

**AN INVESTIGATION ON PHARMACEUTICAL ETHNO
BOTANICALS USED BY THE PRIMITIVE TRIBES OF FIVE AREAS
IN THE EASTERN GHATS OF INDIA**

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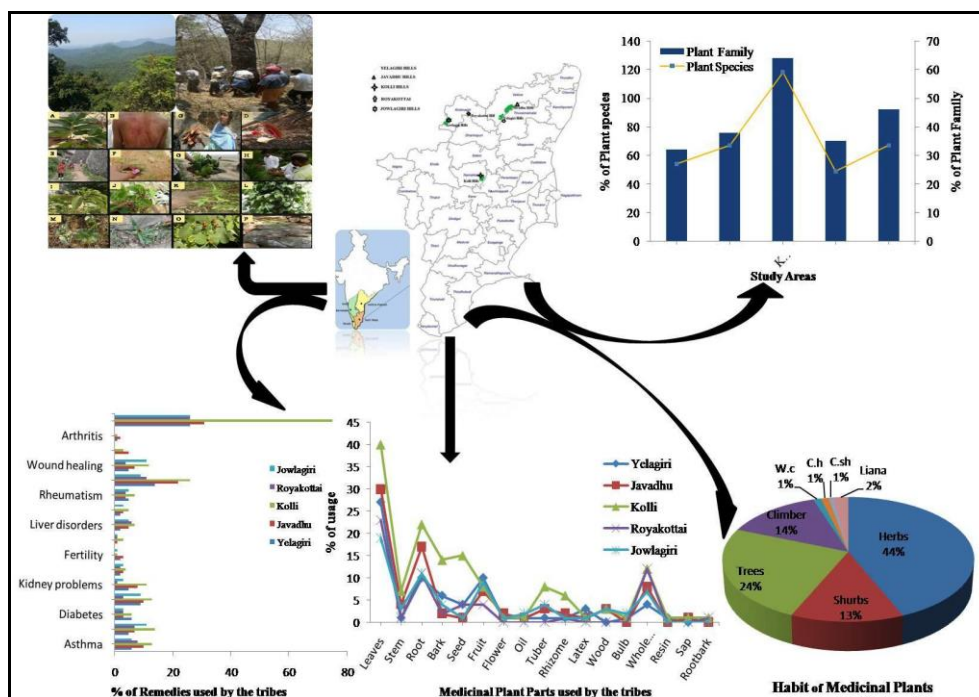
ABSTRACT

This paper provides significant ethno botanical reports on medicinal plants usages by the primitive tribes in five areas of Western Ghats, Southern India. The survey conducted between January 2011 to August 2013, with the help of a guided field-walk method where the medicinal plant practitioners pointed out various medicinal plants. The plants collected from fields, home gardens were identified, evaluated and documented along with their therapeutic uses. The research resulted in the identification of 355 plants species belonging to 87 families distributed in 323 genera is used to treat 587 types of ailments. The various diseases treated with different plants are listed in tables. Our study provides massive evidence and support the persistence of

medicinal plant's role in the health care system of many tribal and local dwellers in different areas of Eastern Ghats. The survey indicated the significance and need for conservation of traditional knowledge of medicinal plants. The study reveals that some of the medicinal plants have never reported and about twenty percent of cited uses, are new and are included in the critically endangered, endangered and rare list. Most of the plants recorded in this ethno botanical investigation suggest the identification of potentially effective plants for future pharmacological activities.

KEYWORDS: Ethno Medicine, Eastern Ghats, Conservation, Endangered, Ailments, Ethnic groups.

GRAPHICAL ABSTRACT



1. INTRODUCTION

India is one of the few countries in the world known for its indigenous and valuable flora and fauna of an excellent therapeutic potential. India among the 12 mega biodiversity countries of the world with rich vegetation and wide varieties of medicinally valuable plants. Use of medicinal plants in India and many other developing countries could be considered as a 'Living Tradition'. The dependence on plants constitutes a major component of cultural heritage in India which reflected on customs and lifestyles throughout the country. It is estimated that more than 6000 species of plants are now being used in local health traditions in India.^[1] The World Health Organization estimated that 80% of developing world populations depend upon traditional medicine to meet their primary health care to cure and prevent their ailments.^[2] Traditional medicine may include formalized aspects of folk medicine, i.e. longstanding remedies passed on and practiced by lay people. Practices known as traditional medicines include Ayurveda, Siddha, Unani, ancient Iranian, Islamic, traditional Vietnamese, traditional Chinese, traditional Korean, acupuncture, Muti, Ifá, Kampo in Japan and Jammu in Indonesia and many other forms of healing practices.

Research interest and activities in the area of ethno medicine have increased tremendously in the last decade. Since the inception of the discipline, scientific research in ethno medicine has

made important contribution to the understanding of traditional medical knowledge and practice. The detonation of the ethno medicine literature has been motivated by an increased awareness of the consequences of the recognition of native health concepts as a means of maintaining ethnic identities, the search for new medical treatments and technologies.^[3] Species like *Pterocarpus santalinus*, *Coscinium fenestratum*, *Janakia arayalpathra*, *Cycus circinalis*, *Saussurea costus* are critically endangered in the wild are found in the Eastern Ghats. Tribes dwelling in remote places depends on the forest that includes a rich diversity of flora and fauna to meet their livelihood and healthcare needs.^[4] Since, the interest in traditional medicine has been increasing, ethno botanical studies have gained prominence to explore the traditional knowledge particularly in developing country.^[5] Therefore, collection of ethno botanical information and documentation of traditional knowledge has gained priority in the perspective of drug development.^[6] India has more than 427 tribal communities with a rich diversity of indigenous traditions. However, traditional knowledge base and practices have been marginalized due to political and socioeconomic reasons. Of late, interest in traditional medicine has been increasing and ethno botanical studies have been initiated to explore the knowledge base from various tribal groups across the country.^[7-11] Knowing the importance of ethno medicine, this survey was conducted in five areas in and around of the Eastern Ghats for a period of two and half years aimed to report the prevalence, role and the necessity of the consideration of conservation status of knowledge of these traditional medicinal plants.

2. MATERIALS AND METHODS

2.1. Study areas

Southern Peninsular India is a treasure of many ethnic groups and a rich source of traditional medicinal plants. It is worthy and prosperous to study ethno biology due to ecotonic niche of flourishing biodiversity of both Western and Eastern Ghats. The eastern edge of the Nilgiris, Anaimalai and Palni hills are also parts of Eastern Ghats. The Eastern Ghats are of broken hills like a long chain and elevated plateaus, running along the Indian east coast and through the states of Tamil Nadu (24%), Karnataka (2%) Andhra Pradesh (48%) and Orissa (25%). It falls under the geographical jurisdiction of southeast peninsular India and lies at 11°30"to 22°34"N and 77°22"to 87°29"E. The area including lowland approximately 262,673 sq km and extends over 1,131km north-south 1,053km east-west with an average width of about 100km. The temperature ranges from 15 °C to 38°C standing this one of India's most comfortable climatic areas. This area forms the second-largest wild elephant population in

India, ranges between the South Eastern and Western Ghats, the Biligiri and Nilgiri Hills. The study was conducted in a series of isolated broken hills of Eastern Ghats namely Yelagiri Hills, Javadhu Hills, Kolli Hills, Royakottai Hills and Jowlagiri Hills in five different districts of Tamil Nadu, India (Fig.1).

2.2. Yelagiri Hills

The Yelagiri lies between 12°34'41" N longitudes and 78° 38' 27" E latitude and located in the Eastern Ghats of Vellore District, Tamil Nadu, India. It spreads over an area of 30 sq km with an elevation of 1048 m above sea level and lies in between four mountains. Temperature ranges between 11°C to 34°C with a moderate climate, which doesn't get too chill during winters. There are 14 villages namely Athnavur, Kottur, Kottaiyur, Mangalam, Manchankolli, Mettukaniyur, Muthanur, Nilavur, Paduvanur, Pallakaniyur, Punganur, Puthur, Rayaneri and Thyalur. The extensive field survey was undertaken in different seasons especially flowering and fruiting time.

2.3. Javadhu Hills

The Javadhu Hills lies between 12°34'35"N longitude and 78°49'22"E latitude, one of the largest in the Eastern Ghats, is a range of hills in Thiruvanamalai District, in the northern part of Tamil Nadu, India. It spread about 80km wide and 32km long. The villages covered in the survey are Jammanamathur, Seramathur, Athipattu, Melpattu, Kallathur, Kanamalai, Palamathur, Veerappanur, Poonkolathur and Puliyur.

2.4. Kolli Hills

Kolli Hills situated in the outliner of Eastern Ghats is a major mountain range. The mountain has been inhabitation from prehistoric times. It is eighteen miles long (28Km, north south) twelve miles wide (19Km, east/west) and covers 441.4 sq km. It falls within the rest Longitude 78° 17'05" to 78° 27'45" and North Latitude 11°55' 05" to 11° 21'10". The maximum elevation ranges from 3500' to 4500' with the tallest peak Vettakaramalai, are rising to 4663' above mean sea level. The temperature varies from 7°C to 27°C.

2.5. Royakottai Fort Hill.

It lies in between 78°03"E 12°31"N, with an altitude of 300 to 1000 m at the mean sea level. The temperature ranges from 19 °C – 37 °C. The hill sparsely forested with many type of plant diversities belongs to deciduous and dry land habitat. Villages near the foot hills are Edavanahalli, Rathnagiri, Urigam, Anchetty, Irughukottai, Thadikal, Thalley and Biligundu.

