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Some interesting medicinal trees of Nilgiris district, Tamil Nadu, India

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Abstract
The Nilgiris is an integral part of the Western Ghats complex is located between 10^0 28' – 11^0 37' N (latitude) and 6^0 27'- 77^0 4' (Longitude) at the junction of the Eastern and Western Ghats. Ethno botanical study was carried out beside of tribal group in the Nilgiri District. Total 54 Tree species belonging to 29 families 43 genera were documented. The collection of sequence on medicinal trees is a prerequisite for its utilization in the field of ethno medicine. The sequence about the therapeutic uses of plants, observation of the local people regarding use of plants in common diseases was collected through questionnaires among the tribal practitioners in the study area. The conservative medicinal trees were mostly used for fever, cold, cough, diarrhoea, dysentery, dermatological disease, wounds, piles, rheumatism and Snake bites. The Medicinal plants used by conventional users of Upper and lower Nilgiris. The Plants are given alphabetically followed by scientific name, family, distribution, place of collection, phenology and useful parts and mode of application and curative uses were documented.

Keywords: medicinal trees, local people, the Nilgiris, medicinal uses

Introduction
India is one of eighteen extremely diverse and top ten species-rich countries of the world. India is one of the major manufacturers of therapeutic plants and is exactly called "Botanical garden of the earth". Human development has evolved as an outcome of communication of people with their surroundings, particularly with vegetation. From the very most primitive days of development, mankind has twisted to plant life for curative, a folklore that has survive the appearance of current remedy and establish new power on the conclusion of 20th century. India was representing by wealthy traditions, civilization and natural biodiversity and recommend exclusive occasion for the remedy invention researchers. Consumption of plants healing purposes in India has been recognized in earliest literature [1]. India has been a pioneer in the treatment of diseases and health disorders by using Ethno-botanic plants as herbal medicine. This has been pure nature cure with organic herbal medicine. The long history has been refined by experience and methods of trial and error, reorganizing the herbs and applications and by curative methods. Herbal medicine has been widely practiced from historic times till date; with more fervor today as a favoured option to allopathic drugs throughout the world only because the herbal medicine has no side effects and is less costly. Herbal drugs are supposed to be much safer [2].
The ecological conditions differ entirely from the other forest types. In the mountain of the Nilgiris, above 1800 m the cool average temperatures of the coldest months, (10-15^{0}C) together with the frost phenomenon during the NE monsoon period imply a strict selection of botanical species. Another important bio-climatic factor is the extremely variable humidity of the air in the non-forest areas; it varies within very short distances between saturation point and 30 percent or less. Champion and Seth [3] considered the plant life of Nilgiri district and Palney sholas to be temperate forests due to the moderately low heat of winter months. The diural difference in hotness here during winter months is also very wide. Therefore, author described these regions as belonging to the tropical montane type.
Traditional medicine, especially the native (folk) herbal medicines have recently been receiving enhanced interest the world over. Such age-old medical care frameworks have been created in various corners of the globe wherever peoples were living in close communication with environment [4]. In Indian country it is accounted that conservative healers utilized two thousand five hundred species of plants as medication [5]. The records of native information on the usage of nearby plant assets by various ethnic gatherings or networks is one among the primary targets of ethnobotanical research [6]. The Western Ghats of Nilgiris is exceptionally wealthy in its therapeutic (spice) abundance. The woods and slopes of this area are a treasury of around 700 restrorative plants, out of which some are utilized for conventional and society therpeutic practices [7].
Nilgiri district comprise totally six ancient tribal groups of fundamental anthropological interest. They are Irulas, Kotas, Todas, Kurumbas, Paniyas and Kattunayakas. The total tribal people of the district were 25,048 [8]. Many common and dangerous diseases like asthma, cholera, eczema, elephantiasis, epilepsy, goitre, jaundice, kidney complaints, leprosy, piles, pyorrhoea, rheumatism, scabies, syphilis and arthritis are hardly curable by allopathic medicine; which provides only a temporary relief. The therapeutics of the above-mentioned diseases in

traditional medicinal system ensures permanent cure and one can be rid of the ailments for the rest of life with this system of medication. The Indian subcontinent has a bounty of therapeutics plants utilized as customary medicine. This also forms a rich source of knowledge for the medical field [9].

