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Integration of Ethnobotany and Diversity of Medicinal Plants in Manar Beat, Karamadai Range of the Western Ghats, India

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***Abstract*:** The present study was carried out among the inhabitants of "Irulas", a tribe settled in the Manar beat of Karamadai Range, the Western Ghats, to make a documentary on the medicinal plants with quantitative scrutiny for the treatment of various human ailments. Systematic and exhaustive field survey was carried out over two years. Acquired data were analyzed by using Use Value (UV), Informant Consensus Factor (ICF) and Fidelity Level (FL). In total, 252 plant species representing 191 genera belonging to 76 families were identified and addressed by the tribe under 13 major disease categories. Euphorbiaceae was one of the wide-spread family, including 7.5% (19 species). Leaves were the most frequently used plant parts and most of the medicines were prepared in the form of decoction (62%). Among all, *Capparis grandiflora* was reported with UV of 0.96 and skeleto-muscular system disorders have the highest ICF of 0.76. The high FL (100%) was for 12 species. This study documents eight plant species recorded for therapeutic use in the Karamadai range for the first time. The present study is the first quantitative survey with the traditional use of medicinal plants in this region, also will help in the conservation of this invaluable inheritance. Plants with the highest use values in the study are suggested to take-up pharmacological activities in the future that result in the development of potential drugs to treat various ailments.

***Keywords*:** Western ghats, Medicinal plants, Irula tribe, Use value, Fidelity level, Informant consensus factor

Plant resources are considered an integral part of human societies used by diverse cultural groups for thousands of years to foster well-being and are the natural remedies in antiquity by people worldwide, and the use of herbal medicines remains the predominant form of healthcare services (Bussmann et al 2018, Kigen et al 2019). The vegetation in the Indian sub-continent is distributed chiefly in the Himalayas, Western and Eastern Ghats (Revathi et al 2013). Approximately 3,500 species of medicinal plants from India have their therapeutic importance and many of them are still used by several tribal communities, especially for their first aid (Venkatachalapathi et al 2018). Besides, other factors such as deforestation, over-exploitation of natural resources, overgrazing, habitat destruction, fragmentation, and agricultural land expansion, heavily threatened the traditional medicinal plant resource and the associated indigenous knowledge (Assen et al 2021). As such, this is a timely effort to document, promote and conserve the tradition of the country's medicinal plant lore. Such documents are essential to define and maintain the cultural identity of the people. Ethnobotanists responsible for documenting complete information on plants and their medicinal uses.

According to WHO 70 to 90 percent of the world's population, particularly in developing countries, use medicinal plants for their health care. Irulas, one of India's 615 tribal communities, inhabit different topographic habitats in Tamil Nadu (plains, mountains, valleys, etc.). They are the second-largest tribal community in Tamil Nadu. The Irulas are not living on the hills but depend on the forest for their traditional activities (Senthilkumar et al 2018). The primary aim of this research was to evaluate the richness of the ethnomedicinal plant species used by the Irulas in Manar beat through quantitative analysis and to undertake an ethnobiological assessment of the socio-cultural background and medical understanding of diseases treated by traditional healers of the Irulas through quantitative ethnobotanical methods.

MATERIAL AND METHODS

Study area and the tribal people: Karamadai range is a reserve forest that comprises five beats: Velliangadu East beat, Velliangadu West beat, Nellimarathur beat, Pillur beat, and Manar beat. The present study was undertaken in the Manar beat in the Coimbatore District of Tamil Nadu, South India. It has a surface area of 22.7971 km^2 between the elevations about 442m above mean sea level. The geographical location of the study area is 11° 18' N and 76° 53" E. The natural vegetation in this study area represents biomes, ranging from moist deciduous forest, dry deciduous forest, scrub jungle and riparian vegetation. The temperature

of the study area is scarcely fluctuating from year to year. The maximum mean daily temperature is 37°C during summer and the minimum mean daily temperature is 15°C during winter. The annual average rainfall is 651.6 mm while the maximum rainfall was recorded from October to November during the northeast monsoon. Karamadai reserve forest is a part of the Western Ghats which is highly valued by botanists and ornithologists who have been overviewed by a wide variety of endemic flora and fauna. Irulas, a forest-dwelling tribal community, dispersed in and around the Manar beat of Coimbatore District. An exhaustive ethnobotanical survey was carried out from May 2018 to April 2020. Field visits were made fortnightly in all seasons. A total of 74 informants (43 males and 31 females) comprise different strata of participants. Selected informants ranged between 20-80 years were questioned by the community for further inquiry. Among them, 9% were above 70-80 years old, whereas 30% were between 40-50 and 14% were younger than 30. A questionnaire was designed to deal with the following ethnomedicinal uses for the plant such as parts of the plant used, medicinal uses, and preparation methods. The social biodata for each participant, such as gender, age, class, educational background, and occupation. During the investigation, two interview methods were also conducted. The 'Specimen display' method is initially used (Upadhyay et al 2010). Plant species were shown to traditional healers to elicit medicinal information. The same plant was shown to individual healers to verify the accuracy of the results. The field data sheet was prepared and used for documentation. The second method was a stroll through the forest with the healers to identify plants and gather detailed information. The plants were first identified by their local names in consultation with the tribal people. Hence, they gained knowledge from their ancestral treatment procedures. Further, the scientific identification of plants was confirmed by a taxonomist.

Plant identification and preservation: The collected plant species were thoroughly checked on authentic websites for correct nomenclature (www.plantlist.org) and compared with IUCN Red List to identify their status. The conservation status of the listed medicinal plants was measured using the following IUCN Red List 2020-1 category and criteria (www.iucnredlist.org). They were arranged alphabetically by Bentham and Hooker's (1862-1883) classification system, including binomial name, family name, vernacular name, forest type, etc. Flowers of India, 2020 verified the local names and the forest types were identified with the help of the India biodiversity portal, 2020. The listed plants were confirmed with the help of published regional floras such as the Flora of Presidency of Madras (Gamble 1984) and the Flora of Tamil Nadu Carnatic (Matthew 1983). Later the unknown specimens were identified by comparing voucher specimens of herbarium collections deposited in the Botanical Survey of India, Southern Circle, TNAU Campus, Coimbatore, India. All the preserved specimens were stored for future reference at the Department of Botany, Vellalar College for Women (Autonomous), Erode, Tamil Nadu, India with valid accession numbers (VCW/BH/Acc. No.1-74).

Ailment categories: Based on the information obtained from Irulas, the survey was grouped into 13 different ailment categories. Many diseases have been classified as ailment category according to the body systems treated. There are 58 different types of illnesses reported in these 13 categories. It includes circulatory system/cardiovascular diseases (CS / CD), dental and oral care (DOC), dermatological infections/diseases (DID), ear, nose, throat problems (ENT), endocrinal disorders (ED), fever (Fvr), gastro-intestinal ailments (GIA), genito-urinary ailments (GUA), hair problems (HP), liver problems (LP), animal/poisonous bites (PB), respiratory problems (RP) and skeleto muscular system disorders (SMSD).

Data Analysis Tools

Use value: The use-value (UV) was calculated for each plant to objectively provide a quantitative measure of its relative importance to the informant. This was calculated with the formula below.

$$UV = \sum U/n$$

Where UV is the use-value of a species, 'U' is the number of use reports cited by each informant for a particular plant species and 'n' refers to the total number of interviewees for a precise plant. Generally, UV is calculated to determine the plants with the highest use (most frequently indicated) in treating an ailment. 'UVs' is high when the use for a plant has many reports and low when there are few reports of its use (Barnert and Messmann, 2008).

Informant consensus factor: The informant consensus factor (Fic) was used to use plants in disease categories amongst plant users in the study area.

$$Fic = (N_{ur} - N_t) / (N_{ur} - 1)$$

Where, 'N_{ur}' refers to the number of use citations in each category and 'N_t' refers to all informants' number of species used for this ailment category. The result of this factor ranged between the values 0 to 1. A high value (nearly 1.0) indicates that a large proportion of respondents uses a relatively small number of taxa. A low value indicates that the informants differ on which taxa to use in treating a disease category. This method is intended to verify the homogeneity of information between users (Ba˘gcı, 2000).

Fidelity level : Fidelity level (FL) is a tool to determine the most frequently used plant species for treating a particular ailment category by the informants in the study area. FL was

derived from the following formula of Martin (1995).

$$FL\ (\%) = Np/N \times 100$$

Where 'Np' is the number of use reports cited for a given species for a specific ailment category and 'N' means the total number of use reports cited for any given species. Generally, high FLs are obtained from plants are almost used for all referred use reports, whereas low FLs are obtained for plants that are used for many different purposes.

RESULTS AND DISCUSSION

Demographic profile of informants: The tribal population in this study area is smaller (around 195 families) and there were no well-developed electrical and transport facilities. Therefore, it is necessary to walk 26 km from their villages to the road and have limited bus facilities. Totally, 74 informants were selected and interviewed; they shared their valuable experiences and co-operated well during the documentation of ethnomedicinal information (Table 1). These people have a long history on the traditional use of plants. The conventional medicines of Irulas are still widely practiced throughout the study region and also rapidly disappearing due to modernization. Nowadays, literate healers and investigators frequently have written documents for their medical preparations with the gathered knowledge. Most traditional healers prefer to pass their folklore of medicinal plants orally to family members or helpers, which is a common practice in many other societies around the world.

Medicinal plant diversity: Through this extensive field survey, a large number of 252 plant species among 191 genera belonging to 76 families were recorded from the study area to cure various ailments (Table 2). Out of 252 studied plant species, 237 were dicot, 14 were monocot, and another was a pteridophyte. The information on local name, parts used, therapeutic uses and mode of preparation were also documented for supporting the ailment categories. The documentation of surveyed list contains new plant records for therapeutic use. There were 8 plants namely, *Butea monosperma, Cassia italica, Crotalaria grahamiana, Croton hirtus, Hardwickia binata, Ipomaea nil, Polygala bolbothrix, Pouzolzia zeylanica* were not been previously documented from this study area and surrounding forests (Fig. 1).

Family abundant: The present study indicates that the family Euphorbiaceae stood first by contributing 19 (7.5%) species, followed by Fabaceae 15 (5.9%), Caesalpiniaceae and Rubiaceae (each with 11 sps.) (4.3%) and finally Asclepiadaceae with ten species (3.9%). However, many species belonging to the family Acanthaceae, Convolvulaceae and Capparidaceae (each with 9 sps.) (3.5%) are also frequently used for treating different types of ailments (Table 3). Our present findings agree with some previous studies (Bhatia et al 2014, Kidane et al 2018, Krupa et al 2019) in the family-wise classification of ethnomedicinal plants.

Life form and parts used: In the current survey, 36% (90 species) of the reported species are herbs, followed by 27% trees, 21% shrubs and climbers 6% (Fig. 2). The shrubs have been identified with sub-categories such as climbing shrubs, large shrubs and under-shrubs. Sivasankari *et al*. (2014) reported that herbs (30.20%) were most used life forms, followed by trees (28.05%), shrubs (20.14%) and climbers (10.07%). In the current investigation, 89.28% of the plants are wild, 54.36% are cultivated and 33.33% are ornamental. The part wise plants used for medicinal purposes in this study shows that the leaves (120 reports) are higher followed by the whole plant, roots, barks, fruits, seeds, flowers, stems, pods, stem bark and root bark, rhizome and wood, tubers and latex. Among the plant parts utilized, leaves were most frequently used by Irula tribal community for various ailments (Fig. 3). Xavier et al (2014) found that leaf crude drug preparations are mostly recommended as ethnomedicine followed by entire plant, root, seeds and fruits, stem or bark, flower, rhizome and bulb.

