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Traditional Phytotherapy For Dermatological Disorders And Poisonous Bites In Naguneri Taluk Of Tirunelveli District, Tamil Nadu.

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ABSTRACT

Traditional medical practices are an important part of the primary health care system in the developing world. The ethnobotanical survey can bring out many different clues for the development of drugs to treat human diseases. Now a days, a trend in the study of medicinal plants and their use in traditional medicine has been drawing the attention of different medical practitioners throughout the world. The ultimate aim of this study is to document the medicinal plants used for the treatment of skin diseases and poisonous bites by the people of Nanguneri Taluk of Tirunelveli District. Intensive surveys were carried out to collect data on traditional knowledge on uses of medicinal plants and ethnomedicinal practices by local communities of villages in and around the present study area. The present study documents as a total 59 taxa distributed in 57 genera representing 29 families. Of these 59 taxa 20 species are herbs, 14 species are shrubs, 13 species are climbers and 12 species are trees. Among these 57 genera 36 are used to treat skin diseases and 21 are used to treat poisonous bites. The plant parts such as stem, leaves, fruits, flowers, latex, rhizome and whole plants were found to be the most frequently used morphological parts of the medicinal plants collected from the study area. The medicines were prepared from plants by various forms, such as decoction, paste, juice, extract, powder, etc to treat different type of skin diseases. Most of the people in the study area depend on traditional medicine for primary healthcare system. Even though modern allopathic medicines are available, people still rely on traditional healthcare system. Therefore, it would be important to document the traditional knowledge of medicinal plants for further healing process.

Key words: Traditional medicine, Phytotherapy, Poisonous bites, Dermatological disorder, Nanguneri taluk.

INTRODUCTION

The study of medicinal herbs in India has its roots in the science of Ayurveda. The use of the herbs, as part of science of Ayurveda has been documented in four Vedas: Rig Veda, Yajur

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Veda, Atharva Veda and Sama Veda. Medicinal plants play a role in healthcare system of large proportions of the world's population. Medicinal plants are known to possess many potentially valuable therapeutic agents that provide raw materials for the preparations of medicines (**Akerle**, 1998). Traditional medical practices are an important part of the primary health care system in the developing world. The ethnobotanical survey can bring out many different clues for the development of drugs to treat human diseases. Now a days, a trend in the study of medicinal plants and their use in traditional medicine has been drawing the attention of different medical practitioners throughout the world. People have become health cautions; the phytotherapy is safer and more effective in curing ailments without any side effects (**Ganesan** *et al.*, 2004). Traditional medicine based on herbal remedies has always played a key role in the primary health care system of our country. In India the native people are exploiting a variety of herbals for effective curing of various diseases. However, the knowledge of herbal medicine is gradually disappearing, although some of the traditional healers are still practicing the art of herbal healing effectively.

According to the World Health Organization (WHO) about 80% of the population around the world depends on traditional medicine, mostly herbal remedies, for their primary health care needs (**Simbo**, 2010, Uma *et al.*, 2020 and Rashida *et al.*, 2021). According to the World Health Organization (2008), the term "traditional medicine" is to be understood as the sum total of the knowledge, skills and practices based on theories, beliefs and experiences indigenous to different cultures that are used to maintain and improve health, as well as to prevent, diagnose, and treat physical and mental illnesses. The World Health Organization has a keen interest in documenting the use of medicinal plants by native peoples from different parts of the world (**Buragohain**, 2011).

