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A REVIEW OF BENEFICIAL EFFECTS OF MEDICINAL PLANTS ON SKIN AND SKIN DISEASES

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Abstract: Siddha system of medicine is one of the oldest traditional systems of medicine, which has been originated from India and is practiced mostly in the southern part of this country for treating various diseases including even chronic conditions by the herbals and herbo-mineral drugs. Skin diseases are the major problem in worldwide. Skin diseases are classified in acute and chronic conditions. Generally chronic skin diseases typically aren't curable, but they can be managed using drugs. But in Siddha medicine so many medicinal plants are using to mange and also treat for skin diseases. Virtually all cultures worldwide have relied historically, or continue to rely on medicinal plants for Skin diseases. Approximately one-third of all traditional medicines are for treatment of skin diseases, compared to only 1-3% of modern drugs. The objectives of this paper to list out the beneficial effects of certain medicinal plants of Siddha system for treating skin diseases. Beneficial aspects of medicinal plants on skin diseases: healing of wounds and burn injuries, antifungal, antiviral, antibacterial, anti-inflammatory activity against skin infections such as acne, herpes and scabies, antitumor promoting activity against skin cancer.

Keywords: Skin disease, Siddha medicine, Medicinal plants, Herbal medicines

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INTRODUCTION

The Siddha System of Medicine (Traditional Tamil System of medicine), which has been prevalent in the ancient Tamil land, is the foremost of all other medical systems in the world. Its origin goes back to B.C 10,000 to B.C 4,000 [1]. Medicinal ingredients in Siddha Vaidya are classified into three main groups: Thavaram (medicines derived from plants), Jangamam (those derived from animals), and Thatu (those derived from earth and organic toxins). Thavaram includes the thousands of whole plants and plant products [2].

Traditional medicinal resources, especially plants have been found to play a major role in managing skin disorders [3]. Plants are the only economic source of a number of well established and important drugs. In addition, they are also the source of chemical intermediates needs for the production of some drugs [4]. Indian Materia Medica includes about 2000 drugs of natural origin almost all of which are derived from 3 different traditional system and folklore practices [5]. WHO estimates that of the 35, 000 – 70,000 species of plants that are used for medicinal purposes around the world, Medicinal plants also play a major role and constitute the backbone of TM (Traditional System of medicine) practices [6,7,8]. The national siddha formulary of India lists more than 10000 well practiced siddha formulations described in Gunavagadam (siddha pharmacology). Of the many indications where traditional herbal medicines have been used, skin and skin related disorders rank among the top where up to one-third of these TM compared to 1-3% of modern drugs are used for treatment of wounds or skin disorders [9,10]. Indeed, skin disorders are among the most prevalent in the world [11]. Skin diseases occur worldwide and amount to approximately 34% of all occupational diseases encountered [12].

Skin disease here refers to disorders of predominantly the superficial layers of the skin [13]. The common skin problems are Acne, Burn, scars, Psoriasis, Scabies, Skin grafting, Vitiligo, Pediculosis, Herpes simplex infection, Varicella, Herpes Zoster, Erythema, Urticaria etc [14]. They are found in children, young and adults as well as in old persons. Usually for peak level skin disorder, the therapy of skin problems is longer for complete removal of problems. In all over the world use of drug like Benzoyl Peroxides, Proactive, Antibiotics, Retin-A, Oral retinoid, Salicylic acid, Anti-Histaminic, Minerals and Vitamins, Steroids, Analgesic are of more interest for skin specialist for the modern treatment [15]. But the herbal medicine is becoming popular due to toxicity and side effects of allopathic medicines [16].

2. Common Skin Diseases:

The common skin disease are predominantly under the following category includes parasitic infestations (e.g., scabies, pediculosis), bacterial (e.g., impetigo), fungal (e.g., dermatophytoses,

candidiasis) and viral (e.g., herpes, warts) infections as well as inflammatory diseases (e.g., atopic dermatitis, contact dermatitis, seborrhoeic dermatitis) [17].

3.Cutaneous (Skin) infections:

The normal skin of healthy subjects is very resistant to invasion by most microorganisms. Infection hence develops when the right combination of causative factors exists and a particular microorganism usually represents only one of the etiologic agents. There are almost always a number of interacting causes for infection of any body tissue, some direct, some indirect, which create circumstances leading to infection and aid in its persistence [18].