Conservation status of plants: Based on the categories and criteria in the IUCN Red List (version 2020-1), the medicinal plants are categorized into three species types viz., vulnerable (VU) (1.19%), least concerned (LC) (19.04%) and not evaluated (NE) (79.76%). Sivasankari et al (2014) considered three species viz., *Pterocarpus marsupium* Roxb., *Santalum album* L. and *Saraca asoca* (Roxb.) De Wilde. as vulnerable in the study region, this supported the study in a significant way.

Method of preparation: In general, the ethnobotanical studies pointed out that, plant parts were grouped into 6 different preparative methods such as decoction (adding water and filtering with cloth), juice (squeezing the juicy part), paste (pounding), tonic (a clear bitter-tasting drink), powder (a dry substance made up of fine particles) and extract (extraction of liquids by maceration and adding water). In most instances, extremely difficult to separate decoction and infusion procedures (Bonet et al 1999) reported. In the current investigation, the most commonly used herbal preparation was decoction (62%) followed by juice (27%), paste (25%), tonic (15%), powder (10%) and extraction (8%) (Fig. 4). A decoction is the primary form of medicine preparation in certain tribal communities all over the world. Furthermore, the traditional healers are informed that medicine preparation was made by using only one part of a plant or in combination with parts of more than one species (Bahmani et al 2014).

Table 1. Demographic profile of the studied tribal people (Irulas) in Manar beat, Karamadai region of Western Ghats, India

Characteristics	No. of respondent		Total number	Percentage (%)
	Male	Female		
Sex	43	31	74	58:42
Age				
20-30	6	4	10	14%
30-40	7	8	15	20%
40-50	16	6	22	30%
50-60	5	6	11	15%
60-70	4	5	9	12%
70-80	3	4	7	9%
Herbalists (Professional healer)	17	8	25	34%
Local people	33	16	49	66%
Educational level				
Illiterate	16	11	27	36%
Adult education	7	9	16	22%
10^{th}	11	8	19	26%
12^{th}	5	4	9	12%
Graduation	2	1	3	4%
Occupation				
Herbalist	13	7	20	27%
Agriculturist	21	9	30	41%
Driver (Jeep)	7	5	12	16%
Coracle rider	3	2	5	7%
Cattle drover	4	3	7	9%

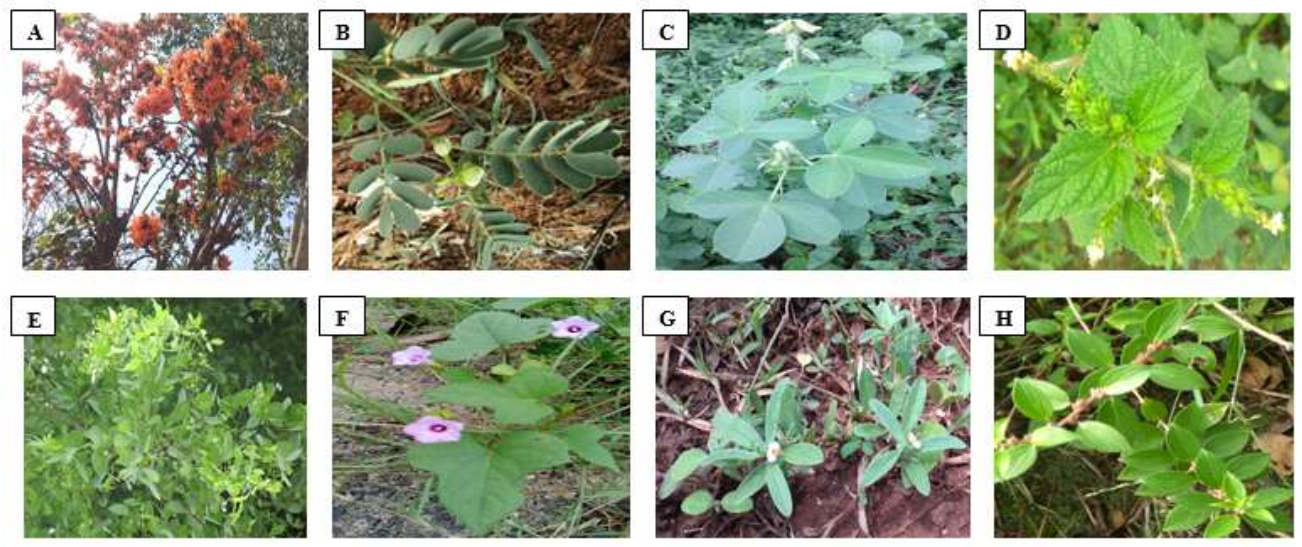

Fig. 1. Some Important Medicinal plants (A-H): A) *Butea monosperma*; B) *Cassia italica*; C) *Crotalaria grahamiana*; D) *Croton hirtus*; E) *Hardwickia binate*; F) *Ipomaea nil*; G) *Polygala bolbothrix*; H) *Pouzolzia zeylanica*

Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Acacia concinna (Willd.) DC.	Mimosaceae	Shikakai	DDF	CS	Leaves and pods	Wild	NE	DID (General skincare, Wounds); GIA (Constipation); LP (Jaundice); HP (Dandruff)	0.32	Powder, paste and decoction
Acacia Senegal Willd.	Mimosaceae	Incakkai	SJ	T	Leaves and fruit	Wild	NE	RP (Cold)	0.28	Decoction and infusion
Acalypha fruticosa Forssk. BHVCW 01	Euphorbiaceae	Seenaichedi	DDF	S	Leaves, roots and stem	Wild	LC (2018)	Fvr (Fever); RP (Cold); DID (Scabies); PB (Snakebite); GIA (Stomach ache, Constipation); DOC (Toothache)	0.36	Paste
Acalypha indica L. BHVCW 02	Euphorbiaceae	Kuppaimeni	DDF	H	Whole plant	Cultivated and wild	NE	SMSD (Headache, Swelling, Joint pain); RP (Asthma); GIA (Stomach ache)	0.12	Decoction
Acalypha paniculata Miq. BHVCW 03	Euphorbiaceae	Malai kuppameni	DDF	H	Leaves	Ornamental and wild	NE	GIA (Stomach ache); GUA (Kidney stone); DID (Pimples)	0.16	Juice
Acanthospermum hispidum DC.	Asteraceae	Mullu Chedi	MDF	H	Leaves and seeds	Wild	NE	Fvr (Fever)	0.20	Paste and juice
Adatoda vasica Nees. BHVCW 04	Acanthaceae	Adatodai	DDF	S	Leaves	Ornamental and wild	NE	RP (Bronchitis)	0.08	Decoction and juice
Adenostemma lavenia O. Kze. BHVCW 05	Asteraceae	Vadakala	SJ	H	Leaves	Cultivated	NE	GIA (Intestinal ulcer); DID (Sunburn)	0.24	Paste
Aegle marmelos (L.) Correa ex Roxb. BHVCW 06	Rutaceae	Vilvam	MDF	T	Leaves, fruits and root	Cultivated and wild	NE	ENT (Earache); ED (Diabetes); GIA (Intestinal ulcer, Stomach ache, Dysentery)	0.44	Decoction and paste
Aerides maculosum Lindl.	Orchidaceae	Fox Brush Orchid	DDF	E	Leaves and flowers	Cultivated	NE	DID (General skincare)	0.08	Decoction
Aerva lanata (L.) Juss. ex Schult. BHVCW 07	Amaranthaceae	Poolai Poo	SJ	H	Leaves and roots	Wild	NE	RP (Cough, Asthma); SMSD (Headache); GUA (Kidney stone); PB (Snakebite)	0.36	Decoction and juice
Aerva tomentosa Forssk. BHVCW 08	Amaranthaceae	Perumpoolai	SJ	H	Roots, seeds and flowers	Wild	NE	SMSD (Rheumatism, Headache); DOC (Toothache); DID (General skincare)	0.12	Decoction and paste
Albizzia amara (Roxb.) Boivin.	Mimosaceae	Thuringil	DDF	T	Leaves, barks and fruit pods	Cultivated, ornamental and wild	NE	RP (Cough); LP (Jaundice); DID (Wounds)	0.24	Decoction
Allamania nodiflora (L.) R. Br.	Amaranthaceae	Kumattikkirai	SJ	H	Leaves and fruits	Wild	NE	GIA (Dysentery, Constipation)	0.04	Paste

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Allophylus serratus Radlk.	Sapindaceae	Siruvalli	MDF	S	Leaves	Wild	NE	GIA (Intestinal ulcer); DID (Wounds)	0.20	Decoction
Aloe vera L. BHVCW 09	Liliaceae	Kathalai	MDF	H	Whole plant	Cultivated, ornamental and wild	NE	ENT (Sore throat); RP (Cough); CSCD (Blood purification); GUA (Kidney stone); GIA (Constipation)	0.44	Juice, tonic and powder
Alysicarpus monilifer DC.	Fabaceae	Kasukkoti	DDF	H	Whole plant	Wild	NE	LP (Jaundice); Fvr (Fever); GIA (Stomach ache); PB (Snakebite); DID (General skincare)	0.44	Paste and decoction
Alysicarpus rugosus DC.	Fabaceae	Heyne's Alyce Clover	MDF	H	Leaves and roots	Wild	NE	RP (Cough); Fvr (Fever)	0.08	Extraction
Alysicarpus vaginalis DC.	Fabaceae	Nilaorila	MDF	H	Whole plant and seeds	Cultivated and wild	NE	RP (Cough); GIA (Dysentery); Fvr (Fever); DID (Wounds)	0.16	Decoction and powder
Anacardium occidentale L.	Anacardiaceae	Munthiri	DDF	T	Leaves, fruit and bark	Cultivated	NE	RP (Cough, Cold); PB (Snakebite); GUA (Kidney stone); DOC (Toothache)	0.32	Juice
Andrographis echioides Nees. BHVCW 10	Acanthaceae	Gopuram Tangi	DDF	H	Whole plant	Cultivated, ornamental and wild	NE	PB (Snakebite, Scorpion sting); ED (Diabetes); RP (Bronchitis); GIA (Dysentery); Fvr (Fever); DID (General skincare)	0.24	Decoction and infusion
Annona reticulata L.	Annonaceae	Ramasita	MDF	T	Leaves, fruits, barks and root bark	Cultivated	LC (2018)	GIA (Intestinal ulcer, Dysentery); DOC (Toothache)	0.24	Paste and decoction
Anodendron paniculatum A. DC.	Apocynaceae	Sarakodi	MDF	C	Leaves and fruits	Wild	NE	GIA (Intestinal ulcer); LP (Jaundice)	0.12	Powder
Anogeissus latifolia Wall.	Combretaceae	Namai	MDF	T	Whole plant	Cultivated and wild	NE	PB (Snakebite, Scorpion sting)	0.04	Decoction and juice
Argemone Mexicana L.	Papaveraceae	Piramathandu	DDF	H	Leaves	Ornamental and wild	NE	RP (Cough, Asthma); Fvr (Fever); LP (Jaundice); SMSD (Headache); DID (General skincare)	0.36	Decoction and juice
Argyreia cuneata Ker-Gawl. BHVCW 11	Convolvulaceae	Kanvalipoo	DDF	S	Leaves and roots	Ornamental and wild	NE	DID (Wounds, General skincare); SMSD (Rheumatism) PB (Scorpion sting)	0.44	Decoction
Artocarpus integrifolia L.	Moraceae	Palamarum	MDF	T	Leaves and roots	Cultivated and wild	NE	GIA (Stomach ache); Fvr (Fever); RP (Asthma); DID (Wounds, General skincare)	0.16	Decoction and tonic
Asclepias curassavica L.	Asclepiadaceae	Neer poo	RV & MDF	H	Root and leaves	Cultivated, ornamental and wild	NE	ENT (Eye pain); DID (Dermatitis); GIA (Dysentery)	0.28	Paste and juice

