

Utilization of Wild Edible Plants in Thiruppuvanam Region of Sivagangai District in Tamil Nadu, Southern India

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Abstract — Wild edible plants have sustained human populations in each of the inhabited continents. In India, the parts collected from the wild edible plants play a significant role in the food and nutrient security of rural and tribal people. Hence, the present study focused to document the traditional knowledge of wild edible plants utilized by the rural people dwelling in various localities of Thiruppuvanam region. By this study, the different parts of 40 plants have been recorded to be used for edible purposes. Out of 40 species recorded, 39 species belongs to angiosperm and 1 to pteridophyte. Research attention is needed to increase awareness on the use and management of wild edible plants for their conservation. The nutritional values of these plants should also be evaluated.

Keywords — Wild edible plants, Thiruppuvanam region, Sivagangai district, Tamil Nadu.

I. INTRODUCTION

The term “wild edible plants” is used to describe all plant resources outside of agriculture areas that are harvested and collected for the purpose of human consumption. They are incorporated into the normal livelihood strategies of many rural people [1]. Wild edible plants play a major role in meeting the nutritional requirement of the tribal and rural populations. Among the various kinds of plants, edible plants received the earliest attention of mankind and reflect man’s search for knowing more and more about the nutrient qualities of food plants.

Wild edible plants are particularly useful during famine and similar scarcity situation. Even during normal times, wild plants provide materials of diet to the less advanced section of human community. Indigenous knowledge of wild edible plants is important for sustainable utilization of those plant species [2]. Many wild plant species are believed to possess edible value and not well documented yet. Hence, the present study was conducted to enhance the knowledge on the edible plants utilized by the rural people inhabiting in various villages of Thiruppuvanam region in Sivagangai district, Tamil Nadu.

II. RELATED WORK

Several attempts have been made to explore the wild edible plants utilized by the various rural and tribal people inhabiting in different regions of Tamil Nadu. It includes 28 wild edible unripe fruits distributed over 20 families eaten by Paliyars of Western Ghats [3], 50 wild edible plant species belonging to 31 families under 43 genera from Kotagiri hills, a part of Nilgiri Biosphere [4], 74 wild

edible plants belong to 58 genera and 41 families used by Irula tribes of Pillur Valley, Coimbatore district [5], 72 are wild edible plants belonging to 37 families used by Paniyas and Kurumbas of Western Nilgiris [6], 51 species in 38 genus belongs to 32 families of wild edible plants consumed by the Irula tribals of Walayar valley, Southern Western Ghats [7], 110 wild edible plant species under 80 genera and 47 families used by Paliyar tribals in Sadhuragiri hills in Western Ghats [8], and 31 wild food plants utilized in the Cauvery delta region [9].

III. MATERIALS AND METHODS

Study area

The study area, Thiruppuvanam is one of the nine Taluks of Sivagangai district in Tamil Nadu. It spreads over an area of 20 Km² and lies between 9°49'37"N latitude and 78°15'24"E longitude. The altitude is about 108 m above mean sea level. Temperature in the year is ranging between 24 and 41°C. The mean annual rainfall is about 80 – 104 mm.

Data collection

The field survey was conducted in the rural habitations of 6 different villages (Keezhadi, Maangudi, Enaathi, Kaanoor, Mudhuvanthidal and Aalankulam) of Thiruppuvanam Taluk for 12 months from January 2019, to December, 2019. For the interview, 13 informants were approached with standard questionnaire. The vernacular names in Tamil for each food plant were recorded. To document the exact period of the availability of parts used as edible, direct field visits were made in the plants’ habitat throughout the study period. All the plants recorded were botanically identified with the help of ‘An Excursion

Flora of Central Tamil Nadu' [10] and authenticated as per APG IV classification [11].

IV. RESULTS AND DISCUSSION

Diversity of wild edible plants

The findings of present study revealed that, the dwellers of the study sites used a total of 40 plants species from 35 genera and 26 families as wild edible plants (Table 1). According to plant group, 39 species are belonging to angiosperm and 1 (*Marsilea quadrifolia*) to pteridophyte. Among the 26 families listed, the most widely utilized species are come under the families Amaranthaceae and Fabaceae (5 species each) followed by Arecaceae, Myrtaceae and Rhamnaceae (2 species each), and the remaining 20 families are represented by one species each (Table 2). In case of genus, *Amaranthus* is found as dominant with 3 species and it is followed by *Physalis*, *Solanum* and *Ziziphus* with 2 species each. The remaining genera are recorded as monospecific (Table 1). The studies conducted in Anamalais of Coimbatore district [12] and Pachalur hills in Dindigul district of Tamil Nadu [13] also revealed that the members of Amaranthaceae were mostly used as wild edibles by the tribal communities of the study area.