Materials and Methods

Study area

In India, NBR was the primary Biosphere Reserve is under concern by the UNESCO for assortment as a World Heritage Site. Nilgiri Biosphere Researve is situated in the Western Ghats connecting the co - ordinates of 11°15' to12°15'N and 76°0' to 77°15'E lying at the tri junction to the three States of Kerala (1455.4Km²), Karnataka (1527.4 Km²) and Tamil Nadu (2537.6 Km²) covering an area about 5520 Km^2. The Nilgiri district is located at an elevation of 900 to 2636 m. above MSL. During summer, the climate remains in the maximum of 21°C to 25°C and the minimum of 10°C to 12°C. During winter, the temperature remains a maximum of 16° C to 21°C and minimum of 2°C. Nilgiri district latitudinal & longitudinal proportions being 130 KM (Latitude: 10-38 WP 11-49N) by 185 KM (Longitude: 76.0 E to 77.15 E) (Figure 1).

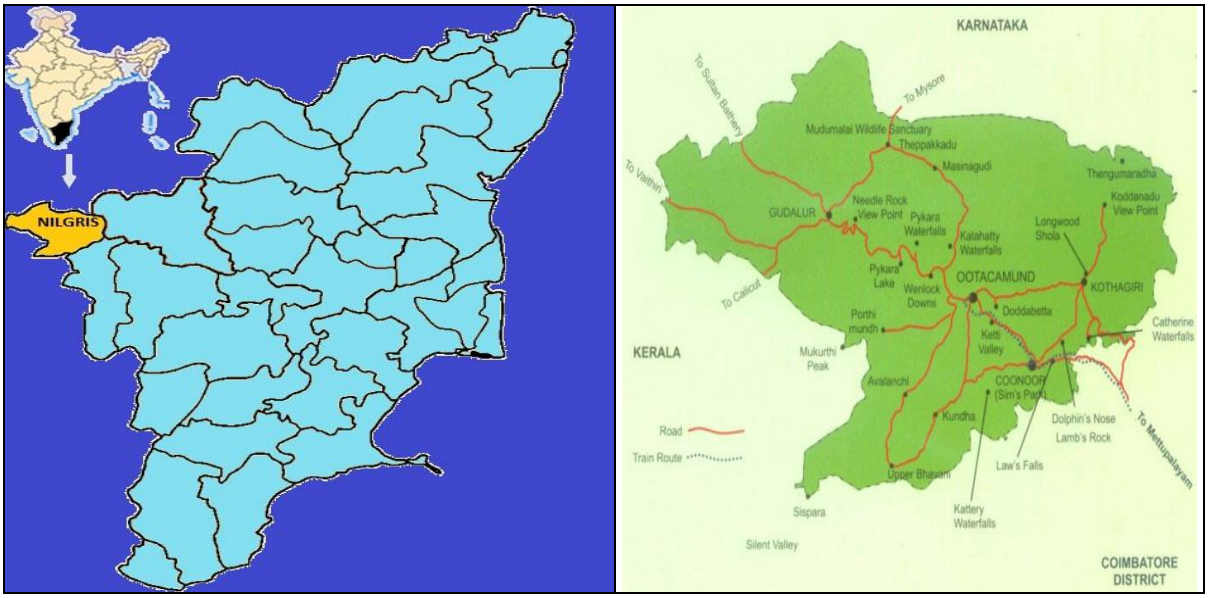

Fig 1: shows Medicinal Trees species were recorded in study area

Methodology

The current study was performed by different field surveys during the period of February 2021 to January 2022. The sequence about the healing uses of plants, awareness of the local people concerning use of plants in general diseases was documented through questionnaires among the ancestral practitioners in the study area. Oral discussion with people was mainly concentrated to the details like rare and less known plants, local names, flowering and fruiting period, medicinal and economic usage. The investigated plants were photographed and collected for the further study. The current work is a result of the field tours conducted for the most part in Nilgiri district. After collection, all the specimens were dried, poisoned and mounted following the routine herbarium practices recommended by standard methodology [10]. Identifications were made with the help of, Flora of the Presidency of Madras by J. S. Gamble and C. E. C. Fischer [11], The Flora of the South Indian Hill Station by P.F Fyson [12], Flora of Tamil Nadu by N.C. Nair and A.N. Henry [13], The Flora of Tamil Nadu and Carnatic by K. M. Mathew [14], The Flora of Nilgiris, Tamil Nadu by B.D. Sharma *et.al* [15] Plant specimens are deposited in herbarium of Centre of Medicinal plants Research in Homoeopathy (CMPRH) at Emerald Acronym SMPRGH, The Nilgiris District, Tamil Nadu under Center Council Research in Homeopathy (CCRH), Ministry of AYUSH. Voucher specimen numbers along with other information are given in and the collected data contains the list of plants of different families with their conventional uses, phenology, place of collection, habit and habitat, common name and their mode of application which are listed in alphabetical order.

Table 1: Shows quantitative analysis of the tree species

S. No	Family	No. of Genera	No. of Species
1.	Mimosaceae	3	7
2.	Rutaceae	4	4
3.	Fabaceae	4	4
4.	Moraceae	1	4
5.	Combretaceae	2	3
6.	Rubiaceae	2	3

7.	Rhamnaceae	1	2
8.	Sapindaceae	2	2
9.	Euphorbiaceae	2	2
10.	Erythroxylaceae	1	2
11.	Capparidaceae	2	2
12.	Anacordiaceae	2	2
13.	Caesalpiniaceae,	1	1
14.	Loganiaceae,	1	1
15.	Sapotaceae	1	1
16.	Ulmaceae	1	1
17.	Hermandiaceae	1	1
18.	Tiliaceae	1	1
19.	Verbinaceae	1	1
20.	Flacourtiaceae	1	1
21.	Myrtaceae	1	1
22.	Boraginaceae	1	1
23.	Louraceae	1	1
24.	Bambacaceae	1	1
25.	Lecthidaceae	1	1
26.	Meliaceae	1	1
27.	Alangiaceae	1	1
28.	Burseraceae	1	1
29.	Salvadoraceae	1	1
Total		43	54

