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## RESEARCH ARTICLE

### AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED BY LOCAL PEOPLE AND TRIBALS IN TOPSLIP (ANNAMALAI HILLS) AND OOTY (CHINCHONA VILLAGE) OF COIMBATORE AND OOTY DISTRICT

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#### ABSTRACT

An ethno botanical study was carried out to collect evidence on the use of medicinal plants by the people who live in Topslip and Ooty Taluk of Coimbatore and Ooty district, Tamil Nadu. This study designed to identify plants collected for medicinal purposes by the local people and tribals of Topslip and Ooty, located in the Coimbatore and Ooty district of Tamil Nadu and to document the traditional names, preparation and uses of these plants. This is the first ethnobotanical study in which statistical calculations about plants are done by ICF (Informant Consensus Factor) method. Field research was conducted by collecting ethno botanical information during structured and semi-structured interviews with native knowledgeable people in region. A total of 51 medicinal plants belonging to 31 families were identified in the area. These plants, used in the treatment of many different diseases, are freely harvested in this region at abundant amounts. In this assertion, the information collected from the traditional healers was used to compare with the already accessible literature on the ethnobotany of India. Results of the survey showed that leaf materials form the major component of plant parts harvested. The majority of the remedies are prepared in the form of dry powder from freshly collected plant parts. Most of the remedies are prepared from a variety of species, and are mainly taken orally. Most of the medicinal plants are collected from the wild. Annamalai hills and Chinchona village Ooty an important area for medicinal plants and associated local knowledge; the natural vegetation being the most important reservoir for the majority of the medicinal plants. Environmental and cultural variations are in the course of threatening the resources and this signals the need for thoughtful efforts to create public awareness so that measures are taken to conserve the plants in the natural ecosystems and other suitable environments.

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## INTRODUCTION

From the every stages of evolution, there is an extreme relationship between human beings and plants. In olden days people used to utilize several parts of plants not only of their daily jobs (e.g., fishing, hunting, etc.) but also as medicines for different treatment purposes. Though each single part of plant consist of numerous medicinal values, the crude plant is not advised to intake directly as it contains both essential and nonessential components.

The nonessential components either does not involve in healing process or toxic to the body. In some cases intake of the essential components via the crude extract may lead to an improper dose. Since current pharmacological reagents are restricted by the increasing spread and evolution of resistance and/or their undesired side effects, and are often difficult to synthesize as the pure bioactive stereoisomer, investigations to explore novel drugs, or those that can act as templates for the development of new therapeutic agents appears imperative.

India is commonly called as Botanical Garden of the world, outstanding to wealth of herbal medicines. India with 13 mega diversity and its great topographic and climatic and has a very rich and diverse flora and fauna. The uses of plants as medicines have been experienced from an ancient time. From around 1500 B.C. Rig Veda is one of the important earliest available documents which emphasizes about herbal medicinal knowledge. Later on Indian herbalists such as Maharshi Charaka and Sushruta worked in search of different herbal plant parts for different ailments of human body. Herbal medicine is the study and use of medicinal properties of plants. Therefore medicinal plants constitute precious resources for mankind. Among the Angiospermic plants, 420,000 flowering plants were reported from the world (Govaerts, 2001) and many tropical species are not yet named. More than 50,000 plants have been used for medicinal purposes (Schippmann *et al.*, 2002).

India is blessed with two (Eastern Himalayas and Western Ghats) of the eighteen worlds' hotspots of plant biodiversity and is seventh among the sixteen Mega diverse countries, where 70% of the world's species occur collectively. In India, there are over 17,500 species of higher plants, 64 gymnosperms, 1,200 pteridophytes, 2,850 bryophytes, 2,021 lichens, 15,500 fungi and 6,500 algae are reported. In India, the main traditional systems of medicine include Siddha and Ayurveda uses over 3000 plants have been reported. Traditional healers provide considerable information about the use of many plants or plant parts as medicine. Herbal medicines are assumed to be of great importance in the primary healthcare of individuals (Sheldon *et al.*, 1997) and communities in many developing countries as the herbal medicines are comparatively safer than synthetic drugs.

## MATERIALS AND METHODS

**Survey of ethno botanical properties plants in topslip (annamalai hills) and ooty (chinchona village):** Annamalai Hills are Located at a distance of 56kms from Pollachi, Coimbatore district. Anaimalai (Elephant Hills) is a wonderful hill station in Tamilnadu along the border of Kerala. Situated at a height of 265 meters altitude above the sea level, it is in the Coimbatore district.

