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Research article

BOTANICAL ETHNOGRAPHY OF MUTHUVANS FROM THE IDUKKI DISTRICT OF KERALA

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ABSTRACT: Muthuvans are one of the prominent tribal groups of Kerala with unique culture and Ethnobotanical practices. The present communication revealed the scientific description of the role of plants in the daily life (botanical ethnography) of Muthuvans. The study reports 103 flowering plant species belongs to 44 families and a lichen (*Parmelia dialatata*) to meet a variety of their requirements. They use 21 plants for construction of huts, 16 for domestic articles, 15 for cultural and traditional purposes, 12 for clothing and cosmetics, 20 for tools and weapons and about 47 as edible/NTFPs and other daily uses. The present paper discusses the traditional uses of plants and their influence in the culture and civilization of Muthuvans and reported claims for further studies.

Keywords: Muthuvan tribe, Botanical ethnography, Idukki, Ethnobotany.

INTRODUCTION

Man lives with and depends on the resources of nature. The progress of humans depends on the exploration of different natural resources. Ethnobotany explores the direct relationship of plants with man. The term has often been considered as a synonym of traditional knowledge or economic botany. Botanical ethnography deals with the scientific description of the role of plants in the life of any ethnic group or race [1]. Man-plant relationship is an abstract and concrete one. The former deals with the good and bad power of plants, taboos, avoidance, while the latter deals with food, medicine, house-building, agriculture operations, and other domestic uses of plants and their relationship leads to the botanical ethnography of a race or a community. Idukki is the one of the loveliest hilly districts of Kerala and is located in the extreme south of Western Ghats. The district located at an altitude of 900-3000 m above sea level in the Central-Eastern part of the state and harbors the second largest population of forest tribes. There are eight scheduled tribes inhabiting this beautiful high range district. Major tribes of the area include Mala-araya, Muthuvan, Mannan, Urali, Ulladan, Paliya, Malapandaram, and Malapulayas. Among them, *Muthuvans* are the second largest tribal community, who generally inhabit in high altitude shoala forests and steep mountains. They are said to have migrated from the Madurai region of Tamil Nadu during the 13-14th century AD [2,3] and prefer an isolated life in the forest. Members of this tribe do not mingle with the local people, but they have good social and cultural values among themselves. Traditionally, there are 20-25 huts in each settlement, with a forest area of 2-5 hectare for cultivation and other needs. In the past, members of the tribe have solely depended upon the forest and forest resources for their livelihood, which they were free to exploit as part of the ecosystem and therefore, plants played a significant role in Muthuvan's life in general and economy of daily life in particular. Later on they rear cattle, goats and had pet dogs which are accompany them who go to the forest to collect honey, fire wood, tubers, and other minor forest products. They had been farmers and practicing shift cultivation. Currently the lifestyle of the tribes has been changed considerably due to the developmental activities monitored by the government and non-government agencies; restrictions of the forest department and depletion of natural resources. The knowledge of their surrounding plants acquired by the tribes by trial and error methods is depleting at a very high speed; so also the traditional knowledge of plants is restricted only to the elders of the tribe, and the new generation is not at all interested in up keeping their knowledge. Therefore, documentation of valuable information of the plants and their importance in the daily life of Muthuvans is a must and study on botanical ethnography of Muthuvans was under taken.

MATERIALS AND METHODS

An extensive ethnobotanical survey was conducted during December 2010 to June 2012, across the Muthuvan settlements of Idukki district of Kerala. The area is located approximately 9° 20' to 10° 23' N latitude and 76° 30' to 77° 30' E longitude; situated in a series of hills and valleys seen in between 600- 2000 m above sea level. During the survey, the botanical ethnographic information were collected from Muthuvans especially '*Kani*' (head of the settlement), elderly people and other members. To get a broader over view of the cultural importance of plants and their uses in day today life, some anthropological methods were applied [4]. Semi-structured interviews with a simple questionnaire were employed to elicit the information regarding the use of plants and plant parts associated with folklore. After eliciting the information, the specimen samples were collected by taking the informants into the field and also by showing the chosen specimens to the elder people in their settlement. The specimens were identified with various flora and herbaria as per the guidelines of Jain and Rao [5]. The voucher specimens were deposited in the herbarium of the Department of Biology, The Gandhigram Rural University, Gandhigram, Tamil Nadu. Documented plants were arranged alphabetically with botanical names followed by common name, family, habit, parts used and uses and tabulated. (Table- 1).

Table 1. Plants used of the construction of Huts by Muthuvans of Idukki district.

