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Research Paper

**LEAFY VEGETABLES USED AS ETHNOMEDICINAL PLANTS BY THE
INDIGENOUS PEOPLES OF PALANI HILLS IN SOUTHERN WESTERN
GHATS, INDIA**

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Abstract

An ethnobotanical survey through questionnaire and personal interviews were undertaken to collect information on the use of leafy vegetables as ethnomedicinal plants by the Paliyars and Pulayrs in the villages of Palani Hills, in the Southern Western Ghats (Dindigul district of Tamil Nadu, India) during the period of November 2012 to January 2013. The local indigenous peoples of the study area are called *Paliyars and Pulayrs* and they are indigenous people of Palani hills. The study revealed that the leafy vegetables which are mostly collected from the local resources of the study area to treat various human diseases. There were 26 species of ethnomedicinal plants belonging to 20 families were documented in the present study and are mostly used to cure skin diseases, stomachache, diarrhea, dysentery, diabetes, fever, cough, cold, rheumatism, headache and wounds. The dominant families recorded in the study are Amaranthaceae with 4 species, Nyctaginaceae and Sapindaceae with each two species in which the leafy vegetables of the plants are frequently used by the local indigenous peoples to treat various human diseases.

Key words: Paliyars, Pulayars, leafy vegetables, ethnomedicinal plants, Palani hills, diseases.

INTRODUCTION

Leaf vegetables are also called green vegetables, plant leaves or whole green plant parts are eaten as a vegetable, sometimes accompanied by tender petioles and shoots. Although they come from a very wide variety of plants, most share a great deal with other leaf vegetables in nutrition and cooking methods. Nearly one thousand species of plants with edible leaves are known. Leafy vegetables are most often come from short-lived herbaceous plants such as lettuce and spinach. Woody plants whose leaves can be eaten as leaf vegetables include *Adansonia*, *Aralia*, *Moringa*, *Morus* and *Toona* species. The primitive people are well acquainted with the properties and uses of plants of their surroundings. They have inherited rich traditional knowledge of

surrounding plants used as food, fodder, fibres, woods, fuel, medicine, beverage, tannin, dye, gum, resin, cosmetics, crafts and religious ceremonies (Dinesh Jadhav, 2006).

The food plants that are cultivated or wild play an important role in sustaining human life for survival. Many wild plants constitute a part of food as vegetables of rural and urban peoples to a certain extent. Shanmugam *et al.* (2013) recorded that 429 species among 325 genera belonging to 104 families in Pachalur hills. Paliyar tribes living in Pachalur hills are used 260 plants for various purposes including food and medicine (Shanmugam, 2008). Mayilsamy *et al.* (2013) recorded that 61 species belong to 59 genera and 43 families are used to medicinal purpose and 45 species belong to 41 genera and 36 families are used for dermatological diseases. Shanmugam *et al.* (2012) reported that 22 species belong to 15 genera and 14 families are leafy vegetables used for various diseases by the Paliyar tribes. But there is no published literature in the Palani Hills with ethnobotanical point of view this study was aimed to document the traditional knowledge of medicinal plants used by the local indigenous peoples, Paliyars and Pulayars.

MATERIALS AND METHODS

Palani hills latitude and longitude - 10⁰.5'-10⁰.25' N and 77⁰.15'-77⁰.50'E with an area of an area of 2068 km². Is an eastward spur of Western Ghats of India with a maximum (east to west) length of 65 km, a maximum width of 40 km (mean width 24 km). The hills fall into two geographically distinct zones, the Upper and the Lower Palnis, along a ravine running from Palani in the north to Periyakulam in the South along the Parappar-Thevankarai Valley. From Western Ghats, Entire Block of Kodaikanal, Adalur and Pandrimalai Panchayats in Reddiyarchatiram Block, Manalur Panchayat in Authur Block of Dindigul District were included during this study. The study area has the highest rain fall during the period of November and December, while January – March are the driest months.

