

An Overview On Role Of Herbs To Treat Psoriasis.

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Abstract:

Psoriasis is an inflammatory disorder of the skin due to hyperproliferation of keratinocytes in millions around the world. This paper reviews psoriasis from its varieties to epidemiology, but focuses all more on the immune-mediated mechanisms behind this disease. Due to the hindrance it causes by side effects and variable efficacy, there is now much interest in the use of alternative remedies. This article discusses herbal medicine for psoriasis, specifically bioactive chemicals that have their origin in 15 botanical species of various sources, such as Aloe vera, turmeric, lycopene, anthocyanidins, genistein, and capsaicin. Evidence has shown that one of the botanicals has established activities, such as reduction of inflammation through anti-inflammatory effects, prevention of oxidation, and possibly protection against the production of free radicals through antioxidant capabilities, and modulation of the defense system through immunomodulatory effects, which may assist in the relief of symptoms for psoriasis. The review would collect and analyze a number of existing research on these natural plant-based therapies in order to identify promising herbal interventions to supplement conventional treatments and thus be part of more holistic approaches to psoriasis therapy.

Keywords: Psoriasis, psoriasis management, botanical medicine, natural remedies.

INTRODUCTION:

Psoriasis is a long-term illness where the body's defense system becomes overreactive, causing skin cells to grow excessively rapidly. Patches of skin become scaly and irritated, usually on the scalp, elbows, or knees, although other portions of the body can also be affected^[1]. About two to three percent of the The population of the entire planet is impacted. Psoriasis is associated to age, gender, geographic region, ethnicity, and other genetic and environmental variables. Psoriasis can affect individuals of all ages, although it is most prevalent in the age categories of 16–22 and 55–60. Genetic predisposition, immunological dysregulation, and environmental aggravators all contribute to the complicated & mostly unknown etiology of psoriasis^[2].

Psoriasis comes in a variety of forms, including erythrodermic, guttate, pustular, inverse, sebo, and psoriasis-related to nails. The most prevalent kind of psoriasis is plaque-based psoriatic condition, it impacts between eighty and ninety percent of people with a psoriatic-like skin condition. Inverse psoriasis develops in the folds of the skin. It results in thin, scale-free plaques. After having a sore throat from a streptococcal infection, guttate psoriasis may develop. A common affliction in youngsters and young adults, it appears as little red, drop-shaped scaly spots. The tops of plaques in pustular psoriasis are covered in tiny, pus-filled pimples. Over 90% of your skin is affected with erythrodermic psoriasis, a severe form of the disease. It results in extensive skin shedding and discoloration Typically, sebo-psoriasis develops as greasy, yellow-scaled pimples and plaques on the face and scalp. This condition is a hybrid of seborrheic dermatitis and psoriasis. Skin darkening, pitting, and alterations to your fingernails and toenails are all symptoms of nail psoriasis. Knees, elbows, face, and inside of mouth Psoriasis primarily affects the scalp, fingernails and toenails, genitalia, lower back, palms, and feet^[3].

Clinically, there are two variants: pustular and non-pustular psoriatic conditions^[4].

1. Non-pustular psoriatic condition

Psoriasis vulgaris: Vulgaris is Latin for "common." Plaque psoriasis accounts for 80-90% of all cases; it is not infectious in nature and causes red lesions covered with silvery scales raised from the skin. The most common

sites are elbows, knees, scalp, and lower back, accompanied by itching and discomfort from the patches. Symptoms tend to vary, worsening during acute flare-ups and improving upon remission.^[5]

Guttate psoriasis: It is the least common type of psoriasis and affects people predominantly in their younger age group. It is the effect of a bacterial infection on the body, which manifests through the appearance of small scaly, red or brown skin patches. These patches itch, too, and can show anywhere on the body^[6].

Erythrodermic psoriasis: It is a severe form of psoriasis that can even be life-threatening. The symptoms include widespread redness and shedding of the skin with intense itching and pain. It may also cause fever, chills, arthralgia, and swelling. It often manifests in people with unstable plaque psoriasis and may progress rapidly.^[7]

Palmoplantar psoriasis: It is a specific variant that typically impact the soles of the feet and palms of the hands, with hypothenar areas being less frequently affected than thenar portions. Although it is uncommon, erythema manifests as a pinkish-yellow patch. Squamae are the most common patches. Keratoderma could resemble dense squamae^[4].

