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Ethnopharmacological studies on the Medicinal Plants used by Tribal Inhabitants of Kottur Hills, Dharmapuri, Tamilnadu, India

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Abstract

Traditional herbal medicine is predominantly practiced by rural people in India, especially in remote areas like Kottur Hills in Dharmapuri District, Tamilnadu, India. Traditional healers play an important role in the management of health related problems of the local aboriginal population. Further, such practices are influenced by socio-economical and geographical factors. An ethnobotanical survey was conducted to collect information about the medicinal plants used by tribal inhabitants in the study area. Informations presented here were gathered from tribal informants using an integrated approach of botanical collections and interview schedules. A total of 12 informants were interviewed and 48 ethno medicinal plant species distributed in 31 families have been documented in the study. Medicinal plants used by tribal inhabitants have been listed along with their vernacular name and the plant part(s) used with its ethnomedical significance. During the study it was observed that for most of the ailments fresh plant materials were invariably used. Likewise, for more than about 50% of the remedies leaf material was used as raw material. Further, it could be inferred that plants were most commonly used to cure asthma, body ache, diabetics, digestive disorders, dry cough, dysentery, ear pain, edema, erysipelas, eye infection, fertility, gastrointestinal problems, microbial infections, headache, insect/snake poison, jaundice, joint pain, laxative, menstrual problem, mouth ulcer, nail infection, nerve disorders, piles, pimples, skin disease, throat infection, toothache,

ulcer, cuts and wounds. Informations collected clearly depicts that tribal inhabitants in the study area largely depend on local medicinal plants to meet their healthcare needs.

Keywords: Malayali tribes; Medicinal plants; Traditional knowledge; Indigenous medicine

Introduction

According to World Health Organization (WHO) more than 80% of the world's population relies on traditional medicine for their primary healthcare needs. Use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance (Farnsworth, 1999). Folk medicine has been used for thousands of years with significant contributions made by its practitioners to human health, particularly as primary health care providers at the community level (Jain, 1967). Traditional medicine uses the knowledge, skills and practices, beliefs and experiences endemic to its cultures, for well begin of the local people. It has reputed heritage, community acceptance and is based on the expertise gained by herbalists over a period of time (Ved and Goraya, 2008). The healing potential of the medicinal plants has been attributed to lie in the chemical substances that evoke specific physiological action on the human body. Invariably the bioactive compounds could be alkaloids, flavanoids, tannins and phenolic compounds; however, neither the chemical nature nor its physiological response in the traditional system of medicine is scientifically defined.

Rural communities, in particular tribal people, depend on plant resources for herbal medicines, food, forage, construction of dwellings, making household implements, sleeping mats, and for fire and shade. The use of medicinal plants as traditional medicines is well known in rural areas of many developing countries (WHO, 2002). Most of the traditional medical practices are empirical in nature, over 200 million people in India with limited access to the organized public health service institutions; depend on varying degrees in the traditional system of medicine to cater their health care needs (Farnsworth, 1998).

India has two hot spots out of the twelve mega-biodiversity of the world. India being a tropical country is rich in vegetation with a wide diversity. Tribal communities dwelling the remote areas depend on the forest resources to meet their livelihood and health care needs. Herbal medicines have been used since antiquity in treating diseases including infectious diseases. The wealth is not only in terms of the number of unique species documented so far for their medicinal use but also the depth of the traditional knowledge base about the uses for human, veterinary health care and crop protection (Ved and Goraya, 2008). However, there are only a few reports on the use of plants in traditional healing by either tribal or indigenous people in Tamilnadu (Ignacimuthu *et al.*, 1998; Rajan *et al.*, 2002; Ganesan *et al.*, 2004; Ayyanar and Ignacimuthu, 2005; Ramya *et al.*, 2009; Sivaperumal *et al.*, 2009).