The lush green hills and the varied flora and fauna attracts hundreds of tourists to Anaimalai each year. The name of the Annamalai Hill is derived from the Tamil term 'Anai' which signifies elephant and 'malai' which signifies hill. When put together the term 'Annamalai' signifies 'Elephant Hill'. The secret of Annamalai's mesmerising beauty lies in its geographical location. These hills form the meeting point of the Western and the Eastern Ghats. The altitude within the sanctuary ranges from 220 m in the foothills along the northern fringes to 2,513 m in the Grass Hills at the southern portion of the reserve. Different parts of the region experience widely varying rainfall ranging from 700 mm in the eastern reaches to more than 4000 mm in the western ranges mostly during the southwest monsoon. These hill ranges have been home to indigenous communities of different ethnic origin such as the Kadar, Muthuvar and Malai Malasars. Other tribal communities also live in the vicinity of the Annamalai hills, chiefly the Pulaiyars, Malasars, and Eravalars along the lower elevations. Though most of these communities were hunter-gatherers in the past they now live in sedentary units within the sanctuary largely along its fringes.

The Nilgiris district known as "The Queen of Hill Stations" is situated at an elevation of 900 to 2636 meters above MSL. Approximately 65% of the geographical area of this district lies at an altitude of above 1800-2500 meters above MSL and the remaining 35% at lower altitude. The climate is temperate to sub-tropical. The average annual rainfall ranges from 950 to 1550 mm. The average rainfall of this sub division is 1210.5 mm in 75 rainy days. The maximum temperature ranges from 10°C to 30°C and the minimum temperature ranges from 2°C to 14°C. The main soil type is lateritic red loam, the pH ranges from 3.9 to 7.5. Due to the receipt of adequate rainfall both during South West and North East monsoons and congenial agro-climatic conditions, foreign exchange earning crops like Tea and Coffee are grown on a large scale

**Disease categories:** Established on the knowledge obtained from the traditional healers and tribes in the study area, all the reported ailments were categorized into 15 categories (Table 1) viz. Antidote for poisonous bites, fever, infertility, Liver complaints, gastro-intestinal diseases, dermatological infections/diseases, respiratory systems diseases, genito-urinary diseases, skeleton-muscular system disorders, circulatory system/cardiovascular diseases, ear, nose, throat problems, cooling agents and general tonic. Several diseases were placed in one ailment category based on the body systems treated.

**Informant consensus factor (Fic):** The informant consensus factor (ICF) was used to see if there was agreement in the use of plants in the ailment categories between the plant users in the study area. The ICF was calculated using the following formula (Heinrich *et al.*, 1998): Where Nur refers to the number of use-reports for a particular ailment category and Nt refers to the number of taxa used for a particular ailment category by all informants. The product of this factor ranges from 0 to 1. A high value (close to 1.0) indicates that relatively few taxa are used by a large proportion of the informants. A low value indicates that the informants disagree on the taxa to be used in the treatment within a category of illness.

## RESULT AND DISCUSSION

**Documentation of indigenous ethnomedicinal knowledge from the traditional healer of topslip (annamalai hills) and ooty (chinchona village):** The present study revealed that the local people of traditional healer of top slip (annamalai hills) and ooty (chinchona village) region were using 51 species of medicinally important plants belonging to 30 families. These herbal plants were categorized into herb, climber, shrub and tree. The prominent family was lamiaceae with six species, followed by apocynaceae and compositae with four and three species respectively. For each reported species were provided the botanical name of the plant, family, local (Tamil) name, life form, use value, parts used, ailments treated, method of preparation, mode of administration and relative importance (Table-1). These are commonly occurring herbal plants used to treat various diseases like snake bites, scorpion sting, fever, diarrhea, dysentery, skin diseases, skin diseases, infertility, liver diseases and wound healing. This is constant with the other general observation which has been reported earlier in relation to herbal plant studies by the Indian Traditional System of Medicine like Siddha and Ayurvedha (Kirtikar and Basu, 2001; Anonymous, 1992).

