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A Comprehensive Review On Role Of Different Medicinal Plants In The Management Of Dermatological Disorders

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ABSTRACT
In the past, skin conditions have not gotten as much attention in health care as other serious, worldwide diseases. Nonetheless, many skin conditions are brought to the attention of primary healthcare systems around the globe, especially in tropical regions. Although the majority of skin problems are treated by contemporary physicians, over 70% of patients with skin ailments are thought to not seek treatment. Traditional medicine has existed since the dawn of human civilization. Traditional medicine makes use of a wide range of materials, but plants play a particularly important role. Skin illnesses may be harmful in a variety of ways and are a common and widespread health issue that affect people of all ages, from newborns to the elderly. A healthy body depends on having good skin. Numerous people are susceptible to skin conditions including cellulitis, herpes, and malignancy. These illnesses are commonly treated using certain wild plants and their components. Since the dawn of humankind, plants have been used. Natural medicine is said to be safe and inexpensive. Additionally, it is a good raw material for making novel synthetic agents. This review paper offers an overview of certain medicinal plants used in the management of skin conditions.

KEY-WORDS: Dermatological disorders, Melanoma, Psoriasis, Hives, Shingles

INTRODUCTION

The biggest organ in the human body is the skin, which covers the exterior of the body. As the initial line of defense, it is as well. Numerous specialized cells and structures are found in skin. The epidermis, dermis, and hypodermis are its three primary layers. Every layer contributes differently to the skin's overall functionality. The thickness of the epidermis, the skin's outermost layer, varies depending on the body part. It is thickest on the palms and soles (1.5 mm) and thinnest on the eyelids (0.05 mm). The location of the skin affects the thickness of the dermis as well. The measurements are 3.0 mm on the back of the torso and 0.3 mm on the eyelid.[1] The subcutaneous connective tissue, or hypodermis, is connected to the dermis. Larger blood arteries and nerves are housed in the subcutaneous tissue, which is a layer of fat and connective tissue. This layer is crucial for controlling the body's and the skin's internal temperature. This layer is different in size in different parts of the body and in different people. The primary skin appendages are sebaceous glands, sweat glands, and hair follicles.[2]

Dermatological problems can be caused by infections, heat, allergies, systemic illnesses, drugs, or simple skin rashes all the way up to serious infections. Skin conditions include rosacea, psoriasis, acne, and eczema are among the most prevalent. The topical administration of gels at pathological locations has substantial advantages in terms of quicker medication release compared to creams and ointments.

The treatment of numerous skin illnesses is still largely dependent on conventional medications for more than 80% of the world's population.[3] Around the world, traditional medicines are essential to healthcare because they provide a plentiful supply of powerful medications derived from medicinal plants. Diseases in humans and animals are treated with a wide range of natural items, including microorganisms, minerals, plants, and animals.

It is widely known that medicinal herbs are frequently used to treat skin conditions and to take advantage of their antibacterial qualities. Primary and secondary metabolites are found in plants, and they all have different medicinal uses. Together, these metabolites are known as plant herbal products, and they function as pressures and deterrents. Numerous plants and plant-based substances have had their dermatological activity reviewed in the review that has been done thus far. A number of plants and the substances found in them have shown great efficacy in treating one or more forms of skin problems that affect both men and women.[4]

COMMON SKIN PROBLEMS

Skin diseases are a prevalent condition that may injure people in many different ways and affect people of all ages, from newborns to the elderly.[5] Although there are over a thousand illnesses that can damage the skin, the majority of skin diseases fall into one of nine primary categories.[6]

1. Rashes

An region of red, irritated skin or a collection of little spots is called a rash. These can be brought on by structural flaws such clogged pores or dysfunctional oil glands, as well as by irritation, allergies, infections, and underlying diseases. Rashes can be caused by psoriasis, rosacea, acne, hives, eczema, etc. [7]

A. Acne

Hair follicles clog with dead skin cells and oil, leading to acne, a skin disorder. It results in pimples, blackheads, or whiteheads. Acne vulgaris has been linked to Propionibacterium acnes and Staphylococcus aureus. Their precise roles in the development of acne are unclear, though. P. acnes substrains can cause long-term acne issues, whereas other substrains can cause normal skin. It has been demonstrated that an increased glycemic diet is linked to a development of acne vulgaris.

