

ETHNOMEDICINAL PLANTS USED BY THE IRULA TRIBALS OF PALAMALAI HILLS, SOUTHERN WESTERN GHATS OF COIMBATORE, TAMIL NADU, INDIA

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ABSTRACT

The present study is aimed to document the ethnomedicinal plants used for various ailments by the Irula tribes of Palamalai hills, Southern Western Ghats of Coimbatore, Tamil Nadu, India. A total number of 53 plants species belonging to 50 genera and 32 families used by them as herbal medicines to treat several common diseases such as skin diseases, dysentery, cough and cold, cuts and wounds, etc. were documented. Among the plant species Herbs were the primary source of medicine (40%) followed by trees (28%), shrubs (15%) and climbers (17%) and leaves were mostly used (35%) for various illness followed by whole plant (18%), root (13%), stem (7%), bark and rhizome (6%) and seeds and tubers (4%). Most of the medicine prescription by healers is decoction. Therefore, it is suggested to take-up pharmacological and phytochemical studies to evaluate the species to confirm the traditional knowledge of Irulas on medicinal plants.

Keywords: Ethnobotany, Irulas, Palamalai hills, Western Ghats.

1. INTRODUCTION

Ethnobotany word is made from two words ethno and botany and the term was coined by John William Harshberger in the 1896. Ethnobotany is the study of people and study of plants; this is represented good relationship between wild plants (Herbs, Shrubs and Trees) and tribal's. Ethnobotany is the branch of Ethnobiology and complete information about plants and their medicinal uses is given by ethnobotanical studies (Jitin, 2013). India is rich in ethnic diversity and indigenous knowledge that has resulted in exhaustive ethnobotanical studies. There are over 537 different aboriginal groups in India with extensive knowledge of plants (Jain, 1991). Herbal medicine is widely practiced throughout the world from time immemorable. These medicines are safe and environment friendly. The World Health Organization (WHO) defines traditional medicine as practices, knowledge and belief systems which uses minerals, plants and animal based remedies, spiritual therapies and exercises to prevent, treat and maintain well being (WHO, 2003). According to the WHO, about 80% of the population of the world depends on traditional medicine, mostly herbal remedies, for their primary health care needs (Muthu *et al.*, 2006). In the developed countries people are seeking for herbal medicine because of their scarcity side effects compared to the synthetic drugs. According to WHO 70 to 90 percent of world population especially from developing countries, use plant remedies for their health care (Belachew, 1984; Nair and Nathan, 1998). Developing countries like India, Pakistan and

China have identified potential usage of medicinal plants, and integrated them in to their overall health care system (Andrew, 1982).

The indigenous traditional knowledge of medicinal plants of various ethnic communities, where it has been transmitted orally for centuries is fast disappearing from the face of the earth due to the advent of modern technology and transformation of traditional culture (Ganesan *et al.*, 2004; Rajadurai *et al.*, 2009). The recent reports have indicated that, 25% of the modern drugs are derived from the extract of medicinal plants. It is estimated that 70% to 80% of the people worldwide rely chiefly on traditional healthcare system and largely on herbal medicines (Robert and John, 1983; Shanley and Luz, 2003; Kaur *et al.*, 2011). Until recently, plants were important sources for the discovery of novel pharmacologically active compounds, with many blockbuster drugs being derived directly or indirectly from plants (Newman and Cragg, 2007; Li, 2010).

Irulars are small tribal community in the part of Dravidian language group which is spoken in south eastern India. They belong to the Negrito (or Negroid) race which is one of the six main ethnic groups that add to the racial mosaic of India (Deepa *et al.*, 2002). The origin of the word "Irula" is not clear. Some surmise that, it is derived from the Tamil word "Iruval" implying the dark complexion of the Irula, often being spotted by villagers as distinct silhouettes in the forests and supporting their local name, the Forest People (Fuchs, 1973). They do not practice agriculture and therefore, fully depend on

forest produces and wild animals. Other occupations of the Irulars include intermittent farm labour and the legendary profession of snake charming (Venkatachalapathi *et al.*, 2015; 2016). In recent years some researchers have reported various medicinal plants used by Irula tribals in Anaikatty hills, Siruvani hills and Maruthamalai hills of Coimbatore district (Palanisamy, 1993; Balasubramanian *et al.*, 1997; Nikkitha, 1999; Hamasavalli, 2001; Karthikeyani, 2003; Senthilkumar, 2004; Senthilkumar *et al.*, 2006; Geetha *et al.*, 2007; Paulsamy, 2011; Tamilselvi *et al.*, 2016). Therefore, the aim of the study was, to documentation of traditional knowledge of utilization of medicinal plants used by Irula tribes for various ailments in Palamalai hills of Coimbatore district, Tamil Nadu.

