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DOCUMENTATION OF TRADITIONAL KNOWLEDGE ON MEDICINAL PLANTS OF DRY DECIDUOUS FORESTS IN KOLLENGODE RANGE OF PALAKKAD DISTRICT, KERALA, INDIA

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ABSTRACT
The ethnic people's understanding and the use of medicinal plants are found to be grounded on traditional background. Knowledge transfer practice among the ethnic communities is reported to be received from generation to generation. Even though these indigenous communities contribute to a very small proportion of the country's population, their knowledge is of a great cultural, social, and potentially economic value. This must be protected and utilized in a conscientious manner and at the same time we have to take steps to make sure there is no disturbance to its ties to the communities. The present investigation was to identify and document some of the plant species used for medicinal purposes by the tribal communities in Kollengode forest area of Palakkad District, Kerala, India. Data are collected through a combination of tools and techniques of questionnaire, interview and discussion. About 96 medicinal plants, belonging to 89 genera and 47 families largely used as medicine by tribals and local people of Kollengode forest area have been enumerated in this paper. The predominant families are Fabaceae and Euphorbiaceae. These plants contain valuable chemical substances and are employed in the treatment of various ailments. The present survey offers a model for studying the relationship between plants and human beings and also traditional remedies of vast therapeutic importance.

KEYWORDS: Ailments, Indigenous, Kollengode, Therapeutic, Tribal communities.

1. INTRODUCTION
The cultural diversity in the Indian society reflects close relationship between the existence of human life and nature including all other living creatures and non- living features. The conservation of environment, natural resources and biological diversity has been deeply rooted in the Indian tradition and culture. The Indian subcontinent, with its rich biodiversity, is one of the 12 mega-diversity centers of the world. Tropical ecosystems are usually perceived to be rich biodiversity reserves.[1,2] About 54% and 37% of Indian tropical forests are classed as dry and moist deciduous forests respectively.[3,4] Compared to other tropical forest types, tropical dry deciduous forests are subject to intensive anthropogenic disturbances and are among the most at-risk ecosystems in the world.[5,6,7] Tropical dry deciduous forests (TDFs) can be found in severe and extremely variable climates characterized by low annual rainfall, 5-6 dry months within the annual cycle, and nutrient-poor soil. Several terms have been used for this vegetation type such as seasonally dry tropical forest (SDTF), tropical dry deciduous forest, monsoon forest, caatinga, etc. More than any other factor, the lack of precipitation during a prolonged portion of the year is what produces true dry forest, an ecosystem type characterized by plants and animals with specific adaptations to survive the long dry season. Deciduousness is an adaptive phenomenon in tropical forests that is due to the synergistic effect of drought, soil moisture and tree characteristics.[8] Most of the trees drop their leaves after the rains end, and essentially halt photosynthesis, as they would otherwise be unable to survive the water loss during the dry season.

Champion and Seth recognised 26 forest sub types in Kerala, of which the prominent types are the west coast tropical evergreen, west coast semievergreen, southern moist mixed deciduous, southern dry deciduous, southern montane wet temperate forests, southern subtropical hill forests, southern montane wet temperate grasslands and littoral forests or mangroves.[9] Vegetation of Palghat district is unique due to gap features prevailing in the area. Flora of Palghat

enumerated about 757 angiosperm species and forms the pioneer attempt to document angiosperm vegetation of Palakkad district [10] followed by the detailed documentation done by Vajravelu.[11] Floristic studies in most of the protected areas in Palghat district have been done.[12,13,14] The dry deciduous forest occupies a major portion of the Palakkad district and receives about 900-1500 mm of rainfall per annum. Tropical Dry Deciduous Forests are occupied in the district, neighbouring to Tamil Nadu, such as border areas of Kollengode, Walayar, Attappady and Parambikkulam. It is very much susceptible to annual fire and small thorny climbers are predominant. The dominant plant species include *Anogeissus latifolia*, *Terminalia crenulata*, *Tectona grandis* and *Helicteres isora*.[15] Chasmophytic vegetation consists of plant communities that colonise the rock crevices and fissures of hill slopes. Rock crevices and cliffs represent specific environment with extreme ecological conditions such as extreme drought, temperature fluctuations, limited soil volume and scarce nutrients.[16,17,18] The structure and composition of tropical deciduous forests undergo changes with the length of wet period, amount of rainfall, latitude and altitude and impacts of human and livestock activities. As a result there is a great deal of spatial and temporal variation in species richness, composition and productivity across these forests. Tropical dry deciduous forests are enriched with economically important species. On account of their economic exploitation, tropical deciduous forests are the most threatened ecosystems in India and the most exploited and endangered ecosystems of the biosphere.

