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## A preliminary ethnobotanical investigation among irula tribes of Palakkad District, Kerala

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### Abstract

The documentation of the angiospermic plants species used among Irula, one of the ancient tribes of Palakkad district are limited compared to the extent of the variety of cultures and the diversity of plants of the region. This paper highlights, about 102 angiospermic plant species from 49 families, also their recorded and unrecorded indigenous ethnobotanical knowledge gained by Irula tribes through their experiences, practices and continues interaction with the nature. Of these, 37 species were used as edibles, 50 species were with medicinal properties and 4 plants were used for miscellaneous purposes including religious rituals and ceremonies. The study sought to establish the major threats to rich heritage of indigenous knowledge and the crucial need to study, authenticate, validate and document this fastly disappearing invaluable source of knowledge for upcoming generations.

**Keywords:** irula tribes, ethnobotanical significance, Palakkad, documentation, conservation strategies

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### Introduction

Ethnobotany is a comprehensive term, that reflects various aspects of ethnotaxonomy, ethno ecology, ethnopharmacology, ethnomedicines, ethnoforestry etc, which illustrates the interactions between human beings and plants (Jain, 2005) <sup>[6]</sup>. It refers to traditional as well as indigenous knowledge practised by tribal communities or ethnic races in which plant material or extract is used as medicines, condiments, food, textile fabrics and other spheres of day to day life (Balick, 1996) <sup>[3]</sup>. Ethnographical investigations are helpful in the identification, analysis and documentation of large amount of wild plants with their ample economic and ecological significance used by tribal communities.

Ethnic races can be considered as the torch bearers of ethnobotany (Remesh, 2007) <sup>[14]</sup>; which includes aboriginal communities with their own culture, customs, myths and taboos with generations of experiences and practices over wide range of wild plants and their interrelationship with mankind (Lalramghinglova & Jha, 1999) <sup>[8]</sup>.

Anthropogenic disturbances, cultural as well as environmental changes have endangered the wild plant resources to some extent and are major threats to rich heritage of indigenous knowledge (Abadie et al, 2011) <sup>[1]</sup>. So in this context, serious efforts has to put forth for the documentation of unrecorded ethnic importance of wild as well as cultivated plants; various strategies has to be adopted for their conservation within their natural habitats, in order to avoid extinction or to prevent biodiversity loss. Special attention should also be given to tribal communities for their proper well-being.

Irula is a Dravidian ethnic group mainly inhabiting the Attapady and Walayar panchayats of Palakkad district, Kerala and are highly dependent on nature for their livelihood. The study is envisaged to mark the distribution, abundance, taxonomic position of various plant species utilised by the tribal groups and also to document their uses among the Irula communities. Conservation status of endemic and endangered species due to over exploitation or over dependence were also evaluated.

### Materials and Methods

#### Study area

Attapadi valley, predominates with irula community (82.25%) situates below the Nilgiri Hills of the Western ghats with an area of around 750 km<sup>2</sup>. This area serves as a buffering zone to Silent valley National Park and with an altitude of 750m from Attapady valley to Malleswaram peak with an height of 1664m from MSL. The area is shared by Sholayur, Pudhur and Agali. Study mainly focused on Sholayur valley which is exclusively an Irula Panchayat. Another area collected for the study is Walayar, which also include dominant hamlets of Irula. Walayar valley (10<sup>0</sup> 77'0-3<sup>0</sup> N and 76<sup>0</sup>51' 06-10<sup>0</sup> E) with an altitude ranging between 370-450m above MSL situated in Palakkad district which is a border town between Palakkad district of Kerala and Coimbatore city of Tamilnadu with quiet good number of Irula communities. Sampling sites were selected in such a way that it represents the entire topography, ecological features, geography and represents the entire Irula diversity of the Palakkad district.

