

USE OF VARIOUS PLANT PRODUCTS IN COSMETICS

Ayesha^{1*}, Hamna Naseem¹

¹Department of Human Nutrition and Dietetics (HND), The Islamia University of Bahawalpur (IUB), Pakistan

*Corresponding author e-mail: abdul.rehmann910@gmail.com

ABSTRACT This study explores the integration of plant-based substances (natural products), particularly herbal extracts, in cosmetic formulations to address dermatological concerns and enhance overall skin health without adverse effects. Herbal cosmetics, characterized by the incorporation of recognized cosmetic components and herbal compounds, are gaining popularity due to their perceived lack of adverse effects. Focusing on key plant extracts like Rosemary, Neem, Grapefruit, Soy, Polyphenols, Aloe Vera, Turmeric, Lemon, Shea Butter, Lavender, and Cinnamon, the research examines their nutritional profiles and specific benefits in skincare. According to some studies, the most often investigated chemicals related with rosemary are carnosic acid (30%), ursolic acid (6%), rosmarinic acid (12%), and volatile essential oil (27%). These natural ingredients exhibit anti-inflammatory, antimicrobial, antioxidant, and anti-aging properties, making them valuable additions to various cosmetic products. The study emphasizes the growing interest in herbal cosmetics, driven by the desire for effective and safe skincare solutions. The findings contribute to the scientific understanding of the role of plant-based ingredients in the formulation of cosmetic products.

Keywords: Antioxidants; anti-inflammatory; pro-inflammatory; anti-aging; anti-bacterial

INTRODUCTION

Plant-based substances (Natural Products) have been used by individuals all over the world to improve their appearance (Desam and Al-Rajab, 2021). The phrase "Herbal Cosmetics" refers to products that are created using a range of recognized cosmetic components as the basis, followed by the addition of one or more herbal compounds to give specific cosmetic advantages. Herbal drugs are becoming increasingly popular as a consequence of their lack of negative effects. The fact that herbal cosmetics are made entirely of herbs and shrubs is their most distinguishing trait. The plants' natural components supply the body with nutrition and other vital elements while having no harmful effects (2011) (Gediya et al., 2011). Natural products are used in a wide range of cosmetics preparations, skin care products such as dryness treatment, eczema treatment, and acne treatment, as well as antioxidant, anti-inflammatory, anti-aging, hair care products such as hair growth impurities, hair color, scalp complaints such as dandruff, and skin protection, and toiletry preparations. Essential oils are a key source of plant materials; essential oils have been used to make perfumes, hair care products, and skin emollients (Desam and Al-Rajab, 2021). Nutritional profile of plant and their products used in cosmetics given below.

Rosemary Extract: Hundreds of things incorporate extracts from the medicinal herb rosemary (*Rosmarinus officinalis*),

which has a variety of purposes. Cleaning milk, deodorant, anti-wrinkle cream, aftershave lotion, moisturizing face cream, cream for the eye contour region, essential oils for massages and aromatherapy, gels, shampoos, soaps, and rosemary water were among the goods manufactured using rosemary derivatives. Its anti-inflammatory characteristics allow it to be used topically as well as therapeutically and prophylactically. The most often investigated chemicals related with rosemary are carnosic acid (30%), ursolic acid (6%), rosmarinic acid (12%), and volatile essential oil (27%). Volatile essential oils are also anti-inflammatory. Volatile essential oils decrease inflammation mostly by inhibiting NF-kB transcription and reducing the arachidonic acid cascade (González-Minero et al., 2020).

Neem (*Azadirachta indica*): Because of its antibacterial and anti-fungal properties, neem is utilized in the formulation and production of goods such as lotion, toothpaste, shampoo, and others. It can also be used to treat psoriasis, eczema, and itchy skin. It is used to manufacture soap and cream that include secondary metabolites of *Azadirachta indica*, which have been demonstrated to have antioxidant qualities. The main components of neem include azadirachtin, nimbin, nimbidin, salinin, and nimbidin B. By breaking down the cell walls of bacteria, neem limits the development of germs. It is also anti-inflammatory due to the inhibition of pro-inflammatory enzymes

such as lipoxygenase (LOX) and cyclooxygenase (CO) (Mishra et al., 2021).

