

Ethno-Medico-Botanical Study of Plants Used as Varma Medicines in Kaaraiyar, Tirunelveli District, Tamil Nadu

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Abstract: The Varma Maruthuvam is a branch of Siddha medicine. It is an Art of warfare found in southern Tamil Nadu and Kerala. In varmam maruthuvam herbs, metals, minerals and even animal product were used in their medicine. Herbs are used in many forms like powder, decoction, medicated oil, medicated ghee etc. These treatment modalities can cure injury, wounds, fractures, dislocation of bones and nerve injury. The present study was initiated with an aim to identify traditional healers who are practicing herbal medicine among the Kaani tribals in Kaaraiyar of Tamil Nadu, India and document their indigenous knowledge on the utilization of medicinal plants, particularly most common ethnomedicinal plants.

Keywords: Varma maruthuvam, Ethno-botanical study, Kaani tribals.

1. Introduction

Ethno medicinal studies are of significant value to discover contemporary drugs from indigenous medicinal plant resources. There are appropriate sources of information about useful medicinal plant species, which can be targeted for management and domestication. The documentation of traditional knowledge of native plant species has contributed a number of vital drugs plants have been used since ancient times for the treatment of various ailments.

Especially, Kaani tribal communities in Kaaraiyar of Tamil Nadu meet their healthcare needs by using plant products and preparations based on traditional knowledge. They still depend on medicinal plants and most of them have a basic knowledge of medicinal plants.

The present study was initiated with an aim to identify traditional healers who are practicing herbal medicine among the Kaani tribals in Kaaraiyar of Tamil Nadu, India and document their indigenous knowledge on the utilization of medicinal plants, particularly most common ethnomedicinal plants.

2. Background

The Varma Maruthuvam is a branch of Siddha medicine. It is an Art of warfare found in southern Tamil Nadu and Kerala. Siddhars found this and handed over from one tradition to other.

The art is commonly used by Aasans of the country as an art of self defence as well as an art of offence and above all it as therapy. The therapies of Varmam are still existing tradition in south Tamil Nadu.

All the poems in the Palm script are in Tamil language. Sangam poets inaugurated many books at Pothigaimalai present in western ghats. Among them Varma pathakothu was first basic text of varmam. The treatment can cure injury, wounds, fractures, dislocation of bones and nerve injury.

Varma aasans also use certain medicine for treating patients with Varmam injury. They use herbs, metals, minerals and even animal product in their medicine. Herbs are used in many forms like powder, decoction, medicated oil, medicated ghee etc.

3. Methodology

A. Study Area and People

The area of investigation is Kalakkad Mundanthurai Tiger Reserve Forest (KMTR) of Tirunelveli hills. It is a representative area of the Southern Dry, Mixed, Deciduous forests in Tamil Nadu. KMTR is India's 17th Tiger Reserve under Project Tiger and the sanctuary is developed as a National Tiger Reserve from the year 1988 with a total area of 817 km² in the south most Western Ghat ranges. Geographically, it is a part of South Western tip of the Western Ghats, a region that is known for its species richness, diversity and high degree of endemism. This sanctuary is very popular with botanists.

The study was conducted in villages of Tirunelveli hills (Agasthiyar Kani kudiiruppu, Chinna Mayilar, Periya Mayilar, in Tirunelveli district) which are inhabited by Kaani tribals each consisting of 5–56 families disbursed in the deep forest areas. The indigenous people of the study area are Kaani or Kanikaran, the oldest group of the branch of ethnic group in South India. They live predominantly in and around the Tirunelveli hills of Tamil Nadu. Many Kaani people trace their community's knowledge of medicinal plants back to the Hindu saint and holy man Agasthiyar Muni who is credited as the founder of Siddha, the Tamil system of medicine. Agasthiyar is said to have lived in the southern Western Ghats approximately 2000 years ago. Most of the Kaani tribals have a general

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knowledge of medicinal plants.

