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ETHNOBOTANICAL STUDY OF WILD EDIBLE FOOD PLANTS USED BY THE TRIBALS AND RURAL POPULATIONS OF ODISHA, INDIA FOR FOOD AND LIVELIHOOD SECURITY

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Abstract

The Wild Edible Food Plants (WEFPs) refer to those species which are neither cultivated nor domesticated but are important source of food in tribal areas of India. Uses of wild edible food as a coping mechanism in times of food shortage, provides an important safety net for the rural poor. In Odisha, there are 62 different tribes, of which the most numerous ones are Kondh, Gond, Santal, Saora, Kolha, Shabar, Munda, Paroja, Bathudi, Bhuiyan, Oraon, Gadabas, Mirdhas and Juang. The tribals of Odisha depend on forests for their food and other needs and regularly collect and consume fruits, leafy vegetables, tubers, flowers, mushrooms etc. from the nearby forests and have acquired vast knowledge about the wild edible food plants. The present study deals with the identification, documentation, ethnobotanical exploration and information on food value of wild edible plants (WEPs) from different tribal dominated villages of Keonjhar, Mayurbhanj, Kalahandi, Bhitarkanika (Kendrapada), Rourkela (Sundargarh), Jeypore (Koraput), Rayagada, Ganjam, Gajapati, Nabarangapur, Phulbani district of Odisha. The ethnobotany and traditional uses of 193 wild edible plants have been dealt in this paper. Although the popularity of these wild forms of foods has declined, they are nutritionally rich and their usage need to be encouraged.

Key words : Odisha, Wild edible food Plants, Tribals, Traditional knowledge, Food security.

Introduction

Nutrition which is a fundamental biological process for self existence of living organisms. Food and nutritional security are key concerns the world over as low food intake and poor access to food in underdeveloped countries results in malnutrition and health hazards (Belcher *et al.,* 2005;Narendran *et al.,* 2001; Scherr *et al.,* 2004;Mahapatra & Panda, 2012). Food habits of human being have developed from the experience and through successive generations. Feeding in excess of 800 million undernourished people depend not only on increased productivity of domesticated crops but also the use of underutilized wild species. The wild plants and their products make significant contributions to the human and animal food web and are often a means of survival for millions of poor rural households. There is now greater recognition that products from the wild may support household subsistence and income generation from their sale, either in raw or processed forms.

WEFPs are an important source of food in India and have a significant place in the dietary habits of small and marginal farmer's families and forest dwelling communities during the periods of food scarcity (Beluhan & Ranogajei, 2010). The food habits of tribals are generally developed according to the seasonal availability of food and their nutritional value and hence, food supply is traditionally based on their own collections.

India harbours 45,000 plant species and 550 tribal communities. The tribals belong to 227 linguistic groups and they inhabit varied geographic and climatic zones with diversified plant species, varied culture, rich traditional knowledge and wisdom. From the ethnobotanical studies of wild plants indicate that more than 7000 species have been used for human food at some stage in human history (Grivetti & Ogle,

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2000;MEA,2005). Forest forms the most important source of wild foods for rural households and forest inhabitants. The majority of the tribal communities of India live close to or within forests and depend on wild products and biomass for food and energy needs. Such communities have distinct socio-cultural traditions and food habits. Historically, tribal and rural people identified and collected plants for food and medicine from forests and developed a range of processing methods according to their needs. Traditional knowledge of wild food plants is passed orally through words of mouth from generation to generation. The younger generation learns to identify the plant and plant parts collected by accompanying their parents to forests (Pegu *et al.*, 2013). With modernization and settled agriculture, this knowledge is becoming lost, a trend that may lead to decreased diversity of indigenous diets and poorer nutrition. Site specific studies have recorded consumption of wild edibles by tribals and the rural poor in a few locations in India (Sundriyal & Sundriyal, 2001;Mishra *et al.*, 2008; Sinha & Lakra, 2005), but general information on edible indigenous plants is scanty and scattered in literature, informal notes and tribal oral traditions. Further, there is little information on the distribution and consumption pattern of the wild foods of different communities of the country. Tribals of Odisha have similarity in use of wild food varieties with tribals of adjoining states like Madhya Pradesh, Chhattisgarh, Jharkhand and West Bengal. (Ahinwar & Sakya, 2015;Roy, 2016;Chowdhry and Mukherjee, 2012; Bhattacharya and Mandal, 2015; Ekka & Ekka, 2015; Banik *et al.*, 2014; Sandhya & Ahinwar, 2015; Horo & Toppo, 2015; Kumari & Kumar, 2014; Singh & Kumar, 2014; Singh & Kumar, 2014; Sharma & Sharma, 2017; Sinha & Lakra, 2007).