2. MATERIALS AND METHODS

2.1. Study area

The present work was undertaken in the Palamalai hills located in the Coimbatore district of Tamil Nadu, South India. Palamalai is an offshoot of the Eastern Ghats geographically contiguous with the Billigrirangaa hills range as they reach out to merge with the Western Ghats at Nilgiris. It lies at an altitude of 1839 m above mean sea level and an attitude of 1400 m on the Western Ghats (Fig. 1). The ethnobotanical survey was carried out during October 2009 to March 2010 among Irula population residing in this area.

2.2. Data collection

The data on medicinal plants was recorded through interview, discussion and field observation with knowledgeable elder people using standard methods adopted by Jain (1991) and Jain and Goel (1995). Out of 19, 10 were male and 9 female respondents under the age group of 35 to 70 years. The information about plants and their local names, parts of plant used for preparation of drug and mode of administration were documented in the field survey and it was confirmed by cross-checking with respondents and also with the already existing literature.

The collected plant species were identified with help of The Flora of Presidency of Madras (Gamble and Fischer, 1915-1936) and confirmed by comparing authentic specimens in Madras Herbarium (MH) at Botanical Survey of India, Southern circle, Coimbatore and through recent floras and taxonomic revisions. The voucher specimens were deposited at the Department of Botany, Kongunadu Arts and Science College, Coimbatore, Tamil Nadu.

3. RESULTS AND DISCUSSION

The present study revealed the use of 53 species of plants distributed in 50 genera belonging to 32 families which were commonly used by Irula tribal healers of Palamalai hills, southern Western Ghats of Coimbatore district, Tamil Nadu for the treatment of 35 types of ailments. The prominent family was Fabaceae with 6 species, followed by Euphorbiaceae with 4 species, Caesalpiniaceae and Verbenaceae with 3 species each, Acanthaceae, Apocynaceae, Asclepiadaceae, Asteraceae, Lamiaceae, Malvaceae, Poaceae and Rutaceae, Solanaceae contributed with 2 species each and Aizoaceae, Amaranthaceae, Anacardiaceae, Aristolochiaceae, Boraginaceae, Caricaceae, Cleomaceae, Convolvulaceae, Cucurbitaceae, Liliaceae, Meliaceae, Mimosaceae, Myrtaceae, Papaveraceae, Piperaceae, Rhamnaceae, Sapindaceae, Vitaceae and Zygophyllaceae contributed with 1 species each. All the reported species were arranged alphabetically and provided the botanical name of the plant, family, specimen number, local (Tamil) name, life form, part (s) used, ailments treated and mode of administration (Table 1).

Herbs were the primary source of medicine (40%) followed by trees (28%), shrubs (15%) and climbers (17%) (Fig. 2). The frequent use of among the indigenous communities is a result of wealth of herbaceous plants in their environs (Tabuti *et al.*, 2003; Uniyal *et al.*, 2006; Giday *et al.*, 2010) and a Yercaud hills harbours more number herbs as compared to trees, shrubs and climbers (Parthipan *et al.*, 2011). Among the different parts used, the leaves (56%) were most frequently used for the preparation of medicine solely or in combination with other parts. It was followed by bark and whole plant (7% each), roots (6%), fruit and seeds (5% each), stem, flowers and latex (4% each) and bulb (2%) (Fig. 3). Many indigenous communities throughout the world also utilized mostly leaves for the preparation of herbal medicines (Teklehaymanot *et al.*, 2007; Cakilcioglu and Turkoglu, 2010; Gonzalez *et al.*, 2010). The reason why leaves were used mostly is that they are collected very easily than underground parts, flowers, fruits, etc. (Giday *et al.*, 2009).

The preparation and utilization of plant parts were grouped in to five categories (Fig. 4). Of these, most commonly used method preparation was decoction (42%) followed by paste (36%) juice (12%), powder (7%) and raw (3%).

