



A REVIEW ON MEDICINAL HERBS: AS A POTENTIAL TREATMENT OF PSORIASIS

Pratibha T. Patil*, Sejal S. Khataki, Tejas R. Kheradkar,

Indrayani S. Bandgar, Manojkumar M. Nitalikar

Rajarambapu College of Pharmacy, Kasegaon (MS) India

Abstract:

An inflammatory, autoimmune skin condition known as psoriasis can have a wide range of symptoms. Atypical keratinocyte proliferation, neutrophil activation, and T-cell (T-lymphocyte) activation are among its principal characteristics. The growth and multiplication of keratinocytes are hindered by a range of cytokines released by T and dendritic cells. One way to treat psoriasis is with a variety of methods, such as phototherapy, systemic, and topical techniques, but there isn't a 100% cure for the condition. The anti-psoriatic drugs of today are costly, prone to negative side effects, and frequently cause the illness to recur. This review article discusses studies on natural herbs used as anti-psoriasis agents. Its objective is to offer fresh approaches to treating psoriasis. The outcomes showed that the anti-psoriatic effect of the herbal mixture was caused by various constituents. Scholars worldwide are searching for novel, safe, and efficacious psoriasis medications derived from natural resources, as the synthetic drugs currently prescribed for the condition have a connection to several unfavorable side effects.

Keywords - Psoriasis, Topical treatment, Medicinal Plant, Skin, Keratinocytes.

I. INTRODUCTION

The Greek terms "psora," which means "itch," and "sis," which means "action," are the source of the word "psoriasis," which means "roughly itching condition." A prevalent, painful, and itchy skin condition, psoriasis affects 1.5% to 3% of people globally. At two square meters, the human body's largest organ is the skin. The area of the body that is most exposed to the environment is the one that is most susceptible to the harmful effects of radiation and UV light exposure. Because their bodies generate new skin cells more quickly than usual, psoriasis sufferers have elevated skin patches. Skin cells normally die and are replaced every 3 to 4 weeks.^[1]

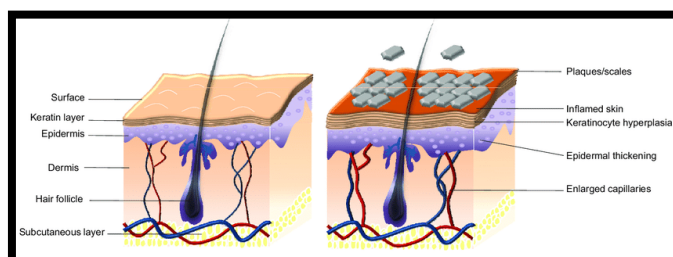


Fig .1 Normal skin and psoriasis affected dead skin cells.

The development of safer and more effective agents is imperative due to the shortcomings present in current therapeutic modalities. Medicinal plants have been used to treat skin conditions. It is an ancient human endeavor that continues to this day. The limitations of synthetic drugs and the multitarget action of natural compounds are the two main causes of the rising use of complementary medicine. ^[1] This covers the genital area, nails, and scalp. There are typically two types of psoriasis: mild to moderate and severe.

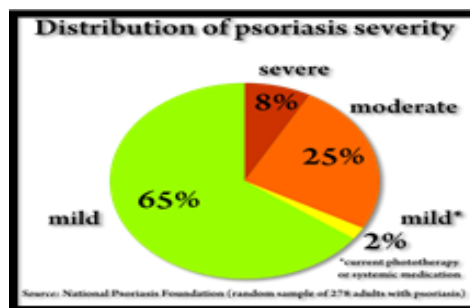


Fig .2 Distribution of Psoriasis Severity.

