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Ethnobotanical survey on medicinal plants used by tribal people in Attappady, Kerala

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Abstract
The survey has been carried out in Attappady, Kerala. A total of 51 medicinal plants belonging to 28 families have been found to have medicinal value in this ethnobotanical survey. The plant have been enumerated with botanical name, family name, common name, habit, plant parts used, ingredients, mode of application and medicinal uses. The medicinal plants includes herbs (24), shrubs (11), climbers (8) and trees (7) and various parts as like root, bark, stem, leaf, seeds, fruit, tuber, dried stem and whole plant are used for curing various ailments. Some of the plants are used for treating threatful female disorders like *Aerva lanata* for curing bleeding during pregnancy, *Bambusa arundinaceae* for regulation of menstrual cycle, *Phyllanthus amarus* for bleeding and stomach ache etc. Mode of application varies depending upon their plant parts used and ingredients chosen.

Keywords: ethnobotanical survey, *aerva lanata, bambusa arundinaceae*

1. Introduction
India is one of the twelve mega-biodiversity countries of the world having rich vegetation with a wide variety of plants. Today tribal and certain local communities in India still collecting and preserving locally available wild and cultivated plant species for their day today life. Traditional ethno medicine uses the knowledge skills and practices based on theories, beliefs and experiences indigenous to its people and culture for maintenance of health. It holds a heritage of communal acceptance and is solely based on the expertise gained by herbalists over a period of time (Ayensu *et al.,* 1986) [2]. The indigenous knowledge on medicinal plants appears when humans started and learned how to use thetraditional knowledge on medicinal plants (Emiru *et al.,* 2011) [4].
The preservation of ethnobotanical diversity in the prevailing ecosystem should from an important item in any overall plan for tribal development in forest areas. Therefore, documenting indigenous knowledge through ethnobotanical studies is important for the conservation of biological resources and their sustainable utilization. Tribal communities in Kerala meet their health care needs by using non-timber minor forest products and preparations based on traditional knowledge. Further, it has been established that herbal drugs obtained from plants are safe in treating various ailments with no side effects.
Attappady is a tribal pocket in Palakkad district, which lies in the northern eastern part of the state. Tribal communities in Attappady, Kerala meet their healthcare needs by using medicinal plants and preparations based on traditional knowledge. They still depend on medicinal plants and most of them have a basic knowledge of medicinal plants which are used for first aid remedies to treat various ailments. Though tribe's folk constitute 1:1 percent of the population of the Kerala state, 27% of the population in Attappady is tribe folk comprising Irular, Mudugar, Kurumbar and Dhodugar. Attappadyis situated in the Palakkad district of Kerala and lies at a highest ranging from 450-2500 meters along mean sea level. The well-known Silent Valley National park which is a part of Nilgiri Biosphere is sharing boundary with a long distance of Attappady. Close association of National park and its buffer zone could preserve the biodiversity of Attappady.

2. Materials and Methods
Site Selection
Attappady is a tribal pocket in Palakkad district, which lies in the northern eastern part of the state. Extensive survey is planned in the tribal pockets of Attappady. Though tribe's folk constitute 1:1 percent of the population of the Kerala state, 27% of the population in Attappady is tribes folk comprising Irular, Mudugar, Kurumbar, and Dhodugar. Attappady situated in the Palakkad district of Kerala and lies at a highest ranging from 450-2500 meters along mean sea level (Figure 2). A political map of the Attappady with the details of tribal inhabited places is collected from AHADS (Attappady Hill Area Development Society).

