



Ethnobotanical Survey of Medicinal Plants Used by *Malayali* Tribes in Yercaud Hills of Eastern Ghats, India

Senthilkumar K., Aravindhan V., Rajendran A.*

Department of Botany, School of Life Sciences, Bharathiar University, Coimbatore – 641 046 Tamil Nadu, India

Abstract

Medicinal plants have played an important role in treating and preventing a variety of diseases throughout the world. India is one of the most medico-culturally diverse countries in the world where the medicinal plant sector is part of a time honoured tradition that is respected even today. The present study was initiated with an aim to identify traditional healers who are practicing herbal medicine among the *Malayali* tribes in Yercaud hills of Eastern Ghats, India and to document their indigenous knowledge on the utilization of medicinal plants particularly most common ethnomedicinal plants. The ethnobotanical information was collected through interviews among local traditional healers in the study area. A total of 90 species of plants distributed in 80 genera belonging to 44 families were identified as commonly used ethnomedicinal plants in the study. As a result, the present study revealed that the information documented regarding the therapeutic uses will provide basic data for further studies mainly focused on conservation, cultivation and economic welfare of the tribal population.

Keywords: Herbal medicine, Ethnobotany, *Malayali* tribes, Yercaud Hills, Tamil Nadu

1. Introduction

Human beings from the very beginning of its appearance on this earth has been indispensably associated with the plant kingdom for its survival [1]. They are important source of therapeutic drugs and play a significant role in the survival of the tribal and ethnic communities. The tribal people are the ecosystem people who live in harmony with the nature and maintain a close link between man and environment.

The World Health Organization (WHO) estimates that some 80% of the developing world relies on the traditional medicines and in which 85% use plants or their extracts as active substances as plant drugs for their primary healthcare needs [2, 3]. In the developed

countries, 25% of the medical drugs are based on plants and their derivatives [4] and the use of medicinal plants is well known among the indigenous people in rural areas. The practice of using plants in medicine is still prevailing not only among the tribal groups, but also others living in the rural areas.

India is one of the most medico-culturally diverse countries in the world where the medicinal plant sector is part of a time honoured tradition that is respected even today. The country possesses an ancient system of healthcare based chiefly medicinal plants of diverse nature, ranging from higher plants to microorganisms from which more than 80% of therapeutic products are derived have been used for 6000–7000 years [5]. The knowledge of medicinal plants has been accumulated in

*Corresponding author:

E-mail: arajendran222@yahoo.com

the course of many centuries based on different medical systems such as Ayurveda, Unani and Siddha [6].

The indigenous people nurture rich knowledge about medicinal plants developed over generations by bold experimentation through trial and error methods [7]. This treasure of knowledge has been passed orally without any written documents and is still retained by them [8]. In the last few years, there has been an exponential growth in the field of herbal or traditional medicine and these drugs are gaining popularity because of their natural origin and exhibit remarkable efficacy in the treatment of various ailments [9]. A vast knowledge of how to use the plants against different illness may be expected to have accumulated in areas where the use of plant is still of great importance [10].

Ethno-medicinal studies are a suitable source of information regarding useful medicinal plants that can be targeted for domestication and management [11]. These studies assume great importance in enhancing our traditional skills and technology about the plant grown and used for native or tribal communities for their sustenance. The use of ethnobotanical information in medicinal plant research has gained considerable attention in segment of the scientific community [12]. Also, traditional medicine and ethno-botanical information play an important role in scientific research, particularly when the literature and field work data have been properly evaluated [13].

In the recent years, number of reports on the use of plants in traditional healing by either tribal people or indigenous communities of India particularly Eastern Ghats of Tamil Nadu is increasing [14–33].

A few reports on ethnomedicinal uses of plants in the forests of Yercaud hills and its adjoining areas were available [34–36]. All these studies were conducted to document the information on traditional and cultural practices of the varied people residing in and around the study region, but there is no such comprehensive study on this region particularly for *Malayali* tribes and also hills as whole. Therefore, the present study was aimed to identify knowledgeable resource persons among the *Malayali* tribes in Yercaud hills of Eastern Ghats in Tamil Nadu, India and to document their indigenous ethnomedicinal knowledge on the utilization of commonly used medicinal plants.

2. Methodology

2.1 Study Area and People

The present study was conducted in the Shevaroy hills range located near Yercaud of Salem district in Tamil Nadu (Fig. 1). The total extends of Yercaud taluk (Sub-district) is 382.67 km. including reserve forest. The National Orchidarium and Botanical Garden is situated in Yercaud, it is maintained by Southern Circle of Botanical Survey of India. The area lies between 11° 48' N latitude and 78° 11' E latitude at an altitude ranging from 1200 -1500 m. The maximum temperature ranges between 25°C and 30°C and minimum between 13°C and 16°C. The average annual rainfall is around 1750 mm. The highest peak of the hills is 1700 m.

