaceae	Jam lakhuti / Devi tokon (As.) Burhi thokon (Bodo)	Young shoot/ rhizome	Young shoots are eaten as vegetable. Rhizome juice is used as medicine for treatment of Jaundice
24	<i>Cycas pectinata</i> Griff.	Cycadaceae	Nagchampa	Stem	Young shoots are used as vegetables
25	<i>Deeringia amaranthoides</i> (Lamk.) Merr.	Amaranthaceae	Mathak thuka / Men meni (As.) Monbir (Bodo)	Leaves	Tender leaves are eaten cooked as vegetable.
26	<i>Dillenia indica</i> L.	Dellineaceae	Outenga	Fruit (fleshy calyx)	Fleshy calyx eaten raw as well as cooked as vegetable
27	<i>Dillenia pentagyna</i> Roxb.	Dellineaceae	Okshi	Fruit	Flowers, fruits especially the fleshy calyx are eaten as vegetable
28	<i>Dioscorea alata</i> L.	Discoreaceae	Kath Alu (As.)	Tubers	Stem tubers and root tubers are eaten cooked as vegetable.
29	<i>Dioscorea bulbifera</i> L.	Discoreaceae	Goch Alu. (As.)	Root	Root tubers are eaten cooked as vegetable.
30	<i>Diplezium asperum</i> Bl.	Woodsiaceae	Dhekia sak (As.)	Leaves	Tender frond is circinate which is eaten cooked by almost all communities.

31	<i>Drymaria cordata</i> (L.) Wild ex Roemer & Schultes	Convolvulaceae	Lai Jabori (As.) Jabshri (Bodo)	Leaves/ young stem	Tender leaves & shoots are eaten as vegetable.
32	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Gakhiroti bon (As.) Nashrai khoro (Bodo)	Young shoot/ Leaves	Young shoots & leaves are used as vegetable by Bodos.
33	<i>Fagopyrum cymosum</i> Meissn.	Polygonaceae	Bon Paleng (As.) Moichunkha (Bodo)	Young shoot/ Leaves	The tender leaves and young shoots are eaten cooked as vegetable.
34	<i>Fagopyrum cymosum</i> Meissn.	Polygonaceae	Bon Paleng (As.) Moichunkha (Bodo)	Young shoot/ Leaves	The tender leaves and young shoots are eaten cooked as vegetable.
35	<i>Fagopyrum esculentum</i> Moench.	Polygonaceae	Chutia Lofa / Dhemsai Sak (As.)	Young shoot/ Leaves	Young leaves and shoots are eaten cooked as vegetable.
36	<i>Fagopyrum esculentum</i> Moench.	Polygonaceae	Chutia Lofa / Dhemsai Sak (As.)	Young shoot/ Leaves	Young leaves and shoots are eaten cooked as vegetable.
37	<i>Ficus hispida</i> L.	Moraceae	Dimoru (As.) Khoksha dumru (Bodo)	Young shoot/ Leaves Fruits	Young shoots, leaves and green fruits are eaten cooked as vegetable. Ripe receptacle is also eaten, considered good for liver.
38	<i>Hedyotis diffusa</i> (Willd.)Roxb.	Rubiaceae	Bonjaluk (As.) Deusri Atheng (Bodo)	Leaves	Leaves are cooked with other vegetables. It is considered medicinal for stomach trouble.
39	<i>Houttuynia cordata</i> T hunb.	Saururaceae	Masundari / Mosondoi (As.) Maisundri (Bodo)	Leaves	Leaves are eaten raw or cooked as vegetable. Roots are also edible, eaten as chutney. It is considered as plant.
40	<i>Hydrocotyle sibthorpioides</i> Lamk.	Araliaceae	Haru manimuni	Whole plant	Young leaves and shoots are cooked as vegetable. Leaves are used in healing wounds of man and animals.
41	<i>Hypericum japonicum</i> Thunb. ex Murr.	Guttiferae or Hypericaceae	Sonaphuli (Bodo)	Leaves/ Stem	It is used as a mixed vegetable; also used as medicine by Bodos.
