Ethnobotanical study of the medicinal plants used by rural communities in the foothill villages of the Alagar Hills region, Eastern Ghats, Tamil Nadu, India

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Research

Abstract

Background: The traditional medicine systems across the world are reliant on the locally available plant species. It is very common for rural communities to treat their diseases using native plant species. This study aimed to document the rich traditional knowledge of medicinal plants used by rural communities in the foothill villages of the Alagar hills region, part of the Eastern Ghats in Tamil Nadu, India.

Methods: Ethnobotanical surveys were conducted with 93 informants selected through non-probability sampling and snowball sampling methods distributed across three foothill villages of the Alagar hills region from December 2020 to February 2023. Sociodemographic characteristics of the informants, and ethnobotanical data including plant families, life forms, parts used, modes of administration, and routes of administration were analysed using percentage. Quantitative indices such as Use Value, Family Use Value, Relative Frequency Citation, Informant Consensus Factor, Informant Agreement Ratio, Fidelity Level % were calculated using established formulae.

Results: About 199 medicinal plants utilized to treat various disease conditions, grouped into 18 different ailment categories, were documented. The Fabaceae family (31 species) was the most commonly used. Herbs (34%) were the most used life form, and leaves (41%) were the most frequently used plant part in herbal drug preparations. Paste (36%) was the most common preparation method, and the oral route (72%) was the most frequently used route of administration.

Conclusions: This study underscores the significant role of medicinal plants in the healthcare practices of rural communities in the study area. Quantitative analysis identified culturally significant species contributing to the conservation of medicinal plant species, preservation of traditional knowledge, and also for isolation and identification of novel bioactive compounds.

Keywords: Ethnobotany, Ethnomedicine, Herbal drugs, Dindigul, Traditional knowledge

Background

Traditional medicine systems have played a pivotal role in global healthcare, particularly in rural areas where communities rely on phytoremedies passed down through generations (Awas & Demissew 2009, Aziz *et al.* 2018). Traditional ethnomedicine is a cumulative body of information and expertise based on culture and tradition that is very specific to the community for their health care. These indigenous medicine systems have evolved through the years within several communities, often directly or indirectly influenced by folklore, rituals, and superstitions predating the advent of Modern medicine (Chevallier 2016). According to World Health Organization, 80% of the population in developing countries depend on traditional medicine for their primary health care needs (WHO 2013). Traditional ethnomedicine practice is very common in developing countries like China, India, Japan, Pakistan, Sri Lanka, Thailand, South Africa, and Korea (Park *et al.* 2012).

India stands eighth amongst the 12 mega biodiverse countries of the world, is renowned for its wealth of plants resources with approximately 17,000 flowering plants, of which 7,000 species are medicinal plants (Manju & Ahad 2021). This biodiversity underpins the country's traditional plant-based medicine systems like Siddha, Ayurveda, Unani, and Homeopathy, which serve as the backbone of healthcare needs of rural communities (Pandey *et al.* 2013, Sankaran 2022). These systems are often more affordable and easily accessible compared to modern medicine making them indispensable to India's healthcare framework.

The Eastern ghats, spanning peninsular India, are a significant component of the nation's biodiversity, boasting a rich flora that supports the livelihoods of local communities. This region harbors diverse ecosystems, ranging from tropical dry deciduous forests to scrublands, which are home to numerous medicinally significant plants. The Alagar hills region situated in Dindigul district of Tamil Nadu, is an understudied region within the Eastern Ghats, characterized by diverse vegetation and a rich cultural heritage. Ethnobotanical surveys in neighboring regions including Sirumalai, Karandamalai, Pachalur, Devankuruchi, and Alagar hills of Eastern Ghats have recorded medicinal plants (Karuppusamy 2007, Kottaimuthu 2008, Ganesan *et al.* 2008, Karuppusamy *et al.* 2009, Shanmugam *et al.* 2011, Alagesaboopathi 2012, Kannan *et al.* 2015). Ethnomedicinal surveys have identified plants used by the rural communities of Dindigul district for treating diabetes, gynecological disorders and venomous bites (Packiaraj *et al.* 2014, Sivasankari *et al.* 2014, Shrinitha & Aruna 2023a, 2023b). In the recent past, medicinal plants used for respiratory diseases, liver diseases and veterinary health care in the foothill villages of Alagar hills in Madurai district have also been documented (Sundaram & Suresh 2019a, 2019b, 2019c). Additionally, research has recorded the medicinal flora of the foothill villages of Karandamalai hills, which are geographically close to the Alagar hills region of Eastern Ghats in Dindigul district (Sundaram & Suresh 2019d, Yasothkumar 2021).

Despite the significance of ethnobotanical knowledge in conservation and sustainable development, there exists a notable research gap in this region. To date, no comprehensive quantitative ethnobotanical study has been conducted in the foothill villages of the Alagar hills region, Eastern Ghats in the Dindigul district, leaving a critical void in our understanding of the traditional plant uses, cultural significance, and conservation status of the region's botanical resources.

Therefore, this study aims to address this gap by documenting the rich traditional knowledge of medicinal plants used by rural communities in the foothill villages. Furthermore, through quantitative analysis, the research identifies culturally significant species, and recommends them for further pharmacological investigation.

Materials and Methods

Study area

Three study sites Vathipatti, Kasampatti, and Reddiapatti villages located in the Reddiapatti Panchayat, Natham block, Dindigul district, were selected for this study. These villages lie at the foothills of Alagar Hills, part of the Eastern Ghats range. The geographic coordinates of the study sites are: Vathipatti (Latitude 10. 20522° N, Longitude 78.22544° E), Kasampatti (Latitude 10.20521° N, Longitude 78.22543° E) and Reddiapatti (Latitude 10.31444° N, Longitude 77.89214° E) (Figure 1). These villages were selected on the basis of prevalence of herbal medicine system in the study villages and their proximity to forests.

The average temperature in this region ranges from 24.18° C to 33.24° C (World Weather Online 2024), while the average annual rainfall as reported by Indian Meteorological Department varies between 925.5 mm and 1238.5 mm (TWAD 2024). The study area features steep, rocky terrain with undulating plains with an average elevation ranging from 300 to 700 m. The study sites are mostly occupied by mixed dry deciduous forests covered with thorn forests and scrub jungles dominated by *Abrus precatorius* L., *Albizia amara* (Roxb.) Boivin, *Albizia lebbeck* (L.) Benth., *Chloroxylon swietenia* DC*, Clausena anisata*

(Willd.) Hook.f. ex Benth, *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f., *Lannea coromandelica* (Houtt.) Merr., *Pterolobium hexapetalum* (Roth) Santapau & Wagh, *Senna alexandrina* Mill., *Senna auriculata* (L.) Roxb., *Senna tora* (L.) Roxb., *Tamarindus indica* L., *Ziziphus oenopolia* (L.) Mill.

According to the 2011 Indian Census, the Reddiapatti panchayat's (which constitutes a total of six villages including the three study villages) demographic population is 7680 in 1840 households. Of which 51.5 % are men and 48.5% are women. The people of the study area are mainly involved in mango and tamarind cultivation, medicinal plant collection, and cattle rearing activities for their livelihood (Suresh 2008, Geological Survey of India 2017).

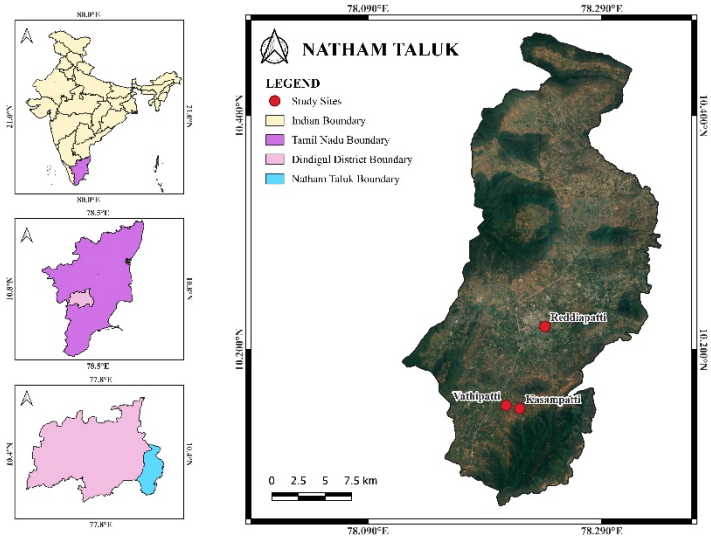

Figure 1. Map of the Study Area, Dindigul district, Tamil Nadu, India showing surveyed villages [QGIS (v3.34]

Ethnobotanical Survey and Data Collection

Monthly field visits were conducted in the study area from December 2020 to February 2023. Extensive ethnobotanical surveys were carried out by guidelines outlined by Jain (1964) and Martin (2008).

About 93 informants were selected using non-probability sampling and snowball sampling methods (Jan *et al.* 2020) with an equal distribution of 31 informants per site. The demographic details of the informants, including their name, gender, age, level of education and their experience were recorded. The key informants were identified based on their expertise and reputation among the local population.

Ethnobotanical data, including local plant names, usage, parts used, modes and routes of administration were collected through semi-structured personal interviews using questionnaires (Hassan *et al.* 2022) with 29 key informants such as herbalists/ traditional medical practitioners/ Naatu Vaidyars. These interviews were supplemented by focus group discussions (FGD) and participatory appraisal techniques (Hassan *et al.* 2021) to confirm plant usage, and the number of ailments treated. Three FGD, one per village, were conducted with 8 -10 key informants from each village.

The general informants participated in open-ended discussions on the commonly used medicinal plants and free listing interviews (Quinlan 2002), where the informants were asked to list plants and their medicinal uses to check the knowledge concordance among the informants.

Guided field walks in the woods and hills were conducted with the key informants (like herbalists and medicine men) enabling plant identification, collection and documentation of their uses (Albuquerque *et al.* 2017). All interviews were conducted in the local vernacular language, Tamil.

Identification of Plants: Plant photographs were captured and voucher specimens were collected, sterilized using 95% ethanol, air dried, mounted on herbarium sheets, identified, using standard methods (Dos Santos *et al.* 2014) which were authenticated, labelled and deposited in the Department Herbarium at the Post Graduate and Research Department of Botany, Thiagarajar College for future reference. The herbarium specimens were stored under controlled conditions like temperature range of 15-20^{o}C, relative humidity of 40-60%, low-intensity light, and a dust free, contamination free environment in a well- ventilated chamber.

The life forms of the collected plants were categorized into herbs, climbers, shrubs, and trees based on the data from the India Biodiversity Portal (Vattakaven *et al.* 2016). The conservation status of the recorded medicinal plants was also assessed using the International Union for Conservation of Nature Red list (IUCN 2024). Botanical identification was performed using existing regional flora and botanical databases (Gamble & Fisher 1956, Matthew 1983, Matthew 1991, WFO 2024).

Data Analysis

Ethnobotanical data on diseases were classified into 18 ailment categories following the International Classification of Diseases- ICD - 11 (WHO 2022) and the International Classification of Primary Care - (ICPC-2) (WHO 2021), with slight modifications.

The number of remedies for each ailment category and the number of medicinal plant species used to treat each ailment category was recorded. Percentage analyses were carried out for ethnobotanical data on families, life forms, parts used, modes of preparation, and routes of administration using Microsoft Excel.

Principal Component Analysis (PCA) was also carried out for plant parts usage to identify the significant difference in plant part groupings (Khoja *et al.* 2023). PAST software (version 3) (Haq *et al.* 2021) was used to create a presence-absence matrix for plant species across ailment categories by means of coding where 0 codes for absence and 1 code for presence.

The ethnobotanical data collected using the survey was evaluated using quantitative indices like Use Reports (UR), Use value (UV), Family Use Value (FUV), Informant Consensus factor (ICF), Relative Frequency of Citation (RFC), Informant Agreement Ratio (IAR), Fidelity level (FL %), using the following formulae in Microsoft Excel 2011. SPSS Statistics software (SPSS v.23) was used to interpret the strength and direction of the relationship between two quantitative indices which were compared using the Pearson correlation coefficient.

Use Report (UR) could be defined as the utilization of a medicinal plant species for a disease as reported by the informant. Higher use reports meant that there was a higher demand for that particular species, which would decline the population and hence these species must be conserved.

Relative Frequency of Citation (RFC) is used to test the frequency at which a species is mentioned by the informants (Tardio & Pardo De Santayana 2008). The RFC value generally ranges from 0 to 1. RFC 0 meant that the informants had not reported any use of the plant and RFC value 1 indicates that the taxon was very well cited by all the informants. Relative frequency of Citation was evaluated to signify the local importance of the medicinal plant species in the study area based on the frequency or number of times a taxon was cited. It is determined using equation 1

$$RFC = \frac{FCs}{N} \qquad \textbf{Equation 1}$$

Where FCs - Number of informants who reported a taxon (frequency of citation);
N - Total number of informants.

Use Value (UV) of a species gives the relative importance of the local plants in the study area. It is calculated with equation 2 (Phillips & Gentry 1993).

$$UV = \sum \frac{Ui}{Ni} \qquad \textbf{Equation 2}$$

Where, Ui - Number of use reports mentioned by each informant for a taxon,
Ni - Total number of informants interviewed for that taxon

Family Use Value (FUV) helps in determining the relative importance of a certain family of medicinal plants that are used in the study area (Phillips & Gentry 1993). It is determined using equation 3.

$$FUV = \frac{UVs}{Ns} \qquad \textbf{Equation 3}$$

Where, UVs - Species usage value of the plants mentioned by informants;
Ns - Total number of plants identified in the family

Informant Consensus Factor (ICF) is used to test the knowledge dispersal among the locals of the study area (Trotter & Logan 1986). It is calculated using equation 4.

$$ICF = \frac{Nur - Nt}{Nur - 1} \quad \textbf{Equation 4}$$

Where, Nur - number of use-reports for a particular ailment category
Nt - Number of taxa used for a particular ailment category by all informants.

ICF values range from 0 to 1. If the values are near to 0, it indicates that a significant number of taxa were used for one ailment category but the informants disagree on the taxa. Meanwhile, if the values are closer to 1, only a few taxa have been used by the informants and they agree with each other on its usage (Gazzaneo *et al.* 2005).