2.6. Jowlagiri Hills

Jowlagiri is located in the Melagiri ranges. Melagiri is a group of hills lying between 12°18'54"N and 77°41'42"E in Dharmapuri district. The major forest type is dry deciduous in nature with dry thorn and dry evergreen elements also. The forests are known for their rich floristic and faunal diversity.

2.7. Ethnobotanical data collection

Data are also based on personal contact, observations and interview with tribes, local traditional healers, village dwellers and medical practitioners of the study area. The botanical survey was carried out during January 2011 to August 2013. The extensive field survey was undertaken in different seasons especially flowering and fruiting time. We followed guided field-walks through areas from where we collected the medicinal plants. Since the tribes are so reserved, the collection of information is a very difficult task. Hence the frequent visits to the same settlements were done for collecting the required data. Detailed information was collected on the local name, mode of use and ailments treated by the plants, later cross-checked with the vaithiyars or local traditional medicinal practitioners around the forest areas. As they are mostly illiterate no structural questionnaire approach was used. The medicinal plant knowledge has been transmitted orally from generation to generation, however it seems that it is vanishing from the modern society, since younger people are not interested to carry on this tradition

2.8. Tribes of the study area

Malayali tribes dwell in the Eastern Ghats hill ranges of Vellore, Thiruvanamalai, Kolli Hills Yercaud, Dharmapuri and Salem districts. Malayali's are predominant hill tribes in Dharmapuri, Tamil Nadu. Tribe of this community is familiar with local herbs and holds a vibrant knowledge base with regard to the use of local plants to cure various ailments.^[12] Irulas are small tribal community that belongs to the Dravidian language group that is spoken in south-eastern India. The Irulas belong to the Negrito (or Negroid) race, which is one of the six main ethnic groups that add to the racial mosaic of India.^[13] The Irulas in the Jowlagiri speak a distinct dialect of Tamil, which is distantly related to other Dravidian Tamil. Kurumba community is shepherds of South India. They are indigenous people of India. They are called by different names like 'Kurumans', 'Kurumbar' or 'Kuruba' as synonyms. They speak tribal Kannada language.

2.10. Specimen collection

On the basis of information provided by the informants, the medicinal plants were collected from wild and also from homestead gardens and checked for their vernacular name by the healers. Herbarium specimens were prepared. Identification and nomenclature of the listed plants were based on the Flora of the Presidency of Madras and Flora of Tamilnadu Carnatic.^[14,15] They were verified by the Loyola college taxonomist Dr. G. Jeyajothi, Department of Plant Biology and Biotechnology. Voucher specimens of each species have been deposited in the Department. The threat status of the identified plant species in the study area was defined after consultation with the Conservation Assessment and Management Planning (CAMP) reports of India.

3. RESULTS AND DISCUSSION

Herbal remedies are considered the oldest forms of health-care known to mankind on this earth. Prior to the development of modern medicine, the traditional systems of medicine that has evolved over the centuries within various communities, are still maintained as a great traditional knowledge base in herbal medicines.^[16] Traditionally, this wealth of precious knowledge has been passed on orally from generation to generation without any written document and is still retained by various indigenous groups around the world.^[17] Due to an increasing demand for chemical diversity in screening programs, seeking therapeutic drugs from natural products, interest particularly in ethno medicinal plants has grown throughout the world.

We have investigated a total of 355 plants species which included two pteridophytes, two gymnosperms and 351 angiosperms were collected under 87 families distributed in 323 genera. The medicinal plants are reported to be used for asthma, antidote, diabetes, skin diseases, kidney and liver disorders, piles, arthritis inflammations, fertility related disorders, rheumatism, stomach problems, wound healing, sexually transmitted diseases (STD) and in common health ailments such as cold, cough, fever, anemia, ear and eye problems also including leprosy, malaria and epilepsy. Tables 1, 2, 3, 4 & 5 showed the details of ethno medicinal plants used in the study areas, and in this survey, Fig.2 elucidates that the herbs (44%) were found to be the most used plants followed by trees (24%), Climbers (14%), Shrubs (13%) and liana (2%), woody climber, climbing herb and climbing shrub in descending order which contribute to 89 remedies. Moreover many species of the family viz., Fabaceae (24 species), Euphorbiaceae (15 species), Solanceae (14), Lamiaceae (14),

Asclepiadaceae (13), Liliaceae (11), Combretaceae (10), Caesalpiniaceae (10) and Verbenaceae (8) are frequently used in these study areas.

Furthermore, Fig.3 enumerates the parts of the plant used for medicinal purposes in the above mentioned five areas. They are leaves, root, stem, fruits, bulb, flower, bud, latex, resin, seeds, the whole plant, barks (root and stem), tubers, rhizome, wood, resin, sap, gum, and oil. Internal uses are predominating over external uses. Juice mixed with water and goat's or cow's milk and paste are the main methods of preparation, either for oral or for external administration. For topical use, the most important methods used are direct application of the paste or ointment with oil. Often people use more than one plant either separately or mixed together. They mix several plants as ingredients to cure diseases immediately. Generally, fresh part of the plant is used for the preparation of medicine. When fresh plant parts are not available, dried parts were also used. Most of medicinal plants were used as simple drugs. However, young leaves and bark were more frequently used when compared to other parts of the plant. Now a day's younger generation almost ignorant or least interested. Hence the documentation of ethno botanical plants knowledge is needed.

Besides, Fig.4 shows the different parameters of study areas grouped under different ailment categories. On the other hand, 43 remedies were used to alleviate problems of the respiratory system such as cold, cough, asthma and fever. Among the plants surveyed *Adhatoda zeylanica* and *Vitex negundo* (4 remedies) were used frequently for the treatment of asthma, cold and joint pain. 82 types of remedies were used against stomach disorders such as indigestion, diarrhoea, dysentery, stomach pain and dyspepsia. 25 kinds of remedies were used against rheumatism and liver disorder, 39 against wound healing, 28 against kidney problems 44 remedies against antidote and skin diseases, for diabetes 21 types of remedies and 14 types of against inflammations.

The results of the study in the Yelagiri hill area have revealed 54 plant species belonging to 32 families of 48 genera (Table 1, 1a & 1b), Javadhu hills area 67 species of 38 families of 59 genera (Table 2, 2a & 2b) Kolli Hills 120 plant species of 64 families of 106 genera (Table 3, 3a, 3b & 3c), Royakottai hills area 49 species belonging to 35 families of 49 genera (Table 4 & 4a) and Jowlagiri hills 67 species of 46 families distributed in 61 genera (Table 5, 5a & 5b) that are frequently used for treatment of different diseases by local tribes, herbalists and traditional healers. Finally Fig.5 exhibited the percentage of total plant species and families

of the survey. It is obvious that 355 species belonging to 87 families are used to treat 587 ailments by the tribes and herbalists in the study areas.

As per Tamilnadu State CAMP reports and IUCN, some of the species identified in the present study areas were endemic and/or threatened. Out of 355 plant species, 43 are of rare, 13 are of vulnerable and 11 belongs to endangered category, followed by 2 critically endangered remains endemic, wild and common. The rich heterogeneity noted for various ethno medicinal uses in the Eastern Ghats groups are highly tantalizing. Although they live in the same vicinity and have considerable extent of inter-ethnic affinities between them, yet they have not only acquired diversified cognition on the therapeutic modalities but also on medicinal plants in their ambient environment. The result of the present study provides an evidence that medicinal plants continue to perform an important role in the health-care system of these tribal communities.

Table: 1 Medicinal Plants used traditionally by Malaiyalis of Yelagiri Hills (61 Genera)

Botanical Name	Family	Vernacular/common name	Habit	Part used	Medicinal use/ Ailments treated	TS
<i>Abrus precatorious</i> Linn.	Fabaceae	Kundrimani	CS	Leaf	Heal boils	R
<i>Acacia Arabica</i> (Lam).Willd.	Mimosaceae	Karuvellai	T	Seed	Headache, diabetes	
<i>Acalypha indica</i> L.	Euphorbiaceae	Kuppaimeni	H	Leaf	Skin diseases	
<i>Achyranthes bidentata</i> Blume	Amaranthaceae	Sevappu nayuruvi	H	WP	Diuretic, psoriasis, antidote, cough and piles	R
<i>Adhatoda zeylanica</i> Medicas	Acanthaceae	Adadodai	S	Leaf	Asthma, cold, cough, And promote fertility	VU
<i>Aegle marmelos</i> (L) Corr.	Rutaceae	Vilvam	T	Leaf	Diabetes	VU
<i>Alangium lamarbi</i> Thwaites	Alagiaceae	Alingil	T	Bark	Antidote	
<i>Albizia thompsonii</i>	Mimosaceae	Vagai	T	Resin	Psoriasis	
<i>Aloe vera</i> Linn	Liliaceae	Chotrukatalai	H	Leaf	Wound healing	
<i>Argemone Americana</i> L	Papavaraceae	Bramadandu	H	Latex	Skin diseases	
<i>Aristolochia indica</i> L	Aristolochiaceae	Perumarunthu	WC	Root and Leaf	Snakebite, indigestion skin disease antidote	
<i>Artocarpus hirsutus</i> Lam	Moraceae	Kattupala	T	Latex, Seed and Fruit	Asthma Appetizer	R
<i>Asparagus racemosus</i> Willd	Liliaceae	Thanneervitankizhangu	C	Leaf and root	Heel crack Treat infertility, diuretic	
<i>Averrhoa carambola</i> Linn	Oxalidaceae	Tamarattai	T	Fruit	laxative, anti dysenteric	
<i>Azadirachta indica</i> Juss.	Meliaceae	Veppamaram	T	Leaf	Skin diseases	
<i>Caesalpinia bonduc</i> (L) Roxb	Caesalpiniaceae	Kazharchi	C	Seed	Stomachache.	
<i>Calotropis gigantea</i> R.BR	Asclepiadaceae	Erukku	S	Root	Asthma, bronchitis, and dyspepsia	
<i>Calotropis procera</i> R.BR	Asclepiadaceae	Vella errukku	S	Leaf	Swellings and intermittent fevers.	
<i>Capparis zeylanica</i> L.	Capparidaceae	Athandai	WC	Leaf, Bark and Root	Indigestion Toothache Chest pain	
<i>Cassia auriculata</i> L.	Caesalpiniaceae	Aavaarai	S	Flower	Diabetes	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber, TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered.