In Odisha, there are 62 different tribes, of which the most numerous ones are Kondh, Gond, Santal, Saora, Kolha, Shabar, Munda, Paroja, Bathudi, Bhuiyan, Oraon, Gadabas, Mirdhas and Juang. The districts of Mayurbhanj, Koraput, Sundargarh, Keonjhar, Phulbani and Kalahandi have high concentration of tribal population. Hunger and poverty of tribals in Odisha region in particular, are acute and malnutrition and diseases are persistent companions of the tribal people living in remote forests of the state. During the 'distress period' when most of the stable foods are out of season, the tribal people turn up to the forests in search of little known, understudied and underexploited plants which are good sources of carbohydrates, proteins, oils, vitamins and aromatic substances used to enhance the flavour of foods. The tribals of Odisha depend on forests for their food and other needs and regularly collect and consume fruits, leafy vegetables, tubers, flowers, mushrooms etc. from the nearby forests. In order to collect field level first-hand data on collection, consumption and sale of wild food plants of Odisha, the present investigation was undertaken with the objective to study the diversity of wild food plants used by forest fringe and tribal communities. Due to various natural and anthropogenic reasons, natural resources of wild vegetables and habitat from where these resources are collected are depleting rapidly (Maikhuri *et al.*, 2008; Bhogaonkar *et al.*, 2010). Genetic resources of wild vegetables and other useful plants should be conserved for future use to overcome malnutrition in vegetarian diet, food security and for crop improvement of cultivated crops using wild species (Kala, 2007).

Materials and Methods

An extensive ethnobotanical field surveys were conducted during the period from July 2012 to Aug 2013. The aim of the field survey was to explore, collect, identify and preserve the wild edible plants used by tribals as well as local inhabitants as food. The data were collected from the tribal people through Participatory Rural Appraisal (PRA) and prepared questionnaire methods. The research taken on WEPs used by the tribals and local inhabitants of Nabarangpur, Gajapati, Ganjam, Jeypore (Koraput), Rayagada, Phulbani, Keonjhar, Mayurbhanj, Bhitarkanika (Kendrapada) districts of Odisha. Details on wild edible plants were recorded by interviewing the knowledgeable elder persons, housewives and local markets were visited for inventory of wild edible plants used for commercial purposes. Tribal peoples were contacted to locate and collect the wild edible plants. The first hand informations like growth forms, plant part(s) used as edible, availability in natural processes, method of processing and vegetables preparation, method of collection, storage and conservation needs were carefully recorded. The specimens of WEPs were collected during field visit with the help of tribal peoples. The collected specimens were than dried and preserved using the techniques described by Jain (Jain, 1967). The collected specimens were identified with taxonomic keys in the floras. The Botany of Bihar and Orissa and The Flora of Orissa (Haines, 1925; Saxena & Brahmam, 1996) were consulted for botanical identification. Voucher specimens were prepared and deposited in the herbarium museum of Regional Plant Resource Centre, Bhubaneswar.

Results and Discussion

The study revealed that the wild edible food plants are used in form of leafy vegetables, fruits, tubers, rhizome, bulb, bulbils, flowers, seeds etc. The

ethnobotanical study in the study areas revealed leaves, flowers, tubers and bulbils are mainly used for consumption as shown in (Table 1). The total 193 species of wild edible plants belong to 72 families were collected and presented with detailed information on their scientific name, common name, purpose of uses. The wild edible food plants belonging to different plant groups is presented in Tables 2 and 3. From the table 2, it is evident that mainly dicotyledonous plants (155spp.) are mostly used as food as compared to monocotyledonous plants (26 spp.), mushroom (7 spp.), pteridophytic plants (3 spp.) and gymnosperm (1 spp.). The wild edible food plants are consumed either raw, or after roasting, cooking, boiling or frying.

