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Original Article

Wild Ethno Pharmacognosy Plants Utilize for the Treatment of Jaundice by Paliyar's Tribe in Sadhuragiri Hills, A Part of Western Ghats, Tamil Nadu, India

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ABSTRACT

A wild ethnobotanical survey of plants used by the traditional healers for the treatment of jaundice was conducted in the Sadhuragiri hills, a part of Western Ghats, Tamil Nadu. Paliyar, the predominant tribal community has its settlements in different areas in the study region. 40 species of Angiospermic plants, belonging to 36 genera under 25 families have been documented for their therapeutic use against jaundice. The plant families which contained the most commonly used species for their effects are Euphorbiaceae and Nyctaginaceae (4 Sps each) followed by, Acanthaceae, Asteraceae, Fabaceae and Liliaceae (3 Sps each). The family Rutaceae recorded two species and the remaining families noted in this study recorded one species each. The wild plants were arranged with correct nomenclature along with their common name, family, the part used and their medicinal value. For which freshly collected medicinal plant parts are used. The majority of the formulations are prepared in crushed and ground form. In all cases, the treatment involved oral administration of the extracts 2 to 3 times empty stomach early morning daily from a week to month till the problem disappears. Phyllanthus amarus, Eclipta prostrata, Eclipta alba, Phyllanthus emblica, Tribulus terrestris and Andrographis paniculata were repeatedly mentioned by the traditional healers as the most widely used for the treatment of jaundice in the study region. The study indicates that the local inhabitants rely on medicinal plants for treatment. This document suggested that further clinical experimentation is needed to scientifically evaluate these widely used herbal remedies for possible bioactive effects. These ethnomedicinal data may provide a base to start the search the new compounds related to phytochemistry, pharmacology and pharmacognosy. Attention should also be made on proper exploitation and utilization of these medicinal plants.

Keywords: Ethnobotany; Traditional medicine; Herbal drugs; Tribal community; Western Ghats.

1. INTRODUCTION

Medicinal plants play an important role in supporting healthcare system in India. According to the World Health Organization (WHO), 80% of the rural population in developing countries utilizes locally available medicinal plants for their primary healthcare needs. About 90% of the

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country's medicinal plants are found in forest habitats. It may be noted that India is one amongst those nations which possess a historical track record of having made a significant global contribution by virtue of its traditional knowledge of the medicinal plants. India has rich medicinal plant heritage of about 8000 species and an estimated 40,000 herbal formulations. If conserved and sustainably utilized it has global relevance. Thus there is an urgent need to conserve the wild populations of medicinal plant diversity in prioritized forest regions of India. Conservation of medicinal plants will contribute to self-reliance of millions for India's own health needs.[1]

Jaundice is liver disorder disease. In this disease there is obstruction in the bile duct or loss of the functions of bile producing liver cells. Jaundice may be caused by an obstruction of bile ducts which normally discharge bile salts and pigments into the intestine. It is caused by bilirubin which comes from red blood cells. The colour of the skin and urine vary depending on the level of bilirubin. The yellow discoloration of the skin and mucous membranes occur due to an increase in the bile pigments means, bilirubin in blood. When the level of the bilirubin mildly elevated, they are yellowish. When it's high; they tend to be brown colour. It disturbs the function of liver and consequently secretion of bile. The symptoms of this disease are extreme weakness, headache, and fever, loss of appetite, severe constipation, nausea, and yellow coloration of the eyes, tongue, skin and urine. In case of severe attack, the hemoglobin content in red blood cells will become low due to high levels chemical bilirubin in blood. The obstruction of the bile ducts could be due to gallstones or inflammation of the liver, which is known as hepatitis and is caused by virus.

