



# Natural Remedies for Psoriasis: An Overview of Herbal Therapies

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## ABSTRACT

Psoriasis is a chronic, immune-mediated inflammatory skin disorder that affects 2–4% of the global population, significantly impacting patients' quality of life. Conventional treatments, including corticosteroids, biologics, and phototherapy, effectively alleviate symptoms but are often associated with severe side effects, long-term toxicity, and high costs. This has driven the exploration of herbal remedies, which have been traditionally used for centuries to manage inflammatory skin diseases. Herbs such as Aloe vera, Curcuma longa (Turmeric), and Camellia sinensis (Tea) have shown promising antipsoriatic potential due to their bioactive compounds. Aloe vera, rich in polysaccharides and glycoproteins, exhibits anti-inflammatory and wound-healing properties. Curcumin, the active compound in turmeric, targets multiple signaling pathways, such as NF- $\kappa$ B and phosphorylase kinase, to mitigate inflammation and keratinocyte proliferation. Similarly, tea extracts (green, black, and white) are abundant in polyphenols like catechins and theaflavins, which modulate oxidative stress and cytokine levels (e.g., IL-17 and TNF- $\alpha$ ). This review highlights the mechanisms through which these herbs act, their clinical applications, and their advantages over synthetic therapies. Herbal treatments offer a safer, cost-effective, and holistic approach, particularly for mild to moderate psoriasis. However, challenges remain, including standardization of herbal formulations, variability in bioactive compound content, and the need for large-scale clinical trials. This review aims to provide a comprehensive understanding of the role of herbs in psoriasis management, emphasizing their potential as adjunct or alternative therapies to conventional treatments.

**KEY WORDS:** Psoriasis, herbal medicine, anti-inflammatory, Curcuma longa, Camellia sinensis.

## INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory disorder affecting the skin and, in some cases, joints, with an estimated global prevalence of 2–4% of the population. Characterized by erythematous, scaly plaques, psoriasis significantly impacts both physical and mental well-being, often resulting in comorbid conditions such as psoriatic arthritis, cardiovascular diseases, and depression. The pathophysiology of psoriasis involves a complex interplay between genetic predisposition, environmental triggers, and dysregulated immune responses. Cytokines such as IL-17, IL-23, and TNF- $\alpha$  play a central role in driving the inflammatory cascade, leading to hyperproliferation of keratinocytes and the formation of psoriatic plaques. (Zhang, 2024)

Despite advancements in treatment, psoriasis remains a challenging condition to manage. Conventional therapies, including topical corticosteroids, vitamin D analogues, phototherapy, and systemic drugs like methotrexate and biologics, are effective but often associated with significant limitations. Side effects such as skin atrophy, photosensitivity, hepatotoxicity, and immunosuppression, combined with the high cost of biologics, necessitate alternative therapeutic strategies.

Herbal medicine, an integral component of traditional healthcare systems worldwide, offers a promising avenue for the management of psoriasis. Historically, medicinal plants have been used to treat various skin ailments due to their anti-inflammatory, antioxidant, and immunomodulatory properties. Herbs like Aloe vera, Curcuma longa (Turmeric), and Camellia sinensis (Tea) have gained attention for their potential antipsoriatic effects. These natural

remedies are believed to address the underlying pathophysiological mechanisms of psoriasis with minimal side effects, making them appealing to patients seeking holistic and safer alternatives (Zhang, 2024).

This review aims to provide a comprehensive overview of the role of herbs in the treatment of psoriasis. It explores their pharmacological actions, mechanisms of efficacy, and potential applications as standalone or adjunctive therapies. Furthermore, the advantages and limitations of herbal treatments are discussed to offer insights into their integration into conventional psoriasis management. By compiling evidence from existing literature, this review underscores the potential of herbs as effective, affordable, and sustainable options in the fight against psoriasis.

### Herbs in Psoriasis Management

The use of herbs for managing psoriasis has deep roots in traditional medicine, offering potential solutions with fewer side effects compared to conventional therapies. These natural remedies are often rich in bioactive compounds that target inflammation, oxidative stress, and immune dysfunction, which are central to the pathophysiology of psoriasis.

Below is a detailed examination of key herbs and their roles in psoriasis management (Reena K. M., 2022):

#### 1. Aloe Vera

Aloe vera is well-known for its soothing and healing properties. The gel extracted from its leaves contains active compounds such as polysaccharides, glycoproteins, aloin, and aloe-emodin. These components exhibit significant anti-inflammatory, antipruritic, and wound-healing effects. In psoriasis, topical application of Aloe vera gel has been shown to reduce redness, scaling, and itching. Studies indicate that it may downregulate inflammatory cytokines like TNF- $\alpha$  and IL-17, providing relief from the hyperproliferation of keratinocytes and inflammation that characterize the condition. Aloe vera is particularly appealing due to its safety profile and ease of application, making it a popular choice among patients (Chandrasekar R. &, 2016), ( Reena K. M., 2022).



**Fig 1: Aloe Vera**

#### 2. Curcuma Longa (Turmeric)

Curcumin, the primary bioactive compound in turmeric, is a potent antioxidant and anti-inflammatory agent. It works by modulating multiple pathways implicated in psoriasis, such as NF- $\kappa$ B signaling and phosphorylase kinase inhibition. Curcumin reduces keratinocyte proliferation and mitigates the immune response by decreasing levels of pro-inflammatory cytokines like IL-6, TNF- $\alpha$ , and IL-17. Clinical studies suggest that both oral and topical formulations of curcumin can effectively alleviate psoriatic symptoms. While its poor bioavailability has been a challenge, advanced delivery systems such as nanocurcumin and piperine-enhanced formulations have demonstrated improved therapeutic efficacy (Reena K. M., 2022).



