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Original Rresearch Article

Important medicinal plants for management of psoriasis

Firoj Allauddin Tamboli[1,*], **Shubhangi M Gawali**[2], **Priti Chandrakant Kokate**[3], **Arbaz Rahimoddin Shaikh**[4], **Anilkumar Jalinder Shinde**[1], **Ajay Namdeo**[5], **Kamal Alaskar**[6]

[1]*Dept. of Pharmacognosy, Bharati Vidyapeeth College of Pharmacy, Kolhapur, Maharashtra, India*
[2]*Dept. of Pharmaceutical Quality Assurance, Bharati Vidyapeeth College of Pharmacy, Kolhapur, Maharashtra, India*
[3]*Dept. of Pharmaceutical Chemistry, Latur College of Pharmacy, Latur, Maharashtra, India*
[4]*Dept. of Pharmaceutics, Bharati Vidyapeeth College of Pharmacy, Latur, Maharashtra, India*
[5]*Dept. of Pharmacognosy, Bharati Vidyapeeth (Deemed to be University)Poona College of Pharmacy, Pune, Maharashtra, India*
[6]*Dept. of Computer Application, Bharati Vidyapeeth (Deemed to be University) Institute of Management, Kolhapur, Maharashtra, India*

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ABSTRACT

Medicinal plants are an important and unique source of medicines. Psoriasis is a chronic skin condition where the skin develops areas that become thick and covered with silvery scales. For psoriasis treatment, topical chemical agents are applied in spite of inefficient effects or less effectiveness but medicinal plants can be one of the alternative methods. The commonly used herbs in psoriasis disease are Aloe vera, Turmeric, and Neem.

1. Introduction

Psoriasis is considered a skin disease, where the skin areas usually become thick and covered with silvery scales. Near about 125 Millions people in the world (2 to 3%) of the total population have psoriasis and suffer from an inflammatory, ugly skin disorder. A type of white blood cell (T cells) becomes overstimulated, then they direct the skin to heal the non-existent injury. These sites become inflamed, reddened, patches with the white scale on them. It occurs when skin cells suddenly rise from below the surface of the skin and pile up on the surface before they can mature. Psoriasis may occur in only a few days.[1] Psoriasis is derived from the Greek word s which means “itch”. Psoriasis may burn or itch. The skin may crack or split in areas that bend. Psoriasis is mostly inherited and mainly characterized by erythematous, plaques, sharply marginated scaly that develop in a relatively symmetrical distribution. Psoriasis is a chronic autoimmune disorder in which the tips of fingers, scalp, toes, palms, umbilicus, elbows, shin, glutes, knees, under the breasts, soles, etc. are mostly affected sites. Patients suffering from psoriasis are at higher risk of developing cardiovascular and NCDs. Moreover, psoriasis affects mental health, and people suffering from the disease experience significant social stigma.[2]

1.1. Importance of ayurveda in the treatment of psoriasis

Ayurvedic practitioners say that psoriasis arises due to an imbalance of two “doshas”or areas of energy. Ayurvedic practitioners call these the “Kapha” and “Vata”. Vata is responsible for controlling bodily functions and could contribute to the dryness and skin scaling of psoriasis. Some

* *Corresponding author*.
E-mail address: firojtamboli143@gmail.com (F. A. Tamboli).

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Table 1: Common types of psoriasis

Types	Description of disease
Psoriasis vulgaris (plaque psoriasis)	The most common type of psoriasis, plaque psoriasis typically appears as inflammatory red, sharply demarcated, raised, differently sized plaques, usually covered by white or silvery scales.
Guttate psoriasis (Droplet psoriasis)	Characterized by copious small oval spots, their lesions are seen as small, pink, individual spots on arms, legs, and torso, and onset is associated with streptococcal infection in the upper respiratory tract.
Pustular psoriasis	Appears as raised bumps that are filled with non-infectious pus known as pustules. Seen in fingertips, palms of the hand, soles of the feet, and nails.
Erythrodermic psoriasis	The most serious type of psoriasis is life-threatening because it can lead to hypoalbuminemia, hypothermia and high output cardiac failure.
Intertriginous Psoriasis (psoriasis in folds and genital areas)	Affects almost exclusively flexural body sites axillae, inframammary creases, antecubital fossae, genital area, groins, umbilicus, gluteal cleft, and other body folds.
Nail psoriasis	Common signs of nail psoriasis pitting, yellowish discoloration, hyperkeratosis, paronychia, etc.

herbs and organic products such as aloe vera and turmeric are already common in managing psoriasis.

