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Herbs Used in Treating Skin Diseases

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ABSTRACT: From neonates to elderly, the commonly affecting health problem is skin diseases, these skin diseases aren't just simple, they cause harm to the skin in numerous ways and in many cases these skin diseases are the symptoms for many complicated underlying health issues i.e., cancer, herpes and cellulitis. Hence, there is a need to know in deeper about skin diseases as well as their treatment using herbs, as herbs have more pros compared to other drugs and plants are often used for treating various diseases. These plants have been used since the start of mankind. They are cheap and safe. They are also useful raw materials for production of new synthetic agents. This review examines some plants for treating these diseases.

KEYWORDS: herbs, skin, disorders, treatment, plants, natural

I. INTRODUCTION

Many thousands of years ago, folk herbal medicine was used to treat skin health problems. Even our biologically close relatives, the great apes, used herbs for self-treatment. Herbs have been used differently on different continents, depending on their availability. Recently, skin diseases have become a major concern due to their association with Human Immunodeficiency Virus and Acquired Immunity Deficiency Syndrome (HIV/AIDS). According to the World Health Organization, over 80% of individuals in developing countries rely on traditional medicine to meet their primary health needs. India is considered to be the botanical garden of the world, as it is home to the largest collection of medicinal herbs globally. In addition to being nontoxic and easily accessible, medicinal plants play a vital role for pharmacological research and drug development, but they are also used as therapeutic agents directly or as starting materials for the synthesis of drugs [1, 2].

Functions of the skin the main functions of the skin include 1. Protection of the human body 2. Sensation i.e. transmitting to the brain information about surroundings 3. Temperature regulation 4. Immunity i.e. the role of the skin within the immune system 5. Enables movement and growth without injury 6. Excretion from the body of certain types of waste materials 7. Endocrine function e.g. re. Vitamin D.

Skin Diseases

1) ATOPIC ECZEMA

Atopic eczema is the most common form of eczema and causes your skin to become itchy, red, dry, and cracked. This is a long-term condition for most people, although it may improve over time, especially in children. It can affect any part of the body, but usually affects, the backs or fronts of the knees, outside or inside the elbows, around the neck, hands, cheeks or scalp.

Aloe Vera

Common name: Aloe Sabar

Family: Xanthorrhoeaceae

Habit: Perennial herb

Parts used: Leaf gel

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Used in treatment of Skin diseases including eczema, irritation, burns, wounds, bruises, abrasions, psoriasis, cuts, scrapes, cold sores, sun buns, inflammation, hair loss, rejuvenating, complexion improvement, cosmetic uses, microbial skin diseases.

Since *A. vera* contains antifungal and antibacterial elements, its gel is applied directly on the eczematous skin, so the skin becomes softer and wounds heal rapidly. Many people reported decrease in eczema symptoms such as skin dryness, scaling and improved skin quality and also due to its antibacterial activity it prevent secondary infection.

Avena sativa

Common name: Oat, Shofan [3,4,5]

Family: Poaceae

Habit: Annual herb

Parts used: Colloidal oat extract, decoction

Used in treatment of Skin diseases including eczema, wounds, irritation, inflammation, erythema, burns, itching, sunburn.

Different clinical studies are undertaken to research the effect of oats on eczema and these have all showed a big decrease in skin redness, dryness, scaliness, itching and erythema after application of oat extracts. These results were observed in adults and children oat extracts. These results were observed in adults and children (Nebus et al., 2012). In vitro, a colloidal oat extract demonstrated anti-inflammatory activity – inhibited releasing of the arachidonic acid from phospholipids and therefore the subsequent metabolism into prostaglandin and leukotrienes. additionally, it inhibited the expression of phospholipase A2 (PLA2) and cyclooxygenase (COX-2) (Aries et al., 2003). A colloidal oat extract stimulated production of the anti-inflammatory transforming protein β 1 (TGF β 1) by keratinocytes, and inhibited production of interleukins [3, 4] (Aries et al., 1999).

Curcuma longa

Common name: Turmeric, Kurkum

Family: Zingiberaceae

Habit: Perennial herb

Parts used: Rhizome paste, powder

Used in treatment of Skin diseases including eczema, wounds, burns, cuts, chicken pox, shingles, allergy, scabies, sores, inflammation, microbial skin diseases, complexion improvement.

The active compound curcumin is supposed to have many biological effects including antiinflammatory, antioxidant, antitumour, antibacterial and antiviral activities, which show potential in clinical medicine (Aggarwal et al., 2007). It is generally used by people for eczema treatment. It appears that the active ingredient curcumin present in turmeric has anti-inflammatory and bactericidal properties, which may assist to treat skin inflammation linked with eczema [5, 6].

Matricaria chamomilla

Common name; Chamomile, Babunaj

Family: Asteraceae

Habit: Annual herb

Parts used: Flower extracts, decoctions, oil

Used in treatment of Skin diseases including eczema, wounds, itching, irritation, inflammation, allergic conditions, dermatitis, erythema, bacterial skin diseases, nappy rash, frostbite, cosmetics uses.

It is found to be efficient in wound healing and skin inflammatory conditions, consequently employed in allergic conditions, atopic eczema. Flowers are made into tea and liquid extracts, capsules and tablets. It's applied to skin by converting them into ointment or cream (Blumenthal et al., 2000). Aertgeerts et al. (1985) performed a clinical study in 161 skin disorder patients employing a cream made up of chamomile extract, in comparison with steroidal and non-

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steroidal creams, it had been equally effective as steroidal cream and a lot more effective than non-steroidal cream. *Chamaemelum nobilis* helps in skin cell regeneration.

2) PSORIASIS

Psoriasis is characterized by flaky red patches of skin coated with silver scales that occur on the elbows, knees, and lower back, and can be uncomfortable or painful and sore. Psoriasis can be a small annoyance for some people, but it can be a severe problem for others. It has a negative impact on their quality of life. Psoriasis patients frequently experience periods of no or minor symptoms. Many herbs can help with psoriasis symptoms by reducing inflammation or slowing the proliferation of skin cells.

