

Dermal disorders and potential of herbal phytomedicines in their treatment

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ABSTRACT

The human skin is assumed to prevent the majority of infections that affect humans and are transmitted through the skin by acting as a first line of defence and barrier. Modern, allopathic, and natural therapy can all be used to achieve healthy skin. Healthy skin is the foundation of a healthy body. Skin cancer, eczema, herpes infection, fungal infection, anti-aging, itching, insect bites, pemphigus vulgaris, trauma, psoriasis, athlete's foot infections, rashes, skin pigmentation, acne, and major and small wound infections are the most prevalent skin conditions that impact humans. Skin infections can be treated with animal and plant-based treatments. Despite scientific and technological developments, the development of natural herbal therapies for treating skin diseases has become critical and vital component of treating skin disorders. Natural herbal remedies for treating skin illnesses have emerged as a fundamental and crucial component in the treatment of skin infections despite improvements in science and technology due to rising demand for herbal treatments, their cheaper cost, and the continuous detrimental effects of contemporary pharmaceuticals. Plant extracts and phytomedicines have made considerable advances in the treatment of human sickness in recent years. Herbal therapies are being employed as a primary treatment for a variety of ailments, such as cancer, cardiovascular disease, diabetes, and brain disorders. This has increased public awareness of the efficacy, safety, and purity of herbal drugs for health care management. A variety of medicinally efficient natural plants, For the treatment of dermatological issues, aloe, neem, licorice, tulsi, amla, papaya, ginger, and eucalyptus are beneficial and secure remedies. In comparison to modern and allopathic medicines, herbal pharmaceuticals and cosmetics such as creams, decocted extracts, serums, poultices, pastes, and lotions aid in the treatment of skin infections and diseases at a relatively lower cost with fewer side effects. This review article summarises the significance of herbal plants and some skin care

acids for protecting, treating, and minimising skin infections and diseases.

I. INTRODUCTION

Ayurveda, an ancient Indian medical system, helped herbal phytomedicines, or natural therapies, gain popularity in India. Due to deforestation and a lack of knowledge about their health benefits, herbal medicines' therapeutic potential is dwindling. There are many issues with dose-dependent side effects including toxicity in the present allopathic and modern medicine approaches [[1]].

The Indian system of medicine gains economically from the use of herbal plants. Nature has gifted us with a variety of environmental conditions and medicinally essential herbal phytomedicines that are effective in treating a wide range of diseases and disorders. Due to their improved capabilities and approval by humans with less negative impacts, herbal medications have recently become a backbone of healthcare [[2]].

In addition to the more popular herbs that have been identified to be effective in the treatment of skin - related problems, those herbal remedies that have clinical effectiveness proven by scientific research are included in this review. To help the doctors to decide which herbal medications they may choose to utilise in therapy, this chapter also describes information on each herb's efficacy. This topic also highlights typical drug interactions and herbal medicine adverse effects that may occur in a dermatology environment[[5]].

II. DERMATOLOGICAL DISORDERS:

Dermatologic conditions have been effectively treated using herbal medications, specifically those derived from plants . By addressing a variety of dermatological problems such eczema, herpes, fungal infections, anti-aging, itching, insect bites, pemphigus vulgaris, trauma, psoriasis, and athlete's foot infections, they considerably promote primary healthcare. Bacterial,

fungal, and viral development on the skin's surface causes skin infections. [[3], [4]].

1. Acne

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit because of its protracted course, pattern of recurrence and relapse, and signs including abrupt outbreaks or sluggish onset. The quality of life of those who suffer with acne is severely impacted in both the psychological and social realms..[[6], [7]]

Acne vulgaris, generally known as acne, is one of the most prevalent viral diseases that humans experience. Its distinctive characteristics include pinheads (papules), blackheads, whiteheads, enormous papules (nodules), varied regions of scaly red skin (seborrhea), pinheads (comedones), and occasionally scarring (pimples). Although it can sometimes be non-inflammatory, severe acne usually has an inflammatory component. Hair follicles and the sebaceous glands that are attached to them are among the skin structures that alter in acne, causing skin changes. Typically, androgen stimulation is necessary for these alterations [[8]]. Regardless of gender, acne vulgaris more frequently develops throughout puberty in adolescence and is typically caused by an increase in body androgens. Acne is typically visible on the face, upper chest, and back of individuals who produce more oil glands. [[9], [10]]

2. Atopic dermatitis

Mostly affecting young children, atopic dermatitis is a prevalent, recurrent, chronic, inflammatory skin condition. Atopy is defined as a genetic predisposition to produce immunoglobulin E (IgE) antibodies in response to very low concentrations of common environmental proteins like pollen, house dust mites, and food allergens. The words "derma" and "itis," which both signify inflammation in Greek, are the origins of the word "dermatitis." The terms eczema and dermatitis are frequently used interchangeably, however eczema (from the Greek ekzema, to boil over), which is used here, is occasionally reserved for the most extreme instance of the condition. Due to the fact that only around half of all patients with the condition have raised immunoglobulin E (IgE) levels and allergic sensitization, the label "atopic dermatitis" is not conclusive. [[11]]

3. **Alopecia:** Alopecia is a dermatological disorder characterized by the partial or complete loss of hair in certain areas of the body. It is a common condition that can affect both men and women of all ages.

There are several types of alopecia, each with its own unique characteristics and causes. Here are some of the most common types:

Androgenetic Alopecia: Also known as male or female pattern baldness, this is the most common form of alopecia. It is typically hereditary and occurs due to a combination of genetic and hormonal factors. In men, it often leads to a receding hairline and baldness at the crown of the head. In women, it can cause overall thinning of the hair.

Alopecia Areata: This type of alopecia involves the sudden onset of round patches of hair loss. It occurs when the immune system mistakenly attacks the hair follicles, resulting in hair loss. The exact cause is unknown, but it is thought to involve a combination of genetic and environmental factors. In some cases, alopecia areata can progress to total hair loss on the scalp (alopecia totalis) or the entire body (alopecia universalis).

Telogen Effluvium: This is a temporary form of hair loss that occurs when there is a disruption in the normal hair growth cycle. It can be triggered by factors such as physical or emotional stress, hormonal changes, nutritional deficiencies, medications, or certain medical conditions. Telogen effluvium usually causes diffuse hair shedding rather than distinct bald patches.

Traction Alopecia: This type of alopecia results from prolonged or repeated tension on the hair follicles. It commonly occurs due to hairstyles that pull the hair tightly, such as braids, ponytails, or cornrows. Traction alopecia is often preventable by avoiding hairstyles that exert excessive force on the hair.

Trichotillomania: This is a psychological disorder characterized by the urge to pull out one's own hair. It is often a response to stress, anxiety, or boredom. The hair pulling can lead to patchy hair loss or even complete baldness in severe cases.

Treatment options for alopecia depend on the type and severity of the condition. In some cases, hair may regrow naturally without treatment.

4. Burns

Burns are tissue injuries that are typically caused by high temperatures, electricity, chemicals, and radiation. High vulnerability to bacterial infections is a hallmark of burns. The depth and size of burns are used to categorize them. Based on the seriousness of the injury, there are four degrees. First-degree burns, commonly referred to as superficial burns, only affect the skin. Although they are characterised by redness, itching, and even discomfort, they frequently do not require medical attention. Deep partial-thickness burns and

superficial partial-thickness burns are the two subtypes of second-degree burns. A superficial partial-thickness burn covers the epidermis and a portion of the dermis. It typically shows up as blisters that are filled with serous fluid. It hurts and necessitates dressing the wound, although it typically does not leave scars. The epidermis and dermis are covered by a severe partial-thickness burn. Because the pain receptors have been damaged, it is deeper but typically less painful. It results in scarring and occasionally calls for surgery is involved. Third-degree burns, also referred to as full-thickness burns, include the entire skin. Due to the injury to the nerve endings, they are typically not painful. Additionally harmed are subcutaneous tissue and blood vessels. [[12]]

5. Actinic keratosis (AK): Actinic keratosis (AK) is a common dermatological disorder characterized by rough, scaly patches or lesions on the skin. It is caused by long-term exposure to ultraviolet (UV) radiation from the sun or artificial sources like tanning beds. AK typically occurs on areas of the body that are frequently exposed to the sun, such as the face, scalp, ears, hands, and forearms.

Appearance: Actinic keratosis lesions often appear as small, red, or pink patches on the skin. They can feel rough or gritty, and may be flat or slightly raised. Over time, they may become thicker and develop a yellow or brown crust.

Risk Factors: Prolonged and repeated exposure to sunlight is the primary risk factor for developing actinic keratosis. Fair-skinned individuals, those with a history of frequent sunburns, and people with a weakened immune system are more prone to developing AK.

