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Natural Compounds Used In The Treatment And Management Of Psoriasis: A Review

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ABSTRACT :

For both patients and medical professionals, psoriasis—a chronic inflammatory skin condition—presents a major difficulty. Approximately 2–5% of people globally suffer with psoriasis. Although it can start at any age, it usually manifests for the first time between the ages of 15 and 25. Psoriasis comes in a variety of forms, each with distinct symptoms and therapeutic approaches. Both licorice (Glycyrrhiza glabra) and neem (Azadirachta indica) exhibit strong anti-inflammatory properties that target the underlying inflammation linked to psoriasis. Curcumin, a strong anti-inflammatory and antioxidant compound found in turmeric (Curcuma longa), shows potential in reducing the aberrant immune responses linked to psoriasis. The anti-inflammatory and antibacterial qualities of tea tree oil (Melaleuca alternifolia) and aloe vera (Aloe barbadensis) point to possible advantages in lowering scaling, redness, and secondary infections. While calendula (Calendula officinalis) offers anti-inflammatory support and aids in the treatment of psoriasis lesions, Santalum album (Sandalwood) has a relaxing impact on the skin. The anti-inflammatory and antibacterial properties of gingerol and allicin, respectively, which are found in Thai ginger (Zingiber officinale) and garlic (Allium sativum), help to relieve the symptoms of psoriasis. Immunomodulatory characteristics of giloy (Tinospora cordifolia) and mahonia aquifolium (Oregon grape) may control the immunological responses that underlie the pathophysiology of psoriasis. Despite this, some organic substances have potential as supplemental treatments. The usefulness of natural items in controlling and curing psoriasis is discussed in this review article.

KEY WORDS: Psoriasis, dermatology, Phytoleads, Natural compounds, Antiinflammatory, Antimicrobial, Phytomedicine.

INTRODUCTION :

A prevalent and long-lasting autoimmune skin disorder, psoriasis is typified by persistent inflammation. It affects between 2 and 5% of people worldwide, with differences depending on gender, age, location, and cultural demography. Interestingly, the prevalence of psoriasis is higher in Europeans than in other populations. Red, inflammatory spots and macules on the skin are indicative of the disorder. Insufficient differentiation and increased proliferation of the epidermal cells that produce keratin are the causes of these symptoms. Silver scales are commonly seen in conjunction with these plaques. These lesions' increased inflammation is caused by immunological signals that aren't working properly, which causes keratin-producing cells to divide ten times faster. It is distinguished by specific chemical characteristics, such as the development of scaly and erythematous skin lesions. These lesions typically appear on the scalp, lower back, and around joints like the knees and elbows. They may eventually spread to the arms, chest, back of the neck, behind the ears, and forehead. Histopathological examination of psoriatic skin identifies prominent characteristics such increased angiogenesis, prominent inflammatory infiltrates, and epidermal hyperplasia with substantial keratinocyte differentiation.

This illness has many underlying causes, including a mix of environmental factors (alcohol, infections, drugs, stress) and genetic factors (family history). All of these elements work together to cause the immuno-histological alterations seen in the skin. Psoriasis is a chronic disorder, and the management and treatment strategies for it vary depending on how severe it is. The first line of treatment for mild to moderate psoriasis is topical medication use. These types of psoriasis can be efficiently managed with this method. However, the suggested courses of action for more serious illnesses, like situations of substantial severity, include systemic therapies or phototherapy. A thorough grasp of the severity of the condition informs treatment plans in the field of psoriasis management. The first line of treatment for mild to moderate cases involves applying topical medications, which are essential for symptom relief. The field of natural goods has shown great promise in recent years as a means of enhancing traditional methods. Notably, certain natural treatments include qualities that may help reduce the symptoms of psoriasis. Fish oil supplements, which are high in omega-3 fatty acids, help to reduce inflammation and promote skin health, while aloe vera, which is well-known for its anti-inflammatory properties, provides skin with moisture and soothing effects.

Turmeric's curcumin molecule exhibits anti-inflammatory and antioxidant properties, and colloidal oatmeal, Dead Sea salt, and tea tree oil show promise in terms of hydrating, exfoliating, and reducing itching. Additionally, using apple cider vinegar to regulate pH and limiting sun exposure to boost vitamin D production show potential as complementing approaches.

