Review of herbal plants used in the treatment of skin diseases

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Abstract
Maintaining healthy skin is important for a healthy body. The acceptance and recognition of herbal medicine is increasing day by day. Many medicinal plants are used to treat diseases such as eczema, psoriasis, vitiligo, cellulitis, herpes, cancer etc. Some wild plants and their parts are frequently used to treat these diseases. India has a rich folklore of medicinal plant on healthcare. A large number of formulations have been used in India for treatment of cuts, wounds, burns and various skin diseases. The use of herbal plants is as old as the mankind. Natural treatment is cheap and claimed to be safe. Herbal clinical research optimistically opens new therapeutic avenues. This review summarizes the published literature on 14 medicinal plants from different families and their uses in the treatment of skin diseases.

Keywords: Plants, skin disorder, skin problems, parts of plants

Introduction
Human skin, the outer covering of the body, is the largest organ in the body. It is also the first line of defense. Skin contains many specialized cells and structures. It is divided into three main layers known as epidermis, dermis and hypodermis. Each layer provides a distinct role in the overall function of the skin. Epidermis, the outer most layer of the skin, varies in thickness in different regions of the body. It is the thinnest on the eyelids (0.05 mm) and the thickest on the palms and soles (1.5 mm). The dermis also varies in thickness depending on the location of the skin. It is 0.3 mm on the eyelid and 3.0 mm on the back of the body. The dermis is attached to an underlying hypodermis or subcutaneous connective tissue. The subcutaneous tissue is a layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important in the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and from person-to-person. Hair follicles, sweat glands and sebaceous glands are the main skin appendages. Many medicinal plant species worldwide are used in traditional medicine for treating different diseases. The world health organization (WHO) has estimated that about 80% of the population living in the developing countries depends tremendously on traditional medicine for their primary health needs. More than half of the world's population still depends exclusively on medicinal plants, and plants offer the active ingredients of most traditional medical products.

Functions of Skin:
Because it interfaces with the environment, skin plays a key role in protecting (the body) against pathogens and excessive water loss. Its other functions are insulation, temperature regulation, sensation, storage and synthesis of vitamin D by action of ultraviolet (UV) and the protection of vitamin B folates, absorption of oxygen and drugs and water resistance. Severely damaged skin will try to heal by forming scar tissue. This is often discolored and depigmented.

Common Skin Problems
Acne
Acne is a skin condition that occurs when your hair follicles become plugged with oil and dead skin cells. It causes whiteheads, blackheads or pimples. Staphylococcus aureus and Propionibacterium acnes have been attributed to acne vulgaris. However, their exact contributions in the acne process are not entirely clear. There are sub-strains of P. acnes in normal skin and some others in long-term acne complications, a high level of glycemic diet has been shown to be associated with worsening of acne vulgaris.
**Eczema**

Eczema is a condition wherein patches of skin become inflamed, itchy, cracked, and rough. Some types can also cause blisters. It is an inflammation-based diseases is atopic dermatitis (atopic eczema), which is a chronic disease affecting people genetically tended to overreact to external factors. It is commonly found in association with allergic rhinitis, asthma, or other manifestations of atopy. Atopic dermatitis is a widespread dermatologic disease in children. The most commonly observed manifestations of atopic dermatitis are extreme skin dryness and itching, redness, scaly patches, and thickened lichenified plaques with excoriation.

**Hives**

Urticaria, also known as hives, is an outbreak of swollen, pale red bumps or plaques (wheals) on the skin that appear suddenly -- either as a result of the body's reaction to certain allergens, or for unknown reasons. Hives usually cause itching, but may also burn or sting. They can appear anywhere on the body, including the face, lips, tongue, throat, or ears. Hives vary in size (from a pencil eraser to a dinner plate), and may join together to form larger areas known as plaques. They can last for hours, or up to one day before fading. It is the fourth most prevalent allergic disease which affects 20% of total population once in their life.

