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Ethnobotanical survey of medicinal plants from Vellore district, Tamil nadu, India

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Abstract

The use of plants and its secondary metabolic products as medicines could be traced as far back as the beginning of human civilization. The earliest mention of medicinal use of plants in Hindu culture was found long years ago in "Rig veda", which was written between 4500 - 1600 B.C. and was supposed to be the oldest repository of human knowledge. It is Ayurveda, the foundation of medicinal science of Hindu culture, in its eight division deals with specific properties of drugs and various aspects of science of life and the art of healing. In the present study, ethnobotanical survey was carried out in Vellore district, Tamilnadu, India. Traditional uses of 80 plant species spread over 31 families are described under this study. The medicinal plants used by them are arranged by Scientific name, Common name, Family name, Plant parts used and Therapeutic uses. The plants documented in this survey belong to the families such as Acanthaceae, Amaranthaceae, Apiaceae, Apocyanaceae, Asclepiadaceae, Asteraceae, Cucurbitaceae, Euphorbiaceae, Labiatae, Liliaceae, Malvaceae, Papilionoideae, Verbanaceae, Vitaceae, Solanaceae, Lythraceae, Marsileaceae, Poaceae, Mimosaceae, Sapindaceae, Oxalidaceae, Aizoaceae, Araceae, Cruciferae, Mimosoideae, Rubiaceae, Lamiaceae, Basellaceae, Portulaceae, Fabaceae and Zingibesaceae. The present investigation revealed that the medicinal plants still play a vital role in the primary health care of the people.

Keywords: Medicinal plants, Ethnobotanical survey, Vellore district and Infectious diseases.

1. Introduction

Ethnobotany is the study of interaction between plants and people with a particular emphasis on traditional tribal cultures. According to the World Health Organization (WHO), about 65 – 80 % of the world's population in developing countries depends essentially on plants for their primary healthcare due to poverty and lack of access to modern medicine. Indian systems of Medicine derive many of their curative tools from plants which are used as drugs. Information about these is often found in old literature like Atharveda, Charak Samhita, Sushruta and Samhita (Kumar *et al.*, 2005; Saranraj *et al*., 2010; Sivasakthi *et al*., 2011; Bharathi *et al*., 2014). In spite of the many achievements of allopathic medicines, the Indian Systems of Medicine still continue to provide medical care to majority of the people on account of their cheaper cost with no side effects (Kokate *et al.*, 2002; Sekar *et al*., 2012). Herbal drugs obtained are safer in the treatment of various diseases. It has been estimated that folk healers in India use approximately about

2500 species of medicinal plants which few more than 100 species serve as regular sources of medicine (Ved and Goraya, 2008; Murugan and Saranraj, 2011).

Ethnomedicine has attracted scientists world over, received and renewed attention in India in recent past because of its local acceptability. Plant extracts used in ethno medical treatments is enjoying great popularity, however, lacks scientific validation (Ved and Goraya, 2008). Traditional medicine still remains the main choice for a large majority of people for treating various diseases and ailments. Management in various forms of diseases like diabetes, cardiovascular disorders, hepatoprotective, antibacterial, antifungal and wound healing etc. are made. In India, traditional medicines find its use on par with Western medicine (Chopda and Mahajan, 2009).

The World Health Organization (WHO) has compiled a list of 20,000 medicinal plants used in different part of the globe. A large number of these species have local uses within the country or spread over several countries in a region. Amongst these, over 100 botanicals are reported to have consistently large demand and are traded in major drug markets in the world. The medicinal virtues of these raw materials including chemical contents and composition of these species have been well worked out to have merited inclusion in National Pharmacopoeias and official formularies in different countries (Govil *et al*., 2002; Saranraj and Stella, 2012; Ganesh *et al*., 2014; Usharani *et al*., 2015).

During the last few decades, there has been an increase in the study of medicinal plants and their traditional use in different parts of the world (Lev, 2006). Several active compounds have been discovered from plants on the basis of ethnobotanical information and are used directly as patented drugs (Carney *et al*., 1999). As indigenous cultures are closely maintained by the tribal and other forest dwellers throughout the world, the ethnobotanical investigation is a prerequisite for any developmental planning concerned with the welfare of tribals and their environment. It is an urgent necessity to record as quickly as possible all information about plants and the role of tribes in conserving them (Saranraj *et al*., 2012; Saranraj and Sivasakthivelan, 2012).