Fig. 1 indicates that fruits of 83 species are used by tribals followed by leaves of 78 species and tubers and roots of 23 species. Similarly, seeds of 10 species, flowers of 8 species and stems of 3 species are used by them as food. Two species such as *Borassus flabellifer* and *Careyota urens* are used mainly for their juices extracted from leaf petiole which is used as local beverage. *Abelmoschus crinitus, Amorphopalus campanulatus, Artocarpus heterophylla, Cycas circinalis, Moringa oliefera* etc have multipurpose use. Some species, *viz. Abelmoschus moschatum,Artocarpous heterophylla, Schleichera oleosa, Madhuca indica are* sometimes having more than one edible plant parts. Some species are used extensively such as wild forms of mango and jackfruit at the time of food non availability. From this study, it is revealed that many of the wild edible food plants have medicinal uses as well as other economic uses too. The tribals as well as the forest use many mushrooms like *Lentinus fusipes, Termitomyces eurrhizus, Tuber rufum, Volvoriella volvaceae* etc after monsoon rains.

Leaves of *Alternanthera* spp, *Amaranthus spinousus, Tridax procumbens, Cleome viscosa, Celosia argentia, Blumea lacera* are also used as leafy vegetable. Flowers of *Indigofera cassoides*, leaves of *Bauhinia purpurea* are mostly eaten and sold during summer season, while leaves of *Glinus oppositifolius, Rungia pectinata, Diplazium exculentum*, *Cassia tora, Celosia argentea, Leucas linifolia, Marsilea quardifolia* are collected and sold in rainy season due to their availability in plenty during this period. Leaves *of Marsilea quardifolia, Azaridirachta indica, Bauhinia purpurea, Chenopodium album, Enydra fluctuans, Leucas linifolia, Moringa oleifera* are plentily available in local markets. The flowers of *Abelmoscus esculentum, Cleome viscosa, Azadirachta indica, Indigofera cassoides, Moringa oleifera, Madhuca indica* are found to be sold along roads and weekly markets. The collection and selling of *Madhuca indica* is done under the supervision of Forest Department. Wild fruits such as *Diospyros melanoxylon, Phoenix sylvestris, Buchnania lanzan,Scheicheria oleosa, Spondias pinnata* are collected by tribals for their own consumption and sale. *Emblica officinalis, Mangifera indica, Syzygium cumini, Tamarindus indica, Annona squamosa, Aegle marmelos* and *Zizyphus* spp. are sometimes cultivated in marginal lands and village grooves for commercial use.Underground parts in form of roots, tubers, bulbs,and rhizome are also used in profusion. Most of the underground tubers are used as food after Nuakhai (Crop harvesting) festival. Underground parts of *Dioscorea* spp., *Colocasia esculenta, Manihot esculentum, Plumeria* spp are mostly used as food. *Dioscorea alata* is cultivated as well as collected from natural habit while others are collected from forests only.

During the scarcity or famine period, the wild edible food plants play an important role as food supplement to fulfil the food deficiency. From the study it is revealed that, *Suaeda maritima* in Bhitarkanika Sanctuary saved most of the lives during the super cyclone of 1999 in Odisha. The list of wild edible plants used as scarcity food is presented in Table 4. *Blumea lacera,* a noxious weed, is also used as leafy vegetable while the tender parts of *Ficus religiosa* is also used for this purpose. The flowers of *Indigofera cassoides,* leaves *of Bauhinia purpurea, Azadirachta indica, Dioscore*a species as well as the young shoots of *Dendrocalamus* species are dried and stored for use during the period of non-availability of food. The endosperm of mango is another important famine food of the tribals. Due to poverty and having no cultivable land, the tribals are forced to eat the endosperm of mango. After making powder, the endosperm is washed and sundried properly and used for making food items, when needed. Species like *Moringa oliefera, Bauhinia vahlii, Amaranthus virdis* are some of WEPs used as emergency food in Odisha as well as in the central part of India. A variety of life supporting plant species which include angiopserms, ferns and fungi are used by Aujh- maria tribe in the Bastar region of Chattisgarh state (Sahu, 1996). In Darbhanga district of Bihar, the leaves and flowers of many wild edible plants are used as supplementary vegetable during the emergency period (Jha *et al.,* 1996). Madhya Pradesh known as land of tribals, have 60 tribal communities who use a large number of wild edible plants during food shortage (Oommachan & Masih, 1998).