Therefore, documentation of traditional knowledge and ethnobotanical information plays an important role in scientific research (Awadh *et al.*, 2004). Also,

scientific evaluation of herbals is mandate before they are included in the mainstream of healthcare medicine. In recent times, interest in traditional medicine has continuously been increasing, and therefore ethnobotanical studies have gained prominence to explore the traditional practices from tribal communities, particularly in the developing countries. 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 (Pei, 2001; Jain and Patole, 2001; Ved and Goraya, 2008).

India possesses a total of 427 tribal communities with rich diversity of indigenous tradition. The knowledge base and the practice have been marginalized due to political, social and economical reasons. Off late, interest in traditional medicine has continuously been increasing; various ethnobotanical studies have been initiated to explore the knowledge base from the various tribal groups (Jain, 2001; Ignacimuthu *et al.*, 2006). The main objective of this study was to assess the diversity of ethnomedicinal plant species used by Malayali tribes in Dharmapuri district and to document the traditional medical practices in healing ailments.

Malayali tribes

Malayali tribes dwell in Sherveroyan hill ranges of Dharmapuri district (12°N 78.5'E). Of the schedule tribes (ST), Malayali, Irular, Kattunayakan, Kurumans and Kondareddis together constitute 85.3% of the ST population of the state. Malayali are the largest tribal group with a population of 310,042, constituting 47.6% of the state ST population. The Malayali claim that they were caste Vellalas of Kancheepuram, Tamil Nadu, and that, following the invasion by several kings, they fled to the Sherveroyan hills Malayali are predominant hill tribes in Dharmapuri, Tamil Nadu. Tribals of this community are familiar with local herbs and hold a vibrant knowledge base with regard to the use of the local plants to cure various ailments (Ramya *et al.*, 2008). Their reliance on herbs for medicine has prompted the present investigation. In this study, an attempt is made to document the medicinal plants used by Malayali to cure ailments.

Description of study area

The area of investigation approximately lies between 87°0' to 89°0' longitude and 28°0' to 37° 0' latitude. The study area - Kottur Hills is located in the Dharmapuri district Tamilnadu, India (Fig.1). There are many villages occurring and every Malayali village has several hamlets. Temperature in the study area ranges from 12°C to 25°C during Mar ó Apr and averages between 12°C during Dec and 35°C during Apr ó May. Present study was conducted in villages located very close to the forest in the study area.

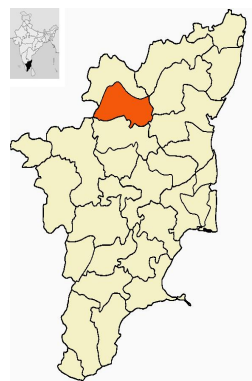


Figure 1. Location of the study

Ethnobotanical survey

Field investigations were conducted in villages of the study area. Field trips ranging from three days to a week in a period of three months (Nov 2008 ó Feb 2009) were conducted. There were 12 informants with in the age group of 32 to 80. Among them one was a local tribal practitioner. The data collected were verified using dictionary of folk medicine and authenticated. Ethnobotanical data were collected according to the methodology suggested by Jain and Goel (1995) and Jain (2001). The ethnobotanical data were collected using questionnaire, interviews and discussions in their local dialect (Ramya *et al.*, 2009). Flora of Presidency of Madras (Gamble, 1935) and Flora of Tamil Nadu Carnatic (Matthew, 1985) were used for identification and authentication of the plants. Medicinal plants used by Malayaliø to various diseases are listed in Table 1. The plants are arranged in alphabetical order of their botanical names, followed by the family, vernacular name, plant parts used and a brief note on its ethnomedicinal use.