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Acronychia pedunculata*(L.)Miq.	Muttanari	Rutacaeae	T	Timber	Pillar
2	*Anogeissus latifolia* (Roxb. ex DC.) Wallich ex Guillemin & Perr.	Mazhu kanjiram	Combrytaceae	T	Timber	Pillar
3	Bamboosa bambos(L.) Voss		Poaceae	S	Clums	Reinforcement of walls
4	*Calamus hookerianus* Becc.	Kakka choral	Arecaceae	S	Cane	Reinforcement of walls
5	*Calamus pseudo-tenuis* Becc. Ex Becc. & Hook. F.	Choral	Arecaceae	S	Cane	Reinforcement of walls
6	*Calamus rotang* L.	Chooral	Arecaceae	S	Cane	Reinforcement of walls /Rope
7	*Caryota urens* L.	Kudapana	Arecaceae	T	Leaves	Thatching
8	*Chionanthus linocieroides* (wight) Bennet ex Raiz	Edali	Oleaceae	T	Timber	Roof rafters
9	*Corypha umbraculifera* L.	Kodappana	Arecaceae	T	Leaf	thatching
10	*Cymbopogon caesius* (Nees ex Hook.f &Arn.) Stap. f.	Inchipul	Poaceae	H	Leaves	Thatching
11	*Drypetes venusta*(Wight) Pax & Hoffm.	Konari maram	Euphorbiaceae	T	Timber	Roof Rafters
12	*Olea dioeca* Roxb.	Mulla maram	Oleaceae	T	Wood	Pillar
13	*Poliyalthia fragrance* (Dalz.)Bedd.	Perumaram	Annonaceae	T	Timber	Pillar
14	*Saccharum spontaneum* L.	Kattkarimp	Poaceae	H	Leaves	Thatching
15	*Syzygium arnottianum* Walp.	Kattu Njaval	Myrtaceae	T	Timber	Pillar
16	*Syzygium cumini* (L.) Skeels	Njaval	Myrtaceae	T	Timber	Pillar
17	*Syzygium gardneri* Thwaites	Kara njaval	Myrtaceae	T	Timber	Pillar
18	*Themeda cymbaria* (Roxb.)Hackel	Ayikka pullu	Poaceae	H	Leaves	Thatching
19	*Themeda triandra* Forsskal	Nil	Poaceae	H	Leaves	Thatching
20	*Wattakaka volubilis*(L.f.) Stapf.	Vattakakkakody	Rhamnacea	C	Whole plant	Rope
21	*Xylopia parviflia* (Wight)Hook. F. & Thomson	Chandau maram	Annonaceae	T	Timber	Roof Rafters

RESULTS AND DISCUSSION

Forest and forest resources, play a significant role in the daily life of Muthuvans. Forest provides them food, medicine, fodder, fuel, wood and wide range of Non-Timber Forest Products (NTPFs), which are essential not only for meeting their requirements, but also act as potential source of income for their livelihood and to keep up their culture and development. There is an assumption about non-agricultural societies that they represent an earlier stage of cultural evolution, or the result of cultural devolution [6]. It was supposed that cultures progressed from hunter–gatherer to agricultural and finally to industrial. The life of 'natural man' was 'solitary, poor, nasty, brutish and short', cultural evolutionary views— distinguishing between 'natural' and 'civilized' peoples—persisted from the eighteenth to the late twentieth centuries [7,8]. We can see this evolutionary trend in the culture and life of Muthuavans also.

In the present study, 103 species of angiospermic plants and plant products including and a lichen (*Parmelia dialatata*) were identified to play a vital role in the daily life of Muthuvans. Of the 103 species of angiosperms, 95 belong to dicotyledons and the eight species to monocotyledons. Plants were enumerated alphabetically by botanical name, common name, family, habit, parts used and uses (Table 1). While analyzing the systematic position of the documented 103 species, the plants of maximum use belonged to Poaceae (13 species) followed by Fabaceae (9 species), Arecaceae (8 species), Dioscoreaceae (five species) and four species each with Combretaceae, Euphorbiaceae and Zingiberaceae. 24 families were represented by single species, eight families with two species (Annonaceae, Asteraceae, Ebenaceae, Menispermaceae, Myristicaceae, Oleaceae, Rubiaceae, Sapotaceae) and the remaining four families with three species (Myrtaceae, Piperaceae, Rhamnaceae and Sapindaceae). (Fig. 1).

Analysis of the data based on the growth forms showed that among the 103 species, 46 are trees (45%), 31 herbs (30 %), 12 climbers (12%) and the remaining 13 shrubs (13%) (Fig.2). Analysis of plants/plant parts used by the Muthuvans showed that trunk as timber was the most widely used items and fruits followed by timber and wood, leaf, whole plant and seeds.

