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ETHNOMEDICINAL SURVEY ON PLANTS USED BY PALIYAR TRIBES IN PACHALUR HILLS, EASTERN GHATS OF TAMIL NADU, SOUTH INDIA

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ABSTRACT

***Ethnopharmacological relevance*:** Traditional remedies used for the treatment of various ailments are considered to be very important in the primary healthcare of paliyar people living in Dindigul district of Tamil Nadu. Novel information gathered from the present investigation is important in preserving folk indigenous knowledge of Paliyar tribe. The present study was initiated to establish a regional profile of the indigenous knowledge system for medicinal plant use and cultural practices associated with the healing process of these plants by traditional healers in the Pachalur hill, Dindigul. ***Methods*:** An ethnobotanical field survey was undertaken to collect information from paliyar traditional healers during May to August 2013. Information was collected from sixteen herbalists of different age through interviews and personal observations made during the field visit. The data obtained was analyzed through informant consensus factor (Fic) to determine homogeneity of informants knowledge on medicinal plants also the fidelity level (FL) to authenticate the uniqueness of a species to treat a particular ailment. ***Results*:** In the present study a total of 30 medicinal plant species belonging to 27 genera and 22 families were presented, used for treating 33 ailments. The major plant parts used are leaves and most of the remedies are suggested to take orally. The informant consensus factor revealed that the Liver Problem, Endocrinal Disorder, Hair Care, Genito Urinary Ailment, ENT and Kidney stone diseases have the highest informant consensus factor Fic of 1 followed by the dental care, Poisonous bite and Respiratory System Disorder (Fic- 0.8). Gastro intestinal ailment, General Health and Dermatological infection showed relatively low levels of consensus (Fic-

0.7). The level of informants consent was high for most ailment categories to highlight some of the plant species in terms of Fidelity level. Shrubs (12%) were the primary source of medicine followed by herbs (11%). *Hibiscus rosa-sinensis* (UV of 0.68) and *Piper betle* (UV of 0.5) are the most frequently and popularly used medicinal plants species in the study area.

KEYWORDS: Pachalur, Paliyar tribes, Ethnomedicine, Hepato protective, Novelty index, Use value.

1. INTRODUCTION

Plants have been used as traditional medicine all over the world and indigenous communities evolved their own specific knowledge on plant resources, uses, management and conservation (Smitherman *et al*., 2005; Cotton, 1996). Ethnomedicinal treatment is not only a medical system but part of a culture in many countries (Thomas, 1998). The traditional use of plants and plant resources is rapidly increasing due to their minimal side effects and inexpensive accessibility and because they sometimes serve the only source of health care available to poorer community (Acharya *et al.,* 2009). The indigenous system of traditional medicines based on the use of plants by the local communities has been practiced for centuries (Ugulu *et al*., 2009). The use of plants in modern medicine has greatly increased, on the other hand traditional knowledge is gradually decreasing due to rapid urbanization and dependence of man on modern health care systems, but this traditional system still prevails in the rural communities. India is one of the twelve – megabiodiversity centers with 2 hot – spots of biodiversity in the Northern region and Western Ghats. There are about 400 families in the world of the flowering plants; 315 are represented in India (Sharma, 2003). According to the World Health Organization (WHO), as many as 80% of the world's people depends on traditional medicine and in India, 65% of the population in the rural areas use medicinal plants to meet their primary health care needs (WHO, 2002; Patta Naik, *et al*., 2006). A review of the literature also reveals that many tribal area and tribal communities in India are either under explored or unexplored with regard to their floral wealth used in curing diseases (Kala, 1964).

Palani Hill is a spur of Western Ghats, which is one of the internationally recognized Hotspots known for its richness and uniqueness of plant wealth (Nayar, 1996). The study area Pachalur cover many individual hamlets belonging to various communities such as Paliyans, Puliyans, Doobies, Parayars, Asariars, Mannadiars, Sakiliyars and Chettiars which include tribal communities and the life of tribal people is woven around forest ecology and forest

resources (Karunyal Samuel and Andrews 2010). The study is an attempt to document the traditional medicinal practices and plant wealth extensively used by the tribal communities of Pachalur.

2. METHODOLOGY

2.1. Study area and people

The study area, Pachalur is located in Dindigul District of Tamilnadu, India. The area of investigation is lies between 10 to 21' 46" N longitudes **(Fig 5)**. The elevation in of the area of investigation ranges from 1000-1500 M above mean sea level. The temperature ranges from 15C to 35˚C. The mean of annual rainfall recorded in the study site was 650-840mm.the study area has the highest rain fall during the period of November and December, while January – March are the driest months.

2.2. Data collection

The study area was investigated to get information from tribal practitioners and also to cross check the information provided by the other tribal practitioners during the earlier visits. During each field survey at least 10 days were spent with the local people in their tribal hamlets. In order to document the utilization of medicinal plants, field trips were made during the 12 months period (March 2013–February 2014) ensuring that the dry and monsoon seasons were accommodated. The collected specimens were identified and authenticated with the help of valid references (Gamble and Fischer, 1921-1935; Bor, 1960; Henry *et al*., 1987; Henry, *et al*., 1989; Matthew, 1991) and further validated through herbarium referencing at the Department of Botany, St. Joseph's College. Angiosperm phylogenic group (APG III. 2009) was followed to classify the species. Nomenclature and correct author citation for all the species were thoroughly checked in the (Tropicos, 2012) database.

2.3. Ailment categories

Based on the information obtained from the traditional healers in the study area, all the reported ailments were categorized into 14 categories (Table 1) viz. Circulatory system / cardiovascular diseases (CSCD), Dental/oral care (DOC), Dermatological infections/diseases (DID), Ear, nose, throat problems (ENT), Endocrinal disorders (ED), Gastro-intestinal ailments (GIA), General health (GH), Genito urinary ailments (GUA), Hair care (HC), Kidney stone (US), Liver problems (LP), Poisonous bites (PB), Respiratory systems diseases (RSD), Skeleto-muscular system disorders (SMSD).

2.4. Data analysis

2.4.1. Informant consensus factor (Fic)

The informant consensus factor (Fic) was used to see if there was agreement in the use of plants in the ailment categories between the plant users in the study area. The Fic was calculated by the following formula (Heinrich *et al*., 1998).

$$Fic = \frac{Nur - Nt}{Nur - 1}$$

Where Nur refers to the number of use-reports for a particular ailment category and Nt refers to the number of taxa used for a particular ailment category by all informants. The product of this factor ranges from 0 to 1. A high value (close to 1.0) indicates that relatively few taxa are used by a large proportion of the informants. A low value indicates that the informants disagree on the taxa to be used in the treatment within a category of illness.

2.4.2. Use value (UV)

The relative importance of each plant species known locally to be used as herbal remedy is reported as the use value (UV) and it was calculated using the following formula (Phillips *et al*., 1994).

$$UV = \frac{\sum U}{n}$$

Where UV is the use value of a species, U is the number of use reports cited by each informant for a given plant species and n is the total number of informants interviewed for a given plant. The UV is helpful in determining the plants with the highest use (most frequently indicated) in the treatment of an ailment. UVs are high when there are many use-reports for a plant and low when there are few reports related to its use.

2.4.3. Fidelity level (FL)

To determine the most frequently used plant species for treating a particular ailment category by the informants of the study area, we calculated the fidelity level (FL). The FL was calculated using the following formula (Friedmen *et al*., 1986):

$$FL\ (\%) = \frac{Np}{N} \times 100$$

Where Np is the number of use-reports cited for a given species for a particular ailment category and N is the total number of use reports cited for any given species. Generally, high

FLs are obtained for plants for which almost all use-reports refer to the same way of using it, whereas low FLs are obtained for plants that are used for many different purposes (Srithi *et al*., 2009).

2.4.4. Relative importance (RI)

We designed the relative importance (RI) of each remedial plant based on the normalized number of pharmacological properties (PH) accredited to it and the normalized number of body systems (BS) it treated. Data on remedial uses were prearranged according to the PH accredited to each taxon (e.g. astringent, anti-inflammatory, emollient, etc.) and to the specific body systems treated (e.g. jaundice, cold, wounds, fever, etc.). The RI was calculated using the following formula (Bennett and Prance, 2000).

$$RL\ (\%) = \frac{RelPH + RelBS}{2} \times 100$$

Where RI is the relative importance, PH is the number of reported pharmacological properties for the given plant, Rel. PH is the relative number of pharmacological properties (PH of a given plant/maximum PH of all reported species), BS is the number of body systems treated and Rel. BS is the relative number of body systems treated (BS of a given plant/maximum BS of all reported species).

3. RESULTS AND DISCUSSION

3.1. Documentation of indigenous ethnomedicinal knowledge

During the present investigation, it was noted that **(Table - 2)** 30 plant species were used as herbal remedy for the treatment of several ailments. Among them, **(Fig.1)** 11 plants were herbs, 12 plants were shrubs and 7 tree species. Out of the 30 plant species studied 26 were dicot and 4 were monocot. More over a single plant is used for more than one disease for example *Piper betle* (Dysentry, Diarrhea and cough), *Terminalia chebula* (teeth inflammation, mouth sore), *Solanum nigrum* (ulcer, piles), *Amaranthus spinosus*(indigestion, tumour), *Ageratum conyzoides* (cuts and wound healing), *Gmelina arborea* (ring worm and skin tumors), *Eucalyptus obliqua* (cough, cold and chest pain), *Hibiscus rosa- sinensis* (Hair growth, over bleeding and cough), *Jatropha gossypifolia* (tooth ache and mouth sore), *Ocimum sanctum* (cough, cold and head ache). Six remedies were used to treat dermatological disease. In Pakistan 13 plants were used for the treatment of jaundice (Ahmad *et al*., 2014). In the present study, 2 remedies (*Terminalia chebula and Jatropha gossypifolia*)

were used to get relief from dental problems and mouth sore; where as (Murugesan *et al*., 2011) reported that (3 remedies) were used to treat dental problem such as *Abutilon indicum, Acalypha indica* and *Calotropis procera*. *Euphorbia obliqua* and *Persea americana* and *Lantana achyranthifolia* were reported for the first time in the study area. However, no plants were reported as a new medicinal plant as all the plants were reported with different uses.

