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Review Article

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Natural Compounds Used in the Treatment and Management of Psoriasis: A Review

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Abstract

Psoriasis, a chronic inflammatory skin disorder, presents a significant challenge for both patients and healthcare providers. Psoriasis affects approximately 2-5% of the population worldwide. It can develop at any age, but it most commonly first appears between the ages of 15 and 25. There are several different types of psoriasis, each with its own unique symptoms and treatment options. Neem (Azadirachta indica) and Licorice (Glycyrrhiza glabra) demonstrate notable anti-inflammatory effects, targeting the underlying inflammation associated with Psoriasis. Turmeric (Curcuma longa) contains curcumin, a potent anti-inflammatory and antioxidant agent, offering promise in modulating the aberrant immune responses observed in Psoriasis. Aloe Vera (Aloe barbadensis) and Tea Tree Oil (Melaleuca alternifolia) exhibit anti-inflammatory and antimicrobial properties, suggesting potential benefits in reducing redness, scaling, and secondary infections. Santalum album (Sandalwood) provides a calming effect on the skin, while Calendula (Calendula officinalis) offers anti-inflammatory support, promoting skin healing in Psoriasis lesions. Allium sativum (Garlic) and Thai ginger (Zingiber officinale) contribute allicin and gingerol, respectively, known for their anti-inflammatory and antimicrobial actions, complementing the management of Psoriasis symptoms. Giloy (Tinospora cordifolia) and Mahonia Aquifolium (Oregon Grape) exhibit immunomodulatory properties, potentially regulating the immune responses underlying Psoriasis pathogenesis. Although these natural compounds show promise as adjunctive therapies. This review article provides the effectiveness of natural products in managing and treating Psoriasis.

Introduction

Psoriasis is a common, enduring autoimmune skin condition characterized by chronic inflammation. It impacts 2–5% of the global population, with variations based on factors such as gender, age, geographical location, and cultural demographics. Notably, European individuals display a higher prevalence of psoriasis compared to other populations [1]. The condition is marked by the presence of red and inflamed plaques and macules on the skin. These manifestations arise due to an elevated proliferation of epidermal cells responsible for producing keratin, accompanied by inadequate differentiation. These plaques are frequently accompanied by the presence of silvery scales. The heightened inflammation in these lesions stems from malfunctioning immune signals that trigger a tenfold increase in the mitotic rate of keratin-producing cells [2]. It is characterized by distinct chemical traits, including the emergence of erythematous and scaly skin lesions. These lesions commonly manifest around joints such as the elbows and knees, as well as the lower back and scalp. Over time, they can extend to areas like the forehead, back of the neck, behind the ears, chest, and arms. Within psoriatic skin, histopathological analysis reveals notable features such as epidermal hyperplasia with significant keratinocyte differentiation, heightened angiogenesis, and the presence of pronounced inflammatory infiltrates.

The underlying causes of this condition are multifaceted, stemming from a combination of genetic factors (family history) and environmental influences (alcohol, infections, medications, stress). These factors collectively contribute to the immuno-histological changes observed in the skin [3]. Psoriasis constitutes a lifelong ailment, and the approach to its management and treatment varies according to the severity of the condition. In cases of mild to moderate psoriasis, the initial strategy involves the application of topical agents. This approach is suitable for effectively managing these forms of psoriasis. However, for more severe conditions, such as cases of substantial severity, the recommended courses of action encompass systemic treatments or the utilization of phototherapy [4].

In the realm of psoriasis management, a comprehensive understanding of the disease severity guides treatment strategies [5]. For cases classified as mild to moderate, the foremost therapeutic line entails the application of topical agents, which serve as a cornerstone in alleviating symptoms [6]. In recent times, the realm of natural products has emerged as a promising avenue for augmenting conventional approaches [7]. Notably, certain natural remedies exhibit properties that can potentially ameliorate psoriasis symptoms. *Aloe Vera*, celebrated for its anti-inflammatory attributes, offers skin soothing and hydration, while fish oil supplements, abundant in omega-3 fatty acids, contribute to mitigating inflammation and supporting skin health [8]. The curcumin compound found in turmeric showcases antioxidant and anti-inflammatory potential, while colloidal oatmeal, Dead Sea salt, and tea tree oil demonstrate promising traits in moisturizing, exfoliating, and alleviating itchiness [9-11]. Moreover, the utilization of apple cider vinegar for pH balance and controlled sunlight exposure for increased vitamin D synthesis hold promise as complementary strategies [12, 13]. While the integration of these natural products presents a noteworthy avenue, collaboration with

healthcare professionals remains crucial to ensure harmonious integration with conventional treatments and optimize holistic psoriasis management [14].