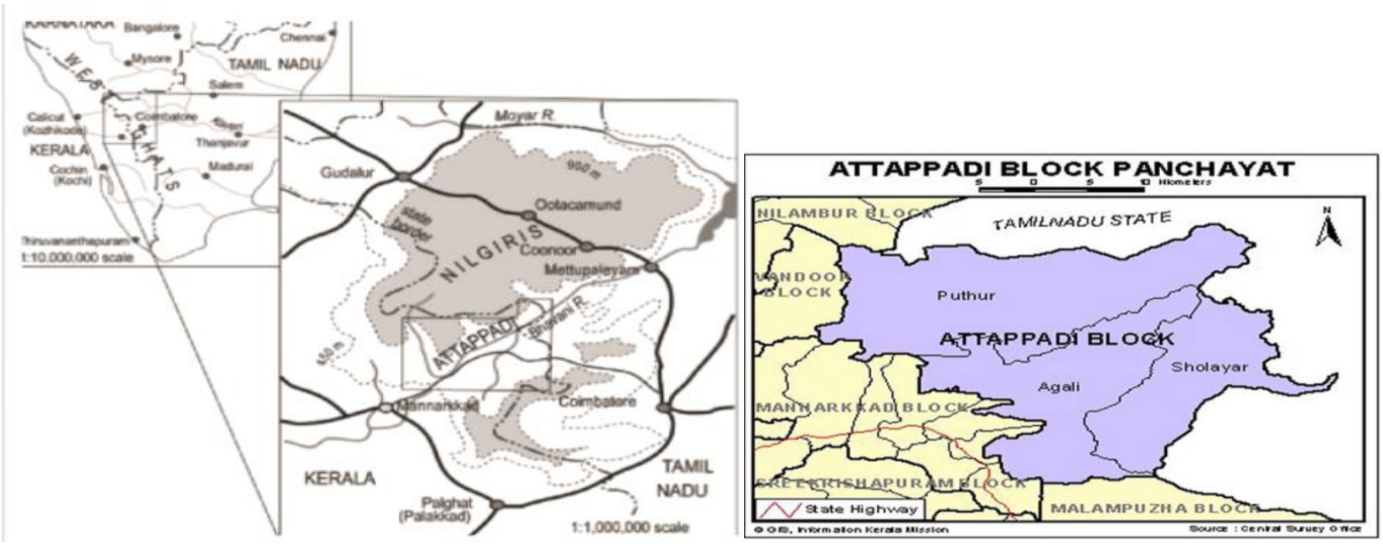

Fig 1

Sampling Informants

The ethnobotanical survey conducted between September 2015 to February 2016. It is planned to cover many tribes especially those who are well knowledge in traditional medical practices belonging to Irular, Mudugar, Dhodugar and Kurumbar. The experts in traditional Ayurveda in the hamlets of Attappady are also consulted and interviewed. A total of 25 tribal people were interviewed for my survey. However age and experience on use of traditional medicinal plants were taken into consideration.

Ethnobotanical Data Collection

The objectives of the study were clearly explained and verbal consent is obtained by interviewer from each informant. Data were collected using questionnaire, interviews and discussions in their local dialect. Traditional medicines used for promoting healing diseases were gathered from the tribal and experienced individuals practicing indigenous medicines. Most interviews are arranged by local people familiar with tribal and who could communicate with native communities. Questionnaires are used to collect information from the informants. The questionnaires used included the following information: Common name, Habit, Plant parts used, Ingredients and Mode of application and their Medicinal uses. Each claim was verified 4 or 5 times with different persons from different localities. The common names of plants and dose or mode of administration were documented from the field.

3. Result

Table 1: List of Medicinal Plants and Their Uses

S. No.	Botanical Name And Family Name	Common Name	Habit	Plant Parts Used	Ingredients	Mode of Application	Medicinal Uses
1	*Oxalis corniculata* L. Oxalidaceae	Puliyarila	Herb	Leaves	Salt, oil	Paste	Mouth ulcer, stomach problems
2	*Ficus racemosa* L. Moraceae	Athhi	Tree	Root, bark	Sugar	Powder and Kashayam	To wash wounds, bleeding
3	*Cocciniagrandis*(L.)Voigt Cucurbitaceae	Appakkovai	Climber	Root,leaves	Raw	Kashayam	Asthma, piles
4	*Euphorbia hirta*L. Euphorbiaceae	Amampachari	Herb	Whole plant	Raw	Kashayam	Worms in stomach, constipation, psoriasis
5	*Achyranthesaspera*L. Amaranthaceae	Vankadaladi	Herb	Leaves	Salt, chilly, oil	Cooked	Rheumatism,bronchitis, cough,stomach pain, ear pain
6	*Ficusreligiosa*L. Moraceace	Aalmaram	Tree	Stem, seeds, root	Honey	Powder	Foot ulcers,cracks
7	*Aervalanata* (L.)Juss.exSchult Amaranthaceae	Cheroola	Herb	Leaves	Salt	Cooked	Urinary stone, bleeding during pregnancy
8	*Emilia sonchifolia* (L.) DC. ex Wight Asteraceae	Muyalcheviyan	Herb	Leaves	Turmeric, salt, garlic	Juice	Throat pain, worms in stomach, bronchitis, mouth ulcer, eye disorders
9	*Cynodondactylon*(L)Pers. Poaceace	Arukampullu	Herb	Root	Coconut oil Honey	Paste Kashyam	Wounds healing for babies, Heart problems
10	*Vernoniacinerea*(L.)Less. Asteraceae	Poovamkurunnila	Herb	Leaves	Raw	Juice	Good for uterus and healthy for baby in the womb, scorpion bite, eye disorders, fever, reduce body temperature, purify blood
11	*Ecliptaprostrata* (L.) L. Asteraceae	Kayyonni	Herb	Leaves	Raw	Paste	Rheumatism, bronchitis, hair growth, good for liver, increase eye sight
12	*Citrus limon*(L.)Burm.F. Rutaceae	Naranga	Tree	Fruit	Honey, sugar	Kashayam	Pitham, eye problems

