

Review Article

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POTENTIAL OF HERBS AS COSMACEUTICALS

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ABSTRACT

Cosmetology, the science of alteration of appearance, has been practiced since primordial times. In India, the concept of using herbs for beautification finds its origin in traditional medicine literature like Ayurveda. The association between Ayurveda, anti-aging and cosmeceuticals is gaining importance in the beauty, health and wellness sector. Ayurvedic cosmeceuticals date back to the Indus Valley Civilization. Modern research trends mainly revolve around principles of anti-aging activity described in Ayurveda. Most herbal supplements are based on, or include, several botanical ingredients with long histories of traditional or folk medicine usage. Among the numerous botanical ingredients available on the market today, several are believed to confer dermatologic benefits. This article will focus on a select group of botanical compounds, many of which have long traditions in Asian medicine, with potential or exhibited dermatologic applications, including curcumin, Ginkgo biloba, ginseng, silymarin, soy, and tea tree oil. Other botanical agents, such as arnica, bromelain, chamomile, pomegranate, caffeine, green tea, licorice, and resveratrol, are also briefly considered.

KEYWORDS: Cosmeceuticals, Herbal extracts, Ayurveda

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INTRODUCTION

Beauty the quality that gives pleasure to the senses, is perhaps the desire of every human being on earth. Some are born beautiful and some are in fact made beautiful. Aesthetic appearance has always been a matter of prime importance. The word beauty' is not only related to women, as is often thought, but men also use cosmetic products.¹ Cosmeceuticals represent the marriage of cosmetics and pharmaceuticals. Examples of products typically labeled as cosmeceuticals include anti-aging creams and moisturizers. Cosmeceuticals are cosmetic products with biologically active ingredients purporting to have medical or drug-like benefits².

Ayurveda is one of the most ancient medical traditions practiced in India, Sri Lanka and other South Asian countries, and has a sound philosophical and experiential basis³ Atharvaveda, Charak Samhita⁴ and Sushruta Samhita are its main classics, giving detailed descriptions of over 700 herbs. Ayurveda has several formulations for management of aging and related conditions. Its literature describes over 200 herbs, minerals and fats to maintain and enhance the health and beauty of the skin.⁵ Today there is once again a revival of preference for natural products and in recent years there has been a great upsurge in the study of Indian herbs⁶.

HERBAL EXTRACTS USED IN COSMETICS

Herbal extracts are primarily added to the cosmetic preparations due to several associated properties such as antioxidant properties. These antioxidant botanicals are generally classified into three categories depending upon the nature of their constituents as carotenoids flavonoids and polyphenols. The carotenoids are structurally related to vitamin A and constitute various retinols like retinoic acid. Flavonoids, in addition to the antioxidant action, impart the UV protection and metal chelating properties. The polyphenolics is a large class and contains various molecules like rosmarinic acid (rosemary), hypericin (Saint John's Wort) and oleuropein (olive leaf)⁷.

ANTI-AGING COSMECEUTICAL CONCEPTS IN AYURVEDA

According to Ayurveda, a number of factors determine skin health and youthfulness. These include proper moisture balance (*Kapha* in balance), effective functioning of the metabolic mechanisms that coordinate all the various chemical and hormonal reactions of the skin (*Pitta* in balance) and efficient circulation of blood and nutrients to the different layers of the skin (*Vata* in balance). The health of the following three *Dhatu*s types of body Tissue are especially related in the skin: nutritional fluid (*Rasa*) blood (*Rakta*) and muscle (*Mamsa*). *Rasa* supports all the body tissues, particularly keeping the skin healthy, *Rakta* in association with liver function, helps detoxify the skin of toxins, while *Mamsa* provides firmness to the skin. An effective Ayurvedic anti-aging cosmeceutical should provide support to all these three areas. Anti aging treatment includes two types of therapies *Urjaskara*(promotive) and *Vyadhihara* (curative)⁸.

USE OF PLANTS AND THEIR EXTRACTS IN COSMETICS

Apart from these, the herbal extracts have also been used for the topical anti-inflammatory properties. These agents block the inflammatory changes that result during the cutaneous ageing and thus may be helpful in reversing the signs of ageing. Some Indian medicinal plants, which have been studied in detail for their use in cosmetics, are being discussed here for further exploration.