Material and methods

TABLE 1 Role of natural products in the treatment and management of psoriasis.

S.N.	Medicinal Plant	Part used	Active Metabolites	Uses	Ref.
1.	Turmeric (*Curcuma longa*)	Rhizomes	Curcumin, Tetrahydro curcumin, desmethoxycurcumin.	Anti-inflammatory activity, Anti-proliferative	[6]
2.	*Aloe Vera*	Aloe-vera gel (inner part of leave)	Anthraquinones, polysaccharides, phenolic	Immunomodulation, Wound healing	[13]
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.	[16]
4.	Neem (*Azadirachta indica*)	Leaves	Azadirachtin, Nimbidin, Nimbin	Antimicrobial activity, Anti-inflammatory properties, Antioxidant effects	[22]
5.	*Santalum album* (Sandalwood)	Sandalwood oil	Santalols, Triterpines, Epiglobulol	Moisturizing and emollient properties, Relaxation, and stress reduction	[28]
6.	Liquorice (*Glycyrrhiza glabra*)	Roots	Glycyrrhizin, glycyrrhetinic.	Anti-inflammatory activity, Antioxidant properties	[33]
7.	Calendula (marigold)	Flowers	Flavonoids, triterpenoids.	Wound healing and tissue regeneration	[36]
8.	*Allium sativum*	Bulb	Allicin, a sulfur compound	Anti-inflammatory properties, Antioxidant activity	[44]
9.	Giloy (*Tinospora cordifolia*)	Leaves	Polysaccharides, Alkaloids	Antiproliferative Effects	[52]
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	[65]

1. TURMERIC (*Curcuma longa*)

Curcumin, a key chemical constituent within turmeric, holds substantial promise in the treatment of psoriasis. As a naturally occurring polyphenol and the primary bioactive compound in turmeric (*Curcuma longa*), curcumin exhibits a compelling array of properties. Its anti-inflammatory, antioxidant, and immunomodulatory attributes are particularly noteworthy, suggesting its

potential to ameliorate psoriasis symptoms [9-11, 15]. By targeting various pathways and cytokines involved in inflammation, curcumin presents a potent anti-inflammatory activity that addresses the chronic inflammation integral to psoriasis development and progression. Furthermore, its immunomodulatory effects resonate with the immune-mediated nature of psoriasis, as curcumin orchestrates a harmonious modulation of immune cell activity, encompassing T cells, dendritic cells, and macrophages. This immunomodulatory prowess extends to curbing the abnormal activation of immune responses and reinstating the delicate equilibrium between Th1 and Th2 immune responses [16, 17]. Meanwhile, oxidative stress, a hallmark of psoriasis, finds an adversary in curcumin's robust antioxidant capacity, which efficiently scavenges reactive oxygen species and attenuates oxidative damage to skin cells [18]. Intriguingly, curcumin's repertoire extends to thwarting the aberrant proliferation of skin cells (keratinocytes) and hampering excessive blood vessel formation (angiogenesis) – two cardinal features of psoriasis. By delicately regulating these aspects, curcumin offers the potential to normalize skin cell growth and curb the development of psoriatic plaques, thereby presenting a multifaceted approach to addressing the complexities of psoriasis pathology [19].