3.2. Life form and parts used

Growth form analysis of medicinal plants used in the study area revealed that shrubs constituted the large proportion (40%) followed by herbs (36.6%) and trees (23%) **(Fig.1)**. This could be the reason; these growth forms are relatively resistant from seasonal variations and easily available in all seasons (Albuquerque, 2006). The leaves were used most frequently (62.5%) followed by the fruits (09%), seed (0.9%), entire plant (6%), milky latex (6%) **(Fig. 2).** In the study area local indigenous healers believed that the leaves and entire plants including roots are more effective than other parts. The predominance of leaf use in the preparation of remedies has also been reported by (Muthu *et al*., 2006). Studies showed that the underground parts of plants like roots have the highest concentration of bioactive compounds (Kunwar *et al*., 2006; Mahmood *et al*., 2013b).

The most frequently used preparations being paste (35%), raw form (23%), juice (21%), powder (9%) the methods and period of administration may be widely different. **(Fig.3)** shows the no. of plants used for treating various diseases. Some remedies consist of single herbs but more than two herbs are reported in several preparations.

3.3. Method of preparation and mode of administration of plants

The preparation and utilization of plant parts were grouped into seven categories **(Fig.4)** of these, the most commonly used method of preparation was paste (35%) followed by raw form (23% taken as raw material of plant parts like leaves, fruits etc.) and juice (21%), powder (9%), extract (3%), decoction (35%), oil and vapours (3%) and soup (3%). Preparation of paste for the treatment of ailments is a common practice among the other tribal communities in India (Perumal Samy *et al*., 2008; Rajakumar and Shivanna, 2009) and other parts of the world (Giday *et al*., 2010). The paste was prepared by grinding the fresh or dried plant parts with oil or water. The decoction was obtained by boiling the plant parts in water until the volume of the water reduced to minimum or required amount. The powder was prepared by the grinding shade dried plant parts.

3.4. Ingredients added

The herbal medicine preparations were made out of a single plant part or in combination of several plant parts. In case of Paliyar's medicinal preparations, single modes of preparations were dominating over the multiple modes of preparations **(Table 3)**. The paliyar traditional healers used one or two plant parts for the preparation of medicine in the single or multiple ailments. Mono therapies founded on single plant preparation were most observable in the study area, although some remedies were prepared from more than one plant species.

Paliyar traditional healers frequently use some ingredients such as salt, sheep milk, onion, coconut oil, honey, rice and black gram to improve the acceptability and medicinal property of certain remedies. The coconut oil was commonly used for the preparation of paste/medicated oil. They used specific plant parts and specific dosages for the treatment of diseases and the dose given to the patient depended on age, physical status and health conditions. Before giving treatment, the condition of the patient was observed deeply and then they were given prepared medicines.

3.5. Plant use values

The use values were high for plant with many use reports. Widely used medicinal plants included for example Hibiscus rosa- sinensis (0.68), Piper betle (0.5), Colocasia esculenta, Centella asiatica, Terminalia chebula, Amaranthus spinosus and Ocimum sanctum (0.37), Eucalyptus obliqua, Phyllanthus amarus, Cipadessa baccifera, Syzygium cuminii, Gmelina arborea and Solanum nigrum (0.31), Ageratum conyzoides (0.25), Sansevieria roxburghiana, Blepharis maderaspatensis, Oxalis corniculata, Ipomea ficifolia, Gymnema sylvestre, Hemidesmus indicus and Jatropha gossypifolia (0.25) etc. The plants with a very low use value were Persea americana and Acorus calamus (0.06), Phyllanthus emblica, Citrus medica, Enicostemma axillare, Oxalis corymbosa, Lantana achyranthifolia, Lantana camara and Asparagus racemosus (0.18)**(Table 4)**.

3.6. Informant Consensus Factor

Table 5 shows 14 consensus factor numbers for categories of diseases. The product of Fic ranges from 0 to 1. A high value Fic indicates the agreement of selection of taxa between informants; where as low value indicates disagreement (Ragupathy *et al*., 2008). The Fic value in our study ranges from 0.60 to 1 (Table 5). The use categories with more than 15 use reports were gastro intestinal ailment (20 use reports 5 species), Dermatological infection or diseases (18 use reports 6 species), Respiratory system disorder (16 use reports 4 species)

(Fig.6). In the present study, ENT (Ear, Nose, Throat), Urinary system, Liver problems, Endocrinal disorder, Hair care and Genito urinary ailment had the highest Fic of 1.00; where as metabolic system disorder had the highest Fic of 1.00 among the Tai Yai communities in Northern Thailand (Khuankaew *et al*., 2013).

The least informant consensus factor between the informants was observed in Skeleto muscular system disorder with the Fic of 0.62 followed by circulatory system with a Fic of 0.72, Dermatological infection with a Fic of 0.70, General Health with a Fic of 0.77, Gastro intestinal ailment with a Fic of 0.78, Respiratory System Disorders and Poisonous bite with a Fic of 0.8 and Dental care with a Fic 0.85. Thus the study indicates that the degree of knowledge shared by the users in the study area regarding the use of medicinal plants in the treatment of ailment is high. Skeleto muscular system disorder had the lowest Fic of 0.62 but this ailment category ranked ninth in the number of use reports (9) and number of taxa (4) Dermatological infection had the lowest Fic of 0.7, but this ailment category ranked second in the number of use reports (18) and the number of taxa (6) attributed to this category. It may be due to lack of communication among the informants in the study area who are practicing these ailment categories (Rajakumar and Shivanna, 2009).

3.7. Fidelity level

The analyzed categories with major agreements to highlight the most important plants in each category are listed in **(Table 6)**. Of the reported plants, 24 species had the highest fidelity level of 100% most of which were used in the single ailment category with multiple informants. The plants with the highest FL of 100% were Solanum nigrum, Enicostemma axillare, Terminalia chebula, Syzygium cumini, Asparagus racemosus, Ageratum conyzoides, Gmelina arborea, Sansevieria roxburghiana, Colocasia esculenta, Lantana camara, L. achyranthifolia, Oxalis corymbosa, Oxalis corniculata, Cipadessa baccifera, Ipomea ficifolia, Citrus medica, Phyllanthus amarus, Gymnema sylvestre, Hemidesmus indicus, Jatropha gossypifolia, Phyllanthus emblica, Acorus calamus, Eucalyptus obliqua and Persea americana. The maximum FL for the above plants indicated 100% choice of the interviewed informants for treating specific ailments and this could be an indication of their healing potential.

3.8. Relative Importance (RI)

The collected ethnomedicinal plants possessed a number of pharmacological properties (Varier and Vaidyaratnam, 1993; Khare, 2007). The plant with the most number of

pharmacological properties (PH) was *Eucalyptus obliqua* (28PH); it had a normalized PH value of 1.00 (28/28). *Hibiscus rosa-sinensis* was employed in 3 body systems and had a normalized BS value of 1.00 (3/3). *Hibiscus rosa- sinensis* had the highest RI value of 67.5 followed by *Eucalyptus obliqua (66.5), Ocimum sanctum (63.0), Piper betle (63.0), Terminalia chebula (61.0), Phyllanthus emblica (54.0), Amaranthus spinosus (47.0), Solanum nigrum (46.5), Centella asiatica (46.5) and Blepharis maderaspatensis* (45.5) **(Table 4)**. These plants were also used to treat more body systems and were considered as the most resourceful taxa in the study area.

According to (Singh and Hamal, 2013), *Curcuma longa* was recognized as the most resourceful taxa since it was mentioned by most of the informants among the tribal practioners in Terai forest of West Nepal. It had a highest frequency of citation 84. (Senthilkumar *et al.*, 2013) reported that, Andrographis paniculata, Lantana camara, Zingiber officinale, Gloriosa superba, Cassia fistula, Terminalia chebula, Cocculus hirsutus, Cissus quadrangularis, Tridax procumbens and Vernonia cinerea were the most resourceful taxa used to cure various ailments. Many of the more resourceful taxa reported in this study were similar **(Table 7)** for some neighboring indigenous in India (Poonam and Singh, 2009; Pandikumar *et al*., 2011).

3.9. Identification of New Claims and Reliability of reported uses

The present investigation reports were comparatively analyzed with the studies done in neighboring hills of Tamil Nadu, adjoining areas in India and hills of other countries **Table- 7** shows newly reported medicinal uses of Acorus calamus, Ageratum conyzoides, Amaranthus spinosus, Asparagus racemosus, Blepharis maderaspatensis, Centella asiatica, Cipadessa baccifera, Citrus medica, Colocasia esculenta, Enicostemma axillare, Eucalyptus obliqua, Gmelina arborea, Hemidesmus indicus, Hibiscus rosa-sinensis, Ipomea ficifolia, Jatropha gossypifolia, Lantana achyranthifolia, Lantana camara, Ocimum sanctum, Oxalis corniculata, Persea americana, Phyllanthus amarus, Piper betle, Sansevieria roxburghiana, Solanum nigrum, Syzygium cumini and Terminalia chebula. In the present study leaves are used most frequently than other parts. The predominance of leaf use in herbal drug preparation has also been reported by (Muthu *et al*., 2006), leaves as frequently used organ in traditional medicine preparation is also reported in previous ethnobotanical studies (Cornara *et al*., 2009; Ahmad *et al*., 2014). Since leaves are the main photosynthetic organs in plants they are considered to

be the natural repository for synthesis of many biologically active compounds against many diseases.