Table: 1a Medicinal Plants used traditionally by Malaiyals of Yelagiri Hills (61 Genera)

Botanical Name	Family	Vernacular/comm on name	Habit	Part used	Medicinal use/ Ailments treated	TS
<i>Ceropegia spiralis</i> Wight	Asclepiadaceae	Palakodi	C	Tuber	Indigestion. Diabetes, Rheumatism	VU
<i>Cissus quadrangularis</i> Linn	Vitaceae	Perandai	L	Stem and leaf	Stomach disorder	
<i>Citrullus colocynthis</i> (L)	Cucurbitaceae	Peikummatti	C	Leaf,	Antidote	R
				Fruit and	Hair growth	
				Root	Rheumatism	
<i>Cryptolepis grandiflora</i> , Wight.	Asclepiadaceae	Mathanakodi	C	WP	Lactation for Animals	
<i>Curcuma pseudomontana</i> Grah	Zingiberaceae	Kattumanjal	H	Rhizome	Antiseptic	V
<i>Decalepis hamiltonii</i> . Wight & Arn	Asclepiadaceae	Mahaali kizhangu	L	Root	Health drink	EN
<i>Delonix elata</i> (L) Gamble	Caesalpinaceae	Vathanarayanan	T	Leaf	Rheumatism	
				Bark	Bile problems	
<i>Dioscorea bulbifera</i> L	Dioscoriaceae	Vethalavallikilangu	C	Bulb	Conjunctivitis, diarrhea and dysentery	R
<i>Eucalyptus grandis</i>	Myrtaceae	Thailamaram	T	oil	Headache cold	
<i>Gymnema sylvestre</i> R.BR	Apocynaceae	Sarkkaraikolli	C	Leaf	Diabetes.	
<i>Hardwickia binata</i> Roxb.	Caesalpinaceae	Kodapalai.	T	Leaf, Bark,	Sexually transmitted diseases	
				Root and latex	Breast cancer	
<i>Hemidesmus indicus</i> H.F	Asclepiadaceae	Nannari	C	Root	Stomachache, fever	
					Menorrhagia,	
<i>Hildegardia populifolia</i> (Roxb.) Schott & Endl	Sterculiaceae	Malai puvarasu	T	Green bark	Malaria	EN
<i>Lantanacamera</i> Linn.	Verbanaceae	Unichedi	S	Leaf	Wounds	
<i>Leucas linifolia</i> (Roth.) Spreng.	Lamiaceae	Thumbai chedi	H	Leaf	Skin eruptions, scabies	
<i>Mimosa pudica</i> L.	Mimosaceae	Thottalsinungi	H	Leaf and Root	Joint pain, kidney stone	
<i>Ocimum basilicum</i> L	Lamiaceae	Thiruneertrupachila i	H	Leaf	Head ache and Ear problems	
<i>Ocimum santum</i> L.	Lamiaceae	Thulsi	H	leaf	Dry cough, cold	

Table: 1b Medicinal Plants used traditionally by Malaiyalis of Yelagiri Hills (61 Genera)

Botanical Name	Family	Vernacular/common name	Habit	Part used	Medicinal use/ Ailments treated	TS
<i>Phyllanthus debilis</i> Klein ex Wild	Euphorbiaceae	Kilanelli	H	WP	Headache, fever,	R
<i>Phyllanthus amarus</i> Schum.&Thonn	Euphorbiaceae	Kizhanelli	H	Leaf	Jaundice	
<i>Phyllanthus niruri</i> auct.non L.,	Euphorbiaceae	Kilanelli	H	WP	Jaundice, break kidney stone	
<i>Piper nigrum</i> L	Piperaceae	Milagu	C	Fruit	Cold ,fever, cough and throat infection	R
<i>Plumbago zeylanica</i> Linn.	Plumbaginaceae	Kodiveli	H	Root	Piles	
<i>Premna tomentosa</i> Willd	Verbenaceae	Pondanganari.	T	Leaf	Dog bite, rabies	
<i>Punica granatum</i> L.	Punicaceae	Madulai	S	Fruit and skin	anti diarrheal	
<i>Solanum nigrum</i> L.	Solanaceae	Manathakkali	H	Leaf and Fruit	Ulcer	
<i>Solanum surattrense</i> Burm. F.	Solanaceae	Kandangkathari	H	Fruit	Asthma	
<i>Solanum trilobatum</i> L	Solanaceae	Thuthuvalai	H	Leaf	Asthma cold and fever	
<i>Syzygium cumini</i> (L) Skeels	Myrtaceae	Naval	T	Seed	Diabetics	
<i>Terminalia chebula</i> Retz.	Combretaceae	Kadukkai	T	Fruit	Cold fever Rheumatism	
<i>Toddalia asiatica</i> Lamk.	Rutaceae	Milagaranai	H	Leaf	Skin disease	
<i>Tribulus terrestris</i> Linn.	Zygophyllaceae	Sirunerunjil	H	Leaf and Fruit	Stomachache Inflammation	
<i>Vitex negundo</i> L.	Verbenaceae	Nochhi	S	Leaf	Rheumatism, cold and headache	
<i>Ziziphus oenoplia</i> Mil	Rhamnaceae	Churikala chedi	S	Fruit and Bark	Diarrhea	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber, TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered.

Table: 2 Medicinal Plants used traditionally by Malaiyalis of Javadhu Hills (59 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated	TS
<i>Abelmoschus moschatus</i> MEDIK	Malvaceae	Kaatukasthuri	H	Root	Gonorrhoea and venereal diseases	R
<i>Abrus fruticosus</i> L	Fabaceae	Venkundri	C	Leaf	Fever, cough and colds	R
<i>Abrus precatorius</i> L	Fabaceae	Cevappu Kundrimani	C	Leaf	Laxative , expectorant	R
<i>Abrus pulchellus</i> L	Fabaceae	Vellakundumani	C	Root	Purgative antidote	R
<i>Abutilon indicum</i> L.	Malvaceae	Thuthi	H	Root	Piles	
<i>Achyranthes aspera</i> L	Amaranthaceae	Nayuruvi	H	WP	Insect bites.	
<i>Acalypha fruticosa</i> Forssk	Euphorbiaceae	Chinni cheddi	H	Leaf	Piles ,skin diseases	
<i>Acorus calamus</i> L	Araceae	Vasambu	H	Stem and bark	Diuretic .induce fertility Laxative, stomach problems	V
<i>Aerva lanata</i> (L) Juss.	Amaranthaceae	Sirupeelapoo	H	Root	Kidney problems	
<i>Aloe vera</i> Linn	Liliaceae	Kumari	H	Leaf	Wound healing, reduce body heat	
<i>Alpinia galangal</i> L	Zingiberaceae	Chithararattai	H	Rhizome	Skin infections	
<i>Atlanta monophylla</i> Correa	Rutaceae	Kattu elumichai	T	Flower and Root	Stomach disorder Rheumatism	
<i>Andrographis echiioides</i> Linn	Acanthaceae	Gopuram tangi	H	Leaf and Root	Hair growth Health tonic	
<i>Andrographis paniculata</i> Nees	Acanthaceae	Nilavembu	H	Leaf	Fever, cold snake bite	
<i>Annona squamosa</i> L	Annonaceae	Sitapalam	S	Leaf	To kill lice	
<i>Aristolochia bracteata</i> Lam	Aristolochiaceae	Atutintappala	C	WP	Woundhealing, snake bite	
<i>Aristolochia indica</i> L	Aristolochiaceae	Perumaruntu	C	Root	Snakebite. stomach disorders	
<i>Asparagus racemosus</i> Willd	Liliaceae	Thanneervittankizhangu	C	Root	Induce fertility, mensural problems	R
<i>Azadirachta indica</i> A.Juss	Meliaceae	Vembu	T	Leaf	Skin diseases, stomach pain	
<i>Baliospermum montanum</i> (Willd.) Muell.	Euphorbiaceae	Peyamanakku	S	Leaf and Root	Asthma, bronchitis, Ulcer,piles	R

Table: 2a Medicinal Plants used traditionally by Malaiyalis of Javadhu Hills (59 Genera)