2. ALOE (*Aloe Vera*)

Aloe Vera, a natural plant with centuries of historical use in treating various skin conditions, has emerged as a promising remedy for psoriasis. Direct application of *Aloe Vera* gel onto affected skin regions and angiogenesis holds profound implications for psoriasis provides a valuable means to address psoriasis symptoms. The gel's inherent moisturizing qualities play a pivotal role in alleviating dryness and itchiness, prevalent symptoms in psoriasis cases. Applying a thin layer of pure *Aloe Vera* gel and gently massaging it into the skin proves beneficial, with repetition several times a day or as necessary [20]. Fundamental to *Aloe Vera*'s efficacy are its chemical constituents, with Acemannan standing out as a primary therapeutic agent. As a polysaccharide settled within the gel of the *Aloe Vera* plant, Acemannan is considered instrumental in driving its therapeutic effects. This compound demonstrates a remarkable ability to counter inflammation, potentially mitigating the inflammatory responses associated with psoriasis. Additionally, Acemannan's contributions extend to fostering wound healing and enhancing the skin's moisture barrier, which holds particular significance for individuals grappling with psoriasis [21, 22].

The pharmacological actions of Acemannan reinforce its potential as a psoriasis treatment avenue. The compound exhibits immunomodulatory prowess, potentially tempering the activities of immune cells like T cells and macrophages, thereby curbing the excessive immune reactions witnessed in psoriasis cases. Moreover, Acemannan's anti-inflammatory attributes come to the fore as it hinders the release of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α) and interleukin-6 (IL-6), both instrumental in psoriasis pathogenesis. Importantly, Acemannan's facilitation of wound healing by stimulating fibroblast proliferation, collagen synthesis,

management. By promoting healthier skin and reinstating balance, Acemannan presents a multifaceted approach to addressing the intricacies of psoriasis [23-25].

3. TEA TREE OIL (*Melaleuca alternifolia*)

Tea tree oil, derived from the leaves of the tea tree (*Melaleuca alternifolia*), is renowned for its potential therapeutic properties, making it a noteworthy contender for treating various skin conditions, including psoriasis. The essential oil, extracted from the Australian native plant *Melaleuca alternifolia*, has a long-standing tradition of use for medicinal purposes, particularly in addressing skin ailments such as psoriasis [26, 27].

The pharmacological actions of tea tree oil underscore its potential effectiveness in psoriasis management. Rich in terpenes like terpinene-4-oil, tea tree oil boasts anti-inflammatory properties that have significant implications for the disease. In psoriasis, chronic inflammation serves as a key driver of its development and progression. Tea tree oil's potential to mitigate skin inflammation holds promise in alleviating the associated psoriasis symptoms [28] [29]. Moreover, the antimicrobial activity exhibited by *Melaleuca alternifolia* adds to its therapeutic potential. Psoriasis often involves an overgrowth of specific microorganisms on the skin, such as Staphylococcus aureus. Tea tree oil's broad-spectrum antimicrobial properties have the potential to counteract the growth of these microorganisms, thereby averting secondary infections that could exacerbate psoriasis symptoms [30] [31].

Furthermore, tea tree oil's immunomodulatory effects offer another layer of potential benefit. By regulating the immune response, tea tree oil may contribute to normalizing the aberrant immune reactions seen in psoriasis. In this context, its ability to potentially modulate the immune response might curtail excessive cell growth and inflammation, characteristic of psoriatic plaques [32][33].

4. NEEM (*Azadirachta indica*)

Neem, scientifically known as *Azadirachta indica*, is an indigenous tree flourishing in the Indian subcontinent, revered for its historical prominence in Ayurvedic medicine. This botanical marvel has been harnessed for diverse therapeutic applications, notably encompassing the management of psoriasis, a skin affliction. Neem's pharmacological profile brims with potential compounds. Notable among these are nimbidin and nimbin, limonoid constituents residing within neem oil. Meticulously scrutinized for their anti-inflammatory attributes, these compounds have emerged as formidable contenders in mitigating inflammation, a pivotal hallmark of psoriasis [34] [35]. Gedunin, a triterpenoid compound nestled within neem's leaves and seeds, adds to the repertoire of therapeutic potential. Scientific inquiry has unveiled its anti-inflammatory prowess, thereby enhancing neem's standing in the realm of psoriasis management [34][35]. Equally noteworthy is nimbidic acid, yet another triterpenoid, found within neem seeds and leaves. Through demonstrable anti-

inflammatory actions, nimbidic acid offers promise in assuaging the symptoms of psoriasis [34] [35].

