

TREATMENT OF SKIN DISEASES THROUGH MEDICINAL PLANTS IN DIFFERENT REGIONS OF THE WORLD

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ABSTRACT

Skin, the largest organ of the human body is a vital component of human health. Skin diseases are numerous and a frequently occurring health problem. Medicinal plants are a rich source of active ingredients and provide a safer and cost effective way to treat skin diseases. This article throws light on the use of medicinal plants in the treatment of skin diseases in different regions of the world. Patents are the richest source of the latest technological information. A review of some patents on herbal products for the treatment of skin diseases is provided that summarizes the recent technical advancements taken place in this area.

KEY WORDS: Skin diseases, medicinal plants, patent

INTRODUCTION

Skin is the largest organ of the human body. It gathers sensory information from the environment and functions as a protective barrier to the body organs. It also helps in maintaining the proper temperature of the body.

Skin contains many specialized cells and structures. It is divided into three main layers viz. epidermis, dermis and hypodermis. Each layer provides a distinct role in the overall function of the skin. Epidermis is the outer most layer of the skin. The thickness of the epidermis varies in different region of the body. It is the thinnest on the eyelids (0.05 mm) and the thickest on the palms and soles (1.5 mm). The dermis also varies in thickness depending on the location of the skin. It is 0.3 mm on the eyelid and 3.0 mm on the back of the body. The dermis is attached to an underlying hypodermis or subcutaneous connective tissue. The

subcutaneous tissue is a layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important in the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and from person to person. Hair follicles, sweat glands and sebaceous glands are the main skin appendages.

Skin disease is a common ailment. It affects all ages from the neonate to the elderly and cause harm in number of ways¹. Skin problems can be caused due to a variety of reasons that include infection, allergy, sun rays, injury etc.

TYPES OF SKIN DISEASES

There are numerous types of skin diseases reported in the texts. However, they can be classified into six broad categories².

1. Inflammatory Skin Disorders

Inflammatory skin disorders include a range of rashes and lesions that cause

irritation and inflammation in the skin. Many of the more well known skin conditions, including acne, fall into this category. Other types of inflammatory skin conditions include dermatitis, eczema, diaper rash, psoriasis and sebaceous cysts.

2. Viral Infections

Most viral skin infections are temporary. But some of the viral infections can lead to scarring on skin if left untreated. Many of the skin rashes caused by childhood diseases are viral in nature. Chicken pox, herpes simplex virus (Type 1), herpes simplex virus (Type 2), measles and warts are some of the common viral skin infections.

3. Bacterial Infections

Bacterial skin problems are easier to treat than viral infections, because antibiotics usually provide an effective treatment. Examples of these disorders include folliculitis (Barber's Itch) and impetigo.

4. Fungal Infections

Some microorganisms live on the skin and leave off dead skin cells. They can spread rapidly, leading to fungal infection. Candida and ringworm are the major microorganisms responsible for fungal infection.

5. Skin Cancer

Three separate forms of skin cancer are recognized viz. basal cell cancer, squamous cell carcinoma and melanoma.

6. Other Skin Disorders

Other skin problems include moles and birthmarks. Neither of these are health problems in themselves, but moles should be watched for changes that may indicate skin cancer.

APPLICATION OF MEDICINAL PLANTS IN TREATMENT OF SKIN DISEASES IN DIFFERENT REGIONS OF THE WORLD

Present review is an effort to put collectively medicinal plants which have potential in the healings of numbers of skin diseases used in different regions of the world.

Medicinal plants used in Spain in the treatment of skin diseases

Cheryl L. *et al.* reported a comparison of plants used for skin and stomach problems in Trinidad and Tobago of Spain with Asian ethnomedicine. As per this study 58 ethnomedicinal plants were used in Trinidad and Tobago for skin and stomach problems. Among them, some plants which were found to be efficacious were *Bambusa vulgaris*, *Bidens alba*, *Jatropha curcas*, *Neurolaena lobata*, *Peperomia rotundifolia* and *Phyllanthus urinaria*³.

Medicinal plants used in Korea in the treatment of skin diseases

Yeon SC. *et al.* reported effects of wogonin, a plant flavone from *Scutellaria radix*, on skin inflammation: in vivo regulation of inflammation-associated gene expression. As per this study it was claimed that flavonoids show both in vitro and in vivo anti-inflammatory activity. For in vivo anti-inflammatory activity, the effect of wogonin was tested on several inflammation-associated genes in intact as well as in the inflamed mouse skin through reverse transcriptase–polymerase chain reaction method. Its topical application on the intact skin showed slightly increased COX-1 and fibronectin m-RNA. Wogonin at the doses of 250–1000 µg/ear/3 days showed decreased m-RNA levels of COX-2⁴.