Mahonia aquifolium

The flowering plant *Mahonia aquifolium* is derived from the mahonia shrub. Oregon grape is another name for it. [6,7,8] This herb has been used to treat inflammatory disorders like psoriasis in the past. Berberine, found in *Mahonia aquifolium*, may help to reduce some of the irritation caused by psoriasis. The plant also contains antiproliferative properties, which means it can halt the growth of cells.

Mahonia aquifolium has one of the strongest evidentiary bases, according to the National Center for Complementary and Integrative Health (NCCIH). All herbal cures for psoriasis are available from this reliable source [7, 8].

Several systematic reviews concur that *Mahonia aquifolium* can help treat the symptoms of psoriasis.

Indigo naturalis

Qing dai, also known as indigo naturalis, is a traditional Chinese herbal medication used to cure skin disorders. It is extracted from a range of plants, including *Baphicacanthus cusia*, by manufacturers. Recent clinical trials have suggested that the medication can help with psoriasis, and a comprehensive review published in 2015 [Complementary and alternative medicine for psoriasis: what the dermatologist needs to know], indicated that indigo naturalis, combined with *Mahonia aquifolium*, was an effective treatment for psoriasis.

In a recent study, 24 patients with mild psoriasis were given either indigo naturalis or a placebo for 8 weeks. People with psoriasis experienced much fewer symptoms after the experiment than those in the placebo group. They also showed reduced levels of interleukin-17 (IL-17), an inflammatory marker in psoriasis patients.

Aloe Vera

Antibacterial and anti-inflammatory effects are found in creams and gels containing Aloe vera extract. They may aid to calm the skin and prevent infection-causing bacteria.

According to the NCCIH, Aloe vera may assist with psoriasis, although there is less proof than for *Mahonia aquifolium* and indigo naturalis.

To treat psoriasis, use a topical aloe vera gel to the affected areas of the skin.

3) VITILIGO

Vitiligo is a skin condition that generates pale white patches on the skin that vary in size and can appear anywhere on the body.

They're more evident on parts like the face and hands that are exposed to sunlight, as well as on dark or tanned skin. Your hair may turn white if you have vitiligo on your scalp. Vitiligo is a chronic skin disorder. It's not contagious. Herbal medications of various natures and effects have been utilized for the treatment of vitiligo since ancient times.

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Ginkgo biloba

Ginkgo extracts have been demonstrated to be useful in the treatment of a variety of diseases, including allergies, varicose veins, premenstrual syndrome, headaches, vertigo, and more. Ginkgo extracts have also been utilised to treat vitiligo in recent years. The medicine is manufactured as a tablet with various dosages that must be taken orally once to three times daily for more than three months to be effective. [16,17]

Khellin

Khellin comes from the plant *Amni visnaga* and is a naturally occurring furanochromone. Since ancient Egyptian times, the plant has been utilised as a herbal medicine for various ailments (such as kidney illness, asthma, and others). Because of khellin's negative effects, such as liver [9,10,11] dysfunction and allergic reactions, analogues of khellin with safer profiles and higher efficacies have been developed. And have been used in medicine for the treatment of vitiligo for several decades, where they have shown to be effective when combined with UVA phototherapy. Despite the fact that the specific mechanism of action is unknown, khellin stimulates melanocyte proliferation and melanogenesis. Khellin can be used topically or systemically (oral dosing). The treatment consists of taking khellin gelatin capsules orally and then having the patient irradiated with UVA after about 2.5 hours. Two to three times a week, the therapeutic session is repeated. The treatment is completely risk-free [9, 10].

Green Tea Polyphenols

Green Tea polyphenols are compounds from green tea leaves that have been utilised in medicine since antiquity. Because of their high content of Epigallocatechin – 3 – gallate (EGCG), they have anti-inflammatory, anti-oxidant, and immunomodulatory properties. The medication can be used both systemically and topically. Recent research suggests that Green Tea polyphenols may be effective in the treatment of vitiligo by reducing oxidative stress in the melanocyte-unit.

Capsaicin

Capsaicin is an active ingredient found in chilli peppers, which belong to the genus *Capsicum*. The medication has been offered as a therapeutic strategy for vitiligo treatments due to its anti-inflammatory and antioxidant effects. An experimental investigation recently confirmed that incubating keratinocytes taken from a vitiliginous patient's perilesional skin with capsaicin prevented the cellular damage by ROS.

4) ACNE

Acne is a skin disorder that occurs when oil and dead skin cells clog your hair follicles. It causes pimples, whiteheads, and blackheads. Teenagers are the most affected by acne, yet it affects people of all ages. Although there are effective acne treatments available, acne can be stubborn. There are many different treatment regimens for acne vulgaris, but none of them are without side effects, and their specific role in therapy is unclear.

Azadirachta indica

The ethanol extracts of *Azadirachta indica*, *G. glabra*, *Andrographis paniculata*, *Ocimum sanctum*, and green tea were found to have the capacity to inhibit acne in a study on an anti-acne formulation made from herbal extracts. The anti-acne compound was found to be effective against *Propionibacterium acnes* and *Staphylococcus epidermis* in the recent investigation. Aqueous extracts of *Azadirachta indica* leaves have also been shown to be chemopreventive against skin cancer in mice. In compared to the control group, skin cancers have been observed to increase the expression of proliferating cell nuclear antigen.

Cannabis sativus

Acne rosacea, seborrheic dermatitis, eczema, dermatitis, psoriasis, and lichen planus can all be treated using *Cannabis sativus* seed oil. This plant's leaves powder can be used to treat wounds and sores. Externally, *cannabis sativus* extract can help reduce itching skin irritation. The seed oil protects the skin by strengthening it and making it more resistant to bacterial, fungal, and viral infections.

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Echinacea angustifolia and Echinacea purpurea

P. acnes, the major cause of acne vulgaris, has been demonstrated to be easily killed by Echinacea purpurea extract. P. acnes caused significant release of various pro-inflammatory cytokines, including IL-6 and IL-8, in cell culture models. The E. purpurea, on the other hand, was able to entirely reverse the effect on regular leaves. As a result, E. purpurea provided acne sufferers with a safe two-fold benefit by decreasing both bacterial-induced inflammation and organism development.