It is observed that plant parts of *Alternanthera philoxeroides, Artocarpus lacucha, Colocasia esulenta,Diplazium esculentum, Trianthema Portulacastrum, Cassiatora Bauhinia purpurea* are used not only by tribals of Odisha but by such communities

from West Bengal, Chattishgarh and Jharkhand. Out of the green leafy vegetables, *Alternanthera sessilis, Amaranthus spinosus, Amaranthus virdis* and *Commelina benghalensis* are the most commonly used leafy vegetables of the tribals of Jharkhand. Many of these wild edible plant species are found to be sold in the local markets by poor tribals families, generating a supplementary income to their household The fruits and leaves are used as food within one or two days after collection, while tubers, seeds are stored and used for longer periods. The wild edible food plants are highly nutritional and have higher ash, moisture, carbohydrate, crude protein, crude fat, crude fibre, energy and iron contents than several other conventional food plants.

During food scarcity, the tribal Dongaria Kandh community in Bisamcuttack area of Rayagada district use the leaves of *Blumea lacera*, which is a noxious weeds. The use of this plant is no where recorded. Another weed, *Grangea maderaspatna* also used as leafy vegetable. The tender flowers of *Cassia fistula* and *Cordia* species are also used as food in Western Odisha as well as Northern Odisha. The flowers of *Cordia* species have high market values. The tender leaves of *Ficus religiosa* and *Cycas sphaerica* are also used as leafy vegetable at southern part of Odisha. The seeds of *Cycas* are used as flour for making delicious food items and cake in southern part of Odisha. The tender fronds of the fern *Diplazium esculentum* is sold as a leafy vegetable in plenty in tribal markets. The tubers of *Dioscorea* species are mostly used as food after

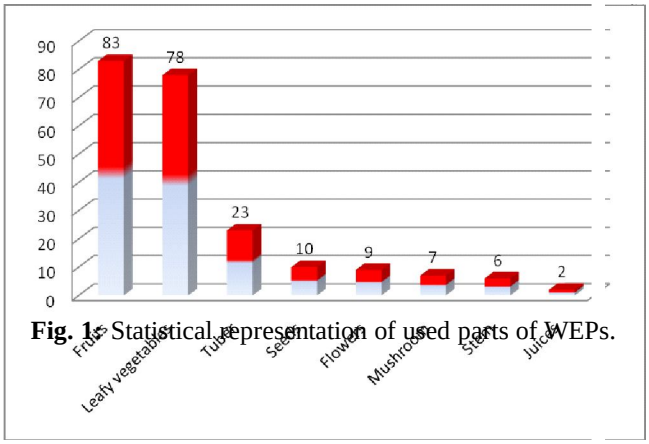

Fig. 1: Statistical representation of used parts of WEPs.

Fig. 2: A-Flowers of *Indigofera cassoides*, B-Roots of *Manihot esculentum*, C- Leaves of *Diplazium esculentum*, D- *Roots of Costus specious* , E-Whole plant of *Glinus oppositifolius*,F- Fruits of *Opilia amentacea*, G-Young shoot of *Dendrocalamus spp*., H-Preparation of country liquor from *Madhuca indica* in traditional method., I- Collection of *Cassia tora* leaves by women, J. Dangaria kandha collecting young stem of *Dendrocalamus* spp. from forest, K- Collection of *Marsilea quardifolia* by a women, L- Collection of information by author from tribal people.

Table 1: Wild Edible Food Plants (WEFPs) of Odisha with their parts used and mode of consumption.