Medicinal plants used in Japan in the treatment of skin diseases

Yukiko I. *et al.* reported inhibitory effect of flavonoids from citrus plants on Epstein–Barr virus activation and two-stage carcinogenesis of skin tumors. As per this study it was found that peel of Citrus plants extract contains 13 flavones which were later tested for inhibitory effects on the Epstein–Barr virus through an in vitro assay. Out of them, the 13th flavones showed an inhibitory action on the mouse skin tumor promotion in an in-vivo carcinogenesis test⁵.

Medicinal plants used in Mexico in the treatment of skin diseases

Lozoya X. *et al.* reported *Solanum chrysotrichum* a plant used in Mexico for the treatment of skin mycosis. As per this study it was claimed that the leaves of plant *Solanum chrysotrichum* are useful particularly in treatment of *Tinea pedis* (skin mycosis). Clinical trials were conducted using cream having 5% of methanolic leaf extract of *Solanum chrysotrichum*. It was found that 45% of the patients were completely cured after 4 weeks of its topical treatment. The extract also showed in-vitro activity by inhibiting the growth of the dematiophytes *T. menlagrophytes*, *T. rubrum* and *Microsporum gypseum* at MICs under 15 mg/ml⁶.

Medicinal plants used in Southern India in the treatment of skin diseases

Kingston C. *et al.* reported Indigenous knowledge of using medical plants in treating skin diseases in Kanyakumari district, Southern India. As per this study it was stated that 30 plants species belonging to 29 genera and 22 families were found to be useful in the treatment of 11 different skin diseases like leprosy, eczema, dandruff, impetigo, psoriasis, scabies, rashes, swelling, tinea

versicularis and tinea cruris. Out of 30 plant species 4 were invariably used for treatment of leprosy disease. Plant *Saraca asoca* has been used commonly for treatment of scabies disease⁷.

Medicinal plants used in Assam, India in the treatment of skin diseases

Abinash PS. *et al.* reported ethnobotany of medicinal plants used by Assamese people for various skin ailments and cosmetics. As per this study 85 plants species belonging to 49 families were selected for the treatment of skin diseases and as herbal care products. Most of the preparations were made using water as the medium. Topical as well as oral modes of administration were considered. About 14 plant species were recognized and among these the major plants were *Curcuma longa* and *Melia azaderach*. Different herbal cosmetics products ranges from the enhancement of skin color, removal of ugly spots, hair care, skin burns, prickly heat, pimples, coloring of nails, palms and teeth⁸.

Medicinal plants used in Kancheepuram, Tamil Nadu, India in the treatment of skin diseases

Muthu C. *et al.* reported Medicinal plants used by traditional healers in Kancheepuram district of Tamil Nadu. As per this study 85 plants species belonging to 41 families were selected for curing of skin diseases, poison bites, stomachache and nervous disorders. The widely used were the leaves of plants belonging to family Euphorbiaceae⁹.

Medicinal plants used in Northeastern India in the treatment of skin diseases

Dilara B. *et al.* reported ethnobotanical review of medicinal plants used for skin diseases and related problems in Northeastern India. As per this study 275 plants species were selected and out of

them 224 species were found to be used for treatment of skin diseases like inflammation, allergies, wounds, leprosy, burns, smallpox, leucoderma and scabies. Among these the major plants used were *Artemisia nilagirica*, *Calotropis gigantean*, *Cannabis sativa*, *Cassia alata*, *C. fistula*, *Centella asiatica*, *Cyclea peltata*, *Datura metal*, *Drymaria cordata*, *Jatropha aureus*, *Litsea cubeba*, *Mimosa pudica*, *Plantago major* and *Plumeria acutifolia*¹⁰.

Medicinal plants used in different regions of India in the treatment of skin diseases

Nagariya AK. *et al.* reported a review on the medicinal plants used in the healing of skin diseases in different regions of India. As per this study it was stated that different plant species are found to be useful in the treatment of skin diseases like eczema, psoriasis, rashes, leprosy, wound, scabies and dandruff. Number of plants extracts, decoctions and pastes are helpful for curing of skin diseases. They compiled the uses medicinal herbs as traditional remedies in treating various skin problems related to different regions of India¹¹.