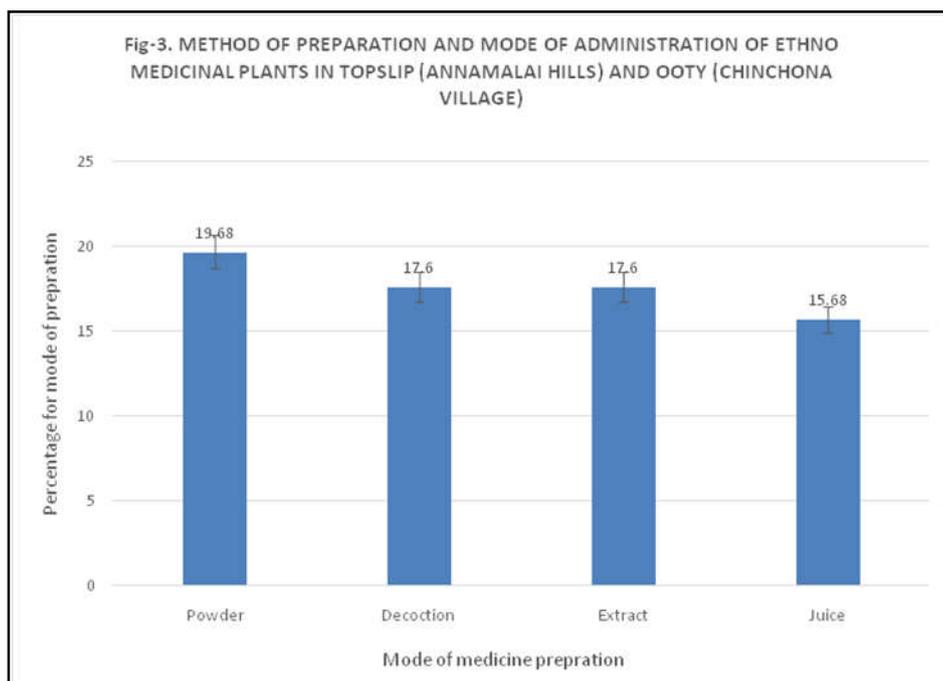
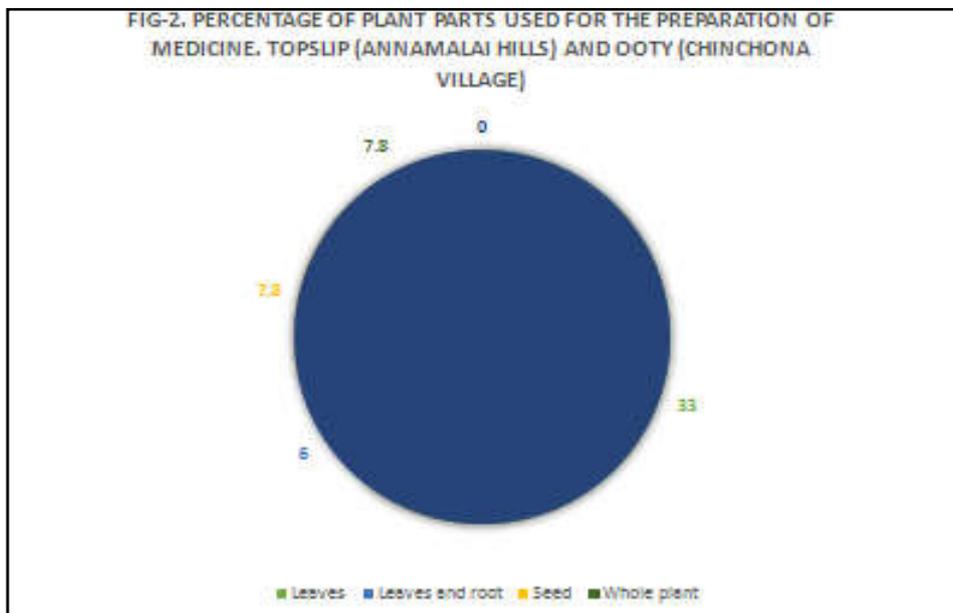
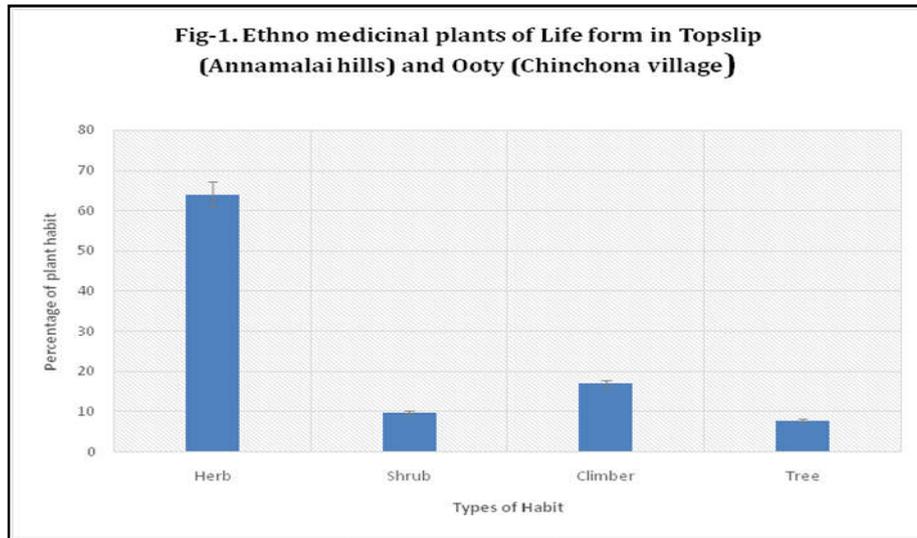