The native tribal people of Shervaroy hills are called *Malayali* (lit. Malai = hill; alu = person). They are one of the 36 scheduled tribes of Tamil Nadu and the population of *Malayali* tribe forms around 54% of the total scheduled tribes population in Tamil Nadu [19]. The *Malayali* tribes are also spread along the adjacent hill ranges of Javathu, Kolli, Yercaud and Pachamalai. In fact, there are several neighbouring habitations in these hill ranges, which are prominently inhabited by the *Malayali*. They are tamil speaking hill tribes and all are basically depend on agricultural and forest resources for their survival [37]. Most of the *Malayali* tribes have a great knowledge of medicinal plants that are used for

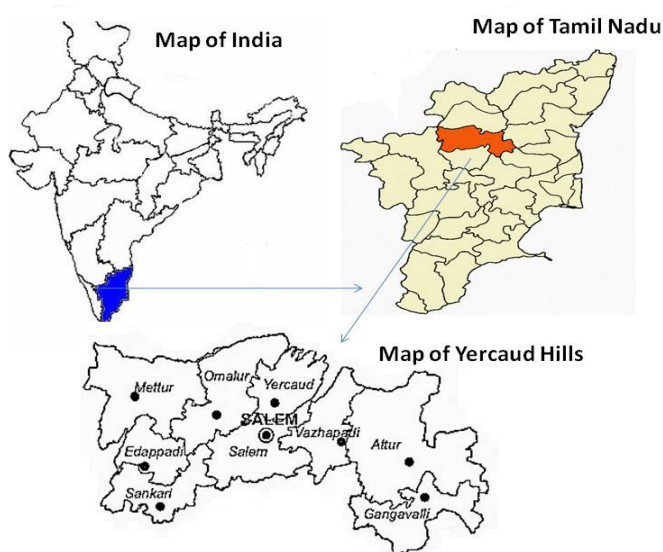


Fig. 1. Location of Yercaud Hills in Tamil Nadu, India

first aid remedies to treat cough, cold, fever, headache, poisonous bites and some other ailments [29].

2.2 Data Collection

During the period of study (July, 2011–February, 2012), frequent field surveys were conducted throughout the hills at different seasons so as to get more information on the utility of the plant species from the tribes. The information was gathered through questionnaires, personal interviews and discussions among them. The interview was conducted with the people who are having the sound knowledge on medicinal plants found in their area and used by their families and neighbours in their local language (Tamil). The questionnaire contains the details of the plants, parts used, medicinal uses and mode of preparation of remedies. The ethnobotanical data were collected according to the methodology suggested [38 – 40].

In the study, 27 knowledgeable elders (17 men and 10 women between the ages of 35 to 70) chosen with the assistance of local administrators and community leaders served as key informants. Each informant was visited three times in order to verify the reliability of the data obtained. If what was said during the first visit concerning the use of particular medicinal plants by any informant did not agree with what was told during the further visits, the information was considered unreliable and had to be discarded. During the course of the study, for each medicinal plant, the proportion of informants who independently reported are against a particular disease category was assessed.

The medicinal plants were also collected during the field survey, identified, and photographed. The collected plant materials was assigned field book number and the field characters such as habit, habitat, colour and odour of flowers, period of flowering and fruiting, occurrence and other relevant ecological features were also observed and are noted in the field book. All the collected plant species were dried and the herbarium specimens were prepared by using standard methods as suggested by [41].

The taxonomic identification of the plant specimens were done with the help of local and regional floras such as *Flora of Presidency of Madras* [42], *Flora of Tamilnadu Carnatic* [43], *Flora of Tamil Nadu* [44, 45]

and *An excursion flora of Central Tamil Nadu, India* [46]. Further, their identities were confirmed by referring authentic specimens in the Madras Herbarium (MH) at Botanical survey of India, Southern Circle, Coimbatore, and Tamil Nadu. The voucher specimens were deposited in the Herbarium of Department of Botany, Bharathiar University, Coimbatore, Tamil Nadu for future reference.

2.3 Ailment Categories

Based on the information obtained from the traditional healers in the study area, all the ailments were grouped into 15 categories. They are *viz.* Gastro-Intestinal Ailments (GIA), Dermatological Infections/ Diseases (DID), Respiratory Systems Diseases (RSD), Genito-Urinary Ailments (GUA), Fever (Fvr), Skeleto-Muscular System Disorders (SMSD), Poisonous Bites (PB), Circulatory System/Cardio-vascular Diseases (CSCD), Endocrinal Disorders (ED), Dental Care (DC), Hair Care (HC), Ear, Nose, Throat problems (ENT), Cooling Agents (CA), Liver Problems (LP) and General Health (GH), Table 1.