Results and discussion

Table 1 provides the botanical name, family, plant parts used together with their traditional therapeutic uses and properties for ethnomedicinal plants documented from Kottur hills. More number of remedies fresh leaf materials was invariably used. The order of usage of the plant part were Leaf - 26, Latex -8, Fruit - 4, Bark - 3, Flower - 2, Root - 2, Seed - 2, Stem - 2, Petiole - 1, Tuber - 1 (Fig. 2). Plant species belonging to families of Caesalpinaceae - 4, Euphorbiaceae - 4, Solanaceae - 4, Lamiaceae - 3, Moraceae - 3, Acanthaceae - 2, Apocynaceae - 2, Liliaceae - 2, Piperaceae - 2, Verbenaceae - 2, Alagiaceae - 1, Amaranthaceae - 1, Anacardiaceae - 1, Araceae - 1, Aricaceae - 1, Asclepiadacea - 1, Convaluvaceae - 1, Fabaceae - 1, Gesneriaceae - 1, Lythraceae - 1, Meliaceae - 1, Musaceae - 1, Myrtaceae - 1, Papavaraceae - 1, Poaceae - 1, Punicaceae - 1, Rutaceae - 1, Sapindaceae - 1, Ulmaceae - 1, Zygophyllaceae ó 1 were used to obtain the healing aliments. Twenty families were with single representative species; familyø viz., Caesalpinaceae, Euphorbiaceae, and Solanaceae were represented by more than 4 plants. The family wise distribution and treatment of the aliments chart of the ethnomedicinal plant species is given in Fig. 3 and 4 respectively.

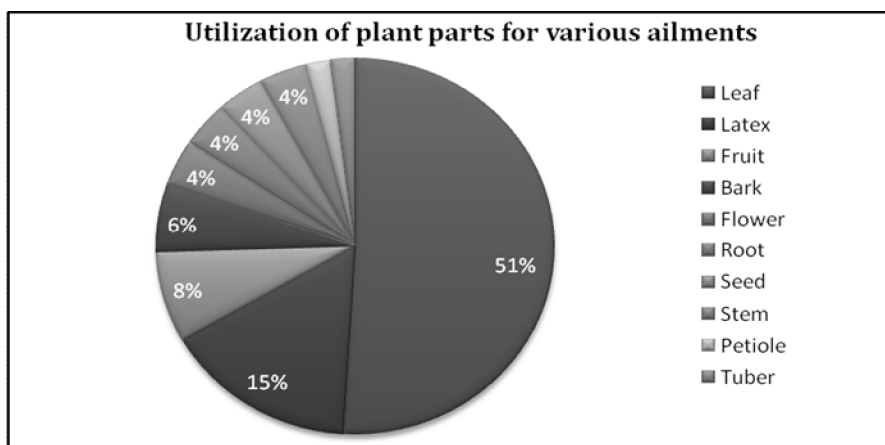


Figure 2. Percentage distribution chart of plant part used in the treatment of ailments