India, the megabiodiversity nation is not only endowed with a variety of flora and fauna but also has several ethnic communities. Use of medicinal plants to treat various diseases has been part of human culture since ancient times.[19] By practicing and using the plants for thousands of years, the ethnic and aboriginal people have gained immense practical knowledge about the medicinal plants.[20] Traditional healing systems play an important role in maintaining the physical and psychological well being of the vast majority of tribal people in India. The term ethnobotany is used to denote the comprehensive approach towards the knowledge of the ethnic people and the plants of their surrounding environment. Tribals are the torch bearers of the ethnobotanical knowledge. All over the world, there has been an increasing interest in the scientific study of man-plant interaction. The Indian sub-continent is inhabited by over 53 million tribals belonging to over 550 communities under 227 ethnic groups as per the classification made by Anthropologists on linguistic basis. As the indigenous people are the more reliable source of information on medicinal plants,[21] for the past few decades, use of ethnobotanical information in medicinal plant research has gained great attention among the scientific community.[22] Documentation of ethnobotanical species for further scientific validation and subsequent processing for commercialization in India are also getting importance in recent decades.[23,24,25,26] Traditional medicine forms a valuable resource for the development of new pharmaceuticals.[27] The exploration, utilization and conservation of these ethnobotanic resources are essential for restoration and preservation of traditional and indigenous knowledge.[28,29] This acquired knowledge about the plants is very essential to be used in the near future.[30] Moreover, in developing countries now, the trend is to incorporate traditional medicines in local healthcare system and interest has increased among the researchers to explore the huge potential of ethnomedicinal knowledge for treating various diseases.[31,32]

Palakkad, the largest district in Kerala is placed third in the diversity and population of tribals. The district has two major tribal zones, namely Attappady and Parambikkulam among the seven zones, identified for Kerala. There are eight tribal groups inhabiting different parts of the district viz. Eravallans, Irulars, Kadars, Kurumbars, Malamalasars, Mudugars, Malasars, and Muthuvans. Among them Malasar and Kadar are the major tribal communities in Kollengode forest doing effective medical practice by using plants. Kollengode forest range is endowed with low altitudinal hillock systems or rocky outcrops, which lie in the Palghat gap region of Western Ghats. These geographically isolated units harbour its own distinct assemblage of floral elements due to spatially and ecologically varied habitats from the surrounding vegetation and by the influence of the Palghat gap features. Despite the high diversity, studies on low altitude granitic hillock systems have not attempted so far. As numerous hillock systems have been transformed into vulnerable habitats due to grazing and prevalence of quarrying, documentation of medicinal plant wealth of such systems turned out to be the need of the hour. However, few reports on ethnobotanical information without much quantitative analysis are only available for Kollengode region.[33] Despite this ethnobotanical significance, no reports are available on medicinal plants used by the tribes of this forest range. Assessment of information on medicinal plants provided by tribal healers is most required as it gives additional support to know the level of healing property of plants. To address this lacuna, documentation was made in Kollengode forest, among the tribals to explore their traditional knowledge on plants for medicinal uses.

2. MATERIALS AND METHODS

2. 1. Study area

Present work is based on extensive field survey in the dry deciduous forest areas in Kollengode (Fig.1). The Kollengode forest range, lying between 10° 36’ N and 50°80’ N latitude and 76° 41’ E to 26° 79’ E longitude. The area presents a panorama of millennia, both from the geographical and anthropological point. These forest zones that have been vested with government were in the possession of various feudal chiefs of the locality, which were under the control of noble family Venganadu Kovilakam. The continuous stretch of Ghats of

Kollengode range is divided into two parts, Puramalavaram forming the southern wall of Palghat gap and Akamalavaram the northern scrap of Nelliyampathy hills. The region is endowed with 68 sq.km vested forests towards the south of Palghat Gap.

2.2. Data collection

Local medicine men and elderly people whose empirical knowledge was respected by everyone in the area were interviewed. After obtaining their consent, information regarding their knowledge of medicinal plants is recorded with the help of questionnaire-based interviews, open-ended field discussions and also by observation of their actual treatment practices, wherever possible. Altogether 65 (50 men and 15 women) persons were interviewed. Traditional healers were requested to accompany with the authors in the field so as to facilitate the identification of different plants employed by them to treat various ailments. The representative plant species were collected, processed, identified and documented. Plants that have been collected during the present study are identified using floras and other relevant literature.[34,11,35] The herbarium specimens were prepared following standard herbarium techniques[36] and are deposited at herbarium of Sir Syed College, Taliparamba, Kannur, Kerala, India for reference. The secondary source of information such books and monographs were also consulted for validating the ethnobotanical information of the collected plants.[37,38] Botanical name of the medicinal plant species with authority, family, voucher number, local name, habit, parts used, mode of administration and diseases treated are provided (Table.1).

3. RESULTS AND DISCUSSION

Different parts of medicinal plants were used as medicine by the tribal people and local traditional healers. Out of the 96 medicinal species recorded from the study area, the maximum number of species used as medicine was found in the family Fabaceae (14 species), followed by Euphorbiaceae (9 species), Cucurbitaceae (5 species), Combretaceae (4 species), Apocynaceae, Asteraceae, Lamiaceae, and Rhamnaceae (each with 3 species), while Amaranthaceae, Meliaceae, Acanthaceae, Sapindaceae, Boraginaceae, Rubiaceae, Asclepiadaceae, Vitaceae, Priplocaceae, Solanaceae, Verbenaceae, Sterculiaceae, Malvaceae contribute 2 species each and the remaining 26 families are monospecific. According to habit of plants, 31 were trees (32%), 24 climbers (25%), 22 shrubs (23%) and 19 herbs (20%) (Fig. 2). The most frequently utilized plant parts percentage were leaves (32%), followed by root (21%), bark (13%), fruit and whole plant (8%), stem and seed (7%), wood (2%) and others (1 %) in the form of decoctions, extracts, paste, juices and powders (Fig. 3). These medicinal plants are known to cure various types of ailments. 49 (51%) plants were categorized as wild plants and 47 (49%) as cultivated plants. The common use of herbaceous medicinal plants was also reported in other parts of world.[39,40,41]

