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Ethnobotanical Studies from Amaravathy Range of Indira Gandhi Wildlife Sanctuary, Western Ghats, Coimbatore District, Southern India

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Abstract

The ethnobotanical studies were carried out in the Amaravathy Range of India Gandhi Wildlife Sanctuary, Anamalais, the Western. Ghats, Tamilnadu during June 2005 – May 2006. Puliyars and Muthuvars are the two dominant tribes who inhabit the dense jungles of this range; they have a fair knowledge on the indigenous flora. Due to intensive and extensive explorations have resulted in the collection of information on ninety four plant species; out of which, 73 are wild and the rest are cultivated; within the wild plants 24 are used as edible fruits; 12 species as a leafy vegetable; 23 species are having medicinal value and 18 species utilized for miscellaneous uses and the same is provided.

Keywords: Amaravathy Range, Western Ghats, Ethnobotanical Survey, Tamil Nadu.

Introduction

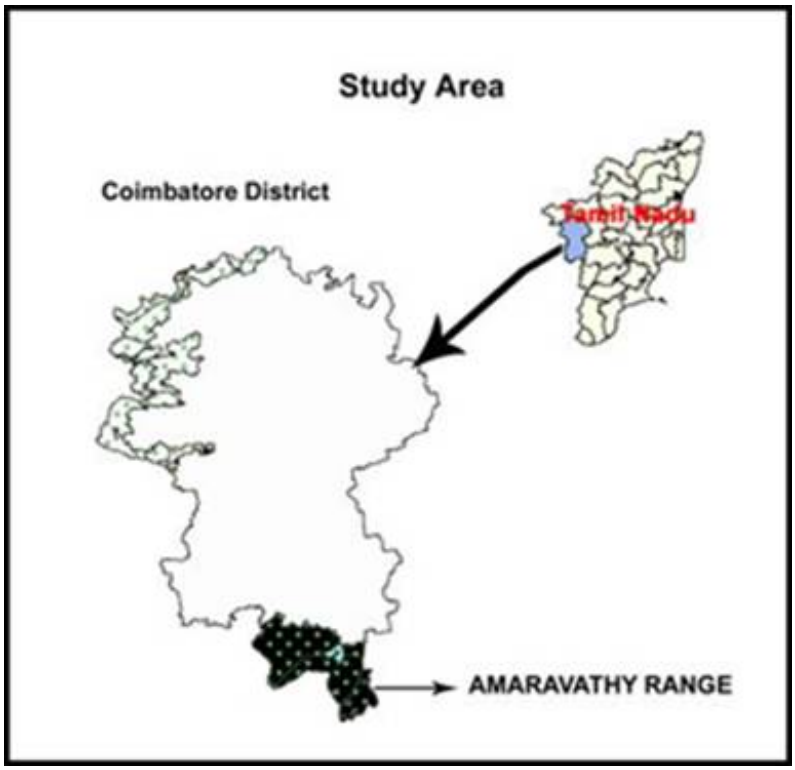
Ethnobotany is the study of direct interrelationship between human beings and plants. Ethnobotanists can play very useful roles in rescuing this disappearing knowledge and returning it to local communities. In this way local ethno botanical knowledge can be conserved as part of living cultural – ecological systems, helping to maintain a sense of pride in local cultural knowledge and practice and reinforcing links between communities and the environment, all of which may be thought of as essential steps in the promotion of conservation (Martin 1995). The Western Ghats is considered as one of the hotspot of the world (Myers *et al* 2000) and harbors about 4500 plant species (Nair and Daniel 1996.) Anamalais is an off shoot of the Western Ghats and it runs from the West to East. There are five types indigenous communities like Puliyars, Muthuvars, Malasars, Malaimalasars and Kadars live in the dense jungles. They have a fair knowledge on the utilization and conservation of these natural resources since they exchange the knowledge from one generation to another. The ethnobotanical studies related to Puliyars and Muthuvars are rather scanty.