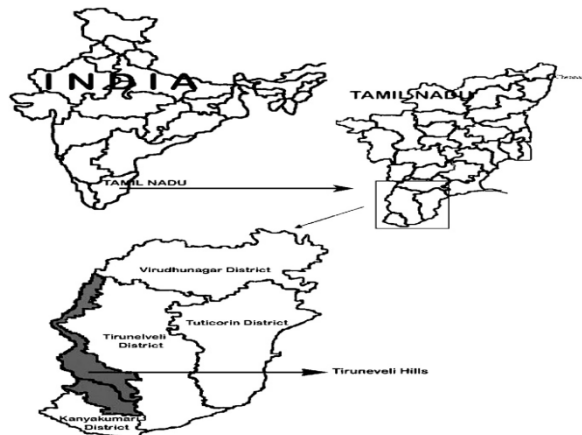


Fig. 1. Location map of study area (Kaaraiyar) in Tirunelveli hills, Tamil Nadu, India

4. Data Collection

The study area was investigated to get information from tribal practitioners and also to cross check the information provided by the other tribal practitioners during the earlier visits. In order to document the utilization of medicinal plants, a total of four field surveys were carried out in Tirunelveli hills. A total of four resource persons or informants or traditional healers were identified to get the ethnomedicinal information through direct interviews/oral conversations. They have sound knowledge on medicinal plants found in their surrounding areas and they practice medicine within their families and neighbors. A field datasheet has been prepared to record the plant details with ethnomedicinal information gathered from the traditional healers. Information on local name of plant, plant part used for curing, method of preparation, any other plants/agents used as ingredients, modes of administration and etc. were recorded for each collected ethnomedicinal plant.

Data Analysis:

Informant consensus factor (Fic)

The informant consensus factor (Fic) was used to see if there was agreement in the use of plants in the ailment categories between the plant users in the study area. The Fic was calculated using the following formula (Heinrich et al., 1998).

Use value (UV):

The relative importance of each plant species known locally to be used as herbal remedy is reported as use value (UV) and it was calculated using the following formula (Phillips et al., 1994).

$$UV = \frac{\sum U}{N}$$

Where UV is the use value of a species, U is the number of use reports cited by each informant for a given plant species and n is the total number of informants interviewed for a given plant. The UV is helpful in determining the plants with the

highest use (most frequently indicated) in the treatment of an ailment. UVs are high when there are many use-reports for a plant and low when there are few reports related to its use.

Fidelity level (FL):

To determine the most frequently used plant species for treating a particular ailment category by the informants of the study area, we calculated the fidelity level (FL). The FL was calculated using the following formula (Friedmen et al., 1986).

$$FL (\%) = \frac{N_p}{N} \times 100$$

Where N_p is the number of use-reports cited for a given species for a particular ailment category and N is the total number of use reports cited for any given species. Generally, high FLs are obtained for plants for which almost all use-reports refer to the same way of using it, whereas low FLs are obtained for plants that are used for many different purposes (Srithi et al., 2009).

5. Results and Discussion

The present study revealed the use of 32 species of plants distributed in 31 genera belonging to 22 families which were commonly used by most of the Kaani traditional healers for the treatment of Varmam under 6 ailment category. The prominent family was Apocynaceae, Acanthaceae & Sapindaceae with nine species, followed by Phylanthaceae, Moraceae & Capparaceae with six species. For each reported species the botanical name of the plant, family, local (Tamil) name, life form, parts used, method of preparation and Ethno medical uses were provided (Table 1).

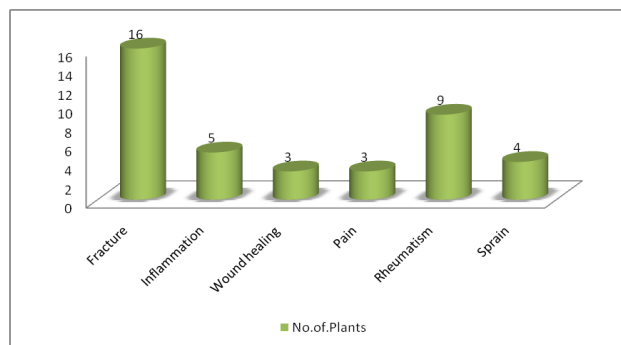


Fig. 2.

Unique formulation for pain management:

The leaf of *piper betel* is soaked in latex of *calotropis* for a day and then dried under shadow. Then it is crushed into powder and adding potable water is rolled into mustard-like pills. It acts as wonderful pain killer for any kind of pain.