Neem's pharmacological activities cascade into a comprehensive framework for psoriasis management. Its anti-inflammatory attributes, manifested through compounds like nimbidin and Nimbin, resonate with the core of psoriasis pathology, countering inflammatory mediators and paving the way for potential relief [36][37]. Neem's immunomodulatory effects offer an intriguing facet, harmonizing with the disorder's immune-mediated essence. By tempering immune responses, neem holds the potential to restore equilibrium and curtail the unrestrained proliferation of skin cells underlying psoriatic manifestations [38] [39]. Additionally, neem's potency as an antimicrobial agent, a consequence of compounds such as azadirachtin, Nimbin, and genuine, stands out. Given that psoriasis can be exacerbated by microbial infections, neem's antimicrobial prowess could temper such infections, potentially alleviating psoriasis severity [40] [41]. Neem's role as an antioxidant is equally captivating. With psoriasis inextricably linked to heightened oxidative stress, neem's treasure trove of antioxidants, including flavonoids, carotenoids, and vitamin C, holds promise in quelling oxidative damage and affording protection to skin cells [42][43].

5. SANDALWOOD (*santalum album*)

Santalum album, commonly known as Indian sandalwood, graces the Indian subcontinent as a native tree of exceptional value. This arboreal marvel yields essential oil from its heartwood, a substance woven into the fabric of traditional medicine and revered for its diverse applications, including the management of skin conditions such as psoriasis [44]. Embarking on an exploration of sandalwood oil's constituents unravels a tapestry of therapeutic potential. At the forefront is α-santalol, the quintessential compound infusing sandalwood's distinctive aroma. Celebrated for its anti-inflammatory and antibacterial prowess, α-santalol emerges as a plausible contender in alleviating the manifestations of psoriasis [45]. Echoing this impact is β-santalol, another pivotal component wielding anti-inflammatory effects. Its demonstrated capacity to impede select inflammatory pathways raises prospects for ameliorating the complexities of psoriasis [46].

Introducing epiglobulol adds an intriguing layer of therapeutic promise. This compound embodies anti-inflammatory and antioxidant attributes, poised to quell the flames of inflammation and oxidative stress, two tenets entwined with psoriasis [47]. The ensemble of santalenes, including α-santalene, β-santalene, and epi-β-santalene, further enriches sandalwood oil's potential. These constituents infuse the oil with both anti-inflammatory and antimicrobial properties, reinforcing its potential in psoriasis management [48] [49].

In the empire of pharmacology, sandalwood oil emerges as an anti-inflammatory champion. Given psoriasis's inflammatory underpinnings, sandalwood oil's anti-inflammatory prowess assumes a role of significance in tempering symptoms like redness,

itching, and scaling [50] [51]. Beyond this, sandalwood oil wields antimicrobial might, potentially mitigating secondary infections that can exacerbate psoriasis [52] [53].

In addressing the parchedness and compromised skin barrier inherent to psoriasis, sandalwood oil assumes the mantle of a moisturizing and emollient agent. Its hydrating effects reach beyond superficial relief, potentially rectifying dryness and bolstering the skin's defensive integrity [54] [55]. Beyond its tactile contributions, sandalwood's aromatic dimensions are harnessed for their calming and relaxation-inducing virtues, a potential asset in the realm of psoriasis management [56] [57].

6. LICORICE (*Glycyrrhiza glabra*)

Licorice (*Glycyrrhiza glabra*), an esteemed botanical herb, has graced the annals of traditional medicine systems, notably Ayurveda and Traditional Chinese Medicine, for centuries. Within its botanical embrace lies a multitude of bioactive compounds that orchestrate its pharmacological symphony. In the realm of psoriasis treatment, licorice unfurls a promising tableau of therapeutic effects, chiefly attributed to its triumvirate of anti-inflammatory, immunomodulatory, and antioxidant actions [58] [59]. Stepping onto the stage of pharmacological action, licorice showcases its anti-inflammatory prowess. The roster of compounds housed within licorice, including glycyrrhizin, glycyrrhizic acid, and liquiritin, all unfurl anti-inflammatory signatures. This ensemble orchestrates a harmonious inhibition of pro-inflammatory cytokines, such as interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α), pivotal architects of psoriasis pathogenesis. In appeasing inflammation, licorice potentially extends a palliative touch to psoriasis symptoms like redness, itching, and scaling [60] [61]. Immunomodulatory prowess surfaces as another forte of licorice. Psoriasis, a testament to autoimmune dynamics, encounters a contender in licorice's ability to recalibrate immune responses. This recalibration extends to T-cell function and the dampening of immune cell proliferation, two elements pivotal in psoriasis development. Licorice's compounds further wield the power to temper the activation of nuclear factor kappa B (NF-κB), a maestro-orchestrating gene implicated in inflammation and immune responses [62][63]. In the sphere of antioxidant prowess, licorice emerges as a sentinel against oxidative stress, intricately interwoven with psoriasis's trajectory. The treasury of flavonoids and antioxidants within licorice dons the role of vigilant scavengers, neutralizing free radicals and defusing oxidative stress. This sentinel's diligence potentially safeguards skin cells from harm's way, offering a nurturing touch to the healing narrative of psoriasis lesions [64] [65].