**Fig 2: Curcuma Longa (Turmeric)**

### 3. *Camellia Sinensis* (Tea)

Green, black, and white teas derived from *Camellia sinensis* are rich in polyphenols, including catechins, theaflavins, and epigallocatechin gallate (EGCG). These compounds exhibit anti-inflammatory and antioxidant effects by scavenging reactive oxygen species (ROS) and downregulating pro-inflammatory cytokines. Studies involving animal models of psoriasis have shown that tea extracts can reduce IL-17 and TNF- $\alpha$  expression while promoting skin barrier repair. The potential of tea extracts as dietary supplements or topical formulations makes them a versatile option for psoriasis management (Zhang, 2024).



**Fig 3: *Camellia Sinensis* (Tea)**

### 4. *Azadirachta Indica* (Neem)

Neem, a staple in Ayurvedic medicine, is valued for its antimicrobial, anti-inflammatory, and immunomodulatory properties. Extracts from neem leaves, bark, and oil have been used to treat various skin conditions, including psoriasis. Neem helps reduce inflammation and scales through its active constituents, such as nimbidin and azadirachtin. Its use in baths, oils, or topical creams has demonstrated effectiveness in alleviating psoriatic symptoms (Chandrasekar R. &, 2016).



**Fig 4: *Azadirachta Indica* (Neem)**

### 5. *Calendula Officinalis* (Marigold)

*Calendula* is recognized for its wound-healing, anti-inflammatory, and regenerative properties. The flavonoids and saponins in calendula extracts contribute to its therapeutic effects. Its application in psoriasis involves reducing redness, irritation, and scaling while enhancing skin hydration. Calendula-based formulations are widely used in creams and ointments for their soothing properties (Chandrasekar R. &, 2016).



**Fig 5: *Calendula Officinalis* (Marigold)**

## 6. Argemone Mexicana (Mexican Poppy)

The latex of *Argemone mexicana* is traditionally used to treat inflammatory skin conditions. It contains bioactive alkaloids like sanguinarine, which exhibit anti-inflammatory and antimicrobial activities. While evidence for its effectiveness in psoriasis is largely anecdotal, its historical use suggests potential benefits in reducing scaling and itching (Chandrasekar R. &, 2016).



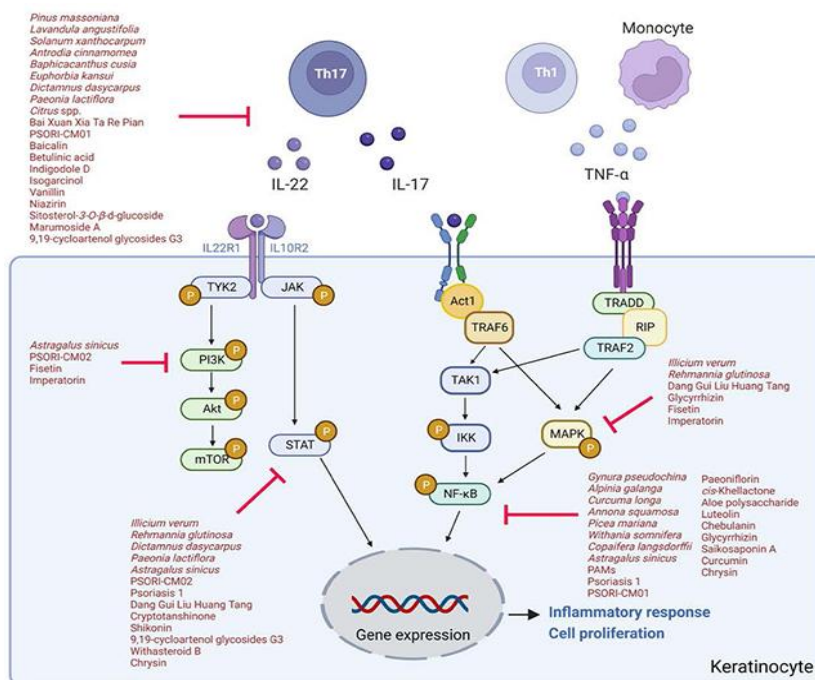
**Fig 6: Argemone Mexicana (Mexican Poppy)**

## 7. Other Noteworthy Herbs

- **Nigella sativa (Black Cumin):** The seeds of *Nigella sativa* are rich in thymoquinone, which exhibits strong anti-inflammatory and antioxidant properties, potentially reducing psoriatic lesions.
- **Momordica charantia (Bitter Melon):** Known for its immunomodulatory effects, extracts of bitter melon have been studied for their potential to reduce skin inflammation and hyperkeratosis.
- **Wrightia tinctoria:** Traditionally used in Indian medicine, *Wrightia tinctoria* leaves have shown promise in managing mild to moderate psoriasis due to their anti-inflammatory properties (Chandrasekar R. &, 2016).

## Mechanisms of Action

Herbs employed in the treatment of psoriasis target a variety of pathophysiological pathways, addressing key processes such as inflammation, oxidative stress, keratinocyte hyperproliferation, and immune system dysregulation. Their bioactive compounds work synergistically to mitigate symptoms, promote skin healing, and prevent disease progression. Below, we explore the primary mechanisms of action of these herbal treatments:



**Fig 7: Mechanisms of Action of Herbs in the treatment of psoriasis**

## 1. Anti-Inflammatory Effects

The inflammatory response is central to the pathogenesis of psoriasis, driven by cytokines like IL-17, IL-23, TNF- $\alpha$ , and IFN- $\gamma$ . Herbal remedies exert anti-inflammatory effects through several pathways:

- **Cytokine Suppression:** Many herbs, including **Curcuma longa (Turmeric)** and **Camellia sinensis (Tea)**, inhibit the production of pro-inflammatory cytokines by downregulating transcription factors such as NF- $\kappa$ B. This reduces inflammation and prevents the recruitment of immune cells to psoriatic lesions (Zhang, 2024), (Reena K. M., 2022).
- **Modulation of T-helper Cells:** Herbs like **Aloe vera** and **Nigella sativa (Black Cumin)** influence T-helper (Th) cells, particularly Th17 and Th1 cells, which are pivotal in psoriatic inflammation. By shifting the balance toward regulatory T cells (Tregs), they help suppress autoimmunity and reduce keratinocyte hyperproliferation( .