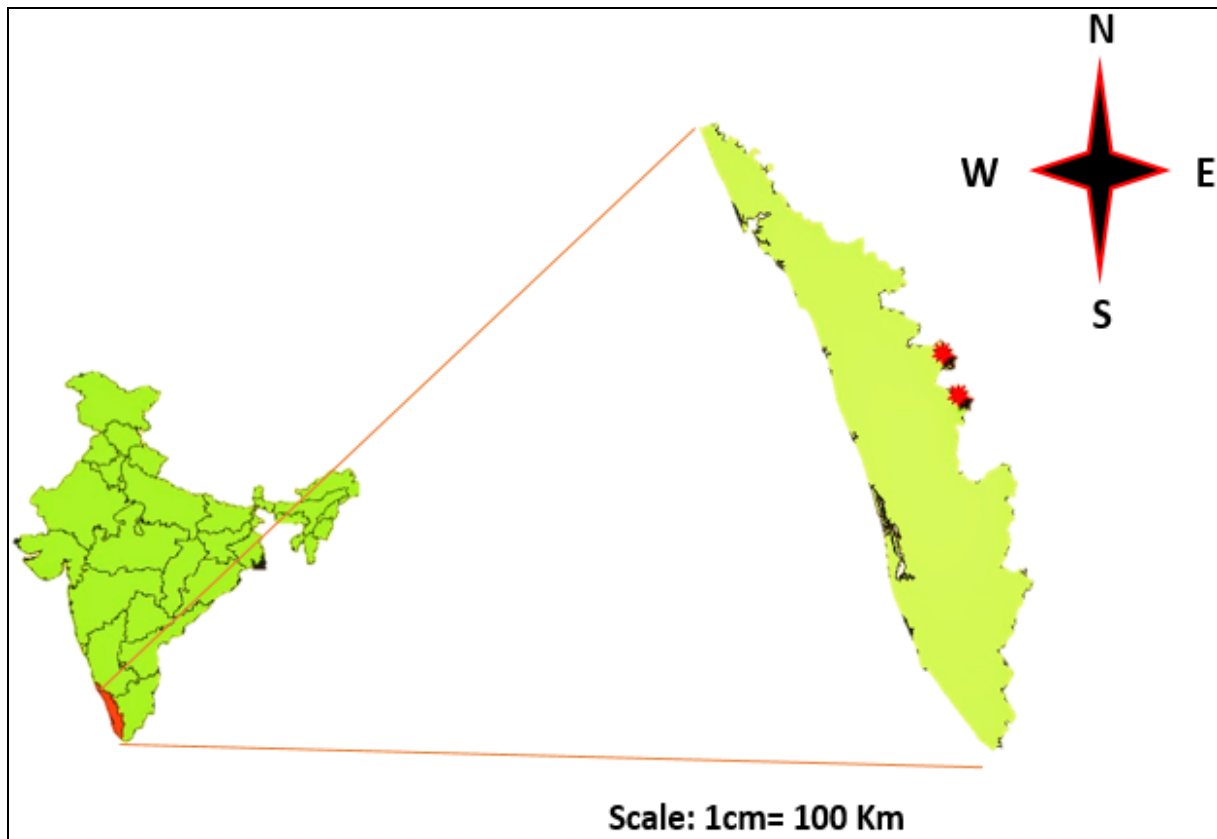


Fig 1: Location of study area (Source: GIS)

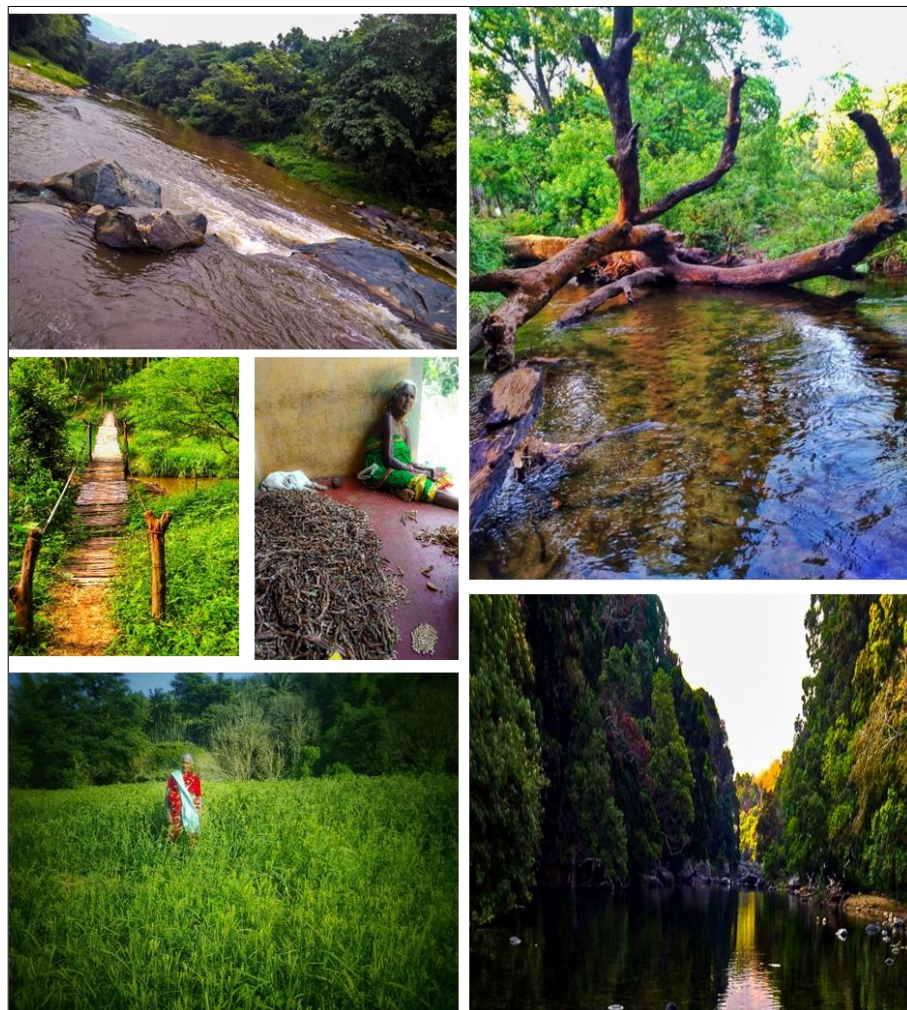


Fig 2: 1-6 Different views collected from various hamlets of study area.

