Research Article

Ethnomedicinal Plants Used by the Kanikkars of Southern Western Ghats

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Accepted on: 24-07-2014; **Finalized on:** 30-09-2014.

ABSTRACT

An ethnobotanical survey was conducted to document the ethnomedicinal plants which are used by a hill tribe Kanikkars in Pechiparai Panchayat (forest range), Kalkulam Taluk, which forms a part of the southern tip of Western Ghats region of Kanyakumari District, Tamil Nadu, India. In the present study 50 species of plants included in 46 genera and 29 families which are being potentially used by the Kanikkars for treating various ailments are documented. The collection and documentation of their empirical knowledge and traditional techniques based on the traditional use of plants is no doubt a remarkable step keeping in view the fading ethnic traditions and culture. More attempts should be made to authenticate and evaluate the efficacy of these medicinal plants and formulations used by the Kanikkars.

Keywords: Ethnomedicine, Kanikkars, Pechiparai, Kanyakumari District.

INTRODUCTION

The medicinal species that reside in natural areas have received increasing scientific and commercial attention in recent years. Worldwide, between 50,000 and 80,000 flowering plants are used medicinally [1, 2]. Our country is commonly called the Botanical Garden of the world, owing to her wealth of herbal medicines. The various tribal sects of India are repositories of rich knowledge on various uses of plant genetic resources, which have hitherto remained unknown[3]. Indian subcontinent is being inhabited by over 53.8 million tribal people in 5000 forest dominated villages of tribal's community and comprising 15% of the total geographical area of Indian landmasses, representing one of the greatest emporia of ethnobotanical wealth[4].

Ethnomedicine denotes plants, animal products and minerals used by tribal communities of a particular region or country for medicinal purposes other than those mentioned in classical streams of the respective cultures. Ethnomedical information/data are playing an important role for developing new scientifically validated and standardized drugs, i.e. both herbal and modern[5]. Ethnomedical research is interdisciplinary; in its study of traditional medicines, it applies the methods of ethnobotany and medical anthropology. Often, the medicine traditions it studies are preserved only by oral tradition[6].

Tribal medicine or traditional medicine plays a vital role in the primary healthcare of tribal as well as rural people[7, 8]. Traditional medicine which is widespread throughout the world has been recognized by World Health Organization (WHO) as an essential building block of primary healthcare[9]. World Health Organization has stated that 80% of the world's population depends on traditional medicine for its primary healthcare and has become indispensable for its survival [10].

The tribals and ethnic peoples are totally depending on local and traditional medicine system for their healthcare because they are living in remote forest areas, where hospital and other modern medical facilities are not available[11]. They use their traditional knowledge for medicinal purpose and the knowledge is passed through oral communication from generation to generation[12, 13]. In India 550 ethnic tribes possess rich traditional and indigenous knowledge. The tribal people are exploiting a variety of herbals for effective curing of various ailments[14].

Of late, interest in traditional medicine has been increasing and ethnobotanical studies have been initiated to explore the knowledge base from various tribal groups across the country[15-19]. Since, interest in traditional medicine has been increasing world over ethnobotanical studies have gained prominence to explore the traditional knowledge particularly in developing countries[20]. Therefore, collection of ethnobotanical information and documentation of traditional knowledge has gained prominence from the perspective of drug development[21]. Ethnomedicinal studies have offered immense scope and opportunities for the development of new drugs[22].

A hill tribe called Kanikkars is the predominant local inhabitants, inhabiting the southern tip of Western Ghats region of Kanyakumari District of Tamilnadu, India. The Kanikkars are also known as Kanis. Like the other aboriginal hunting and gathering tribes, Kanis also have the primitive history of hunting, gathering and shifting cultivation. Long back, the Kanikkars were employed by the Travancore Government to collect honey, wax, ginger, cardamom, dammar and elephant tusks[23]. Kani tribal medicinal experts are called as "Philathies" [13].