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Asystasia gangetica T. And.	Acanthaceae	Miti Kirai	MDF	H	Root and leaves	Ornamental and wild	NE	GIA (Piles, Stomach ache); Fvr (Fever); RP (Asthma); PB (Snakebite)	0.24	Decoction, juice and powder
Atalantia monophylla (L.) Correa. BHVCW 12	Rutaceae	KattuElumichai	DDF	S	Fruits	Wild	NE	SMSD (Rheumatism, Joint pain)	0.24	Decoction
Azadirachta indica A. Juss.	Meliaceae	Vembu	DDF	T	Whole plant	Cultivated and wild	LC (2018)	DID (Wounds, Eczema); GIA (Intestinal ulcer); SMSD (Rheumatism)	0.28	Decoction and juice
Bambusa arundinacea Willd.	Poaceae	Mungil	MDF	S	Leaves and roots	Cultivated and wild	NE	GUA (Problems of menopause); GIA (Indigestion); DID (Wounds); SMSD (Joint pain); ENT (Eye cooling)	0.08	Juice
Barleria acuminata Wt.	Acanthaceae	Vellai kurinji	SJ	S	Whole plant	Cultivated and wild	NE	Fvr (Fever); DOC (Toothache); SMSD (Joint pain)	0.12	Juice
Barleria cristata L. BHVCW 13	Acanthaceae	Semmulli	DDF	H	Leaves and seeds	Ornamental and wild	NE	PB (Snakebite); GUA (Swelling)	0.12	Juice
Bauhinia racemosa Lamk.	Caesalpiniaceae	Aatthi	DDF & MDF	T	Whole plant	Wild	NE	RP (Cough)	0.08	Juice and decoction
Bauhinia tomentosa L.	Caesalpiniaceae	Tiruvatti	MDF	S	Flowers and seed	Cultivated, ornamental and wild	LC (2018)	GIA (Dysentery); DID (Wounds)	0.12	Tonic and paste
Begonia malabarica Lamk.	Begoniaceae	Sengurungu	MDF	H	Leaves	Cultivated	NE	DID (General skincare)	0.08	Decoction and paste
Benkara malabarica (Lamk.) Tirveng.	Rubiaceae	Pudan	SJ & MDF	T	Leaves	Cultivated	NE	ENT (Throat pain)	0.08	Juice and paste
Bischofia javanica Bl.	Euphorbiaceae	Thondi	MDF	T	Bark and leaves	Cultivated, ornamental and wild	LC (2018)	GIA (Stomach ache); ENT (Sore throat)	0.20	Decoction
Blepharis boerhaaviaefolia Pers.	Acanthaceae	Creeping Blepharis	DDF	H	Whole plant	Cultivated	NE	SMSD (Muscle pain, Headache, Swellings); ENT (Throat pain); RP (Asthma)	0.28	Juice and paste
Blepharis molluginifolia Pers.	Acanthaceae	Nethirappoondu	SJ	H	Whole plant	Cultivated and ornamental	NE	SMSD (Headache); GIA (Dysentery); PB (Snakebite); ED (Diabetes); DID (Wounds)	0.16	Paste
Boerhaavia chinensis (L.) Rottb.	Nyctaginaceae	Kodi Minnai	DDF & MDF	H	Root and leaves	Wild	NE	DID (Scabies, Itching)	0.12	Extraction
Boerhaavia diffusa L. BHVCW 14	Nyctaginaceae	Sarandai / Saerandaidagu	DDF & MDF	H	Whole plant	Wild	NE	LP (Jaundice); PB (Snakebite); RP (Asthma); GIA (Dysentery, Stomach ache)	0.12	Decoction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Bridelia stipularis Bl.	Euphorbiaceae	Climbing Bridelia	MDF	S	Bark and leaves	Wild	LC (2019)	RP (Asthma, Cough); GIA (Intestinal ulcer); LP (Jaundice); Fvr (Fever)	0.20	Decoction
Butea monosperma Roxb.	Fabaceae	Muthagai	MDF & DDF	T	Leaves, barks and flowers	Cultivated, ornamental and wild	NE	DID (Wounds)	0.32	Paste
Cadaba trifoliata Wight. & Arn.	Capparidaceae	Kattagatti	DDF	S	Leaves	Cultivated	NE	SMSD (Swellings); Fvr (Fever)	0.20	Paste and juice
Caesalpinia pulcherrima Sw.	Caesalpiniaceae	Mayir-konrai	SJ	S	Leaves and flowers	Ornamental and wild	LC (2018)	RP (Cold); GUA (Kidney stone); Fvr (Fever); GIA (Constipation, Stomach ache)	0.04	Decoction
Calamus rotang L.	Arecaceae	Pirambu	MDF & RV	T	Root	Cultivated	NE	Fvr (Fever); PB (Snakebite)	0.08	Decoction
Canthium umbellatum Wight.	Rubiaceae	Nallamandharam	MDF	T	Leaves and roots	Wild	NE	GIA (Dysentery)	0.04	Decoction
Capparis divaricata Lam. BHVCW 15	Capparidaceae	Thoratti	DDF	T	Leaves and bark	Cultivated and wild	NE	GIA (Intestinal ulcer, Dysentery, Stomach ache)	0.16	Paste and tonic
Capparis grandiflora Hook.f. & Thomson. BHVCW 16	Capparidaceae	Thorattimul / Kevisi	DDF	S	Whole plant and fruit	Wild	NE	GIA (Stomach ache, Gastric complaints, Vomiting); GUA (Menstrual problems); SMSD (Rheumatism)	0.96	Decoction and juice
Capparis sepiaria L. BHVCW 17	Capparidaceae	Kaatukathiri / Aanaikevisi	SJ & DDF	S	Leaves, flowers and roots	Cultivated and wild	NE	PB (Snakebites); Fvr (Fever); DID (General skincare); GIA (Stomach ache)	0.68	Tonic and powder
Caralluma adscendens R.Br.	Asclepiadaceae	Muyal kombu chedi / Ekkaechedi	SJ & DDF	H	Whole plant	Cultivated, ornamental and wild	NE	RP (Cough, Chest pain); SMSD (Swellings); GIA (Indigestion); ED (Diabetes); DID (General skincare); GUA (Kidney stone)	0.08	Decoction
Caralluma bicolor Ramach, S. Joseph, H. A. John & C. Sofiya	Asclepiadaceae	Kattalae	SJ & DDF	H	Stem	Cultivated	NE	DID (Wounds)	0.20	Extraction
Caralluma umbellate Haw. BHVCW 18	Asclepiadaceae	Kallimulaiyaam	DDF	H	Stem	Cultivated and wild	NE	GIA (Stomach ache, Intestinal ulcer); ED (Diabetes)	0.04	Juice
Cardiospermum halicacabum L. BHVCW 19	Sapindaceae	Mudakattan	MDF & SJ	C	Whole plant	Cultivated, ornamental, wild	LC (2020)	SMSD (Rheumatism); GIA (Stomach ache); PB (Snakebites)	0.72	Juice
Carmona retus (Vahl.) Masamune.	Boraginaceae	KuranguVethilai	DDF & SJ	S	Leaves and roots	Cultivated, ornamental and wild	NE	GIA (Stomach ache, Dysentery); PB (Poisonous bites); RP (Cough)	0.16	Decoction
Cassia absus L.	Caesalpiniaceae	Karun kanami	MDF	H	Leaves and seed	Cultivated and wild	LC (2010)	CSCD (Blood purification); RP (Asthma)	0.08	Decoction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Cassia auriculata L. BHVCW 20	Caesalpiniaceae	Aavaram	SJ	S	Roots, bark and flowers	Cultivated, ornamental and wild	NE	DID (General skincare); SMSD (Rheumatism); ED (Diabetes)	0.04	Decoction
Cassia italica (Mill.) Sperg.	Caesalpiniaceae	Nelatangedu	SJ	H	Leaves, roots, pods and seeds	Cultivated, wild	NE	GIA (Indigestion, Vomiting); Fvr (Fever); LP (Jaundice); GUA (Venereal diseases); DID (General skincare); ENT (Nasal infections)	0.08	Decoction
Cassia javanica L.	Caesalpiniaceae	Konari	DDF	T	Seeds and bark	Cultivated, ornamental and wild	LC (2018)	Fvr (Fever)	0.20	Decoction
Cassia montana Heyne.	Caesalpiniaceae	Malaikkondrai	MDF	S	Stems, roots and leaves	Cultivated, wild	NE	DID (Scabies, General skincare)	0.16	Decoction and juice
Cassia occidentalis L. BHVCW 21	Caesalpiniaceae	Payaverai / Thagarai	MDF	S	Whole plant	Cultivated, ornamental and wild	NE	SMSD (Rheumatism, Headache); RP (Cough, Cold); DID (Eczema); Fvr (Fever); GUA (Kidney stone); ED (Diabetes)	0.16	Tonic
Cassine glauca (Rottb.) Kuntze.	Celastraceae	Kaneera	DDF	T	Leaves, root and root bark	Ornamental and wild	NE	SMSD (Headache, Swellings); PB (Snakebite)	0.24	Paste
Celastrus paniculata Willd.	Celastraceae	Valuluvai	MDF	C	Leaves, barks and stembark	Wild	NE	GIA (Dysentery, Indigestion); PB (Poisonous bites); GUA (Kidney stone)	0.16	Extraction, decoction and juice
Celosia argentea L.	Amaranthaceae	Pannaikeerai	MDF	H	Whole plant	Cultivated, ornamental and wild	LC (2019)	DID (Wounds, Eczema); PB (Snakebite); ED (Diabetes)	0.12	Decoction
Celtis tetrandra Roxb.	Ulmaceae	Kuriyaa	MDF	T	Fruits and seeds	Wild	LC (2018)	GIA (Indigestion)	0.12	Juice
Celtis timorensis Span.	Ulmaceae	Kalluviri	MDF	T	Whole plant	Wild	LC (2018)	Fvr (Fever); GIA (Indigestion)	0.28	Decoction
Cenchrus ciliaris L.	Poaceae	Kollukattaipullu	SJ	H	Leaves	Wild	LC (2017)	GUA (Kidney stone); DID (Wounds)	0.16	Decoction
Centella asiatica Urb. BHVCW 22	Apiaceae	Vallarai	MDF	H	Whole plant	Cultivated and wild	LC (2018)	DID (Wounds); Fvr (Fever)	0.08	Decoction and powder
Cereus pterogonus Lamk.	Cactaceae	Oocikalli	DEF	S	Whole plant	Wild	NE	GIA (Constipation)	0.24	Extraction
Cissus quadrangularis L. BHVCW 23	Vitaceae	Pirandai/ Naralaikodi	SJ & DDF	CS	Barks, leaves, roots and stem	Cultivated, ornamental and wild	NE	SMSD (Rheumatism); DID (Wounds, Burns); GIA (Indigestion)	0.84	Paste and powder