Aloe Vera

It is also known as Lily of the desert or the Plant of Immortality. It is recommended for sunburn, minor burns, wrinkles, insect bites, skin irritations minor cuts and scratches. Research has shown that the clear gel has a dramatic ability to heal wounds, ulcers and burns by putting a protective coating on the affected areas and speeds up the healing rate¹⁰. The inner portion of the leaf contains a hydrocolloid, which is composed of polyhexanoses and hexans such as xylose, arabinose and galactose This mucilaginous gel obtained from the leaves of the the plant has long been used for its healing and cosmetic properties The mucilaginous gel acts as a film and has a pH, which is directly compatible with that of the skin. One of the most valuable cosmetic properties of aloe gel is its ability to stimulate the circulation of the skin and remove the dead skin cells so

giving a fresher and younger appearance to the skin. It also clears away blemishes protects the skin against infections and reduces wrinkles¹¹ Aloe shampoo helps to combat dry and brittle hair¹² The gel is also reported to contain salicylic acid which has keratolytic and bacteriostatic properties. It is also cited as being a prophylactic for dry skin, which is prone to inflammation, because of antiphlogistic, bacteriostatic and moisturizing qualities¹³.

Turmeric

Turmeric (*Curcuma longa*, Zingiberaceae) is best known as a spice used primarily in Asian cuisine, particularly curry, and in prepared mustard. It is also used in some traditional Indian communities as a topical burn treatment. Curcumin (Diferuloylmethane), the key biologically active component of turmeric, has shown great potency against acute inflammation,¹⁴ and has been shown to exhibit significant wound healing and antioxidant properties. The paste of turmeric powder has been used as antiseptic and for skin nourishment since centuries. Curcumin the active compound of turmeric, is a polyphenol used in skin care preparations.^{15,16}

Ginkgo Biloba

In China and Japan, the leaves and nuts of the Ginkgo biloba (*G. biloba*) tree have been used for thousands of years to treat various medical conditions, including poor circulation; hypertension; poor memory, dementia, and depression, particularly among the aged; male impotence. In addition, *G. biloba* is gaining a similar reputation as a significant antioxidant and anti-inflammatory agent. The *G. biloba* extract EGb 761, prepared from the tree's leaves, is a natural mixture containing flavone glycosides (33%), mostly quercetin and kaempferol derivatives, and terpenes (6%), which has exhibited the capacity to reduce the number of ultraviolet B (UVB)-induced sunburn cells in mice.¹⁷

Ginseng

Several varieties of ginseng have been used in traditional medicine in different cultures, particularly in Asia and Native America, for thousands of years. In fact, the more often studied major active components of ginseng, ginsenosides, are known to exhibit antiaging, antioxidant, and anti-inflammatory activities.¹⁸ In addition, epidemiological studies have shown the risk of cancer to be reduced by the consumption of ginseng,¹⁹ as several species of this traditionally used herb have become associated with significant anticarcinogenic activity.

Soy and Its Isoflavones

The topical use of soy has been touted to ameliorate hyper-pigmentation, enhance skin elasticity, delay hair regrowth, control oil production, and moisturize the skin. It is also thought by some to have the potential to decrease skin aging and prevent skin cancers through the estrogen-type and antioxidant effects of its metabolites. Small proteins such as soybean trypsin inhibitor (STI) and Bowman-Birk inhibitor (BBI) have been suggested to inhibit skin pigmentation, while large proteins have been found to smooth and soften the skin. STI, BBI, and soy milk have been found not only to exhibit depigmenting activity but also to prevent UV-induced pigmentation in vitro and in vivo; specifically, STI and BBI are thought to influence melanosome transfer, thus pigmentation.²⁰

Arnica

Arnica montana (*A. montana*) has recently become popular as a topical treatment to improve inflammatory skin conditions, reduce bruising, and heal chronic wounds.²¹ The anecdotal experience of the author suggests that arnica accelerates the healing of bruises and topical arnica is recommended to patients after soft tissue augmentation, Botox[R] (botulinum toxin) injections, fat transfer, and liposuction.

Bromelain

Bromelain, the family of sulfhydryl-containing proteolytic enzymes derived from the stem of the pineapple plant, *Ananas comosus*, is most often used to treat inflammation and soft tissue injuries, as well as to aid digestion. Its proteolytic enzymes have been shown to promote wound-healing, reduce edema, bruising, and pain, and presurgical administration is associated with accelerated healing after trauma and surgical procedures.²²

Chamomile

German chamomile (*Matricaria recutita* or *Chamomilla recutita*), one of the 12 most commonly used medicinal herbs,²³ has been recognized for its therapeutic, soothing properties since the age of Hippocrates. Chamomile is thought to impart significant cutaneous benefits, such as improving texture and elasticity, as well as reducing pruritus and signs of photodamage, and chemical assays have suggested that chamomile exhibits some antioxidant activity.²⁴ Chamomile is included in skin formulations as an emollient and to provide anti-inflammatory action for sensitive skin.

