VOLUME 8 ISSUE 1 2022

ISSN 2454-3055

INTERNATIONAL JOURNAL OF ZOOLOGICAL INVESTIGATIONS

Forum for Biological and Environmental Sciences

Published by Saran Publications, India

International Journal of Zoological Investigations Vol. 8, No. 1, 494-509 (2022)

International Journal of Zoological Investigations
Contents available at Journals Home Page: www.ijzi.net
Editor-in-Chief: Prof. Ajai Kumar Srivastav
Published by: Saran Publications, Gorakhpur, India

ISSN: 2454-3055

Species Richness and Therapeutic Diversity of Ethnomedicines of Eastern Ghats, South India

Santhanapandi P., Guruprasad A., Krithika N. and Chittibabu C.V.*

Department of Plant Biology and Plant Biotechnology, Presidency College, Chennai-05, India

**Corresponding Author*

Received: 15th March, 2022; **Accepted:** 20th April, 2022; **Published online:** 30th April, 2022

https://doi.org/10.33745/ijzi.2022.v08i01.057

Abstract: The valayan tribes of Somagiri hills, Eastern Ghats of Tamil Nadu, India were interviewed during January 2020 to November 2021 through a survey instrument to record the details of ethnomedicines currently used by them to cure and manage various human ailments. The informants who had cooperated with the researchers have also revealed the method of drug preparation and the application besides the places of collection in and around the Somagiri hills. The present study has revealed that a total of 107 medicinal plants belonging to 47 angiosperm families and one pteridophyte family are being traditionally used to cure 19 different human ailments. Fabaceae (with 18 plant species) is found topping the list of ethnomedicines of the valayan community. Of the 107 ethnomedicinal plants verified using IUCN Red List, *Chlorophytum borivilianum,* and *Aegle marmelos* gain greater conservation significance owing to their enlistment as Endangered and Near Threatened categories, respectively. Of the different plant parts, leaves were the most widely used plant part which accounted for 41 species, followed by whole plant (36 species) and bark (21 species). The majority of plants species were used for Dermatological diseases (25%), followed by Gastro-intestinal diseases (14%), Poisonous bites (10%), General debility (9%), and Skeleto-Muscular System Disorders (7%). The majority of the ethnomedicinal drug preparation type was in the form of juice from 50% plants. The results confirm that the valayan tribes depended heavily on the medicinal plants of the Somagiri hills inhabited by them for their health care and so, stressing the need for revival of interest in ethnomedicine. Documentation of ethnobotanical knowledge is a valuable effort as it may carry secret solution for cancer and emerging forms of dreadful diseases like COVID-19 and Omicron.

Keywords: Ethnomedicine, Eastern ghats, Fabaceae, Somagiri hills, Valayan tribes

Citation: Santhanapandi P., Guruprasad A., Krithika N. and Chittibabu C.V.: Species richness and therapeutic diversity of ethnomedicines of Eastern Ghats, South India. Intern. J. Zool. Invest. 8(1): 494-509, 2022.
https://doi.org/10.33745/ijzi.2022.v08i01.057

Introduction

The use of medicinal plants to alleviate human diseases has been in vogue since human origin. India inherits the legacy of several ancient herbal systems of medicine, such as, Ayurveda, Siddha, Unani and Homeopathy (Manoharan and Chittibabu, 2019). Nearly 2500 species of plants are used in one way or other by some of these systems. In addition, these traditional systems of medicine are endowed with a vast knowledge of tribal and folk medicines which utilize around 7500 species of medicinal plants called ethnomedicines. The World Health Organization

records that over 80% of the world's population take refuge in the traditional systems of medicine for their primary human health care (Calixto, 2005). During the last few decades, there has been an escalated interest in the research on medicinal plants and in decoding the phytochemistry of ethnomedicines of the world. The affordability and less side effects of ethnomedicines are the reasons for the use by the traditional healers. However, consequent to the overuse of the medicinal plants in the species loss is evident. Also, there is a great danger of traditional knowledge disappearing soon (Maheswari, 1988). Increase in population and the awareness on the side effects of several synthetic drugs have encouraged the usage of traditional medicine in developing countries (Lampert *et al*., 1997). Hence, the current investigation focuses on the ethnomedicines of valayan community inhabiting Somagiri hills in the Eastern Ghats of Tamil Nadu, India, with the objective of compilation of details of the diverse ethnomedicines and their therapeutic uses in curing and managing human diseases by them. Further, the pharmacognosy of the predominant ethnomedicines of the community were analysed from the recorded data obtained during the investigation.

Materials and Methods

Study area:

The study area comprises Somagiri hills (10°.06".71° N, 78°18'10.82" E) located 250 m above mean sea level of Eastern Ghats in Melur Taluk, Madurai District, Tamil Nadu, South India (Fig. 1). The Madurai district receives an annual rainfall of about 600 – 850 mm with temperature variation between 18 and 40 C.It harbours dry evergreen thorn forest on the outskirts of northern part of Madurai and houses a deity locally called 'Somagiri Karuppasamy' at the foot hills. On top of the hills situated is the famous Lord Shiva temple popular for its 'Karthigai Deepam Thiruvila', a grand festival celebrated once a year by almost all the people living in the area. The idol of Lord Karuppasamy, the main deity in the sanctum sanctorum ('moolavar' in Tamil), is in a standing posture with two subordinates namely 'Chinna Karuppu' and 'Periya Karuppu' on either side of the entrance. The weapon of Lord Karuppasamy, 'Arival' (billhook), made up of iron, is worshipped herewith great reverence by the devotees, a tradition which has been inherited since ancient times. *Aegle marmelos* (L.) ex Correa is the 'sthala vriksha' (Sacred temple tree) of this temple and its medicinally important ripe fruits are available in plenty during Karthigai Deepam festival in the Tamil month of Karthigai (October-November).