In addition, many of the ethnomedicinal plants reported during the present investigation were scientifically proved for various biological activities. Among the plants proved, *Amaranthus spinosus* is a one evaluated for antitumor potentials (Samuel Joshua *et al*., 2010). The ethanol extracts of its leaves given orally to mice at the dose of 100 and 200mg/Kg body weight for 16 days. It was observed that decrease in tumor volume and viable cell count, increase in mean survival time and non viable tumor cell count than tumor control animals, indicating the antitumor nature of the extract. *Gymnema sylvestre* is an another scientifically proven ethnomedicinal plant by various researchers in India and elsewhere in the world and it claimed to has blood glucose lowering activity both *in vitro* and *in vivo* (Nakamura *et al*., 1999; Sahu *et al*., 1996; Murray and Pizzorno, 1999; Mukherjee *et al*., 2006). Experimental studies on *Gymnema sylvestre* showed that many of the constituents in Gymnema decrease the uptake of glucose from the small intestine. Many antidiabetic molecules have been isolated and identified from leaves of *Gymnema sylvestre*. Among them Gymnemic acids (**Fig- 8)** are the major components of an extract shown to stimulate insulin release from pancreas (Persaud *et al*., 1999; Thakur *et al*., 2012).

The *Solanum nigrum* has been used by the Paliyar tribes of Pachalur hills as a means of treating ulcer. This claim is proven scientifically by Jainu and Devi (2006) in acetic acid induced ulcer model of rats. The treatment with fruit extract at higher dose significantly inhibited the gastric lesions induced by cold stress, indomethacin, pyloric ligation and ethanol. Further to ascertain the anti secretary action, the effect of *Solanum nigrum* H(+) K(+) ATPase activity and plasma concentration of gastrin hormone in ulcerated rats were determined. The extract significantly inhibits H(+) K(+) ATPase activity and decreases the gastrin secretion in ethanol induced ulcer model. These results further supported that *Solanum nigrum* was found to possess ulcer healing properties.

Similarly *Hemidesmus indicus* has been used in traditional medicine by the Paliyar tribes of Pachalur hills for treating ulcer. This experimental claim is also supported scientifically by Anoop and Jagadeesan, 2003. In their studies, antiulcerogenic activity of aqueous ethanolic root extract of *H.indicus* was evaluated in animal models. A dose dependent response on the intensity of ulceration was noted, 300mg/kg was found to be effective in Aspirin induced ulcerated rats.

Phyllanthus amarus is an another notable medicinal plant in India used as a herbal medicine for jaundice for a long time and claimed to protect liver damage through hepatoprotective activity both *in vitro* and *in vivo* by a number of reports (Chirdchupunseree and Pramyothin, 2010; Ghaskadbi *et al.*, 2012). For scientific support of our study, experimental studies showed that many of the bio active compounds in *Phyllanthus amarus* increase the hepato protective activity. This claim is proven scientifically by Chirdchupunseree and Pramyothin (2010) in phyllanthin (Fig 9) ethanol treated primary culture of rat hepatocytes were pre treated with phyllanthin (1, 2, 3 and 4µg/ml) treated. Krithika *et al*., (2009) also supported the present study claim with the hepatoprotective activity of ethanol: water (50:50, v/v) extracts of *Phyllanthus amarus* and phyllanthin against CCL_4 induced toxicity in human hepatoma $HepG_2$ cell line. Because of the lesser content of Phyllanthin in *P.amarus* extract, the lower protective mechanism was observed in the same compared to Phyllanthin. In the same way Ghaskadbi *et al*., (2012) scientifically proved the two ellagitannins viz. geraniin and amariin (Fig. 10) from *Phyllanthus amarus* with the animal model. Both ellagitannins were effectively protected mouse liver slices against ethanol induced cytotoxicity and apoptosis by reducing oxidative damage to biological molecules and modulating Bax/Bcl-2 ratio respectively, thus minimizing liver injury.

Similarly *Ageratum conyzoides* was scientifically evaluated for its wound healing activity in rats using excision (normal and infected), incision and dead space wound models respectively (Dash and Murthy, 2011). The results of the study revealed that the animals treated with methanol and aqueous extracts of *A. conyzoides* showed faster rate of wound healing compared to Nitrofurazone (0.2% w/w) an simple ointment I. P. was used as reference.

Centella asiatica was evaluated for its neuroprotective activity using animal cell lines (Soumyanath *et al*., 2014). In their study, they were used two *in vitro* models of Aβ toxicity to confirm this neuroprotective effect, and identify several active constituents of the water extract of *Centella asiatica* (CAW). CAW reduced Aβ-induced cell death and attenuated Aβ-induced changes in tau expression and phosphorylation in both the MC65 and SHSY5Y neuroblastoma cell lines. They confirmed and quantified the presence of several mono- and dicaffeoylquinic acids (CQAs) in CAW using chromatographic separation coupled to mass spectrometry and ultraviolet spectroscopy. Isochlorogenic acid A and 1,5- dicaffeoylquinic acid **(Fig 11)** were found to be the most abundant CQAs in CAW, and the most active in protecting MC65 cells from Aβ-induced cell death. Each compound not only mitigated Aβ-

induced cell death, but was able to attenuate Aβ-induced alterations in tau expression and phosphorylation in both cell lines, as seen with CAW.

3.10. Novelty index

The present study results were comparatively analyzed with neighboring regions of India as well as with aligned countries. For comparative analysis, published research articles were selected randomly. In neighboring regions of India all studies were published from (2004-2014) were taken for analysis while from aligned countries 10 research articles from (2007-2014) were analyzed. It was noted that majority of the medicinal plants reported in the present investigations are confined to the neighboring regions of India, because the study is a continuous chain of Eastern Ghats and Western Ghats. This may be also due to their native habitats and their supportive conditions. Many of the plants reported in the presents were also widely distributed in aligned countries due to their adaptability in difference ecological zones. In comparative analysis many new medicinal uses were reported. Among all medicinal plants reported in Pachalur hills, India, there are 4 medicinal plants (*Ipomea ficifolia*, *Lantana achyranthifolia*, *Oxalis corymbosa and Eucalyptus obliqua*) were first time recorded in Pachalur. The present study was also quantitatively compared with thirty three published research articles from neighboring regions and aligned countries through novelty index. Quantitative data between the medicinal plant uses in the present study and previous reports in the ten selected aligned countries were analyzed (Table 8).

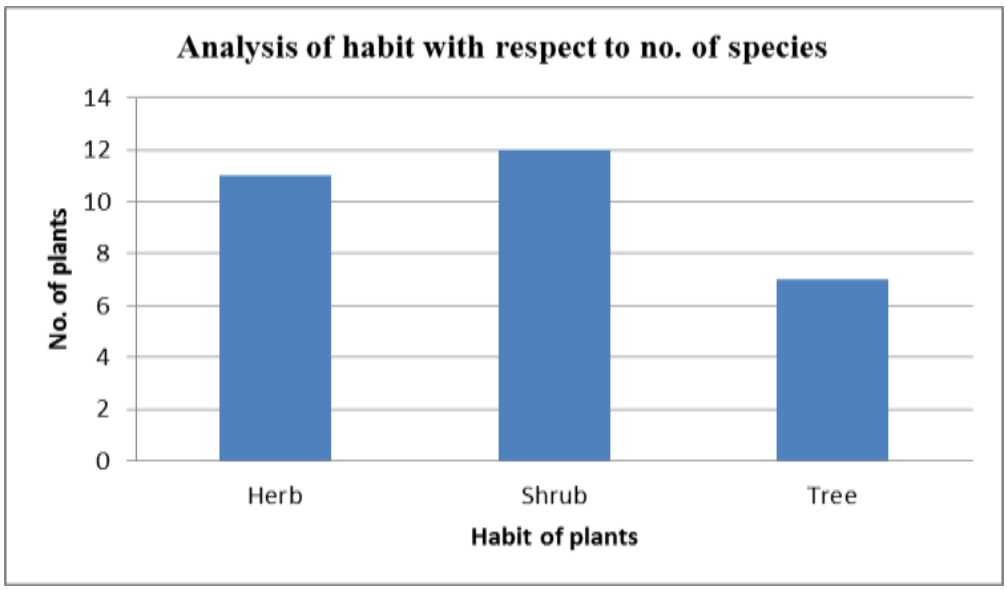


Fig. 1. Analysis of habit with respect to no. of species

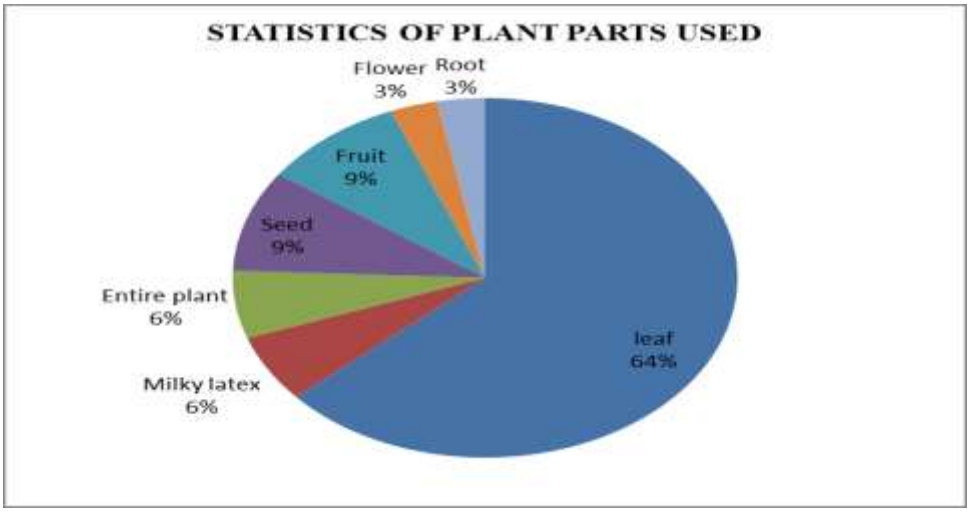


Fig: 2. Statistics of plant parts used.