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 (Chopra *et al*., 1986). Species like *Pterocarpus santalinus, Coscinium fenestratum, Janakia arayalpathra, Cycus circinalis* and *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 (Joshi and Joshi, 2000; Saranraj and Sivasakthi, 2014). Since, the interest in traditional medicine has been increasing, ethno botanical studies have gained prominence to explore the traditional knowledge particularly in developing country (Ragupathy *et al*., 2008). Therefore, collection of ethno botanical information and documentation of traditional knowledge has gained priority in the perspective of drug development. 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 (Ramya *et al*., 2009; Sivasakthi *et al*., 2011). Knowing the importance of ethno medicine, this survey was conducted in the Vellore district and aimed to report the prevalence, role and the necessity of the consideration of conservation status of knowledge of these traditional medicinal plants (Kolanjinathan and Saranraj, 2014).

2. Materials and Methods

The Vellore District lies between 12°15’ to13°15’ north latitudes and 78° 20’ to79° 50’ East latitudes in Tamil Nadu state. The district is spread over an area of about 6077 km^2 and is bounded on the North and Northeast by Thiruvalluvar District, on the South and Southeast by Kanchipuram District, on the south by Tiruvannamalai district, on the Southwest by Krishnagiri District and on the northwest and north by Andhra Pradesh state. The map of the study area Vellore district, Tamil Nadu, India was showed in Figure – 1. The district receives an annual rainfall is about 448.8 – 1544.6 mm. The minimum and maximum temperature varies between 26.3º and 38.2º. The ethnobotanical data were collected using discussions with the local people of Vellore district.

People of this region can easily understand Tamil and can also communicate in that language. In order to document the utilization of medicinal plants, a total field survey was carried out in this area. Field visits were conducted several times. The investigation was carried out where the population was dense. Intensive botanical explorations were undertaken in selected places of Vellore district to find out various medicinal plants used for different ailments in the form of leaves, stems, flowers, fruits and seeds (Ismeet Kaur *et al.*, 2011).

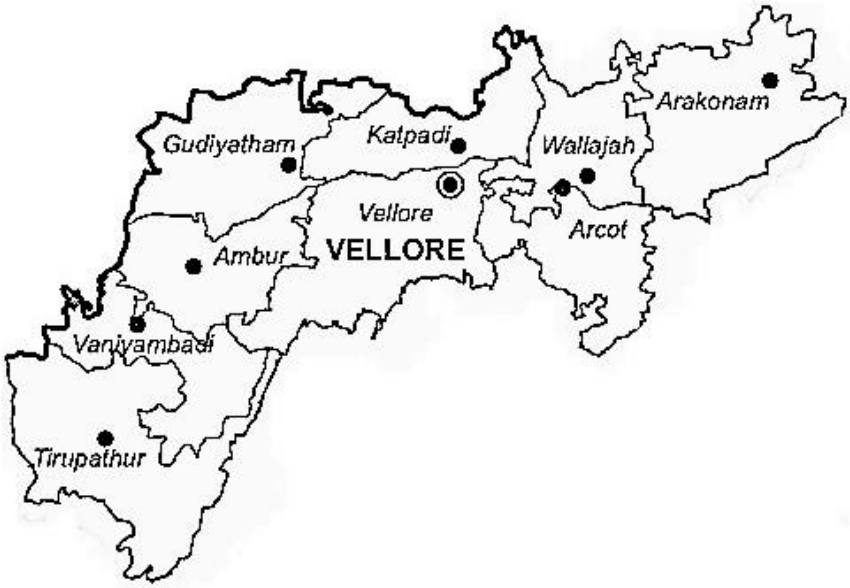

Figure – 1: Map of Vellore District, Tamil Nadu, India

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 (Mukherjee and Wahil, 2006). 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 (Perumal Samy and Ignacimuthu, 2000). 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 (Saranraj and Sujitha, 2015).

Herbal remedies are considered as 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 have evolved over the centuries within various communities are still maintained as a great traditional knowledge base in herbal medicines (Mukherjee and Wahil, 2006). Traditionally, this treasure of 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 (Perumal Samy and Ignacimuthu, 2000; Saranraj *et al*., 2016). Traditional folk medicine uses the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to its cultures for maintenance of health. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources. Ethnobotanical survey has been found to be one of the reliable approaches to drug discovery (Fabricant and Farnsworth, 2001; Kolanjinathan and Saranraj, 2015).

In the present study, ethnobotanical survey was carried out in Vellore district, Tamilnadu, India. Traditional uses of 80 plant species spread over 31 families are described under this study. The tribes and peoples from various rural villages have used the medicinal plants to treat various diseases and disorders like skin allergy, dysentery, antibacterial activity, diabetes, jaundice, asthma, fertility, antifertility, dental diseases, etc. The medicinal plants used by them are arranged by Scientific name, Common name, Family name, Plant parts used and Therapeutic uses.