Informants Agreement Ratio (IAR) is useful in indicating the significance of individual species. The IAR value ranges from 0 to 1. The value 1 indicates all the informants who cited one species mentioned only that species for a particular disease. Values lesser than 1 indicate that the informants cited more than one species to treat that ailment (Trotter & Logan 1986). The IAR value is determined using equation 5.

$$IAR = \frac{Nr - Nac}{Nr - 1} \quad \textbf{Equation 5}$$

Where, Nr - Total number of citations recorded for individual species
Nac - Number of ailment categories treated with that species

Fidelity level (FL %) is used to estimate the percentage of the most preferred and used plant for a particular ailment category by the informants (Friedman *et al.* 1986) using equation 6.

$$FL(\%) = \frac{Np}{N} \times 100 \quad \textbf{Equation 6}$$

Where Np - Number of citations for plant for a particular disease category and
N - Total number of informants who cited that plant for any other use or purpose

Pearson Correlation Analysis is used to establish the relationship between some of the indices (Ahmad *et al.* 2017). Correlation analysis was carried out between UV and RFC, UR and FC, Nt and FL%.

Results

Demography of the Informants

Table 1 depicts the sociodemographic features of the informants. In an ethnobotanical study with 93 informants, 45% were male and 55% female, though males cited more use reports. This is consistent with the findings of a study from Ethiopia (Yiblet & Adamu 2023). Informants included key informants (31% - herbalists/ Naatu vaidyars, midwives) and general (69%- wives of herbalists, common public who had practical knowledge on herbal remedies), with key informants showing higher knowledge as predicted by Giday *et al.* 2009. Age groups were 21-40 (31%), 41-60 (41%), and >60 (28%), with older groups richer in traditional knowledge which is supported by an earlier similar study from India (Ralte *et al.* 2024). This might be because of the decline in knowledge transmission to the younger generations (Cheikhyoussef *et al.* 2011) as traditional knowledge is mostly transmitted orally. Education levels showed that even more educated individuals (59% with middle schooling) were interested in ethnobotanical knowledge, challenging the notion that only the less educated retain traditional knowledge (Gaoue *et al.* 2017). Earlier studies from Mexico and Congo were unable to associate the education level with traditional knowledge (Beltran-Rodriguez *et al.* 2014, Ndavaro *et al.* 2024).

Floristic Analysis

A total of 199 medicinal plants from 170 genera and 67 families were recorded in this study. This included 66 families of angiosperms and 1 family of pteridophytes, with Fabaceae being the most dominant, comprising about 31 species used for ailments such as skeletomuscular disorders, urogenital diseases, sexual disorders, pregnancy and postpartum issues, and poisonous bites (Figure 2). Fabaceae is globally prevalent, considered the third largest plant family (Maroyi 2023), and is

extensively analysed for its biochemical and pharmacological constituents (Wink 2013), as it has been the major contributor of medicinal plant species (Prabhu *et al.* 2014). Its wider distribution and availability (Marles & Farnsworth 1995), contributed to its status as the most commonly used family in this study and in previous ethnobotanical research worldwide (Faruque *et al.* 2019, Omara *et al.* 2020, Bibi *et al.* 2022, Aruna & Shrinitha 2023).

Table 1: Socio- demographic features of the Informants

Variables	Categories	No. of Informants	Percentage %
Gender	Male	42	45
	Female	51	55
Experience	General	64	69
	Key	29	31
Age group	21 - 40	29	31
	41 - 60	38	41
	>60	26	28
Education level	< Primary	25	27
	Middle	56	59
	Higher Secondary	12	13

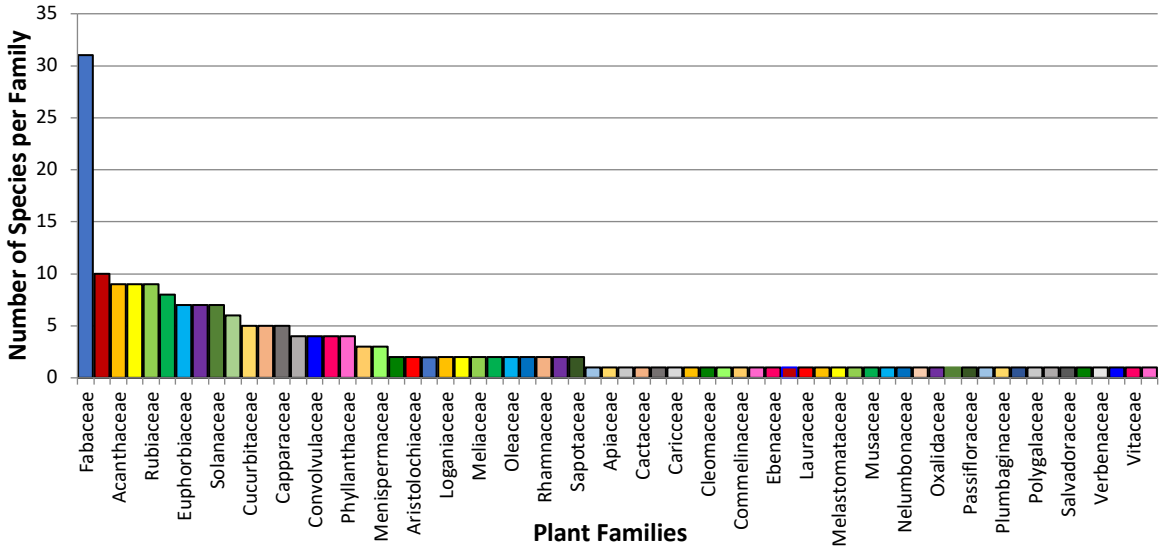

Figure 2. Number of species per Family

The Ailment Categories were classified into 18 categories (Appendix 1 (A)). AC 11 - Urogenital issues (74) had the greatest number of remedies recorded, followed by AC 14 - Poisonous bites had 67 recorded remedies. Figure 3 indicated the presence -absence matrix of various species used per ailment category.

Life forms of Medicinal Plants

The study area documented medicinal plants as herbs (34%), trees (25%), shrubs (24%), and climbers (17%) (Figure 4). Herbs were the most commonly used due to their wide distribution, easy availability, and richness in phytocompounds (Uniyal *et al.* 2006, Lulekal *et al.* 2013, Khoja *et al.* 2022). They are easily harvested and processed (Pieroni & Price 2006) leading to their prevalence in local health care. Ethnobotanical studies globally have also identified herbs as the primary life form utilized for health care needs (Jan *et al.* 2020, Boro *et al.* 2023, Ralte *et al.* 2024).

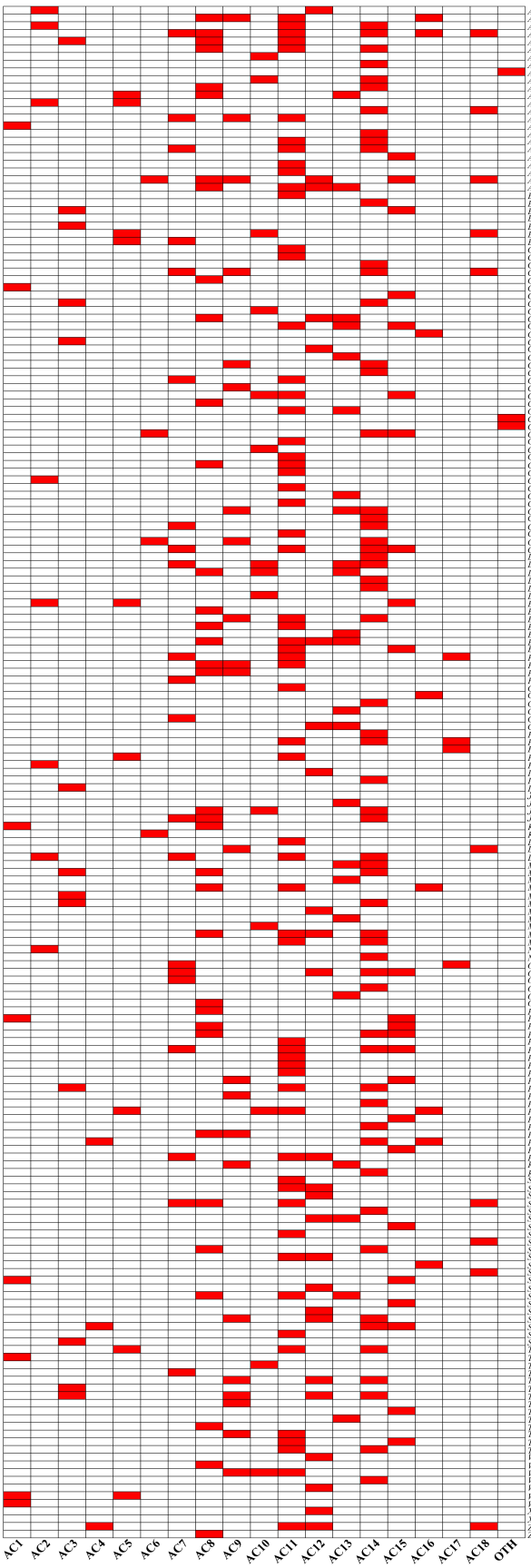

Figure 3. Presence - Absence Matrix of plants used in each Ailment Category. The red color indicates the usage of a particular species in that Ailment Category (AC) and the White color indicates non-usage.

Ailment Categories

Plant Parts Used in Herbal drug formulations

In herbal formulations, optimal plant part collection is essential for potency and quality (Inta *et al.* 2023). Leaves were the most used (41%) in the study area which aligned with other studies in the same region (Ganesan *et al.* 2008, Sundaram & Suresh 2019a), followed by the whole plant (14%), roots (13%), and bark (8%). (Figure 5). Aerial parts are often prioritized to prevent damaging the plant, supporting conservation and sustainability in herbal practices (Giday *et al.* 2009). Especially leaves are mostly utilized because of their abundance, easy harvest, rapid growth and regeneration (Panmei *et al.* 2019, Baidya *et al.* 2020), they could be accessed any time of the year and are rich in bioactive content such as alkaloids (vinblastine, atropine found in the leaves of *Catharanthus roseus*, *Atropa belladonna*), terpenoids (azadirachtin, artemesin found in *Azadirachta indica, Artemesia annua),* phenolic compounds (gallic acid, ferulic acid found in *Terminalia chebula, Ferula foetida)* which are responsible for their therapeutic properties like anticancer, antioxidant and anti-inflammatory activities (Focho *et al.* 2009).

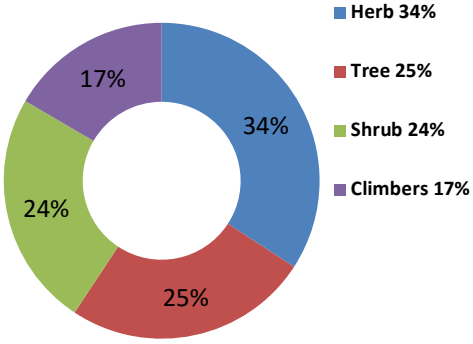

Figure 4. Life forms of Medicinal Plants

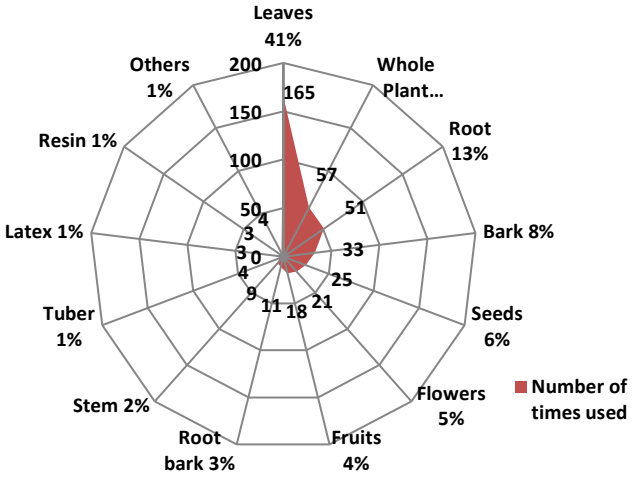

Figure 5. Plant Parts used in Herbal drug formulations

Principal Component Analysis (PCA) was carried out to determine the variables that explain the variance in the data through associational analysis. PCA grouped species based on plant part usage, identifying three main groups. Leaves (24%) and whole plants (18%) formed distinct clusters, with other parts grouped separately. Leaves correlated positively with axis 1, and whole plants with axis 2, highlighting their frequent use. Plant parts in the negative region were used less. The PCA biplot (Figure 6) showed similarities in usage patterns, consistent with previous ethnobotanical analyses on plant part usage (Hassan *et al.* 2022, Khoja *et al.* 2022).

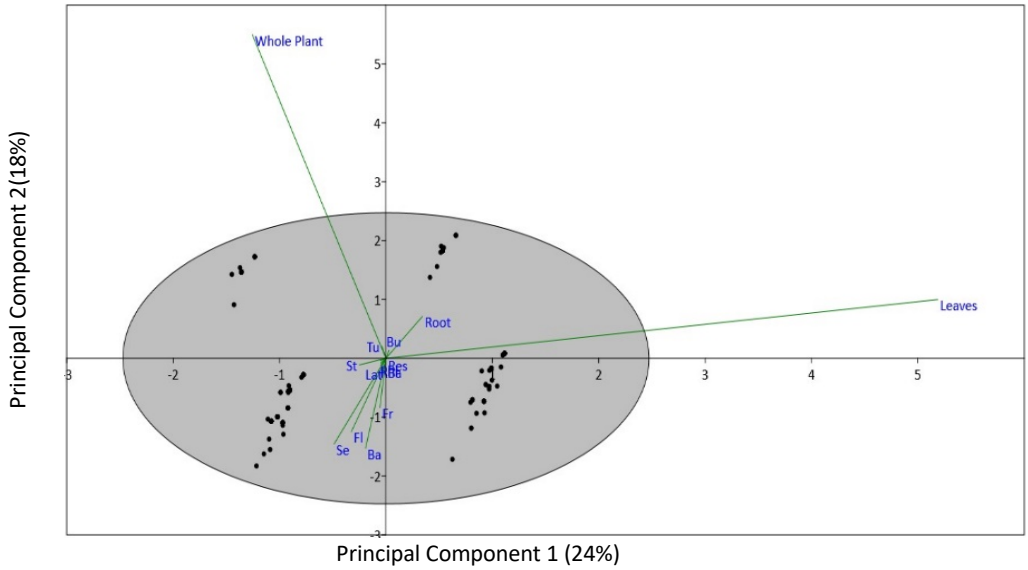

Figure 6. Principal Component Analysis biplot - Plant Parts Used [St - Stem, B - Bark, RBa - Root Bark, Se - Seeds, Fl - Flowers, Fr - Fruits, Tu - tuber, Bu - Bulbs, Lat - Latex, Res - Resin]

Mode and Route of Administration of Herbal Drugs

Medicinal plants in the study area were prepared in various forms: paste (36%), decoction (20%), powder (20%), juice (10%), raw (5%), cooked (4%), extract (2%), oil (2%), and smoke (1%) (Figure 7). The paste was the most preferred form, as it could be easily prepared even without using water (Saha *et al.* 2014). This finding contradicted with the results from other regions of India (Sivasankari *et al.* 2014, Ralte *et al.* 2024) where decoction is the most used form of administration but aligned with studies from rural regions of South Africa (Mwinga *et al.* 2019, Ndhlovu *et al.* 2023).

