Wild edible plants traditionally used by the tribes in the Parambikulam Wildlife Sanctuary, Kerala, India

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Abstract

This paper reports an ethnobotanical investigation performed during 2003 and 2005 to collect, identify and document information on the wild food plants traditionally used by the tribes in the Parambikulam Wildlife Sanctuary in Palakkad district of Kerala state, India. Eighty three species are used by the tribes as vegetables, wild fruits, beverages or in other preparations. Wild vegetables formed the largest group which included roots, tubers, young leaves and buds, inflorescence, unripe/ripe fruits and seeds. Analysis of the information revealed that out of 83 species, 82 belongs to Angiosperms (63 dicot and 19 monocot) and one species belongs to Gymnosperm. Among them 30 species are used as leafy vegetables, 31 species for fruits, 16 species for seeds and 10 species as food in the form of rhizomes/tubers/corms and 6 plants as food from stem/shoot. ***Amaranthus spinosus*** **Linn.**, ***Centella asiatica*** **(Linn.)Urban**, ***Euphorbia hirta*** **Linn.**, ***Oxalis corniculata*** **Linn.** and ***Mollugo pentaphylla*** **Linn.** are used by tribals more extensively. Among the wild fruits, consumption of jackfruit and mango is more common. ***Vigna vexillata*** **(A. Rich.) Linn.** and ***Ensete superbum*** **(Roxb.) Cheesm.** are used for suppressing hunger. Many wild food plants are also used for medicinal purposes, e.g. ***Amorphophallus paeoniifolius*** **(Dennst.) Nicol.**, ***Boerhaavia chinensis*** **(Linn.) Asch. & Schweinf.** and ***Ensete superbum***.

Keywords: Wild edible plants, Vegetables, Fruits, Ethnobotany, Parambikulam Wildlife Sanctuary, Kerala, India.

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Introduction

Forests have a large and indispensable role to play in improving food security of tribes. Wild edible plants are important in the livelihood strategies of forest dwellers/tribal populations. While these foods are not widely accessible, locally they are of great relevance for nutrition and food security in many countries. India has a tribal population of 42 million, of which some 60 per cent live in forest areas and depend on forests for various edible products[1].

In many situations, wild foods are not dietary staples. More generally they provide nutritionally valuable supplements in the form of ingredients, vegetables and beverages. Tribal groups like *Kadars*, *Malasars*, *Muduvans* and *Malamalasars* live in the folds and flats of the mountain terrain of the study area. They are traditionally agriculturists and most of these tribes frequently collect non wood forest products from the forests and also remain engaged in various forestry operations carried out by the Forest Department.

Coccinia grandis

Colocasia esculenta

Wild edible plants are much more important than is generally assumed in the food supplies of many countries. Some wild foods (e.g. Sago palm) are used as staples or as basic components of substantial meals. Many plants used in industrialized countries today were originally identified and developed through indigenous knowledge[2]. ***Trichopus zeylanicus*** **Gaertn.** subsp. ***travancoricus*** **(Bedd.) Burkill** used by the *Kani* tribe of Kerala epitomizes the

Dioscorea hispida

relevance of ethnobotanical research and from this plant scientists formulated a health drink known as *Jeevani*[2]. The survey on wild edible plants in India are conducted by many research workers but the forests of Parambikulam Wildlife Sanctuary and surrounding areas have not been studied from this angle[1-13]. The present investigation is an attempt to record the wild food plants of this area.