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Citrullus lanatus (Thumb.) Matsum. Nakai.	Cucurbitaceae	Tharpoosani	MDF	H	Fruits	Cultivated	NE	ED (Diabetes)	0.72	Juice and tonic
Cleome feline L.f. BHVCW 45	Capparidaceae	CuvarnaciriTaivelai	SJ & DDF	H	Whole plant	Cultivated and wild	NE	RP (Asthma)	0.24	Paste
Cleome gynandra L. BHVCW 24	Capparidaceae	Taivelai	DDF	H	Whole plant	Cultivated, ornamental and wild	NE	PB (Scorpion sting, Snakebite); Fvr (Fever)	0.16	Decoction and juice
Cleome monophylla L. BHVCW 25	Capparidaceae	Ellukkusakkalathi	DDF	H	Whole plant	Wild	NE	SMSD (Swellings, Headache); RP (Cough); Fvr (Fever)	0.20	Juice, paste and decoction
Coccinia grandis (Linn.) Voigt. BHVCW 26	Cucurbitaceae	Kovai/ Thondai	DDF	C	Whole plant	Cultivated and wild	NE	RP (Asthma, Bronchitis); SMSD (Rheumatism, Headache); ED (Diabetes); LP (Jaundice); Fvr (Fever)	0.24	Juice and decoction
Combretum album Pers.	Combretaceae	White Combretum	SJ	CS	Leaves	Ornamental and wild	NE	Fvr (Fever)	0.40	Decoction
Combretum ovalifolium Roxb. BHVCW 27	Combretaceae	Odaikodi	MDF	CS	Leaves and fruits	Wild	NE	GIA (Dysentery)	0.24	Paste, juice and decoction
Commelina benghalensis L. BHVCW 28	Commelinaceae	Kanavazhai / Kayinai	DDF	H	Whole plant	Wild	LC (2018)	GIA (Stomach ache); ENT (Sore throat); DID (Burns)	0.16	Decoction
Cordia dichotoma G. Forst.	Boraginaceae	Karadisellai	SJ & DDF	T	Leaves and stembark	Cultivated and wild	LC (2018)	SMSD (Swellings, Headache); GIA (Dysentery, Stomach ache); Fvr (Fever)	0.12	Decoction, juice and tonic
Cordia sinensis Lam.	Boraginaceae	Sellai	DDF	S	Leaves, roots and barks	Cultivated, ornamental and wild	LC (2020)	GUA (Abortion); Fvr (Fever); GIA (Stomach ache)	0.04	Decoction
Crataeva adansonii DC.	Capparidaceae	Marvilinga	DDF	T	Roots, leaves and barks	Ornamental and wild	NE	SMSD (Headache, Swellings); LP (Jaundice)	0.20	Decoction, powder and tonic
Crataeva religiosa Forst. BHVCW 29	Capparidaceae	Mavilankai	DDF	T	Flowers, bark and leaves	Ornamental and wild	NE	SMSD (Rheumatism); GIA (Stomach ache); ENT (Earache)	0.68	Decoction and juice
Crotalaria grahamiana W. & A.	Fabaceae	Bushy Rattlepod	SJ	S	Whole plant	Cultivated, ornamental and wild	NE	RP (Cough, Cold); Fvr (Fever); DID (Scabies, General skincare); PB (Scorpion sting); GIA (Stomach ache)	0.04	Decoction and powder
Crotalaria pallida Aiton.	Fabaceae	Kilukiluppai	MDF	S	Whole plant	Cultivated and wild	NE	DID (Wounds, General skincare, Eczema); Fvr (Fever); SMSD (Swellings)	0.16	Paste
Croton hirtus L.	Euphorbiaceae	Hairy Croton	RV	H	Fruits and seeds	Cultivated and wild	NE	Fvr (Fever); RP (Bronchitis)	0.12	Tonic

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Croton sparsiflorus Mor.	Euphorbiaceae	Reilpoondu	DDF	S	Whole plant	Wild	NE	DID (General skincare, Wounds)	0.40	Extraction
Cucumis melo L. BHVCW 30	Cucurbitaceae	Thumattikai	MDF	H	Fruits	Cultivated	NE	GIA (Stomach ache); DID (Burns)	0.28	Juice
Curculigo orchioides Gaertn.	Hypoxidaceae	Nilappanakizhangu/ Nilappannai	MDF & SJ	H	Rhizome	Wild	NE	RP (Asthma); GIA (Piles); LP (Jaundice); SMSD (Headache); DID (General skincare)	0.08	Decoction
Cymbidium aloifolium Hk. f.	Orchidaceae	Konkani	MDF	E	Whole plant and pods	Cultivated, ornamental and wild	NE	ENT (Earache); Fvr (Fever); DID (Cuts, Wounds)	0.12	Decoction and paste
Cymbopogon coloratus Stapf.	Poaceae	Kamachipul	MDF	H	Leaves and roots	Cultivated and wild	NE	RP (Cough, Cold); Fvr (Fever); SMSD (Headache)	0.24	Decoction and tonic
Cynodon dactylon (Linn.) Pers. BHVCW 31	Poaceae	Aruhumpul	MDF	CH	Whole plant	Ornamental and wild	NE	RP (Cough); PB (Snakebite); GIA (Dysentery, Stomach ache); SMSD (Headache); DID (Wounds, Itching)	0.60	Juice and decoction
Cyperus rotundus L. BHVCW 32	Cyperaceae	Korai kizhangu	MDF	H	Tubers and roots	Cultivated and wild	LC (2017)	GIA (Stomach ache)	0.28	Paste and tonic
Dactyloctenium aegyptium Beauv.	Poaceae	Kakkakalpul	MDF	H	Whole plant	Wild	NE	GIA (Dysentery)	0.16	Decoction
Dalbergia lanceolaria L. f. BHVCW 33	Fabaceae	Erikai	DDF & MDF	T	Bark	Ornamental and wild	LC (2010)	GIA (Indigestion)	0.16	Tonic and juice
Dalbergia latifolia Roxb. BHVCW 34	Fabaceae	Nukkam	DDF & MDF	T	Bark	Cultivated and wild	VU (1998)	GIA (Indigestion)	0.16	Extraction
Dalbergia sissoo Roxb.	Fabaceae	Nukkam	MDF	T	Leaves	Cultivated, ornamental and wild	NE	DID (Wounds, General skincare)	0.12	Powder
Debregeasia longifolia (Burm.f.) Wedd.	Urticaceae	Kaattunochchi	MDF	LS	Leaves	Wild	LC (2018)	DID (Scabies)	0.40	Juice
Delonix elata Gamb.	Caesalpiniaceae	Vathanarayan	SJ & DEF	T	Leaves	Cultivated, semi-cultivated, ornamental and wild	LC (2011)	DOC (Mouth ulcer)	0.48	Decoction, infusion and paste
Dentella repens Forst.	Rubiaceae	Creeping lickstoop	MDF	H	Leaves and fruits	Wild	LC (2011)	RP (Cough)	0.40	Decoction
Desmodium triflorum DC.	Fabaceae	Sirupullati	MDF	H	Whole plant	Cultivated and wild	LC (2010)	GIA (Dysentery, Intestinal ulcer); DID (Wounds, General skincare)	0.32	Decoction
Dichrostachys cinerea W. & A. BHVCW 35	Mimosaceae	Vadathalla	DDF & SJ	TS	Barks and leaves	Cultivated, ornamental and wild	LC (2009)	GIA (Dysentery); SMSD (Headache); DOC (Toothache); PB (Scorpion sting, Snakebites)	0.36	Decoction and powder

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Digera arvensis Forsk. BHVCW 36	Amaranthaceae	Toya Keerai	DDF	H	Leaves, seeds and flowers	Cultivated and wild	NE	GIA (Indigestion)	0.36	Paste
Digitaria ciliaris (Retz.)	Poaceae	Arisipillu	MDF	H	Whole plant	Wild	NE	GIA (Vomiting)	0.12	Decoction
Diospyros malabarica (Desr.) Kostel. BHVCW 37	Ebenaceae	Tumbika	DDF	T	Barks, seeds and fruits	Cultivated, ornamental and wild	NE	PB (Snakebite); Fvr (Fever); GIA (Dysentery)	0.20	Juice
Dodonaea viscose L. BHVCW 38	Sapindaceae	Vilaari	DDF	LS	Stems, leaves and roots	Ornamental and wild	LC (2018)	RP (Cold); SMSD (Rheumatism, Swellings); GIA (Indigestion, Intestinal ulcer, Constipation); GUA (Menstrual problems); DID (Wounds, Burns)	0.24	Decoction and juice
Drymaria cordata Willd.	Caryophyllaceae	Masipathri	DDF	H	Whole plant	Cultivated and wild	NE	RP (Chest pain, Bronchitis, Cold); GIA (Stomach ache); LP (Jaundice)	0.20	Decoction
Ehretia ovalifolia Wt.	Boraginaceae	Karukamaram	SJ & DDF	T	Bark	Wild	NE	Fvr (Fever); RP (Cough)	0.68	Juice
Emblica officinalis Gaertn. BHVCW 39	Euphorbiaceae	Nelli	DDF & MDF	T	Fruit	Cultivated, ornamental and wild	NE	ENT (Eye pain); ED (Diabetes); SMSD (Joint pain); GIA (Dysentery)	0.04	Decoction, tonic and juice
Entada scandens Benth.	Fabaceae	Anaittellu	MDF	C	Barks and seeds	Wild	NE	Fvr (Fever)	0.72	Paste
Enterolobium saman Prain.	Fabaceae	Thoongumoonjimaram	SJ	T	Bark and seeds	Cultivated, ornamental and wild	NE	DID (General skincare, Eczema); ENT (Sore throat); GIA (Stomach ache)	0.16	Decoction
Erythroxylon monogynum Roxb.	Linaceae	Sembulichan	DDF	LS	Leaves and barks	Wild	NE	GIA (Stomach ache)	0.08	Extraction
Euphorbia thymifolia L.	Euphorbiaceae	Cirramman-pac-carici	MDF	H	Whole plant	Wild	NE	SMSD (Headache); GUA (Venereal diseases); Fvr (Fever)	0.04	Decoction and tonic
Euphorbia tirucalli L. BHVCW 40	Euphorbiaceae	Thirukalli	DDF	S	Whole plant	Cultivated, ornamental and wild	LC (2004)	DID (General skincare, Itching); RP (Cough); PB (Snakebites); SMSD (Rheumatism); DOC (Toothache); ENT (Earache)	0.04	Decoction and juice
Evolvulus alsinoides L.	Convolvulaceae	Vishnu Kiranthi	DDF, MDF & SJ	H	Whole plant	Cultivated	NE	RP (Asthma, Bronchitis); HP (Hair growth); PB (Snakebites)	0.68	Decoction
Evolvulus nummularius	Convolvulaceae	Elikkathuillai	MDF	H	Whole plant	Cultivated and	NE	DID (Cuts, Burns, Wounds); PB (Scorpion sting)	0.36	Paste

