International Journal of Herbal Medicine
Available online at www.florajournal.com

IJHM International Journal of Herbal Medicine

ISSN 2321-2187
IJHM 2014; 2 (1): 92-99
Received: 26-04-2014
Accepted: 26-05-2014

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Ethano Botanical Studies on Medicinal Plants Used For Skin Diseases in Malabar Region of Kerala

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ABSTRACT
The present study was carried out to assess and document ethno botanical knowledge of plants of Malabar region of Kerala, India for Skin diseases, as the area is rich in biodiversity. Geographically, the Malabar Coast, especially on its westward-facing mountain slopes, comprises the wettest region of southern India as the Western Ghats intercept the moisture-laden monsoon rains. The biodiversity of the Western Ghats is the main component of the biodiversity of Kerala. The entire State is blessed with year-round greenery. It was found that 113 different plant species belonging to 46 families were used for treating skin diseases. The predominant families are Fabaceae with 14 plant species and Euphorbiaceae and Rubiaceae with 7 plant species. Different types of medicinal preparation recorded for 15 ailments.

Keywords: Skin diseases, Ethno botanical investigations, Malabar, Eczema, Psoriasis, Scabies, Wound healing

1. Introduction
Malabar region is an area of southern India lying between the Western Ghats and the Arabian Sea. The name is thought to be derived from the Malayalam word Mala (hill) and Vaaram (range, region) derived or westernized in to bar. This part of India was a part of the British East India Company-controlled State, when it was designated as Malabar District. It included the northern half of the state of Kerala. The Indian state of Kerala borders with the states of Tamil Nadu on the south and east, Karnataka on the north and the Arabian Sea coastline on the west. The Western Ghats, bordering the eastern boundary of the State, form an almost continuous mountain wall, except near Palakkad where there is a natural mountain pass known as the Palakkad Gap. Kasaragod, Kannur, Wayanad, Kozhikode, Palakkad, Thrissur and Malappuram are the districts coming under Malabar region. Geographically, the Malabar Coast, especially on its westward-facing mountain slopes, comprises the wettest region of southern India as the Western Ghats intercept the moisture-laden monsoon rains. The biodiversity of the Western Ghats is the main component of the biodiversity of Kerala. The entire State is blessed with year-round greenery. Evergreen forests are its main biological treasure house. Favorable climate and soil conditions and other affable physical factors are responsible for the biological richness. In Kerala humidity is very high at an average of 70 percent. Structurally, Kerala has different geo-physical areas such as forests, marshes, mangroves, ponds, seashores and deltas. The Western Ghats which form the mountain ranges of south-western India have been considered a 'Hot spot' due to their wide range of endemic forms of biodiversity of genera, species and races. Plant-based medicines have a respectable position today, especially in developing countries where modern health services are not sufficient. There has been a shift in public preference towards greater acceptance of herbal medicines to treat infectious diseases. This is possibly due to the problems of over prescription and misuse of synthetic antibiotics [1-3]. It is estimated that plant materials have provided models for 50% of the pharmaceuticals used in modern Western medicine [4]. The area of study for the ethno botanical survey is the Northern part of Kerala, the Malabar region. Documenting the indigenous knowledge through ethno botanical studies is important for the conservation and utilization of biological resources. Ethno botanical survey has been found to be one of the reliable approaches in drug discovery [5]. Traditionally this treasure of knowledge has been passed on orally from generation to generation without any written document [11] and is still retained by various indigenous groups around the world. Today, it is estimated about 64 % of the total global population remains dependent on traditional medicines [6]. Traditional medicine is becoming popular in the world today. The global market for traditional therapies estimated to be at $60 billion a year and is steadily growing [14].

The traditional medical practices are an important part of the primary health care system in the developing world [7].According to World Health Organization (WHO) about 65-80% of the world's population in developing countries, due to the poverty and lack of access to modern medicine, depended essentially on plants for their primary health care.

However the knowledge of medicinal plant is rapidly dwindling due to the influence of western life styles, reduction in number of traditional healers and the lack of interest of younger generations to carry on the tradition [2]. Through ethno botanical surveys, indigenous knowledge from local people and practitioners is collected and documented in order to identify plants that can be a source of drugs against infectious diseases. People inhabiting the tribal localities and villages have used indigenous plants as medicines for generations because this knowledge is based on experience. The tribes and villages also have no health facilities as they are far away from cities. Most inhabitants are poor or middle class and they cannot afford expensive synthetic drugs. About 80% of the world's population depends on traditional systems of health care.