Rosmarinus officinalis

P. acnes, a type of bacteria that causes acne, has also been shown to be beneficial with Rosmarinus officinalis oil. The antibacterial capabilities of R. officinalis essential oil were tested against P. acnes in a study, and significant changes in the size and morphology of P. acnes were seen in response to treatment.

Melaleuca alternifolia

Tea tree oil applied topically in low doses offers anti-acne properties with few side effects. It works well in the treatment of persistent infected wounds and osteomyelitis [11, 12].

5) BASAL CELL CARCINOMA

Dome-like, pink or red, shining, and pearly patches that may have a sunk-in core, like a crater Raised, firm, and pale portions that may resemble a scar. Blood vessels visible on the growth ,Easy bleeding or leaking sore that doesn't seem to heal, or cures but resurfaces .

Basal cell carcinoma (BCC) is a kind of skin cancer that starts in the cells of the basal layer of the skin. The epidermis is lined by normal basal cells. Skin cells that replace old cells with new ones are known as keratinocytes. [12,13,14] Tumors on the skin's surface develop from cancer of the basal cells. Sores, growths, lumps, scars, or red patches are common symptoms of these tumours.

BCC seldom spreads to other parts of the body (metastasizes), yet it can still cause deformity. It can spread to other parts of the body in rare situations. It could become life-threatening if this happens. The most frequent type of skin cancer is BCC.

Turmeric

Turmeric is a herb or spice that has been utilised in natural medicine for hundreds of years. Turmeric is mentioned in ancient Ayurvedic treatments, and it is recognised to provide a variety of health benefits. Turmeric contains curcumin, a powerful antioxidant that aids in the prevention of malignant development Make a thick paste with turmeric and water and apply it to the affected region for around 20 minutes. Turmeric use has also been shown to boost immunity against all diseases.

Ginkgo Biloba

Ginkgo Biloba possesses anti-cancer qualities, according to an article published in the Journal of Food Science in the January 2008 issue, making it a holistic skin cancer remedy. Ginkgo Biloba herb comes in a variety of forms, including pills and extracts. This natural skin cancer treatment must be followed under the supervision of a herbalist and your doctor. Ginkgo Biloba seeds should not be eaten raw. Ginkgo Biloba may induce adverse effects such as headaches, nausea, and moderate gastrointestinal problems. Giddiness is also a possibility for some folks. Those with blood issues should avoid using Ginkgo Biloba since it raises the risk of severe bleeding.

Green Tea

Green tea is currently a popular antioxidant source. Green tea enhances DNA repair and may prevent non-melanoma skin cancer, according to an article published in Archives and Biochemistry and Biophysics in November 2010. This

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natural skin cancer treatment has numerous health benefits, and drinking two cups will only enhance your health and aid in the healing of skin cancer.

Flaxseeds

Flax seed powder and flax seed oil have already established themselves in a number of cuisines. Flaxseeds include fibre, lignans, vitamins, and omega 3 fatty acids, among other things. Lignans aid in the prevention of malignant cell spread.

Astragalus

This natural skin cancer treatment boosts immunity and aids in the fight against malignant cells in the body. It is a Chinese medicinal root that can be used to treat a variety of ailments.

6) MELASMA

Dark patches on the face, neck, chest, and arms are common symptoms of this skin disorder. Pregnant women (chloasma) and people with darker skin who have had a lot of sun exposure are more likely to have it. Additional than skin darkening, there are no other symptoms. It could fade away on its own in a year or it could become permanent.

Melasma is a pigmentary condition that affects women's faces and is divided into four types: centrofacial pattern, malar pattern, mandibular pattern, and mixed.

Aloe vera

Using a topical, liposome-encapsulated aloe vera preparation on pregnant women with melasma greatly improved their melasma, according to a 2017 study <https://pubmed.ncbi.nlm.nih.gov/28139161/>

7) HERPES SIMPLEX

Herpes is caused by the herpes simplex virus (HSV), which is also known as HSV. Herpes can affect any region of the body, however it most usually affects the genitals and mouth. The herpes simplex virus is divided into two types:

HSV-1 causes cold sores and fever blisters around the mouth and on the face, and is predominantly responsible for oral herpes.

HSV-2 It is predominantly responsible for genital herpes outbreaks and is the primary cause of genital herpes.

Lemon balm (*Melissa officinalis*) is a mint family member with a lemon fragrance. The chopped leaves can be steam-distilled to produce an essential oil. Treatment of herpes simplex and small wounds are two examples of topical applications. After using 1

Herbs have a lot of potential for treating a variety of skin conditions. In India, more than 80% of people rely on traditional medicine and employ a variety of plant-based medicines to treat skin disorders. They are relatively inexpensive when compared to conventional allopathic drugs and can be of tremendous benefit to India's population in general, and poor people specifically. Herbals are high in active components and can be a safer and more cost-effective treatment for skin conditions ranging from rashes to deadly skin cancer. Because more than half of the plant species effective for treating skin illnesses tend to be restricted to forests, deforestation, habitat degradation, urbanisation, and other human activities may pose a severe threat to these species. The necessity of the hour is to conserve these plants with the support of local involvement and to conduct comprehensive research in this area to widen the prospects of herbal medications in the treatment of skin diseases.

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II. DISCUSSION

Human skin, the outer covering of the body, is the largest organ in the body. It also constitutes the first line of defense. 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, the outer most layer of the skin, varies in thickness in different regions 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 [13,14,15] 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.

The skin guards the underlying muscles, bones, ligaments and internal organs. There are two general types of skin, hairy and glabrous skin.[1] However, the skin can be dry, sensitive, pale, sagging or tired. People deficient in essential nutrients such as beta-carotene, the B complex vitamins and vitamins C and E often suffer from the drying of the skin.