The Somagiri hills are inhabited by tribal people called 'valayan' community. The 'valayan' community people do not wear any exclusive dresses distinct to a tribal, but clad in regular dhoti and saris similar to people in the plain areas. They construct houses made of mud walls with tile roofs. Brick walled houses with lofts at the top for storing grains are also found. They lead a simple life with almost everyone dependent on agriculture. The 'valaiyans' are good herbalists. Plants are used by them for disease management by different drug formulations, such as, juice extracts, decoctions, pastes, infusions, etc. Food habits of them are characterised by very simple food. Major source of Carbohydrates comes from Ragi ('Keppai'), followed by Rice, Kambu, etc. Further, their food includes other regionally cultivated vegetables and fruits which are naturally available in the surroundings.

Aim of the study:

The present study aimed to identify and document the medicinal plants and their plant parts, methods of drug preparation, etc., used by the traditional healers (valayan community) to treat various human diseases in the Somagiri hills. This is the first study of this area from an ethnobotanical perspective. The traditional knowledge of valayan tribes needs to bring in medicine with adequate research and development on it. The world is gripped with newer forms of viral diseases like COVID-19 and its variant Omicron. The valayan healing practices provide a platform to understand and strengthen

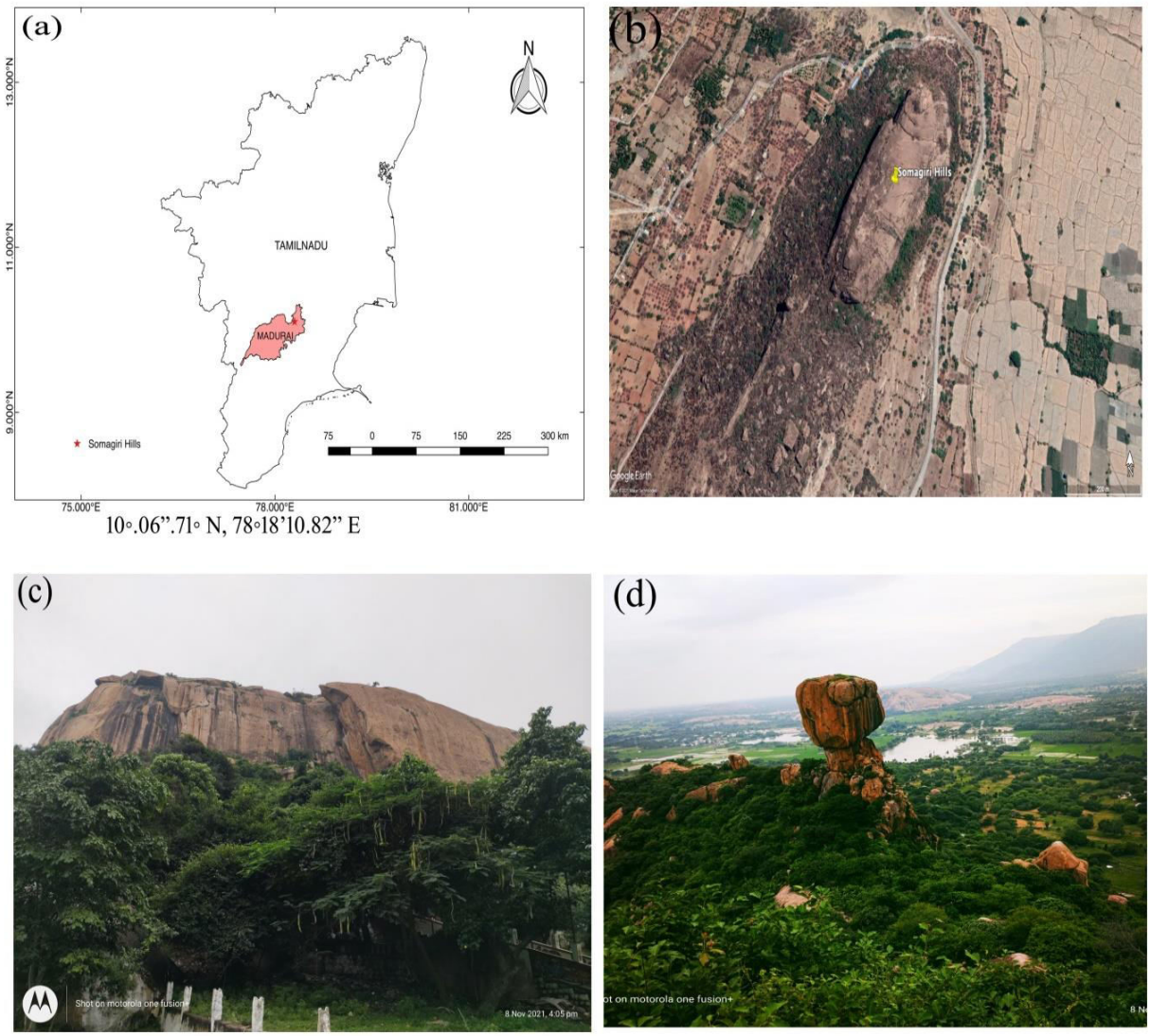

Fig. 1: The Study area map (a), aerial view (b) and front views (c and d) of Somagiri hills of Eastern Ghats, South India.

the traditional medicines and practices, which focus on disease cure as well as control.

Data collection and analysis:

Ethnobotanical data were collected according to the methodology suggested by Jain (2001). A structured questionnaire was used to collect data. An interview and interaction with the eight elderly and experienced individuals practicing indigenous medicines helped in eliciting the data. The medicinal plants used by the practitioners were photographed with GPS data using android mobile phone. The voucher specimens of the medicinal plants were collected for the preparation of herbarium and were identified through pertinent floras (Matthew, 1981, 1995; Nair and Henry, 1983; Henry *et al*., 1987). Scientific names of the medicinal plant species were also corroborated with the online source like http://www.theplantlist.org and http://www.tropicos.org. Information on medicinal plants, local name, life form, plant part(s) used, method of preparation, mode of drug administration, reported risk if any and human illness treated were all recorded from the informants and the data were analysed using

Microsoft excel (Version 2007). The IUCN Red List criteria for all the plant species were investigated using www.iucnredlist.org (Version 3.2) for understanding their significance in conservation. The diseases cured or managed by the informants were categorized (Ranjithkumar *et al.*, 2014) and analysed.