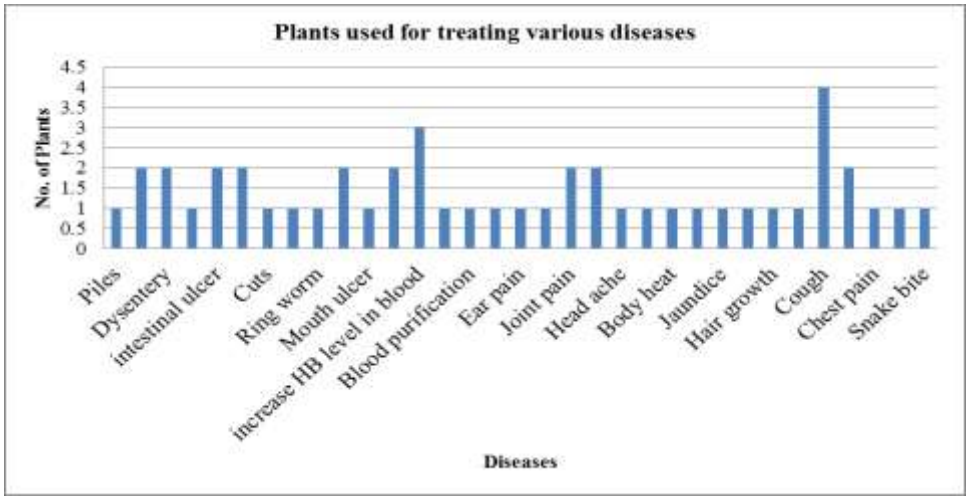


Fig. 3. Plants used for treating various diseases.

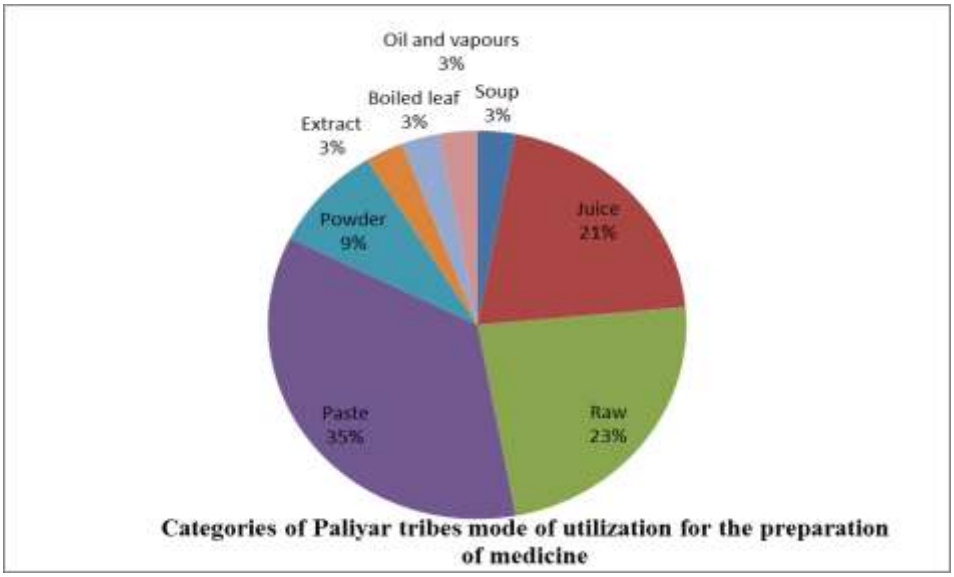
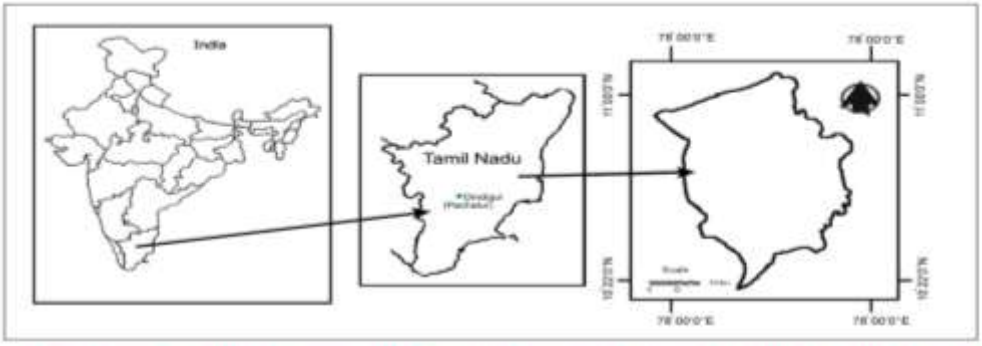


Fig. 4. Categories of Paliyar tribes mode of utilization for the preparation of medicine



I. Map showing the location of Pachalur Hills of Dindigul District. South India.

II. Paliyar tribals in Pachalur Hills of Dindigul District. South India.

Fig. 5 Map showing the location of Pachalur hills, Eastern Ghats, Tamil Nadu, South India.

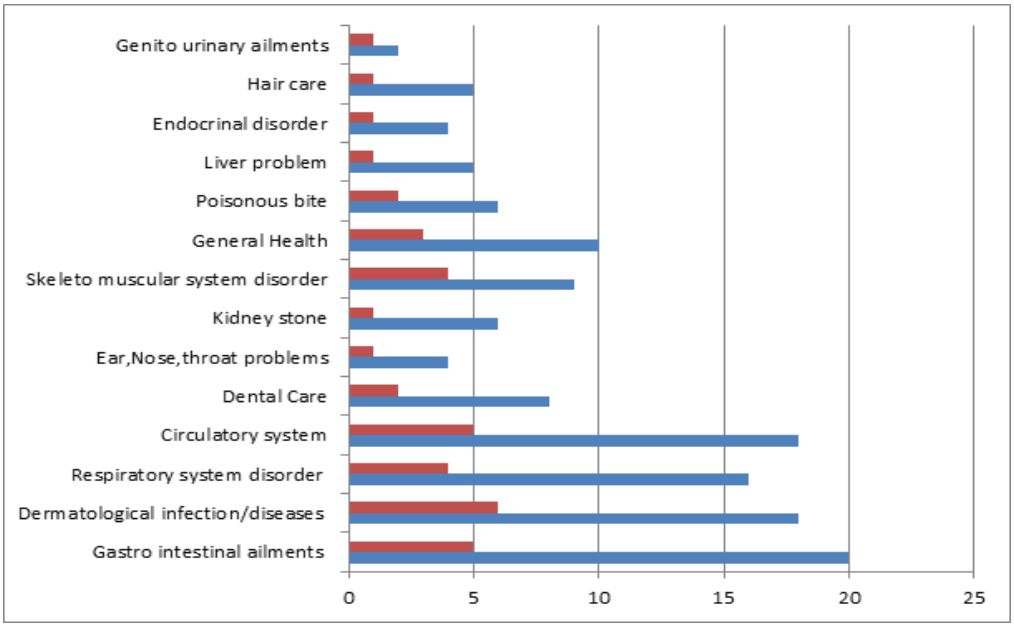
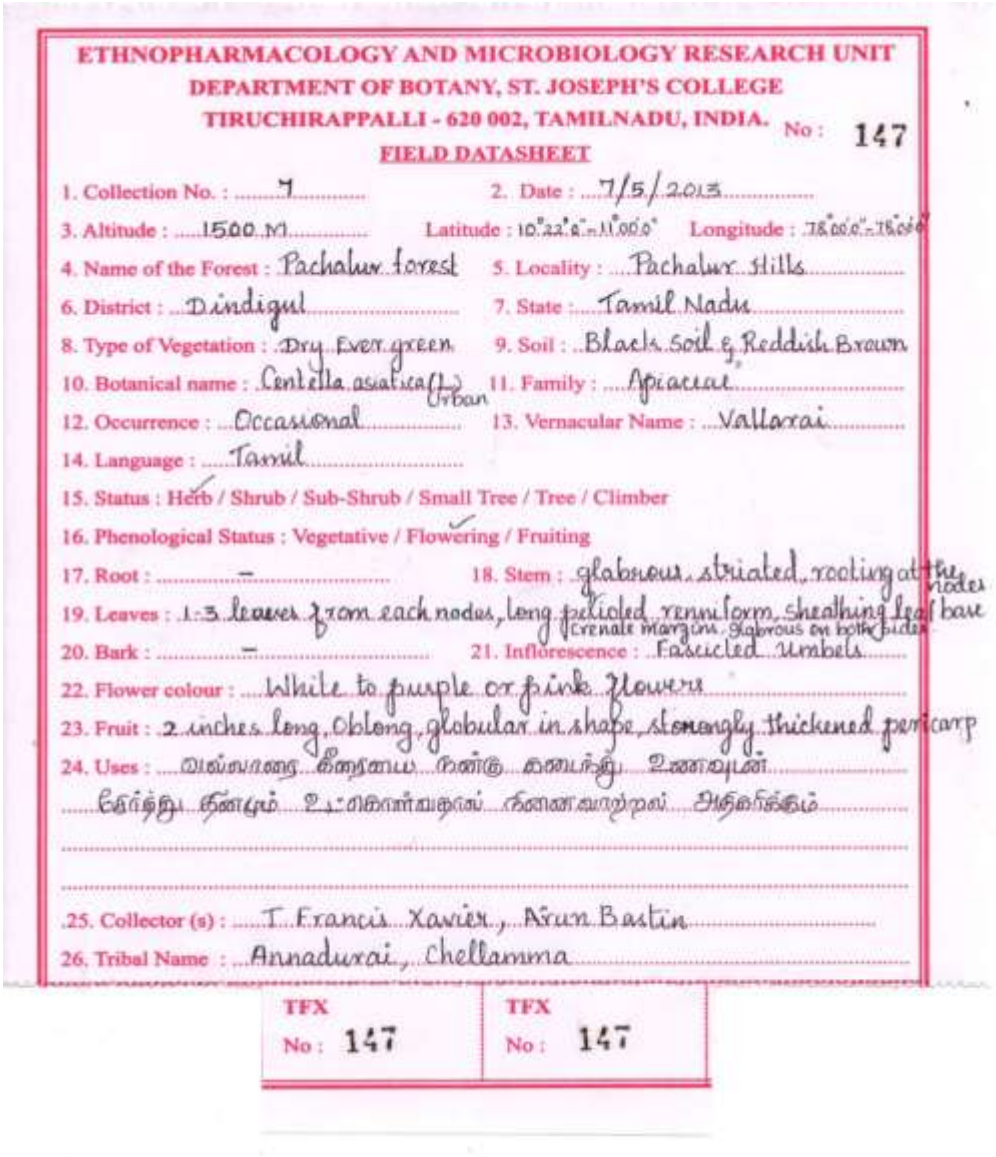


Fig. 6. Categories of ailments treated by Paliyar tribals arranged by no. of use reports.