Most of the tribals have a general knowledge of medicinal plants that are used for first aid remedies, to treat cough, cold, fever, headache, poisonous bites and some other simple ailments.[42] Maximum numbers of plants were used for gastric disorders (17 plants), skin diseases (15 plants) followed by fever and headache (14 plants), cough and cold (13 plants) diarrhea, dysentery and wound healing (each treated with 11 plant species). Similarly for treatment of respiratory disorders, snake bites, diabetes and eye problems (5 plants for each disease) and for jaundice, urinary problems (4 plants for each) were used. 3 plant species were mainly used to recover from bone fracture. Least number of plants (2 species) was used by the healers for treatment of reproductive disorders. We have reported that some plants were used in treatment of more than one disease. For example, bark of *Acacia catechu* was found to be useful in the cure of 10 ailing diseases. *Baliospermum montanum* has been found useful in the treatment of dropsy, constipation, jaundice, leprosy and skin diseases. *Dendrophthoe falcata* has been found useful in wounds, urinary troubles, menstrual disorders, and asthma. *Pterocarpus marsupium*, *Aerva lanata*, *Coccinia grandis*, *Corchorus trilocularis* and *Dillenia pentagyna* were found to be antidiabetic. Species like *Flueggea virosa* and *Diplocyclos palmatus* were found to be useful in treatment of sterility both in male and female. The most prevalent methods of drug preparation were as juices (26%), paste (21%), decoction (13%), powder (10%) and infusion (8%). Remedies were seldom prepared as oil and gum (3% each). 50% of the healer remedies were applied through oral tract while 39% were applied on the skin and 4% administrated through the eyes. Few remedy preparation were applied topically in mouth and through the nasal tract (1% each). Water exuding from cut portion of stem of *Calycopteris floribunda* and *Cassine albens* used for the treatment of urinary problems and red-eyeness due to conjunctivitis respectively.

Common ailments such as headaches or coughs are considered to be diseases with natural causes and hence their symptoms are treated at the house hold level, without resource to magical practices. In the present study 6 remedies (*Ceropegia candelabrum*, *Hemidesmus indicus*, *Leucas aspera*, *Naravelia zeylanica*, *Ocimum gratissimum* and *Ziziphus xylopyrus*) were used to get relief from headache. Ignacimuthu *et al* reported that *Ceropegia candelabrum*, *Pergularia daemia* and *Vitex negundo* were used by the tribals for the treatment of headache.[43] Most of the species listed are used in two or more disease groups, such as asthma, cough, bronchitis, diarrhea, dysentery, wounds, swelling, sprain, inflammation and pains. Major diseases treated included skin diseases, gastric disorders, diarrhea, dysentery and diabetes, which pose the most serious challenge to primary health care in south India. The use of water as diluent was the most frequently found for the preparation of drug, other useful diluting agent were reported as oil, honey and coconut milk. Oils from *Seasamum indicum*,

coconut and *Azadirachta indica* were mixed with plant medicine as dilutant. The mixing of oil of these plants for preparation of drugs was also reported in Arnatans of Nilambur forest, tribal people in Attappady and Wayanad.[44,45,46] Of the reported plants *Aerva lanata*, *Coccinia grandis*, and *Pterocarpus marsupium* have proved as potential anti-diabetic plants in traditional medicine.[47] Ayyanar and Ignacimuthu reported that the plants such as *Acalypha indica*, *Blepharis maderaspatensis*, *Cissampelos pareira* and *Dendrophthoe falcate* having potential wound healing property.[48] Plants such as *Acalypha indica*, *Azadirachta indica*, *Datura metel*, *Santalum album* and *Wrightia tinctoria* are reported as effective for the treatment of various skin diseases.[49]

Table 1: List of medicinal plants used by the tribal communities in Kolllengode forest range.