Oral administration dominated, with 72% of remedies taken orally, 24% applied topically, 3% nasally, and 1% as ear or eye drops (Figure 8). This finding concurred with earlier similar studies in this region and other regions (Sivasankari *et al.* 2014, Umair *et al.* 2017). Oral administration was favoured for better absorption and utilization of bioactive compounds and might be due to the prevalence of internal diseases in the study area (Polat & Satil 2012, Benkhaira *et al.* 2021)

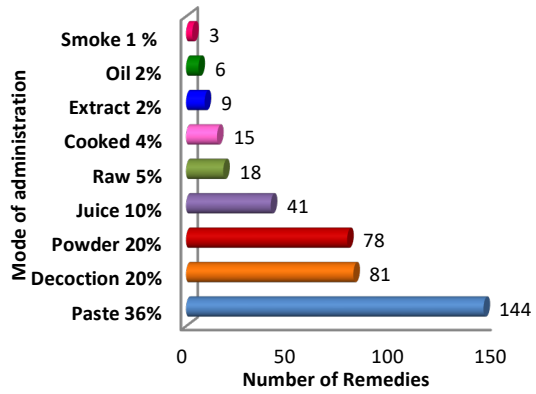

Figure 7. Mode of Administration [paste (most used -easy to prepare), decoction, powder, juice, cooked, extract, oil & smoke - various modes of consumption of herbal drugs]

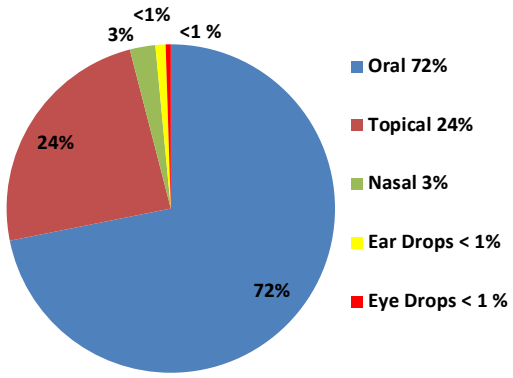

Figure 8. Route of Administration [oral (most preferred- high prevalence of internal diseases), topical, nasal, ear drops, eye drops - various route of administration of herbal drugs]

Adjuvants used in herbal drug formulations

Adjuvants, generally used to enhance the acceptability, medicinal properties, taste or consistency of the preparation (Poonam & Singh 2009, Chen *et al.* 2018), included water as a primary solvent with alternatives like curd, milk, buttermilk, coconut milk, rice water, and lemon juice to make a paste. The list of adjuvants used in the study area to prepare herbal drugs are provided in Appendix 1 (B). Oils such as butter, ghee, neem, and coconut were common for topical applications, while honey and palm jaggery masked bitterness (Silambarasan & Ayyanar 2015). Spices like black pepper, cloves, long pepper, cumin, carom, coriander seeds, sesame seeds, curry leaves, dill, onion, garlic, ginger, chilies, and black gram improved bioavailability, efficacy, stability and preservation with some preparations also using egg, camphor, and limestone. Usage of similar adjuvants has been recorded in earlier studies (Francis Xavier *et al.* 2014, Sivasankari *et al.* 2014).

Ethnobotanical Data

About 199 plant species spread across 67 families and 172 genera have been recorded in the study area. The ethnobotanical data like family name, botanical name, habit, IUCN status, local names, diseases treated, frequency of citation, ailment category, parts used, mode of preparation and route of administration of the drugs were presented in the Table 2.

Table 2. Ethnobotanical data of the Medicinal plants documented in Vathipatti, Kasampatti and Reddiapatti, Dindigul District, Tamil Nadu

Family	Name	Habit	IUCN Status	Tamil Name	Diseases/ Conditions	Frequency of Citation (FC)	Ailment category	Parts Used	Modes of Administration	Routes of Administration
Marsileaceae	*Marsilea minuta* L.	H	LC	Aara keerai	Reduces lactation	15	13	WP	Pa	O
Aristolochiaceae	*Aristolochia bracteolata* Lam.	H	NE	Aadutheenda paalai	Snake bite	18	14	R	Dec	O
					Scorpion sting	32	14	L	Po	O
					Amenorrhoea, Dysmenorrhoea	18	11	Se	Po	O
	Aristolochia indica L.	H	NE	Thalai suruli	Snake bite	32	14	R, L	Pa	O,T
					Sinus	21	7	L	Sm	N
					Oligomenorrhoea	13	11	R	Dec	O
Lauraceae	*Cassytha filiformis* L.	C	NE	Verilla kotran	Placenta removal	3	13	WP	Pa	O
Asphodelaceae	*Aloe vera* (L.) Burm.f.	H	NE	Sotru katralai	Piles	14	8	R	Po	O
					Eye redness	29	5	Lat	Cd	O
					Induce labour pain	9	13	R	Dec	O
Asparagaceae	*Agave americana L.*	H	LC	Aanai katraalai	Bone fracture	39	11	Lat	Pa	T
	Asparagus racemosus Willd.	C	NE	Thaneervittan kilangu	Menorrhagia	6	11	Tu	Pa	O
Commelinaceae	*Commelina benghalensis* L.	H	LC	Kana vazhai	Menorrhagia	2	11	WP	Pa	O
Pontederiaceae	*Pontederia crassipes* Mart.	H	NE	Aahaasa thamarai	Body coolant	3	15	Fl	J	O
Musaceae	*Musa paradisiaca* L.	T	NE	Vaazhai	Ischuria	15	11	St	Dec	O
					Burns	5	18	St	J	T
					Snake bite	4	14	St	J	O
					Menorrhagia	8	11	Fl	J	O
Poaceae	*Cynodon dactylon* (L.) Pers.	H	NE	Arugam	Sinus	16	7	L	J	N
					Body coolant	15	15	WP	Oil	T
					Migraine	12	15	L	J	Ead
					Urinary bladder stones	9	11	WP	J	O
					Centipede bite	17	14	WP	Pa	T
					Menorrhagia	9	11	WP	Pa	O

Papaveraceae	*Argemone mexicana* L.	H	NE	Brammathandu	Scorpion sting	24	14	Wp	J, Pa	O,T
					Snake bite	16	14	L	J	T
Menispermaceae	*Cocculus hirsutus* (L.) W. Theob.	C	NE	Kattukodi	Menorrhagia	19	11	L	Pa	O
	Coscinium fenestratum (Gaertn.) Colebr.	C	DD	Maramanjal	Uterus strengthening	1	11	Rhi	Po	O
	Tinospora cordifolia (Willd). Hook.f. & Thomson	C	NE	Seenthil	Skin rashes	25	9	WP	Dec	T
Nelumbonaceae	*Nelumbo nucifera* Gaertn.	H	DD	Venthamarai	Blood cleansing	3	7	Fl	Dec	O
Vitaceae	*Cissus quadrangularis* L.	C	NE	Pirandai	Kidney stones	24	11	St	Dec	O
					Cold	16	15	St	J	O
					Sprain	33	10	St	J	T
					Amenorrhoea	6	11	WP	Pa	O
Zygophyllaceae	*Tribulus terrestris* L.	H	LC	Nerunji	Bloody urine	13	11	R	Pa	O
					Abscess	24	9	WP	Po	O
					Dysuria	17	11	WP	Po	O
Fabaceae	*Abrus precatorius* L.	C	NE	Kundrin mani	Anaemia	2	2	L	Po	O
					Infertility in women	5	12	R	Pa	O
	Albizia amara (Roxb.) Boivin	T	LC	Usilai	Foot and Mouth disease (Cattle)	28	Ot	L	Pa	O,T
	Albizia lebbeck (L.) Benth.	T	LC	Vaagai	Arthritis	31	10	Ba	Dec	O
					Snake bite	25	14	Fl	Pa	O
	Bauhinia purpurea L.	S	LC	Mantharai	Appetizer	26	3	L	Po	O
	Bauhinia racemosa Lam.	S	LC	Aavi	Migraine	18	15	L	Ex	T
	Cassia roxburghii DC.	T	NE	Sennkondrai	Diabetes	14	3	Ba	Po	O
	Cassia siamea Lam.	T	LC	Kondrai	Gonorrhoea	23	12	Ba	Po	O
	Clitoria ternatea L.	C	NE	Sangu poo	Infertility in women	19	12	R	Dec	O
	Crotalaria verrucosa L.	H	NE	Vattakilukiluppai	Bug bite	13	14	Rb	Dec	T
	Delonix elata (L.) Gamble	T	LC	Vaatharakaachi/ Vaatha narayanan	Gastritis	12	8	L	J	O
					PCOD	18	13	L	Pa	O
					Arthritis	37	10	L	Oil	T
	Dichrostachys cinerea (L.) Wight & Arn.	H	LC	Vidather	Centipede bite	3	14	L, Fl, Fr, Ba	Dec	O
	Erythrina variegata L.	T	LC	Kalyana murungai	Bloody diarrhoea	12	8	Ba	Po	O
	Gliricidia sepium (Jacq.) Kunth.	T	LC	SeemaiAhathi	Bug bite	5	14	WP	Dec	T
	Glycyrrhiza glabra L.	S	LC	Athimathuram	Dry cough	21	7	Ba	Po	O

	Guilandina bonduc L.	C	LC	Kalarchikkai	Oligomenorrhoea	27	11	Se	Po	O
	Indigofera aspalathoides Vahl ex DC.	H	NE	Sevanam	Infertility in women	21	13	Fl	Pa	O
	Indigofera tinctoria L.	S	NE	Neeli	Snake bite	15	14	L	J	O
					Mouth and stomach ulcers	15	8	Ba	Dec	O
	Mimosa pudica L.	H	LC	Thottal surungi	Diabetes	32	3	R, L	Po	O
					Snake bite	3	14	R	Po	O
	Pongamia pinnata (L.) Pierre	T	LC	Pungam	Dental pain	8	16	B	Po	O
					Watery eyes	12	5	Fl	Cd	O
					Arthritis	39	10	R	Pa	T
					Leucorrhoea	27	11	L, R	Pa	O
	Prosopis cineraria (L.) Druce	T	NE	Vanni	Constipation	19	8	Ba	Po	O
					Body itching	8	9	L	Pa	O
	Prosopis juliflora (Sw.) DC.	T	LC	Karuvelam	Dental caries	37	16	Ba	Po	O
					Nerval weakness	16	4	Res	Po	O
					Snake bite	11	14	L	Pa	O
	Pterolobium hexapetalum (Roth) Santapau & Wagh	S	NE	Puliunda soorai	Head ache	13	15	St	Ra	N
	Saraca asoca (Roxb.) W.J.de Wilde	T	VU	Asoka	Menorrhagia	32	11	R	Po	O
					Leucorrhoea	21	11	B& Fl	Pa	O
					Infertility in women	21	12	Ba	Dec	O
	Senna alexandrina Mill.	H	LC	Nilavaagai	Infertility in women	14	12	L	Pa	O
	Senna auriculata (L.) Roxb.	S	LC	Aavaram	Dysuria	26	11	Fl	Dec	O
					Cut wounds	6	18	L	Pa	T
					Piles	13	8	Fl	Po	O
					Asthma	16	7	L, Fl	Po	O
					Stomach ache	9	8	R	Pa	O
					Bug bite	3	14	Fr	Dec	T
	Senna tora (L.) Roxb.	H	NE	Thagarai	Snake bite	4	14	R	Pa	O
	Sesbania grandiflora (L.) Poir.	S	DD	Agathi	Cold	11	15	Fl	J	N
	Sesbania sesban var. *bicolor* (Wight & Arn.) F.W.Andrews	S	LC	Karunchembai	Menorrhagia	6	11	Se	Pa	O
	Tamarindus indica L.	T	LC	Puli	Eyes irritation	16	5	Fl	Po	T
					Dysuria	21	11	Se	Po	O
					Bee sting	24	14	Fr	Pa	T

	Tephrosia purpurea (L.) Pers.	H	LC	Kolingi	Arthritis	19	10	R	Pa	O
	Vigna trilobata (L.) Verdc.	C	NE	Naripayir	Piles	11	8	L	Cd	T
Polygalaceae	*Polygala chinensis* L.	C	NE	Siriyanangai	Dysmenorrhoea	5	11	L	J	O
Rhamnaceae	*Ziziphus mauritiana* Lam.	T	LC	Ilanthai	Wounds	21	18	Ba	Po	T
					Nervous disorder	15	4	R	Dec	O
					Menorrhagia	11	11	Ba	Dec	O
					Infertility in Women	2	12	L	Pa	O
	Ziziphus oenopolia (L.) Mill.	S	LC	Soorai	Stomach ulcers	22	8	Fr	Raw	O
Moraceae	*Artocarpus heterphyllus* Lam.	T	LC	Pala	Head ache	13	15	R	Pa	T
	Ficus benghalensis L.	T	NE	Aalam	Menorrhagia	20	11	Ba	Po	O
					Mouth and stomach ulcers	16	8	Ba	Dec	O
					Skin rashes	19	9	Ba	Pa	T
	Ficus religiosa L.	T	LC	Arasu	Skin rashes	14	9	L	Po	T
					Mouth and stomach ulcers	16	8	Ba	Dec	O
	Streblus asper Lour.	T	LC	Pirayan	Skin rashes	26	9	Ba	Pa	T
					Snake bite	18	14	Wp	Po	O
Cucurbitaceae	*Citrullus colocynthis* (L.) Schard	C	NE	Chummitti kai	Stomach ache	19	8	Fr	Pa	O
	Coccinia grandis (L.) Voigt	C	NE	Kovai	Urine incontinence	13	11	L	Pa	O
					Stomach ache	26	8	L	Dec	O
	Cucumis maderaspatanus L.	C	NE	Musumusakai	Foot irritation	16	3	L	Pa	T
					Asthma	29	7	L	Cd	O
					Bug bite	9	14	L	Dec	T
	Cucumis sativus L.	C	NE	Vellari	Ischuria	18	11	Se	Pa	O
	Kedrostis foetidissima Cogn.	C	NE	Kollan kovai	Shingles	16	1	L	Pa	O
					Stomach ache	13	8	L	Dec	O
Oxalidaceae	*Oxalis corniculata* L.	H	NE	Puliaarai	Diarrhoea	4	8	L	Pa	O
Clusiaceae	*Garcinia gummi-gutta* (L.) N.Robson	T	LC	Panampuli	Uterovaginal prolapse	3	11	Fr	Pa	O
Calophyllaceae	*Calophyllum inophyllum* L.	T	LC	Punnai	Dog bite	5	14	S	Pa	T
Violaceae	*Hybanthus enneaspermus* (L.) F. Muell.	H	NE	Orithal thamarai	Leucorrhoea	55	11	L	Raw	O
					Eye redness	16	5	WP	Pa	O
Passifloraceae	*Passiflora foetida* L.	C	NE	Poonaikaali	Bloody Diarrhoea	18	8	Se	Cd	O
Euphorbiaceae	*Acalypha indica* L.	H	NE	Kuppaimeni	Blood cleansing	33	2	WP	Po	O
					Bug bite	9	14	L	Pa	T
					Snake bite	18	14	R	Dec,Pa	O