ETHNOPHARMACOLOGY AND MICROBIOLOGY RESEARCH UNIT
DEPARTMENT OF BOTANY, ST. JOSEPH'S COLLEGE
TIRUCHIRAPPALLI - 620 002, TAMILNADU, INDIA. No : 147

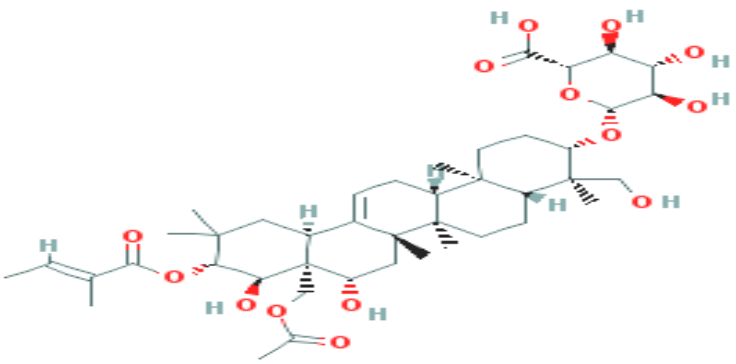
FIELD DATASHEET

1. Collection No. : 7 2. Date : 7/5/2013
3. Altitude : 1500 M Latitude : 10°22'0"-11°00'0" Longitude : 78°00'0"-78°00'0"
4. Name of the Forest : Pachalur forest 5. Locality : Pachalur Hills
6. District : Dindigul 7. State : Tamil Nadu
8. Type of Vegetation : Dry Ever green 9. Soil : Black Soil & Reddish Brown
10. Botanical name : Centella asiatica (L.) Urban 11. Family : Apiaceae
12. Occurrence : Occasional 13. Vernacular Name : Vallarai
14. Language : Tamil
15. Status : Herb / Shrub / Sub-Shrub / Small Tree / Tree / Climber
16. Phenological Status : Vegetative / Flowering / Fruiting
17. Root : – 18. Stem : glabrous, striated, rooting at the nodes
19. Leaves : 1-3 leaves from each nodes, long petioled, reniform, sheathing leaf base crenate margins, glabrous on both sides
20. Bark : – 21. Inflorescence : Fascicled Umbels
22. Flower colour : White to purple or pink flowers
23. Fruit : 2 inches long, Oblong, globular in shape, stronglly thickened pericarp
24. Uses : வல்லாரை கீரையை நன்கு கலைந்து உணவுன்
கோந்து நினைவு உட்கொள்வதால் நினைவாற்றல் அதிகரிக்கும்

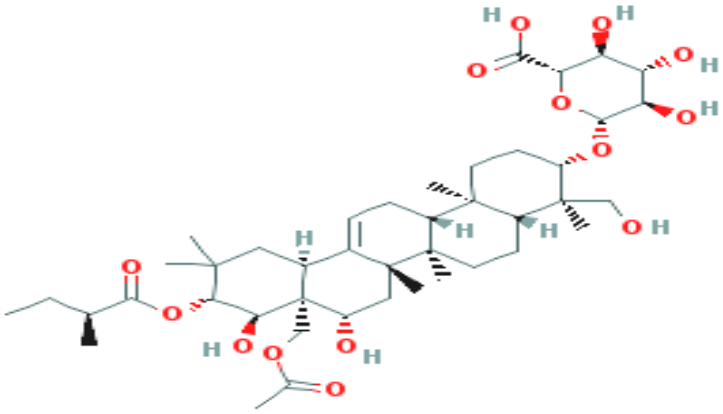
25. Collector (s) : T. Francis Xavier, Arun Bastin
26. Tribal Name : Annadurai, Chellamma

TFX No : 147 TFX No : 147

Fig 7 Format of field data sheet used to record the plant details and ethnomedicinal information.



a)



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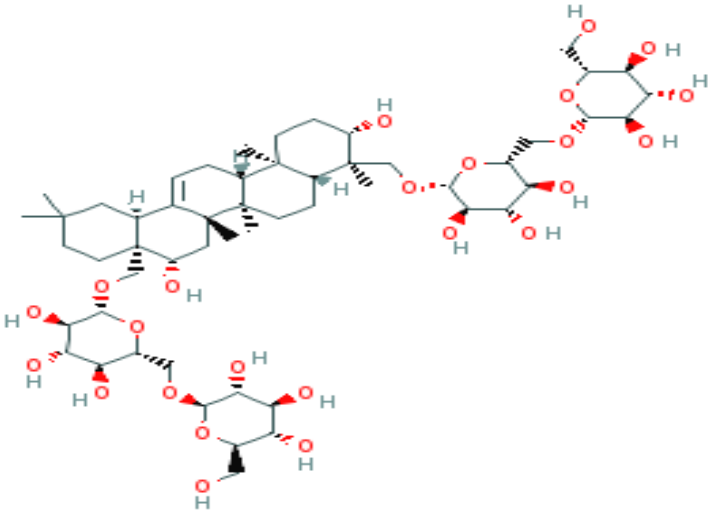
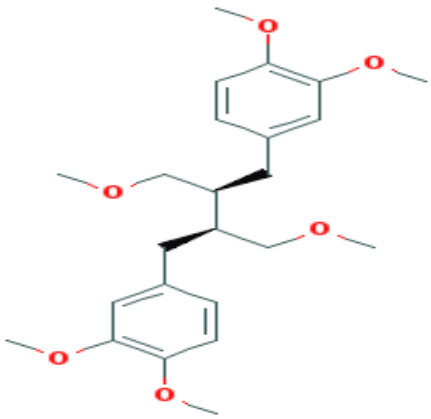
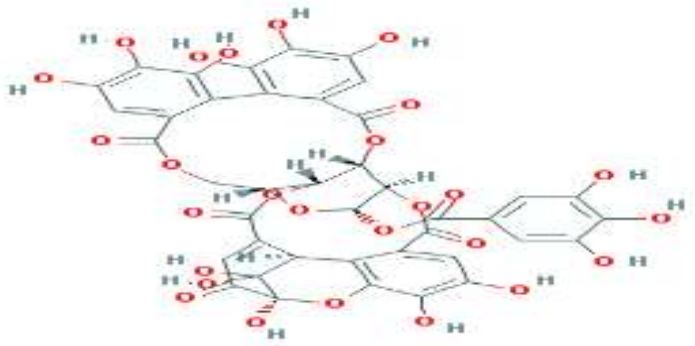


c)

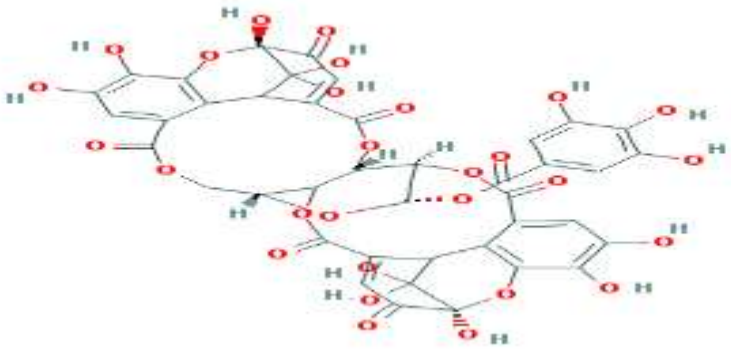
Fig. 8. Anti-diabetic compounds from Gymnema sylvestre: (a) gymnemicacid I; (b) gymnemicacid II and (c) gymnemesaponin V.



a)

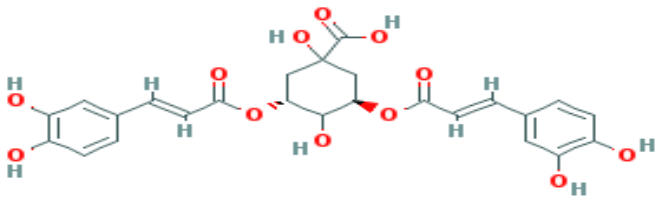


b)

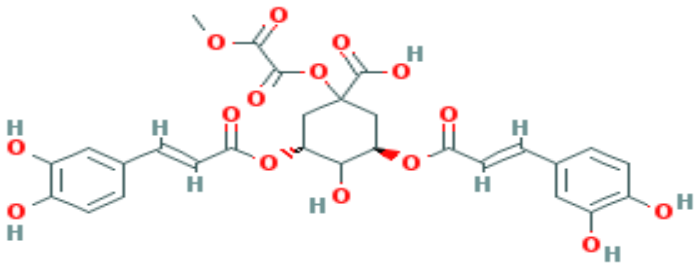


c)

Fig. 10 Hepatoprotective compound isolated from Phyllanthus amarus a) Phyllanthin; b) Amariin; c)Geraniin.



a)



b)

Fig.11 Neuro protective compound isolated from *Centella asiatica* a) Isochlorogenic acid A; b) 1,5- Dicaffeoylquinic acid.