Each Kani settlement has a "Mootukani", a custodian of all social affairs and justice deliverance. The problems pertaining to his people will be taken care by him and he presides over the meetings where solutions to the problems will be found. There is a "Pilathi" in each settlement who finds out the reason for a disease is due to evil spirits or harm done to God. There is a Vilikani, an informer who assembles people in a place, Chattumadam to inform the orders of the Mootukani. The language they speak closely resembles Malayalam[24] with few Tamil words[25]. Economically the Kanikkars are highly backward. Caught up between the traditional forest dependent lifestyles and modernism the Kanikkars are in a transition.

MATERIALS AND METHODS

An ethnomedicinal survey was conducted to collect information on traditional uses of medicinal plants used in the preparation of herbal medicines by the Kanikkars colonized in ten villages namely Kalapparai, Kayalkarai, Kodhayar, Koduthurai, Mangamalai, Maramalai, Mothiramalai, Mudavanpothai, Thachamalai and Thottamalai in Pechiparai Panchayat (forest range), Kalkulam Taluk, which form a part of the southern tip of Western Ghats region of Kanyakumari District, Tamil Nadu, India. Kanyakumari District is the southernmost tip of India with Kerala on the north-west, Tirunelveli District in north-east, Arabian Sea in the south-west, Bay of Bengal in the South east and Indian Ocean in the south. Kanyakumari forest division is located between 77° 10′-77°35′ east longitude and 8°5′-8°35′ north latitude. The forests of this division constitute the southern tip of the Western Ghats forests. Various types of forests from luxuriant tropical wet evergreen forests to southern thorn scrub forests occur in this division because of diverse locality factors (edaphic and biotic) varying rainfall from 50 to 310 cm and elevations from sea level up to 1829 m.

The general procedures for collection of data regarding the use of plants to treat various ailments by the Kanikkars were followed as described by [26-28]. The procedure comprised of by personal contact with village medicine men (kani tribal medicinal experts), herbal drugs practitioners and by personal observation on application of medicines. When recording the names of plants, forest visit was made with the informants for identification of the specific plants.

Information regarding ailments, plants, plant part(s) used, formulation along with dose and duration, etc. gathered from the Kanikkars have been documented. Vernacular names of the plants were obtained from the informants and the plant specimens were collected, prepared herbarium and identified with the help of regional floras, and finally confirmed by comparing with the authenticated specimens in the Herbarium of Botanical survey of India (Southern Circle), Coimbatore District of Tamil Nadu, India. The voucher herbarium specimens were numbered and deposited in the Research Department of Botany, V. O. Chidambaram College, Tuticorin, Tamil Nadu, India.

RESULTS AND DISCUSSION

During the present course of investigation, a total of 50 ethnomedicinal plant species used by the Kanikkars in Pechiparai Panchayat (forest range), Kalkulam Taluk to treat 25 various types of ailments are documented and enumerated with their botanical name in alphabetical order, family, vernacular name, habit, part(s) used, mode of preparation of medicines and mode of administration (Table). The Kanikkars in the study area have been using various plant parts and also the whole plant in the form of decoction, juice, paste and powder with other additives like honey, coconut milk, cow milk and salt to treat various ailments such as asthma, cold, cough, diabetes, dysentery, fever, jaundice, piles, rheumatism, scabies, ulcer, male impotency, gynaecological problems, urinary problems, etc. Fifty medicinal plant species collected from natural vegetation are distributed across 29 families and 46 genera.

Out of 50 plant species recorded, 42 species belong to dicotyledons of angiosperms, 6 species belong to monocotyledons of angiosperms and 2 species belong to pteridophytes. In terms of number of medicinal plant species, Acanthaceae, Amaranthaceae and Solanaceae are represented by the highest number of species (4 species), followed by Apocynaceae, Asclepiadaceae, Asteraceae and Lamiaceae each comprising 3 species. Caesalpiniaceae, Euphorbiaceae, Fabaceae and Lauraceae contain 2 species each, and the remaining 18 families are represented by only 1 species. Among the different plant parts used for the preparation of medicine, leaf (34%) is found to be the most frequently used plant part followed by all parts of the plant i.e. whole plant (20%), flower (8%), root (8%), stem bark (8%), rhizome (6%), seed (6%), and only in one occasion each by corm (2%), fruit (2%), stem (2%), tuber (2%) and young shoot (2%) (Figure). The most common mode of administration of medicine is decoction followed by juice, paste and powder.