The Anamalai Hills possesses a rich diversity of wild plants which are use as food by differed groups of tribal communities like Kadars, Malasars, Malaimalasars, Muthuvars and Puliyars. Due to the habitat degradation

and fragmentation of these forests, have resulted in the depletion of natural resources on which these tribes used to depend on their livelihood options; it has become increasingly difficult for them to live in their traditional way. In addition, the impact of tourism and urbanization has encroached in and around tribal settlements has changed their lifestyle. Therefore, it is realized that there is an urgent need to arrest the erosion of their knowledge at the earliest, since our country is a signatories on the convention on biological diversity and also to protect our indigenous knowledge. In the recent years, there has been growing interest world over to explore, search and collect plants which could have economical viability in near future. The purpose of the present paper is to record some less known ethno botanical informations of wild plants which are used by the Muthuvas and Pulayas from Amaravathy Range, Coimbatore District, Tamil Nadu were carried out during the study period.

Study area

The Amaravathy Range of Indira Gandhi Wild life Sanctuary was selected for the present study; it is located at 10-12 5'-11 7' latitude and 77 77-58.2'E longitude and range from 550 msl to 875 msl (Fig. 1). Based on the vegetation type, the study area consists of (i) Dry deciduous (ii) Moist deciduous and (iii) riparian forests. Even though five types of tribes inhabit the Anamalais, but Puliyars and Muthuvars were found in Amaravathy Range; within the range, there is a one settlement for Muthuvars at Manampally; whereas Puliyars live in the settlements like Thalinzhi, Kodanthur and Moongilpallam. These Puliyars cultivate rice and muthuvars raise different type of vegetables in their own fields. Apart from agricultural work, they also engage in sylvicultural work assigned by the forest department personnel as and when required.



Methodology:

Ethno botanical surveys were conducted during July 2005 – May 2006 in the Amaravathy Range forests of Indira Gandhi Wildlife Sanctuary. In order to collect the ethno botanical studies, PRA technique and key informant interviews were the methods followed. PRA technique was used to collect general information about

the Puliyars and Muthuvars. The specimens have been identified by using relevant flora (Gamble, & Fischer, 1915-1935) Voucher specimens were deposited at the herbarium of the Department of Botany, Kongunadu Arts and Science College, Coimbatore.

Results

Leaves: Various types of leaves are collected from different seasons, cooked and eaten along with boiled rice; out of 12 types of leaves reported (Table I) in the present study, the usages of *Celosia polygonoides, Lycopersicon esculentum, and Capsicum annum* are reported for the first time; however a comparison was made with such studies carried out in North Karnataka (Rajasab & Isaq 2004), Orissa (Sinha and Lakra 2004) and Arunachal Pradesh (Kar 2004), has revealed that the specious like *Portulaca oleracea, Colocacia esculenta, Oxalis corniculata* and *Solanum nigrum* were commonly used for all the four regions.

Fruits: There is a large number of wild edible fruits yielding plants; however in the present investigation only 24 species reported (Table II); Among these, *Dolichos trilobus, Canavalia gladiata,* are cooked and eaten as vegetable, while others are eaten raw; out of which ten plants like *Canthium dicoccum, Clausena dentata , Cordia monoica , Ficus benghalensis, Ficus microcarpa, Ficus racemosa, Miliusa tomentosa, Pachygone ovata, Passiflora foetida, Syzygium cumini* are popular among the two tribes and eaten frequently in different seasons. A few fruits like *Phyllanthus emblica, P. indofischeri* are pickled; surplus fruits of these few fruits are also sun dried and preserved for off-season. The edible nature of fruits like *Cochlospermum religiosum* and *Oxalis corniculata* are reported for the first time.

Medicinal Plants: Puliyars and Muthuvars could able to collect and identify about 23 medicinal plants (table III). They use different plants for curing various ailments like wound healing, cold, heaviness of head, diarrhoea, snake-bite, jaundice, to reduce body heat etc. A comparison was made with adjoining study area in Kerala (Nair, & Jayakumar, 2003) and found that the species like *Boerhavia diffusa, Calotropis gigantean, Chloroxylon swietenia, Phyllanthus amarus and Tridax procumbens* were used by both these communities. The medicinal uses *Strychnos potatorum, Triumfetta pilosa, Spilanthes calva* and *Rivea hypocrateriformis* are seems to be new.