MATERIAL AND METHODS

S.N.	Medicinal Plant	Part used	Active Metabolites	Uses
1.	Turmeric (*Curcuma longa*)	Rhizomes	Curcumin, Tetrahydro curcumin, desmethoxycurcumin.	Anti-inflammatory activity, Anti-proliferative
2.	*Aloe Vera*	Aloe-vera gel (inner part of leave)	Anthraquinones, polysaccharides, phenolic	Immunomodulation, Wound healing
3.	Tea tree oil (*Melaleuca alternifolia*)	Leaves of the tea tree	Terpene-4-ol, 1,8-cineole, α-pinene and gamma-terpenes	Antimicrobial activity, Immunomodulatory effects.
4.	Neem (*Azadirachta indica*)	Leaves	Azadirachtin, Nimbidin, Nimbin	Antimicrobial activity, Anti-inflammatory properties, Antioxidant effects
5.	*Santalum album* (Sandalwood)	Sandalwood oil	Santalols, Triterpines, Epiglobulol	Moisturizing and emollient properties, Relaxation, and stress reduction
6.	Liquorice (*Glycyrrhiza glabra*)	Roots	Glycyrrhizin, glycyrrhetinic.	Anti-inflammatory activity, Antioxidant properties
7.	Calendula (marigold)	Flowers	Flavonoids, triterpenoids.	Wound healing and tissue regeneration
8.	*Allium sativum*	Bulb	Allicin, a sulfur compound	Anti-inflammatory properties, Antioxidant activity
9.	Giloy (*Tinospora cordifolia*)	Leaves	Polysaccharides, Alkaloids	Antiproliferative Effects
10	Thai ginger (*Alpinia galanga*)	Rhizomes	Essential oils, Gingerols, and shogaols	Antiproliferative effects, Anti-microbial activity
11.	Mahonia Aquifolium (*Oregon Grape*)	Root	Alkaloid (Berberine)	Anti-inflammatory activity, Immunomodulatory effects

Turmeric (curcuma longa)

One of turmeric's main chemical components, curcumin, has significant potential for treating psoriasis. Curcumin, the main bioactive ingredient in turmeric (Curcuma longa) and a naturally occurring polyphenol, has a wide range of intriguing qualities. It is especially notable for its immunomodulatory, antioxidant, and anti-inflammatory properties.

Curcumin has strong anti-inflammatory properties that target the many inflammatory pathways and cytokines, addressing the chronic inflammation that is essential to the onset and progression of psoriasis. Furthermore, because curcumin orchestrates a harmonic control of immune cell activity, including T cells, dendritic cells, and macrophages, its immunomodulatory effects are in line with the immunological-mediated character of psoriasis. This immunomodulatory ability also involves restoring the delicate balance between Th1 and Th2 immune responses and reducing aberrant immune response activation. In the meantime, curcumin's strong antioxidant capacity acts as an enemy to oxidative stress, a defining feature of psoriasis, effectively scavenging reactive oxygen species and reducing oxidative damage to skin cells.

Curcumin's interesting range of actions includes inhibiting excessive blood vessel growth (angiogenesis) and preventing the abnormal proliferation of skin cells (keratinocytes), two hallmarks of psoriasis. Curcumin presents a multidimensional strategy to tackling the intricacies of psoriasis pathophysiology by delicately modulating these factors, potentially normalizing skin cell proliferation and preventing the development of psoriatic plaques.

ALOE (Aloe vera)

A natural plant that has been used for millennia to treat a variety of skin disorders, aloe vera has shown promise as a treatment for psoriasis. The natural moisturizing properties of the gel are essential for reducing dryness and itching, which are common psoriasis symptoms. It is recommended to apply a small coating of pure Aloe Vera gel and massage it into the skin gently, repeating the process multiple times daily or as needed. The chemical components of aloe vera are essential to its effectiveness, with acemannan emerging as a key medicinal ingredient. Acemannan, a polysaccharide found in aloe vera gel, is thought to play a key role in the plant's therapeutic benefits. This substance exhibits a great capacity to inhibit inflammation, which may lessen the inflammatory reactions linked to psoriasis. Additionally, Acemannan helps promote wound healing and improve the skin's moisture barrier, both of which are important for people who suffer from psoriasis. Acemannan's pharmacological properties support its promise as a therapy for psoriasis. Due to the compound's immunomodulatory properties, it may be able to reduce the overactive immune responses seen in psoriasis cases by reducing the activity of immune cells such as T cells and macrophages.