42	<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Kolmou (As.) Mande maigong (Bodo)	Young shoot	The leaves and undershoots are eaten cooked as vegetable. Fruit are also eaten fried.

43	<i>Justicia adhatoda</i> L.	Acanthaceae	Boga bahak / Baska tita (As.) Barsikhe (Bodo)	Flowers	Flowers are eaten fried. The plant has got tremendous medicinal importance viz. in cough, cold, allergy etc.
44	<i>Lasia spinosa</i> (L.) Thaw.	Araceae	Chengmora (As.) Chibru (Bodo)	Petiole/ flower	Leaf petioles are eaten cooked as vegetable; flower spadix also used as vegetable
45	<i>Leucas plukenetii</i> (Roth) Spreng.	Lamiaceae	Doron / Kansisa (As.)	Leaves	Leaves and flower buds are used as vegetable. It is highly considered as medicinal plant.
46	<i>Maranta arundinacea</i> L.	Marantaceae	Tora Alu (As.)	Rhizomes	Rhizomes are eaten cooked or raw.
47	<i>Marsilea quadrifolia</i> L.	Marseliaceae	Pani tengesi (As)	Leaves	Leaves with petioles are eaten as vegetable
48	<i>Merremia umbellata</i> Hallier f.	Convolvulaceae	Goria lota (As.)	Young shoot/ Leaves	Young shoots & leaves are used as vegetable; it is also considered medicinal and use to relive pain.
49	<i>Morus. alba</i> L.	Moraceae	Nuni (As.) Bongphang rakhep (Bodo)	Leaves/ Fruits	Leaves are used as vegetable and cooked with fishes. Ripe fruits are eaten fresh.
50	<i>Musa Velutina</i> H. Wendl & Drude	Musaceae	Ramkol	Inflorescence/ young stem	Inflorescence is taken as vegetables.
51	<i>Nymphaea nouchali</i> Burm. f.	Nympheaceae	Boga bhet, Seluk (As.)	Fruit, leaf petiole, seed and root	Fruit, leaf petiole and roots are eaten cooked as vegetable. Seeds are eaten raw or roasted.
52	<i>Ophioglossum reticulatum</i> L. f.	Ophioglossaceae	Apatia (As.) Lai gangse (Bodo)	Whole plant	Whole plant with spike is eaten as vegetable.

53	<i>Oroxylum indicum</i> (L.) Vent.	Bignoniaceae	Bhatghila / Dingdinga (As.) Kharoi Khandai (Bodo)	Young shoot/ Leaves/ Flowers	Tender leaves and shoots are eaten cooked mostly with fishes. Flowers are also used as vegetable, considered medicinal. The whole plant is considered medicinal for various diseases.
54	<i>Oxalis corniculata</i> L.	Oxalidaceae	Soru tengeshi (As.)	Leaves/ Stem	Young shoots & leaves are used as vegetable. It is mildly acidic. The plant is also highly considered medicinal in dysentery and blood pressure.
55	<i>Oxalis debilis</i> H.B.K. var. <i>corymbosa</i> (DC.) Lour.	Oxalidaceae	Bor tengeshi (As.)	Leaves/ Stem	Leaves along with petiole are eaten as vegetable.
56	<i>Paederia foetida</i> L.	Rubiaceae	Paduri lota / Bhedai lota (As.)	Leaves/ tender twigs	Leaves, tender twigs are used as vegetable. It is also considered medicinal for stomach ache, gastric problem etc.
57	<i>Peperomia pellucida</i> (L.) H.B.K.	Piperaceae	Ponounuwa (As.)	Young shoot/ Leaves	The entire plant is eaten cooked as vegetable. The plant is considered as medicinal.
58	<i>Pogostemon benghalensis</i> (Burm. f.) O. Kuntze	Lamiaceae	Suklati (As.)	Young leaves	Young leaves are used as vegetable..
59	<i>Polygonum chinensis</i> L.	Polygonaceae	Behu (As.)	Young shoot/ Leaves	Young shoots are eaten raw, slightly acidic. Leaves & shoots eaten cooked as vegetable with fishes.