Grape fruit extract: Grape seed oil is used as an emollient in cosmetics. It has also been shown to provide additional benefits to the skin, such as antimicrobial activity. Grape seed extracts contain exceptionally high amounts of proanthocyanidins, mostly B type procyanidins but also monomers and oligomers. These chemicals have been shown to be effective antioxidants and free radical scavengers, surpassing both vitamin C and vitamin E. Grape seed extracts also include catechin, epicatechin, and epicatechin gallate. These mixes have tyrosinase inhibitory characteristics, making them useful for anti-aging cosmetics (Ferreira et al., 2021). Linoleic acid is the most abundant fatty acid in grape seed oil, accounting for 66.0% to 75.3% of the total fatty acid composition. It contains more vitamin E than soybean and olive oils, as well as phenolic components such as epicatechins (flavan-3-ols), procyanidin B1 (proanthocyanidin), flavonoids, carotenoids, phenolic acids, and stilbenes. When combined, these ingredients have antioxidant activity that may be beneficial in anti-aging cosmetics (Sharif et al., 2015).

Soy: Numerous plant components, including soy (Glycine soja), are utilized in cosmetic goods, making it the second most used botanical in 2018. The Fabaceae family of peas was initially grown in the United States during World War II and is utilized in traditional Chinese cooking. "Glycine soja (soybean) oil" adds lubricating and moisturizing properties to skin care products. Its composition includes linoleic (54%), oleic (24%), and linolenic (7%) triglycerides, as well as saturated fatty acid (50). Between 2011 and 2018, the number of goods claiming anti-aging benefits increased (Ferreira et al., 2021, Intarakumhaeng et al., 2018).

Phenolic compounds: Polyphenolic chemicals are found in plants such as tea leaves, grape seeds, blueberries, almond seeds, and pomegranate extract. Polyphenols have been shown in studies on human skin and skin cells to have protective properties, which is why they are being used in an increasing number of cosmetic and medicinal goods. Green tea's principal polyphenols include epigallocatechin, gallic acid, and epigallocatechin-3-gallate (EGCG). When exposed to UVB radiation, EGCG reduces MAPK phosphorylation and prevents the production of hydrogen peroxide from cultured normal epidermal keratinocytes (Hoang et al., 2021).

Aloe Vera: Aloe vera is utilized in cosmetics due to its hydrating and anti-inflammatory properties. It is used to treat a range of skin ailments, including sunburn, rashes, and wounds, due to its healing abilities. Abdul Wadood Khan et al., (2013) created Aloe Vera gel to aid in wound healing. The gel was tested on an excision wound model and shown to have better wound healing and anti-inflammatory characteristics. Sterols, tannins, monopolysaccharides, saponin, vitamins, and minerals are all present in aloe vera gel. Healing is facilitated by the way that glucomannan and gibberellin interact with the growth factor receptor to increase the synthesis of collagen (Mishra et al., 2021).

Turmeric: Turmeric is referred to as Auruk-e-Sufr. This spice is made from the root of *Curcuma longa*, a ginger family

member. Apart from its culinary applications, turmeric is also utilized in medicinal applications, particularly in the healing of cutaneous wounds. It has antimicrobial properties on the skin. Turmeric has been demonstrated to have anti-inflammatory, antibacterial, antioxidant, and antineoplastic effects. Curcumin, an active component of turmeric, may be used medically to treat a variety of dermatologic diseases such as acne, alopecia, atopic dermatitis, facial photoaging, oral lichen planus, psoriasis, and radio dermatitis can be treated by using turmeric-containing cosmetic products for skin improvement (Vaughn et al., 2016). Turmeric nutrition profile includes curcumin, which aids in skin repair.