Botanical name	Family	Vernacular/comm on name	Habit	Parts used	Medicinal use/Ailments treated	TS
<i>Barleria prionitis</i> L.	Acanthaceae	Cemmulli	S	Leaf	Heal cracks	
<i>Citrullus colocynthis</i> Schrad.	Cucurbitaceae	Pey-tumatti	C	Seed oil	Hair growth	
<i>Cleome viscosa</i> L.	Capparidaceae	Naivelai	H	WP	Ear infection and pain	
<i>Cocos nucifera</i> L.	Arecaceae	Thennamaram	T	Fruit	Endosperm and milk to cure ulcer	
<i>Corallocarpus epigaeus</i> H & B	Cucurbitaceae	Aakaasagarudan	C	Root	Reduce swelling	R
<i>Crotalaria retusa</i> L.	Fabaceae	Kilukilupai	H	WP	Ulcer, wound healing	
<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Nilappanai	H	Root stem	Tooth ache, Stomach ache, Appetizer	
<i>Curcuma aromatic</i> Wild	Zingiberaceae	Kasthurimanjal	H	Rhizome	Wound, bruises , skin problems, and liver protection	R
<i>Cymbopogon citrates</i> (DC.) Stapf	Poaceae	Vasanapulla	H	Leaf stems	Asthma, urinary tract infections, digestive complaints, headache, fevers	
<i>Cyperus rotundus</i> L.	Cyperaceae	Koraipullu	H	Tuber	Stomach ache	
<i>Datura metel</i> L.	Solanaceae	Oomathai	S	Leaf	Asthma and rheumatism	
<i>Dioscorea bulbifera</i> (L.)	Dioscoreaceae	Vethalavallikizhan gu	C	Tuber	Reduce swellings	
<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Vishnugranthi	H	WP	Fever, cold	
<i>Glinus lotoides</i> L.	Aizoaceae	Siruserrupadai	H	Leaf	Diuretic	
<i>Gloriosa superb</i> L.	Lilliaceae	Kalappaikkilangu	C	Tuber Seed	Inflammation Epilepsy	VU
<i>Gmelina asiatica</i> L.	Verbenaceae	Kumizha	S	Leaf	Gonorrhoea, cough, ulcer	
<i>Gymnema sylvestre</i> (Retz) R.Br.ex	Asclepiadaceae	Sirukurinjan	H	Leaf	Diabetes	R
<i>Hemidesmus indicus</i> (L.)R.Br	Asclepiadaceae	Nannari	H	Root	Reduce body heat, liver tonic	
<i>Hybanthus enneaspermus</i> (L) F.V	Violaceae	Orithal thamarai	H	Leaf	Fever, aphrasiadic	
<i>Indigofera tinctoria</i> (L)	Fabaceae	Kattuavuri	H	WP	Bronchitis, and liver problems	
<i>Kleinia grandifloram</i> (Wall.ex DC.)	Asteraceae	Mosakaathu	H	Leaf	Joint pain	
<i>Lecus aspera</i> (Wild) Link	Lamiaceae	Thumbai	H	Leaf	Skin problem.	

Table: 2b Medicinal Plants used traditionally by Malaiyalis of Javadhu Hills (59 Genera)

Botanical name	Family	Vernacular/ common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Melia azedarach</i> Linn	Meliaceae	Malaiyembu	T	leaf	Rheumatic Problems	
<i>Michelia champaca</i> L	Magnoliaceae	Champanki	T	Flower, Root bark	Diuretic, purgative	V
<i>Ophiorrhiza mungos</i> L	Rubiaceae	Kirippuntu	H	Root	Wound, ulcer and snakebite	
<i>Orthosiphon stamineus</i> Benth.	Lamiaceae	Poonameesai	H	WP	Diuretic. Diabetes	
<i>Passiflora foetida</i> L	Passifloraceae	Cirupunaikkali	C	Fruit	Asthma	
<i>Phyllanthus reticulatus</i> Poir	Euphorbiaceae	Sivappu poolachedi	S	Leaf	Asthma,	
				Root	Fractures & skin injuries	
<i>Premna tomentosa</i> Willd	Verbenaceae	Podanganari	T	Leaf	Diuretic	
<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Vengai	T	Bark and wood	Diabetes	R
<i>Pterocarpus santalinus</i> Linn. f	Fabaceae	Chenchandanam	T	Heartwood and red sap	Bone fracture, leprosy, spider poisoning, and Rheumatism	CR
<i>Santalum album</i> L.f	Santalaceae	Chandanamaram	T	Wood	Skin diseases, acne, dysentery & gonorrhoea	EN
<i>Sarcostemma secamone</i> (L.) Bennet	Apocynaceae	Usipalai	C	Latex	Wounds	
<i>Solanum nigrum</i> L	Solanaceae	Manikutty pazham	H	Leaf & fruit	Ulcer, psoriasis tonic, diuretic and aphrodisiac	
<i>Solanum surattense</i> L	Solanaceae	Kandankathari	H	Fruit	Asthma, cold & cough	
<i>Strychnos potatorum</i> L	Loganiaceae	Thetrankottai.	T	Fruit&seed	Dysentery and venereal sores	
<i>Sida cordata</i> L	Malvaceae	Arrival manippundu	H	Leaf	Diarrhea	
<i>Syzygium jambos</i> L	Myrtaceae	Jammunagai	T	Fruit	Reduce body heat	
<i>Terminalia chebula</i> RETZ & WILLD	Combretaceae	Kadukkai	T	Fruit	Stomach ache	
<i>Toddalia asiatica</i> (L)	Rutaceae	Milakaranai	H	Leaf & root	Expel sputum and cure psoriasis	
<i>Tribulus terrestris</i> (L)	Zygophyllaceae	Sirunerunjil	H	WP	Diuretic. induce fertility	R
<i>Trichodesma indicum</i> R.Br	Boraginaceae	Kavilthumbai	H	WP	Dysentery joint pain	
<i>Tridax procumbens</i> Linn	Asteraceae	Vettukkaya puntu	S	Leaf	Arrest hemorrhage from cut wounds	R
<i>Vitex negundo</i> (L)	Verbenaceae	Notchichedi	S	Leaf	Headache, fever, cold and cough.	
<i>Withania somnifera</i> L	Solanaceae	Amukkira	H	Leaf,Root	Asthma, Bilious problems	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber, TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered.

Table: 3 Medicinal plants used by Kolli hill tribes. (106 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated	TS
<i>Abelmoschus moschatus</i> MEDIK	Malvaceae	Kaattu kasturi	H	Seed	Respiratory disorders	R
<i>Abrus fruticulosus</i> L	Fabaceae	Venkundri	C	Root	Ulcer	R
<i>Abrus precatorius</i> L.	Fabaceae	Chevappukundrimani	C	Root	Dental problems	R
<i>Abutilon indicum</i> L.	Malvaceae	Thuthi	H	Root	Stomach disorder	
<i>Achyranthes aspera</i> L.	Amaranthaceae	Nayuruvi	H	WP	Insect bites, Nerve tonic	
<i>Achyranthes bidentata</i> Blume	Amaranthaceae	Sevappu nayuruvi	H	WP	Diuretic, psoriasis, antidote Cough, piles	R
<i>Acorus calamus</i> L	Araceae	Vasambu	H	Stem bark	Diuretic, induce fertility Laxative, stomach problems	V
<i>Adhatoda vasica</i> Nees.	Acanthaceae	Adathodai	S	Leaf	Asthma, cold and cough.	R
<i>Adina cordifolia</i> Hook. f. ex Brandi	Rubiaceae	Manjal kadampu	T	Bark	Biliousness, skin diseases, uterus problems	
<i>Alpinia galangal</i> L	Zingiberaceae	Chithararattai	H	Rhizome	Skin infections	
<i>Alpinia galanga</i> (L.) WILLD	Zingiberaceae	Dhumarasmi, Aanaivasambu	H	Rhizome	Digestion	
<i>Amorphophallus campanulatus</i> . Blume	Araceae	Boomi Sallaraikilangu	H	Tuber	Dyspepsia and debility	V
<i>Andrographis paniculata</i> Nees	Acanthaceae	Nilavembu	H	Leaf	Fever, cold snake bite	
<i>Annona muricata</i> . Linn	Annonaceae	Attaplam/Mulluseetha	S	Leaf Fruit	To kill lice Hypertension, Wounds, Cough	
<i>Anogeissus latifolia</i> WALL. EX. GUILL. & PERR	Combretaceae	Maruthampattai	T	Bark	Anemia and urinary discharges, piles	
<i>Aquilaria agallocha</i> Roxb	Thymelaeaceae	Akilkattai	T	Oil	Perfume	
<i>Argemone mexicana</i> Linn.	Papaveraceae	Brammadandu	H	Latex	Boils	
<i>Aristolochia bracteata</i> L	Aristolochiaceae	Aadutheentappala	C	WP	Wound healing, snake bite	
<i>Aristolochia indica</i> L	Aristolochiaceae	Perumaruntu	C	Root	Fever, Snake bite	
<i>Asparagus racemosus</i> (Willd)	Liliaceae	Thanneervittan kizhangu	C	Root	Reduce body heat. Diuretic	R
<i>Azadirachta indica</i> Juss.	Meliaceae	Vembu	T	Leaf	Scabies. Gonorrhoea	
<i>Bacopa monnieri</i> (L) Pennel	Scrophulariaceae	Neer brammi	H	Leaf	Diuretic, laxative and aphrodisiac	