7. CALENDULA (*Calendula officinalis*)

Calendula, known by its more colloquial moniker, marigold, stands as a medicinal sentinel with an age-old legacy, harkening back to antiquity as a remedy for a diverse array of skin conditions, including psoriasis. Nestled within its resplendent petals, a treasure trove of active compounds beckons – triterpene saponins, flavonoids, carotenoids,

polysaccharides, and essential oils, all in harmonious communion. Among the heralded constituents, triterpene saponins, including the illustrious calendulosides A and B, reign supreme. These saponins choreograph an anti-inflammatory performance, potentially orchestrating a symphony of relief by tempering the inflammation intricately intertwined with psoriasis [66]. Delving into calendula's aromatic allure unfurls volatile wonders – terpenes and sesquiterpene lactones within its essential oil. These captivating molecules brandish dual virtues as antimicrobial sentinels and anti-inflammatory agents, potentially joining the psoriasis management ensemble [67]. The chronicle of pharmacological action witnessed calendula's emergence as a staunch advocate of anti-inflammatory prowess. Psoriasis, rooted in immune system derangement and chronic inflammation, encounters a potential ally in calendula's anti-inflammatory armor. By gentling inflammation's flames, calendula potentially extends respite to psoriasis's hallmark symptoms a tableau of redness, itching, and swelling [68] [69]. Turning to the tissue regeneration, calendula wears the mantle of a time-honored healer. Psoriasis's narrative often embraces skin lesions and impairment. Calendula's whispered promise of wound healing and tissue rejuvenation resonates, potentially embracing the role of aiding psoriatic skin restoration [70][71]. Calendula's potential as an immunomodulator adds another layer of intrigue. In psoriasis's intricate narrative of immune system hyperactivity and frenzied skin cell turnover, calendula's potential to temper immune responses shines. By harmonizing immune dynamics, it potentially wields influence over the frenetic cell proliferation seen in psoriasis [72][73]. Antimicrobial actions finds its embodiment within calendula's repertoire. As psoriasis casts a shadow of compromised skin barriers and heightened susceptibility to infections, calendula's antimicrobial credentials may bear relevance in forestalling or attending to secondary infections entwined with psoriasis [74][75]. Beneath calendula's blossoming visage, antioxidants emerge as silent guardians. Flavonoids and carotenoids converge, brandishing antioxidant arms against oxidative stress, a sculptor of psoriasis's pathogenesis. This ensemble may stand poised to neutralize free radicals and curb oxidative stress's impact, offering a measure of solace within the realm of psoriatic skin [76][77].

8. GARLIC (*Allium sativum)*

Allium sativum, affectionately known as garlic, stands as an enduring testament to centuries of medicinal reverence. Nestled within its pungent embrace lies a trove of chemical constituents that have danced with the promise of therapeutic effects. The envoys of *Allium sativum*'s medicinal valor parade forth, with allicin at the helm, a sulfur-bearing protagonist that orchestrates garlic's unmistakable aroma and taste. Beyond sensory allure, allicin unfurls its multifaceted banner, bearing witness to antimicrobial, anti-inflammatory, and antioxidant properties. This trinity of attributes paints a canvas of potential benefits in the realm of managing skin conditions, such as the enigma of