Jaundice may result from various diseases or conditions that affect the liver, like Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, Hepatitis E, Auto immune hepatitis, Liver cirrhosis, Liver cancer, Haemolyticanaemia and Malaria. There is no unique treatment for jaundice and hepatitis by prescribing modern allopathic and homeopathic medicine. Jaundice is a frequent complication of a viral infection of the liver and spread through poor sanitation and contaminated water and foods in urban and rural areas of India.[2]

Herbal drugs obtained are safer in the treatment of various diseases.[3,4] The herbal medicines are considered to be of great importance among different rural or indigenous communities in many developing countries.[5] In many cases, the sources of modern drugs have been plants used by indigenous people.[6] 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.[7] Scientific investigations of medicinal plants have been initiated in many parts of our country because of their contributions to health care.

Ethnobotany and ethnomedical studies are today recognized as the most viable method of identifying new medicinal plants or refocusing on those earlier reported for bioactive constituents. It is interesting to note that most of the drugs derived or originally isolated from higher plants were discovered in an ethnobotanical or ethnomedicinal context. The tribal and rural people of various parts of India are highly depending on medicinal plant therapy for meeting their health care needs. 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 the treatment of jaundice.[8-12]

A review of the scientific literature demonstrated that the majority of these plants have been reported to have hepatoprotective effects and thus can prove useful in the discovery of new drugs, which can prove their efficacy in not only alleviating jaundice but also may prove effective in treatment of the underlying cause(s) of jaundice. The scientific review not only validates the use of the various plant species used by the folk medicinal practitioners but also underscores the need for modern allopathic medicine to look to traditional medicinal practices towards discovery of more efficacious drugs.

2. MATERIALS AND METHODS

2.1. Study area

Sadhuragiri hills are situated in Southern Western Ghats comes under The Srivilliputhur Grizzled Squirrel Wildlife Sanctuary Srivilliputhur Taluk, Virudhunagar district. The elevation of Sadhuragiri is 1200 meters (3,937.0 ft.) msl in Western Ghats of South India. It lies between 9º. 42´ - 9 º.44" West latitude and between 77 º.37 - 77 º. - 41" East longitude. Sadhuragiri is in an area with a Tropical Evergreen Forest, Semi Evergreen Forest and Mixed Deciduous Forest climate. The only tribal community residing in this region is Hindu Paliyar tribes (**Fig: 1**).

2.2. Methods

Several field trips were carried out in Sadhuragiri hills from Jan 2014 to March – 2015, Covering different seasons. In order to know the phenology of the plants an Intensive and extensive field survey was made in Sadhuragiri hills and villages in Virudhunagar district. The data were collected through repeated field visits and the careful interaction with the village people and Paliyar tribes. The collected specimens were identified taxonomically with the help of available Monographs, taxonomic revisions and floras and by using field keys.[13-16]Ethenomedicine information was gathered from all categories of village people such as the local healers, village leaders, elderly persons and Paliyar tribes and the person having a through knowledge of Medical practices. Traditional Medicines for the Treatment of jaundice were cross checked and confirmed with some Siddha Doctors. The information gathered from one place was also confirmed with different communities of village people, Paliyar tribals in different places of investigation. The collected plant specimens were deposited in the

Department of Botany, National College (Autonomous), Tiruchirappalli, Tamil Nadu for future reference.

2.3. Paliyar Tribals

The indigenous people of the study area are called Paliyar/Paliyan. They are found in the hilly regions of Madurai, Dindigul, Theni, Thirunelveli, and Virudhunagar districts. It is believed that paliyars are indigenous people of Palani hills (Situated near to Kodaikanal a famous tourist place). In the Palani hills they are found at an altitude of up to 2200m. Generally Paliyars are illiterate and they speak Tamil (Mother tongue of Tamil Nadu). Paliyars when compared to various tribal communities in Tamil Nadu constitute relatively a small group.