Miscellaneous uses: Out of 18 species are enumerated which are used for house construction (*Anamirta cocculus, Argyreia pilosa, Bauhinia malabarica, Cassia fistula, Cymbopogon flexuosus*), fish poisoning (*Ceriscoides turgida, Diospyros Montana, Benkara malabarica, Randia dumetorum*), hairdo for tribal women folk (*Chrysanthemum anethifolium, Crossandra infunduliformis, Psilanthus wightianus*)and other such cases like tooth brush (*Pongamia pinnata*)and brooms (*Sida acuta*) etc are listed(table IV). It is interesting to know that the plant latex of *Strebulus asper* and *Wrightia tinctoria* are commonly used for curd making.

Cultivated plants: It is observed that a total number of 21 species belonging to 21 genera under 19 families are cultivated (table V) by the muthuvars and puliyars in different parts of Anamalai Hills, Coimbatore district. Generally, selection of plants depends upon the daily requirements. Many of these species have multiples uses. The tribal individuals show a tendency towards cultivating mostly edible fruits and vegetables. Other categories like plants yielding spices, beverages, construction material, basketry materials, medicines etc they collect from adjoining forest areas. Their kitchen gardens not only provide their daily requirements but also play a significant role in the economy of these two communities.

Results and Discussion

The indigenous communities possess a thorough knowledge on the usage of wild plants used by the in their day to-day's life. Out of 94 plants studied, further they were classified on basis of utility point of view; the same

is discussed under leafy vegetables, edible fruits, medicinal plants and plants used for miscellaneous purposes. Under leafy vegetables 12 plants were listed, out of which *Celosia polygonoides, Solanum americanum, Lycopersicum esculentum* and *Capsicum annum* probably form additional reports. Similarly, even though they use a number of fruit yielding plants, the fruit like *Ficus benghalensis, F. microcarpa, Miliusa tomentosa, Pachygone ovata, Cochlospemum religiosum, Secamone emetica* will form as an additional list of edible fruits from the wild and are popular among the tribal children of these two communities. The tribes depend up on the plants for curing various diseases since they live dense jungles. They use different parts of plants and have their own traditional way of health care involving the use of locally available plant resources; out of 23 plants they use, *Strychnos potatorum, Triumfetta pilosa, Spilanthes calva,* and *Rivea hypocrateriformis* for various diseases happens to form an additional ethno medicinal use from this district. These tribes use as many as 17 species for various miscellaneous uses like house construction, fish poisoning, live fence, tooth brush, broom and hairdos of women folk; out of these plants, the species like *Bauhinia malabarica, Streblus asper, Wrightia tinctoria, Psilanthus wightii, Anamirta cocculus* were probably form additional information.

The present study on ethnobotanical knowledge of Puliyars and Muthuvars would help in greater dissemination of this knowledge for long term conservation of a sustainable livelihood for the tribes. It is concluded that biodiversity plays important role in functioning of the village ecosystem; hence there is an urgent need to study on the conservation of biodiversity in and around the tribal settlements would help in sustainable development giving more emphasis to the indigenous within the people .It is advocated that the nutritional analysis of these potential species may be tested for their food quality. If it is suited it may form a new food sources; by this approach it is possible to convert the indigenous knowledge into a new product. By way of patenting and it will help the tribal communities by way of benefit sharing and sustainable utilization these wild plants.

In the present investigation it was observed that wild edible plants are valued as supplement diet. These wild edible plants can help to over come the deficiency of nutritional constituents especially in forest areas and to build up immunity power remaining healthy.

Table I. List of Leafy Vegetables.

Sl. No.	Name	Family	Tribe	Life form	Cult. Status	Part used
1	*Amaranthus hybridus* L. subsp. *crentus* (L.) Thell. var. *paniculatus* (L.) Thell.	Amaranthaceae	P	H	Wild	Tuber
2	*Amaranthus roxburghianus* Nevski	Amaranthaceae	P	H	Wild	Tuber
3	*Amaranthus spinosus* L.	Amaranthaceae	P	H	Wild	Tuber
4	*Amaranthus viridis* L.	Amaranthaceae	P	H	Wild	Tuber
5	*Capsicum annum* L.	Solanaceae	P	H	Wild	Leaves
6	*Celosea polygonoides* Retz.	Amaranthaceae	P	H	Wild	Tuber
7	*Colocasia esculenta* (L.) Schott.	Araceae	M	H	Wild, cultivated	Corm