psoriasis [78][79]. Within garlic's sacred precincts, sulfur compounds script their narrative, encompassing the links of diallyl sulfide, diallyl disulfide, and diallyl trisulfide. As stewards of antioxidant and anti-inflammatory domains, these compounds cast their spell. Their potential lies in the reduction of inflammation's ardor and the quelling of oxidative stress, both hallmarks intertwined with the psoriatic saga [80][81]. Venturing into the realm of pharmacological action, garlic unfurls its anti-inflammatory mantle, a potential solace for the inflammation-wracked landscape of psoriasis. Within its arsenal lie allicin and diallyl disulfide, both envoys of anti-inflammatory prowess. These compounds raise their shields against pro-inflammatory cytokines, harbingers of psoriasis's pathogenesis [82][83]. Garlic's whispered promise of immunomodulation extends yet another offering. Immune symphonies are awry in psoriasis's narrative and may find harmony under garlic's sway. The production of immune mediators such as interleukin-1β (IL-1β), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α), chief architects of psoriasis's immune disarray, may find a conductor in garlic's orchestration [84][85]. Against the oxidative stress inherent to psoriasis, garlic strides forth as an antioxidant sentinel. Allicin and its sulfur companions unveil their roles as sentinels, fending off free radicals and quelling oxidative damage. In this dance, the stage is set for inflammation's wane and the potential salve for the psoriatic canvas [86][87]. And, as if wielding an aromatic sword against microbial adversaries, garlic's prowess as an antimicrobial luminary takes center stage. Against the backdrop of psoriasis's vulnerability to secondary infections, garlic's broad-spectrum antimicrobial ballet unfolds, bestowing defense against these lurking adversaries [88][89].

9. GILOY (*Tinospora cordifolia*)

Giloy, well-regarded as *Tinospora cordifolia* or Guduchi in the realm of botanical appellations, stands as a time-honored sentinel within the tapestry of traditional Ayurvedic medicine. Within its verdant embrace, a symphony of constituents takes center stage, each bearing the promise of therapeutic resonance. Polysaccharides, the first note in Giloy's harmonious ensemble, including arabinogalactan and glucans, unfurl their immunomodulatory banners. These harmonizers potentially conduct an immune symphony, orchestrating a dance that seeks equilibrium within the immune response, thus quelling the flames of inflammation that dance within the psoriatic narrative [90][91]. As the increasing progresses, alkaloids step forth, with magnoflorine, berberine, and tinosporin in tow. This trio showcases antioxidant and anti-inflammatory overtures, potentially crafting a soothing lullaby for psoriasis symptoms [92][93]. The diterpenes of Giloy, featuring stars like tinosporide and tinosporaside, tantalize with anti-inflammatory promises unveiled in early studies. This narrative of anti-inflammation intersects with the psoriasis tableau, potentially tempering the crescendo of inflammation that often accompanies the condition [94][95]. Giloy's botanical stage embraces sterols like beta-

sitosterol, which regale the tale of anti-inflammatory and immunomodulatory prowess. These phytosterols potentially bestow their therapeutic touch upon the tapestry of Giloy's role in psoriasis management [96][97].

Stepping into the pharmacological approach, Giloy extends its anti-inflammatory arms, poised to soothe the inflamed chords of psoriasis. Amidst the psoriatic narrative's landscape of chronic inflammation, Giloy's potential as a symphony conductor emerges, potentially silencing the overture of inflammation's dance [98][99]. Antioxidant overtones resound within Giloy's repertoire, echoing the belief in oxidative stress's role in psoriasis's tapestry. Giloy, as a sentinel against oxidative turmoil, brandishes its antioxidant credentials, potentially neutralizing free radicals and attenuating the psoriatic oxidative symphony [100][101]. And as a final crescendo, Giloy's potential antiproliferative performance graces the stage. A hallmark of psoriasis is excessive cell proliferation, and Giloy's antiproliferative aria may hold promise in curbing the exuberant cell growth seen in psoriatic plaques [102][103].