Life form and parts used:

Trees were the primary source of medicine (14) followed by Shrub (10), Herbs (5), Climber (2) and Creeper (1) (Fig. 3). Among the different plant parts used, the leaves (21) were most frequently used for the preparation of medicine solely or mixed

Table 1

S. No.	Botanical name	Family	Habitat	Local name	Part Used	Method of preparation	Ethno-medical Uses
1	<i>Allophylus serratus</i>	Sapindaceae	Shrub	Siruvalli	Leaves	Decoction	Fracture, sprain
2	<i>Ancistrocladus heyneanus</i>	Ancistrocladaceae	Climber	Modiravalli	Leaves	Decoction	Rheumatism
3	<i>Alstoniascholaris</i>	Apocynaceae	Tree	Elilaip-palai	Leaves	Paste	The paste is applied to the swellings
4	<i>Anisomeles malabarica</i>	Lamiaceae	Shrub	Peimeratti	Whole plant, leaves	Decoction	Intermittent fever, rheumatic pains
5	<i>Antiaristoxaria</i>	Moraceae	Tree	Aranthelli	Bark	Powder	Rheumatic problems
6	<i>Antidesma acidum</i>	Phyllanthaceae	Tree	Asaripuli Kaattukoya	Leaves	Decoction	Bone fracture
7	<i>Antidesma montanum</i>	Phyllanthaceae	Tree	Kalakalatha, Paei-eechchi	Whole plant Purify blood, cure	Powder	Rheumatism
8	<i>Areca catechu</i>	Arecaceae	Tree	Adaikai	Leaves, young leaves, young fruits, fruits, young seeds	Paste	Sprains
9	<i>Argyreia cuneata</i>	Convolvulaceae	Shrub	Kanvalipoo	Leaves	Paste	Rheumatism, skin wounds, anti-inflammation
10	<i>Asystasiadalzelliana</i>	Acanthaceae	Herb	Mithikirai	Leaves	Paste	Sprain
11	<i>Atalantiamonophylla</i>	Rutaceae	Tree	Kaatuelumichai	Oil from berries	Decoction	Chronic rheumatism
12	<i>Azanza lampas</i>	Malvaceae	Herb	Kaatupoovarasu	Root	Decoction	Bone fracture
13	<i>Bambusa bambos</i>	Poaceae	Tree	Moongil	Root leaves, young leaves, terminal bud, seed	Decoction Paste	Rheumatism, sprain, poultice prepared from young shoots is applied to fractured bones
14	<i>Bauhinia purpurea</i>	Fabaceae	Tree	Neela viruvatti	Bark, leaves	Powder	Bone fracture
15	<i>Blepharis integrifolia</i>	Acanthaceae	Herb	Elumbotti	Whole plant	Powder	Treating bone fracture
16	<i>Cadaba trifoliata</i>	Capparaceae	Shrub	Maanidakuruthu	Whole plant	Powder	Rheumatism
17	<i>Cardiospermum canescens</i>	Sapindaceae	Climber	Uzhinja	Leaves	Powder	Rheumatic pain
18	<i>Casearia tomentosa</i>	Salicaceae	Shrub	Katiccai	Leaves	Decoction	Bone fracture
19	<i>Crataeva magna</i>	Capparaceae	Tree	Mavulingam	Root, stem bark, leaves	Powder	Rheumatism, inflammation
20	<i>Diaplyta paniculata</i>	Acanthaceae	Herb	Kara kanchiram	Leaves	Powder	Bone fracture
21	<i>Diospyros malabarica</i>	Ebenaceae	Tree	Thumbika	Leaves, flowers, tender fruits, fruit	Paste	Bone fracture
22	<i>Dodonaea viscosa</i>	Sapindaceae	Shrub	Virali	Stem, leaves	Powder	bone fracture, healing wounds, skin cuts, body pain
23	<i>Ficus virens</i>	Moraceae	Tree	Kurukathi	Bark	Powder	To set fractured bones
24	<i>Jasminum auriculatum</i>	Oleaceae	Shrub	Mullai	Root, stem, leaves	Decoction	Bone fractures
25	<i>Leucaena leucocephala</i>	Mimosaceae	Shrub	Periyatakarai	Bark	Powder	Bone Fracture
26	<i>Nyctanthes arbor-tristis</i>	Oleaceae	Shrub	Pavalamalli	Root	Decoction	Bone fracture
27	<i>Persea macrantha</i>	Lauraceae	Tree	Kolamavu	Stem/Bark	Powder	Bone fracture
28	<i>Pterospermum canescens</i>	Sterculiaceae	Tree	Vennangu	Leaves	Powder	Fracture and inflammation
29	<i>Pergularia daemia</i>	Apocynaceae	Herb	Veliparuthi	Leaves	Decoction	Used to cure inflammation
30	<i>Piper betel</i>	Piperaceae	Creepers	Vettilai	Leaves	Paste	Wound healing
31	<i>Calotropis gigantea</i>	Apocynaceae	Shrub	Eruku	Latex	Paste	Used in pain management
32	<i>Centella asiatica</i>	Apiaceae	Herb	Vallarai	Leaf	Raw	Cure joint pains

