

Alternative Natural Treatment for psoriasis: A Review on Herbal Plants.

Dr. Kranti Satpute.^{1*} Dr. Archana Yelmate²

1, 2, Dayanand College of Pharmacy, Latur, Maharashtra, India.

archanayelmate1@gmail.com,¹ krantisatpute80@gmail.com²

Abstract: An autoimmune condition known as psoriasis is characterized by lesion, keratinocyte hyperproliferation, inflammation of the epidermis, and silver-white scales. Both genetic and environmental factors contribute to its occurrence. There are several potential pharmacological targets and targeted treatments for psoriasis. There are several target-specific treatments being developed to lessen this disorder's symptoms. Psoriasis is being treated using a variety of methods, including conventional methods, the use of nano-carriers, and herbal medications. Potential carriers for the treatment of psoriasis include liposomes, nanostructured lipid carriers, niosomes, solid lipid nanocarriers, nanosuspension, and dendrimers. Other cutting-edge drug delivery techniques helpful for treating psoriasis include microspheres, microemulsion, micelles, hydrogels. Iontophoresis therapy with drugs is also successful in treating psoriasis. The numerous plant sources that have been identified as effective in treating psoriasis and that can be exploited to create new therapies have been reviewed in this study.

Keywords: Psoriasis, skin disorder, Interleukin, Liposome, Niosomes, Herbal medicine etc.

Introduction: Psoriasis is an inflammatory, auto immune disorder of the skin affecting 2 to 3% of people globally. It mainly affects all of the body parts especially hands, foot and limbs. In psoriasis, body starts to make new skin cells more rapidly than normal leads to the development of raised skin patches and tissues on the skin. Various kinds of treatment options are available for the treatment of psoriasis but they all are associated with various kinds of side effects. There is research gap between the use of various herbs and crude drugs used in the treatment of psoriasis with various dosage forms. Till now reviews are not available with treatment of psoriasis with herbal formulation. [1] In this review, our objective is to cover the treatment options available for the treatment of psoriasis with the potential use of herbs. In this review, we summarized a list of herbal plants which are known to have potential antipsoriatic activity and can be used for the treatment of psoriasis. But, most of the available literature of herbals are lacking clinical outcome of efficacy of herbals in treating the psoriasis. In the last, we can say that herbs from various natural origins can be used in the treatment of psoriasis as compared to synthetic drugs. [2, 3]

CLINICAL FEATURES:

There are various phenotypes of psoriasis. Psoriasis Vulgaris, which affects between 85 and 90% of all patients with the condition, is the most prevalent clinical form. Raised, well-delineated erythematous plaques with adhering silvery scales are the hallmark of psoriasis vulgaris. The scalp, sacral region, elbows, and knees are the most commonly affected locations. The hands, feet, nails, and intertriginous regions (groins, axilla, umbilicus, crane, and retro auricular folds) are other predilection locations. [4] Intertriginous patches of psoriasis are marked by an oozing, red irritation without scaling. Intertriginous psoriasis's actual incidence is unclear it was found that 44 % of the psoriasis patients had perianal involvement [5, 6]

EPIDEMIOLOGY:

Around 1% to 3% of the world's population suffers from psoriasis. Equally affected are both males and women. The bimodal distribution of psoriasis has a peak between the ages of 15 and 20 and another peak between the ages of 55 and 60. Two forms of psoriasis have been

postulated based on the bimodal distribution of the age at onset and heredity. A positive family history of psoriasis, beginning before the age of 40, a previous streptococcal sore throat, and guttate lesions are all related to type I psoriasis, which accounts for about 65% of all cases of the condition. Type II psoriasis (which affects 35% of psoriasis patients) seems to be more common in people who develop it after the age of 40 and who have no psoriasis in their family. Type II has no connection to an earlier viral trigger. Chronic plaques predominate clinically, and involvement of the joints and nails has been linked to it. [7, 8]

CAUSES OF PSORIASIS:

Genetic factors:

The human genome has at least nine different loci Psoriasis susceptibility 1 (PSORS1–9) that are associated with psoriasis susceptibility. Although the precise gene has not yet been discovered, PSORS-1, a region of the major histocompatibility complex on chromosome 6p2, is the main genetic determinant of psoriasis and accounts for up to 50% of genetic predisposition to the illness. [9]

Numerous of the linked loci are found in other autoimmune and inflammatory conditions, including type1 diabetes, multiple sclerosis, inflammatory bowel disease, and atopic dermatitis, showing that comparable pathways explain many prevalent genetically complex inflammatory conditions. [10]

Immunological and environmental factors:

There is growing evidence that clinically unaffected skin has changed innate (phylogenetically old, broad-spectrum immune systems that are not antigen-specific) and acquired (antigen-specific) immune mechanisms. [11]

In this setting, important primary cytokines like tumor necrosis factor and interferon may be produced as a response to external stimuli such as infection, medication, trauma, or stress. The significant effectiveness of treatments that inhibit the effects of tumor necrosis factor, such as infliximab⁴, and the therapeutic potential of treatments that disrupt the pathways bridging innate and acquired immunity provide evidence in favor of this idea. [12]

Microorganisms:

Numerous microorganisms have been linked to psoriasis initiation and/or exacerbation. One idea holds that enterotoxin, which is produced by some strains of *Staphylococcus aureus*, is most likely causes psoriatic lesions to worsen.

The enterotoxins are extremely powerful T cell activators. The staphylococcal enterotoxins have been classified as Superantigens because they have a high frequency of T cell activation. Superantigens bind to the TCR [T-cell receptor] on T cells and the MHC class II [major histocompatibility complex] on APCs [antigen-presenting cells] at the same time. A polyclonal activation of CD4+ and CD8+ T cells is the result of this cross-linking of APCs and T cells. This results in an incredibly high rate of T cell proliferation and cytokine generation. [13, 14]

CURRENT REMEDIES:

Conventional/topical therapy: First-line treatment for different psoriasis conditions is typically conventional/topical therapy. These take a lot of time, have greasy textures, are sticky, and have an odor. This may be the preferred course of treatment for patients with mild psoriasis, which affects less than 10% of the body's surface area. The major effects of topical treatment are to lessen skin inflammation and keratinocyte proliferation. Combination therapy with topical medications can reduce the side effects of monotherapy and increase the effectiveness of the treatment.[17,18]

- Calcineurin inhibitors
- Corticosteroids
- Anthralin (dithranol)
- Topical retinoids
- Vitamin D analogs
- Miscellaneous therapies

Psoriasis and Herbal drugs: Natural products or herbs can be used as an effective therapy for treating psoriasis, an autoimmune skin disease that involves keratinocyte over proliferation. It has been demonstrated that phytomedicine, which is used for psoriasis patients, provides some advantages, including natural sources, a lower risk of adverse effects, and the avoidance of dissatisfaction with conventional therapy. The herbal products' structural diversity and multiple mechanisms of action have enabled the synergistic activity to mitigate psoriasis. In recent years, the concept of using natural products as antiproliferative agents in psoriasis treatment has attracted increasing attention in basic and clinical

investigations. This review highlights the development of an apoptotic or antiproliferative strategy for natural-product management in the treatment of psoriasis. [19, 20] We systematically introduce the concepts and molecular mechanisms of keratinocyte-proliferation inhibition by crude extracts or natural compounds that were isolated from natural resources, especially plants. Most of these studies focus on evaluation through an in vitro keratinocyte model and an in vivo psoriasis-like animal model. Topical delivery is the major route for the in vivo or clinical administration of these natural products. The potential use of antiproliferative phytomedicine on hyper proliferative keratinocytes suggests a way forward for generating advances in the field of psoriasis therapy. [21, 22]