Pre-cancerous Condition: Actinic keratosis is considered a pre-cancerous condition because a small percentage of lesions can progress to squamous cell carcinoma, a type of skin cancer. However, not all actinic keratoses will progress to cancer, and it is difficult to predict which ones will. It is important to treat and monitor AK to reduce the risk of progression to skin cancer.

Diagnosis: Dermatologists typically diagnose actinic keratosis through a visual examination of the skin. In some cases, a biopsy may be performed to confirm the diagnosis or evaluate any suspicious lesions.

Treatment: The main goal of treating actinic keratosis is to remove or destroy the affected lesions to prevent progression to skin cancer.

Topical Medications: Prescription creams or gels containing ingredients such as 5-fluorouracil, imiquimod, diclofenac, or ingenol mebutate can be

applied directly to the lesions to promote their removal.

Cryotherapy: Liquid nitrogen is used to freeze and destroy the lesions.

Curettage and Electrodesiccation: The lesions are scraped off using a curette and heat is applied to destroy any remaining abnormal cells.

Photodynamic Therapy: A photosensitizing agent is applied to the skin, followed by exposure to a specific type of light that activates the agent and destroys the AK cells.

Laser Therapy: Laser treatment can be used to remove or destroy actinic keratosis lesions.

Prevention: Protecting the skin from excessive sun exposure is the best way to prevent actinic keratosis.

6. Cold Sores

Cold sores, commonly called as the herpes simplex labialis (HSL), are a frequent condition of the lips brought on by the herpes simplex virus, which can be found anywhere in the world. It manifests as a painful vesicular eruption with unattractive crusts that lead to psychosocial anguish and cosmetic deformity. [[13]]

In the case that you come into contact with someone's active sore, the virus may enter your body through a minute skin break. The virus remains in the body of an infected individual for the rest of their lives. This condition cannot be cured. [[14]]

7. Eczema

Eczema is a dermal disorder in which skin lesions start out rough, dry, and breaking. Blebs can also be caused by some categories. Eczema is typically a chronic, infectious skin condition. An extremely itchy rash is this inflammatory disease's primary symptom. Eczema cannot often be cured, but it can be controlled with regular medical attention and a well-thought-out treatment strategy. Avoiding stress, harm, and items that trigger allergic reactions can help prevent some types of eczema. [[15]]

Complications from eczema could include a subsequent infection of the eczema dermatitis caused by bacteria or fungi. [[16]]

8. Furuncles

A furuncle may start as a benign-appearing protrusion on your skin, similar to a zit. The boil may, however, become painful and hard as the illness worsens. Your body's attempt to combat the illness is evident in the boil's presence of pus. The furuncle may break and expel its fluids as a result of pressure building up. [[17]]

9. Skin pigmentation: Pigmentation disorders refer to conditions that affect the coloration of the skin. These disorders can result in abnormal darkening or lightening of the skin or the appearance of patches with different pigmentation. While some cases may be caused by external factors or underlying medical conditions, others are primarily genetic in nature.

Vitiligo: Vitiligo is an autoimmune disorder where the immune system mistakenly attacks and destroys the melanocytes, which are the cells responsible for producing the pigment melanin. This leads to the development of white patches on the skin.

Melasma: Melasma is a common skin condition that causes brown or gray-brown patches to appear on the face, particularly on the cheeks, forehead, and upper lip. It is often associated with hormonal changes, such as during pregnancy or while taking birth control pills.

Albinism: Albinism is an inherited disorder characterized by a lack of melanin production in the skin, hair, and eyes. This results in very light or white skin, light-colored hair, and often vision problems.

Hyperpigmentation: Hyperpigmentation refers to the darkening of patches of skin due to increased melanin production. It can be caused by various factors, including sun exposure, hormonal changes, certain medications, and skin inflammation.

Hypopigmentation: Hypopigmentation is the opposite of hyperpigmentation and refers to the lightening of patches of skin due to decreased melanin production. It can be caused by genetic factors, certain skin conditions, or trauma to the skin, such as burns or injuries.

10. Sunburn: Sunburn is not typically classified as a dermal disorder but rather as a skin condition resulting from excessive exposure to ultraviolet (UV) radiation from the sun or artificial sources like tanning beds. It is considered a form of radiation burn.

When the skin is exposed to excessive UV radiation, it causes damage to the skin cells and triggers an inflammatory response. The severity of a sunburn can range from mild redness and tenderness to more severe symptoms like blistering, peeling, and pain. In severe cases, it can even lead to systemic symptoms such as fever, chills, and nausea.

Repeated sunburns over time can increase the risk of developing long-term skin damage, including premature aging, wrinkles, and an increased risk of skin cancer. Chronic sun exposure without proper protection can also lead to other dermal disorders like actinic keratosis (precancerous skin lesions) and photoaging.

Preventing sunburn is crucial for maintaining healthy skin. This can be achieved by taking measures such as limiting sun exposure during peak hours, wearing protective clothing and hats, seeking shade, and applying sunscreen with a high sun protection factor (SPF) regularly.

11. Scabies

The parasite *Sarcoptes scabiei* var. *hominis* is the source of human scabies. The tiny mite infests the skin, burrows within, and lays eggs. This triggers the host's immune system to overreact, resulting in a rash and severe itching. Infection from bacteria may exacerbate a scabies infestation that results in skin lesions. These sores could subsequently develop into more severe illnesses like septicemia, heart disease, and chronic kidney disease.0 [[18]]

The widespread infection known as human scabies has a variety of effects and presentations depending on the clinical setting. Health care facility and residential home epidemics provide a barrier to the provision of social and health care in developed, high-income environments. The long-term health of communities is significantly impacted in resource-limited settings by the long-term effects of scratching-induced staphylococcal and streptococcal bacteremia. [[19]]

The two main methods that scabies is transmitted (fomites) are through skin-to-skin contact and through indirect contact with contaminated things. Many people with this ailment have relatively mild symptoms, making diagnosis difficult. The classic history of exposure, severe pruritis that worsens at night, and mention of other people who have experienced a similar set of symptoms may be present in other patients, though. [[20]]

12. Bacterial and fungal infections are common dermatological disorders that affect the skin. Infections caused by bacteria respond better to antibiotic treatment. [[30]] Let's take a closer look at each of these types of infections:

Bacterial Skin Infections:

Impetigo: This contagious infection is caused by *Staphylococcus aureus* or *Streptococcus pyogenes* bacteria. It results in red sores or blisters that rupture and develop a honey-colored crust.

Cellulitis: Typically caused by *Streptococcus* or *Staphylococcus* bacteria, cellulitis is an infection that affects the deeper layers of the skin, causing redness, warmth, and swelling. Cellulitis is a prime example of this type of infection. [[29]]

Folliculitis: This infection occurs when hair follicles become inflamed due to bacteria such as

Staphylococcus aureus. It leads to small, red bumps or pustules around the hair follicles.

Boils: Boils are painful, pus-filled bumps that form beneath the skin. They are usually caused by Staphylococcus aureus bacteria and may require medical attention.

Erysipelas: It is a bacterial skin infection typically caused by Streptococcus pyogenes. It results in a raised, red rash with well-defined borders, often on the face or legs.

Fungal Skin Infections:

Ringworm: Despite its name, ringworm is caused by a fungus, not a worm. It leads to a circular, red rash with raised edges and clear skin in the centre.

Athlete's foot: This fungal infection affects the feet, particularly the spaces between the toes. It causes itching, peeling skin, and sometimes blisters.

Candidiasis: Caused by the Candida fungus, this infection commonly affects moist areas of the skin, such as the groin, armpits, and under the breasts. It can cause a red, itchy rash with satellite lesions.

Tinea versicolor: This condition is caused by an overgrowth of the yeast Malassezia on the skin. It results in patches of discoloured skin, usually lighter or darker than the surrounding skin.

Nail fungus: Fungal infection can affect the nails, causing them to become thick, discoloured, and brittle.

Treatment for bacterial and fungal skin infections may involve topical or oral medications, depending on the severity and type of infection.

13. Rosacea: This is a chronic inflammatory skin condition that primarily affects the face. It is characterized by redness, flushing, visible blood vessels, and in some cases, the development of pimples or bumps on the skin. Rosacea most commonly occurs in adults between the ages of 30 and 50 and is more prevalent in fair-skinned individuals, although it can affect people of any skin type or colour.

The exact cause of rosacea is unknown, but several factors are believed to contribute to its development. These include genetics, abnormalities in the immune system, abnormalities in the blood vessels of the face, and certain environmental triggers. Common triggers for rosacea flare-ups include sun exposure, hot or cold weather, spicy foods, alcohol, stress, and certain skincare products.

The symptoms of rosacea can vary from person to person and can range from mild to severe. The primary symptom is persistent facial redness, particularly on the cheeks, nose, forehead, and chin. This redness may come and go, but in some cases, it can become permanent. Other symptoms may

include flushing or blushing easily, the appearance of small blood vessels on the face (telangiectasia), pimples or bumps resembling acne (papulopustular rosacea), and in more advanced cases, thickening of the skin on the nose (rhinophyma).