3. Results and Discussion

3.1 Documentation of Ethnomedicinal Knowledge

The present study revealed the use of 90 species of plants distributed in 80 genera belonging to 44 families which were commonly used by *Malayali* traditional healers for the treatment of 38 types of ailments. The prominent family was Fabaceae with six species, followed by Asteraceae and Asclepiadaceae with five species each and Moraceae and Euphorbiaceae with four 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, method of preparation and mode of administration (Table-2).

The medicinal uses of plants gathered in the study were compared with the previously published information from Yercaud hills and also from Eastern Ghats of Tamil Nadu. The study found that there were 17 claims from the plants such as *Achyranthes aspera*, *Andrographis echinoides*, *Artocarpus heterophyllus*, *Bambusa arundinacea*, *Cardiospermum halicacabum*, *Corallocarpus*

epigaeus, *Crotalaria retusa*, *Evolvulus alsinoides*, *Ficus religiosa*, *Helecteres isora*, *Leucas indica*, *Melia dubia*, *Pongamia pinnata*, *Syzygium cumini*, *Tamarindus indica* and *Tarenna asitica* were reported for the first time from the study area (new claims were given with asterisk mark in Table 2).

3.2 Life Form and Parts Used

Herbs were the primary source of medicine (40%) followed by trees (23%), shrubs (20%) and climbers (17%) (Fig. 2). The frequent use of among the indigenous communities is a result of wealth of herbaceous plants in their environs [47–49] and a Yercaud hills harbours more number herbs as compared to trees, shrubs and climbers [36]. Among the different parts used, the leaves (48%) were most frequently used for the preparation of medicine solely or in combination with other parts. It was followed by fruit (11%), stem bark (9%), rhizome (7%), flowers (6%), roots (6%), latex (4%), seeds (3%), stem (3%) and whole plant (3%) (Fig. 3). Many indigenous communities throughout the world also utilized mostly leaves for the preparation of herbal medicines [50–52].

The reason why leaves were used mostly is that they are collected very easily than underground parts, flowers, fruits, etc. [53].

3.3 Method of Preparation and Mode of Administration of Plants

The preparation and utilization of plant parts were grouped in to five categories (Fig. 4). Of these, most commonly used method preparation was paste (36%) followed by juice (24%), decoction (17%), raw parts (15%) and powder (8%). Preparation of paste for the treatment of ailments is a common practice among the tribal communities in the world [49, 53–55]. 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 [56].

Internal uses (62%) were predominance over external or topical uses (34%) and nasal application

Table 1: Ailments groped by different categories in the study

Sl. No.	Ailments categories	Biomedical terms	No. of plants used
1.	Gastro-Intestinal Ailments (GIA)	Dysentery, Gastric complaints, Indigestion, Intestinal ulcer and Stomachache	18
2.	Dermatological Infections/ Diseases (DID)	Cuts, Burns, inflammations, Skin irritation, Wound in lip and Wounds	21
3.	Respiratory Systems Diseases (RSD)	Asthma, Cold and Cough	3
4.	Genito-Urinary Ailments (GUA)	Abortion, Venereal diseases, Kidney disorders and Menstrual problems	8
5.	Fever (Fvr)	Fever	2
6.	Skeleto-Muscular System Disorders (SMSD)	Body pain, Headache, Migraine, Joint pain, Rheumatism and Swellings	14
7.	Poisonous Bites (PB)	Poison bites, Scorpion sting and Snake bite	10
8.	Circulatory system/cardio-vascular diseases (CSCD)	Heart strength and Memory powder	2
9.	Endocrinal Disorders (ED)	Diabetes	3
10.	Dental Care (DC)	Toothache	3
11.	Hair Care (HC)	Greying of hair, Hair growth and Hair loss	3
12.	Ear, Nose, Throat problems (ENT)	Ear ache, Eye pain / infections and Throat pain	7
13.	Cooling Agents (CA)	Body cooling	3
14.	Liver Problems (LP)	Jaundice	1
15.	General Health (GH)	Body refreshment, Body strength and Disease resistant	3

Table 2: List of commonly used medicinal plants by Malayali tribes in Yercaud hills, India