Psoriasis is a common skin condition where the skin develops areas that become thick covered with silvery scales. It is a common problem, and millions of people in the world have psoriasis. Herbalists used herbs for centuries in the treatment of various diseases including psoriasis for one. Herbal ayurvedic psoriasis treatment originated in India and is considered as one of the oldest medical practice. There are many plants used for the control and care of psoriasis. Herbal medicines-used in treating psoriasis include Psoralea corylifolia, Coleus forskohlii, sarsaparilla, and a lot more. [23, 24] Other herbal therapy includes Aromatherapy- Carrier oils are mixed with oils from lavender, calendula, and bergamot then massaged into the affected skin. Topical herbs which are effective are tea tree oil, oats, and evening primrose oil, cayenne peppers due to its capsaicin content, apple cider vinegar, and aloe. Olive oil has developed a reputation for being an effective treatment for mild cases of plaque psoriasis. [25] It can be massaged directly onto affected areas of the skin to relieve dryness and irritation as well as to facilitate healing. *Andira araroba* is also known as Goa or Bahia Powder. The medullary matter of the stem and branches, dried and powdered, is used. It contains about 80% of *chrysarobin*, which is probably responsible for its activity. *Chrysarobin* is a reduced quinone. Papaya and papain is derived from *Carica papaya* and is also known as vegetable pepsin. It was formerly used in treating a wide variety of conditions including infected wounds, sores, ulcers, and psoriasis. [26, 27]

Advantages of Herbal Drugs:

- ✓ High Low/Minimum cost
- ✓ Complete accessibility
- ✓ Enhanced tolerance
- ✓ More protection

- ✓ fewer side-effects
- ✓ Potency and efficiency are very high. [25,26]

Need of the Study:

The current therapeutic options for psoriasis patients have some disadvantages, which include frustration with medication efficacy, inconvenience, time constraints, and possible adverse effects. Until now, an effective and long-term regimen for psoriasis eradication has been lacking, especially for moderate to severe psoriasis. There is a great need for the continuous development of novel, safe, and effective treatment modalities for psoriasis. Among many active compounds that were investigated for psoriasis mitigation, phytochemicals derived from natural resources have become of great interest over the last decades. Several investigations assessing natural-sources-based psoriasis therapy reveal potential activity, especially the antiproliferative effect. Until now, most of the reports concerning the antiproliferative efficacy of natural compounds for psoriasis treatment have been based on laboratory or animal-related work. Some of the investigations suggest the usefulness of natural products for psoriasis treatment, only for their ability to suppress keratinocyte proliferation. The evidence from in vitro cell study and in vivo animal tests offers limited information regarding the natural products' clinical success. Convincing results in human clinical studies are urgently needed to encourage future investigation on this topic. Scientists should pay attention, not only to the therapeutic benefits of natural products, but also to their adverse effects on human health. Caution should be used in optimizing the feasible conditions of phytomedicine to balance the effectiveness of psoriasis therapy and tissue damage or toxicity. [27, 28]

Herbal Plants possesses anti-inflammatory and immunomodulatory activity. [1, 2, 3]

S. No	Botanical name of plant	family	Common name	Plant part	Use
1.	Acacia Arabica Wild	leguminaceae	Babulla, babul, gum, kikar, barbura, black babool	bark	With honey is used for conjunctivitis and ulcer
2.	Aconitum Napellus	ranunculaceae	vachnaag	root	Fever, joint pain
3.	Adhatoda Vasica	acanthaeae	Adusa, arusa, aruha, basak, simhi, simhika	leaf	Ground wiyth the folwers of hibiscus rosa sinensis and taken orally to treat asthma