Anthropologically Muthuvans are considered as a proto-Australoid in origin [9] with a unique physic. They are healthy, tall, strong, fair with brownish curly hairs [10]. According to some authors [11,12] they are considered to be migrated from the Madurai region of Tamil Nadu during the 13th and 14th century AD. There are many stories and legends about their migration; during the migaration they carry the Idol of their Goddess Madura Meenakshi, their children and household articles on their back. In Malayalam and Tamil 'Muthuku' means back. This may be a reason for the name Muthuvan. They are using a script less language called 'Muthuva' is a mix up of Tamil and Malayalam.

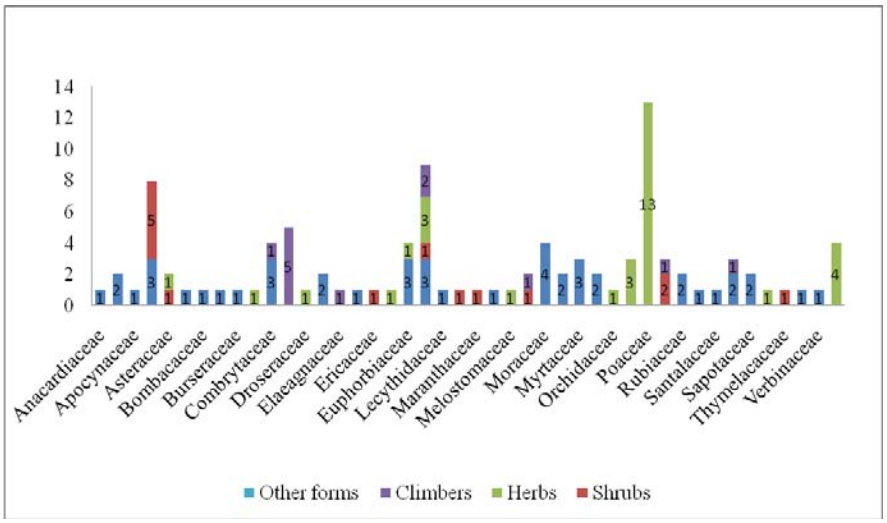

Fig 1. Family wise analysis of Plant used by Muthuvans

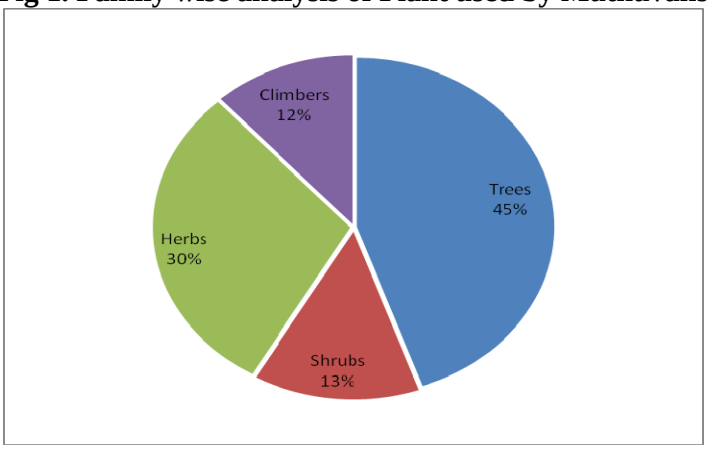

Fig 2. Habit wise analysis of plants utilized by Muthuvan

The hamlets are located on the foothills of the dense forest, with 25-30 huts. Whereas the increase of population and the number of huts, they form another hamlet in the nearby forest area. Huts are built with locally available plant materials and mud (Table 1). Huts are constructed on a raised platform with rock and mud in a rectangular shape. Every hut has two rooms and a courtyard. Wooden staffs have been used as pillars of huts. Plant materials are commonly used for pillars are *Acronychia pedunculata, Anogeissus latifolia, Olea dioeca, Syzygium arnottianum, Poliyalthia fragrance, Syzygium cumini* and *Syzygium gardneri.* Walls reinforced with mud, some grasses, *Calamus* spp.and bamboo. Plants like *Chionanthus linocieroides, Drypetes venusta, Xylopia parvifolia* are used to frame roof rafters. Some plants and plant parts used as ropes (*Calamus rotang, Wattakaka volubilis, Debregeasia ceylanica*) for tighing the structures. Roof is thatched with the leaves of some plants like *Caryota urens, Cymbopogon caesius, Saccharum spontaneum, Themeda cymbaria, Themeda triandra Corypha umbraculifera*. Huts with two doors, but no windows, the main door called *Thalaivasal* and the other one is *Puraivasal*. One room as kitchen and the other as the bedroom. On the corner of the kitchen, an area is separated as a fireplace, where cooking is done. Above the fireplace, there will be a *Cheru* for drying and preserving the meat, seeds by heating and smoking. There is some separate dormitory like a guesthouse in each hamlet known as Chavady or Sathram.Aged men and all boys with 10 years above stayed in it, and share their experiences in their workplaces with their elders. It is a place of socialization among Muthuvans. Women are strictly prohibited to enter the Chavady.