					Dysmenorrhoea	17	11	L	Ex	O
	Euphorbia heterophylla L.	H	LC	Paalperukki	Induce lactation	25	13	L	Pa	O
	Euphorbia hirta L.	H	NE	Ammaan pacharisi	Constipation	5	8	WP	Po	O
					Infertility in women	25	12	L	Po	O
					Induce lactation	34	13	Fl	Pa	O
					Leucorrhoea	11	11	L& Fl	Pa	O
	Jatropha curcas L.	S	LC	Kaatu aamanakku	Induce lactation	3	13	L	Raw	T
	Jatropha gossypiifolia L.	S	LC	Adhalai	Bone fracture	7	10	L	Pa	T
					Gastritis	3	8	R	Raw	O
					Snake bite	5	14	L	Pa, J	O,T
	Ricinus communis L.	S	NE	Aamanakku	Induce lactation	3	13	L	Raw	T
					Skin allergy	8	9	Se	Pa	T
	Tragia involucrata L.	C	NE	Senthatti	Reduce pain during pregnancy	2	13	L	J	O
Phyllanthaceae	*Cleistanthus collinus* (Roxb.) Benth. ex Hook.f.	T	VU	Odugan	Pesticide	29	Ot	L, S	Ex	T
	Flueggea leucopyrus Willd.	S	LC	Vellai poola	Asthma	22	7	L	Dec	O
	Phyllanthus amarus Schumach. & Thonn.	H	NE	Keelanelli	Leucorrhoea	7	11	WP	Pa	O
					Menorrhagia	6	11	R	Po	O
	Phyllanthus emblica L.	T	LC	Nelli	Snake bite	2	14	L	Pa	O
					Menorrhagia	3	11	Fr	Po	O
Combretaceae	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	T	NE	Marudham	Diabetes	32	3	WP	Pa	O
	Terminalia bellirica (Gaertn.) Roxb.	T	LC	Thandrikkai	Asthma	23	8	Fr	Po	O
	Terminalia chebula Retz.	T	LC	Kadukkai	Foot crack	20	9	Se	Po	T
					Syphilis	18	12	Fr	Po	O
					Bug bite	3	14	Fr	Dec	T
Lythraceae	*Lawsonia inermis* L.	S	LC	Maruthani	Wounds	9	18	L	Pa	T
					Foot corn	14	9	L	Pa	T
	Punica granatum L.	S	LC	Maadhulai	Sinus	13	7	L	J	N
					Infertility in Women	19	12	RBa	Dec	O
					Menorrhagia	23	11	RBa	Po	O
Myrtaceae	*Syzygium cumini* (L.) Skeels	T	LC	Naaval	Diabetes	19	3	Se	Po	O
Melastomataceae	*Memecylon umbellatum* Burm.f.	S	LC	Kaya	Diabetes	34	3	L	Po	O
Anacardiaceae	*Lannea coromandelica* (Houtt.) Merr.	T	LC	Odhiyam	Menorrhagia	16	11	Ba	Dec	O

	Mangifera indica L.	T	DD	Maa	Diabetes	13	3	L	Po	O
					Diarrhoea	3	8	Se	Po	O
					Deworming	11	9	Se	Po	O
					Bee sting	15	14	Lat	Raw	T
Sapindaceae	*Cardiospermum halicacabum* L.	C	LC	Siru mudakkathan	Arthritis	16	10	WP	Dec	O
	Dodonaea viscosa Jacq.	S	LC	Virali	Arthritis	18	10	L	Cd	T
Rutaceae	*Aegle marmelos* (L.) Correa	T	NT	Vilvam	Leucorrhoea	16	11	L	Po	O
					Mouth ulcer	14	8	Fr	Pa	O
					Diabetes	37	3	L	Po	O
					Menorrhagia	9	11	L	Pa	O
	Citrus limon (L.) Osbeck	T	LC	Elumicchai	Smooth delivery	3	13	R	Po	O
					Leucorrhoea	6	11	L	Ex	O
	Chloroxylon swietenia DC	T	VU	Purasu	Ring worms	21	9	Se	Pa	T
	Clausena anisata (Willd.) Hook.f. ex Benth	S	LC	Aana	Fruit ripening	5	Ot	L	Ex	T
	Glycosmis pentaphylla (Retz.) DC.	T	LC	Paanja	PCOD	31	13	Ba	Raw	O
	Limonia acidissima L.	T	NE	Vila	Liver diseases	14	17	Fr	Po	O
					Gastritis	23	8	L	Dec	O
					Vaginal wounds	5	11	Res	Po	T
					Menorrhagia	5	11	Res	Po	O
	Toddalia asiatica (L.) Lam.	C	NE	Milakaranai	Cough	17	15	WP	Po	O
Meliaceae	*Azadirachta indica* A. Juss.,	T	LC	Vembu	Ear wax	14	6	L	Ex	Ead
					Body coolant	8	15	Fl	Dec	O
					Skin rashes	16	9	Ba	Pa	T
					Vomiting	7	8	Fl	Po	O
					Burns	11	18	Se	Pa	T
					Female contraceptive	19	12	Ba	Dec	O
	Melia azedarach L.	T	LC	Malai vembu	Deworming	28	8	Ba	Dec	O
					Bad breath	4	16	Se	Raw	O
					Amenorrhoea	26	11	Se	Po	O
Malvaceae	*Abutilon indicum* (L.) Sweet	S	NE	Thuthi	Black spots on skin	18	9	RBa	Po	T
					Dental Pain	18	16	WP	Dec	O
					Piles	43	8	L	Cd	O
					Leucorrhoea	10	11	L	Pa	O

	Hibiscus rosa-sinensis L.	S	NE	Sembaruthi	Chest pain	12	17	Fl	Dec	O
	Pavonia odorata Willd.	H	NE	Peramutti	Fever	22	15	R	Dec	O
					Stomach ulcers	13	8	L	Dec	O
	Pavonia zeylanica (L.) Cav.	H	NE	Sitramutti	Diarrhoea	14	8	L	Pa	O
					Snake bite	22	14	L	Pa	T
					Fever	36	15	R	Dec	O
	Sida acuta Burm.f.	H	NE	Arivaalmanai poondu	Cut wounds	32	18	L	J	T
	Sida cordifolia L.	H	NE	Palampaasi	Diarrhoea	15	8	L	Po	O
					Piles	26	8	L	Dec	O
					Snake bite	19	14	L	Pa	O,T
	Sterculia foetida L.	T	LC	Peenaari	Gonorrhoea	4	12	L	Dec	O
	Thespesia populnea (L.) Sol. ex Correa	T	LC	Poovarasu	Thyroid	23	3	Ba	Dec	O
					Female contraceptive	9	12	Ba	Po	O
					Skin rashes	19	9	L	Pa	O
					Snake bite	10	14	L,Fl, Ba	Dec	O,T
					Bug bite	12	14	Ba	Dec	O
	Waltheria indica L.	H	LC	Sengalipoondu	Impotency in men	19	12	Se	Raw	O
Moringaceae	*Moringa oleifera* Lam.	T	LC	Murungai	Reduce pregnancy pain	4	13	L	Dec	O
					Indigestion	6	8	Ba	Dec	O
					Impotency in men	13	12	Fl	Cd	O
					Snake bite	26	14	L	J	O
					Dysmenorrhoea	4	11	L	Ex	O
Caricaceae	*Carica papaya* L.	T	DD	Pappali	Intestinal wounds	8	8	Fr	Raw	O
					Lactation	11	13	Fr	Cd	O
					Abortifacient	20	12	Fr	Raw	O
Salvadoraceae	*Azima tetracantha* Lam.	S	LC	Sanganilai	Stomach ache	31	8	L	Dec	O
					Ischuria	23	11	RBa	Ex	O
					Abortifacient	6	12	R	Pa	O
					Induce postpartum periods	6	13	L	Dec	O
Capparaceae	*Cadaba fruticosa* (L.) Druce	S	NE	Viluthi	Back pain during periods	19	11	L	Pa	O
	Capparis divaricata Lam.	S	NE	Thoratti	Migraine	15	15	Ba	Oil	T
	Capparis zeylanica L.	S	NE	Aathondai	Antivenom	9	14	L	Pa	O
					Appetizer	18	3	L	Pa	O

	Crateva religiosa G.Forst.	T	LC	Maavilangam	Skin rashes	19	9	L	Pa	O
					Bug bite	15	14	Ba	Dec,Pa	O,T
					Gastritis during pregnancy	5	13	Ba	Pa	O
Cleomaceae	*Cleome gynandra* L.	H	NE	Thaivelai	Migraine	22	15	L	Ex	Ead
					Ear pain	18	6	R	Dec	O
					Snake bite	25	14	L	Pa	O
	Cleome viscosa L.	H	NE	Naaivelai	Menorrhagia	18	11	Se	Pa	O
					Oligomenorrhoea	12	11	Se	Pa	O
Santalaceae	*Santalum album* L.	T	VU	Santhanam	Leucorrhoea	4	11	St	Pa	O
Plumbaginaceae	*Plumbago zeylanica* L.	S	NE	Kodiveli	Amenorrhoea	19	11	R	Dec	O
					Immunity	20	3	RBa	Po	O
					Snake bite	23	14	L	J	O
Caryophyllaceae	*Polycarpaea corymbosa* (L.) Lam.	H	NE	Sadachi poondu	Skin rashes	17	9	R	Pa	T
Amaranthaceae	*Achyranthes aspera* L.	H	NE	Naayuruvi	Cut wounds	13	18	WP	Pa	T
					Piles pain	18	8	L	Cd	O
					Dental pain	12	16	R	Pa	T
					Lung disease	21	7	Se	Po	O
					Scorpion sting	5	14	L	J	T
					Menorrhagia	9	11	WP	Pa	O
	Aerva lanata (L.) Juss. ex Schult.	H	NE	Sirupeelai	Snake bite	22	14	WP	Pa	O
					Gastritis	19	8	R	Raw	O
					PCOD	15	11	R	Dec	O
	Allmania nodiflora (L.)R.Br.ex Wight	H	NE	Kumitti	Snake bite	27	14	R	Pa	O
					Gastritis	24	8	WP	Pa	O
	Alternanthera sessilis (L.) DC	H	LC	Ponnanganni	Eye vision	12	5	WP	Cd	O
					Eye irritation	21	5	WP	Pa	O
					Anaemia	18	2	L	Po	O
	Celosia argentea L.	H	LC	Magili keerai	Snake bite	19	14	R	Pa	O
Aizoaceae	*Trianthema portulacastrum* L.	C	NE	Sathi Saaranai	Stomach ache	13	8	Tu	Pa	O
					Gastritis	16	8	L	Pa	O
					Constipation	28	8	WP	Po	O
Nyctaginaceae	*Boerhavia diffusa* L.	C	NE	Mookirattai	Eye irritation	19	5	WP	Pa	O
					Asthma	21	7	R	Dec	O
Molluginaceae	*Glinus lotoides L.*	H	LC	Siru seruppadai	Mouth dryness	2	16	WP	Po	O

	Mollugo cerviana (L.) Ser.	H	NE	Parpadagam	Reduce pregnancy pain	3	13	WP	Cd	O
Cactaceae	*Opuntia stricta* (Haw.) Haw	S	LC	Chappatikalli	Bug bite	18	14	R	Po	O
					Scorpion sting	17	14	Fr	Cd	T
					Snake bite	14	14	L, Tu	Raw, Pa	O
Cornaceae	*Alangium salviifolium* (L.f.) Wangerin	T	LC	Alingil	Snake bite	7	14	RBa	Po	O
Sapotaceae	*Madhuca longifolia* (L.) JF Macbr.	T	NE	Iluppai	Snake bite	8	14	OCP	Pa	O
					Induce lactation	9	13	L	Dec	T
	Mimusops elengi L.	T	LC	Magizham	Male contraceptive	8	12	Se	Pa	O
Ebenaceae	*Diospyros montana* Roxb.	T	NE	Vakkanna	Bug bite	16	14	WP	Pa	O
Rubiaceae	*Benkara malabarica* (Lam.) Tirveng.	S	NE	Karadi poola	Hernia	17	3	RBa	Po	O
	Canthium coromandelicum (Burm.f) Alston	S	NE	Kaarai	Bloody diarrhoea	11	8	L	Pa	O
	Canthium dicoccum (Gaertn.) Merr.	T	LC	Navugu	Shingles	13	1	L	Pa	T
	Catunaregam spinosa (Thunb.) Tirveng.	S	LC	Marakkaarai	Skin rashes	21	9	RBa	Dec	T
					Bug bite	15	14	RBa	Dec	T
	Morinda coreia Buch-Ham.	T	NE	Manjanathi	Arthritis	36	10	L	Oil	T
	Oldenlandia umbellata L.	C	NE	Inpura	Asthma	27	7	WP	Dec	O
	Pavetta indica L.	S	LC	Pavattai	Shingles	11	1	R	Pa	T
					Fever	15	15	R	Dec	O
	Spermacoce articularis L.f.	H	NE	Nathaichoori	Diarrhoea	12	8	Se	Po	O
					Urinary bladder stones	19	11	Se	Pa	O
					Induce lactation	4	13	R	Pa	O
					Smoothens delivery	9	13	L	J	O
					Leucorrhoea	13	11	Se	Pa	O
	Tarenna asiatica (L.) Kuntze ex K. Schum	S	NE	Thirani	Rheumatism	18	1	R	Dec	O
Gentianaceae	*Enicostema axillare* (Poir. ex Lam.) A.Raynal	H	LC	Vellarugu	Foot corn	5	9	L	Pa	T
					Snake bite	8	14	WP	J, Pa	O,T
					Menorrhagia	1	11	WP	Dec	O
Loganiaceae	*Strychnos nux-vomica* L.	T	LC	Etti	Nervous pain	3	4	L	Dec	T
					Migraine	16	15	L	Pa	T
					Snake bite	4	14	Fr	Pa	T
	Strychnos potatorum L.f.	T	NE	Thettha	Aphrodisiac	6	12	Se	Pa	O
					Ischuria	35	11	Se	Pa	T
Apocynaceae	*Calotropis gigantea* (L.) W.T. Aiton	S	LC	Erukkam	Asthma	6	7	L	Sm	N
					Wounds	17	18	L	Po	T

