Original Research Article

Traditional Medicinal Plants Used in the treatment of different skin diseases

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A B S T R A C T

Medicinal plants are a very good source of active in gradients of herbal medicine and provide a safer and cost effective way to treat diseases. An ethno-botanical survey was carried out among the ethnic groups of Kolli hills region Eastern Ghats of Tamil Nadu. The people have natural knowledge about medicinal plants and its uses. In this present investigation, it has been observed that 26 species of plants are used as herbal solution for the treatment of Dermatological infections and diseases (DID) of 25 genera and 18 different families. The prominent family was Asteraceae with five species, followed by Fabaceae and Lamiaceae with four and two species respectively. The most commonly used species was *Leucas aspera* with 20 use-reports by 26 informants, giving the highest use value of 0.95 *L. aspera* is attributed to its use in the treatment of Dermatological infections/diseases (DID) and it is well recognized by all the informants as most medicinal value. Other important plants with high use value was *Abelmoschus esculentus* with 19 use reports by 26 informants giving the second highest use value of 0.94. *A. esculentus* is mainly used in the treatment of scabies and skin diseases, and it is well recommended plant by all informants

Introduction

Many plants have been used in traditional medicine for several thousand years. During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance. According to the World Health Organization (WHO) about 65–80% of the world's population in developing countries depends essentially on plants for their primary healthcare due to poverty and lack of access to modern medicine (Calixto, 2005). In recent years, use of ethnobotanical information in medicinal plant research has gained considerable attention in segments of the scientific community (Heinrich, 2000). Interest in medicinal plants has been fuelled by the rising costs of prescription drugs in the maintenance of personal health and well-being and the bio prospecting of new plant-derived drugs (Hoareau and DaSilva,

1999).Historically all medicinal preparations were derived from plants, whether in the simple form of plant parts or in the more complex form of crude extracts, mixtures, etc. The primary benefits of using plant-derived medicines are that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits and more affordable treatment (Iwu et al., 1999). About 200 years ago our pharmacopoeia was dominated by herbal medicines (Ernst, 2005) and almost 25% of the drugs prescribed worldwide were come from plants. Of the 252 drugs considered as basic and essential by the WHO, 11% are exclusively of plant origin and a significant number are synthetic drugs obtained from natural pre-cursors. Hence, the present was carried out with an aim to document medicinal plants of Kolli hills region of Eastern Ghats of Tamil Nadu for various skin diseases.

Materials and Methods

Data collection

Ethno-botanical data were collected through survey during November 2012 to October 2013 with traditional healers, local knowledgeable person, old age men and traditional healers in the field trips. During the interview local names, useful part of the plant, method of drug preparation and dosage. The learn part was investigated to get information from local people and also to cross check the information provided by the other tribal practitioners during the earlier visits. The collected specimens were identified and authenticated with the help of valid references (Henry *et al.,* 1987; Gamble and Fisher, 1935; and Bor, 1960 and further validated through herbarium referencing at the Department of Botany, St. Joseph's College. Information gathered from the traditional healers on local name of the plant, plant part used for curing, method of preparation, any other plants agents used as ingredients, mode of administration and etc. were recorded for collected traditional medicinal plant.

Aliment category

Based on the information obtained from the traditional healers in the study area, all the reported ailments were categorized in Dermatological infection/diseases (DID)

Data analysis

Informant consensus factor (F_{ic})

The informant consensus factor (F_{ic}) 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 F_{ic} was calculated using the following formula (Heinrich et al., 1998):

$$Fic = \frac{Nur - Nt}{Nur - 1}$$

Where N_{ur} refers to the number of use-reports for a particular ailment category and N_t refers to the number of taxa used for a particular ailment category by all informants. The product of this factor ranges from 0 to 1. A high value (close to 1.0) indicates that relatively few taxa are used by a large proportion of the informants. A low value indicates that the informants disagree on the taxa to be used in the treatment within a category of illness.

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):

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

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).