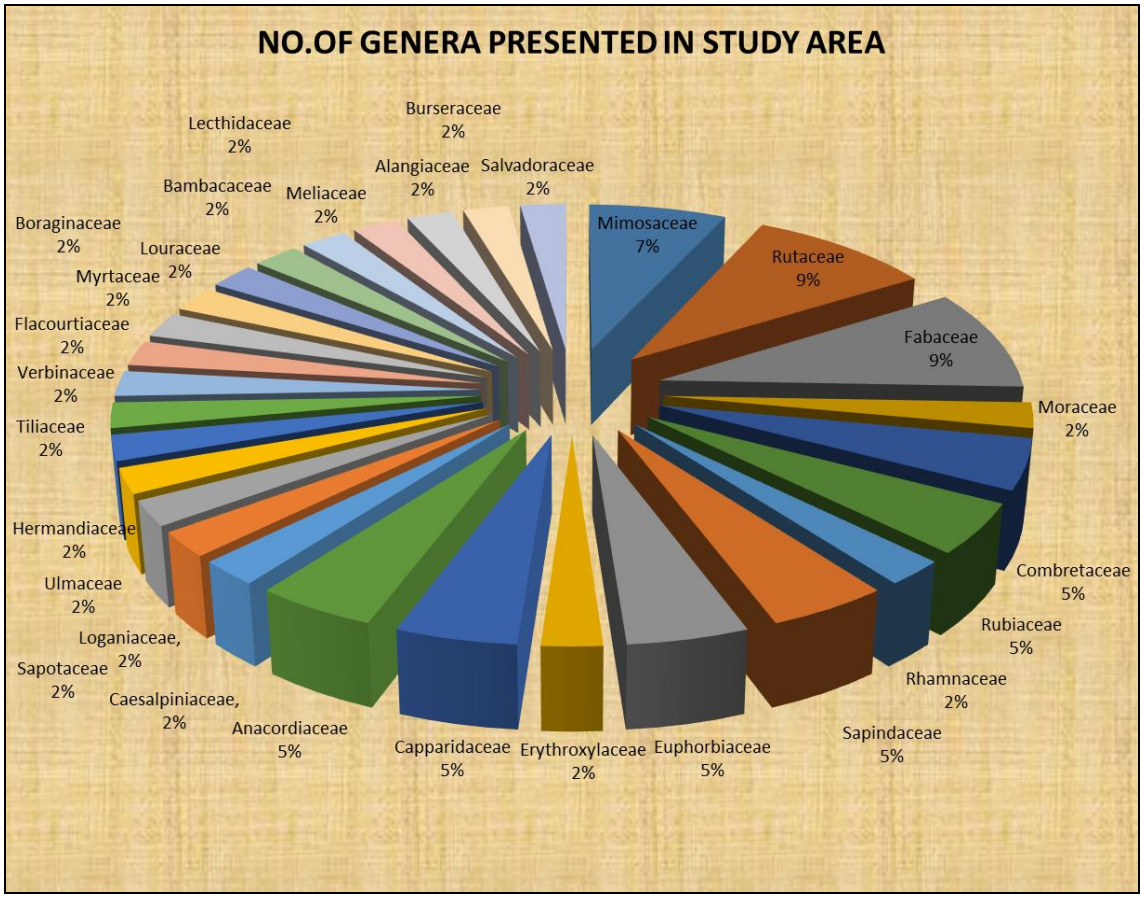

Fig 2: Medicinal trees were documented in the Study site

Table 2: Check list of the Medicinal trees in the present study area

S. No.	Botanical name	Family	Local name	Distribution	Locality	Fls. & frt. Season	Medicinal uses
	Acacia catechu Arn.	Mimosaceae	Karun-kaali	Rare	Segur	June - November	The bark of the tree is used in chronic diarrhoea. It is a highly efficient

							anti-oxidant.
	Acacia chundra (Rottler) Willd.	Mimosaceae	Sengh-karungali	Common	Bokkapuram	April-August	The bark is used in medicinal preparation to cure diarrhoea. Wood used for construction.
	Acacia leucophloea (Roxb) Wild.	Mimosaceae	Velvelam	Rare	Moyar	August - September	The bark juice is taken to heal stomach problem.
	Acacia nilotoca (L.)Delile	Mimosaceae	Karu-velam	Rare	Kallar	August - October	Wood is very hard, durable and preferred for agricultural implements. Cattle feed on the fruits.
	Aegle marmelos Corr. ex. Roxb.	Rutaceae	Vilvam	Occasional	Gudalur	September -March	Unripe fruit stomachic flesh stimulant, demulcent, anti-scorbutic, digestive and antipyretic. Root & Stem bark used as antipyretic properties.
	Ailanthus excelsa Roxb.	Bersuraceae	Peevari maram	Common	Kallatti	January - March	The root bark is used to cure bronchitis, asthma, dyspepsia, dysentery, and earache.
