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## Ethno-botanical studies of edible plants used by tribal women of Thane District

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### Abstract

Nutraceuticals is a newly emerged term across the globe but has been existing in the tribal community in India since ages. This preventive approach of including food of medicinal and nutritional value in the diet had been a regular practice amongst the tribes. Though an integral part of their diet previously, a sharp decline is noted in awareness about this in the recent generations. The present study is conducted in tribal areas of Thane district (Maharashtra, India) in year 2013-14 focusing mainly on the tribes of Warli, Katkari and Konkona community. 54 edible plants from 39 different families were identified from the study locations. Efforts are being taken by NGOs to conserve the traditional knowledge about the wild edible plants and also encourage their use, thereby reducing the problem of malnutrition in tribal areas.

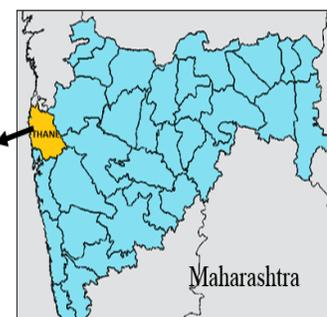
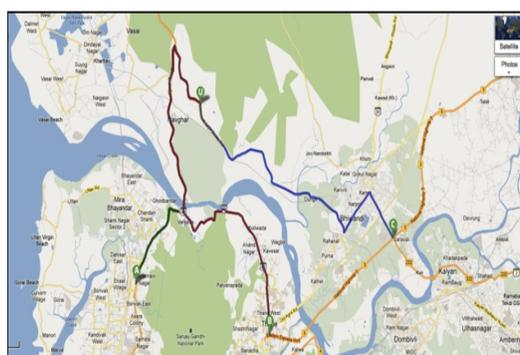
**Keywords:** Thane district, tribes, edible plants.

### 1. Introduction

India is always known for its natural green cover and rich biodiversity. Variations in topography and climate have resulted into highly diverse forest ecosystems. Along with biotic and abiotic components, the 'forest people' have also been an integral part of these ecosystems. These people are completely amalgamated with the nature. Their livelihood, accommodation, food and many other requirements are satisfied by forests. Traditional crops and various parts of wild edible plants like fruits, flowers, leaves tubers, roots form an essential part of the tribal diet and play a major role in their nutrition. These wild plants in addition to meeting their food requirements satisfy the vitamin and mineral necessities. Most of them have medicinal properties. Thus, it can be said that though the term Nutraceutical has been coined recently, Indian tribals have been practicing them since the time immemorable. Objective of the study is to document the indigenous plants of Thane district and their economic importance. As the wealth of knowledge is depleting through generations, it was felt necessary to compile the data and create awareness among the tribes residing in the forest area.

### 2. Material and methods

**Study area:** Three locations were selected from Thane district for the study.



1. Forest near Asangaon (19°29'1.77"N, 73°15'31.83"E), 2. Forest near Jawhar (19°54'20.82"N, 73°13'49.15"E), 3. Yeoor-Patonepada (19°14'30.28"N, 72°56'43.14"E). These forests are inhabited by Katkari, Warli and Konkona tribes. The tribal people of first two locations have exposure to rural population whereas; tribals of Yeoor forest have exposure to urban population due to expansion of Thane city.

The survey was undertaken for the year 2013-14 in parts of Thane district viz. areas near Asangaon, forest areas in Jawhar taluk (now parts of Palghar district), Yeoor forest near Thane city. Edible plants were documented with the help of people from the tribes. Photographs of some important plants were taken. Identification was confirmed using Flora of Maharashtra, and other field guides. The data from all three locations has been pooled and represented in the current paper. Tribal women of different age groups (50yrs and above, 30 to 50 yrs, 18 to 30 yrs) were interviewed to collect information about wild edible plants and frequency of consumption. These were informal interactions. Hence, they could give adequate information.

### 3. Result and Discussion

The study revealed use of 54 edible plants from 39 families as part of the diet (Table 1). Medicinal importance of most of these plants is known to the women of higher age group. As they go to collect vegetables, they have knowledge about their medicinal and nutritional values. But, it was observed that, this awareness has been decreasing as the generations pass. Several researchers have tried to find reasons for the loss of traditional knowledge.

One of the reasons could be, that Post British Era, India was in need of both food production as well as productions that provided raw material for industries, such as cotton, sugarcane etc. Green revolution brought in new ideas such as increased use of water, fertilizers, pesticides and high yielding varieties to increase production. Preference given to high yielding varieties resulted into decreased use, and finally disappearance of traditional crops, such as varieties of legumes, etc. (Gadgil and Guha, 2000) [4] which contributed in the fulfillment of nutritional requirement, also started disappearing, resulting into situations such as nutritional deficiencies.