Result and Discussion

In this study, it was noted that (Table 1) 26 plant species are used as herbal solution for the treatment of dermatological infections and diseases, Of 25 genera and 18 different families, (Table 3) Plants of families Asteraceae (5 species), Fabaceae(3 species), and Lamiaceae (2 species) was largely represented. The rest of the 15 families recorded one species only. Among them, 16

plants were herbs, 5 tree species, 2 plants are shrubs, 2 plants are under shrub and 1 is liana. Most of the remedies are reported for first time. The population use herbal remedies for the treatment of dermatological infections and diseases. The people have a long history of traditional uses of plants. Traditional medicine is still widely practiced throughout the region; it is now fast disappearing due to modernization. Most of time drug is utilized in the fresh or dried state. It is found that the leafy crude drug preparation are mostly recommended as ethno medicine and followed by entire plant, stem or bark, seeds & fruits, flower, root, stem, rhizome and tuber. The most frequently used preparations being paste, powder, raw plant, juice, and decoction. The methods and period of administration may be widely different. Some remedies consist of single herbs but more than two herbs are reported in several preparations. In the present investigation, we observed that almost all parts of the different plant species were used against dermatological infections and diseases. (Table 2) The most commonly used plant species in herbal drug preparation were leaves (52%) followed by stem bark (10%), whole plant (10%), fruit seeds (7%), flower (7%), stem (4%), roots (3%), rhizome (3%) and tuber (3%), in many preparations more than one part of the same species generally leaves, stem bark and tubers are used in various drug preparations. This report is in accordance with the previous ethnobotanical studies made by Arshad et al, 2014; Cornara, 2009. In the present survey, whole plants are also used frequently in the drug preparation next to leaves. This report is disagreement with the studies done by Ahmad et al., 2014 in chail valley of Pakistan where whole plant used less frequently.

The preparation and utilization of plant parts were grouped into five categories. Of these, most commonly used method of preparation

was paste (20 records) followed by juice (4 records), powder (3 records) raw form (1record -taken as raw material of plant parts like leaves, fruits etc.), and decoction (1 record). Preparation of paste for the treatment of ailments is a common practise among the other tribal people in India (Ignacimuthu *et al*., 2006) and other parts of the world (Giday *et al.,* 2010). The paste was prepared by grinding the fresh or dried plant parts with water or oil. The decoction was obtained by boiling the plant parts in water until the volume of the water reduced to minimum or required amount. The methods of administration of traditional medicinal plants prepared products by the local healers/community. The major routes of administration in the study area were reported to be topical, oral/topical and oral. Topical administration was most cited route (61%) followed by oral/topical (31%) and oral (8%). Both oral and topical routes permit rapid physiological reaction of the prepared medicines with the pathogens and raise its therapeutic power.

The medicinal arrangements were complete out of a single plant part or in mixture of several plant parts. In case of *Malayali* traditional healers medicinal arrangements multiple modes of preparation were dominating over the single mode of arrangements. Kolli hills traditional healers used more than two or three plant parts for the preparation of medicine in the treatment of single or multiple ailments; the similar findings were reported by several researchers (Teklehaymanot *et al*., 2007; Ignacimuthu *et al.,* 2008; Tabuti *et al*., 2010 and Upadhyay *et al.,* 2010).

The frequent use of multiple plant remedies among the traditional healers could be attributed to the belief of synergic reactions where one plant could have a potentiating effect than other (Giday *et al*., 2010). It is believed that the multiple prescriptions

contain a range of pharmacologically active compounds and poly-herbal treatment has more healing power than single medicinal plant treatment, since each medicinal plant used in the mixture is a remedy (Teklehaymanot *et al*., 2007).

Kolli hills traditional healers too frequently use some ingredients(Table 5) such as coconut oil, groundnut oil, goat milk and common salt to improve the acceptability and medicinal property of certain remedies (Poonam and Singh, 2009). Water and hot water were commonly used for the preparation of medicine. 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.

The most commonly used species was *Leucas aspera* with 20 use reports by 21informants. giving the highest use value of 0.95, (Table 4) Other important plants with high use value was *Abelmoschus esculentus* with 19use reports by 21informants giving the second highest use value of 0.94. The following plants have high use value were *Asystasia chelonoides* (19 use reports by 21informants with a use value of 0.90), *Eclipta prostrata* (18 use reports by 21informants with a use value of 0.86), *Tridax procumbens* (18use reports by 21informants with a use value of 0.86), *Cynoglossum zeylanicum* (17 use reports by 21informants with a use value of 0.81), *Azadirachta indica* and *Senna auriculata* (16 use reports by 21informants with a use value of 0.76). The plants with very low use value was *Ipomoea asarifolia* (4 use reports by 21informants with a use value of 0.19) but the informants are regularly using the plant in the treatments of wounds.