13	*Alternantherasessilis*(L.) R.Br. ex DC Amaranthaceae	Ponnaganni	Herb	Leaves	Salt, coconut oil	Boiled form	Eye sight, stomach pain, hair greying
14	*Momordicacharantia* L. Cucurbitaceae	Paval	Climber	Fruit, stem, leaves	Salt, coconut oil	Boiled	Diabetes
15	*Bambusaarundinacea*Willd. Poaceae	Illi	Tree	Seeds	Raw	Boiled	Regulation of menstrual cycle
16	*Piper nigrum*L. Piperaceae	Kurumulak	Climber	Dried stem	Honey	Kashayam	Fever
17	*Cissusquadrangularis*L. Vitaceae	Pirandai	Climber	Whole plant	Salt	Boiled	Piles, appetite
18	*Solanumtorvum*Sw. Solanaceae	Chundaikka	Shrub	Fruit	Salt, oil	Cooked	Worms in stomach
19	*Bacopamonnieri*(L.) Pennell Scrophulalariaceae	Brahmi	Herb	Leaves, stem	Raw	Fresh form	Enhance memory
20	*Boerhaaviadiffusa* L. Nyctaginaceae	Thazhuthama	Herb	Leaves	Honey	Kashayam Fresh leaves	Increase eye sight, heart problems, Diabetes, heart problems, constipation
21	*Lagenariasiceraria* (Molina) Standil. Cucurbitaceae	Chorakka	Climber	Fruit	Salt, coconut oil, chilly	Cooked	Urination
22	*Asparagus racemosus*Willd. Liliaceae	Sathavari	Climber	Tuber	Honey	Kashayam	Urine stone
23	*Capsicum frutescens* L. Sloanaceae	Kanthari	Shrub	Leaves, fruit	Salt	Boiled form	Cholesterol, wounds, cancer
24	*Biophytumsensitivum* L. Oxalidaceae	Mukkutti	Herb	Leaves	Honey	Kashayam	Cough, bronchitis, diarrhoea, increase immunity
25	*Centellaasiatica*(L) Urban Apiaceae	Vallaram, muthil	Herb	Leaves	Pepper, honey, coconut oil	Powder	Enhance memory, jaundice,mouth ulcer, urinary disorders, throat pain,gas trouble
26	*Ocimum sanctum* L. Lamiaceae	Tulsi	Shrub	Root, leaves	Raw	Kashayam	Fever, cold, worms
27	*Solanumtrilobatum*L. Solanaceae	Thoothuvazha	Climber	Root, stem, leaves	Honey, sugar	Kashayam	Bronchitis, gas trouble
28	*Leucasaspera* (Willd.) Link Lamiaceae	Thumba	Herb	Root, leaves	Coconut oil	Juice Coconut oil	Snake bite Psoriasis
29	*Mimosa pudica* L. Fabaceae	Thottarvadi	Herb	Root, leaves	Honey	Kashayam	Urinary stone, piles
30	*Phyllanthusamarus*Schum&Thonn Euphorbiaceae	Keezharnelli	Herb	Root	Raw	Powder, paste	Jaundice, stomach pain, bleeding, hair fall, dandruff
31	*Abutilon indicum*(Link)Sweet Malvaceae	Thuthi	Shrub	Leaves	Onion	Paste	Piles
32	*Aconitum heterophyllum*Wall. Ranaunculaceae	Athividayam	Climber	Root	Honey, kadukkatippali	Powder	Fever, diarrhoea
33	*Tribulusterrestris* L. Zygophyllaceae	Nerinjil	Herb	Root, leaves	Sugar	Kashayam	Pain in stomach, urination
34	*Equisetum ramosissimum*Desf. Equisetaceae	Sornappanna	Herb	Dried Stem	Raw	Powder	Speedy healing of wounds,
35	*Menthaarvensis*L. Lamiaceae	Puthina	Herb	Leaves, stem	Raw	Juice	For digestion, ulcer, vomiting, jaundice, fever, skin diseases
36	*Colocasiaesculenta* (L.) Schott Araceae	Chembu	Shrub	Leaves, tubers	Raw	Juice	Leaf juice is stimulant, internal haemorrhages Tuber juice is laxative, somatalgia and congestion of portal system
37	*Aloe barbadensis*Miller Liliaceae	Kattarvazha	Herb	Leaves	Raw	Juice	Carminative, diuretic, stomach pain, burns, skin diseases, constipation, abdominal tumours
38	*Ocimumbasilicum*L. Lamiaceae	Rama tulsi	Shrub	Whole plant	Honey	Kashayam	Antibacterial, stomach pain, bronchitis, asthma, malarial fever, cough, worm in stomach
39	*Tridaxprocumbens*L. Asteraceae	Kandavanekuthhi	Shrub	Whole plant	Raw	Paste Kashayam	Used for pitham, ulcer, anti-inflammatory, haemorrhoids, wound healing
40	*Psidiumguajava*L. *Myrtaceae*	Pera	Tree	Root, fruit	Raw	Root-powder Fruit- fresh	Roots are constipating, useful in haemorrhages, diarrhoea, dysentery, ulcers, vomiting in children, fruits are used for burning sensation, dysentery, diarrhoea
41	*Piper betle*L. Piperaceae	Vettila	Climber	Whole plant	Raw	Juice	Astringent, constipating, pitham, burning sensation, burns, diarrhoea, obesity, skin eruptions

