



# Quantitative ethnobotany of *Paliyar* tribe in Sathuragiri hills, Virudhunagar district, Tamil Nadu, India

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## Abstract

An ethnobotanical survey was conducted in Sathuragiri hills in the Virudhunagar district of the state of Tamil Nadu, India. A total of 139 species belonging to 124 genera under 52 families was recorded as medicinally useful; they were mainly used by the local people to treat various diseases. The families like Fabaceae (18 species), Euphorbiaceae (9 Species) and Apocynaceae (7 Species) contained many important medicinal plants. Some of the important illnesses treated by these species were dermatological ailments, gastrointestinal problems, joint pain, fever and poisonous bites. The data are quantified and important species are highlighted. Conservation of these medicinal plants and local knowledge is the need of the hour.

**Keywords** Traditional medicine · Quantitative ethnobotany · Western Ghats

## Introduction

Ethnomedicine is defined as the cultural interpretation of health, disease and illness; it is a complex and multidisciplinary system constituting the use of natural resources for healing. Many people still depend on plants as alternative remedies in addition to biomedicine. The extent of traditional medicine usage differs with the geographical location and availability of the resources. India has rich biological diversity and possesses almost 7% of the World's flowering plants. The Western Ghats of India are blessed with high biological diversity and various ethnic groups. The ethnobotany of the Western Ghats in Tamil Nadu has been explored previously by some researchers; there are still some places to be

covered. According to 2011 census, the tribal population of Tamil Nadu state in India was estimated as 0.72 million; it constituted 1.1% of the total Tamil Nadu population. There are about 36 tribal groups in Tamil Nadu, mostly dwelling in the fringes of the Western and Eastern Ghats. Virudhunagar district had 2,294 tribal people, which was 0.12% of the total population of the district. *Paliyars* are relatively the smallest tribal group living near the Western Ghats from Palni to Kanyakumari in Tamil Nadu as well as in some parts of Kerala. They were nomadic and had hunter-gatherer type of life style; due to the efforts by the Government and Non-Government organizations, they are now living in settlements; they have changed their occupation to sericulture, dairy farming, social forestry etc. Still some of them are involved in collecting non-timber forest products from the nearest forests.

Sathuragiri hills are one of the holy places in the Western Ghats in Virudhunagar district of Tamil Nadu. In Sathuragiri hills, there are about 36 *paliyar* hamlets; in Shenpagathoppu and Ayyanarkoil there are about 24 and 18 hamlets. We previously documented the local knowledge of non-institutionally trained Siddha practitioners of Virudhunagar district of Tamil Nadu, India (Esakkimuthu et al. 2019; Mutheeswaran et al. 2016, 2014, 2011) and few authors documented the folk medicinal knowledge of this district (Rajendran et al. 2002). Further there were few previous reports on the ethnobotany of paliyars (Aadhan and Anand, 2019, 2017a, 2017b, 2017c; Bose et al. 2014; Kamatchi and Parvathi 2020); they

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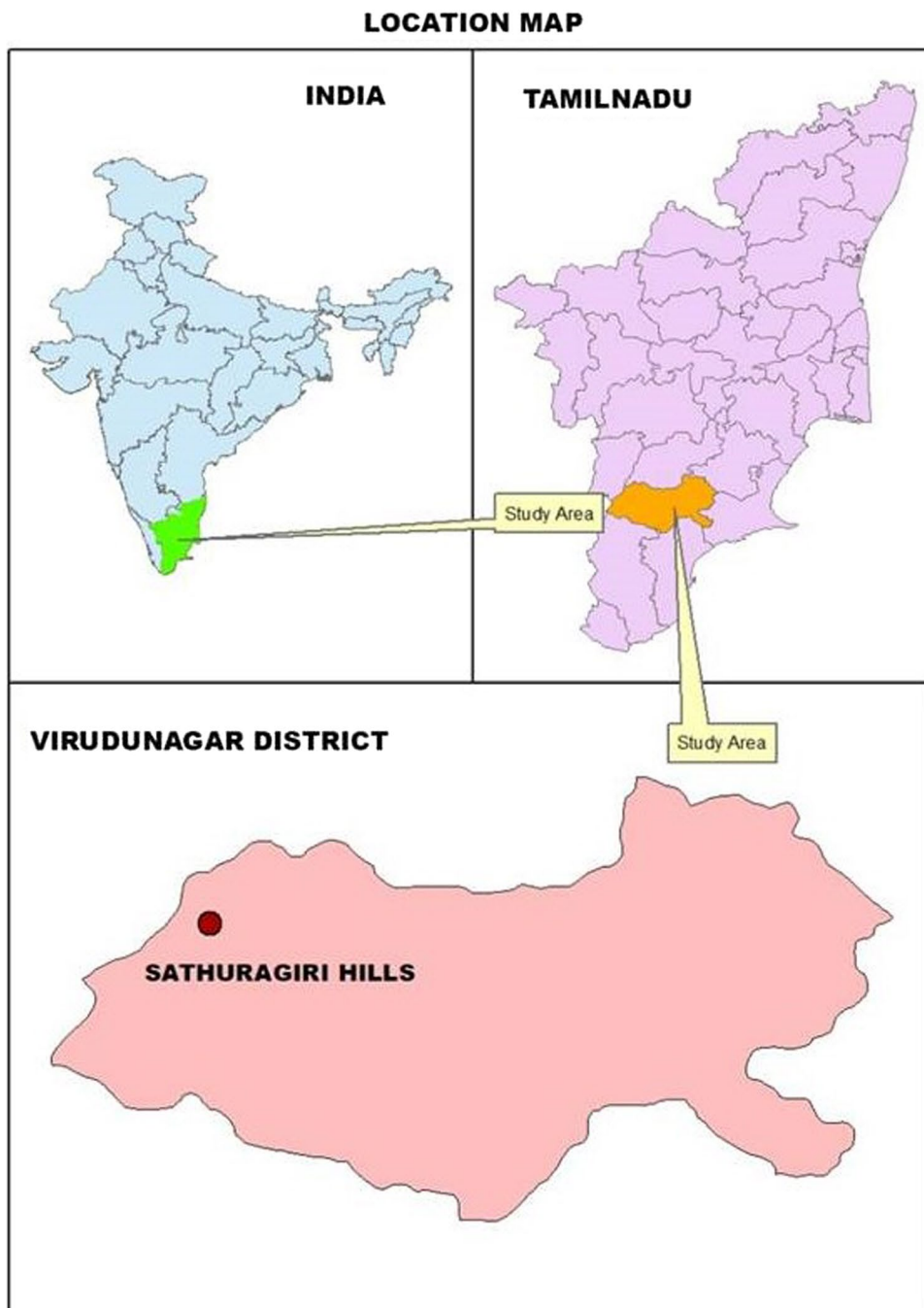
were qualitative in nature. This study was undertaken to quantitatively document the local knowledge of paliyars, a dominant tribe in the Sathuragiri Hills of the Western Ghats.

## Methodology

The study area was in the Wattrap, Srivilliputhur *taluk* of Virudhunagar district between 11°00' and 12°00' N and 77°28' and 78°50' (Fig. 1). This communication is based

on the data collected between April to November 2019 by series of interviews conducted among tribal healers. The tribal healers were identified by interviewing the elders in the society and by approaching tribal association named '*vanakkulu*' in Virudhunagar district. The healers included in this survey were randomly selected. Their knowledge on medicinal plants was gathered after getting permission from the informants. The interviews were conducted in the local language 'Tamil'. The protocols were in accordance with the guidelines of ISE code of ethics for ethnobiological research

**Fig. 1** Map showing the location of the study area



(International Society for Ethnobiology 2006). Successive free-listing method was used to gather the data (Heinrich et al. 2009). The questionnaire consisted of the following details: the local name of the plants, parts used, method of preparation, mode of usage and the symptoms treated. All the species cited as medicinal were collected from the field at reproductive stage in duplicate, with the help of informants. A field sheet was recorded with collector's name, vernacular name, local abundance and ecological parameters. The herbarium samples were dried processed, identified taxonomically and the names were confirmed with the help of regional floras (Gamble and Fischer 1915; Henry et al. 1987; Matthew 1999, 1981; Nair and Henry 1983).

