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Ethno medicinal knowledge of plants used by irula tribes, nellithurai beat, the Nilgiris, Tamil Nadu, India

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ABSTRACT

Background: The study of local knowledge about natural resources is becoming increasingly important in defining strategies and actions for conservation. In recent years, work in ethnobotanical knowledge worldwide has increased especially in some parts of Europe, Asia, and Africa. India, a country with a rich culture and traditional knowledge, has contributed a major share of the world's ethnobotanical work. **Aims and Objectives:** The main objectives behind this study was to record the plants used for medicinal purposes in Nellithurai Beat through regular field visits because there is no previous reports on the documentation of medicinal plants from Nellithurai Beat, Karmadai Range, Western Ghats, Tamil Nadu, India. **Materials and Methods:** An ethnomedicinal survey was conducted from January - 2016 to March – 2016. The information on ethnomedicinal uses of plants was obtained through direct field interviews and designed questionnaire. Their vernacular name, family, mode of preparation and medicinal uses were recorded by interviewing the locals of different age groups. **Results:** During the present study plant species belonging to 36 families were documented. Of the 40 plant species documented 14 were Shrubs,12 Trees, 10 Herbs, 3 Climbers and 1 Epiphyte. Leaves and whole plants are the most widely (50% and 23%) used plant part of the reported medicinal plants and decoction are the most widely (48%) used mode of preparation. **Conclusion:** The study revealed that tribal community have a great faith in the traditional healing system and they rely on medicinal plants for treatment of various diseases. Due to continuous loss of vegetation, it is necessary that suitability requirements are needed in order to protect the traditional knowledge in a particular area with reference to medicinal plant utilization and the study will be useful for future ethno-pharmacological research for the discovery of new drugs.

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Key words: Medicinal plants, Nellithurai beat, Indigenous knowledge, Ailments

INTRODUCTION

Plants are playing an important role in the health of millions of people's life in many villages of India in their day today life by its traditional usage. Herbal medicine is the foundation for about 75– 80% of the world population, mainly targeting primary health care in the developing countries because of better cultural acceptability, compatibility with human body and lesser side effects. However, there is a drastic increase in the usage of herbal medicine was found in last few years from the developed countries. [1]

India is gold mine of practical knowledge on traditional herbal medicines. But unlike China, India has not been able to capitalize on this wealth by promoting its use in the developed world despite their renewed interest in herbal medicines.[2] It is a country rich in indigenous herbal resources which grow on their varied topography and under changing agro climatic conditions permitting the growth of almost, over 6000 plants which are used in traditional, folk and herbal medicines. But only 3000 plants are medicinally recognized for their value, representing about 75% of the medicinal needs of the third world countries.[3]

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Today, continued deforestation and environmental degradation in many parts of India have brought about depletion of medicinal plants and their associated knowledge.[4] The tribal and rural people of various parts of India are highly depending on medicinal plant therapy for meeting their health care needs. However, valid scientific data on the usage of ethnomedicinal plants is rather obscure. This is attracting the attention of several botanists and plant scientists who directing vigorous researches towards the discovery or rediscovery of several medicinal plants along with their medicinal remedies for various diseases. Several workers were reported the utility of plants for the treatment of various diseases by the different tribal and rural people inhabiting in various regions of TamilNadu.[5] Therefore, collection of ethnobotanical information and documentation of traditional knowledge has gained prominence from the perspective of drug development.[6]

The main objective of this study was to assess the diversity of ethnomedicinal plants used by Irulas of Nellithurai beat and document the traditional medical practices followed in healing aliments. Therefore, documenting indigenous knowledge through ethnobotanical studies is important for the conservation of biological resources and their sustainable utilization.

MATERIALS AND METHODS

Study area

The present study was conducted in Nellithurai beat, Karamadai range, Coimbatore district, Western Ghats, Tamil Nadu during January -2016 to March – 2016. The study area is rich in vegetation and lies between the longitudes 76º - 53”and latitudes 11º - 18’and has twelve villages with a total area of about 6207 Hec. long and it lies at 820-910 msl elevations. Temperature in the area ranges from 21ºC to 30ºC. The annual average rain fall ranges from 1000 to 1400 mm. The black and red soil, bright sunlight is the two important natural resources abundantly available in this region which are responsible for the development of the vegetation having variable medicinal properties.

