

Survey of edible plants for human consumption in south Odisha, India

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Abstract: The present paper reports the edible plant species of south Odisha, India. Total 243 edible plant species under 178 genera and 80 families are reported. Out of the total taxa collected, 240 taxa are angiosperms, 2 are pteridophytes and one is gymnosperm. Various ethnic groups and rural people consume 184 wild plants, 35 species that are wild as well as cultivated and 24 plants are under cultivation. The taxa include 208 dicots, 32 monocots and 2 pteridophyte species and one gymnosperm. The edible plants include 102 herbs, 61 shrubs, 15 twiner or climber and 65 tree species. Suggestion has been made for improvement and cultivation of wild edible plants.

Key words: ethnic group, edible plants, edible part consumed, south Odisha.

1. Introduction

WEPs play an important role in ensuring food security and improve the nutrition in the diets of many people in the developing countries. Many wild edible plants are nutritionally rich and can supplement nutritional requirements, especially vitamins and micronutrients [1,19]. Therefore, wild food resources reduce the vulnerability of local communities to food insecurity and provide a buffer in times of food shortage [10]. Among the indigenous forest food plants, the edible plant species play a vital role in supplementing the food requirements of rural/tribal people in remote areas through preserved/stored food stuffs during the time of food shortage. Attempts have been made by some researchers from different parts of India to collect Ethno-botanical information on edible plants [1,11,13,14,21,23]. In Odish, some researchers also enumerated the traditional uses of edible plants [5,16,22,24] However, thorough survey on edible plants of south Odisha has not been done. In the present communication, an attempt has been made to collect information on consumption of edible plants available in south Odisha.

2. MATERIALS AND METHODS:

2.1 Study area

Odisha state in the eastern part of India consists of 30 districts, out of which 7 districts, viz., Ganjam, Gajapati, Rayagada, Koraput, Nabarangpur, Malkangiri and Kandhamal are in the southern part with a diversified geographical status extending from coast to interior mountainous areas. This region constitutes a part of the Eastern Ghats of India. Most of the districts under study are covered with forest. Major ethnic groups, viz., Bhumia, Bonda, Dangaria Kandha, Didayi, Gadaba, Kandha, Koya, Kuti Kandha, Langia-Saura, Paika, Paraja, Sabara, Saura, and other tribes inhabit these districts. The tribal and rural poor people consume many of the wild edible plants available in their surroundings and sometimes during food scarcity.

2.2 Methods

For the survey, different places of southern Odisha were visited in different seasons during 2010-2015 and some of the elderly tribal and non-tribal men and women were identified and were interviewed to collect information on edible plants. A questionnaire was developed to collect information on Odia name of the plant, parts used, method of collection of plant parts, its availability and mode of food preparation. The data collected in this study is based on first-hand information. The referred plant specimens were collected in the company of at least one elderly man to make sure that the correct plant has been collected. The collected plant specimens were dried and herbarium specimens were prepared and deposited in the Herbarium of the P.G. Department of Botany, Berhampur University (BOTB), Berhampur. The specimens were identified with the help of the local floras [16, 20]. The plants are enumerated alphabetically as per their botanical name along with family, Odia name (O), habit, ethno-botanical uses and consumption pattern.

3 RESULTS AND DISCUSSION

3.1 Enumeration of edible plants of South Odisha

Abelmoschus crinitus Wall. (Malvaceae)

Herb with tuberous roots; Common in wasteland and roadside. Underground fleshy tubers are first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property and then consumed as vegetable.

Achyranthes aspera L. O: Apamaranga, E: Prickly Chaff Flower (Amaranthaceae)

Erect, straggling herb; Common weed in village wasteland. Young leaves and shoots are collected, fried then eaten by different tribal and rural people of South Odisha.

Aerva lanata (L.) Juss. O: Paunsia, Pichudi-sago. (Amaranthaceae)

Perennial, diffused or prostrate herb; Common weed in village wastelands and roadsides.

Tender leaves and shoots are consumed as leafy vegetable after cooking.

Alangium salvifolium (L.f.) Wangerin O: Ankula, E: Sage-leaf Alang (Alangiaceae)

Small, bushy tree, Common in waste ground, waysides, farm hedges, degraded scrub forest and mixed deciduous forest. Sweet ripe fruits are eaten by the tribal people.

Allium cepa L. O: Pajja, E: Onion (Liliaceae)

Herb; commonly cultivated in the area. Tender leaves and shoots are eaten. Various types of dishes are prepared with the leaf and inflorescence stalk.

Allophylus serratus (Hiern) Kurz O: Khandakoli (Sapindaceae)

Branched shrub; Common in scrub forest, degraded thorn forests and hedges. Ripe fruits are eaten.

Alternanthera sessilis (L.) R. Br. ex DC. O: Madaranga (Amaranthaceae)

Annual prostrate or ascending herb. Common wetland weed. Tender leaves and leafy shoots are collected in rainy season, fried and eaten.

Amaranthus spinosus L. O: Kantamarisha, Kantakhada, E: Prickly Amaranth (Amaranthaceae)

Annual branched herb, on roadsides and wastelands. Common in wastelands and cultivated lands. Tender leaves and leafy shoots are cut into small piece, cooked with salt and chilly then eaten.

Amaranthus tricolor L. O: Lalkhada (Amaranthaceae)

Amaranthus gangeticus L.

Annual erect or diffused herb. Commonly cultivated or self-sown in the region. Most part of the year. Leaves and shoots are consumed as leafy vegetable.

Amaranthus viridis L. O: Leutia, E: Green or Wild Amaranth (Amaranthaceae)

Erect or procumbent herb; Common weed, also cultivated. Most part of the year. Leaves and young shoots are collected, fried and then eaten.

Amorphophallus paeoniifolius (Dennst.) Nicolson var. **campanulatus** (Decne) Sivadasan O: Olakunda, Olua (Araceae)

Herb, Common often near villages, backyards and also cultivated. Underground fleshy tuber and corms are first boiled with rice husk and kept overnight then sliced and cooked along with boiled potato or other vegetables; also made into chutney; sometimes cooked with gur and tamarind pulp (*Sakara*).

Ampelocissus latifolia (Roxb.) Planch O: Kanjinoi (Vitaceae)

Large shrub. Frequent in open forests, village thickets and scrub forest. Blackish purple berries are sweet-sour in taste, eaten by tribal people.

Anacardium occidentale L. O: Lanka amba, E: Cashew nut tree (Anacardiaceae).

Small tree, commonly planted and almost naturalized in some parts. Ripe are eaten; the juice extracted from the peduncles is used for the preparation of alcohol. Kernels are roasted with salt and eaten. Kernels are used in the preparation of various food items.

Anethum graveolens L. O: Juani, E: Dill (Apiaceae)

Annual herb; Common weed, also cultivated. Leaves and young shoots are collected, roasted and then eaten.

Anisochilus carnosus (L.f.) Wall. O: Bennia (Lamiaceae)

Erect perennial herb; Common in dry rocky ground, steep hill sides, old wall and roof. Young leaves are collected, roasted then eaten.

Annona raticulata L. O: Ramphala, E: Bullock's Heart (Annonaceae)

Small deciduous tree; Cultivated, often self-sown in wastelands close to villages, in homesteads and hedges. Pulp of ripe fruits is consumed.

Annona squamosa L.O: Sita phala, E: Custard Apple (Annonaceae)

Shrub. Cultivated and naturalized in many places, often found self-sown near human settlements and village thickets and in hedges. Pulp of ripe fruits sweet and is eaten.

Antidesma acidum Retz. O: Nunnunia, Murmuri (Euphorbiaceae)

Large shrub or small tree; Common in dry deciduous and scrub forest. Ripe fruits are slightly acidic, but eaten.

Antidesma ghaesembilla Gaertn. O: Katha Murmuri (Euphorbiaceae)

Shrub or Small tree; Common in all types of forest. Fruits are acidic with acrid taste and are eaten.

Aponogeton natans (L.) Engl. & K. Krause (Aponogetonaceae)

Aquatic herb, Common in stagnant, shallow water, rice fields, pond and marshes mostly in open situation. It associates with *Nymphoides indica*, *Nymphaea* spp., *Neptunia oleracea*, *Ipomoea aquatica*. Starchy bulbils and tuberous roots are eaten as raw or as vegetables.

Aponogeton undulatus Roxb. O: Kesrukanda (Aponogetonaceae)

Aquatic herb; Common in stagnant, shallow water, rice fields, pond and marshes. It associates with *Nymphaea pubescens*, *Neptunia oleracea*. Starchy bulbils collected in winter season are consumed after cooking.

Aporosa octandra (Buch.-Ham. ex D.Don) Vickery O: Masania (Euphorbiaceae)

Small tree; Common near streams. Ripe fruits are eaten.

Ardisia solanacea (Poir.) Roxb. O: Tinkoli (Myrsinaceae)

Erect branched shrub; Common in moist open valleys, mostly near water. Young leaves are cooked as vegetable with small fish by Kondha tribe. Juice of ripe fruit is a favourite drink of tribal people.

Argemone maxicana L.O: Kanta Kusuma, Udisamari, E: Prickly poppy, Mexican poppy (Papaveraceae)

Herb; Common weed. Seed oil is used for cooking and edible purpose by the tribal people during emergency.

