

PLANT-BASED ANTIOXIDANTS FOR SKINCARE AND COSMETICS

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ABSTRACT

Natural substances have traditionally been used in skin care for centuries. There is now an ongoing search for new natural bioactives that not only promote skin health but also protect the skin against various harmful factors, including ultraviolet radiation and free radicals. Free radicals, by disrupting defence and restoration mechanisms, significantly contribute to skin damage and accelerate ageing. Natural compounds present in plants exhibit antioxidant properties and the ability to scavenge free radicals. This review focuses on aromatic and medicinal plants as a source of antioxidant substances, such as polyphenols, tocopherols, carotenoids, ascorbic acid, and macromolecules (including polysaccharides and peptides) as well as components of essential oils, and their role in skin health and the ageing process.

KEYWORDS: Herbal cosmetics, pharmaceuticals, herbal creams, facial, phytomedicine.

INTRODUCTION

The world of plants is one of the main sources for materials used in the food, pharmaceutical and cosmetics industries. The ancient art and inscriptions indicate the human eagerness towards its physical appearance. The development of cosmetics and science of cosmetic development have been ever-emerging fields. The medical and therapeutic science particularly based on herbs developed concurrently with the development of cosmetics.^[1,2] The need for herbal cosmetics is increasing rapidly in comparison to conventional cosmetics due to lesser side effects. Herbal cosmetics are favorable because they are produced by the herbs and shrubs. Natural components in the herbs do not possess any unwanted or side effect on the skin of the human body but supplement the skin with nourishment and other favorable nutrients.^[3]

Common Skin Problems:- There are a number of skin conditions that a human being encounters. There are some common skin problems that can be caused by exposure of different environmental conditions. Skin problems are very common in the human population; approximately 6% of infected people visit to physicians whereas approximately 40% of the infected people consult to dermatologists.^[4]

The Cosmeceuticals can be of help in the treatment of these skin infections or can provide support in faster recovery. Following are the most common skin problems found in human beings:

Acne: It is one of the most common skin problems. Is especially found among young ones, adolescents. This

disease was reported as an emerging and common problem.^[5]



The Acne may be caused due to

- I) Oil: oil overproduction because of excessive production of the androgen hormone.
- II) Clogging of pores: because of excessive hormone levels the old skin cells become sticky and they clog pores as they do not get shed leading to acne.
- III) Growth of propionibacterium leading to skin inflammation.

Athlete's Foot: Moist areas like shower cubicles, swimming pool lockers, moist shoes or wet socks have fungi named Dermatophytes and they lead to the development of itchy flaky skin. These diseases infect in the toes of the feet and in between the digits and sometimes it gets spread on the nails.^[6]



Treatment is carried out for at least a week or till few weeks until symptoms seem to get reduced. At first topical medicines are suggested but when the fungus is resistant to topical treatment, then oral antifungals - like Lamisil (terbinafine), Sporanox (itraconazole), and Diflucan (fluconazole) - can be prescribed.^[7]

Vitiligo: It is a disorder in which the melanin producing cells either stop functioning or die as a result of which patchy blotches develop on the skin which are pale due to the loss of skin color pigment synthesizing cells. Melanocytes lose their activity. This disease condition is not contagious, infectious or fatal. It can be hereditary. This is an autoimmune disease because the body's immune system attacks.^[8]



AYURVEDA CONCEPT FOR SKIN CARE

Ayurveda is one of the earliest systems of medicine in the world that originated in the Indian subcontinent. The Indian medicine system, Ayurveda, has a rational and logical foundation. Ayurveda is a science or knowledge of life which describes beauty by Prakriti (Body constitution), Sara (Structural predominance), Sanhanan (Compactness of body), Twak (Skin completion), Praman (Measurement) and Dirghayu Lakshmana (Symptoms of long life). The concept of Ayurveda is based on Indian philosophy which dictates not only treatment of various health problems but also gives direction to pursue a healthy lifestyle.