Parts used	Scientific names of the plants	Mode of Use	Consumption process
Leaves	*Abelmoschus crinitus,Abelmoschus moschatus Medic., Achyranthes aspera, Allmania nodiflora, Alternanthera philoxeroides Griseb, Alternanthera pungens , Alternanthera sessilis , Amaranthus spinosus , Amaranthus virdis , Antidesma acidum, Antidesma bunius, Antidesma ghaesembilla, Azadirachta indica, Bacopa monnieri, Bauhinia purpurea ,Bauhinia acuminata, Begonia pictata, Bidens biternata, Blumea lacera, Boerhavia diffusa, Cassia tora, Celastrus paniculata, Celosia aregentea, Centella asiatica, Chenopodium album, Cleome monophyla , Cleome viscosa, Coccinia grandis, Cocculus hirsutus, Colocasia sp(red pith), Commelina benghalensis, Commelina kurzii, Corchorus aestuans Corchorus capsularis, Corchorus olitorius Cucumis trigonus, Cycas circinalis, Diplazium esculentum, Eclipta prostrata, Emilia sonchifolia, Enydra fluctuans, Ficus religiosa, Glinus lotoides, Glinus opositifolius, Grangea maderaspatana, Hygrophylla auriculata, Ipomoea aquatica, Ipomea cymosa, Leucas aspera, Leucas cephalote, Leucas lavandulifolia, Marsilea minuta, Mecardonia procumbent, Merremea vitifolia, Moringa oleifera, Olax scadens, Ophioglossum reticulatum, Oxalis corniculata, Paderia foetida, Pentatropis capensis, Phaulopsis dorsiflora, Pimpinella anisum, Polygonum barbaratum, Polygonum plebium, Portulaca oleracea, Premna corymbosa, Rumex dentatus, Rungia pectinate, Sesbania sesaban, Streblus taxoides, Suaeda maritime, Trianthema portulacastrum, Tridax procumbens, Vernonia squarrosa, Wrightia arborea*	Mostly the tender leaves are collected for edible. The green leafy vegetables are collected mostly whole of the year in different season. The young leaves are mostly used as side item with rice. The young leaves are directly fried with oil if present neither boiled with only salt and taken as leafy vegetable.	Boiling/Fry of Leafy vegetables
Leaves	*Eryngium foetidum, Murraya koenigii*	The leaves are mostly used for making curry or chutntney which gives a good pleasant flavour to the curry and vegetables.	Flavouring agent
Fruits	*Abelmoschus crinitus, Abelmoschus moschatus, Artocarpus heterophyllus, Canavalia ensiformis, Carissa carandas ,Carissa spinarium,Cucumis melo var utilissimus, Cucumis trigonus,Cynometra iripa, Dillenia pentagyna, Ficus auriculata, Ficus hispida, Ficus semicordata, Garuga pinnata, Heritiera fomes, Luffa aegyptiaca, Madhuca indica, Momordica dioica, Moringa oleifera, Pithecellobium dulce,Solanum virginianum, Solena amplexicaulis,Sonneratia apetala, Sonneratia caesolaris, Streblus taxoides, Tamilnadia uliginosa,Trichosanthes cucumeriana,*	The fruits are used as vegetables by frying in oil or boiled to make curry by adding other vegetables. Due to having less economy no adding of spices except salt and chilly. Sometimes tamatoes also added for making sour and taste to the curry.	Vegetables/Curry
Fruits	*Aegle marmelos, Mangifera indica*	The ripened fruits pulp are collected. By adding sugar sherbat or the cool drink is made to take when the fruit is seasonally available. As the	Sherbat

Table 1 contd....

Table 1 contd....

