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## Research Article

# AN ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED FOR THE DENGUE IN TIRUCHIRAPPALLI DISTRICT

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### ABSTRACT

Ethnomedicine derived from medicinal plants are used by above 60 percent of the global population. This article focus on Tiruchirappalli herbal drugs and plants used in the treatment of dengue. There are various approaches to reduce the ill effects of dengue and its secondary complications, herbal formulation are preferred due to lesser side effects and low cost. Botanical study was undertaken to collect the information from Tiruchirappalli District in Tamilnadu. The traditional knowledge of traditional healer and medicinal practices on medicinal plants was collect through questionnaires' and personal interviews during field trips. The study area field visits conducted during June to November 2017. 51 species of medicinal plants of dengue and malaria were reported the survey and having discussion with local traditional healers and local peoples. These medicinal plants belongs to 30 families. This studies show that the peoples still continue to depend on medicinal plants, however the traditional healer are on the decline because the younger generation of the people have no interest and knowledge of this form of medicine as they have started moving towards the towns and cities. Therefore, it is necessary to document the plants to effectively conserve these.

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### INTRODUCTION

The dengue fever is one of the life threatening diseases is caused by the arthropode borne flavivirus named dengue virus (DENV), transmitted by the *Aedes aegypti* mosquito. As per the estimates of World Health Organization, every year, 50 million people across the world are infected by dengue and about 2/5 of the world population (2.5 billion people) are at risk from this dreadful disease, which spreads over about 100 countries.

Plants have been used in traditional medicine for several thousand years. The knowledge of medicinal plants has been accumulated in the course of many centuries based on different medicinal systems such as Ayurveda, Unani and Siddha. In India, it is reported that traditional healers use 2500 plant species and 100 species of plants serve as regular sources of medicine (Yirga 2010). During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world. Documenting the intangibility of modern health facilities, most people especially rural people are still forced to practice traditional medicines for their common day ailments (Mesfin 2007; Dawit 2001). Most of these people form the poorest link in the trade of medicinal plants. 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 (Diallo *et.al.*, 1999; Bekele 2007).

Ethnobotany is not new to India because of its rich ethnic diversity. Jain printed out that there are over 400 different tribal and other ethnic groups in India. The tribals constitute about 7.5 percent of India's population (Verma *et.al.*, 2007; Sabitha *et.al.*, 2012). During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India and there are many reports on the use of plants in traditional healing by either tribal people or indigenous communities of India. Apart from the tribal groups, many other forest dwellers and rural people also posses' unique knowledge about plants (Hebber *et. al.*, 2004; Mollik *et.al.*, 2010).

Globally, about 85% of the traditional medicines used for primary healthcare are derived from plants [Farnsworth 1988]. India is one of the twelve mega-biodiversity countries of the World having rich vegetation with a wide variety of plants with medicinal value. In many countries, scientific investigations of medicinal plants have been initiated because of their contribution to healthcare. They are in need of these medicinal plants, which are found in plenty around their habitations. They know the practical usage of these Medico-ethno botanical

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plants only by experience. The intimate knowledge of local tribal communities about their medicinal plants is clearly visible when we observe different local names by which these plants. Some individuals are able to tell the properties, habitat of the plants, morphology, and collection time, phenology and able to identify poisonous plants too. The present study was undertaken to explore the wild medicinal plant use for dengue disease and disorders by gathering knowledge from the traditional healers of Tiruchirappalli District district.

## MATERIAL AND METHOD

### Study area

We collected the plants from Tiruchirappalli and its surroundings. It is approximately located at 10.7905° N, 78.7047° E and its land mass is 16.72 Km<sup>2</sup> and its population is 11,29,422.

### Study period

We did our work from June to November 2017.

### Survey

The ethno botanical survey was carried out during June to November 2017 and all the information's were gathered from the local traditional healer of Tiruchirappalli District and these information were selected applying both questionnaire and Random sampling techniques. This questionnaire about the traditional healer and medicinal plants and uses. The collected medicinal plants were identified and authentication with taxonomically using, The Flora of Tamil Nadu Carnatic, Matthew, K.M Vol. I (1981), II (1982), III (1983), The Identified plants species were then confirmed to the Rapinet Herbarium, St. Joseph's College, Tiruchirappalli.