B. Psoriasis:

A widespread, long-term immune-mediated skin disease, psoriasis affects 3-4% of adult US citizens. Redness, scaling, flaking, pruritus, skin tightness, soreness, and bleeding are some of the symptoms of psoriasis that can seriously impair a patient's physical and emotional well-being. Additionally, psoriasis has been linked to reductions in psychological health, productivity at work, and quality of life. [8]

C. Rosacea

Fitzpatrick I and II skin types are the most prevalent ones in people with rosacea, a common chronic skin condition. When a patient comes with flushing, persistent erythema, telangiectasias, eruption of inflammatory papules, pustules, and hypertrophy with fibrosis1 of the nose's sebaceous glands, it is usually adequate to identify diseases based on clinical examination of the face, neck, chest, or ears. There is now no recognized treatment for rosacea, and its precise etiology is still unclear.[9]

D. Hives

Urticaria, sometimes referred to as hives, is an abrupt onset of swollen, pale red pimples or plaques (wheals) on the skin that may be brought on by an allergy reaction the body may be experiencing, or it may occur for other causes. Although they can burn or hurt, hives often cause irritation. Anywhere on the body, including the face, lips, tongue, neck, or ears, is where they can occur. The size of hives can range from that of a pencil eraser to that of a dinner plate, and they can combine to create bigger regions known as plaques. Before fading, they can last for many hours or even a day. Twenty percent of the population is affected by this fourth most common allergy condition at some point in their lives.

E. Eczema

Eczema is a skin disorder characterized by rough, cracked, itchy, and inflammatory areas. Some varieties may also result in blisters. Atopic dermatitis, also known as atopic eczema, is a chronic inflammatory illness that affects persons who have a genetic predisposition to respond to environmental stimuli. It is frequently observed in conjunction with asthma, allergic rhinitis, or other atopy symptoms. A common dermatological condition affecting youngsters is atopic dermatitis. Extreme skin dryness and itching, redness, scaly patches, and thicker lichenified plaques with excoriation are the most often seen signs of atopic dermatitis. [10]

2. Viral infections

These happen when a virus enters the skin's inner layers through the stratum corneum. Warts, shingles (herpes zoster), and herpes simplex virus (HSV) infections are a few examples of viral skin illnesses. Skin infections can also result from some systemic viral illnesses, such measles and chicken pox. Antibiotics cannot treat viral illnesses.