**Rosacea**

Rosacea is a common chronic skin disorder observed primarily among patients with Fitzpatrick I & II skin types. In general, clinical observation is sufficient to diagnose conditions when the patient presents on the face, neck, chest, or ears with flushing, persistent erythema, telangiectasias, eruption of inflamed papules, pustules, and hypertrophy with fibrosis I of the sebaceous glands of the nose. The exact cause of rosacea remains unknown, with no known cure available.

**Psoriasis**

Psoriasis is a common, chronic immune-mediated skin condition that affects 3–4% of the adult US population. Symptoms of psoriasis include redness, scaling, flaking, pruritus, skin tightness, pain, and bleeding, which can all have a significantly negative impact on patients’ physical and mental functioning. Psoriasis is also associated with impairment in quality of life, psychological well-being, and work productivity.
Table 1: List of medicinal plants with its parts and their use in treatment skin disorders.

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Plant Part Used</th>
<th>Skin Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saffron</td>
<td>Stigmas</td>
<td>Acne, skin eruptions, psoriasis</td>
</tr>
<tr>
<td>Oats</td>
<td>Oatmeal, lotion</td>
<td>Erythema, eczema, rashes, burns etc.</td>
</tr>
<tr>
<td>Golden shower</td>
<td>Seeds, flowers, fruits</td>
<td>Ringworm, fungal infections</td>
</tr>
<tr>
<td>Butterfly pea</td>
<td>Flowers, roots</td>
<td>Leprosy, fungal infections and scabies</td>
</tr>
<tr>
<td>Orchid tree</td>
<td>Flowers, leaves, bark</td>
<td>Skin cancer, leprosy and various skin disorders</td>
</tr>
<tr>
<td>Rosemary</td>
<td>Oil</td>
<td>Acne, sunburn, cellulite etc.</td>
</tr>
<tr>
<td>Turmeric</td>
<td>Roots, creams</td>
<td>Eczema, psoriasis, acne, rosacea</td>
</tr>
<tr>
<td>Neem</td>
<td>Leaves, fruits, oil</td>
<td>Fungal infections, dandruff, chicken pox, eczema, acne, rashes, small pox, boils, vitiligo.</td>
</tr>
<tr>
<td>Aghedo</td>
<td>Leaves</td>
<td>Skin rashes, fungal infection, boils</td>
</tr>
<tr>
<td>Mehndi</td>
<td>Leaves</td>
<td>Boils, furunculus, psoriasis, fungal infection</td>
</tr>
<tr>
<td>Chamomilla</td>
<td>Flowers, oil</td>
<td>Bacterial skin infection, erythema, eczema</td>
</tr>
<tr>
<td>Marigold</td>
<td>Flowers</td>
<td>Wound healing, bruises, rashes, boils etc.</td>
</tr>
</tbody>
</table>

Herbal Drugs for Skin Disorders

1. *Crocus sativus*
- Common name: Saffron
- Family: Iridaceae
*Crocus sativus* L. is an herbaceous perennial-cormous plant which is believed to show many pharmacological actions. The plant contains important constituents like crocetin, picrocrocin, safranal (main component for characteristic aroma). Safranal is the aglycon of picrocrocin; those are responsible for many pharmacological actions.

![Fig 6: Plant of Crocus sativus.](image1)

Saffron is a naturally derived plant product that acts as an antispasmodic, diaphoretic, carminative, emmenagogic and sedative. The chemopreventive effect of aqueous saffron on chemically induced skin carcinogenesis using a histopathological approach was studied. Its ingestion inhibited the formation of skin papillomas in animals and simultaneously reduced their size.

2. *Avena sativa*
- Common name: Oats
- Family: Poaceae
It is native to the warm Mediterranean region. It is an annual plant. *A. sativa* is known in Saudi Arabia as 'Shofan'. Oat is cultivated in Europe, North America and Asia for its yield of grain. It has a distinctive inflorescence - a composite panicle, unlike wheat, rye and barley.