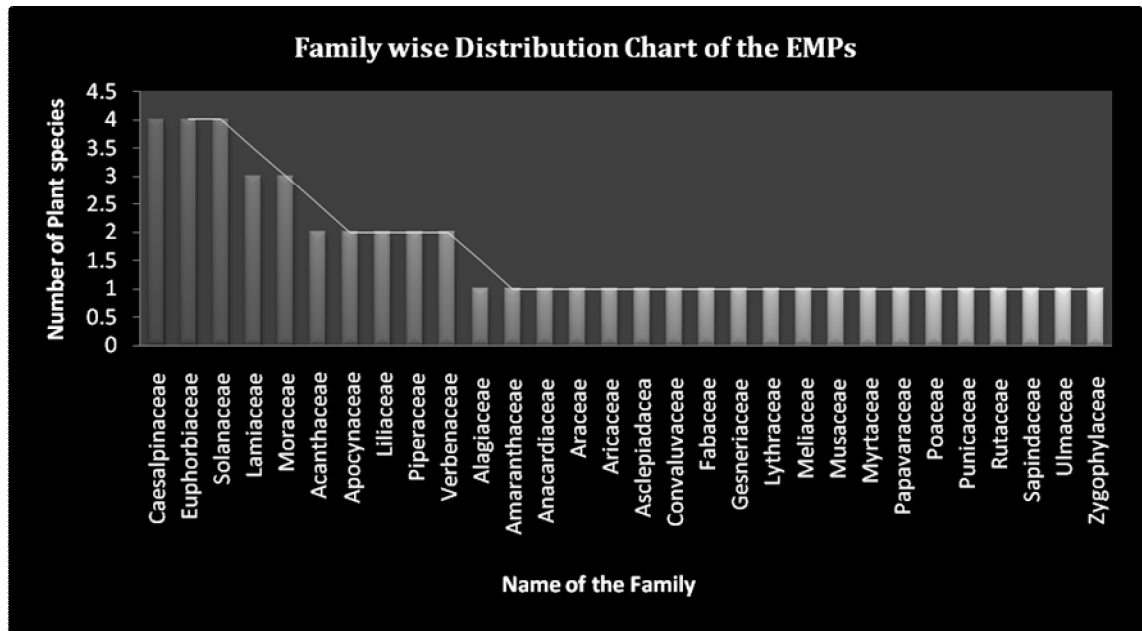


Figure 3. Family wise distribution chart of ethnomedicinal plant species used by Malayaliø

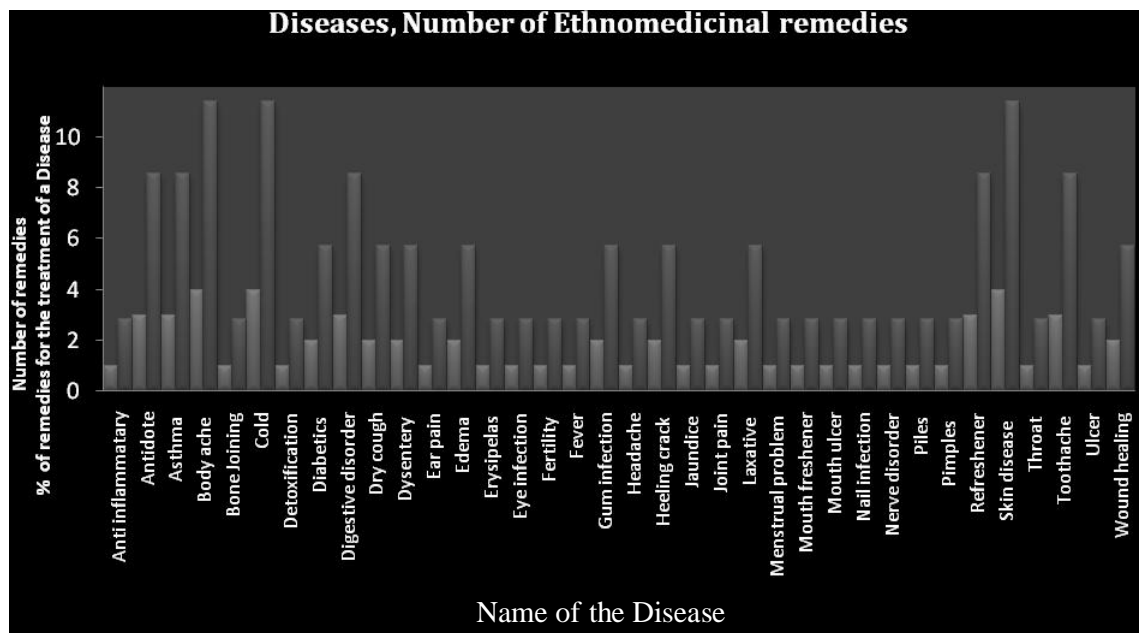


Figure 4. Distribution chart of the medicinal plants used in the treatment of ailments

Table 1 Ethnomedicinal perspectives of botanicals used by Malayaliø in Kottur Hills