Argyria cymosa Sweet (Convolvulaceae)

Herb, Common in jungle. Ripe fruits are sweet in taste and are eaten.

Argyria nervosa (Burm.f.) Bojer O: Brudhajak, E: Elephant Creeper (Convolvulaceae)

Shrub. Frequent in forest. Young leaves are collected, fried then eaten.

Artocarpus heterophyllus Lam.O: Panasa, E: Jackfruit (Moraceae)

Large evergreen tree. Commonly cultivated, often self-sown and semi-wild in damp forests and waste places close to village. Unripe green fruits are cooked and eaten. Ripe fruit pulp is eaten and ripe seeds consumed as vegetable.

Asparagus racemosus Willd. O: Satabari (Liliaceae)

Under shrub, fairly common in forests and scrub jungles. Root stocks are roasted, cooked with salt and chilly then taken. Sliced tuber pieces are dried for a week and the tuber powder along with sugar made into pudding (*khiri*) during festivals and ceremonies. Tuber pieces are added in fermented local wine to enhance taste.

Bacopa monnieri (L.) Wettst. O: Brahmi (Scrophulariaceae)

Creeping herb; Common in wet places near water courses. It associates with *Eclipta prostrata*, *Neptunia oleracea*, *Hedyotis diffusa*, *Marselia minuta*, *Lindernia* spp. The tender shoots are collected from unpolluted area and cooked then eaten as supplementary food (leafy vegetable) by tribal people.

Bambusa bambos (L.) Voss O: Kantabaunsa, E: Thorny bamboo (Poaceae)

Bambusa arundinacea (Retz.) Roxb.

Large shrub, Common in moist valley, but available in most forests, often planted in open places. Young tender shoots (locally called *karada*) are cut into small pieces, cooked with salt and chilly and then eaten. Different types of dishes are prepared out of *karada* by the local tribal and rural people. Seed when available are cooked like rice and eaten. It is also made into flour and cakes are prepared out of this flour.

Basella alba L. O: Poi, E: Indian Spinach (Chenopodiaceae)

Herb, commonly cultivated, also in wild state on rocky grass hillsides, Stem and leaves are used to prepare curry.

Bauhinia purpurea L. O: Barada saga (Caesalpiniaceae)

Moderate sized tree; Frequent in forest, often planted. Leaves are collected, cooked as curry and taken by the tribal and rural people. Flowering buds are edible; used as leafy vegetable.

Bauhinia racemosa Lam.O: Ambalota (Caesalpiniaceae)

Small tree, Frequent in mixed forest. Flowers are cooked as vegetable.

Bauhinia semla Wunderlin O: Amati, Chaunri (Caesalpiniaceae)

Moderate size tree; Common in mixed forests especially in the hills. Leaves are collected, cooked as curry and taken by the tribal people.

Bauhinia vahlii Wight & Arn. O: Sialipatra, Khalipatra (Caesalpiniaceae)

Woody climber; common in mixed and sal forests. Young leaves are collected, cooked as curry and taken. Roasted seeds (cotyledons) are an important diet of tribal people.

Bauhinia variegata L. O: Kanchana (Caesalpiniaceae)

Small tree; Common in mixed forest, especially in the hills, often planted in the backyard, gardens. Leaves are collected, cooked as curry and taken. Flowers are used as vegetable.

Begonia picta Sm. (Begoniaceae)

Herb; Common in cool moist shady place. Leaves are collected, cooked as curry and taken.

Boerhavia chinensis (L.) Rottb. (Nyctaginaceae)

Diffused herb, Common among bushes, in village hedges. It associates with plant species like *Lindernia* spp., *Hedyotis* spp., *Grangea maderaspatana*, *Spilanthes paniculata*, *Heliotropium ovalifolium*. Tender leaves and leafy shoots are cut into small pieces and cooked with salt chilly and then eaten.

Boerhavia diffusa L. O: Ghoda-puruni, Atikapudi-sago. (Nyctaginaceae)

Diffused herb; Common weed on village wastelands and roadsides. Tender leaves and young shoots are collected, fried then eaten by tribal people.

Bombax ceiba L. O: Simuli (Bombacaceae)

Tree with prickly trunk, Common throughout the area. unripe green fruit are fried and eaten. Seeds are fried and eaten by tribal people.

Brassica napus L. var. **glauca** (Roxb.) Schulz O: Sarson-sago, E: Yellow Sarson, Indian Colza. (Brassicaceae)

Herb; Cultivated and often as an escape, Leaves and stems are consumed as leafy vegetable. Chopped leaves and stems are dried in shade, stored in an earthen container, and then consumed by tribal people.

Brassica oleracea var. **botrytis** L. O: Phula-Kobi, E: Cauliflower (Brassicaceae)

Glabrous annual herb; Different varieties are cultivated in the region. Cauliflower is a favorite vegetable. Leaves are fried or made into curry and consumed.

Brassica oleracea L. var. **gongylodes** L. O: Phala-kobi, Olkobi E: Knol-khol (Brassicaceae)

Annual herb, Cultivated. Knol-khol is an important vegetable. Leaves are fried or made into curry and consumed.

Brassica rapa L. O: Salgum, E: Turnip (Brassicaceae)

Herb, Cultivated. Root boiled, cooked, roasted and then consumed as vegetable.

Breynia vitis-idaea (Burm. f.) C.E.C. Fisch.O: Jajan, Jhagangi, E: Indian snowberry (Euphorbiaceae)

Shrub, Common in forest. Tender leaves and young shoots are collected, roasted then eaten.

Bridelia retusa (L.) A. Juss.O: Kasi, Panikasi (Euphorbiaceae)

Small or moderate sized tree, Common in mixed deciduous to semi evergreen forest, especially in valleys. Ripe fruits and seeds are eaten as raw.

Bridelia Montana (Roxb.) Willd.O: Marda (Euphorbiaceae)

Large shrub or small tree; Common in semi evergreen forest, especially in valleys. Ripe fruits and seeds are eaten as raw.

Buchanania cochinchinensis (Lour.) M. R. Almeida O: Charakoli (Anacardiaceae)

Buchanania lanzan Spreng.

Small tree; Common in dry deciduous forest, often as an associate of sal. Ripe fruits and seeds are eaten as raw.

Butea superba Roxb.O: Palas-noi, Laipalasa (Fabaceae)

Large woody shrub, common in the hill forest. Watery sap oozing out from the stem on cutting is used for drinking purpose by the tribal people to quench thirst while passing through the forest.

Caesulia axillaris Roxb. O: Jamjuria (Asteraceae)

Erect annual herb, Common in marshy places. Sometimes floating but usually grows rooted in the substrate in shallow water at the edge of tank, along the bank of irrigation canals and ditches. Young leaves are cooked with rice, and then eaten by tribal people.

Cajanus scarabaeoides (L.) Thouars. O: Kulthia, Ban-Kulthia (Fabaceae)

Atylosia scarabaeoides (L.) Benth.

Slender twinning herb; common along waste open field. Seed are eaten as raw.

Calamus guruba Buch.-Ham. O: Kanta beta (Arecaceae)

Large climber; abundant in the scrub jungles, hill forest; often along the streams.

Use: Pulp of ripe fruits is eaten.

Calamus viminalis Willd. O: Beta, Panibeta (Arecaceae)

Shrub; common in damp forest. Ripe fruits are eaten as raw by tribal people.

Canthium coromandelicum (Burm. f.) Alston. O: Totadi, E: Wild Jassemine, Carray Cheddie (Rubiaceae)

Perennial spinous shrub; common in rocky hills and in village wastelands, scrub forest.

Use: Young leaves are collected and cooked with fermented rice water and eaten.

Capparis brevispina DC. O: Lepura, Niphura, E: Indian Caper (Capparaceae)

Erect shrub; Common in thorny scrub forest and waste lands. Unripe green fruits are fried and eaten. Ripe fruits are eaten as raw.

Capparis zeylanica L. O: Asadhua, E: Ceylon Caper (Capparaceae)

Climbing shrub; Common in scrub forest, thickets, hedges. Ripe fruits with white pulp are occasionally eaten by tribal people. Fruits made into pickle.

Caralluma adscendens (Roxb.) R. Br. O: Hada-sinkula (Asclepiadaceae)

Herb or under shrub; Grow on bare rocks, hillsides, frequent in dry places among bushes. Fresh stem is eaten as raw.

Careya arborea Roxb. O: Kumbi, E: Slow-Match Tree (Lecythidaceae)

Small or medium-sized tree; Common in forest, mostly in valleys also a dominant species of grassy hill top vegetation. Tender leaves are collected, fried then eaten. Ripe fruits are aromatic, often cooked and eaten.

Carissa carandas L. O: Ankukoli, E: Christs Thorn, Karaunda (Apocynaceae)

Large shrub with dichotomous branches; occasionally wild in dry forest; as a hedge plant. Ripe fruits are consumed as raw and unripe fruits are made into pickle.

Carissa spinarum L. O: Ankhu- koli, San Karenda (Apocynaceae)

Shrub with numerous diffused branches; fairly common, especially in thorny scrub jungle, roadside, wasteland, coastal sand dunes, dry rocky areas and in open forest. Ripe fruits are consumed as raw and unripe fruits are made into pickle.