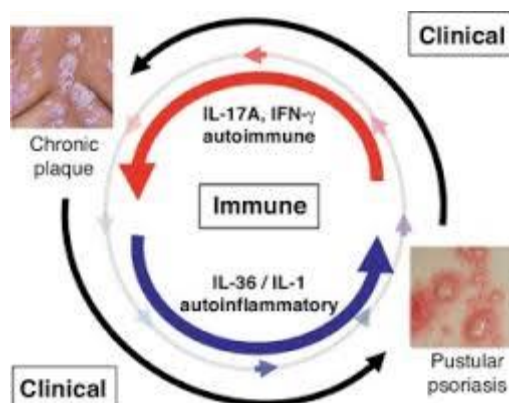
## 2. Antioxidant Properties

Oxidative stress plays a significant role in exacerbating psoriatic lesions by damaging skin cells and perpetuating inflammation.

- **Scavenging Free Radicals:** Herbs such as **Curcuma longa** and **Camellia sinensis** are rich in polyphenols and flavonoids that neutralize reactive oxygen species (ROS) and reduce lipid peroxidation in skin cells.
- **Enhancing Antioxidant Defense:** Compounds like epigallocatechin gallate (EGCG) in tea extracts boost endogenous antioxidant systems, including superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px), to protect the skin barrier (Zhang, 2024).

## 3. Regulation of Immune Responses

Psoriasis is an immune-mediated disorder where dysregulated immune cells, particularly dendritic cells, T cells, and keratinocytes, contribute to disease progression.



**Fig 8: Regulation of Immune Responses**

- **Inhibition of Dendritic Cell Activation:** Extracts from **Azadirachta indica (Neem)** and **Calendula officinalis (Marigold)** reduce dendritic cell activity, preventing the cascade of inflammatory cytokine release.
- **Balancing Immune Cell Activity:** Herbs like **Curcuma longa** and **Wrightia tinctoria** help restore immune homeostasis by modulating the activity of effector T cells and enhancing the suppressive functions of Tregs ( , (Reena K. M., 2022).

## 4. Keratinocyte Modulation

Psoriasis is marked by keratinocyte hyperproliferation and impaired differentiation, leading to the formation of thickened plaques.

- **Anti-Proliferative Effects:** Bioactive compounds such as curcumin and catechins suppress the excessive proliferation of keratinocytes by inhibiting key signaling pathways like STAT3 and PI3K/Akt.

- **Promotion of Normal Differentiation:** Some herbs, including **Aloe vera**, facilitate the proper differentiation of keratinocytes, restoring skin integrity and reducing scaling, (Reena K. M., 2022).

## 5. Inhibition of Angiogenesis

Psoriatic lesions are often accompanied by increased angiogenesis, which sustains inflammation and supports the hyperproliferative environment.

- **Anti-Angiogenic Effects:** Compounds in **Camellia sinensis** and **Curcuma longa** inhibit vascular endothelial growth factor (VEGF), reducing the formation of new blood vessels and limiting nutrient supply to psoriatic plaques (Zhang, 2024), (Reena K. M., 2022).

## 6. Skin Barrier Repair

The disruption of the skin barrier is a hallmark of psoriasis, allowing external irritants to exacerbate inflammation.

- **Hydration and Barrier Strengthening:** **Aloe vera** and **Calendula officinalis** improve hydration and enhance the lipid matrix of the skin barrier, reducing transepidermal water loss and preventing irritant penetration.
- **Wound Healing Properties:** Many herbs promote re-epithelialization and repair of damaged skin through their regenerative properties.

## 7. Reduction of Microbial Load

Psoriatic skin is prone to microbial infections that can aggravate symptoms.

- **Antimicrobial Effects:** Herbs like **Azadirachta indica** and **Argemone mexicana** possess antimicrobial properties, targeting bacteria and fungi that contribute to secondary infections in psoriatic lesions.

## Synergistic Mechanisms

One of the defining advantages of herbal treatments in managing psoriasis is their ability to target multiple pathological mechanisms simultaneously. This multi-targeted approach is inherently synergistic, allowing herbs to exert comprehensive therapeutic effects with fewer side effects compared to conventional mono-target therapies like corticosteroids or biologics. Below, we delve into the synergistic interplay of the mechanisms through which herbs address the complex pathophysiology of psoriasis (Bhat, 2021).

### 1. Anti-Inflammatory and Immune-Modulatory Synergy

Psoriasis is driven by a dysregulated immune response involving pro-inflammatory cytokines, dendritic cells, and T-helper cells. Many herbs combine anti-inflammatory and immune-modulatory actions to break this cycle:

- **Dual Cytokine Modulation:** Curcumin from **Curcuma longa** reduces pro-inflammatory cytokines such as IL-17 and TNF- $\alpha$  while promoting anti-inflammatory cytokines like IL-10. This dual action not only suppresses inflammation but also restores immune balance (Reena K. M., 2022).
- **Adaptive and Innate Immune Regulation:** **Nigella sativa** and **Azadirachta indica** modulate both adaptive (T cells) and innate (dendritic cells, macrophages) immune responses, ensuring broad-spectrum immunomodulation. Together, these actions reduce the recruitment of inflammatory cells to psoriatic lesions and mitigate keratinocyte hyperproliferation, (Reena K. M., 2022).

### 2. Antioxidant and Anti-Inflammatory Synergy

Oxidative stress exacerbates inflammation by generating reactive oxygen species (ROS) that amplify cytokine production and immune activation. Herbs like **Camellia sinensis** (tea) and **Curcuma longa** provide a dual benefit:

- **ROS Neutralization:** Polyphenols in green tea and curcumin act as powerful antioxidants, scavenging free radicals to reduce oxidative stress at the site of inflammation.
- **Inflammatory Pathway Suppression:** By reducing ROS, these antioxidants indirectly inhibit NF- $\kappa$ B and other inflammatory signaling pathways, enhancing their anti-inflammatory efficacy (Zhang, 2024), (Reena K. M., 2022).