FUNCTIONS OF SKIN

Because it interfaces with the environment, skin plays a key role in protecting (the body) against pathogens.[2,3] and excessive water loss.[3] Its other functions are insulation, temperature regulation, sensation, storage and synthesis of vitamin D by action of ultraviolet (UV) and the protection of vitamin B folates, absorption of oxygen and drugs[4] and water resistance.[5] Severely damaged skin will try to heal by forming scar tissue. This is often discolored and depigmented.

COMMON SKIN PROBLEMS

Skin disease is a common ailment and it affects all ages from the neonate to the elderly and cause harm in number of ways.[1] There are more than a thousand conditions that may affect the skin but most skin diseases can be categorized into nine common types.[6]

Rashes

A rash is an area of red, inflamed skin or a group of individual spots. These can be caused by irritation, allergy, infection, an underlying disease, as well as by structural defects for example, blocked pores or malfunctioning oil glands. Examples of rashes include acne, dermatitis, eczema, hives, pityriasis rosea and psoriasis.

Viral infections

These occur when a virus penetrates the stratum corneum and infects the inner layers of the skin. Examples of viral skin infections include herpes simplex, shingles (herpes zoster) and warts. Some systemic viral infections, such as chicken pox and measles, may also affect the skin. Viral infections cannot be cured with antibiotics.

Bacterial infections

Such infections are caused by a variety of bacteria, the most common types being staphylococci and streptococci. Bacteria may infect the topmost layers of skin, the follicles, or the deeper layers of skin. If not treated correctly, these infections may spread throughout the body. Examples include impetigo, folliculitis, cellulitis and Lyme disease. Bacterial infections are better treated with antibiotics.

Fungal infections

Harmless fungi are always present on surface of the skin. Infection occurs when these organisms enter into the body. These infections are usually superficial, affecting the skin, hair, nails and include athlete's foot, lock itch and ringworm.

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However, in people with suppressed immune system or who have been taking antibiotics for long period -, the fungi may spread to deep within the body, causing more serious disease.

Parasitic infections

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

Pigmentation disorders

The amount of pigment in the skin is determined by the amount of melanin being produced by the body. Loss of pigment (hypo pigmentation) can be caused by absence of melanocytes, malfunctioning cells, exposure to cold or chemicals, or some types of infection. An increase in pigment (hyperpigmentation) may be caused by skin irritation, hormonal changes, aging, a metabolic disorder, or any other underlying problem. Age spots, freckles and melasma are examples of hyper pigmentation. Vitiligo is an example of hypo pigmentation.

Tumors and cancers

These growths arise when skin cells begin to multiply faster than normal. Not every skin growth is cancerous. Some tumors are harmless and will not spread. Skin cancer is the most common of all the cancers, affecting 800,000 Americans each year. It is caused, in 90% of cases, by sun exposure. The three types of skin cancers are basal cell cancer (the most curable), squamous cell cancer (which may grow and spread) and malignant melanoma (the most deadly form). Prevention involves protecting the skin against damaging ultraviolet rays. Early detection helps to improve the chances of a cure. Regular self-examinations are, therefore, recommended.

Trauma

Trauma describes an injury to the skin caused by a blow, a cut, or a burn. Whenever the surface of the skin is broken, the body becomes more susceptible to infection and disease.[15]

Other conditions

Wrinkles, rosacea, spider veins and varicose veins are among those conditions that cannot be neatly categorized. Wrinkles are caused by a breakdown of the collagen and elastin within the dermis, which results in sagging skin. Rosacea is a chronic disorder in which the skin of the face becomes red and develops pimples, lesions and more rarely enlargement of the nose. Its cause is unknown. Spider veins and varicose veins become apparent when blood vessels enlarge and become visible through the surface of the skin.

CONVENTIONAL TREATMENT OF SKIN DISEASES

The common medications for topical use include[7]:

- 1.Antibacterials: These medicines, like bactroban or cleocin, are often used to treat or prevent infection
- 2.Anthralin (drithocrema, micanol and others): Although not often used, these help to reduce inflammation and can help treat psoriasis
- 3.Antifungal agents: Lamisil, lotrimin and nizoral are few examples of common topical antifungal drugs used to treat skin conditions such as ringworm and athlete's foot
- 4.Benzoyl peroxide: Creams and other products containing benzoyl peroxide are used to treat acne
- 5.Coal tar: This topical treatment is available with and without a prescription, in strengths ranging from 0.5% to 5%. Coal tar is used to treat conditions including seborrheic dermatitis (usually in shampoos) or psoriasis. Currently, coal tar is seldom used because it can be slow acting and can cause severe staining of personal clothing and bedding
- 6.Corticosteroids: These are used to treat skin conditions including eczema and come in many forms including foams, lotions, ointments and creams
- 7.Retinoids: These medications (such as retin-A and tazorac) are gels or creams derived from vitamin A and are used to treat conditions including acne

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8. Salicylic acid: This medication is available in the form of lotions, gels, soaps, shampoos and patches. It should be used sparingly as putting too much on one's body at once can cause toxicity. Salicylic acid is the active ingredient in many skin care products for the treatment of acne and warts.

Oral treatments for skin conditions include:

1. Antibiotics: Oral antibiotics like erythromycin, tetracycline and dicloxacillin are used to treat many skin conditions
2. Antifungal agents: Common oral antifungal drugs such as ketoconazole and diflucan can be used to treat more severe fungal infections
3. Antiviral agents: Common antiviral agents include valtrex, acyclovir and famciclovir. Antiviral treatments are used for skin conditions including those related to herpes
4. Corticosteroids: These medications, including prednisone can be helpful in treating skin conditions linked to autoimmune diseases including vasculitis and inflammatory diseases such as eczema and psoriasis. Dermatologists prefer topical steroids to avoid side-effects; however, short-term use of prednisone is sometimes necessary
5. Immunosuppressants: Immunosuppressants, such as azathioprine and methotrexate, can be used to treat conditions including severe cases of psoriasis and eczema
6. Biologics: These new therapies are the latest methods being utilized to treat psoriasis and other conditions. Examples of biologics include enbrel, humira, remicade, stelara and amevive.