### Data Collection and Analysis

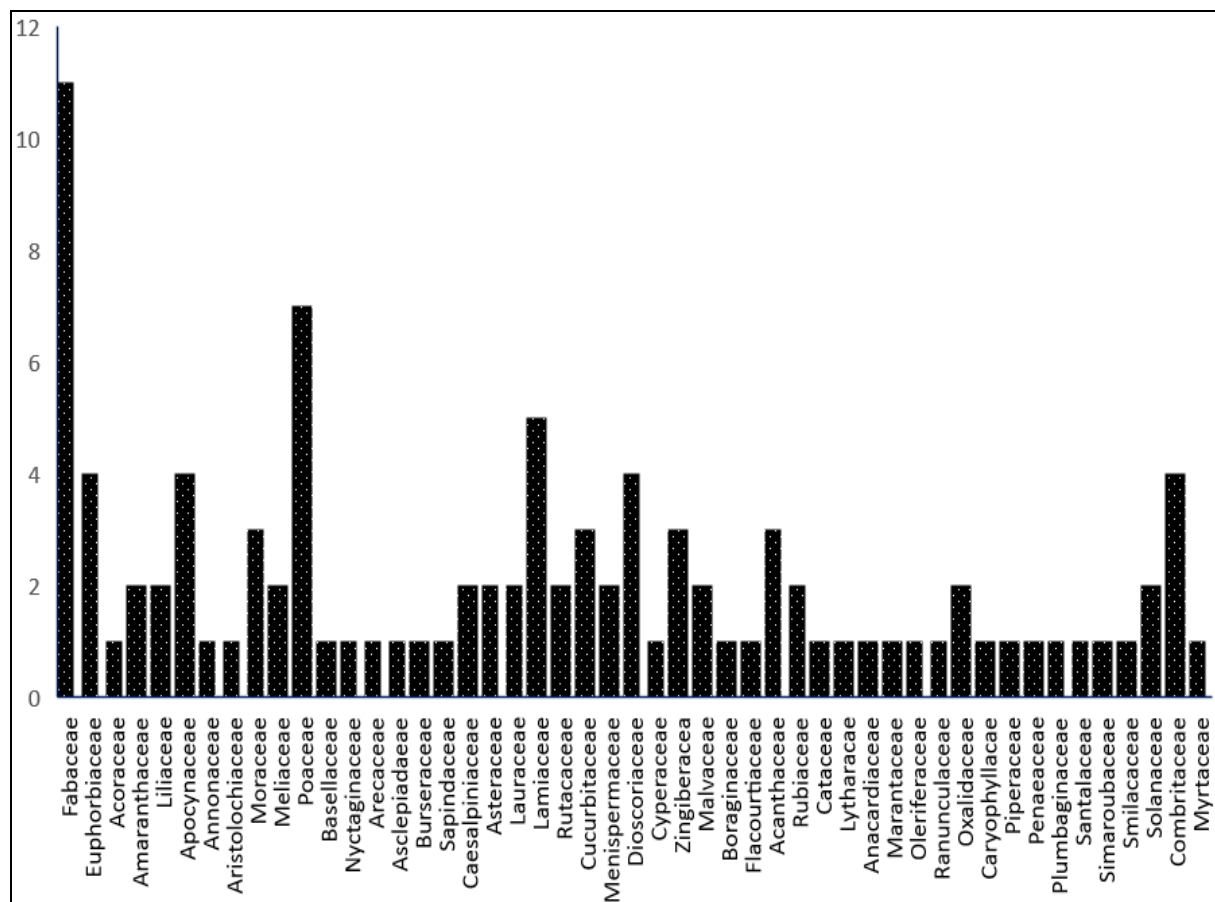
Ethnobotanical data were gathered with many reconnaissance visits during June 2017 to May 2018, based on semi-structured personal or group interviews among local traditional medicinal/herbal practitioners and knowledgeable natives with the permission of local administration. About 35 key-informants including 26 males and 9 females between an age-group of 45 to 80 were focused for interviews; along with data were collected through direct field observations. Data regarding the gathering, mode of preparation, manner of application, plant parts used, previous and current status, threats, conservation strategies and cultivation practice of wild plants which are economically valuable were collected along with their local names as per Bekalo *et al*, (2009) [4]. Based on Martin (2004), information on scarce - rare wild (degree of scarcity) and highly preferred plants with utmost significance among Irula communities were noted from key informants. The plant materials were collected in multiple copies, herbariums were prepared using standard techniques and specimens were identified using published floras and manuals.

### Result and Discussion

Human beings are known to use plants and plant products from ancient times. So such plants were protected, propagated and studied whereas the other plants were given less importance. The vast knowledge on economic and ecological usage of plants developed through their practices, experiences, experiments and continuous interactions with nature which inherited from generations to generations. Irula community, in Palakkad district have immense and invaluable traditional knowledge on the ethnobotanical applications of wide range of plants. During the survey, data were gathered regarding the mode of preparation, manner of application, plant parts used, previous and current status, threats, conservation strategies, local names and cultivation practice of wild plants which are economically valuable, etc.