with other plant parts. It was followed by stem or bark (11), whole plant (5), seed & fruit (3), root (4) and flower (2), latex (1) (Fig.4). Many indigenous communities elsewhere also utilized mostly leaves for the preparation of herbal medicines. The reason why leaves were used mostly is that they are collected very easily than underground parts, flowers and fruits etc. and in scientific point of view leaves are active in photosynthesis and production of metabolites.

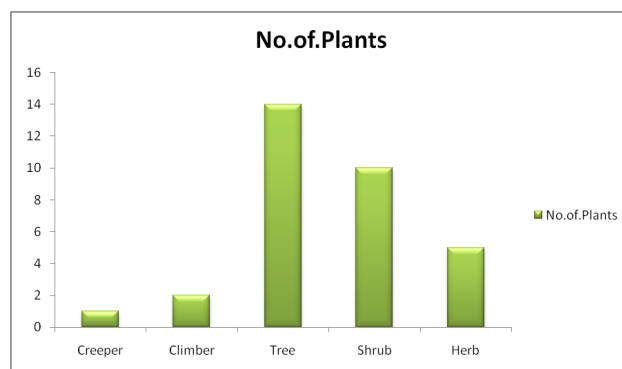


Fig. 3.

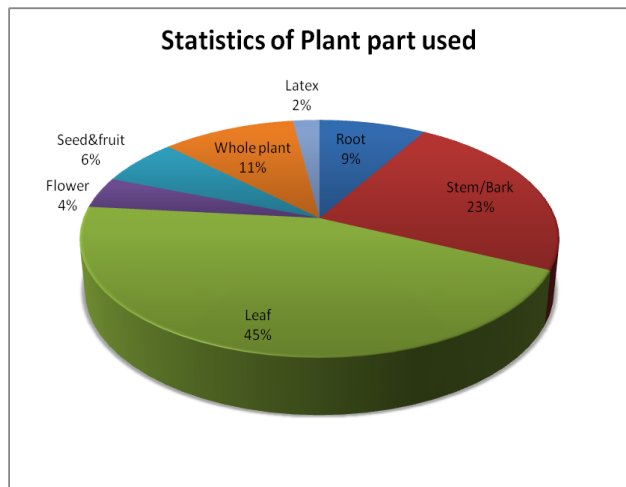


Fig. 4.

Method of preparation and mode of administration of plants:

The preparation and utilization of plant parts were grouped into four categories (Fig. 4). Of these, most commonly used method of preparation was decoction (11) followed by powder (13), paste (8), raw (1). The paste was prepared by grinding the fresh or dried plant parts with oil or water. The powder was prepared by the grinding of shade dried plant parts. The decoction was obtained by boiling the plant parts in water until the volume of the water reduced to minimum or required amount Internal uses (64%) were predominating over external or topical uses (32%) and nasal application. For topical use, the most important methods used were direct application of paste or medicated oil (with oil) and mostly dealt with diseases like rheumatism, pain and wounds.