Table 1. List of medicinal plant species used for their health care by Irula tribals of Palamalai hills, Western Ghats of Coimbatore district, Tamil Nadu.

S. No.	Binomial Name	Local name	Family	Parts used	Medicinal uses	Mode of administration
1	Trees					
	<i>Aegle marmelos</i> (Linn.) Corr.	Vilvam	Rutaceae	Leaf	Dyspepsia	Decoction
2	<i>Albizia amara</i> (Roxb.) B. Boivin.	Arapu	Mimosaceae	Flower and seeds	Piles	Paste
					Diarrhea	Decoction
3	<i>Azadirachta indica</i> A. Juss.	Vembu	Meliaceae	Bark	Stomach worms	Decoction
4	<i>Carica papaya</i> L.	Pappali	Caricaceae	Latex	Scorpion sting	Paste
					Snake bites	Paste
5	<i>Emblica officinalis</i> Gaertn.	Nellikai	Euphorbiaceae	Fruit	Cold and cough	Decoction
6	<i>Mangifera indica</i> L.	Maamaram	Anacardiaceae	Leaf	Cracks	Paste
7	<i>Pongamia pinnata</i> (Linn.) Pierre.	Pungamaram	Fabaceae	Leaf	Ulcers	Decoction
					Diabetes	Decoction
8	<i>Psidium guajava</i> L.	Koiya	Myrtaceae	Leaf	Dysentery	Juice
9	<i>Pterocarpus marsupium</i> Roxb.	Vengai	Fabaceae	Bark	Dysentery	Decoction
10	<i>Tamarindus indica</i> L.	Puliyamaram	Caesalpiniaceae	Fruit	Digestive	Raw
11	<i>Tectona grandis</i> Linn. f.	Tekumaram	Verbenaceae	Leaf	Skin diseases	Paste
					Ulcers	Decoction
12	<i>Vitex negundo</i> L.	Notchi	Verbenaceae	Flowers	Diarrhea	Decoction
					Cardiac disorders	Decoction
13	<i>Wrightia arborea</i> Mabberley.	Karupaalai	Apocynaceae	Bark	Kidney stones	Powder
14	<i>Wrightia tinctoria</i> (Roxb.) R. Br.	Veppalai	Apocynaceae	Leaf	Headache	Paste
15	<i>Ziziphus mauritiana</i> L.	Ilanthai	Rhamnaceae	Leaf	Wound healing	Paste
16	Shrub	Pirammathandu	Papaveraceae	Seed	Cracks at foot	Powder
	<i>Argemone mexicana</i> L.					
17	<i>Calotropis gigantea</i> (Linn.) R. Br.	Erukku	Asclepiadaceae	Latex	Wound healing	Paste
18	<i>Cassia auriculata</i> L.	Avarai	Caesalpiniaceae	Leaf	Scabies	Paste
					Bone fractures	Paste
19	<i>Cassia tora</i> L.	Tagarai	Caesalpiniaceae	Leaf	Leprosy	Decoction
					Ulcers	Decoction
20	<i>Indigofera tinctoria</i> L.	Averi	Fabaceae	Root	Snake bites	Decoction
21	<i>Jatropha curcas</i> L.	Kattu amanaku	Euphorbiaceae	Stem	Digestion	Juice
22	<i>Lablab purpureus</i> (Linn.) Sweet.	Avarai	Fabaceae	Leaf	Ring worm	Paste
23	<i>Lantana camara</i> L.	Unnichi	Verbenaceae	Leaf	Cuts and wounds	Paste
24	Herbs	Thuthi	Malvaceae	Root	Fever	Decoction
	<i>Abutilon indicum</i> (Linn.) Sweet.					