No	Botanical Name	Family	Voucher Number	Vernacular name	Habit	Parts Used	Uses
1	*Abrus precatorius* L.	Fabaceae	SSC510	Kunni	Climber	Leaves	Pounded leaves are used to relieve cough, cold and colic.
2	*Acacia catechu* (L.f.) Willd.	Fabaceae	SSC511	Karingali	Tree	Wood	Its heartwood extract is used in asthma, cough, bronchitis, colic, diarrhea, dysentery, boils, skin afflictions, sores and for stomatitis.
3	*Acacia leucophloea* (Roxb.) Willd.	Fabaceae	SSC521	Vellavelam	Tree	Bark, Leaves	An extract of stem bark and leaves of the plant is applied to cure psoriasis
4	*Acacia sinuata* (Lour.) Merr.,	Fabaceae	SSC527	Cheevikka	Climber	Fruit	Fruit powder used for dandruff
5	*Acalypha indica* Forssk.	Euphorbiaceae	SSC531	Kuppameni	Shrub	Leaves	Grind the leaf with curcuma rhizome and apply for the treatments of skin diseases, wounds and poisonous bites.
6	*Achyranthes aspera* L.	Amaranthaceae	SSC534	Kadaladi	Herb	Roots	Root powder used for cholera
7	*Aerva lanata* (L.) Juss. ex Schult.	Amaranthaceae	SSC536	Cherula	Herb	Leaves	Decoction of *Curcuma longa*, *Strychnos potatorum*, *Salacia oblonga* and *Aerva lanata* is given twice a day in order to treat diabetes.
8	*Alangium salviifolium* (L. f.) Wang.	Alangiaceae	SSC541	Ankolam	Tree	Bark	Decoction of bark is used as emetic. The leaves and fruit are used in diarrhea and dysentery
9	*Albizia amara* (Roxb.) Boivin.	Fabaceae	SSC543	Nenmenivaka	Tree	Leaves	The dried leaves were widely used for washing hair to promote growth and prevent dandruff.
10	*Anogeissus latifolia* (Roxb. ex DC.) Wall.	Combretaceae	SSC547	Kalkanjiram	Tree	Bark	Bark juice is used to cure stomach diseases, cough
11	*Aristolochia indica* L.	Aristolochiaceae	55C550	Garudakodi	Clmber	Root	Fresh root is grounded along with the roots of Rauvolfia serpentina and mixed in water and taken against snake bite.
12	*Atalantia monophylla* (L.) DC.	Rutaceae	SSC552	Katunarenga	Shrub	Root	Root pieces mixed with black pepper and decoction is prepared given orally to get relief from cough and phlegm
13	*Azadirachta indica* A.Juss.	Meliaceae	SSC555	Ariyaveppu	Tree	Fruit, Seed	Neem oil is helpful in treating a variety of skin problems and diseases like psoriasis, eczema and other persistent conditions.
14	*Azima tetracantha* Lam.	Salvadoraceae	SSC558	Sankukuppi	Shrub	Root	Root is applied directly to snakebites
15	*Baliospermum montanum* (Willd.) Muell.	Euphorbiaceae	SSC563	Nagadanthi	Shrub	Root	Root juice is reported to be useful in dropsy, constipation, jaundice, leprosy and skin diseases
16	*Barleria prattensis* Sant.	Acanthaceae	SSC564	Madhurakurinji	Herb	Leaves, Root	Juice of the plant materials used for curing Fever and as energy tonic and for increasing lactation level
17	*Blepharis maderaspatensis* (L.) Roth	Acanthaceae	SSC565	Murikootipacha	Herb	Leaves	Juice extracted from leaf is heated with gingelly oil and applied on affected places to heal wound

18	*Boerhavia diffusa* L.	Nyctaginaceae	SSC568	Thazhuthama	Herb	Leaves	Leaf extract is used internally in the treatment of jaundice and anaemia
19	*Breynia vitis-idaea* (Burm. f.) C.E.C. Fisch.	Euphorbiaceae	SSC574	Kattuniruri	Shrub	Root	Roots decoction is used as mouthwash.
20	*Briedelia stipularis* (L.) Blume.	Euphorbiaceae	SSC575	Cherupanachi	Shrub	Fruits	Fresh fruits are chewed and taken as such against mouth ulcer.
21	*Caesalpinia mimosoides* Lam.	Fabaceae	SSC579	Chingamullu	Climber	Root	The roots along with ginger paste for anti-helminthic property
22	*Calycopteris floribunda* Lam.	Combretaceae	SSC581	Pullanni	Climber	Stem	Water exuding from cut portion of stems given twice a day for urinary problem
23	*Cardiospermum halicacabum* L.	Sapindaceae	SSC590	Uzhinja	Climber	Leaves	The leaf juice is applied on boils and abscess
24	*Careya arborea* Roxb.	Lecythidaceae	SSC595	Pezhu	Tree	Fruit	Fruit powder made into decoction orally given for Stomach ulcers.
25	*Carissa carandas* L.	Apocynaceae	SSC596	Karanda	Shrub	Stem, Leaves	Stem decoction used for strengthening tendons. Leaf paste mixed with milk and used for fevers
26	*Carmona retusa* (Vahl) Masamune.	Boraginaceae	SSC600	Kuranguvettila	Shrub	Leaves	The leaf juice is used as a stomachic, and in the ailments of cough, fever and constitutional syphilis.
27	*Cassia fistula* L.	Fabaceae	SSC603	Kanikonna	Tree	Bark	Powdered bark mixed with water and taken for stomach ache.
28	*Cassine albens* (Retz.) Kosterm.	Celastraceae	SSC605	Thannimaram	Tree	Stem	Watery exudation from the trunk is used for curing red-eyeness due to conjunctivitis
29	*Cassytha filiformis* L.	Lauraceae	SSC607	Akasavalli	Climber	Whole plant	Juice of plant mixed with sugar, considered as specific in inflamed eyes.
30	*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	SSC609	Karachulli	Shrub	Root	A decoction of the powdered root is applied directly on melanomas, and the infusion is administered orally as an emetic and to relieve fever, nausea and general coughs
31	*Ceropegia candelabrum* L.	Asclepiadaceae	SSC612	Nagathunba	Climber	Leaves, Roots	The leaves are ground and applied as paste on forehead to cure head ache. The roots are powdered coarsely made into a decoction and given to recover from diarrhea
32	*Chamaecrista mimosoides* (L.) Greene.	Fabaceae	SSC615	Theemullu	Herb	Leaves, Seeds, Roots	Juice of leaves, seeds and roots of this plant used for diarrhea and dysentery.
33	*Cipadessa baccifera* (Roth) Miq.	Meliaceae	SSC616	Kaipanarangi	Shrub	Leaves	Leaf paste is taken orally to control diarrhea
34	*Cissampelos pareira* L.	Menispermaceae	SSC618	Malathangi	Climber	Root	Root extract is applied to wounds till the wound is healed
35	*Cissus quadrangularis* L.	Vitaceae	SSC621	Changalamparanda	Climber	Stem, Leaves, Root	Stem and leaf paste is used to cure bone fracture and root paste used to control gas trouble
36	*Cissus vitiginea* L.	Vitaceae	SSC622	Kattumunthiri	Climber	Leaves	Leaf juice used in the treatment of healing wounds, swelling, and sprains.
37	*Coccinia grandis* (L.) Voight.	Cucurbitaceae	SSC625	Koval	Climber	Roots, Leaves	The juice of the roots and leaves is used for the treatment for diabetes
38	*Cochlospermum religiosum* (L.) Alston in Trimen.	Cochlospermaceae	SSC628	Parapanji	Tree	Bark	Gum from the bark applied externally for bone fracture
39	*Commiphora caudata* (Wight & Arn.) Engl.	Burseraceae	SSC631	Idinjil	Tree	Bark	The gummy exudate from the bark is used to treat ulcer.