**Table 1** Medicinal plants used for treatment of dengue

S.no	Botanical name	Family	Common Names	Local Name	Parts Used
1	<i>Andrographis paniculata</i> . (Burn.F.)Wall.ex.Nees	Acanthaceae	King of bitter	Nilavembu	Leaf
2	<i>Santhalam album</i> .L	Sandalaceae	Indian sandalwood	santhanam	Powder
3	<i>Cyperus rotundus</i> .L	Cyperaceae	Coco grass	Korai pull	Rhizome
4	<i>Zingiber officinale</i> .L	Zingiberaceae	Ginger	Sukku	Rhizome
5	<i>Piper nigrum</i> .L	Piperaceae	Black pepper	Mulaku	pepper
6	<i>Coleus vettiveroides</i> . JACOB	Lamiaceae	Coleus	Iruveli	Leaf
7	<i>Tragia involucrate</i> .L	Euphorbiaceae	Climbing nettle	Sirukanjori	Leaf
8	<i>Mollugo cervicana</i> (L.)sei	Mollugiaceae	Threadstem carpetweed	Parpadagam	Leaf
9	<i>Aegle marmelos</i> (L.)correa	Rutaceae	Golden apple	Vilvam	Leaf
10	<i>Stereospermum colais</i> .Buch-ham	Bignoniaceae	Yellow snake tree	Pathiri	Leaf
11	<i>Trichosanthes cucumerina</i> .L	Cucurbitaceae	Snake gourd	peypodal	Fruit
12	<i>Plectranthus vettiveroides</i> (Jacob)	Lamiaceae	White cus cus grass	Vilamichu ver	Leaf
13	<i>Justicia gendarussa</i> (C.B.Cl)S.S.R.BENNET	Acanthaceae	Warer willow	karunchi	Leaf
14	<i>Vetiveria zizanioides</i> (C.B.Cl)	Poaceae	Bunch grass	Vettiver	Leaf
15	<i>Ficus religiosa</i> .L	Moraceae	Bodhi tree	Arasamaram	Bark
16	<i>Oxystelma esculentum</i> (L.F)Su	Apocynaceae	Rosy milkweed vine	Pangampalai	Leaf
17	<i>Pavonia zeylancia</i> (L.)Cav	Malvaceae	Ceylon swamp mallow	Chitra mutti	Leaf
18	<i>Lagenaria siceraria</i> (Molina)standl.	Cucurbitaceae	Calabash	Churai	Fruit
19	<i>Coriandrum sativum</i> .L	Apiaceae	Coriander	Kothamalli	Leaf
20	<i>Tinospora cordifolia</i> (Thunb.)Miers	Menispermaceae	Heart leaved moonseed	Seenthil	Leaf
21	<i>Citrus limon</i> (L)obeck	Rutaceae	Lemon		Fruit
22	<i>Elettaria cardamom</i> .L	Zingiberaceae	Cardamom		Alakai
23	<i>Boerhavia diffusa</i> .L.nom.cons	Nyctaginaceae	Purnarhava	Saramathi	Leaf
24	<i>Datura stromonium</i> .L	Solanaceae	Hell 's bell	Umathi	Leaf
25	<i>Punica granatum</i> .L	Lythraceae	Pomegranate	mathulai	Fruit
26	<i>Vitis vivifera</i> .L	Vitaceae	Black grape	Thirachai	Fruit
27	<i>Euphorbia hirta</i> .L	Euphorbiaceae	Ashma plant		Root
28	<i>Momordica charantha</i> .L	Cucurbitaceae	Bitter gourd	Pakarkai	Fruit
29	<i>Tephrosia pupurea</i> (L.)pers	Fabaceae	Fish poison/wild indigo	Kolungi	Leaves
30	<i>Cymbopogan citratus</i> (D.C) strapt	Poaceae	Lemon grass	Elummichai pul	Whole
31	<i>Allium sativum</i> .L	Liliaceae	Garlic	Poonndu	Bulb
32	<i>Citrus sinensis</i>	Rutaceae	Orange	Orangu	Fruit
33	<i>Phyllanthus amblica</i> .L	Phyllanthaceae	Indian gooseberry	Amala	Fruit
34	<i>Curcuma longa</i> .L	Zingiberaceae	Turmeric	Machal	Rhizome
35	<i>Murraya kornigii</i> (L.)sprange	Rutaceae	Curry leaves	Karuvapillai	Leaves
36	<i>Asparagus racemosus</i> .Wild	Asparagaceae	Satavar	Thaneer vita kilangu	Root
37	<i>Vitex regundo</i> .L	Lamiaceae	Chinese chaste tree	Nochi	Leaf
38	<i>Withania somnifera</i> (L.)Dunal	Solanaceae	Ashwagandha	Ashwagandha	Leaf
39	<i>Achyranthus aspera</i> .L	Amaranthaceae	Chaff flower	Nairuvi	Whole
40	<i>Calotrophis procera</i> (Aiton)W.T.Aiton	Apocynaceae	Sodom apple	Eruku	Leaf
41	<i>Solanum xanthocarpum</i> .L	Solanaceae	Yellow berried night shade	kantakathari	Whole
42	<i>Justicia vasica</i> .L	Anathaceae	Malabar nut	Adathoda	Leaf
43	<i>Cassia fistula</i> .L	Fabaceae	Golden rain tree	Mayil konrai	Leaf
44	<i>Abutilon indicum</i> .(link)sweet	Malvaceae	Indian mallow	Thuthi	Whole
45	<i>Bacopa monnieri</i> .(L.)pennell	Plantaginaceae/ scrophulariaceae	Waterhyssop	Neer perambi	Leaf
46	<i>Catharanthus roseus</i> .(L.)G.Don	Apocynaceae	Madagascar pericuinicole	Nithiya kalyani	Leaf
47	<i>Cissampelos pareirira</i> .L	Menispermaceae	Velvet leaf	mancatkatakodi	Leaf climber
48	<i>Psidium guajava</i> .L	Myrtaceae	Guava	Koeya	Leaf
49	<i>Piper retrofractum</i> . Vahl	piperaceae	Balinese long Piper	Mulagu	pepper
50	<i>Gnearia tomentosa</i>	Rubiaceae			Leaf
51	<i>Mimosa scabrella</i> .Benth	Fabaceae			Flower