Caryota urens L. O: Salapa, E: Indian Sago Palm, Toddy Palm (Arecaceae)

Tree, Frequent in the hills in deep ravines and often also planted. Flowers and pith are used as vegetable. The sap collected from the inflorescence stalk, locally called *Salapa*, is sweet before fermentation, mostly consumed after fermentation in the tribal areas of South Odisha.

Cassia fistula L. O: Sunari, E: Indian Laburnum (Caesalpiniaceae)

Small or medium sized tree; fairly common in the forest; also planted. Flowers are fried and eaten as vegetable.

Celosia argentea L. O: Gudugudia-saga, E: Quail Grass (Amaranthaceae)

Erect glabrous herb; Common in crop fields as weed and waysides. Young leaves and shoots are collected, roasted then eaten by the tribal and rural people.

Centella asiatica (L.) Urb. O: Thalkudi (Apiaceae)

Herb with long creeping stems Common in wet places. Fresh leaves and young shoots are collected, roasted then eaten. Leaves made into chutney. Leaves are also cooked with rice and dal.

Cheilocostus speciosus (J.Koenig) C.D. Specht. O: Cheki Kanda, Keukand, Gaigobara (Zingiberaceae)

Costus speciosus (Koenig) Smith.

Herb; Common throughout the area, especially in shady place. Seedlings are consumed as leafy vegetable. Seedlings are roasted then eaten by tribal people in the region. Boiled rhizomes are consumed; cooked with pulses and tamarind/tomato then consumed as curry by the tribal people.

Cipadessa baccifera (Roth) Mig. O: Pittamari (Meliaceae)

Shrub or small tree; Common, especially in scrub and in open mixed forest. Ripe fruits are eaten as raw.

Citrus medica L. O: Limbu, E: Citron (Rutaceae)

Spreading shrub, Wild along streams in the moister valley also cultivated. Fruit juice is consumed. Fruits are made into pickle.

Cleome gynandra L. O: Araka-saga, E: Shona Cabbage or African Cabbage (Cleomaceae)

Erect branched annual herb; frequent weed in wasteland. Leaves and young shoots are collected, fried then eaten by the tribal people.

Cleome monophylla L. O: Ranga-sorisha (Cleomaceae)

Erect glandular-pubescent herb; Occasional in forest outskirts, fallow lands and cleared forests. Leaves and young shoots are collected, fried then eaten.

Cleome viscosa L. O: Bana-sorisha, E: Sticky spider-flower (Cleomaceae)

Erect, glandular, pubescent annual herb; Common weed in wastelands. Leaves and shoots are consumed as leafy vegetable.

Coccinia grandis (L.) Voigt O: Kundri, Bana-kundri, E: Ivy Gourd, Little Gourd (Cucurbitaceae)

Climbing herb, Common in scrub forest, hedges and thickets. Plants with edible fruit variety are cultivated in most of the village backyards in the region. Leaves and leafy shoots are collected, cut into small pieces, cooked with salt and chilly and then eaten. Green fruits are cooked and eaten.

Cocculus hirsutus (L.) W. Theob. O: Musakani (Menispermaceae)

Straggling climber; Common over bushes and small trees. The triturated gelatinous juice from tender leaves are collected and allowed to coagulate and after adding sugar they consume it.

Colocasia esculenta (L.) Schott O: Saru, E: Taro, Cocoyam (Araceae)

Tuberous herb, Common in damp, shady places; also edible varieties are commonly cultivated. The wild plant species is available in patches. Young tender leaves and leafy shoots are collected, cut into small pieces cooked with salt and chilly then eaten by rural and tribal people. Rhizome, tubers and corm are consumed as vegetable after boiling and cooking. Corms are made into chutney along with curry leaf (*Murraya koenigii*). Corm pieces smeared with rice flour and fried as cake.

Combretum album Pers. O: Atundi, Koralkundia (Combretaceae)

Combretum roxburghii Spreng.

Under shrub; Common along waysides in sal forest, often in burnt forest. Watery sap oozing out from the stem is used for drinking purpose by the tribal people while moving through the forest. Seeds are roasted with salt and eaten by tribal people.

Combretum nanum Buch.-Ham. ex D. Don (Combretaceae)

Undershrub, Common along waysides in sal forests, often in burnt forests. Seeds roasted with salt are eaten by tribal people.

Commelina benghalensis L. O: Kaniseera (Commelinaceae)

Diffused or erect herb, Common weed in wet places. Leaves and tender shoots are collected, roasted then eaten by tribal and rural people; consumed as supplementary leafy vegetable.

Corchorus aestuans L. O: Bana-kadali (Tiliaceae)

Diffused branched herb; Common weed. Tender leaves and young shoots are collected, fried then eaten by tribal people.

Corchorus capsularis L. O: Pita-nalita E: White Jute (Tiliaceae)

Herb; Cultivated. Tender leaves are collected, fried and then eaten.

Corchorus fascicularis Lam. (Tiliaceae)

Herb; Common weed. Tender leaves and young shoots are collected, cooked and consumed as curry.

Cordia dichotoma G. Forst. O: Ambota, Goohalo, E: Large sebestén (Boraginaceae)

Cordia obliqua Willd.

Small tree with drooping branch; Frequent in mixed forest. Ripe fruits are eaten by tribal people.

Coriandrum sativum L. O: Dhania (Apiaceae)

Annual Herb; commonly cultivated. Tender leaves are collected, curry is prepared and eaten. Leaves made into chutney. Edible leaves cooked with rice and dal.

Crateva religiosa G. Forst.O: Baruna (Capparidaceae)

Crateva magna (Lour.) DC.

Tree; Common in scrub forest. Unripe green fruits are fried and eaten. Ripe fruits are also eaten.

Cucumis melo L. var. **utilissimus** Duthie & Fuller O: Phuti-kakudi, E: MuskMelon (Cucurbitaceae)

Herb; Frequent in waste ground also cultivated. Tender leaves are cooked, and eaten. Unripe green fruit are made curry and eaten.

Cucurbita maxima Duchesne O: Boitalu, E: Red Pumpkin (Cucurbitaceae)

Annual climbing herb; generally spreading on the ground as an escape; commonly cultivated. Leaves and young shoots are collected and are consumed as leafy vegetable. The fruit is consumed as vegetable; various dishes are prepared out of the fruit.

Curcuma angustifolia Roxb. O: Palu Kanda, Palua, E: East Indian Arrowroot, Bombay arrowroot (Zingiberaceae)

Herb; Frequent in forest. Rhizomes are roasted, cooked then consumed by the tribal people.

Cycas circinalis L. var. **orixensis** Haines O: Arguna, Rengua, E: Sago Palm (Cycadaceae)

Tree, Fairly frequent in forests especially abundant in hills with abundant rainfall. Pulp of ripe dried fruit is made into cake with rice and is consumed.

Cyphostemma auriculatum (Roxb.) P. Singh & B.V. Shetty O: Kanchikanchia (Vitaceae)

Cayratia auriculata (Roxb.) Gamble

Shrub; Common in the forest. Tender leaves and shoots are cooked as currey and then taken as food.

Daucus carota L. O: Gajar, E: Carrot (Apiaceae)

Herb; Cultivated. Root stocks are boiled, cooked, roasted and then consumed as vegetable.

Dendrocalamus strictus (Roxb.) Nees O: Saliabaunsa, E: Solid Bamboo (Poaceae)

Arborescent bamboo; Common in mixed forests on dry hills. Tender culms (locally called Karida) are collected, cut into small pieces; boiled and fry or currey is prepared then consumed by the tribal and rural people.

Dillenia indica L.O: Oau, E: Elephant apple (Dilleniaceae)

Moderate sized tree with a dense crown; frequently planted. It thrives well in damp situations along forest stream. Ripe fruits are sour in taste; curry is prepared with gur or made into jam or jellies.

Dillenia pentagyna Roxb.O: Rai, Kirmilla (Dilleniaceae)

Moderate sized tree, Common in the hilly regions. Ripe fruits are consumed by the local people. Flower and flowering buds are edible, consumed as vegetable.

Dioscorea alata L.O: Khambo alu, E: Greater Yam, Asiatic Yam, and Water Yam (Dioscoreaceae)

Twiner; commonly cultivated. Tuber is edible. Tribal people eat tuber after cooking. Tubers are said to be sweet.

Dioscorea belophylla (Prain) Voigt ex Haines O: Kanda alu, Bata Kanda (Dioscoreaceae)

Twiner, commonly cultivated. Tuber used as vegetable. Tribal people eat tuber raw or cooked as vegetable with pulses.

Dioscorea bulbifera L. O: Pita alu, E: Potato yam, Air Potato (Dioscoreaceae)

Twiner; Fairly common in forest, thickets, Rhizome used as vegetable. Rhizomes are repeatedly washed, sliced, boiled and kept overnight in running water, further boiled to remove bitterness, cooked and then taken as curry.

Dioscorea glabra Roxb. O: Kanta alu (Dioscoreaceae)

Twining herb; fairly common in open forest. Tubers are edible. Tubers are washed properly, boiled, sliced and cooked with other vegetables then eaten. also burnt as snakes.

Dioscorea hispida Dennst.O: Bainya alu (Dioscoreaceae)

Twiner; Strong twiner. Occasional in forest. Tuber sliced soaked in running water and boiled successively with the leaves of Tamarind. The excess water is filtered out further cooked as curry and eaten as such during food scarcity.