The data were converted into use-reports in accordance with previously published methods and they were grouped into illness categories. The consensus over a claim was assessed using consensus factor ( $F_{ic}$ ) (Heinrich et al. 1998; Trotter and Logan 1986). This factor can be given as:  $F_{ic} = (N_{ur} - N_i) / (N_{ur} - 1)$  where  $N_{ur}$  is the number of use reports of informants for particular illness category, and  $N_i$  is the number of species used for particular illness by all informants. The consensus over the use of a species for an illness category was determined using Index on Agreement of Remedies (IAR). This factor can be given as:  $(n_{ur} - n_a) / (n_r - 1)$  where  $n_{ur}$  is the total number of use reports for a species and  $n_r$  is the number of illness categories which are treated by that species. These factors range from 0 to 1, where increasing values of this factor indicate high rate of informant consensus.

## Results

The proportion of male healers was high than female. Regarding educational status of the healers only a few had school education and most of them were uneducated. This study recorded the ethno-medicinal usage of 139 species belonging to 124 genera under 52 families, which were used to prepare formulations (Table 1). Among them, 21 were shrubs, 12 were herbs, 96 were trees and 10 were climbers. Trees (69%) were found to be the dominant life form used by the tribals for medicinal purposes in Sathuragiri hills (Fig. 1). With regard to the plant families, Fabaceae had high number of species followed by Euphorbiaceae (Table 2, 3).

Gastrointestinal and pulmonary ailments were the major illness categories; out of 878 UR, 167 were for gastrointestinal ailments and 158 were on dermatological ailments. The illness categories viz., dermatological ailments and bites had high consensus over the other illness categories ( $F_{ic} \geq \text{Average } F_{ic} + \text{SD}$ ). In the case of dermatological ailments, 38 species had minimum two UR; among them *Wrightia tinctoria*, *Pinus walllichiana* and *Curcuma neilgherrensis* had high number of UR. The species like *Gmelina asiatica* and *Boswellia serrata*

had high IAR values. In the case of bites, the species viz., *Aristolochia bracteolata*, *Aristolochia indica* and *Anogeissus latifolia* were the highly cited species; *Macaranga indica* also had high IAR value.

Twelve illness categories had average consensus ( $F_{ic} < \text{Average } F_{ic} + \text{SD}$ , but  $> \text{Average } F_{ic} - \text{SD}$ ); among them the gastrointestinal, musculo-skeletal and pulmonary ailments had high number of UR. In the case of wounds and fractures, the species such as *Holoptelea integrifolia*, *Lawsonia inermis* and *Commiphora berryi* had high number of UR; *Bambusa bambos* and *Buddleja asiatica* had high IAR. In the case of musculo-skeletal ailments, the species like *Dodonaea viscosa* subsp. *angustifolia*, *Vitex negundo* and *Diospyros melanoxylon* had high UR; *Aristolochia bracteolata* had high IAR. In the case of fever, *Hugonia mystax* had high number of UR; *Gmelina arborea* and *Syzygium gardneri* had high IAR value. Gastrointestinal ailments had high UR and in this illness category, 39 species had minimum two UR. The species such as *Achyranthus aspera*, *Holoptelea integrifolia*, *Hardwickia binata* and *Ficus racemosa* had high number of UR, under this illness category. In the case of oral ailments, *Terminalia chebula* had high UR; *Wrightia tinctoria* had high IAR. For treating gynecological ailments, *Vachellia leucophloea*, *Momordica charantia* and *Melia azedarach* had high number of UR; *Calamus rotang* and *Dichrostachys cinerea* had high IAR. In the case of male reproductive ailments, *Moringa oleifera* had high number of UR, while *Momordica charantia* had high IAR. In the case of neurological ailments, *Vitex negundo* had high UR; *Neolitsea umbrosa* had high IAR. For treating eye ailments, *Spermacoce hispida* had high UR and IAR. For the treatment of urinary ailments, *Aerva lanata* had high UR and IAR. In the case of pulmonary and respiratory ailments, *Calotropis gigantea* had high UR and *Andrographis paniculata* had high IAR. Four illness categories viz., blood ailments, general health, heart ailments and obesity had low consensus ( $F_{ic} < \text{Average } F_{ic} - \text{SD}$ ).

This study recorded the medicinal uses of three endemic plants viz., *Knema attenuata*, *Nothopegia colebrookiana* and *Miliusa eriocarpa* and five threatened plants viz., *Aglaia bourdillonii*, *Syzygium mundagam*, *Agrostistachys borneensis*, *Santalum album* and *Dalbergia latifolia*.

## Discussion

Collections of non-timber forest products like raw drugs, animal products and honey are the major sources of income for the informants and they had more than 15 years of experience with medicinal plants. This study highlights the local knowledge of *paliyars* in Sathuragiri hills and the need to conserve their knowledge. Fabaceae is the third largest family of the angiosperms with around 19,400 species; it is one amongst the five pharmacologically important families

**Table 1** Ethnomedicinal plants used by *Paiyyar* tribe of Sathuragiri hills, Virudhunagar district, Tamil Nadu, India

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
1	<i>Abrus precatorius</i> L Fabaceae XCH-11,268	<i>Kundumani</i>	Leaves	Toothache (2), Arthralgia (2), Cough (1), Cold (1), Fever (2)	0.43
2	<i>Abutilon indicum</i> (L.) Sweet Malvaceae XCH-14,011	<i>Thutti</i>	Whole plant	Jaundice (1), Hemorrhoids (3), Dermatological ailments (3), Bronchitis (2)	0.63
3	<i>Acacia concinna</i> (Willd.) DC Fabaceae XCH-17,691	<i>Sivakkai</i>	Fruit	Coolant (1), Conjunctivitis (2)	0.50
4	<i>Acalypha indica</i> L Euphorbiaceae XCH-17,079	<i>Kuppaimeni</i>	Whole plant	Dermatological ailments (4), Hemorrhoids (2), Cuts (2), wounds (1), Nausea (2), Wheezing (1)	0.55
5	<i>Achyranthus aspera</i> L Amaranthaceae XCH-11,532	<i>Nayurivi</i>	Whole plant	Stomachache (2), Hemorrhoids (5), Poisonous bites (2), Nausea (1)	0.56
6	<i>Alseodaphne semecarpifolia</i> Nees Lauraceae XCH-11,465	<i>Kattu kathihari</i>	Fruits	Wounds (3),	1.00
7	<i>Aegle marmelos</i> (L.) Correa Rutaceae XCH-14,195	<i>Vilvam</i>	Fruit, Bark, Leaves	Diabetes (2), Hemorrhoids (3), Blood purification (1), Insomnia (1)	0.50
8	<i>Aerva lanata</i> (L.) Juss Amaranthaceae XCH-12,365	<i>Perumpoolai</i>	Whole plant	Urolithiasis (3), Productive cough (2)	0.75
9	<i>Aglaia elaeagnoides</i> (A.Juss.) Benth Meliaceae XCH-12,295	<i>Sokkalai</i>	Fruits, Bark	Diarrhea (1), Dermatological ailments (3), Dysuria (2)	0.60
10	<i>Agrostiachys borneensis</i> Becc Euphorbiaceae XCH-10,246	<i>Manikilukki</i>	Latex	Arthralgia (3)	1.00
11	<i>Alangium salvifolium</i> (L.f.) Wangerin Alangiaceae XCH-15,520	<i>Alingil</i>	Bark	Neuropathy (1)	0.00
12	<i>Albizia amara</i> (Roxb.) B.Boivin Fabaceae XCH-17,770	<i>Usilamaram</i>	Leaves	To improve vision (2), Coolant (1), Diarrhoea (1), Dermatological ailments (3)	0.50
13	<i>Albizia odoratissima</i> (L.f.) Benth Fabaceae XCH-11,428	<i>Karuvagaai</i>	Bark	Poisonous bites (3), Dermatological ailments (4), Conjunctivitis (1)	0.71
14	<i>Albizia procera</i> (Roxb.) Benth Fabaceae XCH-15,232	<i>Vaagai</i>	Bark and Leaves	<i>Vadha</i> ailments (3), Ovarian cysts (2), Haemorrhage (1)	0.60