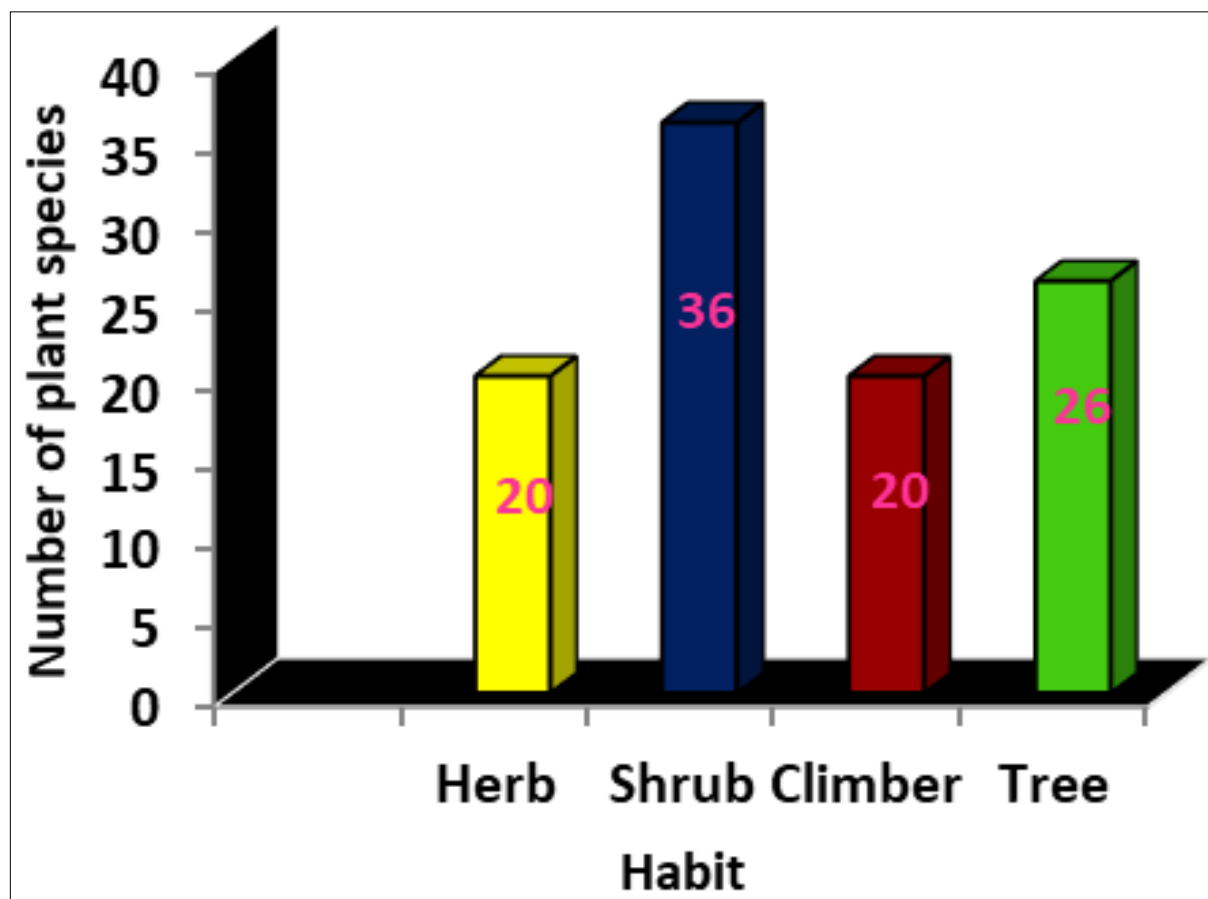
### Analysis of the Flora

In the present investigation, about 102 plant species belonging to 49 families were known to be utilised by Irula community were collected, identified, analysed and documented from the study area. The Family Fabaceae dominated with 10 species, which was followed by Poaceae with 7 species and Lamiaceae with 5 species each (Figure 3).



**Fig 3:** Analysis of the number of species represented from each families of angiosperm.

Among the 102 species, shrubs were accounted by about 30%, trees by 25.4% followed by climbers and herbs with 16.66% each (Figure 4).



**Fig 4:** Analysis of ethnobotanically important species used by Irulas in Palakkad district

Irula community uses these plants for their multifarious activities which include, medicinal, edible and miscellaneous uses. Among the 102 species documented from the study area, about 37 species were used as edible purposes, 50 species with medicinal properties as herbal remedies and 4 plants were used for miscellaneous purposes including religious rituals and ceremonies (Table 1 & Fig. 5).

**Table 1:** Data regarding the names and usage of plants collected

Si. no	Botanical Name	Family	Vernacular name	Habit	Useful part	Uses
1.	<i>Acacia pennata</i> (L) Willd	Fabaceae	Seengai	Climber	Fruit	Cosmetics
2.	<i>Acacia catechu</i> (L) Willd., Oliv	Fabaceae	Karungali	Tree	Bark	Medicine
3.	<i>Acalypha fruticosa</i> Forssk.	Euphorbiaceae	Cheera	Herb	Leaves	Food
4.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Kadaladi	Shrub	Leaves,Seed	Medicine
5.	<i>Acorus calamus</i> L.	Acoraceae	Vayambu	Herb	Rhizome	Medicine,
6.	<i>Aloe vera</i> (L.) Burm. F.	Liliaceae	Kattarvazhae	Herb	Leaves	Medicine
7.	<i>Alstonia venenata</i> R. Br.	Apocynaceae	Sinnapali	Shrub	Latex	Medicine
8.	<i>Annona squamosa</i> L.	Annonaceae	Seethe Pazham	Tree	Fruit	Food
9.	<i>Arachis hypogaea</i> L.	Fabaceae	Nilakadala	Shrub	Seed	Food
10.	<i>Aristolochia bracteolata</i> Lam.	Aristolochiaceae	Karalakam	Climber	Whole Plant	Medicine
11.	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Plavu	Tree	Leaf, Fruit	Medicine, food
12.	<i>Asparagus aspera</i> L.	Liliaceae	Sathavari	Climber	Rhizome	Medicine