Table-1. Documentation of ethnomedicinally used Herbs in Top slip (Annamalai hills) and Ooty chinchona village

Botanical Name	Family	Habit	Vernacular Name	Part Used	Mode of Preparation	Medicinal properties
<i>Alternanthera sessilis</i>	Amaranthaceae	Herb	Ponanganni	Leaves	Roasted leaves	Roasted leaves internally used for improve vision power. The soup form of leaf extract internally used for prevention of tanning of skin.
<i>Borreria hispida</i>	Rubiaceae	Herb	Nathai choori	Seed and leaves	Direct application	Seed internally used for obesity, dysentery and diarrhoea. Leaf extract externally applied for chronic wood and cancerous affection.
<i>Cassia italica</i>	Caesalpinioideae	Herb	Nilavarai	Seed	Powder	This plant stem used for the treatment of osteoarthritis, rheumatoid arthritis and osteoporosis. The stem juice of plant is used to treat scurvy, menstrual disorders, otorrhoea and epistaxis.
<i>Justicia tranquebariensis</i>	Acanthaceae	Herb	Rathapalai	Leaves	Juice and paste	About 15-20 ml of leaf juice, is directed orally for every one hour up to half of the day for the antidote to Cobra bite and also externally applied the leaf paste wounded part.
<i>Mimosa pudica</i>	Mimosoidea	Herb	Thotarsiniki	Leaf and Root	Extract and Powder	The extracts are used in the treatment of headache, migraine, insomnia, diarrhoea, dysentery, fever, piles and fistula. Root is popularly used against cobra bite by snake charmers.
<i>Pavonia zeylanica</i>	Malvaceae	Herb	Peramutti	Leaf and root	Extract and powder	The roots of <i>P. odorata</i> are used for the preparation of perfumery like Hina. Moreover, the roots also have medicinal properties against intestinal haemorrhage, inflammation.
<i>Polygonum glabrum</i>	Polygonaceae	Herb	Aatru arali	Root and leaves	Oil and past	This plant combine with sesam oil is used in the form of demulcent for the treatment of leprosy and cancer. The plant is also used to treat hypertension, which is believed to be related to the fact that in rural areas, where the incidence is lower, the leaf of buckwheat is used as a food.
<i>Ruta graveolens</i>	Rutaceae	Herb	Arvada	Whole plant	Powder	Decoction of the roots of the plant is used as anti-venom. The leaves of this plant infused with vinegar are given to children for the treatment of convulsion and other nervous disorders. An aqueous decoction of the leaves is used for the treatment of fever.
<i>Leuca saspera (Willd.)</i>	Laniaceae	Herb	Thumbai	Flower	Flower boil with cow milk	The plant is used traditionally as an antipyretic and insecticide. Flowers are valued as stimulant, expectorant, aperient, diaphoretic, insecticide and emmenagogue. Leaves are considered useful in chronic rheumatism, psoriasis and other chronic skin eruptions
<i>Urginea indica</i>	Liliaceae	Herb	Narivengayam	Scale leaves	External application	Roasted leaves externally applied for corn and warts.
<i>Sida cordifolia</i>	Malvaceae	Herb	Sitra mutti	Whole plant	Fresh water extract with Goat milk	Fresh extract of the plant combine with goat milk used for problems of stomach, genitourinary system, liver, kidney and spleen. It is bitter, astringent, stomachic, diuretic, febrifuge and antiseptic. The whole plant is used in gonorrhoea.
<i>Salvia officinalis</i>	Lamiaceae	Herb	Sage	Seed and leaves	Powder	In tea form of leaves and seed have been used traditionally for the treatment of digestive and circulation disturbances, bronchitis, cough, asthma, angina, mouth and throat inflammation.
<i>Ocimum gratissimum</i>	Lamiaceae	Herb	Kanjankorai	Leaves and root	Decoction	It has many folk uses, including antidiarrhoeal effects. For this purpose, an aqueous extract of the leaves is taken alone, and diarrhoea ceases after about 4 h. Fresh leaves juice are used to treat a variety of diseases like upper respiratory tract infections, diarrhoea, headache, fever, ophthalmic, skin diseases, and pneumonia.
<i>Cassia occidentalis</i>	Caesalpinioideae	Herb	Ponnararai	Leaves and Root	Extract.	Extract of leaves and seeds externally used for skin diseases and it acts as an Antiperiodic It mainly used to detoxify liver, use to cure internal bacterial and fungal disorders, to kill parasites and viruses, enhances immunity. Seeds are brewed into a coffee-like beverage for asthma, and a flower infusion is used for bronchitis.
<i>Datura stramonium</i>	Solanaceae	Herb	Seemai Oomathai	Leaves	Dried leaves	The dried leaves smoked for reliving asthma. Mild juice of the leaves recommended for snake bite.
<i>Tribulus terrestris L.</i>	Zygophyllaceae	Herb	Neringil	Whole plant	Powder	Tribulus is very well utilized through many formulations. Its cleansing effect on urinary system, its usage in urinary calculi suggests towards its diuretic activity.
<i>Elephantopus scaber</i>	Compositae	Herb	Annaikal suvati	Leaves	Decoction	Leaf decoction internally used for all types of fever. And also externally washed for chronic wound. the whole plant is used in the form of decoction to stimulate diuresis v s, reduce fever and to eliminate bladder stones.
<i>Oxalis corniculata</i>	Oxalidaceae	Herb	Puliyarai	Leaves and Flower	Raw of cooked	The whole plant is edible and used in salads to be eaten raw. Leaves and flowers are used as remedy for fever, influenza, diarrhea, traumatic injuries and urinary tract infections. Leaves also work as an antidote for poison such as snakebite, Datura.