4.	Asparagus Abscendens	liliaceae	Musalisafed, satawar	rhizome	Fine powder cooked in milk is given along with ghee, rock candy, cardamum, almond, cloves and tevak mhas a sex tonic, in burning sensation
5.	Asparagus Officinalis Linn	liliaceae	Satawari, hillua	Young shoots	Diuretic, emmenagogue and aphrodisiac
6.	Azadirachta Indica	meliaceae	kadunimb	Bark, leaf, young twigs	Tonic antipirodic, fever, skin diseases, rheumatism
7.	Baliospermum Montanum	euphonbiaceae	Danti, dantik a, rachan i, vishod hini,	Seeds, roots	Purgative, anthelmintic, diuretic, skin diseases, piles, wounds
8.	Aegle Marmelos, Morrea	rutaceae	bel	Fruits, leaves	Used in dysentery, diarrhoea, piles brain tonic, cure fever
9.	Bryophyllum Calycinum	crassulaceae	Sandan wood	leaves	Treat hypertension, used in kidney stone.
10.	Butea Parviflora	fabaceae	Coconut	Whole plant	astringent., antidiarrheal, antidyentric
11.	Caesalpinia Pulcherrima	Caesalpinaceae	Pomegrana te	seed	Decoction for pain in gum
12.	Caesalpinia Bonducella	Fabaceae	sagargota	seed	Antimicrobial, anti-inflammatory
13.	Mentha Arvensis L	Labiatae	Podina	Root, leaves bark	Stomachic, carminative anthelmintic, Diuretics cure indigestion, constipation.
14.	Clerodendron Serratum	Verbinaceae	Baharangi, kasagh ni, vata ri	Leaf, whole plant	With water to treat fever
15.	Curcuma Aromatica	Zingiberaceae	Vanaharidr a, Sholik a, Jangli Haldi	rhizomae	Flavouring curries, anti-inflammatory
16.	Cuscuta Reflexa	Convolvulaceae	Akasbel, a marvel	Whole plant	Prevent premature hair fall, dandruff
17.	Acacia Chundra Wild	Mimosaceae	Khair	leaf	For dysentery.
18.	Dathura Stramonium	Solanaceae	Unmattha, dhutra	fruits	Skin disorder, ulcer, worms, antidote
19.	Allium Sativum L	Liliaceae	lahsun	bulbs	Lxative, strength promoter, carminative, cures cough.
20.	Ficus Religiosa	moraceae	Pipal, ashw ath, peepal	fruits	Leucorrhoea, dysmenrhea
21.	Ficus Religiosa	Moraceae	Pipal, ashw ath	leaf	Relief from body pain

22.	Ficus Bengahalensis	Moraceae	Banyan tree, vad	Leaf	Strengthen your teeth and gums by Brushing with them. Used to treat skin diseases.
23.	Ficus Rumphii	moraceae	Asht,ashta, pair,pa yar	Stem latex	Heel cracks
24.	Ficus Racemosa L	moraceae	umber	Fruit, gum	Reduce acidity, anti-inflammatory, antimicrobial.
25.	Lagenaria Sciceraria Standal	cucurbitaceae	Dudhi-bhopla	Fruits, leaves	In cattle, during constipation used in mouth diseases.
26.	Argemone Mexicana L	Papaveraceae	Barband, pila datura	Leaves, root seed, stem	Skin diseases, indigestion, anti-diarrhea, antiseptic, antiinflammatory.
27.	Gymnema Sylvestre	Asclepiadaceae	Mesasrangi, gurmar booti	Leaf, root	Powder is mixed with cow's milk to treat diabetes, in snake bite
28.	Hemidesmus Indicus	Apocyanaceae	Sariva, anantmul,	root	Used to check diarrhoea along with fennel and jaggery
29.	Mangifera Indica	anacardiaceae	Aumba, am, nango	Latex from leaf and stem bark	Heel cracks
30.	Ocimum Basilum	lamiliaceae	Sweet basil, kali tulsi	leaves	With onion bulbs used to treat cough
31.	Tamarindus Indica L	Fabaceae	Emli	Leaves, fruit	Laxative, relive gastric pain, hair to nic, cure acne, inflammation and blood disorders.
32.	Trigonella Foenum Gracum L	Fabaceae	Methi	Leaves seed.	Ahrosidiac, stomachic, carminative, pigmentation. Skin diseases.
33.	Ocimum Gratissimum	Lamiaceae	Ramtulsi, s hrubby basil	leaf	With lemon in dysentery
34.	Tribulus Terrestris	Zygophyllaceae	Gokhru Gokantaka, gokshura	Fruit, root	To prevent white discharge in women with boiled raw rice
35.	Vitex Negundo	Verbinaceae	Nirgundi, sambhalu	leaves	Relief from cough, fever, cold
36.	Zingiber Officinale	Zingiberaceae	Zinger, Adrak sunth, Aale.	Rhizome	Cold, cough, asthma, stimulant, rheumatism, piles, hepatitis, liver diseases, obesity, typhoid fever, malaria, digestive disorders
37.	Centella Asiatica	apiaceae	Mandukaparni, brahmi	leaves	On open spres, hair growth
38.	Carica Papaya	Caricaceae	papaya	Leaves, fruits, seeds	to cure malaria; gonorrhoea, syphilis, amoebic dysentery, diabetes,

