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Ethnobotanical studies on the wild edible plants of Irula tribes of Pillur Valley, Coimbatore district, Tamil Nadu, India

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ABSTRACT

Objective: To conduct an ethnobotanical studies and collect information about the wild edible plants collected and utilized by the Irula tribes of Pillur valley, Coimbatore District, Tamil Nadu, India. **Methods:** The study was conducted among the Irula peoples of Pillur valley through survey, interview and field work along with the knowledgeable individuals during January 2009 – September 2010. All the traditional and other knowledge related to the collection and consumption of wild edible plants on which the communities depend was documented. **Results:** A total of 74 plant species have been recorded as wild edible in the study areas, of which, fruits yielding plants ranked first with 42 species, green leaves, tubers, young shoots and flowers ranked next with 26, 7, 4 and 2 species respectively. **Conclusions:** Our study revealed that the adivasi community in the Pillur Valley continues to have and use the knowledge about the wild edible plants, including their habitat, collection period, sustainable collection, mode of preparation and consumption. To date, this knowledge appear to be fairly well conserved and used as a result of continued reliance of local community on the wild uncultivated foods.

1. Introduction

Consuming wild edibles is a part of the food habits of people in many societies and intimately connected to virtually all aspects of their socio-cultural, spiritual life and health [1, 2]. It plays a major role in meeting the nutritional requirement of the tribal population in remote parts of the country throughout the year [3–9]. Knowledge of non-domesticated food resources is part of traditional and unstated ecological knowledge, and is largely transmitted through socialization within cultural and household contexts [2]. The diversity in wild species offers variety in family diet and contributes to household food security [10–11]. The contributions of forest foods that make food security can be categorized into three main ways viz. (i). providing a supplementary source of food, (ii). as seasonal foods in the diet, and (iii) as emergency food supplies during periods when others are unavailable.

Principally, earlier studies in the Nilgiri Biosphere Reserve have dealt with medicinal species and little attention

was paid to wild edible plants [12–17]. Various reports also noted that many wild edibles are nutritionally rich and can supplement nutritional requirements, especially vitamins and micronutrients [18–21]. Nutritional analysis of some wild edible plants demonstrates that in many cases the nutritional quality of wild plants is comparable and in some cases they are superior to domesticated varieties [22–24]. Many wild plant species are believed to possess edible value and not documented yet [4, 18, 21]. So, there is an urgent need to explore, analyze and document the wild foods consumed by the Irula tribal communities in Nilgiri Biosphere Reserve (NBR). Hence the present study was undertaken in the Irula tribes of Pillur Valley.

2. Materials and methods

2.1. Study area

The Nilgiri Biosphere Reserve is the first biosphere reserve in India established under MAB program by UNESCO in 1986 [25]. The Nilgiri Biosphere reserve has a large number of indigenous communities; most of them are forest dwellers and hunter gatherers [15, 26]. Studies were carried out in the Nilgiri Biosphere reserve, particularly on the Pillur Valley (Figure 1). It is situated in Mettupalayam taluk of Coimbatore district and the southeastern part of Nilgiri Biosphere

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Reserve. It is bounded by the Sathyamangalam and Nilgiri divisions on the north and northeast and the Palghat division of Kerala in the south and south west.



Figure 1. Map of Nilgiri Biosphere Reserve showing the study area

The elevations range from 0 to 700m and it receives rain from northeast monsoon. The annual average rainfall ranges from 1000 to 1400mm. Pillur is contiguous with the Kerala forests in the west and Coonoor slopes in the Nilgiri massif in the north. The forests in the area are unique and they exhibit a wide variety of floral diversity in different altitudinal and geographical zones. The major vegetations of Pillur Valley are broadly classified in to 1. Dry deciduous scrub jungles, 2. Riparian forests and 3. the *Phoenix* savannah.

2.2. Peoples

Irulas are a small tribal community that is part of the Dravidian language group that is spoken in south-eastern India. They are recognized as a Scheduled Tribe (ST) by the Government of India [8, 27]. They are basically a semi-nomadic tribe, spread all over the Nilgiri Biosphere Reserve and were initially hunter-gatherers depending on forest products for their day-to-day food and medicinal needs. They are the ultimate jungle folk, and their knowledge of plants and animals is a data bank of immense value. The areas encompass 15 Irula villages namely Poochamarathur, Baralikadu, Nellimarathur, Sethumadai, Shengalur, Nellithurai, Situkunni, Surki, Kodyur, Neeradi, Veerakal, Anaipallam, Chinnalacombai, Thondai and Mannar.