40	*Connarus monocarpus* L.	Connaraceae	SSC634	Kuriel	Climber	Root, Fruits	A decoction of the root is taken to cure syphilis, and the fruits to treat eye diseases.
41	*Corallocarpus epigaeus* (Rottl. & Willd.)	Cucurbitaceae	SSC 641	Kilimukkan kizhangu	Climber	Root	Root paste used as a remedy for snakebite administered internally and applied to bitten part
42	*Corchorus trilocularis* L.	Tiliaceae	SSC657	Arenukam	Herb	Leaves	Leaf juice used against diabetes
43	*Cosmostigma racemosum* (Roxb.) Wight.	Asclepiadaceae	SSC661	Vattuvalli	Climber	Leaves	Leaf juice is used to treat ulcerous sores
44	*Crotalaria juncea* L.	Fabaceae	SSC670	Chanaka	Herb	Seed	The seed paste is used to purify the blood and are used to treat impetigo and psoriasis
45	*Cryptolepis buchananii* Roem. & Schult.	Periplocaceae	SSC675	Kattupalvalli	Climber	Whole plant	Plant juice is used for the treatment of bone fracture.
46	*Datura metel* L.	Solanaceae	SSC683	Ummam	Shrub	Seeds, Leaves	Its paste or oil is prepared and used for external application to relieve pain, inflammation, itching and infested wounds
47	*Dendrophthoe falcata* (L. f.) Etting.	Loranthaceae	SSC684	Ithikkanni	Shrub	Leaves, Bark	The leaf juice is used for wounds, urinary troubles, menstrual disorders, and asthma. The bark is also used as a substitute for betel-nut.
48	*Desmodium gangeticum* (L.) DC.	Fabaceae	SSC685	Orila	Herb	Root	Decoction of root given in fever.
49	*Dillenia pentagyna* Roxb.	Dilleniaceae	SSC690	Pattipunna	Tree	Bark	Bark powder is given for the treatment of diarrhea and diabetes.
50	*Dioscorea bulbifera* L.	Dioscoreaceae	SSC691	Kattukachil	Climber	Bulb	Bulbs are used to treat piles, dysentery, and are applied to pain, and inflammation
51	*Diospyros melanoxylon* Roxb.	Ebenaceae	SSC694	Kari	Tree	Bark	Bark decoction is used in the treatment of diarrhea
52	*Diplocyclos palmatus* (L.) Jeffrey.	Cucurbitaceae	SSC696	Neyyunni	Climber	Fruits	Fruits are widely used as reproductive medicine (female infertility, aphrodisiac, tonic, leucorrhoea etc.)
53	*Emilia sonchifolia* (L.) DC. in Wight.	Asteraceae	SSC705	Muyalchevian	Herb	Leaves	Leaf paste is used for tonsillitis and skin diseases.
54	*Erythroxylum monogynum* Roxb.	Erythroxylaceae	SSC711	Chembulinga	Shrub	Bark, Wood	Different forms of bark, wood are used for diaphoretic diuretic, and also for dyspepsia and as well as continued fever.
55	*Euphorbia nivulia* Buch.-Ham.	Euphorbiaceae	SSC715	Elakkalli	Shrub	Leaves	Leaf juice is used for wound healing
56	*Evolvulus alsinoides* (L.) L.	Convolvulaceae	SSC721	Vishnukranthi	Herb	Whole plant	Ground and mixed with rice water and taken in empty stomach to improve memory of ageing people.
57	*Flacourtia indica* (Burm. f.) Merr.	Flacourtiaceae	SSC724	Kattukara	Shrub	Fruits, Bark	Juice of fruits and bark is used against eczema, snake bite, rheumatism and jaundice
58	*Flueggea virosa* (Roxb. ex Willd.) Voigt.	Euphorbiaceae	SSC725	Perimklavu	Shrub	Root	Root decoction used to treat testicular inflammation, frigidity, sterility, heavy menstruation, rheumatism, arthritis.
59	*Gardenia resinifera* Roth.	Rubiaceae	SSC729	Dikamali kayam	Tree	Gum	Gum, which is excreted on the stems and buds of the plant, is used in the treatment of cutaneous diseases and to keep off flies and worm
60	*Givotia moluccana* (L.) Sreem.	Euphorbiaceae	SSC731	Vandarali	Tree	Bark, Leaves	Stem bark paste is applied and its leaves are used as bandage during deep cuts
61	*Gmelina arborea* Roxb.	Verbenaceae	SSC733	Kumizhu	Tree	Leaves	Leaf juice is taken orally to cure cold and cough due to fever.