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
BHVCW 41						ornamental				
Exacum pedunculatum L.	Gentianaceae	Kana Poondu	MDF	H	Whole plant	Cultivated and wild	NE	Fvr (Fever); GIA (Dysentery)	0.20	Decoction
Feronia elephantum Corr.	Rutaceae	Vilampazam	DDF & SJ	T	Leaves, fruitand bark	Cultivated and wild	NE	GIA (Dysentery, Indigestion); ENT (Sore throat); DID (Itching)	0.76	Paste
BHVCW 42										
Ficus microcarpa Wight.	Moraceae	Kallichchi	MDF	T	Roots, latex and bark	Cultivated, ornamental and wild	LC (2018)	Fvr (Fever); DID (Wounds); SMSD (Headache); DOC (Toothache)	0.04	Extraction
Ficus racemosa L.	Moraceae	Atti	MDF	T	Fruits	Cultivated, ornamental and wild	LC (2018)	ENT (Eye cooling)	0.84	Decoction
Ficus religiosa L.	Moraceae	Arasu	MDF	T	Leaves, barks and roots	Ornamental and wild	NE	DID (General skincare); PB (Poisonous bites); GIA (Intestinal ulcer)	0.64	Decoction
Ficus tomentosa Roxb.	Moraceae	Soft Fig	DDF	T	Leaves and barks	Wild	NE	DID (Wounds, Cuts)	0.08	Paste
Flacourtia indica (Burm. f.) Merr.	Bixaceae	Kodumundi	SJ	S	Leaves and root	Cultivated, ornamental and wild	LC (2018)	Fvr (Fever); RP (Asthma); GIA (kill worms in stomach); GUA (Kidney stone); SMSD (Body pain); PB (Snakebite)	0.04	Decoction and tonic
Fluggea leucopyrus Willd.	Euphorbiaceae	Vellaipoola	SJ & DDF	S	Leaves, fruits and barks	Cultivated, ornamental and wild	NE	GUA (Venereal diseases); Fvr (Fever); GIA (Constipation)	0.72	Decoction
Gisekia pharnaceoides L.	Aizoaceae	Manal Keerai	SJ & MDF	H	Whole plant	Wild	NE	RP (Asthma, Chest pain); SMSD (Swellings)	0.84	Extraction
Givotia moluccana (Linn.) Sreem.	Euphorbiaceae	Thaalamaram	DDF & MDF	T	Seeds and barks	Cultivated, ornamental and wild	NE	HP (Dandruff); DID (Psoriasis); SMSD (Rheumatism)	0.20	Decoction and paste
BHVCW 43										
Gomphocarpus physocarpus E. Mey.	Asclepiadaceae	Balloon Plant	MDF	S	Root and leaves	Cultivated, ornamental and wild	NE	DOC (Toothache); RP (Cough); GIA (Stomach ache); SMSD (Headache)	0.56	Decoction and paste
Gyrocarpus asiaticus Willd.	Hernandiaceae	Thanakku	DDF	T	Leaves, roots and barks	Wild	NE	DID (Wounds, Scabies); GUA (Kidney stone)	0.80	Decoction
Hardwickia binata Roxb.	Caesalpiniaceae	Aacha	DDF	T	Bark	Wild	LC (2018)	GIA (Indigestion, kill worms in stomach)	0.92	Paste
Helicteres isora L.	Sterculiaceae	Valampuri/Kavaram pattai	DDF	LS	Root and seeds	Cultivated and wild	NE	GIA (Dysentery, Stomach ache); DID (Scabies)	0.04	Decoction and juice
BHVCW 44										
Heliotropium indicum L.	Boraginaceae	Tetkotukki	MDF	H	Leaves and flowers	Wild	NE	GIA (Dysentery, Stomach ache, Intestinal ulcer); ED (Diabetes); RP (Asthma, Bronchitis)	0.04	Decoction, juice and powder

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Heliotropium strigosum Willd.	Boraginaceae	Bristly Heliotrope	MDF	US	Whole plant	Wild	NE	GIA (Intestinal ulcer); PB (Snakebites); DID (Wounds)	0.36	Juice
Heliotropium zeylanicum Cl.	Boraginaceae	Ceylon Heliotrope	MDF	H	Whole plant	Ornamental and wild	NE	GIA (Stomach ache); PB (Scorpion sting)	0.12	Decoction and tonic
Hemidesmus indicus R.Br. BHVCW 45	Asclepiadaceae	Nannari	SJ	C	Root	Cultivated and wild	NE	CSCD (Blood purification); DID (General skincare); SMSD (Rheumatism, Swellings); Fvr (Fever); RP (Cough)	0.92	Paste and tonic
Hibiscus micranthus L.f.	Malvaceae	Sitraamutti	SJ	S	Leaves	Wild	NE	RP (Asthma)	0.48	Decoction
Hugonia mystax L.	Linaceae	Mothirakanni	MDF & SJ	T	Roots	Wild	NE	PB (Snakebites); SMSD (Swellings)	0.16	Decoction and juice
Ichnocarpus frutescens R.Br.	Apocynaceae	Udarkodi/ Kadambaikodi	MDF & DDF	C	Whole plant	Wild	NE	GIA (Dysentery); RP (Cough)	0.72	Extraction and decoction
Ionidium suffruticosum Ging. BHVCW 46	Violaceae	Orilai Thamarai	DDF	H	Roots, leaves and fruits	Wild	NE	PB (Scorpion sting)	0.40	Decoction and tonic
Ipomaea nil (L.) Roth.	Convolvulaceae	Kakkattan	RV	C	Seeds	Wild	NE	GIA (Constipation)	0.40	Decoction
Ipomaea obscura K-Gawl.	Convolvulaceae	Siruthaali	DDF & RV	C	Leaves and roots	Ornamental and wild	NE	GIA (Dysentery)	0.80	Decoction, paste and powder
Ipomaea staphylina Rome. & Schult. BHVCW 47	Convolvulaceae	Onaankodi	DDF	CS	Roots	Ornamental and wild	NE	PB (Snakebites); ED (Diabetes)	0.56	Tonic
Ixora arborea Roxb.ex Sm.	Rubiaceae	Vedchi	SJ & DDF	S	Whole plant	Ornamental and wild	NE	GIA (Intestinal ulcer, Dysentery); RP (Bronchitis); SMSD (Headache)	0.72	Decoction
Ixora nigricans Br.	Rubiaceae	Utappu	SJ	S	Leaves and flowers	Wild	NE	GIA (Dysentery, Stomach ache)	0.92	Extraction
Jasminum angustifolium (L.) Willd.	Oleaceae	Kattumalligai	SJ	CS	Leaves	Cultivated, ornamental and wild	NE	GIA (Intestinal ulcer, Stomach ache); DID (General skincare)	0.16	Decoction
Jasminum cuspidatum Rottl. & Willd.	Oleaceae	Parcorikkirai	MDF	S	Flowers, roots and leaves	Ornamental and wild	NE	GIA (Intestinal ulcer); PB (Snakebites)	0.12	Decoction
Jatropha curcas L. BHVCW 48	Euphorbiaceae	Kattukkottai	MDF	S	Leaves, root bark and barks	Cultivated and wild	LC (2018)	DID (Wounds, Pimples); SMSD (Rheumatism, Swellings); LP (Jaundice); GIA (Dysentery); HP (Hair growth); Fvr (Fever)	0.08	Paste and juice
Jatropha gossypifolia Linn.	Euphorbiaceae	Siria Amanakku	SJ	S	Leaves, seeds	Cultivated and wild	NE	CSCD (Blood purifier); SMSD (Headache); GIA (Stomach	0.12	Decoction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
					and stems			ache, Piles, Indigestion); GUA (Venereal diseases)		
Justicia tranquebariensis L.f.	Acanthaceae	Punnakupoodu	DDF	S	Leaves	Cultivated	NE	SMSD (Swellings); PB (Snakebites)	0.24	Extraction
Kalanchoe laciniata DC.	Crassulaceae	Ranakalli	DDF & MDF	H	Leaves	Cultivated and ornamental	NE	GIA (Dysentery); PB (Snakebites); RP (Cough, Cold); SMSD (Headache)	0.08	Decoction
Kyllinga triceps Rottb.	Cyperaceae	Veluttanirbasi	RV	H	Whole plant and rhizome	Wild	LC (2010)	PB (Snakebites); Fvr (Fever); RP (Cold, Bronchitis); ENT (Sore throat)	0.16	Juice
Lantana camara L.	Verbenaceae	Unni Chedi	SJ	S	Leaves, flowers and roots	Cultivated, ornamental and wild	NE	RP (Cough, Asthma, Bronchitis); DOC (Toothache); SMSD (Headache); Fvr (Fever); GIA (Constipation); ENT (Eye cooling)	0.04	Decoction and tonic
Lantana wightiana Wall.	Verbenaceae	Indian White Lantana	SJ	S	Leaves	Cultivated	NE	Fvr (Chickenpox); GIA (Intestinal ulcer); RP (Asthma)	0.20	Decoction
Leea indica (Burm. f.) Merr.	Vitaceae	Ottannalam	SJ & MDF	S	Flowers, roots and leaves	Cultivated, ornamental and wild	LC (2018)	RP (Cough, Chest pain); Fvr (Fever); SMSD (Headache); DID (Cuts, General skincare); GIA (Dysentery, Stomach ache)	0.20	Decoction and juice
Leucas aspera Spr. BHVCW 50	Lamiaceae	Thumbai	DDF & MDF	H	Whole plant	Cultivated and wild	NE	DID (Wounds, General skincare); RP (Cough, Cold); Fvr (Fever); ENT (Sore throat); PB (Snakebites); SMSD (Rheumatism)	0.08	Decoction and juice
Leucas longifolia Hook. f. BHVCW 51	Lamiaceae	Irana-peri	MDF & DDF	H	Whole plant	Cultivated and wild	NE	SMSD (Headache); Fvr (Fever); RP (Cough)	0.16	Decoction
Leucas urticifolia (Vahl) Sm.	Lamiaceae	Kannuthumbai	DDF	H	Whole plant	Wild	NE	Fvr (Fever); RP (Asthma)	0.20	Decoction
Litsea scrobiculata Meissn.	Lauraceae	Mulakunari	MDF & EF	T	Whole plant	Cultivated and wild	NE	ED (Diabetes); SMSD (Arthritis); RP (Cold, Asthma)	0.12	Decoction
Lochnera pusilla K. Schum.	Apocynaceae	Nithyakalyaani	DDF	H	Whole plant	Cultivated, ornamental and wild	NE	RP (Asthma); ED (Diabetes); GIA (Constipation, Indigestion); DID (General skin care)	0.20	Decoction
Loranthus longiflorus Desv.	Loranthaceae	Pulluri	DDF	SP	Whole plant	Ornamental	NE	ENT(Cooling); DID (Wounds, General skin care); GUA (Menstrual problems); RP(Asthma); GIA (Intestinal ulcer)	0.04	Decoction and paste