Lemon extract: *Citrus limon* (L.) Burm. F. is a Rutaceae tree with evergreen foliage and yellow edible fruits. C. Limon's major raw material is the fruit (lemon), namely the essential oil and juice extracted from it. The C. Limon fruit is well-known for its nutritional and biological qualities. Prior to the discovery of vitamin C, C. limon fruit juice (lemon juice) was employed as a scurvy treatment. Numerous scientific investigations have now validated this widespread usage of C. Limon, which has been known since ancient times. This is lemon extract, which is used in the cosmetics industry to cure acne, relieve inflammation, balance out skin tone, and many other things (Klimek-Szczykutowicz et al., 2020). Lemon juice contains vitamin C, a highly potent chemical that is used to cure skin.

Shea butter: Shea butter is a fat derived from the African Shea tree's nut (*Vitellaria paradoxa*). It's utilized in cosmetics and as a replacement for cocoa butter in the chocolate industry. In Africa, it is edible and used as a cooking fat. It is predominantly constituted of stearic and oleic acids, with trace quantities of palmitic, linoleic, and arachidic acids, whereas the unsaponifiable fraction of Shea butter contains bioactive compounds responsible for Shea butter's therapeutic effects. Shea butter is a solid at room temperature and melts when heated. As it contains sun-screening characteristics and functions as an emollient and skin moisturizer, it is excellent for skin care. Shea butter has also been shown to have anti-aging and anti-inflammatory effects when applied topically. Shea butter has a hypocholesterolemic impact and lowers serum and organ protein contents (Israel, 2014). It contains linoleic, palmitic, stearic, and oleic fatty acids, which help to regulate the oils on your skin. Antioxidants such as vitamins A, E, and F stimulate circulation and the formation of healthy skin cells. The triglycerides in this moisturize your skin.

Lavender: Lavenders are fragrant plants of the Lamiaceae family. These plants' aqueous extracts, essential oils, and dried portions have long been employed in cosmetics and hygiene goods. It possesses antibacterial, anti-fungal, and antioxidant characteristics that are beneficial to skin development. Essential oils in food preservation, taste, and safety (Erland and Mahmoud, 2016). Lavender essential oils are used in fragrances, cosmetics, food processing, and, most recently, aromatherapy goods. The chemical composition of lavender and lavandin essential oils is characterized by the presence of terpenes (e.g., linalool and linalyl acetate) and terpenoids (e.g., 1,8-cineole), which are primarily responsible for their characteristic flavor and

biological and therapeutic properties. They are mineral- and carbon-rich plant residues, making them a low-cost, readily available source of valuable industrial substances, particularly aroma and antioxidants (terpenoids, lactones, and phenolic compounds such as coumarin, herniarin, -bisabolol, rosmarinic, and chlorogenic acids). Its antibacterial and antioxidant effects contribute to the development and health of the skin (Lesage-Meessen et al., 2015).

Cinnamon extract: Cinnamon is a spice as well as an aromatic plant. Cinnamon oil is extracted from their leaves and bark. Cinnamon is a member of the Lauraceae family. Cinnamon has a high concentration of vitamins and minerals, and the primary bioactive substances are polyphenols and cinnamaldehyde. The quantity of bioactive chemicals relies on a number of elements, including variety, plant portion, edaphoclimatic conditions, drying conditions, extraction and analytical procedures. Cinnamon may be utilized in the beauty business because to its various biological qualities. Its scent contributes to its application in the cosmetics sector. It acts as an anti-aging agent on the skin by preventing collagen breakdown and elasticity loss (Ribeiro-Santos et al., 2017). The primary constituents are cinnamaldehyde (89.31%), cinnamyl acetate (2.44%), and linalool (1.60%). Cinnamon has several components that are beneficial to skin health and development (Ainane et al., 2019).

CONCLUSION

The usage of medicinal herbs by the inhabitants of seems to be well known to their culture and history. In this investigation, we found several plants that individuals use to treat dermatological problems and as cosmetics. Some of the plants were discovered to have both medicinal and cosmetic uses. Herbal cosmetics have recently emerged as a viable answer to the current issue. Personal care sector is presently primarily focused on herbal cosmetics since it is a rapidly expanding area with a large scope of expansion in the next years. Herbal cosmetics are cosmetic preparations that contain active bio-ingredients, nutraceuticals, or medicines. Furthermore, cosmetics alone are insufficient to care for skin and body parts; an association of active components is required to prevent skin damage and aging.