Collection of information

The information on ethnomedicinal uses of plants was obtained through direct field interviews and designed questionnaire with knowledgeable people of the villages and traditional healers. The data regarding names of plant parts used and their method of preparation and mode of administration of various remedies were also noted down. The medicinal value of each plant was enumerated viz., Botanical name, habit, family, vernacular name, parts used, ethnomedicinal uses and mode of action.

Identification

The plant materials were identified with the help of standard local floras (Flora of Presidency of Madras and Fyson), Preliminary identification was done by examining fresh plants products from the field with the help of villagers. Few respondents were more informative and co-operative. They have shown fresh plants in the habitat, which was useful for the final identification. The identification of plant materials was confirmed with the help of published data.

RESULTS

Ethnomedicinal survey

A total of 40 medicinal plants belonging to 36 families were collected simultaneously recording their Vernacular names. These were reported to be used in the cure and treatment of innumerable ailments. Their botanical names, vernacular names, families, part(s) being used, mode of action and medicinal uses are shown in Table 1. Most of the plants are wholly medicinal. The local tribals of Nellithurai beat are using these plants to cure many diseases like Asthma, Jaundice, Tuberculosis, Leprosy, Rheumatism, cough, fever, vomiting, skin diseases, hypertension, wound healing, diabetes, anti inflammation, anti cancerous, etc.,

The families with the largest number of plant species were Acanthaceae, Fabaceae, Euphorbiaceae and Rubiaceae with 2 species each, The remaining plant families had one species each (Table 2). Among the recorded species shrub (35%) were found to be dominating over, trees (30%), herbs (20%), climber (7.5%) and epiphyte (2.5%) (Table 3).

Analysis of the plant’s parts used showed that leaves are the mostly used plant parts (50%) followed by whole plants (23%), root, stem and fruit (10%), seeds (5%) and gum, tuber and latex (2.5% each) (Figure 1). The most frequently cited modes of plant used are as decoction (48%), juice (15%), paste (12.5%), extraction and tonic (7.5%), infusion (5%) and raw (2.5%) (Figure 2).

DISCUSSION

Medicinal plants used in the modern healthcare system are, obviously, from the accumulated knowledge on folk medicine of different sources, worldwide. WHO has listed about 21,000 plant species around the world that are used in the healthcare systems.[7] Among 60,000 flowering plants in India, about 3000 plants are identified to be used as ethno medicine or folk medicine, and of them about 1500 plants are used in Indian Ayurveda, Unani and Siddha system.[8]