While there is no cure for rosacea, there are several treatment options available to manage its symptoms and minimize flare-ups. These include topical medications (such as metronidazole or azelaic acid), oral antibiotics (such as doxycycline or minocycline) for their anti-inflammatory effects, and in severe cases, isotretinoin (a powerful acne medication). Additionally, dermatologists may recommend lifestyle modifications and avoidance of triggers, such as protecting the skin from sun exposure, using gentle skincare products, and managing stress levels.

14. Warts /viral infection

The mucosa and skin can develop warts, the benign lesions of which. Warts are brought on by the more than 100 different varieties of the human papillomavirus (HPV). A HPV outbreak could occur anywhere. The most common symptoms and indicators of HPV infection are plantar cysts, localised epithelial hyperplasia, epidermodysplasia verruciformis, deep palmoplantar warts (Myrmecia), vaginal warts, flat warts, common warts, and vaginal and flat warts. Warts can spread by direct or indirect touch. Wart development is more likely to occur under situations that interfere with the regular epithelial barrier. [[21], [22]]

15. Chronic venous insufficiency (CVI): CVI is not primarily a dermatological disorder, but rather a condition affecting the veins in the lower extremities. However, it can manifest with dermatological symptoms and complications. CVI occurs when the veins in the legs have difficulty returning blood to the heart, leading to blood pooling and increased pressure in the veins. This can cause a range of symptoms, including:

Skin changes: CVI can result in various skin manifestations. The affected skin may become discoloured, usually with a brownish or reddish hue. It can also appear mottled or have a leathery texture. In severe cases, the skin may develop ulcers or open sores, known as venous ulcers.

Oedema: Swelling in the legs and ankles, known as oedema, is a common symptom of CVI. It occurs due to fluid retention caused by the impaired venous circulation.

Varicose veins: CVI is often associated with the development of varicose veins. These are enlarged,

twisted veins that are visible beneath the skin and are caused by the weakened valves within the veins.

Itching and dryness: The affected skin may become dry and itchy. Scratching can further damage the skin, leading to the development of sores or infections.

Lipodermatosclerosis: In some cases, CVI can lead to a condition called lipodermatosclerosis, which involves inflammation and hardening of the subcutaneous fat tissue in the lower legs. This can cause pain, thickened skin, and a woody appearance.

16. Psychosomatic refers to the interaction between the mind and the body, where psychological factors can influence physical symptoms or conditions. While psychosomatic conditions are typically associated with internal bodily processes, such as headaches or gastrointestinal issues, they can also manifest as dermatological disorders.

Psychosomatic dermal disorders, also known as psych cutaneous disorders, are skin conditions that have a significant psychological or emotional component. The underlying emotional distress can trigger or exacerbate these conditions, although they may also have other contributing factors.

17. Herpes simplex virus: Herpes simplex is a viral infection caused by the herpes simplex virus (HSV). While it primarily affects the mucous membranes and genitals, it can also manifest as a dermatological disorder. There are two types of herpes simplex virus: HSV-1, which typically causes oral herpes (cold sores), and HSV-2, which usually causes genital herpes.

When herpes simplex virus infects the skin, it results in a range of dermatological manifestations, including:

Cold sores (Herpes labialis): These are small, painful blisters or sores that typically appear on or around the lips, mouth, or nose. Cold sores can also occur on the chin, cheeks, or inside the nostrils. They may break open, ooze fluid, and form a crust before healing.

Herpetic Whitlow: This is a painful infection of the fingers or hands caused by direct contact with HSV. It can occur in healthcare workers, individuals who engage in oral-genital contact, or people with active oral or genital herpes. Herpetic whitlow results in swollen, red, and painful blisters on the fingers or hands.

Herpes Gladiatorum: This is a herpes simplex infection common among athletes involved in contact sports like wrestling. It presents as clusters of painful blisters or ulcers on the skin, often on the face, neck, shoulders, or arms.

Eczema Herpeticum: This is a rare but serious complication that occurs when herpes simplex virus infects areas of pre-existing eczema or dermatitis. It leads to a widespread eruption of painful and rapidly-spreading blisters, often accompanied by systemic symptoms such as fever and malaise.

Herpes Simplex Gingivostomatitis: In children, primary infection with HSV-1 can cause inflammation of the gums and mouth, resulting in painful ulcers and blisters. It may be associated with fever, difficulty eating or drinking, and swollen lymph nodes

18. Herpes zoster/ Shingles : **Herpes zoster** commonly known as shingles, is a dermatological disorder caused by the varicella-zoster virus (VZV). This virus is the same one responsible for causing chickenpox (varicella) during childhood. After a person recovers from chickenpox, the virus remains dormant in the sensory nerve cells near the spinal cord and can reactivate later in life, leading to the development of herpes zoster.

Herpes zoster primarily affects the skin and nerves, resulting in a painful rash that typically appears as a band or stripe on one side of the body. The most common location for the rash is the chest or abdomen, but it can also occur on the face, neck, or other parts of the body. The rash consists of small, fluid-filled blisters that gradually crust over and heal within a few weeks.

The main symptom of herpes zoster is pain, which can be severe and persistent. It is often described as a burning or shooting pain that precedes the appearance of the rash. Other common symptoms include itching, tingling, and sensitivity to touch in the affected area. Some individuals may also experience fever, headache, fatigue, and general malaise.

Herpes zoster is more common in older adults and individuals with weakened immune systems. Factors that can increase the risk of developing the condition include advanced age, stress, certain medical conditions (such as cancer or HIV/AIDS), and the use of immunosuppressive medications.

The treatment of herpes zoster focuses on relieving symptoms, reducing pain, and promoting healing. Antiviral medications, such as acyclovir, famciclovir, or valacyclovir, are often prescribed to reduce the duration and severity of the infection. Pain medications, topical creams, and antihistamines may also be used to manage discomfort and itching. In some cases, corticosteroids may be prescribed to reduce inflammation and nerve-related pain.

Shingles vaccine or Zostavax is used to treat herpes zoster. In recent years, a newer and more effective vaccine called Shingrix has been developed and recommended for adults aged 50 and older. Vaccination is an important preventive measure, especially for individuals at higher risk of complications from herpes zoster.

19. Tumour

Lack of melanin leads to an auto-immune condition like vitiligo, which in turn causes skin cancer. In albinism, a hereditary disorder caused by a lack of melanin cells, subsequent UV radiation exposure results in skin cancer, and early discovery may increase the likelihood of patient survival and cure.[[4]]

20. Hives/Urticaria: Hives is also called urticaria, is a common dermatological disorder characterized by raised, itchy, and often red welts or bumps on the skin. These welts, known as wheals, can vary in size and shape and may appear anywhere on the body. Hives can be acute or chronic, depending on the duration of the condition.

Acute hives typically last for less than six weeks and are often caused by an allergic reaction to certain foods, medications, insect bites, or environmental factors such as pollen or animal dander. In some cases, acute hives may be triggered by infections, such as viral or bacterial infections.

Chronic hives, on the other hand, persist for longer than six weeks and their cause is often more difficult to determine. While allergic reactions can still be a factor, other underlying conditions or triggers may be involved, such as autoimmune disorders, hormonal changes, stress, or even unknown causes. The main symptom of hives is the appearance of raised wheals on the skin that are typically red or pink and surrounded by an area of inflammation. The welts can be small or large and may merge together, forming larger areas of swelling. They are usually accompanied by intense itching or a burning sensation.

The treatment of hives depends on the underlying cause and the severity of the symptoms. In mild cases, over-the-counter antihistamines may help alleviate itching and reduce the appearance of hives. For more severe or persistent cases, prescription-strength antihistamines, corticosteroids, or other medications that modulate the immune system may be prescribed by a healthcare professional.

Additionally, it is important to identify and avoid triggers that may be causing or exacerbating the hives.

21. Pruritus/Itching: Pruritus commonly known as itching, is an unpleasant sensation that prompts the

desire to scratch the affected area. It can occur on the skin or mucous membranes throughout the body and may vary in intensity and duration. Pruritus can be acute or chronic and is often a symptom of an underlying condition rather than a standalone disorder.

There are numerous potential causes of pruritus, including:

Skin conditions: Conditions like eczema, psoriasis, dermatitis, hives (urticaria), or fungal infections can cause itching.

Allergies: Allergic reactions to certain substances, such as pollen, animal dander, or certain foods, can lead to itching.

Dry skin: Dryness of the skin, particularly during colder months or in dry climates, can cause itching.

Insect bites and stings: Mosquito bites, bee stings, or other insect bites can cause localized itching.