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<i>Peperomia pellucida</i>	Piperaceae	Herb	Azhukanni	Leaves	Extract or cooked	Whole plant extract used to treat abscesses, boils and skin wounds, eye inflammation(conjunctivitis)lower blood cholesterol level and also recommended for proteinuria. The leavers used to cure measles, small-pox, male impotence, mental disorders and breast cancer
<i>Curculigo orchioides</i>	Hypoxidaceae	Herb	Nilapanai Kizhangu	Root tubers	Powder	Root tubersare tonic for health and cures general weakness. It is also prescribed in <a href="#">treatment of piles, jaundice</a> , asthma, diarrhea and gonorrhoea. It is present in several herbal formulations for gynecological problems and sexual weakness of males.
<i>Costus speciosus</i>	Costaceae	Herb	Kostam	Rhizomw and Leaves	Juice or decoction	The plant parts has many medicinal uses, juice of the rhizome is applied to head for cooling and relief from head-ache, bruised leaves are applied for fever, decoction of stem is used in fever and dysentery, patients with high fever mostly utilize leaf infusion or decoction as a sudorific and diabetic mellitus or in a bath, sap from leaves, young stems are used against diarrhea cough, cuts, wounds, scabies, antidote for snake bite, jaundice, arthritis, burning sensation, constipation.
<i>Rauwolfia serpentina</i>	Apocynaceae	Herb	Sarpagantha	Root	Powder or decoction	The root helps to reduce blood pressure, depresses activity of central nervous system and acts as a hypnotic. It is used as an antidote to the bites of poisonous reptile like snakes. It is also used to treat dysentery and other painful affections of the intestinal canal.
<i>Justicia gendarussa</i>	Acanthaceae	Herb	Neer notchi	Leaves	Decoction	Leaf of the plant is recommended to treat ailments such as fever, hemiplegia, rheumatism, arthritis, headache, earache, muscle pain, respiratory disorders, and digestive trouble.
<i>Rauwolfia tetraphylla</i>	Apocynaceae	Herb	Pambukala	Root	Powder	Root powder mixed with castor oil externally used for skin diseases and also antidote for insect bites and destroy parasites. 10 years old plant root powder 5 to ten gram internally taken with milk for all snake bites.
<i>Leucas aspera</i>	Lamiaceae	Herb	Thumbai	Leaves and Flower	Juice	Juice of the flowers is combined with cow milk and is internally useful in the treatment of coughs, cold and asthma this prepration is especially recommended for the children. Two or three drops of flower juice are used for nasal blackness
<i>Emilia sonchifolia</i>	Compositae	Herb	Thumbai	Leaves and Flower	Juice	Leaf juice treating night blindness, epilepsy, fever and inflammatory diseases, malaria, asthma, liver diseases, eye inflammation, influenza, burns and breast abscesses.
<i>Solanum indicum</i>	Solanaceae	Herb	Karimulli	Seed	Seed powder	The smoke from burning seeds is said to relieve toothache. In Africa, the plant is used against itch and ringworm. Root is carminative and expectorant, useful in coughs and catarrhal affections, dysuria and colic. A decoction of root is prescribed as a tonic and is also used in difficult parturition.
<i>Trichodesma indicum</i>	Boraginaceae	Herb	Kavizhthumbai	Leaf	Past and Juice	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. Leaves paste of T. indicum was used in chest problem. Leaf Juice is used for external ear pain and wounds.
<i>Pedaliium murex</i>	Pediliaceae	Herb	Anainerinchil	Fruit and Seed	Extract and powder	Leaf extract internally used forleucorrhea and syphylitic. Fruit powder internally used for renal failure and kidney stone disorder.
<i>Euphorbia hirta</i>	Euphorbiaceae	Herb	Amman-pacharisi	Whole plant	Decoction	Decoction of dry herbs is used for skin diseases. Decoction of fresh herbs is used as gargle for the treatment of thrush.
<i>Rosmarinus officinalis</i>	Lamiaceae	Herb	Rosmarina	Whole plant	Extract and decoction	Both fresh and dried leaves of rosemary have been used for their characteristic aroma in food cooking or consumed in small amount as herbal tea, while rosemary extracts are routinely employed as natural antioxidant to improve the shelf life of perishable foods.
<i>Digitalis purpurea</i>	Scorpphulariaceae	Herb	Nari pugai illai	Leaves	Decoction	The powder of Digitalis is given in a dose of 250 mg to 300 mg to treat cough, asthma and inflammation of the lungs.The powder of Digitalis is given with hot water or cow urine in a dose of 300-500 mg to treat pedal edema due to cardiac disease.
<i>Artemisia annua</i>	Compositae	Herb	Inipu puzhu kolli	Seed	Decoction	The seed decoction internally used for various types of fever, such as summer heat with low fever, headache, dizziness and tightness in the chest.
<i>Mentha citrata</i>	Lamiaceae	Herb	Ellumichai puthina	Leaf	Tea	Leaves tea form beneficial effect on digestion, use as an antiseptic, and as an <i>herbal</i> tea remedy for headaches and general ailments.