Table: 3a Medicinal plants used by Kolli hill tribes. (106 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Curcuma aromatic</i> Wild	Zingiberaceae	Kasthurimanjal	H	Rhizome	Wound, bruises , skin problems, digestive aid, liver protection	R
<i>Cycus circinalis</i>	Cycadaceae	Madhanakamapoo	T	Seed	Induce libido	CR
<i>Cymbopogon citrates</i>	Poaceae	Vasanapulla	H	Leaf stems	Asthma, diuretic digestive complaints, headache, fever	
<i>Cyperus rotundus</i> L.	Cyperaceae	Koraipullu	H	Tuber	Stomach ache	
<i>Datura stromanium</i> L	Solanaceae	Karoomathai	S	leaf	Asthma and rheumatism	
<i>Decalepis hamiltonii</i> Wight & Am	Asclepiadaceae	Mavilikizhanngu	C	Root	Wound, bronchial asthma, fever, intrinsic hemorrhage	EN
<i>Dioscorea bulbifera</i> (L)	Dioscoreaceae	Vethalavallikizhangu	C	Tuber	Reduce swellings	
<i>Dioscorea purpurea</i>	Dioscoreaceae	Chevallikodi	C	Tuber	Nutritive	
<i>Drynaria quercifolia</i> (L).	Polypodiaceae	Attukal khilangu	H	Rhizome	Paralysis	
<i>Elettaria cardamomum</i> (L) Maton	Zingiberaceae	Ellakkai	H	Fruit	Appetizer	
<i>Embelia ribes</i> Burm. f.	Myrsinaceae	Vayuvilngam	H	Seed	Anathematic and diuretic	EN
<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Vishnugranthi	H	WP	Fever, cold	
<i>Ficus retusa</i> Linn.	Moraceae	Athimaram	T	Leaf Fruit	Diabetes, bone fracture cold,	
<i>Gloriosa superba</i> L	Lilliaceae	Kalappaikkilangu	C	Tuber, seed	Inflammation, epilepsy	R
<i>Glycyrrhiza glabra</i>	Fabaceae	Adhimadhuram	T	Root Leaf	Diuretic, emollient and laxative	
<i>Gymnema sylvestre</i> (Retz) R.Br.ex	Asclepiadaceae	Sirukurinjan	H	Leaf	Sugar complaints	R
<i>Hemidesmus indicus</i> R. Br.	Asclepiadaceae	Nannari	H	Root	Jaundice	
<i>Hemonitis arifolia</i> (Burn. f) Moore	Heminonitidaceae	Kalthamarai	H	Leaf	Cut wounds	
<i>Holoptelia integrifolia</i> (Roxb.) Planch.	Ulmaceae	Agilpattai	T	Bark	Rheumatism	R
<i>Hybanthus enneaspermus</i> (L.) F. Muell.	Violaceae	Orilaitthamarai	H	WP	Aphrodisiac	
<i>Illicium verum</i> Hook. F	Illiciaceae	Annasipoo	T	Fruit	Stomachache	
<i>Justicia adhatoda</i> L	Acanthaceae	Aadathodai	S	Leaf	Cold and fever	R
<i>Lagerstroemia lanceolata</i> Wall.	Lythraceae	Venthekkku	T	Bark	Stimulant and febrifuge	
<i>Lannea coromandelica</i> (Houtt) Merr	Anacardiaceae	Udhayam	T	Leaf	Inflammations	
<i>Lawsonia inermis</i> Linn	Lythraceae	Marudhani	S	Bark	Skin disease	

Table: 3b Medicinal plants used by Kolli hill tribes. (106 Genera)

Botanical name	Family	Vernacular/ commonname	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Leucas aspera</i> (Wild)	Lamiaceae	Thumbachedi	H	Leaf	Skin diseases, Ear pain	
<i>Martynia annua</i> Linn	Martyniaceae	Anavanangi	S	WP	Boils	
<i>Melia azedarach</i> Linn	Meliaceae	Malaivembu	T	Leaf	Rheumatic	
<i>Michelia champaca</i> L.	Magnoliaceae	Chanpakam	T	Bark	Expectorant	VU
				Root and bark	emmenagogue	
<i>Mimosa pudica</i> Linn.	Mimosaceae	Thotta sinungi	H	Leaf and Root	Wounds, ulcer	
<i>Mucuna atropurpurea</i> (Roxb.) DC	Fabaceae	Poonaikodi	C	Leaf	Wounds	R
<i>Mucuna pruriens</i> (Linn).DC	Fabaceae	Poonaykali	S	Leaf and Seed	Antidote Libido enhancer	
<i>Myristica fragrans</i> Houtt	Myristicaceae	Jathikai	T	Seed	Induce Neurological activity	R
<i>Naravelia zeylanica</i> (L)DC	Ranunculaceae	Vathamkolli	C	WP	Headache	
<i>Nervilia aragoana</i> Comm. ex Gaudich.	Orchidaceae	Orillaithamarai	H	Tuber	Postnatal treatments	EN
<i>Nigella sativa</i> L	Ranunculaceae	Karunseeragam	H	Seed	Toothache	
<i>Ocimum basilicum</i> Linn.	Lamiaceae	Thiruneetrapachai	H	Leaf	Asthma, ear ache	
<i>Ocimum sanctum</i> Linn	Lamiaceae	Karunthulasi	H	Leaf	Headache cough anthelmintic	
<i>Ophiorrhiza mungos</i> L	Rubiaceae	Kirippuntu	H	Root	Wound, ulcer and snakebite	
<i>Opuntia stricta</i> (Haw) Var.dillenii	Cactaceae	Chappathikalli	S	Leaf	Inflammations, stomach ache	
<i>Phyllanthus amarus</i> Linn.	Euphorbiaceae	Keela nelli	H	Root and fruit	Liver problems	
<i>Piper cubeba</i> Linn	Piperaceae	Valmilagu	C	Fruit	Cough, bronchitis, asthma	R
<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Vengai	T	Resin	Rheumatism	R
<i>Pterocarpus santalinus</i> L.F	Fabaceae	Sivappuchandanam	T	Wood sap	Bone fracture and Rheumatism	CR
<i>Pueraria tuberosa</i> (ROXB) DC.	Fabaceae	Nilapooani/ gumadi gida	C	Tuber	Galactagogue, Poultice, Refrigerant, Tonic.	V
<i>Quercus infectoria</i> Oliver	Fagaceae	Maasikaai	S	Seed, Bark	Hemorrhoids, gonorrhoea, vaginal infections	
<i>Rauwolfia serpentina</i> (L) benth ex Kurz	Apocynaceae	Sarpagandhi	H	Root	Antidote	EN
<i>Rauwolfia tetraphylla</i>	Apocynaceae	Pambukalachedi	H	Leaf	Eczema,	
<i>Rhus saccadanea</i>	Anacardiaceae	Kadukkai poo	T	Fruit	Antidote	
<i>Rubia cordifolia</i> Linn	Rubiaceae	Chevvalikodi	C	Leaf	Antidote	
<i>Santalum album</i> L	Santalaceae	Chandanam	T	Wood	Skin diseases, acne and dysentery	EN

Table: 3c. Medicinal plants used by Kolli hill tribes. (106 Genera)

Botanical name	Family	Vernacular/ common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Sarcostemma brevistigma</i> Wight & Arn	Apocynaceae	Kodikalli	H	WP	Anti-syphilitic and anthelmintic.	
<i>Scindapsus officinalis</i> (Roxb.) Schott	Araceae	Yaanathipili	C S	WP	Diabetes & asthma	
<i>Scoparia dulcis</i> Linn	Scrophulariaceae	Sakkaravembu	H	Leaf	Kidney stone, diabetes	
<i>Sesbania aegyptiaca</i> Pers.	Fabaceae	Sithahathi	S	Tender twig Seed	Problems in hair growth and body heat	
<i>Sida acuta</i> Burm.f.	Malvaceae	Ponmusuttai	H	WP	Antidote. Wound healing	
<i>Sida rhoboidea</i> Linn	Malvaceae	Chithamutti	H	WP	Body pain	
<i>Smilax zeylanica</i> Linn	Smilacaceae	Kattukodi	C	Leaf	Reduce body heat	VU
<i>Solanum nigrum</i> L	Solanaceae	Manathakkali	H	Leaf Fruit	Ulcer, Cough	
<i>Spilanthes acmella</i> Murr.	Asteraceae	Manjapoochedi	H	Flower	Toothache	
<i>Strychnos nux-vomica</i> Linn	Loganiaceae	Yetti	T	Bark	Stomach pain	R
<i>Syzygium cumini</i> Linn.	Myrtaceae	Naval	T	Bark	Dental problems	
<i>Syzygium aromaticum</i> (L.) Merrill et L.M. Perry	Myrtaceae	Elavangam	T	Flower Bud	Asthma and bleeding gums	
<i>Terminalia arjuna</i> (Roxb.ex DC) Wight & arn	Combretaceae	Maruthumaram	T	Bark	Fever	R
				Leaf	Ear ache	
<i>Terminalia bellarica</i> Roxb.	Combretaceae	Thaanrikai maram	T	Bark Root	Skin diseases and stomach problems	
<i>Terminalia chebula</i> Retz	Combretaceae	Kadukkai	T	fruit	Promote galactogogue	
<i>Ulginea indica</i> (Roxb.) kunth	Liliaceae	Narivengayam	H	Bulb	Hydrocele(piles)	R
<i>Vernonia anthehelmintica</i> Willd.	Asteraceae	Kaattu siragam	H	Seed	Malaria	R
<i>Vetiveria Zizanioides</i> L.	Poaceae	Vettiver	H	Root	Mouth sore	
<i>Withania somnifera</i> Dunal	Solanaceae	Amukkira	H	Root	Snake bite	
<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Injii	H	Rhizome	Cold cough	
<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Elandai	T	Bark	Stomach pain	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber,TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered

Table: 4 Medicinal Plants used by the Tribes and local dwellers of Royakottai Hills (49 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Actiniopteris radiate</i>	Pteridaceae	Visiriberani	H	WP	Blood pressure and tuberculosis.	R
<i>Alternanthera sessilis</i> L	Amaranthaceae	Koddupai	H	WP	Reduce lipids	
<i>Andrographis alata</i> (Vahl) Nees	Acanthaceae	Periannangai	H	WP	Antidote	
<i>Anethum sowa</i> Roxb. ex Fleming	Apiaceae	Sadakuppai	H	WP	Cold and bronchitis	
<i>Anisomeles malabarica</i> (L.) R.Br. ex Sims	Lamiaceae	Peruthumbai	H	Leaf	Dyspepsia and fever	
<i>Aristolochia indica</i> Linn	Aristolochiaceae	Eeswaramooli	H	Leaf	Antidote	
<i>Blepharis madaraspatensis</i> (L) Roth	Acanthaceae	Nethirapoondi	H	Leaf	Eye problems	
<i>Brassica alba</i> (BOISS)	Brassicaceae	Venkadugu	H	Seed	Rheumatism	
<i>Caesalpinia bonduc</i> (Linn)Roxb	Caesalpinaceae	Kazharchikai	S	Root, Bark,leaf	Jaundice, cough, fever, cough, worms and diabetes	
<i>Cassia angustifolia</i>	Caesalpinaceae	Nilavaarai	S	Leaf Fruit	Constipation and indigestion	
<i>Catharanthus roseus</i> (Linn.)	Apocynaceae	Nithyakalyani	H	WP	Leukemia, wound heal	
<i>Centella asiatica</i> L	Apiaceae	Vallarai	H	Leaf	Health and nerve tonic	
<i>Cipadessa baccifera</i> Miq.	Meliaceae	Pullipuchedi	T	Leaf	Stomach ache	
<i>Citrullus colocynthis</i> (L) Schrader	Cucurbitaceae	Kummattikai	C	Root	Jaundice, hair growth	R
<i>Curcuma aromatic</i> Wild	Zingiberaceae	Kasthurimanjal	H	Rhizome	Wound, bruises , skin problems, digestive aid	R
<i>Cymbopogon citrates</i> Linn.	Poaceae	Vasanapulla	H	Leaf	Asthma, diuretic digestive complaints, headache, fever	
<i>Datura stromaniuml</i> L	Solanaceae	Karuoomathai	S	Leaf	Asthma and rheumatism	
<i>Enicostemma axillare</i>	Gentianaceae	Vellarugu	H	WP	Abdominal ulcers and malaria	
<i>Entada pursetha</i> DC	Mimosaceae	Yanai kalarchi	WC	Seed	Emetic, febrifuge	EN
<i>Evolvulus alsinoides</i> L.	Convolvulaceae	Vishnugranthi	H	WP	Fever, cold	
<i>Ficus retusa</i> Linn.	Moraceae	Athimaram	T	fruit	Ulcer	
<i>Glycyrrhiza glabra</i>	Fabaceae	Adhimadhuram	T	Root	Bronchitis, fever and skin disease	
<i>Guizotia abyssinica</i>	Asteraceae	Malai ellu	H	Seed	Rheumatism	
<i>Gymnema sylvestre</i> (Retz) R.Br.ex	Asclepiadaceae	Sirukurinjan	H	Leaf	Stomach ailments, constipation	R
<i>Helicteres isora</i> Linn	Sterculiaceae	Vallampuri	T	Root,Bark	Hemorrhoids and diabetes	

Table: 4a Medicinal Plants used by the Tribes and local dwellers of Royakottai Hills (49 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Hemidesmus indicus</i> Linn	Asclepiadaceae	Nannari	H	Root	Blood purification.	
<i>Hemonitis arifolia</i> (Burn. f) Moore	Hemionitidaceae	Kalthamarai	H	Leaf	Intestinal worms and diabetes	
<i>Hybanthus enneaspermus</i> (L) F.V	Violaceae	Orithal thamarai	H	Leaf	Fever and aphrasiadic	
<i>Indigofera tinctoria</i> (L)	Fabaceae	Avuri	H	WP	Bronchitis, and liver problems	
<i>Justicia gendarussa</i> Burm.f	Acanthaceae	Vatham kolli	S	WP	headache cough	
<i>Leucas aspera</i> Spreng.	Lamiaceae	Thumbai	H	Leaf	Skin problems	
<i>Melia azedarach</i> Linn	Meliaceae	Malaiyembu	T	Leaf	Rheumatic	
<i>Mirabilis jalapa</i> Linn	Nyctaginaceae	Badthrathi	H	Leaf	Wound healing	
<i>Mukia maderaspatana</i> (L) M. Roemer	Cucurbitaceae	Musumusukkai	C	Leaf and Root	Dry cough. Cold and antidote	
<i>Naravelia zeylanica</i> (L)DC	Ranunculaceae	Vathamkolli	C	WP	Headache	
<i>Ocimum basilicum</i> Linn.	Lamiaceae	Thiruneetrapachai	H	Leaf	Ear ache	
<i>Opuntia stricta</i> (Haw) Var.dillenii	Cactaceae	Chappathikalli	S	Leaf	Inflammations	
<i>Oxalis corniculata</i> Linn	Oxalidaceae	Puliyarai	H	WP	Hepatitis, dysmenorrheal, amenorrhea	
<i>Phyllanthus amarus</i> Linn.	Euphorbiaceae	Keela nelli	H	Root and Fruit	Liver problems	
<i>Plumbago zeylanica</i> .Linn	Plumbaginaceae	Chithiramoolum	H	Root	Snakebite	
<i>Pseudarthria viscida</i> W&A	Fabaceae	Moovilai	S	Root	Asthma, fever	R
<i>Rauvolfia serpentina</i> (L) benth ex Kurz	Apocynaceae	Sarpagandhi	H	Root	Antidote	EN
<i>Rubia cordifolia</i> Linn	Rubiaceae	Chevvalikodi	C	Leaf	Antidote	
<i>Sida rhoboidea</i>	Malvaceae	Arivalmanai poondu	H	WP	Body pain	
<i>Solanum nigrum</i>	Solanaceae	Manathakkali	H	Leaf and Fruit	Ulcer & cough	
<i>Stachytarpheta cayennensis</i>	Verbenaceae	Rluthanipoondu	H	Leaf	Blood cleanser, to treat asthma and ulcerated stomachs	
<i>Strychnos nux vomica</i> Linn	Loganiaceae	Etti	T	Seed	Snakebite	R
<i>Withania somnifera</i>	Solanaceae	Amukkira	H	Root	Nerve tonic	
<i>Ziziphus oenoplia</i> . Mill	Rhamnaceae	Soorai	S	Root and bark	Wound healing	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber,TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered

Table: 5 Medicinal plants used by Jowlagiri hill. (61 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated	TS
<i>Abrus fruticulosus</i>	Fabaceae	Venkundri/galaganji	CH	Leaf	Heal boils	
<i>Acacia sinuata</i> (Lour) Merr.	Mimosaceae	Seegaikkai	WC	Fruit	Skin diseases	R
<i>Acalypha frutiocosa</i> Forsskal	Euphorbiaceae	Sinni	S	Leaf	Stomach ache, Flatulence	
<i>Accacia leucophila</i>	Mimosaceae	Velvaelam	T	Bark	Clears skin white patches	
<i>Acorus calamus</i> Linn.	Araceae	Vasambu	H	Stem	Diuretic, and carminative	VU
<i>Aegle marmelos</i> (Linn.)Correa	Rutaceae	Bilpatrae/vilvam	T	Leaf	Stomach pain	VU
<i>Ageratum conyzoides</i> Linn	Asteraceae	Uralgidda	H	Leaf	Wound healing	
<i>Ailanthus excelsa</i> Roxb	Simaroubaceae	Doddamaram/Perru	T	Stem and bark	Induce sterility	R
<i>Allium cepa</i> Linn.	Alliaceae	Ulli/Vengayam	H	Bulb	Wasp bite	
<i>Aloe barbadensis</i> Mill	Liliaceae	Kumari	H	Leaf	Soriasis, remove burn marks	
<i>Anethum graveolens</i> Linn	Apiaceae	Satakuppa	H	Seeds	Insomnia	
<i>Annona muricata</i>	Annonaceae	Mulluseethapazham	S	Leaf	Wound healing	
<i>Anogeissus latifolia</i> (Roxb.ex DC) Wall.	Combretaceae	Maruthampattai	T	Bark	Wound, Ulcer,Diabetes	
<i>Aphanamixis polystachya</i> (Wall.) Parker	Meliaceae	Mullu muttaga/Chemmaram	T	Seed oil	Rheumatism.	
<i>Aquilaria agallocha</i>	Thymelaeaceae	Akilkattai	T	Wood		
<i>Aristolochia bracteata</i> Lam	Aristolochiaceae	Aadutheendapalai	H	WP	Antidote, indigestion.	
<i>Asparagus racemosus</i> Willd	Asperagaceae	Aherubali/kattusadavari	C	Root	Increase lactation	R
<i>Atlantia monophylla</i> L.Correa	Rutaceae	Kattunimbae kattuelimichai	T	Leaf	Skin problems	
<i>Averrhoa bilimbi</i> Linn.	Oxalidaceae	Ilumbanpuli	T	Fruit	Obesity	
<i>Bacopa monnieri</i> (L) Wettst	Scrophulariaceae	Brammi	H	WP	Anemia and biliousness.	
<i>Chassalia curviflora</i> L	Rubiaceae	Nirvisha/Vellakurinji	S	Leaf	Wound healing, blood pressure	R
<i>Cissampelos pareira</i>	Menispermaceae	Kodupalli/Ponmusati	CH	Leaf	Cut and Wound healing	R
<i>Clerodendrum serratum</i>	Verbenaceae	Kandubaarangi	S	Root	Rheumatism	
<i>Costus speciosus</i> (J.Koen) Smith	Costaceae	Chengalvakosthu	H	Root	Vermifuge	
<i>Crateava religiosa</i> DC	Capparaceae	Maavilangam	T	Leaf, bark	Apetizer, Laxative	
				Root and bark	Antidote, indigestion	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber,TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered CR-Critically endangered.