Table 2. Plants used for making House hold utensils by Muthuvans of Idukki district

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Bamboosa bambos* (L.) Voss.	Illy	Poaceae	S	Clums	Cot
					Stem	Glass/ Tumbler
2	*Calamus hookerianus* Becc.	Kakka choral	Arecaceae	S	Cane	Basket
3	*Calamus pseudo-tenuis* Becc. ex Becc.& Hook. F.	Choral	Arecaceae	S	Cane	Basket
4	*Calamus rotang* L.	Chooral	Arecaceae	S	Cane	Basket
5	Calycopteris floribunda Lam.	Pullanni	Combrytaceae	C	Stem	Basket /winnow
6	*Cocculus laurifolius* DC.	Marpingi	Menispermaceae	S	Bushy Stem	Broom
7	*Corypha umbraculifera* L	Kodappana	Arecaceae	T	Leaf	Mat,basketHouse
8	*Dalbergia latifolia* Roxb.	Eetti	Fabaceae	T	Timber	Mortar for Pounding
9	*Diospyros ebenum* Koenig	Karingali	Ebenaceae	T	Timber	Mortar for Pounding
10	*Ficus racemosa* L.	Athiya tholi	Moraceae	T	Leaf/Bark	Domestic Cloth
11	*Gmelina arborea* Roxb.	Kumbil	Verbinaceae	T	Wood	Mortar for pounding/
12	*Macaranga indica* Wight	Vattakanni ela	Euphorbiaceae	T	Leaves	Used as Plates
13	*Macaranga peltata* (Roxb.) Muell.-Arg.	Vattakanni ela	Euphorbiaceae	T	Leaves	Used as Plate
14	*Ochlandra travancorica* (Bedd.) Benth. ex Gamble	Eetta/reeds	Poaceae	H	Clums	Mat/Basket
15	*Schumannianthus virgatus* (Roxb.)Rolfe	Channa koova	Maranthaceae	S	Leaves	Used as Plate
16	*Wattakaka volubilis*(L.f.) Stapf.	Vattakakkakody	Rhamnacea	C	Whole plant	Mat/basket

Most of the domestic articles or household utensils such as cot, blankets, plates, tumbler, mortars for Pounding are also made up of plants and plant parts (Table 2) Country cots are made by the clums of Bamboosa bambos blankets are made with the bark of Ficus. They used the leaves as plates (*Macaranga indica, M.peltata*) and clums of Bamboo as tumblers. For pounding the grains, they use Mortar (ural) with the wood of *Diospyros ebenum, Gmelina arborea*.

From the birth to death there are so many indigenous customs and traditions stand in the Muthuvans life. All the childbirth is happened in a special isolated house 'Thinnaveedu,'midwives or some elderly adult females are allowed to enter that house. Herbal drugs and sorcery are the remedy for postmaternal difficulties They give colostrum as the fist food for the infants, instead of breast milk rice water is also administrated. Only after 30 days the women and child come back to home, at that time, they give a mixture honey, jaggery and the latex of *Ficus bengalensis* in a bronze bowl, to avoid the voice disorders. On the 90th day, they tied a cincture on the baby with the bark of *Debregeasia ceylanica*. At the time of marriage a special chain made by the seeds of *Cordia obliqua* is given to bride and also leaves (*Piper betle*) between the bride and groom. At the time death, they practice either burial or cremation according to the age of the person. The corpes will be bathed well and wrapped with bamboo mat or the leaves of *Mitragyna parvifolia* (Padakadambu), some grasses and buried in a pit. They sowed the seeds of paddy and ragi and wave the spiny twigs of *Zizipus oenoplia* and *Zizipus rugosa* over the grave (Mudipattal) to avoid to move spirit. Even at the time of cremation, plants such as *Kydia calycina*, *Melia azedarach* and *Santalam albam* for incineration.