8	*Lycopersicon esculentum* (L.) Krsten.	Solanaceae	P	H	Wild	Leaves
9	*Portulaca oleracea* L.	Portulacaceae	M	H	Wild	Stem
10	*Solanum americanum*	Solanaceae	P	H	Wild, cultivated	Tuber
11	*Solanum nigrum*	Solanaceae	P	H	Wild, cultivated	Tuber
12	*Solanum villosum*	Solanaceae	P & M	H	Wild, cultivated	Tuber

Table II. List of Edible Fruits.

1.	*Annona reticulata* L.	Annonaceae	M	T	C	Fruit
2.	*Artcocarpus heterophyllus* Lam.	Moraceae	P, M	T	W , C	Fruit
3.	*Canavalia gladiata* (Jacq.) DC.	Fabaceae	M	Cl	C	Fruit
4.	*Canthium dicoccum* (Gaertn.) Tey. & Binn.	Rubiaceae	P&M	T	W	Fruit
5.	*Clausena dentata* (Willd.) M. Roem.	Rutaceae	P	T	W	Fruit
6.	*Cochlospermum religiosum* (L.) Alston	Cochlospermaceae	P&M	T	W	Fruit
7.	*Cordia monoica* Roxb.	Boroginaceae	P	T.	W	Fruit
8.	*Diospyros ferrea* (Willd). Bakh. var. *buxifolia* (Rottb.) Bakh.	Ebenaceae	P	T	W	Fruit
9.	*Dolichos trilobus* L.	Fabaceae	M	Cl.	W	Fruit
10	*Ficus benghalensis* L.	Moraceae	P	T	W	Fruit
11.	*Ficus microcarpa* L.f.	Moraceae	P	T	W	Fruit
12.	*Ficus racemosa* L.	Moraceae	P	T	W	Fruit
13.	*Lantana camara* L.	Verbenaceae	P	S	W	Kernel
14.	*Mangifera indica* L.	Anacardiaceae	P&M	T	W,C	Fruit
15.	*Miliusa tomentosa* (Roxb.) Sinclair	Annonaceae	P	T	W	Fruit
16.	*Morus alba* L.	Moracea	P	T	W	Fruit
17.	*Oxalis corniculata* L.	Oxalidaceae	M	H	W	T, Fruit

18.	*Pachygone ovata* (Poir.) Miers ex Hook. f. & Thoms.	Menispermaceae	P&M	Cl	W	Fruit
19.	*Passiflora foetida* L.	Passifloraceae	P&M	Cl	W	Fruit
20.	*Phyllanthus indo-fischeri* Bennet	Euphorbiaceae	P, M	T	W	Fruit
21.	*Phyllanthus emblica* L.	Euphorbiaceae	P, M	T	W	Fruit
22.	*Phyllanthus reticulatus* Poir.	Euphorbiaceae	P	T	W	Fruit
23.	*Schleichera oleosa* (Lour.) Oken	Sapindaceae	P	T	W	Fruit
24.	*Syzygium cumini* (L.) Skeels	Myrtaceae	P	T	W	Fruit

Table III. List of Medicinal Plants.

Sl.No.	Name	Family	Tribe	Life form	Cult. Status	Part used	Uses
1	*Achyranthes aspera* L.	Amaranthaceae	P	H	W	Leaves	Leaves are squashed and the juice is applied to the wound.
2	*Aloe vera* (L.) Burm. f.	Liliaceae	P	H	C	Leaves	Sliced leaves are given for elderly people to reduce body heat; whereas for tribal kids in order o induce cold.
3	*Anisochilos carnosus* (L. f.) Wallich	Lamiaceae	P	H	W	Leaves	Crushed leaves are used to eliminate the ticks of the domestic dogs.
4	*Bidens triplenarvia* HBK. var. *macrantha* Wedd.	Asteraceae	P	H	W	Leaves	Leaves are squashed and the juice is applied to the wound.
5	*Boerhavia diffusa* L.	Nyctaginaceae	P	H	W	Leaves	Leaves are squashed and the juice is applied to the wound.
6	*Calotropis gigantea* (L.) R.Br.	Asclepiadaceae	M	S	W	Latex	The white latex is smeared on the affected part.
7	*Ceiba pentandra* (L.) Gaertn.	Bombacaceae	P	T	C	Bark fibre	Surface fibres; kernels edible; fruits used as vegetable.