13.	<i>Azadirachta indica</i> A.Juss	Meliaceae	Veppu	Tree	Leaves, Fruit	Medicine, Sacred use
14.	<i>Bambusa arundinacea</i> (Retz.) Willd.	Poaceae	Mula	Shrub	Stem, Seed	Food, Economic
15.	<i>Basella alba</i> L.	Basellaceae	Basela	Climber	Fruit	Medicine and Cosmetics
16.	<i>Boerhavia diffusa</i> L.	Nyctagiaceae	Thazhuthama	Herb	Leaves, whole plant	Food, Medicine
17.	<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	Thuvara	Shrub	Fruit	Food
18.	<i>Calamus rotang</i> L.	Arecaceae	Chooral	Shrub	Stem	Economical
19.	<i>Calotropis gigantea</i> (L.) Dryand.	Asclepadeae	Eruku	Shrub	Latex, Leaves	Medicine, sacred use
20.	<i>Canarium strictum</i> Roxb.	Burseraceae	Sambrini chedi	Tree	Latex	Sacred uses ,Spices
21.	<i>Canavalia gladiate</i> (Jacq.) DC.	Fabaceae	Valamara	Climber	Fruit	Food
22.	<i>Canthium coromandelicum</i> (Burm. f.) Alston	Rubiaceae	Kaaramullu	Tree	Bark	Medicine
23.	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Mudakkathan	Climber	Whole Plant	Medicine
24.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Kakkaemaram	Tree	Stem, Flower	Medicine, Sacred uses
25.	<i>Chenopodium album</i> L.	Amarantaceae	Cheera	Herb	Leaves	Food
26.	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.	Asteraceae	Communist Paccha	Shrub	Leaves	Medicine
27.	<i>Cinnamomum camphora</i> (L.) J. Presl	Lauraceae	Karpooram	Tree	Latex	Sacred Uses ,Medicine
28.	<i>Cinnamomum verum</i> J. Presl.	Lauraceae	Karuvapatta	Tree	Bark	Spices, Medicine
29.	<i>Citrus reticulata</i> Blanco	Rutaceae	Orange	Tree	Fruit	Food
30.	<i>Coleus zeylanicus</i> (Benth.) cramev	Lamiaceae	Iruveli	Herb	Whole Plant	Medicine, Economical
31.	<i>Cryptolepis buchananii</i> R.Br.ex Roem. & Schult.	Apocynaceae	Kattupalvalli	Climber	Latex, Leaves	Medicine
32.	<i>Cucumis melo</i> L.	Cucurbitaceae	Mathan	Climber	Fruit	Food
33.	<i>Cucumis sativus variety</i> L.	Cucurbitaceae	Kattu Vellari	Climber	Fruit	Food
34.	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Kumbalam	Climber	Fruit	Food
35.	<i>Cyclea peltata</i> Hook. f. & Thoms.	Menispermaceae	Pada Valli	Climber	Rhizome, Whole Plant	Medicine, Cosmetics
36.	<i>Cymbopogon citratus</i> Lin	Poaceae	Thaila pull	Herb	Whole plant	Food, cosmetics
37.	<i>Cynodon dactylon</i> (L.) Pers.	Graminae	Karuka	Herb	Whole Plant	Medicine, Sacred Plant
38.	<i>Cyperus esculentus</i> L.	Cyperaceae	Muthanga	Herb	Tuber	Food ,Medicine

39.	<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae	Orila	Shrub	Leaves	Medicine
40.	<i>Desmodium</i> sps.	Fabaceae	Kattu Thuvvara	Shrub	Leaves,Fruit	Food
41.	<i>Dioscoria bulbifera</i> L.	Dioscoriaceae	Noora Kizhngu	Climber	Rhizome	Food
42.	<i>Dioscorea oppositifolia</i> L.	Dioscoriaceae	Kattukizhangu	Climber	Rhizome	Food
43.	<i>Dioscorea pentaphylla</i> L.	Dioscoriaceae	Nurakizhangu	Climber	Rhizome	Food, Medicine
44.	<i>Dioscoria tomentosa</i> (Koenig ex Spreng) Kunth	Dioscoriaceae	Chaval	Climber	Rhizome	Food
45.	<i>Diplazium esculentum</i> (Retz.) Sw.	Pteridophyte	Cheera	Herb	Leaves	Food
46.	<i>Elettaria cardamomum</i> (L.) Maton.	Zingiberacea	Elam	Shrub	Seeds	Food, Spices
47.	<i>Eleusine coracana</i> Gaertn.	Poaceae	Cora	Shrub	Seed	Food
48.	<i>Emilia Sonchifolia</i> (L.) DC. Ex Wight	Asteraceae	Muyalchevian	Shrub	Whole Plant	Medicine
49.	<i>Ficus benghalensis</i> L.	Moraceae	Allmaram	Tree	Root,Bark	Medicine
50.	<i>Ficus racemose</i> L.	Moraceae	Athi	Tree	Fruit	Medicine, Food
51.	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Malakulukki	Shrub	Root,Leaves,Fruit	Food, Medicine
52.	<i>Helicteres isora</i> L.	Malvaceae	Valapiri Idam Piri	Tree	Fruit	Medicine
53.	<i>Hemidesmus indicus</i> (L.) R. Br	Boraginaceae	Nannari	Climber	Root,Whole Plant	Food, Medicine
54.	<i>Hemigraphis alternata</i> (Burm.f.) T. Anderson	Acanthaceae	Murikutti	Herb	Leaves	Medicine
55.	<i>Hydnocarpus pentandra</i> (Buch. - Ham.) Oken	Flacourtiaceae	Marotti	Tree	Seed	Medicinal
56.	<i>Indigofera tinctoria</i> L.	Fabaceae	Neelamari	Shrub	Root	Medicine
57.	<i>Ixora Coccinea</i> L.	Rubiaceae	Chethi	Shrub	Fruit,Root	Medicine, Food
58.	<i>Justicia adathoda</i> L.	Acanthaceae	Adalodakam	Shrub	Leaves	Medicinal
59.	<i>Justicia beddomei</i> (Clarke) Bennet	Acanthaceae	Adalodakam	Shrub	Leaves	Medicinal
60.	<i>Lawsonia inermis</i> L.	Lytharaceae	Mylanji	Shrub	Leaves	Medicine, cosmetics
61.	<i>Leucas aspera</i> (Willd.) Link, Enum.	Lamiaceae	Thumbai	Herb	Root,	Sacred, Medicine
62.	<i>Macrotyloma uniflorum</i> (Lam.)	Fabaceae	Muthira	Shrub	Seeds	Food
63.	<i>Malotus philipensis</i> (Lam.) Muell. Arg.	Euphorbiaceae	Chadachi Pazham	Tree	Fruit	Food
64.	<i>Mangifera indica</i> L.	Anacardiaceae	Maavu	Tree	Fruit, Leaves,	.Food, Medicine