### 3. Keratinocyte Modulation and Skin Barrier Repair

The hyperproliferation of keratinocytes and disruption of the skin barrier are hallmarks of psoriasis. Herbs often work synergistically to address both issues:

- **Inhibition of Keratinocyte Proliferation:** Bioactive compounds like catechins and curcumin suppress keratinocyte proliferation through pathways such as STAT3 inhibition.
- **Barrier Function Restoration:** Herbs like **Aloe vera** and **Calendula officinalis** enhance skin barrier function by promoting lipid synthesis and re-epithelialization. This combined action not only reduces plaque formation but also protects against irritants and secondary infections .

### 4. Anti-Angiogenic and Anti-Inflammatory Synergy

Angiogenesis plays a critical role in sustaining psoriatic inflammation by providing nutrients and oxygen to hyperproliferative skin tissues. Anti-angiogenic compounds in herbs like **Camellia sinensis** work synergistically with their anti-inflammatory effects:

- **Reduction in Vascular Growth:** Polyphenols inhibit vascular endothelial growth factor (VEGF), reducing blood vessel formation.
- **Decreased Inflammatory Mediators:** Simultaneously, these herbs lower cytokine levels that stimulate angiogenesis, creating a reinforcing effect that limits nutrient supply to psoriatic plaques (Zhang, 2024), (Reena K. M., 2022).

### 5. Antimicrobial and Anti-Inflammatory Synergy

Psoriatic skin is prone to secondary microbial infections, which can exacerbate inflammation and delay healing. Herbs like **Azadirachta indica** and **Argemone mexicana** provide dual benefits:

- **Microbial Control:** Antimicrobial compounds such as nimbidin and sanguinarine eliminate pathogens from psoriatic plaques.
- **Inflammation Reduction:** By reducing microbial load, these herbs prevent further activation of immune responses, thereby controlling inflammation and promoting healing .

### 6. Multi-Level Molecular Targeting

The bioactive compounds in herbs often target multiple molecular pathways involved in psoriasis. For example:

- **Curcumin:** Simultaneously inhibits NF- $\kappa$ B (inflammatory signaling), STAT3 (keratinocyte proliferation), and VEGF (angiogenesis).
- **Catechins in Tea:** Act on oxidative stress, inflammation, and immune signaling, providing a holistic therapeutic effect.
- This multi-level targeting ensures that herbs address the interconnected pathways of psoriasis, unlike conventional drugs that typically focus on a single mechanism (Zhang, 2024), (Reena K. M., 2022).

### 7. Comprehensive Symptom Relief

Herbs like **Aloe vera** and **Calendula officinalis** offer a broad range of benefits, including:

- Reduction of itching and erythema (anti-inflammatory).
- Healing of plaques and cracks (wound healing).
- Skin hydration and protection (barrier repair).
- By addressing multiple symptoms simultaneously, these herbs improve patient comfort and quality of life while minimizing the need for additional therapies .

#### Advantages and Applications (Koo, 2020)

The use of herbal treatments in managing psoriasis offers numerous advantages over conventional therapies. These benefits stem from their ability to address multiple pathological pathways simultaneously, their safety profile, and their holistic approach to health and well-being. Additionally, the versatile applications of herbs, ranging from dietary

supplements to topical formulations, make them suitable for diverse patient populations. Below is a detailed discussion of the advantages and applications of herbs in psoriasis management.

## Advantages of Herbal Treatments

### 1. Reduced Side Effects

One of the most significant advantages of herbal remedies is their minimal adverse effects compared to conventional treatments such as corticosteroids, biologics, and systemic immunosuppressants:

- **Fewer Systemic Risks:** Herbs like **Aloe vera** and **Curcuma longa** are generally well-tolerated, even with long-term use, avoiding issues such as skin atrophy, hepatotoxicity, and immunosuppression commonly associated with synthetic drugs, (Reena K. M., 2022).
- **Natural Composition:** Most herbs are derived from plant-based sources, reducing the risk of synthetic drug-induced toxicity and allergic reactions.

### 2. Multimodal Action

Herbs act on multiple biological targets simultaneously, providing comprehensive symptom relief. For example:

- **Curcuma longa (Turmeric):** Combines anti-inflammatory, antioxidant, and keratinocyte-regulating effects.
- **Camellia sinensis (Tea):** Offers antioxidant, immune-modulatory, and anti-angiogenic properties (Zhang, 2024), (Reena K. M., 2022).

### 3. Cost-Effectiveness

Herbal therapies are generally more affordable than biologics or other advanced treatments, making them accessible to a larger patient population. This is particularly relevant in resource-limited settings where the cost of conventional treatments can be prohibitive.

### 4. Safety in Long-Term Use

Many herbs, such as **Calendula officinalis** and **Aloe vera**, are safe for prolonged use, allowing for chronic management of psoriasis without the cumulative side effects seen with long-term corticosteroid or systemic drug use (Chandrasekar R. &, 2016), (Reena K. M., 2022).

### 5. Holistic Approach

Herbal treatments often provide additional health benefits beyond managing psoriasis, including:

- Improving general skin health and hydration.
- Reducing the risk of comorbid conditions such as oxidative stress-related diseases.
- Supporting overall immune system function.

## APPLICATIONS OF HERBAL TREATMENTS IN PSORIASIS

### 1. Topical Formulations

Topical application of herbs is one of the most effective methods for managing psoriasis. These formulations deliver active compounds directly to affected areas, offering localized relief:

- **Aloe vera Gel:** Reduces erythema, scaling, and itching while promoting wound healing.
- **Curcumin Creams:** Effective in reducing plaque thickness and inflammation.
- **Calendula Ointments:** Soothe irritation, hydrate the skin, and support barrier repair (Chandrasekar R. &, 2016), (Reena K. M., 2022).

### 2. Dietary Supplements

Herbs such as **Camellia sinensis (Tea)** and **Nigella sativa (Black Cumin)** can be consumed as dietary supplements or beverages to support systemic health:

- **Green Tea Extracts:** Help reduce systemic inflammation and oxidative stress.
- **Turmeric Supplements:** Provide anti-inflammatory benefits at the systemic level when consumed orally (Zhang, 2024), (Reena K. M., 2022).