Dioscorea oppositifolia L.O: Pani Alu (Dioscoreaceae)

Strong twiner, Occasional in forest. Tuber is peeled and eaten raw or sliced and cooked with other vegetables and onion and consumed as curry.

Dioscorea pentaphylla L.O: Bana alu, Masia kanda (Dioscoreaceae)

Twiner, Fairly common in forest. Tuber and bulbils are thoroughly washed then boiled, sliced and cooked with onion and spice and taken as curry.

Dioscorea puber Blume O: Kasa kanda (Dioscoreaceae)

Twiner; Common in forest. Tuber and bulbils are washed properly cooked as curry by frying with oil and spice. Chutney is also prepared out of the tuber.

Dioscorea wallichii Hook. f. O: Phala Kanda (Dioscoreaceae)

Twiner; Frequent in forest. Rhizome, tubers and bulbils are sliced and cooked as curry after successive boiling to remove the acrid principle. Tuber dried, powdered and made into sherbet with sugar. Boiled tuber consumed during food scarcity.

Diospyros chloroxylon Roxb.O: Gaura kasa, E: Green Ebony Persimmon (Ebenaceae)

Shrub or small tree; frequent in the hills and the scrub forest. Ripe fruits are sweet and consumed by the local people.

Diospyros malabarica (Desr.) Kostel O: Kendu, E: Gaun Persimmon (Ebenaceae)

Tree Common in valleys along streams. Ripe fruits are sweet and consumed.

Diospyros melanoxylon Roxb.O: Kendu, E: Coromandel Ebony Persimmon (Ebenaceae)

Large tree; common in dry mixed deciduous forest. Ripe fruit are edible and also marketed in the area.

Ehretia laevis Roxb.O: Masania (Boraginaceae)

Small or medium sized tree, Frequent in forest. Stem bark used as vegetable, cooked then eaten. Ripe fruits are consumed.

Emilia sonchifolia (L.) DC. O: Sitalapani, Sarkara (Asteraceae)

Erect herb, Common in moist shady places. Tender leaves and young shoots are collected, cooked then eaten.

Eryngium foetidum L. O: Jangala-dhania, Bana-dhania (Apiaceae)

Erect, perennial aromatic herb, in damp places close to streams in cool valleys. Leaves are used as flavouring agent. Leaves made into chutney and also used as condiment and spices. Young leaves are cooked with rice and dal.

Euphorbia thymifolia L. O: Patra-siju (Euphorbiaceae)

Prostrate herb, Common weed. Tender leaves and shoots are collected, cooked then consumed.

Ficus auriculata Lour. O: Rajadimiri (Moraceae)

Tree; Common near stream. Ripe fruits are sweet and consumed by the local people.

Ficus benghalensis L. O: Bara (Moraceae)

Large tree, fairly common near villages, open places; planted in groves and along roads for shade. Ripe fruits are sweet and consumed by the tribal people.

Ficus heterophylla L. f. O: Bhui dimir, Ganthi sahada (Moraceae)

Shrub; Common in wet and watery places. Unripe receptacle (figs) are cooked after processing and eaten as curry.

Ficus hispida L. f. O: Dimiri, Baidimiri (Moraceae)

Small tree, Common in forest and waste places. Unripe fruits (receptacle) are cooked as curry. Ripe fruits are edible; also made into jam.

Ficus racemosa L. O: Dimiri, E: Clustered Fig. (Moraceae)

Large or moderate sized tree. Fairly common in valleys and village surrounding. Ripe fruits are edible.

Ficus semicordata Buch. - Ham. ex Sm. O: Bhui dimiri, Kuji dimri (Moraceae)

Small or moderate sized tree, Common near streams and in cool, damp places.

Receptacle (fig) are cooked and then eaten.

Flacourtia indica (Burm.f.) Merr O: Kanteikoli, E: Madagascar Plum (Flacourtiaceae)

Deciduous or evergreen shrub, Common both in plain and hill areas. Abundant in scrub jungles, wasteland and in sandy soil close to sea coast. Ripe fruits are eaten raw.

Flacourtia jangomas (Lour.) Raeusch O: Bainchakoli, E: Puneala Plum (Flacourtiaceae)

Small deciduous tree with decompound spines, Common in forest cool valleys, often cultivated. Sweet and tasty ripe berries are eaten raw in summer.

Garcinia xanthochymus Hook. f. ex T. Anders O: Sitambu, Chiuri (Cluciaceae)

Small or moderate sized tree, Fairly common in evergreen and semi-evergreen forest, near streams. Rarely planted in gardens and homesteads. Ripe fruits are eaten raw.

Gardenia gummifera L. f. O: Bhurana Koli, Guruda (Rubiaceae)

Shrub with twisted branch; Common in dry hill, open forest or sand stone hills. Fleshy pulps of the fruits are consumed by tribal people. Seeds are roasted with salt and eaten.

Gardenia latifolia Aiton. O: Dambaru (Rubiaceae)

Small tree, Common in open forest, rocky hills. Fleshy pulps of the fruits are consumed by tribal people.

Garuga pinnata Roxb. O: Sarupatri (Bursaceae)

Tree, Common in mixed forest along streams. Fruits are eaten raw, cooked or made to pickle.

Seeds are eaten raw, cooked or made to pickle.

Glinus oppositifolius (L.) Aug. DC. O: Pita-saga (Molluginaceae)

Small diffuse or prostrate glabrous herb; Common in sandy soil, especially along river banks and borders of ponds and watercourses. Young leaves and shoots are collected, roasted then eaten by tribal and rural people.

Globba marantina L. O: Chhota rasna (Zingiberaceae)

Herb with creeping rhizome; Common in forests. Rhizome first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to remove the irritating property and then consumed as vegetable.

Glycosmis pentaphylla (Retz.) DC. O: Chauladhua (Rutaceae)

Shrub; Common in scrub forest, village surroundings, wasteland, open forest under moderate shade. Ripe berries are pulpy and eaten as such by the local people.

Grewia carpinifolia Juss. (Tiliaceae)

Large climbing shrub; Occasional in scrub forest. Ripe fruits are eaten.

Grewia hirsuta Vahl O: Sunaranga (Tiliaceae)

Shrub; Common in open dry deciduous forest and scrub jungle. Ripe fruits are eaten.

Grewia rothii DC. O: Phulari (Tiliaceae)

Shrub; Common in the forests especially in the hills. Ripe fruits are eaten.

Grewia hispida Roxb. ex DC. O: Burso (Tiliaceae)

Under shrub; frequent in open places, near forest, grasslands etc. Ripe fruits are eaten.

Hedychium coronarium J. Koenig O: Ada phula, E: Common Ginger Lily (Zingiberaceae)

Herb; Common along streams and other water courses. Rhizome first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property and then consumed as vegetable.

Hemidesmus indicus (L.) R. Br. ex Schult. O: Dudhi, Dudholeh, E: Indian Sarsaparilla (Asclepiadaceae)

Twining herb; fairly common in forest, wasteland, and cultivated land. Roots are roasted, cooked then consumed by tribal people.

Hibiscus sabdariffa L. O: Kaunria- sago, E: Red Sorrel, Roselle (Malvaceae)

Erect annual herb; Cultivated and often self-sown. Tender leaves are collected, cooked then eaten.

Holoptelea integrifolia (Roxb.) Planch. O: Charla (Ulmaceae)

Large or small tree; occasional in deciduous forest. Ripe fruits are eaten.

Hydrolea zeylanica (L.) Vahl O: Langulia, Balluballua, Kashindri (Hydrophyllaceae)

Erect or diffuse herb, Common in wet places, rice swamps, on the margin of tanks and watercourses. Leaves and young shoots are collected, roasted and taken as food.

Hygrophila auriculata (Schumach.) Heine O: Koelekha (Acanthaceae)

Herb or under shrub; Common along water courses. Tender leaves and young shoots are roasted and taken as food.

Indigofera astragalina DC. (Fabaceae)

Erect herb; Frequent in waste ground. Seed pounded with rice and eaten as cake.

Indigofera cassioides Rottl. ex DC. O: Girala, Jheli (Fabaceae)

Branched shrub; Common in hilly areas. Flowers and flowering buds are edible.

Ipomoea aquatica Forssk. O: Kalamba-saga, Tuti-saga, E: Swamp cabbage (Convolvulaceae)

Shrub; Trailing on mud or floating in water, common in water bodies. Fresh leaves and tender shoots are collected, cooked and then eaten as leafy vegetable.

Ipomoea batatas (L.) Lam.O: Kandamula, E: Sweet Potato (Convolvulaceae)

Herb, Cultivated. Underground fleshy tubers are consumed as raw or after boiling. Various dishes are prepared out of sweet potato.

Ipomoea cairica (L.) Sweet O: Bana kamala (Convolvulaceae)

Large climber; frequently planted. Underground fleshy tubers are first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property and then consumed as vegetable.

Justicia betonica L. (Acanthaceae)

Erect under shrub; common in forest. Terminal spike; Tender leaves are collected, cooked then eaten.

Kavalama urens (Roxb.) Raf.O: Genduli, Kavili (Sterculiaceae)

Sterculia urens Roxb.

Moderate sized tree; Common in deciduous forest. Seeds are roasted and eaten.

Lannea coromandelica (Houtt.) Merr.O: Mahi, E: Wodier (Anacardiaceae)

Small or moderate sized tree, fairly common in forest throughout the area. Ripe fruits are eaten.