	Alangium salvifolium (L.f.) Wang.	Alangiaceae	Alingile	Rare	Cherambadi-Erumadu	March - June	Root liquid of 10 ml given orally for cattle in case of snake bite.
	Albizia amara (Roxb) *Bovin*	Mimosaceae	Usilai	Common	Barliar	March - May	Leaves used for fodder. The young leaves are dried powdered and used as a alternate for soap and shampoo.
	Albizia lebbeck (L.) Benth	Mimosaceae	Vaagai	Common	Mayar		A leaf paste is applied to cure eczema; Dried bark is made into powder and used as tooth powder to get release from dental problem.
	Anogeissus latifolia (Roxb.ex DC.)Wall. Ex Guill & Perr.	Combretaceae	Vetkali	Common	Kallatti	April - July	Branches are used as fuel wood. A piece of bark is chewed to cure high fever.
	Azadirachta indica A. Juss.	Meliaceae	Vembu	Common	Moyar	March - June	The young branches are used as toothbrushes. The crushed leaves are used for de worming. The leaves are used to treat chickenpox.
	Semecarpus anacrdium L.	Anacardiaceae	Sengottai	Common	Mudumalai, Moyar.	October - November	Fruit of this plant, fruit of pineapple and rhizome of Winter cherry are ground with water and the sap thus obtain is in use verbally to heal wounds. Dosage 50 ml of juice is in use three times a day after food to 2-5 days.
	Barringtonia acutangula Gaetrn.	Lecythidaceae	Sengh-kadambu	Rare	Gudalur	August - October	Bark extract is used as mouthwash in gum probable's fruit is used in astrigenitic and anthelmantic. Bark in decoction is stomachic.