Several researchers have documented the wild edible products used in the diet by tribes in various parts of India. (Sundriyal M & Sundriyal R, 2004; Jadhav, Mahadkar & Valvi, 2011; Rasingam, 2012; Rekha & Kumar, 2014) [14, 6, 10, 12]. These researchers have also highlighted the nutritive value of these wild edible plants. They also stressed the need for the revival of this knowledge. Jadhav, Mahadkar, and Valvi documented 50 wild edible plants from Kolhapur district of Maharashtra and also gave an account of their food and medicinal values.

Deshmukh and Waghmode (2011) put forth the traditional knowledge about the role of wild edible fruits in the parts of Western Ghats of Maharashtra as food resource and studied 11 fruit plant species for their nutritional and medicinal value. They stressed on the importance of those fruits as dietary supplements.

Khyade, Kolhe and Deshmukh (2009) [9] documented wild edible plants used by tribes of Akole Tehsil, District Ahmednagar, Maharashtra. They documented 31 plant species belonging to 23 families. It was revealed in this study that the plants were in use by the tribes, and also stressed the nutritional values of the plants.

The women from these three areas were contacted and through informal discussion they were ready to share their knowledge. Medicinal applications of these plants mentioned in classical Ayurvedic texts were already known to elderly women and are being practically implemented in their day to day lives. Deworming property of Shevga (*Moringa oleifera*), Takla (*Cassia tora*), Neem (*Azadirachta indica*), blood purifying property of Palash (*Butea monosperma*), anti diarrhoeal property of Pimpal (*Ficus religiosa*), Murudsheng (*Helicteris isora*), Kuda (*Holarrhena antidysentrica*), etc. were already known to them and they consciously use them in diet. Younger generation seems to be negligent about this and further, they are getting attracted towards modern junk foods like chips, burgers, etc especially in yeoor forest.

The laws and policies such as National Forest Policy (1988), State/Union Territory Minor Forest Produce (Ownership of Forest Dependent Community) Act, 2005; Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, are changing the situation. The tribes, villagers have been given right to use minor produce from the forest. Forest Rights Act has recognized the traditional rights of the tribes on the forests. Revival of the traditional knowledge about the wild edible plants is necessary.

Efforts for the conservation of the traditional knowledge about the wild edible plants and traditional crops are being taken up by Government as well as by various Non-Government organizations. Efforts of documenting the ethno botanical values of these plants are being taken. However, documentation by the direct users of these plants is necessary. Some organizations in Maharashtra are creating awareness among the tribes about their traditional knowledge and need to conserve it.

Innovative methods like recipe contests are being used by few of the organizations to create the awareness among the tribes. Wild vegetable recipe competition is an excellent example of this method. A competition of wild vegetable recipes for women was organized by an Organization, 'Vayam', in 6 Villages of Jahwar Taluk of 'Palghar District' of Maharashtra during September, 2014. There was an appreciable response by tribal women to this activity.

Kalpavriksh environmental action group from Pune conducted similar activity during October 2010, in the villages Velavali and Bhorgiri of Bhimashankar (Pune district).

**Table 1:** List of wild edible plants used by tribals from three study locations & their medicinal value

	Botanical name	Family	Part used	Uses
1	<i>Achyranthes aspera</i>	Amaranthaceae	All parts	Diarrhoea and dysentery
2	<i>Amorphophallus commutatus</i>	Araceae	Tubers	Rhizome used in piles, For treating gram +ve and gram -ve bacterial infections
3	<i>Azadirachta indica</i>	Meliaceae	leaves, fruits,	Against tapeworms, rheumatism
4	<i>Bauhinia racemosa</i>	Caesalpiniaceae	stem bark, flowers	Worm infestation, skin diseases, bleeding disorders
5	<i>Bombax ceiba</i>	Bombacaceae	Bark	Bark and Thorns is used for wounds, ulcers, skin diseases, hemorrhoids, urinary calculus, cystitis, inflammations, cough and bronchitis
6	<i>Bridelia retusa</i>	Euphorbiaceae	Bark	Bark is used for removal of urinary concretions
7	<i>Butea monosperma</i>	Papilionaceae	Flower, and seeds	Palash flowers are used to remove body toxins. Inflammation, Sprain, Swelling due to any reason. seeds of palash tree are anthelmintic and laxative, flowers to cure urinary complaints
8	<i>Carissa carandas</i>	Apocynaceae	Fruit	Scabies, intestinal worms, pruritus,