8	*Chloroxylon swietenia* DC.	Rutaceae	P	T	W	Stem bark	The inner bark is pounded and used to cure itchy skin.
9	*Drymaria cordata* (L.) Roem. ex. Schultes. Ssp. *diandra* (Blume) Duke	Caryophyllaceae	P	H	W	Whole plant	The entire plant is squashed and the juice is applied to the wound.
10	*Euphorbia hirta* L.	Euphorbiaceae	P	H	W	Fruits	The fruit is edible but sour and it will help in reducing body heat.
11	*Hemidesmus indicus* (L.) R.Br.	Asclepiadaceae	P	TW	W	Roots	A decoction from the root is drunk for cooling the body.
12	*Naravelia zeylanica* (L.) DC	Ranunculaceae	M	Cl	W	Root	Root paste to cure problems with snoring
13	*Ocimum sanctum* L.	Lamiaceae	P	H	W	Leaves	Crushed leaves to cure ulcer in the intestine.
14	*Phyllanthus amarus* Schum. & Thonn.	Euphorbiaceae	P	H	W	Whole plant	All parts of the plant is crushed and given for curing jaundice.
15	*Rivea hypocrateriformis* (Desr.) Choisy	Convolvulaceae	M	Cl	W	Root	Crushed roots as an antidote for sname-bite
16	*Secemore emetica* (Roxb.) R.Br. ex Schultes	Asclepiadaceae	P	TW	W	Leaves	The leaves are applied as a bandage on the forehead to reduce heaviness of the head.
17	*Sida acuta* Burm.f.	Malvaceae	P	H	W	Leaves	The freshly pounded leaves are smeared on knees and elbow for joint pains.
18	*Spilanthes calva* DC.	Asteraceae	P	H	W	Flowers	The freshly crushed flower heads are used for tooth- ache.
19	*Strychnos potatorum* L. f.	Loganiaceae	M	T	W	Seed	Crushed seeds are pasted on the forehead to relieve giddiness
20	*Terminalia arjuna* (Roxb. ex DC) Wight & Arn.	Combretaceae	P	T	W	Stem, inner bark	A decoction of inner bark is given for live-stock as a tonic
21	*Terminalia chebula* Roxb.	Combretaceae	P	T	W	Fruits	Crushed fruit powder is given for tooth ache.
22	*Tridax procumbens* L.	Asteraceae	P	H	W	Leaves	Crushed leaf juice is applied to the wound.

23	*Triumfetta pilosa* Roth.	Tiliaceae	P	H	W	Leaves	To cure diarrhea, a decoction from the leaf is drunk.

Table IV. Plants used for miscellaneous purposes.

Sl. No.	Name	Family	Tribe	Life form	Cult. Status	Part used	Uses
1	*Anamirta cocculus* (L.) & Wight. & Arn.	Menispermaceae	P	Cl	W	Stem bark	Fibre used in construction
2	*Argyreia pilosa* Arn.	Convolvulaceae	M	Cl	W	Stem	Used in construction
3	*Bauhinia malabarica* Roxb.	Fabaceae	P	T	W	Bark	Fibre
4	*Benkara malabarica* (Lam.) Tirv.	Rubiaceae	P	S	W	Fruit	Fish poison
5	*Cassia fistula* L.	Caesalpiniaceae	P	T	W	Trunk	House construction
6	*Ceriscoides turgida* (Roxb.) Tirvengadum	Rubiaceae	P	S	W	Fruit	Fish poison
7	*Chrysanthemum anethifolium* Brouss. ex Willd.	Asteraceae	M	H	C	Flower	hairdo
8	*Cissus quadrangularis* L.	Vitaceae	P	Cl	W	Twig	Veterinary medicine
9	*Crossandra infunduliformis* (L.) Nees	Acanthaceae	P	S	C	Flower	hairdo
10	*Cymbopogon flexuosus* (Nees ex. studs) Wats.	Poaceae	P	H	W	Culms	Thatching material
11	*Diospyros Montana* Roxb.	Ebenaceae	P	T	W	Stem bark	Fish poison
12	*Jatropha curcas* L.	Euphorbiaceae	P	S	C	Plant	Live fence
13	*Pongamia pinnata* (L.) Piarre	Fabaceae	P	T	W	Twig	Tooth brush
14	*Psilanthus wightianus* (Wight & Arn.) Leroy	Rubiaceae	P	S	W	Flower	hairdo
15	*Randia dumetorum* (Retz.) Poir.	Rubiaceae	P	S	W	Fruit	Fish poison
16	*Sida acuta* Burm. f.	Malvaceae	P	H	W	Twig	Brooms
17	*Strebulus asper* Lour.	Moraceae	P	T	W	Latex	Curd-making
18	*Wrightia tinctoria* (Roxb.) R. Br.	Apocynaceae	P	T	W	Latex	Curd-making