	Bombax ceiba L.	Bombacaceae	Elavam	Frequent	Kalhatti	March - June	Tap root used as demulcent tonic, aphrodisiac, and emetic.
	Buchanania lanzan Spreng.	Anacardiaceae	Kaattu-munthiri	Rare	Kallatti	December - January	Leaves are used in the curative of skin diseases. Fruit are used to cure cough and asthma.
	Butea monosperma (Lam.) Taub.	Fabaceae	Palasam	Common	Theppakadu	March - April	Decoction of bark is used to menstrual disorders, cold and coughs and a tonic. Root is used in night loss of sight & other problems of vision and elephantiasis.
	Cadaba fruticosa (L.) Druce.	Capparidaceae	Viluthi	Common	Moyor	December - February	The leaf sap is inside used in the case of general weakness and vigorous during dysentery & diarrohea.
	Chloroxylon swietenia DC.	Rutaceae	Porinja maram	Rare	Kallar	March - August	The bark and leaves used to stun fish while fishing. The honey from the flowers is bitter in taste.
	Cinchona officinalis L.	Rubiaceae	Koina	Planted	Naduvattam	October - December	It can anti -malarial drug, extracted from root, stem and twig bark, also used in tonics, hair lotions, flu mixtures and analgesic tablets
	Cinnamomum camphora (L.) Nees & Eberm.	Louraceae	Sugantha maram	Planted	Ooty	April - November	Camphor oil used to relieve rheumatic pains, inflammation of joints, chest pains etc. Camphor crystal used in cardiac disorder and as incense.
	Cordia dichotoma Forst. f.	Boraginaceae	Naruvalli	Common	Gudalur	April - June	Leaf past used to cure headache and ulcers. Fruit affection of diseases of lungs, Urinary passages, and grumpiness.
	Crateva adansonii DC.	Capparidaceae	Maa-vilangam	Rare	Moyar	March – June	Root & Bark used as lithotropic laxative, alterative. Flowers laxative. Bark urinary complaints, nausea, fevers and gastric irritation.
	Dalbergia lanceolaria L. F. Supp.	Fabaceae	Erigai	Common	Bokkapuram	August - February	Bark is used in herbal preparation.
	Dichrostachys cinerea (L.) Wt. & Arn.	Mimosaceae	Veduttalam	Common	Burliar	April - September	The bark is compressed and useful on the forehead to treat headache.
	Drypetes roxburghii Hurus.	Euphorbiaceae	Irukolli	Garden plant	Moyar	March - June	Leaves are used as superficially to inflamed joints and areas.
	Erythroxylum monogynum Roxb.	Erythroxylaceae	Sembulichan	Common	Kalhatti	October - May	The hard wood is sliced and oil distilled from it is used in the treatment of knee pain.
	Erythroxylon coco Lamk.	Erythroxylaceae	-	Rare		May - September	A local anaesthetic drug extracted; also used as a tonic for digestive and nervous system.