Table 1: List of Medicinal plants used by the Irula Tribes of Nellithurai beat

S. No	Botanical name	Habit	Family name	Local name	Parts used	Medicinal usage	Mode of action
1.	*Abrus precatorius, L.*	Climber	Fabaceae	Gundumani	Seed, leaves	Eyediseases, asthma, gonorrhea, swellings	Decoction
2.	*Adenanthera pavonina, L.*	Tree	Mimosaceae	Coral wood	Leaves	Diarrhea	Juice
3.	*Barleria buxifolia, L.*	Shrub	Acanthaceae	Kallimullu & Rosmullippuntu	Leaves	Respiratory diseases, tooth ache, joint pains	Extraction
4.	*Borreria ocymoides, Dc.*	Herb	Rubiaceae	Peeli	Leaves	Ring worm and eczema	Decoction
5.	*Breynia retusa, L.*	Shrub	Euphorbiaceae	Perin-nirouri	Stem and Leaves	Conjunctivitis, hasten suppuration	Tonic
6.	*Cansjera rheedii, J.F.Gmel.*	Climbing shrub	Opiliaceae	Kalimanak keerai	Leaves	Anti diabetes and anti inflammatory	Paste
7.	*Capparis grandiflora, Wall.*	Shrub	Capparidaceae	Mudkondai	Pulp and root	Gastralgia, vomiting, abdominal pain	Decoction
8.	*Cereus pterogonus, Lem.*	Shrub	Cactaceae	Ooci kalli	Whole plant	Purgative, astringent, constipating, refrigerant, anti periodic and antipyretic	Extraction
9.	*Chloroxylon swietenia DC.*	Tree	Rutaceae	Purush	Leaves	Wound healing	Decoction
10.	*Cipadessa baccifera, (Roth.) Miq.*	Shrub	Meliaceae	Pullipancheddi & savattuchedi	Whole plant	Indigestion	Juice
11.	*Crotalaria pallida, Aiton.*	Shrub	Fabaceae	Kilukiluppai	Leaves	Vermifuge, fever	Extraction
12.	*Croton bonplandianum Baill.*	Tree	Euphorbiaceae	Yeliaamanakku	Leaves	Cuts and wounds to stop bleeding	Infusion
13.	*Dactyloctenium aegyptium, (L.) P. Beauv.*	Herb	Poaceae	Kakkakalpul	Whole plants, seeds	Dysentary, anti inflammatory, Urinary diseases	Extraction
14.	*Decalepis hamiltonii, Wight & Arn.*	Climber	Asclepidaceae	Magalie	Tuber	Wound healing, fever, bronchial, asthma.	Tonic
15.	*Decaschistia crotonifolia, Wight. & Arn.*	Shrub	Malvaceae	Kallasedi	Leaves, root	Fever and cough	Decoction
16.	*Diospyrous malabarica, (Desr.) Kostel.*	Tree	Ebenaceae	Benson	Fruit	Cold, astringent, anti bacterial	Infusion
17.	*Diplocyclos palmatus, (Linn.) Jeffrey.*	Climber	Cucurbitaceae	Shivalingi	Fruits &	Jaundice, inflammation and fever	Juice
18.	*Drypetes sepiaria, (Wight & Arn.) Pax & K.Hoffm.*	Tree	Euphoriaceae	Thanuvam	Fruit and bark	Fever, diarrhea	Decoction
19.	*Ecbolium viride, (Forssk.)*	Shrub	Acanthaceae	Nilaambari	Leaves, roots	Anti inflammatory	Decoction
20.	*Erythroxylon monogynum, Roxb.*	Large shrub	Erythroxylaceae	Devadary	Wood and bark	Stomachic, diaphoretic and diuretic	Infusion
21.	*Ficus carica, L.*	Tree	Moraceae	Simaiyattai	Bark, leaves, shoot	Anti-inflammatory, throat infection	Decoction
22.	*Grevillea robusta, A. Cunn.*	Shrub	Proteaceae	Savukkumaram	Leaves	Antibacterial, antifungal and anti-inflammatory	Decoction
23.	*Hemionitis arifolia, (Burm.F.)*	Herb	Cheilanthaceae	Chakuliya	Leaves	Anti diabetes anti inflammation	Decoction
24.	*Holoptelea integrifolia Planch.*	Tree	Ulmaceae	Bachi	Stem &Bark	Anti inflammatory	Decoction
25.	*Ixora arborea, Roxb.ex SM.*	Small shrub	Rubiaceae	Vedchi	Whole plant	Diarrhea, nausea, cough, asthma, wounds and sores.	Paste
26.	*Jasminum trichotomum, B. Heyneex Roth.*	Climbing shrub	Oleaceae	Parumalli	Whole plant	Analgesic, antipyretic	Decoction
27.	*Kyllinga triceps, Rohb.*	Herb	Cyperaceae	Veluttanirbasi	Leaves	Antidiabetics	Juice
28.	*Leucas Longifolia, Hk. f.*	Large shrub	Lamiaceae	Irana-peri	Whole plant	Hypertension, cough, headaches, fever, cough.	Decoction
29.	*Ludwigia peruviana,(L.) H.*	Herb	Onagraceae	Kattukkirampu	Whole plants	Dysentery, purgative, vermifuge	Decoction
30.	*Odina Wodier Roxb.*	Tree	Anacardiaceae	Odayam.	Plant and Bark Gum Stem and bark	Used to treat leucorrhoea, eye diseases used in the treatment of ulcers Used for treating bruises, sprains Used as a remedy for wounds	Decoction
31.	*Passiflora leschenaultia, Dc.*	Shrub	Passifloraceae		Leaves	Blood pressure, diabetes	Decoction

(Contd...)