### 3. Adjunct Therapy with Conventional Treatments

Herbal remedies can be used alongside conventional treatments to enhance efficacy and reduce the side effects of synthetic drugs:

- **Combining Curcumin with Biologics:** Curcumin has been shown to enhance the effectiveness of biologics by reducing inflammatory cytokine levels.
- **Using Aloe vera with Phototherapy:** Aloe vera improves skin hydration, enhancing the effects of UVB therapy.

### 4. Preventive Care and Maintenance

Herbs can be used for preventive care, particularly in patients with mild psoriasis or those in remission:

- **Regular Use of Neem Oil:** Helps prevent flare-ups by maintaining healthy skin.
- **Tea Consumption:** Offers long-term benefits in reducing inflammation and preventing plaque formation .

### 5. Innovative Delivery Systems

Recent advancements in formulation science have enabled the incorporation of herbs into modern drug delivery systems, improving their bioavailability and efficacy:

- **Nanoformulations of Curcumin:** Overcome bioavailability issues and enhance therapeutic outcomes.
- **Hydrogel Formulations of Aloe Vera:** Improve skin penetration and provide sustained release of active compounds (Reena K. M., 2022).

## SPECIAL POPULATIONS

### 1. Pediatric and Elderly Patients

Herbal treatments are particularly advantageous for children and the elderly, who are more susceptible to the side effects of conventional drugs:

- Gentle formulations like **Calendula officinalis** creams can be safely used on sensitive skin.

### 2. Patients with Comorbidities

For patients with conditions such as diabetes, hypertension, or cardiovascular disease, herbal treatments provide a safer alternative with reduced risk of drug interactions (Reena K. M., 2022).

## CHALLENGES AND FUTURE DIRECTIONS

While herbal treatments offer promising benefits for managing psoriasis, several challenges must be addressed to fully integrate these therapies into mainstream clinical practice. From variability in efficacy to a lack of rigorous scientific evidence, these obstacles necessitate further research and development. Additionally, future directions must focus on overcoming these challenges through innovation, standardization, and interdisciplinary approaches.

### Challenges in Herbal Psoriasis Treatment (Stander, 2021)

#### 1. Variability in Bioactive Compounds

- **Plant Source Variability:** The concentration of bioactive compounds in herbs can vary significantly due to differences in plant species, geographic origin, cultivation conditions, and harvesting techniques. For example, the curcumin content in **Curcuma longa** may differ based on soil quality and environmental factors.

- **Extraction and Processing Differences:** Variations in extraction methods (e.g., ethanol vs. water extraction) can lead to inconsistencies in the active ingredient profile, affecting the therapeutic efficacy of herbal products, (Reena K. M., 2022).

## 2. Lack of Standardization

- **Inconsistent Formulations:** Herbal products often lack standardization, resulting in differences in potency and quality across brands. This makes it difficult for clinicians to recommend precise dosages or formulations.
- **Quality Control Issues:** Contamination with pesticides, heavy metals, or adulterants is a concern in herbal preparations, particularly when sourced from unregulated markets.

## 3. Limited Clinical Evidence

- **Scarcity of Rigorous Trials:** While preclinical studies and anecdotal evidence support the efficacy of herbs in psoriasis, there is a lack of large-scale, randomized controlled trials (RCTs) to validate their use.
- **Short-Term Studies:** Most existing studies are of short duration, providing limited information on the long-term safety and efficacy of herbal treatments (Zhang, 2024), (Reena K. M., 2022).

## 4. Poor Bioavailability

- **Absorption Challenges:** Many herbal compounds, such as curcumin, suffer from poor oral bioavailability due to low solubility, rapid metabolism, and limited systemic absorption. This reduces their therapeutic potential when administered orally.
- **Variable Delivery Systems:** The lack of optimized delivery mechanisms for some herbs can hinder their effectiveness in reaching target tissues (Reena K. M., 2022).

## 5. Integration with Conventional Medicine

- **Potential Interactions:** Herbal remedies may interact with conventional treatments, such as immunosuppressants or biologics, potentially reducing their efficacy or causing adverse effects.
- **Limited Awareness Among Clinicians:** Many healthcare providers are unfamiliar with the pharmacology of herbal medicines, making them hesitant to incorporate these therapies into treatment plans.

## 6. Regulatory and Policy Barriers

- **Lack of Standardized Guidelines:** Regulatory frameworks for herbal medicines vary widely across countries, leading to discrepancies in approval processes and quality assurance.
- **Consumer Misinformation:** The marketing of herbal products often lacks scientific rigor, leading to exaggerated claims that undermine trust in their efficacy.

## FUTURE DIRECTIONS FOR HERBAL PSORIASIS TREATMENT

### 1. Advancing Scientific Research

- **Large-Scale Clinical Trials:** Conducting rigorous RCTs to evaluate the safety, efficacy, and optimal dosages of herbal treatments for psoriasis is essential. Studies should assess both standalone herbal therapies and their use as adjuncts to conventional treatments.
- **Mechanistic Studies:** Further research is needed to elucidate the molecular mechanisms through which herbs exert their antipsoriatic effects. This will provide a scientific basis for their therapeutic use.
- **Long-Term Safety Assessments:** Investigating the long-term effects of chronic herbal therapy is critical for establishing their viability in managing psoriasis.

### 2. Standardization and Quality Control

- **Development of Standards:** Establishing global standards for the cultivation, extraction, and formulation of herbal products will ensure consistent quality.

- **Bioactive Marker Identification:** Identifying and quantifying key bioactive compounds (e.g., curcumin in turmeric, catechins in tea) can help standardize dosages and enhance efficacy.
- **Good Manufacturing Practices (GMP):** Adopting GMP guidelines for herbal production will improve safety and reliability.