62	*Helicteres isora* L.	Sterculiaceae	SSC735	Valampiri	Shrub	Fruit	Fruit soaked in coconut oil and apply hair for reduce hair fall.
63	*Hemidesmus indicus* (L.) R.	Periplocaceae	SSC736	Nannari	Climber	Root	Root paste is applied on the forehead to reduce fever; root paste with sugar is given to children for cough and diarrhoea.
64	*Hibiscus hispidissimus* Griff.	Malvaceae	SSC738	Matthippuli	Shrub	Leaves, Root	The juice of the leaves are mixed with honey and used in treatment of eye diseases. In summer the roots of the plant infused in water is used as a cooling drink
65	*Ichnocarpus frutescens* (L.) R.	Apocynaceae	SSC741	Palvalli	Climber	Root	Root juice is used for the treatment of anaemia.
66	*Lannea coromandelica* (Houtt.) Merr.	Anacardiaceae	SSC751	Karasu	Tree	Leaves	Leaf paste applied for body pains and inflammation
67	*Leucas aspera* (Willd.) Link.	Lamiaceae	SSC763	Thumba	Herb	Whole plant, Root	Plant paste is applied on forehead for headache. Root decoction is used in bronchial diseases.
68	*Microstachys chamaelea* (L.) Muell.	Euphorbiaceae	SSC765	Kodiyavannakku	Herb	Whole plant	Plant extract along with coconut milk and Cuminum cyminum seeds is taken orally for rheumatism and arthritis.
69	*Mukia maderaspatana* (L.) Roem.	Cucurbitaceae	SSC766	Kasappuchedi	Climber	Whole plant	The oil is extracted from dried plant parts and it is used against body pain.
70	*Naravelia zeylanica* (L.) DC.	Ranunculaceae	SSC767	Thalavedana valli	Climber	Stem	Stem grinded and smelled when in cold and headache
71	*Ocimum gratissimum* L.	Lamiaceae	SSC775	Ramathulasi	Shrub	Leaves, Stem	Juice of leaves and stem are used internally in the treatment of colds, especially chest colds, fevers and headache
72	*Pithecellobium dulce* (Roxb.) Benth.	Fabaceae	SSC779	Kodakapuli	Tree	Leaves	Leaf juice traditionally used for treating leprosy, intestinal disorders, peptic ulcer, and toothache, ear ache,
73	*Phyllanthus emblica* L.	Euphorbiaceae	SSC783	Nelli	Tree	Leaves, Root	Leaf juice is used for stomachache. Root bark paste mixed with fruit powder of Terminalia chebula is used internally for bleeding.
74	*Phyllanthus virgatus* G. Forst.	Euphorbiaceae	SSC791	Chirukizhukanelli	Herb	Whole plant	Juice of the plant is used as an antiseptic and anti-inflammatory agent
75	*Plectranthus barbatus* Andr.	Lamiaceae	SSC798	Panikoorka	Herb	Leaves	Leaf extract with pepper are taken internally for cold and cough
76	*Polyalthia cerasoides* (Roxb.) Bedd.	Annonaceae	SSC800	Cherunedunar	Tree	Bark, Seeds	Powder from Stem bark and seeds used to combat stress
77	*Premna tomentosa* Willd.	Verbenaceae	SSC814	Naithekku	Tree	Leaves	Decoction of the leaves used for liver diseases.
78	*Pseudarthria viscida* (L.) Wight & Arn.	Fabaceae	SSC816	Moovila	Shrub	Leaves	Oral administration of leaf paste is used for internal bleeding.
79	*Pterocarpus marsupium* Roxb.	Fabaceae	SSC818	Venga	Tree	Wood	Heart wood paste is used for body pain and diabetes.
80	*Santalum album* L.	Santalaceae	SSC821	Chandanam	Tree	Stem, Bark	Bark paste applied on skin burn, cut wounds for quick relief. Shoot paste applied externally for body cooling
81	*Sapindus emarginatus* Vahl.	Sapindaceae	SSC824	Soapumka	Tree	Fruit	The fruit juice is used in the treatment of asthma, colic due to indigestion, diarrhea and paralysis of limbs.
82	*Sida acuta* Burm. f.	Malvaceae	SSC827	Kurunthotti	Shrub	Leaves	Paste made from leaves applied to cut wounds
83	*Solanum violaceum* Ortega.	Solanaceae	SSC834	Cheruchunda	Shrub	Root, Seeds	Root paste is applied for poison. Seeds are used for the preparation of oil used in the case of cough and bronchial diseases.