Systemic diseases: Pruritus can be associated with certain medical conditions, such as liver disease (cholestasis), kidney disease, thyroid disorders, or certain cancers.

Nerve-related conditions: Conditions like shingles (herpes zoster) or neuropathy (nerve damage) can lead to itching.

Psychological factors: Emotional stress or anxiety can exacerbate itching or make it more noticeable.

22. Hyperhidrosis is indeed a dermatological disorder characterized by excessive sweating that goes beyond what is necessary to regulate body temperature. It is a condition that affects both men and women and can occur at any age. Hyperhidrosis can be classified into two main types: primary hyperhidrosis and secondary hyperhidrosis.

Primary Hyperhidrosis: This form of hyperhidrosis occurs without an identifiable cause and is thought to be due to overactive sweat glands. It often begins in childhood or adolescence and tends to affect specific areas of the body, such as the palms of the hands, soles of the feet, underarms, or face. Primary hyperhidrosis is usually symmetrical, meaning it affects both sides of the body equally. Sweating is often triggered by emotional stimuli or temperature changes and can be disruptive to daily life.

Secondary Hyperhidrosis: Secondary hyperhidrosis is caused by an underlying medical condition or external factor. It can occur at any age and usually involves generalized sweating, affecting larger areas of the body. Some possible causes of secondary hyperhidrosis include hormonal imbalances, certain medications, infections, neurological disorders, and systemic diseases.

Treatment options for hyperhidrosis vary depending on the severity and underlying cause of the condition. They can include:

Topical Antiperspirants: Over-the-counter or prescription-strength antiperspirants containing aluminum chloride can be applied to the affected areas to reduce sweating.

Medications: Oral medications like anticholinergics may be prescribed to block the chemical signals that stimulate sweat glands. However, these medications may have side effects and are typically used for generalized sweating.

Botulinum Toxin (Botox) Injections: Botox injections can temporarily block the nerves that trigger sweat production. This treatment is commonly used for focal sweating, such as in the underarms or palms.

Iontophoresis: This procedure involves passing a mild electric current through water or a wet pad to the affected areas, such as the hands or feet. It can temporarily reduce sweating in those areas.

Surgical Options: In severe cases, surgical interventions may be considered. Procedures like sympathectomy involve cutting or clamping the nerves that stimulate sweat production.

23. Wounds

Physiologically, skin integrity is restored as part of the wound healing process, which repairs the injured tissue. Injuries to the skin's anatomy and physiology result from wounds that are created by the opening or rupture of skin. Skin wounds cause the epithelium to lose consciousness, whether or not underlying connective tissue is also lost. [[23]]

There are a lot more stages involved in wound healing than the conventional four of homeostasis, inflammation, proliferation, and remodeling. A new mediator is purportedly identified every year that has an external or intrinsic effect on the healing process of wounds. [[24]]

24. Impetigo: Impetigo is a common and highly contagious bacterial skin infection that primarily affects children, although it can occur in individuals of any age. It is caused by bacteria, usually either *Staphylococcus aureus* or *Streptococcus pyogenes* (group A Streptococcus). These bacteria can enter the body through a break in the skin, such as a cut, scrape, or insect bite, and cause an infection.

The characteristic symptoms of impetigo include red sores or blisters that can rupture and ooze fluid, forming a yellowish-brown crust. The sores are usually itchy and commonly appear on the face, particularly around the mouth and nose, but they can also occur on other parts of the body. Impetigo is

typically more common in warm and humid climates or during the summer months when bacteria thrive.

There are two main types of impetigo:

Non-bullous impetigo: This is the most common form and is characterized by the formation of small red sores that eventually burst and form a honey-colored crust.

Bullous impetigo: This form is less common and is characterized by larger fluid-filled blisters that can be painful and eventually rupture, leaving a thin, fragile skin surface.

Impetigo is highly contagious and can spread through direct contact with an infected person or by touching contaminated items such as towels, clothing, or bedding. Scratching the sores and then touching other parts of the body can also spread the infection.

Treatment for impetigo typically involves topical or oral antibiotics to eliminate the bacteria causing the infection.

25. Raynaud's phenomenon: Raynaud's phenomenon also known as Raynaud's disease or Raynaud's syndrome, is a vascular disorder that primarily affects the blood vessels in the fingers and toes. Although it is primarily considered a vascular disorder, it can have dermatological manifestations as well.

In Raynaud's phenomenon, the blood vessels in the affected areas, typically the fingers and toes, constrict excessively in response to cold temperatures or emotional stress. This constriction of the blood vessels limits blood flow to the extremities, leading to characteristic colour changes in the skin.

During an episode of Raynaud's phenomenon, the affected digits may first turn white (pallor) due to the lack of blood flow. As the episode progresses, the digits may then turn blue or purple (cyanosis) due to decreased oxygen supply. Finally, as blood flow returns, the digits may turn red (rubor) and become warm, often accompanied by a tingling or throbbing sensation.

These colour changes in the skin are a result of the disrupted blood flow to the area. The lack of oxygen and nutrients reaching the skin can cause it to become pale or discoloured. In severe cases, recurrent episodes of Raynaud's phenomenon can lead to skin ulcerations, digital ischemia (tissue damage due to insufficient blood supply), or even gangrene.

Raynaud's phenomenon can occur as a primary condition (Raynaud's disease) without any underlying medical condition, or it can be secondary to other conditions such as autoimmune disorders

(e.g., systemic lupus erythematosus), connective tissue diseases (e.g., scleroderma), or certain medications.

26. Scleroderma/Systemic sclerosis: Scleroderma is a chronic autoimmune disorder that affects the connective tissues, including the skin. While it primarily manifests as a systemic disease involving multiple organs, it has distinct dermatological features and is considered one of the major dermatological disorders.

In scleroderma, the body's immune system mistakenly attacks healthy tissues, leading to excessive production and accumulation of collagen, a protein that forms the connective tissues. This abnormal collagen buildup causes thickening and hardening of the skin and other affected organs, leading to various symptoms and complications.

Dermatological manifestations of scleroderma can vary widely among individuals, but they typically include:

Skin Tightening: Scleroderma often leads to skin tightening, particularly in the fingers, hands, face, and arms. The skin may become stiff, hard, and shiny. In severe cases, it can restrict joint mobility.

Raynaud's Phenomenon: This condition frequently accompanies scleroderma and involves exaggerated vasospasms of the small blood vessels in response to cold temperatures or stress. It causes colour changes in the skin, primarily in the fingers and toes, ranging from white to blue to red. Raynaud's phenomenon can be painful and may lead to ulcerations or sores in severe cases.

Calcinosis: Calcium deposits can form in the skin, particularly in the fingers and hands. These deposits can cause small, hard nodules under the skin's surface.

Telangiectasia: Small dilated blood vessels can appear on the skin, commonly on the face, hands, and mucous membranes. These vessels may look like red or purple clusters or streaks.

Digital Ulcers: Due to compromised blood flow and reduced tissue perfusion, ulcerations can develop on the fingers or toes. These ulcers are painful and slow to heal.

Skin Discoloration: The affected skin may become lighter or darker than the surrounding skin.

Facial Changes: Scleroderma can cause facial changes, such as tightening of the skin around the mouth, resulting in a thinning or beak-like appearance. The skin may also become taut over the forehead.

It's important to note that scleroderma can affect internal organs, such as the lungs, heart, kidneys, and gastrointestinal tract, in addition to the skin.

Therefore, a comprehensive evaluation by a rheumatologist or dermatologist is essential for accurate diagnosis, monitoring, and management of the condition.

Treatment for scleroderma aims to control symptoms, slow disease progression, and prevent complications. It typically involves a multidisciplinary approach that may include medications to suppress the immune system, manage symptoms, and improve blood circulation. Physical and occupational therapy, as well as lifestyle modifications, are often recommended to maintain joint mobility.

27. Hidradenitis suppurativa (HS): Hidradenitis suppurativa **also** known as acne inversa, is a chronic inflammatory skin condition. It primarily affects areas of the body with apocrine sweat glands, such as the armpits, groin, and buttocks. HS is characterized by the formation of painful, recurrent nodules, abscesses, and sinus tracts in the affected areas.

The exact cause of hidradenitis suppurativa is not fully understood, but it is believed to involve a combination of genetic and environmental factors. Hormonal imbalances, immune system dysfunction, and follicular occlusion are thought to play a role in the development of HS. Risk factors for the condition include family history, smoking, obesity, and certain hormonal disorders.

The symptoms of hidradenitis suppurativa can vary in severity. Early-stage HS typically presents as painful, tender bumps or boils that may rupture and form abscesses. Over time, the affected areas may develop chronic sinus tracts, leading to the formation of interconnected tunnels under the skin. These tunnels can result in the development of recurrent infections and the formation of scar tissue. Hidradenitis suppurativa is a chronic condition, and there is currently no known cure. However, various treatment options can help manage the symptoms and improve quality of life. Treatment approaches may include:

Medications: Antibiotics, such as tetracycline or clindamycin, may be prescribed to control infections and reduce inflammation. Other medications, such as hormonal therapies (e.g., oral contraceptives or spironolactone) or immunosuppressants, may be used in certain cases.