![Fig 7: Plant of Avena sativa.](image2)

Different clinical studies have been undertaken to investigate the effect of oats on eczema and these have all showed a significant decrease in skin redness, dryness, scaliness, itching and erythema after application of oat extracts. These results were observed in adults and children. Oat straw is applied for inflammatory and seborrheic skin diseases; particularly those that come with itching. Oatmeal is a long-time home remedy for rosacea. It’s thought to strengthen skin and reduce water loss, which can worsen the condition. Oatmeal may also help itching.Oat in colloidal form is a centuries-old topical treatment for different skin conditions, including skin rashes, erythema, burns, itch and eczema but few studies have examined the precise mechanism of action for the anti-inflammatory activity of colloidal oatmeal.
3. **Cassia fistula**
   - Common name: Golden shower, purging cassia, Indian laburnum, pudding-pipe tree
   - Family: Fabaceae

*Cassia fistula*, a semi-wild Indian Labernum (also known as the Golden Shower), is distributed in various countries including Asia, South Africa, Mexico, China, West Indies, East Africa and Brazil. It is an ornamental tree with beautiful bunches of yellow flowers.

![Fig 8: Cassia fistula plant with inflorescence.](image)

This plant is widely used by tribal people to treat various ailments including ringworm and other fungal skin infections. *Cassia fistula* exhibited significant antimicrobial activity and showed properties that support folkloric use in the treatment of some diseases as broad-spectrum antimicrobial agents. The pulp of the ripe fruits has a mild, pleasant purgative action and is also used as an anti-fungal drug. The whole plant is used to treat diarrhea; seeds, flowers and fruits are used to treat skin diseases.

4. **Clitoria ternatea**
   - Common name: Butterfly pea, Aparajeeta, Shankhpushpi
   - Family: Fabaceae

*Clitoria ternatea* is a twining herbal medicinal plant mostly found in Asia. Various constituents are found in different parts of the plant. Butterfly pea or blue pea (*Clitoria ternatea*) from family of Fabaceae is a vine with vivid blue flowers 1 to 2 inches long.

![Fig 9: Plant and flowers of Clitoria ternatea.](image)

It is a perennial climber widely used in the traditional ayurvedic system of Indian medicine for treating a wide variety of diseases. It is also used in the treatment of chronic bronchitis, dropsy, goiter, leprosy, mucous disorders, sight weakness, skin diseases, sore throat and tumors. Leaf juice is given orally twice a day for six days to cure scabies. The root powder is used as one of the ingredients in the preparation of the drug “SULAK” and its ointment to treat leprosy.

5. **Bauhinia variegata**
   - Common name: Kachanar, Orchid tree, Camel’s Foot Tree, Mountain Ebony;
   - Family: Caesalpiniaceae

It is a well-known ornamental tree of tropical and subtropical climate with hot and dry summers and mild winters. It is native of Asia and is widely found in the Indian subcontinent and in regions of China. Tree grows well in areas with full sun or partial shade and is fairly resistant to drought but susceptible to fire.

![Fig 10: Orchid tree.](image)

The bark is alterative, astringent and tonic and is useful in the treatment of skin diseases, scrofula and ulcers. The bark decoction is used for diarrhea control, as an astringent alternative and for treating scrofula, skin diseases and ulcers. It is also used to treat leprosy.

6. **Rosmarinus officinalis**
   - Common name: rosemary
   - Family: Lamiaceae

It is an aromatic plant with needle-like leaves belonging to the *Lamiaceae* family. Rosemary has therapeutic properties and has been used in the folk medicine, pharmaceutical, and...
cosmetics industries, mainly for its antioxidant and anti-inflammatory properties, which are attributed to the presence of carnosol/carnosic and ursolic acids.

Fig 11: Plant of *Rosmarinus officinalis*.