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
15	<i>Alistonia scholaris</i> (L.) R.Br Apocynaceae XCH-11,793	<i>Elilai palai</i>	Tender Fruits, Bark, Leaves	Digestive ailments (1), Menorrhagia (1), Dermatological ailments (3), Cold fever (2)	0.50
16	<i>Anacardium occidentale</i> L Anacardiaceae XCH-12,838	<i>Munthiri</i>	Leaves, Bark, Fruits, Nuts	Urinary retention (1), Wheezing (1), Bronchitis (1), Dry cough (3), Gastric ulcer (1), Venereal disease (1), Oligospermia (2), Dermatological ailments (1)	0.30
17	<i>Andrographis paniculata</i> (Burm.f.) Nees Acanthaceae XCH-19,804	<i>Nilavembu</i>	Leaves	Diabetes (2), Dry cough (5), Gastric ulcer (4), Intestinal worms (1)	0.73
18	<i>Anisomeles malabarica</i> (L.) R.Br. ex Sims Lamiaceae XCH-11,488	<i>Peyimarrutai</i>	Leaves	Dermatological ailments (1), Diarrhea (2)	0.50
19	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guillem. & Perr Combretaceae XCH-13,833	<i>Vekkali</i>	Stem, Bark	Vitiligo (1), Diabetes (1), Amenorrhoea (3), Dermatological ailments (3), Snakebite (1), Scorpion bites (3), Colic (1), Cough (2), Diarrhea (1)	0.60
20	<i>Antidesma acidum</i> Retz Phyllanthaceae XCH-11,239	<i>Kattukooya</i>	Fruits, Leaves	Stomachache (4), Headache (1), Fever (2), Toothache (1)	0.57
21	<i>Aristolochia bracteolata</i> Lam Aristolochiaceae XCH-18,427	<i>Thalisurli</i>	Roots, Leaves	Swelling (3), Poisonous bites (5), Dermatological ailments (4)	0.82
22	<i>Aristolochia indica</i> L Aristolochiaceae XCH-13,981	<i>Karudankilangu</i>	Roots	Dermatological ailments (6), Poisonous bites (4), Gastric ulcer (2), Vitiligo (2)	0.77
23	<i>Artocarpus heterophyllus</i> Lam Moraceae XCH-12,384	<i>Pala</i>	Bark, Leaves	Digestive ailments (1), Dermatological ailments (3)	0.67
24	<i>Atalantia monophylla</i> DC Rutaceae XCH-11,446	<i>Kattuelumitchai</i>	Fruits, Leaves	Sinusitis (1), Coolant (1), Urinary retention (2), Dermatological ailments (4)	0.57
25	<i>Azima tetraacantha</i> Lam Salvadoraceae XCH-16,173	<i>Mulsankan</i>	Leaves, Roots, Fruit	Neuropathy (1), Ovarian cysts (1) Gastric ulcer (1)	0.00
26	<i>Bambusa bambos</i> (L.) Voss Poaceae XCH-17,682	<i>Mungil</i>	Tenderr leaves	Oligomenorrhoea (3), Burns (2)	0.75
27	<i>Blepharis maderaspatensis</i> (L.) B.Heyne ex Roth Acanthaceae XCH-19,726	<i>Nathirapoondu</i>	Whole plant	To improve vision (3), Gastric ulcer (1), Coolant (1)	0.50

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
28	<i>Bombax ceiba</i> L Malvaceae XCH-14,549	<i>Kattu paruthi</i>	Young root, Gum, Leaves, Shoots	Fractures (2), Toothache (1), Productive cough (1), Micturition (1)	0.25
29	<i>Boswellia serrata</i> Roxb. ex Colebr Burseraceae XCH-12,301	<i>Kunguliyam</i>	Resin	Dermatological ailments (4), Cracks and fissures in feet (1)	0.50
30	<i>Bridelia retusa</i> (L.) A.Juss Phyllanthaceae XCH-10,762	<i>Mulvengai</i>	Bark	Dysuria (2), Rheumatalgia (3)	0.75
31	<i>Buchanania cochinchinensis</i> (Lour.) M.R.Almeida Anacardiaceae XCH-12,824	<i>Mudamaa</i>	Leaves, Fruit, Root	Gastric ulcer (2), Diabetes (1), Digestive ailments (1), Productive cough (1), Purgative (1), Wounds (2)	0.29
32	<i>Buddleja asiatica</i> Lour Scrophulariaceae XCH-17,382	<i>Karikattan</i>	Leaves, Latex	Dermatological ailments (5), Cuts (1), Wounds (2)	0.71
33	<i>Cadaba fruticosa</i> (L.) Druce Capparaceae XCH-12,420	<i>Viluthi</i>	Leaves	Hemorrhoids (2), Coolant (1), Amenorrhea (2)	0.50
34	<i>Cajanus cajan</i> (L.) Millsp. Fabaceae XCH-13,205	<i>Thuvarai</i>	Stem, Bark	Body strength (1), Gastric ulcer (2)	0.50
35	<i>Calamus rotang</i> L Arecaceae XCH-17,186	<i>Pirambu</i>	Young stem	Amenorrhea (2)	1.00
36	<i>Calophyllum austroindicum</i> Kosterm. ex P.F.Stevens Clusiaceae XCH-20,312	<i>Chiru pinnai</i>	Bark and Leaves	Gastric ulcer (2), Dermatological ailments (4), Rheumatalgia (1), Psoriasis (2), Conjunctivitis (1)	0.56
37	<i>Calotropis gigantea</i> (L.) Dryand Apocynaceae XCH-14,581	<i>Erukku</i>	Flower, Root bark	Wheezing (2), Bronchitis (4), Poisonous bites (3)	0.13
38	<i>Canarium strictum</i> Roxb Burseraceae XCH-12,317	<i>Karung kunkuliyam</i>	Resin	Cold fever (2), Dry cough (3), Wheezing (1), Epilepsy (1), Dermatological ailments (5), Wounds (3), Hernia (1), Rheumatalgia (1)	0.56
39	<i>Capparis sepitaria</i> L Capparaceae XCH-12,360	<i>Thoratti mullu</i>	Leaves	Cold fever (3), Bronchitis (1), Diarrhoea (1)	0.50
40	<i>Carissa spinarum</i> L Apocynaceae XCH-17,816	<i>Narikala</i>	Leaves, Bark	Sinusitis (2), Angina (1), Gonorrhoea (1), Blood pressure (1), Rheumatalgia (3), Syphilis (1), Cold fever (2), Oedema (1), Dry cough (1), Inflammation (2), Gastric ulcer (3), Dry fever (1)	0.39

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
41	<i>Ehretia microphylla</i> Lam Boraginaceae XCH-13,489	<i>Kurangu vetrilai</i>	Leaves, Root	Productive cough (3), Diarrhoea (2), Colic (1), Dysentery (1), Haemorrhage (3)	0.56
42	<i>Chloroxylon swietenia</i> DC Rutaceae XCH-13,829	<i>Porasu</i>	Root, Fruits, Flower	Swelling (2), Diarrhoea (3), Wounds (2), Headache (1)	0.57
43	<i>Citrus aurantiifolia</i> (Christm.) Swingle Rutaceae XCH-17,593	<i>Kattu elumitchai</i>	Leaves, Fruit	Sinusitis (1), Angina (1), Bronchitis (2), Bone fractures (3), Dysuria (2)	0.50
44	<i>Cochlospermum religiosum</i> (L.) Alston Bixaceae XCH-14,641	<i>Thanakku</i>	Stem, Bark	Wounds (2)	1.00
45	<i>Commiphora berryi</i> (Arn.) Engl Bursaceae XCH-12,346	<i>Pattchai kiluvai</i>	Bark, Leaves	Muscle (1), Wounds (3), Fractures (1), Blood purification (1), Arthritis (1)	0.33
46	<i>Commiphora caudata</i> (Wight & Arn.) Engl Bursaceae XCH-12,065	<i>Pattcaikiluvai</i>	Leaves, Stem, Bark	Pulmonary ailments (1), Blood purification (1)	0.00
47	<i>Cordia monoica</i> Roxb Boraginaceae XCH-15,755	<i>Mookuchali palzham</i>	Leaves, Fruits, Bark	Pulmonary ailments (1), Dysmenorrhea (3), Wounds (3), Inflammation (3), Productive cough (2), Dysentery (1), Diarrhoea (1)	0.54
48	<i>Cratava religiosa</i> Forst. f Capparaceae XCH-12,713	<i>Mavilangam</i>	Stem, Bark	Menorrhagia (1), Blood purification(1)	0.00
49	<i>Crotalaria laburnifolia</i> L Fabaceae XCH-15,210	<i>Narimiratti</i>	Root	Paroxysm (1), Dermatological ailments (3)	0.67
50	<i>Curcuma neilgherrensis</i> Wight Zingiberaceae XCH-18,542	<i>Kattumanjal</i>	Rhizome	Dermatological ailments (7), Gastric ulcer (2)	0.88
51	<i>Dalbergia latifolia</i> Roxb Fabaceae XCH-11,396	<i>Thothagaththi</i>	Leaves, Bark	Diarrhoea (2), Dermatological ailments (3)	0.75
52	<i>Datura metel</i> L Fabaceae XCH-21,352	<i>Nilaomaththai</i>	Leaves, Seeds	Dermatological ailments (2), Digestive ailments (1)	0.50
53	<i>Dichrostachys cinerea</i> (L.) Wight & Arn Fabaceae XCH-13,247	<i>Vedaththali</i>	Leaves	Dysmenorrhea (2), Diarrhoea (3)	0.75

