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Knowledge and uses of wild edible plants by Paniyas and Kurumbas of Western Nilgiris, Tamil Nadu

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The ethnobotanical study on wild edible plants was carried out from January 2010 to June 2011 in two talukas of Nilgiris, Tamil Nadu. Information on edible plants was gathered from the ethnic community of "Paniyas and Kurumbas". Plant specimens were collected and identified along with their ethnobotanical uses. A total of 123 ethnobotanical species were collected in which 72 are wild edible plants belonging to 37 families. Out of these, 56 species were collected from wild and 16 species from semi wild/cultivated places. The life forms include 24 species of trees which makes up the higher proportion of the edibles followed by herbs (22), shrubs (14) and climbers (11). The dominant families which are used by the tribals are Solanaceae (7 species), Amaranthaceae and Euphorbiaceae (5 species each), Myrtaceae and Rutaceae (4 species each). The plants widely used by this tribal community are eaten as raw or boiled, fried, sometimes consumed as pickles and also as flavour. Present study highlights the new ethnobotanical uses of the plants used by the tribals of Western Nilgiris.

Keywords: Wild edible plants, Paniyas, Kurumbas, Nilgiris, Ethnobotany

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Introduction

India, a land of rich biodiversity, is a store house of natural resources that can be sustainably used for food and nutritional supplements with the wide variety of biological communities. Wild food plants play very important role in the livelihoods of rural communities as an integral part of the subsistence strategy of people in many developing countries[1]. It serves as a substitute to staple food during periods of food deficit which are valuable supplement for a nutritionally balanced diet, as an alternative source of income for poor communities and for domestication[2]. Tribal have acquired unique knowledge about the use of wild flora through their ancestors and their traditional knowledge is beneficial to scientific studies and humankind in many ways. In India large numbers of wild edible plants are widely distributed throughout the country and consumed in various ways[3]. Most of the edible plants are nutritionally important because of their high vitamin, mineral and fibre contents[4]. Modernization is presently posing a threat to their traditional knowledge and in the imminent danger of losing out[5]. Increasing human population leads in the search of necessitates of new plant species as source of food.

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The study area

The Nilgiris, a region of the Western Ghats is a great emporium and treasure house of ethno botanical wealth. The Nilgiri is commonly termed as "Blue Mountains" which is the highest mountain ranges of South India. The study area covers Gudalur taluk which is located at a longitude of 76°30' E and latitude of 11°30' N and Pandalur taluk, located at a longitude of 76° 20' E and latitude of 11° 29' N, with an altitude of 880-950 MSL. The region is located in the tri-junction of three states, viz. Tamil Nadu in the east, Karnataka in the north and Kerala in the west. Pandalur is a habitat for many indigenous tribal communities like Paniyas, Kurumbas and Kattunayakkas where they had a well-defined social structure and culture. A large part of the areas are covered by forest and few patches are used for Tea plantations. At present, the forest boundaries are encroached for the cultivation of tea which leads in the steady degradation in the forest area.

Tribes of Western Nilgiris

In the Nilgiri district, there are six tribal communities inhabitations namely the Todas, the

Kotas, the Kurumbas, the Irulas, the Paniyas and the Kattunayakas and all these are groups considered as primitive groups. The two main tribes of western Nilgiris are, Paniyas and Kurumbas. The term Paniya means "Labourer" which is derived from the Malayalam Language who are residing in the borders of Tamil Nadu and Kerala. The Kurumbas have subsisted as hunters and food gatherers and well versed in honey collection techniques. Their staple foods are wild tubers, wild fruits and other minor forest products. Today, with increasing population and deforestation, the Kurumbas have been forced to migrate to lower elevations of the plateau and working in tea or coffee plantations as agricultural labourers.

Materials and Methods

Many ethnobotanical studies are extensively surveyed in Nilgiris[6-9]. But still there is a long gap and need to study the unique uses of wild edible plants used by the tribal community with respect to Western Nilgiris. On this concept, an intensive exploration trips were performed monthly from January 2010-June 2011 at the residents of six tribal hamlets in Pandalur and Gudalur taluks. During these trips, information on ethnobotanically useful plants was obtained from experienced and elderly people drawn from Kurumbas and Paniyas. Data were obtained by informal interviews of informants from the indigenous populations. These informants are aged between 25-70 years old. Interviews with the men were usually carried out in forests and out of their houses whereas the women gave information in their nearby settlements. The wild edible plants are collected and confirmed for their uses by at least two informants and noted for their local names, their muliti-purpose uses, plant parts used, habit of plants, habit of the plants etc. were also gathered. The specimens mentioned by them are collected to prepare herbarium and identified with the help of regional/local floras[10] and the nomenclatural changes were made[11]. The specimens were deposited in the Herbarium of Department of Botany, Bharathiar University, Coimbatore. The plants are enumerated alphabetically with their botanical name, family, voucher number, local names, parts used and mode of uses are given (Plate 1).