The list of medicinal plants was furnished in Table - 1. The plants documented in this survey belong to the families such as Acanthaceae, Amaranthaceae, Apiaceae, Apocyanaceae, Asclepiadaceae, Asteraceae, Cucurbitaceae, Euphorbiaceae, Labiatae, Liliaceae, Malvaceae, Papilionoideae, Verbanaceae, Vitaceae, Solanaceae, Lythraceae, Marsileaceae, Poaceae, Mimosaceae, Sapindaceae, Oxalidaceae, Aizoaceae, Araceae, Cruciferae, Mimosoideae, Rubiaceae, Lamiaceae, Basellaceae, Portulaceae, Fabaceae and Zingibesaceae.

In India, there are about 54 million indigenous people of different ethnic groups inhabiting various terrains. These indigenous groups possess their own distinct culture, religious rites, food habit and have a rich knowledge of traditional medicine. Even today, indigenous and certain local communities practiced herbal medicine to cure a variety of diseases, with plants particularly used as folk medicine to treat snakebites (Parinitha *et al*., 2005). Utilization of plants for medicinal purposes in India has been documented long back in ancient literature because they are essential to human survival (Mohamed Tariq and Md Rayees Ifham, 2013; Sastri *et al*., 1996). The consumption, management and valuation of wild plants are central aspects of the traditional knowledge in many human populations. Thus, plants gathering, the diffusion and conservation of knowledge within the community are traditional practices that have contribution to the subsistence of many cultures. In most of the societies the medical system coexists with several traditional systems. These traditional medical systems are generally based on the uses of natural and local products which are commonly related to the people's perspective on the world and life (Toledo *et al*., 2009).

Table – 1: Ethnobotanical survey of medicinal plants from Vellore district, Tamil Nadu, India

S. No	Name of the plant	Common Name (Tamil)	Family	Parts used	Therapeutic use
1	*Adhatoda vasica*	Adathodai	Acanthaceae	Aerial parts	Bronchitis, Leprosy, Heart troubles, Asthma, Cough, Sore eyes and Gonorrhea.
2	*Andrographis paniculata*	Seriyanangai or Nilavembu	Acanthaceae	Leaf	Snake bites and Liver diseases.
3	*Hygrophila auriculata*	Nirmulli	Acanthaceae	Leaf and Seed	Used against cough, seeds used as aphrodisiac and increase male fertility.
4	*Alternanthera sessilis*	Ponnakanni	Amaranthaceae	Leaf	Burning sensation, Diarrhoea, Leprosy, Skin diseases and Fever.
5	*Amaranthus graecizans*	Serukeerai	Amaranthaceae	Aerial parts	Antimicrobial activity.
6	*Amaranthus spinosus*	Mullikkirai	Amaranthaceae	Leaf	Leprosy, Eczema, Nausea, Fever and Anaemia.
7	*Lannea coromandelica*	Anaikarai	Amaranthaceae	Leaf	Wounds, Bruises, Ulcer, Ophthalmia, Odontalgia, Diarrhoea and Dysentery.
8	*Achyranthes aspera*	Naivooruvi	Amaranthaceae	Leaf	Wounds
9	*Amaranthus artis*	Araikeerai	Amaranthaceae	Leaf	Antimicrobial activity.
10	*Amaranthus viridis*	Kuppaikeerai	Amaranthaceae	Leaf	Antimicrobial activity.
11	*Amaranthus blitum*	Mulaikeerai	Amaranthaceae	Leaf	Antimicrobial activity.
12	*Amaranthus spinosus*	Mullikeerai	Amaranthaceae	Leaf	Antimicrobial activity.
13	*Celosia argentea*	Pannaikeerai	Amaranthaceae	Leaf	Antimicrobial activity.
14	*Spinacea oleracea*	Palakeerai	Amaranthaceae	Leaf	Antimicrobial activity.
15	*Centella asiatica*	Vallari	Apiaceae	Aerial parts	Antimicrobial activity and Increase the memory power.
16	*Coriandrum sativum*	Kothamalli	Apiaceae	Leaf	Antimicrobial activity