2. Pathophysiology

Skin inflammatory T-cell-mediated activation requires two signals through cell-cell interaction between surface proteins and antigen-presenting cells such as dendritic cells and macrophages:

1. T-cell receptor-antigen interaction Actions
2. Co-stimulation mediation by various surface interactions.

Activated T-cells migrate from lymph nodes and the bloodstream into skin and release cytokines (INFg, IL-2) which induce pathologic changes.

Local keratinocytes and neutrophils produce other cytokines such as TNFa and IL8. T cell production and activation leads to keratinocyte proliferation. Studies of histocompatibility antigens illustrate associations with human leukocyte antigens (HLA) Cw6, TNF-a and IL-3.[2]

3. Psoriasis Treatment

Psoriasis treatment can be divided into two groups

3.1. Topical

Topical therapies are used to manage mild-to-moderate psoriasis. Topical therapy may be also used to treat severe psoriasis in combination with systemic regimes such as, coal tar or short-contact dithranol in combination with UV light

3.2. Systemic

Systemic therapies are used to the severe spectrum of the disease.[3]

Some Medicinal plants for skin disease

Aloe barbadensis Miller: It is biologically active among 400 species. According to a World Health Organization report, this medicinal herb is the best source to prepare natural drugs. The plant is native to southern and eastern Africa then it was then introduced to the territory of North Africa and other countries.

Aloe vera **:** It belongs to the Liliaceae family. Different parts of the plant especially the gel, are effective on the body. ***Aloe Vera*** Gel helps reduce redness and peeling associated with psoriasis. Aloe vera contains anthraquinones, mucopolysaccharides, steroids, saponins, and salicylic acid. Active ingredients of Aloe vera is anthraquinone and acemannan which have antibacterial activity and are therapeutic for psoriasis disease. Salicylic acid as a component in this plant has a keratolytic effect that removes psoriatic plaques.[3]

Curcuma longa **:** It is commonly called Turmeric. It consists of dried as well as fresh rhizomes of the plant known as Curcuma longa, belonging to the family Zingiberaceae. India accounts for as much as 90% of the total output of the world. Curcuma is a genus of about 70 species of rhizomatous herbs distributed in southeast Asia and especially in India, China, and Thailand. It contains 5% of volatile oil, resin, and yellow coloring substances known as curcuminoids. The chief component of curcuminoids is known as curcumin (50 to 60%). Curcumin has been proved as an anti-inflammatory drug.[4]

Azadirachta indica **:** Commonly known as neem belongs to the family Meliaceae. Typically grown in tropical and semitropical regions. Its fruits and seeds are the main source of neem oil. Azadirachtin is an insect anti-feedant, growth disrupter, and insecticide. It contains quercetin and beta-sitosterol, polyphenolic flavonoids. Neem leaves have antibacterial and antifungal activity. Neem oil has been used to treat chronic skin conditions such as psoriasis, eczema, and ringworm.

Avena sativa **:** The Avena sativa is commonly called oats. This is a species of cereal grain grown for its seed, which is known by the same name. Types of oats like rye are usually considered a secondary crop, which is derived