In this documentation, for a variety of medicinal uses, the Kanikkars in the study area depend maximum on herbs (64%) followed by shrubs (14%), trees (12%) and climbers (10%). The results of the present study provide evidences that these indigenous medicinal plants continue to play an important role in the healthcare system of this tribal community. This treasure of information is gradually vanishing due to modernization and also the younger generation not showing any interest in learning those practices.

Medicinal plants grow naturally around us. Over centuries, cultures around the world have learned how to use plants to fight illness and maintain health. These readily available and culturally important traditional medicines form the basis of an accessible and affordable health-care regime and are an important source of livelihood for indigenous and rural populations. Medicinal plants are at increasing risk from destruction of their habitats, bioprospecting for new sources, and overharvesting of known medicinal species.

Table 1: Ethnomedicinal Plants Used by the Kanikkars of Southern Western Ghats, Tamil Nadu, India

S. No.	Botanical Name	Family	Vernacular Name	Habit	Part(s) Used	Mode of Preparation of Medicine and Mode of Administration
1	*Acalypha indica* L.	Euphorbiaceae	Kuppaimeni	Herb	Leaf	One teaspoon of leaf juice is given to children to remove accumulated phlegm in chest and to relieve cold symptoms.
2	*Achyranthes aspera* L.	Amaranthaceae	Nayuruvi	Herb	Leaf	One ounce of leaf decoction is taken twice a day to treat vaginal bleeding during pregnancy.
3	*Aerva lanata* (L.) Juss.	Amaranthaceae	Sirukanpeelai	Herb	All Parts of the Plant (Whole Plant)	Half cup decoction obtained by boiling various plant parts or the whole plant in two cups of water is drunk in the morning and evening to dissolve kidney stones naturally.
4	*Ageratina adenophora* (Spreng.) R.M. King & H.Rob.	Asteraceae	Karikalanpachilai	Herb	Leaf	A paste of fresh leaves mixed with a pinch of salt is used as topical cream to heal cuts and wounds.
5	*Alpinia calcarata* (Haw.) Roscoe	Zingiberaceae	Chittarathai	Herb	Rhizome	One teaspoon of rhizome powder mixed with one teaspoon of honey is taken to tackle indigestion.
6	*Alternanthera sessilis* (L.) R.Br. ex DC.	Amaranthaceae	Ponnankannikeerai	Herb	Young Shoots	The young shoots are cooked and consumed as a remedy for piles.
7	*Amorphophallus paeoniifolius* (Dennst.) Nicolson	Araceae	Kattukarunai	Herb	Corm	The corm is cooked and consumed as a remedy for piles.
8	*Andrographis paniculata* (Burm.f.) Nees	Acanthaceae	Nilavaembu	Herb	All Parts of the Plant (Whole Plant)	Half cup of decoction of whole plant is taken three times a day for five days to treat viral fever.
9	*Barleria prionitis* L.	Acanthaceae	Kodippachalai	Spiny Shrub	Leaf	One ounce of leaf juice is drunk two times a day to treat urinary tract infection (acute cystitis).
10	*Biophytum sensitivum* (L.) DC.	Oxalidaceae	Manivattipachilai	Herb	All Parts of the Plant (Whole Plant)	Half cup decoction of leaves is taken two times a day to get relief from asthma.
11	*Blepharis maderaspatensis* (L.) Heyne ex Roth	Acanthaceae	Muruvuporundhi	Herb	Leaf	A paste of fresh leaves is used as topical cream to heal cuts and wounds.
12	*Cardiospermum halicacabum* L.	Sapindaceae	Ulincha	Herb	Leaf	A fine paste of whole plant is applied on the abdomen and back to ease labor pain and for easier delivery than expected.
13	*Cassia fistula* L.	Caesalpiniaceae	Sarakonnai	Tree	Stem Bark	Essence of the fresh chopped stem bark is taken to relieve stomachache.
14	*Cassytha filiformis* L.	Lauraceae	Moodillathali	Herb	All Parts of the Plant (Whole Plant)	A paste of whole plant (about the size of a gooseberry) is taken with half a tumbler of coconut milk twice a day for one week to cure jaundice (icterus). Chilly, ghee, oil and salt are avoided during the treatment period.
15	*Cinnamomum verum* J.Presl	Lauraceae	Karuvapattai	Shrub	Stem Bark	Half cup decoction of stem bark is taken to treat asthma.
16	*Cissampelos* pareira L.	Menispermaceae	Malaithangi	Herb	All Parts of the Plant (Whole Plant)	One ounce of fresh whole plant decoction is taken two times every day to get relief from rheumatic pain.