Lantana camara L. var. **aculeate** (L.) Mold.O: Nagairi, Jaikoli, E: Lantana (Verbenaceae)

Aromatic shrub, Found in wasteland, roadside, open forest area and scrub jungle. Ripe fruits are consumed.

Lasiaspinosa (L.) Thwaites O: Kanta-saru (Araceae)

Spinous herb, along muddy streams under shade. Leaves are roasted and taken as food. Rhizome properly washed, spines are peeled, cut into small pieces, cooked with tamarind, salt and chilly then consumed. Fried rhizomes are taken as morning snacks.

Lepisanthes rubiginosa (Roxb.) Leenth. O: Nanga (Sapindaceae)

Small tree, Common in damp forest and mangrove forest. Ripe fruits are consumed by the local people.

Leucas aspera (Willd.) Link O: Gayasa (Lamiaceae)

Erect or diffused much branched herb; Common weed along waysides and in cultivated land. Tender leaves and young shoots are collected during rainy season, cooked and taken as food.

Leucas cephalotus (Roth) Spreng. O: Bada-gayasa (Lamiaceae)

Erect herb. Common weed along waysides, in wasteland and cultivated land. Leaves and young shoots are cooked and taken as food.

Leucas decemdentata (Willd.) Sm. var. **decemdentata** O: Pungi-sago (Lamiaceae)

Leucas mollissima Wall. ex Benth.

Slender herb; fairly common in forests and waste ground especially in the hill areas. Leaves and young shoots are cooked and taken as food.

Limonia acidissima Groff O: Kaitha (Rutaceae)

Tree with axillary spine, Frequent in open forest and villages. Ripe fruit pulp is eaten. Pulp of unripe fruit is made into pickle. Fruits are marketed.

Linnophila indica (L.) Druce O: Keralata (Scrophulariaceae)

Small marsh herb, Common along borders of ponds, flooded paddy fields, wet low land. Leaves and young shoots are roasted and taken as food.

Luffa acutangula (L.) Roxb. O: Janni, E: Ribbed Gourd (Cucurbitaceae)

Annual herb. Widely cultivated. Tender leaves are mixed with fish and cooked as curry for edible purpose. Fruits are consumed as vegetable.

Madhuca longifolia var. **latifolia** (Roxb.) A. Chev O: Mahula, Mahua, E: Butter Tree (Sapotaceae)

Madhuca indica Gmel.

Large or moderate sized tree; Common in forests and village sides. Leaves are roasted and taken as food. Flower and flowering buds are edible, taken as vegetable. Cake is prepared from the flowers. Country liquor (alcohol) is prepared from the dried flowers. Oil obtained from the seed is used for cooking purpose by the local tribes.

Manihot esculenta Crantz O: Simuli konda, Katha Alu, E: Cassava, Tapioca (Euphorbiaceae)

Shrub. Frequently cultivated. Flesh swollen/tuberous roots are boiled and consumed. Sometimes cooked then eaten as vegetable.

Mangifera indica L. O: Amba, E: Mango (Anacardiaceae)

Large tree; Wild in valleys along the bank of streams; also cultivated. Ripe fruit eaten as raw and unripe fruit made into pickle and chutney. The cotyledons are washed thoroughly and cooked and taken at times by the tribal people in the remote areas.

Manilkara hexandra (Roxb.) Dubard. O: Khirikoli (Sapotaceae)

Small tree. Abundant in open forest, sand stone hills. Cultivated in some parts of India for its sweet edible fruits. Ripe fruits are consumed by the local people.

Marsilea minuta L.O: Sunusunia-sago (Marsileaceae)

Small herb; Common in wet places. Tender leaves and young shoots are roasted and taken as food.

Marsilea polycarpa Hook. & Grev.O: Sunsunia (Marsileaceae)

Marsilea quadrifolia L.

Small herb; Frequent in wet places and water bodies. Leaves are collected in the morning, roasted and taken as food.

Merremia emarginata (Burm. f.) Hallier f.O: Musakani (Convolvulaceae)

Ipomoea reniformis (Roxb.) Choisy.

Creeping herb rooting at the node, Occasional along waysides and wastelands. Leaves and tender shoots are collected, cooked and then eaten.

Meyna spinosa Roxb. ex LinkO: Langal Kanta, Salara Koli (Rubiaceae)

Small tree or large shrub; Common in open forest and scrub Jungle; also along streams in mixed forest. Seeds are roasted and eaten.

Milium tomentosa (Roxb.) J.Sinclair O: Gandha palasa (Annonaceae)

Small or moderate sized tree; Common in dry deciduous forest. Fleshy ripe fruits are consumed as raw.

Mimusops elengi L.O: Baula, E: Indian Medaller (Sapotaceae)

Large or often small tree; frequently planted. Fleshy ripe fruits are consumed as raw, occasionally used for making pickles.

Mollugo pentaphylla L. O: Pita-gahama (Aizoaceae/Ficoideae)

Erect annual herb; Common weed in cultivated land, roadside and village wasteland. Leaves are collected, roasted then eaten.

Momordica charantia L. O: Tusi-kalara, E: Bitter Gourd (Cucurbitaceae)

Herb, Common in hedges and thickets. Improved varieties are cultivated. Leaves are eaten after frying or roasting. Fruit is used as vegetable.

Monochoria hastata (L.) Solms O: Kaupana, Kajalpatia (Pontederiaceae)

Aquatic herb, Common in stagnant or slow moving fresh-water tank, shallow pools, flooded paddy fields and swampy area. The young inflorescence is cooked as vegetable.

Moringa oleifera Lam. O: Sajana, Muniga, E: Drumstick (Moringaceae)

Small perennial tree, commonly cultivated in backwards. Hybrid varieties are also available. Leaves are eaten after frying or roasting. Liquid curry is prepared with fermented rice water and rice granules. Fruits are eaten after cooking. Different dishes are prepared out of drumstick.

Mucuna pruriens (L.) DC.O: Baidanka, E: Common Cowitch, Cowhage (Fabaceae)

Annual twinner, Throughout India. Pantropic. Young fruits and seeds are eaten after cooking by tribal people.

Mukia maderaspatana (L.) M. Roem. (Cucurbitaceae)

Climbing herb; Common in hedges, thickets and often climbing over bushes in open forests. Ripe berries are eaten by children.

Murraya koenigii (L.) Spreng.O: Mersinga, E: Curry Leaf Tree (Rutaceae)

Perennial shrub or small tree; in wasteland, shady moist locality close to human settlement and forests, also cultivated. Leaves are edible, cooked with rice or dal vegetable. Chutney is prepared out of leaves; used as condiment and spice.

Musa x paradisiaca L. O: Kadali Kanda, Ban Kadali, E: Edible Banana, Plantain (Musaceae)

Large shrub; commonly cultivated. Rhizomes boiled and cooked then are eaten as vegetable.

Naringi crenulata (Roxb.) Nicolson. O: Benta (Rutaceae)

Small tree with axillaries spine; Common in scrub dryer forest and mixed deciduous forest. Not cultivated. Fleshy ripe fruits are consumed as raw by the tribal people.

Nelumbo nucifera Gaertn. O: Padma, Ranga/ Dhala Padma, E: Indian Lotus, Sacred Lotus (Nymphaeaceae)

Aquatic herb; Common in ponds and lakes. The rhizome (locally called *mrunala*) are used as vegetable; boiled and cooked and consumed. The rhizomes are also sun dried and stored for later consumption. The immature seeds are eaten as raw.

Neptunia oleracea Lour.O: Pani-lajakuli (Mimosaceae)

Annual aquatic prostrate herb, in tank and other stagnant water bodies. Tender leaves and shoots are eaten after frying or roasting.

Nymphaea nouchali Burm. f.O: Nilakain, E: Blue Water Lily (Nymphaeaceae)

Aquatic herb; Common in lakes and ponds. Rhizomes, locally called *madhi*, are eaten after boiling.

Nymphaea pubescens Willd.O: Rangakain, E: Indian Water Lily, The Night Lotus (Nymphaeaceae)

Aquatic herb; Common in lakes and ponds. Rhizomes, locally called *madhi*, are eaten after boiling. Seed, locally called *leuda*, roasted with salt and eaten.

Ocimum americanum L.O: Bana Tulasi, E: Holy Basil (Lamiaceae)

Ocimum canum Sims.

Erect branched herb; Common weed especially in cultivated land. Seed are eaten as raw.

Olax scandens Roxb. O:Bhadbhadalia (Oleaceae)

Shrub or small tree; Common in open forest or scrub jungle. Leaves are collected, fried then eaten.

Oldenlandia trinervia Retz. (Rubiaceae)

Hedyotis trinervia (Retz.) Roem. & Schult.

Annual herb; Common in canal sides, on moist sandy bank of lake. Leaves are collected, fried and are consumed as leafy vegetable.

Operculina turpethum (L.) Silva Manso O: Dudholomo (Convolvulaceae)

Large climber; Wild in bushy jungles, sometimes cultivated. The chopped leaves are made into cake with rice is used for edible purpose.

Oxalis corniculata L.O: Ambiliti, Kumari, E: Indian Sorrel, Yellow Wood (Oxalidaceae)

Herb; Common weed in gardens, wastelands, wet places. Leaves are plucked, fried and taken.