A. Herpes Simplex Virus (HSV) Infection

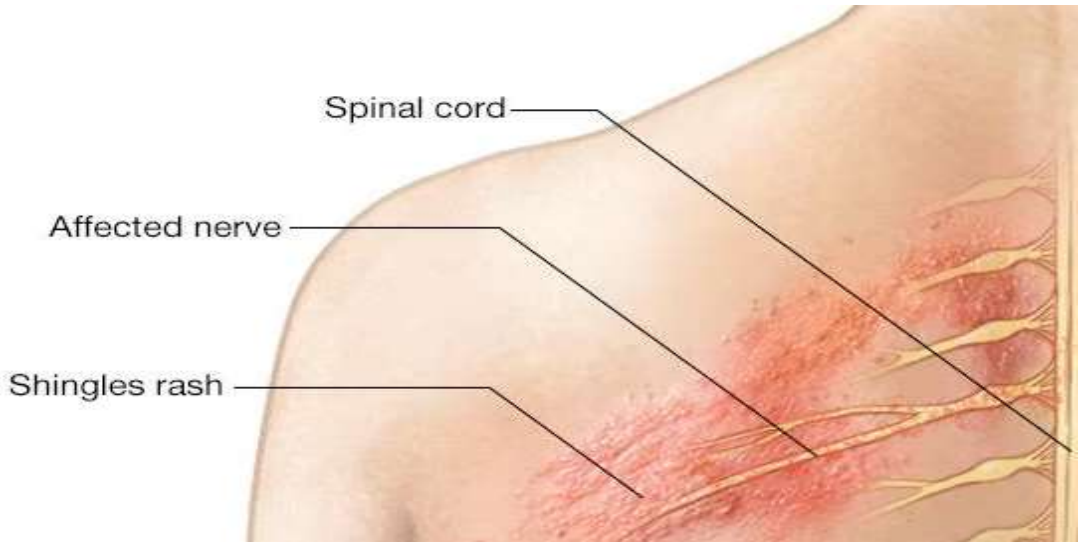
Common infections with the herpes simplex virus (HSV) can result in excruciating blisters or ulcers. The main way it spreads is through skin-to-skin contact. Although treated, it cannot be cured. The herpes simplex virus comes in two varieties.[11]

i)Oral herpes and cold sores are diseases in or around the mouth that are usually transmitted via oral contact with Type 1 (HSV-1). Herpes genitalia can also result from it. The majority of people have HSV-1 infection.

ii)Genital herpes is caused by Type 2 (HSV-2) and is spread through sexual contact.

B. Shingles (Herpes Zoster)

The varicella-zoster virus, which also causes chickenpox, is the source of shingles. Shingles may strike anyone who has ever had chickenpox. The virus enters the nerve system after healing from chickenpox and remains dormant for years. Shingles can occur when the virus reactivates and moves through nerve pathways to the skin. Still, not every person who has had chickenpox will go on to get shingles. It's unknown what causes shingles. It might be because as individuals age, their immunity against infections declines. Immune system compromise and older age groups are more susceptible to shingles[12]. Herpes viruses include the virus that causes varicella-zoster. This is the same group that includes the viruses that cause cold sores and genital herpes. As a result, shingles is also known as herpes zoster. But the virus that causes chickenpox and shingles isn't the same virus that causes cold sores or genital herpes, which is a sexually transmitted infection.



3. Bacterial infections

Many bacteria can cause these illnesses, but the most prevalent kinds are streptococci and staphylococci. The outermost layers of skin, the follicles, or the deeper layers of skin can all get infected by bacteria. These infections have the potential to spread throughout the body if improperly managed. Lyme illness, cellulitis, and impel folliculitis are a few examples. Antibiotics are a superior way to treat bacterial infections.[13]

A. Folliculitis

It's a frequent skin disorder brought on by inflammation of the hair follicles. It is frequently brought on by a bacterial infection. It may first appear as little pimples surrounding the tiny pockets (hair follicles) where each hair develops.[14]It can be an unsightly, painful, and irritating condition. Crusty sores may develop as a result of the infection spreading. With simple self-care, mild folliculitis should cure in a few days without leaving any scars. Recurring or more severe infections could require prescription medication. Severe infections can result in lifelong scarring and hair loss if left untreated.[15]

B. Cellulitis

A deep skin infection brought on by bacteria is called cellulitis. Usually, the arms and legs are affected. Moreover, it may appear on the abdomen or around the lips, eyes, and anus.[16]Cellulitis can damage normal skin, although it typically develops following a trauma or surgical procedure that breaks the skin.Usually, germs that enter a wound or an area without skin create cellulitis. The most frequent bacteria that cause cellulitis are Staphylococcus aureus (Staph), Group A ß-hemolytic streptococcus (Strep), and Streptococcus pneumoniae (Strep).