17	*Catharanthus roseus*	Nithyakalyani	Apocyanaceae	Aerial parts	Antimicrobial and Anticancer activity.
18	*Wrightia tinctoria*	Vetpalai	Apocyanaceae	Aerial parts	Antimicrobial and Antioxidant activity.
19	*Ervatamia divaricata*	Nantiyavarttam	Apocyanaceae	Leaf	Antibacterial and Antifungal activity.
20	*Plumeria rubra*	Segappu Arali	Apocyanaceae	Leaf	Ulcers, Pruritus, Leprosy and vitiated conditions of Vata and Kapha.
21	*Calotropis gigantean*	Erukkam	Asclepiadaceae	Leaf and Milk	Cure rheumatic Joints pain and swellings.
22	*Hemidesmus Indicus*	Nannari	Asclepiadaceae	Aerial parts	Fever and Skin diseases
23	*Pentatropis capensis*	Upilankodi	Asclepiadaceae	Leaf	Constipation, Colic and Diarrhea.
24	*Pergularia daemia*	Uttamani	Asclepiadaceae	Leaf	Bath with leaf decoction is taken to cure body pain.
25	*Eclipta prostrata*	Karisalankanni	Asteraceae	Whole parts	Antibacterial activity and Eye diseases.
26	*Eclipta procera*	Mangel Karisalankanni	Asteraceae	Whole parts	Antibacterial activity and Jaundice.
27	*Cichorium intybus*	Kasinikeerai	Asteraceae	Leaf	Antimicrobial activity.
28	*Lactuca sativa*	Manalikeerai	Asteraceae	Leaf	Antimicrobial activity.
29	*Coccinia grandis*	Kovai	Cucurbitaceae	Leaf	Eye diseases
30	*Cucumis sativus*	Vellari	Cucurbitaceae	Leaf and Fruits	Fever, Bronchitis, Jaundice, Haemorrphages Strangury and General debility.
31	*Cucurbita moschata*	Poosani	Cucurbitaceae	Leaf and Fruits	Burns, Scalds, Inflammations, Abscesses, Boils, Migraine and Neuralgia
32	*Lagenaria siceraria*	Sorakkai	Cucurbitaceae	Leaf	Cough, Bronchitis, Asthma, Fever, Inflammations, Leprosy, Skin diseases, Jaundice, Decaying teeth, Flatulence and Baldness.
33	*Mukia maderaspatana*	Musumusukai	Cucurbitaceae	Leaf	Burning sensation, Dipsia, Flatulence, Colic consumption, Ulcers, Cough, Asthma, Neuralgia, Notalgia, Odontalgia and Vertigo.
34	*Momordica somnifera*	Pavakai	Cucurbitaceae	Leaf and Vegetable	Antimicrobial, Antioxidant and Antidiabetic activity.
35	*Acalypha indica*	Kuppaimeni	Euphorbiaceae	Leaf	Leaf juice is applied externally for curing body itching.
36	*Phyllanthus amarus*	Kilanelli	Euphorbiaceae	Aerial parts	Plant extract is used to cure jaundice.
37	*Euphorbia heterophylla*	Amman paccarici	Euphorbiaceae	Aerial parts	Remove intestinal worms
38	*Leucas aspera*	Thumbai	Labiatae	Leaf	Leaf juice is given with honey to treat bronchitis in children.

39	*Ocimum sanctum*	Thulasi	Labiatae	Leaf	Leaf juice is mixed with cumin is given to cure the dry cough.
40	*Ocimum basilicum*	Karpura Thulasi	Labiatae	Leaf	Leaf juice is mixed with cumin is given to cure the ear pains.
41	*Aloe vera*	Kathazai	Liliaceae	Aerial parts	Promotes menstrual flow, Heals wounds and fresh cuts, Eye diseases, Asthma, Leprosy and Jaundice.
42	*Abutilon indicum*	Thuthi	Malvaceae	Leaf	Antimicrobial activity.
43	*Hibiscus rosasinensis*	Semparuthi	Malvaceae	Leaf and Flower	Hair growth and hair infections.
44	*Hibiscus cannabinus*	Pulichakeerai	Malvaceae	Leaf	Antimicrobial activity.
45	*Melochia corchorifolia*	Pinnakukeerai	Malvaceae	Leaf	Antimicrobial activity.
46	*Lablab purpureus*	Avarai	Papilionoideae	Leaf	Alexipharmic, Emmenagogue, Astringent, diuretic, anaphrodisiac, stomachic and antispasmodic.
47	*Sesbania grandiflora*	Agathei	Papilionoideae	Leaf	Cooked leaves are taken to get cooling effect to infected eyes.
48	*Vitex negundo*	Nochi	Verbanaceae	Leaf	Headache and Sinus problem.
49	*Cissus quadrangularis*	Perandai	Vitaceae	Aerial parts	Heart diseases, diabetes and metabolic Syndrome
50	*Solanum trilobatum*	Thuthulai	Solanaceae	Leaf	Antimicrobial activity and Cough.
51	*Solanum nigrum*	Manathakalli	Solanaceae	Aerial parts	Antimicrobial activity.
52	*Solanum torvum*	Cuntai	Solanaceae	Aerial parts	Skin diseases, Inflammations, Colic, Flatulence, Rheumatoid arthritis, Cough, Fever, Asthma, Bronchitis, Urinary retention and Kidney stones.
53	*Physalis minima*	Sodaku	Solanaceae	Leaf and Fruits	Antimicrobial and Anticancer activity.
54	*Datura metel*	Vellaiumattai	Solanaceae	All parts	Antimicrobial and Anticancer activity.
55	*Datura alba*	Vellaiumattai	Solanaceae	All parts	Antimicrobial and Anticancer activity.
56	*Datura stramonium*	Umattai	Solanaceae	All parts	Antimicrobial and Anticancer activity.
57	*Withania somnifera*	Ashwagandha	Solanaceae	All parts	Antimicrobial activity.
58	*Lawsonia inermis*	Maruthani	Lythraceae	Leaf	Antimicrobial activity and Cooling of body
59	*Marsilea minuta*	Aarakkerai	Marsileaceae	Leaf	Antimicrobial and Diabetes.
60	*Cynodon dactylon*	Arugampul	Poaceae	Whole parts	Antimicrobial and Diabetes.

