Journal of Chemical, Biological and Physical Sciences

An International Peer Review E-3 Journal of Sciences

Available online at www.jcbsc.org

Section B: Biological Sciences

CODEN (USA): JCBPAT Research Article

Ethanomedicinal Values of Sacred Trees in Cuddalore District, Tamilnadu, India.

D. Sivalingam*, R. Rajendran and K. Anbarasan

Department of Botany, Annamalai University, Annamalai Nagar-608 002.India

Received: 17 December 2015; **Revised:** 29 December 2015; **Accepted:** 05 January 2016

Abstract: This study provides a significant Ethanomedicinalinformations, about the sacred plants in cuddalore district, tamilnadu state qualitatively and quantitatively. Ethanobotanical studies are very important to reveal the multi sort values of plants in the world in past and present. In this way since this is the first ethanobotanical study which records the traditional important medicinal values of sacred plants in cuddalore district. The information was obtained through open and semi-structured interviews with 35 (22 males, 13 females) knowledgeable local people and traditional healers. The collected data were analyzed qualitatively and quantitatively. In addition, conservation status of the plants, usage value and relative importance were determined. A total of six species of sacred plants, mostly trees, belonging to six families were studied in this investigation. They were used to treat 30 diseases and 12 major ailment categories. Leaves were the most frequently used plant part. Based on IUCN red data, the identified sacred plants include one least concerned species, one vulnerable species and two endangered and threatened species. The ailment categories of Gastro-intestinal problems had the highest percentage (83.3) of use plant species. The most important species according to their high use value (UV) were *Aeglemarmelos* (0.97) and *Prosopis cineraria* (0.94) which are the most frequently and popularly used plants. The species which had the highest Relative Importance (RI) values are *Aeglemarmelos* (1.80) and *Ficusreligiosa*(1.71).As a result of the present study, it can be concluded the sacred plants play an important role in the health care of human being and people rely on medicinal plants to treat various ailments and diseases. In addition, the ethanomedicinal plants with high UV and RI values might give some useful leads for further pharmacological inverstigation.

Keywords: Sacred trees, Sthalavriksha, Ethanomedicine, Conservation and Documentation

INTRODUCTION

Plants are the important source of therapeutic drugs and play a significant role in the survival of many tribal and ethnic communities[1]. According to World Health Organization (WHO), 80% of the developing countries rely on the traditional medicines and in which 85% of use plants or their extracts are used as plant drugs for their healthcare need[2, 3]. India is one of the treasure houses of medicinal plants in the world. The survey of medicinal plants in a particular area is important to conserve the traditionally important plants of that particular landscape4. Sthalavriksha is referred to as a plant which is venerated from time immemorial by devotees as being as holy as the presiding deity of a temple[5]. The sanskrit term sthalavriksha means tree of the locality (sthal-place; vriksha-tree). Sthalavriksha is a natural tree found in the temple site before construction of the temple and most temple myths (Sthalapuranas) and temple histories (Sthalavaralaru) refer to a prime diety that was first unearthed or found under the tree[6]. Due to traditional beliefs, both the devotees and temple authorities serve as protectors of the sthalavriksha in temples and if a tree (sthalavriksha) dies because of old age, it is usually replaced by a sapling from the same species. Hence, the tree occurs constantly in a temple for several centuries. However, in most cases the original sthalavriksha is still living within the temple grounds. In Hindusim, especially in Shaivam, there are three important aspects of the temple grounds, Moorthy (a Deity), Sthalam, (a Shrine and Sthalavriksha) and a Theertham, (Sacred tank or water body). These are the three prime elements to learn about the antiquity of a temple. The worship of these three elements will yield wisdom even without a guru or teacher[7]. Sthalavriksha worship is mostly associated with Shaivam (worship of Lord Siva), Vaishnavam (worship of Lord Vishnu) and Sthalavriksha gets divine power from these deities, which are treated as equal to the prime deity of the temple[8, 9].