Parts used	Scientific names of the plants	Mode of Use	Consumption process
		poor tribals cant buy sugar so without sugar the sherbat is made. The raw mango is burnt then make sherbat to make body cool	
Fruits	*Alangium salvifolium, Annona reticulata, Annona squamosa, Anthocephalus cadamba, Antidesma buniu, Antidesma ghaesembilla, Artocarpus lacucha, Averrhoa carambola, Borassus flabellifer, Buchanania lanzan, Caesalpinia bondac, Capparis zeylanica , Carissa spinarium, Cordia dichotoma, Cynometra iripa, Dillenia aurea, Diospyros malabarica, Diospyros melanoxylon, Erythroxylon monogynum, Ficus benghalensis, Ficus hispida, Flacourtia indica, Gardenia gummifera, Garuga pinnata, Glycosmis mauritiana , Glycosmis pentaphylla, Grewia helicterifolia, Lepisanthes rubiginosa,Lepisanthes tetraphyllus, Morus indica,Mangifera indica, Opilia amentacea, Phoenix acaulis, Phoenix paludosa, Phoenix sylvestris, Protium serratum, Phyllanthus acidus, Phyllanthus embilica, Physalis minima,Pithecellobium dulce, Protium serratum, Salacia chinensis, Schleichera oleosa, Semecarpus anacardium, Solanum nigrum, Syzygium cumini, Tamarindus indica, Terminalia bellirica, Terminalia cattapa, Terminalia chebula, Tetrastigma lanceolarium, Trapa natans, Ziziphus rugosa, Zizyphus mauritiana, Zizyphus oenoplia*	The ripened fruits are edible directly after ripened. Sometimes the fruits are eaten as seasonal fruits. Some of fruits are eaten to get relief during thirsty.	Raw/Ripened
Fruits	*Averrhoa carambola, Carissa carandas, Dillenia aurea, Dillenia aurea,Limonia acidissima, Mangifera indica, Protium serratum,Pithocellobium dulce, Phyllanthus acidus, Spondias pinnata, Sonneratia apetala, Sonneratia caesolaris, Spondias pinnata, Tamarindus indica, Ziziphus rugosa, Zizyphus mauritiana, Zizyphus oenoplia*	The matured ripened fruits are used to make chutney by adding salt, tomato and chilly. By adding only salt and chilly the fruits are made to pickle used for the year. The mango pulp are dried and make jelly which is stored for year to use during hunger period.	Chutney/Pickle/ Jelly
Stem	*Amorphophallus campanulatus,Caraluma atenuata ,Dendrocalamus strictus*	The young stem/rhizome are chopped and boiled. After boiling the the rhizomes or young stem are fried with oil or make curry with other vegetables. Sometimes fishes are also added to the item. The chopped *Dendrocalamu*s stem are steam boiled or without boiled are undried and kept for future in dry form which are used in food scarcity.	Curry/Boiled/Fry
Flowers	*Abelmoschus moschatus,Azadirachta indica, Bauhinia acuminata, Cassia fistula, Crotolaria juncea, Indigofera cassioides, Merremea umbellate, Moringa oleifera*	Flowers collected and boiled. After boiling the flowers are taken as food directly. Sometimes after boiled, the flowers are fried to eat with other vegetables.	

Table 1 contd....

Table 1 contd....

Parts used	Scientific names of the plants	Mode of Use	Consumption process
		Most time the boiled flowers are used to make curry with small fish and dry fish to eat.The excess flowers collected and dried and these dry flowes are used to make curry with small fish and dry fish to eat.The excess flowers collected and dried and these dry flowes are used in lean period.	Fried/Boiled
Seeds	*Artocarpus heterophyllus, Artocarpus lacucha, Bauhinia semla, Bauhinia vahlii, Cassia ocidentalis, Kandelia candel, Mangifera indica, Schleichera oleosa, Semecarpus anacardium, Shorea robusta*	The seeds are mostly boiled and make curry with other vegetables. The seeds of Cassia is used to make dal for protein. Sometimes the seeds are directly used as snacks after burnt in fire.	Boiled/Curry/Dal
Mushroom	*Lentinus fusipes, Termitomyces eurrhizus, Termitomyces heimii, Termitomyces medius, Termitomyces microcarpus, Volvoriella volvaceae*	The fresh mushrooms are collected. By boiling and adding spices with tomatoes and vegetables curry is made to eat. Sometimes dry fish are also used to the curry. The mushrooms are also dried in sunlight for future use when no other vegetables are used. By adding salt and chilli the mushroom are wrapped with leaf and burnt in fire. Then the fired mushroom is taken as food with rice.	Curry/Boiled/ Burnt
Root/Tubers	*Alocasia fornicata Amorphophhallus bulbifer, Amorphophallus campanulatus , Colocasia esculenta, Colocasia sp(red pith, Costus speciosus, Curcuma aungustifolia, Dioscorea alata, Dioscorea belophylla, Dioscorea bulbifera, Dioscorea glabra, Dioscorea hispida, Dioscorea oppositifolia Dioscorea pentaphylla, Dioscorea puber, Dioscorea tomentosa, Dioscorea wallichi, Ipomea mauritiana, Lasia spinosa, Leea macrophylla, Manihot esculenta, Pandanus foetidus, Pueraria tuberosa*	The tubers are boiled and fried with oil to consume. During boiling, tamarind is sometimes added to reduce bitterness.The tubers of Dioscorea spp. are again boiled to remove the bitterness and made curry or directly taken as food.	Curry/Boiled/Fry
Flowers/ Sap	*Careyota urens,Madhuca indica, Phoenix sylvestris*	The dry flowers of Madhuca longifolia is boiled and distilised to cool down for collection of countryliquor known as Mahuli. While sap collected from the petiole of Caryota urens and Phoenix sylvestris. The sap are mostly collected before sunrise to avoid alcoholic fermentation	Beverages
Endosperm/ Tubers	*Cycas sphaerica,Lasia spinosa, Dioscorea alata, Dioscorea bulbifera*	The seed endosperm of Cycas are collected and sundried. Then these owdered dry endosperm mixed with sugar and fried with oil to make sweet cake used for snacks. The slices of Lasia spinosa, Dioscorea alata, Disoscorea bulbifera are made chips after boiling it properly.	Snacks/Cakes /Chips