Table.1 Ethnomedicinal plants used by Malayali tribal's in Kolli hills of Tamil Nadu

Botanical Name	Family	Local Name	Life form
Abelmoschus esculentus (L.) Moench	Malvaceae	Kasthuri vendai	Under shrub
Acacia caesia (L.) Willd.	Fabaceae	Nanjupatti	Liana
Acacia nilotica (L.) Willd. ex Del. subsp. indica (Benth) Brenan	Fabaceae	Shikakaai	Tree
Acalypha indica L.	Euphorbiaceae	Kuppaimeni	Herb
Alangium salvifolium (L. f.) Wang.	Alangiaceae	Alangi	Tree
Anisochilus carnosus (L. f.) Wall. ex Benth.	Lamiaceae	Saetthupun thazhai	Herb
Argemone mexicana L.	Papavaraceae	Brumma thundu	Herb
Asystasia chelonoides Nees.	Acanthaceae	Sirugurunjan	Herb
Azadirachta indica A. Juss.	Meliaceae	Vembu	Tree
Bidens pilosa L.	Asteraceae	Ottaraichedi	Herb
Boerhavia diffusa L.	Nyctaginaceae	Mukkuratai	Herb
Calotropis gigantea (L.) R.Br.	Apocynaceae	Erukku	Shrub
Citrus aurantifolia (Christm.) Swingle	Rutaceae	Ezhumitchai	Tree
Cleome viscosa L.	Capparaceae	Naikadugau	Herb
Cymbidium aloifolium (L.) Sw.	Orchidaceae	Uttuchedi	Herb
Cynoglossum zeylanicum (Vahl ex Hornem.) Thunb. ex Lehm.	Boraginaceae	Vandugadi chedi	Herb
Eclipta prostrata (L.) L.	Asteraceae	Karisalanganni	Herb
Ficus racemosa L.	Moraceae	Athi	Tree
Gloriosa superba L.	Colchicaceae	Senganthal	Herb
Helianthus annuus L.	Asteraceae	Suriyakanthi	Herb
Ipomoea asarifolia (Desr.) Roem. & Schultes	Convolvulaceae	Sundangodi	Herb
Launaea nudicaulis (Linn.)Hook.f.	Asteraceae	Ezhuthani poondu	Herb
Leucas aspera (Willd.) Link	Lamiaceae	Thumbai chedi	Herb
Mimosa pudica L.	Fabaceae	Thottal surungi	Under shrub
Senna auriculata (L.) Roxb.	Fabaceae	Avvarai	Shrub
Tridax procumbens L.	Asteraceae	Vettukaya Poondu	Herb

Table.2 Used parts, Preparation method and Mode of application of Surveyed plants in Kolli hills of Tamil Nadu

Botanical Name	Part(s) used	Preparation	Application
Abelmoschus esculentus (L.) Moench	Leaf, Flower	Paste	Topical
Acacia caesia (L.) Willd.	Bark	Paste	Topical
Acacia nilotica (L.) Willd. ex Del. subsp. indica (Benth) Brenan	Stem bark	Paste	Topical
Acalypha indica L.	Leaf	Paste	Topical
Alangium salvifolium (L. f.) Wang.	Leaf	Powder, Paste	Oral /Topical
Anisochilus carnosus (L. f.) Wall. ex Benth.	Leaf	Paste	Topical
Argemone mexicana L.	Leaf	Paste	Topical
Asystasia chelonoides Nees.	Whole plant	Paste	Topical
Azadirachta indica A. Juss.	Leaf, Stem	Paste, Raw	Topical
Bidens pilosa L.	Whole plant	Paste	Oral /Topical
Boerhavia diffusa L.	Leaf	Paste	Oral
Calotropis gigantea (L.) R.Br.	Leaf	Paste	Topical
Citrus aurantifolia (Christm.) Swingle	Fruit	Juice	Oral /Topical
Cleome viscosa L.	Leaf	Paste	Topical
Cymbidium aloifolium (L.) Sw.	Tuber	Paste	Topical
Cynoglossum zeylanicum (Vahl ex Hornem.) Thunb. ex Lehm.	Whole plant	Paste	Topical
Eclipta prostrata (L.) L.	Leaf	Powder	Oral /Topical
Ficus racemosa L.	Stem bark	Juice	Topical
Gloriosa superba L.	Rhizome	Paste	Topical
Helianthus annuus L.	Seed, Root	Powder	Oral /Topical
Ipomoea asarifolia (Desr.) Roem. & Schultes	Leaf	Juice	Oral /Topical
Launaea nudicaulis (Linn.)Hook.f.	Leaf	Juice	Oral
Leucas aspera (Willd.) Link	Leaf	Paste	Topical
Mimosa pudica L.	Leaf	Paste	Oral /Topical
Senna auriculata (L.) Roxb.	Flower	Decoction, Paste	Oral /Topical
Tridax procumbens L.	Leaf	Paste	Topical

