

RESEARCH ARTICLE

DOCUMENTATION OF ETHNOMEDICINAL AND ETHNOVETERINARY PLANTS USED BY PALIYAR TRIBES, KURANGANI HILLS, WESTERN GHATS, THENI DISTRICT, TAMIL NADU, INDIA

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ABSTRACT

A study on medicinal plant utilization in area revealed that the communities commonly used for maintaining their primary healthcare. The ethnomedicinal and ethnoveterinary documentation in the Kurangani forest of Tamil Nadu state was made for a period of two month from January to March 2021. The forest is a tropical evergreen with high species richness where the temperature and rainfall data indicates that it is suitable vegetation for the inhabitation of great number of species. In order to sort out health disorders or diseases based on the plants prescribed there are 8 ailment categories were classified. In present study, totally 50 plant species for ethnomedicine and 25 species of ethnoveterinary were encountered through the knowledge of indigenous tribal communities, Paliyar of Kurangani forest. Most of the treatments in both ethnobotany and ethnoveterinary practices with the use of herbs particularly leaf parts were perceived. For medicinal purposes, the family Malvaceae contributed majorly 5 species followed by Solanaceae with 4 species, Euphorbiaceae and Zingiberaceae contributed 3 species and afterward other family species solely mentioned for different ailments. In ethnoveterinary medicine documentation, 3 species belongs to the family Euphorbiaceae which is predominant, subsequently 2 species belong to Zingiberaceae. The mode of preparation and dosage, mode of application, duration of the treatment for each ailments have documented. This study highlights the traditional medicinal knowledge of the Kurangani tribal people, providing basic data for further research and protection of minority medicine. Thus, conservation of medicinal plants by local communities is emphasized in present study to avoid further loss. Moreover, phytochemical and pharmacological investigation is recommended with due consideration to frequently used medicinal plants.

Keywords: Kurangani, Ethnomedicine, Ethnoveterinary, Paliyar tribes, Traditional knowledge.

1. INTRODUCTION

India is one of the twelve mega-biodiversity countries in the world having rich vegetation with wide varieties of plants [1]. In India, medicinal plants are widely used by all sections of the population with an estimated 7,500 species of plants used by several ethnic communities and it is known that India has the largest tribal population in the world after Africa. With enormously diversified ethnic groups and rich biological resources, India represents one of the great emporia of ethnobotanical wealth. Even today, tribal communities in India still collect and preserve locally available wild and cultivated plant species and practice herbal medicine to treat a variety of diseases and disorder [2].

Ministry of Tribal affairs presents a list of tribal communities in India for each state and Tamil

Nadu contains 36 types of tribal communities distributed in different districts in the forests and adjoining areas. It is estimated that tribal people of Tamil Nadu accounts 1.05% of the total state population and 0.77% of the total tribal population of the country. Out of 17,500 species of flowering plants described from India about 5640 species are recorded in Tamil Nadu [3]. World Health Organization estimated that nearly 80% of the earth's inhabitants still rely on ethnomedicine, as the mid-1990s, upwards of 80-90% of humans toughly to rely on ethno-veterinary care for livestock [4].

India has great heritage of medicinal plants. India is basically agricultural country; domesticated livestock's are backbone of farmers. To maintain these livestock there is phenomenal increase in the demand of herbal traditional medicine in developing

country like India. Ethno-veterinary medicine practices cover the knowledge, skill, methods and belief about health care found among the members of community. Ancient records on animal health care are found in *Vedas*, *puranas* like *Ashwapuran*, *Garudapuran* and *Hastipuranam* which devoted to animal husbandry [5].

From the vedic period till the end of 19th century, much of the veterinary practice in India was based on the experiences gathered through generations and improved through informal experimentation this traditional system of medicine also referred to as ethno-veterinary medicine [6].

Ethnoveterinary medicine is mainly concerned with folk beliefs, knowledge, skills, methods and practices which are used in the healthcare of animals. It comprises traditional surgical techniques, traditional immunization, magico-religious practices and the use of herbal medicines to treat livestock diseases [7]. Ethnoveterinary medicine has become an elemental factor of primary health care, especially for marginalized and poor communities living in remote rural areas. Ethnoveterinary medicine often offers less expensive options than conventional medicines, products are locally available and more easily accessible, and are generally less toxic [8]. Knowledge of ethnoveterinary practices is declining due to inadequate documentation and verbal passage of plant heritage verbally. Documenting indigenous knowledge is important for the conservation and use of biological resources [9].

Indian government has inaugurated the plan to develop the Agriculture and farmers' welfare through Animal husbandry, Dairying and Fisheries by the Ministry of Tribal affairs, 2021. Hence, the Aims and Objectives of present study are proper documentation of indigenous knowledge about medicinal plants by ethnobotany and ethnoveterinary study. To know about the plant species of ancient medicinal properties and collect the data, the tribal people of the particular area have approached through the methods of questionnaire and direct conversation. This information may not be reaching the younger generations of tribal people because of their job and educational reasons and lifestyle.