There are also many reports on the use of medicinal plants for treating various ailments either by tribal or indigenous communities of India (**Saikia** *et al.*, 2006 and Uma *et al.*, 2020). Snake envenomations have been a serious yet often overlooked public health threat especially in tropical and subtropical countries, Southeast Asia. The incidence of snakebite is high in India. Apart from mortality, the morbidity is due to various complications. According to the estimation by WHO it's been found that about more than 70% of people rely on herbal medicines. But however, the use of these medicines against snake's venom is limited and mostly unknown. The analysis and studying of the herbal antivenoms i.e., Traditional herbs have been proving to be fruitful and within years of further research it would be possible to avail these formulations against snake bites instead of waiting or depending on anti-venoms which possesses numerous side effects and related problems (**Vaidya** *et al.*, 2018). Siddha system of medicine has rich collection of herbs for the treatment of various acute and chronic ailments. These plants represent rich source of pharmacologically active compounds that interact with the toxins and neutralizes them. The recent experiments work not only proves its efficacy of various herbal drugs on snake bite, but also evidently show their mode of action along with active principle. So single plant and combination of polyherbal preparation of siddhar's are beneficial for the treatment of snakebite and may find alternative to antiserum (**Manonmani** *et al.*, 2016). Since

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very ancient times, a poisonous animal bite is a serious issue in world. India is not an exception to this. Major animals belonging to this category are snakes, scorpions, spiders and many more. Among these, snake bites are relatively more lethal leading to vast number of mortality and morbidity issues. Snakes are remarkable animals, successful on land, in a sea, in forests, in grasslands, in lakes, and in deserts. However, most snakebite is caused by non-venomous snakes. Snake envenomation is an important global health issue. Snakebite is declared as a "Neglected Tropical Disease" by the World Health Organization. As a result, this may be considered as a matter of global health concern for the people in general and the rural communities of the developing countries in particular. It constitutes an occupational hazard especially in field of agriculture for farmers, farm labours, villagers, migrating population and hunters. It is a major health hazard that leads to high mortality due to snake bites is reported from South and Southeast Asian countries having extensive agricultural practices and diversity in snake species (**Alirol** *et al*., 2010). In India alone, more than 200,000 cases of snake bite are reported and estimated 35,000 to 50,000 people die each year. In Kenya, it is estimated that only 19% of the annual 151 snake bite per 100,000 people were potentially of venomous snakes (**Bawaskar**, 2004). In this study, we focused on scientific documentation of traditional knowledge on common medicinal plants used for the treatment of snakebite and skin diseases by local healers. Hence, this information could be more beneficial to local village people of Nanguneri Taluk. Therefore, we had undertaken a survey of medicinal plants to document traditional knowledge in the Nanguneri taluk of Tirunelveli district, Tamil Nadu, India. Similar type of work was carried out by **Abraham Yirgu** *et al*., (2019); **Uma** and **Parthipan**., (2019); **Deletta and Parthipan**, (2018); **Vaidya** *et al*., (2018).

METHODOLOGY

Description of the Study Area

The present study was carried out in and around Nanguneri Taluk of Tirunelveli District. The district is located in the southern part of Tamil Nadu. It is surrounded by Virudhunagar district in the north, the Western Ghats in the west, Kanyakumari district in the south and Thoothukudi district in the east. The district covers an area of 6,823 km^2. It lies between 8°05' and 9°30' north latitude and 77°05' and 49 78°25' east longitude. The Tirunelveli district was formed in 1790 by the East India Company. Later it came under the direct control of the British crown Queen Victoria. This has several distinct features of religious importance. The name Tirunelveli has been derived from three Tamil words "Thiru-Nel-Veli" meaning "Sacred paddy Hedge."

For the purpose of effective administration Tirunelveli District has been divided into 3 Revenue Divisions namely Tirunelveli, Cheranmahadevi and Tenkasi and they are sub-divided in to 11 taluks. Among the 11 taluks, Nanguneri is the Taluk's headquarters which is located at a distance of 29 km from Tirunelveli. One of the famous Lord Vishnu temple is situated, this temple is commonly called as Nambi Koil and Nambi river is also originated from this area. Nanguneri is located at 8.48 N 77.67 E. It has an average elevation of 141 meters.