3.1.Bacterial skin infection:

Cutaneous bacterial infections may be divided into primary and secondary types. Primary infections are most frequently incited by Staphylococci, especially Staphylococcus aureus, as well as Streptococci, mainly group A Streptococci [19, 20]. These are also the most common invaders in secondary infections, but gram-negative organisms also often colonize dermatitic skin, though they do not frequently produce true secondary infection except in special locations such as the external ear, or in certain types of chronic lesions [21, 22].

3.2. Fungal skin infections:

Superficial fungal infections can and do occur in both healthy and compromised individuals. The most common fungal skin infections are the dermatophytoses (ring worm, tinea), ptyriasis versicolor and candidiasis [23]. Dermatophytic infections are generally restricted to the non-living cornified layers of the skin, hair and nail and are traditionally named according to the anatomic location of the infected body surface. The major types are tinea barbae, facie, capitis, corporis, cruris, pedis, manuum and unguium. The most frequently isolated causative dermatophytes are T. rubrum, T. mentagrophytes and E. flocossum in case of tinea pedis while M. canis, T. mentagrophytes, T. rubrum as well as T. violaceum are common causative agents in case of tinea capitis [24].

3.2.1.Candidiasis:

Candidiasis, the general term for pathogenic infection with Candida, can be divided into superficial mucocutaneous infection, deep local infection, or dissemination. Candida infections of the skin and nails are one of the most common infections worldwide. Candida species are commonly found in the human gastro-intestinal tract, mouth and vagina. Predisposition factors for pathogenic Candida infection include prolonged antibiotic therapy, steroid therapy, diabetes mellitus, skin trauma and immunodeficiency, with the most severe infections now occurring in patients with AIDS [25].

3.3.Viral Infection:

3.3.1.Herpes simplex:

Herpes simplex is an infection of the skin with the herpes simplex virus. This can be caught from another person after direct skin-to-skin contact, mouth contact, or sexual contact. The first time the virus is caught, it does not always show up on the skin, but can lie dormant within special parts of the sensory nerves (the sensory nerve ganglia). Later in life, the virus can become active again and appear as herpes simplex on the skin. The commonest areas to be affected by herpes simplex are the lips (as cold sores) and the genital area (as genital herpes). The very first infection is often un-noticed as it may only produce a short-lived redness of the skin, swollen lymph glands and soreness and blisters in the mouth and on the lips or elsewhere on the skin. When the herpes simplex virus infection becomes active again, the first symptom is a burning or stinging pain at the affected site, followed by pink bumps and small blisters. The blisters quickly dry and crust over, and the areas usually heal over within a few days. Repeated attacks usually occur in roughly the same place each time [26].

3.4.Inflammatory Skin Disease:

3.4.1.Eczema (atopic dermatitis):

Eczema is the term used to describe changes in the upper layer of the skin that include redness, blistering, oozing, crusting, scaling, thickening and sometimes pigmentation. It is most common in children, affecting at least 10% of infants at some stage. It usually disappears during childhood, although it can carry on into adult life or come back in the teen age or early adult years. It may occasionally develop for the first time in adulthood. Eczema can affect any part of the skin, including the face, but the area most commonly affected are the bends of the elbows and knees, and around the wrists and neck. Other common appearances of atopic eczema include discrete coin-sized areas of inflammation [26].

3.5.Parasite Infection:

3.5.1.Scabies:

Scabies is a common and very itchy skin condition caused by human scabies mites. It can affect people of any age but is most common in the young and the elderly. The mites that cause scabies are tiny parasites, smaller than a pinhead. They are usually picked up by direct skin-to-skin contact with someone who already has scabies, and only very rarely from objects such as clothing or bedding. Itching is the main symptom of scabies, usually starting about a month after the mites were picked up. The itching affects the body and limbs but usually spares the head and neck, except in infants. The itch often gets worse in bed at night. It is common for

several people in the same family, and their friends, to become itchy at roughly the same time [26].

3.6.Vitiligo:

Vitiligo is a condition in which areas of skin lose their normal pigment and so become white. It is common, and affects about 1% of the world's population. The pigment that gives your skin its normal colour is melanin, which is made by cells known as melanocytes. The cause of vitiligo is not yet fully known but many think that it is a disease in which the body makes antibodies to its own melanocytes, and in doing so destroys them. After that, the skin cannot make melanin properly, and vitiligo is the result. The most common sites for vitiligo are: The exposed areas – vitiligo often begins on the hands and face, Around body openings: the eyes, nostrils, mouth, umbilicus, and genitals, In body folds: the armpits and groin, Anywhere your skin has been damaged, for example by a cut or a burn, Areas around pigmented moles [26].