Among 40 plants recorded in the present study, 13 species (32.5%) are herbs, 3 species (7.5%) are shrubs, 6 species (15.0%) are climbers and 18 (45.0%) are trees (Fig. 1). This results is concordance with the findings of ethnobotanical studies conducted in Sadhuragiri hills [8], Anamalais [12] and Nilgiris [14], [15] of Tamil Nadu, by which it was reported that trees are the mostly used life form among the wild edible plants utilized by the people living in the respective area. This might be due to the greatest traditional knowledge on the usage of edible parts from trees and also due to the availability of such parts in all seasons.

While predict the conservation status of the recorded plants, it is noted that 9 species (*Alternanthera sessilis*, *Azadirachta indica*, *Cyperus articulatus*, *Delonix regia*, *Erythrina variegata*, *Guazuma ulmifolia*, *Ipomoea aquatica*, *Tamarindus indica* and *Terminalia catappa*) are categorized as Least Concerned (LC) species and the left over plants are Not Evaluated (NE) according to IUCN [16]. Of various parts used for edible purposes, fruits ranked first with 26 species (55.31%). It is followed leaf (7 species, 1.89%), shoot (5 species, 10.63%) and nut (2 species, 4.26%). Endosperm, flower, flower bud, seed, sprout, stem and tuber are noted as least used parts from each 1 species with 2.13% (Table 3; Fig. 2). The use of wild fruits as edibles in major contribution than other parts has been reported by several studies [17], [18], [19], [20]. A study conducted in West Bank of Palestine [21] revealed that leaves and stems are the most widely used parts of wild edible plants. This difference might be due to variation in the available species and culture of the communities with respect to food preference and preparation.

Availability of edible parts

According to the field observations, it was noted that the inhabitants have collected the edible parts as per their seasonal availability in surrounding resources. In case plants used as leafy vegetables, they are available throughout the year as their presence in vegetative stage in all seasons. Out of 40 plants recorded by present investigation, the edible parts of 22 plants are collected round the year. The available and collection period of edible parts from each plant are highlighted in Table 3.

Mode of usage

Edible fruits

The fruits used as edible by the rural people of the study area are consumed either in unripened, ripened or both stages. Among them, the fruits of *Annona squamosa*, *Azadirachta indica*, *Borassus flabellifer*, *Carica papaya*, *Coccinia grandis*, *Guazuma ulmifolia*, *Lantana camara*, *Limonia acidissima*, *Mangifera indica*, *Morinda tinctoria*, *Opuntia stricta*, *Passiflora foetida*, *Phoenix sylvestris*, *Physalis minima*, *Physalis peruviana*, *Pithecellobium dulce*, *Psidium guajava*, *Solanum nigrum*, *Syzygium cumini*, *Tamarindus indica*, *Ziziphus jujuba* and *Ziziphus mauritiana* are eaten in ripened condition. On other hand, the fruits of *Carica papaya*, *Coccinia grandis*, *Euphorbia hirta*, *Mangifera indica*, *Oxystelma esculentum*, *Psidium guajava*, *Solanum torvum*, *Tamarindus indica* and *Vigna trilobata* are consumed in unripened condition. Among the fruits used in unripened stage, *Carica papaya*, *Coccinia grandis* and *Solanum torvum* are consumed after cooking as vegetable curry or gravy, at the same time, the fruits of *Euphorbia hirta*, *Mangifera indica*, *Oxystelma esculentum* and *Psidium guajava* are eaten freshly as raw. In case of *Coccinia grandis* and *Solanum torvum*, their edible parts are made into dried fruits, roasted in oil and consumed along with normal diet. The fruits of *Mangifera indica* are prepared as pickle and consumed.

Edible leaves

The inhabitants of the study area are used the leaves of *Alternanthera sessilis*, *Ipomoea aquatica*, *Marsilea quadrifolia* and *Solanum nigrum*, and the shoot along with leaves of *Amaranthus spinosus*, *Amaranthus tristis*, *Amaranthus viridis*, *Portulaca oleracea* and *Pupalia lappacea* as leafy vegetables. The edible parts of these plants are cut into small pieces and cooked by adding common pulses, spices, onion or tomato as needed to prepare leaf curry and it is eaten along with normal diet mostly cooked rice. Leaves of *Cardiospermum halicacabum* are boiled with spices and drink or eaten with cooked rice. Leaves of *Erythrina variegata* are ground into paste and mixed with rice flour. This mixture is made into round shaped rotti, roasted with anyone edible oil and eaten. In case of *Tamarindus indica*, its tender leaves are eaten freshly as raw.