Persicaria barbata (L.) H. HaraO: Dhainsula (Polygonaceae)

Polygonum barbatum L.

Erect or spreading herb; Common along river and stream. Tender leaves and shoots are collected, cooked then eaten.

Persicaria glabra (Willd.) M. Gomez (Polygonaceae)

Polygonum glabrum Willd.

Erect herb; along streams, rivers and water bodies. Leaves and young shoots are collected, fried then eaten. Rhizome first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property and then consumed as vegetable.

Phoenix acaulis Roxb. O: Bana-khajuri, E: Dwarf Date Palm (Arecaceae)

Small palm, the plant is abundant in wastelands and roadsides in forest area. Tender shoots are used as vegetable. Interior of the basal part of the stem is collected, cooked then eaten.

Flesh ripe fruits are consumed.

Phoenix loureiroi Kunth O: Bukhorjuro, Kojiri (Arecaceae)

Shrub; Common in hilly areas. Ripe fruits are consumed as raw.

Phoenix sylvestris (Linn.) Roxb. O: Khajuri, E: Wild Date Palm (Arecaceae)

Tall palm; the plant is abundant in wasteland and roadsides, cultivated in limited scales.

Ripe fruits are sweet and eaten. Sap collected from the base of the crown by puncturing the tender xylem. Sap is very nutritious and sweet; consumed before and after fermentation.

Phyla nodiflora Lour.O: Jala Brahmi (Verbenaceae)

Prostrate herb covered with short hairs; Frequent in moist open localities near watercourses. Leaves are collected and taken after cooking. It contains rich potassium nitrate.

Phyllanthus acidus (L.) Skeels O: Narakoli, E: Tahitian gooseberry (Euphorbiaceae)

Small or moderate-sized tree; Commonly planted. It is grown in gardens and homesteads; sometimes self-sown occurs near human settlement as an escape. Fruits are eaten raw or made into chutney or pickle.

Phyllanthus emblica L.O: Amla, E: Indian Gooseberry (Euphorbiaceae)

Small or moderate sized tree; Common in mixed deciduous forest in dryer habitats.

Ripe fruit eaten as raw made into pickle.

Physalis angulata L.O: Tipai, E: Wild Cape Gooseberry (Solanaceae)

Physalis minima L.

Erect herb; Fairly common weed, abundant in agricultural fields, Wastelands, homesteads on roadside during monsoon and post-monsoon period where the soil is porous and rich in organic matter. Sweet mature fruits are eaten as raw.

Pithecellobium dulce (Roxb.) Benth. O: Simakoina, E: Madras Thorn, Manila Tamarind (Mimosaceae)

Tree with small stipular spines; Cultivated and self sown, often found in hedges, wastelands, sandy soil of the coast, saline and inundated soils. Sweet mature seeds are eaten.

Polyalthia suberosa (Roxb) Thwaites. O: Karadia, Lohania mossu (Annonaceae)

Small tree or shrub; Common in shady forests, generally near streams, moist localities. Ripe fruits are consumed as raw.

Polygala arvensis Willd. (Polygalaceae)

Erect herb; in grasslands, wastelands, fields and waysides in the hills and plains.

Tender leaves are collected, fried and then eaten.

Portulaca oleracea L. O: Purunu sago, Badabalbalua (Portulacaceae)

Prostrate or erect herb; Common weed of cultivated land, wasteland, waysides near watercourses. Tender leaves and shoots are collected, fried then eaten.

Pouzolzia zeylanica (L.) Benn. (Urticaceae)

Herb with creeping rhizome; Common in moist shady places often among bushes and hedges. Rhizome first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property and then consumed as vegetable.

Premna mollissima Roth O: Gandhana (Verbenaceae)

Premna latifolia Roxb.

Shrub or small tree; in scrub forests, mango orchards, sometimes planted in village backyards. Ambila (a liquid curry) is prepared out of the leaves with tamarind pulp and gur with or without rice granules.

Protium serratum (Wall. ex Colebr) Engl. O: Rajamahi, E: Indian red Pear (Burseraceae)

Tree; Common in mixed forests along streams. Ripe fruits are acidic. They are eaten raw or made into pickle.

Psophocarpus tetragonolobus (L.) DC. O: Asana Simba, E: Goa Bean (Fabaceae)

Twinning herb; Cultivated. Ripe fruits are consumed as raw.

Psydrax dicoccos Gaertn. O: Dalasinga (Rubiaceae)

Canthium dicocum (Gaertn.) Merr.

Large shrub or small tree; fairly common near streams. Tribal people eat both ripe and raw fruit.

Pupalia lappacea (L.) Juss. (Amaranthaceae)

Under shrub; in waste places, edges of fields, in forests. Tender leaves are collected, cooked then eaten.

Raphanus raphanistrum subsp. *sativus* (L.) Domin O: Mula (Brassicaceae)

Raphanus sativus L.

Annual herb, Cultivated. Leaves are either fried along with other vegetables or *kanji* (liquid diet) is prepared out of leaves along with rice granules and fermented rice water. Swollen root is consumed as vegetable. Roots are cooked with other vegetables then consumed.

Rubus ellipticus Sm. O: Machdim, Machkoli, E: Cheeseberry (Rosaceae)

Shrub; Occasional in cool valleys in partially open places. Ripe fruits are consumed as raw.

Rungia pectinata (L.) Nees (Acanthaceae)

Diffused or erect herb; Common weed in wastelands. Tender leaves and shoots are collected, cooked then eaten.

Schleichera oleosa (Lour.) Oken O: Kusum, Swad Kusum, E: Ceylon Oak (Sapindaceae)

Tree; Frequent in forests, especially in the valleys. Often found near village surroundings.

Ripe fruits are consumed as raw or made into pickle.

Semecarpus anacardium Linn.f. O: Kalabhalia, E: Oriental Cashew, Dhobi nut (Anacardiaceae)

Small deciduous tree; Common in dry deciduous forest. Ripe peduncles are eaten raw or as pickle. Kernels (seed) roasted and eaten.

Senna alata (L.) Roxb. O: Dadamari (Caesalpinaceae)

Cassia alata L.

Shrub; Common in the forest, Naturalised. Flowers are cooked as vegetable.

Senna hirsuta (L.) H. S. Irwin & Barneby O: Bado chakunda (Caesalpiniaceae)

Cassia hirsuta L.

Erect shrub; Common along wayside in forest, on rocky ground. Seeds are roasted with salt and eaten by tribal people.

Senna occidentalis L. O: Kala-chakunda, E: Coffee senna, coffeeweed, Negrocoffee, (Caesalpiniaceae)

Cassia occidentalis L.

Erect glabrous herb or under-shrub; Common weed on wastelands and roadsides. Leaves and young shoots are collected, fried then eaten.

Senna sophera (L.) Roxb.O: Ghoda-chakunda (Caesalpiniaceae)

Cassia sophera L.

Shrub; Occasional in wastelands. Leaves are cooked and then taken as food by tribal and local people.

Senna tora (L.) Roxb. O: Chakunda, E: Sickle Pod (Caesalpiniaceae)

Cassia tora L.

Herb or undershrub; fairly a common weed. Tender leaves and shoots are cooked and then taken as food by rural and tribal people.

Sesbania grandiflora (L.) Poir. O: Agasti, E: Swamp Pea, Sesban (Fabaceae)

Small tree; Planted in gardens, particularly inside betel (*Piperbetle*) garden. Leaves are fried with or without mung and consumed.

Shorea robusta Gaertn. f. O: Sal (Dipterocarpaceae)

Tree, common in forest. Seed oil is sometimes used for cooking purpose by the local tribal people.

Smilax zeylanica L. O: Mutri, Rajdanti (Smilacaceae)

Climbing shrub; Common in forest. Ripe fruits are consumed. Seeds are roasted and eaten. Tuberous roots are edible. Roots are washed properly then cooked with other vegetable to makecurry. Root powder is added in local wines to kill the growth of unwanted micro-organisms and to enhance its taste.

Solanum americanum Mill.O: Nunununia, E: Black Night-shade (Solanaceae)

Solanum nigrum L.

Branched herb; fairly common weed. Ripe fruits have sweet taste and are consumed.

Solanum rudepannum Dunal O: Kontua (Solanaceae)

Solanum torvum Swartz

Shrub; Common, in moist waste places in forests, especially near streams. Leaves and young shoots are cut into small piece, cooked with salt and chilly and eaten. Ripe fruits are consumed as raw.

Solanum tuberosum L.O: Alu, E: Patato (Solanaceae)

Herb, Cultivated.Underground fleshy tubers sliced, boiled, cooked as curry then consumed as vegetable.

Solena amplexicaulis (Lam.) Gandhi O: Kainchikakudi (Cucurbitaceae)

Melothria heterophylla (Lour.) Cogn.

Climbing herb, Common in hedges, thickets and often climbing over bushes in open forests. Leaves are roasted and taken as food. Unripe fruits are cooked as vegetable. Tubers are eaten as raw or brunt; consumed as snacks like sweet potato, also cooked as curry with other vegetables.

Spermaceoce hispida L.O: Solaganthi (Rubiaceae)

Diffused or prostrate herb. Common weed in wastelands. Young leaves are collected, roasted then eaten by tribal people.