Botanical name, (Family), Voucher specimen number	Local name	Life form	Part (s) used	Ailment treated	Preparation	Application
<i>Abrus precatorius</i> L. (Fabaceae) SEN – 114	Kundumani	Climber	Seeds	Abortion	Powder	Oral
<i>Acacia pennata</i> (L.) Willd. (Mimosaceae) SEN – 182	Kattuchikai	Tree	Stem bark	Diarrhoea	Decoction	Oral
<i>Achras zapota</i> (L.) P. Royen. (Sapotaceae) SEN – 170	Sappoda	Tree	Fruit	Stomach pain	Raw	Oral
<i>Achyranthes aspera</i> L. (Amaranthaceae) SEN – 198 *	Nayuruvi	Shrub	Root	Tooth ache	Paste	Oral
<i>Acorus calamus</i> L. (Araceae) SEN – 202	Vasambu	Herb	Rhizome	Stomach problems	Decoction	Oral
<i>Aerva lanata</i> (L.) Juss. (Amaranthaceae) SEN – 135	Pooli poo	Herb	Flowers	Menstrual problems	Decoction	Oral
<i>Ageratum conyzoides</i> Mill. (Asteraceae) SEN – 183	Naththa poondu	Herb	Whole plant	Inflammation	Paste	Topical
<i>Albizia amara</i> (Roxb.) Boivin. (Mimosaceae) SEN – 185	Unja maram	Tree	Stem bark	Inflammation	Paste	Oral
<i>Allium cepa</i> L. (Liliaceae) SEN – 198	Vengayam	Herb	Tuber	Body swelling	Paste	Topical
<i>Andrographis echinoides</i> (L.) Nees in Wall. (Acanthaceae) SEN – 106 *	Goburamthanki	Herb	Leaves	Tooth pain	Paste	Oral
<i>Andrographis paniculata</i> (Burm.f.) Wall. (Acanthaceae) SEN – 205	Nagamalli	Herb	Roots	Snake bite	Powder	Oral
<i>Aristolochia bracteolata</i> Lam. (Aristolochiaceae) SEN – 193	Adu thenna palli	Climber	Leaves	Scorpion bite	Paste	Topical
<i>Artocarpus heterophyllus</i> Lam. (Moraceae) SEN – 110 *	Palamaram	Tree	Latex	Animal bite	Raw	Topical
<i>Asclepias curassavica</i> L. (Asclepiadaceae) SEN – 154	–	Herb	Latex	Inflammation	Raw	Oral
<i>Asparagus racemosus</i> L. (Liliaceae) SEN – 105	Thanneervittan kilangu	Climber	Tuber	Snake bite	Paste	Topical
<i>Azadirachta indica</i> A. Juss. (Meliaceae) SEN – 169	Vepamaram	Tree	Leaves	Skin diseases	Paste	Oral
<i>Begonia malabarica</i> Lam. (Begoniaceae) SEN – 125	Sengurunthu	Shrub	Stem	Wounds	Juice	Topical

(Continued)

Table 2: (Continued)

Botanical name, (Family), Voucher specimen number	Local name	Life form	Part (s) used	Ailment treated	Preparation	Application
<i>Bambusa arundinacea</i> (Retz.) Roxb. (Bambusaceae) SEN – 203 *	Mungle	Shrub	Stem	Indigestion	Raw	Oral
<i>Blepharis maderaspatensis</i> (L.) Heyne (Acanthaceae) SEN – 127	Nalalai mantheri	Herb	Leaves	Cuts and wounds	Juice	Topical
<i>Cajanus cajan</i> (L.) Mill. (Fabaceae) SEN – 149	Tuvarai	Shrub	Leaves	Scorpion bite	Paste	Topical
<i>Calotropis gigantea</i> (L.) R. Br. (Asclepiadaceae) SEN – 194	Erukku	Shrub	Leaves	Swellings	Paste	Topical/oral
<i>Calotropis procera</i> (Ait.) R. Br. (Asclepiadaceae) SEN – 199	Vellarukku	Shrub	Latex	Scorpion bite	Raw	Topical
<i>Canthium parviflorum</i> Lam. (Rubiaceae) SEN – 134	Karakai	Shrub	Leaves	Rheumatism	Paste	Topical
<i>Cardiospermum halicacabum</i> L. (Sapindaceae) SEN – 159 *	Mudakkuthan	Climber	Leaves, roots	Head ache	Decoction	Oral
<i>Carica papaya</i> L. (Caricaceae) SEN – 165	Pappali	Shrub	Latex, Fruits	Swellings	Paste/raw	Oral
<i>Cassia fistula</i> L. (Fabaceae) SEN – 141	Konnai	Tree	Leaves, Bark	Snake bite	Paste	Topical
<i>Cassia occidentalis</i> L. (Fabaceae) SEN – 113	Satty thuvurai	Shrub	Leaves	Skin diseases	Paste	Oral
<i>Centella asiatica</i> (L.) Urban (Apiaceae) SEN – 120	Vallarai	Herb	Leaves	Induce memory	Raw	Oral
<i>Cissus quadrangularis</i> L. (Vitaceae) SEN – 181	Pirandai	Climber	Stem	Bone fracture	Paste	Oral
<i>Citrus medica</i> L. (Rutaceae) SEN – 161	Elumitchi	Shrub	Fruit	Thumb swellings	Juice	Oral
<i>Cleome monophylla</i> L. (Cleomaceae) SEN – 123	–	Herb	Leaves	Earache	Juice	Oral
<i>Cleome pentaphylla</i> L. (Cleomaceae) SEN – 157	Nallavelai	Herb	Leaves	Earache	Juice	Oral
<i>Coccinia grandis</i> L. (Cucurbitaceae) SEN – 108	Kovakkai	Climber	Leaves, Fruit	Diabetes	Juice/raw	Oral
<i>Cocculus hirsutus</i> (L.) Diels (Menispermaceae) SEN – 117	Kattu kodi	Climber	Leaves	Stomach pain	Paste	Topical
<i>Colocasia esculenta</i> (L.) Schott. (Araceae) SEN – 204	Sembu	Herb	Leaves, Tuber	Reduce body heat	Raw	Oral