The indigenous people of study area are Paliyars and Pulayars. The Paliyars, when compared to various tribal communities in Tamilnadu constitute relatively a small group. They are found in the hilly regions of Tripur, Dindigul, Madurai, Theni, Virudhunagar and Tirunelveli districts. They are found at an altitude of up to 2200 m. Generally the Paliyars are illiterate and they speak Tamil. It is believed that the Paliyars are indigenous people of Palani hills. The name Paliyan also said to be derived from the word Palani. Their costume, habits and manners have undergone changed due to outside contacts. They are also engaged in seasonal collection of minor forest produces such as honey and bee wax. The traditional structure of the community has highly coordinated unit under the control of a tribal chief called as *Nattamai* or *Thalaivar* (Ignacimuthu *et al.* 2006, 2008).

Another tribes are Pulayars. They are living in colonies at the end of villages (Oorady) or some distance away from the village. Majority of them are living in their traditional thatched shed. The shed constructed by a primitive kind of wall with bamboo reapers and stones and plastered with mud. The Cympobogan plant is used for the roof. Collection of tubers & honey is the basic activity. They are also involved as labour in the farmer's field. Cattle maintenance is the important activity of this tribe. Their orchestra is known as Singaram (literally meaning beauty), is played by them to invoke the gods. They sing while they dance. They play the different types of music during temple festival and in the deaths. In addition to this the other major communities are Mannadies, Chettiyar, Pillaimar, Asaries Dheva rand Maniyakarar (Ganesan *et al.* 2004).

The present study was conducted in the forest areas in Palani Hills of Southern Western Ghats. The forests of the Palani Hills of the Southern Western Ghat is one of the few world ecological hot spots and rich in Bio-diversity of fauna and flora that provides 'food security' to mankind. In the present study, ethnobotanical study was conducted among the tribals of Paliyar and Pulayars in the various villages of Palani Hills forest ranges during November 2012 to January 2013. The information on plants were collected by interviewing local traditional practitioners. The data (local name, parts used, mode of preparation and medicinal uses) were collected through interviews and discussions among the traditional healers of Paliyar and Pulayar who are practicing traditional medicine in their local language (Tamil). The collected ethnomedicinal plants were botanically identified using the Flora of Presidency of Madras (Gamble, 1935) and the Flora of Tamil Nadu Carnatic (Mathew, 1983). Plants were identified in the field by trekking different areas of the forests along with some of the members of the community who already practiced traditional medicine.

RESULTS AND DISCUSSION

An account of collected medicinal plants with information on botanical name, family, local name, part used, mode of preparation and medicinal uses for the treatment of various diseases by the the traditional healers of Paliyar and Pulayar in Palani Hills of Southern Western Ghats are given in table 1. They are using 27 Angiospermic plant species of 22 genera belonging to 20 families and one pteridophyte to treat various diseases. The documented medicinal plants were mostly used used to cure skin diseases, stomachache, diarrhea, dysentery, diabetes, fever, cough, cold, rheumatism, headache and wounds. These leafy vegetable of the documented ethnomedicinal plants were cooked along with pulses and other vegetables like Brinjal (*Solanum melongena*), Onion (*Allium cepa*), Potato (*Solanum tuberosum*), etc. for consumption. Paliyar tribals in Madurai district (Ignacimuthu *et al.*, 2006), Malayali tribals in Tiruvannamalai district (Ravikumar and Vijayasankar, 2003), Irulas in Nilgiri hills (Balasubramanian and Narendra Prasad, 1996), Kadars, Malasars and Muthuvan tribals in Coimbatore district (Hosagoudar and Henry, 1996) are also utilized mostly leaves for the preparation of herbal formulations to the treatment of diseases.