Results and Discussion

Species richness of ethnomedicines:

The study revealed a high level of unity among the healers on traditional knowledge of medicinal plants within the valayan tribes. The results of this study showed that a large number of medicinal plants are traditionally used by the tribal community of Somagiri hills for the treatment of different diseases and health disorders of humans. A total of 107 medicinal plants belonging to 48 families are traditionally used by the valayan tribe over ages. The 107 plant species encountered are tabulated alphabetically by their botanical name, family name in parentheses, followed by vernacular names in Tamil, and, part(s) used, mode of preparation and the type of drug administration (Table 1). Fabaceae (with 18 plant species) was found topping the total 48 plant families contributing to the 107 medicinal plants of the valayan community. This was followed by Apocynaceae and Euphorbiaceae (8 plants each), Lamiaceae (6 plants), Malvaceae (4 plants), and Acanthaceae, Asparagaceae, Rhamnaceae, Rubiaceae (3 plants each). Whereas, Amaranthaceae, Arecaceae, Aristolochiaceae, Asteraceae, Bignoniaceae, Boraginaceae, Molluginaceae, Moraceae, Phyllanthaceae, Poaceae, Rutaceae and Sapindaceae contributed two (2) medicinal plants each. Rest of the 27 families contributed only one (1) medicinal plant each for the ethnomedicines (Fig. 2). Interestingly, it is noted that 106 medicinal plants are angiosperms and one (1) pteridophyte (*Actinopteris radiata* (Sw.) Link). Of these 106 medicinal plants 98 plants belong to 42 families of dicotyledons as detailed above, whereas eight (8) plants belong to five (5) families of monocotyledons: three (3) from Asparagaceae; two (2) from Poaceae; and one (1) each from Arecaceae, Commelinaceae, and Colchicaceae. The life forms of medicinal plants were categorized as herbs (40%), trees (35%), both climbers and shrubs (11% each), and small trees (3%)(Fig.3).

The analysis on the current status of the medicinal plants used by the informants of the Somagiri hills of Eastern Ghats of revealed the following. Of the 107 ethnomedicinal plants verified using IUCN Red List, *Chlorophytum borivilianum* Santapau & R.R. Fern (Asparagaceae), and *Aegle marmelos* (L.) Corrêa (Rutaceae) gain greater significance owing to their enlistment as Critically Endangered and Near Threatened, respectively. The diminishing population of these two plants qualify them to be placed under criterion A2cd and A2acd of IUCN List, and calls for more attention on them with regard to their conservation.

The ethnomedicinal plants collected during the study were analysed for their plant part(s) or whole plants being used in the ethnomedicines by the practitioners. At times, the plant parts of one or more species were found used in combination as drug (Table 1). The different plant parts used in the ethnomedicines include leaves, barks, fruits, rhizomes, roots, seeds, stem and flowers. Of them, the leaves were found prominently used by the valayan communities for ethnomedicines. A total of 41 plant species (31 %) were used for their leaves in the ethnomedicines, followed by whole plants (27 %), barks (16 %), fruits (9.0 %), stem and latex (5.0 %), roots and flowers (2.0 %), and tubers and gum (1.0%) (Fig. 4). As the plant parts used by these communities differed from plant to plant, herbal medicines prescribed by the tribal healers were also found varying, from single drug preparation to polyherbal preparations of two to many drugs. Based on their drug type, it is found that the juice form of drug is the highest (50%), followed by paste (29%), decoction (16%), raw edible parts (4%), and ash (1%)(Fig. 5).

Therapeutic diversity of ethnomedicines:

Ethnomedicinal plants used by the valayan tribals

Table 1: Details of medicinal plants used by Valayan tribes of Somagiri hills, Eastern Ghats, South India

S. No.	Botanical Name (Family)/IUCN Category	Vernacular Name	LF	Parts Used	Medicinal use	Drug type	Preparation Type
1	*Abrus precatorius* L. (Fabaceae)	Kundumani	C	Seed and Leaf	Nerve disorders, body pain, cold, diarrhoea, and fever and hair fall disease	Internal	Paste and Juice
2	*Acacia caesia* (L.) Willd. (Fabaceae)/ LC	Indu	T	Bark and Leaf	Blood disease and fever, Could and cough	Internal	Decoction
3	*Acacia horrida* (L.) Willd. (Fabaceae)	Karuvelam	T	Leaves and Gum	Sexual disorders, piles, blood disease	Internal	Decoction
4	*Acacia leucophloea* (Roxb.) Willd. (Fabaceae)/ LC	Parambai	T	Bark	Diabetes, poisonous bites and tooth ache	Internal	Juice
5	*Acalypha alnifolia* Klein ex Willd. (Euphorbiaceae)	Sinni	S	Leaf	Skin disease	External	Paste
6	*Acalypha fruticosa* Forssk. (Euphorbiaceae)/ LC	SiruSinni	S	Leaf	Skin disease and Insect bites	External	Paste
7	*Achyranthes aspera* L. (Amaranthaceae)	Nayuruvi	H	Whole plant	Poisonous bites, Dental problems	Internal	Juice
8	*Actiniopteris radiate* (Sw.) Link (Pteridaceae)	Mailsikai	H	whole plant	Leucorrhoea, rickets, Piles, Vomiting, diarrhoea, Menses, Paediatric disease	Internal	Juice
9	*Aeglemar melos* (L.) Corrêa (Rutaceae)/ NT	Vilvam	T	Fruit	Skin disease	External	Paste
10	*Aerva lanata* (L.) Juss. (Amaranthaceae)	Sirukanpeelai	H	Whole plant	Poisonous bites and Kidney disease	Internal	Juice
11	*Ailanthus excelsa*Roxb. (Simaroubaceae)	Vatthikuchi Maram	T	Bark	Diarrhoea and dysentery	Internal	Decoction
12	*Alangiums alviifolium* (L.f.) Wangerin. (Cornaceae)/ LC	Alinjil	T	Bark and Fruit	Fever, Vomiting, poisonous bites	Internal	Decoction and Raw Edible
13	*Albizia amara*(Roxb.) Boivin (Fabaceae)/ LC	usilai	T	Bark	Body heat	Internal	Decoction