					Skin rashes	13	9	L	J	T
					Abscess	7	9	L	Cd	T
					Scorpion sting	14	14	L	Pa	T
	Carissa carandas L.	S	NE	Kala	Excessive sweating	12	15	R	Po	O
					Menorrhagia	5	11	L	Pa	O
					Induce periods post-partum	5	13	R	Dec	O
	Gymnema sylvestre (Retz.) R.Br. ex Sm.	C	NE	Siru kurinjan	Syphilis	3	12	R	Raw	O
					Induce periods post-partum	5	13	L	Pa	O
	Hemidesmus indicus (L.) R. Br.	C	NE	Nannari	Snake bite	35	14	R	Dec	O
					Jaundice	22	17	R	Po	O
					Leucorrhoea	18	11	R	Dec	O
	Pergularia daemia (Forssk.) Chiov.	C	LC	Veli paruthi	Sinus	6	7	WP	J	N
					Fever	5	15	R	Dec	O
					Snake bite	33	14	L	J	T
					Oligomenorrhoea	32	11	L	Pa	O
	Tylophora indica (Burm. f.) Merr.	C	NE	Nanjaruppan	Snake bite	33	14	WP	Po	O
					Leucorrhoea	4	11	L, Bu	Pa	O
	Stephanotis volubilis (L.f) S.Reuss, Leide & Meve	C	NE	Kurinja	Rheumatic fever	8	1	L	Pa	O
					Pterygium	16	5	R	Pa	Ed
	Wrightia tinctoria (Roxb.) R.Br.	T	LC	Veppalai	Shingles	20	1	Ba	Po	T
Boraginaceae	*Carmona retusa* (Vahl) Masam.	H	NE	Kaatu Vetrilai	Dental pain	19	16	R	Pa	O
	Coldenia procumbens L.	H	LC	Seruppadai	Blood cleansing	12	7	WP	Dec	O
	Heliotropium indicum L.	H	NE	Siruthel kodukku	Scorpion sting	15	14	L	J	T
	*Trichodesma indicum (*L.) Sm.	H	NE	Kavil thumbai	Dysmenorrhoea	12	11	L	Dec	O
					Cold	37	15	WP	Pa	O
Convolvulaceae	*Evolvulus alsinoides* (L.) L.	H	NE	Vishnu karanthai	Body coolant	29	15	WP	Dec	O
					Leucorrhoea	6	11	WP	Pa	O
	Ipomoea marginata Desr.	C	NE	Thaali keerai	Induce lactation	8	13	L	Pa	O
	Ipomoea staphylina Roem. & Schult.	C	NE	Oona	Diabetes	6	3	Le	Dec	O
	Xenostegia tridentata (L.) D.F. Austin & Staples	C	NE	Muthiyar koonthal	Urinary infections	23	11	L	Po	O
Solanaceae	*Datura innoxia* Mill.	S	NE	Karuoomathai	Snake bite	28	14	L	Pa	O
	Datura metel L.	S	NE	Oomaththai	Sinus	4	7	L	Sm	N
					Arthritis	18	10	L,Fr	Oil	T

					Dog bite	29	14	L	Pa	T
					Reduce lactation	5	13	L	Raw	T
	Solanum anguivi Lam.	S	LC	Mullikathiri	Dental Caries	5	16	Fr	Raw	O
	Solanum nigrum L.	H	NE	Milaguthakkali	Hydrocele	4	12	L	Pa	O
					Leucorrhoea	7	11	L	Dec	O
	Solanum torvum Sw.	S	NE	Sundai	Wounds	13	14	L	Pa	T
	Solanum trilobatum L.	C	NE	Thoothuvalai	Cold	26	15	L	Dec	O
					Rheumatic fever	16	1	WP	Dec	O
	Solanum virginianum L.	H	NE	Kandankatthiri	Infertility in women	1	12	R	Pa	O
Oleaceae	*Jasminum sambac* (L.) Aiton	C	NE	Malligai	Reduce lactation	7	13	Fl	Pa	T
	*Nyctanthes arbor-tristi*s L.	S	LC	Pavala malli	Bug bite	21	14	WP	Pa	O
Plantaginaceae	*Bacopa monnieri* (L.) Wettst.	H	LC	Brahmi	Leucorrhoea	5	11	WP	Pa	O
Pedaliaceae	*Pedalium murex* L.	H	NE	Aanai nerunji	Urinary infection	19	11	L	Pa	O
					Leucorrhoea	3	11	WP	Pa	O
	Sesamum indicum L.	H	NE	Ellu	Reduce lactation	9	13	L	Raw	T
					Abortifacient	18	12	L/Se	Pa	O
Acanthaceae	*Andrographis echioides* (L.) Nees	H	NE	Gopuram thaangi	Cut wounds	28	18	L	Pa	T
					Snake bite	21	14	L	Pa	O,T
	Andrographis paniculata (Burm.f.) Wall. ex Nees	H	NE	Nila vembu	Menorrhagia	40	11	L	Pa	O
					Sinus	33	7	L	Po	O
					Foot crack	15	10	L	Pa	T
	Asystasia gangetica (L.) T.Anderson	H	NE	Silanthi nayagam	Snake bite	6	14	WP	J, Pa	O,T
					Vaginal wounds	2	11	L	Po	O
	Barleria prionitis L.	S	LC	Kaatu kanagambaram	Snake bite	25	14	WP	J	O
	Blepharis maderaspatensis (L.) B. Heyne ex Roth	H	NE	Nethirapoondu	Bone fracture	37	10	L	Pa	T
					Cut wounds	29	18	L	Pa	T
					Cataract	18	5	L	Pa	Ed
	Elytraria acaulis (L.f.) Lindau	H	NE	Nila kadambu	Indigestion	6	8	L	Pa	O
	Hygrophila auriculata (Schumach.) Heine	H	LC	Neer mulli	Anaemia	4	2	Se	Po	O
	Justicia adhatoda L.	S	LC	Adathodai	Cough	37	7	L	Dec	O
					Gastritis	10	8	L	Dec	O
					Scorpion sting	33	14	L	J	O
	Ruellia patula Jacq.	H	LC	Kiranthinayagam	Scorpion sting	9	14	L	Raw,Pa	O,T
Verbenaceae	*Phyla nodiflora* (L.) Greene	H	LC	Poduthalai	Leucorrhoea	5	11	L	Pa	O

Lamiaceae	*Anisomeles malabarica* (L.) R.Br.	S	NE	Pei miratti	Rheumatic fever	16	1	WP	Dec	O
					Infantile diarrhoea	28	1	L	Dec	O
	Clerodendrum phlomidis L.f.	S	LC	Thaluthalai	Arthritis	9	10	L	Cd	T
	Leucas aspera (Willd.) Link	H	NE	Thumbai	Oligomenorrhoea	43	11	L	Pa	O
					Sinus	4	7	L	J	N
					Blood cleansing	5	2	WP	Po	O
					Snake bite	31	14	R, L	Pa	O,T
	Ocimum basilicum L.	S	NE	Karunthulasi	Chest pain	4	17	L	Dec	O
	Ocimum tenuiflorum L.	H	NE	Thulasi	Snake bite	18	14	L	J	O
					Cold	11	15	L	J	O
					Sinus	7	7	L	J	N
					Asthma	16	7	L	Po	O
					Abortifacient	5	13	L	Dec	O
	Orthosiphon stamineus Benth.	H	NE	Kulumittan	Induce lactation	34	13	WP	Pa	O
	Plectranthus amboinicus (Lour.) Spreng.	H	NE	Omavalli	Head ache	26	15	WP	J	T
					Skin rashes	4	9	L	J	O
	Premna latifolia Roxb.	S	LC	Munnai	Rat bite	2	14	RBa	Dec	O
	Vitex negundo L.	S	LC	Nochi	Athlete's foot	13	9	L	Pa	T
					Back pain during periods	33	11	L	Dec	T
					Arthritis	26	10	L	Oil	T
	Volkameria inermis L.	S	NE	Peesangu	Snake bite	17	14	L	J	O
Asteraceae	*Cyanthillium cinereum* (L.) H. Rob.	H	NE	Seethevi sengaluneer	Skin rashes	16	9	WP	J	T
					Snake bite	32	14	WP	Pa	O
					Ear pain	19	6	Tu	Dec	Ead
	Eclipta prostrata (L.) L.	H	LC	Karisaalai	Cold	14	15	L	J	O
					Anaemia	12	2	WP	Dec	O
					Eye infections	10	5	L	Po	O
	Kleinia grandiflora (DC.) N.Rani	S	NE	Muyal kaadhilai	Ear pain	26	6	L	J	T
	Sphaeranthus indicus L.	H	LC	Kottai karanthai	Body coolant	26	15	WP	Po	O
	Vicoa indica (L.) DC.	H	NE	Mookathipoondu	Female contraceptive	9	12	L	Pa	O
	Xanthium strumarium L.	S	NE	Marul Oomathai	Impotency in men	18	12	L	Po	O
Apiaceae	*Centella asiatica* (L.) Urb.	H	LC	Vallarai	Menorrhagia	16	11	L	Pa	O
					Asthma	11	7	WP	Dec	O
					Amenorrhoea	19	11	L	Po	O

#Legend

IUCN- International Union for Conservation of Nature; **Life form:** H- Herb, S-Shrub, T-Tree, C-Climber; **IUCN Status:** NE- Not Evaluated, LC-Least Concerned, DD-Data Deficient, VU-Vulnerable, NT- Near Threatened; **Parts Used:** L - Leaves, R - Root, St - Stem, B - Bark, RBa - Root Bark, Se - Seeds, Fl - Flowers, Fr - Fruits, WP - Whole Plant, Tu - tuber, Bu - Bulbs, Lat - Latex, Res - Resin; **Mode of Preparation:** Pa - Paste, Dec - Decoction, Po - Powder, J - Juice, Cd - Cooked, Sm - Smoke; **Route of Administration**: O - Oral, T - Topical, N - Nasal, Ed - Eye drops, Ead - Ear drops.

IUCN Status of the Medicinal Plants

About 105 species recorded were not evaluated (NE), 84 species were considered least concerned (LC), *Coscinium fenestratum* (Gaertn.) Colebr., *Nelumbo nucifera* Gaertn., *Sesbania grandiflora* (L.) Poir., *Mangifera indica* L. *and Carica papaya* L. (5 species) were found to be data deficient (DD), *Saraca asoca* (Roxb.) W.J.de Wilde, *Cleistanthus collinus* (Roxb.) Benth., *Chloroxylon swietenia* DC, and *Santalum album* L. (4 species) were found to be Vulnerable (VU) and *Aegle marmelos* (L.) Correa (1 taxa) was found to be near threatened (NT) (Table 2).

Quantitative Ethnobotanical Indices

Use Reports (UR)

Achyranthes aspera, *Azadirachta indica*, *Cynodon dactylon* were the most frequently cited plants, each used for six medicinal purposes. These plants and their bioactive compounds have been recorded with a number of proven therapeutic properties viz. *A.aspera* 's bioactive compounds (like achyranthine, betaine, eupatorin, chrysin, quercetin, kaempferol, tiliroside) contribute to its antimicrobial, antituberculosis, anti-dermatophytic, anticancer, antidiabetic and wound healing properties (Senthil Kumar *et al.* 2022); *A.indica* 's phytoconstituents (like azadirachtin, nimbolinin, nimble, salanin, quercetin) provide anti-inflammatory, antiarthritic, antimicrobial, antidiabetic, anti-gastric, antiulcer, antibiotic, and anticancer effects (Islas *et al.* 2020); *C.dactylon* exhibits antioxidant, antibacterial, cardio-protective, immunomodulatory, wound healing, and diuretic activities (Venkatachalam *et al.* 2018). Additionally, six species had five use reports, while 103 species had only one (Appendix 2 (A)). Lower usage reports suggest limited popularity, availability, or knowledge in the study area.

Relative Frequency of Citation (RFC)

RFC values of medicinal plants used in the study area ranged from 0.01 to 0.96 (Appendix 2 (A)). *Abutilon indicum* had the highest RFC (0.96) with 4 URs for black spots, dental pain, piles pain, and leucorrhoea. Earlier ethnobotanical studies have recorded the usage of these leaves for piles treatment by rural folks of Karnataka, Irulars of Walayar (Shivanna & Rajkumar 2010, Venkatachalapathi & Paulsamy 2018) and for skin diseases by Hoorali tribes of Sathyamangalam (Revathi *et al.* 2013). *Coscinium fenestratum* used for uterovaginal issues and *Solanum virginianum* used for infertility problems had the lowest RFC (0.01), indicating low popularity or utility among informants (Najem *et al.* 2019). Higher RFC values suggest widespread use and knowledge retention among locals of the study area, often due to the plant's availability as well as its therapeutic properties (Ijaz *et al.* 2016, Faruque *et al.* 2018). Plant species with higher RFC values must be prioritized for phytochemical and pharmacognostic studies for drug discovery, as they are the locally relevant species (Valussi & Scire 2012, Vitalini *et al.* 2013, Ahmed 2017).