4. Fungal infections
The skin's surface is always covered in harmless fungus. When these germs get into the body, infection happens. These diseases, which often affect the skin, hair, and nails, include ringworm, athlete's foot, and lock itch. However, the fungus may grow deep into the body, leading to more serious illness, in those with weakened immune systems or long-term antibiotic users. [17]

5. Parasitic infections
These infections occur after exposure to parasites such as lice and scabies.

6. Pigmentation disorders
The quantity of melanin that the body produces determines how much pigment is in the skin. Hypopigmentation, or loss of pigment, can be brought on by infections, malfunctioning cells, exposure to chemicals or the cold, or the lack of melanocytes. Hyperpigmentation, or an increase in pigment, can result from a variety of underlying issues, including age, metabolic disorders, hormonal changes, and skin irritation. Melasma, freckles, and age spots are a few manifestations of hyperpigmentation. One instance of hypopigmentation is vitiligo.[18,9]

7. Tumors and cancers
These growths appear when skin cells start to proliferate more quickly than usual. Not every growth on the skin is malignant. Certain cancers are benign and do not metastasize. Of all the diseases, skin cancer affects 800,000 Americans annually, making it the most frequent type. In ninety percent of instances, sun exposure is the reason.[19] There are three forms of skin cancer: malignant melanoma (the most fatal form), squamous cell cancer (which can develop and spread), and basal cell cancer (which is the most treatable). Preventive care entails shielding the skin from harmful UV radiation. The likelihood of a cure is increased with early discovery. For this reason, it is advised to regularly examine oneself.[7]

Trauma
An damage to the skin brought on by a blow, cut, or burn is referred to as trauma. The body is vulnerable to infection and illness whenever the skin's surface is breached.[20]

8. Other conditions
Spider veins, varicose veins, rosacea, and wrinkles are a few of the disorders that are difficult to classify. Skin that is drooping due to wrinkles is caused by a breakdown of collagen and elastin inside the dermis. Rosacea is a chronic condition that causes redness on the face, pimples, lesions, and, in rare cases, enlargement of the nose. We don't know what caused it. Varicose and spider veins are evident when blood vessels expand and protrude through the skin's surface.[21–23]

DIFFERENT MEDICINAL PLANTS IN THE MANAGEMENT OF DERMATOLOGICAL DISORDERS

1. Purslane
With its inherent cooling qualities, the plant relieves skin irritations and rashes while the weather is extremely hot. An excellent infusion made from the leaves can be used to treat burns and skin eruptions such as boils and carbuncles. The aqueous extract works well as an antibacterial and antifungal topical treatment on the skin.[24] The fresh herb is often used as a poultice or the extracted juice is used externally to treat burns, earaches, insect stings, inflammations, skin sores, ulcers, pruritis (itching skin), eczema, and abscesses.[25] The leaves are

crushed, combined with oil, and fastened to boils in Ghana.[8] The leaves are occasionally used in conjunction with tiger nuts (Cyperus esculentus) as a treatment for chancres and skin conditions.[26]

2. Mango

Gum is utilized in scabies and cracked foot treatments. Applying latex helps heal ulcers.[17] Rats with fresh egg albumin-induced paw edema showed a dose-dependent and substantial ($P < 0.05 \sim 0.001$) anti-inflammatory response to an aqueous extract of stembark (MIE, 50~800 mg/kg i.p.).[27]

3. Lavender

Studies have been conducted on the effects of lavender oil (1:500, 1:100, 1:10, 1:1, and 1:0) on mast cell-mediated acute type allergic responses in rats and mice.[28] It has been documented to block the peritoneal mast cells' concentration-dependent release of histamine. When tested on mice and rats, it also prevents immediate-type allergic responses by preventing mast cell degranulation both in vivo and in vitro.[29]

4. Turmeric

In a research using male Swiss albino mice, where skin cancer was created by topical administration of DMBA, the number of tumors per animal was much lower in the group that received 1% curcumin derived from C. longa rhizomes. [30]

5. Saffron

A naturally occurring plant product, saffron has sedative, emmenagogic, carminative, diaphoretic, and antispasmodic properties.[31] Using a histological method, the chemopreventive impact of aqueous saffron on chemically induced skin carcinogenesis was investigated. When ingested by animals, it decreased the size of cutaneous papillomas while also inhibiting their production. When administered at an early stage, saffron prevented mice's skin cancer caused by DMBA. Cellular defense mechanisms may have been induced, at least partially, to explain this.[32] Psoriasis has also been proven to respond well to its therapy.