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Ludwigia abyssinica A. Rich.	Onagraceae	-	MDF	H	Leaves and roots	Wild	LC (2018)	GIA (kill worms in stomach); DID (Wounds)	0.02	Decoction
Macaranga peltata Muell. Arg. BHVCW 52	Euphorbiaceae	Vattakanni	MDF	T	Leaves and stem bark	Wild	NE	GUA (Kidney stone); DID (Cuts)	0.40	Decoction and extraction
Maesa perrottetiana A.DC.	Myrsinaceae	Periya-unni	MDF	T	Leaves	Ornamental	NE	Fvr (Fever)	0.12	Decoction and paste
Mallotus philippinensis Muell. Arg.	Euphorbiaceae	KuranguManjanathi	MDF & DDF	T	Leaves, fruits and barks	Cultivated, ornamental and wild	NE	GIA (Intestinal ulcer)	0.08	Decoction
Manilkara hexandra (Roxb.) Dubard.	Sapotaceae	Ulakkai-p-palai	SJ & DDF	T	Bark	Cultivated and wild	NE	Fvr (Fever); LP (Jaundice); GIA (Gastric complaints)	0.88	Decoction
Melhania incana Heyne.	Sterculiaceae	Hairy Melhania	SJ & DDF	H	Whole plant	Cultivated	NE	RP (Cough, Cold); Fvr (Fever)	0.12	Paste
Memecylon umbellatum Burm. f.	Melastomaceae	Sirugasa	MDF	S	Leaves, flowers and roots	Ornamental and wild	NE	GUA (Menstrual problems); ENT(Cooling)	0.04	Decoction
Merremia aegyptia Gamb.	Convolvulaceae	Mochukkodi	SJ	H	Leaves	Ornamental and wild	NE	DID (Burns)	0.20	Paste
Merremia tridentata Hall. f.	Convolvulaceae	Mudiyaakunthal	DDF	H	Leaves and roots	Wild	NE	Fvr (Fever); PB (Snakebites); DOC (Toothache); GIA (Piles); SMSD (Swellings)	0.12	Decoction
Microtropis ramiflora Wt.	Celastraceae	-	MDF	T	Fruits and barks	Cultivated, ornamental and wild	NE	DID (General skincare)	0.28	Extraction
Miliusa tomentosa Bedd.	Annonaceae	Perivuvav	MDF & DDF	S	Barks	Wild	NE	Fvr (Fever)	0.12	Decoction
Mimosa instia L.	Mimosaceae	Seekkai	MDF	T	Flowers and barks	Wild	NE	DID (General skincare, Wounds)	0.16	Decoction and paste
Mimosa pudica L.	Mimosaceae	Thottasinungi	MDF	H	Leaves, seeds and roots	Cultivated, ornamental and wild	LC (2010)	Fvr (Fever); GIA (Piles); LP (Jaundice)	0.08	Tonic
Mitracarpus villosus (Sw.) DC.	Rubiaceae	Kayapoondu	MDF	H	Whole plant	Wild	NE	DID (General skincare); GIA (Intestinal ulcer)	0.12	Paste
Morinda citrifolia L.	Rubiaceae	Nuna	DDF & MDF	T	Roots, fruits and rootbark	Cultivated and wild	NE	RP (Asthma); ED (Diabetes); Fvr (Fever); SMSD (Headache); GIA (Dysentery); DID (General skincare); DOC (Mouth ulcer)	0.16	Decoction, juice and tonic
Morinda umbellate L.	Rubiaceae	Kundalchurukki	SJ, DDF & MDF	C	Leaves and roots	Wild	NE	GIA (Dysentery)	0.32	Decoction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Murraya exotica L. BHVCW 53	Rutaceae	Vengarai	MDF	S	Leaves	Cultivated, ornamental and wild	NE	GIA (Dysentery, Stomach ache); PB (Snakebites); DOC (Toothache)	0.28	Powder, tonic and decoction
Naravelia zeylanica DC. BHVCW 54	Ranunculaceae	Kattuseekkaaikodi	MDF & SJ	C	Leaves, roots and stems	Wild	NE	RP (Chest pain, Cold); DOC (Toothache); DID (General skincare); GIA (Intestinal ulcer); SMSD (Headache); Fvr (Fever)	0.28	Paste
Neptunia oleracea Lour. BHVCW 55	Mimosaceae	Sundaikkirai	MDF	H	Stem	Cultivated and wild	LC (2018)	ENT (Earache)	0.20	Juice
Oldenlandia herbacea (L.) Roxb.	Rubiaceae	Nonnanampullu	MDF	H	Whole plant	Wild	LC (2011)	Fvr (Fever); RP (Asthma, Bronchitis); GIA (Intestinal ulcer)	0.24	Decoction, powder and tonic
Olea europaea (Wall. ex G. Don.) cif.	Oleaceae	Saidun	MDF	T	Whole plant	Cultivated, ornamental and wild	NE	RP (Asthma)	0.32	Decoction
Opilia amentacea Roxb.	Opiliaceae	Manjandamaram	DDF	CS	Roots, barks and leaves	Wild	NE	SMSD (Headache); Fvr (Fever); RP (Cough); DOC (Toothache); GIA (Stomach ache)	0.20	Decoction
Opuntia dillenii Haw. BHVCW 56	Cactaceae	Mullu Kalli	SJ & DDF	S	Fruit	Cultivated and wild	LC (2009)	ED (Diabetes)	0.16	Juice
Opuntia monacantha Haw. BHVCW 57	Cactaceae	Kalli	SJ &DDF	S	Fruits	Cultivated and wild	LC (2010)	GIA (Intestinal ulcer); ED (Diabetes)	0.16	Juice
Orthosiphon glabratus Benth.	Lamiaceae	Chilannippadam	MDF	H	Leaves	Wild	NE	GIA (Intestinal ulcer)	0.16	Paste
Osbeckia zeylanica Willd.	Melastomaceae	Senthumbai	MDF	H	Flower and leaves	Wild	NE	GIA (Intestinal ulcer); DID (Itching, General skincare)	0.60	Decoction
Oxalis corniculata L.	Geraniaceae	Puliyarai	MDF	H	Whole plant and leaves	Wild	NE	DID (Burns, Pimples); GIA (Stomach ache); Fvr (Fever); SMSD (Swellings); PB (Snakebites)	0.72	Juice
Passiflora leschenaultia DC.	Passifloraceae	-	DDF	CS	Whole plant	Cultivated	NE	ED (Diabetes); DID (Wounds); CSCD (Blood pressure); GIA (Dysentery); GUA (Kidney stone)	0.40	Decoction
Pavonia zeylanica Cav. BHVCW 58	Malvaceae	Sevagan	SJ & DDF	S	Roots, barks and leaves	Ornamental and wild	NE	GIA (Intestinal ulcer); DID (Scabies, Acne); SMSD (Swellings)	0.80	Decoction, powder and tonic
Pedalium murex L.	Pedaliaceae	Yanai nerunjil	DEF	H	Roots and leaves	Wild	NE	GUA (Venereal diseases)	0.56	Decoction and tonic

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Peristrophe bicalyculata Nees.	Acanthaceae	Kara-k-kanciram	MDF	H	Whole plant	Wild	NE	Fvr (Fever); RP (Cough, Cold); PB (Snakebites)	0.72	Powder
Perotis indica O. Ktz. BHVCW 59	Poaceae	Narival	MDF	H	Whole plant	Wild	NE	Fvr (Chickenpox); PB (Snakebites)	0.16	Paste
Phyllanthus debilis Hook. f.	Euphorbiaceae	Arulundi	MDF	T	Whole plant	Wild	NE	LP (Jaundice); GIA (Dysentery, Stomach ache, Intestinal ulcer); DID (Wounds)	0.12	Decoction and juice
Phyllanthus polyphyllus Willd.	Euphorbiaceae	Arunelli	MDF	S	Whole plant	Wild	NE	DID (Wounds, Scabies); GIA (Dysentery); LP (Jaundice)	0.68	Decoction and paste
Phyllanthus virgatus Forst.	Euphorbiaceae	Siru Nelli	MDF	H	Leaves	Wild	NE	GIA (Intestinal ulcer); DID (Itching)	0.16	Juice
Physalis minima L.	Solanaceae	Tholtakkali	DDF	H	Leaves and roots	Wild	VU (2017)	Fvr (Fever); ED (Diabetes); SMSD (Headache); DID (Itching); ENT (Earache)	0.12	Decoction, tonic and juice
Polycarpaea corymbosa Lam.	Caryophyllaceae	Cataicciver	SJ & DDF	H	Leaves	Cultivated	NE	Fvr (Fever); SMSD (Swellings); PB (Snakebites); LP (Jaundice)	0.08	Decoction
Polygala bolbothrix Dunn.	Polygalaceae	Milakunankai	DDF	H	Roots	Wild	NE	RP (Cough, Bronchitis); GIA (Dysentery, Vomiting)	0.12	Decoction
Polygonum chinense L.	Polygonaceae	Actalaree / Neerkapachi	RV	S	Whole plant	Ornamental and wild	NE	GIA (Stomach ache)	0.24	Juice and tonic
Polygonum hydropiper L.	Polygonaceae	Water Pepper	RV	H	Leaves, seeds and roots	Cultivated and wild	LC (2013)	GIA (Piles, Stomach ache); GUA (Menstrual problems); DOC (Toothache)	0.68	Decoction and tonic
Portulaca wightiana Wall.	Portulacaceae	Paruppukeerai	DDF	H	Whole plant	Cultivated, ornamental and wild	NE	GUA (Kidney stone)	0.08	Decoction
Pouzolzia zeylanica (L.) Benn & R.Br.	Urticaceae	Nir-c-cinni	MDF	H	Whole plant and root	Wild	NE	GIA (Dysentery, Intestinal ulcer, Indigestion); Fvr (Fever); DOC (Toothache)	0.08	Juice and paste
Premna tomentosa Willd.	Verbenaceae	Malai Thekku	SEF & DDF	T	Leaves	Wild	LC (2018)	DID (Skin irritation)	0.12	Decoction and tonic
Psychotria flavida Talb.	Rubiaceae	South Indian Wild Coffee	MDF	S	Leaves, roots and barks	Wild	NE	SMSD (Headache); GIA (Dysentery, Intestinal ulcer); DID (Wounds)	0.84	Decoction
Pterygota alata R.Br.	Sterculiaceae	Anathondi	EF & SEF	T	Leaves	Ornamental and wild	NE	PB (Poisonous bites)	0.16	Decoction
Pupalia lappacea var. velutina (Miq.) Hook. f.	Amaranthaceae	Adai-otti	SJ	H	Leaves and root	Wild	LC (2006)	RP (Cough); DID (Cuts); GIA (Intestinal ulcer, Constipation); PB (Snakebites)	0.04	Decoction
Pyrenacantha volubilis Hook.	Icacinaceae	-	MDF	CS	Seeds	Cultivated	NE	GUA (Breast pain)	0.04	Extraction and paste
Rhus mysorensis Heyne. BHVCW 60	Anacardiaceae	Neyyikiluvai / Sipilai	SJ	S	Fruits and leaves	Cultivated	NE	GIA (Dysentery, Stomach ache); DID (Itching); ED (Diabetes)	0.16	Decoction, juice and extraction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Rhynchosia rufescens DC. BHVCW 61	Fabaceae	Hadupudukanam	MDF	S	Roots	Wild	NE	PB (Snakebites); GIA (Dysentery)	0.08	Paste
Rivea hypocrateriformis Choisy.	Convolvulaceae	Musuttai Kodi	DDF & SJ	CS	Whole plant	Wild	NE	RP (Cough); SMSD (Headache); GIA (Piles, Intestinal ulcer)	0.04	Juice and extraction
Santalum album L.	Santalaceae	Chandanam	DDF	T	Wood	Cultivated and wild	VU (2018)	Fvr (Fever)	0.08	Paste
Sapindus emarginatus Vahl. BHVCW 62	Sapindaceae	Ponnankottai	DDF	T	Fruits	Cultivated and wild	NE	RP (Asthma); GIA (Dysentery)	0.20	Paste
Sarcostemma brevistigma W. & A.	Asclepiadaceae	Kodi-Kalli	SJ & DDF	C	Whole plant	Cultivated and wild	NE	SMSD (Arthritis); Fvr (Fever); DID (Wounds); RP (Cough, Cold, Asthma); PB (Snakebites); GUA (Menstrual problems); GIA (Dysentery)	0.16	Decoction
Schleichera oleosa (Lour.) Merr.	Sapindaceae	Kumpatiri / Pulipoosamaram	MDF	T	Seeds and bark	Cultivated and wild	LC (2018)	DID (Wounds, Itching, Acne); GIA (Intestinal ulcer)	0.16	Powder
Sclerocarpus africanus Jacq.	Asteraceae	African Bonebract	MDF	H	Whole plant	Cultivated	NE	GUA (Venereal diseases)	0.24	Decoction
Scutellaria violacea Heyne. BHVCW 63	Lamiaceae	Novupacchilai	DDF	H	Whole plant	Cultivated, ornamental and wild	NE	GIA (Dysentery)	0.16	Decoction
Secamone emetica R.Br.	Asclepiadaceae	Ankaravali	SJ & DDF	CS	Leaves and roots	Wild	NE	RP (Cough); DID (Scabies); GIA (Stomach ache); PB (Snakebites)	0.12	Decoction
Solanum anguivi Lam.	Solanaceae	Forest Bitterberry	MDF	S	Roots and fruits	Ornamental, semi-cultivated and wild	NE	CSCD (Blood pressure); RP (Cough, Chest pain); DOC (Toothache)	0.12	Decoction
Solanum xanthocarpum S. & W.	Solanaceae	Kantankattiri	DDF & MDF	S	Whole plant	Cultivated and wild	NE	RP (Bronchitis, Cough); GIA (Constipation); ENT (Sore throat)	0.28	Decoction, juice and powder
Stachytarpheta indica Vahl. BHVCW 64	Verbenaceae	Seemainayaroovi	DDF	H	Roots	Cultivated and wild	NE	ENT (Eyewash)	0.16	Decoction
Stereospermum colais (*Buch-Ham. ex Dillwyn*) Mabb.	Bignoniaceae	Ampuvakini/ Pathiri	MDF	T	Flowers, roots and barks	Ornamental and wild	NE	Fvr (Fever); GIA (Indigestion)	0.08	Juice
Strychnos nux-vomica L.	Loganiaceae	Yetti / Yettimaram	MDF & DDF	T	Wood and leaves	Cultivated and wild	NE	DID (Wounds, General skincare); GIA (Intestinal ulcer, Dysentery, Constipation); Fvr (Fever); ED (Diabetes)	0.24	Paste and tonic
Strychnos potatorum L.f.	Loganiaceae	Sillamaram	DDF	T	Seeds and roots	Wild	NE	RP (Cold, Cough, Bronchitis); GUA (Venereal diseases); ED (Diabetes)	0.72	Decoction and powder