39	Coriandrum Sativum Linn.	umbeliferae	Dhaniya	Leaves, seeds	Carminative, stomachic, used in conjunctivitis, used to check blood in stools
40.	Punica Granatum, L	punicaceae	Anaar	Fruits, Leaves	As an anthelmintic. Improves memory, brain, strength, cure fever and heart diseases.
41.	Ricinus Communis L.	Euphorbiaceae	Arandi	Seed	Used as carminative, purgative, aphrosidiac, in urinary disorders.
42.	Ziziphus Jujuba Lamk	Rhamnaceae	Ber	Leaf	Used in diarrhea, fever, blood purifier,
43.	Ziziphus Rugosa Lamk	Rhamnaceae	Bor	Leaf	Used during loose motions.
44.	Citrus Limonis	Rutaceae	Lemon, Citrus	Fruits	Carminative, stimulant.
45	Vitex negundo Linn	Verbenaceae	Nirgundi.	leaves	Anti-inflammatory, astringent, leprosy, Skin diseases.
46	Calotropis Gigantea	Asclepiadaceae	Ruchik	Leaves, latex	Anti-inflammatory, astringent, leprosy, Skin diseases.

Conclusion: The epidermis of the skin develops scales and lesions as a result of the autoimmune disease psoriasis, which is persistent. The quality of life of patients is impacted by this kind of disease. Many researches is now being undertaken to better understand the intricate mechanisms behind the development of psoriasis, despite the fact that the precise mechanism involved in its onset is not fully understood. Keratinocyte hyper proliferation and epidermis deposition play a major role in its occurrence. For the treatment of psoriasis, there are several conventional treatments available, but none of them have been successful. In order to have the greatest impact on psoriatic patients, researchers are now focusing on targeted and new medicines. The main focus of targeted therapy is on the cytokines IL, TNF, and cytokines that cause psoriasis to develop. In the treatment of psoriasis, transdermal medication delivery technologies are unquestionably important. In order to discover a solution for unsolved medication delivery problems, advanced Nano carriers are now being thoroughly evaluated. Due of their greater therapeutic effectiveness, micro needles have recently attracted increased interest among the Nano carriers. These herbal plants are all readily available, and several herbal-based remedies have been created to help decrease negative effects. For the treatment of psoriasis, plants mostly with antioxidant qualities are employed. A significant target for the creation of novel medications for the treatment of psoriasis is the ubiquitination processes which down regulates the cell types that cause the condition. Psoriasis can be successfully

treated with herbal drugs. However, it is challenging to include them in Nano formulations.

Acknowledgements: The authors would like to sincerely thank the Rajiv Gandhi Science and Technology Commission, Government of Maharashtra, Mumbai and Swami Ramanand Teerth Marathwada University – Nanded for providing financial assistance.