Hailu T. *et al.* reported Antimicrobial activities of some selected traditional Ethiopian medicinal plants in the treatment of skin disorders. As per this study 8 species of medicinal plants like *Acokanthera schimperi*, *Calpurnia aurea*, *Kalanchoe petitiiana*, *Lippia adoensis*, *Malva parviflora*, *Olinia rochetiana*, *Phytolacca dodecandra* and *Verbascum sinaiticum* were screened for antimicrobial activity against different strains of bacteria and fungi for the treatment of various skin disorders. Their Hydroalcoholic extracts was used in the agar well diffusion method at three concentration levels (100, 50 and 25 mg/ml). It was found that *Lippia adoensis*

and *Olinia rochetiana* were active against bacterial and fungal strains respectively¹².

Medicinal plants used in North-West Frontier Province, Pakistan in the treatment of skin diseases

Arshad MA. *et al.* reported ethnopharmacological application of medicinal plants to cure skin diseases and in folk cosmetics among the tribal communities of North-West Frontier Province, Pakistan. As per this study 66 plants species belonging to 45 families were selected for curing of skin diseases. Topical as well as oral modes of administration were considered in this study. About 15 plant species were recognized and among these the major plants were *Berberis lyceum*, *Bergenia ciliata*, *Melia azedarach*, *Otostegia limbata*, *Phyla nodiflora*, *Prunus persica* and *Zingiber officinale*. Different herbal cosmetics products ranges from face freshness, hair care, removal of ugly spots, coloring of palm, feet, gums and teeth¹³.

SOME PATENTS ON HERBAL PRODUCTS FOR TREATING SKIN DISEASES

Patents are latest technical information provider to human beings. A review on some patents provides usefulness of medicinal plants in the treatment of skin diseases. This review shows information on the recent advances that have taken place in the area of herbal therapy related to skin problems/diseases.

Herbal acne control composition, method of manufacturing the same and use thereof: An herbal acne control compositions is being formulated using extracts of *Swietenia mahagoni*, *Salix tetrasperma*, *Aloe vera* and *Curcuma longa* along with pharmaceutically

acceptable excipients. The same was later designed into different delivery systems and used thereof for the prevention of acne disease in human beings¹⁴.

Herbal composition for maintaining/caring the skin around the eyes, methods of preparing the same and uses thereof: A novel herbal composition is being formulated using extracts of *Saxifraga ligulata*, *Bergenia ligulata*, *Cipadessa baccifera* and *Emblica officinalis* along with pharmaceutically acceptable excipients. The composition was designed into a suitable delivery system which could be used for maintaining/caring the skin around the eyes of human beings¹⁵.

Topical composition for the treatment of psoriasis and related skin disorders: A topical formulations of glucosamine including keratolytic substances like coal tar extract or salicylic acid in an emollient base is being formulated for the treatment of psoriasis and related skin disorders. The formulation also consisted of antioxidant anti-inflammatory herbal extracts like *oleuropein* and *berberine* in an emollient base¹⁶.

Method of treating dyshidrosis (pompholyx) and related dry skin disorders: A topical herbal formulation comprising of a combination of dry, aqueous, acidic and alcoholic extracts of *Juglans Nigra*, *Artemisia Absinthium*, *Curcuma Longa*, *Allium sativum*, antibacterial agents from the group consisting of *Matricaria Chamomile*, *Glycyrrhiza Glabra*, *Hypericum perforatum*, *Syzygium aromaticum*, *Myristica fragans*, *Zingiber officinale*, *Boswellia carteri* and *Commiphora molmol*, with aloe vera and niacin is being developed for the treatment of dyshidrosis (pompholyx) and related skin diseases.

The designed product help in treatment of contact eczema, dermatitis, palmoplantar pustulosis and skin infections caused by pathogens like bacteria, fungus and mold¹⁷.

Herbal compositions for the regression of chronic inflammatory skin disorders: For the treatment of chronic inflammatory skin disorders on human beings like psoriasis, eczema and seborrheic dermatitis, different herbal compositions are being formulated containing extracts of *Wrightia tinctoria*, *Tragia involucrata* L., *Salix* L., *Cocos nucifera* and pharmaceutically acceptable excipients¹⁸.