Flora of the Presidency of Madras, J S Gamble vol. I-III (1957).

**Data Analysis**

The ethno botanical data has been analyzed using quantitative methods of data analyses. Descriptive statistics like percentage and frequency method to analyze the data.

**RESULTS AND DISCUSSION**

The result of present study shown that 51 and 55 species of medicinal plants of dengue and malaria were reported the survey and having discussion with local traditional healers and local peoples. These medicinal plants belongs to 30 and 31 families. The following (Table-1 and 2) families categorized according to their, botanical name, local name, common name family, parts used and habit is recorded. Thus families for dengue are Acanthaceae, Sandalaceae, Cyperaceae, Zingiberaceae, Piperaceae, Lamiaceae, Euphorbiaceae, Mollugiaceae, Rutaceae, Bignomiaceae, Cucurbitaceae, Poaceae, Moraceae, Apocynaceae, Malvaceae, Apiaceae, Menispermaceae, Nyctaginaceae, Solanaceae, Lythraceae, Vitaceae, Phyllanthaceae, Aspragaceae, Amaranthaceae, Anatheceae, Fabaceae, Plantaginaceae, and Myrtaceae, Piperaceae, Rubiaceae and Families for malaria are Meliaceae, Euphorbiaceae, Capparaceae, Ploygalaceae, Mrtiaceae, Breceiaceae, Solanaceae, Lamiaceae, Zingerberaceae, Fabaceae, Cariaceae, Amaryllidaceae, Rubiaceae, Verbenaceae, Cucurbitaceae, Phyllanthaceae, Piperaceae, Rutaceae, Asteraceae, Diliaceae, malvaceae, Myrtaceae, Poaceae, Combretaceae,acoaceae, lamiaceae, Caesalpinaceae, Pittosporaceae, Plumbaginaceae, Araliaceae, Apocynaceae, Meliaceae and Annonaceae.

**Table 2 Families For Anti Dengue Medicinal Plants**

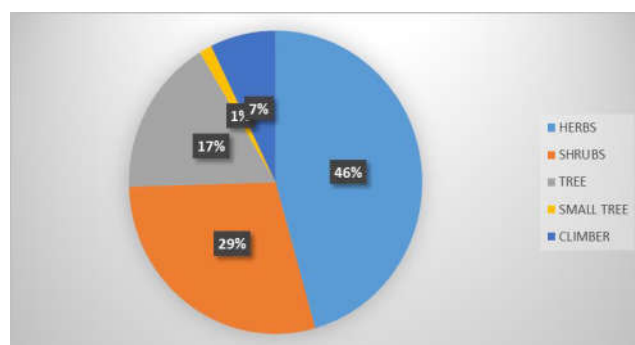
S.No	Name of The Families	The Number of The Families
1	Acanthaceae	2
2	Sandalaceae	1
3	Cyperaceae	1
4	Zingiberaceae	3
5	Piperaceae	1
6	Lamiaceae	3
7	Euphorbiaceae	2
8	Mollugiaceae	1
9	Rutaceae	4
10	Bignomiaceae	1
11	Cucurbitaceae	3
12	Poaceae	2
13	Moraceae	1
14	Apocynaceae	3
15	Malvaceae	2
16	Apiaceae	1
17	Menispermaceae	2
18	Nyctaginaceae	1
19	Solanaceae	3
20	Lythraceae	1
21	Vitaceae	1
22	Phyllanthaceae	1
23	Aspragaceae	1
24	Amaranthaceae	1
25	Anatheceae	1
26	Fabaceae	2
27	Plantaginaceae	1
28	Myrtaceae	1
29	Piperaceae	1
30	Rubiaceae	1

Which are active application by the people living in an around Tiruchirappalli district have been recorded not only conserve their heritage but also to bring out their traditional folk wisdom and belief concerning health care (Figure 1 and 2)

According to the analysis on habitats of the medicinal plants and parts as medicine for human beings. Herbs were the primary source of medicine and the largest number contributing to (39.58%) species and following by shrub, tree and the lowest number of climber (6.26%) (TABLE 3).Habit of medicinal plants used to treat dengue in figure 1.