Psoriatic arthritis (PsA): Psoriasis, a long-term skin and nail condition, is linked to psoriatic arthritis. Thick, pitted fingernails and red, scaly rashes are symptoms of psoriasis. In addition to joint swelling (inflammation), psoriatic arthritis has symptoms with rheumatoid arthritis. But compared to rheumatoid arthritis, it usually affects fewer joints. Additionally, it doesn't generate the typical rheumatoid arthritis antibodies^[8].

Inverse psoriasis: Inverse psoriasis is characterized by discoloration areas that are most commonly observed in the folded area such as the groin, buttocks and breasts. People with inverse psoriasis frequently have other types of psoriasis on their bodies. On white skin, inverse psoriasis appears as bright red or pink markings. On black or brown skin, it can seem red, purple, or darker than the surrounding area. Inverse psoriasis most commonly affects the armpits, groin, behind the breasts, and behind the knees^[9].

2. Pustular psoriatic condition

Impetigo herpetiformis: It is an uncommon and pregnancy-related generalized pustular variant. It is distinguished by erythematous abrasion covered with blisters with pus that tend to cluster and spread from flexural areas. At skin wrinkles, it can start to exhibit vegetative traits. Mucous membrane involvement and onycholysis brought on by subungual pustules may be seen as it advances. Lesions hurt, itch, and smell awful. Along with a decline in general health, nausea and vomiting, fever and chills are possible symptoms^[4].

Generalized pustular psoriasis: It is a quite uncommon kind of variant that causes blisters with pus. Young folks are most often noted to exhibit it. It can happen on its own or as a result of psoriasis vulgaris, for example, following a sudden stop to systemic steroid treatment, hypocalcemia, triggering factors, or irritating treatments. It manifests rapidly on an erythematous background and is accompanied by vague symptoms including polyarthralgia, lassitude, and elevated fever. Leukocytosis, lymphopenia, a negative nitrogen balance, and an increase in sedimentation rate are all present. After a few days, the pustules dry up and new ones start to grow. Erythroderma may result from the propensity of peri pustular erythema to spread. It needs to be taken care of immediately. The acute phase of the disseminated form could be fatal if treatment is not received^[4].

Pathogenic Mechanisms and Epidemiology

Worldwide, the mean prevalence of psoriatic conditions is approximately two %. Disease affects Caucasians more frequently, Asians less frequently, and Black people less frequently. People who live in colder northern locations are more likely to have psoriasis, whereas people who live in tropical countries are less likely to have it. Psoriasis affects 0.66–6.5% of people in Europe, with northern regions having higher rates of occurrence. Any individual may develop psoriasis, regardless of age. Because clinic visits can be somewhat delayed and the disease may present with symptoms even years before the initial medical session, it is challenging to determine the typical age at which the disease most usually manifests. According to multiple studies, the condition's early symptoms should appear between the ages of fifteen to twenty at the earliest and between fifty-five and sixty at the latest.

Psoriasis can be defined by a wide range of pathophysiology concepts due to the complexity of the disease, which impacts the nails, skin, joints, and reactions of the adaptive and immune systems. Depending on the

pathomechanisms, it can show up as one of the multiple forms of psoriasis. These days, it's common knowledge that the primary focus of psoriasis treatment is on immune system cells and cytokines linked to autoimmune-related patho mechanisms.

An additional concept on the pathogenic mechanisms of psoriasis is related to the skin microbiome. Numerous microbes that grow on patients' skin contribute to immune system regulation. Therefore, it is thought that the pathophysiology of autoimmune illnesses involves an abnormal immune activation brought on by the skin microbiome.