HERBAL DRUGS FOR SKIN DISEASES

Natural drugs from the plants are gaining popularity because of several advantages such as often having fewer side-effects, better patient tolerance, being relatively less expensive and acceptable due to a long history of use. Besides herbal medicines provide rational means for the treatment of many diseases that are obstinate and incurable in other systems of medicine. For these reasons several plants have been investigated for treatment of skin diseases ranging from itching to skin cancer. So far 31 plants have been reported to be effective in various skin diseases during the past 17 years (1995-2012) of research work, which are mentioned below.

Achyranthes aspera (Common name: Prickly chaff flower, Devil's horsewhip; Family: Amaranthaceae)[12]

Traditionally, the plant is used in boils, scabies and eruptions of skin and other skin diseases. The MeOH extract, alkaloid, non-alkaloid and saponin fractions obtained from the leaves of *A. aspera* exhibited significant inhibitory effects (concentration 100 µg) on the Epstein-Barr virus early antigen (EBV-EA) activation induced by the tumor promoter 12-O-tetradecanoylphorbol-13-acetate (TPA) in Raji cells. In this in vitro assay the non-alkaloid fraction containing mainly non-polar compounds showed the most significant inhibitory activity (96.9%; 60% viability). In the in vivo two-stage mouse skin carcinogenesis test the total methanolic extract possessed a pronounced ant carcinogenic effect (76%). The results revealed that leaf extract and the non-alkaloid fraction are valuable antitumor promoters in carcinogenesis.[8]

Allium cepa (Common name: Onion; Family: Liliaceae)

A study undertaken in patients with seborrheic keratoses to evaluate the ability of onion extract gel to improve the appearance of scars following excision, has shown that this extract gel improved scar softness, redness, texture and global appearance at the excision site at study weeks 4, 6 and 10 as assessed by the blinded investigator.[9]

In another study, the antifungal activity of aqueous extracts prepared from *A. cepa* (onion; AOE) and *Allium sativum* (garlic; AGE) were evaluated against *Malassezia furfur* (25 strains), *Candida albicans* (18 strains), other *Candida* sp. (12 strains) as well as 35 strains of various dermatophyte species. The results indicated that onion and garlic might be promising in treatment of fungal-associated diseases from important pathogenic genera like *Candida*, *Malassezia* and the dermatophytes.[10]

A. sativum (Common name: Garlic; Family: Liliaceae)

In a study conducted on Swiss albino mice in whom cancer was induced by 7,12-dimethylbenz(a)anthracene (DMBA) revealed that best chemo preventive action of garlic was observed in mice in which garlic treatment was performed before and after the induction of skin carcinogenesis. Garlic ingestion delayed formation of skin papillomas in animals

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and simultaneously decreased the size and number of papillomas, which was also reflected in the skin histology of the treated mice. The protective effect against skin cancer elicited by garlic in mice is believed to be due at least in part to the induction of cellular defense systems.[11]

Aloe vera (Common name: Barbados aloe; Family: Xanthorrhoeaceae)

Aloe vera has shown very good results in skin diseases and it is often taken as health drink. It is also found effective in treating wrinkles, stretch marks and pigmentations. It also seems to be able to speed wound healing by improving blood circulation through the area and preventing cell death around a wound. One of the studies conducted on mice to investigate the effects of *Scutellariae radix* and Aloe vera gel (AV), in spontaneous atopic dermatitis (AD)-like skin lesions revealed that the group receiving only AV in a dose of 0.8 mg/kg p.o provided relief in AD due to reduction of interleukin (IL)-5 and IL-10 levels.[12]

The gel has properties that are harmful to certain types of bacteria and fungi. A cream containing 0.5% aloe for 4 weeks reduced the skin “plaques” associated with psoriasis.[13] Application of gel helped in the improvement of partial thickness burns.[14] When applied to the skin, the gel seems to help skin survive frostbite injury.[15] It might delay the appearance of skin damage during and after radiation treatment.[16]

Azadirachta indica (Common name: Neem; Family: Meliaceae)

Leaf extract is applied externally on boils and blisters.[17] In one study, skin tumors were induced in mice by topical application of DMBA (500 nmol/100 µl for 2 weeks) followed by TPA (1.7 nmol/100 µl of acetone, twice weekly) as a promoter. The test group received aqueous *Azadirachta indica* leaf extract (AAILE) orally at a dose level of 300 mg/kg body weight three times a week for 20 weeks. The results of this study revealed the chemopreventive potential of *A. indica* against murine skin carcinogenesis.[18]

Study designed to determine the modulatory effect of aqueous AAILE on cell cycle-associated proteins during two-stage skin carcinogenesis in mice in which skin tumors were induced by topical application of DMBA as a carcinogen followed by the repetitive application of TPA as a promoter. Skin tumors obtained in the DMBA/TPA group exhibited enhanced expression of proliferating cell nuclear antigen (PCNA, index of proliferation), p21 and cyclin D1, with no alterations in p53 expression in comparison to the control group. Tumors in AAILE + DMBA/TPA group exhibited low PCNA and cyclin D1 expression and enhanced expression of p53 and p21 in comparison to the DMBA/TPA group. The skin tumors obtained in the AAILE + DMBA/TPA group exhibited high lipid peroxidation levels in comparison to the tumors obtained in the DMBA/TPA group. The observations of the study suggested that AAILE behaves as a pro-oxidant in the tumors, thereby rendering them susceptible to damage, which eventually culminates into its anti-neoplastic action. Also, cell cycle regulatory proteins may be modulated by AAILE and could affect the progression of cells through the cell cycle.[19]

Another study, conducted on an anti-acne moisturizer formulated from herbal crude extracts and investigated for the physico-chemical parameters as well as antibacterial activity of the formulation, revealed that ethanol extract of *Andrographis paniculata*, *Glycyrrhiza glabra*, *Ocimum sanctum*, *A. indica* and Green tea possessed the potential for inhibiting acne. It was observed that the optimal formula of anti-acne moisturizer was satisfactorily effective to control acne inducing bacteria i.e., *Staphylococcus epidermis* and *Propionibacterium*. [20]