Table-2. Documentation of ethnomedicinally used climbers in Top slip (Annamalai hills) and Ooty chinchona village

<i>Asparagus Racemosus</i>	Liliaceae	Climber	Thannivitan kizhangu of satavari	Root tubers	Dried powder of boiled root	Its roots have reproductive tonic, galactagogue, anti-diarrhoeatic, anti-dysenteric.
<i>Cocculus hirsutus</i>	Menispermaceae	Climber	Kattukoti	Leaves	Root and leaves decoction and juice	Decoctions of the root is mixed with long pepper is used in chronic rheumatism and syphilitic cachexia. Juice of leaves coagulates in water and forms mucilage which is used externally as cooling medicine in eye problems and soothing application in prurigo, eczema, impetigo and dyspepsia.
<i>Cyclea peltata</i>	Menispermaceae	Climber	Malaitanki	Root and leaves	Root and leaves decoction and juice	Paste of leaves and root is used in purities, skin disorders and snake poison. Juice or powdered roots are used as a nasya.
<i>Solanum trilobatum L.</i>	Solanaceae	Climber	Thuthuvelai	Leaf	Leaf fry with sesam oil	Leaves fry with ghee to cure numerous diseases viz., respiratory problems and bronchial asthma. The leaf extracts are used to increase male fertility and to cure snake poison.
<i>Passiflora foetida</i>	Passifloraceae	Tendrill climber	Siruppunaikkal	Leaves and Fruit		The decoction of leaves and fruits to treat asthma and biliousness, leaves and root decoction is emmenagogue, used in hysteria and leaf paste is applied on the head for giddiness and headache
<i>Aristolochia indica</i>	Aristolochiaceae	Climber	Eswara mooli	Root	Fresh and dried powder	The fresh juice of the root is a popular antidote to snake poison. The roots are used externally for skin diseases and locally applied for abortifacient.
<i>Dioscorea bulbifera</i>	Dioscoreaceae	Climber	Vettilai kodi kizhangu	Stem bulbils	Cooked	The traditional process is fresh Stem bulbils covered by cow dung and burn with rice cooked stove after remove cow dung and washed Stem bulbils directly eaten for inflammatory diseases, female reproductive problem.
<i>Tylophora indica</i>	Asclepiadaceae	Climber	Nanchu aruppan	Leaves and root	Paste	The paste of the leaves 5 gram internally used for all poisonous bites. Decoction of the root used for asthma.
<i>Rubia cordifolia</i>	Rubiaceae	Climber	Manchitti	Root	Powder	The root powder of the manjiti internally used hepatopathy, specifically jaundice and intermittent fevers.
<i>Pergularia daemia</i>	Asclepiadaceae	Climber	Veliparuthi	Leaves	Juice	Fresh leaf used as fish poison, while leaf juice used for amenorrhea, dysmenorrhoeal, catarrhal infections, infantile diarrhea.