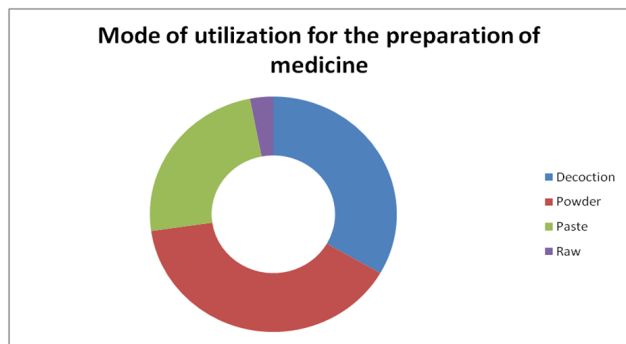


Fig. 5.

Kani traditional healers too frequently use some adjuvants such as honey, cow/goat's milk, sugar, ghee, salt, boiled rice and butter milk to improve the acceptability and medicinal property of certain remedies. The oils of castor, coconut, gingelly, mustard, neem and pongam were commonly used for the preparation of paste/medicated oil. They were using specific plant parts and specific dosages for the treatment of diseases and the dose given to the patient depended on age, physical status and health conditions. Before giving treatment the condition of the patient was observed deeply and then they gave the prepared medicines.

Plant use values:

The most commonly used species was *Blepharis integrifolia*

with 8 use-reports by 3 informants, giving the highest use value of 2.66. *Blepharis integrifolia* (Table 2) is attributed to its use in the treatment of various diseases and it is well recognized by all the informants as healing fracture.

Other important plants with high use value were *Areca catechu*, *Diospyros malabarica*, *Piper betel*, *Centella asiatica*, *Ficus virens* (With use value 1.66). The plant with very low use value was *Dodonaea viscosa* and *Jasminum auriculatum* which is reported by only one informant with a UV of 0.33. But the informant is regularly using this plant in the treatment of fracture. In the present study, plants reported with a low use value (two use-reports by three informants with a UV of 0.66) were *Allophylus serratus*, *Ancistrocladus heyneanus*, *Alstonia scholaris*.

Table 2

Plant name	Use value
<i>Allophylus serratus</i>	0.66
<i>Ancistrocladus heyneanus</i>	0.66
<i>Alstonia scholaris</i>	0.66
<i>Anisomeles malabarica</i>	0.78
<i>Antiaristoxicaria</i>	0.78
<i>Antidesma acidum</i>	0.85
<i>Antidesma montanum</i>	0.85
<i>Areca catechu</i>	1.66
<i>Argyrea cuneata</i>	0.96
<i>Asystasia dalzelliana</i>	0.78
<i>Atalantia monophylla</i>	0.78
<i>Azanza lampas</i>	0.69
<i>Bambusa bambos</i>	1.2
<i>Bauhinia purpurea</i>	0.98
<i>Blepharis integrifolia</i>	2.66
<i>Cadabatrifoliata</i>	1.2
<i>Cardiospermum canescens</i>	1.5
<i>Casearia tomentosa</i>	0.96
<i>Crataeva magna</i>	1.2
<i>Dicliptera paniculata</i>	0.89
<i>Diospyros malabarica</i>	1.66
<i>Dodonaea viscosa</i>	0.33
<i>Ficus virens</i>	1.66
<i>Jasminum auriculatum</i>	0.33
<i>Leucaena leucocephala</i>	0.85
<i>Nyctanthes arbor-tristis</i>	0.78
<i>Persea macrantha</i>	0.86
<i>Pterospermum canescens</i>	0.65
<i>Pergularia daemia</i>	1.3
<i>Piper betel</i>	1.66
<i>Calotropis gigantea</i>	1.38
<i>Centella asiatica</i>	1.66

Informant consensus factor:

Generally, FIC of local knowledge for disease treatment depended on the availability of the plant species in the study area. In order to use the informant consensus factor (FIC), we classified Varmam ailments into different categories. The FIC values in our study are ranged from 0.5 to 1. The use categories, inflammation (18 use-reports, 5 species), sprain (19 use-reports, 5 species) and Rheumatism (28 use-reports, 9 species) (Fig. 4) and Table 3. In the present study, Pain and Wound healing had the highest FIC of 1 and 0.81 respectively.