Furthermore, hereditary susceptibilities to psoriasis are significant variables, and understanding the pathophysiology of psoriasis may be improved by psoriasis gene expression analysis. Different cytokine expression is impacted by genetic abnormalities in immune cell regulatory proteins, and this in turn affects keratinocyte proliferation and differentiation. In summary, distinct psoriasis episodes are caused by genetic variations in immune cells and proteins linked to the disease ^[10].

Natural remedy for psoriasis:

1. ***Aloe vera***: This plant's gel is frequently utilized in medications, dietary supplements, and cosmetics. Salicylic acid, vitamins, anthraquinones polysaccharides, and a number of antioxidants, such as flavonoids and carotenoids, are among the many potentially beneficial components found in aloe vera extract. According to in vitro studies, the gel and leaf extract of aloe vera can disrupt several proinflammatory cascades, including those that decrease the production of Macrophages that produce IL-6, IL-1, and iNOS, inhibit IngNF-B, MAPK, and PI3K signaling, and lower prostaglandin E2 levels by COXbiocade. HaCaT cells boosted TNF-alpha in a psoriatic model used in the study. The study examined the survival of HaCaT cells triggered with 10 mg/mL TNF-alpha using dosages of twenty, forty, and Eighty grams per milliliter of aloe vera during the course of one day ^[11,12].

2. ***Artemisia capillaris***: This species has active flavonoids, coumarins, and chlorogenic acids that show promise as treatments for pathogenic infections, cancer, hepatitis, and obesity ^[13]. With respect to psoriasis, *Artemisia capillaris* extract has the capacity to block widespread keratinocyte proliferation and induce death. By lowering intercellular adhesion molecule-1 expression and lowering NO levels through iNOS suppression, this plant may restrict leukocyte influx. The study examined, *artemisia capillaris* dosages of 1, 2.5, 5, 10, 25, 50, and 100 µg/ml were used during 72 hours to test the viability of human keratinocyte cells (HaCaT cell line). In subsequent trials, research scientists only utilized a dose of fifty µg/mL. Researchers created a psoriatic model by stimulating HaCaT cells and mice with IMQ ^[14,15].

3. ***St. John's Wort***: Compared to the placebo group, external application of this herb's ointment yielded substantially lower developed redness grades and skin flakes width, according to clinical studies involving twenty individuals ^[16,17]. Mansouri et al. investigated *Hypericum perforatum* topical treatment's clinical benefits on psoriasis with plaque. The study found that using the designed ointment significantly reduced erythema, scaling, and thickness ^[18].

4. ***Rehmannia glutinosa***: According to studies, *Rehmannia glutinosa* extracts effectively scavenge free radicals and suppress the formation of iNOS, resulting in strong antioxidant effects. Furthermore, This herb appears to limit the expression of chemoattractants like C-C motif chemokine ligand 2 and C-X-C motif chemokine ligand 10, decrease Prostaglandin E2 production by cyclooxygenase-2 inhibition, and limit the synthesis of cytokines that promote inflammation including tumor necrosis factor-alpha, interleukin-6, interleukin-17A, and interleukin-23—possibly by limiting anas kinase-signal transducer and activator of transcription signaling. In vitro studies using 0.1, 0.5, and 1.0 mg/mL for 24 hours and in vivo experiments using hundred and two-hundred mg/kg for seven days were conducted using *Rehmannia glutinosa* extract ^[19,21].

5. ***Capsaicin***: It is susceptible for vanilloid receptors, it can deplete P substance from dermal sensory neurons. This reduces excessive keratinocyte proliferation, angiogenesis, and local vasodilation. Additionally, capsaicin can inhibit AP-1 and NF-B signaling, which influences inflammation and reduces redness and itching in psoriasis sufferers. However, because topical medicines cause discomfort when they work, their use

is restricted. In vitro experiments using TPA-stimulated human promyelocytic leukemia (HL-60) cells corroborate these findings^[22-23].

6. **Resveratrol:** The herb reduces the synthesis of cytokines that elevates the mediators as interleukin-17-A, interleukin-19, and interleukin-23, in an imiquimod-induced animal model of psoriasis. Through a mechanism most likely connected to SIRT1 activation and Akt kinase inhibition, it enhanced keratinocyte death. Resveratrol has been shown in vitro to reduce the growth of epidermal keratinocytes in NHEK cells. Additionally, this material inhibits aquaporin 3 (AQP3)^[24-26].