25	<i>Achyranthes aspera</i> L.	Naayuruvi	Amaranthaceae	Leaf	Dog bite	Paste
26	<i>Allium cepa</i> L.	Vengayam	Liliaceae	Bulb	Boils	Paste
27	<i>Andrographis echiioides</i> (Linn.) Nees.	Gopuram thangi	Acanthaceae	Leaf	Fever	Juice
28	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees.	Nilavembu	Acanthaceae	Bark	Fever	Decoction
					Skin diseases	Paste
					Snake bite	Paste
29	<i>Bambusa arundinacea</i> (Retz.) Roxb.	Mungil	Poaceae	Leaf	Wound healing	Paste
30	<i>Cleome gynandra</i> L.	Veli Keerai	Cleomaceae	Leaf	Ear ache	Juice
31	<i>Cynodon dactylon</i> Dress.	Arugampull	Poaceae	Whole plant	Eye disorder	Juice
32	<i>Datura metel</i> L.	Oomethai	Solanaceae	Leaf	Respiratory troubles	Juice
33	<i>Eclipta prostrata</i> L.	Karasilaganni	Asteraceae	Leaf	Black hair	Paste
					Skin diseases	Paste
					Wound healing	Paste
34	<i>Euphorbia hirta</i> L.	Amman pacharisi	Euphorbiaceae	Leaf	Dysentery	Decoction
35	<i>Evolvulus alsinoides</i> L.	Vishnukranthi	Convolvulaceae	Leaf	Wound healing	Paste
36	<i>Mollugo nudicaulis</i> L.	Parpadakam	Aizoaceae	Leaf	Boils	Paste
37	<i>Leucas aspera</i> L.	Tumbai	Lamiaceae	Leaf	Bronchitis	Decoction
38	<i>Ocimum americanum</i> L.	Nai thulasi	Lamiaceae	Leaf	Cold	Decoction
39	<i>Phyllanthus amarus</i> Schum. and Thonn.	Kila nelli	Euphorbiaceae	Leaf	Jaundice	Juice
40	<i>Sida cordifolia</i> L.	Nilathuthi	Malvaceae	Leaf	Ear ache	Juice
41	<i>Solanum nigrum</i> L.	Manathakkali	Solanaceae	Leaf	Mouth sores	Raw
42	<i>Tribulus terrestris</i> L.	Nerunjimul	Zygophyllaceae	Fruit	Cough	Juice
43	<i>Trichodesma indicum</i> L.	Kavil thumbai	Boraginaceae	Leaf	Diarrhea	Decoction
					Dysentery	Decoction
44	<i>Tridax procumbens</i> L.	Kinathupoondur	Asteraceae	Leaf	Wound healing	Paste
45	Climbers					
	<i>Abrus precatorius</i> L.	Kundumani	Fabaceae	Root	Cough	Decoction
46	<i>Aristolochia bracteolata</i> Lam.	Aaduthinnappalai	Aristolochiaceae	Whole plant	Skin diseases	Decoction
					Snake bites	Decoction
47	<i>Cardiospermum halicacabum</i> Linn.	Mudakkathan	Sapindaceae	Whole plant	Swellings	Paste
					Joints pains	Paste
48	<i>Cissus quadrangularis</i> L.	Perandai	Vitaceae	Stem	Stomachache	Decoction
49	<i>Clitoria ternatea</i> L.	Thuthi	Fabaceae	Whole plant	Fever	Decoction
50	<i>Coccinia indica</i> Wight and Arn.	Kovaikai	Cucurbitaceae	Leaf	Diabetes	Powder
51	<i>Pergularia daemia</i> (Forsk.) Chiov.	Veliparuthi	Asclepiadaceae	Leaf	Cold	Decoction
					Fever	Decoction
52	<i>Piper nigrum</i> L.	Kurumilagu	Piperaceae	Seed	Cough	Powder
					Throat infection	Powder
53	<i>Toddalia asiatica</i> L.	Kindu mullu	Rutaceae	Leaf	Stomachache	Decoction

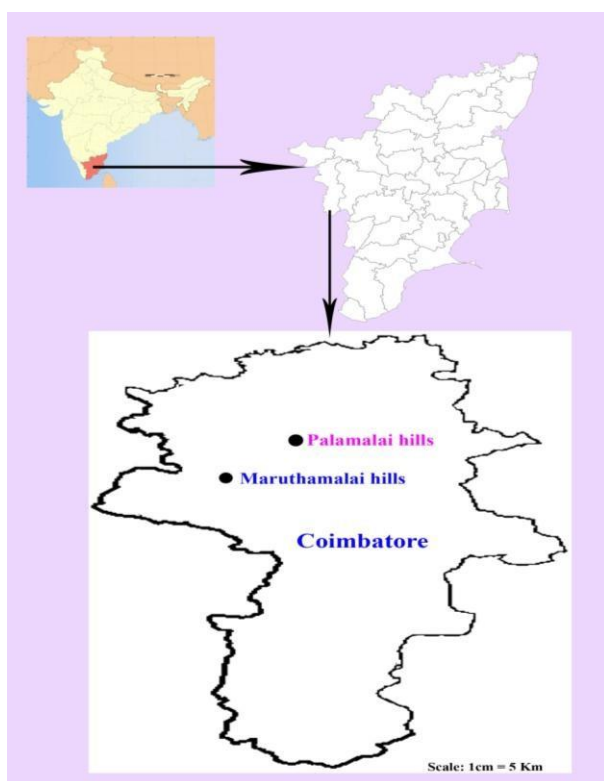


Fig. 1. Location of the study area of Palamalai hills.