Table-3. Documentation of ethnomedicinally used shrub and tree in Top slip (Annamalai hills) and Ooty chinchona village

<i>Glycosmis pentaphylla</i>	Rutaceae	Shrub	Kozhingi	Leaves	Extract	Paste of leaves is used externally in eczema and other skin affections. Root is beneficial in fever and fruits used in dysentery.
<i>Carissa carandas</i>	Apocynaceae	Shrub	Kattu kala	Fruit and flower	Juice	Unripe fruit used for appetizer, antiscorbutic, cooling, acidic, stomachic, anthelmintic and flower juice is used for ophthalmic diseases specifically eye catarrh.
<i>Randia dumetorum</i>	Rubiaceae	Shrub	Madkarai	Stem	Decoction	The stem bark decoction used as astringent in cases of diarrhoea and dysentery. It is administered internally and applied externally in the form of paste in rheumatism and to relieve pain of bruises and bone aches during fevers and to disperse abscesses.
<i>Calotropis gigantea</i>	Asclepiadiaceae	Shrub	Erukku	Leaves	Hot	The purified flower petal combine with pepper internally used for asthma.
<i>Lippia citriodora</i>	Verbenaceae	Shrub	Elumichai notch	Leaves	Decoction	The leaves are used in the form of decoction for antispasmodic, antipyretic (fever reducer), carminative, sedative, stomachic, and bacterial infection.
<i>Cinchona officinalis</i>	Rubiaceae	Small tree	Goina maram	Stem bark	Decoction	Stem bark decoction internally used for malarial fever and intestinal worm
<i>Premna tomentosa</i>	Verbenaceae	Small tree	Pitangu nari	Leaves	Decoction	Decoction of the leaves used for liver diseases.
<i>Cinnamomum camphora</i>	Lauraceae	Small tree	Karpura maram	Stem bark	Powder	Stem bark powder used to treat fungal infections of the toenail, warts, cold sores, hemorrhoids, and osteoarthritis
<i>Melia azadirachta</i>	Meliaceae	Small tree	Malai vembu	Leaves	Extract	The leaves extract internally used for fever and externally applied for chronic wound.



*Alternanthera sessilis*



*Borreria hispida*



*Cassia italica*



*Justicia tranquebariensis*



*Mimosa pudica*



*Pavonia zeylanica*



*Polygonum glabrum*



*Ruta graveolens*



*Urginea indica*

Fig-1a. Documentation of ethnomedicinally used Herbs in Top slip (Annamalai hills) and Ooty



*Sida cordifolia*



*Tribulus terrestris*



*Salvia officinalis*



*Ocimum gratissimum*



*Cassia occidentalis*



*Datura stramonium*



*Elephantopus scaber*



*Oxalis corniculata*



*Peperomia pellucida*

Fig-1b. Documentation of ethnomedicinally used Herbs in Top slip (Annamalai hills) and Ooty



*Curculigo orchioides*



*Costus speciosus*



*Rauvolfia serpentina*



*Justicia gendarussa*



*Rauvolfia tetraphylla*



*Leucas aspera*



*Emilia sonchifolia*



*Solanum indicum*



*Trichodesma indica*

Fig-1c. Documentation of ethnomedicinally used Herbs in Top slip (Annamalai hills) and Ooty

*Pedalium murex**Euphorbia hirta**Rosmarinus officinalis**Artemisia annua**Mentha citrata**Digitalis purpurea*

Fig-1d. Documentation of ethnomedicinally used Herbs in Top slip (Annamalai hills) and Ooty