14	*Albizia lebbeck* (L.) Benth. (Fabaceae)/ LC	Vagai	T	Bark	Dysentery and Diarrhoea	Internal	Decoction
15	*Alysicarpus monilifer* (L.) DC. (Fabaceae)	Panappul & Kasukatti	H	Whole Plant	Jaundice	Internal	Juice
16	*Andrographis echioides* (L.) Nees (Acanthaceae)	Kopuramthangi	H	Whole Plant	Poisonous bites and eczema	Internal	Juice
17	*Anisochilus carnosus* (L.f.) Wall. (Lamiaceae)	Karpuravalli	H	Whole Plant	Could and cough	Internal	Juice
18	*Anisomeles malabarica* (L.) R.Br. ex Sims. (Lamiaceae)	Peimiratti	H	Leaf	Itching and skin disease	Internal	Juice
19	*Annona squamosal* L. (Annonaceae)/ LC	Seethapala	T	Fruit and Bark	Body heat, Anaemia and abdominal diseases	Internal	Juice and Raw Edible
20	*Aristolochia bracteata* Retz. (Aristolochiaceae)	Aduthinnapalai	H	Whole Plant	Snake bite (Cobra) and skin disease	Internal/ External	Paste and Juice
21	*Aristolochia indica* L. (Aristolochiaceae)	Karudakodi	C	Whole Plant	Poisonous bite and Skin disease	Internal	Juice
22	*Asparagus racemosus* Willd. (Asparagaceae)	Thannervittan Kizangu	C	Tuber	Sexual disorders and wounds	Internal	Decoction and Raw Edible
23	*Atalantia monophylla* DC. (Rutaceae)	Kattunaragam, katuelumbitchai	T	Bark	Skin disease and diarrhoea	Internal/ External	Ash and Decoction
24	*Azadiracha indica* A.Juss. (Meliaceae)/ LC	Vembu	T	Whole plant	Abdominal infection and wound infections, body heat, dental problem	Internal	Juice
25	*Azima tetracantha* Lam. (Salvadoraceae)/ LC	Mulsangu	S	Leaf	Paediatric for strength	Internal	Juice
26	*Barleria prionitis* L. (Acanthaceae)/ LC	Semmulli	S	Leaf	Itching and skin disease	Internal	Juice
27	*Bauhinia racemosa* Lam. (Fabaceae)	Aaththi	T	Bark	Ulcer and wounds, diarrhoea	Internal/ External	Paste and Juice

28	*Borassus flabellifer* L. (Arecaceae)	Panai	T	Whole Plant	pimple and Wounds	Internal	Juice
29	*Cadaba trifoliata* Wight &Arn. (Capparaceae)	Manudukkuru-ndu	T	Bark	Dysentery, diarrhoea and skin disease	Internal	Decoction
30	*Calotropis gigantean* (L.) Dryand. (Apocynaceae)	Erukku	S T	Leaf	Joint Pains and skin Infections	External	Paste
31	*Caralluma diffusa* (Wight) N.E.Br. (Asclepiadoideae)	SiruKalli	S	Stem	Body cooling	Internal	Juice
32	*Cardiospermum halicacabum* L. (Sapindaceae)/ LC	Mudakkathan Kodi	C	Leaf	Joint Pain	Internal	Juice
33	*Cassia auriculata* L. (Fabaceae)	Aavaram	S	Leaf, Flower	Diabetes and body cooling, heart disease	Internal	Juice
34	*Cassia montana* Náves ex Fern.-Vill. (Caesalpinioideae)	Kondrai	T	Flower and Leaf	jaundice	Internal	Decoction
35	*Cassia roxburghii* DC. (Fabaceae)	Senkondrai	T	Leaf and Bark	headache, Skin disease, kidney disease	Internal	Juice
36	*Catunaregam spinosa* (Thunb.) Tirveng. (Rubiaceae)	Madukarei	S T	Bark	Dysentery and diarrhoea	Internal	Decoction
37	*Chlorophytum borivilianum* Santapau&R.R.Fern. (Asparagaceae)/ CR	Tiravamticham	H	Whole Plant	Health tonic	Internal	Juice
38	*Chromolaena odorata* (L.) R.M.King&H.Rob. (Asteraceae)	Pachilai	S	Leaf	Skin disease	External	Paste
39	*Cissus quadrangularis* L. (Vitaceae)	Pirandai	C	Whole Plant	Joint Pain	External	Paste and Juice
40	*Clerodendrum inerme* (L.) Gaertn. (Lamiaceae)	Pinari Sangukuppi	S	Leaf	Fertility level and strength	Internal	Juice
41	*Croton bonplandianus* Baill. (Euphorbiaceae)	Siru Kolunji	H	Whole Plant	Kidney disease and skin disease	Internal/ External	Juice
42	*Cyanotis axillaris* (L.) D.Don ex Sweet.	Valukkaipul	S T	Whole Plant	Skin disease	External	Paste

	(Commelinaceae)/ LC						
43	*Cymbopogon citratus* (DC.) Stapf (Poaceae)	Karpurapullu	H	Whole Plant	Wounds and cuts	External	Paste
44	*Cymbopogon schoenanthus* (L.) Spreng. (Poaceae)	Elumbichampul	H	Whole Plant	Digestive problem	Internal	Juice
45	*Datura metal* L. (Solanaceae)	Karuoomathai	H	Leaf	Mouth freshener and cure mouth ulcer	Internal	Decoction
46	*Delonix elata* (L.) Gamble (Leguminosae)/ LC	Vathanarayanan	T	Bark and Leaf	Digestive problem, vomiting	Internal/ External	Paste and Juice
47	*Derris scandens* (Roxb.) Benth. (Fabaceae)/ LC	Seenikkodi, Athiral, thirudankodi	S	whole Plant	Digestive problem, vomiting	Internal	Juice
48	*Dichrostachys cinerea* (L.) Wight &Arn. (Fabaceae)/ LC	Vidathari	T	Whole Plant	Eye infection and wounds	Internal	Juice
49	*Diospyros cordifolia* Roxb. (Ebenaceae)	Seenthil	C	Whole Plant	Joint pain and bone crack disease	Internal	Juice and Decoction
50	*Dodonaea viscosa* (L.) Jacq. (Sapindaceae)/ LC	Virali	S	Leavs	Joint pains	External	Paste
51	*Ehretia microphylla* Lam. (Boraginaceae)	Kuruvipalam	T	Fruit	Body strength and eye wound	Internal	Juice
52	*Euphorbia antiquorum* L. (Euphorbiaceae)	Sadurakalli	S	Stem	Skin disease, poisonous bites, increase sexual activity	Internal	Juice
53	*Euphorbia cyathophora* Murray (Euphorbiaceae)	Thithili poo	H	Stem	Body pain and joint pain	External	Decoction
54	*Euphorbia hirta* L. (Euphorbiaceae)	Amman pacharisi	H	Whole Plant	abdominal disease	Internal	Edible Raw
55	*Ficus benghalensis* L. (Moraceae)	Alamaram	T	Bark and Leaves	Bone fracture and joint pain	External	Paste
56	*Ficus religiosa* L. (Moraceae)	Arasamaram	T	Bark	Fever	Internal	Juice
57	*Furcraea foetida* (L.) Haw. (Asparagaceae)	Sirupoonaikali	S	Leaf	Mothers milk stimulating and crack heel, pimples	Internal	Juice