Furthermore, Acemannan’s anti-inflammatory properties are highlighted by its ability to prevent the release of proinflammatory cytokines including interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α), which are both crucial to the pathophysiology of psoriasis. Acemannan offers a comprehensive strategy for managing the complexities of psoriasis by encouraging better skin and restoring equilibrium.

Neem (Azadirecta indica)

Azadirachta indica, the scientific name for neem, is an indigenous tree that grows throughout the Indian subcontinent and is valued for its long history of use in Ayurvedic medicine. This botanical wonder has been used for a variety of medicinal purposes, most notably the treatment of the skin condition psoriasis. The pharmacological profile of neem is full of promising chemicals. Among these are the limonoid components found in neem oil, nimbidin and nimbin. Carefully examined for their anti-inflammatory properties, these substances have proven to be strong contenders in reducing inflammation, a key feature of psoriasis. The triterpenoid substance gedunin, which is found in neem leaves and seeds, expands the range of possible therapeutic uses. Scientific research has demonstrated neem's anti-inflammatory properties, elevating it in the field of psoriasis treatment. The pharmacological effects of neem flow into an all-encompassing strategy for managing psoriasis. Its anti-inflammatory properties, which are exhibited by substances like nimbin and nimbidin, target the underlying pathophysiology of psoriasis, inhibiting inflammatory mediators and opening the door to possible alleviation. An fascinating aspect of neem is its immunomodulatory properties, which complement the immune-mediated nature of the illness. Neem has the ability to restore homeostasis and limit the unchecked proliferation of skin cells that underlie psoriatic symptoms by reducing immunological reactions. Furthermore, neem's strength as an antibacterial agent, which results from substances like azadirachtin, Nimbin, and real, is noteworthy. Since microbial infections can worsen psoriasis, neem's antibacterial properties may reduce the severity of psoriasis by reducing such infections. The antioxidant properties of neem are similarly fascinating. With psoriasis integrally related to heightened oxidative stress, neem's treasure trove of antioxidants, including flavonoids, carotenoids, and vitamin C, holds promise in quelling oxidative damage and giving protection to skin cells.

SANDALWOOD (Santalam album)

Native to the Indian subcontinent, Santalum album, also referred to as Indian sandalwood, is a tree of great value. This amazing tree produces essential oil from its heartwood, a material used extensively in traditional medicine and valued for its many uses, including the treatment of skin disorders like psoriasis. Investigating the components of sandalwood oil reveals a wealth of therapeutic possibilities. The primary ingredient responsible for the unique scent of sandalwood is α-santalol. Regarded for its ability to reduce inflammation and bacteria, α-santalol shows promise as a potential treatment for psoriasis symptoms.β-santalol, another essential ingredient with anti-inflammatory properties, echoes this action. There may be hope for reducing the complications of psoriasis due to its proven ability to block specific inflammatory pathways. An intriguing layer of therapeutic potential is added with the introduction of epiglobulol. With its anti-inflammatory and antioxidant properties, this substance is well-positioned to put out the fires of oxidative stress and inflammation, two factors linked to psoriasis. The potential of sandalwood oil is further enhanced by the group of santalenes, which includes

α-, β-, and epi-β-santalene. These ingredients give the oil anti-inflammatory and antibacterial qualities, enhancing its potential for treating psoriasis.
Sandalwood oil acts as a hydrating and emollient agent to alleviate the dryness and weakened skin barrier that are characteristics of psoriasis. Its moisturizing properties go beyond surface-level alleviation; they may also address dryness and strengthen the skin's protective layer. In addition to its tactile benefits, sandalwood's fragrant qualities are used for their ability to promote calmness and relaxation, which may be useful in the treatment of psoriasis.