A perusal of the literature reveals that, several ethnobotanical and ethnoveterinary studies among paliyar tribals have been reported from the various districts of Tamil Nadu except Theni district which has not yet been studied from ethnoveterinary point of view. Therefore, this study was undertaken in order to ascertain the detailed

information on plants used by paliyar tribals for ethno-veterinary purposes in different places of Theni district. With the above fundamental reason, the ethnomedicine and ethnoveterinary study is planned to do with the following objectives.

1. To document the traditional knowledge about herbal plants.
2. To explore and document the traditional information regarding usage of ethnoveterinary medicinal plants utilized by rural farmers and traditional herbal healers.
3. To create awareness about its role in cultural, social and health of people
4. To initiate attempts to find the alternate and reliable drug discovery by tracing the traditional knowledge on medicinal plants.
5. To conserve our national heritage before its extinction and to encourage the conservation and sustainable utilization of traditionally important plants.

2. MATERIALS AND METHODS

2.1 Study area

Theni District lies at the foot of Western Ghats and is situated between 90° 53' and 10° 22' north latitude and 77 ° 17' and 77 ° 67' east longitude. The general geographical information of the district is diversified by several ranges and hills. The vegetation is classified as southern tropical forest in the plains and foot hills, dry deciduous forests, moist deciduous forests and evergreen forests in the high altitudes. In the present study, ethnobotanical and ethoveterinary surveys were carried out in Kurangani hills village of Theni District.

2.2 Tribal communities in the study area

The tribe found in the study area called Paliyars and Muthuvars. Compared to various tribal communities in Tamil Nadu, paliyars constitute a small group. The Paliyar tribals inhabit a narrow strip of Western Ghats in the hilly regions of Madurai, Dindigul, Theni, Thirunelveli and Virudhunagar Districts of Tamil Nadu and Idukki District of Kerala. They are also engaged in seasonal collection of minor forest products such as honey and bee wax. They cultivate edible plants such as tapioca, banana, millets, and cash crops such as pepper, coconut, arecanut and cashewnut.

2.3 Method of collecting information [10]

The fieldwork in the villages of Theni District took place between January to March 2021. The tribal settlements were located through field surveys in this region. A total of five tribal practitioners were identified to get the ethnomedicinal and ethnoveterinary information through direct interviews/oral conversations. A field datasheet has been prepared to record the plant details with ethnomedicinal information gathered from the traditional healers. The information has collected through questionnaires and discussions among the informants in their local language (Tamil). The questionnaire allowed responses on the plant prescribed, part of the plant used, medicinal uses for each part, mode of preparation (*i.e.*, decoction, paste, powder, and juice), form of usage (either fresh or dried) and additional plants used as ingredients. Information on local name of plant, plant parts used for curing, method of preparation.



Figure 1. Study area of Kurangani hills, Western Ghats, Theni district, Tamil Nadu, India

3. RESULTS AND DISCUSSION

3.1 Meteorological data

The climatic data for the study area was collected in Bodinayakanur Taluk Office, Theni

district, for a period of three months from January 2021 to March 2021. The maximum temperature is ranging between 30°C to 35°C. Similarly the minimum temperature during the study period is ranging between 21°C and 28°C. The annual rainfall of the study area is 883mm. Most of the rainfall occurred during the period of south-west monsoon (July) as it is generally most effective part of Western Ghats. The relative humidity of the air was between 65% and 89%.

3.2 Documentation of indigenous ethnomedicinal knowledge

The present study revealed the use of 50 species of plants distributed in 48 genera belonging to 31 families which were commonly used by most of the Paliyar traditional healers for the treatment of different types of ailments.

In present study it has been identified that tribes regularly use 25 Herb species, 10 Shrub species, 5 Climbers species and 10 Tree species. The prominent family is Malvaceae which contributed 5 species, followed by Solanaceae with 4 species and followed by Zingiberaceae and Poaceae with 3 species (Figure 4). For each reported species, the botanical name of the plant, family, local name (Tamil), life form, parts used, ailments treated, method of preparation, mode of administration and its medicinal importance (Table 1) are provided.

Among the different plant parts used for the preparation of medicine and veterinary, the herb is predominant and leaves were most frequently used for the treatment of different ailments (Figure 2, 3 and 4). The preparation methods of categorized as raw material (raw plant), decoction, paste, juice, oil, gel, latex and soup. In these different methods of preparation, raw material is frequently used in this documentation by Paliyar tribes of Kurangani hills.

The medicinal uses of plants gathered in present study are compared with the previously published information from other parts of India. There were 20 plants such as *Gloriosa superba*, *Solanum torvum*, *Sida cardifolia*, *Alpinia officinarum*, *Melia azedarach*, *Ficus racemosa*, *Mimosa pudica*, *Bambusa vulgaris*, *Syzigium cumini*, *Eclipta alba*, *Cymbopogon citrates*, *Atalantia monophylla*, *Helicteros isora*, *Phyllanthus emblica*, *Vicia faba*, *Piper nigrum*, *Capsicum frutescens*, *Jasminium angustifolium*, *Elettaria cardamomum* and *Canna indica* are reported for the first time for the particular ailment from the study area. However, no plants are reported as a new medicinal plant but with different uses.

Table 1. Ethnomedicine information collected from Paliyar tribes of Kurangani Hills.