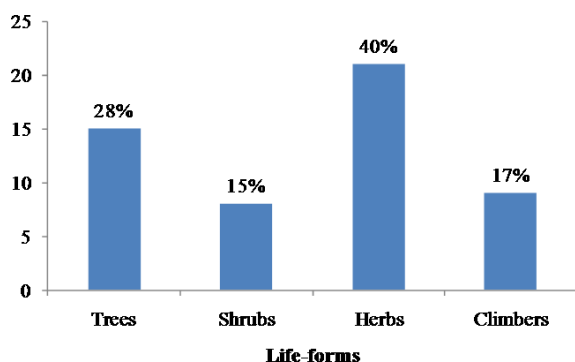


Fig. 2. Per-cent life-forms of medicinal plants used by Irulas in Palamalai hills.

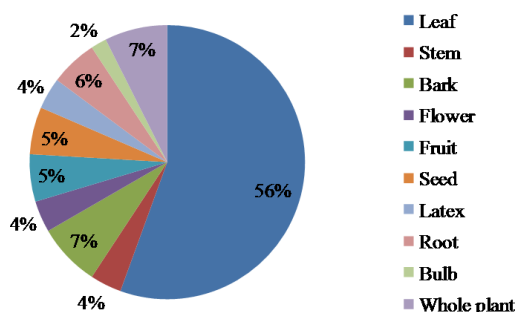


Fig. 3. Per-cent plant parts used for medicine preparation.

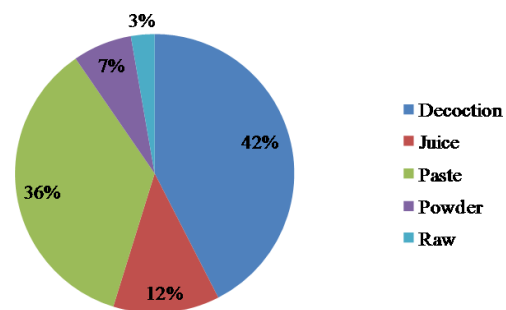


Fig. 4. Per-cent form of medicine preparation by Irula tribe.

Preparation of paste for the treatment of ailments is a common practice among the tribal communities in the world (Giday *et al.*, 2007; Roosita *et al.*, 2008; Giday *et al.*, 2010). The paste was prepared by grinding the fresh or dried plant parts with oil or water. The powder was prepared by grinding of shade dried plant parts. The decoction was obtained by boiling the plant parts in water until the volume of the water reduced to minimum or required amount. The inhalation was done by the burning of plant parts and inhaled the smoke through nose or mouth (Roosita *et al.*, 2008).

The ethnomedicinal studies evidently pointed out that, instead of trying to identify the active compounds and pharmacological actions of plants through massive collection of plants from natural sources, it is better to start investigating the efficacy of the plant based on their use in folk medicine, since most of the commercially proven drugs used in modern medicine were initially tried in crude form in traditional of folk healing practices (Fabricant and Fransworth, 2001).

4. CONCLUSION

All the enumerated plant species are very commonly used for various ailments by the Irula tribes of Palaalai hills, southern Western Ghats of Coimbatore district, Tamil Nadu. A few interesting observations made in the present study are: the use of *Coccinia indica* and *Pongamia pinnata* for diabetes, *Vitex negundo* for cardiac disorders, *Carica papaya* and *Indigofera tinctoria* for poisonous snake bites, *Cardiospermum halicacabum* for joints pains, *Cassia auriculata* for scabies and bone fractures. Although traditional medication is still practiced in this area, it is now fast disappearing due to modern life style. Hence, proper documentation and preservation of traditional skills and technology of medicinal plants is a vital necessity. Further investigations on

pharmacological importance of these plants and their diversity may add new knowledge to the traditional medical and cultural systems.

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