TREATMENT IN AYURVEDA

According to Ayurveda, skin conditions originate from deep-rooted Dosha imbalances and it can be cured by deep Dosha analysis.

Dosha's are biological energies, part of every human being that governs all mental and biological processes and provide an individual design of health and fulfillment. These Doshas are based on the five elements i.e. earth, water, space, fire & air and their related properties. In Ayurveda there are three types of Doshas:

Vata dosha (ether and air), pitta dosha (water and fire), Kapha dosha (water and earth). Ayurveda system of medicine isn't concerned about only beauty or skin care; it also defines concerns about 'Chaitanya Mann' spirituality, healthy lifestyle, diet modification, medical intervention, personal and social hygiene. This treatment is generally based on natural ingredients, natural therapeutic products given.

Indian Medicinal Plants:- There are a number of plants of Indian origin that find application in Cosmeceuticals for treatment of various skin diseases and conditions along with rejuvenating the skin appearance.^[9] The selected prominent plants are as below:

- **Amla**

Common Name: Amla, Indian Gooseberry.
Systematic Name: *Emblica officinalis* Gaertn.
Family: Phyllanthaceae



Amla also known as Indian gooseberry is an ancient Ethanopharmacological and Indian ayurvedic medicinal plant. Amla also known as Indian gooseberry (figure 1) is an ancient ethanopharmacological and Indian ayurvedic medicinal plant. It has a lot of potential to cure diseases and problems in most of its plant parts but its fruit is used for cosmetic purposes. It contains vitamin C, minerals and amino acids, and also contains various phenolic compounds. Research reports show that amla possesses antipyretic, analgesic, antitussive, antiatherogenic, adaptogenic, antianemia, cardioprotective, gastroprotective, antidiarrheal, wound healing, antihypercholesterolemia, antiatherosclerotic, hepatoprotective, nephroprotective, and neuroprotective properties.^[10]

- **SHIKAKAI**

Common Name: Shikakai
Systematic Name: *Acacia concinna* DC.
Family: Fabaceae



Shikakai is a shrub like a tree grown in Central India. It is rich in vitamin A, C, D, E and K and other antioxidants. Since ancient times its fruit has been used in powder form to cleanse hair. Shikakai fruit is known and used for the purpose of hair treatment. Shikakai enhances hair growth, prevents dandruff, removes lice, oil and dirt from hair, improves scalp health and strengthens hair roots.^[11,12]

- **ALMOND**

Common Name: Almond, Badam, Systematic Name: *Prunus dulcis*
Family: Rosaceae



Almond oil is extracted from the fruit of the almond plant. It contains omega – 9 fatty acids, vitamin E and protein that promote strength of hair. It is a natural antioxidant. It also repairs hairs it improves hair's resilience capacity.^[13]

- **TURMERIC**

Common Name: Turmeric, Haldi, Systematic Name: *Curcuma longa* Linn
Family: Zingiberaceae



Turmeric is an age old medicine used to cure various ailments. It has been used traditionally in India as a common recommendation for fasting the wound healing supplement and has been included in the spices for daily use. It possesses anti-diabetic, anti-inflammatory, antifungal, antibacterial, anti-arthritis, anti oxidant, anti microbial. Turmeric has the potential of curing pimples and eczema, healing of burning wound, developing

smooth skin surface.^[14,15]

- **HENNA**

Common Name: Heena, Henna Systematic Name: *Lawsonia inermis*
Family: Lythraceae



Henna has been used cosmetically for applying on hands and feet. It possesses hepatoprotective, antioxidant, antibacterial, antifungal, antiviral, antiparasitic properties. Since years it has found its uses for various purposes. Henna plant parts can be used for various purposes, such as leaves for Hair dye, applying on hands and feet; Flowers for perfume, and Seed for Deodorant.^[16]