42	*Plectranthusamboinicus*(Lour.)spreng. Lamiaceae	Panikoorka	Herb	Leaves	Raw	Juice	Fever, cold, cough, bronchitis for children
43	*Ocimumtenuiflorum* L. Lamiaceae	Krishna tulasi	Shrub	Whole plant	Honey	Kashayam	Diuretic, digestive, asthma, bronchitis, vomiting, urinary problems, skin diseases, worms in stomach, cardiopathy
44	*Nyctanthesarbortristis*L. Oleaceae	Parijatham	Shrub	Leaves, seeds	Raw	Powder	Seeds are useful in scurvy, affection of scalp, leaves are antibacterial, digestive, bronchitis, asthma, cough, greyness of hair, baldness
45	*Chromolaenaodorata*(L.) King&H.E. Robins. Asteraceae	Communist Pacha	Shrub	Leaves	Raw	Paste, juice	Wound healing
46	*Selaginelladelicatula*(Desv. exPoir.) Alston. Selaginellaceae	Kuruvevannasappu	Herb	Whole plant	Spermacocae Hispida	Paste	Wound healing
47	*Ageratum conyzoides*L. Asteraceae	Appachedi	Herb	Leaves	Raw	Paste	Speedy healing of wound
48	*Clerodendruminfortunatum*L. Verbenaceae	Peruku Perukila	Small Tree	Leaves	Lime	Paste	Wound healing
49	*Anacardiumoccidentalae*L. Anacardiaceae	Kashumavu	Tree	Fruits	Raw	Juice	Anthelmintic, dysentery, prevent hair loss, increase hair growth
50	*Adhatodavasica*(L.) Nees Acanthaceae	Adalodkam	Shrub	Leaves	Raw	Juice	Cough, psoriasis, bronchitis
51	*Eleusinecoracana*(L.) Gaertn. Poaceae	Ragi	Herb	Fruits	coconut oil	Fried and powdered	Speedy healing of wounds