Fig.3 Plants used in culture and tradition of Muthuvans of Idukki district

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Arenga wightii* Griff.	Ayyapana	Arecaceae	T	Inflorescence	Toddy
2	*Careya arborea* Roxb.	Pezhu	Lecythidaceae	T	wood	Musical Instrument
3	*Caryota urens* L.	Kalipana	Arecaceae	T	Inflorescence	Toddy
4	*Cordia obliqua* Willd.	Pasakai maram	Boraginaceae	T	Seeds	Chain
5	*Debregeasia ceylanica* Hook.f.	Kattunochi	Urticaceae	T	Bark	Cincture
6	*Dendrocalamus strictus*(Roxb.) Nees.	Kallumula	Poaceae	H	Culms	Musical Instrument
7	*Gmelina arborea* Roxb.	Kumbil	Verbinaceae	T	Wood	Musical instruments
8	*Melia azedarach* L.	Kattu veppu	Meliaceae	T	Timber	Cremation
9	*Mitragyna parvifolia*(Roxb.)Korth.	Padakadambu	Rubiaceae	T	Leaves	Cremation
10	*Piper betle* L.	Vettila	Pipreraceae	C	Leaves	Cremation
11	*Pterocarpus marsupium* Roxb.	Venga	Fabaceae	T	Wood	Mucical Instrument
12	*Santalam albam* L.	Chandanam	Santalaceae	T	Timber	Cremation
13	*Terminalia arjuna*(Roxb.ex.DC) Wight & Arn.	Maruthy	Combrytaceae	T	Wood	Mucical Instrument
14	*Zizipus rugosa* Lam.	Thodali	Rhamnaceae	S	Twig	Cremation
15	*Zizipus oenoplia*(L.) Miller	Thodali	Rhamnaceae	S	Twig	Cremation

Table 4. Plants used as cosmetics by Muthuvans of Idukki district

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Abrus precatorius L.*	Kunnikuru	Fabaceae	C	Seeds	Beads of chain
2	*Bulbophyllum sterile* (Lam.) Suresh	Mookkuthi kaya	Orchidaceae.	H	Fruit	Ear ring
3	*Careya arborea* Roxb.	Pezhu	Lecythidaceae	T	Stem	Tooth cleaning
4	*Cardiospermum helicacabum* L.	Uzhinja	Sapindaceae	C	Whole plant	Anti - dandruff
5	*Curcuma longa* L.	Manjal	Zingiberaceae	H	Rhizome	Face cream
6	*Cordia oblique* Willd. var. Obliqua	Pasarikaya/ Pasaikamaram	Boraginaceae	T	Seeds	Beads of the chain
7	*Debregeasia ceylanica* Hook.f.	Narumaram /vanji	Urticaceae	T	Bark fiber	String of chain/Girdle
8	*Ficus sp.*	Aal	Moraceae	T	Bark & Leaves	Cloth
9	*Mangifera indica* L.	Mavu	Anacardiaceae	T	Leaves	Tooth cleaning
10	*Oryza sativa* L.	Nellu	Poaceae	H	Leaves	Cosmetics/Ear ring
11	*Pterocarpus marsupium* Roxb.	Venga kara	Fabaceae	T	Gum/Resin	Ornamental mark on forehead
12	*Sapindus emarginatus* Vahl.	Poochakotta mara	Sapindaceae	T	Fruit	Soap

Festivals and music give colour to the life of Muthuvans. They follow the Tamil calendar. Their major festivals on the month of Chithira (April-May), Karthika (December) and Thayi (January). Festivals are classified as the temple based and nature based. On the month Chithira and Karthika, the festival of Siva and Vishnu-Parvathy celebrates are being respectively. Those days, they have some unique worships (poojas) with Coconut, camphor, betel leaves, areca nut, turmeric powder, banana, rice, gingili oil, jaggery etc. They prepare some particular food (Pongala) as offerings. On the month of Thayi, they celebrate 'thai- pongal' for eight days with fasting. On the eighth day, they go to the hill where the goddess of Nature is situated, and pray into the forest, rain, flowering and fruiting of trees and for the cordial relations with the wild animals. This is token of man to the mother nature for sustaining their lives. At the end of each festival there is some special customary dance like Koothu, Kummiyadi. All their customary dances are rich with traditional folk music. They use some musical instruments Kettle drums (Mutty), Tumbor (Urimi), Flute (Kuzhal) for their cultural festivals. These instruments are made with the wood of some plants like *Gmelina arborea, Terminalia arjuna, Pterocarpus marsupium, Dendrocalamus strictus ,Careya arborea.*