Bauhinia variegata (Common name: Kachanar, Orchid tree, Camel's Foot Tree, Mountain Ebony; Family: Fabaceae)

The bark is internally administered for treating skin diseases, asthma, sore throat, diarrhea and abdominal discomfort and also applied externally for skin ulcers. In the skin papilloma model, significant prevention, with delayed appearance and reduction in the cumulative number of papillomas was observed in the DMBA + Kachanar + croton oil treated group as compared to the DMBA + croton oil group. C57 Bl mice which received a 50% methanolic extract of Kachanar extract at the doses of 500 and 1000 mg/kg body weight for 30 days showed increase in life span and tumor size was significantly reduced as compared to controls. In anti-mutagenic studies, a single application of Kachanar

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extract at doses of 300, 600 and 900 mg/kg dry weight, 24 h prior the i.p. administration of cyclophosphamide (at 50 mg/kg) significantly prevented micronucleus formation and chromosomal aberrations in bone marrow cells of mice, in a dose dependent manner.[21]

Beta vulgaris (Common name: Beetroot; Family: Brassicaceae)

The in vitro inhibitory effect of beet root extract on EBV-EA induction using Raji cells revealed a high order of activity compared to capsanthin, cranberry, red onion skin and short and long red bell peppers. An in vivo anti-tumor promoting activity evaluation against the mice skin and lung bioassays also revealed a significant tumor inhibitory effect. The combined findings suggest that beet-root ingestion can be one of the useful means to prevent cancer.[22]

Brassica oleraceae (Common name: Red Cabbage; Family: Brassicaceae)

Significant reduction of tumors was observed in mice in whom skin cancer was induced by a single topical application of 200 nmol of the initiator DMBA to their backs, followed 1 week later by promotion with 10 nmol of TPA twice weekly for 30 weeks followed by 0.1 g/L of aqueous extract of *B. oleraceae* 1 week after administration of initiator.[23]

Calendula officinalis (Common name: Marigold; Family: Asteraceae)

The flowers of marigold have long been employed in folk therapy and more than 35 properties have been attributed to decoctions and tinctures from the flowers. The main uses are as remedies for burns (including sunburns), bruises and cutaneous and internal inflammatory[13] diseases of several origins. Topical formulations containing marigold extract (ME), evaluated in hairless mice against UV-B irradiation-induced photo damage, revealed that application of ME in gel formulation, containing 0.21 µg/cm of narcissin and as 0.07 µg/cm of the rutin in the viable epidermis, were associated with a possible improvement in the collagen synthesis in the sub epidermal connective tissue.[24]

One of the experiments carried out in 34 patients with venous leg ulcers to determine the therapeutic efficacy of ME on the epithelialization of lower leg venous ulcers revealed significant acceleration of wound healing by producing epithelialization.[25] Research conducted on cream preparations containing seven different types of marigold and rosemary extracts, revealed that such creams are effective in experimentally induced irritant contact dermatitis when tested on healthy human volunteers.[26]

Camellia sinensis (Common name: Green tea, Chaay; Family: Theaceae)

Green tea comes from the tea plant *C. sinensis* and may play a beneficial role in treatment of skin tumours and cancer. It contains polyphenols, which act as antioxidants in the body. A specific polyphenol in Green tea called epigallocatechin gallate, according to the National Center for Complementary and Alternative Medicine, has been reported to prevent the onset of further growth of skin tumor in the body. It can rejuvenate old skin cells to start reproducing again, keeping the skin younger looking.[27]

Cannabis sativus (Common name: Charas, Ganja; Family: Cannabinaceae)

The powder of the leaves serves as a dressing for wounds and sores. Ganja is externally applied to relieve pain in itchy skin diseases. Hemp seed oil is useful for treatment of eczema and host of other skin diseases like dermatitis, seborrheic dermatitis/cradle cap, varicose eczema, psoriasis, lichen planus and acne roseacea. By using hemp seed oil, the skin is strengthened and made better able to resist bacterial, viral and fungal infections. Crushed leaves are rubbed on the affected areas to control scabies.[16]

Crocus sativus (Common name: Saffron; Family: Iridaceae)

Saffron is a naturally derived plant product that acts as an antispasmodic, diaphoretic, carminative, emmenagogic and sedative. The chemopreventive effect of aqueous saffron on chemically induced skin carcinogenesis using a histopathological approach was studied. Its ingestion inhibited the formation of skin papillomas in animals and simultaneously reduced their size. Saffron inhibited DMBA-induced skin carcinoma in mice when treated early. This

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may be due, at least in part, to the induction of cellular defense systems.[28] It has also been found useful in treatment of psoriasis.[29]

Curcuma longa (Common name: Turmeric; Family: Zingiberaceae)

A study conducted on male Swiss albino mice in whom skin cancer was induced by topical application of DMBA, revealed a significant reduction in number of tumors per mouse in the group receiving 1% curcumin obtained from rhizomes of *C. longa*. [30]

III. RESULTS

Daucus carota (Common name: Carrot; Family: Apiaceae)

A study, conducted to investigate the chemopreventive effects of oil extract of *D. carota* umbels on DMBA-induced skin cancer in mice for 20 weeks, revealed significant reduction in tumor incidence following administration via intraperitoneal (0.3 ml of 2% oil) and topical (0.2 ml of 5, 50 and 100% oil) but least with gavage (0.02 ml of 100% oil). [31]

Echinacea angustifolia, *Echinacea purpurea* (Common name: Purple cone flower; Family: Asteraceae) [14]

Echinacea has been applied to and used to treat skin problems such as skin boils, wounds, ulcers, burns, herpes, hemorrhoids and psoriasis. Forms of *Echinacea* include tablets, juice and tea. [27] A study conducted on patients to determine the effect of oral supplementation with a nutraceutical, containing methionine, *Echinacea*, zinc, probiotics and other antioxidant and immunostimulating compounds, on the response of cutaneous warts revealed a significant reduction of warts in such patients. [32]