58	*Commiphora mukul* (Hook. Ex Stocks) Engl. (Burseraceae)	Guglu	T	Gum	Sexual hormone and Skin disease	Internal/ External	Paste and Juice
59	*Gloriosa superba* L. (Colchicaceae)/ LC	Senkanthal Malar	H	Whole Plant	Dog bites	External	Paste
60	Cocos *nucifera* L.(Arecaceae)	Thennaimaram	T	Fruit	poisonous bites	Internal	Juice
61	*Hemidesmus indicus* (L.) R. Br. ex Schult. (Apocynaceae)	Nannari	H	Root	Snake bite and Piles, skin disease	External	Paste
62	*Hibiscus micranthus* L.f. (Malvaceae)	Siddha mutti	H	Whole Plant	Body heat	Internal	Juice
63	*Hippocratea obtusifolia* Roxb. (Celastraceae)	Puramkodi	C	Leaf	Skin disease and wound infections	External	Paste
64	*Hybanthus enneaspermus* (L.) F.Muell. (Violaceae)	Orithalthamarai	H	Root	Skin disease	External	Paste
65	*Ichnocarpus frutescens* (L.) W.T.Aiton (Apocynaceae)	Udargodi, palvalli, Manipilankodi	C	Whole Plant	Sexual problems	Internal	Juice
66	*Indigofera aspalathoides* DC. (Fabaceae)	Sivanar Vembu	H	Root	Diabetes	Internal	Juice
67	Jasminum sps. (Oleaceae)	Malligai	T	Leaf	Snake bite	Internal	Juice
68	*Jatropha gossypiifolia* L. (Euphorbiaceae)/ LC	Khattu Amanakku	S	Stem and latex	Wounds and cuts	External	Paste
69	*Justicia tranquebariensis* L.f. (Acanthaceae)	Thavasu Murungai	S	Leaves	mouth ulcer and skin disease	External	Paste
70	*Leucas aspera* (Willd.) Link (Lamiaceae)	Thumbai	H	Leaves	Could and cough	Internal	Juice
71	*Loranthus falcatus*L.f. (Loranthaceae)	Pulluruvi	H	Whole Plant	Skin disease and psoriasis	Internal/ External	Paste and Juice
72	*Millingtonia hortensis* L.f. (Bignoniaceae)	Kattumalli	T	Bark	Skin disease and urinal disorders	Internal	Decoction
73	*Mimosa pudica* L. (Fabaceae)/ LC	Thottalsinungi	H	Whole Plant	Fever, malaria	Internal	Decoction

74	*Mollugo nudicaulis* Lam. (Molluginaceae)	Kuttuthirai	H	Leaf	Kidney disease	Internal	Juice
75	*Mollugo pentaphylla* L. (Molluginaceae)	Parpadagapul	H	Whole Plant	Jaundice and cough	Internal	Juice
76	*Morinda tinctoria* Roxb. (Rubiaceae)	Manjanathi	T	Fruit	Skin disease and diabetes	Internal	Juice
77	*Ocimum sanctum* L. (Lamiaceae)	Thulasi	H	Whole Plant	Piles and abdominal disease	Internal	Juice
78	*Oxystelma esculentum* (L. f.) Sm. (Apocynaceae)/ LC	Oosipalai	C	Whole Plant	Could and cough, skin disease	Internal	Juice
79	*Pavonia odorata* Willd. (Malvaceae)	Peramutti	H	Whole Plant	Body heat and urinal disorders	Internal	Juice
80	*Pedalium murex* L. (Pedaliaceae)	Yanai Nerunjil	H	Leaves	Kidney disease, Fever, dizziness	Internal	Juice
81	*Pergularia daemia* (Forssk.) Chiov. (Apocynaceae)/ LC	Veliparuthi	C	Whole Plant	Joint pain and Skin disease	Internal/ External	Paste and Juice
82	*Phyllanthus amarus* Schumach. &Thonn. (Phyllanthaceae)	Kilanelli	H	Whole Plant	Periods pain and Skin disease and swelling, gastric problems	Internal	Juice
83	*Phyllanthus reticulatus* Poir. (Phyllanthaceae)/ LC	Karumpoolac -hedi	H	Stem and Leaves	Jaundice and urinal disease	Internal	Juice
84	*Pongamia pinnata* (L.) Pierre (Fabaceae)/ LC	Pungaimaram	T	Leaves	Gastric problem	External	Paste
85	*Pouzolzia zeylanica* (L.) Benn. (Urticaceae)/ LC	Neerchinni	H	Leaves	Skin disease, eczema	External	Paste
86	*Prosopis juliflora* (Sw.) DC. (Fabaceae)	Seemai Karuvelam	T	Leaves	Skin disease, poisonous bites	External	Paste
87	*Secamone emetic* (Retz.) R. Br. ex Schult. (Apocynaceae)	Nilamarandai Kodi	C	Whole Plant	Swelling and infections	External	Paste
88	*Sida acuta* Burm.f. (Malvaceae)	Arivalmanai Poondu	H	Leaves	Dysentery and Fever, Headache	Internal	Juice
89	*Sida cordifolia* L. (Malvaceae)	Siddha mutti	H	Whole Plant	Insect bite and Skin disease	External	Paste