Topical treatments: Antiseptic washes or topical antibiotics can be applied to the affected areas to prevent infection and promote healing.

Surgical interventions: In severe cases or when conservative measures fail, surgery may be necessary. Procedures can range from drainage of

abscesses to excision of affected tissue or removal of large, recurrent lesions.

Lifestyle changes: Certain lifestyle modifications can help manage hidradenitis suppurativa symptoms. These may include maintaining good hygiene, wearing loose-fitting clothing, quitting smoking, and managing weight through a healthy diet and regular exercise.

28. Ringworm

A fungus causes the skin condition known as "ringworm." It is referred to as "ringworm" because it can cause a ring-shaped rash that is often itchy and red. Anyone can get a fungus infection. This infection's fungus can live on surfaces, clothes, beds, towels, and other household goods. There are several names for ringworm. Dermatophytosis and tinea are terms used in medicine. Depending on where on the body it appears, ringworm has several names; for example, "athlete's foot" is another name for ringworm on the feet. Adults frequently contract ring worm infections, which may be linked to increased physical activity, exposure opportunities, and hormonal changes. Men are more frequently affected than females; this might be because they spend more time outdoors because they are the ones who work to support their families and have more chances to be exposed to the fungus. [[25]]

29. Psoriasis

Among the many skin disorders, such as lupus, scleroderma, and atopic dermatitis (AD), psoriasis is the most prevalent and severe autoimmune disorder. It greatly impairs the quality of life for patients and their families, placing a financial, emotional, and social burden on them. [[26]]

The word "psoriasis" comes from the Greek word "psora," which means "itching." A complicated multifunctional inflammatory autoimmune skin condition called psoriasis is characterised by the activation of T-cells (T-lymphocytes), aberrant keratinocyte proliferation, local vascular alterations, and neutrophil activation. [[27]]

The inflammatory skin condition known as psoriasis, which can last a lifetime, is also accompanied by morbidities such psoriatic arthritis, mental health problems, cardiovascular problems, and hepatic problems. [[28]]

30. Ichthyosis: It is a dermatological disorder that affects the skin. It is a group of genetic skin conditions characterized by dry, scaly skin that resembles fish scales. The term "ichthyosis" is derived from the Greek word "ichthys," which means fish.

There are several types of ichthyosis, each with different underlying genetic causes and clinical presentations. Some common types include:

Ichthyosis vulgaris: This is the most common type of ichthyosis and usually appears in early childhood. It causes dry, rough, and scaly skin, especially on the legs and arms. The scales may be white or grey in colour.

Lamellar ichthyosis: This type is typically present at birth and affects large areas of the body. The skin is covered with thick, plate-like scales that are often dark and may cause tightness or restriction of movement.

X-linked ichthyosis: This form of ichthyosis is caused by a genetic mutation on the X chromosome and primarily affects males. It leads to dry, scaly skin, especially on the torso and limbs. It may be associated with other symptoms such as redness and itching.

Harlequin ichthyosis: This is a rare and severe form of ichthyosis that is present at birth. Infants with harlequin ichthyosis have thick, diamond-shaped plates of skin that crack and split apart. This condition requires intensive medical care.

30. Pemphigus is a group of rare autoimmune blistering disorders that affect the skin and mucous membranes. Although pemphigus primarily manifests as a mucocutaneous disorder, meaning it affects both the skin and mucous membranes, it primarily affects the skin, making it a dermal disorder.

In pemphigus, the immune system mistakenly produces antibodies that target specific proteins present in the skin and mucous membranes, leading to the formation of blisters and erosions. The two main types of pemphigus are pemphigus vulgaris (PV) and pemphigus foliaceus (PF), with PV being the more severe form.

Pemphigus vulgaris is characterized by painful blisters that form in the mouth, throat, and other mucous membranes, as well as on the skin. These blisters can rupture easily, leading to the formation of raw, painful sores. Pemphigus foliaceus primarily affects the skin, resulting in the formation of superficial blisters and crusted erosions, often without affecting the mucous membranes.

The exact cause of pemphigus is not fully understood, but it is believed to involve a combination of genetic predisposition and environmental factors. Certain medications, such as ACE inhibitors and penicillamine, can also trigger pemphigus in some individuals. The diagnosis is typically made through a combination of clinical

examination, biopsy, and immunofluorescence testing.

Treatment for pemphigus usually involves a combination of systemic corticosteroids and immunosuppressive medications to suppress the immune system and reduce the production of antibodies. Other supportive measures, such as wound care and pain management, may also be necessary.

31. Pachyonychia congenita (PC) is a rare genetic disorder that affects the skin, nails, and other parts of the body. It is caused by mutations in one of several genes, including KRT6A, KRT6B, KRT6C, KRT16, and KRT17, which are responsible for producing proteins called keratins. PC is inherited in an autosomal dominant pattern, which means that a person only needs to inherit one copy of the mutated gene from either parent to develop the condition.

There are two main types of pachyonychia congenita: PC type 1 (PC-1) and PC type 2 (PC-2), which are caused by mutations in different genes. PC-1 is typically associated with mutations in the KRT16 or KRT17 genes, while PC-2 is associated with mutations in the KRT6A, KRT6B, or KRT6C genes.

PC is characterized by several common features, although the severity and specific symptoms can vary between individuals. Some of the common signs and symptoms of PC include:

Nail abnormalities: Thickened nails (pachyonychia) are a hallmark of PC. The nails may be discolored, abnormally shaped, and can be prone to splitting or breaking.

Skin changes: Affected individuals may develop thickened, calloused skin on the palms of the hands and soles of the feet (palmoplantar keratoderma). This can be painful and may affect mobility. Other skin changes may include blistering, redness, and scaling.

Oral lesions: Some individuals with PC may develop painful sores or blisters inside the mouth.

Sweating abnormalities: PC can affect sweat gland function, leading to reduced or excessive sweating. Some individuals may experience frequent episodes of heat intolerance or have trouble regulating body temperature.

Other features: Additional symptoms that can occur in PC include cysts on the skin or internal organs, hair abnormalities, and eye problems such as corneal dystrophy or cataracts.

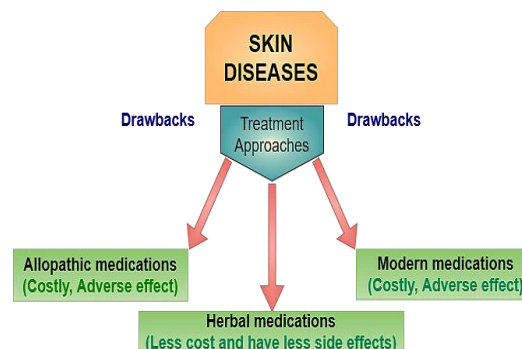
There is currently no cure for pachyonychia congenita, and treatment focuses on managing the symptoms and providing support.

III.SCOPE OF HERBAL PHYTOMEDICINES AND THEIR APPLICATIONS IN DERMAL DISORDERS:

Herbal medicine, also known as botanical medicine or phytomedicine, refers to the therapeutic use of any plant's seeds, berries, roots, leaves, bark, or flowers. Herbalism has traditionally been practised outside of traditional medicine, but it is now gaining popularity as recent analysis and research demonstrate its efficacy in the treatment and disease prevention. According to a recent assessment by the World Health Organization, 80% of people worldwide depend in some way on herbal medications for their primary healthcare. [[31]]

Traditional medicine is a significant source of novel chemicals that may prove helpful in the creation of chemotherapeutic drugs. The first step towards attaining this goal is screening plants utilised in conventional therapy. Hence, the goal of antimicrobial research is to identify and create new antibacterial and antifungal agents. Compared to synthetic pharmaceuticals, plant-based medications are frequently thought to be less toxic and less likely to cause side effects. [[32]]

In terms of wound care, medicinal plants have reportedly proven to be quite helpful, speeding up wound healing while causing the patient the least amount of suffering & scarring. [[33]]



1. Neem (*Azadirachta indica*)

Botanical Name: *Azadirachta indica*

Family: Meliaceae

Part Used: Leaves and Barks

Chemical constituents: Nimbidin, Azadirachtin

MOA: It contains important fatty acids, which enhance hydration and texture to the skin while repairing by inhibiting inflammatory cells. [[4]]

Use to treat : Paste of leaves useful in treating Acne, eczema, Scabies, Skin allergies, Psoriasis. [[4]]

2. Licorice (*Glycyrrhiza glabra*)

Botanical Name: *Glycyrrhiza glabra*

Family: Leguminosae

Part Used: Root

Chemical constituents: Glabridin, Liquiritin

MOA: Melanoma cell tyrosine B16 elimination diffused melanin from the active site

Use to treat : Skin lightening ,Depigmentation [[34]], Allergic dermatitis [[35]], Atopic dermatitis [[36]].