Table 2: (Continued)

<i>Corallocarpus epigeaus</i> (Rottl. & Willd.) Clarke (Cucurbitaceae) SEN – 177 *	Agasagarudan	Climber	Leaves	Body swellings	Paste	Oral
<i>Crotalaria retusa</i> L. (Fabaceae) SEN – 143 *	Kelukelupan	Shrub	Seed	Promote health	Powder	Oral
<i>Curcuma longa</i> L. (Zingiberaceae) SEN – 180	Manjal	Herb	Rhizome	Insects bite	Powder	Topical
<i>Gynodon dactylon</i> (L.) Pres. (Poaceae) SEN – 201	Aruvan pullu	Herb	Whole plant	Kidney disorder	Juice	Oral
<i>Eclipta prostrata</i> (L.) Mant. (Asteraceae) SEN – 178	–	Herb	Leaves	Hair tonic	Paste	Oral
<i>Enicostema littorale</i> (Lam.) Raynal (Gentianaceae) SEN – 202	Vellaruku	Herb	Leaves	Headache	Paste	Topical
<i>Evolvulus alsinoides</i> L. (Convolvulaceae) SEN – 107 *	Vishnukiranthi	Herb	Leaves	Induce memory	Juice	Oral
<i>Ficus hispida</i> L. (Moraceae) SEN – 144	–	Tree	Stem bark	Jaundice, inflammations	Paste	Oral
<i>Ficus microcarpa</i> L. (Moraceae) SEN – 153	Echi	Tree	Leaves	Stomach problem	Decoction	Oral
<i>Ficus racemosa</i> L. (Moraceae) SEN – 168	Aththi maram	Tree	Root, Fruits	Cooling agent	Juice	Topical
<i>Ficus religiosa</i> L. (Moraceae) SEN – 184 *	Arasamaram	Tree	Stem bark	Bone fracture	Paste	Topical
<i>Gloriosa superba</i> L. (Liliaceae) SEN – 196	Kannuvali sedit	Herb	Flower	Eye infection	Juice	Oral
<i>Gymnema sylvestre</i> (Retz) R. Br. (Asclepiadaceae) SEN – 200	Sirukurinchan	Climber	Leaves	Diabetes	Decoction	Oral
<i>Helecteres isora</i> L. (Sterculiaceae) SEN – 158 *	Yelumotty	Shrub	Leaves	Cuts and wounds	Juice	Oral
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) SEN – 160	Semparruthi	Shrub	Flower	Hair tonic	Powder	Oral
<i>Jasminum grandiflorum</i> L. (Oleaceae) SEN – 112	Kattu malli	Climber	Flower	Skin disease	Paste	Topical
<i>Jatropha villosa</i> Wight (Euphorbiaceae) SEN – 196	Pai cottai	Shrub	Bark	Earache	Juice	Oral
<i>Lagenaria siceraria</i> (Mol.) Stan. (Cucurbitaceae) SEN – 166	Sorakkai	Climber	Fruit	Ulcer, indigestion	Juice	Oral
<i>Lantana camara</i> L. (Verbenaceae) SEN – 207	Unnimullu	Shrub	Leaves	Cuts and wounds	Juice	Topical
<i>Lawsonia inermis</i> L. (Lythraceae) SEN – 162	Maruthondri	Shrub	Leaves	Hair tonic	Juice	Oral
<i>Leucas aspera</i> (Willd.) Link. (Lamiaceae) SEN – 147	Thumbai	Herb	Leaves	Fever, stomachache	Decoction	Oral
<i>Leucas indica</i> (L.) R. Br. (Lamiaceae) SEN – 139 *	Kutta thumbai	Herb	Leaves	Migraine	Juice	Topical

(Continued)

Table 1: (Continued)