7. **Turmeric:** It has anticancer, antibacterial, free-radical scavenging, and anti-inflammatory properties^[27]. It can be taken 8 grams daily without any side effects^[28]. Curcumin may fight psoriasis by binding to the tumor necrosis factor receptor-binding sites. This direct contact can decrease inflammation^[29]. Clinical trials showed curcumin's tolerability but inconclusive results on mechanism of action^[30]. Curcumin acts on the important pathways involved in inflammatory as well as autoimmune diseases. In vivo studies by Tu et al. have exhibited the ability of curcumin to suppress the expression of TLR2, TLR4, and TLR-9 in the mouse, with a corresponding reduction in proinflammatory cytokine levels and an increase in IL-10 levels, which is anti-inflammatory in nature^[31]. In vitro experiments from Cho et al. and Sun et al. have further substantiated these findings, demonstrating that curcumin suppresses TNF- α -induced cytokine secretion and NF- κ B activation in HaCaT cells^[32,33]. Curcumin has also been demonstrated to inhibit phosphorylase kinase activity, which is associated with psoriatic activity. According to research curcumin has an anti-inflammatory effect the action of curcumin in psoriasis due to reduction in inflammatory and immunomodulatory activity^[34-36].

8. **Quercetin:** Quercetin that is found in some plants such as *Hypericum perforatum* and Ginkgo biloba^[37-38], shows several biological properties, including antioxidant, anti-inflammatory, liver-protective, cardioprotective, anticancer, vasodilatory^[39]. Kiekow et al. showed that quercetin inhibits the activation of signaling pathways such as nuclear factor-kappa B and mitogen-activated protein kinase in vitro in C6 [rat glioma] cells, suggesting that it had anti-inflammatory effects^[40]. Chen et al. 's seven-day study found quercetin administration had a dose-dependent effect on cytokine levels in psoriatic mice models with 30, 60, and 120 mg/kg doses^[41].

9. **Apigenin:** Apigenin is a flavonoid found in certain food products such as tea and parsley, which exhibits antioxidant, antimicrobials and anti-inflammatory activities. Autowed [42-43] is a non-mutagenic plant flavone on inhibiting NF- κ B activation in autoimmune cells. According to Miroeva et al., their in vivo studies indicated that apigenin decreased the levels of interleukin and interleukin in mice [44]. Since psoriasis may be induced by overproduction of certain cytokines, the fact that apigenin may modulate levels of these cytokines offers a promising therapeutic avenue for the treatment of this condition.

10. **Kaempferol:** An abundant flavonoid in a variety of vegetables and fruits, such as broccoli, apples, tea, strawberries, apples, and beans, is kaempferol^[45]. Because of their anti-inflammatory qualities, polyphenols like the underlying cause of psoriasis and other inflammation-induced conditions is significantly influenced by kaempferol. According to Liu et al., kaempferol reduced inflammation and psoriatic skin lesions while also reducing inflammation-promoting cytokine expression. For their in vivo studies, the researchers used imiquimod to construct a psoriasis mice model of psoriasis. The mice were given oral dosages of fifty and one-hundred mg/kg of kaempferol for seven days. They discovered that it reduced T helper 17 levels and prevented nuclear factor-kappa B, one of the many common signals that promote inflammation in psoriasis, from being phosphorylated^[46].

11. **Genistein:** It is a flavonoid that is commonly found in a range of plants, such as fava beans and soybeans^[47]. It is present in food at levels of one to two mg/g. Several studies have documented a variety of biological benefits, including as antioxidant, anticancer properties and antiangiogenic^[48]. At fifty and one hundred mg, it reduces the production of cytokines such interleukin-1, interleukin-6, TNF-alpha, CCL2, interleukin-17, and interleukin-23 during a two-hour period in a mouse model of psoriasis, according to Wang et al.'s in vivo experiments^[49]. Smolinska et al. discovered through in vitro tests that genistein, at a dosage of one g/mL for one day, prevented the generation of reactive oxygen species in HaCaT cell lines that had been stimulated by TNF- α or LPS. Studies have shown that genistein can decrease reactive oxygen species-mediated

nuclear factor-kappa B activation in the psoriatic model as well as NF-B-dependent production of inflammatory cytokines^[50].