Table: 5a Medicinal plants used by Jowlagiri hill. (61 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Cucumis trigonus</i> Roxb	Cucurbitaceae	Kattuthummattikai	C	Fruit	Cure Whitlow	R
<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Kuchikizhangu / Maragenasu	S	Rhizome	Inflammations	
<i>Curculigo orchiooides</i> Gaertn.	Hypoxidaceae	Nilappanai	H	Root Shoot Rhizome	Snake poison Jaundice and asthma	
<i>Cyclea peltata</i> (Lam).Hook.f & Thomson	Menispermaceae	Padathaalikizhangu	CH	Root	Stomach pain	
<i>Cynodon dactylon</i> (Linn) Pers	Poaceae	Kudigarikai/Arugampullu	H	WP	Scorpion sting	
<i>Debregeasia longifolia</i> (Burn.f) Wedd	Urticaceae	Kattunochi	T	Leaf	Asthma	
<i>Desmodium longipes</i>	Fabaceae	Sirupullati,	H	WP	Skin disease and asthma	
<i>Dioscorea oppositifolia</i> Linn	Dioscoreaceae	Kattukizhangu/Kavala Kodi	CS	Tuber	Energetic indigestion	
<i>Eclipta prostrate</i> (Linn)	Asteraceae	Garagadasoppu/karisalai	H	Leaf	Stop Gum bleeding	
<i>Embelia ribes</i> Burn	Myrsinaceae	Vayuvilngam	CS	Fruit	Anthelmintic	
<i>Erythroxylum monogynum</i> Roxb	Erythroxylaceae	Devadaru/Chemanti	T	Bark	Skin disease	R
<i>Ficus racemosa</i> Linn	Moraceae	Athi	T	Latex	Wound healing. Sprain	R
<i>Gloriosa superb</i> Linn	Liliaceae	Agnisikhe/Kalapai kizhangu	CH	Tuber	Antidote	R
<i>Hemionitis arifolia</i> (Burn. F) Moore	Hemionitidaceae	Kaketha gidda/Kalthamarai	H	Leaf	Cut and wound healing	
<i>Holoptelea integrifolia</i> (Roxb.) Planch	Ulmaceae	Kaladri/Akilpattai	T	Stem bark	Inflammations	R
<i>Hybanthus enneaspermus</i> (L.) F. Muell.	Violaceae	Orithalthamarai	H	WP	Aphrodisiac, Diuretic	
<i>Jasminium auriculatum</i> Vahl	Oleaceae	Kattumalliga	CS	Flower	Snake bite & wound healing	
<i>Justicia gendarussa</i> Burm.f	Acanthaceae	Karunochi	S	WP	Headache, cough, bronchitis	

Table: 5b Medicinal plants used by Jowlagiri hill. (61 Genera)

Botanical name	Family	Vernacular/common name	Habit	Parts used	Medicinal use/Ailments treated.	TS
<i>Martynia annua</i> Linn.	Martyniaceae	Pulinagam	S	WP	Inflammations, wounds	
<i>Menispermum hirsutus</i> (Linn) Diels	Menispermaceae	Kattu muska/kattukodi	CH	Root	Stomach ache	R
<i>Pavetta indica</i>	Rubiaceae	Paavettai	S	Leaf	Piles	
<i>Phyllanthus virgatus</i> Forster f	Euphorbiaceae	Sirunelli	H	Leaf	Jaundice	R
<i>Pterocarpus santalinus</i> Linn. f.	Fabaceae	Chenchandanam	T	Wood sap	Bone fracture, leprosy, spider poisoning, and Rheumatism	CR
<i>Pueraria tuberosa</i> (ROXB. EX. WILLD.) DC.	Fabaceae	Nilapoosani/ gumadi gida	C	Tuber	Demulcent; Emetic; Galactogogu, Poultrice; Refrigerant; Tonic.	VU
<i>Ricinus communis</i> Linn	Euphorbiaceae	Haralu/Amanakku	S	Leaf & seedoil	Paralysis Constipation	
<i>Sansevieria roxburghiana</i>	Asparagaceae	Pambukathalai	H	Root	Throat infection, cough and cold.	
<i>Santalum album</i> Linn	Santalaceae	Gandba/ Chandanam	T	Wood	Skin diseases	R
<i>Sappindus emarginatus</i> Vahl	Sapindaceae	Soppukai/ Poovankai	T	Fruit	Laxative	R
<i>Semacarpus anacardium</i> Linn	Anacardiaceae	Seraankottai	T	Resin Fruit	Leprosy Rheumatism, asthma	EN
<i>Senna auriculata</i> (Linn)Roxb	Caesalpiniaceae	Avarike/Avarum	S	Root	Skin diseases	
<i>Tamarindus indicus</i> Linn	Caesalpiniaceae	Huli/Puli	T	Fruit	Inflammations	
<i>Terminalia arjuna</i> Roxb.ex DC) Wight & arn	Combretaceae	Maruthumaram	T	Bark	Fever, Ear ache	R
<i>Terminalia bellirica</i> Roxb.	Combretaceae	Thandrikai	T	Fruit	Asthma, laxative	R
<i>Terminalia chebula</i> Retz	Combretaceae	Kadukkai	T	Fruit	Tooth ache and heal hydrocele	
<i>Tinospora cordifolia</i> Miers	Menispermaceae	Seenthilkodi	C	Stem bark	Liver pancreas tonic, diabetes, jaundice anemic	EN
<i>Trichopus zeylanicus</i> Gaerin	Trichopodaceae	Arogyapachila	H	Leaf	Strengthen body	R
<i>Urginea indica</i> (Roxb.) Kunth	Liliaceae	Adairirulli/ Nari vengayam	H	Bulb	Piles	VU
<i>Vetiveria zizanioides</i> (Linn.) Nash	Poaceae	Vetiver	H	Root	Antidote	
<i>Withania somnifera</i> Dunal.	Solanaceae	Amukkira	H	Fruit	Antidote	

H-Herb, S-Shrub, T-Tree, CH- Climbing herb, CS-Climbing shrub, WC- Woody climber, TS- Threat Status, R-Rare, VU- Vulnerable, EN- Endangered, CR-Critically endangered.