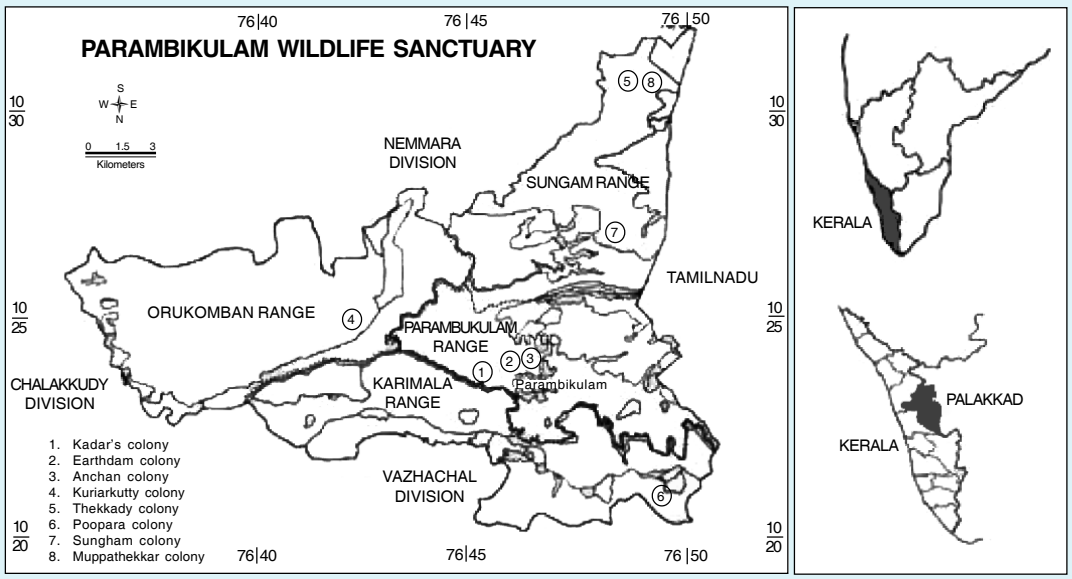
Study area

Parambikulam Wildlife Sanctuary is situated in Palakkad district, Kerala State, India, with an extent of 274 km^2 within 76^o 35' and 76^{o}50' E longitude and between 10^{o}20' and 10^{o}26' N latitude. The Sanctuary is contiguous with the natural forests of Sholayar and Vazhachal in Thrissur district of the state. The boundary on the East is purely an administrative one with the forest clearance running throughout the area bordered by Indira Gandhi Wildlife Sanctuary of Tamil Nadu. The Sanctuary is contiguous with forests of Anamalais, Nelliampathis, Sholayar, High ranges and Palani hills. The major interception of the Western Ghats, namely the Palghat gap, lies North of this area (Map). The area in general has a slope towards West with the highest peak of Karimalagopuram (1,438 m) descending to the banks of Chalakkudy River (439.5m). The Sanctuary includes both hilly terrains with undulated plateau. The Sanctuary spreads in the Sungam and Parambikulam valleys, which are well known for teak plantation.

Costus speciosus

Materials and Methods

The study was conducted during the year 2003-2005. The aim of the study was to explore, collect, identify and preserve the wild and domesticated plants used by tribals as food, fodder, medicine, oil, tannin, gum, small timber, fuel, fibres, furniture, tools, musical instruments, etc. The data were collected from the tribals through participatory rural appraisal and questionnaire survey. The paper reports a part of the study, i. e. wild food plants used by the tribals of the Sanctuary. The elder persons and also tribal medicine men (*vaidyas*) were



Map : Tribe colonies and location map of Parambikulam Wildlife Sanctuary

contacted to collect data on uses of plants. Local names, plant parts used, method of utilization were gathered from them with regard to each plant. The specimens collected were identified with the help of floras and taxonomic revisions, monographs and other available field keys[14-16]. Identification was later confirmed by matching the specimens with the authentic specimens available at herbarium of Kerala Forest Research Institute, Peechi.

Results and Discussion

During this study it was observed that the tribal communities of the Sanctuary fulfil the deficiency in food needs by supplementing with wild food plants in their daily diet. They were well acquainted with the plants of surrounding forests and knew what to eat and how to separate harmful substances from the edible part of plants.

Out of eighty three species of edible plants collected from this area, eighty two species belong to Angiosperms and one species to Gymnosperm. Among them 31 species are used for fruits, 30 leafy vegetables, 16 for seeds, 10 as food in the form of rhizomes/tubers/corms and 6 as food from stem/shoot (Tables 1-5 and Fig. 1). Dicots are represented by 63 species and monocots by 19 species. Sometimes more than one part of the species is edible like both fruits and seeds are edible in ***Artocarpus heterophyllus, A. hirsutus, Calamus rotang*** and ***Tamarindus indica***. Similarly more than one part of the species is edible in ***Bambusa bambos, Colocasia esculenta, Coccinia grandis, Costus speciosus*** and ***Sarcostigma kleinii***.

