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Herbal remedies of Madayipara hillock tribals in Kannur district, Kerala, India.

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This survey provides information on 58 medicinal plant species included in 46 families, categorized in seventeen traditional treatment groups from the Madayipara hillock, Payangadi, Kannur, Kerala are enumerated in this study.

Keyword: Traditional medicines, Madayipara hillock, Payangadi, Kannur, Kerala.

1. Introduction

Madayipara is a flat laterite hillock spread in around 365 ha area, located near Payangadi in Kannur district, Kerala, South India. Madayipara hillock attracts many tourists from India and abroad due to its bio-diversity and its vibrant history. Payangadi is a small village, approximately 22 kilometers north of Kannur Township, in Kerala.

The Madayipara hillock carries several signs of historic and religious importance. Madayipara was used as the site of coronation ceremony by the Kolathunadu rulers between AD 14 and AD 18 and it was the administrative center of Ezhimala kings. The name 'Ezhimala' means a chain of seven mountains, is nearly 4 km west to Payangadi. Now Ezhimala is the centre of Indian Naval Academy.

This hilly sphere is remarkably rich for its flora and fauna, consists of rare butterflies, migratory birds and valuable medicinal plants[13].The Madayipara hillock area from which the medicinal plant data were gathered is situated at latitude 12°2' N and longitude 75°16' E and with an altitude of 40–47 m from sea level.

The *Mannan, Velan and Malayan* are the tribal groups inhabited on the hillock. They are mainly located in the Madayi village panchayat. There are totally around 15 families and the total population is about 250. The information on the folk medicinal plants were gathered through interviews with local vaidyars (medicine men of tribals) and recorded with the help of interpreters. These tribals speak a language which is mixture of Tamil and Malayalam. These tribal healers maintain their status of medicine men by passing informations from father to son. They are worshipping the goddess Kali, Bhagavathi, lord Vishnu and Shiva.

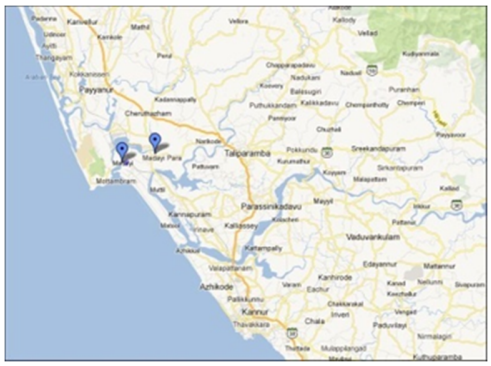

Fig A: Surveyed area of Madayipara hillock in Kannur District

The colorful ritual dance known as *theyyam* performed by these communities is essentially with regard to the deities such as Bhagavathi, Vishnu or Shiva. Theyyam is a unique

combination of dance, and music which reflects the characteristic features of a tribal culture.

Fig B: The dry, wet, and scrub jungles at Madayipara hillock

The rainfall in this region is mainly from southwest monsoon, commences during early June and normally ends in the middle of September. The average annual rainfall recorded here lies in the range of 1500-1800 mm.The average annual minimum temperature is 31.5 ºC. The river Kuppam flows through the south eastern edge of Madayipara, then meet the larger Valapattanam River at Matakkara, and finally discharging in to the Arabian Sea at Azhikkal. The *wet*/*dry* phase grasslands and *scrub jungles* mainly constitutes the vegetation on this plateau. Most of the plants flourish in the rainy season commences normally in the month of June, and lasts up to November. The plants enter in to their dormant phase by the start of summer .The dry phase of the laterite hillock starts along with the summer season, usually commences by mid January. Plants with xerophytic adaptations thrive during this phase. The plant *Lepidagathis keralensis* is found to grow well on the laterite rocks during the dry phase .This plant is otherwise known as Paramullu in Malayalam. Many insectivorous plants[7] germinate immediately after the start of the south west monsoon which marks the start of the wet phase. Plants like *Utricularia*, *Drosera*, *Eriocaulon*, *Polygala elongata*, *Justicia japonica*, *Leucas aspera*, *Sopubia trifida*, flower abundantly during this period. Some endemic, very peculiar water plants like *Nymphoides krishnakesara* (fig. 1), *Marsilea minuta*, *Cryptocoryne spiralis*, *and Rotala malabarica* also start germinating during the wet phase of this laterite plateau.