18	*Dioscorea pentaphylla* L.	Dioscoreaceae	Nooran	Climber	Tuber	Boiled tubers are taken as natural antacid to relieve heartburn (pyrosis).
19	*Drynaria quercifolia* (L.) J. Sm	Polypodiaceae	Attukalparani	Herb	Rhizome	The juice of skin peeled rhizome is taken once a day for three days in the early morning in empty stomach to cure jaundice (icterus). Fatty foods and gourds are avoided during the treatment period.
20	*Ensete superbum* (Roxb.) Cheesman	Musaceae	Kalvazhai	Herb	Seed	Seeds are pounded with three year old acidulous tamarind pulp and consumed daily for diabetes treatment.
21	*Erythrina variegata* L.	Fabaceae	Mullumurukku	Tree	Leaf	The juice obtained by pounding the tender leaves together with finely chopped stem bark of *Moringa pterygosperma* is taken to treat painful menstrual periods (dysmenorrhoea).
22	*Euphorbia nivulia* Buch.-Ham.	Euphorbiacae	Ilaikalli	Shrub	Stem Bark	The stem bark paste is used as a plaster for bone fracture.
23	*Gomphrena celosioides* Mart.	Amaranthaceae	Vellaraki	Herb	All Parts of the Plant (Whole Plant)	One cup decoction of whole plant is taken twice daily for one week to treat leucorrhoea.
25	*Hemidesmus indicus* (L.) R. Br.	Apocynaceae	Nannari	Climber	Root	A thick syrupy paste (about the size of a lemon) obtained by boiling a blend of root powder and coconut milk is taken regularly to prevent or heal peptic ulcer and mucosal ulcer/oral ulcer/mouth ulcer naturally.
26	*Hemionitis arifolia* (Burm. f.) T. Moore	Pteridaceae	Kalthamarai	Herb	Leaf	A paste of fresh leaves prepared with few onions (bulbs of *Allium cepa)* and a pinch of salt is taken to treat dysfunctional uterine bleeding (menorrhagia/hematomunia).
27	*Hybanthus enneaspermus* (L.) F.Muell.	Violaceae	Orithalthamarai	Herb	All Parts of the Plant (Whole Plant)	A mix of honey and whole plant powder is taken to treat to treat the problem of erectile dysfunction.
28	*Ixora coccinia* L.	Rubiaceae	Kattuthethi	Shrub	Flower	Two heaped teaspoonfuls of flower powder is dissolved in a tumbler of cow milk and taken twice daily to treat leucorrhoea.
29	*Leucas aspera* (Willd.) Link	Lamiaceae	Thumbai	Herb	Leaf	A handful of fresh leaves and flowers are ground and the juice squeezed out is given with honey/cow milk to children to remove accumulated phlegm in chest and to relieve cough.
24	*Marsdenia sylvestris* (Retz.) P.I.Forst.	Asclepiadaceae	Sarkaraikolli	Herb	Leaf	Fresh leaves are chewed to treat diabetes.
30	*Moringa oleifera* Lam.	Moringaceae	Murungai	Tree	Flower	Flower juice is taken to treat common urinary problems.
31	*Mucuna pruriens* (L.) DC.	Fabaceae	Poonakali	Climber	Seed	A mix of honey and seed powder is taken to treat the problem of erectile dysfunction.
32	*Naravelia zeylanica* (L.) DC.	Ranunculaceae	Mookeripankodi	Climber	Leaf	The leaf paste is used as a topical analgesic to treat rheumatic diseases (painful conditions caused by inflammation).