6. Green tea

Green tea, which is produced by the C. sinensis tea plant, may be useful in the treatment of cancer and skin tumors. Polyphenols, which are found in it, function as antioxidants in the body. The National Center for Complementary and Alternative Medicine reports that a particular polyphenol found in green tea called epigallocatechin galllate has been shown to stop the body's skin tumors from starting to develop further. It helps maintain the skin appearing younger by revitalizing aging skin cells so they may begin to reproduce once again.[33]

7. Marigold

Marigold flowers have been used in folk medicine for a long time, and tinctures and decoctions made from the flowers are said to contain over 35 characteristics. The primary use are as treatments for bruising, burns (including sunburns), and inflammatory illnesses of the skin and internal organs that have several causes.[34] Application of marigold extract (ME) in gel formulation, containing 0.21 μg/cm of narcissin and as much as 0.07 μg/cm of rutin in the viable epidermis, was linked to a potential improvement in the collagen synthesis in the sub epidermal connective tissue. Topical formulations containing ME were evaluated in hairless mice against UVB irradiation-induced photo damage.[35]

8. Walnut

The extract is prepared from the young, green English walnut (Juglans regia) shells. The aqueous extract functions as a sunscreen agent that self-tans. The main constituent is juglone, a naphthol that shares tight ties with lawsone. Sclerojuglonic chemicals are known to be formed when juglone reacts with the keratin proteins found in the skin. These feature UV protection qualities and are colored. It is used as a scrub to lessen skin damage caused by the sun [36–39].

9. Neem

Blisters and boils are treated externally using leaf extract.[40] In a particular investigation, mice were given topical treatment of DMBA (500 nmol/100 μl) for two weeks, and then TPA (1.7 nmol/100 μl of acetone, twice weekly) as a promoter to produce skin tumors. For 20 weeks, the test group was given 300 mg/kg body weight of aqueous Azadirachta indica leaf extract (AAILE) orally three times a week. The study's findings demonstrated A. indica's chemopreventive ability against the development of skin cancer in mice.[41]

10. Garlic

Garlic's greatest chemopreventive effect was seen in mice treated with it both before and after skin carcinogenesis was generated, according to a research done on Swiss albino mice in which cancer was caused by 7,12-dimethylbenz(a)anthracene (DMBA). Consuming garlic slowed the development of skin papillomas in

animals and concurrently reduced their size and quantity, as evidenced by the treated mice's skin histology. The stimulation of cellular defense mechanisms is thought to be responsible for at least some of the preventive effect of garlic against skin cancer in mice.[42]

11. Red Cabbage

Mice that had skin cancer caused by a single topical application of 200 nmol of the initiator DMBA to their backs showed a significant reduction in tumors. One week later, the mice were promoted with 10 nmol of TPA twice weekly for 30 weeks, and one week after that, they were given 0.1 g/L of an aqueous extract of B. oleraceae.[43]

12. Cucumber

Its extract is used to manufacture sheet masks and gel because it is high in vitamins, particularly C and A, which have some cosmetic advantages for the skin. Whether the skin irritation is from a cutaneous eruption or the sun, cucumber has a great ability to soothe and cool it. Cucumber extract is frequently used as an antioxidant, for sunburn, wrinkles, and skin issues [44]. For skin health, cucumber extract is a superfood. The juice has moisturizing and emollient qualities and is mostly made up of proteins, fats, vitamins, and other minerals. In addition, it contains astringent properties that help reduce puffiness in the skin.[17]