Table 1: *Continued*

S. No	Botanical name	Habit	Family name	Local name	Parts used	Medicinal usage	Mode of action
32.	*Pedalium murex,*	Herb	Pedaliaceae	Yanai nerunjil	Whole plants	Puerperal diseases, digestive tonics, ulcer	Juice
33.	*Physalis minima, L.*	Herb	Solanaceae	Kupanti	Leaves	Laxative, abdominal troubles	Juice
34.	*Plumbago zeylanica L.*	Herb	Plumbaginaceae	Chithiramoolam (or) Venkodiveli	All parts	Piles , diarrhoea, leprosy and jaundice	Paste
35.	*Pterolobium indicum A.Rich.*	Small tree	Caesalpiniaceae	Indumullu	Root	Used in fever, spermicidal activity	Decoction
36.	*Salvadora persica, L.*	Tree	Salvadoraceae	Uka	Leaves	Antiplaque, analgesic	Tonic
37.	*Santalum album L.*	Tree	Santalaceae	Sandhanam	Leaf and Stem	Gastric irritability, dysentery, Skin diseases, gonorrhea	Paste
38.	*Scurrula parasitica, L.*	Parasite	Loranthaceae	-	Leaves	Reduce swelling, lower blood pressure, liver diseases	Decoction
39.	*Strychnos nux-vomica, L.*	Tree	Loganiaceae	Yetti	Stem, bark	Stomach pain, dysentery, fever, cold	Decoction
40.	*Triumfetta pilosa, Wall.*	Shrub	Tiliaceae	Ottupulla	Leaves	Antidiabetes and anti oxidant	Decoction

Table 2: Distribution of species among different families

S. No	Family name	No. of species	Percentage	Total no. of species
1.	Acanthaceae	2	5	40
2.	Anacardiaceae	1	2.5	40
3.	Asclepiadaceae	1	2.5	40
4.	Cactaceae	1	2.5	40
5.	Caesalpiniaceae	1	2.5	40
6.	Capparidaceae	1	2.5	40
7.	Cheilanthaceae	1	2.5	40
8.	Cucurbitaceae	1	2.5	40
9.	Cyperaceae	1	2.5	40
10.	Ebenaceae	1	2.5	40
11.	Erythroxylaceae	1	2.5	40
12.	Euphorbiaceae	2	5	40
13.	Fabaceae	2	5	40
14.	Lamiaceae	1	2.5	40
15.	Loganiaceae	1	2.5	40
16.	Loranthaceae	1	2.5	40
17.	Malvaceae	1	2.5	40
18.	Meliaceae	1	2.5	40
19.	Mimosaceae	1	2.5	40
20.	Moraceae	1	2.5	40
21.	Oleaceae	1	2.5	40
22.	Onagraceae	1	2.5	40
23.	Opiliaceae	1	2.5	40
24.	Passifloraceae	1	2.5	40
25.	Pedaliaceae	1	2.5	40
26.	Plumbaginaceae	1	2.5	40
27.	Poaceae	1	2.5	40
28.	Proteaceae	1	2.5	40
29.	Rubiaceae	2	5	40
30.	Rutaceae	1	2.5	40
31.	Salvadoraceae	1	2.5	40
32.	Sapindaceae	1	2.5	40
33.	Scorphulariaceae	1	2.5	40
34.	Solanaceae	1	2.5	40
35.	Tiliaceae	1	2.5	40
36.	Ulmaceae	1	2.5	40