Many medieval Tamil sacred hymns, e.g., Devaram[10] and Thiviyaprabantham[11]refer to Sthalavrikshas and their associated deities. Even though Sthalavriksha worship is an ancient practice in Tamil Nadu a very few studies have been conducted on its ethno importance[12, 13, 14]. In particular, ethnomedicinal uses of Sthalavriksha were referred to, based on secondary sources only. Hence, the present study was designed to gather data using a field survey with special reference to: 1. to catalogue all Sthalavriksha species and their associated deities in the temples of cuddalore district, Tamil Nadu. 2. To document the ethnomedicinal utilization of user groups including devotees, priests, Nattuvaidiyas on Sthalavriksha and Excutive officers of the temples studied.

MATERIALS AND METHODS

2.1. Study area: Cuddalore districts is located (11º43′ N and 79º49′ E) in the East Coast about 23 kms south of Puducherry region. Various types of soil are found in the Cuddalore region which include red loamy, coastal alluvium, delta alluvium, red laterite, deep black and red sandy. The mean annual rain fall is 1,079 mm and the dry season lasts for six months (January to June), and receives less than 60 mm rainfall on monthly average. The mean annual minimum and maximum temperature are 22.75°C and 33.64°C, respectively.

Field trips were made to collect informations about six sacred trees of big temples in cuddalore district, namely i) *Ficusreligiosa*(L.) (Moraceae), ii) *Stereospermumsuavelons DC.* (Bignoniaceae), iii)

Aeglemarmelos(L.) (Rutaceae), iv) *Prosopis cineraria* (L.) (Mimosaceae), v)*Exoecariaagallocha*(L.) (Euphorbiaceae) and vi) *Pterocarpusmarsupium* (Roxb.) (Fabaceae), informations obtained from BhuvarahaswamiThirukovil, Srimushnam; Padaleshwarar Temple, Cuddalore; Veeranateswarar Temple, Panruti; Vridhagireeswarar Temple,Vriddhachalam; Natarajar Temple, Chidambaram and Vaidyanathasami Temple of Tittagudi respectively (**Table 1**).

Table 1: Particulars about Sacred Trees (Sthalavrikshas) studied.

S. No.	Name of the Sacred Tree (Sthalavriksha)	Family	Vernacular Name	Name of the Temple and place	Deity of the temple
1	*Aegle marmelos* L.	Rutaceae	Vilvam	VeeranateswararTemple,Tiruvatikai, Panruti	Shivan
2	*Exoecaria agallocha* L.	Euphorbiaceae	Thillai	Natarajar Temple, Chidambaram	Shivan
3	*Ficus religiosa* L.	Moraceae	Arasu	Bhuvarahaswami Temple, Srimushnam	Shivan
4	*Prosopis cineraria* L.	Mimosaceae	Vanni	Vridhagireeswarar Temple, Vriddhachalam	Shivan
5	*Pterocarpus marsupium* Roxb.	Fabaceae	Vengai	Vaidyanathaswami Temple, Tittagudi	Shivan
6	*Stereospermum suavelons* DC.	Bignoniaceae	Paathiri	Padaleshwarar Temple, Cuddalore	Shivan

The local people including village heats, traditional healers and traders of cuddalore district who have indigenous knowledge about sacred plants of their locality and informations were collected by group discussions and interviews with them in their local language (Tamil).

Binomials of the plants with family, their local name(s), part(s) used and therapeutic uses were recorded (**Table 2**). Voucher specimens were collected and identified with the standard floras[15, 16, 17]. All the voucher specimens were maintained in the herbarium centre of Department of Botany, Annamalai University, Chidambaram (India).

2.2. Interview and ethanomedicinal data collection: The ethanomedicinal informations were collected using questionnaires by semi-structured interviews. A total of 35 informants (22 males and 13 females) include various strata of participants (local users, knowledgeable persons, village heads and traditional vaidyas/healers with the age ranged between 40-75 years) were selected for interview and get the data.

2.3. Collection of plants: Generally, the plant specimens were collected with flower and fruit conditions. Incase, if there is no flower and fruit conditions, the plant twig with few leaves were collected for proper identification and herbarium preparation. For herbarium preparation, standard procedures given by Jain and Rao[18], were followed.