Table.3 Taxonomical diversity of medicinal plants in the study area

Family	No. of genera	Percentage	No. of species	Percentage
Asteraceae	5	20	5	19.23
Fabaceae	3	12	4	15.38
Apocynaceae	1	4	1	3.84
Alangiaceae	1	4	1	3.84
Acanthaceae	1	4	1	3.84
Euphorbiaceae	1	4	1	3.84
Papavaraceae	1	4	1	3.84
Lamiaceae	2	8	2	7.69
Rutaceae	1	4	1	3.84
Nyctaginaceae	1	4	1	3.84
Capparaceae	1	4	1	3.84
Malvaceae	1	4	1	3.84
Moraceae	1	4	1	3.84
Meliaceae	1	4	1	3.84
Colchicaceae	1	4	1	3.84
Convolvulaceae	1	4	1	3.84
Orchidaceae	1	4	1	3.84
Boraginaceae	1	4	1	3.84
Total	**25**	**100**	**26**	**100**

Table.4 Number of use-reports (ailment treated), Use value for commonly used medicinal plants

Botanical name	Ailment category: No. of use-reports	Use value
Abelmoschus esculentus	DID:13 (scabies) DID: 6(skin diseases)	0.94
Acacia caesia	DID: 14(skin diseases)	0.67
Acacia nilotica	DID:7(skin diseases)	0.33
Acalypha indica	DID:13(skin diseases)	0.62
Alangium salvifolium	DID:12(skin diseases)	0.57
Anisochilus carnosus	DID:8(skin diseases)	0.38
Argemone mexicana	DID:6(skin diseases)	0.28
Asystasia chelonoides	DID:7(skin rashes) DID:3(skin diseases) DID:5(body irritation) DID:4(swelling)	0.90
Azadirachta indica	DID:16(skin diseases)	0.76
Bidens pilosa	DID:14(wounds)	0.67
Boerhavia diffusa	DID:9(skin diseases)	0.43
Calotropis gigantea	DID:12(tumours/hard swelling)	0.57
Citrus aurantifolia	DID:8(skin emollient)	0.38
Cleome viscosa	DID:11(wounds)	0.52
Cymbidium aloifolium	DID:13(wounds)	0.62
Cynoglossum zeylanicum	DID:17(fungal infection on skin)	0.81
Eclipta prostrata	DID:18(skin diseases)	0.86
Ficus racemosa	DID:12(cracks)	0.57
Gloriosa superba	DID:9(wounds)	0.43
Helianthus annuus	DID:10(allergy)	0.47
Ipomoea asarifolia	DID:4(wounds)	0.19
Launaea nudicaulis	DID:9(allergy)	0.43
Leucas aspera	DID:20(skin diseases)	0.95
Mimosa pudica	DID:12(swelling)	0.57
Senna auriculata	DID:16(skin rashes)	0.76
Tridax procumbens	DID:18(wounds)	0.86

Table.5 Ingredients added for the preparation of herbal medicines

Botanical name	Other plants added in drug preparation	Other ingredients added
Abelmoschus esculentus	*Acorus calamus*	—
Anisochilus carnosus	—	Coconut oil
Calotropis gigantea	—	Groundnut oil
Cynoglossum zeylanicum	*Citrus aurantifolia*	—
Eclipta prostrata	—	Coconut oil
Leucas aspera	*Vitex negundo, Allium cepa*	—
Mimosa pudica	*Ipomoea asarifolia*	Common salt
Senna auriculata	—	Goat milk