Skin is the largest organ of the human body, as such plants showing dermatological properties and the ability to stop bleeding, and to heal wounds and burns are of great significance to human health [9]. Skin diseases occur all over the world, but are prevalent in tropical regions [4]. Skin diseases occur in various forms basically classified as non-contagious and contagious diseases. Contagious diseases are primarily categorized as bacterial, fungal, viral or parasitic diseases. Skin diseases such as scabies may be caused by mites; rash and itch could be caused by something such as stinging nettles, while diseases such as eczema may be hereditary [12].

There has been a shift in public preference towards greater acceptance of herbal medicines to treat infectious diseases. This is possibly due to the problems of over prescription and misuse of synthetic antibiotics [3]. Many medicinal plants are readily accessible, contributing to their popularity. It is estimated that plant materials have provided models for 50% of the pharmaceuticals used in modern Western medicine [13]. The area of study for the ethno botanical survey is the North part of Kerala, the Malabar region.

2. Materials and methods

The Malabar region of Kerala was explored during the ethno botanical survey. Survey was conducted in the Malabar region of Kerala from 2008-2011.Information was collected through investigations and by interviewing the local people during various field trips. Semi-structured interviews with the aid of a questionnaire were used to obtain data including local names of plants, plant parts used in medicinal preparation, therapeutic effects, diseases treated, and method of preparation, method of administration, dosages, and duration of treatment. Interviews were conducted individually with traditional medical practitioners (TMPs). Specific questions based upon preformed designed by Jain and Goel (1995) were asked and the resultant information were recorded in the ethno botanical field book. According to ethno botanical investigations, Plants with their local name, botanical name, family, part of plant used and ethno botanical uses are reported in Table 1. The plants were collected, pressed, and later identified. The information gathered is compared with important works pertaining to Indian medicinal plants and ethno botany. Local names were provided in their own language by the traditional physicians. From this survey, 46 families were gathered consisting of 103 genera and 113 plant species. Different types of medicinal preparation recorded for 15 ailments.

3. Results & Discussion

Ethno botanical investigations revealed the use of 113 species of plants for curing skin diseases. Information on the plants used in the treatment of skin diseases and related ailments is given in Table1. The informants used local names for all the species catalogued. These names were checked against the book Biodiversity documentation of Kerala which claims to contain all previously published common plant names. The information gathered about medicinal utility of plants was compared with the previous work in ethno botanical surveys conducted in this region by Silja *et al.* (2008), Pramod *et al.* (2003), and found some similar works. The present study revealed information of plants used for skin diseases. 43 families belong to dicot and 3 monocot were recorded. The plants are arranged in the alphabetical order of families with their local name, parts used, and folk use. The present study includes 113 plants used for treating skin diseases belongs to 46 families and the predominant families are Fabaceae with 14 plant species and Euphorbiaceae and Rubiaceae with 7 plant species. Out of 113 Plants 2 are pteridophytes. Among the plant species leaves of 50, whole plant of 17, root of 5, seeds of 5, stem bark of 10, rhizome of 6 are predominantly used for treating skin diseases. From the survey list *Justicia beddomei* (Clarke) bennet, *Symplococcus cochinchinensis* (Lour), *Grewia tilifolia* Vahl, are endemic to Western ghats and *Rauvolfia serpentine* L. is vulnerable.

3.1 Tables

No.	Scientific Name	Family	Parts Used	Purpose	Mode Of Use
1	*Beloperone plumbaginifolia* L.	Acanthaceae	Leaf	Insect bite	*Grind the leaf and used as poultice*
2	*Hemigraphis colorata Hallier f.,*	Acanthaceae	Leaf	Wound healing	Apply the fresh juice of leaf
3	*Hygrophila schulli (Buch.-Ham.) M. R. & S. M. Almeida,*	Acanthaceae	Whole plant	Anti-inflammatory	Decoction of plant taken orally
4	*Justicia beddomei*	Acanthaceae	Leaf	Ring worm	Application of leaf paste