Other edible parts

The particulars gathered from the informants revealed that the following parts are also utilized as edible in respective manners. The endosperms obtained from the unripened

fruits of *Borassus flabellifer* are eaten freshly. Sprout of *Borassus flabellifer* is cooked, peeled and eaten. The tender stem portion of *Cissus quadrangularis* is cut into small pieces and made as vegetable curry along with common spices. Tubers of *Cyperus articulatus* are cooked, peeled and consumed. The flower buds of *Delonix regia* and flowers of *Tamarindus indica* were also consumed freshly by the people of the study area. The seeds of *Tamarindus indica* are roasted without oil and the kernels are soaked in water with pinch of salt overnight. Then the water is decanted and kernels are eaten freshly. The nuts of *Mangifera indica* and *Terminalia catappa* are consumed raw.

V. CONCLUSION AND FUTURE SCOPE

The wild edible plants are still unknown or less known to other parts than rural and tribal settlement areas. These

plants will become popularized after phytochemical analyses and nutraceutical studies. Therefore, further studies such as phytochemical and nutraceutical potentialities of these plants should be explored.

Almost, all the recorded plants in present study are already reported to be used in the treatment of various ailments which is strongly evidenced from the earlier ethnomedicinal studies conducted in Thiruppuvanam region [22], [23], [24], [25]. So that, the medicinal properties of these food plants should be confirmed by pharmaceutical evaluations and such therapeutic properties should also be communicated to people dwelling in other regions, by which we can achieve the quote "Our food should be our medicine; Our medicine should be our food; But to eat when we are sick, is to feed our sickness".

TABLES AND FIGURES

Table 1. List of wild edible plants recorded from the study area

S. No.	Botanical name	Family	Local name	Habit
1	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae	Ponnaanganni	Herb
2	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Mullikkeerai	Herb
3	<i>Amaranthus tristis</i> L.	Amaranthaceae	Thandangeerai	Herb
4	<i>Amaranthus viridis</i> L.	Amaranthaceae	Kuppaikkeerai	Herb
5	<i>Annona squamosa</i> L.	Annonaceae	Seethaapazham	Tree
6	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Vaambu	Tree
7	<i>Borassus flabellifer</i> L.	Arecaceae	Panai	Tree
8	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Mudakkathaana	Climber
9	<i>Carica papaya</i> L.	Caricaceae	Pappaali	Tree
10	<i>Cissus quadrangularis</i> L.	Vitaceae	Pirandai	Climber
11	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Kovai	Climber
12	<i>Cyperus articulatus</i> L.	Cyperaceae	Kizhangukkorai	Herb
13	<i>Delonix regia</i> (Boj. ex Hook.) Raf.	Fabaceae	Kondrai	Tree
14	<i>Erythrina variegata</i> L.	Fabaceae	Mullmurungai	Tree
15	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Ammaanpacharisi	Herb
16	<i>Guazuma ulmifolia</i> Lam.	Malvaceae	Karuppattikkaai	Tree
17	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	Sunnaambukkeerai	Climber
18	<i>Lantana camara</i> L.	Verbenaceae	Unnichi	Shrub
19	<i>Limonia acidissima</i> L.	Rutaceae	Vilaampazham	Tree
20	<i>Mangifera indica</i> L.	Anacardiaceae	Maa	Tree
21	<i>Marsilea quadrifolia</i> L.	Marsileaceae	Araakkeerai	Herb
22	<i>Morinda tinctoria</i> Roxb.	Rubiaceae	Manjanathi	Tree
23	<i>Opuntia stricta</i> (Haw.) Haw.	Cactaceae	Sappaathikkalli	Shrub
24	<i>Passiflora foetida</i> L.	Passifloraceae	Anilpazham	Climber
25	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Yeechambazham	Tree
26	<i>Physalis minima</i> L.	Solanaceae	Sodakkuthakkaali	Herb
27	<i>Physalis peruviana</i> L.	Solanaceae	Sodakkuthakkaali	Herb
28	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fabaceae	Kodukkaappuli	Tree
29	<i>Portulaca oleracea</i> L.	Portulacaceae	Paruppukkeerai	Herb
30	<i>Psidium guajava</i> L.	Myrtaceae	Koyyaa	Tree
31	<i>Pupalia lappacea</i> (L.) Juss.	Amaranthaceae	Mayilikkeerai	Herb
32	<i>Oxystelma esculentum</i> (L.f.) Sm.	Apocynaceae	Oosippalai	Climber
33	<i>Solanum nigrum</i> L.	Solanaceae	Manathakkaali	Herb
34	<i>Solanum torvum</i> Sw.	Solanaceae	Sundai	Shrub
35	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Naaval	Tree