Table 5. Plants used as tools and weapons used by Muthuvans of Idukki district

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Alstonia scholaris* (L.)Br.	pala	Apocynaceae	T	Wood	Hunting Arrow for
2	*Anamirta cocculus* (L.)Wight & Arn.	Nanjuvally	Menisperrmaceae	C	Fruit	Fish poison
3	*Bamboosa bambos* (L.) Voss.	Illy	Poaceae	S	Clums	Saw/Bow
6	*Calamus pseudo-tenuis* Becc. Ex Becc.& Hook. F.	Choral	Arecaceae	S	Cane	Basket
7	*Calamus rotang* L.	Chooral	Arecaceae	S	Cane	Rope / Basket
8	*Calycopteris floribunda* Lam.	Pullanni	Combrytaceae	C	Stem	Basket/winnow
9	*Caryota urens* L.	Kudapana	Arecaceae	T	Fiber	Traditional fire production (Thee kallu)
10	*Caryota urens* L.	Kudapana	Arecaceae	T	Rachis	Fishing rod
11	*Chionanthus linocieroides* (Wight) Bennet ex Raiz.	Edali	Oleaceae	T	Timber	Plough
12	*Debregeasia ceylanica* Hook.f.	Narumaram /vanji	Urticaceae	T	Bark fiber	Fishing line/ rope
13	*Derris scandens* (Roxb.) Benth.	Nanju vally/ Ponni valli	Fabaceae	C	Bark	Fishing-poison
14	*Diospyros cordifolia* Roxb.	Vakkana	Ebenaceae	T	Fruit	Fish poison
15	*Ficus amplissima* Smith.	Chela	Moraceae	T	Bark-Fibers	wild Fishing net
16	*Ficus bengalensis* L.	Alamaram	Moraceae	T	Stem	Bow
17	*Gnidia glauca* (Fresen.) Gilg.	Najukaya	Thymelaeaceae	S	Fruit	Fish poison
18	*Haldina cordifolia* (Roxb.) Ridsd.	Manja kadambu	Rubiaceae	T	Gum	Fish poison
19	*Ochlandra travancorica* (Bedd.) Benth. ex Gamble	Eetta/reeds	Poaceae	H	Clums	Coop for fishing
20	*Phoenix humilis* Royel ex Becc.& Hook. f.	Chittenthu mullu	Arecaceae	S	Thone	Pierce the ear

Traditionally, men folk grows their hair after the age of fourteen. They often wear the dress made up of bark and leaves of *Ficus spp*. Often they use a turban on their head with a white cloth, as the symbol of their identity. They also use ear rings with some stones or metals like silver or gold. Womenfolk use a long cloth (Chela) which covers the whole body. They are much aware of their beauty; they often use earrings, chains, bangles with coloured beads or coins.