60	<i>Polygonum plebejum</i> R. Br.	Polygonaceae	Pani jaluk (As.)	Young shoot/ Leaves	Tender leaves with young shoots are eaten as vegetable.
61	<i>Portulaca oleracea</i> L.	Portulacaceae	Malbhog Khutura / Malbhog sak (As.)	Leaves/ Stem	Tender shoots and leaves are used as vegetable mixed with other vegetables. Also used as medicine in liver problem and in jaundice.
62	<i>Pouzolzia zeylanica</i> (L.) Benn	Urticaceae	Mesaki jola phang (Bodo) Khojo (Rabha)	Leaves	Young leaves are eaten as vegetable.
63	<i>Pteris ensiformis</i> Burm.f.	Pteridaceae	Dhekia sak	Leaves	Young fronds are eaten as vegetable mixing with others.
64	<i>Rorippa indica</i> (L.) [Nasturtium indicum auct non (L.) D.C.]	Brassicaceae	Gonga mula (As.)	Stem / Leaves	Young plant is used as vegetable.
65	<i>Scoparia dulcis</i> L.	Scrophulariaceae	Bon chini / Modhumehari (As.)	Young shoot/ Leaves	Tender leaves are chewed, and are used as vegetable. It is considered highly medicinal for diabetic patient.
66	<i>Sesbania grandiflora</i> (L.) Poir.	Fabaceae	Bokphul (As.)	Flower	Flowers are eaten as vegetable, either fried or with pounded rice or gram.
67	<i>Smilax zeylanica</i> L.	Smilacaceae	Tikoni borual (As.) Soima Jaseb (Bodo)	Young shoot	New shoots or young leaves are eaten cooked as vegetable.
68	<i>Solanum indicum</i> L.	Solanaceae	Tit bhekuri / Bhekuri (As.) Hecho (Karbi)	Fruit	Fruits are eaten as vegetable. Also considered medicinal for worm infection and skin diseases.
69	<i>Solanum nigrum</i> L.	Solanaceae	Los kochi (As.)	Young leaves	Young leaves are used as mixed vegetable with others. Ripe fruits are eaten. It is also considered highly medicinal for burns
70	<i>Sonchus brachyotus</i> DC	Asteraceae	Moirathiki (Bodo)	Leaves	Leaves are eaten cooked as curry;
71	<i>Spilanthes paniculata</i> Wall. ex D.C.	Asteraceae	Bhringaraj/ Huhuni Sak (As.) Ushumoi (Bodo)	Leaves	Young shoots and leaves are eaten cooked as vegetable, also used as medicine in sore mouth, tooth ache and in wounds etc.
72	<i>Spondias pinnata</i> (L.f.) Kurz.	Anacardiaceae	Amora (As.) Dorge	Fruit, flower bud, leaves	Fruit is eaten raw; unripe green fruits are made in to curry, also forms good pickles. The tender leaves and flower buds are used to prepare curry with fishes.
73	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Morolia (As.)	Leaves/ Stem	Young leaves are eaten as vegetable and are also used as medicine in nasal problems and stomach disorders.
74	<i>Sterculia coccinea</i> Roxb.	Sterculiaceae	Nak Chepeta (As.)	Fruits/Seed	The fruits are eaten cooked like beans. Mature seeds are also eaten fried or roasted.
75	<i>Tamarindus indica</i> L.	Fabaceae	Teteli (As.)	Fruit/ leaves	Fruits are sour, eaten fresh or by drying prepare Jelly, pickles or eaten in curries & chutneys. Tender leaves are eaten as vegetable.
76	<i>Tetrastigma thomsonianum</i> Planch.	Vitaceae	Nal tenga (As.) Demshri (Bodo)	Leaves/ Stem	Tender shoots and leaves are eaten which are acidic; It is very tasty when it is cooked with fish.
77	<i>Thunbergia grandiflora</i> Roxb.	Acanthaceae	Kokua lota / Kauri lota (As.) Dengkhakhlu (Bodo)	Leaves	Leaves are eaten cooked as vegetable.