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Medicinal Plant survey

Ethnomedicinal plant information was gathered by interview method. The present data is outcome of field research carried out as part of ethnomedicinal studies during June 2019 to March 2020 and semi structured questionnaire method. More than 10 medicinal practitioners from the study area were interviewed to document the plants used to treat the poisonous bites and skin disorders. The medicinal plants were collected and identified for their local medicinal uses through ethnobotanical interviews with local healers, medicinal plant collectors, medicinal plant practitioners and farmers adjacent to the study area. All the collected medicinal plants were tabulated with legitimate binomial nomenclature, local name, family, habit, disease, useful part, mode of preparation and uses.

Preservation and Identification of plant materials

The voucher specimens collected from the field were made into herbarium by using the standard method. All the herbarium specimens were deposited in the P.G and Research Department of Botany, S. T. Hindu College, Nagercoil. Preliminary identification of the plants was carried out by using different regional floras (**Gamble,** 1915-1936; **Nair and Henry**, 1983; **Nair** *et al*., 1983), and the authentication of the identity of plant species were confirmed with specimens deposited in Botanical Survey of India, Southern Circle, Coimbatore. The valid nomenclature of the plant species was checked with Kew website, The Plant List 2010 on line (**www.theplantlist.org**). IUCN threatening category of the plant species were also checked from IUCN web site (**www.iucn.org**). The plants species were also checked with the websites **www.flowersofindia.net** and **indiabiodiversity.org.**

Table 1. List of plants used for the preparation of medicine to treat skin diseases and poisonous bites by the traditional healers of the study area.

S.NO	BOTANICAL NAME / FAMILY	HABIT	PREPARATION OF MEDICINE	USES
1	*Acalypha indica* L. (Euphorbiaceae)	Herb	Leaves ground well and the paste applied on skin	Impetigo (skin infection)
2	*Achyranthes aspera* L. (Amaranthaceae)	Herb	Leaves and seed ground well and the paste is applied on bitten area	Snake / Scorpion bites
3	*Aloe vera* (L.) Burm.F (Asphodelaceae)	Perennial herb	The leaves are crushed and the juice is applied on skin	Psoriasis, burns

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4	*Amaranthus viridis* L. (Amranthaceae)	Herb	The leaves are crushed and the juice is applied on skin	Boils
5	*Andrograrphis paniculata* (Burm.F.) Nees. (Acanthaceae)	Herb	The decoction of leaves taken orally	Snake bites
6	*Anona squamosa* L. (Annonaceae)	Tree	The leaves are crushed and the juice is applied on skin	Skin allergy, wounds
7	*Asyetasia gangetica* (L.) T.Anderson. (Acanthaceae)	Herb	The root and leaves with boiled water and taken orally	Snake bites, Rheumatism
8	*Azardiracta indica* A.Juss. (Meliaceae)	Tree	Leaves ground well and the paste is applied on skin	Chicken box
9	*Bauhinia racemosa* Lam. (Fabaceae)	Tree	Roots are powdered mixed with coconut oil and applied for skin	Allergy
10	*Calotrophis gigantean* L. (Apocynaceae)	Shrub	The decoction of roots taken orally	Snake bites
11	*Carica papaya* L. (Caricaceae)	Tree	The leaves are crushed and the juice is applied on skin	Warts, eczema
12	*Catharanthus rosesus* (L.) G. Don. (Apocynaceae)	Shrub	The decoction of leaves taken orally to reduce poison and the paste is applied on skin	Insect bites, eczema
13	*Cayrata trifolia* (L.) Domin. (Vitaceae)	Climber	Roots with boiled water taken orally	Snake bites
14	*Centella asiatica* (L.) Urban. (Apiaceae)	Creeping herb	The leaves are crushed and the juice is applied on skin	Skin infection
15	*Chrysanthemum indicum* L. (Asteraceae)	Shrub	The petals are boiled with water and the juice is applied for skin	Swellings