- **SAFFRON**

Common Name: Saffron
Systematic Name: *Crocus sativus* Linn
Family: Iridaceae



Saffron has been used since ages as a flavouring agent and as a potential plant for skin treatment. It possesses antihypertensive, anticonvulsant, antitussive, antigenotoxic and cytotoxic effects, anxiolytic aphrodisiac, antioxidant, antidepressant, antinociceptive, anti-inflammatory, and relaxant properties.^[17,18]

- **SANDALWOOD**

Common Name: Sandal wood,
Systematic Name: *Santalum album*
Family: Santalaceae



Sandalwood plant also known as 'Royal tree' in Indian Subcontinent, is a traditional plant used since ages. The wood of The tree is used to extract oil. Sandalwood oil is used for the Prevention and treatment of warts, skin blemishes, and tumors due to viral infections.^[19,20]

- **ALOE VERA**

Common Name: Aloe vera,
Systematic Name: Barbados aloe
Family: Asphodelaceae



Aloe vera plant has been used for medicinal purposes since ages in India. It has anti-microbial, antioxidant, antiseptic and anti-inflammatory properties. good moisturizer and nourishes hair, skin. It rejuvenate skin by reducing effects of aging, wrinkles increases the collagen content of the skin when directly applied, thus breaking the scar tissue and healing the skin.^[21,22]

- **SUNFLOWER**

Common Name: Sunflower, Suryamukhi
Systematic Name: Helianthus
Family: Asteraceae



Sunflower oil is extracted from the seeds of its flower. It contains active components: lecithin, tocopherols,

carotenoids and waxes. It has non- comedogenic properties, i.e., it prevents blockage of pores. It is therefore, suitable for skin care.^[23]

- **JOJOBA**

Common Name: Jojoba
Systematic Name: Simmondsia chinensis
Family: Simmondsiaceae



Jojoba also is known as goat nut is used widely due to its therapeutic uses. The oil extracted from the fruit has the capacity to treat many diseases. It has anti-oxidant, anti-inflammatory, anti-ageing and anti- cancer properties. It balances natural pH in skin and hair preventing dryness and aging process.^[24,25]

- **BHANG**

Common Name: Hemp, Charas, Ganja.
Systematic Name: Cannabis sativus
Family: Cannabaceae



The powder of leaves of these plants is used to treat wounds and soars. Ganja is used to reduce pain cause because of itchy skin disease.

Eczema and host of other skin diseases like dermatitis, seborrhoeic dermatitis/cradle cap, varicose eczema, psoriasis, lichen planus and acne rosacea may be treated by hemp seed oil.^[26,27]

- **APRICOT**

Common Name: Khubani, Apricot
Systematic Name: Prunus armeniaca
Family: Rosaceae



Apricot oil obtained from dried seeds is used for healing damaged skin.²¹⁷ It reduces wrinkles, maintain skin elasticity, removes blackheads, used as skin moisturizer and help in improving skin tone.^[28]

• FENUGREEK

Common Name: Fenugreek, Greek-clover, Greek hay, Assamese

Systematic Name: *Trigonella foenum-graecum*

Family: Fabaceae



Fenugreek recognized as an significant medicinal plant and it's seeds comprises with natural oils, fats, and mucus benefit to hydrate, and moisturize the skin to be soften.^[29] The seeds of Fenugreek, also consist of the polysaccharide galactomannan, and because of such compounds, it showed anti-inflammatory and antioxidants properties.^[30]

CONCLUSION

Plant products have been used for centuries for skin care purposes. Today, the use of natural ingredients in various innovative formulations for skin care, cleaning, and protection remains very popular. Both single active compounds and sets of compounds that are present in plants are used for therapeutic and cosmetic purposes, usually in the form of extracts obtained from various parts of the plant. Plant extracts are used because they can protect the skin against harmful exogenous or

endogenous factors. The plant can serve excellent source of ingredients that serve the purpose of both; and products for skin care have emerged as the prominent area of development.

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