Sphaeranthus indicus L.O: Bhuinkadamba, Gurak Mundi, Hati Mundi (Asteraceae)

Aromatic, glandular herb; Common in wet places, occasionally temporarily submerged common in and around irrigation ditches and rice fields, but not considered to be a serious weed. Young scented leaves and tender shoots are cooked then taken as food. Seedlings are cooked then taken as food.

Spinacea oleracia L.O: Palanga, E: Spinach (Chenopodiaceae)

Annual herb; commonly cultivated during winter season. Often self-sown.Young leaves and twigs are collected, cooked then eaten.

Spondias pinnata (L. f.) KurzO: Ambada, Amta, E: Hog plum (Anacardiaceae)

Large or medium-sized tree, Occasional near rivers and often planted near villages. Ripe fruits are consumed as raw and unripe fruits are cooked as vegetable.

Streblus asper Lour. O: Sahada, E: Siamese Rough Bush (Moraceae)

Branched shrub or small tree; Common in open and scrub forests, near streams, wastelands. Ripe fruits are eaten as raw.

Streblus taxoides (Heyne ex Roth) Kurz. O: Jhumpuri, Phutkuli (Moraceae)

Small evergreen tree or shrub; Frequent in scrub forests and also in damp forest. Fruits are cooked and eaten as vegetable.

Strychnos potatorum L.f. O: Nirmali, Kataka, E: Clearing Nut Tree (Strychnaceae)

Small tree; Common in deciduous forests. Seeds are roasted and eaten.

Syzygium cumini (L.) Skeels O: Jamukoli, E: Jambolan, Black Plum (Myrtaceae)

Large glabrous tree; fairly common in forest. Ripe fruits are consumed as raw.

Syzygium samarangense (Blume) Merr. & L. M. Perry O: Jamrul (Myrtaceae)

Small tree; Commonly cultivated. Fruits are eaten as raw.

Tacca leontopetaloides (L.) Kuntze O: Dhoi, E: Fiji Arrow root, Tahiti Arrow root (Taccaceae)

Herb with large globose tuber; Frequent in forest. Tubers are first boiled along with the leaves of common guava (*Psidium guajava*) or tamarind (*Tamarindus indica*) to avoid the irritating property of the tubers and then consumed as vegetable.

Tamarindus indicus L. O: Tentuli, E: Tamarind Tree (Caesalpiniaceae)

Large tree, fairly common, planted or self-sown. Young plants (seedlings) are cooked then taken as food. Tender leaves are pasted, made into granules, dried and stored. The granules are used as soaring material. Leaves made into chutney, also used as condiment and spices. Fruits (pulp and seed) are eaten both ripe and raw. Pulp used as spice.

Tamilnadia uliginosa (Retz.) Tirveng. & Sastre O: Telkur (Rubiaceae)

Small thorny tree or shrub; Frequent in the forest, on field bunds and on black cotton soil.

The ripe fruits are eaten as such or after boiling, roasted or made into curry.

Tephrosia purpurea (L.) Pers. O: Kolathia, E: Wild Indigo (Fabaceae)

Under shrub. Fairly common in wasteland, along road sides. Leaves are cut into small piece, cooked with salt and chilly and eaten.

Terminalia bellirica (Gaertn.) Roxb. O: Bahada, E: Belleric myrobalan (Combretaceae)

Tree; Common in sal and mixed forests. Seed are roasted and eaten.

Toddalia asiatica (L.) Lam. O: Tundapoda, E: Lopez Tree, Forest Pepper (Rutaceae)

Prickly shrub; Common in scrub forests and also in the hills. Fresh leaves made into chutney with salt and tamarind pulp. Ripe fruits are consumed as raw or as pickle.

Trapa natans L. O: Pani Singada (Trapaceae)

Trapa natan L. var. *bispinosa* (Roxb.) Mak

Aquatic herb, Frequent in tanks. The kernel of the fruit is consumed as raw or after boiling.

Trianthema protulacastrum L. O: Puruni-sago (Aizoaceae)

Herb; Common weed. Leaves and young shoots are collected, fried then eaten.

Trichosanthes cucumerina L. O: Ban potala (Cucurbitaceae)

Climbing herb; Common, in hedges and thickets. Unripe fruits are cooked as vegetable and ripe fruits are consumed as raw.

Trichodesma indicum (L.) R.Br. ex Lehm O: Hetamundia (Boraginaceae)

Erect herb. Common along grassland, waste open fields and in cultivated land. Leaves are collected and used as leafy vegetable.

Tridax procumbens (L.) L. O: Bisalyakarani (Asteraceae)

Hairy herb; fairly common weed. Leaves and young shoots are collected, fried then eaten by the tribal people.

Trigonellafoenum-graecum L. O: Methi, E: Fenugreek (Fabaceae)

Erect, strong smelling herb; Cultivated. Fresh leaves are collected and chutney is prepared or roasted and taken.

Uvaria hamiltonii Hook.f. & Thomson O: Lakun Koli (Annonaceae)

Shrub; Common in hill forest, in shady moist localities especially close to streams.

Ripe fruit consumed as raw.

Vigna radiata (L.) R. Wilczek O: Muga, E: Green Gram (Fabaceae)

Herb; commonly cultivated, as an escape during winter season. Leaves and young shoots are cut into small pieces cooked and eaten. Seeds are roasted and eaten. Dal is prepared out of seeds.

Woodfordia fruticosa (L.) Kurz O: Dhatuki, E: Fire-flame Bush (Lythraceae)

Large spreading shrub; Common especially in the hills. Ripe fruits are consumed as raw.

Xylocarpus (Roxb.) Taub. O: Dhamani (Mimosaceae)

Small tree; Frequent in forest and commonly associated with Sal. Seeds are roasted and eaten.

Ziziphus mauritiana Lam.O: Barkoli, E: Common Jujube (Rhamnaceae)

Branched, thorny moderate tree; Abundant in sandy river bank, scrub forest and along roadsides. Ripe fruits are eaten raw or as pickle.

Ziziphus nummularia (Burm. f.) Wt. & Arn.O: Jangali koli, E: Wild Jujube (Rhamnaceae)

Small shrub; Frequent in grazing lands, in black cotton soil and scrub forests. Ripe fruits are consumed as raw.

Ziziphus oenoplia (L.) Mill. O: Kanteikoli, E: Jackal Jujube (Rhamnaceae)

Thorny shrub, Common in scrub forest, wasteland, hedges, village thicket and dry degraded forest. Ripe fruits are sweet acidic in taste and consumed by children in villages.

Ziziphus rugosa Lam.O: Tinkoli, Simukoli (Rhamnaceae)

Large shrub or small tree, fairly common, in open forest, near ravines. Ripe fruits are sweet in taste and consumed as raw.

Ziziphus xylocarpa (Retz) Willd. O: Kanta Bohul, Ghat (Rhamnaceae)

Small tree armed with spines. Fairly common in open forest, scrub forests. Ripe fruits are eaten.

The study area is floristically rich and includes various useful wild edible plant species. When all the seven districts of South Odisha were taken together, the number of edible plants encountered was 243 species under 178 genera and 80 families. However, 271 plant products (items) were used by the rural people of south Odisha. Out of the total taxa collected, 240 taxa are angiosperms, 2 are pteridophytes and one is gymnosperm (Fig.1). Of these, 208 species are dicotyledons under 156 genera and 67 families; 32 species are monocotyledons under 20 genera and 11 families; 2 species are pteridophytes under 1 genus and 1 family and one gymnosperm species under 1 genera and 1 family (Table 1).

Table 1. Total number of wild edible plant species collected from south Odisha under different groups.

	Dicot	Monocot	Total	Pteridophytes	Gymnosperm	Total
Species	208	32	240	02	01	243
Genera	156	20	176	01	01	178
Family	67	11	78	01	01	80

The edible plants include 184 wild species, 35 species that are wild as well as cultivated and 24 species are under cultivation (Fig. 2). Out of 243 edible plant species recorded in the study area 102 species are herbs, 61 species are shrubs, 15 species are twiner /climber and 65 species are tree (Fig. 3).