REFERENCES

- Ainane, T., Khammour, F., Merghoub, N., Elabboubi, M., Charaf, S., Ainane, A., Elkouali, M., Talbi, M., Abba, E. & Cherroud, S. 2019. Cosmetic bio-product based on cinnamon essential oil "Cinnamomum verum" for the treatment of mycoses: Preparation, chemical analysis and antimicrobial activity. *MOJ Toxicol*, 5, 5-8.
- Desam, N. R. & Al-Rajab, A. J. 2021. The importance of natural products in cosmetics. *Bioactive natural products for pharmaceutical applications*, 643-685.
- Erland, L. A. & Mahmoud, S. S. 2016. Lavender (*Lavandula angustifolia*) oils. *Essential oils in food preservation, flavor and safety*, 501-508.
- Ferreira, M. S., Magalhães, M. C., Oliveira, R., Sousa-Lobo, J. M. & Almeida, I. F. 2021. Trends in the use of botanicals in anti-aging cosmetics. *Molecules*, 26, 3584.
- Gediya, S. K., Mistry, R. B., Patel, U. K., Blessy, M. & Jain, H. N. 2011. Herbal plants: used as a cosmetics. *J Nat Prod Plant Resour*, 1, 24-32.
- González-Minero, F. J., Bravo-Díaz, L. & Ayala-Gómez, A. 2020. *Rosmarinus officinalis* L.(Rosemary): An ancient plant with uses in personal healthcare and cosmetics. *Cosmetics*, 7, 77.
- Hoang, H. T., Moon, J.-Y. & Lee, Y.-C. 2021. Natural antioxidants from plant extracts in skincare cosmetics: Recent applications, challenges and perspectives. *Cosmetics*, 8, 106.
- Intarakumhaeng, R., Shi, Z., Wanasathop, A., Stella, Q., Wei, K., Styczynski, P., Li, C., Smith, E. & Li, S. 2018. In vitro skin penetration of petrolatum and soybean oil and effects of glyceryl monooleate. *International journal of cosmetic science*, 40, 367-376.
- Israel, M. O. 2014. Effects of topical and dietary use of shea butter on animals. *Am J Life Sci*, 2, 303.
- Klimek-Szczykutowicz, M., Szopa, A. & Ekiert, H. 2020. Citrus limon (Lemon) phenomenon—a review of the chemistry, pharmacological properties, applications in the modern pharmaceutical, food, and cosmetics industries, and biotechnological studies. *Plants*, 9, 119.
- Lesage-Meessen, L., Bou, M., Sigoillot, J.-C., Faulds, C. B. & Lomascolo, A. 2015. Essential oils and distilled straws of lavender and lavandin: a review of current use and potential application in white biotechnology. *Applied microbiology and biotechnology*, 99, 3375-3385.
- Mishra, D., Asima, M. & Targhotraa, M. 2021. Herbal Cosmetics: natural approach to cosmeceuticals. *Int J Sci Dev Res*, 6, 6-16.
- Ribeiro-Santos, R., Andrade, M., Madella, D., Martinazzo, A. P., Moura, L. D. A. G., De Melo, N. R. & Sanches-Silva, A. 2017. Revisiting an ancient spice with medicinal purposes: Cinnamon. *Trends in Food Science & Technology*, 62, 154-169.
- Sharif, A., Akhtar, N., Khan, M., Menaa, A., Menaa, B., Khan, B. & Menaa, F. 2015. Formulation and evaluation on human skin of a water-in-oil emulsion containing M uscat hamburg black grape seed extract. *International Journal of Cosmetic Science*, 37, 253-258.
- Vaughn, A. R., Branum, A. & Sivamani, R. K. 2016. Effects of turmeric (*Curcuma longa*) on skin health: a systematic review of the clinical evidence. *Phytotherapy Research*, 30, 1243-1264.