1. Types of Psoriasis:

1.1) Mild to Moderate Psoriasis

The hands, feet, genitalia, and face are unaffected by mild to moderate psoriasis, which affects less than 5% of the body's surface. For these patients, topical therapies like calcineurin inhibitors, tazarotene, vitamin D analogs, and corticosteroids are frequently successful. Topical treatments such as coal tar, anthralin, salicylic acid, and non-medicated moisturizer are less commonly used. ^[1,2] Corticosteroids that are appropriate for treating psoriasis are frequently used. In addition to phototherapy, patients whose psoriasis covers five to twenty percent of their body surface are treated with vitamin D analogs. Compared to relevant corticosteroids, these agents show a longer disease-free interval but a slower rate of action onset. One retinoid that is both relevant and teratogenic is tazarotene; it reduces psoriasis symptoms just as well as topical corticosteroids, but it has a longer disease-free interval. When compared to topical corticosteroids, it lessens signs that are less prone to skin atrophy when used as a first-aid treatment for flexural and facial psoriasis. ^[1]

1.2) Severe Psoriasis

severe psoriasis encompassing more than 5% of the body's surface, or the face, feet, hands or genitalia. Phototherapy is typically when combined with systemic therapies for the purpose of treating individuals with severe psoriasis. Biologics, methotrexate, cyclosporine, and acitretin are examples of systemic therapies. ^[1,2] The main signs are skin blistering, redness, and irritation. ^[1]

2. ETIOLOGY OF PSORIASIS:

2.1 Immunological Factors:

When autoimmunity is present, the body attacks itself. The condition psoriasis is autoimmune. WBCs that have invaded the body target and destroy invasive bacteria and infections. T cells assault the skin cells in psoriasis. This attack might speed up the skin's natural renewal process. There is an excess of new skin cells due to accelerated skin cell formation. From wherever they congregate, the hyperproliferated skin cells migrate toward the outer skin. ^[3]

2.2 Environmental Factors:

Numerous environmental factors, including UV radiation, mechanical trauma, different infections, chemical injuries, use of prescription medications, and smoking, can cause psoriasis. Psychological stress can also lead to psoriasis. ^[4]

2.3 Genetic Factors:

A genetic component plays a role in the course of psoriasis development, and family aggregation exacerbates the condition. The first and second generations of affected individuals are more prone to have emergent psoriasis. The probability is raised two to three times for monozygotic twins and twice to three times for dizygotic twins and vice versa. Thus far, a comprehensive linkage analysis of psoriasis-affected families has identified at least 60 chromosomal loci linked to psoriatic susceptibility. PSORS1 is located on chromosome 6P21, which is encircled by the major his to compatibility complex. The risk factor PSORS1 contains more than fifty single-nucleotide polymorphisms (SNPs) associated with psoriasis. [5]

3. Types of Psoriasis:

3.1 Single plaques psoriasis:



Fig. 3- Single plaques psoriasis

This type psoriasis can occur identified by its reddish or salmon pink color and by the white or gleaming scales that cover it; these scales can be thick, thin, huge, or small, as shown in Figure No. 3. Normally, they are engaged at the edges; but, rapidly spreading sores can be annular, with normal skin present in the middle.

3.2 Chronic plaques psoriasis



Fig. 4 – Chronic plaques psoriasis

This type of psoriasis usually affects the skeletal muscles of the elbows, scalp, knees, lumbosacral region, and umbilicus, as shown in Figure No. 4. What sets it apart is the koebner occurrence, which is the development of new lesions at pressure points. It resembles discrete, small to large red, scaly, thickened skin patches.

3.3 Inverse psoriasis:



Fig. 5 – Inverse psoriasis

Site-responsive vulgaris is a characteristic of this kind of psoriasis. As Figure No. 5 illustrates, the intertriginous site is reddish- glossy and devoid of scales. Psoriasis vulgaris is likely to manifest in a number

of close in relationship, but different in terms of genotype and phenotype, scenarios. Because of the drugs' interactions with T cells, it may explain the varying responses to treatment.

3.4 Guttate psoriasis



Fig. 6 Guttate psoriasis

Young adults and teens pick it up. In this case, psoriasis papules may be less than one centimeter in diameter when they blow on the trunk, as Figure No. 6 illustrates. This psoriasis lasts for 120– 130 days, and the prognosis is unknown in the long run.