LICORICE (Glycyrrhiza glabra)

For millennia, the revered plant herb licorice (Glycyrrhiza glabra) has been a part of traditional medical systems, particularly Ayurveda and Traditional Chinese Medicine. Numerous bioactive substances that compose its pharmacological symphony are found within its botanical embrace. Licorice exhibits a potential array of therapeutic effects in the treatment of psoriasis, mostly due to its triad of antioxidant, immunomodulatory, and anti-inflammatory properties. Licorice enters the realm of pharmacological action and demonstrates its potent anti-inflammatory properties. The list of substances found in licorice, such as liquiditin, glycyrrhizic acid, and glycyrrhizin, all produce anti-inflammatory effects**.** Proinflammatory cytokines including interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α), which are essential players in the pathophysiology of psoriasis, are harmoniously inhibited by this group. Licorice may provide a palliative touch to psoriasis symptoms such as redness, itching, and scaling by reducing inflammation. Licorice's immunomodulatory properties also come to light. A rival in licorice's capacity to rebalance immune responses is psoriasis, which is evidence of autoimmune dynamics. T-cell activity and the inhibition of immune cell proliferation, two factors essential to the development of psoriasis, are also affected by this recalibration.

The chemicals found in licorice also have the ability to reduce the activation of nuclear factor kappa B (NF-κB), a maestroorchestrating gene linked to immunological responses and inflammation. Within the realm of antioxidant capacity, licorice stands out as a guardian against oxidative stress, closely

linked to the development of psoriasis. By neutralizing free radicals and reducing oxidative stress, licorice's store of flavonoids and antioxidants assumes the function of watchful scavengers. The diligent work of this sentinel may protect skin cells from damage, adding a caring element to the psoriasis lesions' healing process.

GARLIC (Allium sativum)

The plant commonly referred to as garlic, Allium sativum, is a living reminder of its long history of therapeutic use. A wealth of chemical components that have danced with the promise of therapeutic effects are hidden within its acrid embrace. Allicin, a sulfur-bearing protagonist that controls garlic's distinctive flavor and perfume, leads the parade of Allium sativum's medicinal heroes. Beyond its sensual appeal, allicin reveals its many facets, including its antibacterial, anti-inflammatory, and antioxidant qualities.

Sulfur compounds, which include diallyl sulfide, diallyl disulfide, and diallyl trisulfide, write their story within the hallowed confines of garlic. These substances work as stewards of the anti-inflammatory and antioxidant domains. They have the ability to lessen the severity of inflammation and reduce oxidative stress, two characteristics that are linked to the psoriatic syndrome. Garlic reveals its anti-inflammatory mantle, a potential remedy for the

inflammatory terrain of psoriasis, as it ventures into the field of pharmaceutical activity. Its arsenal includes the anti-inflammatory agents diallyl disulfide and allicin. These substances strengthen their defenses against pro-inflammatory cytokines, which are precursors to the pathophysiology of psoriasis.

The rumored Immunomodulatory potential of garlic adds yet another benefit. Garlic may bring the immune symphonies that are out of sync with the story of psoriasis into harmony. Garlic may operate as a conductor in the orchestration of immune mediators including interleukin-1β (IL-1β), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α), which are the main architects of psoriasis's immunological chaos. Garlic acts as an antioxidant sentinel to protect against the oxidative stress that is a natural part of psoriasis. By acting as sentinels to ward off free radicals and stop oxidative damage, allicin and its sulfur-containing companions reveal their functions. This dance sets the setting for the reduction of inflammation and the possible healing of the psoriatic canvas.Garlic's abilities as an antibacterial luminary also take center stage, as though brandishing an aromatic sword against microbiological foes. Given that psoriasis is susceptible to secondary infections, garlic's broad-spectrum antibacterial activity provides protection against these nefarious opponents.

GILOY (Tinospora cordifolia)

In the field of botanical designations, giloy, also known as Tinospora cordifolia or Guduchi, is revered as a sentinel in the fabric of traditional Ayurvedic treatment. A symphony of components, each with the potential for therapeutic resonance, take center stage within its lush embrace. The immunomodulatory flags of polysaccharides, the first note in Giloy's harmonious ensemble, which includes glucans and arabinogalactan, are revealed. These harmonizers have the ability to perform an immune symphony, directing a dance that aims to balance the immune response and extinguish the inflammatory fires that dance within the psoriatic narrative . Magnoflorine, berberine, and tinosporin are among the alkaloids that emerge as the increase continues.