13. Carrot

A study that looked at the chemopreventive effects of D. carota umbels oil extract on DMBA-induced skin cancer in mice for 20 weeks found that tumor incidence significantly decreased when the oil was administered intraperitoneally (0.3 ml of 2% oil), topically (0.2 ml of 5, 50, and 100% oil), and least when it was gavaged (0.02 ml of 100% oil).[45]

14. Henna

The Middle Eastern herb henna is historically used to apply makeup on the hands and feet. To treat impetigo, the traditional medical practice applies leaf paste to the afflicted areas twice a day.[40] Henna has anti-inflammatory, antipyretic, and analgesic properties, as demonstrated by a research where the use of henna with capecitabine, an anticancer medication, improved the clinical condition of patients with hand and foot illness.[46,2]

15. Ashoka

The paste made from the roots can be used to treat skin conditions, ulcers, freckles, and external inflammations. To relieve skin irritation caused by eczema, psoriasis, dermatitis, and herpes kushta/visarpa, use crushed flower paste. It is a popular plant for treating tinea pedis, scabies, and pruritis. To cure eczema and scabies, 50 g of dried S. asoca flowers and leaves of L. inermis are cooked in coconut oil, and the resulting extract is applied topically twice daily.[47] According to a research, pretreatment with S. asoca's flavonoid fraction significantly reduced the proportion of tumor-bearing mice and the number of tumors per animal. Moreover, pretreatment with S. asoca prolonged the latency time before the first tumor appeared. In the group treated with plants, there was a noteworthy decrease in the expression of ornithine decarboxylase, an enzyme crucial to the promotion stage of two-stage skin cancer. This observation suggests that the flavonoids derived from S. asoca have chemopreventive properties against the development of two-stage skin carcinogenesis.[48]

16. *Sandalwood*

Santulum album L., a member of the Santalaceae family, has been used for over 4,000 years as a fragrance mostly in religious ceremonies. It is also employed as a flavoring ingredient in Ayurvedic medicine to treat inflammatory responses that cause a variety of skin problems [29, 30]. It was additionally used as an astringent. It is used as masks, face packs, and other forms [49].

17. *Amla*

Together with a number of dietary components, superoxide dismutase, catalase, glutathione, GSH peroxidases, reductase, vitamin E, vitamin C, and other defensive antioxidant processes are gifts from nature to Emblica officinalis. Numerous studies have shown the wide range of possible uses for antioxidant or free radical modulation in the prevention or management of illness. When used as a scrub, the fruit extract yields positive results in tests for total phenol, total flavonoids, and total tannin [50].

18. *Papaya*

Ascorbic acid, saponins, carpaine, dehydrocarpaine, and pseudocarpaine enzymes, myrosin, alkaloids, rutin, resin, and tannins are a few of the components found in Carica papaya leaves. Aroma is influenced by both aromatic and aliphatic hydrocarbons. Conversely, when the fruit ripens, the levels of the following carotenoids—lycopene, β-criptoxanthin, and β-carotene—increase in conjunction with vitamin C [51, 52]. Carotenoids, which are often used as face wash, aid in the depigmentation of the skin and aid in the removal of tan.

CONCLUSION

Herbs or medicinal plants have great potential to cure a wide range of skin diseases. For the treatment of skin conditions, over 80% of Indians use traditional medicine including a range of plant-based medications. They may be quite beneficial to the Indian populace in general and the impoverished in particular, and they are comparatively cheap when compared to traditional allopathic medications. Because they include a lot of active ingredients, herbal remedies can be a safer and more affordable way to treat a variety of skin diseases, from fatal skin cancer to rashes. Due to the fact that the majority of plant species that are useful in treating skin conditions are often found only in forests, these species may be seriously threatened by urbanization, deforestation, habitat degradation, and other human activities. It is urgently necessary to protect these plants with community support and to carry out thorough study in order to increase the potential applications of herbal remedies for the management of skin conditions.

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