The Irula tribals are mainly Non Timber Forest Produces (NTFPs) collectors and depend on forest resources for their survival. Most of their daily needs are met by the forest and very often they barter forest produce in the market. They also engage in agriculture which provide for some part of their food security. There are several honey gathering villages in the area. Villages like Poochamarathur and Neeradi have the highest number of honey gatherers. Most of the elder peoples in this area possess immense knowledge on forest plants. They use a wide variety of plant species for their daily sustenance and livelihood.

2.3. Data collection

The study was conducted among the Irula peoples of Pillur valley through survey, interview and field work along with the knowledgeable individuals during January 2009 – September 2010. All the traditional and other knowledge related to the collection and consumption of on which the communities depend was documented. The data was collected about collections and consumption of wild edible plants, such as frequency of consumption and collection groups. Interviews held in the villages was used to determine villagers' perceptions of their own and other's social attitudes towards collection and consumptions were collected. Moreover, informal discussions and forest walks with key informants, both adults and children, was carried out to enhance understanding about traditional knowledge and about different species of wild edible plants available around the village. The collected specimens were identified with the help of local floras [28–33]. The identified plants are arranged alphabetically with family names, local name and part(s) used.

3. Results

The result shows that, Irula tribes of Pillur Valley possess a very good knowledge on the wild edible plants found around the forest areas. A total of 74 plants species from 58 genera and 41 families have been recorded as wild edible plants in the study areas (Table 1). Of which, fruits ranked first with 42 species, green leaves, tubers, young shoots and flowers ranked next with 26, 7, 4 and 2 species respectively (Figure 2). Among the 41 families, the most widely utilized species belonged to Amaranthaceae (7), Rhamnaceae (4) and Euphorbiaceae (4). The families Solanaceae, Tiliaceae, Asclepiadaceae, Cactaceae were represented by 3 species each and the remaining families were represented by one or two species each. In the present study, about 74 wild edible plants have been enumerated, among them 19 are herbs, 14 shrubs, 15 climbers, 4 stragglers and 22 trees (Figure 3).

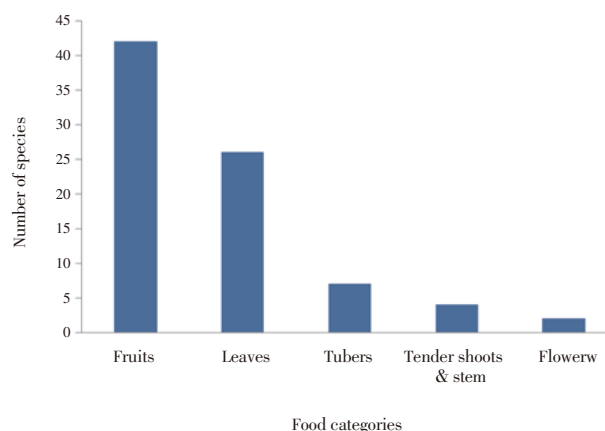


Figure 2. Wild edible plant species in different categories

Table 1

Plants used as wild edible in the Pillur Valley by Irula tribe.