Table 2: Sacred trees and their religious and medicinal uses.

S. No	Botanical name	Religious uses and belives	Medicinal uses
1	*Aegle marmelos* L.	i) Sthalavriksham of Veeranateswarar Temple ii) Leaves and flowers are offered to God for pooja.	i) 25g of root powder is boiled in water and filtered decoction is taken thrice a day for 7 days to cure fever. ii) Half of ripe fruit is taken twice a day for 3-4 days to cure constipation and dyspepsia.
2	*Exoecaria agallocha* L.	i) Sthalavriksham of Natarajar temple.	i)The roots are used to treat toothache and swellings ii) A novalphorbol ester, an anti-HIV principle has also been isolated from the leaves and stem of this unique plant.
3	*Ficus religiosa* L.	i) Sthalavriksham of Bhuvaraha Swami Temple. ii) Male offspring is entreated, if poious woman move around its trunk 108 times.	i) Milky latex is applied externally to cure foot cracks, and healing of blood clotted site. ii) 20-50g of root bark is made in to a powder and one tea spoonful of powder is mixed with little amount of coconut oil and is applied externally on the blood clotted site to cure blood clotting.
4	*Prosopis cineraria* L.	i) Sthalavriksham of Vridhagireeswarar Temple ii) To fulfil the vow of getting a child, yellow cloth cradles are tied in the branches of this tree by childless women	i) Gives relief from muscular and joint pain and snake poison and also acts as anti-inflammatory and flatulence.
5	*Pterocarpus marsupium* Roxb.	i) Sthalavriksham of Vaidyanatha Swami Temple	i) It is useful in diabetes and heart problems. ii) It is helpful in controlling skin diseases. iii) It causes significant decrease in cholestral level. iv) It shows antimicrobial activity against bacteria and virus.
6	*Stereospermum suavelons* DC.	Sthalavriksham of Padaleshwarar Temple	Flowers pounded with honey are taken for highcough.

2.4. Taxonomic identification: The sacred plants were identified and their scientific names were known with the help of professional/subject experts and the reputed flora and books like [19]Hooker, 1973; [20]Kritikar and Basu, 1975; [21]Jain and De Filipps, 1991.

2.5. Conservation status of the present sacred plants: In this study, collected sacred species were compared with IUCN Red List in order to identify their living status[22].

2.6. Data analysis: The majority of the data collected in this study were descriptive in nature. Interview data were coded and sorted into themes. Inconsistencies and unique statements were noted and given particular attention. Recurrent themes were uncovered in this report by a process of systematic content anlalysis. In its broadest sense, different researchers have emphasized various aspects of content analysis, from its capacity to generate quantitative descriptions by analyzing work counts[23]. Ethanomedicinal data were analyzed and summarized by using Microsoft excel.

2.7. Use value (UV): The use svalue (UV) [24], a quantitative method that demonstrates the relative importance of species known locally was also calculated using the formula UN= (∑ U/n). Where UV is the use value of species, 'U' is the total number of use reports per species and 'n' represents the total number of informants interviewed for a given plant. Values will be high (near 1) if there are many use reports for a plant, implying that the plant is important, and near 0 if there are few reports related to its use.

2.8. Relative importance (RI): Relative importance value (RI) was calculated according to Bennett and Prance[25]. RI=PP+AC, where PP is obtained by dividing the number of pharmacological properties (reported by dividing the number of pharmacological properties (reported specific ailments) attributed to a species divided by the maximum number of properties attributed to the most resourceful species (species with the highest number of properties). AC is the number of ailment categories treated by a given species divided by the maximum number of ailment categories treated by the most resourceful species. The highest possible value of RI is 2.0, which indicates the highest diversity of medicinal uses of a palnt[26].

RESULTS AND DISCUSSION

In the present study, totally six plant species belonging to six genera and six families were recorded which were associated with culture, religious belief, medicinal uses. All these species were considered as sacred plants used regularly by the local people in various religious cultural rituals and also used for the treatment of various diseases in traditional medicine.