References:

1. Kranti Satpute, Chaus Wajid, Kaumudee Bodas, Nirvi Sheth. Ethnomedicinal Wisdom of Tribes of Latur District (Sanjivani Bet) Maharashtra, Journal of Natural Remedies. 2013; 13(1):25-28.
2. Yelmate AA, Thonte SS. Ethnobotanical Survey of Plants on Hattibet (Deverjan) District Latur Maharashtra. Journal of Pharmacognosy and Photochemistry. 2018; 7(3):1345-1348.
3. A.A. Yelmate, P. Gundewar, R.S. Moon; Design Development And Evaluation Of Anti- Inflammatory Nanogel For The Treatment Of Psoriasis, Biologically Active Natural Products From Asia And Africa: A Selection Of Topics (2021) 1: 57. <https://doi.org/10.2174/9789811489747121010008>.
4. Krishna Baliram Kadam, Archana Ashok Yelmate, Anjali Ambadas Sabne, Shweta Shivraj Eklinge, Current Treatment of Psoriasis: Review, Journal for basic sciences, 22(12)2022, 1466-1488.
5. Miroddi, M., Navarra, M., Calapai, F., Mancari, F., Giofrè, S. V., Gangemi, S., & Calapai, G. (2015). Review of clinical pharmacology of Aloe vera L. in the treatment of psoriasis. *Phytotherapy Research*, 29(5), 648–655. <https://doi.org/10.1002/ptr.5316>
6. Aghmiuni, A. I., & Khiavi, A. A. (2017). Medicinal plants to calm and treat psoriasis disease. *Aromatic and Medicinal Plants—Back to Nature*, 1–28. <https://doi.org/10.5772/67062>
7. Rout, S. K., Tripathy, B. C., & Kar, B. R. (2017). Natural green alternatives to psoriasis treatment—A review. *Global Journal of Pharmacy & Pharmaceutical Sciences*, 4(1), 001–007. <https://doi.org/10.19080/GJPPS.2017.04.555631>
8. Sanati, S., Razavi, B. M., & Hosseinzadeh, H. (2018). A review of the effects of *Capsicum annum* L. And its constituent, capsaicin, in metabolic syndrome. *Iranian*

- Journal of Basic Medical Sciences, 21, 439–448. <https://doi.org/10.22038/IJBMS.2018.25200.6238>
9. Bylka, W., Znajdek-Awizen, P., Studzinska-Sroka, E., Danczak-Pazdrowska, A., & Brzezinska, M. (2014). Centella asiatica in dermatology: An overview. *Phytotherapy Research*, 28(8), 1117–1124. <https://doi.org/10.1002/ptr.5110>
 10. Sampson, J. H., Raman, A., Karlsen, G., Navsaria, H., & Leigh, I. M. M. O. P. (2001). In vitro keratinocyte antiproliferant effect of Centella asiatica extract and triterpenoid saponins. *Phytomedicine*, 8(3), 230–235. <https://doi.org/10.1078/0944-7113-00032>
 11. Talcott, P. (2018). Toxicologic problems. In *Equine internal medicine* (4th ed. Amsterdam, The Netherlands). Elsevier. <https://doi.org/10.1016/B978-0-323-44329-6.00021-8>
 12. Disphanurat, W., Viarasilpa, W., Chakkavittumrong, P., & Pongcharoen, P. (2019). The clinical effect of oral vitamin D2 supplementation on psoriasis: A double-blind, randomized, placebo-controlled study. *Dermatology Research and Practice*, 2019, 1–9. <https://doi.org/10.1155/2019/5237642>
 13. Rapalli, V. K., Kaul, V., Gorantla, S., Waghule, T., Dubey, S. K., Pandey, M. M., & Singhvi, G. (2020). UV spectrophotometric method for characterization of curcumin loaded nanostructured lipid nanocarriers in simulated conditions: Method development, in-vitro and ex-vivo applications in topical delivery. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 224, 117392. <https://doi.org/10.1016/J.SAA.2019.117392>
 14. Varma, S. R., Sivaprakasam, T. O., Mishra, A., Prabhu, S., Rafiq, M., & Rangesh, P. (2017). Imiquimod-induced psoriasis-like inflammation in differentiated human keratinocytes: Its evaluation using curcumin. *European Journal of Pharmacology*, 813, 33–41. <https://doi.org/10.1016/j.ejphar.2017.07.040>
 15. Singh, K. K., & Tripathy, S. (2014). Natural treatment alternative for psoriasis: A review on herbal resources. *Journal of Applied Pharmaceutical Science*, 4(11), 114–121. <https://doi.org/10.7324/JAPS.2014.41120>
 16. Michel, P., Granica, S., Magiera, A., Rosinska, K., Jurek, M., Poraj, Ł., & Olszewska, M. A. (2019). Salicylate and procyanidin-rich stem extracts of *Gaultheria procumbens*