3.5 Pustular psoriasis:



Fig. 7 Pustular psoriasis

This severe condition is characterized by painful reddish skin covered in tiny, sterile, monomorphic pustules (Figure 7). Fever, co-infection, and an unplanned stop of both general and, in certain situations, ultra potent topical corticosteroids are possible side effects for the patient.

3.6 palmoplantar pustulosis:

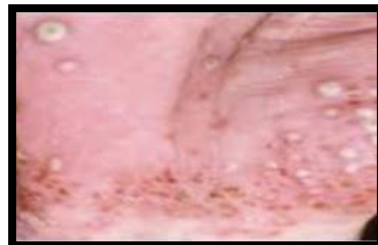


Fig. 8 Palmoplantar pustulosis

As illustrated in Figure No. 8, this form of psoriasis, which affects the foot's palms and soles, is characterized as an inflammatory condition that recurs. Affected individuals develop small to large sterile blisters (pustules) filled with a yellow, turbid liquid on the palms of their hands and/or the soles of their feet. There were yellow-brown pimples on the palm and soles. In general, chronic plaque psoriasis coexists with palmoplantar pustulosis in over 25% of patients. Psoriasis vulgaris and palmoplantar pustulosis belong to different demographic groups. The majority of women who smoke or have previously smoked are impacted by it. The typical age range for onset is between 40 and 50. For several years, there has been an indirect correlation between the genetic test and psoriasis.

3.7 Erythroderma:



Fig .9 Erythroderma

The entire body exhibits pretentious psoriasis when erythroderma psoriasis is present. Hypo - albuminemia, hypothermia, and elevated cardiac output are the results. As seen in Figure No. 9, erythroderma can be a side effect of other illnesses such as drug eruptions, atopic dermatitis, and cutaneous T-cell lymphoma.

3.4 Psoriatic arthritis

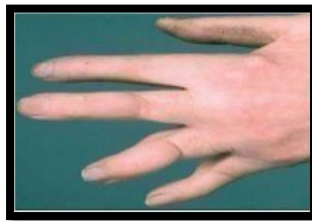


Fig. 10 – Psoriatic arthritis

As illustrated in Figure No. 10, psoriatic arthritis is one kind of psoriasis characterized by recurrent episodes of joint inflammation. Even in cases where skin psoriasis is mild, patients may experience severe arthritis. Development of this Psoriatic arthritis is rapid and slow.^[6] Nail psoriasis affects almost everyone with psoriatic arthritis. More than 10% of individuals with psoriatic arthritis also had skin psoriasis.

II. Natural remedies used as Anti-psoriasis Agent

There are many herbal psoriasis treatments on the market today, available all over the world. Because medicinal plants have many advantages over other medications, such as a wide range of side effects, ease of availability at a lower cost, and patient compliance, they are crucial to pharmacological research and drug development. For this reason, scientists are looking for possible herbal remedies to replace synthetic medications in the psoriasis treatment. The active ingredients and mode of action of number of herbal plants used as a psoriasis treatment.^[7]

1. Aloe vera



Fig. 11 Aloe Vera

The plant known by its common name is aloe vera. Aloe vera's botanical name is aloe barbrdensis miller. One of its active ingredients is lignin. The family is called Liliaceae. By permitting AV to penetrate the skin's inner layers via a penetrating mechanism, lignin mostly treats psoriasis.^[8]

2. Bakuchi



Fig. 12 Bakuchi

While the plant is known by its common name, "bakuchi," its scientific name is *Psoralea corylifolia* Linn. It belongs to the family Fabaceae. Bakuchi Psoralens Isopsoralen, Bakuchalcone, and Bakuchiol all contain an active ingredient. A photoactive furocoumarin called psoralen generates photoproducts when it combines with pyrimidine bases. It absorbs light with a wavelength between 200 and 320 nm. Psoralen helps treat skin conditions by slowing down cell growth by inhibiting DNA synthesis, Such as psoriasis. [9]