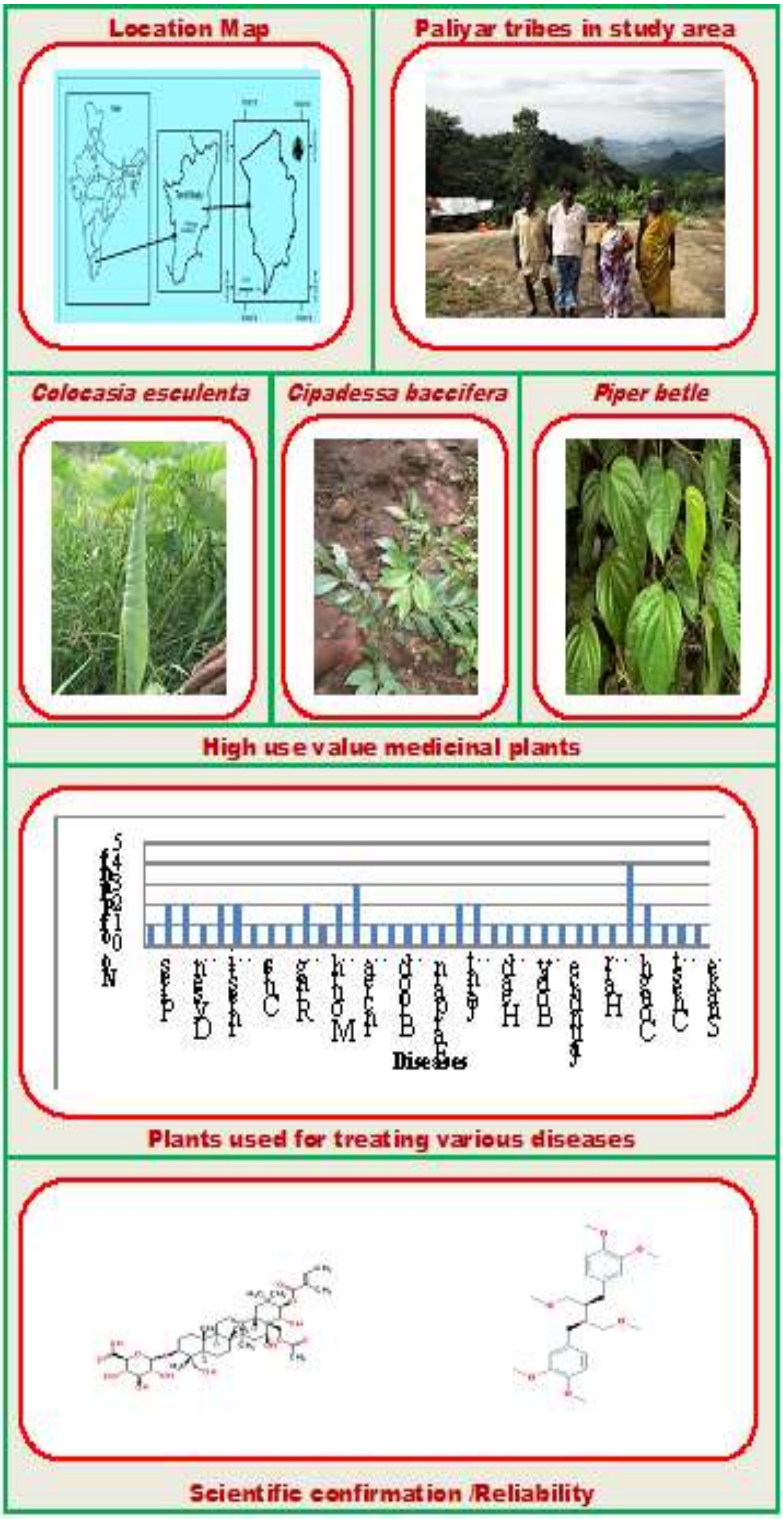

Location Map
Paliyar tribes in study area
Colocasia esculenta
Cipadessa baccifera
Piper betle
High use value medicinal plants
Diseases
Plants used for treating various diseases
Scientific confirmation /Reliability

Table 1: Ailments grouped by different ailment categories.

Ailment category	Biomedical terms	Tamil terms
Circulatory system/Cardiovascular system (CSCD)	Increase HB level in blood	Ratha viruthi
	Blood purification	Ratha suthigarippu
	Heart pain	Nenju vali
	Memory power	Gnabaga sakthi
Cooling agent (CA)	Body cooling	Udal kulirchi
Dental care (DC)	Tooth ache	Pal Vali
Dermatological infections /Diseases (DID)	Foot sore	Kaal pun
	Inflammation	Veekam
	Skin tumor	Thol katti
	Mouth sore	Vaipun
	Cuts	Vettukkayam
	Wounds	Kayam
	Ring worm	padarthamarai
Ear, Nose, Throat problems (ENT)	Ear pain	Kaadhu vali
Endocrinal disorder (ED)	Diabetes	Neerilivu noi
Gastrointestinal ailments (GIA)	Intestinal ulcer	Kudal pun
	Piles	Moolaviyathi
	Indigestion	Ajeeranam
	Dysentery	Seedhabaethi
	Diarrhoea	Vaitruppokku
General health (GH)	Body strength	Udal Valimai
Gastro urinary ailments (GUA)	Over bleeding	Rathappokku
Hair care (HC)	Hair growth	Mudivalardhal
	Hair loss	Mudiuthirdhal
Liver problems (LP)	Jaundice	Manjal kamalai
Poisonous bites (PB)	Snake bite	Pambukkadi
	Insect bite	Poochikkadi
Respiratory system disease(RSD)	Cough	Irumal
	Cold	Jalathosham

	Chest pain	Nenjuvali
Skeleto muscular system Disorder (SMSD)	Joint pain	Mootuvali
	Swelling	Veekam
	Head ache	Thalaivali
	Bone fracture	Elumbumurivu

Table 2: List of commonly used medicinal plants by Paliyar tribals in Pachalur hills, India.

Botanical name	Local name	Life form	Part used	Preparation	Application
Acorus calamus L.(Araceae)	Vasambu	Herb	Lf	Paste	Topical
Ageratum conyzoides L.(Asteraceae)	Kalyamman thalai	Herb	Lf	Paste	Topical
Amaranthus spinosus L.(Amaranthaceae)	Mulukeerai	Herb	Lf, Ep	Juice, Paste	Oral/Topical
Asparagus racemosus Willd.(Asparagaceae)	Nevakai mul	Shrub	Lf	Paste	Topical
Blepharis maderaspatensis L.(Acanthaceae)	Nanthirpoondu	Shrub	Lf, Ep	Paste	Topical
Centella asiatica (L.) Urban (Apiaceae)	Vallarai	Herb	Lf	Juice	Oral
Cipadessa baccifera Roth.(Meliaceae)	Semitikolunthu keerai	Shrub	Lf	Paste	Oral
Citrus medica L.(Rutaceae)	Elumicchai	Tree	Fr	Juice	Oral
Colocasia esculenta L.(Araceae)	Seeman keerai	Herb	Lf	Boiled leaf	Oral
Enicostemma axillare Lam.(Gentianaceae)	Vellaruku	Shrub	Ml	Raw	Topical
Eucalyptus obliqua L.Her.(Euphorbiaceae)	Thailamaram	Tree	Lf	Oil, vapours	Inhalation/topical
Gmelina arborea Roxb.(Lamiaceae)	Muthupattai	Tree	Lf	Juice, Paste	Oral/Topical
Gymnema sylvestre R.Br.(Asclepiadaceae)	Sirukurinjan	Herb	Lf	Raw	Oral
Hemidesmus indicus L.(Asclepiadaceae)	Nannari	Shrub	Rt	Juice	Oral
Hibiscus rosa-sinensis L.(Malvaceae)	Sembaruthi	Shrub	Fl	Paste	Topical
Ipomea ficifolia Lindl.(Convolvulaceae)	Kuthirai kaal keerai	Herb	Lf	Raw	Oral
Jatropha gossypifolia L.(Euphorbiaceae)	Kaatamanuku	Shrub	Ml	Raw	Topical
Lantana achyranthifolia Desf.(Verbenaceae)	Karunai mul	Shrub	Lf	Paste	Topical
Lantana camara L.(Verbenaceae)	Unni mul	Shrub	Lf	Paste	Topical
Ocimum sanctum L.(Lamiaceae)	Thiruneetruppachilai	Shrub	Lf	Raw	Oral
Oxalis corniculata D.C(Oxalidaceae)	Peru pulichan keerai	Herb	Lf	Raw	Oral
Oxalis corymbosa D.C.(Oxalidaceae)	Sirupulichan keerai	Herb	Lf	Juice	Oral
Persea americana Mill.(Lauraceae)	Avagoda	Tree	Fr	Paste	Oral

Phyllanthus amarus L.(Euphorbiaceae)	Keelanelli	Herb	Lf	Raw	Oral
Phyllanthus emblica L.(Euphorbiaceae)	Nelli	Tree	Fr	Juice	Oral
Piper betle L.(Piperaceae)	Vetrilai	Shrub	Lf	Raw, powder	Oral
Sansevieria roxburghiana Schult.(Agavaceae)	Muralikai	Shrub	Sd	Extract	Oral
Solanum nigrum L.(Solanaceae)	Karuntha keerai	Herb	Lf	Soup, Juice	Oral
Syzygium cuminii L.(Myrtaceae)	Naval	Tree	Sd	Powder	Topical
Terminalia chebula Ret.(Combretaceae)	Kadukkai	Tree	Sd	powder	Topical

Parts used: Ep – entire plant, Rt – root, Lf – leaf, Ml – milky latex, Fr – fruit, Sd– seed, Fl- flower.

Table 3: Ingredients added for the preparation of Herbal medicines by the Paliyar tribes.