Results

A total number of 72 species from 61 genera belonging to 37 families of vascular plants were collected and identified. Among these, majority of the species 56 (78%) were collected from wild; the rest of them 16 (22%) are semi-wild/cultivated species. The major life forms are trees (24 species) followed by herbs (22 species), shrubs with 14 species and climbers (11 species). The dominant families are: Solanaceae with 7 species, Amaranthaceae and Euphorbiaceae with 5 species, Myrtaceae and Rutaceae each with 4 species and Moraceae is represented by 3 species and the rest of the families represented with less than three species. The edible parts of the various plants used by the tribes are: fruits (36 species), leaf/twig (23 species), rhizome (5 species), tubers and shoots (3 species), seeds (2 species) and corm, flower and fronds (1 species).

Plants consumed raw

Out of 72 species, 24 are eaten raw in which *Acronychia pedunculata* (L.) Miq., *Coix lacryma-jobi* L., *Eugenia uniflora* L., *Glycosmis pentaphylla* (Retz.) Correa, *Lantana camara* L., *Melastoma malabathricum* L., *Nicandra physaloides* (L.) Gaertn., *Osbeckia wynaadensis* C. B. Clarke, *Oxalis corniculata* L., *Passiflora edulis* Sims., *Psidium guajava* L., *Solanum pseudocapsicum* L., *Urena lobata* L., and *Ziziphus rugosa* L. are eaten raw with out any preparation. Throughout the year they collect different type of fruits from the forest for their food. The maximum varieties of ripe fruits are eaten during summer (March- June). Species of *Aporosa cardiosperma* (Gaertn.) Merr., *Artocarpus hirsutus* Lam., *Bridelia retusa* Spreng., *Elaeagnus kologa* Schlult., *Syzygium cuminii* (L.) Skeels and *Vaccinium neilgherrense* Wight are well known for their edible value in the study area.

Plants consumed by cooking

In twenty nine species, plants like *Alocasia macrorrhiza* (L.) G. Don., *Alternanthera sessilis* (L.) R.Br. ex DC, *Alternanthera tenella* Moq., *Amaranthus graecizans* L., *Amaranthus spinosus* L., *Amaranthus viridis* L., *Amorphophallus paeonifolius* (Dennst.) Nicols., *Basella alba* L., *Boussingaultia baselloides* HBK, *Dioscorea pentaphylla* L., *Momordica charantia* var. *muricata* (Willd.) Chakrav., *Senna tora* (L.) Roxb. and *Sechium edule* (Jacq.) Sw. are cooked and consumed. The seeds of *Solanum torvum* Sw. are removed because of their bitter taste and fried in palm oil and eaten as a vegetable, whereas in the case of *Colocasia esculenta* (L.) Schott. and *Boussingaultia baselloides* HBK the leaves are

Aporosa cardiosperma (Gaertn.) Merr

Bridelia retusa (L.) A. Juss.

Coix lacryma-jobi L.

Melastoma malabathricum L.

Persicaria chinensis (L.) H. Gross

Caesalpinia mimosoides Lam.

Eryngium foetidum L.

Mussaenda hirsutissima (Hook.f.) Hutch. ex Gamble

Plate 1—Some wild edible plants of Western Nilgiris, Tamil Nadu

cut and boiled and the water is decanted to remove toxic substance and later used as gravy.

Plants consumed raw as well as cooked

In rare cases, the fruits of *Artocarpus heterophyllus* Lam., *Capsicum frutescens* L., *Carica papaya* L. and *Solanum anguivi* Lam., the leaves of *Bidens pilosa* L., *Brassica juncea* (L.) Czern. & Coss., *Diplazium esculentum* (Retz.) Sw., *Hibiscus hispidissimus* Griff., *Solanum nigrum* L. and *S. villosum* Mill. and the tuber of *Manihot esculenta* Crantz. are eaten raw as well as cooked.