S. No.	Scientific Name	Family	Vernacular Name	Habit	Part Used	Ailments treated	Preparation and Mode of Applications
1	<i>Solanum nigrum</i> L.	Solanaceae	Milakuthakkali	Herb	Leaves	Mouth Ulcer	Decoction of fresh leaves taken in early morning to treat mouth ulcer. Also the decoction is used as mouth wash
2	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Mullikeerai	Herb	Leaves, Stem	Jaundice	Decoction of fresh leaves and stem are taken orally twice a day for three days to cure indigestion
3	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Thulasi	Herb	Leaves	Cold, cough, fever	Fresh leaves are taken orally twice a day to get relief from cold, cough and fever.
4	<i>Achyranthus aspera</i> L.	Amaranthaceae	Nauruvi	Herb	Root, seed	Teeth pain, Snake bites	Fresh roots are used as toothbrush. Seeds are used as nutritive food.
5	<i>Circuma angustifolia</i> Roxb.	Zingiberaceae	Kooravathi	Herb	Rhizomes, Leaves	Bronchitis, Antifungal	Decoction of dried rhizomes are taken to cure Bronchitis. Fresh leaves are used orally to cure wound. Also leaves are used as antifungal, antibacterial agents.
6	<i>Gloriosa superba</i> L.	colchicaceae	Kanvali kilangu	Climbing herb	Leaves	Asthma	Decoction of fresh leaves are used to cure Asthma for children.
7	<i>Solanum torvum</i> Sw.	Solanaceae	Sundakkai	Shrub	Fruit, leaves	Antimicrobial, Anti-inflammatory	Fruits are widely used as vegetable and food ingredient. Leaves are used as antimicrobial, anti-inflammatory agents.
8	<i>Hibiscus-rosa-sinensis</i> L.	Malvaceae	Sembaruthi	Shrub	Leaves, Flower	Herbal Oil	From the flowers extract oil has been taken and used to enhance hair growth and used in hair fall treatment.
9	<i>Sida cardifolia</i> L.	Malvaceae	Kurunthuthi	Herb	Root	Urinary, Nervous disorders	Decoction of dried roots are taken orally in early morning to cure urinary problem.
10	<i>Psidium guajava</i> L.	Myrtaceae	Koyya	Shrub or small tree	Leaves	Edible	Fresh leaves are used to cure stomach pain. Fruits are edible.
11	<i>Lawsonia inermis</i> L.	Lythraceae	Maruthani	shrub	Leaves	Bile	Paste is prepared with the leaves along with turmeric orally to reduce the bile level. Mostly used in southern India.
12	<i>Alpinia officinarum</i> Hance.	Zingiberaceae	Sitharathai	Galangal	Rhizomes	Cold, Cough	Decoction of dried rhizomes are taken as orally in early morning to cure cold and cough.

13	<i>Melia azedarach</i> L.	Meliaceae	Malai vembu	Tree	Leaves	Eye-diseases, Headaches and Indigestion	Fresh leaves are taken as orally to cure indigestion and headaches. Also decoction is used to cure eye-diseases.
14	<i>Aristolochia bracteolata</i> Lam.	Aristolochiaceae	Aaduthinnapai	Herb	Leaves	Stomach problems (tape warms)	A pinch of leaves are ground into paste and taken orally along with honey to treat stomach problems.
15	<i>Ficus racemosa</i> L.	Moraceae	Athimaram	Tree	Bark, leaves	Carterpillar Bristles, Injury	Fresh leaves paste are apply in skin for protect from mosquito bite. Also used to protect from carterpillar bristles lodged in skin. Latex from leaves are orally apply for the injury and fracture.
16	<i>Mimosa pudica</i> L.	Fabaceae	Thottal Sinugi	Herb	Leaves, Stem	Joint Pain	Decoction from dried leaves and stem are taken orally to cure joint pain.
17	<i>Bambusa vulgaris</i> Scrad	Poaceae	Moongil	Shrub	Bud	Thoracic Problem	Juice from buds are used to cure thoracic problem.
18	<i>Tridax procumbens</i> L.	Asteraceae	Vettukayapundu	Herb	Leaves	Anticoagulant, Antifungal	Paste from leaves are apply to heal wound. Also used as anticoagulant, antifungal.
19	<i>Barleria prionitis</i> L.	Acanthaceae	Kattu kanakambaram	Subshrub	Leaves	headache	Decoction of leaves is inhaled to get free from headache.
20	<i>Syzigium cumini</i> L.	Myrtaceae	Naval maram	Tree	Bark	Stomach clean	Soup from dried bark is used to clean stomach.
21	<i>Cissus quadrangularis</i> L.	Vitaceae	Pirandai	Herb	Leaves	Cold, Cough	Decoction from fresh leaves taken orally to cure cold and cough.
22	<i>Piper betle</i> L.	Piperaceae	Vetrilai	Creepers	Leaves	Headache, Bronchitis, antiseptic	Fresh leaves are taken orally and apply on head to cure headache. Leaves juices are taken for Bronchitis.
23	<i>Abutilon indicum</i> (Link) Sweet	Malvaceae	Thuthi	Herb	Leaves	Piles	Decoction from fresh leaves are taken orally to cure piles.
24	<i>Pergularia daemia</i> (Forssk). Chiov	Apocynaceae	Veliparuthi	Herb	Leaves	Skin disease, Rhumantism	Decoction from fresh leaves are used to cure skin diseases and rhumantism.
25	<i>Eclipta alba</i> (L.) L.	Asteraceae	Karappankulai	Herb	Leaves	Vitilligo	Fresh leaves are taken orally to cure vitilligo.
26	<i>Andrographis paniculata</i> (Burm.f) Nees	Acanthaceae	Siriyanangai	Herb	Leaves	Fever, Poisonous bites	Leaves are mixed with the root of <i>Aristolochia indica</i> and ground into paste. The paste obtained is applied over the body to treat fever. Decoction of fresh leaves is taken orally for two days thrice a day to treat poisonous bites.
27	<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae	Sothu kathalai	Herb	Succulent	Stomach issue	Gel is used to cure stomach issue. Also used