3. Tulsi ,basil (*Ocimum sanctum*)

Botanical Name: *Ocimum sanctum*

Family: Labiatae

Part Used: Leaves

Chemical constituents: Fixed oils, Linolenic acid ,Eugenol

MOA: Blocks cyclooxygenase lipoxygenase pathways of arachidonic acid metabolism

Use to treat : Allergy, rashes, insect bite, scars, Leucoderma[[37]], Blisters, chickenpox, round worm infections[[38]]

4.Green chiretta (*Andrographis paniculata*)

Botanical Name: *Andrographis paniculata*

Family: Acanthaceae

Part Used: Aerial Parts,Roots, Leaves

Chemical constituents: Andrographolide

MOA: Inhibits inflammatory mediators nitrous oxide (NO), prostaglandin E2(PGE2), interleukin (IL) inhibits macrophages

Use to treat : Eczema, Leucoderma, cuts and wounds [[39]]

acids, Enzymes

MOA: Enhances collagen and elastin synthesis,

Suppresses immune cells of the skin

Use to treat : Sunburns, insect bites, wound infections, cuts, itching and swelling, scabies, dandruff [[40]] wound healing burns [[41]]

5.Indian gooseberry (*Emblicca officinalis*)

Botanical Name: *Emblicca officinalis*

Family: Euphorbiaceae

Part Used: Fruit

Chemical constituents: Gallic acid, Tannic acid, Emblicanin A

MOA: Inhibits microbial adhesion, inactivates enzymes, suppresses influenza A virus and prevents viral absorption, treats HIV by inhibiting HIV-RT

Use to treat : Treating warts, skin infections and preventing premature aging [[42]], scabies and reducing itching [[43]], reducing wrinkles [[44]]

6. Aloe vera

Botanical Name: *Aloe vera*

Family: Lilaceae

Part Used: Leaves

MOA: Enhance Collagen synthesis.[[40]]

Chemical constituents: Vitamins, Minerals, Amino

7.Papaya (*Carica papaya*)

Botanical Name: *Carica papaya*

Family: Caricaceae

Part Used: Roots, Pulp, Bark, Seeds,Peels

Chemical constituents: Papain

MOA: Inc. prothrombin, removes necrotic tissues

Use to treat : Eczema, warts [[45]].

8. Jathropha curcus

Botanical Name: *Jathropha curcus*

Family: Euphorbiaceae

Part Used: Fruits, Seeds,Roots

Chemical constituents: Glycosides, Tannins, Steroidal Saponin

MOA: By bacterial phagocytosis, cytokine releases causing division and migration of cells in the proliferative phase

Use to treat : Major skin lesions, wound healing [[46]]

9.Ginger (*Gingiber officinalis*)

Botanical Name: *Gingiber officinalis*

Family: Zingiberaceae

Part Used: Root and Rhizomes

Chemical constituents: Gallic acid, Tannic acid, Emblicanin A

MOA: Inhibits microbial adhesion, inactivates enzymes, suppresses influenza A virus and prevents viral absorption, treats HIV by inhibiting HIV-RT

Use to treat : Skin problems [[47]]

10. Tasmanian blue gum (*Eucalyptus globulus*)

Botanical Name: *Eucalyptus globulus*

Family: Myrtaceae

Part Used: Leaves

Chemical constituents: Trichlosan

MOA: Trichlosan interacts with enzymes of the fatty acid pathway and inhibits gram-negative and gram-positive bacteria

Use to treat : Skin problems, wound healing, fungal infection [[48]]

11. Asthma-plant (*Euphorbia hirta*)

Botanical Name: *Euphorbia hirta*

Family: Euphorbiaceae

Part Used: Root

Chemical constituents: Flavonoids, Tannins, Phenolic compounds, Rutin, Gallic acid, Quercetin, Quercitrin

MOA: Relaxation of bronchial muscles

Use to treat : Major wounds, boils and swelling, acne [[49], [50]]

12.Fig (*Ficus carica*)

Botanical Name: *Ficus carica*

Family: Moraceae

Part Used: Fruits

Chemical constituents: Catechin, Gallic acid

MOA: Inhibits tyrosine, reduces melanin content

Use to treat : Hyperpigmentation, acne, wrinkles, itching and irritation. Eczema, skin ulcers [[51]]

13. The onion plant (*Allium cepa*)

Botanical Name: *Allium cepa*

Family: Amaryllidaceae

Part Used: Bulbs

Chemical constituents: Quercetin, Diallyltrisulphide (DATS)

MOA: Acts on the fibroblast cell line, Inhibits nuclear factor kappa B (NFkB) and matrix metalloproteinases (MMPs-2/9)

Use to treat : Skin allergy, anti-aging, scars [[52]], stimulates blood circulation [[53]]

14. Rosary pea (*Abrus precatorius*)

Botanical Name: *Abrus precatorius*

Family: Fabaceae

Part Used: Leaves

Chemical constituents: Abruquinones a, b, c, d

MOA: Inhibits superoxides

Use to treat : Leucoderma [[54]], preventing greying of hairs [[55]], wound healing [[56]]

15. Wild carrot (*Daucus carota*)

Botanical Name: *Daucus carota*

Family: Apiaceae

Part Used: Seeds

Chemical constituents: Carotene, Vitamin A

MOA: Acts on epidermal cells

Use to treat : Moisturizer for skin and hairs, eczema, warts [[57]]

16. Peppermint (*Mentha piperata*)

Botanical Name: *Mentha piperata*

Family: Labitae

Part Used: Seeds

Chemical constituents: Menthol

MOA: Improves blood circulation of the scalp

Use to treat : Reduces dandruff and lice [[58], [59]]

OTHER TREATMENTS FOR DERMAL DISORDERS

HYALURONIC ACID

Mammal connective tissue and skin have the highest quantities of hyaluronic acid (HA), also known as hyaluronan, which is a glycosaminoglycan found in many tissues and body fluids of mammals. The body as a whole contains the most hyaluronic acid. Even though HA functions have been studied recently despite being discovered in the extracellular matrix, synovial fluid of joints, and vitreous body of the eye over 50 years ago and initially believed to be an inert filler material. In fact, new biological and pharmaceutical components have developed over the past 20 years, and due to its distinct benefits, HA is now extensively utilised in the fields of dermatology, rheumatology, and ophthalmology. HA is used in dermatology as a biomaterial for bioengineering, as a temporary dermal filler in

aesthetic dermatology, as well as to promote wound healing and as a delivery system for medications in topical formulations. [[60]]

ASCORBIC ACID

Vitamin C, also known as Ascorbic acid, is a water-soluble vitamin and well-known antioxidant medication that is used topically to the skin in dermatology to treat and prevent photoaging-related changes as well as hyperpigmentation. Ascorbic acid has the ability to interact with superoxide, hydroxyl, and free oxygen ions and neutralise free radicals, which helps to prevent the inflammatory processes, carcinogens, and other processes that quicken photoaging in the skin. The focus of current research is on the quest for ascorbic acid stable molecules and fresh dermal delivery options. Humans lack the enzyme L-gulonogamma-lactone oxidase, which catalyses the passage terminal in the ascorbic acid biosynthesis, preventing us from producing our own ascorbic acid, unlike plants and the majority of other animals. Humans deal with this scenario by getting this vitamin from their diet and/or vitamin supplements, which helps them stay healthy overall and prevent the onset of disease. Ascorbic acid is vital for the growth and maintenance of healthy blood vessels, bones, teeth, gums, and other connective tissues. It also plays a significant part in a number of metabolic activities. One of the most unstable vitamins, ascorbic acid is easily oxidised in aqueous solutions and cosmetic compositions. Ascorbic acid is frequently found as sodium ascorbate or ascorbyl palmitate in anti-aging cosmetics. [[61]]

QUERCETIN AND RUTIN:

Quercetin and rutin are two flavonoid compounds commonly found in various fruits, vegetables, and herbs. They have been studied for their potential therapeutic effects in various dermal disorders. Here's an overview of their use in the treatment of dermal disorders:

Anti-inflammatory properties: Both quercetin and rutin exhibit significant anti-inflammatory properties, which can be beneficial in treating dermal disorders characterized by inflammation, such as psoriasis, dermatitis, and eczema. They can help reduce redness, swelling, and itching associated with these conditions.

Antioxidant activity: Quercetin and rutin possess potent antioxidant properties, which help protect the skin against oxidative stress caused by free radicals. This can be beneficial in managing skin aging, UV radiation damage, and other skin conditions influenced by oxidative damage.