These sacred plants were enumerated and arranged in alphabetical order with botanical name, family, vernacular (Tamil) names, name of the temple &place, deity of the temple, religious usages&belives, medicinal uses, part(s) used, diseases cured, IUCN status, UV value, Relative importance (RI) values and major ailment categories (**Table 1 to 6**).

3.1. Conservation status of the plants: According to IUCN Red List Categories and Criteria (Version 3.1), four types of species are found, Vulnerable (Vu), Endangered (En), Threatened (T) and Least concerned (LC) at local level. For the present species it is given in **Table 3**.

Table 3: IUCN Red listed sacred plants recorded in study area.

S.No	Botanical Names	Family	IUCN status
1	*Aegle marmelos* L.	Rutaceae	T
2	*Exoecaria agallocha* L.	Euphorbiaceae	En
3	*Ficus religiosa* L.	Moraceae	LC
4	*Prosopis cineraria* L.	Mimosaceae	T
5	*Pterocarpus marsupium* Roxb.	Fabceae	Vu
6	*Stereospermum suavelons* DC.	Bignoniaceae	En

3.2. Use value (UV): Use value representing the relative importance of plants, were high for *Aeglemarmelos* (0.97) and *Prosopis cineraria* (0.94). The lowest use value was calcualted at 0.80 (**Table 4**). High use-value plants were the most frequently used sacred pant species.

Table 4: Sacred plants – Ethanomedicinal value and use value (UV).

S.No	Botanical Names	Parts used	Disease Treated	UV value
1	*Aegle marmelos* L. (Rutaceae)	Leaf paste	Knee and joint pain, infertility	0.97
		Leaves	Blood sugar reduction	
		Fruit pulp	Skin boils	
		Fruit pulp with milk	Diarrhea	
		Leaves (sweet leaves)	Diabetes, skin disease	
		Leaves & Fruit	Cold and cough	
		Leaf juice	Menstrual disorder in women	
		Leaf juice & Fruit paste	Cold, cough, chest diseases	
2	*Prosopis cineraria* L. Druce (Mimosaceae)	Bark	Tooth ache	0.94
		Leaves	Cold, cough, fever	
		Flowers	Prevent miscarriage	
		Gum	Dysentery	
3	*Excoecaria agallocha* L. (Euphorbiaceae)	Flowers	Eye diseases	0.8
		Root	Tooth ache, intestinal worms	
		Oil	Joint pain, leprosy	
4	*Pterocarpus marsupium* Roxb. (Fabaceae)	Bark	Tooth ache	0.85
		Flowers	Fever	
		Gum	Tooth ache	
5	*Ficus religiosa* L. (Moraceae)	Bark	Ulcer	0.88
		Fruit	Laxative	
		Latex	Piles, diarrhea	
		Leaves	Cut wounds	
		Seeds	Refrigerant	
6	StereospermumsuavelonsD C. (Bignoniaceae)	Flowers	Diabetic boils	0.91

3.3. Relative importance: The plant with more number of pharmacological properties (PP) were *Aeglemarmelos, Prosopis cineraria* (7 PP); so they have a normalized PP value of 1.00 (7/7). *Ficusreligiosa* was employed to treat five ailments categories and had a normalized AC value of 1.00 (5/5). *Aeglemarmelos* had the highest RI of 1.80 and it was followed by *Ficusreligiosa*(1.71) (**Table-6**).