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16	*Cissus quadragularis* L. (Vitaceae)	Climber	The decoction of whole plant taken orally	Join pain& rheumatism
17	*Citrullus colocynthis* (L.) Schrad. (Cucurbitaceae)	Climber	The leaves powdered with boiled water taken orally	Snake bites
18	*Citrus limon* L. *(*Rutaceae)	Tree	Fruit juice is applied on skin	Pimples, wrinkles
19	*Clitoria ternatea* L. (Fabaceae)	Climber	The leaves are crushed and the juice is applied on skin	Pimples
20	*Coccinia indica* L. (Cucurbitaceae)	Climber	The leaves are crushed and the juice is applied on skin	Wounds, skin infection
21	*Curcuma longa* L. (Zingiberaceae)	Perennial herb	Rhizome of *Curcuma longa* and leaves of *Azardiracta indica* into paste and applied for skin	Itching, ringworm, acne
22	*Dautra metal* L. (Solanaceae)	Shrub	The leaves are crushed and mixed with gingelly oil applied for bitten area	Dog bites
23	*Duranta erecta* L. (Verbenaceae)	Shrub	Leaves ground well and the paste applied on skin	Skin itches
24	*Eclipta prostrata* L. (Asteraceae)	Herb	The leaves are crushed and the juice is applied on skin	Skin allergy
25	*Euphorbia hirta* L. (Euphorbiaceae)	Herb	A drop of milky juice is applied on presence of warts	Warts
26	*Ficus benghalensis* L. (Moraceae)	Tree	The decoction of root taken orally	Insect bites
27	*Hibiscus rosa-sinensis* L. *(*Malvaceae)	Shrub	Leaves and flowers are crushed and the mucilage's juice is	Age spots

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			applied on skin	
28	*Indigofera tinctoria* L. (Fabaceae)	Herb	The leaves are crushed and the juice is applied on bitten area	Snake bites
29	*Ipomoea pes-tigridis* L. (Convolvulaceae)	Climber	Leaves ground well and the paste applied on skin	Dog bites, pimples, boils
30	*Jatropha curcus* L. (Euphorbiaceae)	Shrub	The leaves are crushed and the juice is applied on skin	Allergy
31	*Lagenaria sinceraria* (Molina) Standl. (Cucurbitaceae)	Climber	The pulp is applied on a skin	Allergy
32	*Lawsonia inermis* L. (Lythraceae)	Tree	Leaves ground well and the paste is applied on skin	Pimples
33	*Mirabilis jalapa* L. (Nyctaginaceae)	Perennial herb	The decoction of whole plant taken orally	Scorpion bite
34	*Momordica charantia* L. (Cucurbitaceae)	Climber	The decoction of leaves taken orally	Rheumatism
35	*Musa paradisiaca* L. (Musaceae)	Tree	The juice of stem is applied on affected area	Snake bites
36	*Nerium oleander* L. (Apocynaceae)	Shrub	The leaves are crushed and the juice is applied on skin	Rashes
37	*Phyllanthus niruri* L. (Phyllanthaceae)	Herb	The leaves are crushed and the juice is applied on skin	Psoriasis
38	*Physalis minima* L. (Solanaceae)	Herb	Leaves ground well and the paste is applied on skin	Itches
39	*Piper betle* L. (Piperaceae)	Climber	Crushed leaves of *Piper betle* and the fruit of *Piper nigrum* with boiled water taken orally	Insect bites