	(Clarke) Bennet,			infection	,along with tender leaf *Bridelia scandes*, whole plant of *Centella aesiatica* ,Leaves of *Hygrophylla schulli*.
5	*Rhinacanthus nasutus (L.) Kurz, J.*	Acanthaceae	Root	Athelets foot disease ,Ringworm infection	Grind the root and made in to a paste ,mix with curd, then apply
6	*Achyranthes aspera L.,*	Amaranthaceae	Whole plant	Wound healing	Apply the fresh juice of plant
7	*Amaranthus spinosus L.,*	Amaranthaceae	Whole plant	Athelets foot disease	Put the parts of the plant in boiled water and insert the foot ,kept for 2 hours
8	*Amaranthus viridis* L.	Amaranthaceae	Leaf	Eczema	,Leaf paste taken orally
9	*Anacardium occidentale L.,*	Anacardiaceae	Seed oil	Foot crack	The oil from nut applied on the crack
10	*Holigarna arnottiana Hook. f.,*	Anacardiaceae	Fruit	Foot crack	The endosperm from seed applied on the crack
11	*Centella asiatica (L.) Urban in Mart.,*	Apiaceae	Whole plant	Boils	apply the fresh juice
12	*Anethum graveolens L.,*	Apiaceae	Seeds	Boils	apply the seed oil
13	*Rauvolfia serpentina (L.) Benth. ex Kurz*	Apocyanaceae	Leaf ,stem, Rhizome	Sore, Psoriasis	Boiled stem and leaves made in to a paste and applied on affected area, decoction of rhizome taken orally
14	*Wrightia tinctoria (*Roxb)R.Br.	Apocyanaceae	Leaf	Psoriasis, eczema, Ringworm infection	Leaf juice boiled with coconut oil and apply in affected area
15	*Cocos nucifera* L.	Araceae	Endocarp - tender coconut	Ringworm infection	coconut shell charcoal and boiled with coconut oil ,apply in the affected area 2.grind the endosperm and apply
16	*Areca catechu* L.	Araceae	Leaf juice	Tinea infection	Apply the leaf juice along with garlic paste and Resinous exudations from *Caryota urens.*
17	*Pergularia daemia (Forssk.) Chiov.*	Asclipiadaceae	Leaf	Eczema	Leaf juice boiled with coconut oil and apply in affected area,
18	*Calotropis gigantea (L.) R. Br. in Ait.f*	Asclipiadaceae	Leaf	Eczema	Aqueous paste of leaf powder is applied externally on the lesions
19	*Hemidesmus indicus* (L.) *R. Br. in Ait.f.*	Asclipiadaceae	Leaf	Eczema	Leaf paste used as poultice
20	*Ageratum conyzoides* L.,	Asteraceae	Leaf	Scabies	leaf grind with coconut shell charcoal and boiled with coconut oil ,apply in the affected area
21	*Ayapana triplinervis* Vahl.	Asteraceae	Leaf	Wound healing	Leaf paste used as poultice
22	*Eclipta alba* (L.)var.dixitii Anand kumar and Khana	Asteraceae	Whole plant	Dandruff	apply the plant juice
23	*Elephantopus*	Asteraceae	Root	Wounds	Root paste is applied