	Eucalyptus citriodora Hook.	Myrtaceae	Thaila maram	Cultivated	Doddabetta	-	Oil extracted from leaves, used in the manufacture of soaps, germicides, hair oil and disinfectants.
	Euphorbia tirucalli L.	Euphorbiaceae	Thiru Kalli	Common	Coonoor	March - April	The vesicant latex is used as relevance for cough, toothache, earache, asthma, rheumatism, neuralgia and warts in India.
	Ficus benghalensis L.	Moraceae	Alamaram	Common	Bokkapuram	Throughout the year	The immature prop root is boiled with coconut oil and the combination is applied on the hair to advance hair growth. Prop roots used as rope and tooth cleaning stick.
	Ficus hispida L.f	Moraceae	Peaiatthi	Common	Gudalur	February - July	During diabetes, ripe fruits are addicted daily for ulcer burns.
	Ficus microcarpa L.f.	Moraceae	Kalichi	Common	Moyar	January - April	The bark is combination with other herbs is used to cure boils and swellings on the limbs. Monkeys and birds eat the figs.
	Ficus racemosa L.	Moraceae	Arasamarm	Common	Gudalur	February - June	Stem bark of this plant, stem barks of Jamun tree and Pomegranate tree are boiled in water and the decoction thus obtained is used to clean wounds three time of day to cure soon.
	Flacourtia indica (Burm.) Mer	Flacourtiaceae	Cottaikala	Rare	Kallatti	February - May	The tree has various uses in local remedy. The fruits are used for jaundice and inflamed spleens. The leaves and roots are taken for malaria and diarrhea.
	Gardenia gummifera L.f.	Rubiaceae	Kambil	Rare	Ulikal	January - April	The resin from the bark of the tree is taken off with moist wet hands, and is apply on the forehead of children to heal headache. The resin is heated in oil, and the vapour is inhaled to treat running nose.
	Gardenia resinifera Roth.	Rubiaceae	Kumbili	Rare	Moyar	May - July	Gum exuadate is used in medicine Chilled toothache.
	Gliricidia sepium L.	Fabaceae	Semai agathi	Common	Masinagudi	February - June	Compressed fresh leaves an applied as a poultice.
	Gmelina arborea Roxb.	Verbinaceae	Kumil	Common	Kallatti	February - May	The ash from the wood is used as tooth powder.
	Grewia tiliifolia Vahl.	Tiliaceae	Unnu, Satachi	Common	Throughout the District	May - September	Root bark paste is applied on the surface three times a day for one week over swellings.
	Gyrocarpus americanus Jacq.	Hernandiaceae	Vellai-thanukku	Common	Kallar	January - February	The bark mixed with cumin is used to treat fevers and drive away evil sprits