Plant Name	Family	Local Name	Parts used
1 <i>Acacia pennata</i> (L.) Willd.	Mimosaceae	Seengai	Leaf
2 <i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	Ponnakanni	Leaf
3 <i>Amaranthus caudatus</i> L.	Amaranthaceae	Thandu keerai	Leaf
4 <i>Amaranthus graecizans</i> L.	Amaranthaceae	Sirukeerai	Leaf
5 <i>Amaranthus spinosus</i> L.	Amaranthaceae	Mullu	Leaf
6 <i>Amaranthus viridis</i> L.	Amaranthaceae	Pattikerae	Leaf
7 <i>Asparagus racemosus</i> Willd.	Liliaceae	Neer vekkaea	Tuber
8 <i>Nastus borbonicus</i> J.F.Gmel.	Poaceae	Peria mungil	Shoot
9 <i>Basella alba</i> L.	Basellaceae	Vasala dagu	Leaf
10 <i>Boerhavia diffusa</i> L.	Nyctaginaceae	Serandai	Leaf
11 <i>Brassica juncea</i> (L.) Czern.	Brassicaceae	Kadugu	Leaf
12 <i>Cansjera rheedii</i> J.F.Gmel.	Opiliaceae	Povi	Leaf
13 <i>Canthium coromandelicum</i> (Burm.f.) Alston	Rubiaceae	Bellakarai	Fruit
14 <i>Capparis zeylanica</i> L.	Capparaceae	Kevisi	Fruit
15 <i>Caralluma bicolor</i> Ramach, S. Joseph, H. A. John & C. Sofiya	Asclepiadaceae	Kattalae	Shoot
16 <i>Cardiospermum halicacabum</i> L.	Sapindaceae	Sitiki	Leaf
17 <i>Carissa carandas</i> L.	Apocynaceae	Kallakai	Fruit
18 <i>Carissa spinarum</i> L.	Apocynaceae	Sirukallakai	Fruit
19 <i>Celosia argentea</i> L.	Amaranthaceae	Pannae	Leaf
20 <i>Cereus pterogonus</i> Lem	Cactaceae	Ooci kalli	Flower
21 <i>Cissus quadrangularis</i> L.	Vitaceae	Naralai	Leaf
22 <i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Kovakai	Fruit
23 <i>Commelina benghalensis</i> L.	Commelinaceae	Kannae	Leaf
24 <i>Cordia sinensis</i> Lam.	Boraginaceae	Sellai	Leaf & Fruit
25 <i>Cordia dichotoma</i> G.Forst.	Boraginaceae	Karadisellai	Fruit
26 <i>Cycas circinalis</i> L.	Cycadaceae	Enthu	Tuber & tender leaf
27 <i>Decalepis hamiltonii</i> Wight & Arn.	Asclepiadaceae	Magalie	Tuber
28 <i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Theyya	Leaf
29 <i>Dioscorea oppositifolia</i> L.	Dioscoreaceae	Riya	Tuber
30 <i>Dioscorea tomentosa</i> J.König ex Spreng.	Dioscoreaceae	Noorai	Tuber
31 <i>Diospyros montana</i> Roxb.	Ebenaceae	Bankini	Leaf
32 <i>Diospyros malabarica</i> (Desr.) Kostel.	Ebenaceae	Benson	Fruit
33 <i>Drypetes sepiaria</i> (Wight & Arn.) Pax & K.Hoffm.	Euphorbiaceae	Thanuvam	Fruit
34 <i>Elaeagnus conferta</i> Roxb.	Elaeagnaceae	Kolaga	Fruit
35 <i>Ficus benghalensis</i> L.	Moraceae	Aal	Fruit
36 <i>Ficus racemosa</i> L.	Moraceae	Athi	Fruit
37 <i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Melaekulukki	Fruit
38 <i>Grewia hirsuta</i> Vahl	Tiliaceae	Kallai	Fruit
39 <i>Grewia tiliifolia</i> Vahl	Tiliaceae	Lumma	Fruit
40 <i>Grewia villosa</i> Willd.	Tiliaceae	Jenukallai	Fruit
41 <i>Hemidesmus indicus</i> (L.) R.Br. ex Schult.	Asclepiadaceae	Nannari	Tuber
42 <i>Ipomoea staphylina</i> Roem. & Schult.	Convolvulaceae	Unnagodi	Tuber
43 <i>Jasminum trichotomum</i> B.Heyne ex Roth	Oleaceae	Malligai	Leaf
44 <i>Lantana camara</i> L.	Verbenaceae	Unnichedi	Fruit
45 <i>Madhuca longifolia</i> (J.König ex L.) J.F.Macbr.	sapotaceae	Lippae	Fruit
46 <i>Mangifera indica</i> L.	Anacardiaceae	Manga	Fruit
47 <i>Moringa oleifera</i> Lam.	Moringaceae	Nugae/Murungai	Leaf
48 <i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Kariveppilai	Leaf
49 <i>Opuntia monacantha</i> (Willd.) Haw.	Cactaceae	Kalli	Fruit
50 <i>Opuntia stricta</i> (Haw.) Haw.	Cactaceae	Chappathikalli	Fruit
51 <i>Oxalis corniculata</i> L.	Oxalidaceae	Pulichera	Leaf
52 <i>Pachygone ovata</i> (Poir.) Diels	Menispermaceae	Varinkodi	Fruit
53 <i>Phoenix loureiroi</i> Kunth	Arecaceae	Eechipullu	Tender shoot & fruit
54 <i>Phyllanthus emblica</i> L.	Euphorbiaceae	Nelli	Fruit
55 <i>Phyllanthus indofischeri</i> Bennet	Euphorbiaceae	Nelli	Fruit
56 <i>Phyllanthus reticulatus</i> Poir.	Euphorbiaceae	Poola	Fruit