84	*Solena amplexicaulis* (Lam.)	Cucurbitaceae	SSC839	Kakkarikka	Climber	Root	The decoction of the root is administered orally to cure stomachache
85	*Sterculia urens* Roxb.	Sterculiaceae	SSC843	Thondi	Tree	Leaves	Leaf juice applied externally to treat wound, fractures and cracked skin
86	*Strychnos nux-vomica* L.	Loganiaceae	SSC851	Kanjiram	Tree	Seed	Seed powder mixed with hot water orally given for jaundice
87	*Terminalia chebula* Retz.	Combretaceae	SSC865	Kadukka	Tree	Seed	Seed decoction orally given for stomach ulcers and constipation.
88	*Terminalia cuneata* Roth.	Combretaceae	SSC871	Neermaruthu	Tree	Leaves, Bark	Leaves and bark crushed well and it is mixed with water then it is used to wash hair as cooling agent
89	*Tribulus terrestris* L.	Zygophyllaceae	SSC874	Njerinjil	Herb	Whole plant	Extract from the thorns along with Cyanodon juice is taken internally for urinary infection
90	*Trichodesma indicum* (L.) Lehm.	Boraginaceae	SSC879	Kazhuthakkali	Herb	Root	The root is pounded into a paste and is applied to reduce swellings, particularly of the joints; the extract is given to children in dysentery and fever
91	*Vernonia anthelmintica* (L.) Willd.	Asteraceae	SSC880	Karinjeeragum	Herb	Seeds	Seed paste mixed with salt and hot water is taken internally in the case of stomachache.
92	*Vernonia cinerea* (L.) Less.	Asteraceae	SSC884	Puvankurunal	Herb	Leaves	Leaf juice applied raw in eyes to treat conjunctivitis.
93	*Wrightia tinctoria* (Roxb.) R. Br.	Apocynaceae	SSC885	Dhanthappala	Tree	Leaves	The extract of the leaves is mixed with coconut oil and apply for various skin diseases like, psoriasis.
94	*Ziziphus mauritiana* Lam.	Rhamnaceae	SSC893	Jujuba	Tree	Bark	The bark was made into a powder and given against dry coughs
95	*Ziziphus oenoplia* (L.) Mill.	Rhamnaceae	SSC895	Thodalli	Climber	Leaf, Fruit	Leaf paste used for dressing wounds. Fruit is Edible
96	*Ziziphus xylopyrus* (Retz.) Willd.	Rhamnaceae	SSC897	Kotta	Tree	Stem, Leaves	Juice of stem and leaves used against hysteria, headache and as antiseptic.

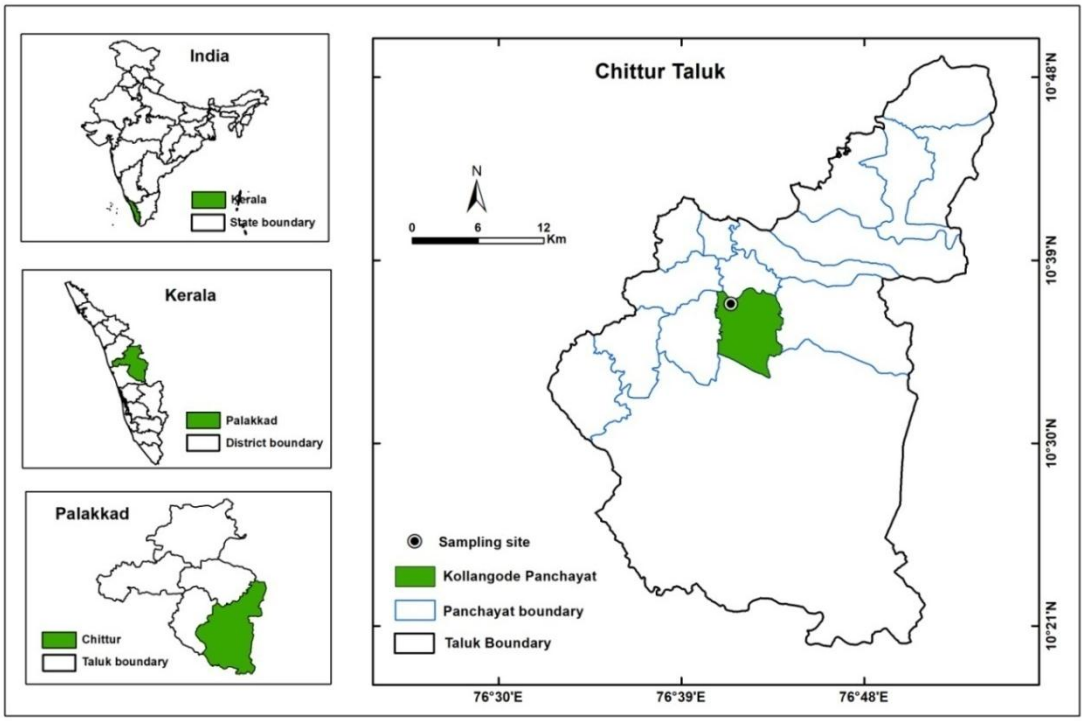

Fig. 1: Geographical location of study area.