Traditional recipes

The leaves of *Colocasia esculenta* (L.) Schott, *Diplazium esculentum* (Retz.) Sw., *Passiflora subpeltata* Ortega, *Bidens pilosa* L. and *Persicaria chinensis* (L.) Gross. the rhizomes of *Cyclea peltata* (Lam.) Hook.f. & Thoms., *Dioscorea pentaphylla* L. and *Stephania japonica* (Thunb.) Miers and fruits of *Solanum anguivi* Lam. are used in the preparation of their traditional foods. The leaves of *Persicaria chinensis* (L.) Gross.,*Cardiospermum halicacabum* L. and *Plumbago zeylanica* L. are used to make a liquid recipe (commonly known as Rasam).

Plants with medicinal property

There is no clear cut demarcation between food and medicinal plants which are available especially in indigenous communities. Food can be used as medicinal and vice-versa[12]. Even today certain wild edible plants are used because of their assumed health benefits and thus can be called medicinal foods[13]. The plants such as *Cardiospermum halicacabum* L., *Centella asiatica* (L.) Urban, *Oxalis corniculata* L., *Passiflora subpeltata* Ortega, *Plumbago zeylanica* L., *Psidium guajava* L., *Solanum pseudo-capsicum* L., *Solanum nigrum* L. and *Solanum villosum* Mill. are used as food and also for curing various common ailments.

Plants as substitutes and pickle

Species like *Capsicum frutescens* L. (for chilly), *Eryngium foetidum* L. (for coriander), *Bambusa arundinacea* (Retz.) Willd. (for rice) and *Murraya paniculata* (L.) Jacq. (for curry leaf) are used as a substitute for the cultivated ones. Fruit-yielding plants like *Phyllanthus emblica* L., *Capsicum frutescens* L., *Citrus grandis* Osbeck and *Mangifera indica* L. are treated with lemon and salt and used as a pickle.

Annual plants

Annual plants like *Alternanthera sessilis* (L.) R. Br. ex DC., *A. tenella* Moq., *Amaranthus graecizans* L., *A. spinosus* L., *A. viridis* L., *Basella alba* L., *Bidens pilosa* L., *Boussingaultia baselloides* HBK, *Brassica juncea* (L.) Crezn. & Coss., *Canna indica* L., *Carica papaya* L., *Colocasia esculenta* (L.) Schott, *Cyclea peltata* (Lam.) Hook.f. & Thoms., *Diplazium esculentum* (Retz.) Sw., *Hibiscus hispidissimus* Griff., *Lantana camara* L., *Manihot esculenta* Crantz., *Morus alba* L., *Oxalis corniculata* L., *Solanum nigrum* L., *Solanum torvum* Sw., *Solanum villosum* Mill., *Sauropus androgynus* (L.) Merr. and *Urena lobata* L. are consumed regularly throughout the year. They were growing as wild and few species are cultivated in their kitchen gardens.

Seasonal/Cultivated plants

Field studies revealed that *Aporosa cardiosperma* (Gaertn.) Merr., *Artocarpus heterophyllus* Lam., *Artocarpus hirsutus* Lam., *Bambusa arundinacea* (Retz.) Willd., *Bridelia retusa* (L.) Spreng., *Elaeagnus kologa* Schult., *Eriobotrya japonica* (Thunb.) Lindl., *Eugenia uniflora* L., *Garcinia gummi-gutta* (L.) Robs., *Glycosmis pentaphylla* (Retz.) DC., *Mangifera indica* L., *Melastoma malabathricum* L., *Nicandra physaloides* (L.) Gaertn., *Osbeckia wyaanadensis* Clarke, *Senna tora* (L.) Roxb., *Syzygium aqueum* (Burm. f.) Alston, *S. cuminii* (L.) Skeels, *S. jambos* (L.) Alston, *Vaccinium neilgherrense* Wight and *Ziziphus rugosa* Lam. are consumed as seasonal plants and some are sold in the market to earn additional income.