Paliyars can be grouped into three categories based on their life styles, namely, Nomadic, Seminomadic and Settled Nomadic Paliyars don't built houses, they live temporarily in rock caves called "Pudai" Semi nomadic Paliyar build temporary house and confine themselves to small territories most of their huts are dark with no window or any other opening to admit air. Settled Paliyars are almost urbanized and live as agricultural laborers. Importance of traditional and folk medicine in the treatment of various human ailments is well recognized amongst this people.[17]

3. RESULTS AND DISCUSSION

The findings of the ethnomedicinal survey revealed that 40 species of Angiospermic plants, belonging to 36 genera under 25 families are used by Paliyar tribe of the state for treatment of jaundice .The botanical name, family, vernacular name, part(s) used, mode of use, dose and duration are given (**Table -1& Fig: 2**). The dominant families with more number of medicinal plants in the present study are Euphorbiaceae and Nyctaginaceae (4 Sps each) followed by Acanthaceae, Asteraceae, Fabaceae and Liliaceae (3 Sps each). The family Rutaceae recorded two species and the remaining families noted in this study recorded one species each (**Fig: 3**).

Among the various plant parts used for the preparation of drugs, leaves (19) are more commonly used when compared to other plant parts. It may be because of the ease of collection and its availability throughout the year. The other plant parts used are fruits (5), root and seeds (4), whole plants (3), flower (2), stem (1), root bark (1) and tuber (1) (**Fig: 4**). The methods of most preparations fall into 13 categories plant parts used in the form of Crushed & Grounded (20%), Paste (17.5%), Powder & Extract (15%), Juice (12.5%), Decoction (10%) and remaining of the preparation categories (1%) (**Fig: 5**).

Herbal medicines are prepared in the form of juice/extract followed by infusion, powder, decoction, paste and as such. During the survey it was observed that some plants are used alone while some are used in combination with other plant parts. This study determined that phytotherapy is the most common form of treatment for jaundice which showed significant results based on their use of traditional herbal medicine in this region. The medicinal plants used by the Paliyars need to be systematically screened by phytochemists and pharmacologists for the potent active principles. Scientific validation of these remedies may help in discovering new drugs from these medicinal plants for jaundice. Any person who is affected with jaundice does start with the medical treatment in a hospital, but the majority of the people know that allopathic treatment cannot cure jaundice. Due to the frequent effect of the disease, people do prefer a parallel alternative treatment to allopathic that is to visit the healer who specializes in giving medicine for jaundice.

The use of these plants to treat various illnesses is still needed by the communities because of poor socio-economic conditions the high cost and a difficult access to allopathic medicines. The majority of the reported species are wild and rare. These demand an urgent attention to conserve such vital resources so as to optimize their use in the primary health care system. Nowadays, conservation of traditional knowledge is greatly menaced by several factors related to modernization of the region and lack of interest in traditional healers. This is a major difficulty transferring traditional healing knowledge to the next generation. It is, therefore, urgent to save the cultural heritage of the natives by confirming the therapeutically used plants with scientific criteria. In this context, screening for active substances and testing their activities against jaundice and hepatitis causing organisms forms an interesting subject for the feature studies.[49] Herbal medicines derived from plant extracts are being increasingly utilized to treat a wide variety of clinical diseases but very little knowledge is available regarding their modes of action. The traditional uses of medicinal plants in healthcare practices provide clues to new areas of research for new biological compounds and discovery of new drugs. Nevertheless there is no doubt that more phytochemical, pharmaceutical and clinical studies are needed to evaluate hepatoprotective properties, efficacy and safety of all the claimed medicinal plants. [25]

The ethno-medico-botanical survey revealed that the people of this area possess good knowledge of herbal drugs but as these ethnic societies are in progressive exposure to modernization their knowledge of traditional uses of plants may be lost in due course. Plant drugs and herbal formulations are frequently considered to be less toxic and free from side effects than synthetic ones. In general, there is very little biological knowledge on the specific modes of action in the treatment of jaundice, but most of the plants have been found to contain substances like glycosides, alkaloids, terpenoids, flavonoids etc. that are frequently implicated in treatment of this diseases. Systematic inventories of this knowledge need to be made and research related to isolation and purification of active compounds from these plants should be carried out to provide leads in future drug therapy.[20]