Botanical name, (Family), Voucher specimen number	Local name	Life form	Part (s) used	Ailment treated	Preparation	Application
<i>Mangifera indica</i> L. (Anacardiaceae) SEN – 172	Mamaram	Tree	Stem bark	Menstrual disorder	Decoction	Oral
<i>Melia dubia</i> Cav. (Meliaceae) SEN – 146 *	Seruthaviti	Tree	Bark	Promote health	Decoction	Oral
<i>Mimosa pudica</i> L. (Mimosaceae) SEN – 192	Thottal Surungi	Herb	Leaves	Cuts and wounds	Juice	Oral
<i>Moringa oleifera</i> Lam. (Moringaceae) SEN – 175	Murungai	Tree	Leaves	Stomach problem	Juice	Oral
<i>Musa paradisiaca</i> L. (Musaceae) SEN – 179	Vazhli	Herb	Rhizome	Kidney disorder	Raw	Oral
<i>Ocimum basilicum</i> L. (Lamiaceae) SEN – 200	Tirunitrupatchi	Herb	Leaves	Fever, cough, cold	Raw	Oral
<i>Pergularia daemia</i> (Forssk.) Chiov. (Asclepiadaceae) SEN – 104	Veli paruthi	Climber	Leaves	Stomach ulcer	Decoction	Oral
<i>Phyllanthus madraspatensis</i> L. (Euphorbiaceae) SEN – 119	Melaa nelli	Herb	Leaves	Menstrual problem	Decoction	Oral
<i>Physalis minima</i> L. (Solanaceae) SEN – 129	Putter thalai	Herb	Leaves	Asthma	Decoction	Oral
<i>Plumbago zeylanica</i> L. (Plumbaginaceae) SEN – 126	Kodivelli	Herb	Flower	Headache	Paste	Topical
<i>Pongamia pinnata</i> (L.) Pierre. (Fabaceae) SEN – 174 *	Pongam	Tree	Bark	Ulcer problem	Decoction	Oral
<i>Psidium guajava</i> L. (Myrtaceae) SEN – 116	Koyya	Tree	Fruit, Leaves	Diabetes, earache	Raw/juice	Oral
<i>Pterocarpus marsupium</i> Roxb. (Fabaceae) SEN – 128	Vengai	Tree	Bark	Diabetes	Decoction	Oral
<i>Ricinus communis</i> L. (Euphorbiaceae) SEN – 145	Kotta muthu	Shrub	Seed	Skin disease	Raw	Topical
<i>Rubus niveus</i> Thunb. (Rosaceae) SEN – 190	-	Climber	Root	Cuts and wounds	Paste	Topical
<i>Ruta graveolens</i> L. (Rutaceae) SEN – 163	Aruvathan thalai	Herb	Leaves	Dysentery	Paste	Topical
<i>Scoparia dulcis</i> L. (Scophulariaceae) SEN – 197	Sarakkothini	Herb	Whole plant	Kidney disorder	Juice	Oral
<i>Sida acuta</i> Burm. (Malvaceae) SEN – 124	Salar	Herb	Leaves	Swellings	Paste	Topical
<i>Sida cordifolia</i> L. (Malvaceae) SEN – 152	Kuruthavidi	Shrub	Leaves	Cuts and wounds	Juice	Oral
<i>Solanum nigrum</i> L. (Solanaceae) SEN – 195	Kamanchi	Herb	Leaves, Fruits	Stomachache	Raw/paste	Oral
<i>Spermacoce hispita</i> L. (Rubiaceae) SEN – 186	-	Herb	Leaves	Cuts and wounds	Juice	Oral
<i>Synedrella nodiflora</i> (L.) Gaertn. (Asteraceae) SEN – 148	Gamali pondu	Herb	Leaves	Diarrhoea	Decoction	Oral
<i>Syzygium cumini</i> (L.) Skeels. (Myrtaceae) SEN – 191 *	Navalmaram	Tree	Bark	Stomach problem	Decoction	Oral

Table 2: (Continued)

<i>Tamarindus indica</i> L. (Caesalpiniaceae) SEN – 176 *	Puliaramam	Tree	Fruit, Leaves	Body pain	Paste	Topical
<i>Tarenna asiatica</i> (L.) Kutze (Rubiaceae) SEN – 133 *	Therani	Shrub	Leaves	Animal bite	Paste	Topical
<i>Terminalia bellerica</i> (Gaertn.) Roxb. (Combretaceae) SEN – 109	–	Tree	Fruits	Body swelling, wounds	Paste	Topical
<i>Terminalia chebula</i> Retz. (Combretaceae) SEN – 121	Kadukkai	Tree	Fruit	Asthma	Powder	Oral
<i>Todallia asiatica</i> (L.) Lam. (Rutaceae) SEN – 132	Mulakarandi	Climber	Leaves	Rheumatism	Paste	Topical
<i>Tragia involucrata</i> L. (Euphorbiaceae) SEN – 115	Kodikansala kai	Climber	Leaves	Cuts and wounds	Paste	Topical
<i>Tridax procumbens</i> L. (Asteraceae) SEN – 167	Thatha poo	Herb	Leaves	Cuts and wounds	Juice	Topical
<i>Vernonia cinerea</i> (L.) Less. (Asteraceae) SEN – 166	–	Herb	Leaves	Eye disease	Juice	Topical
<i>Vitex negundo</i> L. (Verbenaceae) SEN – 136	Nochchei	Shrub	Leaves	Headache	Raw	Inhalation
<i>Zingiber officinale</i> Roscos. (Zingiberaceae) SEN – 187	Ingi	Herb	Rhizome	Throat infection	Decoction	Oral