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
54	<i>Diospyros ebenum</i> J.Koenig ex Retz Ebenaceae XCH-17,352	<i>Karunkaali</i>	Stem	Dysmenorrhea (1), Urolithiasis (2)	0.50
55	<i>Diospyros melanoxylon</i> Roxb Ebenaceae XCH-17,815	<i>Beedi elai</i>	Leaves, Bark	Diarrhea (1), Cholera (1), Dysentery (1), Cold fever (2), Rhinitis (3), Cramps (1), Pneumonia (1), Syphilis (1), Swelling (3)	0.38
56	<i>Diospyros paniculata</i> Dalzell Ebenaceae XCH-18,968	<i>Karunthavarai</i>	Root, Bark	Diarrhoea (3), Gastric ulcers (2), Wounds (2), Blood purifier (1)	0.57
57	<i>Diotacanthus grandis</i> (Bedd.) Benth Acanthaceae XCH-17,680	<i>Kattupakku</i>	Root	Arthralgia (1)	0.00
58	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> (L.f.) J.G.West Sapindaceae XCH-14,865	<i>Virali</i>	Leaves	<i>Vadha</i> ailments (5), Neuropathy (2)	0.83
59	<i>Dolichandrone falcata</i> (Wall. ex DC.) Seem Bignoniaceae XCH-18,838	<i>Kombaa thaarai</i>	Bark	Arthralgia (3), Menorrhagia (2), Dysmenorrhoea (1)	0.60
60	<i>Drypetes obtusifolia</i> (Bedd.) Airy Shaw Putranjivaceae XCH-14,949	<i>Ayil maram</i>	Root, Leaves, Seed	Scorpion bites (1), Rheumatalgia (1), Inflammation (2)	0.33
61	<i>Elaeocarpus serratus</i> L Elaeocarpaceae XCH-10,195	<i>Kotilaan</i>	Fruits, Leaves	Urolithiasis (1), Rheumatalgia (2), Poisonous bites (3), Diarrhea (2), Dysentery (1)	0.50
62	<i>Elephantopus scaber</i> L Asteraceae XCH-16,017	<i>Yanaichuvadi</i>	Leaves	Angina (1), Dermatological ailments (2), Dry Cough (3), Swelling (3)	0.63
63	<i>Erythrina suberosa</i> Roxb Fabaceae XCH-14,737	<i>Mulmuringai</i>	Wood	Antiulcer (1), Analgesic (3)	0.67
64	<i>Erythrina orientalis</i> L Fabaceae XCH-10,440	<i>Kaliyanamurungai</i>	Leaves	Gastric ulcer (2), Dermatological ailments (4)	0.80
65	<i>Erythroxylum monogynum</i> Roxb Erythroxylaceae XCH-11,187	<i>Semmanai</i>	Barks, leaves	Oligomenorrhoea (1), Dyspepsia (1), Cold fever (2), Dropsy (1)	0.25
66	<i>Excoecaria oppositifolia</i> var. <i>crenulata</i> (Wight) Chakrab. & M.Gangop Euphorbiaceae XCH-12,159	<i>Thillai</i>	Latex	Scar reduction (1)	0.00



Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
67	<i>Ficus drupacea</i> Thunb Moraceae XCH-17,760	<i>Kalall</i>	Fruits, aerial roots	Oligospermia (1), Gastric ulcer (4), Diabetes (1)	0.60
68	<i>Ficus hispida</i> L.f Moraceae XCH-10,531	<i>Peitathi</i>	Fruit and Leaves	Oligomenorrhea (3), Blood purification (1)	0.67
69	<i>Ficus racemosa</i> L Moraceae XCH-13,210	<i>Kattukathi</i>	Fruit, Bark and Leaves	Diabetes (1), Bronchitis (1), Diarrhoea (1), Inflammatory (3), Hemorrhoids (2), Pulmonary ailments (1), Dysuria (2)	0.40
70	<i>Ficus tinctoria</i> G.Forst Moraceae XCH-13,996	<i>Kattuathih</i>	Fruit and Bark	Insomnia (2), Diarrhoea (3), Diabetes (1)	0.60
71	<i>Flacourtia indica</i> (Burm.f.) Merr Salicaceae XCH -10,341	<i>Kattukila</i>	Fruits, Flower	Conjunctivitis (1), Hemorrhoids (1), Gastric ulcer (3)	0.50
72	<i>Flueggea leucopyrus</i> Willd Phyllanthaceae XCH-11,141	<i>Vellaikiluvai</i>	Stem, Bark	Menorrhagia (1), Urinary retention (1)	0.00
73	<i>Givottia moluccana</i> (L.) Sreem Euphorbiaceae XCH-11,199	<i>Vandaalai</i>	Bark, Seed	Jaundice (2), Vadha ailments (3), Dandruff (2), Psoriasis (1)	0.57
74	<i>Gmelina arborea</i> Roxb Lamiaceae XCH-14,753	<i>Perunkumil</i>	Whole plant	Dermatological ailments (4), Cold fever (2), Trichogenous (2)	0.71
75	<i>Gmelina asiatica</i> L Lamiaceae XCH-14,758	<i>Kumilam</i>	Leaves	Dermatological ailments (5)	1.00
76	<i>Gyrocarpus americanus</i> Jacq Hernandiaceae XCH-12,305	<i>Kathaddi maram</i>	Root and Bark	Diarrhoea (2), Wounds (2), Swelling (2), Urolithiasis (1)	0.50
77	<i>Hardwickia binata</i> Roxb Fabaceae XCH-10,644	<i>Aacha</i>	Wood	Diarrhoea (3), Hemorrhoids (1), Dermatological ailments (3), Dysentery (2), Intestinal worms (1)	0.56
78	<i>Helicteres isora</i> L Malvaceae XCH-14,098	<i>Valampuri</i>	Fruit and Leaves	Dermatological ailments (3), Metrorrhagia (3)	0.80
79	<i>Hemidesmus indicus</i> (L.) R.Br. ex Schult Apocynaceae XCH-13,894	<i>Nannaari</i>	Roots	Coolant (1), Diarrhoea (3)	0.67