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40	*Psidium guajava* L. (Myrtaceae)	Tree	Leaves and bark ground well and the paste is applied on skin	Ringworms, wounds
41	*Ricinus communis* L. (Euphorbiaceae)	Shrub	Seeds are powdered mixed with water and applied for skin	Dark spots
42	*Senna auriculata* (L.) Roxb. (Fabaceae)	Shrub	The decoction of seed, root and leaves taken orally	Rheumatism, itching
43	*Solanum melongina* L. (Solanaceae)	Perennial herb	Leaves ground well and the paste is applied on skin	Cold sore, burns
44	*Solanum nigrum* L. (Solanaceae)	Herb	The decoction of leaves taken orally	Insect bites
45	*Solanum trilobatum* L. (Solanaceae)	Herb	The decoction of whole plant taken orally	Rheumatism
46	*Tabernaemotana divericata* (L.).R.Br.ex Roem & Schult. (Apocynaceae)	Shrub	The decoction of leaves, root and flower taken orally	Scorpion & Snake bites
47	*Trichosanthes cucumarina* L. (Cucurbitaceae)	Climber	The leaves are crushed and the juice is applied on skin	Skin allergy
48	*Tridax procumbans* L. (Asteraceae)	Herb	Leaves ground well and the paste is applied on skin	Boils, wounds
49	*Tylophora asthmatica* (L.f)Wright& Arn. (Apocynacae)	Climbing herb	The decoction of whole plant taken orally	Snake bites
50	*Veronia cineraia* (L.) Less. (Asteraceae)	Herb	Seeds are powdered mixed with water taken orally	Psoriasis
51	*Vitex nigundo* L. (Verbenaceae)	Shrub	The leaves are crushed and the juice is applied on skin	Swelling, skin infection
52	*Withania somnifera* (L.) Dunal. (Solanaceae)	Perennial shrub	Leaves and seed are powdered and mixed with boiled	Snake bites

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			water	
53	*Zingiberi officinali* Roscoe. (Zingiberaceae)	Herb	The decoction of leaves taken orally	Insect bites

RESULT AND DISCUSSION

Traditional medicine based on herbal remedies has always played key role in the health system of many countries. In India the native people are exploiting a variety of herbals for effective curing of various ailments. The useful part, preparation and administration of drugs varied from one place to other. Ethnomedicinal studies have offered immense scope and opportunities for the development of new drugs. The present exploration on medicinal plants used for various skin diseases and poisonous bites by rural people of Nanguneri taluk has yielded information on 59 plants belonging to 29 families. They include herbs, shrubs, trees and climbers. They are mostly found growing either in waste lands as weeds or in forest slopes and sometimes widely distributed in all places. Some of them are cultivated near the houses particularly of medicine men. Herbs form major source of medicine consisting of about 34% followed by trees, climbers and shrubs comprising 20%, 22% and 24% respectively. Cucurbitaceae is the most dominant family which have 6 species. This is followed by Apocynaceae, Euphorbiaceae and Solanaceae are the families which have 5 members each. Asteraceae and Fabaceae are the families which include 4 members each. Acanthaceae, Amaranthaceae, Vitaceae, Rutaceae, Malvaceae and Zingiberaceae are the families which include 2 members each. Annonaceae, Apiaceae, Asphodelaceae, Caricaceae, Convolvulaceae, Lamiaceae, Lythraceae, Musaceae, Myrtaceae, Morginaceae, Nyctaginaceae and Phyllanthaceae are represented by only single species each.

The most dominant genera of study area are *Solanum* and *Euphorbia* which include 2 species. The remaining 55 genera are having single species each. Several plants are used by the people directly, because most of the people in the rural area know about the uses of common medicinal plants for poisonous bites, simple wounds, allergies, psoriasis, eczema, impetigo, etc., so, the people never go to hospitals or to herbal doctors. For example, the people squash the leaves of *Tridax procumbens* and apply the juice over the wound directly and get cured. Leaf decoction of *Andrographis paniculata* is taken orally as a remedy for snake bites. Different plant parts like leaves, roots, stem, bark, flowers, fruit, rhizome, seeds and sometimes the whole plant are used as medicines for poisonous bites as well as skin diseases. Leaves from 41 plants are invariably used alone as a cure for skin diseases and poisonous bites. From this observation it is noted that poisonous bites and skin diseases such as boils, psoriasis, eczema, chicken pox, etc., can be cured by the leaves. This is followed by roots from 7 plants are used to cure snake bites and skin diseases also. Seeds from six plants, fruits from 3 plants, flowers from 3 plants, latex from two plants Bark from two plants are used for skin diseases and snake bites. Rhizome of *Curcuma longa* and leaves of *Azardiracta indica* ground into paste and applied for curing

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ringworm and itching. The decoction of whole plant of *Mirabilis jalapa* taken orally to cure for scorpion bites.