Rosemary has potential applications in cosmetic formulations and in the treatment of pathological and non-pathological conditions, such as cellulite, alopecia, ultraviolet damage, and aging. Chronic UV exposure has manifestations such as photo-cancers and photo aging. Aqueous extract of *R. officinalis* is effective in prevention of photo damage induced by UV radiations due to its antioxidant effect. Infections are also associated with oxidative stress. Therefore, the compounds, which possess antioxidant properties, might be beneficial in this way. Antioxidant activity is generally attributed to free radical scavenging, but secondary metabolites may play a biological role in the regulation of apoptosis, cell signal transduction, and xenobiotic metabolism in the liver.

7. *Curcuma longa*
   - Common name: turmeric
   - Family: Zingiberaceae

Turmeric is an ancient spice, a native of South East Asia, used from antiquity as dye and a condiment. It is a mild digestive, being aromatic, a stimulant and a carminative. Turmeric is one of nature's most powerful healers. The active ingredient in turmeric is curcumin. An ointment base on the spice is used as an antiseptic in India. Turmeric water is an Asian cosmetic applied to impart a golden glow to the complexion. Curcumin has been shown to be active against Staphylococcus aureus (pus-producing infections). Turmeric has been historically used in herbalism as a traditional medical remedy for cutaneous and gastrointestinal inflammation, weight control, and poor digestion. Curcumin is a compound isolated from turmeric; a plant known for its medicinal use.

In animal studies, daily applications of 1% curcumin gel reduced skin psoriasis-like inflammation artificially induced by imiquimod. Clinically, daily applications of a turmeric tonic significantly reduced the cutaneous symptoms and quality of life of patients affected by scalp psoriasis compared to the placebo. So, it is also useful in treatment of eczema. It may be recommended for painful and inflamed rosacea symptoms.

8. *Azadirachta indica*
   - Common name: Neem
   - Family: Meliaceae

Neem (*Azadirachta indica*) is perhaps the most useful traditional medicinal plant in India. The former is popularly known as Indian neem (margosa tree) or Indian lilac, and the latter as the Persian lilac. Neem is an evergreen tree, cultivated in various parts of the Indian subcontinent. Every part of the tree has been used as traditional medicine for household remedy against various human ailments, from antiquity. Neem has been extensively used in ayurveda, unani and homoeopathic medicine and has become a cynosure of modern medicine.

Neem is used in Dermatitis Eczema, Acne, Bacterial, Fungal infections and other skin disorders. It has demonstrated its effectiveness as a powerful antibiotic. Neem also has shown antiviral, anti-fungal and anti-bacterial properties. It helps support a strong immune system and is used in cases of inflammatory skin conditions. Traditionally Neem has been used for skin and blood purifying conditions. Perhaps Neem's most trusted advantage is the effect it has upon the skin. Preparations from the leaves or oils of the tree are used as general antiseptics. Due to Neem's antibacterial properties, it is effective in fighting most epidermal dysfunction such as acne, psoriasis, and eczema. Since there has never been a report of the topical application of Neem causing an adverse side effect, this is a common procedure to cure skin ailments or allergic reactions. Neem also may provide antiviral treatment for smallpox, chicken pox and warts--especially when applied directly to the skin. It is effective against a broad spectrum of skin diseases including eczema, psoriasis, dry skin, wrinkles, rashes and dandruff. Neem preparations are reportedly efficacious against a variety of skin diseases, septic sores, and infected burns. The leaves, applied in the form of poultices or decoctions, are also recommended for boils, ulcers, and eczema. The oil is used for skin diseases such as scrofula, indolent ulcers and ringworm. Experiments with smallpox, chicken pox, and fowl pox show that although
neem does not cure these diseases, but it is effective for purposes of prevention. Neem is effective against dermatological insects such as maggots and head lice. It is a common practice to apply neem all over the hair to kill head lice.

9. Achyranthes aspera
   - Common name: Latjira, Chirchira, Aghedo, Prickly chaff flower
   - Family: Amaranthaceae

Achyranthes aspera (Amaranthaceae) is an important medicinal herb found as a weed throughout India. Though almost all of its parts are used in traditional systems of medicines, seeds, roots and shoots are the most important parts which are used medicinally.