Table 1. Leafy Vegetables Used as Ethnomedicinal Plants

S. No	Botanical Name and Family	Local Name	Ethnomedicinal Uses
1	<i>Adenanthera pavonina</i> L. (Mimosaceae)	Anaikundumani	The decoction of leaves is taken orally for treatment of rheumatism.
2	<i>Allophylus serratus</i> (Roxb.) Kurz (Sapindaceae)	Amalai	The leaf and stem paste with turmeric is topically applied for chronic rheumatism. Medicated bath with leaves taken for liver complaints.
3	<i>Alternanthera sessilis</i> (L.) R.Br. (Amaranthaceae)	Ponnanganni	The decoction of leaves is taken orally for fever. The decoction of leaves with little salt is taken orally for blood vomiting. The leaves are made in to very fine paste and taken every day up to 45 days for various eye problems. The soup prepared with leaves, garlic and peper is

			taken orally for piles. The plant juice with goat or cow's milk is taken for strength and vitality.
4	<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Mullukkerai	The whole plant decoction is taken orally for reduction of menstrual flow. The whole plant extract is taken orally for 3 days to treat burning sensation during urination. The whole plant paste with <i>Carum copticum</i> and <i>Allium sativum</i> is taken orally three times in a day for stomach pain and urinary problems. The Leaf extract is taken orally for abdominal discomfort and intestinal worms.
5	<i>Amaranthus tricolor</i> L. (Amaranthaceae)	Serikkeerai	The extract of root with rice water is taken orally for acute diarrhoea. The leaf paste is mixed with local liquor and applied for wound healing. The fruits with Tamarind and rhizomes of <i>Acorus calamus</i> are chewed for cold and cough.
6	<i>Amaranthus viridis</i> L. (Amaranthaceae)	Kuppaikirai	The whole plant juice is mixed with jaggery and is taken orally before sleep for constipation. The root decoction is taken thrice a day to control menstruation problems. The paste of fresh root with rhizome of <i>Zingiber officinale</i> and 2-3 seeds of black pepper is taken orally in the morning for indigestion.
7	<i>Anethum sowa</i> Kurz. (Apiaceae)	Kattu Kothamalli	The seed extract with hot water is taken orally to initiate delivery pain. The women chew the seeds after delivery for easy digestion of food. The juice obtained from whole plant is gently boiled with tamarind pulp and garlic is taken orally for body pain and tiredness. The leaves are combined with sesame oil and topically applied for swollen joints.
8	<i>Asystasia gangetica</i> T. And. (Acanthaceae)	Meddykeerai	The infusion or decoction of whole plant is mixed with pepper and is used as an enema in the later months of pregnancy. The paste made from the leaves and flowers is mixed with honey and is taken orally twice a day for three weeks for rheumatism. The infusion of leaves is taken orally for pain during childbirth. The root paste is applied topically for skin allergies. The root powder is taken orally for stomachache and snakebites.
9	<i>Basella alba</i> L. (Basellaceae)	Sambarkeerai	The leaf paste is applied topically for pimples.
10	<i>Boerhaavia chinensis</i> (L.) Asch.	Muukkarattai	The juice prepared from boiled leaf is taken orally in morning and evening for swellings.