36	<i>Tamarindus indica</i> L.	Fabaceae	Puli	Tree
37	<i>Terminalia catappa</i> L.	Combretaceae	Baadhaam	Tree
38	<i>Vigna trilobata</i> (L.) Verdc.	Fabaceae	Minnikkaai	Herb
39	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Yilandhai	Tree
40	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Yilandhai	Tree

Table 2. List of families with genus and species

S. No.	Family	Genus	Species
1	Amaranthaceae	3	5
2	Anacardiaceae	1	1
3	Annonaceae	1	1
4	Apocynaceae	1	1
5	Arecaceae	2	2
6	Cactaceae	1	1
7	Caricaceae	1	1
8	Combretaceae	1	1
9	Convolvulaceae	1	1
10	Cucurbitaceae	1	1
11	Cyperaceae	1	1
12	Euphorbiaceae	1	1
13	Fabaceae	5	5
14	Malvaceae	1	1
15	Marsileaceae	1	1
16	Meliaceae	1	1
17	Myrtaceae	2	2
18	Passifloraceae	1	1
19	Portulacaceae	1	1
20	Rhamnaceae	1	2
21	Rubiaceae	1	1
22	Rutaceae	1	1
23	Sapindaceae	1	1
24	Solanaceae	2	4
25	Verbenaceae	1	1
26	Vitaceae	1	1
Total		35	40

Table 3. Wild edible plants with IUCN status, parts used and seasonal availability

S. No.	Botanical name	IUCN status*	Edible part(s)	Period
1	<i>Altemanthera sessilis</i> (L.) R.Br. ex DC.	LC	Leaf	Round the Year
2	<i>Amaranthus spinosus</i> L.	NE	Shoot	Round the Year
3	<i>Amaranthus tristis</i> L.	NE	Shoot	Round the Year
4	<i>Amaranthus viridis</i> L.	NE	Shoot	Round the Year
5	<i>Annona squamosa</i> L.	NE	Fruit	Jul. – Aug.
6	<i>Azadirachta indica</i> A. Juss.	LC	Fruit	May – Jul.
7	<i>Borassus flabellifer</i> L.	NE	Fruit, Endosperm, Sprout	F & E: May – Aug. S: Dec. – Jan.
8	<i>Cardiospermum halicacabum</i> L.	NE	Leaf	Round the Year
9	<i>Carica papaya</i> L.	NE	Fruit	Round the Year
10	<i>Cissus quadrangularis</i> L.	NE	Stem	Round the Year
11	<i>Coccinia grandis</i> (L.) Voigt	NE	Fruit	Round the Year
12	<i>Cyperus articulatus</i> L.	LC	Tuber	Round the Year
13	<i>Delonix regia</i> (Boj. ex Hook.) Raf.	LC	Flower bud	Apr. – May
14	<i>Erythrina variegata</i> L.	LC	Leaf	Round the Year
15	<i>Euphorbia hirta</i> L.	NE	Fruit	Round the Year
16	<i>Guazuma ulmifolia</i> Lam.	LC	Fruit	Round the Year
17	<i>Ipomoea aquatica</i> Forssk.	LC	Leaf	Round the Year
18	<i>Lantana camara</i> L.	NE	Fruit	Round the Year
19	<i>Limonia acidissima</i> L.	NE	Fruit	Nov. – Dec.
20	<i>Mangifera indica</i> L.	NE	Fruit, Nut	Feb. – May
21	<i>Marsilea quadrifolia</i> L.	NE	Leaf	Round the Year
22	<i>Morinda tinctoria</i> Roxb.	NE	Fruit	Round the Year
23	<i>Opuntia stricta</i> (Haw.) Haw.	NE	Fruit	Feb. – Jul.