3.7.Acne:

Acne is a very common skin condition characterised by comedones (blackheads and whiteheads) and pus-filled spots (pustules). It usually starts at puberty and varies in severity from a few spots on the face, back and chest, which most adolescents will have at some time, to a more serious problem that may be embarrassing, sap self-confidence and cause scarring. The sebaceous (oil-producing) glands of people who get acne are particularly sensitive to normal blood levels of a hormone called testosterone, which is present in both men and women. This causes the glands to produce an excess of oil. At the same time, the dead skin cells lining the pores are not shed properly and clog up the follicles. The acne bacterium (known as Propionibacterium acnes) lives on everyone's skin, usually causing no problems, but, in those prone to acne, the build up of oil creates an ideal environment in which these bacteria can multiply. This triggers inflammation and the formation of red or pus-filled spots [26].

3.8.Psoriasis:

Psoriasis is a common skin problem affecting about 2% of the population. It occurs equally in men and women, at any age, and tends to come and go unpredictably. It is not infectious, and does not scar the skin. The outer layer of skin (the epidermis) contains cells which are formed at the bottom and then move up towards the surface, gradually changing as they go, finally dying before they are shed from the surface. This journey normally takes between 3 and 4 weeks. In psoriasis, the rate of turnover is dramatically increased within the affected skin, so that cells are formed and shed in as little as 3 or 4 days. Lesions of psoriasis (often known as plaques) are pink or red, but covered with silvery-white scales. They can form a variety of shapes and sizes, and have well-defined boundaries with the surrounding skin [26].

4.SOME MEDICINAL PLANTS USED FOR SKIN DISEASE IN SIDDHA MEDICINE

Table 1 [32]

S.No	Botanical Name	Family	Local Name (Siddha)	Part used
1.	Smilax china	Liliaceae	Parankipattai	Root, Leaves
2.	Indigofera aspalathoides	Fabaceae	Sivanar Veembu	Root, Leaves
3.	Gymnema sylvestre	Asclepiadaceae	Sirukurinjan	Root, Leaves
4.	Aristolochia indica	Aristolochiaceae	Eechura mooli	Root
5.	Clerodendrom inerme	Verbenaceae	Esangu	Leaves
6.	Azima tetracantha	Salvadoraceae	Sangan	Root
7.	Enicostemma axillare	Gentianaceae	Vellarugu	Leaves
8.	Eclipta prostrate	Astreraceae	Vellai Karisalai	Leaves
9.	Cynodon dactylon	Poaceae	Arugam pul	Leaves, Root
10.	Cassia tora	Caesalpiniaceae	Thagarai	Leaves, Seeds

4.1.Smilax china:

Antimicrobial activity: Antimicrobial activities of Smilax china leaf extract obtained with methanol, ethonal, acetone, and water were investigated. The antimicrobial activity of all the extracts against foodborne microorganisms was determined by paper disc method. All the extract inhibited the growth of Listeria monocytogenes, S. Aureus, and S. Typhimurium [27].

Anti-oxidant activity: Antioxidant activity was evaluvated by determining the DPPH radical scavenging activity, ABTS radical scavenging activities, total phenol content (TPC), and reducing power (RP). The highest DPPH, ABTS radical scavenging activity, and RP were found in the ethanol extract, which also showed the highest TPC (105.81+0.48microgram gallic acid equivalent/mL) [27].

4.2.Indigofera aspalathoides:

Anti-oxidant activity: The free radical scavenging activity of two fractions from the leaves of Indigofera aspalathoides was investigated by four in vitro models namely- DPPH radical, ABTS radical, Nitric oxide radical and hydroxyl radical scavenging assays were used. Both fractions showed significant antioxidant activity when compared to standard antioxidants. Even though chloroform fraction contains lesser amount of polyphenolic compounds, it exhibits more radical scavenging activity than the ethanol fraction which indicates the role of structural features of polyphenolic compounds with respect to their antioxidant potential [28].

Wound healing activity: The wound healing property of chloroform extract of Indigofera asphalathoides vahl. Ex DC.was evaluated in two different dose levels employing excision wound model. The wound treated with plant drug showed higher rate of wound contraction, increased level of Hydroxy proline, Hexosamine, SOD, Ascorbic acid and decreased levels of Lipid peroxides as well as histopathological studies also showed progressive collagenation and few macrophages compared to the control rats [29].