Some soecies, *viz.* ***Amaranthus spinosus*** **Linn.**, ***Centella asiatica*** **(Linn.) Urban**, ***Euphorbia hirta*** **Linn.**, ***Oxalis corniculata*** **Linn.** and ***Mollugo pentaphylla*** **Linn.** are used by tribals more extensively. Among the wild fruits, consumption of jackfruit and mango is more common.

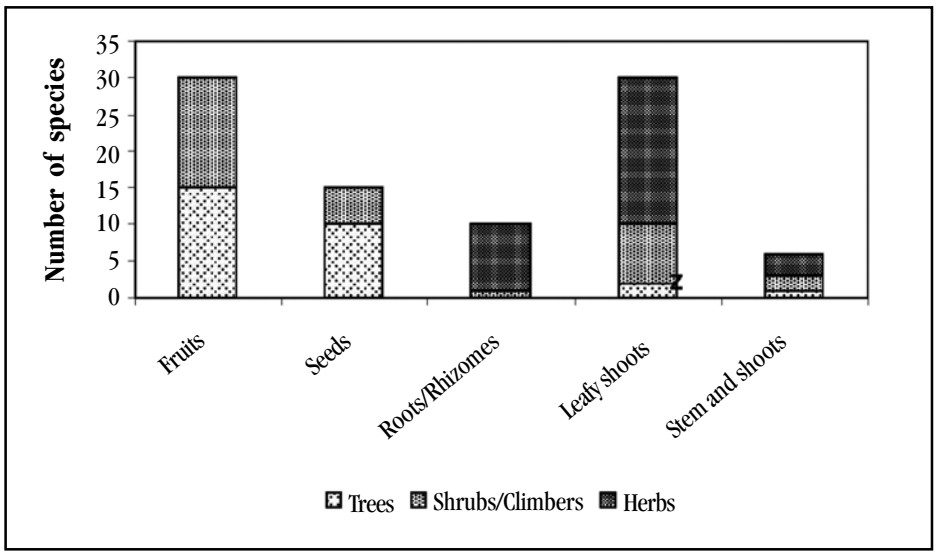


Fig. 1: Number of species of each category of food use and habit

Many wild food plants were also used for various medicinal purposes. The demarcation line between food and medicine may not always be clear. For example ***Amorphophallus paeoniifolius*** **(Dennst.) Nicol.**, ***Boerhaavia chinensis*** **(Linn.) Asch. & Schweinf.** and ***Ensete superbum*** and **(Roxb.) Cheesm.** serve as food and medicines both. ***A. paeonifolius*** (underground part) is used against piles; ***B. chinensis*** is used for bronchitis and ***E. superbum*** is given for kidney stones. According to Etkin wild food are consumed not only for caloric value, but also for other nutrient and pharmacologic potential[17]. Several of the species reported by our informants maintained their medicinal uses. ***Oxalis corniculata***, ***Sarcostigma kleinii*** **Wight & Arn.**, ***Cassia obtusifolia*** **Linn.**, ***Ensete superbum*** and ***Terminalia bellirica*** **(Gaertn.) Roxb.** are some more examples of food as well as medicinal plants. Some plants are used to make infusions or liquors which were initially used for their medicinal properties, but in most cases they eventually become simply as beverages, e.g. ***Caryota urens*** **Linn.**, ***Borassus flabellifer*** **Linn.**, etc. The tribals also use many mushrooms like ***Termitomyces microcarpus*** **(Berk. & Br.) Heim**, ***Pleurotus ostreatus*** **(Fries) Kummer**, etc. and some other unidentified wood inhabiting fungi and many lichens as food. Plants like ***Saccharum spontaneum*** **Linn.**, ***Calycopteris floribunda*** **Lam.**, ***Ensete superbum*** and ***Vigna vexillata*** suppress thirst or hunger.