### 3. Innovations in Drug Delivery

- **Enhanced Bioavailability:** Advanced delivery systems, such as nanoparticles, liposomes, and micelles, can improve the absorption and efficacy of poorly bioavailable compounds like curcumin.
- **Topical and Transdermal Systems:** Innovations in hydrogel, emulgel, and sustained-release formulations can enhance localized delivery to psoriatic lesions, maximizing therapeutic outcomes.
- **Combination Therapies:** Exploring formulations that combine herbal compounds with synergistic effects can enhance their overall efficacy (Chandrasekar R. &, 2016), (Reena K. M., 2022).

### 4. Integration with Conventional Therapies

- **Adjunctive Use:** Herbal treatments can be integrated with conventional therapies to enhance efficacy and reduce side effects. For example, combining Aloe vera gel with phototherapy can improve skin hydration and healing.
- **Personalized Medicine:** Developing tools to assess patient-specific responses to herbal treatments will enable tailored therapies, improving outcomes.

### 5. Education and Awareness

- **Clinician Training:** Educating healthcare providers about the pharmacology and clinical applications of herbal treatments will promote their integration into evidence-based care.
- **Public Awareness Campaigns:** Informing patients about the benefits and limitations of herbal therapies can empower them to make informed decisions.

### 6. Policy and Regulation Improvements

- **Harmonized Regulations:** Creating unified regulatory frameworks will ensure the safety and efficacy of herbal products across global markets.
- **Encouraging Research Investments:** Government and industry collaboration to fund research into herbal treatments will accelerate their development and clinical adoption.

## ADVANTAGES OVER CONVENTIONAL THERAPIES

Herbal treatments offer several notable advantages over conventional therapies in the management of psoriasis, primarily due to their natural composition, multi-targeted actions, minimal side effects, and overall accessibility. While conventional treatments such as corticosteroids, biologics, and systemic immunosuppressants are effective in managing psoriasis, they often come with significant drawbacks, including severe side effects, high costs, and long-term health risks. Below, we explore the key advantages of herbal treatments over conventional therapies.

### 1. Fewer and Less Severe Side Effects

One of the most compelling advantages of herbal treatments is their generally mild side effect profile compared to the long-term use of conventional drugs, which often cause significant adverse effects.

- **Skin Atrophy and Irritation from Corticosteroids:** Topical corticosteroids are a common treatment for psoriasis but can cause thinning of the skin (atrophy), delayed wound healing, and increased risk of skin infections with prolonged use. In contrast, herbs like **Aloe vera** and **Calendula officinalis** are well-tolerated and reduce skin irritation while promoting healing (Chandrasekar R. &, 2016), (Reena K. M., 2022).
- **Immunosuppression from Biologics:** Biologic drugs, while effective, suppress the immune system and increase the risk of infections, cancers, and other systemic issues. Herbal remedies like **Curcuma longa** and **Azadirachta indica (Neem)** modulate immune responses without broadly suppressing immune function, offering a safer alternative for long-term management.

- **Systemic Toxicity from Systemic Drugs:** Systemic treatments such as methotrexate and cyclosporine can have toxic effects on the liver and kidneys. Herbal alternatives, such as **Turmeric** or **Green Tea extracts**, do not carry the same level of systemic toxicity and can be used for prolonged periods with fewer health risks (Zhang, 2024), (Reena K. M., 2022).

## 2. Multi-Targeted Mechanisms of Action

Herbal treatments are often characterized by their ability to target multiple pathways involved in the pathophysiology of psoriasis simultaneously, whereas conventional therapies often focus on a single mechanism.

- **Cytokine Suppression, Inflammation, and Immune Modulation:** Herbs like **Curcuma longa** and **Camellia sinensis (Tea)** target various inflammatory cytokines (e.g., IL-17, TNF- $\alpha$ ), reduce oxidative stress, and promote immune balance by enhancing T-regulatory cell functions. Conventional drugs often target one cytokine or pathway (e.g., TNF- $\alpha$  inhibitors) but do not have the broad-spectrum effects of herbal treatments (Zhang, 2024), (Reena K. M., 2022).
- **Keratinocyte Modulation and Skin Repair:** While corticosteroids primarily target inflammation, herbs like **Aloe vera** and **Calendula officinalis** not only reduce inflammation but also promote keratinocyte differentiation and accelerate skin healing. This dual action is less commonly found in synthetic drugs .

## 3. Cost-Effectiveness

Herbal remedies are generally more affordable than conventional treatments, especially biologics and systemic therapies, which can be prohibitively expensive.

- **Lower Treatment Costs:** Biologic drugs, such as TNF- $\alpha$  inhibitors, can cost thousands of dollars per month, making them unaffordable for many patients. In contrast, herbal treatments like **Green Tea** and **Turmeric** are relatively inexpensive and can provide long-term symptom relief at a fraction of the cost (Chandrasekar R. &, 2016), (Zhang, 2024).
- **Affordable Over-the-Counter Availability:** Many herbal products are available over the counter in various forms (e.g., creams, oils, and supplements), making them more accessible to patients without the need for a prescription or expensive healthcare visits.

## 4. Safer Long-Term Use

While psoriasis is a chronic condition, conventional treatments often require long-term use, which can result in cumulative toxicity and adverse effects over time.

- **Chronic Use Without Cumulative Risk:** Herbal treatments like **Turmeric** and **Neem oil** can be used safely over long periods without the significant risks of systemic toxicity seen with long-term corticosteroid or biologic therapy. This makes herbal remedies an attractive option for managing psoriasis as a lifelong condition (Chandrasekar R. &, 2016), (Zhang, 2024).
- **Prevention of Relapses and Flare-Ups:** Many herbal treatments can also be used as preventive measures to maintain remission and reduce the frequency of flare-ups. For example, **Aloe vera** and **Tea extracts** can help manage milder forms of psoriasis, reducing the need for intense pharmacological interventions .

## 5. Support for Overall Skin Health and Well-Being

Herbal treatments are often associated with additional health benefits beyond managing psoriasis, improving overall skin health and systemic well-being.