**Ethno medicinal plants of life form and parts used in topslip (annamalai hills) and ooty (chinchona village):**

Herbs were the primary source of medicine (64%) followed by climbers (17%), shrubs (9.8%) and tree (7.8%) (Fig-1). The frequent use of herbs among the indigenous communities is a result of wealth of herb plants in their neighbourhoods. Similarly, Tirunelveli hills harbours more number of herbs as compared to trees, shrubs and climbers (Manickam *et al.*, 2004). Among the different plant parts used, the leaves (50%) were most frequently used for the preparation of medicine solely or mixed with other plant parts. It was followed by Leaves (33.3%), Leaves and root (11.76%), whole plant (7.8%), Seed (7.8%), bark, resin and young twig (2% each) (Fig-2). Numerous indigenous communities in another place also utilized mostly leaves for the preparation of herbal medicines (Gonzalez *et al.*, 2010). The reason for leaves were used mostly as medicine due to they are collected very easily than underground parts, flowers and fruits etc. and in scientific point of view leaves are active in photosynthesis and synthesis of secondary metabolites (Ghorbani, 2005; Giday *et al.*, 2009).

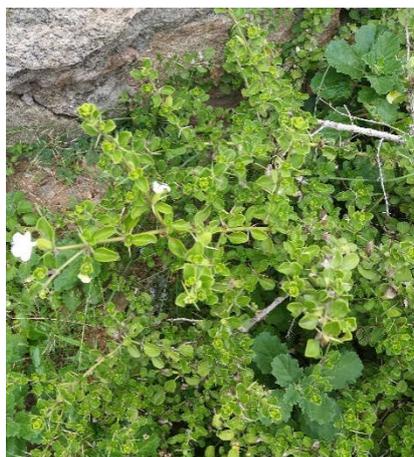
**Method of preparation and mode of administration of ethno medicinal plants in topslip (annamalai hills) and ooty (chinchona village):** The preparation and utilization of plant parts were grouped into four categories (Fig-3).

Of these, most commonly used method of preparation was powder (19.60%) followed by decoction (17.6%), juice (15.68%), extract (17.6) (5%, taken as raw and plant part prepared as pickles). The paste was prepared by grinding the fresh or dried plant parts with oil or water. The powder was prepared by the grinding of shade dried plant parts. The decoction was obtained by boiling the plant parts in water until the volume of the water reduced to minimum or required amount. Preparation of powder and decoction for the treatment of ailments is a common practice among the other tribal communities in India (Sankaranarayanan *et al.*, 2010; Giday *et al.*, 2010; Roosita *et al.*, 2008).

**Informant consensus factor:** Generally ICF of local knowledge for disease treatment depended on the availability of the plant species in the study area. In order to use the informant consensus factor, we classified the illnesses into broad disease categories. The ICF values in our study are ranged from 0.52 to 0.61. The use categories with more than 17 use-reports were skin infections/diseases (28 use-reports, 14 species), gastro-intestinal diseases (20 use-reports, 11 species) and female reproductive disorders (32 use-reports, 23 species). In the present study, endocrinal disorders and liver problems had the highest ICF of 0.64 and 0.69 respectively and it is in

*Asparagus racemosus**Cocculus hirsutus**Cyclea peltata**Passiflora foetida**Aristolochia indica**Dioscorea bulbifera**Tylophora indica**Rubia cordifolia**Pergularia daemia*

**Fig. 2.** Documentation of ethnomedicinally used climbers in Top slip (Annamalai hills) and Ooty

*Glycosmis pentaphylla**Carissa carandas**Randia dumetorum**Calotropis gigantea**Lippia citriodora**Cinchona officinalis*

agreement with the previous studies among the neighboring indigenous communities in Tamil Nadu, India; diabetes and jaundice had the highest Fic of 1.00 among the Irulas in Thanjavur district (Ragupathy and Newmaster, 2009), jaundice has the highest Fic of 0.92 among the Malasar tribals in Coimbatore district (Ragupathy *et al.*, 2008) and 0.923 among the Paliyar tribals in Theni district (Pandikumar *et al.*, 2011). *Curculigo orchioides* and *Elephantopus scaber* were very commonly used for the treatment of fever and infertility correspondingly in these studies.

### Conclusion

The present study revealed that traditional medicines were immobile in common use by the Top slip (Annamalai hills) and Chinchona Village, Ooty traditional user and tribal communities accurate knowledge of the plants and their medicinal properties were held by only a few individuals in this community. Hence a need for detailed investigation of ethnobotanical knowledge held by each traditional user community is required before such valuable knowledge vanishes. Thus, our work would be useful in preventing the loss of ethnomedicinal traditions of Top slip (Annamalai hills) and Chinchona Village, Ooty traditional user communities. The new claims which are recorded from the study area showed that still much can be learned from investigating herbals available abundantly in the forests. The plants with maximum loyalty level and use values in the present study may specify the possible existence of valuable phytochemical compounds and it requires a search for potential new drugs to treat various ailments.

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