	Holoptelea integrifolia (Roxb.) Planch.	Ulmaceae	Avimaram	Garden plant	Burliar-Kallar	March - May	Powdered bark applied on sticky juice to cover the boile bark liquid.
	Limonia acidissima Linn.	Rutaceae	Vilampalam	Common	Kallatti	March - September	Fruit used as anti-fermentive. Root used in colic. Leaf epilepsy.
	Madhuca longifolia (J.) Macb	Sapotaceae	Iluppai	Rare	Moyar	February - April	Stem bark of this plant, rhizomes of *Aristolochia indica*, *Asparagus racemosus* leaves of *Elephantopus scaber* and *Ocimum basilicum* are mixed and boile with water and the decoction thus obtained is taken or a to cure wounds.
	Murraya paniculata (L.) Jack	Rutaceae	Sidisil maram	Common	Marapalam	March - Sept	Roots used in traditional medicine
	Pterocarpus marsupium Roxb.	Fabaceae	Vengai	Common	Moyar	June - March	The sap from the trunk applied on children's forehead as a mark and believed to keep away evil spirits, The leaves feed to cattle.
	Salvadora persica L.	Salvadoraceae	Ukamaram	Rare	Moyar	December – May	To make stronger gums and for foul smell, Applied on the surface on gums till cure.
	Sapindus emarginatus Vahl.	Sapindaceae	Mani pungan maram	Common	Kallatti	October - November	Fruit a good shampoo, fumigation is useful in melancholia, hysteria.
	Schleichera oleosa (Lour) Oken.	Sapindaceae	Puvam	Garden plant	Mudumalai	March - June	Bark is used to cure skin diseases and ulcers.
	Strychnos potatorum L. f.	Loganiaceae	Thettankottai	Rare	Kunjapanai	September -October	The seeds are used to obvious turbid water astringent to the bowels, diuretic the root cures all kinds of leucoderma.
	Tamarindus indica L.	Caesalpiniaceae	Puliyan	Common	Gudalur	December - March	Bark ash mixed with coconut oil and used to cure burn wounds.
	Terminalia arjuna W.& A.	Combretaceae	Marutham	Occasional	Moyar	March - April	Bark powder is taking inside with milk or water to strengthen the heart.
	Terminalia bellirica (Gaertn.) Roxb.	Combretaceae	Thanikkai	Garden plant	Gudalur	February - March	Fruit powder is taken internally with buttermilk to treat stomach problem.
	Ziziphus rugosa Lam.	Rhamnaceae	Thodari	Common	Kallatti	January - June	The bark used to prepare alcohol and a paste from it is used to cure gastric problems. The dry leaves are used to make conventional cheroots.
	Ziziphus oenoplia Mill.	Rhamnaceae	Churipalam	Common	Kallattti	November - March	Bark and fruit paste mixed with cumin seed is taken inside to treat diarrhea.

Results and Discussion

The current study revealed that the local people of The Nilgiri district using 54 tree species of medicinally significant belonging to 29 families. These medicinally significant plants were categorized in to tree species. These are commonly occurring medicinally important plants used to treat various diseases. Drugs are prearranged either as a solo or in a mixture of more than one plant and parts of same or dissimilar plants to the people suffering from different diseases. The collected trees are belongs 29 families, 43 genera and 54 species. Dominant families in the study area are Mimosaceae (3 genera, 7 species), Rutaceae (4 genera, 4 species), Fabaceae (4 genera, 4 species), Moraceae (1 genera, 4 species), Combretaceae (2 genera, 3 species), Rubiaceae (2 genera, 3 species), Rhamnaceae (1 genera, 2 species), Sapindaceae (2 genera, 2 species), Euphorbiaceae (2 genera, 2 species), Erythroxylaceae (1 genera, 2 species), Capparidaceae (2 genera, 2 species), Anacardiaceae (2 genera, 2 species), Caesalpiniaceae, Loganiaceae, Sapotaceae,Ulmaceae, Hermandiaceae, Tiliaceae, Verbinaceae, Flacourtiaceae, Myrtaceae, Boraginaceae, Louraceae, Bambacaceae, Lecthidaceae, Meliaceae, Alangiaceae, Burseraceae, Salvadoraceae are each one species moderately present in Nilgiris hills (Table 1 and 2). Medicinal plants play an essential role in given that comprehension to the researchers in the field of ethno botany and ethno pharmacology. The observation of current study revealed that conventional medicine plays important role in the life of general people. Nilgiri district, the ecological area of study comes under the Western Ghats range of mountains, which is known to have a flora which for its fortune and variety has only a few parallels in the world. Unfortunately such a rich tropical forest is deteriorating due to various forces, natural and human. The use of medicinal plants for curing diseases in human culture is almost as old as man himself. In India, the most primitive mentioned use of medicinal plant is found in Rigveda [16]. It is remarkable to note that most of the drugs derived or initially isolated from higher plants were exposed in an ethno botanical context [17]. Reports of the ethnomedicine followed by critical scientific evaluation has given to the world a number of newer drugs. A great amount of natural products have come to us from the systematic study of remedies conventionally working by a mixture of cultures. Atropine, digitoxin, quinine, reserpine, emetine, physostigmine, Pilocarpine, and vincristine are but a few familiar examples [18].