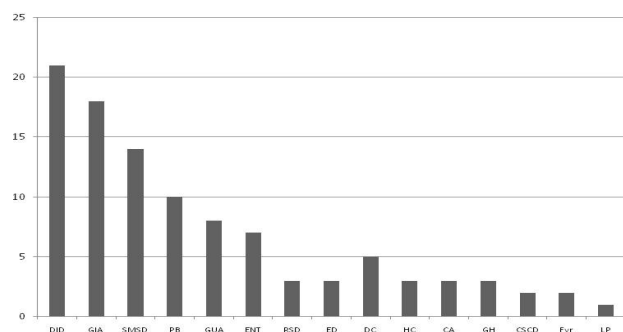


Fig. 2. Categories of ailments treated by Malayali tribes in the study

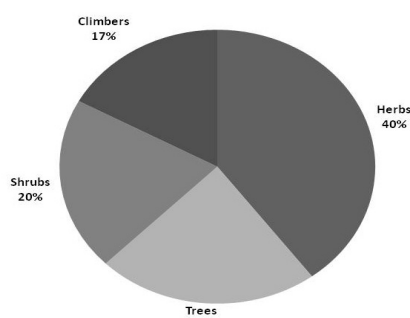


Fig. 3. Life form analysis of documented common medicinal plants

(4%). For topical use, the most important methods used were direct application of paste or with oil and mostly dealt with diseases like skin diseases, cuts and wounds, poison bites, rheumatism, body pain, swellings and headache. Most of the medicines were given orally which were also suggested by some other workers in the world [57, 58].

3.4 Ingredients Added

The medicinal preparations were made out of a single plant part or in combination of several plant parts. The present study revealed that both single mode (52 plants) and multiple modes (38 plants) of preparations were involved in the medicinal preparations. The *Malayali* traditional healers used more than one plant parts for the preparation of medicine in the treatment of single or multiple ailments. The frequent use of multiple plant remedies among the traditional healers could be attributed to the belief of synergic reactions where one plant could have a potentiating effect than other [49]. It is believed that the multiple prescriptions contain a

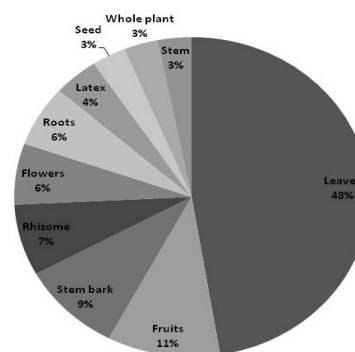


Fig. 4. Percentage of plant part used for the preparation of medicine

range of pharmacologically active compounds and poly-herbal treatment has more healing powder than single medicinal plant, since each medicinal plant used in the mixture is a remedy [50].

The *Malayali* traditional healers too frequently use some adjuvants such as honey, cow milk, butter milk, hot water and jiggery to improve the acceptability and medicinal property of certain remedies. The oils of castor, coconut, gingelly, mustard, neem and sesamum were commonly used for the preparation of paste or medicated oil (Table -3). The local healers were using specific plant parts and specific dosages for the treatment of diseases and the dose given to the patient depends on age, physical status and health conditions.

3.5 Reliability of the Reported Uses

Plants which are used in repetitive manner in any ailment could be more likely to have biologically active component or pharmacologically active [59]. Most of the plants reported in this study as good evidence of effectiveness and were scientifically validated as significant pharmacological agents. For example, *Gymnema sylvestre* has been used in the treatment of diabetes for a long time in Indian traditional medicine and elsewhere in the world and it claimed to have blood glucose lowering activity both *in vitro* and *in vivo* by a number of reports [60] and the informants in the present also using this plant for the treatment of diabetes. Also, in support of the present study the plant species viz., *Andrographis paniculata*, *Lantana camara*, *Zingiber officinale*, *Gloriosa superba*, *Cassia fistula*, *Terminalia chebula*, *Cocculus hirsutus*, *Cissus*

Table 3: Ingredients added for the preparation of herbal medicines by *Malayali* traditional healers