					Bark	
65.	<i>Maranta arundinacea</i> L.	Marantaceae	Koova	Shrub	Rhizome	Food, Medicine
66.	<i>Melia dubia</i> Cav.	Meliaceae.	Malivembu	Tree	Bark	Medicine
67.	<i>Moringa oleifera</i> Bedd.	Oleriferaceae	Murigai	Tree	Leaves, Fruit, Flower	Food, Medicine
68.	<i>Naravelia zeylanica</i> (L.) DC.	Ranunculaceae	Malai Valli	Climber	Leaves	Medicine
69.	<i>Ocimum americanum</i> L.	Lamiaceae	Nayathulasi	Shrub	Leaves	Medicine
70.	<i>Ocimum gratissimum</i> L.	Lamiaceae	Kattuthulasi	Shrub	Leaves	Medicine
71.	<i>Ocimum Sanctum</i> L.	Lamiaceae	Tulasi	Shrub	Whole Plant	Medicine, Sacred
72.	<i>Opuntia ficus –</i> <i>indica</i> (L.) Mill.	Cataceae	Kallimull chedi	Shrub	Fruit	Food
73.	<i>Oryza sativa</i> L.	Poaceae	Nellu	Shrub	Seed	Food
74.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Puliyaral	Herb	Whole Plant, Fruit	Food, Medicine
75.	Oxalis sps	Oxalidaceae	Thuruthu Malli	Herb	Whole Plant	Ornamental
76.	<i>Panicum sumatrense</i> Roth ex Roem. & Schult	Poaceae	Chama	Shrub	Seed	Food
77.	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Kizharnelli	Herb	Whole Plant	Medicine
78.	<i>Drymaria cordata</i> (L.) Willd. ex Roem. & Schult	Caryophyllaceae	Kozhijeerakam	Herb	Whole Plant	Medicine
79.	<i>Piper Longum</i> L.	Piperaceae	Thippalli	Climber	Fruit	Medicine
80.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Chethi Koduveli	Shrub	Root	Medicine
81.	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Pungu	Tree	Seed, Root, Leaves, Flower	Medicine, Sacred
82.	<i>Psophocarpus</i> <i>tetragonolobus</i> DC.	Fabaceae	Chathurapayar	Climber	Fruit	Food
83.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Rubiaceae	Amalpori	Shrub	Root	Medicine
84.	<i>Ricinus communis</i> L.	Euphorbiaceae	Avanaku	Shrub	Bark, leaves	Medicine, Cosmetics
85.	<i>Santalum album</i> L.	Santalaceae	Santhanam	Tree	Wood	Medicine, Sacred Plant
86.	<i>Senna tora</i> (L.) Roxb.	Casealpinioidea	Thakara	Shrub	Leaves	Food
87.	<i>Setaria italica</i> (L.) P. Beauvois	Poaceae	Thinai	Shrub	Seed	Food
88.	<i>Sida rhomboidea</i> Roxb. ex Fleming	Malvaceae	Kurunthotty	Shrub	Root, leaves	Medicine, Cosmetics
89.	<i>Simarouba glauca</i> DC.	Simaroubaceae	Kaapuchedi	Tree	Bark	Medicinal
90.	<i>Smilax zeylanica</i> L.	Smilacaceae	Koduvamadak	Climber	Leaves, Root	Medicine
91.	<i>Solanum torvum</i> Sw.	Solanaceae	Chundakka	Shrub	Fruit	Medicine, Food