Table 1 : Edible fruit bearing plants

S. No.	Scientific name	Local name	Habit	Form of Use/Recipe
1.	***Aegle marmelos* Corr.**	Koovalam	Medium sized tree	Raw fruit pulp
2.	***Ailanthus triphysa* (Dennst.)Alston**	Mattipal, Perumaram	Tree	Ripe fruits
3.	***Alangium salvifolium* (Linn.f.) Wang**	Ankollam	Climbing shrub and acidic properties	Edible fruits possess astringent
4.	***Antidesma montanum* Blume**	Puliyilamaram	Tree	Ripe fruits
5.	***Artocarpus hetrophyllus* Lamk**	Pilavu	Tree ripe fruits are also eaten	Raw fruits cooked and eaten,
6.	***Artocarpus hirsutus* Lamk**	Anjili	Tree	Ripe fruits
7.	***Calamus rotang* Linn.**	Cheruchooral	Climbing	Ripe fruits
8.	***Canthium rheedei* DC.**	Malankara	Stout shrub	Ripe fruits
9.	***Coccinia grandis* (Linn.) Voigt**	Kattukoval	Climber and eaten	Green fruits cooked
10.	***Diospyros malabarica* (Desr.) Kostel**	Panachi	Tree	Ripe fruits
11.	***Emblica officinalis Gaertn*** syn. *Phyllanthus emblica* Linn.	Nelli	Tree	Green fruits pickled, ripe fruits eaten
12.	***Garcinia gummi-gutta* (Linn.) Rob.**	Karukkampuli	Tree	Fruit rinds used in curries to get a sour taste
13.	***Gmelina arborea* Roxb.**	Kumbil, Kumil	Tree	Ripe fruits
14.	***Grewia tiliaefolia* Vahl**	Chadachi	Tree	Ripe fruits
15.	***Hibiscus surattensis* Linn.**	Chemeenpuli	Shrub to get a sour taste	Fruits used in curries
16.	***Ixora brachiata* DC.**	Malathechi	Shrub	Ripe fruits
17.	***Lantana camara* Linn.** var. ***aculeata* (Linn.) Mold.**	Koothadichipoov	Shrub	Ripe fruits
18.	***Mangifera indica* Linn.**	Mavu	Tree	Green fruits pickled, ripe fruits eaten
19.	***Mesua ferrea* Linn.**	Nanku	Tree	Ripe fruits
20.	***Mimusops elengi* Linn.**	Elengi	Tree	Ripe fruits
21.	***Olea dioica* Roxb.**	Edana	Shrub	Ripe fruits
22.	***Passiflora foetida* Linn.**	Kurukkan pazham	Climber	Ripe fruits
23.	***Piper longum* Linn.**	Thippali	Scandent shrub	Used as spice
24.	***Piper nigrum* Linn.**	Kattukurumulaku	Glabrous climber	Used as spice
25.	***Sarcostigma kleinii* Wight & Arn.**	Odalvalli	Straggling shrub	Ripe fruits
26.	***Smilax zeylanica* Linn.**	Kareenlanchi	Climbing shrub	Ripe fruits
27.	***Solanum anguivi* Lamk**	Chunda	Shrub	Green fruits salted, dried, roasted in oil and eaten
28.	***Syzygium cuminii* (Linn.) Skeels**	Njaval	Tree	Ripe fruits
29.	***Syzygium palaghatensis* Gamble**	Kattunjaval	Tree	Ripe fruits
30.	***Tamarindus indica* Linn.**	Puli	Tree	Fruits used in curries to get a sour taste, young fruits also pickled
31.	***Ziziphus rugosa* Lamk**	Vanthodali	Climbing shrub	Ripe fruits