							to treat diabetes and used for skin remedy.
28	<i>Cymbobogan citrates</i> (DC.) Stapf	Poaceae	Bothaipul	Herb	Leaves	Antioxidants, antimicrobial,	Fresh leaves are taken orally and inhaled for 2 to 3 minutes to cure headache.
29	<i>Atalantia monophylla</i> (Roxb.) A.Dc.	Rutaceae	Kattu elumichai	Shrub or small tree	Leaves, fruits	diabetes	Fruits are edible. Fresh fruits are taken orally to cure diabetes.
30	<i>Helicteros isora</i> L.	Malvaceae	Valamberikai	Shrub or small tree	Fruit	Herbal oil	Oil is taken from dried fruit and used as herbal oil and reduce the body heat.
31	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Malai nelli	Tree	Fruit	Diabetes	Dried fruits are ground into powder. The powder decoction is taken twice in a day to cure diabetes.
32	<i>Vicia faba</i> L.	Fabaceae	Kattu mochai	Shrub or small tree	Fruit	Edible, nutrients	Fruits are commonly edible. Also used as highly nutrient value.
33	<i>Piper nigrum</i> L.	Piperaceae	Karu milagu	Climber	Fruit	Edible, antimicrobial	Fruits are edible and used as ingredient. Also used as antimicrobial.
34	<i>Capsicum frutescens</i> L.	Solanaceae	Kana milagai	Subshrub	Fruit	Edible	Highly medicinal valued and edible.
35	<i>Jasminum angustifolium</i> (L.) Willd.	Oleaceae	Kattu malli	Shrub	Flower	Chronic ulcers	Mild anesthetic, astringent, and used as chronic ulcers.
36	<i>Elettaria cardamomum</i> (L.) Maton.	Zingiberaceae	Elakkai	Herb	Seed	teeth decay, bad breath	The seeds are taken orally daily morning to cure teeth decay, bad breath.
37	<i>Canna indica</i> L.	Cannaceae	Kalvalai	Herb	Fruit	Diabetes, kidney stone	Fresh fruits are taken orally as food and cure diabetes, indigestion. Also pseudostem is used to cure kidney stone.
38	<i>Leucus aspera</i> (Willd.) Link	Lamiaceae	Thumbai	Herb	Leaves	Skin allergy	Juice extracted from the leaves is mixed with honey and taken orally to treat skin allergy
39	<i>Bombox ceiba</i> L.	Bombacaceae	Ilavamaram	Tree	Prickles	Pimples	The broad and thick prickles of the plant are rubbed on pimples to disappear.
40	<i>Urena lobata</i> L.	Malvaceae	Ottuthuthi	Herb	Root	Stomach pain	Paste made from the root is taken orally thrice a day for two days to get relief from stomach pain.
41	<i>Persea Americana</i> Mill	Lauraceae	Avocado	Tree	Fruit, leaves, seeds	Cholesterol, nutritious, dysentery and	The fruit used as food, good source of potassium and vitamin D. Also fruit is used to lower cholesterol levels. The seeds, leaves,

						diarrhea	and barks are used for dysentery and diarrhea
42	<i>Aegle marmelos</i> (L.) Correa.	Rutaceae	Vilvamaram	Tree	Leaves	Cough, eye problems	Decoction of fresh leaves is taken orally twice a day for a week to treat cough, breast inflammation, eye problems and to keep the body in cool.
43	<i>Asperagus racemosus</i> Willd.	Liliaceae	Thanneervitan kilangu	Herb	Tuber	Urinary problem	Fresh tuber is ground with water and taken orally with milk twice a day for a week to cure urinary problems.
44	<i>Cassia auriculata</i> (L.) Roxb.	Cesalpiniaceae	Aavarampoo	Herb	Flowers	Kidney problems	Fresh flower petals are made into a paste and taken orally with honey once a day before going to bed for month to treat kidney problems.
45	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Arukampul	Herb	Plant parts	Normal blood circulation	Fresh plant parts are ground with hot water and make into a paste and taken orally in empty stomach to ensure the normal blood circulation.
46	<i>Solanum trilobatum</i> (L.)	Solanaceae	Thoothuvalai	Herb	Leaves	Cold and cough	Fresh leaves are boiled with black pepper and tender coconut and the paste thus obtained is taken orally thrice a day for two days to get relief from cold and cough. Also leaves are mixed with egg and taken as food for twice a day for one week to get relief from cold and cough.
47	<i>Santalum album</i> (L.)	Santalaceae	Santhanamaram	Tree	Bark, essential oil	Cosmetic, skin cancer	The powder from bark is used as cosmetic and skin texture, essential oil is taken orally to prevent from the skin cancer
48	<i>Euphorbia tirucalli</i> (L.)	Euphorbiaceae	Thirukalli	Tree	Latex	Dandruff	Milky latex is dipped in cotton. After drying of cotton, burn it and the obtained ash is mixed with coconut oil and applied over the head skin to get rid of dandruff.
49	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Cucurbitaceae	Kumatikai	Climbers	Fruits	Rheumatism	Fresh fruits are made into paste and heated with neem oil and the paste thus obtained is tied over the painful places with cloth to treat rheumatism.
50	<i>Momordica charantia</i> L.	Cucurbitaceae	Kaatupagarkai	Climbers	Fruits	Diabetes	Fruits are edible. Fruits are used as ingredients. Also Fruits used to treat diabetes.