	scaber L.				externally on wounds
24	*Sphaeranthus indica* L.	Asteraceae	Leaf,stem	For all types of skin diseases	application of leaf paste and stem paste
25	*Vernonia cinerea* (L.)Less	Asteraceae	Whole plant	Eczema	Grind the whole plant and made in to a paste. apply
26	*Aristolochia indica* L.Aristolochia indica L.,	Aristalochaceae	Leaf	Scabies	Leaf juice boiled with coconut oil and apply in affected area2.apply the fresh juice of the plant
27	*Bixa orellana* L.	Bixaceae	Fruit	Boils	Apply the fruit juice
28	*Commelina erecta* L.	Commalinaceae	Whole plant	Scabies	Application of leaf paste and stem paste
29	*Calycopteris floribunda* Lam.	Combretaceae	Leaf	Eczema	Decoction of leaf effective for bathing
30	*Terminalia chebula* Retz.	Combretaceae	Fruit	Eczema	Grind the Fruit and made in to a decoction. Apply in affected area.
31	*Shorea roxburghii* G.Don	Dipterocarpaceae	Resinous exudation from the bark	Scabies	Dissolve the exudation in vinegar
32	*Luffa acutangula (L.) Roxb.,*	Cucurbitaceae	Fruit	All skin diseases	Rub the fruit juice in affected area
33	*Acalypha indica L.,*	Euphorbiaceae	Leaf	Scabies	Grind the leaf with curcuma rhizome and apply
34	*Briedelia stipularis (L.) Blume,*	Euphorbiaceae	Tender leaves	Scabies, Eczema	Application of leaf paste
35	*Flueggea virosa (Roxb. ex Willd.) Voigt,*	Euphorbiaceae	Leaf	Ringworm infection	Grind the leaf along with *Curcuma longa* rhizome.T hen apply in the affected area.2.grind the leaf and tender shoot and made in to a paste and apply
36	*Jetropha multifida* L.	Euphorbiaceae	Leaf	Boils, scabies	Leaf juice boiled with coconut oil and apply in the affected area.
37	*Tragia involucrata* L.	Euphorbiaceae	Whole plant	Dandruff	Apply the fresh juice of the plant in head.
38	*Phyllanthus emblica* L.	Euphorbiaceae	Whole plant	Dandruff	Apply the fresh juice of the plant in head.
39	*Albizia lebbeck* (L.)Benth.	Fabaceae	Bark powder	For skin diseases	Used for bathing
40	*Butea monosperma* (Lam.)Taub	Fabaceae	Bark	For alltypes of skin diseases	Burn the bark without charring and apply the ash in affected area.
41	*Cassia alata* L.	Fabaceae	Leaf	Boils	Apply the leaf paste
42	*Cassia fistula* L.	Fabaceae	Leaf, bark,	Eczema	Boil the leaf and bark in water and wash the affected area
43	*Cassia tora* L.	Fabaceae	Leaf	Athelets foot disease	Boil the leaf in water and wash the affected area
44	*Cullen corylifolium (*L.)Medik.,	Fabaceae	Seeds	Leucoderma	Grind the seeds in Cow urine
45	*Derris scandens (*Roxb.)Benth	Fabaceae	Leaf	Scabies	Leaf juice boiled with coconut oil and apply in affected area
46	*Desmodium motorium* (Houtt.)Merr.,	Fabaceae	Leaf	Wound healing	Apply the leaf paste

47	*Desmodium triflora* (L.)DC	Fabaceae	Whole plant	Scabies	Leaf juice boiled with coconut oil and apply in affected area,
48	*Erythrina variegate* L.	Fabaceae	Leaf	Eczema	Grind the leaf and used as poultice
49	*Indigofera tinctora* L.	Fabaceae	Leaf	Dandruff	Leaf juice boiled with coconut oil and apply in affected area,
50	*Mimosa pudica* L.	Fabaceae	Whole plant	Eczema, Cracks on foot	Leaf juice boiled with coconut oil and apply in affected area,
51	*Pongamia pinnata* (L.)Pierre	Fabaceae	Bark,seeds	Psoriasis, Eczema, Ringworm infection	Decoction of bark effective for bathing 2.bark boiled with coconut oil and apply
52	*Tamarindus indicus* L.	Fabaceae	Leaflets	Scbies	Prepare thaila from the leaf juice along with fruits of *Phyllanthes emblica* and *Terminalia chebula.*
53	*Salacia fruticosa* Heyne ex Lawson	Hippocrataceae	Root	Psoriasis	Grind the root and made in to a paste and apply in affected area
54	*Anisomeles indica (L.) O. Ktze.,*	Lamiaceae	Leaf	Ringworm infection	Boil the leaf in water and wash the affected area
55	*Leucas aspera* (Willd.)Link	Lamiaceae	Whole plant	Wound healing	Apply the fresh juice
56	*Ocimum tenuiflorum* L.	Lamiaceae	Leaf	Insect bite	Grind the plant along with curcuma rhizome
57	*Plectranthus amboinicus* (Lour.)spreng.	Lamiaceae	Leaf	Wound healing	Rub the leaf in the wounds.
58	*Plectranthus hadiensis (*Forssk.)Schweinf.ex, spreng. var.*tomentosus*	Lamiaceae	Leaf	Wound healing	Rub the leaf in the wounds.
59	*Aloe vera (*L.)Burm.f.	Lilliacea	Leaf	Paronychia	Leaf paste used as poultice
60	*Allium cepa* L.	Lilliacea	Bulb	Psoriasis	Make thaila with onion and apply
61	*Lawsonia inermis* Lam.	Lythraceae	Leaf	Athelets foot disease	Leaf paste used as poultice
62	*Lobelia nicotianifolia* Roth ex Roem.&Schult.,	Lobeliaceae	Root	Wounds	The root paste is applied externally to cure old wound
63	*Hibiscus rosa-sinensis* L.	Malvaceae	Leaf and Flower	Eczema,dandruff	Leaf juice and flower boiled with coconut oil and apply in affected area,
64	*Pavonia odorata* Willd.,	Malvaceae	Root	Athelets foot disease	Grind the root along with *curcuma longa* rhizome, *Mimosa pudica* leaves .Then apply in the affected area
65	*Thespesia populnea (L.) Soland.*	Malvaceae	Leaf	Scabies,eczema	Decoction of leaf effective for bathing
66	*Cyclea peltata(*Lam.)Hook. f &Thoms.	Menispermaceae	Whole plant	Eczema	Application of leaf paste
67	*Tinospora cordifolia (*willd.)Miers	Menispermaceae	Leaf	Boils,scabies	1.Leaf juice boiled with coconut oil and apply in affected area, 2.application