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
80	<i>Holigarna nigra</i> Bourd Anacardiaceae XCH-10,308	<i>Karunsaari</i>	Bark, Leaves	Astringent (1), Inflammatory (1), Nausea (1)	0.00
81	<i>Holoptelea integrifolia</i> Planch Urticaceae XCH-11,892	<i>Elumporakki</i>	Bark, Leaves	Vitiligo (1), Diabetes (3), Hemorrhoids (2), Gastric ulcer (2), Dyspepsia (1), Colic (1), Intestinal worms (1), Nausea (1), Wounds (3), Dysmenorrhea (1), Rheumatism (1)	0.38
82	<i>Hugonia mystax</i> Cav Linaceae XCH-11,166	<i>Mothirakkanni</i>	Root	Cold fever (3), Snake bites (2), Intestinal worms (1)	0.60
83	<i>Ipomoea batatas</i> (L.) Lam Convolvulaceae XCH-11,286	<i>Kattu kilangu</i>	Leaves, Tubers	Diabetes (1), Inflammation (3)	0.67
84	<i>Jasminum angustifolium</i> (L.) Willd Oleaceae XCH-13,017	<i>Kattumalli</i>	Leaves	Coolant (1), Trichogenous (1), Oligomenorrhea (3)	0.50
85	<i>Knema attenuata</i> Warb Myristicaceae XCH-15,408	<i>Chora pathiri</i>	Leaves, Stem	Inflammatory (1), Dermatological ailments (3)	0.67
86	<i>Lannea coromandelica</i> (Houtt.) Merr Anacardiaceae XCH-14,730	<i>Uthiyar</i>	Leaves, Bark, Stem, Gum	Cold fever (2), Dysentery (1), Conjunctivitis (1), Vitiligo (1), Arthralgia (1), Gastric ulcer (3), Oligospermia (2), Wounds (3)	0.46
87	<i>Lawsonia inermis</i> L Lythraceae XCH-18,422	<i>Maruthani</i>	Leaves and Seed	Trichogenous (4), Burns (4), Nail infection (1)	0.75
88	<i>Liisea wightiana</i> (Nees) Hook.f Lauraceae XCH-19,472	<i>Milagu naari</i>	Leaves	Pulmonary ailments (1), Gastric ulcer (2)	0.50
89	<i>Macaranga indica</i> Wight Euphorbiaceae XCH-15,686	<i>Vandalai</i>	Leaves, Stem, Bark	Dermatological ailments (4), Poisonous bites (2)	0.80
90	<i>Macaranga peltata</i> (Roxb.) Müll.Arg Euphorbiaceae XCH-14,719	<i>Vattakkanni</i>	Leaves, Bark	Amenorrhea (3), Dysentery (1), Productive cough (1), Dry cough (3), Cold fever (2), Wounds (3), Gastric ulcer (2)	0.57
91	<i>Madhuca longifolia</i> var. <i>latifolia</i> (Roxb.) A.Chev Sapotaceae XCH-10,878	<i>Ituppai</i>	Stem Bark and Seed	Gastric ulcer (1), Arthralgia (3)	0.67
92	<i>Mallotus philippensis</i> (Lam.) Müll.Arg Euphorbiaceae XCH-10,664	<i>Kamala</i>	Bark, Fruits	Diabetes (1), Coolant (1), Wound wash (2)	0.33

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
93	<i>Mallotus tetracoccus</i> (Roxb.) Kurz Euphorbiaceae XCH-12,989	<i>Sevappu Vattakkanni</i>	Fruit, Bark	Oligomenorrhea (3), Gastric ulcer (2)	0.75
94	<i>Mangifera indica</i> L Anacardiaceae XCH-14,614	<i>Maa</i>	Leaves, Bark, Fruit and Kernel	Diarrhea (2), Dysentery (1), Anemia (1), Wheezing (1), Toothache (1), Dysmenorrhea (1), Hemorrhoids (2), Bronchitis (1), Dry cough (3), Vatha ailments (2)	0.36
95	<i>Gymnosporia emarginata</i> (Willd.) Thwaites Celastraceae XCH-19,975	<i>Kattu kala</i>	Leaves, Wood	Oligospermia (1), Swelling (2)	0.50
96	<i>Melia azedarach</i> L Meliaceae XCH-12,226	<i>Malaivembu</i>	Stem, Bark, Leaves	Ovarian cysts (2) Oligomenorrhea (2), Dysentery (1)	0.50
97	<i>Mesua ferrea</i> L Calophyllaceae XCH-17,325	<i>Naaangu</i>	Seeds, Leaves	Wounds (2) Inflammatory (1), Blood Purification (1), Purgative (1), Wheezing (1)	0.20
98	<i>Miliusa eriocarpa</i> Dunn Annonaceae XCH-13,865	<i>Kattikila</i>	Stem bark	Constipation (1), Rheumatism (3)	0.67
99	<i>Mimusops elengi</i> L Sapotaceae XCH-15,691	<i>Makilam</i>	Flower	Aphrodisiac (2), Body strength (1)	0.50
100	<i>Momordica charantia</i> L Cucurbitaceae XCH-12,009	<i>Palupagal</i>	Fruit, Tuber	Oligospermia (2), Menorrhagia (2)	0.67
101	<i>Moringa oleifera</i> Lam Moringaceae XCH-15,841	<i>Kattumurungai</i>	Leaves	Oligospermia (3), Wheezing (1), Poisonous bites (1), Rhinitis (4)	0.63
102	<i>Mundulea sericea</i> (Willd.) A.Chev Fabaceae XCH-10,710	<i>Pillavurai</i>	Root and Leaves	Oligospermia (1) Poisonous bites (2)	0.50
103	<i>Myristica dactyloides</i> Gaertn Myristicaceae XCH-19,875	<i>Kattu jathikkai</i>	Fruits, Leaves	Dry fever (1), Body strength (1)	0.00
104	<i>Neolamarckia cadamba</i> (Roxb.) Bosser Rubiaceae XCH-13,561	<i>Kadambu</i>	Leaves	Blood purification (1)	0.00
105	<i>Neolitsea umbrosa</i> (Nees) Gamble Lauraceae XCH-18,606	<i>Chinnatili</i>	Leaves	Neuropathy (2)	1.00

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
106	<i>Nothopegia colebrookiana</i> (Wight) Blume Anacardiaceae XCH-10,923	Saarai	Bark, Leaves	Toothache (1), Productive cough (2), Rhinitis (1)	0.33
107	<i>Pavetta indica</i> L Rubiaceae XCH-19,261	Pavattai	Leaves	Sinusitis (1), Toothache (1)	0.00
108	<i>Pavonia odorata</i> Willd Malvaceae XCH-11,510	Venthuthi	Leaves	Hemorrhoids (1), Coolant (1)	0.00
109	<i>Phyllanthus reticulatus</i> Poir Phyllanthaceae XCH-16,291	Kattunelli	Fruit, Stem	Arthralgia (2), Pulmonary ailments (1), Gastric ulcer (1)	0.33
110	<i>Pinus wallichiana</i> A.B.Jacks Pinaceae XCH-18,632	Pine	Wood	Dermatological ailments (5), Wounds (2), Sores (1), Burns (1), Boils (1), Gastric ulcer (3)	0.58
111	<i>Pterocarpus marsupium</i> Roxb Fabaceae XCH-12,947	Sivappu Santhanam	Stem, Leaves	Blood purification (1), Hemorrhoids (1), Dermatological ailments (2)	0.33
112	<i>Pterolobium hexapetalum</i> (Roth) Santapau & Wagh Fabaceae XCH-13,644	Karuindu	Leaves, Stem	Coolant (1), Sinusitis (2)	0.50
113	<i>Catunaregam spinosa</i> (Thunb.) Tirveng Rubiaceae XCH-11,494	Madhukkarai	Leaves, Fruits	Metrorrhagia (2), Gastric ulcer (2)	0.67
114	<i>Rauwolfia serpentina</i> (L.) Benth. ex Kurz Apocynaceae XCH-12,654	Sarpagantha	Leaves, Roots	Neuropathy (2), Poisonous bites (2)	0.67
115	<i>Santalum album</i> L Santalaceae XCH-11,303	Santhanam	Stem	Coolant (3), Metrorrhagia (2), Angina (2), Dermatological ailments (4)	0.70
116	<i>Sapindus mukorossi</i> Gaertn Sapindaceae XCH-14,643	Sivakkai maram	Roots	Dermatological ailments (4), Rheumatism (1), Arthralgia (2)	0.67
117	<i>Scolopia crenata</i> Clos Salicaceae XCH-10,259	Vedimul	Stem and Bark	Arthralgia(1)	0.00
118	<i>Semecarpus anacardium</i> L.f Anacardiaceae XCH-14,042	Mugamvenki	Seed	Hemorrhoids (2)	1.00