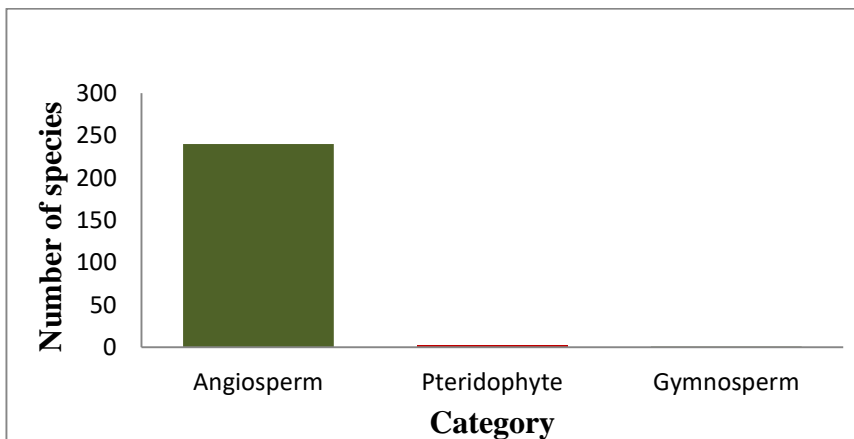


Fig.1. Different category of edible plants of South Odisha

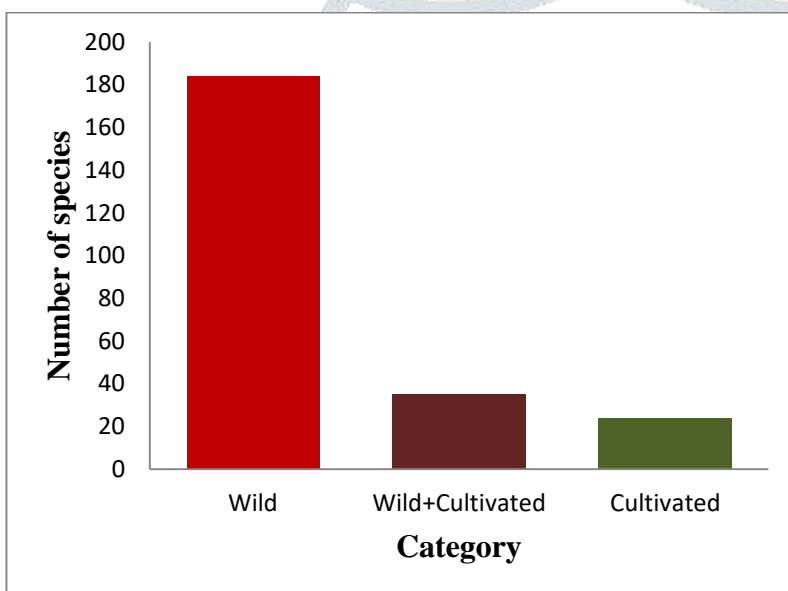


Fig. 2. Category wise distribution of edible plant of South Odisha.

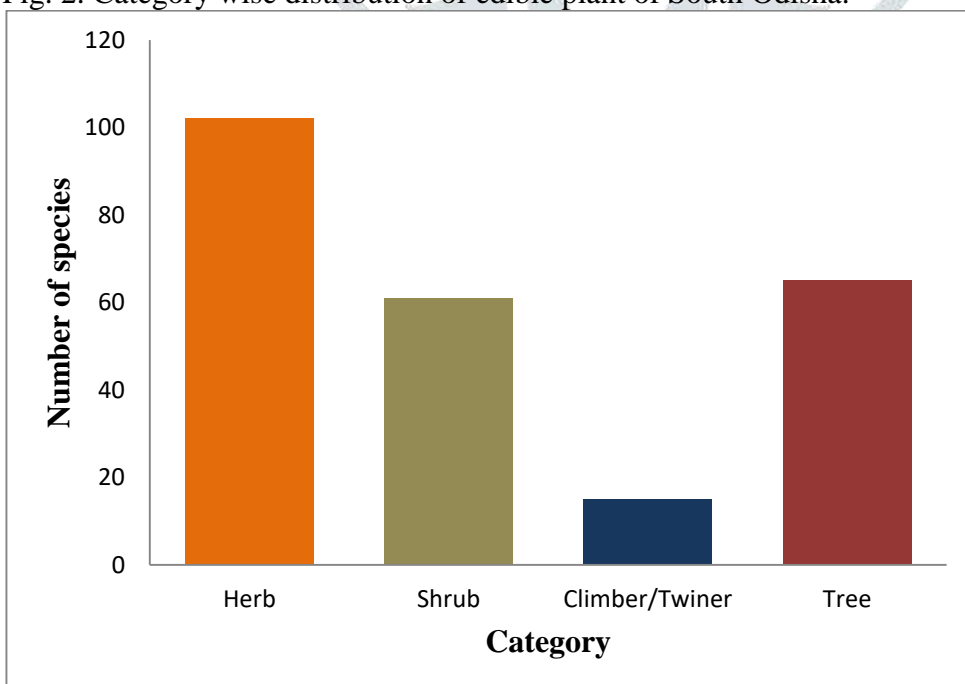


Fig. 3. Habit wise distribution of edible plants of South Odisha.

Analysis of data on use category showed that in all districts of South Odisha, fruit was the most used category of wild edible plants followed by other vegetable. The most frequently used parts are fruits (86), leaves (48), young shoot (45) seeds (36), tuberous root (23), rhizomes (15), flowers (9), bulbil (5), corm (2), Stem bark (1), and whole plant (1). Based on local uses 13 fundamental groups of wild edible plants were identified: eaten as raw (95), cooked as vegetables (151), drinking purposes [Ambila ,kanji, liquor, juice, sherbet] (11), as snacks (3), as cake (5), as chutney (12), as flavouring agent (3), as fermented food (2), prepared as pickle (14), as pudding (2), as condiment and spice (4), as jam or jelly (2) and used as medicinal plants (49).

3. 2.Discussion

The edible part consumed as vegetables are young leaf, leafy shoot, stem, fruit (edible part) root, rhizome, tuber, bulb, bulbils. The edible plant parts are mostly collected from underground, aerial, washed properly, boiled cooked, sliced and then eaten. In India, the tribal and rural people traditionally use about 9500 wild plants for various purposes such as medicine, food, fodder, fuel, fibre, essence, culture and other miscellaneous purposes [15]. Out of these about 3900 wild plants are used as food that is mostly consumed during emergency [3]. Consumption pattern of wild food plants depends mostly upon their availability in nature. Majority of the wild food plants are consumed by tribal and non-tribal poor people due to their poor economic condition. However, it is established that most of the wild food plants are rich in nutrients and vitamins [3]. Natural and uncultivated fruits and berries contribute significantly to the food basket of tribal community. The whole family gets engaged in the process of collection and marketing. Mango and Jackfruit are widely used across the tribes as they serve as a vegetable when raw as well as a fruit when ripened. Mango kernel and jackfruit seeds help the tribal communities to get food through the days of severe food shortage. *Semecarpus anacardium* has market value and affords monetary gains. Tribal women take *Diospyrous melanoxylon*, *Syzygium cumini* and *Phoenix sylvestris* to the local weekly market for either sell or barter them for other necessary products. *Carissa carandas*, *Careya arborea* are mostly collected for personal consumption. They occasionally come to the market [15]. The rhizomes of lotus plant are rich in starch and carpels of lotus, which are considered more nutritive than cereals [4] are consumed as food/ vegetable in the Asian countries. Moreover, different parts of the lotus plant are used as medicine [15]. Some of these wild edible food plants contain photochemical that provide health benefit and prevent diseases and physiological disorders in humans. For example, in the present study, *Alternanthera sessilis*, taken as leafy vegetable, increases the flow of bile in the intestine stimulates lactation in nourishing mother and helps in the treatment of leucorrhoea [2]. From the present study, it is revealed that some leafy vegetable are consumed by the tribal and rural people of South Odisha regularly as per their availability while some are consumed at times. Plant species like *Caralluma adscendens*, *Leucas aspera*, *Cleome viscosa*, *Celosia argentea*, *Melothria heterophylla*, *Corchorus aestuans* and *Coccinia grandis* are used at the time of food scarcity because these edible leafy vegetable plants are nutritionally rich and can supplement nutritional requirement of humans and livestock, especially in terms of vitamins, proteins, carbohydrates and fats while *Glinus oppositifolius*, *Senna tora*, *Premna latifolia* and *Flacourtia indica* are consumed during their availability. They play an important source of food for tribal and rural people of South Odisha to meet their food need especially in the period of food crisis. *Ficus racemosa*, an edible fruit bearing plant, the latex of unripe fruit is given internally to cure piles [12]. In *Phyllanthus emblica*, acute dysentery can be checked by taking internally the fruit juice along with lemon juice. Its dried fruit is also useful in Jaundice [8]. Juice of the fruit is given in case of cough and cold [8]. The rhizome of *Nymphaea* spp. contains rich starch and medicinally used against diabetes, dysentery, leucorrhoea, piles and dyspepsia [15]. Rhizome of *Nymphaea nouchali* used to cure tumours [6]. The corms of *Amorphophallus paeoniifolius* are acrid, astringent, irritant, anti-inflammatory, carminative, and digestive, they are useful in elephantiasis, tumours, inflammations, haemorrhoids, haemorrhages, vomiting, cough, bronchitis, asthma, anorexia, dyspepsia, flatulence, colic, constipation, seminal weakness, fatigue, anaemia and general debility [18]. The rhizome of *Curcuma angustifolia* used in folk medicine as stimulant, digestive, stomachic and therefore the rhizome is not only culinary but also medicinal to increase the digestibility of the cooked food [17]. This confirms the fact that the food and medicinal plants are closely related and can lead to the development of pharma-foods or nutraceuticals [9, 19].

4. Conclusion

The results of the study revealed that the practice of consumption of wild edible plants are still alive among the tribal communities of south Odisha, which are taken as food supplements and further to fill the gap of food deficiency during critical periods. The high diversity of these indigenous species showed the importance in sustaining the livelihoods of tribal communities. The less availability of sufficient food, poor accessibility and marketability and very low agriculture yield are the main attributes for use of wild edible plants as food items as observed in the study area. Biochemical investigations of these wild edible plants need to be done to know not only the food and nutritional values but also the chemical compounds present that are useful for human health as medicine. If the wild edible plants are evaluated for their food value and brought under cultivation it will unfold the market potential in the tribal belt of the state. The quality of these wild edible plants may be improved for food value by scientific methods through hybridization for mass consumption.

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