Fig 1: *Nymphoides krishnakesara*

2. Materials and methods

Our survey starts during the last week of May 2011 (wet phase of the hillock) and ends by January 2012. Even though many biodiversity surveys had been undertaken on this laterite hillock, this is for the first time a survey exclusively for medicinal plants of ethnomedical and traditional importance has been carried out by the Post Graduate department of Pharmacognosy, Crescent college of

Pharmaceutical sciences, Payangadi, Kannur District, Kerala.

Interviews were conducted in the village with the co-operation of the corresponding tribal people with their prior informed consent and the data were gathered from tribal groups and native informants who were healers, priests or ordinary villagers with their ancestral knowledge and empiric experiences about the healing properties of plants growing over the hillock.

Each herbal traditional use information was considered authentic only after confirmation through three or more informants of village localities and by cross checking in different times. Samples of all medicinal plants were identified and authenticated at the Parassinikadavu Govt. Ayurveda Medical College and voucher herbarium specimens were prepared and deposited in the Department Pharmacognosy, PG studies of Crescent College of Pharmaceutical sciences, Payangadi, Kannur, Kerala, India.

The slope of the laterite hills are well protected by the scrub jungles. Medicinal plants[1, 13, 15] like *Cinnamomum camphora*, *Ficus arnottiana* (Kallarayal in Malayalam), *F.bengalensis*, *F. religiosa*, *F.racemosa*, *F. tinctoria*, *F. exasperata* and *F. hispida*, *Hydnocarpus pentandra* are found to grow on this segment of the hillock. Bushy plants like *Ixora coccinia*, *Ziziphus oenoplia*, *Z.rugosa*, *Passiflora foetida* (fig. 9) constitutes small groves on the slope of the scrub jungles.

Fig 9: *Passiflora foetida* fruit

Even big woody trees like *Stereospermum colais*, *Careya arborea* are also found scattered on this plateau. Medicinal plant species like *Curcuma cannanorensis* var. *cannanorensis*, *Hopea ponga, Capparis rheedei* appear on the hillock just after the first shower of the monsoon.

The families and the species are arranged in alphabetical order. Species names are followed by family, local tribal names (LTN), herbarium accession number (HAN) of each plant and the medicinal uses with parts of the plant used are enumerated in Table 1.

Table 1: Enumeration of medicinal plants of Madayipara

Medicinal plant	Family	LTN	HAN	Use in Traditional folklore medicine	parts of the plant used
Curculigo orchioides	Hypoxidaceae	Nilappana	211/PGSY/CCOPS/2011	aphrodisiac	Storage roots
Curcuma oligantha Syn C.cannanoorensis	Zingiberaceae	Kaalamukham	221/PGSY/CCOPS/2011	Sprains, skin eruptions, infections	Roots and rhizomes
Dioscorea oppositifolia	Dioscoriaceae	Kanjirakkizhangu	212/PGSY/CCOPS/2011	Contraceptive, dry coughs, diabetes, and emotional instability	roots
Drosera indica	Droseraceae	Azhukanni,Theeyokku	220/PGSY/CCOPS/2011	Rheumatoid arthritis, Diabetes mellitus	Entire plant
Eclipta alba	Asteraceae	Kayyonni	228/PGSY/CCOPS/2011	Improves and nourishes hair	Leaf
Ficus arnottiana	Moraceae	Kallarayal	213/PGSY/CCOPS/2011	Astringent	Fruits, leaves, bark
Ficus tinctoria	Moraceae	Kallithhi	218/PGSY/CCOPS/2011	Internal remedy for convulsions and weakness	Stem and leaf juice