Table 2. Ethnoveterinary Information collected from Paliyar tribes of Kurangani Hills

S. No.	Botanical Name	Family	Vernacular name	Habit	Parts Used	Mode of application	Disease cured	Animals treated	Preparation and application
1	<i>Bryophyllum pinnatum</i> (Lam.) Pers.	Crassulacaceae	Ranakalli	Herb	Leaves	Paste	Mastitis	Goat	Fresh leaves given orally two times for goat to cure Mastitis.
2	<i>Azadirachta indica</i> A. Juss.,	Meliaceae	Veppilai	Tree	Seed	Paste	Flu repellent Maggot Wound	Goat	Oil paste is applied externally to the goat's foot heal for Maggot wound ie. In wound, worms will be produced over the period where once in a day at the empty stomach for 2 days orally given.
3	<i>Abutilan indicum</i> L.	Malvaceae	Thuthi	Shrub	Leaves	Decoction	Diarrhoea	Goat	Fresh leaves given two or three times a day to diarrhoea
4	<i>Acacia nilotica</i> (L.) Delile	Mimosaceae	Karuvelam	Tree	Fruit	Paste	Stomach worms	sheep	Mature fruits are given as feedstuff daily for 4-5 days to the sheep and goats to kill the stomach worms.
5	<i>Acalypha paniculate</i> Miq	Euphorbiaceae	Kattukuppa men	Herb	Leaves	Paste	Skin diseases wound	Goat	Fresh leaves crushed and made into extract which is applied directly to the goat and cattle externally once in a day for 2 days.
6	<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppameni	Herb	Leaves	Paste	Wound	Goat	Fresh leaves crushed applied directly, to the goat and cattle, superficially once in a day for 2 days.
7	<i>Aloe vera</i> (L.) Burm. F.	Liliaceae	Kathalai	Herb	Leaves	Juice	Mastitis	Goat	Juice is mixed with neem juice and given orally to the goat and cattles for once a day to cure Mastitis
8	<i>Andrographis paniculate</i> nees.	Acanthaceae	Nelavembu	Herb	Leaves	Decoction	Fever	Goat	Fresh leaves are ground with the seeds of <i>Cuminum cyminum</i> , seeds of <i>Piper nigrum</i> , leaves of <i>Piper betel</i> are made into paste and it is applied on the tongue of goat for fever, twice in a day for 2 days.
9	<i>Aristolochia indica</i> L.	Aristolochiaceae	Aduthinna-palai	Climber	Leaves	Paste	Poison bit	Goat	Leaves are crushed and applied on the infected position twice a day until cure.

10	<i>Calotropis procera</i> R.Br.	Asclepiaceae	Earukku	Shrub	Latex	Paste	Wound	Goat	The latex collected from the branch is directly applied on wound. Leaf sticks are used to apply the latex.
11	<i>Cannabis sativa</i> L.	Cannabinaceae	Ganja	Herb	Seed	Decoction	Dysentery	Goat	Matured leaves paste given twice in a day for 2 days.
12	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Mudukkattan	Climber	Leaves	Paste	Rheumatic pain	Goat	Young leaves crushed and mixed with coconut oil are used as dressing on pain area and cut injury once in a day.
13	<i>Carica papaya</i> L.	Cariaceae	Papali	Tree	Leaves	Juice	Fever	Goat	Fresh mature leaf juice with equal quantity of ginger is given twice/day for a week.
14	<i>Cissus quadrangularis</i> L.	Vitaceae	Pirandai	Climber	Stem	Paste	Bone fracture, wound	Goat	Aerial parts paste is used as poultice. It is also used to control maggots and ticks, to prevent secondary wound infection due to tick bites. In case of lumpy skin disease, the stem is crushed with red soil and pork fat smear over the whole body.
15	<i>Circumaamada</i> Roxb.	Zingiberaceae	Mansalinji	Herb	Rhizome	Paste	Bone fractured	Goat	Young rhizomes crushed and mixed with coconut oil is dressed up on bone fracture area and cut injury once in a day.
16	<i>Circuma longa</i> L.	Zingiberaceae	Inji	Herb	Rhizome	Decoction	Throat pain, Ear pain	Cow	Leaves extract mixed with salt and pepper which is given to animals with the help of drenching tubes in tympany.
17	<i>Datura metell</i> L.	Solanaceae	Umathai	Herb	Leaves	Paste	Poison bite	Goat	Matured leaves are crushed and pure extract applied on bite area.
18	<i>Jatropha curcas</i> L.	Euphorbiaceae	Katamanakku	Shrub	Latex	Paste	Wound infection	Goat	Latex mixed with curcuma powder, 1 table spoon paste prepared and used to dressing on infestation and for fly repellent once in a day.
19	<i>Lawsoniainermis</i> L.	Lytheraceae	Maruthani	Tree	Leaves	Powder	Fertilization	Goat	Matured leaf powder is given with any fodder to maintain pregnancy just after fertilization for one week.
20	<i>Mangifera indica</i> L.	Anacardiaceae	Mamaram	Tree	Stem	Decoction	Indiges	Goat	Bark extract made decoction which