4.3.Gymnema sylvestre :

Antimicrobial Activity: The antimicrobial activity of saponin fractions from the leaves of Gymnema sylvestre was evaluated against pathogenic bacteria and fungi in an in vitro condition. A series of concentrations of crude and pure saponin fractions were tested for antimicrobial activity by zone of inhibition method. The pure saponin fractions were found to be more effective against tested bacterial pathogens when compared to crude saponin fractions. The minimum inhibitory concentration (MIC) exhibited by the pure saponin fraction of G. sylvestre was found to be in the range of 600–1,200 mg/l against bacterial strains and 1,400 mg/l for fungal isolates. The susceptibility of bacterial pathogens for saponin fractions was in the order of Bacillis pumilis, B. subtilis, Pseudomonas aeruginosa, Staphylococcus aureus P. aeruginosa, E. coli, S. typhi, K. pneumoniae, P. mirablis, S. aureus and for fungal pathogens A. fumigatus followed by A. Niger and A. flavus. The antimicrobial potential of saponin fractions was compared with antibiotics, Chloramphenicol and Amphotericin-B with respect to bacteria and fungi. This study suggests that the saponin fractions G. sylvestre possess significant antibacterial and antifungal activity [30].

4.4.Aristolochia indica:

Antimicrobial activity: The antimicrobial activities of ethanolic extract of Aristolachia indica L. which was a creeper used as traditional folk medicine for the treatment of different infectious diseases and disorders. The antimicrobial activities of the extract against 12 strains belong to bacteria and fungi species were tested by using agar diffusion method. The results showed that ethanolic extract of Aristolachia indica had moderately significant antibacterial and significant antifungal activity. It inhibited the growth of both bacterial and fungal species dose dependently. The inhibition of growth was highest at 100mg/ml as compared to the controls. Ethanolic extract showed stronger antimicrobial activity against the fungi than that of the bacteria's [31].

4.5.Clerodendrom inerme:

Antibacterial activity: The crude extracts of **Clerodendrum inerme** (L.) Gaertn. against some of the human pathogenic bacteria. Five plant extracts (Petrol, Benzene, Methanol, Ethly acetate and Aqueous) under six different concentrations (500mg/ml, 1mg/ml, 2mg/ml, 5mg/ml, 10mg/ml and 15mg/ml) were tested by disk diffusion method. Methanol, Ethyl acetate and Aqueous extracts of the plant showed significant inhibition against fifteen of the eighteen bacteria tested. Benzene extract inhibited the growth of eleven tested bacteria and the maximum inhibition zone was recorded against Staphylococcus albus (zone of inhibition 6mm/500mg/ml/disk) [33].

4.6.Azima tetracantha:

Antifungal activity: The antifungal activity of Azima tetracantha crude extracts and isolated compound (friedelin) were evaluated using the micro dilution method. The extracts of Azima tetracantha only the hexane extract showed some antifungal activity against tested fungi. A pure compound identified as Friedelin was isolated from the active hexane extract which exhibited antifungal activity. The compound and extracts possessed good antifungal activity in vitro and can be considered as potential candidate drug in the treatment of infectious diseases caused by pathogenic fungi [34].

4.7.Enicostemma axillare:

Antimicrobial activity: The in vitro antimicrobial activity (well diffusion Method) of aqueous, hydro alcoholic, methanolic, chloroform and ethyl acetate extract of leaves of Enicostemma axillare has been prominent antimicrobial activity against S.aureus, Bacillus subtilis, proteus vulgaris, E. Coli, Pseudomonas aeruginosa, Shigella sonni, Aspergillus niger and Candida albicans. The prominent antioxidant and antimicrobial activity may be due to presence of higher content of tannins, phenolic and saponins [35].

Anti-inflammatory activity: This activity along with Mollugo caviama was observed [36].

4.8.Eclipta prostrate:

Antimicrobial activity: The antimicrobial activity of saponin fractions from the leaves of Eclipta prostrate was evaluated against pathogenic bacteria and fungi in an in vitro condition. A series of concentrations of crude and pure saponin fractions were tested for antimicrobial activity by zone of inhibition method. The pure saponin fractions were found to be more effective against tested bacterial pathogens when compared to crude saponin fractions. The minimum inhibitory concentration (MIC) exhibited by the pure saponin fraction of Eclipta prostrate was found to be the range was 1,000–1,200 mg/l for bacteria and 1,400 mg/l for fungal isolates. The susceptibility of bacterial pathogens for saponin fractions was in the order of Bacillis pumilis, B. subtilis, Pseudomonas aeruginosa, Staphylococcus aureus P. aeruginosa, E. coli, S. typhi, K. pneumoniae, P. mirablis, S. aureus and for fungal pathogens A. fumigatus followed by A. niger and A. flavus. The antimicrobial potential of saponin fractions was compared with antibiotics, Chloramphenicol and Amphotericin-B with respect to bacteria and fungi. This study suggests that the saponin fractions Eclipta prostrate possess significant antibacterial and antifungal activity [30].