Table V. List of Cultivated Plants.

Sl. No.	Plant name	Family	Plant part	Purpose	Consumption pattern
1.	*Allium cepa* L.	Liliaceae	Bulb	Culinary	Per. cons.
2.	*Annona reticulata* L.	Annonaceae	Mature Fruita	Edible	Per. cons
3.	*Areca catechu* L.	Arecaceae	Endosperm	Spice	Per. cons
4.	*Artocarpus heterophyllus* Lam.	Moraceae	Mature fruits	Edible	Per. cons
5.	*Bougainvillea spectabilis* Willd.	Nyctaginaceae	Flower	Decoration	Partly add in the market per. cons.
6.	*Canna indica* L.	Cannaceae	Rhizome	Edible	Partly add in the market per. cons
7.	*Capsicum annum* L.	Solanaceae	Fruits	Culinary	Partly add in the market per. cons
8.	*Carica papaya* L.	Caricaceae	Fruits	Edible	Partly add in the market per. cons
9.	*Chenopodium album* L.	Chenopodiaceae	Twigs	Leafy vegetable	Partly add in the market per. cons
10.	*Citrus limon* (L.) Burm. f.	Rutaceae	Fruits	Edible	Per. con
11.	*Cocos nucifera* L.	Arecaceae	Fruits	Oil	Per. con
12.	*Colocasia esculenta* (L.) Schott.	Araceae	Rhizome	Edible	Partly add in the market per. cons
13.	*Crossandra infunduliformis* (L.) Nees.	Acanthaceae	Flower	Hairdo	Per. con
14.	*Chrysanthemum anethifolium* Brouss. ex Willd	Asteraceae	Flowers	Hairdo	Per. con
15.	*Curcuma longa* L.	Zingiberaceae	Rhizome	Culinary	Partly add in the market per. cons
16.	*Ipomoea batatas* (L.) Lam	Convolvulaceae	Tubers	Edible	Per. con
17.	*Jasminum sambac* (L.) Ait.	Oleaceae	Flower	Hairdo	Per. con
18.	*Lawsonia inermis* L.	Lythraceae	Leaves	Dyeing	Per. con
19.	*Lycopersicon esculentum* Mill.	Solanaceae	Fruits	edible / vegetable	Per. con
20.	*Manihot esculenta* Crantz.	Euphorbiacieae	Tuber	Food	Per. con
21.	*Maranta arundinacea* L.	Marantaceae	Rhizome	Food	Per. con

Abbreviations Used: P- Puliyars, M- Muthuvars, H- Herbs, S- Shrubs, T- Trees, Cl- Climber, TW- Twiner, W- Wild, and C- Cultivated, Per. Con- Personal Consumption.

While scrutinizing the existing literature, it was found that the diversity of wild edible plants in different regions of India. For example, the wild edible plants documented in East India (Kar 2004, Sinha and Lakra 2004) are entirely different when compared to South India. Even in South India (Nair & Jayakumar 2003, Rajasab & Isaq 2004), the diversity of wild edible plant plants for Karnataka (Rajasab & Isaq 2004) is different from that of Tamil Nadu. Therefore, it is vital to document the folk knowledge on wild edible plant in different region for their optimum utilization and conservation which will be beneficial to the mankind.

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