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Synedrella nodiflora Gaertn.	Asteraceae	MudiyanPachchai	DDF	H	Leaves and roots	Cultivated	NE	SMSD (Arthritis, Swellings)	0.24	Decoction and paste
Syzigium cumini (Linn.) Skeels.	Myrtaceae	Naval / Nagamaram	SJ	T	Barks, leaves and fruits	Cultivated, ornamental and wild	NE	DID (Wounds); GUA (Menstrual problems); GIA (Dysentery); ED (Diabetes); DOC (Mouth ulcer)	0.16	Juice
Tarenna asiatica (L.) Kuntze ex K. Schum.	Rubiaceae	Tharani	SJ & MDF	S	Whole plant	Wild	NE	PB (Snakebites); Fvr (Fever); SMSD (Headache); GIA (Intestinal ulcer, Indigestion, Constipation); DID (General skincare); ED (Diabetes)	0.20	Decoction
Tectona grandis L.f.	Verbenaceae	Thaekku	MDF	T	Roots and bark	Cultivated, ornamental and wild	NE	DID (Eczema); RP (Bronchitis);	0.24	Extraction, paste and tonic
Tephrosia villosa W. & A.	Fabaceae	Hoary Tephrosia	MDF	S	Leaves	Cultivated	LC (2010)	ED (Diabetes)	0.40	Juice
Terminalia arjuna W. & A.	Combretaceae	Kula Maruthu / Mathi	MDF	T	Bark and leaves	Cultivated, ornamental and wild	NE	CSCD (Blood pressure); ENT (Earache)	0.24	Juice and tonic
Terminalia chebula Retz.	Combretaceae	Kadukkaai / Aralae	MDF & DDF	T	Fruits and barks	Cultivated and wild	NE	GIA (Constipation, Dysentery, kill worms in the stomach); RP (Cough, Asthma)	0.16	Tonic
Thespesia populnea Soland. ex Correa.	Malvaceae	Puvarasu	MDF	T	Bark and leaves	Cultivated, ornamental and wild	LC (2017)	DID (Itching, Scabies); GIA (Dysentery, Intestinal ulcer, Indigestion, Constipation); SMSD (Headache); CSCD (Blood pressure); ED (Diabetes); GUA (Breast pain)	0.12	Decoction and juice
Tiliacora acuminata Miers.	Menispermaceae	Perunkattukkoti	MDF	CS	Root	Ornamental and wild	NE	GUA (Kidney stone); PB (Snakebites)	0.04	Paste and decoction
Toddalia asiatica Lam. BHVCW 65	Rutaceae	Kattu-milaku / Erikonthai	SJ	C	Whole plant and bark	Cultivated and wild	NE	Fvr (Fever); GIA (Indigestion); SMSD (Rheumatism); RP (Cough, Asthma)	0.20	Tonic
Trema orientalis Blume.	Ulmaceae	Pey-munnai	DDF & MDF	T	Bark and leaves	Cultivated, ornamental and wild	LC (2017)	GIA (Dysentery); RP (Cough, Asthma, Bronchitis); PB (Poisonous bites); ENT (Sore throat); DOC (Toothache)	0.68	Decoction
Tribulus terrestris L. BHVCW 66	Zygophyllaceae	Nerunci	DDF	H	Stems and fruits	Wild	NE	DID (Psoriasis, Scabies, General skincare); SMSD (Headache); GIA (Stomach ache)	0.04	Decoction and tonic
Trichodesma zeylanicum R. Br.	Boraginaceae	Kalutaikkali	MDF	H	Leaves and roots	Wild	NE	GIA (Stomach ache, Dysentery); PB (Snakebites, Poisonous bites); Fvr (Fever);	0.16	Decoction

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
								RP (Cough); DID (Scabies, Wounds)		
Tylophora asthmatica W. & A. BHVCW 67	Asclepiadaceae	Nay-p-palai	SJ	C	Root	Wild	NE	GIA (Dysentery, Stomach ache); RP (Asthma, Bronchitis)	0.12	Decoction
Vernonia albicans DC.	Compositae	Neichati	DDF & MDF	H	Leaves, seeds and roots	Cultivated and wild	NE	GIA (Stomach ache, Piles); DID (Cuts, Wounds, General skincare); Fvr (Fever); CSCD (Blood purification); GUA (Kidney stone); SMSD (Headache, Swellings); PB (Scorpion sting)	0.40	Decoction, paste and juice
Viscum articulatum Burm.	Loranthaceae	Logolai / Leafless Mistletoe	MDF	SP	Whole plant	Cultivated, ornamental and wild	NE	Fvr (Fever); DID (Cuts)	0.28	Paste
Viscum trilobatum Talb.	Loranthaceae	Ottuttutti	DDF & MDF	SP	Leaves	Cultivated, ornamental and wild	NE	RP (Cough, Cold)	0.08	Decoction
Vitex peduncularis Wall. BHVCW 68	Verbenaceae	Mayilei	MDF	T	Leaves, barks and roots	Cultivated and wild	NE	RP (Chest pain); LP (Jaundice); GUA (Menstrual problems); ED (Diabetes)	0.12	Juice
Wattakaka volubilis (L.fil.) Stapf. BHVCW 69	Asclepiadaceae	Kurincha	SJ & MDF	C	Leaves and roots	Cultivated and wild	NE	PB (Snakebites); Fvr (Fever); RP (Cough, Cold); SMSD (Rheumatism, Headache)	0.24	Paste
Withania somnifera L. BHVCW 70	Solanaceae	Amukkuram	MDF	S	Whole plant	Cultivated and wild	NE	SMSD (Swellings); DID (Wounds)	0.28	Paste
Xylia xylocarpa Taub. BHVCW 71	Mimosaceae	Iruvel	MDF	T	Bark and seeds	Cultivated and wild	LC (2018)	GIA (Intestinal ulcer, Piles, Vomiting); SMSD (Rheumatism)	0.16	Decoction
Zizyphus abyssinica Hochst. ex A. Rich.	Rhamnaceae	Kottae	DDF	T	Roots	Cultivated and wild	NE	GIA (Stomach ache); PB (Snakebites)	0.16	Decoction and powder
Zizyphus glabrata W. BHVCW 72	Rhamnaceae	Karukaavu / Karattai	DDF	T	Fruits	Cultivated and wild	NE	Fvr (Fever); RP (Cough); SMSD (Rheumatism)	0.16	Decoction
Zizyphus jujuba Lam. BHVCW 73	Rhamnaceae	Ellanthai	DDF	T	Fruits, leaves and roots	Cultivated and wild	NE	GIA (Stomach ache, Intestinal ulcer); RP (Bronchitis); CSCD (Blood purification); Fvr (Fever); DID (Wounds)	0.12	Decoction, powder and tonic
Zizyphus lotus (L.) Lam.	Rhamnaceae	Jharberi	DDF	S	Leaves	Wild	NE	DID (Wounds); ED (Diabetes)	0.40	Decoction and powder
Zizyphus oenoplia	Rhamnaceae	Suraimullu /	DDF &	CS	Roots,	Cultivated	NE	DID (Cuts, Wounds); GIA	0.16	Decoction,

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Table 2. Surveyed medicinal plants in Manar beat, Karamadai range, Western Ghats

Botanical name	Family name	Local name	Forest types	Habit	Parts used	Cultivation status	Ecological status	Therapeutic uses	Use value	Mode of preparation
Mill. BHVCW 74		Soolikodi	MDF		bark and fruits	and wild		(Stomach ache, Indigestion)		paste and juice
Zizyphus rugosa Lamk.	Rhamnaceae	Totari	DDF	TS	Barks	Wild	NE	DOC (Worms in gums and teeth, Toothache)	0.32	Paste
Zornia diphylla Pers.	Fabaceae	Chirupalatai	DDF	H	Whole plant	Wild	NE	GUA (Venereal diseases); GIA (Dysentery)	0.08	Extraction
Actiniopteris radiata (Sw.) Link.	Pteridaceae	Fan leaf Fern	DDF	H	Whole plant	Ornamental and wild	NE	Fvr (Fever)	0.04	Decoction

Note: DDF – Dry Deciduous Forest; **MDF** – Moist Deciduous Forest; **SJ** – Scrub Jungle; **RV** – Riparian Vegetation
H – Herb; **S** – Shrub; **C** – Climber; **T** – Tree; **LS** – Large Shrub; **CS** – Climbing Shrub; **US** – Under Shrub; **ST** – Small Tree; **CH** – Climbing Herb; **TS** – Thorny Shrub; **E** – Epiphyte; **SP** – Semi-Parasite
NE – Not Evaluated; **LC** – Least Concern; **R** – Rare; **EN** – Endangered; **Ex** – Extinct; **EW** – Extinct in the Wild; **CR** – Critically endangered; **VU** – Vulnerable; **NT** – Near Threatened; **E** – Endemic

Novel Formulations of the Present Study Plants

1. The juice obtained from the leaves of *Leucas aspera* was mixed with the milk of *Calotropis procera* and applied topically on the center and back portion of the throat around the neck for the treatment of prolonged cough.
2. Decoction of crushed *Cyperus rotundus* tuber was used orally on empty stomach to cure prolonged fever.
3. The overnight macerated (copper vessel) *Aegle marmelos* leaves and the water taken in an empty stomach for seven days is used to treat peptic, gastric and duodenal ulcers.
4. Juice obtained from the leaves of *Solanum nigrum* is taken for seven days on an empty stomach to cure peptic ulcer disease (PUD).
5. Decoction of crushed *Tribulus terrestris* whole plant in empty stomach is taken orally to treat renal calculus.
6. Immatured fruits of *Psidium guajava* and *Manilkara zapota* are used orally to cure dysentery.
7. Decoction of *Anethum graveolens* powder taken orally for the treatment of dysentery.

Fig. 2. Life forms of the reported plant species used by Irulas in Manar beat

Fig. 3. Parts of plants used for the preparation of folk medicine

8. Seeds of *Papaver somniferum* are mixed with fresh cow milk or buttermilk and are taken for dysentery.
9. Seeds of *Trigonella foenum-graecum* are crushed and taken with curd for dysentery disorder.
10. The extract obtained from the rhizome of *Zingiber officinale* thrice a week is taken against vomiting also taken for the treatment of diabetes.
11. Three pieces of *Allium sativum* bulb were heated in an open fire were taken by chewing was a better remedy for atrioventricular (AV) block.
12. Decoction of *Foeniculum vulgare* seeds was taken orally for the treatment of flatulence.