Table 2: Medicinal plants for management of psoriasis

Herb name	Active ingredients	Important properties (in dermatology)
Aloe barbadensis (Aloe vera)	Contains anthraquinones, saponins, salicylic acid, steroids and mucopolysaccharides	Restoration properties, removing psoriatic plaques, and moisturizing effects
Curcuma longa (Turmeric)	Curcumin, demethoxycurcumin, curcuminoids, Bisdemethoxycurcumin	Anti-inflammatory, antimicrobial soothes skin condition
Azadirachtaindica (Neem)	Azadirachtin, B nimbin, salannin, nimbandiol, Ascorbic acid, nimbolide, nimbanene	Antibacterial, used in skin ulcers, anti-inflammatory
Santalum album (Sandalwood)	Contains high amount of alpha and beta santalol, santenone	To treat skin disorders like psoriasis, eczema, relaxing and calming
Avenasativa (Oats)	Linoleic acid, saponins, vitamins D, A & E, alkaloids, oleic acid	Improvements in skin dryness, moisturization & collagen synthesis, high properties
Ziziphusspina-christi (Christ'sthornjujube)	Alpha-pinene, flavonoids, essential oils, tannin	Anti-microbial, skin freshness, Improves the structure of epidermis
Tinospora cordifolia (Giloy)	Octacosanol, nonacosan-15-one, heptacosanol, tinosporidine, Giloin	Detoxifies skin, improve skin structure, antiaging
Allium sativum (Garlic)	Allicin, ajoene, allyl sulfides, vinyldithiins	Effective on psoriasis, skin aging and rejuvenation, antifungal, antiviral
Pinus eldarica (Afghan pine)	Germacrene, beta-caryophyllene, alpha-pinene, beta-pinene, Vitamin A, magnesium	Improving structure of damaged skin, prevents normal celldeath & antioxidants properties
Minnettia pinnata (karanj)	Bitter flavonoids, tannin, karanjin, ponganon & karanjachromene	Antibacterial, anti-inflammatory, helpful in skin problems like itching, bleeding, pain
Cactus (Cacti)	Ascorbic acid, vitamin E carotinoids, amino acid, antioxidants compound	Helps in hydration & keeps skin moisturized, treats redness & inflammation
Solanum nigrum (Black night shade)	Kaempferol-coumaric acid, Alpha & beta solanigrine, Solamargine & solasonine, gentisic acid	Treat swelling, burn, deeps skin infection, skin ulcers
Cydonia seed-mucus (Quince seed)	Vitamins, mucilage, tannins, triterpenes	Moisturizing, healing the skin wounds, filling skin
Silybum marianum (Milk thistle)	Silibinin, schristin, silidianin, isomeric, linoleic acid flavonolignans, silymarin	Anti-inflammatory, antioxidants, antiaging properties
Rosa damascenea (Damask rose)	Beta-citronellol, trans-geraniol-hen eicosane, n-nonadecene	Antimicrobial, antibacterial, Anti-inflammatory, soothe skin
Arctium lappa (Greater burdock)	Mucilage, polyacetylenes, guaianolide-type & contain vitamins C, E, B3 & K	Antibacterial, Regenerative properties, and moisture supply too
Archillea millefolium (Yarrow)	Alkaloids, coumarins, flavonoids (apigenin,luteolin,quercitin) salicylic acid, volatile oil, tannins, sterols	Relaxing and healing of damaged skin, anti-inflammatory
Lavandula angustifolia (Lavender)	Linalool, linalyl acetate, geraniol, caryophyllene, lavndulyl acetate	Helps even skin tone, antibacterial, helps in wound healing
Glycyrrhiza glabra (Licorice)	Glycyrrhizinaci, isoflavones, triterpene sterols, coumarins	Rich in antioxidants, mayhelp fight bacteria that infect the skin
Matricaria chamomilla (Chamomile)	Apigenin, quercetin, patuletin, coumarin, essential oils, luteolin, terpene, bisabolol	Antiseptic properties, great for soothing various skin problems
Mahonia aquifolium (Oregon grape)	Berberine, berbamine, Oxyacanthine, alkaloids	Anti-inflammatory, reduce redness in psoriatic flares, antifungal
Coleus (Flame nettle)	Forskolin A, Forskolin B, Forskolin H, alpha-cedrene	Antimicrobial, anti-inflammatory,Skin condition such as eczema
Rubia cordifolia (Manjistha)	Quinones, iridoids, oleananes triterpenoid, Rubicordifolia, Alizarin, purpurin	Antioxidant property, Treat inflammation, itchiness, bleeding

from a weed of the primary cereal domesticates wheat and barley. Oat extract can be used to soften skin. Oat grass has been used traditionally for medicinal purposes like treating dysmenorrhoea, balancing the menstrual cycle, osteoporosis and urinary tract infections.[5]