Representation of Plant Habits

Table 2

Plant Habits	Number Used
Herbs	24
Shrubs	11
Climbers	8
Trees	7

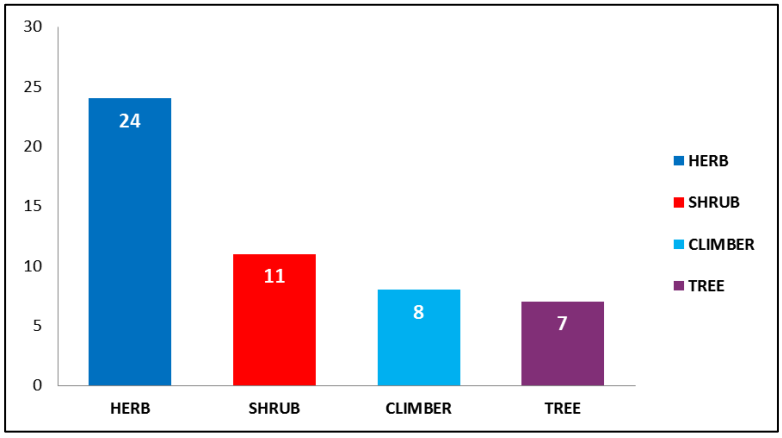

Fig 2: Representation of Habits of Medicinal Plants

Table 3: Representation of Plant Parts Used

Plant Parts Used	Used	Percentage
Root	11	17%
Bark	1	1%
Stem	3	5%
Leaves	29	45%
Seed	3	5%
Fruit	8	12%
Whole plant	6	9%
Tuber	2	3%
Dried stem	2	3%

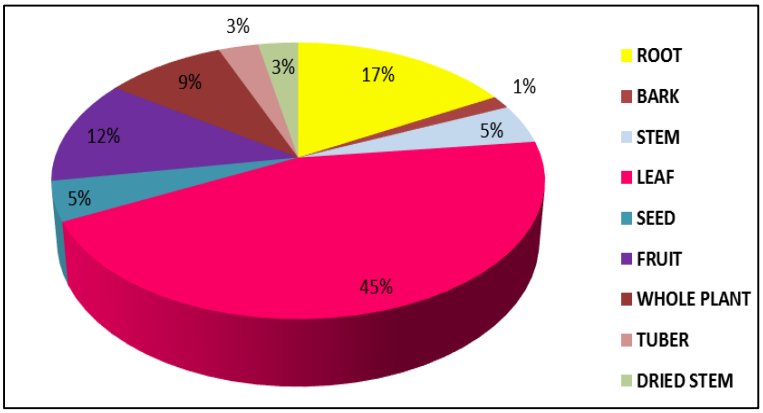

Fig 3: Representation of Plant Parts Used

Table 4: Representation of Families of Medicinal Plants

Family	No.Of Species
Oxalidaceae	2
Moraceae	2
Cucurbitaceae	3
Euphorbiaceae	2
Amaranthaceae	3
Asteraceae	**6**
Poaceace	3
Rutaceae	1
Piperaceae	2
Vitaceae	1
Solanaceae	3
Scrophulalariaceae	1
Nyctaginaceae	1
Liliaceae	2
Apiaceae	1
Lamiaceae	5
Fabaceae	1
Ranaunculaceae	1
Malvaceae	1
Zygophyllaceae	1
Equisetaceae	1
Araceae	1
Myrtaceae	1
Oleaceae	1
Selaginellaceae	1
Verbenaceae	1
Anacardiaceae	1
Acanthaceae	1