12. **Rutin:** It is present in numerous foods, such as betula leaves, apples, buckwheat, citrus, black tea, and green tea, contain this polyphenolic hydrophobic molecule^[51]. Numerous investigations have been conducted to assess this substance's potential as an active ingredient in medicinal goods^[52]. Rutin comes from the small blue-flowered tree *Memecylon malabaricum*. The anti-psoriatic effects of rutin were examined in vitro using HaCaT cell lines at a dose of one hundred mg/m and in vivo using a mouse tail test. The plant did not perform well in their three in vitro tests, despite having great activity in the mice's tail test for psoriasis. *Memecylon malabaricum* showed both robust in vivo activity and low activity in the LOX inhibition experiment. Their findings support the traditional use of *M. malabaricum* leaves by Siddha healers by showing that the entire leaf exhibits anti-psoriatic properties^[53].

13. **Naringenin:** Among the flavanones present in fruits like orange, lemon, grapefruit, and tangerine is naringenin^[54]. Numerous medicinal characteristics of this substance include anti-inflammatory, cardioprotective, antioxidant, anticancer, and anti-inflammatory actions^[55]. In contrast to UVB radiation, In vivo experiments, Martinez et al. found that naringenin dramatically lowers the levels of the cytokines interleukin-1, interleukin-6, and tumor necrosis factor- α , which control the inflammatory response in the psoriasis model^[56].

14. **Anthocyanidins:** They belong to green flavonoids and soluble in water. Fruit and vegetables contain the compounds that give them their colors, purple, red, and blue. Tropical fruits like strawberries, grapes, berries, and currants. grapes contain them. In the same way, red cabbage and aubergine skin are rich in anthocyanin^[57]. Among the many advantages of this flavonoid are its antioxidant, anti-inflammatory, and radiation-protective qualities^[58]. In a test conducted in live animals, Chamcheu et al. noticed that in a psoriatic model, delphinidin (anthocyanins) therapy activated markers of epidermal differentiation while reducing inflammation and proliferation. Additionally, they found the delphinidin lowers elevated emit of cytokines linked with inflammation linked to psoriasis^[59].

15. **Lycopene:** The most prevalent carotenoid in tomatoes is lycopene. Other fruits that contain lycopene include apricots, red grapefruits, rosehips, watermelons, papayas, and pink guavas^[60-61]. Promising anti-invasive, antiangiogenic, potent anti-inflammatory and antimetastatic effects of lycopene have been demonstrated both animal and in vitro studies^[62]. In both in vitro and animal studies, Shih et al. discovered that lycopene prevented Imiquimod from inducing psoriasis-like skin conditions in keratinocytes. For seven days, the researchers applied 120 μg /mL lycopene topically, and for forty-two days, they gave 120 μg /kg oral route. Additionally, in a psoriasis-like dermatitis model of mouse induced by Imiquimod, topical lycopene therapy lowered monocytic cell adhesion, leading to both local clinical relief and lower monocytic cell adhesion of monocytes^[63].

CONCLUSION: Psoriasis is a difficult condition to treat. Conventional medications are restricted in their efficacy and negative effects. The review focuses on the potential involvement of natural medicines, namely bioactive chemicals derived from plants such as Aloe vera, turmeric, lycopene, anthocyanidins, genistein, and capsaicin, which have anti-inflammatory, antioxidant, and immune-modulating characteristics. These botanical remedies may provide a safer and more comprehensive alternative to synthetic drug use in this ailment, as well as others with symptoms and underlying inflammation. Botanicals are expected to be used in future psoriasis treatments, given that additional research into their processes and benefits continues. Natural therapies have significant promise for mainstream integration in psoriasis management, with greater research needed to determine ideal dosages, safety profiles, and efficacy, giving accessible, long-term solutions for patients looking to enhance their quality of life.

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