This trio may create a calming lullaby for psoriasis symptoms by showcasing antioxidant and anti-inflammatory overtures. Early research has revealed promising anti-inflammatory properties of Giloy's diterpenes, which include stars like tinosporide and tinosporaside. The psoriasis narrative and this anti-

inflammatory narrative cross, possibly reducing the flare-up of inflammation that frequently accompanies the disorder.Giloy enters the pharmacological arena with its anti-inflammatory arms, ready to calm the psoriasis's irritated chords. Giloy's promise as a symphony conductor arises within the landscape of chronic inflammation in the psoriatic tale, with the capacity to silence the overture of inflammation's dance. Antioxidant overtones resound inside Giloy's repertoire, underlining the belief in oxidative stress's involvement in psoriasis's tapestry. As a guardian against oxidative stress, giloy flaunts its antioxidant properties, which may neutralize free radicals and lessen the oxidative symphony associated with psoriasis. Finally, Giloy's potentially antiproliferative act takes the stage as a crescendo. Excessive cell proliferation is a characteristic of psoriasis, and Giloy's antiproliferative aria may be able to reduce the psoriatic plaques' flamboyant cell development.

8.GREEN TEA (Camellia sinensis)

Research has focused on green tea (Camellia sinensis) because of its possible therapeutic benefits for psoriasis and other illnesses. Research on the health benefits of green tea has been spurred by psoriasis, a chronic inflammatory skin condition marked by red, scaly patches on the skin. The possible advantages of green tea for psoriasis sufferers are attributed to its chemical makeup. Numerous catechins, especially epigallocatechin gallate (EGCG), are strong anti-inflammatory and antioxidant agents that may help reduce the symptoms of psoriasis. The abundance of polyphenols in green tea further boosts its antioxidant qualities and exhibits immunomodulatory and anti-inflammatory actions, all of which are essential for psoriasis management.
Another type of catechin found in green tea, epicatechins, enhances the tea's anti-inflammatory and antioxidant properties and may help reduce the symptoms of psoriasis. Green tea contains theanine, a special amino acid that has anti-inflammatory and immune-modulating properties and may help treat psoriasis. Although green tea's mild caffeine content is unrelated to the treatment of psoriasis, it may increase the efficacy of some psoriasis drugs. Together, these chemical constituents highlight green tea's potential as a supplemental treatment for psoriasis. The polyphenols in green tea, particularly epigallocatechin-3-gallate (EGCG), have possible anti-inflammatory properties that may lessen psoriasis symptoms like redness, scaling, and itching.
It is thought that the antioxidants in green tea help to promote skin health by preventing oxidative stress linked to psoriasis. Additionally, the immune

system-regulating qualities of green tea components, particularly EGCG, may help control immune cells implicated in inflammation linked to psoriasis. Green tea components may help normalize skin cell turnover and lessen psoriatic lesions by lowering abnormal skin cell proliferation, a defining feature of psoriasis. Furthermore, green tea may help treat psoriatic skin lesions due to its wound-healing properties, which are ascribed to its capacity to promote collagen synthesis and tissue regeneration.

CONCLUSION :

Psoriasis is a chronic inflammatory and metabolic disease that affects around 2-5% world population. For people suffering from this chronic skin illness, managing and treating psoriasis with natural solutions offers a promising way to reduce symptoms and improve quality of life. A variety of anti-inflammatory, antimicrobial, and immunomodulatory qualities found in neem, licorice, turmeric, aloe vera, tea tree oil, Santalum album, calendula (marigold), Allium sativum, giloy, Thai ginger, and Mahonia aquifolium (Oregon grape) are essential in reducing the inflammation, redness, itching, and scaling associated with psoriasis. These all-natural solutions could be used in addition to conventional therapies. Even while there is already evidence to support their effectiveness, additional research is need to determine their long-term safety and efficacy, opening the door for a more thorough strategy to managing psoriasis in the future.

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