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
119	<i>Senna alata</i> (L.) Roxb Fabaceae XCH-12,308	<i>Seemai agaththi</i>	Leaves	Dermatological ailments (4), Poisonous bites (2)	0.8
120	<i>Sida acuta</i> Burm.f Malvaceae XCH-13,536	<i>Palampaasi</i>	Whole plant	Ovarian cysts (1), Dysmenorrhea (1), Digestive problems (2)	0.33
121	<i>Spermacoce hispida</i> L. Rubiaceae XCH-20,355	<i>Nathathaisuri</i>	Seeds, Root	To improve vision (3), Obesity (1)	0.67
122	<i>Stereospermum tetragonum</i> DC Bignoniaceae XCH-10,648	<i>Poom pathiri</i>	Root	Micturition (1), Aphrodisiac (1), Nausea (1), Dry fever (1), Wheezing (1) Productive cough (2)	0.17
123	<i>Strychnos potatorum</i> L.f Loganiaceae XCH-11,103	<i>Theethankottai</i>	Seed, Bark	Diarrhea (1), Dysentery (1), Gonorrhoea (1), Dysmenorrhea (1), Digestive ailments (1), Bronchitis (1), Wounds (1), Diabetes (1), Conjunctivitis (1)	0.00
124	<i>Suregada lanceolata</i> (Willd.) Kuntze Euphorbiaceae XCH-16,943	<i>Kutti amanakku</i>	Stem, Leaves	Toothache (1), Dermatological ailments (2)	0.50
125	<i>Swietenia mahagoni</i> (L.) Jacq Meliaceae XCH-20,758	<i>Thaen kaai</i>	Fruit	Diabetes (2)	1.00
126	<i>Syzygium cumini</i> (L.) Skeels Myrtaceae XCH-10,725	<i>Naaval</i>	Fruits, Bark	Diabetes (3), Anemia (3), Coolant (2), Gastric ulcers (3)	0.70
127	<i>Syzygium gardneri</i> Thwaites Myrtaceae XCH-13,482	<i>Nari naval</i>	Seed, Bark	Diabetes (1), Dry cough (2), Cold fever (2), Dermatological ailments (4)	0.63
128	<i>Syzygium aqueum</i> (Burm. f.) Alston Myrtaceae XCH-17,944	<i>Kattu koyya</i>	Bark, Leaves	Diabetes (1), Gastric ulcers (1), Wounds (3)	0.50
129	<i>Eugenia mooniana</i> Wight Myrtaceae XCH-11,653	<i>Chinna kaattu samba</i>	Fruit, Bark	Digestive ailments (1) Diabetes (1), Analgesic (2), Oligomenorrhea (2)	0.40
130	<i>Tamarindus indica</i> L. Fabaceae XCH-10,709	<i>Puli</i>	Stem, Seed, Bark	Toothache (3), Arthralgia (1)	0.67
131	<i>Tectona grandis</i> L.f Lamiaceae XCH-12,280	<i>Thekku</i>	Leaves, Bark	Dry fever (2), Headache (3), Urinary incontinence (2)	0.67

Table 1 (continued)

S. No	Botanical name, family and voucher no.	Vernacular name	Part used	Illnesses treated	IAR
132	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn Combretaceae XCH-12,325	<i>Maruthu</i>	Stem, Bark	Menorrhagia (3), Gastric ulcer (1)	0.67
133	<i>Terminalia bellirica</i> (Gaertn.) Roxb Combretaceae XCH-12,406	<i>Thani</i>	Fruit pulp	Body strength (1), Blood purification (1)	0.00
134	<i>Terminalia chebula</i> Retz Combretaceae XCH-10,721	<i>Kadukkai</i>	Fruit	Pulmonary ailments (1), Toothache (5), Blood purification (2)	0.71
135	<i>Thespesia lampas</i> (Cav.) Dalzell Malvaceae XCH-12,683	<i>Paruthimaram</i>	Flower	Anemia (2), Gastric ulcer (1), Intestinal worms (1)	0.33
136	<i>Tylophora indica</i> (Burm. f.) Merr Apocynaceae XCH-14,048	<i>Paalkodi</i>	Leaves	Wheezing (1), Bronchitis (1), Dry Fever (2), Rheumatologia (3)	0.50
137	<i>Vachellia leucophloea</i> (Roxb.) Maslin, Seigler & Ebinger Fabaceae XCH-12,731	<i>Velvelam</i>	Tender leaves, bark	Menorrhagia (2), Dysmenorrhea (2)	0.67
138	<i>Vitex negundo</i> L Lamiaceae XCH-16,479	<i>Kattunotci</i>	Leaves, flower	Headache (4), Trichogenous (1), Arthralgia (4)	0.75
139	<i>Wrightia tinctoria</i> R.Br Apocynaceae XCH-11,168	<i>Veppalai</i>	Leaves	Dermatological ailments (7), Toothache (2)	0.87

**Table 2**  $F_{ic}$  values for different illness categories reported by the Paliyar tribe of Sathuragiri hills, Virudhunagar district of Tamil Nadu, India

S. No	Illness category	No of UR	% of UR	No of species	$F_{ic}$
1	Bites	36	4.100	15	0.600
2	Blood ailments	23	2.61	18	0.227
3	Dermatological ailments	158	17.99	53	0.660
4	Diabetes	24	2.73	17	0.304
5	Eye ailments	15	1.70	9	0.420
6	Fever	35	3.98	18	0.510
7	Gastrointestinal ailments	167	19.02	100	0.403
8	General health	19	2.16	16	0.160
9	Gynecological ailments	70	7.92	39	0.440
10	Heart ailments	5	0.56	4	0.250
11	Male reproductive ailments	15	1.70	9	0.420
12	Musculo-skeletal ailments	94	10.70	44	0.530
13	Neurological	22	2.50	13	0.420
14	Obesity	1	0.11	1	0.000
15	Oral	18	2.05	10	0.470
16	Pulmonary and Respiratory ailments	87	9.90	52	0.406
17	Urinary ailments	23	2.61	14	0.409
18	Wounds and Fractures	66	7.51	31	0.538
Total		878			

(Molares and Ladio 2012). Euphorbiaceae is also another major family with about 7,500 species; these species are mainly distributed in the tropics of Indo-Malayan region and America. In many cultures, Euphorbiaceae members were used extensively for their medicinal needs (Rahman and Akter 2013). In this study also, the members of Fabaceae and Euphorbiaceae occupied an important place.

There are wide array of dermatological ailments; due to their recurrence they seriously affect the quality of life. Further they have been reported as one of the common illnesses of rural people (Malik et al. 2019). *Wrightia tinctoria* is one of the widely used medicinal plants for dermatological ailments like psoriasis and non-specific dermatitis in India (Srivastava 2014). The antimicrobial efficacy of *Pinus wallichiana* and *Boswellia serrata* against various microbes including dermato-pathogens were reported (Shaik et al. 2014; Sinha 2019). *Curcuma neilgherrensis* is endemic to India and Indo-China and has been used to treat dermatological ailments also in other cultures (Yasodamma et al. 2013). In many cultures, the use of *Aristolochia* species is predominant; though it shows serious adverse effects, lack of modern diagnosis and latency in documenting the adverse events are worrisome (Grollman and Marcus 2016). *Calotropis gigantea* is a toxic plant, being used to treat venomous bites in India (Gaikwad et al. 2015). A preliminary study showed reduction in hemolysis, coagulation and edema by the treatment with the hydroalcoholic extract of *C. gigantea* (Pandey et al. 2011); robust experiments are needed to evaluate this effect.

Herbs are the primary source for the tribal people for treating wounds, cuts and fractures which happen during their field works in the forests; it might be the reason for high consensus. The species such as *Holoptelea integrifolia* (Reddy et al. 2008), *Lawsonia inermis* (Rekik et al. 2019) and *Bambusa bambos* (Davane and Nagoba 2016) had some preclinical evidences for their traditional usage to treat wounds. Musculo-skeletal ailments are the second cause of disability and where the usage of self-medications are high (Esakkimuthu et al. 2019). Our previous survey in Virudhunagar district also documented the use of *Dodonaea viscosa* and *Vitex negundo* for treating musculo-skeletal ailments (Mutheeswaran et al. 2011). *Hugonia mystax* was reported for the treatment of fever and showed antibacterial effect against many pathogenic bacteria (Rajeswari et al. 2012; Vimalavady and Kadavul 2012).