Wound healing: Studies have shown that quercetin and rutin can accelerate wound healing by promoting collagen synthesis, angiogenesis (formation of new blood vessels), and tissue regeneration. They may enhance the healing process in chronic wounds, burns, and ulcers.

Antimicrobial effects: Quercetin and rutin have demonstrated antimicrobial activity against various bacteria, fungi, and viruses. This property may be useful in the treatment of skin infections, including acne, fungal infections, and viral skin conditions.

Skin whitening: Quercetin has been investigated for its potential skin-whitening effects. It inhibits the enzyme tyrosinase, which is involved in melanin production. By reducing melanin synthesis, quercetin may help lighten skin pigmentation disorders like melasma and hyperpigmentation.

Allergic skin reactions: Quercetin has been studied for its anti-allergic properties, particularly its ability to inhibit histamine release and reduce allergic responses. This could be beneficial in managing allergic skin conditions like urticaria (hives) and allergic contact dermatitis.

While there is promising research on the potential benefits of quercetin and rutin in dermal disorders, it's important to note that most studies have been conducted in vitro or in animal models. Further research, including clinical trials, is necessary to determine their efficacy and safety in humans.

ELLAGIC ACID

Ellagic acid has several advantages for the health of your skin beyond just treating skin cancer. Ellagic acid may be able to shield skin from oxidative stress brought on by UV rays and the ageing process. Using ellagic acid to treat light sunburned skin has been shown to lessen inflammation, according to a recent Korean study. A possible explanation for this outcome is that ellagic acid has the capacity to block the actions of intercellular adhesion molecule (ICAM), a substance involved in the inflammatory response. Ellagic acid also blocks the enzyme matrix metalloproteinase (MMP), which alerts the body when collagen is breaking down. Together, these qualities support the preservation and/or enhancement of the skin's suppleness, which may lessen the appearance of wrinkles and fine lines. But ellagic acid has other benefits than reducing wrinkles. Ellagic acid is a powerful tyrosinase inhibitor and skin brightener. However, ellagic acid is a safer option to other skin-brightening chemicals like hydroquinone because it does not modify the

DNA of melanocytes (the skin cells that create pigment). [[62]]

AHA, BHA, PHA.

The abbreviations AHA BHA PHA stand for the three hydroxy acids—Alpha, Beta, and Poly—that are present in a variety of natural compounds. Since they are substances obtained from nature, primarily from food sources, they are not synthetic chemicals that could be hazardous to your body. That puts the concern about dangerous chemicals out of the window. These acids are also not the kind that can burn your face off. Instead, they offer a variety of advantageous advantages for your skin to maintain it radiant and lovely. Hydroxy acids are primarily used to exfoliate skin (the removal of dead skin cells from the skin's surface), reduce pigmentation, and slow down the ageing of the skin as well as to remove more oil. Some of the acids have anti-oxidant or anti-inflammatory characteristics, and some can also be used as sunscreens. These are the normal goals of someone trying to improve the health and appearance of their skin. Each of the acids has a special quality that enables it to be used for particular uses or skin types. Some products, for example, are ideal for dry skin while others are suitable for oily skin. Additionally, certain acids are a good choice for people with sensitive skin who could react to skincare products. [[63]]

1) AHA

Alpha hydroxy acids are frequently used for exfoliation because they assist in reducing the links between skin cells (the technical term is desmosomes), making it easier to clean them. Dead skin cells should be removed because they are completely useless. Why? because they accentuate your skin's texture and make wrinkles and fine lines more likely. Contrarily, exfoliating your skin can actually lighten it and make it smoother, as anyone who has done it previously is sure to know. Additionally, this kind of exfoliation uses chemicals rather than physical exfoliation, which could harm the skin's vital cells. The AHA concentration should still be monitored, though. The hydrophilic nature of the alpha hydroxy acids causes them to be drawn to water. When you apply them on your skin, they can trap in moisture because of this. AHA is therefore a good choice for dry skin. AHA are ideal for persons with ageing skin since they can smooth the skin and minimise fine lines and wrinkles. This would benefit people of all ages, including some who may have prematurely aged skin. The best AHAs for skincare are lactic acid,

which is obtained from milk, and glycolic acid, which is formed from sugars. Glycolic acid is effective at controlling sebum production in addition to exfoliation, which make it suited for skin that is oily or prone to acne. On the other hand, lactic acid is ideal as a skin moisturiser because it has good moisturising characteristics. Additionally, it possesses anti-microbial qualities that make it effective for treating acne and pimples. Citric acid, another AHA with anti-aging benefits and the ability to brighten your skin, is obtained from citrus fruits like lemons and oranges. Then there is mandelic acid, which is derived from bitter almonds and has anti-inflammatory qualities while being mild on delicate skin. More AHAs include tartaric acid from grapes, which has antioxidant qualities, and malic acid from apples, which hydrates skin and encourages tissue respiration.. [[63]]

2) BHA

Salicylic acid, which is obtained from willow tree bark, wintergreen oil, and sweet birch, is the BHA that is most frequently utilised. Aspirin contains salicylic acid. You now understand why not to take aspirin to treat acne if you have ever done so. Beta Hydroxy Acids are also exfoliators, like the AHA, but they work in a slightly different way and have a few other advantages. BHA has a greater ability to permeate the skin and deliver positive results. BHA is lipophilic, which means it is drawn to oil, in contrast to AHA's hydrophilicity. It is therefore quite effective at removing extra oil and sebum from the skin. A complete pore cleaning results from its ability to penetrate deeply into the skin. BHA is suitable for those with oily skin, which is frequently accompanied with acne, as you may have realised by now given its lipophilic qualities. The main BHA, salicylic acid, has anti-inflammatory qualities as well, making it suitable for reducing redness and irritation. This is still another justification for utilising this acid to treat acne, which frequently comes with these symptoms. It is additionally anti-microbial. Since bacteria are the main cause of acne, this characteristic should also aid in reducing the condition. Salicylic acid can also be used as a sunscreen since, according to certain study findings, it is also photoprotective. [[63]]

3) PHA

The Poly Hydroxy Acids are no different from the other hydroxy acids in that they all aid in skin exfoliation. The PHA is the most recent member of the hydroxy acid family used in skincare. Regarding both the molecular makeup and the mode

of action, PHA and AHA are very similar. It too weakens the link between cells to aid in exfoliation, much like the latter. Additionally, it has the same moisturising qualities as AHA. The sole distinction is that PHA has a bigger molecular size than AHA, which slows down its ability to permeate the skin. If there is any skin irritation, it is reduced as a result of this. Because of this PHA feature, it can be used by those with sensitive skin who could react to AHA-containing products. For people who have rosacea or dermatitis, the PHA is a safe alternative. PHA has anti-oxidant qualities as well, which helps it slow down the ageing process of the skin. It is suitable for those with aged skin because of this and the fact that it can diminish lines and wrinkles (a similar action to AHA). Gluconic acid, which is naturally present in cells, lactobionic acid, which is generated from the lactose in milk, and galactose are a few of the PHAs that are frequently employed. [[63]]

RESVERATROL

Resveratrol is a natural polyphenol compound found in certain plants, such as grapes, berries, and peanuts. It has gained significant attention for its potential health benefits, including its role in the treatment of dermal disorders. While research on resveratrol's effects on the skin is ongoing and limited, some studies suggest that it may have therapeutic properties for various dermal conditions. However, it's important to note that more research is needed to establish its efficacy and determine appropriate dosages for specific disorders.

Aging and Wrinkles: Resveratrol exhibits antioxidant and anti-inflammatory properties, which may help reduce the signs of aging and wrinkles. It has been shown to protect against UV-induced skin damage, increase collagen production, and improve skin elasticity. These effects may contribute to a more youthful appearance and improved skin health.

Acne: Resveratrol has been investigated for its potential antibacterial and anti-inflammatory effects on acne-prone skin. It may help inhibit the growth of acne-causing bacteria and reduce inflammation associated with acne lesions. However, more research is needed to determine its effectiveness and optimal application methods for acne treatment.

Psoriasis: Some studies suggest that resveratrol may have anti-inflammatory and immunomodulatory properties that could be beneficial in managing psoriasis. It may help reduce the excessive proliferation of skin cells and alleviate inflammation associated with this chronic autoimmune disorder.

However, further research is required to validate these findings.

Dermatitis and Eczema: Resveratrol's anti-inflammatory properties make it a potentially useful compound in managing dermatitis and eczema, two inflammatory skin conditions. It may help soothe irritated skin, reduce redness, and alleviate itching. However, more clinical studies are needed to establish its effectiveness in these conditions.