The herbal extract of *E. purpurea* (*Echinaforce*®), readily killed a standard laboratory strain of *Propionibacterium acnes* (main cause of acne) and several clinical isolates. In cell culture models of human bronchial epithelial cells and skin fibroblasts, *P. acnes* induced the secretion of substantial amounts of several pro-inflammatory cytokines, including IL-6 and IL-8 (CXCL8), as determined by means of cytokine-antibody arrays. However, the *E. purpurea* completely reversed this effect and brought the cytokine levels back to normal. Thus *Echinaforce*® could provide a safe two-fold benefit to acne individuals by inhibiting proliferation of the organism and reversing the bacterial-induced inflammation. [33]

Eucalyptus globulus (Common name: Blue gum, Camphor oil; Family: Myrtaceae)

In a study conducted on humans it was revealed that human facial demodicidosis when treated with freshly prepared camphor oil with or without glycerol dilutions gave complete cure with concentrations of 100%, 75% and 50% respectively. [34] Study conducted on humans revealed that camphor oil with or without glycerol dilutions completely cured zoonotic scabies with concentrations of 100%, 75% and 50% within 5-10 days. [35]

Euphorbia walachii, *Euphorbia hirta*, *Euphorbia tirucalli* (Common name: Wallich spurge; Fam. Euphorbiaceae)

Juice of *E. walachii* is used to treat warts and skin infections. [36] A study, conducted on various species of *Euphorbia*, *E. hirta*, exhibited best antioxidant activity. The plant extracts showed more activity against Gram-positive bacteria and fungi. The best antimicrobial activity was shown by *E. tirucalli*. The study supported the folkloric use of *E. hirta* and *E. tirucalli* against some skin diseases caused by oxidative stress or by microorganisms. [37]

Ficus carica, *Ficus racemosa*, *Ficus bengalensis* (Common name: Fig; Family: Moraceae)

In some rural areas of Iran, a traditional method for the treatment of warts comprises the use of fig tree (*F. carica*) latex. A study conducted in patients with warts has revealed that this therapy of warts offers several beneficial effects including short-duration therapy, no reports of any side-effects, ease-of-use, patient compliance and a low recurrence rate. Although, exact mechanism of the antiwart activity of fig tree latex is unclear it is likely to be the result of the

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proteolytic activity of the latex enzymes.[38] *F. recemosa* L. bark powder is used externally in case of pimples, itches and scabies and *F. bengalensis* L. bark powder is also used externally to cure scabies.[17]

Lavendula officinalis (Common name: Lavender; Family: Labiatae)

The effects of lavender oil (1:500, 1:100, 1:10, 1:1, 1:0) on mast cell-mediated immediate-type allergic reactions in mice and rats have been studied. It has been reported to inhibit concentration-dependently the histamine release from the peritoneal mast cells. It also inhibits immediate-type allergic reactions by inhibition of mast cell degranulation in vivo and in vitro when tested on mice and rats.[39]

Lawsonia inermis (Common name: Henna; Family: Lythraceae)

Henna is a traditionally used plant of Middle-East that is applied on hands and feet. In the traditional system of medicine, leaf paste is applied twice a day, on the affected parts to cure impetigo.[40] In a study, clinical improvement in the patients suffering from hand and foot disease due to use of capecitabine, an anti-cancer drug, with use of henna revealed anti-inflammatory, antipyretic and analgesic effects of henna.[41]

Lycopersicon esculentum (Common name: Tomato; Family: Solanaceae)

A study conducted on healthy human volunteers using tomato paste (40 g), providing approximately 16 mg/d of lycopene, ingested with 10 g of olive oil over a period of 10 weeks has revealed that it is feasible to achieve protection against UV light-induced erythema by ingestion of a commonly consumed dietary source of lycopene.[42]

Another study conducted in healthy human volunteers using 55 g of tomato paste containing 16 mg of lycopene ingested with olive oil, also revealed that tomato paste containing lycopene provides protection against acute and potentially longer-term aspects of photo damage.[43]

Mangifera indica (Common name: Mango; Family: Anacardiaceae)

The gum is used in dressings for cracked feet and for scabies. Latex is applied to cure ulcers.[17] Aqueous extract of stem-bark (MIE, 50-800 mg/kg i.p.) produced a dose-dependent and significant ($P < 0.05-0.001$) anti-inflammatory effect against fresh egg albumin-induced paw edema in rats.[44]

Matricaria chamomile, *Matricaria recutita* or *Chamomilla recutita* (Common name: Chamomile; Family: Asteraceae)

It aids in skin cell regeneration and acts as an antioxidant, fighting free radical damage on the skin. Free radicals are a dangerous oxygen by-product of cellular metabolism. There have been allergies reported and those with daisy allergies may find themselves allergic to chamomile.[27] A controlled study of 161 individuals found chamomile cream equally effective as 0.25% hydrocortisone cream for the treatment of eczema.[45] In a double-blind study, chamomile cream proved less effective for reducing inflammation of the skin than hydrocortisone cream or witch hazel cream.[46]

Finally, in a single-blind trial, 50 women receiving radiation therapy for breast cancer were treated with either chamomile or placebo. Chamomile failed to prove superior to placebo for preventing skin inflammation caused by the radiation therapy.[47]

Mirabilis jalapa (Common name: Four o'clock flower, Marvel of Peru; Family: Nectaginaceae)

M. jalapa is used traditionally in allergic skin disorders and asthma. A study, employing ethanol: acetone (1:1) extract of the roots of *M. jalapa*, revealed that the extract (0.5 mL of 100 mg mL⁻¹) inhibited histamine-induced guinea pig tracheal chain contractions non-competitively. The extract (100 or 200 mg kg⁻¹ i.p.) inhibited milk-induced eosinophilia, albumin-induced paw edema and protected mast cells against clonidine-induced granulation justifying the folkloric use of *M. jalapa* in the treatment of allergic diseases and asthma.[48]

Momordica charantia (Common name: Bitter gourd; Family: Cucurbitaceae)