					Bark		-tion		is given to goat for fever and bloody diarrhoea. Fruits and bark are crushed with water and given to animals against diphtheria.
21	<i>Nerium oleander</i> L.	Apocynaceae	Aralli	Shrub	Latex	Raw material	Poison bite	Goat	Latex applied on poisoned area and orally for insect and snake bite.
22	<i>Piper nigrum</i> L.	Piperaceae	Milaku	Climber	Fruit	Tea	Fever Cough	Goat	Fruits and ginger decoction is drenched daily once to buffaloes to treat fever and cough.
23	<i>Psidium guajava</i> L.	Myrtaceae	Koya	Tree	Leaf	Juice	Dysentery	Goat	Fresh young leaves of the extract mixed with 1 spoon of table salt are given 2 times in a day for 2 days.
24	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Nerunji	Herb	Whole plants	Powder	Urinary problem	Goat	Whole plant extract made with water is given orally twice a day for 2-3 days to goats for curing urinary problem.
25	<i>Vitex negundo</i> L.	Verbenaceae	Notchi	Shrub	Leaves	Paste	Foot and mouth disease	Goat	Mature leaf paste is applied over the wounds once in a day until heal.

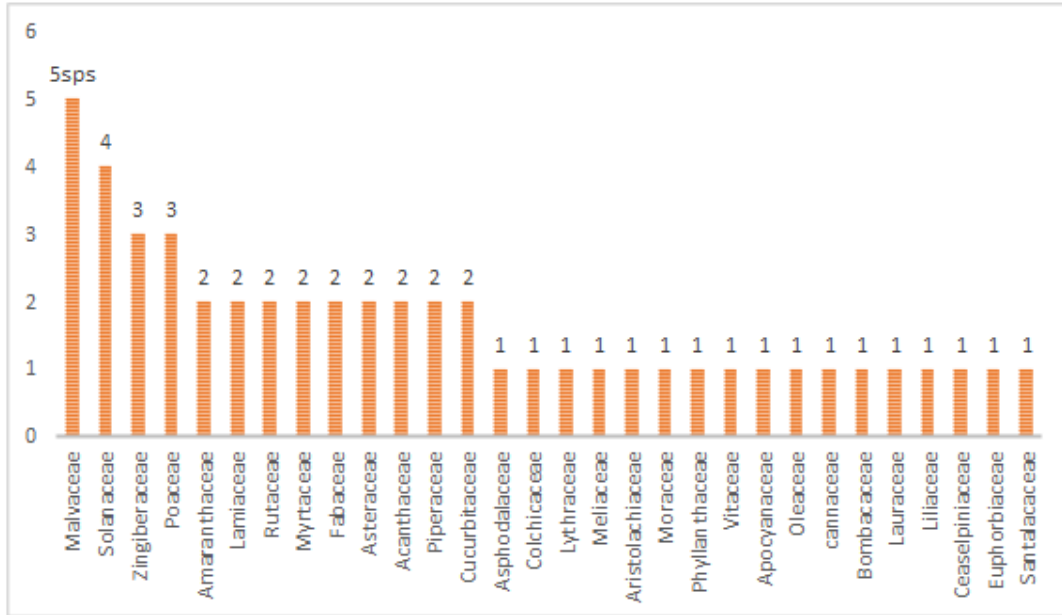


Figure 2. Family distribution of Ethnomedicinal plants used by Paliyar Tribes.