Botanical name	Other plants added in medicinal preparation	Other ingredients added
Solanum nigrum	-	Sheep milk
Piper betle	-	Salt
Colocasia esculenta	Oxalis corymbosa	Salt
Lantana camara	Lantana achyranthifolia, Amaranthus spinosus	Salt
Lantana achyranthifolia	Lantana camara, Amaranthus spinosus	Salt
Blepharis maderaspatensis		Black gram/ Egg white
Oxalis corniculata		Rice
Cipadessa baccifera	Acorus calamus	Salt
Citrus medica	-	Honey
Phyllanthus amarus	-	Onion/ sheep milk
Eucalyptus obliqua	-	Coconut oil
Ocimum sanctum	-	Onion bulb

Table 4: Use value, no. of use-reports (ailment treated) and relative importance (RI) for commonly used medicinal plants.

Botanical Name (Family)	Use value	Ailment category: no. of use-reports (ailment treated)	RI
Acorus calamus L.(Araceae)	0.06	PB: 1(insect bite)	39.5
Ageratum conyzoides L.(Asteraceae)	0.25	DID: 4(cuts, wound healing)	34
Amaranthus spinosus L.(Amaranthaceae)	0.37	GIA: 4 (indigestion)DID:2(skin tumor)	47
Asparagus racemosus willd.(Asparagaceae)	0.12	DID: 2(foot sore)	39.5
Blepharis maderaspatensis L.(Acanthaceae)	0.25	SMSD: 3 (bone fracture) CSCD : 1 (heart pain)	45.5
Centella asiatica (L.) Urban (Apiaceae)	0.37	CSCD: 6(memory power)	46.5
Citrus medica L.(Rutaceae)	0.18	CSCD:3(increase HB in blood)	39.5
Colocasia esculenta L.(Araceae)	0.37	US: 6 (kidney stone)	29
Cipadessa baccifera Roth.(Meliaceae)	0.31	PB: 5(snake bite)	29
Enicostemma axillare Lam.(Gentianaceae)	0.18	DID: 3(foot sore)	37.5
Eucalyptus obliqua L.Her.(Euphorbiaceae)	0.31	RSD: 5(cough,cold, chest pain)	66.5
Gmelina arborea Roxb.(Lamiaceae)	0.31	DID: 5(ring worm, skin tumor)	41.5
Gymnema sylvestre R.Br.(Asclepiadaceae)	0.25	ED: 4(diabetes)	37.5
Hemidesmus indicus (L.) R.Br.(Asclepiadaceae)	0.25	GIA: 4(intestinal ulcer)	39.5
Hibiscus rosa-sinensis L.(Malvaceae)	0.68	HC: 5 (hair growth)GUA:2 (over bleeding) RSD: 4(cough)	67.5
Ipomea ficifolia Lindl.(Convolvulaceae)	0.25	GH: 4(body strength)	25
Jatropha gossypifolia L.(Euphorbiaceae)	0.25	DC:2(tooth ache)DID: 2(mouth ulcer)	43.5
Lantana achyranthifolia Desf.(Verbenaceae)	0.12	SMSD: 2 (joint pain,swelling)	25
Lantana camara L.(Verbenaceae)	0.12	SMSD: 2 (joint pain,swelling)	34
Ocimum sanctum L.(Lamiaceae)	0.37	RSD: 4(cough,cold) SMSD: 2(head ache)	63.5
Oxalis corniculata D.C(Oxalidaceae)	0.25	GH: 4(body heat)	36
Oxalis corymbosa D.C.(Oxalidaceae)	0.12	GIA:2 (dysentery)	29
Persea americana Mill.(Lauraceae)	0.06	CSCD: 1 (increase HB in blood)	27
Phyllanthus amarus L.(Euphorbiaceae)	0.31	LP: 5(jaundice)	41.5
Phyllanthus emblica L.(Euphorbiaceae)	0.18	CSCD: 3(blood purification)	54
Piper betle L.(Piperaceae)	0.5	GIA: 5(dysentery, diarrhea) RSD: 3(cough)	63
Sansevieria roxburghiana Schult.(Agavaceae)	0.25	ENT: 4(ear pain)	23.5
Solanum nigrum L.(Solanaceae)	0.31	GIA: 5(intestinal ulcer, piles)	46.5
Syzygium cuminii L.(Myrtaceae)	0.31	CSCD: 5 (increase HB level in blood)	29
Terminalia chebula Retz.(Combretaceae)	0.37	DC: 6 (Tooth ache)	61

Table 5: Informant consensus factor for commonly used medicinal plants.

Ailment category	Number of use reports(Nur)	Number of taxa (N_t)	Informant consensus factor (Fic)
Gastro intestinal ailments	20	5	0.78
Dermatological infection/diseases	18	6	0.7
Respiratory system disorder	16	4	0.8
Circulatory system	19	6	0.72
Dental Care	20	2	0.85
Ear, Nose, throat problems	20	1	1
Kidney stone	20	1	1
Skeleto muscular system disorder	20	4	0.62
General Health	20	3	0.77
Poisonous bite	20	2	0.8
Liver problem	20	1	1
Endocrinal disorder	20	1	1
Hair care	20	1	1
Genito urinary ailments	20	1	1
Total	124	38[a]	

[a]**A taxa may be reported in more than one ailment category**

Table 6: Fidelity (FL) values for common plants used by Paliyar traditional healers by ailment category.

Ailment category	Most preferred species with specific ailment	FL (%)
Gastro intestinal ailments (GIA)	Solanum nigrum	100
	Piper betle	62.5
Dermatological infection/diseases (DID)	Gmelina arborea	100
	Ageratum conyzoides	100
Respiratory system disorder (RSD)	Eucalyptus obliqua	100
	Ocimum sanctum	66.6
Circulatory system (CSCD)	Citrus medica	100
	Syzygium cumini	100

Dental Care (DC)	Terminalia chebula	100
Ear,Nose,throat problems (ENT)	Sansevieria roxburghiana	100
Kidney stone (US)	Colocasia esculenta	100
Skeleto muscular system disorder(SMSD)	Blepharis maderaspatensis	100
	Ocimum sanctum	33.3
General Health (GH)	Oxais corniculata	100
	Ipomoea ficifolia	100
Poisonous bite (PB)	Cipadessa baccifera	100
Liver problem (LP)	Phyllanthus amarus	100
Endocrinal disorder (ED)	Gymnema sylvestre	100
Hair care (HC)	Hibiscus rosa-sinensis	45.45
Genito urinary ailments (GUA)	Hibiscus rosa-sinensis	18.8

Table 7: Comparison of medicinal uses reported by Paliyar tribes and neighboring indigenous communities.

Botanical name	Medicinal uses	MURNIC	References
Acorus calamus L.	Insect bite	▪	Senthilkumar *et al.*, 2013; Smita, *et al.*,2013; Dutt, *et al*., 2011; Bhaskar and Samant, 2012; Singh, *et al*., 2012; Uddin, et *al.*, 2013; Kumar, 2013; Lense, 2012.
Ageratum conyzoides L.	Cuts and wounds	Θ▪	Singh, *et al*., 2012;Lense, 2012; Shukla, *et al*.,2010; Mustafa, *et al.*, 2014; Kisangau, *et al.*, 2007; Kasali, *et al*.,2014; Oladunmoye and Kehind, 2011.
Amaranthus spinosus L.	Indigestion, tumor	Θ▪	Amuthavalluvan, 2011; Shukla, *et al.*,2010; Shanmugam, *et al*., 2012; Bhaskar and Samant, 2012; Singh, *et al*., 2012;Uddin, *et al*.,2013; Mou, *et al.*, 2012; Abbasi, *et al*., 2013.
Asparagus racemosus willd.	Inflammation	Θ▪	Divya, *et al*., 2013;Shukla, *et al*.,2010;Alagesaboopathi, 2012; Bhaskar and Samant, 2012;Smita, *et al*.,2013; Mishra, *et al.*, 2014; Ganesan, *et al.*, 2008; Ganesan, *et al*., 2004; Kadhirvel, *et al*.,2010; Karuppusamy, 2007; Singh, *et al*., 2012; Uddin, *et al*.,2013; Das, *et al*.,2009; Choudhary, *et al*., 2008; Shrivatsava and Kanugo, 2013.
Blepharis maderaspatensis L	Bone fracture	Θ▪	Ganesan, *et al*., 2004;Senthilkumar *et al*., 2013; Divya, *et al*., 2013

*Centella asiatica (*L.) Urban	Memory development	Θ▪	Divya, *et al*., 2013;Senthilkumar *et al*., 2013;Ganesan, *et al*., 2008; Singh, *et al*., 2012;Shukla, *et al*.,2010; Amuthavalluvan, 2011; Bhaskar and Samant, 2012; Ganesan, *et al*., 2004;Karuppusamy, 2007; Uddin, *et al*.,2013;Lense, 2012; Kidane, *et al*.,2014;
Cipadessa baccifera Roth.	Snake poison	▪	Ganesan, *et al*., 2004;
Citrus medica L.	Increase haemoglobin	▪	Senthilkumar *et al.*, 2013
Colocasia esculenta L.	Kidney stone	Θ▪	Ganesan, *et al.*, 2004; Smita, *et al*., 2013; Kadhirvel, *et al.*,2010; Singh, *et al*., 2012;Choudhary, *et al*., 2008
Enicostemma axillare Lam.	Inflammatory pain	▪	Shanmugam, *et al*., 2012; Ganesan, *et al*., 2008
Eucalyptus obliqua L.Her.	Cough, cold, Chest pain	*	
Gmelina arborea Roxb.	Ring worm, Skin tumor	▪	Choudhury, *et al*., 2011;Karuppusamy, 2007
Gymnema sylvestre R.Br.	Diabetes	Θ▪	Alagesaboopathi, 2012; Amuthavalluvan, 2011; Bhaskar, A and Samant, 2012;Senthilkumar *et al*.,2013; Ganesan, *et al.*, 2008; Kadhirvel, *et al*., 2010; Karuppusamy, 2007; Shrivatsava and Kanugo, 2013
*Hemidesmus indicus (*L.) R.Br.	Stomach sore	Θ▪	Karuppusamy, 2007;Shukla, *et al.*,2010;Alagesaboopathi, 2012; Divya, *et al.*, 2013;Bhaskar and Samant, 2012; Ganesan, *et al*., 2008; Lingaiah and Rao, 2013.
Hibiscus rosa-sinensis L.	Hair growth, over bleeding, cough	Θ▪	Amuthavalluvan, 2011;Divya, *et al.*, 2013; Senthilkumar, *et al*., 2013; Choudhury, *et al.*, 2011;Ganesan, *et al*., 2008; Mou, *et al.*, 2012; Kadhirvel, *et al*.,2010;Uddin, *et al*.,2013
Ipomea ficifolia Lindl.	Strength	*	
Jatropha gossypifolia L.	Tooth ache, mouth sore	Θ▪	Shukla, *et al*.,2010;Ganesan, *et al*., 2008; Divya, *et al.*, 2013; Mustafa, *et al*., 2014
Lantana achyranthifolia Desf.	Joined pain	*	
Lantana camara L.	Joined pain	Θ▪	Divya, *et al.*, 2013;Shukla, *et al*.,2010;Senthilkumar *et al*.,2013; Kadhirvel, *et al*.,2010; Kidane, *et al*.,2014;Kasali, *et al*.,2014.
Ocimum sanctum L.	Cough, cold, Chest pain	Θ▪	Amuthavalluvan, 2011;Divya, *et a*l., 2013;Kadhirvel, *et al*., 2010; Rajesh and Mathew, 2013; Suresh, *et al*., 2012; Pareek and Trivedi, 2011.
Oxalis corniculata D.C.	Body heat	Θ▪	Shukla, *et al*.,2010;Alagesaboopathi, 2012;Amuthavalluvan, 2011; Dutt, *et al.*, 2011; Abbasi, *et al*.,2013; Karuppusamy, 2007;