New ethnobotanical reports

It is observed that some of the species reported in the present study are commonly used in other parts of the country also[8,14-24]. However, many species like *Acronychia pedunculata* (L.) Miq., *Amaranthus graecizans* L., *Bidens pilosa* L., *Boussingaultia baselloides* HBK, *Caesalpinia mimosoides* Lam., *Cyclea peltata* (Lam.) Hook. f. & Thoms., *Hibiscus hispidissimus* Griff., *Nicandra physaloides* (L.) Geartn., *Osbeckia wynaadensis* Clarke, *Passiflora subpeltata* Ortega, *Solanum pseudo-capsicum* L., *Stephania japonica* Miers., *Urena lobata* L., *Vaccinium neilgherrense* Wight and *Zingiber wightianum* Thw. are either less known or unknown for their uses and the same is provided in Table 1. Out of 56 underutilized food plants documented, four species such as *Artocarpus hirsutus* Lam.,

Table 1—Reported ethnobotanical uses of wild edible plants used by Paniyas and Kurumbas of Western Nilgiris, Tamil Nadu, Southern India (*Contd*.)

S.No	Binomial name, family & voucher no.	Vernacular name	Habit	Part used	Uses
1	*Acronychia pedunculata* (L.) Miq. (Rutaceae) CU-013	Muttanari	T	Fruit	Ripe fruits are eaten raw (K)
2	*Amaranthus graecizans* L. (Amaranthaceae) CU-113	Sirukeerai	H	Twig/ Leaf	Young twigs and leaves are cooked and eaten as leafy vegetable (K &P)
3	*Aporosa cardiosperma* (Gaertn.) Merr. (Euphorbiaceae) CU-076	Chappu palam	T	Fruit	Ripened yellow fruits are eaten raw (K &P)
4	*Artocarpus hirsutus* Lam. (Moraceae) CU-061	Ayani pala	T	Fruit	Ripe fruits are eaten raw (K &P)
5	*Bambusa arundinacea* Willd. (Poaceae) CU-001	Moongil	T	Young shoot/ seed	The young terminal shoots are cooked and eaten. The grains are cooked and eaten as nutritious and palatable substitute for rice (K &P)
6	*Bidens pilosa* L. (Asteraceae) CU-086	Mukkutthi	H	Twig/ Leaf	The young twigs and leaves are eaten raw; also cooked and eaten as leafy vegetable (P)
7	*Boussingaultia baselloides* HBK. (Basellaceae) CU-088	Pasalai	Cl	Leaf	The young leaves are cooked and eaten as leafy vegetable (P)
8	*Brassica juncea* (L.) Czern & Coss. (Brassicaceae) CU-079	Kadugu	H	Leaf	The young twigs and leaves are eaten raw; also cooked and eaten as leafy vegetable (K)
9	*Bridelia retusa* (L.) Spreng. (Euphorbiaceae) CU-115	Adamarudu	T	Fruit	Ripe fruits are eaten raw (P)
10	*Caesalpinia mimosoides* Lam. (Caesalpinaceae) CU-070	Pulinagakondrai	S	Leaf & Flower	The young leaves are used for making chutney (K)
11	*Cardiospermum halicacabum* L. (Sapindaceae) CU-050	Mudakkathan	Cl	Leaf	The leaves are used for making liquid recipe (rasam); also eaten for medicinal purpose (P)
12	*Caryota urens* L. (Arecaceae) CU-068	Thippili panai	T	Terminal shoot	The young terminal shoots are eaten (P)
13	*Cinnomomum iners* Reinw. (Lauraceae) CU-097	Lavangam	T	Leaf	The leaves are used for flavouring agent (K)
14	*Coix lacryma- jobi* L. (Poaceae) CU-069	Kattu kundumani	H	Seed	Seeds are eaten raw (P)
15	*Colocasia esculenta* (L.) Schott (Araceae) CU-051	Sambu	H	Leaf/ petiole	The young leaves and petiole are cooked and eaten as leafy vegetable (K &P)
16	*Cyclea peltata* (Lam.) Hook. f. & Thoms.(Menispermaceae) CU-064	Para, Paachi	Cl	Tubers	The tubers are cooked and eaten as vegetable (K)
17	*Dioscorea pentaphylla* L. (Dioscoreaceae) CU-009	Chedhukandhi	Cl	Rhizome	Rhizome are cooked and eaten as vegetable (K&P)
18	*Diplazium esculentum* (Retz.) Sw. Athyriaceae (Pteridophyte) CU-087	Vegetable fern	H	Frond	The young fronds are eaten raw; also cooked and eaten as leafy vegetable (K)
19	*Elaeagnus kologa* Schult. (Elaeagnaceae) CU-101	Korangu palam	S	Fruit	The succulent red fruits are eaten raw, but are acidic and sour in taste (K &P)
20	*Eryngium foetidum* L. (Apiaceae) CU-084	Mexican coriander	H	Leaf	The leaves are used as substitute for coriander (P)
21	*Garcinia gummi- gutta* (L.) Roxb. (Clusiaceae) CU-053	Kodukka puli	T	Fruit pulp	The fruit pulp is eaten while making fish curry (K)

(*Contd*.)