90	*Spermacoce hispida* L. (Rubiaceae)	Natthaisoori	H	Whole Plant	Skin disease and Insect bites, Poisonous bites	Internal	Juice
91	*Stachytarpheta* sp. (Verbenaceae)	Seemai Nayuruvi	H	Whole plant	Menstrual pain and Skin disease and increase sperm count	Internal	Juice
92	*Tamarindus indica* L. (Fabaceae)/ LC	Puliyamaram	T	Leaves and Fruit	Skin disease and Poisonous bites	Internal/ External	Paste and Juice
93	*Tecoma stans* (L.) Juss. ex Kunth (Bignoniaceae)/ LC	Nagasambagam, Sornapatti	T	Bark	Body heat and Lung disease	Internal	Juice
94	*Tectona grandis* L.f. (Lamiaceae)	Thekku	T	Bark	Urinal disease and Skin disease	Internal	Decoction
95	*Tephrosia purpurea* (L.) Pers. (Fabaceae)	Kolunji	H	Whole Plant, Latex	Diarrhoea	Internal	Decoction
96	*Thevetia peruviana* (pers) K.Schum (Appocynaceae)	Manjalarali	T	Fruit	Diarrhoea and wounds cuts	External	Paste
97	*Tiliacora acuminate* (Lam.) Miers (Menispermaceae)	Perum Kattukodi	C	Leaf	Infection and Skin disease	External	Paste
98	*Tragia involucrate* L. (Euphorbiaceae)	Kanjori	H	Leaf	Body heat	Internal	Juice
99	*Tribulus terrestris* L. (Zygophyllaceae)/ LC	Nerunjil	H	Leaf and Fruit	Skin disease	External	Paste
100	*Trichodesma indica* R.Br. (Boraginaceae)	Kavilthumbai	H	Whole Plant	Joint Pains	Internal/ External	Paste and Juice
101	*Triumfetta rhomboidea* Jacq. (Tiliaceae)	Adaiyotti	H	Whole plant	Joint pain, swellings	Internal	Juice
102	*Ulmus integrifolia* Roxb. (Ulmaceae)	Aavimaram	T	Leaf	Blood disease, Abdominal wounds	Internal	Juice
103	*Wrightia tinctoria* R.Br. (Apocynaceae)	Veppalai	T	Leaf and Latex	Piles	External	Paste
104	*Xanthium strumarium* L. (Asteraceae)	Maruloomathai	H	Leaf and Fruit	Weight loss and Skin disease	Internal/ External	Paste and Juice
105	*Ziziphus oenoplia* (L.) Mill.	Sooraimullu	S	Fruit	infections in eyes and	External	Paste

	(Rhamnaceae)				wounds		
106	*Ziziphus xylopyrus* (Retz.) Willd. (Rhamnaceae)	Kottaillanthai	T	Bark	mouth freshener and cure mouth ulcer, diabetes	Internal	Edible Raw
107	*Ziziphus montana* W.W. Sm. (Rhamnaceae) / LC	Malaillanthai	T	Bark	diarrhoea	Internal	Decoction

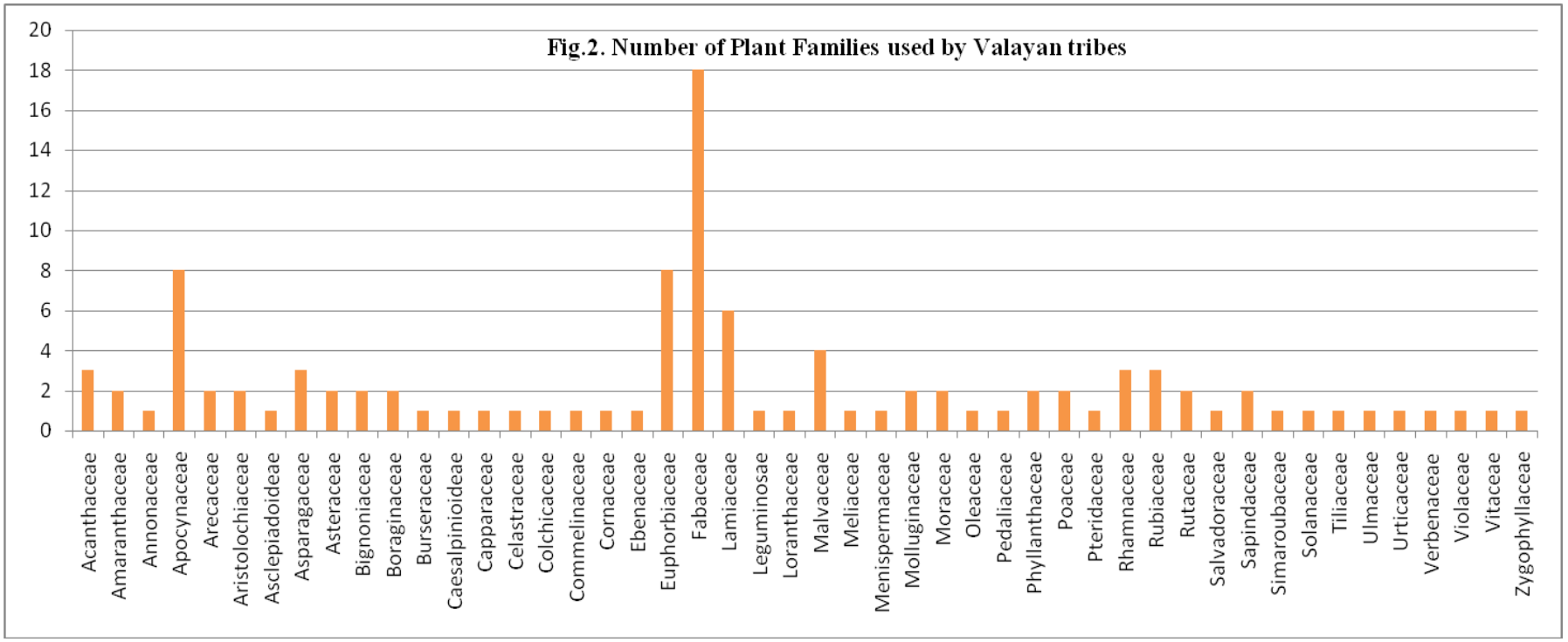

Fig. 2: The plant families of ethnomedicines used by valayan tribes in Somagiri hills, Eastern Ghats, South India.