61	*Chrysopogon zizanioides*	Vetiver	Poaceae	Whole parts	Antimicrobial and Anticancer activity.
62	*Mimosa pudica*	Thottasurungi	Mimosaceae	Leaf	Wounds
63	*Cardiospermum halicacabum*	Mudakkaththan	Sapindaceae	Leaf	Rheumatic arthritis
64	*Oxalis corniculata*	Pulichcha keerai	Oxalidaceae	Leaf	Antimicrobial activity.
65	*Gisekia pharnaceoides*	Manalikkirai	Aizoaceae	Aerial parts	Antibacterial activity.
66	*Pistia stragiotes*	Akayattamarai	Araceae	Aerial parts	Bladder complaints, Kidney afflictions, Diabetes, Hematuria, Dysentery and Anemia.
67	*Typhonium trilobatum*	Karunai	Araceae	All parts	Antibacterial activity.
68	*Brassica juncea*	Katuku	Cruciferae	Leaf and Seeds	Eye diseases
69	*Cleome gynandra*	Nalvelai	Capparaceae	Leaf	Toothache
70	*Mimosa pudica*	Tottalvati	Mimosoideae	Leaf	Liver disease, constipation, dysentery and kidney problems.
71	*Morinda coreia*	Nuna	Rubiaceae	Leaf	Antibacterial activity.
72	*Ixora coccinea*	Idlipoo	Rubiaceae	Leaf and Flower	Liver toxicity.
73	*Plectranthus amboinicus*	Karpuravalli	Lamiaceae	Leaf	Antimicrobial activity
74	*Mentha arvenis*	Pudhina	Lamiaceae	Leaf	Antimicrobial activity
75	*Basella alba*	Kodipasalai	Basellaceae	Leaf	Antimicrobial and Anticancer activity.
76	*Portulaca oleraceae*	Paruppukeerai	Portulaceae	Leaf	Antimicrobial activity.
77	*Portulaca quadrifida*	Mukulikeerai	Portulaceae	Leaf	Antimicrobial activity.
78	*Trigonella faenum*	Vendhayakeerai	Fabaceae	Leaf	Antimicrobial activity.
79	*Clitoria ternatea*	Sangu Pushpam	Fabaceae	Leaf	Antimicrobial activity, Eye diseases and Headache.
80	*Curcuma longa*	Manjal	Zingibesaceae	Whole parts	Antimicrobial activity, Anticancer activity and Skin infections.

Conclusion

Through this ethnobotanical survey, the availability and presence of many medicinal plants have been investigated and verified. We suggested that these plants can be used as drugs by pharmacologically unexplored areas of India, which may be utilized for the better human health. In such cases, laboratory investigations and clinical trials are suggested to validate the therapeutic properties of these herbal preparations for effective and safe use. This present study also provides an ethnobotanical data of the medicinal plants used by the local people to cure different diseases and disorders. Moreover, it may promote a practical use of medicinal plants and the focus must be on its pharmacological validation. This study offers a model for studying the relationship between plants and people, within the context of traditional remedies is obviously ensure therapeutical efficacy.

The value of using ethnobotanical information is to initiate drug discovery efforts. This study also gathered a broad spectrum of information concerning medicinal plants used by the peoples of Vellore district. Due to lack of interest among the younger generation of tribal the traditional and conventional knowledge is unable to transfer the new generation. The present investigation revealed that the medicinal plants still play a vital role in the primary health care of the people.

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