Gastrointestinal ailments are one of the highly cited illness categories in many ethnobiological explorations, since they represent a wide array of illnesses which are common in rural areas (Tangjitman et al. 2015; Tariq et al. 2015); our study is also in line with the previous surveys. The use of *Achyranthes aspera* for treating hemorrhoids was also recorded in our previous surveys (Pandikumar et al. 2011) and it has been in clinical use in *ayurveda* for treating hemorrhoids (Mahapatra et al. 2012). Likewise, the use of *Ficus racemosa* for treating various gastrointestinal ailments including hemorrhoids as also reported (Ahmed and Urooj 2010). The tannin rich bark decoction of *Hardwickia binata* was reported to treat diarrhea (Deshmukh and Ghanawat 2019). The aqueous extract of *Terminalia chebula* showed

**Table 3** List of important plant species prescribed by the *Paliyar tribe* of Sathuragiri hills, Virudhunagar district of Tamil Nadu, India

S.No	Illness categories	List of important species
1	Bites	<i>Aristolochia bracteolata</i> (0.820), <i>Aristolochia indica</i> (0.770), <i>Anogeissus latifolia</i> (0.600), <i>Calotropis gigantea</i> (0.130), <i>Albizia odoratissima</i> (0.710), <i>Elaeocarpus serratus</i> (0.500), <i>Achyranthus aspera</i> (0.560), <i>Macaranga indica</i> (0.800), <i>Senna alata</i> (0.800), <i>Rauwolfia serpentina</i> (0.670), <i>Mundulea sericea</i> (0.500), <i>Hugonia mystax</i> (0.600)
2	Blood ailments	<i>Syzygium cumini</i> (0.700), <i>Terminalia chebula</i> (0.710), <i>Givotia moluccana</i> (0.570), <i>Thespesia lampas</i> (0.330)
3	Dermatological ailments	<i>Wrightia tinctoria</i> (0.870), <i>Pinus wallichiana</i> (0.580), <i>Curcuma neilgherrensis</i> (0.880), <i>Gmelina arborea</i> (0.857), <i>Calophyllum austroindicum</i> (0.560), <i>Aristolochia indica</i> (0.846), <i>Lawsonia inermis</i> (0.875), <i>Gmelina asiatica</i> (1.000), <i>Canarium strictum</i> (0.560), <i>Buddleja asiatica</i> (0.710), <i>Boswellia serrata</i> (1.000), <i>Syzygium gardneri</i> (0.630), <i>Senna alata</i> (0.800), <i>Sapindus mukorossi</i> (0.670), <i>Santalum album</i> (0.700), <i>Macaranga indica</i> (0.800), <i>Gmelina arborea</i> (0.710), <i>Erythrina orientalis</i> (0.800), <i>Atalantia monophylla</i> (0.570), <i>Aristolochia bracteolata</i> (0.820), <i>Albizia odoratissima</i> (0.710), <i>Acalypha indica</i> (0.500), <i>Knema attenuata</i> (0.670), <i>Helicteres isora</i> (0.800), <i>Hardwickia binata</i> (0.560), <i>Givotia moluccana</i> (0.570), <i>Dalbergia latifolia</i> (0.750), <i>Crotalaria laburnifolia</i> (0.670), <i>Artocarpus heterophyllus</i> (0.670), <i>Anogeissus latifolia</i> (0.600), <i>Alstonia scholaris</i> (0.500), <i>Albizia amara</i> (0.500), <i>Aglaiia elaeagnoidea</i> (0.600), <i>Abutilon indicum</i> (0.630), <i>Suregada lanceolata</i> (0.500), <i>Pterocarpus marsupium</i> (0.330), <i>Elephantopus scaber</i> (0.630), <i>Datura metel</i> (0.500)
4	Diabetes	<i>Syzygium cumini</i> (0.700), <i>Holoptelea integrifolia</i> (0.380), <i>Swietenia mahagoni</i> (1.000), <i>Andrographis paniculata</i> (0.730), <i>Aegle marmelos</i> (0.500)
5	Eye ailments	<i>Spermacoce hispida</i> (0.670), <i>Blepharis maderaspatensis</i> (0.500), <i>Acacia concinna</i> (0.500), <i>Albizia amara</i> (0.500)
6	Fever	<i>Hugonia mystax</i> (0.600), <i>Carissa spinarum</i> (0.390), <i>Capparis sepiaria</i> (0.500), <i>Tylophora indica</i> (0.500), <i>Tectona grandis</i> (0.670), <i>Syzygium gardneri</i> (0.630), <i>Macaranga peltata</i> (0.570), <i>Lannea coromandelica</i> (0.460), <i>Gmelina arborea</i> (0.710), <i>Erythroxylum monogynum</i> (0.250), <i>Diospyros melanoxylon</i> (0.380), <i>Canarium strictum</i> (0.560), <i>Antidesma acidum</i> (0.570), <i>Alstonia scholaris</i> (0.500), <i>Abrus precatorius</i> (0.430)
7	Gastrointestinal ailments	<i>Achyranthus aspera</i> (0.560), <i>Holoptelea integrifolia</i> (0.380), <i>Hardwickia binata</i> (0.560), <i>Ficus racemosa</i> (0.400), <i>Mangifera indica</i> (0.360), <i>Diospyros paniculata</i> (0.570), <i>Carissa spinarum</i> (0.390), <i>Andrographis paniculata</i> (0.730), <i>Lannea coromandelica</i> (0.460), <i>Flacourtia indica</i> (0.500), <i>Ficus drupacea</i> (0.600), <i>Ehretia microphylla</i> (0.560), <i>Buchanania cochinchinensis</i> (0.290), <i>Antidesma acidum</i> (0.570), <i>Anisomeles malabarica</i> (0.600), <i>Acalypha indica</i> (0.550), <i>Syzygium cumini</i> (0.700), <i>Pinus wallichiana</i> (0.580), <i>Macaranga peltata</i> (0.570), <i>Hemidesmus indicus</i> (0.670), <i>Ficus tinctoria</i> (0.600), <i>Elaeocarpus serratus</i> (0.500), <i>Dichrostachys cinerea</i> (0.750), <i>Chloroxylon swietenia</i> (0.570), <i>Aegle marmelos</i> (0.500), <i>Abutilon indicum</i> (0.630), <i>Sida acuta</i> (0.330), <i>Semecarpus anacardium</i> (1.000), <i>Mallotus tetracoccus</i> (0.750), <i>Litsea wightiana</i> (0.500), <i>Gyrocarpus americanus</i> (0.500), <i>Erythrina orientalis</i> (0.800), <i>Dalbergia latifolia</i> (0.750), <i>Curcuma neilgherrensis</i> (0.880), <i>Catunaregam spinosa</i> (0.670), <i>Calophyllum austroindicum</i> (0.560), <i>Cajanus cajan</i> (0.500), <i>Cadaba fruticosa</i> (0.500), <i>Aristolochia indica</i> (0.770)
8	General health	<i>Santalum album</i> (0.700), <i>Syzygium cumini</i> (0.700)
9	Gynecological ailments	<i>Vachellia leucophloea</i> (0.670), <i>Momordica charantia</i> (0.670), <i>Melia azedarach</i> (0.500), <i>Terminalia arjuna</i> (0.670), <i>Mallotus tetracoccus</i> (0.750), <i>Macaranga peltata</i> (0.570), <i>Jasminum angustifolium</i> (0.500), <i>Helicteres isora</i> (0.800), <i>Ficus hispida</i> (0.670), <i>Dolichandrone falcata</i> (0.600), <i>Cordia monoica</i> (0.540), <i>Bambusa bambos</i> (0.750), <i>Anogeissus latifolia</i> (0.600), <i>Albizia procera</i> (0.600), <i>Santalum album</i> (0.700), <i>Eugenia mooniana</i> (0.400), <i>Dichrostachys cinerea</i> (0.750), <i>Catunaregam spinosa</i> (0.670), <i>Calamus rotang</i> (1.000), <i>Cadaba fruticosa</i> (0.500)
10	Heart ailments	<i>Santalum album</i> (0.700)
11	Male reproductive ailments	<i>Moringa oleifera</i> (0.630), <i>Momordica charantia</i> (0.670), <i>Mimusops elengi</i> (0.500), <i>Lannea coromandelica</i> (0.460), <i>Anacardium occidentale</i> (0.300)
12	Musculo-skeletal ailments	<i>Carissa spinarum</i> (0.390), <i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> (0.830), <i>Vitex negundo</i> (0.750), <i>Diospyros melanoxylon</i> (0.380), <i>Tylophora indica</i> (0.500), <i>Sapindus mukorossi</i> (0.670), <i>Miliusa eriocarpa</i> (0.670), <i>Madhuca longifolia</i> var. <i>latifolia</i> (0.670), <i>Ipomoea batatas</i> (0.670), <i>Givotia moluccana</i> (0.570), <i>Ficus racemosa</i> (0.400), <i>Erythrina suberosa</i> (0.670), <i>Elephantopus scaber</i> (0.630), <i>Drypetes oblongifolia</i> (0.330), <i>Dolichandrone falcata</i> (0.600), <i>Cordia monoica</i> (0.540), <i>Bridelia retusa</i> (0.750), <i>Aristolochia bracteolata</i> (0.820), <i>Albizia procera</i> (0.600), <i>Agrostistachys borneensis</i> (1.000), <i>Phyllanthus reticulatus</i> (0.330), <i>Mangifera indica</i> (0.360), <i>Gyrocarpus americanus</i> (0.500), <i>Gymnosporiaemarginata</i> (0.500), <i>Eugenia mooniana</i> (0.400), <i>Elaeocarpus serratus</i> (0.500), <i>Chloroxylon swietenia</i> (0.570), <i>Abrus precatorius</i> (0.430)