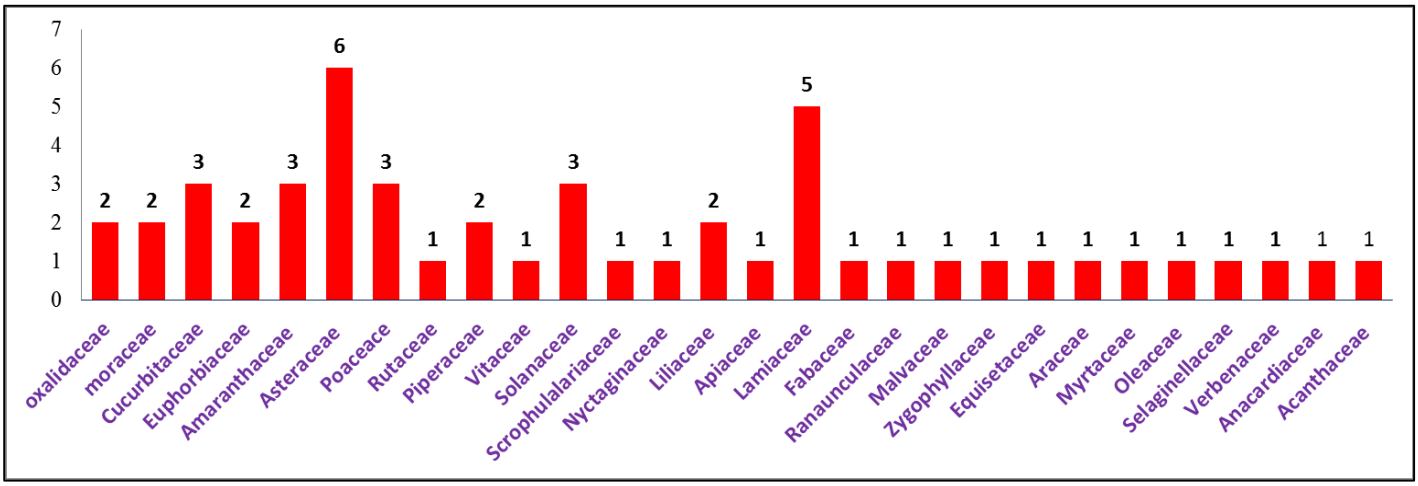

Fig 4: Representation of Families of Medicinal Plants

Table 5: List of Some Plants Used For the Following Diseases

Wound Healing	Toxicity	Female Disorders
Cynodondactylon(L.)Pers.	*Vernoniacinerea*(L.)Less.	*Aervalanata* (L.) Juss. ex Schult
Capsicum frutescens L.	*Leucasaspera* (Willd.) Link	*Bambusaarundinacea*Willd.
*Equisetum ramosissimum*Desf.		*Phyllanthusamarus*Schum et Thonn
*Tridaxprocumbens*L.		
Chromolaenaodorata (L.) King & H.E. Robins.		
Selaginelladelicatula (Desv. exPoir.) Alston.		
*Ageratum conyzoides*L.		
*Clerodendruminfortunatum*L.		
Eleusinecoracana(L.) Gaertn.		

4. Discussion

The ethnobotanical survey conducted between September to February 2015-16. It is covered over many tribes especially those who are well knowledged in traditional medical practices belonging to Irular, Mudugar, Dhodugar and Kurumbar. The experts in traditional Ayurveda in the hamlets of Attappady are also consulted and interviewed. A total of 25 tribal people were interviewed for the survey. However, age and experience on use of traditional medicinal plants were taken into consideration. The objectives of the study were clearly explained and verbal consent is obtained by interviewer from each informant. Data were collected using questionnaire, interviews and discussions in their local dialect. Traditional medicines used for promoting healing diseases were gathered from the tribalsand experienced individuals practicing indigenous medicines. The ethnobotanical survey shows about 51 medicinal plants have been used for medicinal purposes by tribal peoples of Attappady. Medicinal plants used in the treatment of various ailments are listed in the table 1. This medicinal plants are arranged with their botanical name, family name, common name, habit, plant parts used, ingredients, mode of application and medicinal uses.

In this 51 medicinal plants belonging to 28 families, family Asteraceae (6), Lamiaceae (5) are dominant (table 4) and figure 4. Distribution analysis of plants habit revealed that maximum remedies were obtained from herbs (24) followed by shrubs (11), climbers (8) and the trees (7) respectively (table 2 and figure 2). Different parts of medicinal plants viz. Leaf (45%), root (17%), fruit (12%), whole plant (9%), stem (5%),seeds (5%),tuber (3%),dried stem(3%) and bark(1%), were used as source of medicines by the tribes and traditional healers. Further most of the remedies for ailments were obtained from leaves.

Leaves are the most frequently used plant part which is followed by the roots, fruits, whole plant, tubers, dried stems, seeds and barks. Similar type of results were also obtained by other researches (Mahishi *et al.,* 2005, Abo *et al*., 2008, Gonzalez *et al*., 2010) [10, 1, 7]. The leaves are the main photosynthetic organs containing photosynthesis which might be responsible for medicinal value (Balick *et al.,* 1996, Ghorbani 2005) [3, 6]. Collections of leaves and then using the as medicine is very easy us compared to roots and fruits (Telefo *et al.,* 2011) [9]. Another reason of using leaves could be concerning conservation of the plants as digging out roots might be the cause of death of the plant and pulling the species in a vulnerable condition.

Most of the remedies used for disease healing were prepared from single plant. Sometimes combination of other parts of the same plant has been reported (Latheef *et al.,* 2014) [8]. Ingredients used and mode of application varied significantly depending on the plant species and plant parts used. Most of the formulations used were in the form of paste, kashayam, juice and powder. These analysis were closely correlating the ethnomedicinal survey conducted in Malayali tribes of Vattalhills, Dharmapuri, Tamil Nadu, India (Ramya *et al.,* 2009) [11].

Representation of some medicinal plants used for the wound healing, toxicity and female disorders are also have been in table 5. This analysis of diseases correlated with the survey of ethno medicine used for treating cuts and wounds but the tribes of Attappady, Kerala (Latheef *et al.,* 2014) [8] and ethno botanical study of Kani tribes in Thoduhills of Kerala South India (Francis *et al.,* 2013) [5].

5. Acknowledgement

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