10. THAI GINGER (*Alpinia galanga*)

Thai ginger, celebrated by the moniker of galangal (*Alpinia galanga*), unfurls its verdant story across the tapestry of Southeast Asia, as the protagonist of Herbal Landscapes. Thai ginger houses an entourage of chemical constituents, each whispered to carry within them the potential for healthful benefits. Nestled within its embrace, essential oils take center stage, with cineol, camphene, eugenol, and terpene wielding their aromatic charms. Beyond sensory allure, these oils unfurl antimicrobial and anti-inflammatory banners, offering solace to the realm of psoriasis symptoms [104][105]. Gingerols and shogaols join the ensemble, lending their phenolic virtues to the tale. With anti-inflammatory and antioxidant motifs, these compounds may craft a harmonious chorus in the psoriasis narrative [106][107]. A cascade of flavonoids, including kaempferol and quercetin, dance within Thai ginger's domain. Within their ethereal ballet lies the promise of antioxidant prowess, harmonizing with anti-inflammatory notes in the symphony of psoriasis management [108][109]. Tannins, the next actors on this herbal stage, add their chapter to the narrative. With antioxidant and anti-inflammatory prowess, tannins extend their promise to Thai ginger's potential as a therapeutic ally [110][111]. In the pharmacological composition, Thai ginger unfurls its anti-inflammatory mantel, poised to temper the flames of inflammation coursing through the psoriatic saga. As inflammation forms a pivotal chapter in psoriasis's narrative, Thai ginger's potential to quell this flame emerges as a beacon of potential hope [112][113]. The symphony of Thai ginger finds a crescendo in its antioxidant cadence. The bioactive notes within this herbal composition reverberate with antioxidant resonance, potentially standing as shields against oxidative turmoil, a known actor in psoriasis's unfolding plot [114][115]. With an enchanting tilt toward immunomodulation, Thai ginger graces the stage. In psoriasis's tapestry of immune dysfunction, Thai ginger may

emerge as a conductor, orchestrating the immune dance to a more harmonious melody [116][117]. Antiproliferative whispers emerge from Thai Ginger's embrace. In the psoriatic narrative, the keratinocyte ballet spins into chaos, leading to the hallmark thickened, scaly patches. Thai ginger's antiproliferative note may herald a return to normalcy within this dance of skin cells [118][119]. And as a final crescendo, Thai ginger's antimicrobial serenade resounds. Against the backdrop of psoriasis's susceptibility to secondary infections, Thai ginger's antimicrobial strains may stand guard, shielding against these lurking adversaries [120].

11. CHAMOMILES *(Matricaria chamomilla)*

Chamomile, known by its botanical epithet *Matricaria chamomilla* and revered as German chamomile, stands as a storied medicinal herb with an ancestral legacy of tending to diverse health realms, including the canvas of skin ailments, notably enigmatic psoriasis. Amidst its renowned eminence for placid serenity and anti-inflammatory prowess, chamomile unveils an ensemble of chemical constituents that thread the fabric of its therapeutic symphony. Bisabolol, an eminent protagonist within chamomile's narrative, orchestrates a dance of anti-inflammatory, anti-irritant, and soothing prowess. A maestro of calm, it weaves a tapestry of tranquility, curbing the tempestuous fires of inflammation and irritation that waltz within the realm of psoriasis, thus nurturing the healing embrace of afflicted skin [121]. Chamazulene, the compound that paints chamomile's petals with their signature cerulean hue, commands the stage with its dual banners of anti-inflammatory and antioxidant elegance. A virtuoso of relief, it unfurls its melodic strains to quell the symphony of redness and irritation, melodies that often echo through the psoriatic journey [122]. Apigenin, a mellifluous flavonoid within chamomile's garden, lends its dulcet tones to the chorus of anti-inflammatory and antioxidant resonance. With each note, it reverberates against the inflammatory crescendo, harmonizing the cadence of oxidative tumult that often accompanies psoriasis [123]. In the symphony of chamomile, Quercetin steps forth, a steadfast guardian armed with aegis of antioxidants and anti-inflammatory grace. As the psoriatic tale spins its fervent narrative, quercetin interlaces the verses with protection against the ravages of free radicals and temperance of inflammation [123]. Matricin, a precursor to chamazulene, takes its rightful place in this herbal stage. Embracing anti-inflammatory virtues akin to its progeny, chamazulene, matricin embarks on a transformative journey, contributing to the resonance of relief in psoriatic pathways [124]. Embarking on the pharmacological overture, chamomile unfurls its anti-inflammatory elegy. Within its bioactive folds lie the harmonies of flavonoids and terpenoids, entwined in a dance of anti-inflammatory grace. Psoriasis, that tempestuous symphony of autoimmune inflammation, finds its echoes tamed within the calming embrace of chamomile [125]. A guardian of the skin's sentinel, chamomile steps forth as a nurturer of barriers. In the realm of