- L. inhibit pro-inflammatory enzymes and suppress pro-inflammatory and pro-oxidant functions of human neutrophils ex vivo. *International Journal of Molecular Sciences*, 20(7), 1–17. <https://doi.org/10.3390/ijms20071753>
17. Janeczek, M., Moy, L., Lake, E. P., & Swan, J. (2018). Review of the efficacy and safety of topical *Mahonia aquifolium* for the treatment of psoriasis and atopic dermatitis. *The Journal of Clinical and Aesthetic Dermatology*, 11(12), 42–47.
18. Singh, K. K., & Tripathy, S. (2014). Natural treatment alternative for psoriasis: A review on herbal resources. *Journal of Applied Pharmaceutical Science*, 4(11), 114–121. <https://doi.org/10.7324/JAPS.2014.41120>
19. Bensouilah, J. (2003). Psoriasis and aromatherapy. *International Journal of Aromatherapy*, 13, 2–8. [https://doi.org/10.1016/S0962-4562\(03\)00036-5](https://doi.org/10.1016/S0962-4562(03)00036-5).
20. Sharifi-rad, J., Salehi, B., Varoni, E. M., Sharopov, F., Yousaf, Z., Ayatollahi, S. A., Iriti, M. (2017). Plants of the *Melaleuca* Genus as antimicrobial agents: From farm to pharmacy. *Phytotherapy Research*, 31(10), 1475–1494. <https://doi.org/10.1002/ptr.5880>
21. Pazyar, N., & Yaghoobi, R. (2012). Tea tree oil as a novel antipsoriasis. *Skin Pharmacology and Physiology*, 4156, 162–163. <https://doi.org/10.1159/000337936>
22. Asogwa, F. C., Ibezim, A., Ntie-Kang, F., Asogwa, C. J., & Okoye, C. O. B. (2020). Anti-psoriatic and immunomodulatory evaluation of *psorospermum febrifugum* spach and its phytochemicals. *Scientific African*, 7, e00229. <https://doi.org/10.1016/j.sciaf.2019.e00229>
23. Aghmiuni, A. I., & Khiavi, A. A. (2017). Medicinal plants to calm and treat psoriasis disease. *Aromatic and Medicinal Plants—Back to Nature*, 1–28. <https://doi.org/10.5772/67062>
24. Abraham, N., & Krishnan, N. (2019). Management of psoriasis-ayurveda and allopathy—A review. *International Journal of Dermatology and Clinical Research*, 5, 18–23
25. Shenefelt, P. D. (2011). Herbal treatment for dermatologic disorders. In *Herbal medicine: Biomolecular and clinical aspects* (2nd ed.). <https://doi.org/10.1201/b10787-19>. Boca Raton, FL: CRC Press/Taylor & Francis.

26. Padmawar A, Bhadoria U. Phytochemical investigation and comparative evaluation of in vitro free radical scavenging activity of Triphala & Curcumin. Asian Journal of Pharmacy and Medical Science. 2011; 1(1): 9-12.
27. Harish P. Herbal drugs. Current Science 2001; 81(1):15.
28. Mohammed S, Faizan A, Mohammed S, Syeda A , Bader UZ. Study of the Levels of Trace Elements (Cu, Mg, Zn) in Psoriasis Patients: A Case Control Study International Journal of Research and Review. 2020;7;10;311-317.