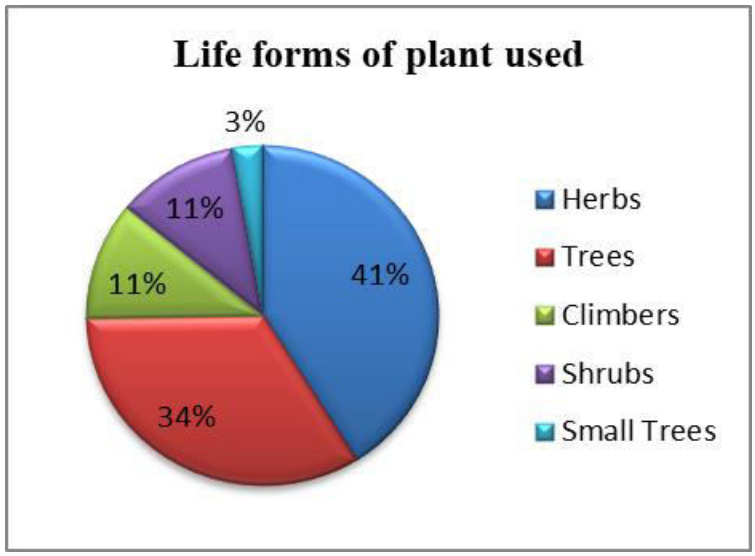

Fig. 3: Life form of plants used as ethnomedicines by valayan tribes.

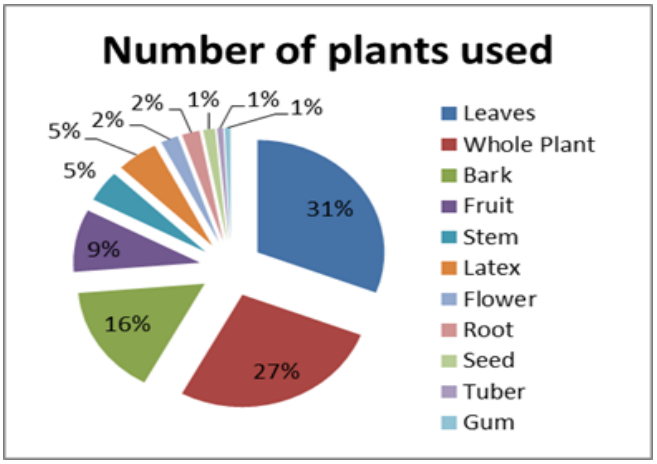

Fig.4: Plant parts used for treatment of various human diseases.

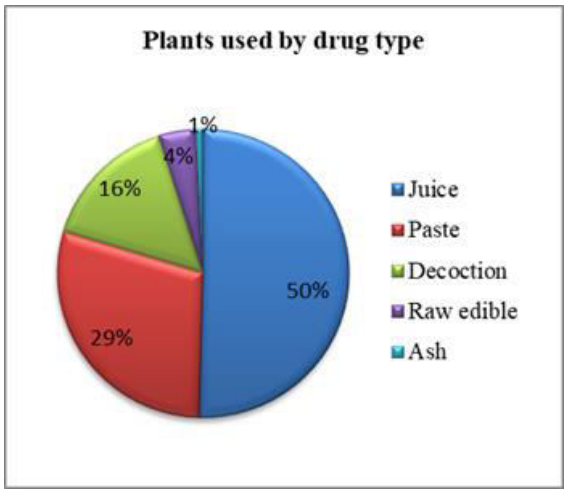

Fig. 5: Drug categories and their contribution (%) in the overall ethnomedicines of valayan tribes.

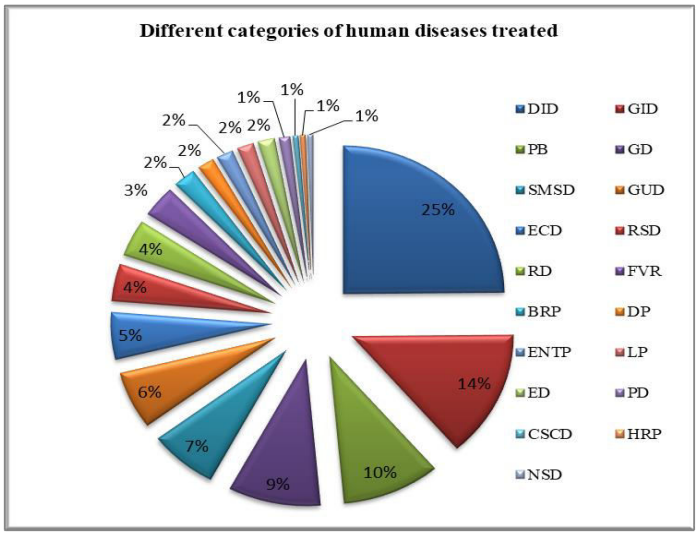

Fig. 6: Major Diseases cured through Ethnomedicinal plants of valayan tribes in Somagiri hills.

were classified based on Ranjithkumar *et al.* (2014). A total of 19 different categories of human diseases and the contribution of medicinal plants to each of them are presented in Table 2. The maximum number of medicinal plants were found used to cure Dermatological Infections/ Diseases (DID)(25%), followed by Gastro-intestinal diseases (GID) (14%), Poisonous Bites (PB) (10%),General Debility (GD) (9%), Skeleto-Muscular System Disorders (SMSD)(7%), Genito-Urinary Diseases (GUD)(6%), and Endocrinal Disorders (ECD)(5%). The Respiratory Systems Diseases (RSD) and Reproductive Disorders (RD) were each cured by using four (4%) per cent of the medicinal plants recorded in the study. Whereas, Fever (Fvr) 3%, Blood Related Problems (BRP), Dental Problems (DP), Ear, Nose, Throat problems (ENTP), Liver Problems (LP) and Eye Disease (ED) were treated with two (2%) per cent species each, and while only one species each was known to be used to treat various Paediatric disease (PD), Circulatory System/Cardiovascular Diseases (CSCD),Hair Related Problems (HRP), and Nervous System Disease (NSD) (Table 2; Fig 6). A great number (19) of disease categories cured by valayan tribes indicate rich therapeutic diversity and inherent potential of the ethnomedicines used by them. Also, 39% of the medicinal plants are being in treatment strategy of the dermatological and gastro-intestinal problems imply the prevalence of the diseases and the hidden traditional knowledge towards them in the region which may be explored in further research. The pharmacognosy, *in vitro* and *in silico* studies on the dominant medicinal and unique medicinal plant species will help in new drug discovery to combat dreadful diseases like cancer and novel diseases like corona.