Use Value (UV)

Use values indicated the relative significance and use diversity of plants in the study area. Higher UVs reflected greater URs and FC. *Cynodon dactylon* had the highest UV (4.59) with 6 UR for treating sinus, body heat, migraine, urinary bladder diseases, centipede bite, and menorrhagia, followed by *Azadirachta indica* with UV- 3.95 (Appendix 2(A)) with 6 UR for treating ear wax, body heat, skin rashes, vomiting, burns, and as a contraceptive. Higher UVs indicated wide spread availability and familiarity among locals (Caetano *et al.* 2020, Haq *et al.* 2023), often making these plants the first choice for treatment (Rahman *et al.* 2016). Conversely, plants with only one UR had lower UV reflecting scarce availability of the plants, diminishing knowledge, or shifting preferences (Rashid *et al.* 2015). Higher UVs also highlight the versatility and reliability of plants for specific ailments (Cakilcioglu *et al.* 2010, Ayyanar & Ignacimuthu 2011), suggesting their suitability for further research to validate traditional knowledge and explore bioactive compounds.

Family Use Value (FUV)

Family Uses Value increased with higher Species use values, indicating each family's significance in the study area. The highest FUV was for Amaranthaceae (FUV=1.8), represented by 5 species *Achyranthes aspera*, *Aerva lanata*, *Allmania nodiflora*, *Alternanthera sessilis*, *Celosia argentea,* Apocynaceae (FUV = 1.8) represented by 8 species *Carissa carandas*, *Gymnema sylvestre*, *Hemidesmus indicus, Pergularia daemia*, *Wrightia tinctoria*, *Calotropis gigantea, Tylophora indica*, *Stephanotis volubilis* and Moraceae (FUV = 1.8) represented by 4 species *Artocarpus heterophyllus*, *Ficus benghalensis*, *Ficus religiosa*, *Streblus asper* (Appendix 2(B)). But Fabaceae (31 species; FUV = 1.3), and Lamiaceae (10 species; FUV = 1.5), were more represented without the highest FUVs. This suggests family importance is based on species use value rather than representation. Amaranthaceae, Apocynaceae and Moraceae were widely valued in the tropical countries like India, Pakistan and Africa, due to their distribution, and therapeutic properties (Islam & Lucky 2019, House *et al.* 2020, Basnett 2023), reflecting environmental influence in the resource selection. From the above findings, it could be drawn that people preferred the most abundant, most available species over the less common, rare species for their usage in medicine or food as explained by the ecological appearance theory (Feeny 1976). Species availability and cultural importance are interdependent on each other i.e. abundant species become an integral part of local culture and highly valued. Similarly,

multipurpose species are protected on the basis of ritualistic values. The associated traditional knowledge of abundant species also remains conserved which influences the locals' priorities for species selection and usage.

Informants Consensus Factor (ICF)

Informant Consensus Factor quantifies knowledge concordance among informants, showing how widely knowledge is shared within a community (Al-Quran 2009). To calculate ICF, disease conditions were clustered into 18 different ailment categories, with ICF ranging from 0.91 to 0.96, indicating high degree of shared knowledge and strong agreement among informants on most species (Figure 9; Appendix 3 (A)).

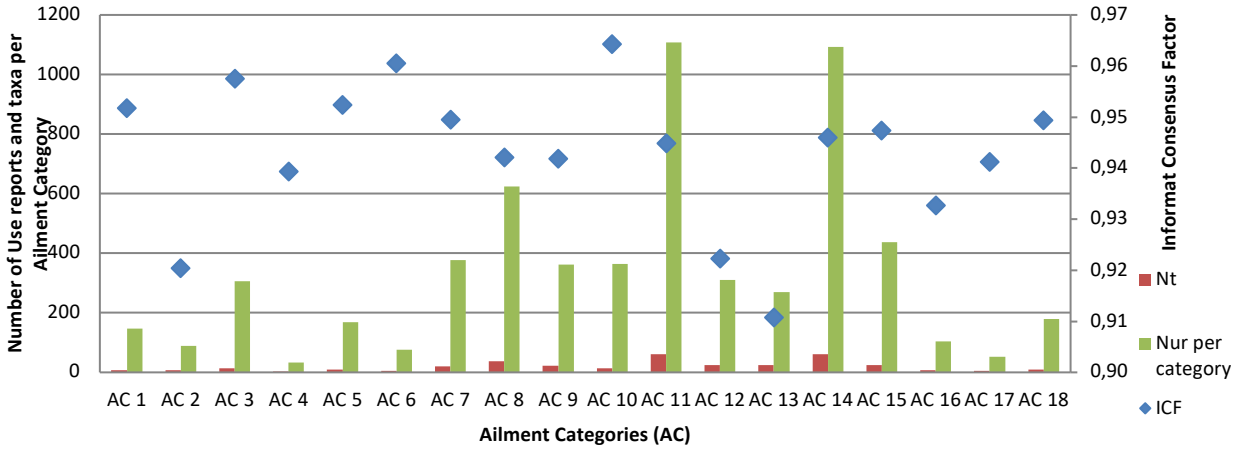

Figure 9. Relationship between Number of Use Reports (Nur), Number of taxa (Nt) and Informant consensus factor (ICF)

In this study, the Ailment Category AC 10 - Skeletomuscular disorders had the highest ICF (0.96) with 14 remedies (for bone fracture, arthritis, sprain, and joint pain), 14 medicinal plant species, and 365 use reports contrasting with earlier studies where AC 10 had lowest ICF values (Ayyanar & Ignacimuthu 2011; Parthiban *et al.* 2016) and gastro intestinal, cardio vascular issues had high ICF values (Sivasankari *et al.* 2014; Silamabrasan & Ayyanar 2015). High ICF suggested efficacy of the taxa used to cure that ailment (Teklehaymanot & Giday 2007, Sharma & Manhas 2015). The lowest ICF (0.91) was for AC 13 - Pregnancy and Postpartum issues indicating low knowledge exchange and varied plant choices due to disagreement among the informants (Canales *et al.* 2005, Najem *et al.* 2019). High ICF values suggest effective treatments and could help identify promising plant taxa for novel phytocompounds (Canales *et al.* 2005, Neves *et al.* 2009, Giday *et al.* 2009).

Informant Agreement Ratio (IAR)

Informant Agreement Ratio assessed the significance of the individual taxa based on the number of ailment categories they could treat (Boro *et al.* 2023). Species treating multiple categories had high IAR values, ranging from 0 to 0.99. *Saraca asoca* (2 AC - Urogenital diseases and sexual disorder), *Hybanthus enneaspermus* (2 AC - Urogenital diseases and diseases of the visual system), *Aristolochia bracteolata* (2 AC -Poisonous bites and urogenital diseases) had the highest IAR value = 0.99, with 74, 71, and 68 citations respectively. *Tylophora indica* also treating 2 AC (Poisonous bites and Urogenital diseases) had the lowest IAR value of 0.67 with just 4 citations (Appendix 2(A)).

IAR differs from ICF in that IAR indicates the significance of each species by the number of ailment categories treated, while ICF reflects the significance of each ailment category by the number of species used for treatment.

Fidelity Level (FL %)

Fidelity level identified the most desired plant species for treating diseases categories, calculated as percentage. FL % values in this study ranged from 3.2% to 47.06 % (Figure 10). *Prosopis juliflora* (FL % - 47.06) was the most preferred species in AC 4 - diseases of the nervous system to treat nerval weakness, followed by *Hemidesmus indicus* (FL % - 42.31 %) in AC 17 - liver, cardiovascular diseases for treating jaundice, and *Acalypha indica* (FL % - 37.08) in AC 2 - Blood and circulatory system-related diseases especially for blood cleansing (Appendix 3 (B)). Widely used species had higher FL% indicating frequent use by many people, while lower FL% meant that the informants did not agree upon the same species. Earlier studies from other regions of Tamil Nadu have used FL% as a quantitative index to analyse ethnobotanical data (Ayyanar & Ignacimuthu 2011, Silamabrasan & Ayyanar 2015). Species with higher preference are often biologically active with strong curative properties (Trotter & Logan 1986), making them suitable for pharmacological research to validate their usefulness. However, plants with low FL% should not be overlooked, as neglecting them could risk depleting traditional knowledge (Chaudhary *et al.* 2006) and they may still offer various medical applications despite low frequency.

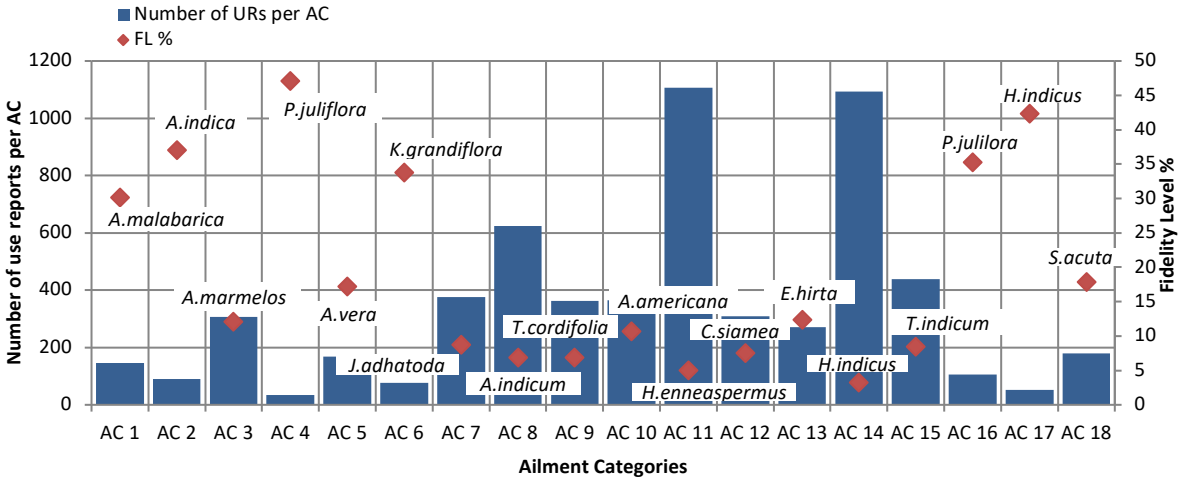

Figure 10 Fidelity level % (FL%) of the most significant species and Number of Use Reports (URs) per Ailment category (AC) [[*A.malabarica- Anisomeles malabarica, A.indica- Acalypha indica, A.marmelos-Aegle marmelos, P.juliflora-Prosopis juliflora, A.vera- Aloe vera, K.grandiflora-Kleinia grandiflora, J.adhatoda-Justicia adhatoda, A.indicum-Abutilon indicum, T.cordifolia-Tinospora cordifolia, A.americana-Agave americana, H.enneaspermus-Hybanthus enneaspermus, C.siame-Cassia siamea, E.hirta-Euphorbia hirta, H.indicus-Hemidesmus indicus, T.indicum-Trichodesma indicum, S.acuta-Sida acuta]*

It could be deduced from the above analyses that medicinal plants with the highest UV, RFC, and IAR values were the most highly regarded and culturally significant species in the study area. Based on the UV, RFC, and UR rankings, the 20 medicinal plants with the highest values were nearly identical. Even though there were certain similarities between the indices of some species, each index revealed a different rating for each species.

Correlation between Use Value and Relative frequency of citation

Pearson correlation analysis revealed a strong positive correlation ($r = 0.766$, $p < 0.01$) (Appendix 4(A)) between Use Value (UV) and Relative Frequency of Citation (RFC), aligning with previous studies (Awan *et al.* 2021; Ralte *et al.* 2024). It signified that there was a strong relation between the local importance of individual taxa and the relative significance of the use of the taxa (Bano *et al.* 2014). The coefficient of determination value $R^2 = 0.586$ (Figure 11) suggests that 59% of the variation in UV can be elucidated concerning their citations. This indicates that the current investigation has contributed significantly towards the reporting of medicinal plants and their associated traditional knowledge. Species with high UV and RFC values should be prioritized for conservation due to potential threats from overexploitation. Conversely, taxa with low UV and RFC values may be overlooked due to a lack of awareness, but they are not necessarily insignificant.

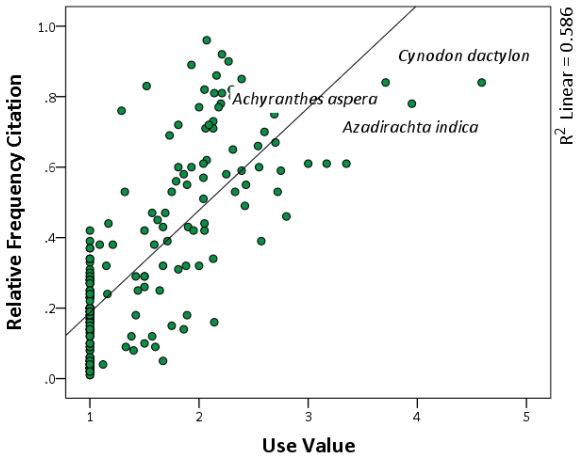

Figure 11. Correlation graph between Use Value and Relative Frequency of Citation

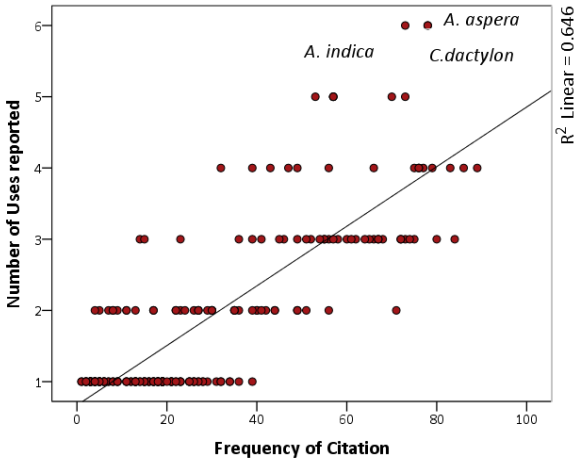

Figure 12. Correlation graph between Frequency of Citation and Number of uses reported [*A.aspera-Achyranthes aspera, A.indica- Azadirachta indica, C.dactylon- Cynodon dactylon*]

Correlation between Number of Uses reported and Frequency of Citation

A strong positive correlation (r = 0.804, p < 0.01) (Appendix 4 (B)) was found between the number of use reports (UR) and the frequency of citations (FC), indicating a significant association between these two variables which aligned with a similar study (Umair *et al.* 2019). Species with higher UR values also tended to have higher FC values. For example, *Achyranthes aspera*, *Azadirachta indica*, *Cynodon dactylon* with 6 reported uses each, had the highest FC values (78, 73, and 78, respectively). The coefficient of determination value R^2 = 0.646 suggests that around 65% of the variation in number of use reports (Figure 12) could be described in terms of the number of citations.