Botanical Name	Family	Vernacular	Part	Use
<i>Adhatoda zeylanica</i> Medicus.	Acanthaceae	Adathodai	Leaf	Asthma, Cold
<i>Alangium lamarbi</i> Thwaites.	Alagiaceae	Alingi	Bark	Antidote
<i>Aloe vera</i> Linn.	Liliaceae	Katralai	Leaf	Wound healing
<i>Amaranthus viridis</i> L.	Amaranthaceae	Thoiã	Leaf	Erysipelas
<i>Andrographis lineata</i> Wallich ex Nees.	Acanthaceae	Siriyangai	Leaf	Diabetics
<i>Argemone mexicana</i> L.	Papavaraceae	Bramam thandu	Latex	Skin infection
<i>Artocarpus hirsutus</i> Lam.	Moraceae	Kattupala	Latex	Asthma
<i>Asparagus racemosus</i> Willd.	Liliaceae	Thanervittankilangu	Leaf	Heeling crack
<i>Azadiracta indica</i> A Juss.	Meliaceae	Vembu	Leaf	Diabetics
<i>Betel piper</i> L.	Piperaceae	Vettilai	Leaf	Pimples
<i>Borasis flabellifer</i> L.	Aricaceae	Panai, palmyrah	Petiole	Eye infection
<i>Calotropis gigantea</i> R. Br.	Asclepiadaceae	Erukku	Latex	Antidote
<i>Cardiospermum canescens</i> Wall.	Sapindaceae	Mudakkathan	Leaf	Dysentery
<i>Cassia ariculata</i> L.	Cesalpiniaceae	Auarampao	Flower	Body ache
<i>Cassia fistula</i> Linn.	Caesalpiniaceae	Kattu talai	Leaf	Laxative
<i>Cassia senna</i> L.	Cesalpiniaceae	Kattu thalai	Leaf	Laxative, Bone Joining
<i>Citrus medica</i> L.	Rutaceae	Elumichai	Fruit	Nail infection, Re-freshener
<i>Colocasia esculenta</i> (L.) Schott.	Araceae	Seman kizhangu	Tuber	Piles
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Arugan	Leaf	Body ache, Re-freshener
<i>Erythrina indica</i> Lam.	Fabaceae	Kalyanamurungai	Leaf	Menstrual problem
<i>Eucalyptus globules</i> Labill.	Myrtaceae	Nelagri	Leaf	Body ache, Re-freshener
<i>Euphorbia anticaram</i> L.	Euphorbiaceae	Sadarakalli	Latex	Edema
<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	Sathura kalli	Latex	Body ache, Nerve disorder
<i>Ficus bengalensis</i> L.	Moraceae	Alamaram	Latex	Wound healing
<i>Haloptetea integrifolia</i> L.	Ulmaceae	Aauli	Bark	Skin infection
<i>Henckelia incana</i> (Vahl) Spreng	Gesneriaceae	Kal thamarai	Leaf	Ear pain
<i>Ipomia staphylinal</i> Roemer.	Convolvaceae	Oonangkodi	Leaf	Edema
<i>Jatropha glandulifera</i> Rox.	Euphorbiaceae	Kattan pal	Latex	Toothache, Gum infection
<i>Lantana camara</i> L.	Verbenaceae	Unni chedi	Leaf	Digestion
<i>Lawsonia inermis</i> L.	Lythraceae	Aivanam ilai	Leaf	Heeling crack
<i>Lucas aspera</i> Spreng.	Lamiaceae	Thumbai	Leaf	Toothache, Gum infection
<i>Mangifera indica</i> L.	Anacardiaceae	Mamaram	Seed	Dysentery
<i>Musa paradisiaca</i> L.	Musaceae	Valai	Stem	Antidote, Detoxification
<i>Ocimum basilicum</i> L.	Lamiaceae	Tirunirippachai	Leaf	Mouth freshener
<i>Ocimum santum</i> L.	Lamiaceae	Thulasi	Leaf	Dry cough
<i>Phyllanthus amarus</i> Schum. & Thonn.	Euphorbiaceae	Kizhaanelli	Leaf	Jaundice
<i>Piper nigrum</i> L.	Piperaceae	Milagu	Seed	Throat, cold, cough
<i>Pulmaria rutral</i> L.	Apocynaceae	Arali	Flower	Anti inflammation
<i>Pulmaria acutifolia</i> Pair.	Apocynaceae	Thevarali	Latex	Mouth ulcer
<i>Punica granatum</i> L.	Punicaceae	Madulai	Fruit	Gastrointestinal
<i>Solanum nigrum</i> L.	Solanaceae	Manathakkali	Leaf	Ulcer, Digestion
<i>Solanum surattrense</i> Burm. f.	Solanaceae	Kandankathiri	Fruit	Toothache
<i>Solanum trilobatum</i> L.	Solanaceae	Thoodhuvalai	Leaf	Asthma
<i>Tamarindus indica</i> L.	Caesalpiniaceae	Puliamaram	Bark	Skin disease
<i>Tarstenia brasiliensis</i> L.	Moraceae	Athi	Root	Joint pain
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Nerungi	Fruit	Fertility
<i>Vitex negundo</i> L.	Verbanaceae	Nochi	Leaf	Headache, Fever, Cold
<i>Withania somnifera</i> Dun.	Solanaceae	Amakalan	Leaf	Asthma