Gymnema sylvestre	Asclepiadaceae	Chakkarakkolli	216/PGSY/CCOPS/2011	Anti diabetic	leaves
Helicteres isora	Sterculiaceae	Edampiri valampiri	217/PGSY/CCOPS/2011	intestinal infections , diabetes and cure for scabies	Root juice
Impatiens balsamina	Balsaminaceae	Kasithumba	215/PGSY/CCOPS/2011	anti rheumatic, used in fractures	Seed pods,leaves, flower
Ixora brachiata	Rubiaceae	Marachethhi	224/PGSY/CCOPS/2011	Anti-inflammatory and antipyretic	Roots , leaves
Ixora coccinia	Rubiaceae	Chethhi	214/PGSY/CCOPS/2011	Anti inflammatory	Roots
Justicia ekakusuma	Acanthaceae	Ekakusumam	229/PGSY/CCOPS/2011	febrifuge	Root
Lepidagathis keralensis	Commelinaceae	Paramullu	233/PGSY/COPS/2011	Anti inflammatory	roots
Leucas plukenetti	Lamiaceae	Thumba	232/PGSY/COPS/2011	Anti bacterial	leaves
Mallotus philippensis	Euphorbiaceae	Kurukkutti,Kamala	226/PGSY/CCOPS/2011	skin problem, for tape worm infestation , urinogenital infection	glands and hairs of the fruits
Mimusops elengi	Sapotaceae	Elanji	225/PGSY/CCOPS/2011	anthelmintic, astringent	bark, flowers, fruits ,seeds
Mucuna pruriens	Fabaceae	Nayikkurana	227/PGSY/CCOPS/2011	Parkinson's disease, anxiety, parasitic infections, scorpion stings	bean, seed,
Murdannia nudiflora	Commelinaceae	Paravellamkudiyan	230/PGSY/CCOPS/2011	Asthma	roots
Nymphoides krishnakesara	Nymphaeaceae	Poothali	228/PGSY/CCOPS/2011	febrifuge	Flower ,roots
Oxalis corniculata	Oxalidaceae	Puliyaarila	222/PGSY/CCOPS/2011	Diuretic	Entire plant ,leaf
Passiflora foetida	Passifloraceae	Poodappazham	219/PGSY/CCOPS/2011	Neurological disorders Insomnia edema.	Fruit , leaves
Rotala malabarica	Lythraceae	Parathamara	231/PGSY/CCOPS/2011	Anti inflammatory	roots
Santalum album	Santalaceae	Chandanam	223/PGSY/CCOPS/2011	Cooling ,perfumery	wood
Scoparia dulcis	Scrophulariaceae	Kallurukki	210/PGSY/CCOPS/2011	Anti diabetic ,anti hypertensive, gall bladder stones	Entire plant
Sida cordifolia	Malvaceae	Kurunthoti	209/PGSY/CCOPS/2011	Nervine tonic, correcting ,astringent	root
Syzygium cumini.	Myrtaceae	Njaaval	208/PGSY/CCOPS/2011	for digestive ailments	fruits
Tinospora cordifolia	Menispermaceae	Amruthu	207/PGSY/CCOPS/2011	Bitter tonic, Immune stimulant	Stem
Utricularia reticulata	Lentibulariaceae	Kaakkappoo	205/PGSY/CCOPS/2011	urinary tract infections	Entire plant
Uvaria narum	Annonaceae	Narumpaanal	203/PGSY/CCOPS/2011	anti bacterial, anthelmintic	leaves
Vitex negundo	Verbenaceae	Karinochchi	202/PGSY/CCOPS/2011	Anti inflammatory	bark
Wedelia trilobata	Asteraceae	kammalpoo	206/PGSY/CCOPS/2011	antibacterial, larvicidal	leaves , stem
Wrightia tinctoria	Apocynaceae	Danthappaala	204/PGSY/CCOPS/2011	Anti bacterial, wound healing	leaves, bark
Zornia gibbosa	Fabaceae	Kozhuppa	201/PGSY/CCOPS/2011	Soporific, anti inflammatory	Root, entire plant