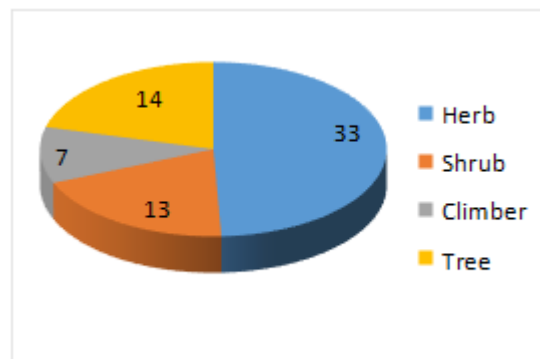


Figure 3. Contribution of various life forms in ethnomedicinal and ethnoveterinary herbs studied at Kurangani forest

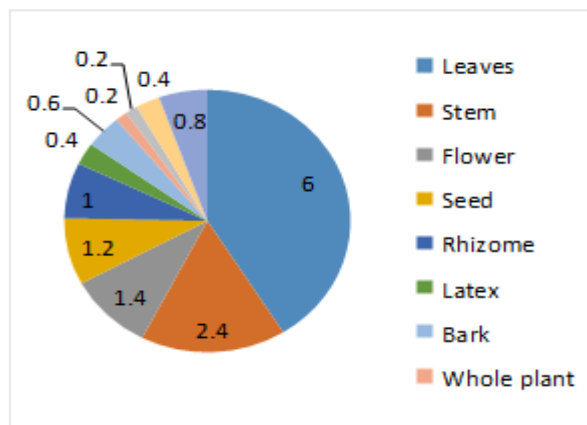


Figure 4. Percentage of ethnomedicinal and ethnoveterinary plant parts used for the preparation of medicine

Loganathan and Selvam (2018) reported that a total of 82 plant species and belonging to 40 families in Vathalmalai Hills of Dharmapuri, Tamil Nadu [12]. They are most frequently used plant parts leaf and most of the medicine prepared in the form powder and paste. The important disease cure for cold, diarrhoea, chicken pox, smallpox, cough, headache, and stomach ache. In a previous report, a total of 86 plant species belonging to 75 genera and 45 families were reported with ethnomedicinal uses. In terms of the number of medicinal plant species, *Acanthaceae* and *Cucurbitaceae* are dominant families [13]. In another report, a total of 65 plant species belonging to 37 families are described among Paliyar tribes in Theni district along the method of drug preparation, mode of administration, probable dosage and duration of treatment for skin diseases [14].

An ethnobotanical survey was carried out to collect information on the use of medicinal plants in Southern Western Ghats of India (Madurai district, Tamil Nadu). A total of 60 ethnomedicinal plant species distributed in 32 families are documented in this study. The medicinal plants used by paliyars are listed with Latin name, family, local name, parts used, mode of preparation and medicinal uses. Generally, fresh part of the plant was used for the preparation of medicine [15].

3.3 Documentation of indigenous ethnoveterinary knowledge

The present investigation indicates a high level of consensus of traditional Ethno-veterinary medicine knowledge of medicinal plants within paliyar's community. The results of this study shows that a large number of medicinal plants are traditionally used by the tribal community of Kurangani hill for the treatment of various ethnoveterinary diseases or health disorders of animals. In this study, 25 plant species are reported and arranged alphabetically by the botanical name. Vernacular names (Tamil), parts used, ailment and their administration have also been tabulated (Table 2 & Figures 3 and 4).

In ethnoveterinary documentation, it has been identified that the tribes frequently used Herb plants (10) followed by Tree species (6), Shrub species (5) and Climber species (4) for the ethnoveterinary ailments (Figure 6). In this study, the 25 species have reported belongs to different genera with highest representative the family Euphorbiaceae (3 species), and 2 species belong to the family Zingiberaceae and other genera from Piperaceae, Apocyanaceae, Meliaceae, Malvaceae,

Mimosaceae, Liliaceae, Acanthaceae, Aristolachiaceae, Asclepidiaceae, Cannabinaceae, Sapindaceae, Cariaceae, Vitaceae, Solanaceae, Lythraceae, Anacardiaceae, Myrtaceae, Zygophyllaceae, Verbenaceae and Crassulacaceae are documented (1 species each) (Figure 5).

In a previous study carried out in southern districts of Tamil Nadu, ethnoveterinary medicine for the treatment of 44 veterinary health hazards is enumerated. A total of 113 plant species belonging to 100 genera and 46 families are used by rural peoples in the treatments including anthrax, bone fracture, bloat, bronchitis, blackquarter, corneal opacity, dog bite, enteritis, foot and mouth diseases. The medicinal plants are listed with their scientific name, family, local name (Tamil) and mode of utilization [16]. An ethnobotanical survey was conducted in selected sites of Villupuram district. Twenty six plant species belonging to fourteen families were documented in the present study, to cure different diseases in animals [17].

These observations would serve as data base to formulate plant derived compounds in herbal veterinary drugs which could serve as better alternative to allopathic medicines that cause side effects in livestock. The study focuses the adoption of folk medicines for immediate action on animal care along with livestock related social realities.

The use of plants among the *Paliyars* reflects their interest in ethnomedicine and further investigation on these species may lead to the discovery of novel bioactive molecules. In the case of safety and effectiveness, they can be refined and processed to produce natural drugs. At the same time the traditional healers are dwindling in number and there is a grave danger of traditional knowledge disappearing soon as the younger generation is not interested to carry on this traditional work.