Ethnomedicines have received renewed global attention of scientists in India and elsewhere in recent past because of their local acceptability. Plant extracts used in ethnomedical treatments is enjoying great popularity, however, lacks scientific validation (Pushpangadan and Atal, 1984; Ved and Goraya, 2008). Nevertheless, ethnopharmacological studies are expected to provide leads to the discovery of new drugs of plant origin (Bannerman, 1982). The informations collected from this study are in agreement with the previous reports (Pushpangadan and Atal, 1984; Jain, 2001; Ayyanar and Ignacimuthu, 2005; Ignacimuthu *et al.*, 2006). For common ailments such as wounds and skin diseases more number of medication were used. On the other hand, few were used to alleviate problems such as cold, cough and asthma. Ayyanar and Ignacimuthu (2005) reported that *Andrographis* sp. is used by tribal people to treat poisonous bites, similar observations have been made in the present study. Healers in the area diagnose diseases based on symptoms but sometime they may also associate it to spirit. Therefore, preparation of medicines and treatment of diseases are sometimes accompanied by rituals (Ramya *et al.*, 2009).

Tribal practitioner(s) use specific plant parts and dosages in treatment of specific ailments. Plant products are consumed raw or taken as decoction (juice)/ infusion (oral treatment) and paste (external application). Fresh leaves were more frequently used when compared to other parts of the plant. However, in most of the cases, it was recorded that internal uses predominates external application as reported in our earlier studies (Ramya *et al.*, 2009; Sivaperumal *et al.*, 2009). Juice and paste formulations were quite common for external applications. For topical application, the paste was mixed with oil. If more than one plant is used, such preparations are more or less similar to Siddha formulations. Sometimes the healer may mix several plants as ingredients to cure a single disease but detailed information on the role of the components used in such formulations are obscure.

The most important aspect of the Malayali tribal medicine is that fresh plant material is used for the preparation of medicine. Alternatively, if the fresh plant parts are not available, dried plant materials are used. For this reason several plants serve as alternative remedy to cure a single disease. From this study it is clear that Malayali tribal possess innate ability to discern the character of plants and exploit the plant resources to meet their health care needs.

Conclusion

This study depicts that traditional knowledge forms the basis for the treatment of various ailments among Malayali. Still, this age old practice forms the basic aspect of their lifestyle and rituals. Data depicts that most of the remedies are preferred as oral. Present study reveals that medicinal plants continue to play a major role in healthcare needs of Malayali community.

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