The present observation revealed that different types of skin diseases such as eczema, warts, ringworm, itching, psoriasis, skin allergy, dark spots, wounds, impetigo and poisonous bites are cured by 59 plants. The important and common medicinal plants like *Amaranthus viridis*, *Chrysanthemum indicum*, *Cucurbita pepo*, *Solanum melongena*, etc., used to treat various skin diseases. Thirteen plants are known to cure snake bites and scorpion sting. Six plants are used to cure insect bites. Two plants are used in treatment of dog bites. These plants are *Datura metal* and *Ipomoea pes-tigridis*.

The medicines were prepared from plants by various forms, such as decoction, paste, juice, extract, powder, etc to treat different diseases. The mode of administration, it depends upon the disease type of medicine may be external application or internal consumption (oral). Medicines are prepared in the form of juice from 19 species followed by decoction from 16 species, paste from 12 species, fresh extract from 7 species, powder from 4 species and milky latex from 2 species. In some cases, the same plant is used for treating different diseases in different form.

The medicinal plants of the study area, their botanical names, family, local name, habit, useful part and ailments are listed in Table 1. Medicinal plants are a rich source of many natural inhibitors and pharmacologically active compounds and plants application against snake bite is known. This natural resource was unexplored until in recent years when it started getting scientific attention as indicated in an array of published ethnopharmacological reviews/articles from different countries reporting many medicinal plants claimed to neutralize the action of snake venom (**Blaylock**, 1982). Snake bites in rural areas are commonly treated with plant extracts. In general, the plant families Compositae, Fabaceae and Solanaceae members used as an antidote in East African compendia for treat snake bite and scorpion sting. The frequent uses of leaves and roots are antivenin preparation is noted by (**Bennet**, 2000). The irula constitute a small tribal community live in different parts of India. Their main occupation is snake and rat catching and they fully depend on forest produces and wild animals. They have rich knowledge about medicinal plants and its uses against various ailments. Snake bite is a common acute medicinal emergency faced by rural people throughout the world; therefore, people need adequate safety measures to counter these types of emergencies (**Kunjam**, 2013). The traditional indigenous knowledge transferred orally for centuries is fast disappearing because of the technological developments and changing culture of ethnic groups. Moreover, transferring the knowledge from one generation to next generation sustains the medicinal plant diversity and knowledge which can be useful for human health society. This wisdom is now fast vanishing due to modernization, habitat destruction and the tendency of younger generation to discard their traditional life style. However, habitat would be major problem for current developing modern human civilization that leads many forests medicinal plants might be vulnerable. Therefore,

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using forest medicinal plants might be rare chance for local people. Thus, common medicinal plants are always useful for village people to use easily with the help of local healer or traditional knowledge.

CONCLUSION

The findings of the study envisage that the herbal medicine have great potentiality to cure different kinds of skin diseases. The indigenous rural community depends on traditional healthcare system. About 80% of human population in India is using herbal medicine to cure different kinds of diseases. The medicinal wealth of the region is not yet explored desirably. There is an ample scope of such kind of studies to gather the information on medicinal of Tirunelveli district. In addition to this, the ecologist should also pay much attention towards research studies on conservation status and population behavior of such species. Undoubtedly, this will help is developing an appropriate strategy for conservation of important plant species of the region, and also preserve genetic diversity. Most of the people in the study area depend on traditional medicine for primary healthcare system. Even though modern allopathic medicines are available, people still rely on traditional healthcare system. Therefore, it would be important to document the traditional knowledge of medicinal plants for further healing process. However, the current study would be beneficiary for the research and development sectors in pharmaceutical towards new drug discovery and find new bio-molecules, through the information about the medicinal plants that have been documented.

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