Table.6 Informant consensus factor (Fic) for commonly used medicinal plants

Diseases	No. of use-reports *(Nur)*	No. of taxa *(Nt)*	*(Fic)*
Scabies	13	1	1
Skin Diseases	132	12	0.92
Skin Rashes	23	2	0.95
Body Irritation	05	1	1
Swelling	16	2	0.93
Wounds	69	6	0.93
Tumours/Hard Swelling	12	1	1
Skin emollient	08	1	1
Fungal Infection on Skin	17	1	1
Cracks	12	1	1
Allergy	19	2	0.94
Total	**326**	**30**[*]	

* A taxa may be reported in more than one ailment category

Table.7 Fidelity Level(FL) values for common medicinal plants used by Kolli hills tribes

Specific ailment	Most preferred species	FL%
Allergy	*Helianthus annuus*	100
	Launaea nudicaulis	100
Hard swelling / Tumours	*Calotropis gigantea*	100
Wounds	*Tridax procumbens*	100
	Bidens pilosa	100
	Cymbidium aloifolium	100
	Cleome viscosa	100
	Gloriosa superba	100
	Ipomoea asarifolia	100
Swelling	*Mimosa pudica*	100
Scabies	*Abelmoschus esculentus*	100
Skin rashes	*Senna auriculata*	100
Skin diseases	*Leucas aspera*	100
	Eclipta prostrata	100
	Azadirachta indica	100
	Acacia caesia	100
	Acalypha indica	100
	Alangium salvifolium	100
	Boerhavia diffusa	100
	Anisochilus carnosus	100
	Acacia nilotica	100
	Argemone mexicana	100
Body irritation	*Asystasia chelonoides*	26.31
Skin emollient	*Citrus aurantifolia*	100
Fungal infection on skin	*Cynoglossum zeylanicum*	100
Crack	*Ficus racemosa*	100

In general, scarce availability of the plants in the study area leads them to low UV (Rokaya *et al*., 2010) as in the case of Kolli hills, in the present study plants reported with a low use value (6 use reports by 21 informants with a UV of 0.28) were *Argemone mexicana* and *Acacia nilotica* (7 use reports by 21 informants with a UV of 0.33)

Commonly F_{ic} of local knowledge for disease treatment depended on the availability of the plant species in the study area (Raja Kumar and Shivanna, 2009). The F_{ic} values in our study are ranged from 0.92 to 1. (Table 6)The use categories were skin diseases (132 use reports, 12 plant species), wounds (69 use reports 6 plant species), skin rashes (23 use reports 2 plant species) and allergy (19 use reports, 2 species). In the present study, scabies, body irritation, tumour/hard swelling, skin emollient, fungal infection on skin and cracks had the highest F_{ic} of 1. The least agreement between the informants was observed in skin rashes with a F_{ic} of 0.95 followed by allergy with a F_{ic} of 0.94, swelling and wounds with a F_{ic} of 0.93. Thus the study indicate the degree of knowledge shared by the users in the study area regarding the use of medicinal plants in the treatment of ailments are high. Skin diseases had the lowest F_{ic} of 0.92, but this category rank first in the number of use reports (132) and number of taxa (12) attributed to this category. It may be lack of communication among the informants in the study area who are practicing these categories (Raja Kumar and Shivanna, 2009).

Analysed ailments with major agreements to highlight the most important plants in each ailments (Table 7). Of the reported plants, 25 species had highest fidelity level of 100% most of which were used in single ailment category with multiple informants. The plants with highest FL of 100% were *Helianthus annuus, Launaea nudicaulis, Calotropis gigantea, Tridax procumbens, Bidens pilosa, Cymbidium aloifolium, Cleome viscosa, Gloriosa superba, Ipomoea asarifolia, Mimosa pudica, Abelmoschus esculentus, Senna auriculata, Leucas aspera, Eclipta prostrata, Azadirachta indica, Acacia caesia, Acalypha indica, Alangium salvifolium, Boerhavia diffusa, Anisochilus carnosus, Acacia nilotica, Argemone mexicana, Citrus aurantifolia, Cynoglossum zeylanicum* and *Ficus racemosa.* 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. In support to our study. 100% FL was reported in *Euphorbia hirta, Mimosa pudica* for dermatological infections and diseases among the herbal healers in Kani tribals in Tirunelveli hills (Ayyanar and Ignacimuthu, 2011).

Acknowledgement

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