	(Nyctaginaceae)		The leaf decoction is taken orally to check bleeding in the post-natal women after delivery. The powder of roots along with honey is taken orally for cough and asthma.
11	<i>Boerhavia diffusa</i> L. (Nyctaginaceae)	Mukarattekirei	The fried leaf paste is taken orally twice in a week to prevent jaundice and paralysis. The paste prepared from leaves is taken orally twice in a day for one week to treat jaundice and gastric troubles. The leaves are boiled with coconut oil and the oil extract is applied twice in a day for scabies and ringworm infections. The filter taken from the root is boiled with 4 black pepper and castor oil is taken orally twice in a week for concipation, scabies, itches, vomiting and indigestion.
12	<i>Canthium parviflorum</i> Lamk. (Rubiaceae)	Mullukaarai	The boiled leaf is taken orally as vegetable for stomachache and diarrhoea.
13	<i>Cardiospermum halicacabum</i> L. (Sapindaceae)	Mudukattan	The whole plant paste with cow's milk is applied for swellings of leg. The leaf juice with paste of long pepper is taken orally for diabetes and headache. The leaf juice is mixed with hot rice and is consumed to relieve pain in joints at the time of delivery. The leaf is boiled and the juice is taken orally once in a week for concipation and gastric problems. 2 drops of fried leaf juice is pored in to the ear for earache Dosai is prepared from paste of fresh leaves, rice, black gram and common is taken orally for rheumatic complaints. The root is boiled with water is taken orally in the morning and evening up to 21 days for piles.
14	<i>Centella asiatica</i> (L.) Urban (Apiaceae)	Vallarai	The powder is prepared from dried leaves and is taken orally along with ghee twice in a day for gastric troubles. The extract is prepared from fresh leaves along with leaves of <i>Solanum trilobatum</i> and boiled with cow's milk is taken orally for throat pain, cold and cough. The leaf paste is mixed with goat milk is taken orally for venereal diseases. The shade dried leaf powder with ghee is taken orally in the morning and evening for paralysis, elephantiasis, leprosy and diabetes The leaf juice is taken orally twice in day for fever. The leaf extract is taken orally for impotence.

			<p>The leaf paste with sugar is taken orally for jaundice.</p> <p>The paste of whole plant and leaves of <i>Pergularia daemia</i> with pepper seed with hot water is taken orally in the morning and evening for all kinds of fever.</p> <p>The paste of whole plant and leaves of <i>Phyllanthus amara</i> is taken orally with curd for urinal infections.</p>
15	<i>Chenopodium album</i> L. (Chenopodiaceae)	Parukkirai	<p>The seed paste is topically applied for cure skin diseases.</p> <p>The whole plant juice is taken orally for ulcers, swellings, seminal weakness and urinary troubles.</p>
16	<i>Cissus quadrangularis</i> L. (Vitaceae)	Pirandai	<p>The whole plant paste is taken orally for indigestion and hunger</p> <p>The plant juice is boiled with tamarind pulp and salt is applied for swellings and bone fracture.</p> <p>The shade dried whole plant ash dissolved water and the extract allowed to form precipitation in heating and the precipitation is taken orally with milk for 3 times for dysentery, vomiting, mouth ulcer and prolong stomach pain.</p> <p>The shade dried root powder is taken orally in the morning and evening for bone setting.</p> <p>The leaf paste is topically applied for fracture.</p> <p>The made from the tender shoots is consumed twice a in day up to three weeks for rheumatism.</p>
17	<i>Commelina benghalensis</i> L. (Commelinaceae)	Naara valli	<p>The juice extracted from the stem with <i>Canna indica</i> stem and fruits of <i>Areca catechu</i> is applied topically wound healing.</p> <p>The whole plant decoction is taken orally for all kinds of fever symptoms due to infection.</p> <p>The juice from the fresh plant is taken orally for poisonous snake bites.</p>
18	<i>Coscinium fenestratum</i> (Gaertn.) Colebr. (Menispermaceae)	Maramanjai	<p>The dried stem are boiled with coconut oil (<i>Cocos nucifera</i>) is topically applied for burns and wound healings.</p>
19	<i>Gisekia pharnaceoides</i> L. (Aizoaceae)	Manali Keerai	<p>The leaf and green gram is mixed and boiled is taken orally for chest cough. The leaf paste is topically for swellings.</p>
20	<i>Hibiscus cannabinus</i> L. (Malvaceae)	Pulichha keerai	<p>The leaf paste is topically applied for swellings.</p> <p>The mixture of flower extract, pepper powder and country sugar is taken orally in the morning and evening for tasteless and vomiting.</p> <p>The filtrate of tender fruit with sugar in water is taken orally for indigestion.</p>
21	<i>Marsilea</i>	Araakeerai	<p>The cooked leaves are taken orally as vegetable</p>