92.	<i>Solanum virginianum</i> L.	Solanaceae	Chundakkai	Shrub	Fruit ,Root	Medicine Food
93.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Njaval Pazham	Tree	Fruit	Food
94.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combritaceae	Thanikai	Tree	Bark	Medicine
95.	<i>Terminalia chebula</i> Retz.	Combritaceae	Kadukkai	Tree	Fruit	Medicine
96.	<i>Terminalia cuneata</i> Roth, Nov.	Combritaceae	Maruthu	Tree	Bark	Medicine
97.	<i>Tinospora cordifolia</i> (Willd.) Miers	Menispermaceae	Amruthu valli	Herb	Whole plant	Medicine
98.	<i>Vitex negundo</i> L.	Combritaceae	Vennochi	Shrub	Root	Medicine
99.	<i>Wrightia tinctoria</i> (Roxb.) R. Br	Apocynaceae	Dhandhapala	Tree	Leaves	Medicine
100.	<i>Zea-mays</i> L.	Graminae	Cholakam	Shrub	Seed	Food
101.	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Inji	Herb	Rhizome	Medicine, Spices
102.	<i>Zingiber zerumbet</i> (L.) Smith	Zingiberaceae	Malayinji	Herb	Rhizome	Medicine, Spices

The modern health facilities enjoyed by other people were not highly recommended or used by the inhabitants of the study area, especially the old- age people and were largely depended on herbal remedies for the treatment of various diseases.

The utilization of various plant parts were also investigated for the species it was interesting to note that, leaves (22 species) were used in greater number followed by fruits (20 species), whole plant (13 species), Rhizomes (11 sp.), root (11 sp.), seed (10 sp.) and Bark (10 sp.) (Fig 6).

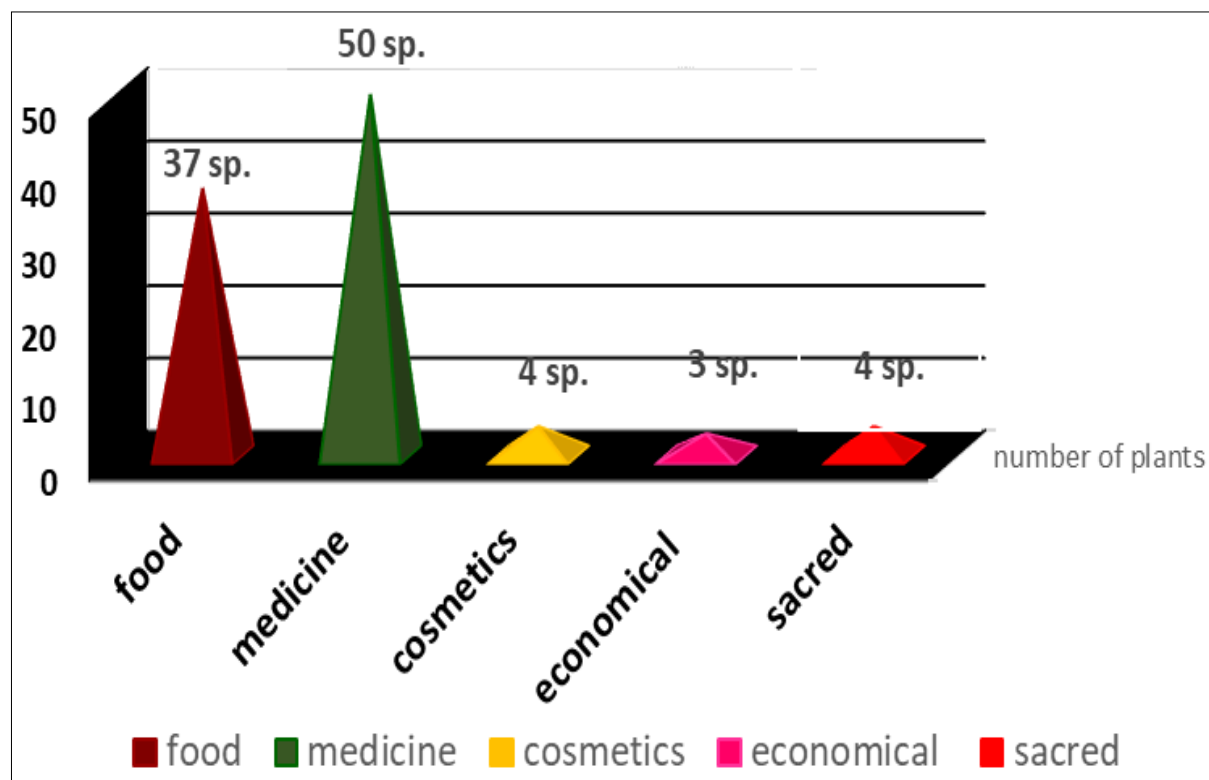
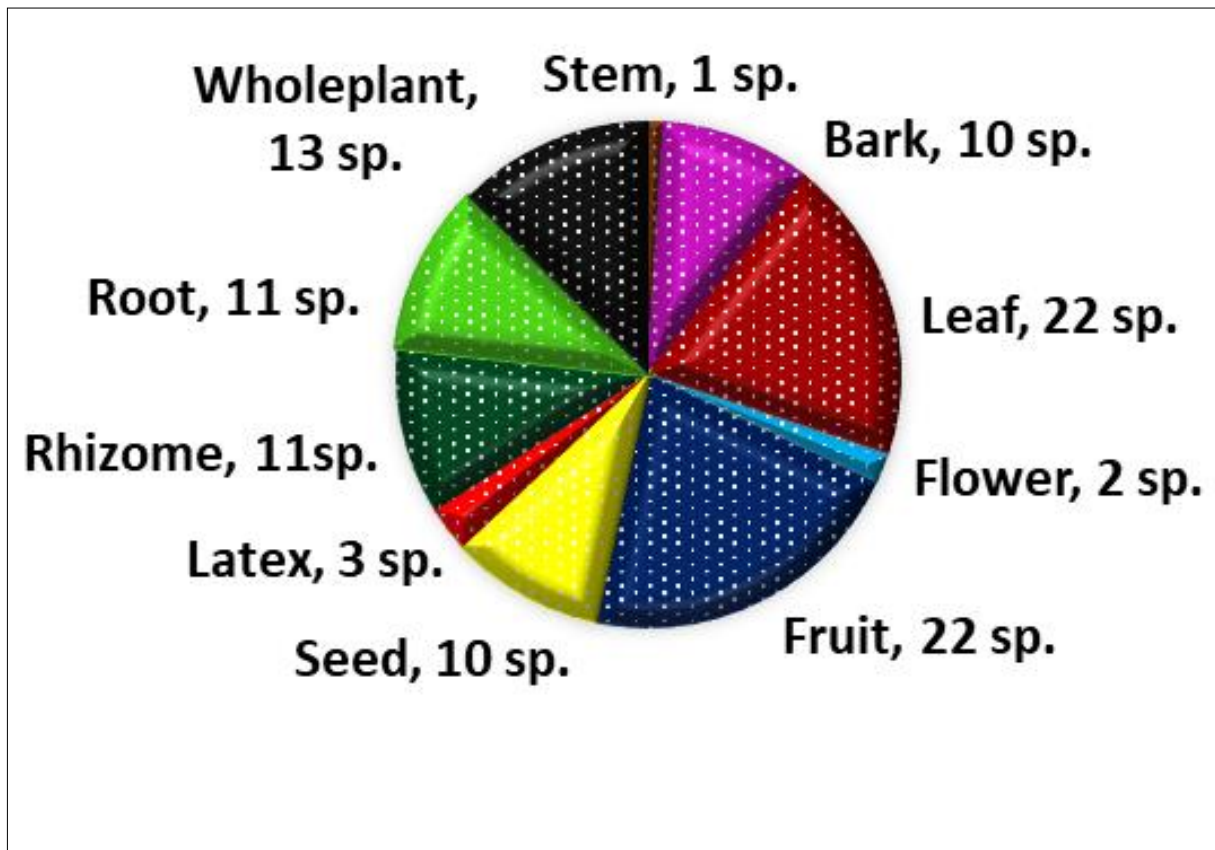