Ziziphus spina-Christi **:** The name 'Ziziphus' is often erringly written as Zizyphus. The generic name is derived from the latinized version of the Arabic vernacular name 'zizouf' for *Z. jujuba*. The specific name is derived from its common name Christ thorn. Ziziphus spina-christi is a shrub and also a tall tree, having a height of 20 m & diameter of 60 cm. The bark is in light grey colour which is scaly and cracky. Leaves barren on the upper surface, finely growing below. The leaves contain various alkaloids, including ziziphine, amphibine, jubanine, linalool, alpha terpinol, diverse saponins. The roots are used to treat headaches, the spines or ashes of this species are applied on snake bites. Boiled leaves are applied on a different surface of wounds, also have antihelminthic and anti-diarrhetic properties. In Morocco, the fruits are used as astringent agent & an emollient. Young leaves of this species is used to reduce eye inflammations.[6]

Giloy: *Tinospora cordifolia* (Thunb.) Miers has long been a part of Ayurvedic medicine in India. Thisherb belongs to the family Menispermaceae with comm on names like Giloy, Gurcha, Amrita, Guduchi. It is found in India, Sri Lanka, Bangladesh, Myanmar, Thailand, China, Philippines, Indonesia, Malaysia, Vietnam, South Africa & North Africa. Giloy is a large climbing shrub with lengthy twining branches spreading extensively. The plant contains different active components like steroids, alkaloids, aliphatics, glycosides, & terpenoid lactones. These active ingredients are distributed in all parts of the plant. Giloy is a tonic and has aphrodisiac & diuretic properties. It is also a liver tonic, used in malarial and chronic fever. Studies have reported different medicinal properties of the plant, including antidiabetic, antispasmodic, antiperiodic, anti-arthritic, antioxidant, antimalarial, antistress, anti-allergic, antimalarial, hepatoprotective, antineoplastic, and immunomodulatory activities.[7]

Garlic: Garlic (*Allium sativum*) belongs to the family Liliaceae. It is mainly cultivated in central Asia, southern Europe, U.S.A and in India. Garlic bulbs contain 29% of carbohydrates, about 56% of proteins (albumin). The volatile oil of the drug is the chief active constituent and contains allyl propyl disulphide, diallyl disulphide, alliin and allicin. Garlic is used as disinfectant in pulmonary conditions. Garlic has antibacterial, antifungal, antiviral, and antiseptic properties from allicin. Allicin helps to kill the bacteria causing acne.[4]

Cactus: Several studies demonstrated that cactus fruit contain substantial quantities of important nutrients, vitamins, minerals and antioxidants. The cactus plant appears to be the finest source of phytochemicals of nutraceutical importance. Cactus plants are available as a whole because their bioactive components can be extracted from different parts of their anatomical structure flowers, fruits, cladode, roots and seeds. Cactus plants have been used by Americans for centuries as a dietary supplement. Cactus pear fruit has been used in traditional medicine for the treatment of different pathologies such as dyspnoea, ulcers, glaucoma, and liver diseases as well as to heal wounds and fatigue. The consumption of cactus fruits and their juices are recommended for their diuretic effect functions as hypoglycaemic agent, analgesic, anti-allergic, anti-inflammatory actions, and for gastritis relief.[8]

Black nightshade: The black nightshade (*Solanum nigrum L.* and related species) are worldwide weeds of arable land, gardens, rubbish heaps, and soils rich in nitrogen, in moderately light and warm situations which occur from sea to montane level. Recent studies on agropastoralin Africa indicate that these plant resources play a significant role in nutrient food security and income generation. Therefore, worthwhile to note that the incorporation or maintenance of edible wild and non-cultivated plant resources could be beneficial to the nutritional marginal population or to certain vulnerable groups within-population especially in developing countries.[9]

Cydonia seed-mucus: Quince (*Cydonia oblonga*) is a fruit that has high nutritive value. It is stated that the fruit itself and its peel have free radical binding and antioxidant properties. Fruits are useful in the treatment of inflammatory bowel disease and stomach ulcers. Leaves are used as sedatives and seeds are used as an emulsifying agent in the cosmetic industry.[10]