				biliousness and also used as antiscorbutic, anthelmintic, analgesic, anti-inflammatory, anti-pyretic, cardiotoxic and histamine releasing
9	<i>Cassia tora</i>	Caesalpiniaceae	Leaves	Leaves are used as vegetables. seeds of Cassia Tora are great laxatives, ophthalmics, anthelmintics and expectorants
10	<i>Celosia argentea</i>	Amaranthaceae		<p>Treating kidney stones. Stems and leaves of celosia, bruised and applied as poultice, is used for treating of infected sores, wounds and skin eruptions.</p> <p>Poultice of leaves, smeared with honey, used as cooling application to inflamed areas and painful affections such as buboes and abscesses.</p> <p>Seeds are used to relieve gastrointestinal disorders and are antipyretic, improves vision, relieves fever associated with liver ailments.</p> <p>Seeds when in decoction or finely powdered, are considered antidiarrheal and aphrodisiac.</p> <p>The juice of the seeds forced into the nostrils is a cure for epistaxis.</p> <p>Whole plant used as antidote for snake-poison. Root used for colic, gonorrhoea and eczema.</p> <p>Decoction of the seeds with sugar is prescribed against dysentery.</p> <p>Flowers and seeds used for bloody stools, hemorrhoidal bleeding, leucorrhoea and diarrhea</p>
11	<i>Cleome viscosa</i>	Capparidaceae	Leaf	Leaf paste on the wound
12	<i>Colocasia esculenta</i>	Araceae	Leaves, tuber	Leaves are cooked and eaten as vegetable. haematinic
13	<i>Cordia dichotoma</i>	Boraginaceae	fruits, bark	Respiratory tract infections, Antihelminthic, Cough, fruits consumed
14	<i>Curculigo orchioides</i>	Amaryllidaceae	Tubers	Urinary diseases, as tonic
15	<i>Curcuma aromatica</i>	Zingiberaceae	roots, stem	Antibiotic properties, helps in digestion
16	<i>Derris trifoliata</i>	Papilionaceae	Leaves	
17	<i>Dioscorea bulbifera</i>	Discoraceae		Anticancer, Weight gain.
18	<i>Eleusine coracana</i>	Poaceae	Roots,	Used as staple foos, root infusion for abdominal distension
19	<i>Ficus racemosa</i>	Urticaceae	Leaves, fruits, bark, gum	Gum for treatment of acidity, stringent, antidiabetic, antiasthma tic, anti-inflammatory, antioxidant, antiulcer, anti-pyretic and anti diarrheal in action
20	<i>Ficus religiosa</i>	Urticaceae	Bark, seeds, fruits, latex, leaves	Fruits consumed diarrhoea, gastric problems, skin diseases, tonic
21	<i>Gloriosa superba</i>	Liliaceae	Roots, bulb	Used in release of placenta, leaves used to cure asthma in children
22	<i>Grewia tiliaefolia</i>	Tiliaceae	Fruits, bark	Fruits in digestive disorders, bark to prevent hair fall
23	<i>Haldina cordifolia</i>	Rubiaceae	Fruits, leaves	The fruit treats dehydration, antifungal use and acts as a coolant.
24	<i>Helicteris isora</i>	Sterculiaceae	Bark, fruit	Digestive infections in children
25	<i>Hibiscus cannabinus</i>	Malvaceae	Leaves, stem	<p>Consumed as vegetable, anodyne, aperitif, aphrodisiac, fattening, purgative, and stomachic bilious conditions, bruises, fever, and puerperium. Stem peelings for anemia, fatigue, lassitude</p> <p>In Gambia, the leaf infusion is used for coughs. leaves for dysentery and bilious, blood and throat disorders. Seeds are applied externally to aches and bruises. juice of the flowers with sugar and black pepper is used in biliousness with acidity. Seeds are considered aphrodisiac and fattening</p>
26	<i>Holarrhena antidysenterica</i>	Apocynaceae	Fruits	Diarrhoea, Dysentery
27	<i>Holoptelea integrifolia</i>	Urticaceae	Leaves	Antidiarrhoeal property
28	<i>Hyoscyamus niger</i>	Solanaceae	Seeds	Oil is extracted from seeds
29	<i>Lagerstroemia nana</i>	Lythraceae	Bark, leaves	Purgative astringent fruit
30	<i>Lannea coromandelica</i>	Anacardiaceae	Bark	Digestive infections, sour eyes, leprosy
31	<i>Macaranga peltata</i>	Euphorbiaceae	Leaves, bark	Decoction of leaves and bark used as vulnerary.
32	<i>Madhuca india</i>	Sapotaceae	Fruits	Urinary tract infections, Menstrual irregularities, Skin diseases
33	<i>Mangifera indica</i>	Anacardiaceae	Fruits, leaf,	Urinary tract infections, Skin diseases, Anaemia, Bleeding
34	<i>Momordica dioica</i>	Cucurbitaceae		<p>The roots are used in head trouble, treating urinary calculi.</p> <p>The leaves having aphrodisiac and anthelmintic properties.</p> <p>The fruit was used as stomachic; treating constipation, and the powder or infusion of the dried fruits,</p>