Medicinal plant	Family	LTN	HAN	Use in Traditional folklore medicine	Parts of the plant used
Capparis rheedei	*Capparaceae*	Kakkamullu	251/PGSY/COPS/2011	Fruits rich in proteins	Fruits
Careya arborea	Lecythidaceae	Peelam	252/PGSY/COPS/2011	Used in cough ,astringent	Fruit, bark, flowers
Celosia argentea	Amaranthaceae	Kozhopoo	249/PGSY/COPS/2011	For wound healing, Used in poultice for broken bones	Leaves ,roots
Cryptocoryne spiralis	Araceae	Thakaram	258/PGSY/COPS/2011	Fever, jaundice	Roots and rhizomes
Cynodon dactylon	Poaceae	Karukappullu	242/PGSY/COPS/2011	Antipyretic, eye disorders	Leaves, roots
Desmodium gangeticum	Fabaceae	Orila	241/PGSY/COPS/2011	Anti Diarrheal, respiratory ailments, tonic	roots
Eriocaulon madayiparense	Eriocaulaceae	Choothu	234/PGSY/COPS/2011	anti bacterial	Entire plant
Ficus bengalensis	Moraceae	Peral	254/PGSY/COPS/2011	skin diseases, leucorrhoea, burning sensation, hemorrhage,	roots, bark, leaves, fruits
Ficus exasperata	Moraceae	Therakam	256/PGSY/COPS/2011	Wound healing	Roots, leaves, fruits
Ficus hispida	Moraceae	Parakam	255/PGSY/COPS/2011	psoriasis, jaundice	Roots, leaves, fruits
Ficus racemosa	Moraceae	Athi	237/PGSY/COPS/2011	For general weekness , Anti bacterial	Fruits ,leaves ,bark
Ficus religiosa	Moraceae	Arayal	253/PGSY/COPS/2011	asthma, diabetes, anti inflammatory	Fruits ,leaves ,bark
Hemidesmus indicus	Periplocaceae	Nannari	236/PGSY/COPS/2011	Anti bacterial, stomachic	root
Hopea ponga	Dipterocarpaceae	Binga	250/PGSY/COPS/2011	Used in piles	Whole plant
Hydnocarpus pentandra	Flacourtiaceae	Marotti	235/PGSY/COPS/2011	Anti fungal , anti psoriatic,anti leprotic	Seed oil
Jasminum malabaricum	Oleaceae	Kaattumulla	240/PGSY/COPS/2011	Anti bacterial ,eye infections	Root , flower juice
Justicia adhatoda	Acanthaceae	Aadalodakam	243/PGSY/COPS/2011	Bronchodilatory	leaves
Kalanchoe pinnata	Crassulaceae	Elamulachchi	246/PGSY/COPS/2011	anti inflammatory, urolithiatic	leaves
Mallotus repandus	Euphorbiaceae	Vallikkurukkutti	247/PGSY/COPS/2011	For reducing muscular pains	Stem ,leaves
Marsilea minuta	Marsileaceae	neeraral	257/PGSY/COPS/2011	Respiratory disorders	Leaves,

					shoots
Merremia tridentate	Convolvulaceae	Prasarini	248/PGSY/COPS/2011	Anti arthritic	Whole plant
Naregamia alata	Meliaceae	Nilanaarakam	244/PGSY/COPS/2011	expectorant	Whole plant
Polygala elongata	Polygonaceae	Amrtanjan Chedi	239/PGSY/COPS/2011	Anti rheumatic	root
Salacia fruticosa	Hippocrateaceae	Ekanaayakam	245/PGSY/COPS/2011	Anti diabetic	Leaves and roots
Ziziphus mauritiana	Rhamnaceae	Elantha	238/PGSY/COPS/2011	anthelmintic, astringent	Fruits and leaves

HAN: Herbarium Accession Number, LTN: Local Tribal Name

3. Results and discussion

The present work initiated to explore 58 medicinal plant species included in 46 families used by the tribal inhabitants like *Mannan, Velan and Malayan* from the Madayi hillock which were collected, enumerated and specimen samples were deposited at the herbarium of the Department of Pharmacognosy, PG studies, Crescent college of Pharmaceutical sciences. Around 17 different treatment groups were identified in the study. Most of the herbal preparations are used internally or applied externally in the form of infusion, decoction, paste or powder by the native folklore people. Study reports indicated the use of plants like *Drosera indica* (fig 6); *Impatients balsama, Polygala elongata* (fig 4), *Merremia tridentate* (fig 5) are used traditionally for rheumatism and arthritis by the tribals of Madayi hillock.

Fig 4: *Polygala elongate* (Amrtanjan plant)

The plants *Salacia fruticosa, Ficus religiosa, Gymnema sylvestre, Dioscoria oppositifolia,*

Fig 5: *Merremia tridentate* (prasarini)