Table 6. Plants used as food and NTFPs by Muthuvans of Idukki district

S.No	Botanical Name	Common Name	Family	Habit	Parts Used	Tribal Use
1	*Alpinia galangal* Sw.	Chittaratha	Zingiberaceae	H	Tuber/ Rhizome	NTFPS
2	*Anaphalis marcescens* Wight C.B.Clarke	Nil	Asteraceae	H	Whole plant	NTFP-Medicine
3	Arachis hypogea L.	Nila kadala	Fabaceae	H	Seed	Edible/Food
4	Bamboosa bambos(L.) Voss		Poaceae	S	Fruit/seed	Edible/food
5	*Cajanus cajan* (L.) Mill Hepper.	Thuvara	Fabaceae	S	Fruit	Edible /food-Vegitable
6	*Canarium strictum* Roxb.	Thelli	Burseraceae	T	Gum/Resin	NTFP_fumigator
7	*Canna indica* L.	Vazha chedi	Cannaceae	H	Rhizome	Edible/Food
8	*Costus speciosus* (Koenig) J. E. Smith	Malavayambu	Zingiberaceae	H	Rhizome	NTPF
9	*Cullenia extrillata* Robyns	Vedi plavu	Bombacceae	T	Seeds	Edible/food
10	*Curcuma aromatica* Salisb.	Kasthuri manjal	Zingiberaceae	H	Rhizome	NTFP
11	*Cymbopogon citrates*(DC.)Staof.	Theruva	Poaceae	H	Leaves	NTFP-oil
12	*Debregeasia ceylanica* Hook.f.	Narumaram /vanji	Urticaceae	T	Bark fiber	Tools & Weapons Fishing line/ rope
13	*Dioscorea alata* L.	Kachil	Dioscoreaceae	C	Tuber	Edible/food
14	*Dioscorea bulbifera* L.	Vellachi/ vella kizangu	Dioscoreaceae	C	Tuber	Edible/food
15	*Dioscorea esculenta* (Lour.) Burkill	Cherukizangu	Dioscoreaceae	C	Tuber	Edible/food
16	*Dioscorea pentaphylla* L. var. *pentaphylla*	Nooran	Dioscoreaceae	C	Tuber	Edible/foood
17	*Dioscorea wallichi* Hook.f.	Mulli kizhangu	Dioscoreaceae	C	Tuber	Edible/food
18	*Dolichos biflorus* L.	Muthira-	Fabaceae	H	Seeds	Edible/food
19	*Drosera peltata* Smith ex Willd.	Kosuvettipullu	Droseraceae	H	Whole plant	NTFP-Sold as Medicine
20	*Elaeaguns conferta* Roxb.	Kattumunthiri	Elaeagnaceae	C	Fruit	Edible/NTFP
21	*Elaeocarpus serratus* L.	Attu kara	Elaeocarpaceae	T	Fruits/ Seed	Edible/NTFP
22	*Eleusine corocana* (Linn) Gaertn.	Ragi	Poaceae	H	Fruits/ Seed	Edible
23	*Eriocaulon cinereum* R.Br.	Nil	Eriocaulaceae	H	Whole plant	NTFP- Medicinal
24	*Gaultheria fragrantissima* Wall.	Thailachedi	Ericaceae	S	Whole plant	NTFP-Medicinal
25	Glycine max (L.) Merril	Soya-	Fabaceae	H	Fruit and	Edible/food
26	*Helichrysum perlanigerum* Gamble	Nil	Asteraceae	S	Whole pant	NTFPMedicinal
27	*Madhuca longifolia* (Koenig)J. F. Macbr.	Ilippa	Sapotaceae	T	Flower & Fruit	Edible/food
28	*Medinilla beddomi* C.B.Clark	Not Known	Melostomaceae	H	Leaves	Edible/
29	*Myristica malabarica* Lam.	Ponnampoo	Myristicaceae	T	Aril/ Seed	NTFP/Spices
30	*Myristica beddomei* King	Kattujathi	Myristicaceae	T	Aril/ Seed	NTFP/Spices
31	*Oryza sativa* Linn.	Nellu	Poaceae	H	Fruits/ Seed	Edible
33	*Palaquim ellipticum* (Dalz.) Baillon	Pali	Sapotaceae	T	Fruit	Edible/Chewed
34	*Parmelia dialatata*	Plasma	Lichen	Thallus	Plant body	NTFP - condiment
35	Phyllanthus amurus Schum & Thonn.	Keezhanelli	Euphorbiaceae	H	Whole plant	NTFP
36	*Piper longum* L.	Thippali	Piperaceae	C	Fruit	NTFP /spice
37	*Piper mullesua* Buch- Ham. ex D. Don.	Kattukurumulaku	Piperaceae	C	Fruit	NTFP/spices
38	*Setaria italica* (L) Beauv.	Thina	Poaceae	H	Fruits/ Seed	Edible/food
39	*Sida rhombifolia* L.	Kurunthotty	Malvaceae	S	Root	NTFP
40	*Stereospermum colais* (Buch.Ham.ex Dillw.)Mabb.	Poopathiry	Bignoniaceae	T	Flower & Fruit	NTFP
41	*Syzygium arnottianum* Walp.	Kattu Njaval	Myrtaceae	T	Fruits	Edible
42	*Syzygium cumini* (L.) Skeels	Njaval	Myrtaceae	T	Fruits	Edible NTFP
43	*Tamerindus indica* L.	Vallen puli	Fabaceae	T	Leaves & Seeds	Edible
44	*Terminalia chebula* Retz.	Kadukka	Combrytaceae	T	Fruit	NTFP
45	*Vigna mungo* (L.)	Uzhunnu-	Fabaceae	H	Seeds	Edible/food
46	*Sapindus emarginatus* Vahl.	Poochakotta mara	Sapindaceae	T	Fruit	Anti leech
47	*Solanum viarum* Dunal	Kandakaramullu	Solanaceae	H	Fruit pulp	Anti leech

Other than that they use some plant-based cosmetics too. Resin exuded from the bark of *Pterocarpus marsupium* is being used as the ornamental mark on the forehead. Seeds of *Bulbophyllum sterile* and the leaves *Oryza sativa, Saccharum officinarum* are used as Earrings and nose stud.Thornes of *Phoenix humilis* and *Bamboosa bambos* are used for piercing the ears and nose. A chain made up of the seeds of *Cordia oblique* is used at the time of marriage and they often use the chain with *Abrus precatorius*. They used comb like hair clips made up of *Bamboosa*. Some plants like *Cardiospermum helicacabum* is being used against dandruff. Muthuvans use the fruit of *Sapindus emarginatus* as soap and leaves of *Mangifera indica*, twig of *Careya arborea*, charcoal or mattikallu (a type of stone) are used for cleaning tooth.