Table 2: Different plants groups of WEPs.

Plant Groups	Family	Genera	Species
Fungi	4	4	7
Pteridophytes	3	3	3
Gymnosperm	1	1	1
Dicotyledons	58	67	155
Monocotyledons	7	13	27
Total	72	83	193

Table 3: Different forms of WEPs.

Plant Groups	Mushrooms	Herbs	Shrubs	Trees	Climbers	Small tree	Total
Fungi	7						
Pteridophyte		3					
Gymnosperm				1			
Dicotyledons		48	28	55	21	3	
Monocotyledons		11	1	5	10		
Total	7	62	29	61	31	3	193

Table 4: List of species used as food during scarcity period as hunger food.

Sl.No.	Plants	Parts Used
1	*Abelmoschus moschatum*	*Fruits, Leaves, Flowers*
2	*Antidesma acidum*	*Leaves*
3	*Begonia pictata*	*Leaves*
4	*Blumea lacera*	*Leaves*
5	*Cucumis melo var utilissimus*	*Fruits*
6	*Cucumis tetragonous*	*Fruits*
7	*Dendrocalamus species*	*Young stem*
8	*Dioscorea bulbifera*	*Tuber*
9	*Dioscorea belophylla*	*Tuber*
10	*Dioscorea hispida*	*Tuber*
11	*Dioscorea oppositifolia*	*Tuber*
12	*Dioscorea pentaphylla*	*Tuber*
13	*Dioscorea puber*	*Tuber*
14	*Dioscorea wallichi*	*Tuber*
15	*Diplazium esculentum (fern)*	*Leaves*
16	*Ficus religiosa*	*Leaves*
17	*Grangea madraspatna*	*Leaves*
18	*Indigofera cassoides*	*Flowers*
19	*Lasia spinosa*	*Tubers*
20	*Lentinus fusipes*	*Mushroom*
21	*Madhuca indica*	*Flowers, Fruits*
22	*Mangifera indica*	*Fruits, Kernel*
23	*Pentatropis capensis*	*Leaves*
24	*Phaulopsis dorsiflora*	*Leaves*
25	*Solena amplexclenae*	*Fruits*
26	*Soneratia apetala*	*Fruits*
27	*Soneratia caesolaris*	*Fruits*
28	*Streblus taxoides*	*Fruits, Leaves*
29	*Suaeda maritime*	*Leaves*
30	*Vernonia squarrosa*	*Leaves*

Nuakhai festival.

Conclusion

In recent years, food security is one of the burning issues in our country. From the recent studies, it has been found that the wild edible food plants can play an important role in nutrition and income generation of the tribal communities. The consumption of wild food plants has been and still is being underestimated, and research, particularly concerning the socio–economic, cultural, traditional, and nutritional aspects of wild food plants needs adequate attention. These wild resources are closely related with the socio-economic development of rural and tribal peoples which help in meeting their day to day requirements. Further, there is little scientific information on the distribution and the consumption pattern of the wild foods of different communities along landscapes. The older people of tribal communities possess adequate knowledge about wild food plants while younger generation show little or no interest to learn about it. There is always a fear of loss of invaluable traditional knowledge, if somehow it fails to pass on from one generation to the other. There is now growing awareness of the value of such traditional knowledge and recognition of the urgent need to document such knowledge concomitant to the efforts to preserve the natural forest resources and which is the home to rich floral and faunal diversity. Steps need to be taken for cultivation and utilization of important wild edibles in agroforestry systems which will be an effective major for restoration of traditional knowledge systems and its biological components.

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