- **Skin Hydration and Healing:** **Aloe vera** and **Calendula** are particularly effective in moisturizing the skin, reducing itching, and accelerating wound healing, which is essential in the management of psoriasis plaques. Conventional therapies, on the other hand, may lead to dry skin and irritation as a side effect .
- **Anti-Stress and General Health Benefits:** Herbs like **Turmeric** and **Green Tea** offer anti-inflammatory and antioxidant effects that go beyond the skin, supporting general health by reducing oxidative stress and inflammation in other parts of the body. This holistic effect is not typically found in targeted psoriasis treatments like biologics (Zhang, 2024), (Reena K. M., 2022).

## 6. Minimal Risk of Dependency or Withdrawal Symptoms

Many conventional treatments, particularly corticosteroids, can lead to dependency and withdrawal symptoms when discontinued.

- **No Dependency Risks:** Unlike steroids, which can cause rebound flare-ups when stopped abruptly, herbal treatments like **Curcuma longa** and **Azadirachta indica** do not cause withdrawal symptoms and can be gradually reduced or used intermittently without the risk of dependency (Chandrasekar R. &, 2016), (Reena K. M., 2022).

## 7. Compatibility with Complementary and Integrative Approaches

Herbal treatments are highly compatible with other complementary therapies, such as dietary changes, exercise, and acupuncture, which are often used alongside conventional psoriasis treatments to enhance outcomes.

- **Integrative Therapies:** Combining herbal treatments with dietary modifications (e.g., anti-inflammatory diets), stress-reduction techniques, and phototherapy offers a holistic approach to psoriasis management. This integrative approach addresses multiple aspects of the disease, including immune dysfunction, skin health, and overall well-being (Zhang, 2024).

## LIMITATIONS AND FUTURE DIRECTIONS

While herbal treatments for psoriasis offer promising benefits, there are several limitations and challenges that must be addressed to maximize their potential in clinical practice. To fully integrate herbal therapies into psoriasis management and ensure their widespread acceptance, these obstacles need to be overcome through further research, standardization, and improved clinical application. Below, we examine the limitations of herbal treatments and outline the future directions necessary to optimize their effectiveness and clinical use.

### Limitations Of Herbal Treatments

#### 1. Lack of Rigorous Clinical Evidence

- **Limited Large-Scale Trials:** Although preclinical studies and anecdotal evidence suggest that herbal treatments can be effective for managing psoriasis, there is a lack of large-scale, well-designed randomized controlled trials (RCTs) to establish definitive evidence. The majority of existing studies are of small sample size, often focusing on short-term outcomes. Without extensive clinical trials, it is difficult to confidently recommend herbal treatments as first-line therapies (Zhang, 2024).
- **Short Duration of Studies:** Many studies evaluating herbal treatments are limited by their short duration, leaving unanswered questions about the long-term safety and efficacy of these therapies in chronic psoriasis management. Psoriasis is a lifelong condition, and herbal treatments need to be evaluated for their effectiveness over extended periods (Zhang, 2024).

#### 2. Standardization and Quality Control Issues

- **Variability in Herbal Composition:** One of the primary challenges with herbal treatments is the variability in the concentration of active ingredients. The therapeutic effects of herbal products are often inconsistent due to factors such as differences in plant cultivation, extraction methods, and environmental conditions. For example, the curcumin content in **Curcuma longa** can vary widely depending on how the turmeric is grown and processed, leading to inconsistent therapeutic outcomes .
- **Lack of Standardized Formulations:** Many commercially available herbal preparations lack standardization, making it difficult to ensure consistent potency and efficacy. This lack of consistency can lead to variable clinical results and may make it challenging for clinicians to recommend specific herbal products (Zhang, 2024).
- **Contamination and Adulteration:** Unregulated herbal products may contain contaminants such as heavy metals, pesticides, or other adulterants that could pose health risks, particularly for patients with compromised immune systems or those using herbal remedies over long periods .

### 3. Poor Bioavailability of Active Compounds

- **Absorption Issues:** Many herbal compounds, such as curcumin from *Curcuma longa*, have poor bioavailability due to their low solubility, rapid metabolism, and limited absorption in the gastrointestinal tract. This limits the therapeutic effects when these compounds are taken orally (Reena K. M., 2022).
- **Inadequate Delivery Systems:** While topical formulations of herbal extracts can provide localized relief, there is still room for improvement in delivery systems to enhance the penetration and effectiveness of active compounds in the skin. Current delivery systems may not sufficiently address the challenge of delivering active ingredients deep into psoriatic plaques .

### 4. Potential for Herb-Drug Interactions

- **Interaction with Conventional Medications:** Herbal treatments, particularly when taken orally, may interact with conventional psoriasis medications, such as immunosuppressants or biologics. These interactions may either enhance or inhibit the effects of pharmaceutical drugs, potentially leading to adverse outcomes or reducing the effectiveness of prescribed treatments.
- **Lack of Awareness Among Healthcare Providers:** Many healthcare providers are not fully aware of the pharmacokinetics and pharmacodynamics of herbal treatments, which may lead to reluctance in incorporating them into treatment plans. The lack of clear clinical guidelines on combining herbal treatments with conventional therapies further complicates their use (Reena K. M., 2022).

### 5. Regulatory and Legal Challenges

- **Lack of Comprehensive Regulation:** Herbal products are not uniformly regulated across countries, leading to discrepancies in quality control, product labeling, and safety standards. In some regions, herbal products may not undergo the same rigorous testing and approval processes required for conventional medications, which can affect the trust patients place in these treatments .
- **Inconsistent Labeling and Claims:** Many herbal products are marketed with claims of efficacy that are not substantiated by scientific evidence. This contributes to consumer confusion and skepticism regarding the actual benefits of these treatments. Proper regulation and evidence-based marketing are essential to ensure that patients receive safe and effective herbal treatments (Reena K. M., 2022).