Correlation between Number of taxa and Fidelity level % of each ailment category

Correlation analysis revealed a strong negative correlation (r = -0.720, p < 0.01) (Appendix 4(C)) between the number of taxa used to treat an ailment and the fidelity level (FL%). When multiple taxa were used for an ailment category, the FL% was lower, indicating less agreement among informants. Conversely, when fewer taxa were used, the FL% was higher, suggesting greater consensus on their effectiveness. The coefficient of determination value R^2 = 0.518 implied that 52% of the variability in fidelity level could be described using number of taxa (Figure 13).

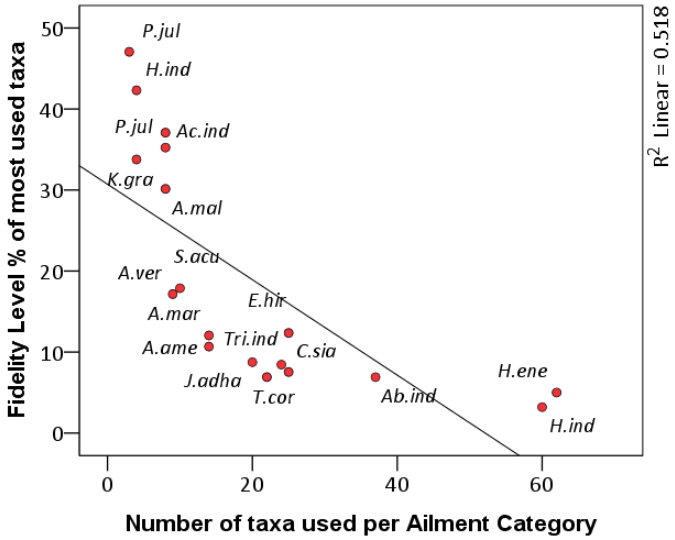

Figure 13. Correlation graph between Number of taxa and Fidelity Level %. [*A.mal- Anisomeles malabarica, Ac.ind- Acalypha indica, A.mar-Aegle marmelos, P.jul-Prosopis juliflora, A.ver- Aloe vera, K.gra-Kleinia grandiflora, J.adha-usticia adhatoda, Ab.ind-Abutilon indicum, T.cor-Tinospora cordifolia, A.ame-Agave americana, H.ene-Hybanthus enneaspermus, C.sia-Cassia siamea, E.hir-Euphorbia hirta, H.ind-Hemidesmus indicus, Tri.ind-Trichodesma indicum, S.acu-Sida acuta]*

Significance of the Study

This study is vital for biodiversity conservation as it identifies species that are heavily relied upon and may require protection. Furthermore, the findings contribute to sustainable healthcare solutions, support the validation of traditional remedies, thereby integrating them into modern medicine systems and open avenues for bioprospecting and drug discovery. Overall, the study emphasizes the need to preserve both the ecological and cultural heritage of the region while promoting sustainable development.

Limitations of the study

While this study provides a comprehensive inventory of medicinal plants used by local communities, there are certain limitations. This study was limited to three foothill villages of Alagar hills region (Eastern Ghats) of Dindigul district. Similar studies in other villages are required to document the region's rich ethnobotanical knowledge. Long-term ethnobotanical monitoring will also be vital to assess the impact of conservation efforts and the sustainability of plant use over time.

Conclusion

The present study documented the medicinal usage of 199 plants employed by rural communities in the foothill villages of the Alagar hills region, Eastern ghats, Tamil Nadu, India. These plants were used to prepare different remedies for about 18 ailment categories. Fabaceae (31 species) was the most used family. Herbs (34%) were the predominantly used life form, leaves (41%) were the frequently used plant part in herbal drug preparation. Paste (36%) was the most common drug preparation method and oral route (72%) was the most used route of administration.

The most widely used and culturally significant species in the study area included *Achyranthes aspera* L., *Azadirachta indica* A.Juss., *Cynodon dactylon* (L.) Pers. as denoted by their highest UR and UVs, *Abutilon indicum* (L.) Sweet with the highest RFC. Some of the most commonly used prominent families such as Amaranthaceae, Apocynaceae and Moraceae demonstrated their significance through their higher FUV. *Saraca asoca* (Roxb.) W.J.de Wilde, *Hybanthus enneaspermus* (L.) F. Muell., *Aristolochia bracteolata* Lam. were the species whose uses were agreed upon by the informants as reflected in their IAR values.

Correlation analyses carried out between UV and RFC, UR and FC resulted in strong positive correlation, whereas negative correlation was established between Nt and FL%. Thus, through this study knowledge consensus amongst the people of the study area was evaluated by means of quantitative indices, and their interdependence was also evaluated to identify the culturally significant species.

This study has three significant far-reaching implications for knowledge preservation, plant conservation and drug discovery. First, the documentation preserves the traditional knowledge on medicinal plants and prevents knowledge loss. Second, identification of the most used, locally important species aids in their conservation and ensuring their long-term availability. Finally, indigenous popular usage acts as a cue for plant selection and simplifies the drug discovery process as ethnobotanical leads are very effective and reliable.

Further investigations, including phytochemical analysis, isolation, identification, and evaluation of novel bioactive compounds are required to validate medicinal plant species' reported use and therapeutic properties.

Declarations

List of abbreviations: TCM - Traditional Chinese Medicine; PCA - Principal Component Analysis; WHO -World Health Organization; FC - Frequency of Citation; UR -Use Report; UV - Use Value; FUV -Family Use Value; ICF - Informant Consensus Factor; RFC -Relative Frequency of citation ; IAR -Informant Agreement Ratio; FL % -Fidelity Level %; AC - Ailment Category; H - Herb; S - Shrub; T - Tree; C -Climber; LC - Least Concern; NE - Not Evaluated; DD - Data Deficient; VU - vulnerable; NT - Near Threatened;L - Leaves; R - Root ; St - Stem; B - Bark; RBa - Root Bark ; Se - Seeds; Fl - Flowers; Fr - Fruits; WP - Whole Plant; Tu - tuber; Bu - Bulbs; Rh - Rhizome; Lat - Latex; Res - Resin; Pa - Paste; Dec - Decoction; Po - Powder; J - Juice; Cd - Cooked; Sm - Smoke; O - Oral; T - Topical; N - Nasal; Ed - Eye drops; Ead - Ear drops.

Ethics approval and consent to participate: The data were collected with respect to confidentiality and consent. All the informants were informed about the aim of this study

Consent for publication: Not applicable

Availability of data and materials: All data is available within the article and the appendices attached

Competing interests: The authors declare no conflict of interest

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Author contributions: Muthukrishnan Shrinitha: Study design, ethnobotanical surveys, Methodology, Manuscript Writing, Data Analysis, Interpretation of Results and Review editing. **Ramachandran Aruna**: Study design, Methodology, Supervising, Manuscript improving and Review editing. All authors read, reviewed and approved the final version of manuscript.

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APPENDIX 1

A) List of Ailment Categories
AC 1 - Infectious Diseases
AC 2 - Blood and circulatory system related Diseases
AC 3 - Endocrinal, Nutritional, Immunity and Metabolic disorders
AC 4 - Diseases of the Nervous System
AC 5 - Diseases of the Visual system
AC 6 - Diseases of ENT
AC 7 - Diseases of the Respiratory System
AC 8 - Diseases of the Digestive System
AC 9 - Skin diseases
AC 10 - Skeletomuscular disorders
AC 11 - Urogenital diseases
AC 12 - Sexual disorders
AC 13 - Pregnancy and Postpartum issues
AC 14 - Poisonous bites
AC 15 - General health issues
AC 16 - Dental/ Oral issues
AC 17 - Liver or Cardio-vascular diseases
AC 18 - Cuts and Wounds
Others - Miscellaneous

*AC - Ailment Category

B) List of Adjuvants used for Herbal drug Preparation

Plants	Families	Vernacular Name	Common Name	Parts Used
Allium cepa L.	Amaryllidaceae	Vengayam	Onion	Bulbs
Allium sativum L.	Amaryllidaceae	Vellai poondu	Garlic	Bulbs
Anethum graveolens L.	Apiaceae	Sathakuppai	Dill	Seeds
Capsicum annum L.	Solanaceae	Milagai	Chilli	Fruits
Carum carvi L.	Apiaceae	Karunjeeragam	Carom	Seeds
Cocus nucifera L.	Arecaceae	thengai	Cocunut	Endosperm
Coriandrum sativum	Apiaceae	Malli	Coriander	Seeds
Cuminum cyminum L.	Apiaceae	Jeeragam	Cumin	Seeds
Curcuma longa L.	Zingiberaceae	Manjal	Turmeric	Tuber
Eleusine coracana (L.) Gaertn.	Poaceae	Kambu	Ragi	Seeds
Murraya koenigii (L.) Spreng	Rutaceae	Kariveppalai	Curry leaves	Leaves
Piper nigrum L.	Piperaceae	Milagu	Pepper	Fruits
Piper longum L.	Piperaceae	Thippili	Long pepper	Fruits
Sesamum indicum L.	Fabaceae	Ellu	Sesame	Seeds
Syzygium aromaticum (L.) Merr. & Perry	Myrtaceae	Kirambu	Cloves	Flowers
Vigna mungo (L.) Hepper	Fabaceae	Ulundhu	Black gram	Seeds
Zingiber officinale Roscoe	Zingiberaceae	Ingi	Ginger	Rhizome

APPENDIX 2

A) Use value, Relative Frequency of Citation and Informant agreement Ratio of Individual species

Plants	UR	Ni	UV	RFC	IAR
Abrus precatorius L.	2	5	1.4	0.08	0.83
Abutilon indicum (L.) Sweet	4	43	2.07	0.96	0.97
Acalypha indica L.	4	33	1.52	0.83	0.97
Achyranthes aspera L.	6	21	3.71	0.84	0.94
Aegle marmelos (L.) Correa	4	37	2.05	0.82	0.97
Aerva lanata (L.) Juss.	3	22	2.55	0.6	0.96
Agave americana L.	1	39	1	0.42	1
Alangium salviifolium (L.f.) Wangerin	1	7	1	0.08	1
Albizia amara (Roxb.) Boivin	1	28	1	0.3	1
Albizia lebbeck (L.) Benth.	2	31	1.81	0.6	0.98
Allmania nodiflora (L.) R.Br.ex Wight	2	27	1.89	0.55	0.98
Aloe vera (L.) Burm.f.	3	29	1.79	0.56	0.96
Alternanthera sessilis (L.) DC	3	21	2.43	0.55	0.98
Andrographis echioides (L.) Nees	2	28	1.75	0.53	0.98
Andrographis paniculata (Burm.f.) Wall. ex Nees	3	40	2.2	0.78	0.97
Anisomeles malabarica (L.) R. Br.	2	28	1.57	0.47	1
Argemone mexicana L.	2	24	1.67	0.43	1
Aristolochia bracteolata Lam.	3	32	2.13	0.73	0.99
Aristolochia indica L.	3	32	2.06	0.71	0.97
Artocarpus heterophyllus Lam.	1	13	1	0.14	1
Asparagus racemosus Willd.	1	6	1	0.06	1
Asystasia gangetica (L.) T.Anderson	2	6	1.33	0.09	0.86
Azadirachta indica A.Juss.,	6	19	3.95	0.78	0.93
Azima tetracantha Lam.	4	31	2.13	0.71	0.95
Bacopa monnieri (L.) Wettst.	1	5	1	0.05	1
Barleria prionitis L.	1	25	1	0.27	1
Bauhinia purpurea L.	1	26	1	0.28	1
Bauhinia racemosa Lam.	1	18	1	0.19	1
Benkara malabarica (Lam.) Tirveng.	1	17	1	0.18	1
Blepharis maderaspatensis (L.) B. Heyne ex Roth	3	37	2.27	0.9	0.98
Boerhavia diffusa L.	2	21	1.9	0.43	0.97
Cadaba fruticosa (L.) Druce	1	19	1	0.2	1
Guilandina bonduc L.	1	27	1	0.29	1
Calophyllum inophyllum L.	1	5	1	0.05	1
Calotropis gigantea (L.) W.T. Aiton	5	17	3.35	0.61	0.95
Canthium coromandelicum (Burm.f) Alston	1	11	1	0.12	1
Canthium dicoccum (Gaertn.) Merr.	1	13	1	0.14	1
Capparis divaricata Lam.	1	15	1	0.16	1
Capparis zeylanica L.	2	18	1.5	0.29	0.96
Cardiospermum halicacabum L.	1	16	1	0.17	1
Carica papaya L.	4	20	1.95	0.42	0.95
Carissa carandas L.	2	12	1	0.24	0.9
Carmona retusa (Vahl) Masam.	1	19	1	0.2	1
Cassia roxburghii DC.	1	14	1	0.15	1
Cassia siamea Lam.	1	23	1	0.25	1
Cassytha filiformis L.	1	3	1	0.03	1
Catunaregam spinosa (Thunb.) Tirveng	2	21	1.71	0.39	0.97
Celosia argentea L.	1	19	1	0.2	1
Centella asiatica (L.) Urb.	3	19	2.42	0.49	0.98
Chloroxylon swietenia DC	1	21	1	0.23	1
Cissus quadrangularis L.	4	33	2.39	0.85	0.97