Topical application of the fruit extract of (100 µl/animal/day) during the peri-initiation stage (1 week before and 2 weeks after initiation) by DMBA and/or during the tumor promotion stage[15] reduced the (i) tumor burden to 4.26,

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3.72 and 3.11 (positive control value: 5.42); (ii) cumulative number of papillomas to 81, 67 and 53 (positive control value: 103); and (iii) percent incidence of mice bearing papillomas to 100, 94 and 94, respectively (positive control value: 100). In a comparison of the anticarcinogenic efficacy of Momordica peel, pulp, seed and whole fruit extract (100 µl/animal/day), after topical treatment during the peri-initiation and during the tumor promotion stage, revealed the modulation of the (i) tumor burden (tumors/mouse) to 3.06, 3.61, 3.17 and 3.11; (ii) cumulative number of papillomas to 49, 65, 54 and 53; and (iii) percent incidence of mice bearing papillomas to 84, 100, 94 and 94, respectively.[49]

Plumbago zeylanica (Common name: Doctor Bush; Family: Plumbaginaceae)

Whole plant is crushed with a pinch of salt and the paste is applied externally in case of ringworm.[17] A study conducted on plumbagin (5-hydroxy-2-methyl-1,4-naphthoquinone), a medicinal plant-derived naphthoquinone, isolated from the roots of the *P. zeylanica* revealed that topical application of plumbagin in mice inhibited UV induced development of squamous cell carcinomas.[50]

Portulaca oleraceae (Common name: Purslane, Pigweed, Little Hogweed; Family: Portulacaceae)

The herb possesses natural cooling properties that soothe the skin, relieving it of skin inflammations and rashes during scorching heat. Burns and skin eruptions like boils and carbuncles can be treated with an effective concoction of the leaves. Topical application of the aqueous extract on to the skin is effective as antibacterial and antifungal.[51] Externally it is used to treat burns, earache, insect stings, inflammations, skin sores, ulcers, pruritis (itching skin), eczema and abscesses which are usually treated with the fresh herb as a poultice or the expressed juice is used.[51] In Ghana, the leaves are ground, mixed with oil and tied on boils.[52] Sometimes in combination the leaves are also eaten with tiger nuts (*Cyperus esculentus*) as a remedy for skin diseases and chancres. Extract of this plant was also found to be effective in treatment of AD using hairless mice.[53]

Prunus persica (Common name: Peach; Family: Rosaceae)

Ethanol extract of the flowers (Ku-35) (50-200 µg/ml) were found to inhibit UVB and UVC induced deoxyribonucleic acid (DNA) damage by the COMET assay in the skin fibroblast cell (NIH/3T3). In addition, Ku-35 inhibited UVB-or UVC-induced lipid peroxidation, especially against UVB-induced peroxidation at higher than 10 µg/ml.[54]

Rosmarinus officinalis (Common name: Rosemary; Family: Labiatae)

Rosemary is a common household plant grown in many parts of the world. It is used for flavoring food, a beverage drink, as well as in cosmetics. The most important constituents of rosemary are caffeic acid and its derivatives such as rosmarinic acid. These compounds have antioxidant effect. Chronic UV exposure is responsible for long term clinical manifestations such as photo aging and photo-cancers. Aqueous extract of *R. officinalis* has been reported to be effective in preventing cutaneous photo damage induced by UV radiations.[55]

In another study, the antibacterial activity of rosemary essential oil against *P. acnes* was observed with atomic force microscopy (AFM). Significant changes in morphology and size of *P. acnes* were observed by AFM in response to essential oil treatment. Rosemary oil has also been seen to be effective against *P. acnes*, a bacterium causing acne.[56] Application of methanol extract of leaves of rosemary to mouse skin inhibited the covalent binding of benzo(a)pyrene [B(a)P] to epidermal DNA and inhibited tumor initiation by B(a)P and DMBA.[57]

Sarco asoca (Common name: Ashoka; Family: Caesalpinaceae)

Paste of the roots is useful in freckles and external inflammations, ulcers and skin diseases. It is used for itching in eczema, psoriasis, dermatitis and herpes-kushta/visarpa by rubbing the crushed flower on the skin. It is a favorite herb to relieve pruritis, scabies and tinea pedis. 50 g of the dried flowers of *S. asoca* and the leaves of *L. inermis* are boiled in coconut oil and the extract is externally applied twice a day to treat eczema and scabies. [11]A study revealed that pretreatment with the flavanoid fraction of *S. asoca* caused significant reduction in the number of tumors per mouse and

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the percentage of tumor-bearing mice. Furthermore, the latency period for the appearance of the first tumor was delayed by *S. asoca* pretreatment. A significant reduction in the expression of ornithine decarboxylase, a key enzyme in the promotion stage of 2-stage skin cancer, in the plant-treated group was also observed suggesting the chemopreventive activity of flavonoids from *S. asoca* on 2-stage skin carcinogenesis.[58]

Thyme vulgaris (Common name: Thyme; Family: Lamiaceae)

It may relieve the symptoms of cellulitis, an infection of the skin caused by bacteria which can lead to pain, tenderness, edema, fever, chills and reddening of the skin. It may also offer anti-fungal and antibacterial benefits. However, the University of Maryland Medical Center cautions that thyme has not been proven to specifically benefit cellulitis. In addition, this herb may raise the risk of bleeding.[27]

IV. CONCLUSION

Herbals have great potential to cure different kinds of skin diseases. More than 80% of people in India depend on traditional health care and use different plant based products for curing skin related problems. Compared with the conventional allopathic drugs, they have relatively low cost and can be of great benefit to the population of India in general and poor people in particular. Herbals are a rich source of active ingredients and can be safer and cost effective treatment for skin diseases ranging from rashes to dreadful skin cancer. More than 50% of plant species useful for treatment of skin diseases appear to be restricted to forests, so activities such as deforestation, habitat destruction, urbanization etc., may pose a serious threat to these species. Conservation of these plants with the help of local participation and carrying out of extensive research in this respect to broaden the prospects of herbal drugs in skin disease treatment is the need of the hour.[15]

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