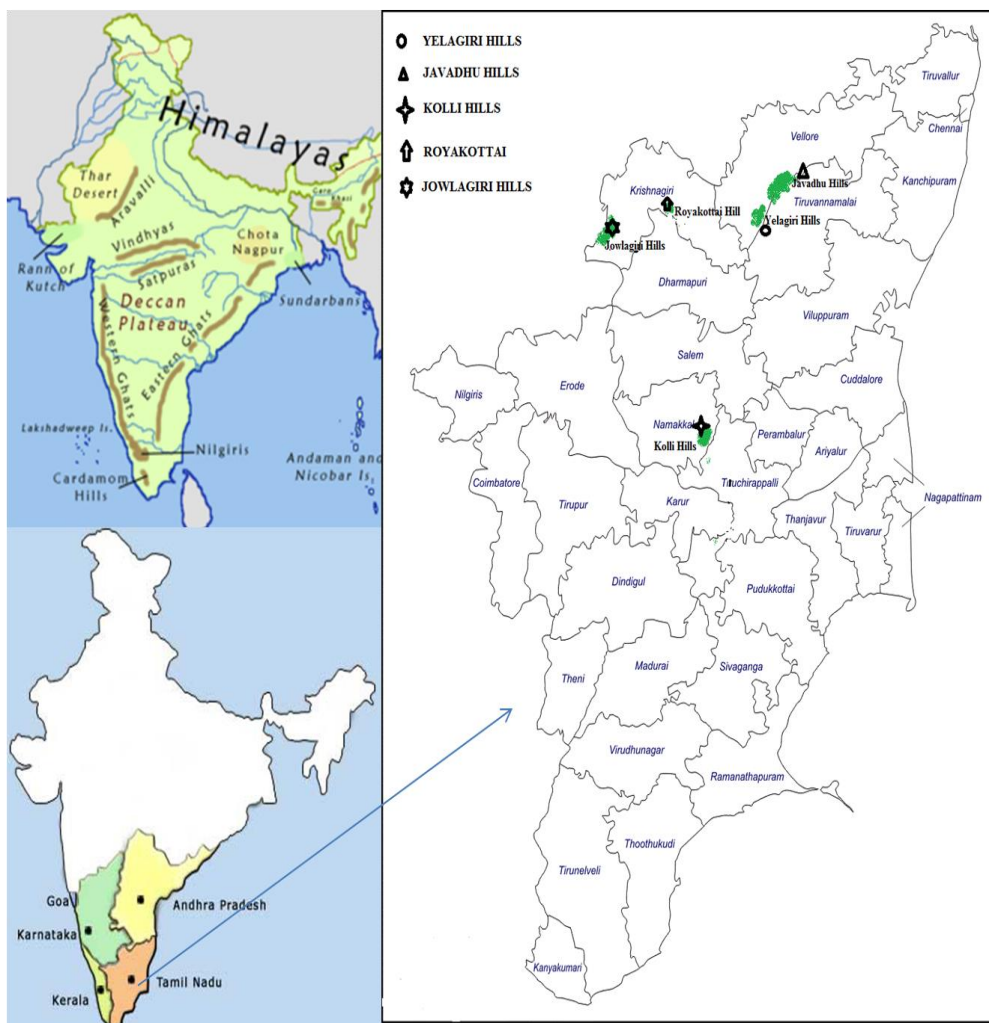


Fig 1. Map showing Geographical areas in Eastern Ghats, Tamil Nadu, India

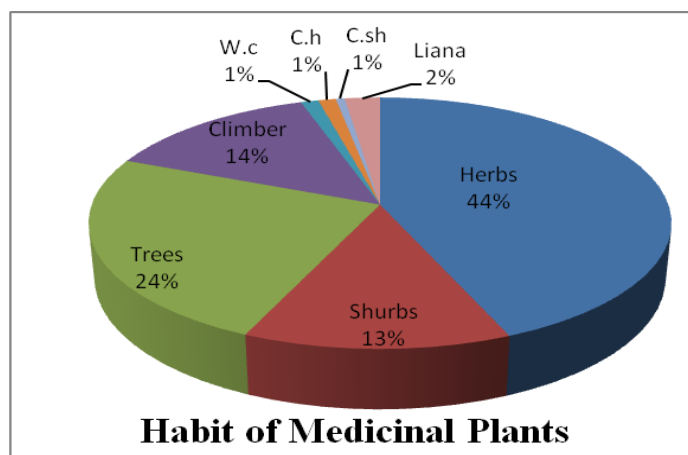


Fig. 2. Shows habit-wise analysis of medicinal plants used by the tribes in total study areas

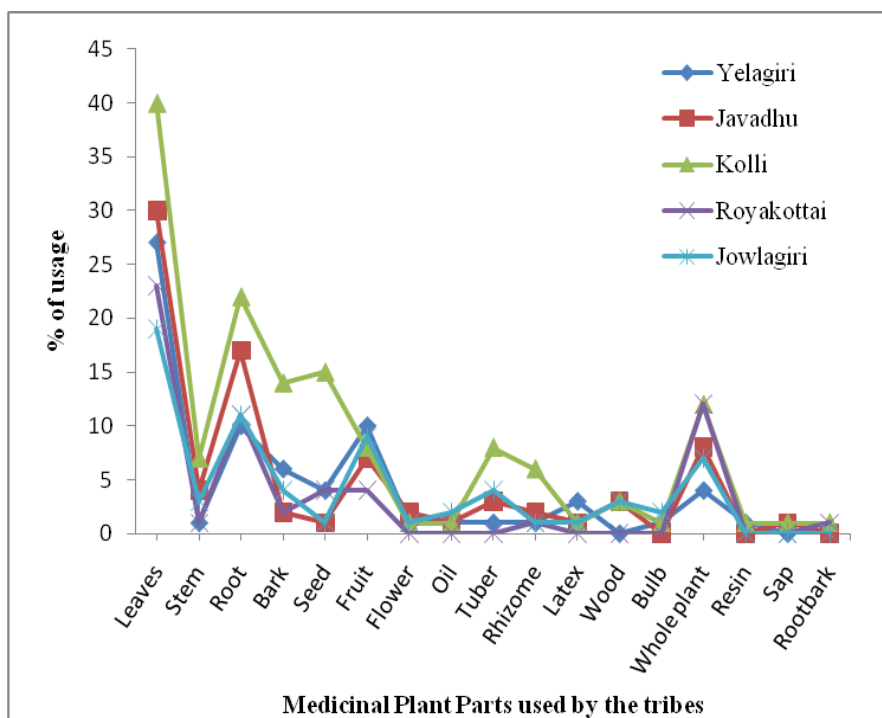


Fig 3. Shows the Percentage of Plant Parts used by the tribes in study areas

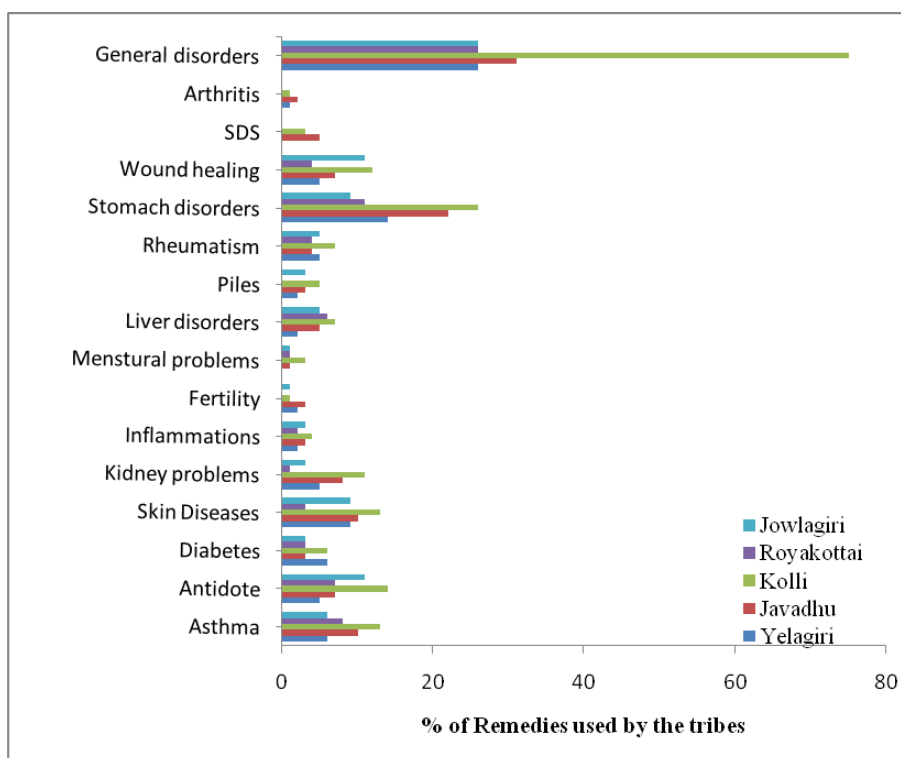


Fig 4. Different parameters of study areas grouped under different ailments categories

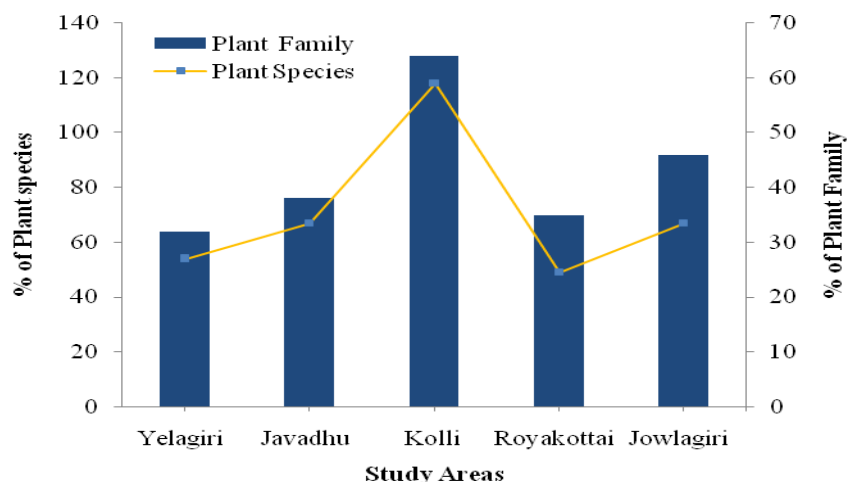


Fig 5. Percentage of Plant species and families in the study areas

CONCLUSION

Out of four areas Kolli Hill area showed more biodiversity and rich knowledge in traditional medicine than the other four areas, followed by Javadhu Hills and Royakottai Hill finally Jowlagiri showed a moderate level. The results from our survey of ethno medicinal plants assure therapeutic potential of plants used by the ethnic groups as traditional medicine. This report forms an excellent basis for identification and selection of good plant species for phytochemical and pharmacological investigation in future, to develop and produce novel drugs. Ethno botanical study offers an extra support for continued use of the documented plants as essentially traditional medicines that are important for basic healthcare of tribal communities in the Eastern Ghats hilly areas. The medicinal plant knowledge has been transmitted orally from generation to generation, however it seems that it is vanishing from the contemporary society, since younger people are not interested to carry on this tradition. This insists the need for documentation of ethno botanical medicinal knowledge. Conservation will be successful only when the government and NGOs together formulate effective policies and strategies to conserve ethno medicinal plants to facilitate and encourage more knowledge generation through scientific research, surveys and assessments.

CONFLICT OF INTEREST

The authors declare that we do not have competing interests.

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