Method and composition for treatment of wounds and burns: An herbal composition is being formulated into a topical delivery system for its application to skin ulcerations, surgical incisions wounds and cuts, which help in accelerating the wound healing process. This herbal composition cures skins affected with acne, allergic reactions, dermatitis, inflammatory rashes, eczema, psoriasis, rosacea and dryness¹⁹.

Organic extract of *Geum japonicum* Thunb variant and use thereof: An organic extract of a *Geum Japonicum thunb var.* was found to possess a potent stimulatory effect on rapid angiogenesis, myogenesis in rabbit and rat animal models. The extract can be further used into a therapeutic formulation for the treatment of skeletal muscle trauma, soft tissue healing like cut, burn, wound and bone fracture²⁰.

Topical antifungal treatment: For treatment of skin and nails fungal infections in immune compromised and diabetic patient, a topical herbal formulation is being formulated consisting of triacetin with an antifungal agent. The

formulation also comprises of a fatty acid source like fish oil. Cod liver oil and tolnaftate were also used in combination with triacetin at a concentration of 96.0-99.0% triacetin, 0.5-3.0% tolnaftate and 0.5-1.0% cod liver oil. Other compounds like ethyl alcohol, amino acids (n-acetylcysteine) may also be added into the preparation. Similarly other antifungal agents like butenafine, clotrimazole, econazole, miconazole, oxiconazole and terbinafine may be used in place of tolnaftate²¹.

Herbal healing oil: For reducing pain from arthritis, sore muscles, lower back pain, bruised ligaments, tendons and ailments related with common aches and pains, an herbal oil is being formulated having an analgesic property. It comprises of a stabilizer and various essential oils like olive oil, castor oil, grapeseed oil, almond oil, apricot kernel oil and Vitamin E. These oils could be extracted out from *Eucalyptus globulus*, *Lavandula angustifolia*, *Melaleuca alterniflora*, *Zingiber officinale*, *Cymbopogon citratus*, *Thymus vulgaris*, *Betula lenta* and *Cananga odorata*²².

Herbal skin formulation: An herbal skin formulation is being formulated by mixing Chinese herbs along with sesame oil. The herbs are then removed and beeswax is then added to the sesame oil till melting of beeswax occurs. On cooling, the formulation is poured into the jars²³.

Skincare composition against free radicals: A topical skincare cosmetic preparation against free radicals is being formulated. It consists of herbal extracts of *Ginkgo biloba*, *Morus alba*, *Origanum vulgare*, *Panax ginseng*, *Rosmarinus officinalis*, *Birch*, *Camellia sinensis*, *Acerola cherry* and *Grape seed oil* along

with a suitable diluent or carrier in combination with a synergistic mixture of three anti-free-radical agents from glucosides and glucosamines, ascorbic acid, its salts and tocopherol, its esters²⁴.

Herbal composition: An herbal composition includes the combination of *Sage leaf*, *Raspberry leaf*, *Bayberry bark*, *Capsicum pepper*, *Damiana leaf*, *Ginger root*, *Licorice root*, *Vaierian root*, *Cohosh root*, *Clover extract* and *Kudzu root*. The composition is bound in tablet form and administered orally. Alternatively, the composition is applied to the skin of the user as a cream, a patch or spray²⁵.

Herbal formulation useful for treatment of skin disorders: A novel herbal formulation for the treatment of skin disorders is being formulated. It comprises of plant extracts from *Tagetes erecta*, *Moringa oleifera*, *Ocimum sanctum*, *Tridax procumbens*, *Aloe vera* and *Gum olibanum* with some conventionally used additives²⁶.

Chinese herbal medicine health care tea for enriching blood, nourishing skin as well as resisting fatigue and aging: A Chinese herbal tea is being formulated. This tea is useful in enriching blood, nourishing skin, resisting fatigue and aging. It comprises of *Sea buckthorn*, *American ginseng*, *Sealwort*, *Dodder*, *Pueraria yam*, *Astragalus root*, *Barbary Wolfberry fruit*, *Angelica*, *Raspberry*, *Rhodiola* and *Kombucha slices*²⁷.

CONCLUSION

Current research work conducted in different regions of the world indicates that the medicinal plants have great potentiality to cure skin diseases. Medicinal plant provides leads to develop new therapeutically effective compounds. More efforts should be made to isolate

active ingredients from these medicinal plants, so that more effective and safer drugs could be developed for the treatment of skin diseases.

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