					of leaf paste
68	*Azadirachta indica* Wight & Arn.	Meliaceae	Leaf	Boils,chicken pox	Decoction of leaf effective for bathing
69	*Naragamia alata* Wight & Arn.	Meliaceae	Whole plant	Insect bite	Grind the plant along with curcuma rhizome
70	*Moringa pterigosperma* Gaertn.,	Moringaceae	Stem bark	Against inflamations	Grind the stem bark along with curcuma rhizome and apply in affected area
71	*Myristica fragrans* Houttt.	Myristicaceae	Tender leaf	Scabies	Apply the leaf paste
72	*Ficus auriculata* L.	Moraceae	Fruit	Leucoderma	Crush the dried fruit and dissolve one teaspoon in 20 ml. Water and kept it in 6 hrs. And then apply in affected area
73	*Ficus benghalensis L.,*	Moraceae	Leaf and Bark	Eczema, All skin diseases	The four plant together known as Nalpamara.The decoction used for bathing
74	*Ficus racemosa* L.	Moraceae	Leaf and Bark		
75	*Ficus tinctoria Foster* F.	Moraceae	Leaf and Bark		
76	*Ficus religiosa* L.	Moraceae	Leaf and Bark		
77	*Jasminum grandiflorum L.*	Oleaceae	Leaf	Ringworm infection	Application of leaf paste
78	*Biophytum sensitivum* (L.)DC.	Oxalidae	Whole plant	Wound healing	Apply the fresh juice
79	*Piper betel* L.	Piperaceae	Leaf	Dandruff	Apply the fresh juice of leaf
80	*Piper nigram* L.	Piperaceae	Leaf	Psoriasis	Decoction of leaf effective for bathing
81	*Cynadon dactylon (*L.)Pers,	Poaceae	Whole plant	Eczema	Application of leaf paste along with paste of rhizome of *Curcuma longa*
82	*Polygonum plebeium R. Br.,*	Polygonaceae	Leaf	All skin diseases	The decoction of leaves used for effective bathing.
83	*Ixora coccinea L.,*	Rubiaceae	Flower	Eczema	Grind the flower and apply
84	*Oldenlantia umbellata* L.	Rubiaceae	Whole plant	Leucoderma	Leaf paste used as poultice
85	*Rubia cordifolia L.,*	Rubiaceae	Leaf	Ringworm infection	Application of leaf paste
86	*Spermacoce latifolia* Aubl.	Rubiaceae	Whole plant	Ringworm infection	Leaf paste used as poultice
87	*Glycosmis pentaphylla (*Retz.)DC.	Rutaceae	Root	Psoriasis	Apply the root paste in affected area
88	*Citrus limon (*L.)Burn.f.,	Rutaceae	Fruit	Tinea infection	Fruit juice mix with sodium borate'
89	*Toddalia asiatica (L.) Lam.,*	Rutaceae	Leaf	For all skin diseases	Leaf juice boiled with coconut oil along with *Hibiscus -rosa sinensis* leaf and apply in affected area,
90	*Ventilago madraspatana* Gaerh.,Fruct	Rhamnaceae	Bark	Dermatitis, Tinea infection	Apply the fresh juice of bark
91	*Ziziphus oenoplia (L.) Mill.*	Rhamnaceae	Leaf	Scabies	Grind the leaf along with the bark and leaf of *Phyllanthus emblica*. Then apply in the affected area.
92	*Ziziphus xylopyrus* (Retz.)Willd.	Rhamnaceae	Leaf	Eczema	Grind the leaf along with *Phyllanthus emlica* leaf and