Table 1: Enumeration of medicinal plants list out in Sadhuragiri hills

S.NO	Botanical name	Family	Local Name	Part Used	Mode of Utilization in Paliyar Tribes	References
1	*Abrus precatorius* L.	Fabaceae	*Kudumani*	Seeds	Crushed and mixed with goat's milk. The mixture is taken orally to cure jaundice and liver problems.	[18,11]
2	*Abution indicum* (L.) Sweet.	Malvaceae	*Thuthi*	Leaves	The juice extracted from leaf is taken orally once a day for 7days to treat	[19]
3	*Achryanthes aspera* L.	Amaranthaceae	*Naiuruvi*	Root	The root crushed to powder and boiled in water. 2 glasses of root decoction is given in the morning daily.	[20]
4	*Aegle marmelos* (Linn.) Correa ex Roxb	Rutaceae	*Villvam*	Leaves	A blend of juice prepared from 5 gms of the fresh leaves along with 5 gms of the fresh leaves of *Eclipta prostrate* L. is taken with honey twice a day for a period of 2 weeks to treat.	[8, 21, 22, 23]
5	*Aloe barbedensis* Mill.	Liliaceae	*Kathalai*	Leaves	The leaf sap is mixed with *Curcuma longa* L. rhizome paste and cow milk is taken daily for 10-12 days, twice a day.	[19, 24]
6	*Aloe vera* (L) Burm.f.	Liliaceae	*Kathalai*	Leaves	The leaf sap is mixed with Curcuma longa Linn rhizome paste and cow milk is taken daily for 10-12 days, twice a day.	[20, 25]
7	*Andrographis neesiana* Wight	Acanthaceae	*Nelavembu*	Leaves	Young twigs are crushed to paste, 20-30 gms paste taken three times daily after meal for 2-3 weeks.	[19]

8	***Andrographis paniculata* (Burm.f)WalEx.Nees**	**Acanthaceae**	***Nelavembu***	**Leaves**	**Young twigs are crushed to paste, 20-30 gms paste taken three times daily after meal for 2-3 weeks.**	[20, 25]
9	***Asparagus racemosa* Willd.**	**Liliaceae**	***Thnnirvitan kizhanku***	**Tuber**	**Powder obtained from mixed with freshwater as tonic to treat.**	[2, 24, 26, 27]
10	***Averrhoa Carambola* L.**	**Oxalidaceae**	***Pulichaam***	**Fruit**	**Dry fruits and mixed With *piper nigram* L. and salt prepared dictions 7-10 days.**	[24, 25]
11	***Azadirachta indica* A. Juss**	**Meliaceae**	***Veampu***	**Leaves**	**Young leaves are fried with salt and powder given with cow milk.**	[2, 8, 20, 21, 23, 25]
12	***Boerhaavia Procumbens* L.**	**Nyctaginaceae**	***Mookaratti***	**Root bark**	**Cursed root bark powder mixed boiled water drinking 7-10 days treat.**	[23, 25, 28]
13.	***Boerhaavia diffusa* L.**	**Nyctaginaceae**	***Mookaratti***	**Leaves**	**One teaspoon of the leaf paste is taken twice a day for period of one week to treat.**	[8, 22, 23, 29, 30]
14.	***Bougainvillaea Spectabilis* Willd.**	**Nyctaginaceae**	***Kaethapo***	**Flower**	**Dictions and mixed with salt in prepared early morning 2 glass drinking treat**	[26]
15.	***Cajanus cajan* L.**	**Fabaceae**	***Thuvarai***	**Seeds**	**30 ml of the salted boiled water extract of the fresh leaves is taken in empty stomach for a period of 2 weeks to treat.**	[8, 24, 25, 31]
16.	***Cassia fistula* L.**	**Caesalpiniaceae**	***Semaiagathi***	**Flowers**	**One teaspoon of leaf and flower powder is taken with a glass of cow's milk once a day for a period of 2 weeks to treat.**	[8, 24, 25, 32]