	<i>quadrifolia</i> L. (Marsileaceae)		for increasing breast milk and induction of urination. The shade dried leaf powder with milk is boiled with palm sugar is taken orally in the morning and evening for urinal complaints. Two drops young juice is pored in the nostrils of nose twice a in day for migraine. The whole plant paste is mixed with black cow's milk curd is taken orally once in a day with empty stomach up to one month for epilepsy.
22	<i>Melochia corchorifolia</i> L. (Sterculiaceae)	Pinnakku keerai	The cooked leaf with dhal is taken orally as vegetable for white discharge, diarrhoea. The decoction of leaves, dried zinger and pepper is taken orally in the morning and evening for 5 days for paralytic irritation, dysentery.
23	<i>Mentha arvensis</i> L. (Lamiaceae)	Puthina	The leaf paste is taken orally stomach upset, stomachache and indigestion. The leaf oil is applied on the forehead for headache. The shade dried leaf powder is boiled with water is taken orally for fever. The leaf juice is topically applied for pimples.
24	<i>Oxalis corniculata</i> L. (Oxalidaceae)	Puliyarai	The whole plant is boiled with butter milk taken orally for indigestion and diarrhoea in children. The whole plant is taken orally for as vegetables for headache. The leaf paste is applied over forehead for headache. The decoction leaves with banana flower is taken orally along with honey for dysentery. The leaf paste is topically applied for pimples. The paste of leaves with lemon juice and butter milk is taken orally for stomach ulcer. The leaf decoction is taken orally bone swellings. The leaves are cooked with meat is taken after child birth for insufficient milk and excessive menstruation.
25	<i>Piper wallichii</i> Hand. (Piperaceae)	Kaattu-milagu	The bathing with boiled water of leaves, tender shoots, tender shoots of <i>Bambusa arundinacea</i> and neem leaves for body pain. The paste of dried leaves with water and is taken orally for fever.
26	<i>Sesbania sesban</i> (L.) Merr. (Fabaceae)	Chitthagathi	The leaf decoction is taken orally with milk is taken orally once in a day for 7 days for diarrhoea, itches and skin diseases. The leaf paste is topically applied for burns and tumours. The paste of leaves with <i>Acalypha indica</i> leaves is topically applied for scabies.

Most of people interviewed traditional healers of Paliyar and Pulayars were familiar with the species dealing with common ailments like skin diseases, stomachache, diarrhea, dysentery, diabetes, fever, cough, cold, rheumatism, headache, wounds and dental problems were used on regular basis. Like other rural and tribal communities, common knowledge were learned from the elders and community members who share knowledge of mode of collection, preparation and administration of medicinal plants to cure diseases. Earlier studies on traditional medicinal plants reveals that the economically backward local people of Kani tribals in Tirunelveli hills prefer folk medicine due to low cost and sometimes it is a part of their social life and culture (Ignacimuthu et al., 1998; Viswanathan et al., 2001; Ayyanar and Ignacimuthu, 2005). The data collected from the respondents is raw and traditionally practiced one. But the actual component which is responsible for curing the particular disease is not proved so far. So, chemical analysis may be carried out on these plants to estimate their chemical composition for the same. It will be helpful to use the particular plant for specific disease in proper manner and to conserve the species for sustainable use.

CONCLUSION

The results of the present study provide evidence that medicinal plants continue to play an important role in the health care system of this tribal communities. Among the Paliyars and Pulayars only the older people could provide the full information regarding the medicinal properties of plants. The observation found the fact that the specific uses of their plants are known and restricted to the local Indigenous peoples only. In fact the present study in the tribal settlement areas of Palani Hills of Southern Western Ghats indicates that most of the younger people are now depending on modern medicines because of their fast curing capacity. So the traditional knowledge of them is eroding fast. Hence, a need for detailed investigation of ethnobotanical knowledge held by the tribals of Paliyars and Pulayars in the study area is required before such valuable knowledge vanishes.

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