## FUTURE DIRECTIONS FOR HERBAL PSORIASIS TREATMENT

### 1. Expansion of Clinical Research

- **Rigorous, Multi-Center Clinical Trials:** To establish the safety and efficacy of herbal treatments for psoriasis, large-scale, multi-center RCTs are essential. These trials should focus on long-term outcomes and include a diverse patient population to account for variations in individual responses. Long-term studies will help determine the sustained effects of herbal therapies and provide data on their safety profile over extended periods of use (Chandrasekar R. &, 2016), (Zhang, 2024).
- **Mechanistic Research:** Further research is needed to explore the molecular mechanisms by which herbs exert their effects. Studies that identify specific molecular pathways such as the inhibition of specific cytokines or the regulation of immune cell activity will provide a scientific foundation for the use of herbs in psoriasis treatment .
- **Comparative Effectiveness Studies:** Comparative studies that evaluate the efficacy of herbal treatments relative to conventional therapies will help clarify the role of herbs in psoriasis management. These studies can identify which herbs are most effective for specific types of psoriasis and in combination with other therapies (Zhang, 2024).

### 2. Standardization and Quality Assurance

- **Development of Standardized Formulations:** One of the key advancements needed is the standardization of herbal formulations. This includes establishing consistent dosages and ensuring that active ingredients are present in therapeutic amounts in every batch. Standardized formulations will make it easier for healthcare providers to prescribe and monitor herbal treatments for psoriasis .

- **Quality Control and Regulatory Oversight:** Strengthening regulations to ensure the quality, safety, and efficacy of herbal products is crucial. This includes implementing Good Manufacturing Practices (GMP) for herbal production and establishing clear guidelines for herbal product labeling, ensuring that patients receive safe and reliable treatments (Reena K. M., 2022).
- **Quality Monitoring Systems:** Ongoing monitoring of the quality of herbal products in the market will help prevent contamination, adulteration, or the sale of substandard products that may compromise patient safety

### 3. Improving Bioavailability and Delivery Systems

- **Enhanced Formulations for Oral and Topical Use:** Advances in formulation technology are needed to enhance the bioavailability of herbal compounds, particularly those with poor absorption like curcumin. Nanoformulations, liposomal delivery systems, and piperine-enhanced curcumin formulations could significantly improve the therapeutic effects of herbs.
- **Topical Delivery Innovations:** The development of novel topical delivery systems, such as hydrogels or microencapsulation techniques, could enhance the penetration of active herbal compounds into the skin, improving the efficacy of treatments for psoriasis plaques (Reena K. M., 2022).

### 4. Integrating Herbal and Conventional Therapies

- **Combination Therapies:** Herbal treatments could be used as adjuncts to conventional therapies, particularly for patients who experience side effects from long-term use of corticosteroids or biologics. Future research should focus on identifying effective combinations of herbal remedies and pharmaceuticals, allowing for the synergistic effects of both treatment modalities while minimizing side effects (Chandrasekar R. &, 2016), (Reena K. M., 2022).
- **Personalized Treatment Plans:** Integrating herbal treatments into personalized medicine will allow clinicians to tailor psoriasis management to individual patient needs, considering factors such as disease severity, comorbidities, and response to prior therapies (Zhang, 2024).

### 5. Education and Awareness

- **Clinician Training:** To improve the adoption of herbal treatments in clinical practice, healthcare providers must be trained in the benefits, risks, and interactions of herbal therapies. This can be achieved through continuing medical education (CME) programs, workshops, and evidence-based guidelines.
- **Patient Education and Empowerment:** Educating patients on the potential benefits and limitations of herbal treatments will help them make informed decisions about their care. Clear communication between healthcare providers and patients about the integration of herbal treatments into existing treatment plans is essential for patient success (Reena K. M., 2022).

## CONCLUSION

Psoriasis, a chronic and often debilitating skin disorder, requires effective, long-term management strategies. While conventional therapies, such as corticosteroids, biologics, and systemic immunosuppressants, have demonstrated efficacy, they come with significant drawbacks, including severe side effects, high costs, and long-term health risks. In this context, herbal treatments offer a promising alternative or adjunct, with their natural composition, multi-targeted mechanisms, and minimal adverse effects.

Herbal remedies such as **Aloe vera**, **Curcuma longa (Turmeric)**, **Camellia sinensis (Tea)**, and **Azadirachta indica (Neem)** have been shown to address multiple pathophysiological aspects of psoriasis, including inflammation, oxidative stress, immune dysregulation, and keratinocyte hyperproliferation. These herbs not only provide symptom relief, such as reduced scaling, erythema, and pruritus, but also promote overall skin health, supporting the skin's barrier function and accelerating wound healing. Furthermore, herbs like **Curcuma longa** and **Green Tea** offer additional systemic benefits, such as antioxidant and anti-inflammatory properties, contributing to overall health and well-being.

Despite their promising potential, herbal treatments face several limitations that must be addressed before they can be fully integrated into clinical practice. The lack of large-scale, rigorous clinical trials and the variability in the



bioactive compounds found in herbal products pose challenges to their widespread adoption. Furthermore, the poor bioavailability of many active compounds, combined with the potential for herb-drug interactions, necessitates further research and innovation in formulation and delivery systems. Standardization of herbal preparations and the establishment of quality control measures are essential to ensure the consistency, safety, and efficacy of these treatments.

Looking forward, the future of herbal treatments for psoriasis is promising, but it requires a multi-faceted approach. Expanding clinical research, including large-scale, long-term trials, will provide the evidence needed to substantiate the role of herbs in psoriasis management. Innovations in delivery systems, such as Nano formulations and topical formulations that enhance the absorption of active ingredients, will improve the bioavailability of herbs, increasing their therapeutic potential. The integration of herbal therapies with conventional treatments, personalized medicine, and greater clinician and patient education will be crucial in making herbal treatments a mainstream option for psoriasis care.

In conclusion, herbal treatments hold great promise as a safe, cost-effective, and sustainable solution for managing psoriasis. With continued research and development, they could become a valuable addition to the therapeutic arsenal for psoriasis, providing patients with an alternative or complementary approach to conventional therapies that better aligns with their preferences for natural, holistic care. By addressing the current limitations and expanding their clinical evidence, herbal remedies can play a significant role in improving the quality of life for individuals suffering from psoriasis, offering hope for better, safer long-term management.

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