				The leaves have reported for having strong antioxidant, hepatoprotective action
35	<i>Morinda citrifolia</i>	Rubiaceae		analgesic, antiinflammatory, antioxidant, detoxifier
36	<i>Morinda tinctoria</i>	Rubiaceae	Leaf, roots, fruits	Diarrhoea, Dysentery
37	<i>Moringa oleifera</i>	Moringaceae		Wormicidal, Anticancer
38	<i>Oroxylum indicum</i>	Bignoniaceae		Diarrhea, fever, ulcer and jaundice
39	<i>Peucedanum grande</i>	Apiaceae		½ to 1 ounce like that of fennel seeds, as carminative, diuretic and stimulant in flatulency, gastric and intestinal disorders etc.
40	<i>Emblica officinalis</i>	Euphorbiaceae		The juice of amla fruit reduces burning sensation of skin. It strengthens the hair follicles and reduces the inflammation of scalp skin. Amla boosts immunity of skin and helps to prevent acne and pimples Amla fruits help to reduce burning sensation in eyes and help to maintain health of eyes. According to texts of ayurveda amla enhances memory power and strengthens the nervous system. It sharpens the sensitivity of sense organs. It normalizes digestion, reduces acidity and rejuvenates liver. It relieves constipation when taken in more quantity. Amla acts as a cardiac tonic and helps in anemia Clears respiratory system in infection as it reduces kapha. Amla acts as aphrodisiac and increases sperm count and motility. It helps to rejuvenate male reproductive system
41	<i>Phyllanthus niruri</i>	Phyllanthaceae	Roots, leaves, fruits, latex	Bronchitis, leprosy, anemia, urinary discharge, anuria, biliousness, asthma,
42	<i>Pongamia pinnata</i>	Papilionaceae	Twigs, seeds	Skin diseases, piles, worm infection
43	<i>Pterocarpus marsupium</i>	Papilionaceae	Leaves	Anti diabetic, leaves used to treat sores, boils and various other skin diseases
44	<i>Rotheca serrata</i>	Verbenaceae	Leaves	Malays give a decoction for colic. Flowers eaten during childbirth. India, a decoction of root with ginger & coriander for nausea. Tender leaves eaten as a vegetable. Dutch Indies, roots eaten to clear the voice. Leaves. eaten during labor. Extract given for a distended stomach. Ripe & unripe fruits chewed for coughs. Leaves. given to cattle for stomach diseases. Tender immature infl. eaten as a bitter seasoning, raw or toasted. Malays use it mostly externally. A poultice for ringworm, leprosy, headache, persistent fever. Fomentation for puru [? inflammation]. Embrocation of leaves for stiffness in the joints. Rich in potash, acts as a diuretic.
45	<i>Sterculia urens</i>	Sterculiaceae	Bark, seeds, gum	Trees exude gum karaya used in foodstuffs as emulsifiers, stabilizers and thickeners. Seeds are eaten after roasting. Seeds and young tender roots are eaten in times of famine. The gum, leaf and bark of Karaya is used for wound and throat infection
46	<i>Syzygium cumini</i>	Myrtaceae	Fruits	Wormicidal, Diabetes.
47	<i>Tamarindus indica</i>	Fabaceae	Fruits	Rehydration, Improves digestion.
48	<i>Tectona grandis</i>	Verbenaceae	Leaves, bark	Anemia, inflammatory swellings, skin itching, dysentery and Wood is good for headache, biliousness, burning sensation pain, and liver related troubles.
49	<i>Terminalia bellerica</i>	Combretaceae	Fruit	Chronic diarrhoea and dysentery
50	<i>Terminalia chebula</i>	Combretaceae	Fruit	Purgative astringent fruit
51	<i>Vernonia anthelmintica</i>	Asteraceae	Seeds	Skin diseases, fever, sore throat
52	<i>Wrightia tinctoria</i>	Apocynaceae	Fruit	Fever, stomach ache, skin diseases especially psoriasis and non-specific dermatitis. It has anti-inflammatory and anti-dandruff properties and hence is used in hair oil preparations.
53	<i>Ziziphus jujuba</i>	Rhamnaceae	Fruit, bark	Cough, Mouth cleanser, Improves digestion.
54	<i>Ziziphus rugosa</i>	Rhamnaceae	Bark, root, fruit	Bark, root and fruits are used for treatment of carbuncle, menorrhoea, syphilis and ulcerated tongue

#### 4. Conclusion

Further study is needed for the documentation of wild edible plants used by tribes, and the traditional knowledge of their uses. The efforts such as wild vegetable recipe competition for women are effective in creating awareness. This increases participation of women. Creating awareness among women about these plants may help more effectively to increase their use. Increased use of these plants may prove to be one of the major solutions to the problem of malnutrition and other increasing health issues among the tribals.

#### 5. Acknowledgement

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