The least agreement between the informants was observed in the fracture with a FIC of 0.5. Thus, the study indicated the degree of knowledge shared by the users in the study area

Table 3

Ailment category	Number of use-reports (Nur)	Number of taxa (Nt)	Informant consensus factor (Fic)
Fracture	31	16	0.5
Inflammation	18	5	0.76
Wound healing	12	3	0.81
Pain	14	1	1
Rheumatism	28	9	0.70
Sprain	19	5	0.77

Table 4

Ailment category	Most preferred species with specific ailment	Fidelity value (%)
Fracture	<i>Blepharis integrifolia</i>	100
	<i>Diospyros malabarica</i>	100
	<i>Areca catechu</i>	100
Inflammation	<i>Pergulariadaemia</i>	100
	<i>Crataeva magna</i>	100
Wound healing	<i>Dodonaevivose</i>	55
	<i>Argyrea cuneata</i>	52
Pain	<i>Calotropis gigantean</i>	65
Rheumatism	<i>Cardiospermum canescens</i>	85
	<i>Atalantiamonophylla</i>	75
Sprain	<i>Allophylus serratus</i>	45
	<i>Ancistrocladusheyneanus</i>	33

regarding the use of medicinal plants in the treatment of ailments is high. We found that Fracture, rheumatism, Sprain and inflammation employed the most plants with 16, 9, 5 and 5 species respectively.

Fracture had the lowest Fic of 0.5, but this ailment category ranks first in the number of use reports (31) and number of taxa (16) attributed to this category. It may be due to the lack of communication among the informants in the study area who are practicing this ailment category or it may be due to the less fracture case among the studied tribal people.

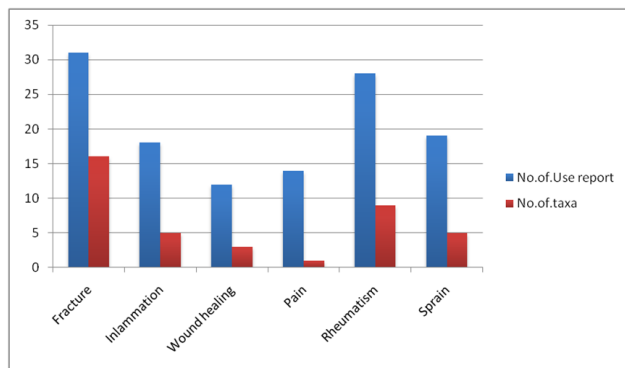


Fig. 6.

Fidelity level:

We analyzed the categories with major agreements to highlight the most important plants in each category (Table 4). Of the reported plants, 5 species had highest fidelity level of 100%, most of which were used in single ailment category with multiple informants. For this analysis the plants with less than two use reports were not considered. The plants with highest FL of 100% were *Blepharisintegriflora*, *Diospyros malabarica*, *Areca catechu*, *Pergulariadaemia* and *Crataeva magna*. The maximum FL for the above plants indicated the 100% choice of the interviewed informants for treating specific ailments and this could be an indication of their healing potential.

6. Conclusion

The present study revealed that traditional medicines were still in common use by the Kaani tribal communities. The accurate knowledge of the plants and their medicinal properties are possessed only by few individuals in this community.

Hence there is a need for detailed investigation of ethnobotanical knowledge held by each tribal community is required before such valuable knowledge vanishes. Thus, this research work would be useful in preventing the loss of ethno medicinal traditions of Kaani tribal communities.

The new claims which are recorded from the study area showed that still much can be learned from investigating herbals available abundantly in the forests. The plants with highest fidelity level and use values in the present study may indicate the possible occurrence of valuable phytochemical compounds and it requires a search for potential new drugs to treat various ailments.

The efficacy and safety of all the reported ethnomedicinal plants and unique formulation for pain needs to be evaluated for phytochemical and pharmacological studies. The plants with high informant consensus factor, use value and fidelity level should be given priority to carry out bioassay and toxicity studies.

As a result of the study the plants *Blepharis integrifolia*, *Diospyros malabarica*, *Areca catechu*, *Piper betel*, *Centella asiatica*, *Ficus virens* are suggested for further ethno pharmacological studies since these plants had the high UV values.

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