			Uddin, *et al*.,2013;
Oxalis corymbosa D.C.		*	
Persea americana Mill.	Increase haemoglobin	▪	Kasali, *et al*.,2014; Oladunmoye and Kehind, 2011
Phyllanthus amarus L.	Jaundice	Θ▪	Divya, *et al*., 2013;Suresh, *et al.*, 2012;Ganesan, *et al.*, 2008; Kadhirvel, *et al*.,2010;Karuppusamy, 2007; Lingaiah, and Rao, 2013; Mishra, *et al*., 2014; Bhaskar and Samant, 2012.
Phyllanthus emblica L.	Blood purification	▪	Alagesaboopathi, 2012; Amuthavalluvan, 2011; Bhaskar and Samant, 2012;Smita, *et al*.,2013; Lingaiah, M and Rao, 2013;Pareek and Trivedi, 2011; Rajesh and Mathew, 2013;Singh, *et al.*, 2012;Uddin, *et al*., 2013; Mishra, *et al*., 2014; Mou, *et al*., 2012.
Piper betle L.	Dysentery, Diarrhea, Cough	Θ▪	Karuppusamy, 2007; Kadhirvel, *et al*., 2010; Uddin, *et al*., 2013.
Sansevieria roxburghiana Schult.	Ear disorder	Θ▪	Smita, *et al*.,2013;
Solanum nigrum L.	Ulcer, piles	Θ▪	Divya, *et al*., 2013; Shukla, *et al*.,2010; Suresh, *et al.*, 2012; Ganesan, *et al*., 2008; Kadhirvel, *et al*.,2010;Karuppusamy, 2007; Rajesh and Mathew, 2013;Dutt, *et al*., 2011;Senthilkumar *et al*., 2013; Pareek and Trivedi, 2011; Singh, *et al*., 2012; Abbasi, *et al*., 2013.
Syzygium cuminii L.	Increase haemoglobin	▪	Shukla, *et al*.,2010;Amuthavalluvan, 2011;Bhaskar and Samant, 2012; Senthilkumar, *et al*., 2013;Smita, *et al*.,2013; Ganesan, *et al.*, 2008; Kadhirvel, *et al*.,2010;Rajesh and Mathew, 2013;Singh, *et al*., 2012; Mishra, *et al.*, 2014; Shrivatsava, S and Kanugo, 2013.
Terminalia chebula Retz.	Teeth inflammation, mouth sore	Θ▪	Kumar, 2013; Shukla, *et al*.,2010; Uddin, *et al*.,2013; Bhaskar and Samant, 2012;Senthilkumar *et al*., 2013; Lingaiah and Rao, 2013;Singh, *et al*., 2012;

MURNIC- Medicinal uses reported by neighboring indigenous communities. Similar uses (Θ), different uses (▪),uses not reported (*).

Table 8: Quantitative Comparative Ethnomedicinal data between Pachalur hills and other countries.

Author (Year of Study)	Area (Country)	Total No. of species reported (Σ U)	No. of species with similar uses as in Pachalur Hills (Θ)	No. of species with different uses from Pachalur Hills(▪)	No. of species with new uses reported	Percentage of New uses reported
Abbasi, *et al., 2013.*	Himalayas (Pakistan)	45	0	3	27	90%
Alagesaboopathi, 2012	Dindigul District- T. N. (India)	44	1	4	25	83%
Amuthavalluvan, 2011	Kattunayakan - T. N. (India)	60	4	4	22	73%
Bhaskar and Samant, 2012	Pachamalai Hills - T. N. (India)	66	1	9	20	67%
Choudhary, *et al*., 2008	Rajasthan - (India)	38	0	2	28	93%
Choudhury, *et al.*, 2011	Kamrup District - Assam (India)	22	1	1	28	93%
Das, *et al*.,2009	Tripura (India)	33	0	1	29	97%
Divya, *et al*., 2013	Kanyakumari - T. N. (India)	106	7	3	20	67%
Dutt, *et al*., 2011	Himachal Pradesh (India)	70	0	3	27	90%
Ganesan, *et al*., 2004	Palani Hills - T. N. (India)	45	2	3	25	83%
Ganesan, *et al.*, 2008	Alagarkoil Hills - T. N. (India)	111	6	4	20	67%
Kadhirvel, *et al*.,2010	Chitteri Hills - T. N. (India)	65	4	6	20	67%
Karuppusamy, 2007	Sirumalai Hills - Southern India	90	5	4	21	70%
Kasali, *et al*.,2014	Bukoba city (Congo)	40	1	2	27	90%
Kidane, *et al*.,2014	Southern Ethiopia	128	0	2	28	93%
Kisangau, *et al.*, 2007	Bukoba District (Tanzania)	75	0	1	29	97%
Kumar, 2013	Himachal Pradesh (India)	32	1	1	28	93%
Lense, 2012.	West Papua (Indonesia)	99	1	2	27	90%
Lingaiah and Rao, 2013.	Adilabad District - A.P. (India)	44	1	3	26	87%
Mishra, *et al.*, 2014	Rajasthan (India)	31	1	3	26	87%
Mou, *et al.*, 2012	Moulvibazar (Bangladesh)	25	1	2	27	90%
Mustafa, *et al.*, 2014	Osun State (Nigeria)	45	0	2	28	93%
Oladunmoye and Kehind, 2011	South Western Nigeria	208	0	2	28	93%
Pareek and Trivedi, 2011	Kaladera - Jaipur District (India)	29	0	3	27	90%
Rajesh and Mathew, 2013	Namakkal District - T. N.(India)	37	2	2	26	87%

Senthilkumar *et al.*, 2013	Eastern Ghats (India)	90	3	7	20	67%
Shanmugam, *et al.*, 2012	Sivagangai District - T. N. (India)	71	0	2	28	93%
Shrivatsava and Kanugo, 2013.	Surguja - Chhattisgarh (India)	15	1	2	27	90%
Shukla, *et al.*,2010	Rewa District- M. P. (India)	166	2	9	19	63%
Singh, *et al.*, 2012	Western Nepal	66	2	8	20	67%
Smita, *et al.*,2013	Koraput District - Odisha (India)	50	0	6	24	80%
Suresh, *et al.*, 2012	Sivagangai District - T. N. (India)	25	3	0	27	90%
Uddin, *et al.*, 2013	Bazar District (Bangladesh)	82	0	9	21	70%
Average mean value			**1.51**	**3.48**	**25**	**83.3**

T. N. → Tamil Nadu, A. P. → Andhra Pradesh, M. P. → Madhya Pradesh.

CONCLUSION

The present investigation revealed that medicinal plants still play a vital role in the primary health care of the people. The information gathered from the Paliyar tribal is useful for further researchers in the field of ethno-medico-botany, taxonomy and pharmacology. This study offers a model for studying the relationship between plants and people, within the context of traditional medical system. The purpose of standardizing traditional remedies is obviously to ensure therapeutically efficacy. The value of using ethno medical information is to initiate drug discovery efforts. Therapeutic applications of the medicinal plants discussed in the present article open new vistas for the researchers to carryout in-depth phytochemical and pharmacological investigations about the plants so as to validate the efficacy of indigenous herbal medicine.

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Revision Notes

The present study was initiated to establish a regional profile of the indigenous knowledge system for medicinal plant use and cultural practices associated with the healing process of these plants by traditional healers in the Pachalur hills, Dindigul district. In the present study a total of 30 medicinal plant species belonging to 27 genera and 22 families were presented, used for treating 33 ailments. The major plant parts used are leaves and most of the remedies are suggested to take orally. The informant consensus factor revealed that the Liver Problem, Endocrinal Disorder, Hair Care, Genito Urinary Ailment, ENT and Kidney stone diseases have the highest informant consensus factor Fic of 1 followed by the dental care, Poisonous bite and Respiratory System Disorder (Fic- 0.8). Gastro intestinal ailment, General Health and Dermatological infection showed relatively low levels of consensus (Fic-0.7). The level of informants consent was high for most ailment categories to highlight some of the plant species in terms of Fidelity level. Shrubs (12%) were the primary source of medicine followed by herbs (11%). *Hibiscus rosa-sinensis* (UV of 0.68) and *Piper betle* (UV of 0.5) are the most frequently and popularly used medicinal plants species in the study area.

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