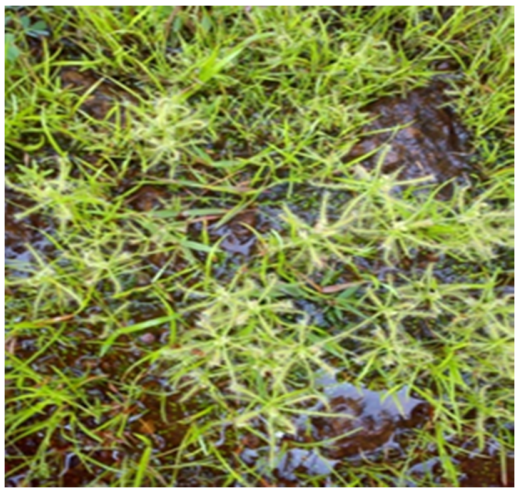

Fig 6: *Drosera indica*

Helectres isora, and Scoparia dulcis are used by the natives for their antidiabetic activity. *Eclipta alba, Santalum album* (fig 2), *Wedelia trilobata* are used for making hair revitalizing oils.

The two rare species *Justica ekakusuma and Nymphoides krishnakesara* identified first time from Madayi hillock are used as a febrifuge by the tribal natives. *Mimusops elangi, Uvaria narum, Ziziphus mauritiana, and Mallotus*

Fig 2: *Santalum album*

philipinensis are used for their anthelmintic activity. Plants like Ficus arnottiana, *Mimusops elangi, Tinospora cordifolia, Sida cordifolia, Hemidesmus indicus, and Ziziphus mauritiana* are used by natives for gastric disorders, as astringents, and bitter tonics.

The plants *Kalanchoe pinnata, Mallotus philipinensis, Urticaria reticulata, Scoparia dulcis* are used for urinary tract infections[15]. The plants *Curculigo orchioides* (fig. 7), *Mucuna pruriens and Sida cordifolia* are included in preparations used for nervine stimulation by the tribal natives.

Plants like *Justicia ekakusuma*[8], *Rotala malabarica*[9], *Lepidagathis keralensis*[4], *Eriocaulon madayiparens*[2, 5, 10, 11, 14], *and Lindernia madayiparense*[6], *Nymphoides krishnakesara*[3] are very rare and endangered varieties are first discovered from this laterite hillock but used by the tribal inhabitants and local villagers for therapeutic purposes since long time. Plant species like *Lepidagathis keralensis*[4], *Polycarpaea corymbosa*[4] start appearing on the laterite rocks during the month of January. During this month, the speed of wind increase and direct sun light falling on the hills therefore most of vegetation starts drying up.

Fig 7: *Curculigo orchioides*

The decoctions made from plants like *Ixora brachiata* (fig. 12), *Ixora coccinia, Lepidagathis keralensis, Rotala malabarica* (fig. 3), *Vitex negundo, Zornia gibbosa* (fig. 8), *and Kalanchoe pinnata* are used for reducing inflammation. The leaves, bark and roots collected from *Ficus exasperata, Celosia argentea, and Wrightia tinctorea* are used for wound healing purpose.

Fig 3: *Rotala malabarica*

Fig 8: *Zornea gibba*

Fig 12: *Ixora bracheata*

The Madayipara natives use plants named *Curcuma cannanorensis, Leucas plukenetti, Uvaria narum, Wrightia tinctorea, Wedelia trilobata and Jasminum malabaricum* for their antibacterial activity and *Hydnocarpus pentandra* for its antifungal activity.

4. Conclusion

During the survey we have observed that, this laterite hillock is facing very high degree of ecological threat nowadays, as these areas are being converted slowly to building sites, china clay mining grounds, and dumping areas. Deforestation at the scrub jungles makes additional damage to the vegetation of the hillock. The valuable endangered medicinal plants present over this hillock will be extinct in the near future, if they are not conserved by proper action plans.

The present study focused on the existence, conservation and information of available medicinal plants of traditional and ethnomedicinal importance[12] on the Madayipara hillock.

The species like *Eriocaulon madayiparens* (fig.11) , *Lindernia madayiparense*, *Lepidagathis keralensis* (fig. 10), *Curcuma cannanorensis*, *Nymphoides krishnakesara*, *Justica ekakusuma* were found to be identified from this hillock for the first time. Further detailed phyto pharmacological studies are warranted in order to explore the major active compounds and related bioactivities of these unique plant species growing over the hillock.

Fig 10: *Lepidagathis keralensis*

Fig 11: *Eriocaulon madayiparens*

As the traditional herbal remedies are based mainly on ancestral knowledge and empiric experiences, these types of surveys appeared to be useful for the scientific community to bring out clues and better explore the efficiency of plant medicines.

5. Acknowledgement

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