Table 2 : Edible seed bearing plants

S. No.	Scientific name	Local name	Habit	Form of Use/Recipe
1.	***Acacia nilotica* (Linn.) Delile**	Karivelom	Armed tree	Seeds roasted with salt and eaten
2.	***Acacia sinuata* (Lour.) Merr.**	Cheevakay	Climbing shrub	Seeds roasted with salt and eaten
3.	***Adenanthera pavonia* Linn.**	Manchadi	Tree	Raw seeds are eaten
4.	***Artocarpus heterophyllus* Lamk**	Pilavu	Tree	Seeds cooked and eaten
5.	***Artocarpus hirsutus* Lamk**	Anjili	Tree	Seeds cooked and eaten
6.	***Bambusa bambos* (Linn.) Voss**	Illi, Moongil	Tufted bamboos	Seeds made into edible flour and cakes
7.	***Calamus rotang* Linn.**	Cheruchooral	Climbing cane	Flesh around the seeds is edible
8.	***Cycas circinalis* Linn.**	Eanthal	Palm	Endosperm is made in to edible flour
9.	***Elaeocarpus serratus* Linn.**	Kara	Tree	Seeds Roasted and eaten
10.	***Entada rheedii* Spreng.**	Kakkumkai	Straggler	Endosperm of the seed scooped out and (after removing harmful substances by putting endosperm overnight in water) cooked with rice
11.	***Schleichera oleosa* (Lour.)Oken**	Poovam	Tree	Seeds roasted with salt and eaten
12.	***Semecarpus anacardium* Linn.f.**	Vellacheru	Tree	Seeds roasted and eaten
13.	***Sterculia guttata* DC.**	Pottakavalam	Tree	Seeds roasted and eaten
14.	***Sterculia urens* Roxb.**	Thondi	Tree	Seeds roasted and eaten
15.	***Tamarindus indica* Linn.**	Puli	Tree	Seeds roasted and eaten
16.	***Terminalia bellirica* (Gaertn.) Roxb.**	Thanni	Tree	Seeds roasted and eaten

Table 3 : Plants bearing edible underground parts

S. No.	Scientific name	Local name	Habit	Form of Use/Recipe
1.	***Amorphophallus paeoniifolius* (Dennst.) Nicol.**	Kattuchena	Herb	All are cooked with salt, chilly, tamarind and turmeric powder and used as curry
2.	***Asparagus racemosus* Willd.**	Sathavari	Shrubaceous straggler	
3.	***Bambusa bambos* (Linn.) Voss**	Illi, Moongil	Tufted bamboos	
4.	***Colocasia esculenta* (Linn.) Schott**	Kattuchembu	Tuberous herb	
5.	***Costus speciosus* (Koenig) Sm.**	Channakoova	Herb	
6.	***Curculigo orchioides* Gaertn.**	Nilapana	Herb	
7.	***Curcuma neilgherrensis* Wight.**	Manjakoova	Herb	
8.	***Dioscorea bulbifera* Linn.**	Kattukachil	Tuberous herb	
9.	***Dioscorea hispida* Dennst.**	Chaval kizhangu	Tuberous herb	
10.	***Dioscorea pentaphylla* Linn.**	Nuran kizhangu	Tuberous herb	