**Table 3 Anti Dengue Medicinal Plants Percentage**

Habitat	Total numbers	Percentage
Herbs	19	39.58%
Shrubs	12	25%
Tree	7	14.58%
Small to Medium sized Tree	7	14.58%
Climber	3	6.26%

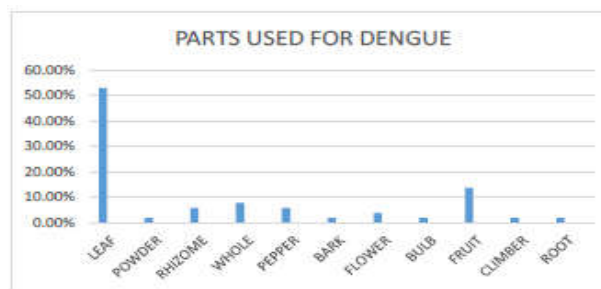


**Figure 1 Anti Dengue Medicinal Plants Percentage**

Among these, leaves are the most frequently used plant part (52.94%) which is followed by fruit, whole plant, rhizome, flower, pepper and the lowest level used is Powder, bark, bulb, climber and root(1.9%).All the plant parts are used in the traditional medication in dengue in (Figure- 2)

**Table 5 Medicinal Plant Parts Used For Dengue**

S.no	Part used	Total Number	Percentage
1	LEAF	27	52.94%
2	POWDER	1	1.9%
3	RHIZOME	3	5.8%
4	WHOLE	4	7.8%
5	PEPPER	3	5.8%
6	BARK	1	1.9%
7	FLOWER	2	3.9%
8	BULB	1	1.9%
9	FRUIT	7	13.72%
10	CLIMBER	1	1.9%
11	ROOT	1	1.9%



**Figure 2 Medicinal Plant Parts Used For Dengue**

The medicinal plants are useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases (Srithi *et.al.*, 2009; Chaitanya *et.al.*, 2013). Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds. Terpenoids exhibit various important 12 pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities. Terpenoids are very important in attracting useful mites and consume the herbivorous insects. Alkaloids are used as anaesthetic agents and are found in medicinal plants. These compounds are synthesized by primary or rather secondary metabolism of living organisms (Mikawlawng 2014; Rahman *et.al.*, 2004). Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function. They are widely used in the human therapy, veterinary, agriculture, scientific research and countless other areas. A large number of phytochemicals belonging to several chemical classes have been shown to have inhibitory effects on all types of microorganisms *in vitro*. Plant products have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruits, seeds. Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances. (Nostro *et.al.*, 2000; Awoyeni *et.al.*, 2012).

Herbal medicines have good values in treating many diseases including infectious diseases, hypertension, etc. That they can save lives of many, particularly in the developing countries, is undisputable (Patick 2002). Even today many local and indigenous communities in the Asian countries meet their basic needs from the products they manufacture and sell based on their traditional knowledge. Herbal drugs obtained from plants are believed to be much safer; this has been proved in the treatment of various ailments (Mitalaya *et.al.*, 2016). Nearly 80% of the world population use traditional medicine, mainly medicinal plants, to cure illnesses and ailments. Ethno botany is the scientific study of the relationship that exists between people and plants. Since the beginning of civilization, people have used plants as medicine (Benthy and Trimen 1980). 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 (Diallo 1999). Many investigators are of the view that there should not be any further delay in the recording of useful data concerning ethno medicine and Phytotherapeutic practices by ethnic groups lest such vital information would be lost permanently as primitive populations become more and more acculturated to modern life styles and technological changes. A great deal of attention has been devoted to medico-ethno botanical research in folk society in recent time.

## CONCLUSION

Present survey revealed that a number of medicinal plant species are used by indigenous people of the study area to treat various ailments. The indigenous community still relies on traditional medicine although; the modern health-care services are available, which indicates the significance of plant based traditional medicine. Our findings provide baseline data to establish a connection between the traditional health practioners and scientific communities, which could be substantial in novel drug discovery. Furthermore, ethnobotanical data is of significant value for conservation managers and policy makers for sustainable management of medicinal plant species, which are under threat due to over exploitation. Therefore such popular plant species could be further analyzed for bioactive constituents, *in vivo/in vitro* biological activities, which may leads to new and potential drugs for dengue.

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