psoriasis, where barriers falter and vulnerability reigns, chamomile emerges as a steward of moisturization, a proponent of the skin's resilient shield [126]. Within its petals lies the gentle touch of anti-pruritic resonance, soothing the itchy crescendos that often beset psoriatic narrative. While the exact melodies remain shrouded, chamomile's balm unfurls to cradle the itch-ridden souls seeking solace amidst the psoriatic enigma. As the curtains rise on antimicrobial prowess, chamomile's extracts echo tales of resistance. Be it bacteria or fungi, the chamomile's antimicrobial prelude strides forth, a sentinel against the encroaching shadows of secondary infections that may threaten psoriasis's delicate canvas [127].

12. GREEN TEA (*Camellia sinensis*)

Green tea (*Camellia sinensis*) has been the subject of research due to its potential therapeutic advantages for various health conditions, including psoriasis. Psoriasis, a persistent autoimmune skin disorder characterized by scaly, red patches on the skin, has prompted investigations into the beneficial properties of green tea [128]. The chemical components of green tea contribute to its potential benefits for individuals with psoriasis. Abundant catechins, particularly epigallocatechin gallate (EGCG), serve as potent antioxidants and anti-inflammatory agents, suggesting a role in alleviating psoriasis symptoms. Green tea's richness in polyphenols further enhances its antioxidant properties and showcases anti-inflammatory and immunomodulatory effects, which are crucial in managing psoriasis. Epicatechins, another catechin variety in green tea, amplify its antioxidant and anti-inflammatory potential, potentially providing relief from psoriasis symptoms. The presence of theanine, a unique amino acid in green tea, adds anti-inflammatory and immune-modulating qualities, holding promise for psoriasis management. While caffeine levels in green tea are moderate and not linked to psoriasis treatment, they might enhance the effectiveness of specific psoriasis medications. These chemical components collectively underscore green tea's potential as a complementary approach to psoriasis management [129,130]. Green tea's polyphenols, especially epigallocatechin-3-gallate (EGCG), exhibit potential anti-inflammatory attributes that could alleviate symptoms of psoriasis such as itching, scaling, and redness [130,131,]. The antioxidants present in green tea are believed to combat oxidative stress associated with psoriasis, contributing to improved skin health [132]. Furthermore, the immune system-regulating properties of green tea compounds, notably EGCG, could assist in managing immune cells involved in psoriasis-related inflammation. Abnormal skin cell proliferation, a hallmark of psoriasis, might be mitigated by green tea compounds, thereby normalizing skin cell turnover, and reducing psoriatic lesions [133]. Additionally, the wound-healing potential of green tea, attributed to its ability to stimulate collagen synthesis and tissue regeneration, could aid in the recovery of psoriatic skin lesions [134].

CONCLUSION

Psoriasis is a chronic inflammatory and

metabolic disease that affects around 2-5% world population. The management and treatment of Psoriasis using natural products present a promising avenue for alleviating symptoms and enhancing the quality of life for those afflicted with this chronic skin condition. Neem, Licorice, Turmeric, *Aloe Vera*, Tea Tree Oil, *Santalum album*, Calendula (marigold), *Allium sativum*, Giloy, Thai ginger, and Mahonia Aquifolium (Oregon Grape) exhibit a range of anti-inflammatory, antimicrobial, and immunomodulatory properties that play pivotal roles in mitigating Psoriasis-related inflammation, redness, itching, and scaling. These natural remedies hold the potential to complement traditional treatments. While current evidence supports their efficacy, continued research, is imperative to establish their long-term effectiveness and safety, thus paving the way for a more comprehensive approach to Psoriasis management in the future.

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Author contributions

Aswani Tanwar collected and analyzed the data and drafted the manuscript.

Declarations

Competing interests.

The author declares that no competing interests.

Ethical approval and consent to participate.

No ethics approval or consent was required.

Consent for publication.

The author declares no conflict of interest.

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