Table 1—Reported ethnobotanical uses of wild edible plants used by Paniyas and Kurumbas of Western Nilgiris, Tamilnadu, Southern India

S.No	Binomial name, family & voucher no.	Vernacular name	Habit	Part used	Uses
22	*Hibiscus hispidissimus* Griff. (Malvaceae) CU-065	Adavi	S	Leaf	The young leaves are eaten raw; also used for making soup and given to pregnant women as a tonic (P)
23	*Melastoma malabathricum* L. (Melastomataceae) CU-104	Nakkukaruppan	H	Fruit	Ripe fruits are eaten raw (P)
24	*Murraya paniculata* (L.) Jack. (Rutaceae) CU-019	Wild curry leaf	T	Leaf	The leaves are used as substitution for curry leaf (K)
25	*Nicandra physaloides* (L.) Gaertn. (Solanaceae) CU-094	Sodakku thakkali	H	Fruit	Ripe fruits are eaten raw (P)
26	*Osbeckia wynaadensis* C.B.Clarke (Melastomataceae) CU-055		H	Fruit	Ripe fruits are eaten raw (K)
27	*Oxalis corniculata* L. (Oxalidaceae) CU-095	Pulicharai	H	Leaf	Leaves are eaten raw for medicinal purpose (K)
28	*Passiflora subpeltata* Ortega (Passifloraceae) CU-003	White passion flower	Cl	Leaf	The young leaves are cooked and eaten as leafy vegetable; also eaten for medicinal purpose (P)
29	*Persicaria chinensis* Gross. (Polygonaceae) CU-091	Yerumai naakku chedi	H	Twig/leaf/ fruit	The twigs, leaves and fruits are eaten fresh; also the leaves are used for making liquid recipe (rasam). Twigs are eaten for substitution for water (P)
30	*Plumbago zeylanica* L. (Plumbaginaceae) CU-056	Kodiveli	H	Leaf	The leaves are used for making liquid recipe (rasam) (P)
31	*Senna tora* L. (Caesalpinaceae) CU-005	Thagarai	S	Leaf	The young leaves are cooked and eaten as leafy vegetable (K)
32	*Solanum pseudo-capsicum* L. (Solanaceae) CU-100	Jerrusalem cherry	H	Fruit	The ripe fruits are eaten for medicinal purpose (P)
33	*Stephania japonica* Miers. (Menispermaceae) CU-111	Molaga ranai kodi	Cl	Tuber	Tubers are cooked and eaten as vegetable (K)
34	*Urena lobata* L. (Malvaceae) CU-039	Ottuttuti	H	Flower	Flowers are eaten raw (P)
35	*Vaccinium neilgherrense* Wight (Ericaceae) CU-093	Manalamaram	T	Fruit	Ripe fruits are eaten raw (P)
36	*Zingiber wightianum* Thw. (Zingiberaceae) CU-102	Malai inchi	H	Rhizome	Rhizomes are used as substitute for ginger. (K)

H-Herb; S-Shrub; T-Tree; Cl- Climber; P – Paniyas, K-Kurumbas.

Cinnamomum iners Reinw., *Osbeckia wynaadensis* Clarke and *Vaccinium neilghirrense* Wight are found endemic to the Southern Western Ghats. Most of the wild plants used by them are collected from forests, degraded lands, forest plantations and backyards of their homes, apart from the cultivated form.

Discussion

The food habits of the tribals are generally developed according to the availability of food and their nutritional value and hence the food supply is traditionally based on their own collection of food materials. Starvation among them due to seasonal scarcity of food is a regular phenomenon. Kurumbas and Paniyas tribes in western Nilgiris use wild edible plants in their daily life. They identify these plants quickly by some characters and they give name to the plants based on these characters. The review of the literature indicates that the tribals have a sound knowledge on the edible plants in their vicinity[14,19,20,23,25 & 26].

Conclusion

The ethnobotanical studies have revealed that wild edible plants with its potential value are used for human exploitation. The health vitality and longevity enjoyed by the tribals have been ascribed by them mainly to the wild edibles. Attention need to pay in collection and conservation of endemic plants which are available in the wild. Additional

studies on their nutritional evaluation will help us to exploit these potential wild plants for domestication.

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