The plant is used in indigenous system of medicine as, antiarthritic, antifertility, laxative, anti-helminthic, aphrodisiac, antiviral, anti-plasmodic, antihypertensive, anticoagulant, diuretic and anti-tumor. It is pungent, antiphlegmatic, antiperiodic, diuretic, purgative and laxative, useful, boils and eruptions of skin etc. The plant is useful in liver complaints, scabies and other skin diseases. The ethanolic and aqueous extracts of leaves of Achyranthes aspera for wound healing activity. It is also useful to treat cough, scrofula, skin rash, fungal infection, fever and snake bites. The juice of the plant is used in the treatment of boils, itches and skin eruptions.

10. Lawsonia inermis
   - Common name: Henna, mehndi
   - Family: Lythraceae

Lawsonia inermis is a small shrub frequently cultivated in India, Persia, and along the African coast of the Mediterranean Sea. It is much branched, deciduous, glabrous, sometime spinescent shrub or small tree with grayish brown bark, attaining a height of 2.4-5 m. It is cultivated as a hedge plant throughout India, and as a commercial crop in certain states of India for its dye. Powdered leaves of this plant, in the form of a paste, are used both as a cosmetic dye and as a remedy for boils, wounds, and some mycotic infections. Leaves made into the paste are applied daily on the affected areas to cure impetigo twice a day. Mehndi also have effective antifungal activity against Candida albicans and other fungi, hence also be used in fungal infections of skin. The leaf paste is applied on cracked heels in rainy season due to mud infection. Henna also has antifungal properties and strongly absorbs UV light, thus its application is beyond cosmetic as it has proven useful against fungal diseases like athlete’s foot and as a sunscreen.

11. Matricaria chamomilla
   - Common name: Chamomilla
   - Family: Asteraceae

It is a well-known and generally used medicinal herb. M. chamomilla, a member of the Asteraceae family, is one of the oldest medicinal plants. It is used in herbal medicine for a sore stomach, irritable bowel syndrome, and as a gentle sleep aid. In addition, it is used as a mild laxative and is anti-inflammatory and bactericidal. Its recommendations, derived from both traditional and modern medicine, include many diseases such as inflammation, ulcers, wounds, gastrointestinal disorders, stomach ache, pharyngitis, rheumatic pain.

12. Calendula officinalis
   - Common name: Marigold
   - Family: Asteraeceae
Calendula officinalis L. (marigold) is native to the Mediterranean countries. It has characteristic yellow-orange flower heads. Active ingredients of the calendula flower are triterpene saponins (oleanolic acid glycosides), triterpene alcohols (β-, β-amyrins, faradiol), and flavonoids (quercetin andisorhamnetin). Marigold, Calendula officinalis L. (Asteraceae) is well known for its medicinal properties and also its pharmaceutical and cosmetic uses.

Anti-inflammatory effects of Calendulae flos are related to the content of flavonoids and triterpene derivatives. Isorhamnetin 3-glycosides isolated from calendula flowers inhibited lipoxygenase. Oleanane-type triterpene glycosides exhibited a marked anti-inflammatory activity in the TPA-induced inflammation in the mouse ear.

13. Withania somnifera
- Common name: Ashwagandha, winter cherry
- Family: Solanaceae

The plant Withania somnifera, commonly known as “Ashwagandha”, is well known for its therapeutic uses in the Ayurveda system of traditional medicine. It grows as a short shrub (35~75 cm) with a central stem from which branches extend radially in a star pattern (stellate) and covered with a dense matte of wooly hairs.

Root preparations of and Echinacea angustifolia have been used for the treatment of wounds, burns and other cutaneous affections, and to treat disorders such as viral infections, cutaneous illnesses and acute and chronic disease due to a deficiency of immunological responses.

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