Conclusion

Traditional medicines and the healing systems of the ethnic people in the hills across the world played a vital role in the modern healthcare system. The current study focused on bringing it to light the important elements of the traditional medicines and the healing practices among the valayan community of Eastern Ghats, south India. This study provided the details of the traditional knowledge of valayan tribes, the elaborate procedures followed by them for treating diseases which include the use of minerals along with the herbals in the cure of 19 different categories of diseases such as pneumonia, migraine, fevers, skin infections, dog bites and snakebites, jaundice, infertility, malnutrition, leucorrhoea, diarrhoea, etc. It is found that the traditional valayan healers use the medicinal plants as a fresh produce from the study area and avoid long term storage of medicinal plants in dried form or in preserved conditions which resulted in better therapeutic values. The study on the diversity status of the

Table 2: The total 19 different categories of human diseases cured or managed by valayan tribes using the medicinal plants contribution to each category of disease

S. No.	Disease category	Biomedical terms	No. of plants used	Relative
1	Dermatological Infections/ Diseases (DID)	Foot infection Burns, inflammations, Skin irritation, Skin Allergy, Nail infection, Scalp increases, Skin infection, Bruises, Mouth Wound and Wounds.	43	40.2%
2	Gastro-Intestinal Diseases (GID)	Dysentery, Diarrhoea, Gastric complaints, Indigestion, Constipation Parasites, Intestinal worms, ulcer, dysmenorrhoea and Stomach ache.	24	22.4%
3	Poisonous Bites (PB)	Poison bites, Scorpion sting and Snake bite	17	15.9%
4	General Debility (GD)	Body refreshment, Body strength, Body Cooling Depression and Disease resistant	16	14.9%
5	Skeleto-Muscular System Disorders (SMSD)	Body pain, Pain relief, Headache, Migraine, Joint pain, Bone setter, Bone joints, Fracture, Blisters and Swellings	12	11.2%
6	Genito-Urinary Diseases (GUD)	Abortion, Hydrocele, Diuretic, Kidney disorders, Bleeding disorder Over bleeding for Woman and Menstrual problems	11	10.3%
7	Endocrinal Disorders (ECD)	Diabetes	9	8.4%
8	Respiratory Systems Diseases (RSD)	Asthma, Cold and Cough	7	6.5%
9	Reproductive Disorders (RD)	Improve fertility and stimulation	7	6.5%
10	Fever (Fvr)	Fever, Malaria	6	5.6%
11	Blood Related Problems (BRP)	Blood Sugar, Blood Pressure and Blood Production	4	3.7%
12	Dental Problems (DP)	Toothache	3	2.8%
13	Ear, Nose, Throat problems (ENTP)	Ear, Nose, Throat pain / infections and Throat pain	3	2.8%
14	Liver Problems (LP)	Jaundice	3	2.8%
15	Eye Disease (ED)	Eye infections and wounds	3	2.8%
16	Paediatric disease (PD)	Infant disease and Paediatric	2	1.8%
17	Circulatory System/Cardiovascular Diseases (CSCD)	Heart strength and Memory powder	1	0.9%
18	Hair Related Problems (HRP)	Greying of hair, Hair growth and Hair loss	1	0.9%
19	Nerves System Disease (NSD)	Nerve problems, varicose veins	1	0.9%

medicinal plants exhibited threat to their posterity and requires conservation strategy. The valuable knowledge of the local healers documented in the present study will be of use as a source for the pharmacists in the new drug discovery for the diseases like COVID-19 and Omicron also.

Acknowledgements

We thank the eight informants of the valayan tribes of Madurai District who have readily shared their knowledge besides preserving the traditional knowledge of herbal treatments for the wellbeing of mankind.

References

Calixto JB. (2005) Twenty five years of research on medicinal plants in Latin America: a personal view. J Ethnopharmocol. 100(1-2): 131-134.

Henry AN, Kumari GR and Chitra V. (1987). Flora of Tamil Nadu India. Series 1: Analysis. Vol. 2, Botanical Survey of India, Coimbatore.

Jain SK. (2001) Dictionary of Indian folk medicine and Ethnobotany. Deep Publications, New Delhi, pp. 311.

Lampert J, Srivastava J and Vietmeyer N. (1997) Medicinal Plants: Rescuing a Global Heritage. The World Bank, Washinton, DC, 61. Pp. 54-342.

Manoharan A and ChittiBabu CV. (2019). Hypolipidaemic activity of the siddha medicinal plants. Indian J Pharmacognosy 2(4): 145-154.

Matthew KM. (1981) The Flora of the Tamil Nadu Carnatic. The Rapinat herbarium, St Joseph's College, Tiruchirapalli, Tamil Nadu, India, pp. 2154.

Matthew KM. (1995) An excursion flora of central Tamilnadu, India. CRC Press, pp. 682.

Nair NC and Henry AN. (1983) Flora of Tamil Nadu, India. Indian Series 1 Analysis, Botanical Survey of India, Coimbatore.

Ranjithkumar A, Chittibabu CV and Renu G. (2014) Ethnobotanical investigation on the Malayali tribes in Javadhu hills, Eastern ghats, South India. Indian J Med Healthcare 3(1): 322-332.

Rasingam L. (2012) Ethnobotanical studies on the wild edible plants of Irula tribes of Pillur Valley, Coimbatore district, Tamil Nadu, India. Asian Pacific J Tropical Biomed. 2(3): 1493-1497.