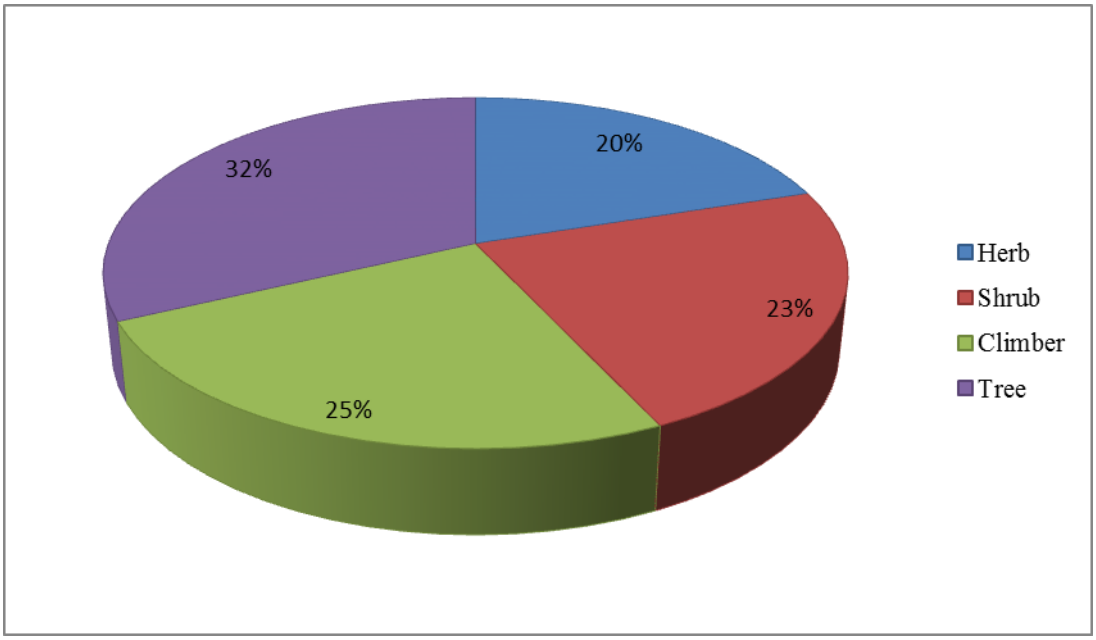

Fig. 2: Percentage distribution of plant habit.

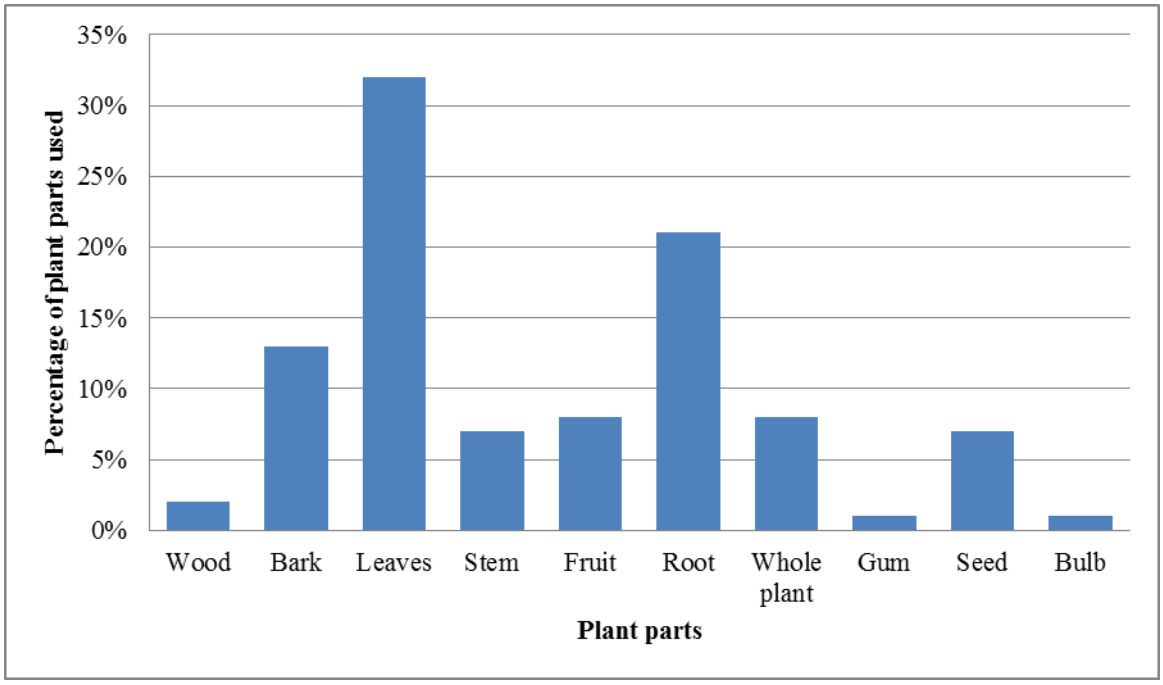

Fig. 3: Percentage of plant parts used for preparing various medicinal formulations.

4. CONCLUSION

In conclusion, the present study revealed that the knowledge and usage of conventional medicine for the treatment of various diseases among the tribal community is still a major part of their life and culture. They have a strong faith in the efficacy and success of traditional medicine and the results of the present study provide evidence that the medicinal plants continued to play a vital role in the healthcare system of this tribal communities. The plants are used either singly or in combination with others. Same information pertaining to a particular remedy from different localities or groups of informants reflects the accuracy and authenticity of the medicine. However, the therapeutic uses of plant species reported here are having less information on their phytochemical study. So, the effectiveness and safety of the commonly used ethnomedicinal plants needs to be evaluated for detailed phytochemical and pharmacological studies especially the plants with high trade value should be given priority to carry out bioassay and toxicity studies. At the same time, due to lack of interest among the younger generation as well as their tendency to migrate to cities for lucrative jobs, there is a possibility of losing this wealth of knowledge in the near future. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens.

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