Citrullus colocynthis (L.) Schard	1	19	1	0.2	1
Citrus limon (L.) Osbeck	2	6	1.5	0.1	0.88
Clausena anisata (Willd.) Hook.f. ex Benth	1	5	1	0.05	1
Cleistanthus collinus (Roxb.) Benth. ex Hook.f.	1	29	1	0.31	1
Cleome gynandra L.	3	25	2.6	0.7	0.97
Cleome viscosa L.	2	18	1.67	0.32	1
Clerodendrum phlomidis L.f.	1	9	1	0.1	1
Clitoria ternatea L.	1	19	1	0.2	1
Coccinia grandis (L.) Voigt	2	26	1.5	0.42	0.97
Cocculus hirsutus (L.) W. Theob.	1	19	1	0.2	1
Coldenia procumbens L.	1	12	1	0.13	1
Commelina benghalensis L.	1	2	1	0.02	1
Coscinium fenestratum (Gaertn.) Colebr.	1	1	1	0.01	0
Crateva religiosa G.Forst.	3	19	2.05	0.42	0.95
Crotalaria verrucosa L.	1	13	1	0.14	1
Cucumis maderaspatanus L.	3	29	1.86	0.58	0.98
Cucumis sativus L.	1	18	1	0.19	1
Cyanthillium cinereum (L.) H. Rob.	3	32	2.09	0.72	0.97
Cynodon dactylon (L.) Pers.	6	17	4.59	0.84	0.96
Datura innoxia Mill.	1	28	1	0.3	1
Datura metel L.	4	29	1.93	0.6	0.95
Delonix elata (L.) Gamble	3	37	1.81	0.72	0.97
Dichrostachys cinerea (L.) Wight & Arn.	1	3	1	0.03	1
Diospyros montana Roxb.	1	16	1	0.17	1
Dodonaea viscosa Jacq.	1	18	1	0.19	1
Eclipta prostrata (L.) L.	3	14	2.57	0.39	0.94
Elytraria acaulis (L.f.) Lindau	1	6	1	0.06	1
Enicostema axillare (Poir. ex Lam.) A.Raynal	3	8	1.75	0.15	0.85
Erythrina variegata L.	2	12	1.42	0.18	0.94
Euphorbia heterophylla L.	1	25	1	0.27	1
Euphorbia hirta L.	4	34	2.21	0.81	0.96
Evolvulus alsinoides (L.) L.	2	29	1.21	0.38	0.97
*Ficus benghalensis*L.	3	20	2.75	0.59	0.96
Ficus religiosa L.	2	16	1.88	0.32	0.97
Flueggea leucopyrus Willd.	1	22	1	0.24	1
Garcinia gummi-gutta (L.) N.Robson	1	3	1	0.03	1
Glinus lotoides L.	1	2	1	0.02	1
Gliricidia sepium (Jacq.) Kunth.	1	5	1	0.05	1
Glycosmis pentaphylla (Retz.) DC.	1	31	1	0.33	1
Glycyrrhiza glabra L.	1	21	1	0.23	1
Gymnema sylvestre (Retz.) R.Br. ex Sm.	2	5	1.6	0.09	0.86
Heliotropium indicum L.	1	15	1	0.16	1
Hemidesmus indicus (L.) R. Br.	3	35	2.14	0.81	0.97
Hibiscus rosa-sinensis L.	1	12	1	0.13	1
Hybanthus enneaspermus (L.) F. Muell.	2	55	1.29	0.76	0.99
Hygrophila auriculata (Schumach.) Heine	1	4	1	0.04	1
Indigofera aspalathoides Vahl ex DC.	1	21	1	0.23	1
Indigofera tinctoria L.	2	15	2	0.32	0.97
Ipomoea marginata Desr.	1	8	1	0.09	1
Ipomoea staphylina Roem. & Schult.	1	6	1	0.06	1
Jasminum sambac (L.) Aiton	1	7	1	0.08	1
Jatropha curcas L.	1	3	1	0.03	1
Jatropha gossypiifolia L.	3	7	2.14	0.16	0.86
Justicia adhatoda L.	3	37	2.16	0.86	0.97
Kedrostis foetidissima Cogn.	2	16	1.81	0.31	0.96
Kleinia grandiflora (DC.) N.Rani	1	26	1	0.28	1
Lannea coromandelica (Houtt.) Merr.	1	16	1	0.17	1

Lawsonia inermis L.	2	14	1.64	0.25	0.95
Leucas aspera (Willd.) Link	4	43	1.93	0.89	0.96
Limonia acidissima L.	4	23	2.04	0.51	0.96
Madhuca longifolia (L.) JF Macbr.	2	9	1.89	0.18	0.94
Mangifera indica L.	4	15	2.8	0.46	0.93
Marsilea minuta L.	1	15	1	0.16	1
Melia azedarach L.	3	28	2.07	0.62	0.96
Memecylon umbellatum Burm.f.	1	34	1	0.37	1
Mimosa pudica L.	2	32	1.09	0.38	0.97
Mimusops elengi L.	1	8	1	0.09	1
Mollugo cerviana (L.) Ser.	1	3	1	0.03	1
Morinda coreia Buch. - Ham.	1	36	1	0.39	1
Moringa oleifera Lam.	5	26	2.04	0.57	0.96
Musa paradisiaca L.	4	15	2.13	0.34	0.97
Nelumbo nucifera Gaertn.	1	3	1	0.03	1
*Nyctanthes arbor-tristi*s L.	1	21	1	0.23	1
Ocimum basilicum L.	1	4	1	0.04	1
Ocimum tenuiflorum L.	5	18	3.17	0.61	0.95
Oldenlandia umbellata L.	1	27	1	0.29	1
Opuntia stricta (Haw.) Haw	3	18	2.72	0.53	1
Orthosiphon stamineus Benth.	1	34	1	0.37	1
Oxalis corniculata L.	1	4	1	0.04	1
Passiflora foetida L.	1	18	1	0.19	1
Pavetta indica L.	2	15	1	0.28	0.96
Pavonia odorata Willd.	2	22	1.59	0.38	0.97
Pavonia zeylanica (L.) Cav.	3	36	2	0.77	0.97
Pedalium murex L.	2	19	1.16	0.24	1
Pergularia daemia (Forssk.) Chiov.	4	33	2.3	0.82	0.96
Phyla nodiflora (L.) Greene	1	5	1	0.05	1
Phyllanthus emblica L.	2	3	1.67	0.05	0.75
Phyllanthus amarus Schumach. & Thonn.	2	7	1.86	0.14	1
Plectranthus amboinicus (Lour.) Spreng.	2	26	1.15	0.32	0.97
Plumbago zeylanica L.	3	20	2.7	0.67	0.97
Polycarpaea corymbosa (L.) Lam	1	17	1	0.18	1
Polygala chinensis L.	1	15	1	0.16	1
Pongamia pinnata (L.) Pierre	4	39	2.21	0.92	0.96
Pontederia crassipes Mart.	1	3	1	0.03	1
Premna latifolia Roxb.	1	2	1	0.02	1
Prosopis cineraria (L.) Druce	2	19	1.42	0.29	0.96
Prosopis juliflora (Sw.) DC.	3	37	1.73	0.69	0.97
Pterolobium hexapetalum (Roth) Santapau & Wagh	1	13	1	0.14	1
Punica granatum L.	3	23	2.39	0.59	0.96
Ricinus communis L.	2	8	1.38	0.12	0.9
Ruellia patula Jacq.	1	9	1	0.1	1
Santalum album L.	1	4	1	0.04	1
Saraca asoca (Roxb.) W.J.de Wilde	3	32	2.31	0.8	0.99
Senna alexandrina Mill.	1	14	1	0.15	1
Senna auriculata (L.) Roxb.	5	26	2.69	0.75	0.96
Senna tora (L.) Roxb.	1	4	1	0.04	1
Sesamum indicum L.	2	18	1.5	0.29	0.96
Sesbania grandiflora (L.) Poir.	1	11	1	0.12	1
Sesbania sesban var. *bicolor* (Wight & Arn.) F.W. Andrews	1	6	1	0.06	1
Sida acuta Burm.f.	1	32	1	0.34	1
Sida cordifolia L.	3	26	2.31	0.65	0.98
Solanum nigrum L.	2	7	1.57	0.12	0.9

Solanum anguivi Lam.	1	5	1	0.05	1
Solanum torvum Sw.	1	13	1	0.14	1
Solanum trilobatum L.	2	26	1.62	0.45	0.98
Solanum virginianum L.	1	1	1	0.01	0
Spermacoce articularis L.f.	5	19	3	0.61	0.96
Sphaeranthus indicus L.	1	26	1	0.28	1
Sterculia foetida L.	1	4	1	0.04	1
Streblus asper Lour.	2	26	1.69	0.47	0.98
Strychnos nux-vomica L.	3	16	1.44	0.25	0.95
Strychnos potatorum L.f.	2	35	1.17	0.44	0.98
Syzygium cumini (L.)Skeels	1	19	1	0.2	1
Tamarindus indica L.	3	24	2.54	0.66	0.97
Tarenna asiatica (L.) Kuntze ex K.Schum.	1	18	1	0.19	1
Tephrosia purpurea (L.) Pers.	1	19	1	0.2	1
Terminalia bellirica (Gaertn.) Roxb.	1	32	1	0.25	1
Terminalia chebula Retz.	3	23	2.05	0.44	0.95
Terminallia arjuna (Roxb. ex DC.) Wight & Arn.	1	20	1	0.34	1
Thespesia populnea (L.) Sol. ex Correa	5	23	3.17	0.78	0.96
Tinospora cordifolia (Willd). Hook.f. & Thomson	1	25	1	0.27	1
Toddalia asiatica (L.) Lam.	1	17	1	0.18	1
Tragia involucrata L.	1	2	1	0.02	1
Trianthema portulacastrum L.	3	28	2.04	0.61	1
Tribulus terrestris L.	3	24	2.25	0.58	0.98
*Trichodesma indicum (*L.) Lehm.	2	37	1.32	0.53	0.98
Tylophora indica (Burm. f.) Merr.	2	33	1.12	0.04	0.67
				(Appendix 2 Cont.)	
Vigna trilobata (L.) Verdc.	1	11	1	0.12	1
Vitex negundo L.	3	33	2.18	0.77	0.97
Volkameria inermis L.	1	17	1	0.18	1
Waltheria indica L.	1	19	1	0.2	1
Wattakaka volubilis (L.f) Stapf	2	16	1.5	0.26	0.96
Wrightia tinctoria (Roxb.) R.Br.	1	20	1	0.22	1
Xanthium strumarium L.	1	18	1	0.19	1
Xenostegia tridentata (L.) D.F. Austin &Staples	1	23	1	0.25	1
Ziziphus mauritiana Lam.	4	21	2.33	0.53	0.94
Ziziphus oenopolia (L.) Mill.	1	22	1	0.24	1

UR - Use Reports; Ni - Number of Informants; UV - Use Value; RFC - Relative Frequency of Citation; IAR - Informant Agreement Ratio

B) Family Use Values

Family	Nt	NUVs	FUV
Fabaceae	31	39.43	1.3
Malvaceae	9	11.83	1.3
Lamiaceae	10	15	1.5
Acanthaceae	9	13.72	1.5
Apocynaceae	8	14.02	1.8
Amaranthaceae	5	9.15	1.8
Rubiaceae	9	11.71	1.3
Euphorbiaceae	7	9.24	1.3
Rutaceae	7	9.6	1.4
Asteraceae	6	8.67	1.4
Cucurbitaceae	5	7.17	1.4
Moraceae	4	7.32	1.8

Capparaceae	5	5.55	1.1
Combretaceae	3	4.05	1.4
Boraginaceae	4	4.32	1.1
Convolvulaceae	4	4.21	1.1
Phyllanthaceae	4	5.52	1.4
Solanaceae	7	9.12	1.3
Menispermaceae	3	2	0.7

Nt - Number of taxa; NUVs - Number of Use Values; FUV - Family Use Value

APPENDIX 3

A) Informant Consensus Factor of Ailment Categories

Category	ICF	Nt	Nur per category
AC 1	0.95	8	146
AC 2	0.92	8	89
AC 3	0.96	14	307
AC 4	0.94	3	34
AC 5	0.95	9	169
AC 6	0.96	4	77
AC 7	0.95	20	377
AC 8	0.94	37	623
AC 9	0.94	22	362
AC 10	0.96	14	365
AC 11	0.94	62	1107
AC 12	0.92	25	310
AC 13	0.91	25	270
AC 14	0.95	60	1093
AC 15	0.95	24	438
AC 16	0.93	8	105
AC 17	0.94	4	52
AC 18	0.95	10	179

AC - Ailment Category; ICF - Informant Consensus Factor; Nt - Number of Taxa; Nur - Number of Uses reported

B) Fidelity Level % of the most cited Taxa

Ailment Category	Number of URs per AC	Most cited Taxa	FL %
AC 1	146	*Anisomeles malabarica* (L.) R. Br.	30.14
AC 2	89	*Acalypha indica* L.	37.08
AC 3	307	*Aegle marmelos* (L.) Correa	12.05
AC 4	34	*Prosopis juliflora* (Sw.) DC.	47.06
AC 5	169	*Aloe vera* (L.) Burm.f.	17.16
AC 6	77	*Kleinia grandiflora* (DC.) N.Rani	33.77
AC 7	377	*Justicia adhatoda* L.	8.75
AC 8	623	*Abutilon indicum* (L.) Sweet	6.9
AC 9	362	*Tinospora cordifolia* (Willd). Hook.f. & Thomson	6.91
AC 10	365	*Agave americana* L.	10.68
AC 11	1107	*Hybanthus enneaspermus* (L.) F. Muell.	5
AC 12	310	*Cassia siamea* Lam.	7.54
AC 13	270	*Euphorbia hirta* L.	12.36
AC 14	1093	*Hemidesmus indicus* (L.) R. Br.	3.2
AC 15	438	*Trichodesma indicum* (L.) Lehm.	8.45
AC 16	105	*Prosopis juliflora* (Sw.) DC.	35.24
AC 17	52	*Hemidesmus indicus* (L.) R. Br.	42.31
AC 18	179	*Sida acuta* Burm.f.	17.88

AC - Ailment Category; URs per AC -Uses reported per Ailment Category; FL% - Fidelity Level %

APPENDIX 4

A) Pearson Correlation between Use Value and Relative Frequency of Citation

Variables	Mean	Standard Deviation	Minimum	Maximum
UV	1.49	0.67	1	4.59
RFC	0.33	0.25	0.01	0.96

Association between UV and RFC using Pearson Correlation Method

R	0.766 (0.000)**
R^2	0.587

** p value for significance of correlation coefficient

**Correlation is significant at the 0.01 level (2-tailed)

UV - Use Value; RFC - Relative Frequency of Citation

B) Pearson Correlation between Number of Uses reported and Frequency of Citation

Variables	Mean	Standard Deviation	Minimum	Maximum
Nur	1.95	1.22	1	6
FC	30.68	23.5	1	89

Association between NUr and FC using Pearson Correlation Method

R	0.804 (0.000)**
R^2	0.646

** p value for significance of correlation coefficient

**Correlation is significant at the 0.01 level (2-tailed)

Nur- Number of uses reported; FC - Frequency of Citation

C) Pearson Correlation between Number of taxa and Fidelity Level %

Variables	Mean	Standard Deviation	Minimum	Maximum
Nt	19.83	17.57	3	62
FL %	19.03	14.38	3.2	47.06

Association between Nt and FL % using Pearson Corrrelation Method

R	-0.720 (0.000)**
R^2	0.518

** p value for significance of correlation coefficient

**Correlation is significant at the 0.01 level (2-tailed)

Nt - Number of Taxa; FL% - Fidelity Level %