**Table 3** (continued)

S.No	Illness categories	List of important species
13	Neurological ailments	<i>Vitex negundo</i> (0.750), <i>Neolitsea umbrosa</i> (1.000), <i>Ficus tinctoria</i> (0.600), <i>Dodonaea viscosa</i> subsp. <i>angustifolia</i> (0.830), <i>Rauvolfia serpentina</i> (0.670), <i>Tectona grandis</i> (0.670)
14	Oral ailments	<i>Terminalia chebula</i> (0.710), <i>Tamarindus indica</i> (0.670), <i>Wrightia tinctoria</i> (0.870), <i>Abrus precatorius</i> (0.430)
15	Pulmonary and respiratory ailments	<i>Calotropis gigantea</i> (6; 0.130), <i>Andrographis paniculata</i> (5; 0.730), <i>Moringa oleifera</i> (5; 0.630), <i>Mangifera indica</i> (5; 0.360), <i>Macaranga peltata</i> (4; 0.570), <i>Canarium strictum</i> (4; 0.560), <i>Diospyros melanoxylon</i> (4; 0.380), <i>Stereospermum tetragonum</i> (4; 0.170), <i>Elephantopus scaber</i> (3; 0.630), <i>Ehretia microphylla</i> (3; 0.560), <i>Cordia monoica</i> (3; 0.540), <i>Citrus aurantiifolia</i> (3; 0.500), <i>Carissa spinarum</i> (3; 0.390), <i>Nothopegia colebrookiana</i> (3; 0.330), <i>Anacardium occidentale</i> (3; 0.300), <i>Aerva lanata</i> (2; 0.750), <i>Syzygium gardneri</i> (2; 0.630), <i>Abutilon indicum</i> (2; 0.630), <i>Anogeissus latifolia</i> (2; 0.600), <i>Pterolobium hexapetalum</i> (2; 0.500)
16	Urinary ailments	<i>Aerva lanata</i> (3; 0.750), <i>Bridelia retusa</i> (2; 0.750), <i>Tectona grandis</i> (2; 0.670), <i>Aglaia elaeagnoidea</i> (2; 0.600), <i>Atalantia monophylla</i> (2; 0.570), <i>Citrus aurantiifolia</i> (2; 0.500), <i>Diospyros ebenum</i> (2; 0.500), <i>Ficus racemosa</i> (2; 0.400)
17	Wounds and fractures	<i>Holoptelea integrifolia</i> (5; 0.380), <i>Lawsonia inermis</i> (4; 0.750), <i>Commiphora berryi</i> (4; 0.330), <i>Syzygium aqueum</i> (3; 0.500), <i>Pinus wallichiana</i> (3; 0.580), <i>Macaranga peltata</i> (3; 0.570), <i>Lannea coromandelica</i> (3; 0.460), <i>Ehretia microphylla</i> (3; 0.560), <i>Cordia monoica</i> (3; 0.540), <i>Citrus aurantiifolia</i> (3; 0.500), <i>Canarium strictum</i> (3; 0.560), <i>Buddleja asiatica</i> (3; 0.710), <i>Alseodaphne semecarpifolia</i> (3; 0.100), <i>Acalypha indica</i> (3; 0.550), <i>Mesua ferrea</i> (2; 0.200), <i>Mallotus philippensis</i> (2; 0.330), <i>Gyrocarpus americanus</i> (2; 0.500), <i>Diospyros paniculata</i> (2; 0.570), <i>Cochlospermum religiosum</i> (2; 0.100), <i>Chloroxylon swietenia</i> (2; 0.570), <i>Buchanania cochinchinensis</i> (2; 0.290), <i>Bombax ceiba</i> (2; 0.250), <i>Bambusa bambos</i> (2; 0.750)

Species were arranged in accordance with the number of UR for the particular illness category; Values mentioned within the parentheses indicate IAR

anticariogenic effect (Rekha et al. 2014). Treating the salivary samples of human subjects with 10% aqueous extract of *T. chebula* significantly reduced the microbial load (Carounanidy et al. 2007). Preliminary in vitro experiments indicated the antibacterial effect of *Wrightia tinctoria* against common dental pathogens (Khyade et al. 2014).

Use of astringents for treating various gynecological ailments like leucorrhoea was reported in many ethnobotanical explorations and it might be reason for the use of species such as *Vachellia leucophloea* and *Dichrostachys cinerea* by the informants in our survey (Andel et al. 2015). The use of *Melia azedarach* for treating gynecological ailments was also reported previously (Mutheeswaran et al. 2014). For treating male reproductive ailments, the non-institutionally trained *siddha* practitioners of Virudhunagar district had high consensus (Mutheeswaran et al. 2011). The tribal healers of this study had average consensus and both surveys documented the use of *Moringa oleifera*. The use of *Spermocoe hispida* for treating inflammation of the eyes as reported (Conserva and Ferreira 2012). The use of *Aerva lanata* and its constituents like quercetin and betulin for treating urolithiasis was supported with preclinical studies (Dinnimath et al. 2017; Soundararajan et al. 2006). Our previous survey in Virudhunagar district also recorded the use of *Calotropis gigantea* for wheezing (Mutheeswaran et al. 2014); an arabinogalactan was reported from *Andrographis paniculata* with antitussive effect (Nosálová et al. 2014). The uses of *Syzygium cumini* and *Swietenia mahagoni* for

treating diabetes had considerable preclinical evidences (Helmstädter 2008; Sukardiman and Ervina 2020).

## Conclusion

This is a first report from Sathuragiri hills, Western Ghats in Virudhunagar district which quantifies the medicinal plants used by *Paliyars*. The results of our exploration revealed the traditional uses of plants to treat nineteen illness categories; among them, dermatological ailments and bites had high importance. Twelve illness categories like gastrointestinal, musculo-skeletal and pulmonary ailments had average consensus; four illness categories had low consensus. Many of the claims had some scientific support; the use of potentially toxic species like *Aristolochia bracteolata*, *Aristolochia indica*, etc. warrants deeper investigations on their traditional medicinal practices and the local health. This study also documented the endemic and threatened plants used for medicinal purposes by the tribal healers in the study area. This study demonstrates that the traditional remedies need further attention to conserve this knowledge for future generation.

**Authors' contribution** SI and SM conceived the idea, developed the methodology and did overall execution of the study. SM, AM, KR and VP did the field surveys; SM, PE, PP, NAA and MVA did the data processing and manuscript preparation; SI, SM and PP finalized the manuscript.

## Declaration

**Ethical statement** The study protocols have been reviewed by the Institutional Ethics Committee for Ethnobiology, Xavier Research Foundation, St Xavier's College, Palayamkottai-627002, Tamil Nadu, India (IECE-001).

**Conflict of interest** Subramanian Mutheeswaran has no conflict of interest. Antony Mariappan has no conflict of interest. Kamaraj Ravagendran has no conflict of interest. Vedapuri Porchezhiyan has no conflict of interest. Poovan Elankani has no conflict of interest. Naif Abdullah Al-Dhabi has no conflict of interest. Mariadhas Valan Arasu has no conflict of interest. Savarimuthu Ignacimuthu has no conflict of interest.

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