Table 4 : Plants bearing edible leaves or leafy shoots

S. No.	Scientific name	Local name	Habit	Form of Use/Recipe
1.	*Acalypha fruticosa* Forssk.	Kuppameni	Subshrub	Leaves and leafy shoots of all these plants are cut in to small pieces and cooked with salt, chilly and garnished by mustard seeds, curry leaves and onion in oil
2.	*Allmania nodiflora* (Linn.) R.Br. ex Wight	Ponnamkannicheera	Herb	
3.	*Alternanthera sessilis* (Linn.) R.Br. ex DC.	Kozhuppa cheera	Prostrate herb	
4.	*Amaranthus spinosus* Linn.	Mullancheera	Armed subshrub	
5.	*Amaranthus viridis* Linn.	Pachacheera	Glabrous herb	
6.	*Bambusa bambos* (Linn.) Voss	Illi, Moongil	Armed bamboo	
7.	*Boerhaavia chinensis* (Linn.) Asch. & Schweinf.	Thazhuthama	Diffuse herb	
8.	*Cardiospermum helicacabum* Linn.	Pokkanamthooki	Climber	
9.	*Cassia obtusifolia* Linn.	Thakara	Shrub	
10.	*Celosia nodiflora* Linn.	Kozhivalan	Subshrub	
11.	*Centella asiatica* (Linn.) Urban	Kodangal	Herb	
12.	*Cleome monophylla* Linn.	Kattukaduku	Under shrub	
13.	*Cleome viscosa* Linn.	Kattukaduku	Herb	
14.	*Coccinia grandis* (Linn.) Voigt	Kattukoval	Climber	
15.	*Cochlospermum religiosum* (Linn.) Alston	Appakudukka	Trees	
16.	*Colocasia esculenta* (Linn.) Schott	Kattuchembu	Tuberous herb	
17.	*Commelina benghalensis* Linn.	Thavalapottan	Herb	
18.	*Dendrocalamus strictus* Nees.	Kallan mula	Tufted bamboo	
19.	*Euphorbia hirta* Linn.	Nilapala	Herb	
20.	*Mollugo pentaphylla* Linn.	Kozhuppacheera	Herb	
21.	*Oxalis corniculata* Linn.	Pulyarila	Herb	
22.	*Portulaca oleracea* Linn.	Kolambucheera	Herb	
23.	*Pouzolzia zeylanica* (Linn.) Bennet & Brown	Kuppacheera	Procumbent herb	
24.	*Sarcostigma kleinii* Wight. & Arn.	Odalvalli	Climber	
25.	*Sida cordata* (Burm.f.) Bross.	Vallikurunthotty	Prostrate herb	
26.	*Solanum villosum* Mill.	Kattukathrica	Shrub	
27.	*Solanum torvum* Sw.	Sukkuti cheera	Shrub	
28.	*Vigna radiata* (Linn.) Wilcz.	Kattupayar	Trailing herb	
29.	*Vigna trilobata* (Linn.) Verdc.	Kattupayar	Trailing herb	
30.	*Vigna vexillata* (Linn.) A. Rich.	Kattupayar	Trailing herb	

Table 5 : Plants bearing edible stem or shoots

S. No.	Scientific name	Local name	Habit	Form of Use/Recipe
1.	*Caryota urens* Linn.	Anappana	Palm	Crushed and powdered shoots placed in water overnight and settled starch dried in sunlight and make in to flour, cake, etc.
2.	*Cissus quadrangularis* Linn.	Changalamparanda	Climber	Stem cut in to small pieces and cooked with salt and chilly and garnished by mustards in oil and eaten
3.	*Cleome viscosa* Linn.	Kattukaduku	Herb	Stem cut in to small pieces and cooked with salt and chilly and garnished by mustards in oil and eaten
4.	*Costus speciosus* (Koenig) Sm.	Channakoova	Herb	Crushed green stem yields a juice
5.	*Ensete superbum* (Roxb.) Cheesm.	Kalluvazha	Herb	Stem cut in to small pieces and cooked with salt and chilly
6.	*Saccharum spontaneum* Linn.	Kattu karimbu	Cane	Green stem yields a juice

Conclusion

Tribal people through their traditional knowledge infer what to eat and what not to eat. They are thoroughly acquainted with the methods of excluding the harmful substances from wild plants and preparing acceptable recipes for their meager meals for example preparation of seed powder of ***Cycas circinalis*** **Linn.**, and rhizome of ***Dioscorea*** **Linn.**, etc. Corms and aerial bulbs of wild Dioscorea eaten raw, cause a terrible itching sensation in one's throat, hence for removing itching sensation, they will be peeled, boiled in tamarind water and smeared with turmeric paste. This is one of the methods devised in the kitchens of the tribals to make these wild plants palatable. The toxicity of Cycas seeds is removed by placing crushed and powdered seeds in water overnight next morning run off the water and again washes with pure water and decanted off. Then sun dry, the powder is used for making delicious dishes. Crushed young shoots and rhizome of Dioscorea is also cleaned from harmful substances in similar way.

There is much scope for improving the growth forms of wild edible plants by using modern agronomic research and experimental cytogenetical studies. For all such endeavour, thorough field work in various tribal areas and critical ethnobotanical observation on wild edible plants are the basic requirements.

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