3. Barberry bark



Fig. 13 Barberry bark

Mahonia aquifolium is the botanical name given to the plant. One common name is barberry bark. The family name is Berberidaceae. Berberine is one of its active ingredients. Berberine is an alkaloid present in *Mahonia aquifolium* extract that helps people with psoriasis. Numerous mechanisms have been shown by berberine to have anti-inflammatory properties, including the down regulation of lipoxygenase and lipid peroxidation, a reduction in T cell infiltration in exposure lesions, as well as a decline in cyclooxygenase activity, which in turn lessens the suppression of prostaglandin E2 and IL-8. [10]

4. Black Cumin



Fig. 14 Black Cumin

Nigella sativa Linn is the plant's scientific name. Black cumin is the colloquial term. The family name is Ranunculaceae. Dithymoquinone, thymol, carvacrol, thymohydroquinone, and thymoquinone are some of its active components. These active ingredients can stop aberrant differentiation and excessive keratinocyte proliferation. [11]

5. Chilli Peppers



Fig. 15 Chilli Peppers

The plant's scientific name is Capsicum annum. Another word for them is chillies. We are called the family Solanaceae. Capsaicin is its active ingredient. Reduces the local concentration of the neuropeptide substance in the skin, which is known to irritate people with psoriasis. [12]

6. China Root



Fig. 16 China Root

The botanical name of plant is smilax china. Common name is China root. Family name is Smilacaceae. Active constituent present in it is flavonoid quercetin. Acts to inhibit leucocyte migration, there by significantly reducing the breadth of the epidermis. [13]

7. Fennel



Fig. 17 Fennel

Studies to the botanical name for this plant is foeniculum vulgare. The common name for this plant is fennel. Apiaceae is the name of the family. It has the active ingredient anethol. Anethole has been shown to inhibit cancer and inflammatory growth. There is evidence that antioxidants have unique properties. They demonstrated how one way to restrict NF-B activation is by blocking its breakdown. [14]

8. Garlic [7]



Fig. 18 Garlic

This plant's botanical name is Allium sativum. This plant is commonly known as garlic. Amaryllidaceae is the name of the family. Active ingredients include S-allylmercaptocysteine, ajoene, and diallyl sulfide. This transcription factor can be inhibited by garlic (S-allylmercaptocysteine, diallylsulfide, ajoene). [15] Recent research has linked nuclear transcription activation of factor kappa B to psoriasis.

9. Ginger [7]



Fig. 19 Ginger

Zingiber officinale is the botanical name for this plant. The common name is ginger. Zingiberaceae is the name of the family. Gingerol is the active ingredient. Furthermore, gingerol inhibits the NF-B-regulated enzymes cyclooxygenase (COX-2) as well as nitric oxide synthase. Ginger is an effective herbal remedy for psoriasis due to its anti-inflammatory qualities. [16]

10. Neem



Fig. 20 Neem

Azadiracta indica is the botanical name for this plant. The common name for this plant is neem. *Meliaceae* is the name of the family. *Azadirachtin* is the active ingredient. While neem oil contains vitamins E as well as omega-6 and omega-9 fatty acids, which hydrate the skin and reduce dryness and scaling, *azadirachtin* heals skin ailments that are deep beneath the epidermis.^[17]

11. Pomegrante ^[7]



Fig. 21 Pomegrante

This shrub's botanical name is *Punica granatum*. The common name for this plant is pomegrante. *Punicaceae* is the family name. Active ingredients include elagic acid, punicic acid, ellagitannins, and punicalagin. Through activation of NF- κ B in vascular endothelium cells.^[18]

12. Soybean



Fig. 22 Soybean

This plant's botanical name is *Glycine max*. This plant's common name is soybean. The family is known as *Fabaceae*. The active component is genistein. Genistein, the most common isoflavone in soybeans, possesses potent antioxidant and anti-inflammatory properties. Immunological evidence suggests that pro-inflammatory biomarkers such as IL-1, TNF-, IL-6, and IL-8 production and expression are reduced in this circumstance. Because of its capacity to inhibit NF κ B signaling, genistein is hypothesized to have anti-proliferative properties.^[19]