17	*Centella asiatica* (L.) Urban.	Apiaceae	*Vallarai*	Whole plant	The whole plant is crushed in water with few black pepper and sugar candy and the mixture is taken for few days to cure.	[19, 20]
18	*Cynodon dactylon* (L.) Pers.	Poaceae	*Arugambul*	Leaves	Juice prepare and mixed with *Piper nigrum* L. drinking 2 week's continuous period treat.	[20, 21, 25]
19	*Eclipta alba* (L.) Hassk.	Asteraceae	*Manjalkarisalanganni*	Leaves	The leaves boiled in hot water combined with extracts with buttermilk twice a day for a period of one week to treat.	[2, 19, 21]
20	*Eclipta prostrata* L.	Asteraceae	*Karisalanganni*	Leaves	The leaves boiled in hot water combined with extracts with buttermilk twice a day for a period of one week to treat.	[19, 25]
21	*Euphorbia nivulia* Buch. Ham.	Euphorbiaceae	*Kalli*	Leaves	20 ml of the salted leaf extract is taken for a period of one week to treat jaundice	[8]
22	*Ficus hispida* L. f.	Moraceae	*Peyathi*	Leaves	The leaves boiled in hot water combined with extracts with Buttermilk twice a day for a period of one week to treat.	[33]
23	*Hemidesmus indicus* (L.) R.Br.	Asclepiadaceae	*Nannari*	Root	Root powder given along with honey once a day.	[2, 21, 23, 24]
24	*Indigofera tinctoria* L.	Fabaceae	*Kattavurineeli*	Seeds	The leaf infusion in goat's milk is taken in the early morning hours for a period of 2 weeks to treat.	[8]
25	*Justicia Gendarussa* Burm.f.	Acanthaceae	*Karunochi*	Leaves	Juice internally treated.	[19]
26	*Lawsonia inermis* L.	Lythraceae	*Maruthanni*	Root	The decoction of roots, 1teaspoonful is taken orally, twice a day for 10–15 days	[23, 25]
27	*Leucus aspera* (Willd.) Link	Lamiaceae	*Thumbai*	Leaves	Paste preparation applied on head to cure.	[2, 21]

28	***Litsea glutinosa* (Lour.) Roxb.**	**Lauraceae**	***Medala Kavi***	**Leaves**	**The leaf is crushed in water with few black pepper and sugar candy and the mixture is taken for few days to cure.**	[24, 26, 28, 34, 35, 36, 37]
29	***Mirabilis jalapa* L.**	**Nyctaginaceae**	***Andhimalli***	**Leaves**	**Leaf juice mixed with water to cure.**	[26]
30	***Momordica charantia* L.**	**Cucurbitaceae**	***Pagal***	**Fruits**	**The dried fruit pieces are fried and given with normal treat.**	[19, 21, 25]
31	***Phyllanthus amarus* Schumach. &Thonn.**	**Euphorbiaceae**	***Keelaanelli***	**Whole plant**	**Plants powder and mixed with goat milk, taken internally to cure**	[2, 8, 19, 25, 38, 39, 40]
32	***Phyllanthus emblica* L.**	**Euphorbiaceae**	***Nelli***	**Fruits**	**The decoction of roots, 1teaspoonful is taken orally, twice a day for 10–15 days**	[8, 32]
33	***Phyllanthus fraternus G.***	**Euphorbiaceae**	***Keelaanelli***	**Fruits**	**Ripened fruits are eaten daily for 10-15 days.**	[20]
34	***Piper nigram* L.**	**Piperaceae**	***Mellaku***	**Whole plant**	**It is mixture of three plants leaves, fruits made into a juice and given to patient to cure the treat.**	[2]
35	***Polycarpaea corymbosa* (Linn) Lam.**	**Caryophyllaceae**	***Pallipoondu***	**Leaves**	**One teaspoon of the leaf paste is taken once a day for a period of 2 weeks to treat.**	[8]
36	***Tinospora cordifolia* (Willd.) Hook.**	**Menispermaceae**	***Centhilkodi***	**Stem**	**Pieces of stems are soaked in water; this water is taken in themorning with honey.**	[2, 20, 23, 24, 41, 42, 43, 44, 45, 46, 47]
37	***Toddalia asiatica* (L.) Lam.**	**Rutaceae**		**Leaves**	**About 20 grams leaves ground with three pepper seeds and eaten daily morning for 10-20 days treat.**	[32]
38.	***Tribulus terrestris* L**	**Zygophyllaceae**	***Nerunji***	**Seeds**	**The crushed in water with few black pepper and sugar candy and the mixture is taken for few days to cure treat.**	[25, 32]
39	***Tridax procumbens* L.**	**Asteraceae**	***Vettukaya poondu***	**Root**	**Root crushed and cow's milk mixed taken orally to cure.**	[48]
40	***Zizyphus jujube* L.**	**Rhamnaceae**	***Illanthai***	**Fruits**	**Raw fruits Cursed with powder mixed boiled water drinking 7-10 days treat**	[38]