57	<i>Physalis angulata</i> L. var. <i>angulata</i>	Solanaceae	Potolai	Fruit
58	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Mimosaceae	Konapuli	Fruit
59	<i>Portulaca oleracea</i> L.	Portulacaceae	Goni	Leaf
60	<i>Psyrax dicoccos</i> Gaertn.	Rubiaceae	Oppai	Fruit
61	<i>Rivea hypocrateriformis</i> Choisy	Convolvulaceae	Mustae	Leaf
62	<i>Schleichera oleosa</i> (Lour.) Merr.	Sapindaceae	Pulipoocha	Fruit
63	<i>Scutia myrtina</i> (Burm.f.) Kurz	Rhamnaceae	Sodalie/Julie	Fruit
64	<i>Senna tora</i> (L.) Roxb.	Caesalpiniaceae	Oosi thagarai	Leaf
65	<i>Solanum americanum</i> Mill.	Solanaceae	Kakae dagu	Leaf
66	<i>Solanum virginianum</i> L.	Solanaceae	Kandakathiri	Fruit
67	<i>Solanum rudepannum</i> Dunal	Solanaceae	Sundai	Fruit
68	<i>Strychnos potatorum</i> L.f.	Loganiaceae	Sillakottai	Fruit
69	<i>Syzygium cuminii</i> (L.) Skeels	Myrtaceae	Neera/Naval	Fruit
70	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Puli	Fruit
71	<i>Zaleya decandra</i> (L.) Burm. f.	Portulacaceae	Koni dagu	Leaf
72	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Lanthai	Fruit
73	<i>Ziziphus oenopolia</i> (L.) Mill.	Rhamnaceae	Julie	Fruit
74	<i>Ziziphus abyssinica</i> Hochst. ex A.Rich.	Rhamnaceae	Kottae	Fruit

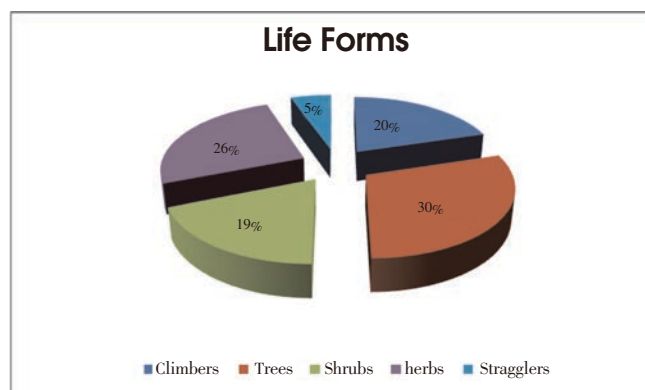


Figure 3. Life-forms of wild edible plants

The edible parts are consumed in many different ways. Some of them need only the washing of the part of the plant and some others imply a more or less complex preparation process. Nearly 47% of plants with edible leaves, roots or fruits are eaten after cooking. On the other hand, many edible fruits are directly consumed as desserts (44%), in fresh form (*Carissa spinarum*, *C.carandus*, *Cordia wallichii*, *Drypetes sepiaria*, *Ficus racemosa*, *Opuntia stricta*, *Scutia myrtina*, *Syzygium cuminii*, *Ziziphus mauritiana*, *Z. xylopyrus* and *Z. oneoplia*). Nearly 8% of the wild edibles are utilized as cooked/raw. A few of them are *Solanum nigrum*, *Coccinia grandis*, *Tamarindus indica* and *Mangifera indica*, *Phyllanthus emblica*, and *P. indofischerii*. A number of plants are gathered and preserved to be stored and consumed all year round. Many plants products are stored in pot vessels and plastic bags after proper preparations and used all year round. Some of them are *Cycas circinalis*, *Tamarindus indica*, *Ficus racemosa*, *Coccinia grandis*, *Solanum torvum*, *Mangifera indica*, *Phyllanthus embelica* and *P.indofischerii*.

4. Discussion

Documentation of wild edible plants from ethnobotanical approach is important for enhancing the understanding of indigenous knowledge systems [10, 34–35]. The wide consumption and availability of wild plants attest their value, and are especially visible among indigenous cultures. But in recent times, the old traditions in many tribal communities are at risk and gradually decline; hence, there is urgent need to study such knowledge systems and find innovative ways of tapping their potential for the welfare of mankind [36]. But, our study revealed that the adivasi community in the Pillur Valley continues to have and use the knowledge about the wild edible plants, including their habitat, collection period, sustainable collection, mode of preparation and consumption. To date, this knowledge appear to be fairly well conserved and used as a result of continued reliance of local community on the wild uncultivated foods [37–38]. It is recommended that a harmonious blend of indigenous knowledge with modern science is essential to promote sustainable and sustained utilization of these uncultivated sources of nutrition.

Conflict of interest statement

We declare that we have no conflict of interest.

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