4. CONCLUSION

The ethnomedicinal and ethnoveterinary documentation in the Kurangani forest of Tamil Nadu state was carried out. This study highlights the need for more comprehensive documentation of medicinal plants used for treating different ailments and it is providing basic data for further research and protection of minority medicine. The traditional medicinal systems of indigenous cultural communities are sources of knowledge for bioprospecting which is most important by linking this ethnomedicinal knowledge with modern

medicine system. More ethnobotanical studies should be encouraged before the traditional knowledge of indigenous people vanishes. This wealth of traditional knowledge of tribals should be transmitted in its entirety to the younger generation and make its importance to reach wider. Our results reinforce the need for complete documentation of indigenous traditional knowledge related to various ailments before it becomes lost and forgotten. It is also essential to recognize the role of indigenous knowledge for future drug discovery and development, sustainability and conservation of plant genetic resources and making tribal youths aware about its benefits and opting this as a carrier option.

REFERENCES

1. Ignacimuthu, S., Ayyanar, M. and Sankarasivaraman, K. (2006). Ethnobotanical investigation among tribes in Madurai district of Tamil Nadu, India. *J. Ethnobiol. Ethnomedicine*. 79: 562-568.
2. Kala, C.P. (2005). Current status of medicinal plants used by traditional vaidyas in Uttaranchal State of India. *Ethnobot Res Appl*. 3: 267-278.
3. Ayyanar, M., Sankarasivaraman, K., Ignacimuthu, S. and Sekar, T. (2010). Plant species with ethno botanical importance other than medicinal in Theni district of Tamilnadu, Southern India. *Asian J. Exp. Biol. Sci.* 1(4): 765-771.
4. Kamatchi, A. and Parvathi, A.S. (2020). Quantitative Analysis in Traditional Knowledge of Wild Medicinal Plants Used to Treat Livestock Diseases by The Paliyar's Tribe of Sadhuragiri Hills, Tamil Nadu, India. *Asian Journal of Pharmaceutical Research and Development*. 8(4): 44-57.
5. Jain, S.K. and Srivastava, S. (2003). Some folk herbal medicines for possible use in veterinary practices. *Indian Journal of Traditional Knowledge*. 2(2): 118-125.
6. Krishna, L., Swarup, D. and Patra, R.C. (2005). An overview of prospects of ethnoveterinary medicine in India. *Indian. J. Anim. Sci.* 75: 1481-1491.
7. Muhammad, G., Khan, M.Z., Hussain, M.H., Iqbal, Z., Iqbal, M. and Athar, M. (2005). Ethnoveterinary practices of owners of pneumatic-cart pulling camels in Faisalabad City (Pakistan). *J. Ethnopharmacol.* 97(2): 241-246
8. Jean Paul Dzoyem, Roland T. Tchuenteu, Kofia Mbarawa, Awung Keza, Akah Roland, Abdel Jelil Njouendou, and Jules Clement N. Assob. (2020). Ethnoveterinary Medicine and Medicinal Plants Used in the Treatment of Livestock Diseases in Cameroon. In book: *Ethnoveterinary Medicine*, Project: Phytochemistry, pp.175-209.
9. Yogeswari, R., Arivuchelvan, A., Murugesan, S., Balasubramaniam, G.A., Selvaraj, P., Punniyamurthy, N., Raja, A. and Vikrama, C.P. (2017). Review on pharmacological actions of medicinal plants used in ethnoveterinary practices in Namakkal district of Tamil Nadu. *J. Pharmacogn. Phytochem.* 6(6): 1722-1729
10. Ayyanar M. and Ignacimuthu, S. (2011). Ethnobotanical survey of medicinal plants commonly used by Kani tribals in Tirunelveli hills of Western Ghats, India. *J. Ethnopharmacol.* 134(3): 851-864.
11. Ignacimuthu, S., Ayyanar, M. and Sankarasivaraman, K. (2008). Ethnobotanical study of medicinal plants used by Paliyar tribals in Theni district of Tamil Nadu, India. *Fitoterapia* 79: 562-568.
12. Loganathan, S. and Selvam, K. (2018). Identification and Ethnobotanical Survey of Medicinal Plants in Vathalmalai Hills, Eastern Ghats, Dharmapuri District, Tamil Nadu, India. *Asian J. Pharm. Clin. Res.* 11(6): 324-328.
13. Jeyapraksh, K., Ayyanar, M., Geetha, K.N., and Sekar, T. (2011). Traditional uses of medicinal plants among the tribal people in Theni District (Western Ghats), Southern India. *Asian Pac. J. Trop. Biomed.* 1(1): S20-S25.
14. Mehalingam, P. and Elango V.P. (2017). An ethnobotanical study of medicinal plants used by the Paliyars aboriginal community in Theni district, Tamil Nadu, India, with special reference to skin diseases. 3rd Global Summit on Herbals & Traditional Medicine. October 18-20, 2017 Osaka, Japan.
15. Boomibalagan, P., Eswaran S. and Rathinavel, S. (2013). Traditional Uses of Medicinal Plants of Asclepiadaceae by Rural People In Madurai District, Tamil Nadu, India. *Int. J. Botany*, 9: 133-139.

16. Datta, T., Patra, A.K. and Dastidar, S.G. (2014). Medicinal plants used by tribal population of Coochbehar district, West Bengal, India-an ethnobotanical survey. *Asian Pac. J. Trop. Biomed.* 4(Suppl 1): S478-S482.
17. Dhanam, S. and Elayaraj, B. (2014). Ethnoveterinary Practices in Villupuram District, Tamil Nadu, India. *Int. Lett. Nat. Sci.* 24:1-7.

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