Pomegranate

The pomegranate plant (*Punica granatum*) appears to offer numerous dermatologic uses. Pomegranate seed oil has been demonstrated to exhibit chemopreventive activity against skin cancer. Pomegranate extract has antioxidant and antiviral properties and is said to enhance the effectiveness of topical sunscreens. In addition, pomegranate peel fractions may foster dermal regeneration and pomegranate seed oil fractions may facilitate epidermal regeneration.²⁵ Finally, pomegranate fruit extract has been identified as an effective photochemopreventive agent.

Caffeine

Caffeine, consumed in popular beverages such as coffee and tea, as well as in certain foods, is thought to have significant anticarcinogenic and antioxidant properties. Specifically, caffeine is believed to confer an anticarcinogenic effect after UVB exposure, chemically inducing apoptosis of UV-damaged cells, suggesting the potential for incorporation of caffeine in topical formulations intended for use after UV exposure.²⁶ Green tea, another popular beverage ingredient that has already been incorporated into several skin care products, is considered to be the antioxidant with the strongest array of evidence supporting its inclusion in such formulations.

Green Tea

Green tea (*Cammelia sinensis*) polyphenols have been found to be particularly potent at suppressing the carcinogenic activity of UV radiation and exerting broad protection against other UV-mediated responses such as sunburn, immunosuppression, and photoaging, and are thus thought to have the potential to protect skin when combined with traditional sunscreens.²⁷

Ferulic Acid

Ferulic acid (4-hydroxy-3-methoxycinnamic acid) is pervasive in the plant world, and considered a potent antioxidant known to provide photoprotection to skin when it is incorporated into cosmetic lotions, sunscreens, and other skin products.²⁸ Further, it is believed to act synergistically with vitamins C and E and beta-carotene. It is speculated that a topical antioxidant formulation combining vitamins C and E with ferulic acid in a broad-spectrum sunscreen would impart optimal protection to the skin from sun damage.²⁹

Licorice

Glycyrrhiza glabra (*G. glabra*) extract has been used to treat dermatitis, eczema, pruritus, cysts, and skin irritation. In addition, *G. glabra* has demonstrated antimutagenic, anticarcinogenic, and tumor suppressive capacity against skin cancer in animal models, and the National Cancer Institute has formally recognized the chemopreventive value of its primary constituent glycyrrhizin.³⁰ The primary active ingredient isolated and

extracted from *Glycyrrhiza inflata* is licochalcone A, an oxygenated retrochalcone, which has exhibited antiparasitic and antibacterial activity, as well as antitumorigenic activity,³¹ and has also been incorporated into a formulation intended to treat rosacea.

Resveratrol

This polyphenolic phytoalexin compound, present in the skin and seeds of grapes, berries, peanuts, and other foods, is considered a potent antioxidant, anti-inflammatory, and anti-proliferative agent. Evidence is sufficiently promising that resveratrol has been deemed suitable for inclusion in various product types (eg, emollient, patch, sunscreens, and other skin care products) intended to prevent skin cancer and other conditions thought to be generated by the sun.³²

CONCLUSION

The present review focuses on the potential of herbal extracts for cosmetic purposes. It also makes an attempt to give scientific account of use of herbal extracts in cosmetics. The addition of herbal extracts for therapeutic or for excipient purpose requires better understanding of the modern ingredients and herbal extracts. This review may help cosmetic and personal care industry, marketers and modern scientists understand various different trends of potential use to research on anti-aging cosmeceutical approaches to delaying, defying, and preventing skin aging.

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Table 1: List of phytochemicals having cosmetic potential

S. No	Phytochemical	Source	Uses
1	Arbutin	Arctostaphylos uva-ursi Spreng	Skin whitening, melanin-inhibiting
2	Azulene	Matricaria recutita Linn	Colouring agent, antioxidant and anti-inflammatory
3	Carnosic acid	Rosmarinus officinalis Linn	Antioxidant
4	Glycyrrhizin	Glycyrrhiza glabra Linn	Reduces skin discolorations
5	Glycyrrhitinic acid	Glycyrrhiza glabra Linn	Anti-inflammatory
6	Nordihydro-guaiaretic acid	Larrea tridentate Coult	Anticancer and sunscreen
7	Pycnogenol	Malus sylvestris Hort	Antioxidant
8	Rutin	Afrormosia laxiflora Harms	Antioxidant and emollient
9	Squalene	Bucida spinosa Jennings	Emollient, antioxidant and immunostimulant

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