Silybum marianum **:** It belongs to the family Asteraceae a herbaceous annual species. Having origin in Mediterranian regions of North Africa and Europe. All parts of the plants are edible, and leaves have been used as antioxidant-rich salad. Seeds of the plant are known to be used in traditional medicine for the treatment of liver and gall bladder ailments and to protect the liver from poisoning by toxins such as toxic mushrooms, insect stings, and snake bites. This plant has good hepatoprotective activity. *Silybum marianum* can be used for skin disorders such as psoriasis. High levels of cyclic adenosine monophosphate (cAMP) and leukotrienes were observed in patients with psoriasis. The role of silymarin in treating psoriasis is the improvement of endotoxin removal by the liver, inhibition of cAMP phosphodiesterase, and leukotriene synthesis.[3]

Arctium lappa: *Arctium lappa* (Burdock) belongs to the family Compositae/Asteraceae. Burdock has been also used in a few countries to treat problems arthritis and skin disorders. The Chinese used burdock to treat upper respiratory infections. A combination of burdock and wine was used to treat leprosy in the fourteenth century in Europe. Burdock is used for a variety of dermatologic conditions

(eczema, psoriasis, scrapes, and burns) etc. This plant acts as an anti-inflammatory, antimicrobial, antibacterial, antiviral, antineoplastic, antimutagenic, antitumor, and antioxidant.[3]

Glycyrrhiza glabra **:** Liquorice is the dried unpeeled rhizome and its roots. It mainly cultivated in Spain, Italy, and France. Liquorice extract is usually produced by extracting with alcohol. The liquorice root contains about 20% of water-soluble active ingredients and glycyrrhizic acid, which is comprised 3–5% of the root. The color of liquorice root is bright yellow due to 1–1.5% of flavonoids such as liquiritigenin and isoliquiritigenin. The liquorice roots contain 5–15% of sugars (glucose and sucrose). The liquorice extracts contain corticosteroid like and anti-inflammatory activities. Liquorice extract plays an important role in converting prostaglandins and glucocorticoids into inactive metabolites and inhibiting enzymes important for raising prostaglandin levels prostaglandins such as PGE2 and PGF2α.[4]

Matricaria chamomile **:** It is the one of the important medicinal herb native to southern and east Europe. It belongs to family Asteraceae. Chamomile is used as anti-inflammatory, antiseptic, antispasmodic. It contain sesquiterpenes, flavonoids, coumarins, polyacetylenes, alpha bisolol and cyclic ethers contain antimicrobial and umbelliferone is fungistatic, whereas chamazulene and alpha bisolol are antiseptic.[11]

Coleus forskohii **:** It consists of roots of *Coleus forskohii*, belonging to family Labiatae. The plant grows perennially over the tropical and subtropical regions including India, Pakistan, Sri-lanka, Brazil. It contains various diterpenoid derivatives. The roots contain colenol B, colenol C, deoxycolenol, and labdane diterpenoids. Forskolin inhibits human platelet aggregation induced by epinephrine or collagen.[4]

Rubia cordifolia: It belongs to the family it has been cultivated for a red pigment derived from roots, genus Rubia fell into about 70 species distributed widely around the world. The roots contain quinones like glycosides include rubiadin, 1-hydroxy, 2-methoxy anthraquinone shows wound healing activity, antibacterial and anti-inflammatory effect. Powdered dried roots and fruits are taken internally for the treatment of skin diseases and disorders of spleen.[12]

4. Conclusion

Psoriasis is a complex and multifunctional inflammatory skin disease characterized by the initiation of T cells, changes in nearby blood vessels, abnormal keratinocyte enlargement, and neutrophil activation. Synthetic drugs used for treatment have side effects, and some synthetic drugs have been found to have psoriasis as a side effect. Medicinal plants are being increasingly used in the treatment of skin diseases like psoriasis. In this case, natural herbal remedies are an obvious alternative that is as safe and effective as the medicines manufactured.

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None.

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Author biography

Firoj Allauddin Tamboli, HOD https://orcid.org/0000-0002-5809-6303

Shubhangi M Gawali, P G Student https://orcid.org/0000-0002-7724-2468

Priti Chandrakant Kokate, Student https://orcid.org/0000-0002-8762-0477

Arbaz Rahimoddin Shaikh, Student https://orcid.org/0000-0001-9006-3774

Anilkumar Jalinder Shinde, Associate Professor https://orcid.org/0000-0003-1857-3133

Ajay Namdeo, Associate Professor https://orcid.org/0000-0002-8849-090X

Kamal Alaskar, Professor https://orcid.org/0000-0001-6430-823X

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