Table 5: Major categories of ailments

Ailment categories	Biomedical terms	No. of species used	Percentage
Gastro-intestinal problems	Intestinal problems, Stomachic, anthelmintic, diarrhea, dysentery, cholera, carminative, indigestion, dyspepsia, vermifuge, hiccup, flatulence, laxative, purgative, antispasmodic, appetizer, deobstruent, cathartic, colicpain, anorexia, nausea, antibilious	5	83.3
Respiratory problems	Cough, bronchitis, asthma, hemoptysis, expectorant, tuberculosis, scrofula	3	50.0
Urinary and rectal problems	Hematuria, piles, dysuria, kidney, urinary, urethrorhea, nephritis, crystalluria, lithontriptic, strangury, calculi, constipation	2	33.3
Circulatory diseases	Hypertension, anemia, styptic, astringent, blood purifier, hemorrhage, dropsy, depurative	1	16.6
Infections and parasitic diseases	Elephantiasis, antiseptic, ascariasis, chicken pox, head lice, ringworm, scabies, amebiasis, antiprotozoal	2	33.3
Inflammations and pains	Abdominal pain, rheumatism, narcotic, anodyne, abdominal pain, sedative, pectoral pain, cephalalgia, fever, analgesic, antipyretic, abdominal pain, febrifuge	4	66.6
Dermatological problems	Leprosy, rubefacient, antiscorbutic, demulcent, cooling, eczema, leukodermatic, emollient, diaphoretic, eruptions, psoriasis, erysipelas, dermatitis, boils, skin diseases, suppurative	2	33.3
Female problems	Emmenagogue, galactagogue, menorrhagia, leucorrhea, dysmenorrhea, hemorrhage, vaginal laxity, vaginal disinfectant, abortifacient	2	33.3
Male fertility problems	Seminal weakness, sperm coagulant, spermatorrhoea, Aphrodisiac	1	16.6
Eye, ear, nose and throat problems	Gout, otalgia, ophthalmia, pharyngitis, rhinitis, cold, nyctalopia	3	50
Endocrine, nutritional and metabolic disorders	Stimulant, alterative, beriberi, diabetes, scurvy, splenomegaly, diuretic	2	33.3
Injury and poisons of external causes	Snake bite, allergy, burns, cuts, wounds, fracture	1	16.6

Table 6: Relative Importance (RI) values of medicinal plants used against five specific use categories and seven ailments categories treated.

Plant species	PP [a]	AC[b]	RI [c]
Aegle marmelos L.	1.00	0.80	1.80
Exoecaria agallocha L.	0.28	0.20	0.48
Ficus religiosa L.	0.71	1.00	1.71
Prosopis cineraria L.	1.00	0.60	1.60
Pterocarpus marsupium Roxb.	0.85	0.80	1.65
Stereospermum suavelons DC.	0.42	0.40	0.82

[a]**PP**: Pharmacological properties
[b]**AC:** Ailment categories
[c]**RI:** Relative importance (PP+AC)

CONCLUSION

Sthalavrikshas are valued for their botanical, medicinal, environmental, religious and mythical importance. The sthalavrikshas of Tamilnadu constitute a part of genetic resources for the conservation of species diversity. Propagation of sthalavrikshas in temples contributes to the conservation of our floral diversity. Some trees are important for their economic role in ship building or in the timber industry, some for providing homes for various animals, birds and others for their medicinal and air purifying qualities.

In the present study, it is concluded that the religious activities are having close relationship with plants boost up the mental health of local people of Cuddalore district and many of the sacred plants found in the household and temples were used for various religious cultural activities as well as for health care.

These sacred plants are worshiped by the local people for getting the blessing of health and wealth by positive powers of nature.

Hence the religious ceremonies, rites act as a protective factor or device for the conservation of sacred plants. So, it is the duty of present generation to preserve and promote these aesthetic treasures to conserve biodiversity and nature, which will surely play a part in progeression of human beings. These sacred trees preserved through millennia by our ancestors as potential bio resources should be respected and conserved for the future generation.

ACKNOWLEDGMENTS

The authors are cordially grateful to the people inhabiting the study area for sharing their traditional knoledge and also thankful to the Department of Botany, Annamalai University. The authors gratefully acknowledge the University Grants Commission (UGC), New Delhi, for the financial support in the form of BSR meritorious Fellowship.

We specially express our sincere thaks to Mr. R. Rajendran, for providing ethanomedicial information about the study plants.

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Corresponding author: D. Sivalingam

Department of Botany, Annamalai University, Annamalai Nagar-608 002.