Botanical name	Other plants added in medicinal preparation	Other ingredients added
<i>Abrus precatorius</i>	–	Curd (Abortion)
<i>Achras zapota</i>	–	Butter milk (Stomach pain)
<i>Aerva lanata</i>	<i>Allium cepa</i> , <i>Piper nigrum</i> (Menstrual problems)	–
<i>Ageratum conyzoides</i>	<i>Piper nigrum</i> (Inflammations)	–
<i>Allium cepa</i>	–	Groundnut oil (Body swellings)
<i>Andrographis paniculata</i>	–	Hot water (Snake bite)
<i>Calotropis gigantea</i>	–	Coconut oil (Swellings)
<i>Canthium parviflorum</i>	<i>Calotropis gigantea</i> , <i>Todallia asiatica</i> (Rheumatism)	–
<i>Cardiospermum halicacabum</i>	–	Jaggery (Back pain)
<i>Cassia fistula</i>	<i>Azadirachta indica</i> , <i>Piper nigrum</i> (Snake bite)	–
<i>Cissus quadrangularis</i>	–	Egg (Bone fractures)
<i>Coculus hirsutus</i>	<i>Mimosa pudica</i> (Stomach pain)	–
<i>Corallocarpus epigeaus</i>	–	Sesamum oil (Body swellings)
<i>Crotalaria retusa</i>	–	Milk (Promote health)
<i>Curcuma longa</i>	–	Coconut oil (Insect bites)
<i>Eclipta prostrata</i>	<i>Citrus limon</i> (Hair tonic)	–
<i>Evolvulus alsinoides</i>	–	Hot water (Induce memory)
<i>Ficus racemosa</i>	<i>Cuminum cyminum</i> (Cooling agent)	–
<i>Jasminum grandiflorum</i>	–	Coconut oil (Skin diseases)
<i>Leucas indica</i>	–	Coconut oil (Migraine)
<i>Melia dubia</i>	–	Jatropha oil (Promote health)
<i>Moringa oleifera</i>	–	Curd (Stomach problems)
<i>Osmium basilicum</i>	–	Water (Fever, Cough and Cold)
<i>Pergularia daemia</i>	<i>Allium cepa</i> , <i>Piper nigrum</i> (Stomach ulcer)	–
<i>Phyllanthus madraspatensis</i>	<i>Piper nigrum</i> (Menstrual problems)	–
<i>Plumbago zeylanica</i>	–	Sesamum oil (Headache)
<i>Pongamia pinnata</i>	<i>Piper nigrum</i> (Ulcer problems)	–
<i>Psidium guajava</i>	–	Coconut oil (Diabetes and Ear ache)
<i>Pterocarpus marsupium</i>	–	Hot water (Diabetes)
<i>Scoparia dulcis</i>	–	Milk (Kidney disorders)
<i>Syzygium cumini</i>	–	Hot water, Butter milk (Stomach ache)
<i>Tamarindus indica</i>	–	Castor oil (Body pain)
<i>Tarennia asitica</i>	<i>Piper nigrum</i> (Animal bites)	–

(Continued)

Table 3: (Continued)

Botanical name	Other plants added in medicinal preparation	Other ingredients added
<i>Terminalia bellerica</i>	–	Water (Body swellings, Wounds)
<i>Terminalia chebula</i>	–	Jaggery (Asthma)
<i>Todallia asiatica</i>	<i>Butea monosperma</i> (Rheumatism)	–
<i>Vitex negundo</i>	–	Water (Head ache)
<i>Zingiber officinale</i>	<i>Coriandrum sativum</i> (Throat infection)	–

quadrangularis, *Tridax procumbens* and *Vernonia cinerea* has been scientifically proved to cure various ailments.

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 [61].

4. Conclusion

The present study revealed that the knowledge and usage of traditional medicine for the treatment of various ailments among the *Malayali* tribes is still a major part of their life and culture. They have a strong belief in the efficacy and success of traditional medicine and the results of the study provide evidence that the medicinal plants continued to play an important role in the healthcare system of this community. This treasure of information is gradually vanishing in the near future due to lack of interest among the younger generations of tribal people as well as their tendency to migrate to cities for luxuriant jobs. Thus, the present study would be useful in preventing the loss of ethnomedicinal traditions of *Malayali* tribe communities. The new claims which re recorded from the study area showed that still much can be learned from investigating herbals available abundantly in the forests. These plants may indicate the possible occurrence of valuable phytochemical compounds and it requires a search for potential new drugs to treat various ailments.

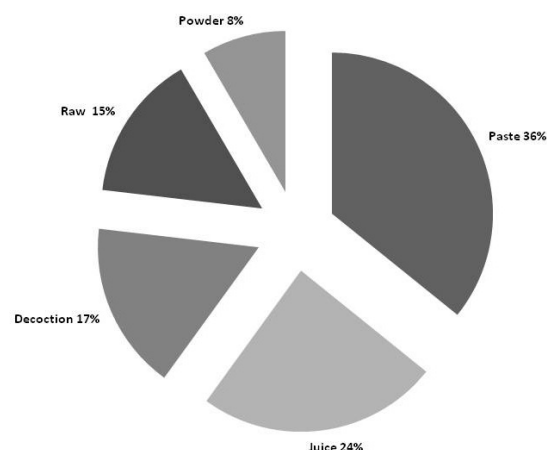


Fig. 5. Analysis of mode preparation and utilization of plant parts

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