Fig 5: Analysis of ethnobotanical applications of species collected



**Fig 6:** Analysis of plant parts used for various ethnobotanical needs.

Leaves, fruits and seeds of the species were mostly used by Irulas as the food where as other parts like root, stem and bark were mainly used as medicines; flower and latex were commonly used for religious purposes. Usage of fruits and leaves than other plant part indicates their traditional culture followed by these tribes who does not threaten biological diversity in and around their hamlets instead trying to conserve them for next generations. The usage of shrubs over trees also implies this culture. The time and frequency of harvesting varies from plant to plant, so plants used in different seasons may vary. In case of medicines, the mode of preparations (whether as decoction, powder or any other form), dosage and application of medicines (internal/ external) used among Irulas may vary according with the plants they used for treatment, herbalist/ medical practitioner, intensity and nature of the disease.

The study revealed that, vast range of cultivated as well as wild plants were used among Irula tribes of Palakkad districts. The indigenous knowledge about the ethnobotanical aspects of plants including their ample significances were known and maintained among elders between the age group of 45 to 90 years.

Ethnobotanical studies carried out by various researchers during like Latheef *et al.*, (2014)<sup>[9]</sup>, Limcy *et al.*, (2013)<sup>[10]</sup>, Remesh (2007)<sup>[14]</sup>, Nadanakunjidam (2003)<sup>[13]</sup> and Manilal *et al.*, (2002)<sup>[11]</sup> and have published ethnobotanical and multifarious uses of plants among various tribals of Palakkad district. Recently works by Jenny *et al.*, (2017)<sup>[7]</sup> proposed about 58 plants belonging to 28 families with medicinal properties used among various tribal races of Attapady and Venkatachalapathy *et al.*, (2018) proposed medicinal aspects of about 146 plants in 122 genera belonging to 58 families from Walayar valleys (including Tamilnadu and Kerala) among Irula tribes. All these studies are an evidence to the depth of ethnobotanical knowledge of the natives and ethnobotanical importance of study area selected for the present work.

### Conclusion

The major threats faced by these tribes were the declined use of plants and lack of traditional knowledge among their young generation which may gradually leads to the depletion of these valuable ethnobotanical knowledge specific to this race. It was also observed that, many wild species were growing under tremendous pressures from various anthropogenic activities in the study area. Thus, public awareness and community- based management need to be encouraged at all levels to maintain the biodiversity and the ethnobotanical knowledge of Irula people.

This paper deals with the ethnobotanical study that is focused specifically on the documentation of angiospermic plants used among the Irula tribes of Palakkad district for their various day to day needs; No reports of lower group plants are included in the study, since this is only a preliminary report. The complete scenario of the plants used by Irula in their day to day routine can be revealed, only if the study is further extended to lower forms of plants including lichens, fungi, pteridophytes and bryophytes. Thus this study calls for further extensive studies.

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