Skin Cancer: Resveratrol has been studied for its potential chemopreventive effects against various types of skin cancer, including melanoma and non-melanoma skin cancers. It may exhibit anti-carcinogenic properties, such as inhibiting cancer cell growth, inducing apoptosis (cell death), and reducing inflammation. However, further research is necessary to determine its potential role in the prevention and treatment of skin cancer.

It's important to note that while resveratrol shows promise in the treatment of dermal disorders, its effectiveness and optimal usage (e.g., topical application or oral supplementation) are still being investigated. Additionally, the concentration and bioavailability of resveratrol in topical products may vary, affecting its efficacy.

NIACINAMIDE

One of eight B vitamins that promote numerous elements of your health is niacinamide, a kind of vitamin B3. When there is an excess of niacin in your body, niacinamide is produced. Niacinamide can also be produced by your body from the amino acid tryptophan. A versatile skin care component is niacinamide. It supports the keratin protein's synthesis, which keeps the health of the skin. It has also been demonstrated to make your skin stronger, smoother, and more radiant.

Benefits:

1. Boost hydration

The lipid barrier on your skin—a layer of water and oil that shields it—might perform better when niacinamide is present. This keeps pollution or other potential irritants out while helping to lock in moisture, hydrating your skin and reducing its sensitivity.

2. Calm redness

It has been demonstrated that niacinamide reduces inflammation, which can help lessen redness brought on by diseases including eczema, rosacea, and acne. It can also reduce discomfort brought on by potent exfoliants like glycolic acid or retinol,

which exfoliate dead skin cells from the surface of your skin.

3. May lessen the visibility of pores

Nothing has been shown to actually shrink your pores. Niacinamide, however, may lessen their visibility by assisting in the maintenance of clean, smooth skin. The amount of oil your glands secrete may also be controlled, helping to avoid breakouts and clogged pores.

4. Prevent skin cancer

Another B vitamin called nicotinamide is closely related to niacinamide. Some people may benefit from taking oral nicotinamide supplements to help prevent the growth of new skin cancer or precancerous lesions. But further research is required to substantiate this advantage. The relative of niacinamide, nicotinamide, may raise the risk of triple-negative breast cancer in people who take the dietary supplement at high doses, according to a recent study. However, topical application of niacinamide in a skin care product is generally viewed as safe.

5. Treat blemishes

Dermatologists recommend niacinamide for improving skin tone. According to some research, skin care products containing 5% niacinamide may also aid in fading dark spots. In one tiny trial, retinol and niacinamide, two skin-brightening agents, reduced dark spots and fine wrinkles. They also enhanced the texture and shine of the skin.

6. Reduce wrinkles and fine lines:

This vitamin's antioxidant qualities may assist to safeguard your skin and speed up its recovery from harm caused by things including ageing, sun exposure, and stress. According to some research, niacinamide applied topically can minimise the appearance of wrinkles and fine lines and skin sallowness. [[64]]

KOJIC ACID

Numerous kinds of fungus are used to produce kojic acid. Additionally, it results from the fermentation of several foods, such as Japanese sake, soy sauce, and rice wine. Kojic acid inhibits and prevents tyrosine, an amino acid necessary for the synthesis of melanin. The pigment melanin determines the colour of the skin, eyes, and hair.

Kojic acid has the potential to lighten skin because it prevents melanin from being produced.

Kojic acid is frequently applied topically to treat a variety of aesthetic issues. It can be used in cosmetic goods in concentrations of 1% or less, according to approval. Its primary application is as a skin-lightening agent.

Powders, serums, creams, cleansers, and soaps, among other cosmetic product categories, all contain kojic acid. Depending on the product directions, powders should be combined with either water or lotion. Some goods, such as soaps and cleansers, are designed to be removed right away with water. Some, like creams and serums, are meant to be applied and then left on the skin for absorption. (However, total absorption rates of kojic acid below the skin's surface are quite poor.)

Face masks are one example of a product that should only be used occasionally. You can use creams and cleansers every day. Kojic acid-containing products can be applied to all non-sensitive parts of the body, however they are most frequently used on the hands and face.

The main advantage and application of kojic acid is to fade visible scars, age spots, and sun damage. The skin may benefit from this having an anti-aging impact.

Kojic acid has skin-lightening effects in addition to certain antibacterial qualities. Even at low concentrations, it may aid in the defence against a number of common bacterial strains. This can assist in treating acne brought on by skin-related germs. Additionally, it could lighten acne scars that haven't yet disappeared.

Additionally, kojic acid possesses antifungal qualities. Reliable Source. Even some antifungal products Trusted Source have it added to them to boost their potency.

It might be helpful in treating skin fungal diseases such athlete's foot, ringworm, and candidiasis. Regular usage of soap containing kojic acid may aid in preventing bacterial and fungal diseases on the body. [[65]]

AZELIC ACID

Azelaic acid is a medication that is commonly used in the treatment of various dermal disorders. It has been shown to be effective in managing conditions such as acne, rosacea, and hyperpigmentation. Here's some information on how azelaic acid is used and its benefits in treating these dermal disorders:

Acne: Azelaic acid has both antibacterial and anti-inflammatory properties, making it an effective treatment option for acne. It helps to reduce the

growth of acne-causing bacteria and also decreases inflammation associated with acne breakouts. Azelaic acid is available in topical form and can be applied directly to the affected areas of the skin.

Rosacea: Rosacea is a chronic inflammatory skin condition characterized by redness, flushing, and the formation of papules and pustules. Azelaic acid is commonly prescribed for the treatment of rosacea as it helps to reduce redness and inflammation. It also has a mild antibacterial effect, which can be beneficial in managing symptoms.

Hyperpigmentation: Hyperpigmentation refers to the darkening of certain areas of the skin due to an increase in melanin production. Azelaic acid has been found to inhibit the enzyme tyrosinase, which is involved in melanin production. By reducing melanin synthesis, azelaic acid can help lighten dark spots and even out skin tone.

In addition to its therapeutic effects, azelaic acid is generally well-tolerated and has a favorable safety profile.

ALPHA ARBUTIN

Arbutin is a hydroquinone derivative that can be produced synthetically or derived from a variety of Ericaceae-family plants, including marjoram, cranberry, blueberry, and pear. It is a naturally occurring skin-brightening substance that prevents melanin (the skin pigment) from being secreted, making it an excellent skin brightener. There are various skin care treatments that actively use the chemically processed form of alpha arbutin. Beta arbutin, which is taken from the leaves of various plants and fruit peels, and alpha arbutin, which is biosynthesized by microbes, are the two different forms of arbutin. Alpha-arbutin is 10X more effective than natural arbutin at suppressing tyrosinase activity, according to a number of studies. Arbutin competes mostly with other milder brighteners like licorice and kojic acids, but it is significantly more effective than these substances. It is a derivative of hydroquinone, which is regarded as one of the chemicals with the greatest potential for skin whitening and removing black spots. Here is how this key component functions:

Dark spots are caused by pigments that are formed in melanocytes, skin cells that also contain the enzyme tyrosinase. Freckles and sunspots are the result of the cells being activated when the skin is exposed to a protracted exposure to UV radiation. Over time, alpha arbutin releases hydroquinone, inhibiting tyrosinase, the enzyme in charge of secreting melanin.

Both the overproduction of melanin and the tyrosinase enzyme are successfully stopped by this skincare ingredient. Consequently, without causing any negative side effects, skin pigmentation is gradually improved. [[66]]

CONCLUSION

The Indian medical system is deeply rooted in the art of using herbs for their therapeutic benefits. Due to the advancement of science, technology, and modern medicine, people from all over the world still rely significantly on the herbal remedial healing system for their basic healthcare. Herbal phytomedicine is gaining popularity, being inexpensive, having few negative effects, and being widely available in nature, making it more and more dependable every day. In an effort to meet the demands of an expanding human population and the needs of a deteriorating health, nature contributes to the provision of important and vital medications for human survival on the planet. The herbal remedies offer effective treatments for many infections brought on by the skin. [[4]]

Most herbs with good topical potential for treating the majority of skin problems may be found in the Indian subcontinent, while some are also found elsewhere in the world. The most prevalent conditions in daily life that have a significant impact on human physiology include psoriasis, pityriasis rosea, eczema, hives, dermatitis, and acne. The various herbal medications that have had the most notable results when used topically were included in this review. Traditional medicine for the treatment of skin problems has primarily relied on herbal species. These species have antibacterial action. It has been successful to isolate many single chemical entities that are in charge of antibacterial activity against skin ailments. The medicinal plants' purported antibacterial qualities are utilised to treat the majority of diseases around the world.

The medicinal plants' antimicrobial properties have been reported from all over the world and are used to treat the majority of skin conditions. The best place to find a variety of more modern herbal drugs is from medicinal plants. This review supports the study of skin problems by screening out efficient or unique techniques in reported plants and looking for related lead compounds in additional plants that may be a step ahead in the drug discovery process. [[3]]

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