					bark made in to a paste and apply in the affected part
93	*Santalam album* L.	SantalaceaeE	Wood	For fairness	Grind the stem and apply
94	*Physalis angulata* L.	Solanaceae	Whole plant	Psoriasis	Leaf juice boiled with coconut oil and apply in the affected area.
95	*Datura stramonium* L.	Solanaceae	Leaf,fruit	Dandruff	Leaf juice and fruit juice boiled with coconut oil and apply in the affected area.
96	*Smilax china* L.	Solanaceae	Rhizome	Wound healing	Grind the rhizome and apply in the paste form
97	*Bacopa monnieri* (L)Pennell	Scorphulariceae	Whole plant	Eczema	Grind the Whole plant and apply in the paste form
98	*Picrorrhiza kurroa* Royle ex Benth	Scorphulariceae	Seed	Scabies	Grind the seeds and apply in the affected portion.
99	*Scoparia dulsis* L.	Scorphulariceae	Root	Itching and inflammation	3 gm. Root grind and taken orally
100	*Symplocos cochinchinensis* (Lour)	Symplocaceae	Stem bark	For fairness, Discolouration	The bark is made in to a paste and mix with sandal paste and turmeric powder .
101	*Grewia tilifolia* Vahl	Tiliaceae	Leaf	Dandruff	Apply the fresh juice of leaf
102	*Dendrocnide sinuate (*Blume)	Urticaceae	Leaf	Eczema	Leaf juice mixed with *Santalam album* L. wood paste boiled with coconut oil and apply.
103	*Holoptelia integrifolia* (Roxb.)Planch	Ulmaceae	Tender leaf	Ringworm infection, Scabies	Grind the young leaves and add ghee ,and apply
104	*Callicarpa tomentosa* (L) Murr	Verbanaceae	Leaf	Scabies, and other Skin diseases	Apply the tender Leaf juice
105	*Clerodendrum infortunatum* L.	Verbanaceae	Leaf	Wounds	Leaf paste used as poultice
106	*Premna serratifolia* L.	Verbanaceae	Leaf	Wound healing ,boils	Boil the leaf in water and wash the affected area 2.Leaf paste mix with paste of *Terminalia chebula* L. Seeds
107	*Vitex negundo* L.	Verbanaceae	Leaf	Ringworm infection	Leaf paste used as poultice
108	*Cissus quadrangularis* L.	Vitaceae	Leaf and stem	Ringworm infection	Grind the useful part and apply
109	*Curcuma longa* L.	Zingiberaceae	Rhizome	Tinea infection, all Skin diseases	Grind the rhizome with root paste of *Mangifera indica* L. and apply
110	*Kaempferia galangal* L.	Zingiberaceae	Rhizome	Leucoderma, Corns	Grind the rhizome and mix with calcium hydroxide and apply
111	*Zingiber zerumbet* (L) J.E Smith	Zingiberaceae	Rhizome	Leucoderma	Grind the rhizome and add one teaspoon honey and then apply
112	*Marsilea sp.*	Pteridophyte	Leaf	Wound healing	Apply the leaf paste
113	*Lygodium flexuosum* L.	Pteridophyte	Leaf	Anti-inflammatory	Apply the leaf paste

4. Conclusions

Documenting the indigenous knowledge through ethno botanical studies is important for the conservation and utilization of biological resources. Ethnobotanical survey has been found to be one of the reliable approaches in drug discovery.

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