Fig 1: View of study region

Fig 2: Author Interaction with Paliyar's Tribes

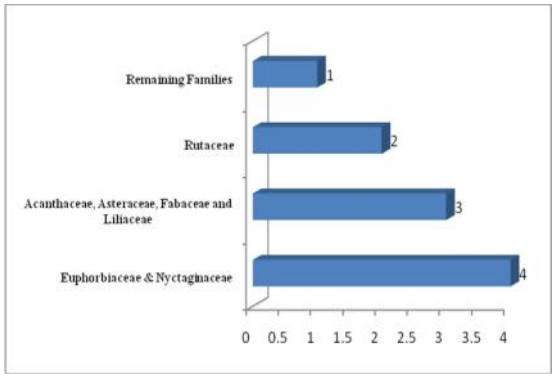

Fig: 3 Family wise classifications of the collected medicinal plants from the study region

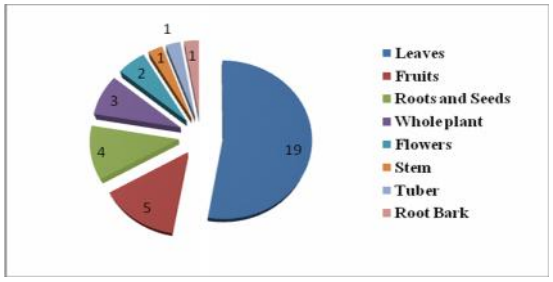

Fig: 4 Plant parts wise used for the treatment of jaundice.

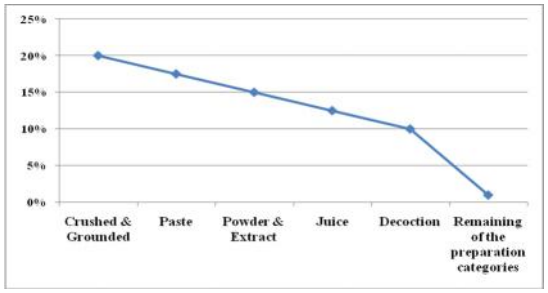

Fig 5: Mode of preparation in medicinal plants

4. CONCLUSION

In the present study 40 angiosperm species belonging to 25 families collected from Sadhuragiri hills, a part of Western Ghats, Tamil Nadu have been reported for treating jaundice. This study reveals that medicinal plants still play a vital role in the primary healthcare of this tribal community. Traditional medicines also have the potential to form the basis of pharmaceutical drugs for the treatment of a range of diseases. This may provide new sources of herbal drugs and help to understand the molecular basis of their activities. Moreover, it may further be mentioned that over exploitation of these species in the name of medicine may lead to extinction of some plant species ultimately to the disappearance in future. Therefore attention should also be made on proper exploitation, utilization and rejunuvation of these medicinal plants.

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