13. Star anise



Fig. 23 Star anise

This plant's botanical name is *Illicium verum*. This plant is referred to as star anise. The family is known as Illiciaceae. P- anisaldehyde, an active ingredient of *Illicium verum*, reduced ICAM-1 expression, preventing Jurkat T cells from adhering to HaCaT cells in response to IFN.[20]

14. Turmeric



Fig. 24 Turmeric

Curcuma longa is the botanical name for this plant. Turmeric is the most typical name for it. Zingiberaceae is the name of the family. It contains the active ingredient curcumin. Curcumin inhibits the kappaB protein family, a nuclear factor that regulates inflammation in psoriasis. It also improves the skin's ability to renew and speeds up recovery. TNF-alpha and interleukin are important mediators of psoriasis inflammation. Curcumin effectively inhibits the activity of these proteins in addition to the turning on of other biochemical channels that may aggravate the illness. [21]

Table 1: Natural Remedies for Anti-psoriasis Agent

Sr. no	Common name	Botanical name	Family	Plant part used	Active constituent
1	Aloe vera	Aloe barbrdensis miller	Liliceae	Leaf	lignin
2	Bakuchi	Psoraliya corylifolia Linn	Fabaceae	Seeds	Bakuchi Psoralens, Isopsoralen, Bakuchalcone, and Bakuchiol
3	Barberry bark	Mahonia aquafolium	Berberidaceae	Bark	Berberine
4	Black Cumin	Nigelia sativ aLinn	Ranunculaceae	Seeds	Dithymoquinone, thymol, carvacrol, thymohydroquinone, and thymoquinone
5	Chilli Peppers	Capsicumannum	Solanaceae	Leaves	Capsaicin
6	China Root	Smilax china	Smilacaceae	Rhizome	Quercetin
7	Fennel	Foeniculum vulgare.	Apiaceae	Seeds	Anethol
8	Garlic	<u>Allium sattium</u>	Amaryllidaceae	Garlic cloves	Allylmercapto cysteine, ajoene, and diallyl sulfide.
9	Ginger	Zingiber officinale	<u>Zingiberaceae</u>	Rhizome	Gingerol
10	Neem	Azadiracta indica	Meliaceae	Leaves,b ark and stem	Azadirachtin
11	Pomegrante	Punica granatum	Punicaceae	Seeds	Elagic acid, punicic acid, ellagitannins, and punicalagin.
12	Soybean	Glycine max	Fabaceae	Seeds	Genistein
13	Star anise	Illicium verum	Illiciaceae	Fruits	P-anisaldehyde
14	Turmeric	Curcuma longa	Zingiberaceae	Rhizome	Curcumin

CONCLUSION

Psoriasis is a multidimensional and intricate inflammatory skin condition that is typified by abnormal keratinocyte proliferation, neutrophil activation, alterations in the local vascular structure, and T cell activation. In certain cases, psoriasis has been cited as a side effect of the synthetic drugs used to treat it. Thus, an attempt was made to include potential mechanisms of action and chemical components extracted from various plants that were thought to have anti-psoriatic properties. The majority of contemporary medications are connected to plants in one way or another. The use of phytomedicines has been the subject of numerous books and monographs. However, the majority isn't currently stored in the databases that are in use. Because of poor patient satisfaction and therapy adherence, patients' medical needs remain unmet despite the abundance of conventional treatment options available for managing their diseases. As such, new and emerging therapeutic vistas must be investigated for the administration of psoriasis. Many plant sources have been highlighted in this article, drawing from both traditional knowledge and reports from different researchers. A recent study in this area has provided a number of psoriasis treatment options. Using herbal medicine is one such growing tactic. It will take longer and a bigger number of samples to assess these natural compounds' therapeutic efficacy.

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