78	<i>Typha angustata</i> Chaub. & Bory.	Typhaceae	Googol bon / Hati ghah (As.)	Rhizome/ young shoot	Rhizome and young shoots are eaten.
79	<i>Typhonium trilobatum</i> (L.) Schott.	Araceae	Syam kachu / Sam kochu (As.)	Whole plant	Leaf blade, petiole, tubers and spadix are eaten cooked as vegetable.
80	<i>Vigna vexillata</i> Benth.	Fabaceae	Banoria Urahi (As.)	Seed/ root	The seeds are used as pulse. Tuberous roots are also eaten.
81	<i>Vitex negundo</i> L.	Verbanaceae	Pasotia / (As.)	Leaves	Tender leaves are used as vegetable. The plant is considered highly medicinal.
82	<i>Xanthium strumarium</i> L.	Asteraceae	Ogara (As.)	Young Leaves	Saplings, young shoots and leaves are used as vegetable usually with potato and other vegetables.
83	<i>Zanthoxylum rhetsa</i> (Roxb) D.C.	Rutaceae	Bajramoni (As.) Bajruli (Bodo)	Leaves/ Stem	Tender leaves are eaten as vegetable by

REFERENCE

- [1] Arora R K, & Pandey Anjula, 1996. Wild edible plants of India-diversity, conservation and use. ICAR, NBPGR, New Delhi, pp 294. | [2] Biswas J, Das J, Borah D, Sarkar P, Bhattacharjee P.C. (2006) Golden Langur: Note on mysterious death reserve forest, Assam : Zoos Print 21(9) :7-16 | [3] Brahma, B. K. 1992. A study on the Ethnobotany of the Bodos of Kokrajhar district of Assam, PhD. Thesis. Gauhati University. | [4] Choudhury A., 2002. Golden Langur *Trochilopythecus geei* Threatened by habitat fragmentation. : Zoos Print 17(2):699-703 | [5] Choudhury, K. 2010. Rediscovery of two rare butterflies *Papilio elephenor* Doubleday, 1845 and *Shijimia moorei* Leech, 1889 from proposed Ripu-Chirang Wildlife Sanctuary, Assam, India. J. Threatn. Taxa 2(4): 831 – 834. | [6] Das, S, Khan ML, Rabha A andd Bhattacharya DK, 2009. Ethnomedicinal plants of Manas National Park, Indian Journal of Traditional Knowledge, Vol: 8 (4), pp 514-517. | [7] Jain, S.K. & Rao R.R. 1977. A handbook of field and herbarium methods. Today and Tomorrow's Printers and Publishers, New Delhi. | [8] Lahkar, B.P; Das, J.P; Nath, N.K; Dey, S; Brahma N. & Sarma P.K. 2007. A study of habitat utilization patterns of Asian elephant *Elephas maximus* and current status of human – elephant conflict in Manas National Park within Chirang – Ripu Elephant Reserve, Assam. Report, Aaranyak, Assam, India. | [9] Mao A A & Hynniewta T M, 2000. Floristic diversity of NE India, J Assam Sci Society, 41 (4), 255-266 | [10] Patgiri S.R., Plant Diversity of Assam, Envis Assam, 2006, 2-1-8 | [11] Rao RR, 1989. Methods & Techniques in Ethnobotanical study and Research: some basic considerations, by SK Jain, In : Methods and Approaches in Ethnobotany, (Society of Ethnobotanists, Lucknow), 13-23. | [12] Saud R, Dey N.K. Mazumdar K.J. etal. 2010 "Conservation priorities of lesser cats (Family: Felides) of Chirang Reserve Forest, BTAD, Assam, India" Tiger paper, Vol XXXVII(No.1), 20-23 | [13] Talukdar, B.K. Lahkar, B.P. Nath N.K. & Brahma N. 2007. Conservation and monitoring of Asian elephants through continued involvement and capacity building of local communities around Chirang Ripu elephant reserve including Manas World Heritage Site. Aaranyak. Guwahati |