Muthuvans traditionally led a life as hunter –gatherers, foragers, fishers, and later they turned as cultivators. They are experts in hunting and fishing and use various tools and weapons for that. They generally capture wildbores, and some small animals like rodents. They use the meat in the dried form. For hunting, they use some plant-based weapons such as spears *(Bamboosa bambos*), saw named as *Kayma* (*Bamboosa bambos*), bow (*Bamboosa bambos, Ficus bengalensis*) arrow *(Alstonia scholaris*) and bow -string is made up of the thread made from bark of *Ficus*. Muthuvans are engaged in fishing in the near by streams and rivers. Generally, they use some small fishes, which are common in streams. For fishing they generally use some mild poisons extracted from plants like *Anamirta cocculus, Diospyros cordifolia, Gnidia glauca, Haldina cordifolia* and *Derris scandens*. Sometimes, they use Coop made up of *Ochlandra travancorica* and Fishing rod (*Caryota urens*) & line (*Debregeasia ceylanica*) (Table. 5). In the daytime, most of the Muthuvan menfolk wander through the forest to collect food. They have expertise in identifying useful plants and plant parts and other minor forest products. They collect honey, wild edible fruits and tubers for their dietary needs. According to Ajesh *et al. a, b* [13,14] about 38 wild edible fruits and 40 wild vegetables supplement the diet of the Muthuvans. Apart from that they consume wild tubers such as *Dioscorea esculenta, Dioscorea alata, Dioscorea bulbifera, Dioscorea pentaphylla and Dioscorea wallichi*. They use the raw leaves of *Medinilla beddomei*, and fresh fruits of *Palaquim ellipticum* as a refresher while going in to the forest.

Muthuvans are shift cultivators; they practice stash-and burn method. They clear the nearby forest area in January and it allow to dry for a month and burn it off. On the pre-monsoon shower, they broadcast the seeds of the crops like *Oryza sativa, Eleusine corocana, Setaria italic*. Katty (pudding with Ragi) is their staple food among them. In the past they gave least attention for agriculture, but at present they practice the cultivation of cardamom, pepper and vegetables. The women do not go out for work after their house hold works they are engaging themselves in making baskets and mats, using bamboos and canes.

Muthuvans collected number of forest products and plant parts as their source of income. They are the experts to collect and forest product like honey, shellac, wild fruits, medicinal plants, bamboos, reeds and other minor forest products. The collected products are sold into the nearby markets, or it is collected from the settlements itself by the local peoples. Along with honey, they collect some fruits (*Elaeocarpus serratus, Elaeaguns conferta, Madhuca longifolia, Palaquim ellipticum, Syzygium arnottianum, Syzgium cumini*) and vegetables (*Cajanus cajan, Dolichos biflorus, Glycine max, Vigna mungo*) seasonally and included in their diet as well as the source of their income. Apart from that spices (*Myristica malabarica, Myristica beddomei, Piper mullesua, Piper longum*) fumigators (*Canarium strictum*) medicinal herbs (*Alpinia galangal, Helichrysum perlanigerum, Eriocaulon cinereum, Gaultheria fragrantissima, Anaphalis marcescens, Drosera peltata*), reeds and bamboos (*Ochlandra travancorica, Calamus hookerianus, Calamus rotang, Calamus pseudo-tenuis, Calycopteris floribunda, Corypha umbraculifera, Cocculus laurifolius*). Even though they cultivate lemongrass (*Cymbopogon citrates*) fairly on a large scale nearby forest area and distilled it for lemon grass oil, they collect reeds and bamboos for making mats, baskets, and some other handicrafts. Lichens like *Parmelia dialatata* collected in large-scale and sold on the markets, which is used as an ingredient in 'Garam masal'.

Critical analysis of early literature reveals, among the information gathered in the present study, many of them were not yet documented ([15,15,16,17,13,14]). The lifestyle of the Muthuvans changed considerably due to the mingling with other people, the effect of mass media installed in the settlements by government agencies, modernization and technological advancement. In this context, it is an urgent need to document the traditional knowledge of tribal communities, for sustainable utilization of biological resources.

CONCLUSION

The study has brought out the first-hand information of 92 plant resources used by of Muthuvans of Kerala. Use of some plants in their lively hood is typical and relatively new, and the future scientific confirmation is required. Muthuvans have been isolated from the outside world, and their economic status is also very critical.

So they have developed the novel practice of using some unexploited plants for their day to day life. This aspect equally remarkable and proper research of such plants may open new vistas in the area of botanical ethnography. It is therefore, an urgent need to take every possible step to conserve the botanical wisdom of Muthuvans, and make them economically viable through suitable scientific research.

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