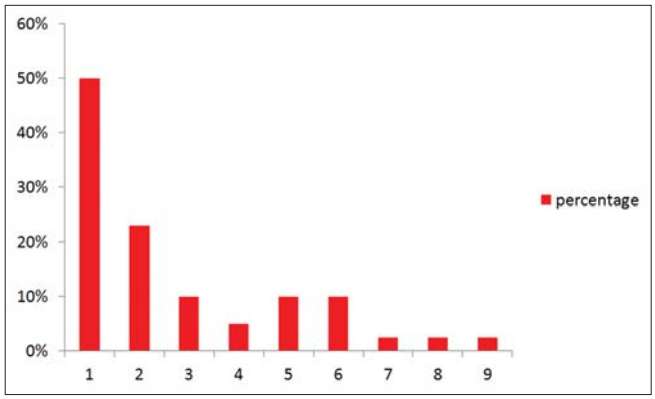

Figure 1: Histogram showing the percentage of parts used

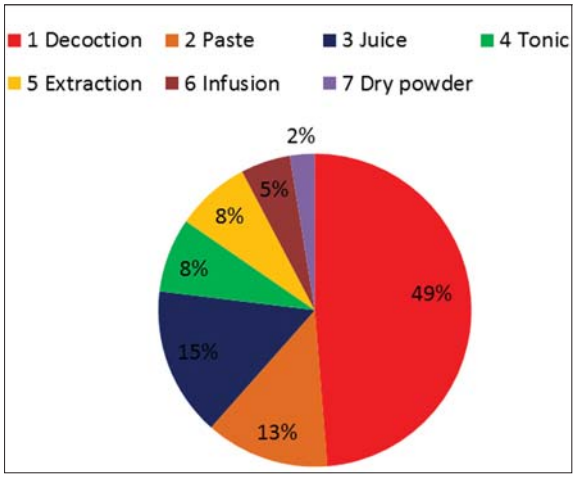

Figure 2: Pie diagram showing the mode of action of ethnomedicinal plants

In the present study 40 plants belonging to 36 families were identified with their medicinal uses. Similar ethnobotanical studies have been reported in several parts of India to document the traditional knowledge that has been vanishing.[9-12] Indigenous knowledge of folk is the important sources of locating bio-resources of the locality. The people have been using plant remedies against various ailments from time immemorial without

Table 3: Analysis of the data based on habit

S. No	Habit	Number of species	Percentage	Total no. of species
1.	Shrubs	14	35	40
2.	Trees	12	30	40
3.	Herbs	10	20	40
4.	Climbers	3	7.5	40
5.	Epiphytes	1	2.5	40

knowing their effective constituents.[13] This finding of common medicinal plant families in the study is in agreement with that of previous findings.[14] Among the recorded species shrub (35%) were found to be dominating over other forms.[15] Analysis of the plant's parts used showed that leaves are the mostly used plant parts in the study area. The recent ethno botanical studies confirmed that leaves are the major portion of the plants used in the treatment of diseases.[16,17] It is important to highlight that such a wide harvesting of leaves and seeds, compared to roots which are important for survival of plants, has a less negative influence on the survival and continuity of useful medicinal plants and hence does not affect sustainable utilisation of the plants.[18]

In a nutshell, scientific validation of identified plants will established their importance in treatment of various ailments this will also encourage the native people to cultivate these plants as a sources of income in addition to the preservation and conservation of these plants. Further, it has been observed that the traditional practitioners are the custodian of this traditional knowledge and they have their own reservation to pass on this unwritten traditional knowledge to their next generation. Hence, proper method must be adopted to document this traditional knowledge of the local practitioners.

CONCLUSION

The medico-botanical survey of the area revealed that the people of the area possessing good knowledge of herbal drugs but as the people are in progressive exposure to modernization, their knowledge on traditional uses of plants may be lost in due course. So it is important to study and record the uses of plants used by different tribes for future study. Such studies may also provide some information to biochemists and pharmacologists in screening of individual species.

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SMD and KK - Concept and design of the study, reviewed the literature, Manuscript preparation; **KK -** Critical revision of the manuscript.

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