33	*Orthosiphon aristatus* (Blume) Miq.	Lamiaceae	Poonameesai	Herb	Leaf	One ounce of leaf juice is drunk two times a day for two weeks to dissolve kidney stones naturally.
34	*Pterospermum rubiginosum* Heyne ex Wight & Arn.	Sterculiaceae	Ellootti	Tree	Stem Bark	The stem bark paste is used as a plaster for bone fracture.
35	*Rauvolfia serpentina* (L.) Benth. ex Kurz	Apocyanaceae	Amalpori	Herb	Root	Two ounces of root juice is drunk two times daily for three days as an antidote for snake bite.
36	*Rhinacanthus nasutus* (L.) Kurz	Acanthaceae	Nagamalli	Herb	All Parts of the Plant (Whole Plant)	Two ounces of whole plant decoction is drunk three times daily for ten days as an antidote for snake bite.
37	*Saraca asoca* (Roxb.) Willd	Caesalpiniaceae	Asoka	Tree	Flower	Coconut oil in which flowers are boiled is applied topically to treat scabies.
38	*Sarcostemma acidum* (Roxb.) Voigt.	Asclepiadaceae	Kodikalli	Shrub	Stem	The juice obtained by crushing the gently heated soft stem is used as pain relief ear drops.
39	*Scoparia dulcis* L.	Scrophulariaceae	Sarkaraivaembu	Herb	All Parts of the Plant (Whole Plant)	Half cup of decoction of whole plant is taken two times per day for three days to treat all types of fever.
40	*Smilax zeylanica* L.	Smilaceae	Karuvulanchikodi	Climber	Rhizome	One ounce decoction of rhizome is taken two times a day to treat dysentery.
42	*Solanum americanum* Mill.	Solanaceae	Manathakali	Herb	All Parts of the Plant (Whole Plant)	Half cup decoction of whole plant is taken two times a day for forty five days to cure and even relieve peptic ulcer.
41	*Solanum diphyllum* L.	Solanaceae	Aarogyamooligai	Herb	Seed	Dried seeds fried in oil are taken as a vermifuge.
43	*Solanum rudepannum* Dunal	Solanaceae	Sundai	Shrub	Fruit	Boiled fruits are taken as a vermifuge. Fresh leaf stew is also taken as a vermifuge.
44	*Solanum trilobatum* L.	Solanaceae	Thoothuvalai	Herb	Leaf	Half cup decoction obtained by boiling leaves, flowers and seeds in two cups of water is taken to remove accumulated phlegm in chest and to cure cough.
45	*Spilanthus calva* DC.	Asteraceae	Kalapachai	Herb	Flower	The flower heads are chewed to relieve toothache.
46	*Tabernaemontana alternifolia* L.	Apocyanaceae	Kundalampalai	Tree	Root	The lateral roots spreading towards the north side of the tree are ground into a fine paste and applied on the painful sore tooth to get instant relief.
47	*Tylophora indica* (Burm. f.) Merr.	Asclepiadaceae	Nancharuthan	Herb	Root	A mix of honey and root powder is taken two times a day to treat dysentery.
48	*Vanda tessellata* (Roxb.) Hook. ex G.Don	Orchidaceae	Vanda	Herb	Leaf	The juice obtained by squashing the gently heated leaf is used as pain relief ear drops.
49	*Vernonia cinerea* (L.) Less	Asteraceae	Kucharipachilai	Herb	Leaf	Half a teaspoon of juice obtained by crushing the leaves is given to infants to remove accumulated phlegm in chest and to avoid cold infections.
50	*Zizyphus mexicana* Rose	Rhamnaceae	Thodali	Shrub	Leaf	The leaf paste is applied topically to treat scabies.