4.9.Cynodon dactylon:

Antioxident Activity: The ethanolic extract shows positive result for tannin, saponins, proteins and steroids. In-vitro antioxidant activity of ethanolic extract of Cynodon dactylon was determined by DPPH free radical scavenging assay. The reducing power of the extract was also determined. Ascorbic acid was used as standard and positive control for both the analysis. The ethanolic extract of Cynodon dactylon had shown very significant DPPH radical scavenging activity compared to standard antioxidant [37].

Antimicrobial activity The ethanolic extract of Cynodon dactylon was more effective against Salmonella typhii than Proteus mirabilis and Enterococcus faecalis. The fungal species Candida albicans shows more effective against Trichoderma viridie. So, the ethanolic extract of Cynodon dactylon has both Antibacterial and antifungal activity against the tested organism [37].

4.10.Cassia tora:

Antifungal activity: The antifungal activity of dealcoholized extract of leaves of Cassia tora Linn. on five different fungal organisms was determined. Crude leaf extract significantly inhibited the growth of C.albicans, A.niger, S.cerevisiae and T.mentagophytes when tested by turbidity and spore germination methods in a concentration dependent fashion [38].

In another study, ethanolic extracts of Cassia tora seeds and leaves showed positive results for Candida albicans and Microsporum canis, respectively [39].

The fungicidal activities of Cassia tora extracts and their active principles were determined against Botrytis cineria, Erysiphe graminis, Phytophthora infestans, Puccinia recondita, Pyricularia grisea, and Rhizoctonia solani using a whole plant method in vivo. The responses varied with the plant pathogen tested. At 1 g/L, the chloroform fraction of C. Tora showed a strong fungicidal activity against B. cinerea, E. graminis, P. infestans, and R. solani. Emodin, physcion, and rhein were isolated from the chloroform fraction using chromatographic techniques and showed strong and moderate fungicidal activities against B. cinerea, E. graminis, P. infestans, and R. solani. Furthermore, aloe-emodin showed strong and moderate fungicidal activities against B. cinerea and R. solani, respectively [40].

Antibacterial activity: In a study by Das G et al, the chloroform, methanol and aqueous extract of leaves of Cassia tora L. showed antibacterial activity (0-5000 µg/ml) against 38, 58 and 29 bacterial strains respectively out of 120 various bacterial strains and also methanol extracts showed antifungal activity (0-64mg/ml) against 3 out of 4 strains. Five strains of Shigella dysenteriae, four strains of Staphylococcus aureus, and three strains of Escherichia coli, have shown sensitivity against in vitro treatment of the methanol extracts up to 2000 µg/ml concentration. The minimum inhibitory concentration (MIC) values ranges from 2–64 mg/ml for dermatophytes. Minimal Bactericidal Concentration (MBC) value lies in the range of 2000- 2500 µg/ml against Escherichia coli ATCC25938 and Shigella dysenteriae[41].

Another study reports the antibacterial activity of the aqueous, petroleum ether, methanolic and ethanolic extract of Cassia tora L. which were subjected to antibacterial evaluation against both gram positive and gram negative organisms by cup plate technique. Aqueous extracts of seeds of Cassia tora exhibited better antibacterial activity as compared to its petroleum ether, methanolic and ethanolic extracts. Among the organisms tested S. Aureus was more susceptible to the aqueous extract of this herb [42].

CONCLUSION:

Siddha system of medicine has rich collection of herbs for the treatment of various acute and chronic ailments. Skin disease stands as one of the leading health problem worldwide especially in developing countries like India. The herbs in siddha system award having least side effects, proven to be useful for the management of skin and skin diseases And the above told herbs broadly used by siddha practitioners and people of southern regions of India. From this review it should be evident that there are many siddha herbs which handle for many skin diseases by the so many activities such as Anti-microbial, Anti-bacterial, Anti-fungal, Antiviral, Anti-oxident,

Anti-inflammatory, etc... By this review, it can be concluded that many herbs have beneficial effect on skin diseases with lesser side effects.

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