The root bark of *Pergularia daemia* is thoroughly mixed with cow's milk and used as a purgative in treating rheumatism (Senthilkumar et al 2006) and the fresh leaves of *Pergularia daemia* were boiled and inhaled to treat headaches (Poongodi et al 2011). The whole plant powder of *Cissus quandrangularis* is taken orally with cow milk in treating asthma (Alagesaboopathi, 2009). In contrast, the same plant was used in treating wounds, burns, rheumatism, and indigestion in our survey.

Quantitative analysis of data: During the interview, the majority of the data collected in this study were analyzed through quantitative descriptions. Further, the collected ethnobotanical data were processed using essential tools such as use value, informant consensus factor and fidelity level.

Use value: Use value is the purport associated with the usage by the people that may be high due to good results through their experience. Some of them with low use value may be due to lack of communication or a minimum activity. High-value plants are used to cure rheumatism and poisonous stings that are the common disease categories often encountered by the inhabitants of this study area. They share their knowledge among themselves to treat these diseases. The present study demonstrated that some plants have a high use value (Table 2). *Capparis grandiflora* was reported by all the interviewed informants in the study area and gives the highest UV of 0.96 due to its potential effectiveness in treating various diseases. It was followed by *Hardwickia binata* (0.92), *Ixora nigricans* (0.92), *Manilkara hexandra* (0.88), *Gisekia pharnaceoides* (0.84), *Cissus quadrangularis* (0.84), *Ficus racemosa* (0.84), *Pavonia zeylanica* (0.80), *Ipomaea obscura* (0.80), *Feronia elephantum* (0.76) and *Cardiospermum halicacabum* (0.72). At the same time, *Ludwigia abyssinica* revealed a low use value (0.02). Similar to present study, Shil et al (2014) and Krupa et al (2019) also reported certain plant species with shallow use values (<0.20).

Informant consensus factor: In ethnobotanical studies, the consensus factor provides a definitive measure of any claim which provides reliable evidence. The Fic product ranges between 0 to 1. A high-value Fic denotes the agreement of taxa selection among informants, whereas a low value indicates a disagreement (Ragupathy et al 2008). To determine the informant consensus factor values (ICF), all the recorded 58 ailments were grouped into 13 major ailments according to their body parts treated. More than 100 use-reports were obtained for certain ailment categories viz., skeleto-muscular system disorders (288 use-reports, 71 species), dermatological infections (252 use-reports, 99 species), gastro-intestinal ailments (200 use-reports, 145 species), respiratory problems (147 use-reports, 83 species) and fever (118 use-reports, 77 species). Together, their Fic values were ranged between 0.10 and 1.0 (Table 4). This study obtained a high Fic value for skeleto-muscular system disorders (0.76), whereas a lower Fic was obtained for circulatory system / cardiovascular diseases (0.11). A higher ICF value suggests that informants strongly agree that a certain species should be used to treat a particular ailment. A similar higher informant consensus was recorded by other workers based on their ailment categories (Ragupathy et al 2008, Ayyanar and Ignacimuthu 2011, Venkatachalapathi et al 2015). The informant consensus factor was abbreviated as “FIC” and “ICF” in the previous articles (Kaval et al 2014, Polat et al 2015). The results showed that these disease categories had many use reports among the Irula tribals with average Fic values.

Fidelity level: The fidelity level of each studied species has been calculated. It indicates the choice of informants for each ailment and the potential for disease-related species. The fidelity level values in this study varied from 25 to 100% (Table 5). Thirteen species had the 100% (highest) fidelity level from the available information, most of which were used in one disease category with multiple informants. For this analysis, the plants with less than three use reports were not

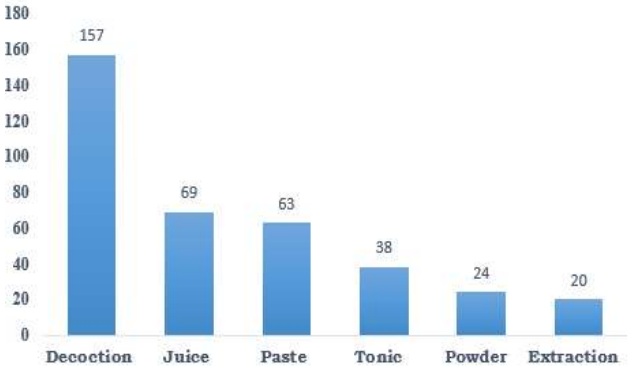

Fig. 4. Mode of preparation of herbal medicines by the informants

Table 3. Diversity of medicinal plant species belonging to individual plant family in Manar beat, Karamadai region of Western Ghats

Plant families	No. of plant genera	Percentage of genera	No. of plant species	% of species
Euphorbiaceae	12	6.25	19	7.54
Fabaceae	10	5.21	15	5.95
Caesalpiniaceae	5	2.60	11	4.37
Rubiaceae	9	4.69	11	4.37
Asclepiadaceae	8	4.17	10	3.97
Acanthaceae	7	3.65	9	3.57
Convolvulaceae	5	2.60	9	3.57
Capparidaceae	4	2.08	9	3.57
Boraginaceae	5	2.60	8	3.17
Mimosaceae	6	3.13	8	3.17
Poaceae	7	3.65	7	2.77
Amaranthaceae	5	2.60	6	2.38
Verbenaceae	5	2.60	6	2.38
Rhamnaceae	1	0.52	6	2.38
Combretaceae	3	1.56	5	1.98
Lamiaceae	3	1.56	5	1.98
Moraceae	2	1.04	5	1.98
Rutaceae	5	2.60	5	1.98
Sapindaceae	5	2.60	5	1.98
Asteraceae	4	2.08	4	1.59
Solanaceae	3	1.56	4	1.59
Others	78	40.63	85	33.73
Total	192	100	252	100

Table 4. Informant consensus factor for certain ailment categories

Ailment categories	Diseases reported in the present study	No. of use reports (N_{ur})	No. of taxa (N_t)	F_{ic}
Circulatory System / Cardiovascular Diseases (CS / CD)	Blood purification (6), Blood pressure (4)	10	9	0.11
Dental and oral Care (DOC)	Toothache (29), Mouth ulcer (13), Worms in gums and teeth (4)	46	23	0.51
Dermatological Infections / Diseases (DID)	General skincare (77), Wounds (69), Scabies (13), Pimples (9), Sun burn (5), Dermatitis (3), Eczema (6), Itching (30), Burns (17), Cuts (9), Psoriasis (12), Acne (2)	252	99	0.61
Ear, Nose, Throat problems (ENT)	Earache (27), Sore throat (19), Eye pain (2), Eye cooling (3), Throat pain (29), Nasal infections (4), Cooling (8)	92	25	0.74
Endocrinal Disorders (ED)	Diabetes (29)	37	29	0.22
Fever (Fvr)	Fever (97), Chickenpox (21)	118	77	0.35
Gastro-Intestinal Ailments (GIA)	Constipation (17), Stomach ache (50), Intestinal ulcer (39) Dysentery (54), Piles (9), Indigestion (21), Gastric complaints (2), Vomiting (5), Kill worms in stomach (3)	200	145	0.28
Genito-Urinary Ailments (GUA)	Kidney stone (16), Problems of menopause (1), Swelling (23), Menstrual problems (8), Venereal diseases (8), Abortion (1), Breast pain (2)	59	37	0.38
Hair Problem (HP)	Dandruff (11), Hair growth (1)	12	4	0.73
Liver Problems (LP)	Jaundice (24)	24	19	0.22
Animal / Poisonous Bites (PB)	Snakebite (45), Scorpion sting (19), Poisonous bites (26)	90	56	0.38
Respiratory Problems (RP)	Cold (20), Cough (49), Asthma (53), Bronchitis (18), Chest pain (7)	147	83	0.44
Skeleto-Muscular System Disorders (SMSD)	Headache (56), Swelling (23), Joint pain (35), Rheumatism (98), Muscle pain (19), Body pain (4), Arthritis (53)	288	71	0.76

considered. Plants with the highest FL of 100% were *Atalantia monophylla*, *Zizyphus oenoplia* (DID), *Adenostemma lavenia* (ENT), *Digera arvensis*, *Pavonia zeylanica*, *Tribulus terrestris* (GIA), *Rhynchosia rufescens*, *Wattakaka volubilis* (PB), *Kalanchoe laciniata*, *Scutellaria violacea* (RP), *Aerva tomentosa* and *Capparis grandiflora* (SMSD). The maximum FL for the plants as mentioned above indicated that 100% of the informants were interviewed for the treatment of certain diseases, which could indicate their healing potential. In support of our study, 100% FL was reported in *Capparis grandiflora* for rheumatism among the herbal healers in Manar beat. Following the present findings, the species viz., *Acacia nilotica, Cassia auriculata, Cissus quadrangularis and Tridax procumbens* has been previously reported to have 100% fidelity in Tirunelveli hills (Ayyanar and Ignacimuthu 2011).

Table 5. Fidelity level (FL) for certain interesting medicinal plants in the study area

Ailment categories	Important plants	FL (%)
Circulatory System/ Cardiovascular Diseases (CS /CD)	*Aloe vera*	25
	Barleria cristata	60
	Centella asiatica	75
Dental and Oral Care (DOC)	*Acalypha fruticosa*	50
	Murraya exotica	60
Dermatological Infections /Diseases (DID)	*Atalantia monophylla*	100
	Jatropha curcas	55.55
	Naravelia zeylanica	66.66
	Zizyphus oenoplia	100
Ear, Nose, Throat problems (ENT)	*Adenostemma lavenia*	100
	Commelina benghalensis	83.33
Endocrinal Disorders (ED)	*Argyreia cuneata*	50
	Caralluma umbellate	50
Fever (Fvr)	*Andrographis echioides*	60
	Macaranga peltata	50
	Zizyphus glabrata	66.66
Gastro-Intestinal Ailments (GIA)	*Digera arvensis*	100
	Pavonia zeylanica	100
	Tribulus terrestris	100
	Zizyphus oenoplia	100
Genito-Urinary Ailments (GUA)	*Cissus quadrangularis*	83.33
	Vitex peduncularis	83.33
Hair Problem (HP)	*Adenostemma lavenia*	50
	Givotia moluccana	50
Liver Problems (LP)	*Andrographis echioides*	40
	Emblica officinalis	83.33
Animal/Poisonous Bites (PB)	*Crataeva religiosa*	87.5
	Dichrostachys cinerea	85.71
	Rhynchosia rufescens	100
	Wattakaka volubilis	100
	Actiniopteris radiata	60
Respiratory Problems (RP)	*Kalanchoe laciniata*	100
	Scutellaria violacea	100
	Tylophora asthmatica	80
Skeleto-Muscular System Disorders (SMSD)	*Aerva tomentosa*	100
	Capparis grandiflora	100
	Cleome gynandra	71.42
	Withania somnifera	50
	Zizyphus glabrata	50

CONCLUSION

The present investigation quantifies the vast knowledge by Irulas about various medicinal plants existing in their surroundings. However, very few professional healers were identified within the study area, which allowed this traditional knowledge to be preserved before it disappeared from this generation. The current ethnic observation on medicinal plants with the highest use values in this study indicates valuable metabolites' possible occurrence. Also, the tribal people (informants) in the study area used several plants to prepare folk medicines with the appropriate training acquired from their ancestors and some elders. Among the tribal people, the male informants had more knowledge than females. However, some of the surveyed plant species include *Crotalaria grahamiana*, *Capparis grandiflora*, *Croton hirtus, Dentella repens*, *Exacum pedunculatum*, *Heliotropium zeylanicum*, *Ipomoea nil, Melhania incana* and *Polygala bolbothrix* were prescribed for further ethnopharmacological studies that are reported with high UV, ICF and FL values. This study was undertaken to provide a baseline for further phytomedicine and phytochemical studies. Also, there are urgent protective measures needed to prohibit ethnomedicinal plants frequently used to develop potential new drugs to treat various human ailments.

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