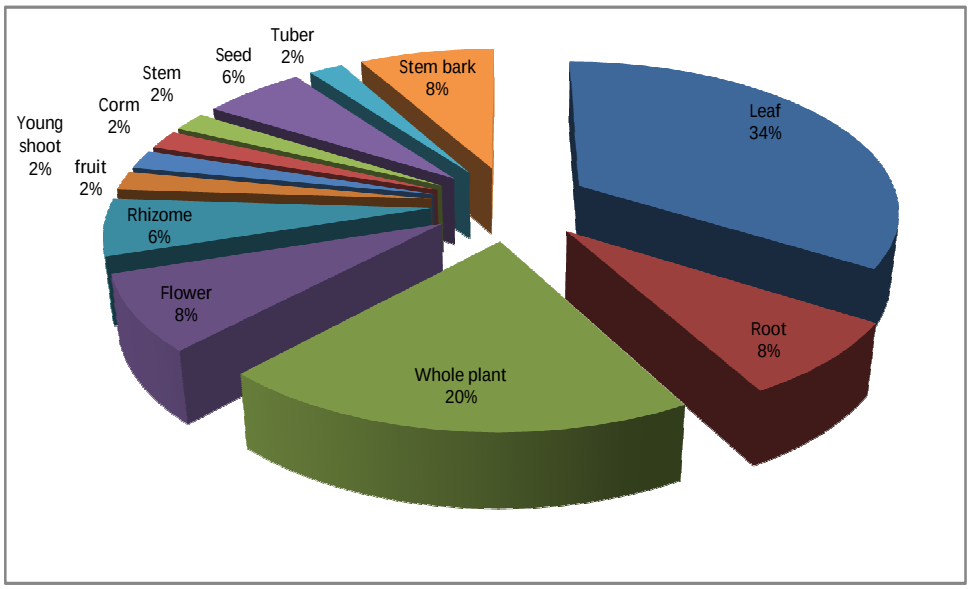

Figure 1: Percentage of Plant Parts Used for Various Ailments

The ethnomedicinal plants are under threat due to deforestation, overgrazing and their reckless utilization. It indicates the urgent need of their conservation for sustainable development[29, 30]. As medicinal plants use has become more popular worldwide, concern about plant conservation and sustainability has increased. According to the Medicinal Plant Specialist Group of the International Union for the Conservation of Nature and Natural Resources (IUCN), more than 20,000 plant species are used medicinally worldwide. Nearly half of these species are potentially threatened by either over-harvest or loss of habitat[31]. *Amorphophallus paeoniifolius*, *Rauvolfia serpentina* and *Smilax zeylanica* have come under vulnerable category in the study area. Conservation measures targeted at threatened plants as well as other medicinal plants will help in the long-term protection of the natural vegetation. Also further research on the medicinal plants mentioned in this study might provide some potential leads to fulfill the needs of search for bioactive compounds and the discovery of new drugs to fight diseases.

CONCLUSION

Traditional knowledge of plants in many tribal communities is changing because of rapid industrialization, urbanization, socioeconomic and cultural changes. Exploration of medicinal plants is essential from the view point of documentation of indigenous and traditional knowledge, which consequently helps in formulation of potential raw materials in modern pharmaceutical industry for further availability and for the greater benefit of mankind. Such documentation of comprehensive ethnomedicinal knowledge is very valuable and needs to be scaled up so that it could be followed up with phytochemical and pharmacological analyses in order to give scientific ground to the ethnomedicinal knowledge. It is also essential to promote the cultivation of these medicinal plants that would provide strong impetus to agricultural diversification, leading to increased income for farmers and conservation of the wild population of the indigenous medicinal plants.

Acknowledgements: We are thankful to the Kanikkar informants in Pechiparai Panchayat (forest range) of Kallkkulam Taluk, Kanyakumari District, Tamil Nadu, India for sharing their indigenous ethnobotanical knowledge. The authors are also thankful to the Management and Principal of V. O. Chidambaram College, Tuticorin, Tamil Nadu, India for their moral support and encouragement. We also remember with gratitude the support and help we received from the research scholars in the Research Department of Botany, V. O. Chidambaram College, Tuticorin, Tamil Nadu, India.

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Source of Support: Nil, **Conflict of Interest:** None.