24	<i>Oxystelma esculentum</i> (L.f.) Sm.	NE	Fruit	Aug. – Feb.
25	<i>Passiflora foetida</i> L.	NE	Fruit	Sep. – Nov.
26	<i>Phoenix sylvestris</i> (L.) Roxb.	NE	Fruit	Sep. – Oct.
27	<i>Physalis minima</i> L.	NE	Fruit	Round the Year
28	<i>Physalis peruviana</i> L.	NE	Fruit	Round the Year
29	<i>Pithecellobium dulce</i> (Roxb.) Benth.	NE	Fruit	Jun.
30	<i>Portulaca oleracea</i> L.	NE	Shoot	Round the Year
31	<i>Psidium guajava</i> L.	NE	Fruit	Mar. – May
32	<i>Pupalia lappacea</i> (L.) Juss.	NE	Shoot	Round the Year
33	<i>Solanum nigrum</i> L.	NE	Leaf, Fruit	Round the Year
34	<i>Solanum torvum</i> Sw.	NE	Fruit	Jul. – Mar.
35	<i>Syzygium cumini</i> (L.) Skeels	NE	Fruit	Jun. – Jul.
36	<i>Tamarindus indica</i> L.	LC	Leaf, Flower, Fruit, Seed	L: Round the Year Fl.: Apr. – Jun. Fr.: Jun. – Dec. S: Dec. Jul. – Sep.
37	<i>Terminalia catappa</i> L.	LC	Nut	Jul. – Sep.
38	<i>Vigna trilobata</i> (L.) Verdc.	NE	Fruit	Round the Year
39	<i>Ziziphus jujuba</i> Mill.	NE	Fruit	Oct. – Dec.
40	<i>Ziziphus mauritiana</i> Lam.	NE	Fruit	Oct. – Jan.

*LC = Least Concerned; NE = Not Evaluated

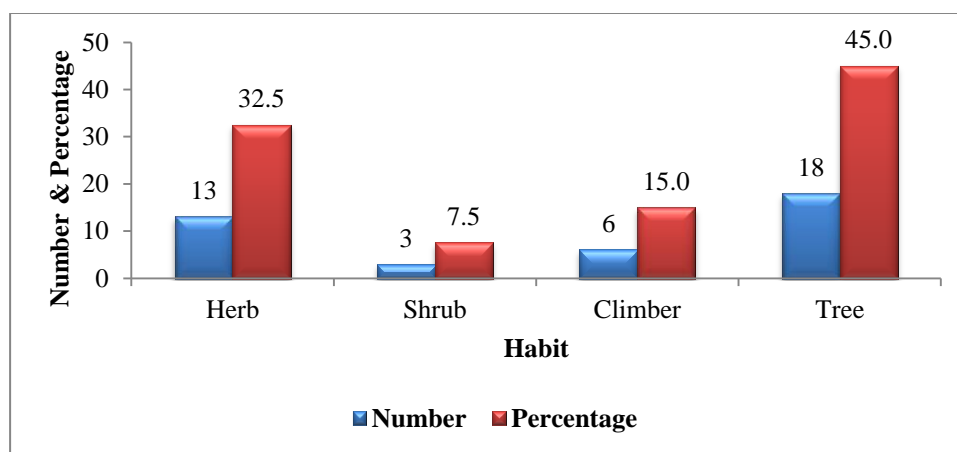


Figure 1. Number and Percent distribution of plants in different habits

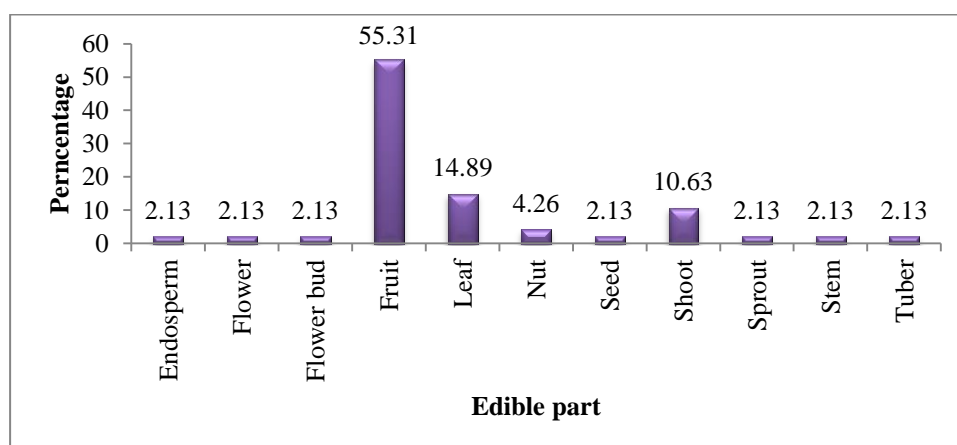


Figure 2. Percent distribution of different edible parts

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CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

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AUTHORS PROFILE

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