Conclusion

The present advancements came through a long way of experiences and investigations. However, it is evident that physical disasters and diseases accompanied life forever and man invested his whole knowledge and efforts to evaluate a happy and healthy life. Man has discovered plants as a rich source of food, fibers, wood, medicines etc. India has glorious past in ancient periods and there were well established vegetation medicine systems like Indo-Aryans, charak etc. Further, this research has placed the local uses of medicinally significant plants on record by interviewing the local people adapting the preparation from the traditional healers, which are the rich sources of the traditional knowledge of the medicinal plants. Therefore this research article will attract the attention of ethno botanists, phytochemists and pharmacologists for further critical analysis of medicinal plants present in the Nilgiris, Tamil Nadu.

References

1. Charak, Drdhbala In, Sastri R, Uppadhayaya Y, Pandeya GS, Gupta B *et al*. Chaukhamba Bharti Academy, Varanasi, 1996.
2. Ayyanar M, Ignacimuthu S. Medicinal plants used by the tribals of Tirunelveli hills, Tamil Nadu to treat poisonous bites and skin diseases. I. J. Trad. Knowl,2005:4(3):229-236.
3. Champion HG, Seth SK. General Silviculture for India, 1968.
4. Katewa SS, Galav PK. Traditional herbal medicines from Shekhawati region of Rajasthan. I. J. Traditional. Knowledge,2005:4(3):237-245.
5. Pei S. Ethnobotanical approaches of traditional medicinal studies some experiences from Asia. Pharama Bio,2001:39:74-79.
6. Shrestha K. Ethnobotanical inventory and plant taxonomy basic approaches for ethno botanical research: Ethnobotany for conservation and community Development. Ethnobotanical Society of Nepal, 1998, 58-65.
7. Babu PA, Suneetha G, Boddepalli R, Lakshmi VV, Rani TS, Rambabu Y, Srinivas K. A database of 389 medicinal plants for diabetes. Bioinformation,2006:1(4):130-171.
8. Anonymous. Census Reports. Government of India, New Delhi, 1981.
9. Bagchi P, Nikita Sinha, Ajith Kar, Mahesh M. Ayur Informatics: Establishing an Ayurvedic remedy for Bronchial Carcinoma. Int. J. Bioscience. Biochem. Bioinform,2011:1:41-46.
10. Jain SK, Roa RR. Handbook of Field and Herbarium Methods. Today and Tomorrow Printers & Publishers, New Delhi, 1976.
11. Gamble JS, Fischer CEC. Flora of the Presidency of Madras. Botanical Survey of India, Calcutta, 1935, 3.
12. Fyson PF. The Flora of Nilgiri and Pulney Hill Tops. Superintendent, Government Press, Madras,1915-20:3.
13. Nair NC, Henry AN. Flora of Tamil Nadu. Series 1: Analysis. Botanical Survey of India, Howrah, 1983, 1.
14. Mathew KM. The Flora of the Tamil Nadu Carnatic. The Rapinat Herbarium, St. Joseph's College, Tiruchirapalli, 1983, 3.
15. Sharma BD, Shetty BV, Vajravelu E, Kumari GR, Vivekanthan K, Chandrabose M. Studies on the Flora of Nilgiris, Tamil Nadu. Bio Mem,1977:2(1-2):1-86.

16. Joshi DN, Sah BCL, Suri RK. Some medicinal plants of Rudranath Bugyal (Dist. Chamoli), U.P. Bull. Med. Ethnobot. Res,1978:3:27-42.
17. Cox PA, Sperry LR, Tuominen M, Bohlin L. Pharmacological activity of the Samoan ethnopharmacopoeia. Econ. Bot,1989:43:487-497.
18. Bruhn G, Helmstedt B. Ethnopharmacology: objectives, principles and perspectives: Beal L, Reinhard E. Natural Products as Medicinal Agents. Hippokrates - Verlag, Stuttgart, 1981, 405-430.