

CONTRIBUTION OF HERBAL COSMETICS AND LASER THERAPY AGAINST SKIN
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Article Received on 29/04/2025

Article Revised on 19/05/2025

Article Accepted on 08/06/2025

ABSTRACT

Skin aging is a major symptom seen nowadays among the people of old age and even younger due to environmental factors, mostly the UV radiation. Photoaging is common among the population these days and is the major cause of skin aging. There are several anti-aging treatments that people are now aware of. In this article, we aim to review two effective anti-aging strategies - Herbal cosmetics and Laser therapy.

KEYWORDS: Skin aging, Anti-aging, Herbal cosmetics, Laser therapy, Skin elasticity, Antioxidants, Extracellular matrix (ECM).

INTRODUCTION

Skin aging is an irreversible natural process of human life. It involves the gradual degradation of its constituent substances, structure of tissue, and physiological functions with the flow of time. Skin aging is divided into two types: one is chronological aging, and the other is premature aging. Chronological aging is caused by the passage of time, and premature aging is caused by environmental factors like pollution, heat, smoke, and UV (ultraviolet) radiation emerging from the sunlight (Photoaging).^[1-3]

A specific type of premature aging known as photoaging gives rise to about 80% of skin aging and is mainly the cause of extended duration of the contact with UV radiation or sunlight that leads to signs like light/dark pigmentation, laxity, sallowness, irregular dryness, premalignant lesions, deep furrows or severe atrophy, and a leathery appearance. Skin molecules absorb UV radiation and generate reactive oxygen species (ROS) which causes oxidative damage to cellular components like lipid membranes, mitochondria, and DNA. Some other signs of skin aging involve degradation of extracellular matrix (ECM) in both epidermal and dermal layers of skin, dermal thinning, decrease in elastic fibers which results in the loss of elasticity and tension of skin, gradual reduction of the collagen fiber content.^[1,2]

Nowadays various skin anti-aging treatments are used to prevent skin aging that includes cosmeceutical care, topical medical agents, invasive procedures, systemic agents, avoiding of exogenous factors of aging,

correction of lifestyle and habits, and preventive medicine – Cosmeceutical care involves daily skin care, correct sun protection, and aesthetic non-invasive procedures; Topical medical agents involve antioxidants and cell regulators; Invasive procedures comprise chemical peelings, visible light devices, intense pulsed light (IPL), ablative and non-ablative laser photo-rejuvenation, radiofrequency (RF), injectable skin stimulation and rejuvenation, prevention of dynamic wrinkles, correction of static and anatomical wrinkles, and restoration/redistribution of fat and volume loss, skin augmentation and contouring; Systemic agents involve hormone replacement therapy (HRT), antioxidants; avoiding of exogenous factors of aging comprehends avoiding smoking, pollution, solar UV radiation, and stress; And finally, correction of life style and habits encompasses correction of nutrition, diet restriction and alimentary supplementation, physical activity, and control of general health.^[4]

This review briefly focuses on the plant extract/herbal cosmetics and laser therapy and their contribution in skin anti-aging.

Plant Extract or Herbal Cosmetics

Herbal cosmetics, in simple words, are phytochemical preparations that are derived from several different botanical sources and influence skin functions and deliver nutrients for healthy skin and hair.^[5] These are also called natural cosmetics or ayurvedic cosmetics and are in rapidly increasing demand in the market because of its lack of side effects. Herbal cosmetics are composed

of floras like ashwagandha, saffron (kesar), sandal (chandan), and various others that are expanded with healthy nutrients and essential compounds. According to the evaluation, about 400 flavors are utilized far and wide.^[6]

Advantages

The major benefits or advantages of using herbal cosmetics are that they are made up of natural plant extracts and not with harmful synthetic chemicals which may have lethal effect on the skin and since they consist of natural ingredients, they are safe to use anywhere and anytime without worrying about getting skin rashes or itchiness. Moreover, natural cosmetics can be used on all skin types, be it dark/fair/oily/dry, without having to worry about skin degradation. Herbal cosmetic products are economical and affordable and have almost no side effects as that of synthetic cosmetic products.^[6]

Natural anti-aging treatment primarily focuses on slow or reverse approaches to the signs of aging. The natural ingredients take part in the biochemical reactions taking place in the body at the time of cell aging. The natural

anti-aging formulations also include anti-inflammatory agents that work to soothe, protect and heal skin tone and integrity. Furthermore, natural oils are a good source of tocopherols and phytosterol components which give both antioxidant activity and bioactivity for skin care formulations. The eye firming fluid contain aosain, from seaweed which helps in maintaining skin elasticity.^[7]

Global Cosmetic Market Value

In 2022, the global cosmetics market size was valued at \$429.2 billion and is predicted to reach \$864.6 billion by the year 2032, growing at a 7.1% of CAGR (Compound Annual Growth Rate) from the year 2023 to 2032.^[8] The demand for herbal products in the world has been expanding at a rate of 10% – 15% per annum. In India, the trade related to medicinal plants is around Rs. 5.5 billion. According to the WHO (World Health Organization), by the year 2050, the global market of herbal cosmetics would be worth \$5 trillion. The two major herbal product markets in the world are in Europe and United States, having a market share of 20% and 41% respectively.^[7]

Points scored

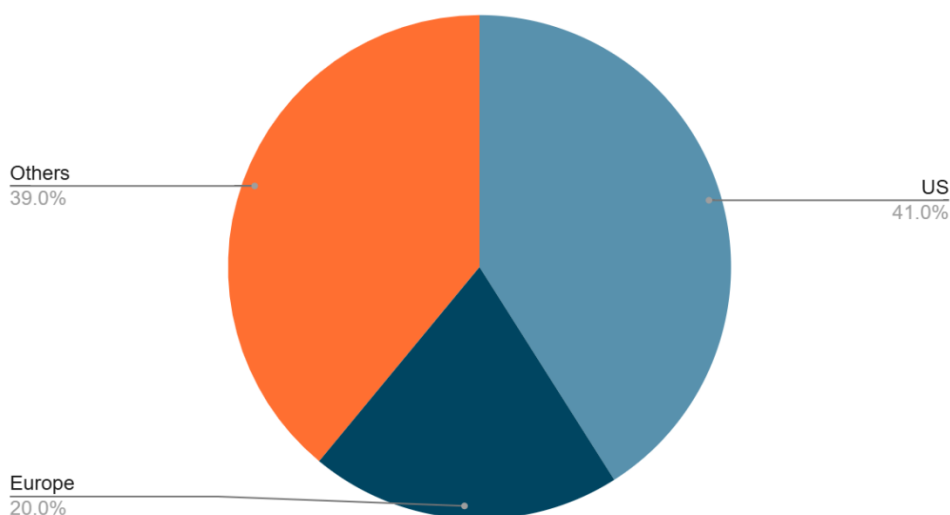


Fig.: Major Herbal Product Markets in the World.

Anti-aging Herbs

There are many Indian herbs which have anti-aging effects and some of them are.

- Aloe Vera (*Aloe barbadensis*): The leaves of Aloe Vera are used in anti-aging and anti-wrinkle cream or moisturizers due to its property to inhibit the action of collagenase enzymes.
- Amla (*Emblica officinalis*): Amla helps to slow down the process of aging being a rich source of vitamin C.
- Turmeric (*Curcuma longa*): Turmeric has curcumin present in it which gives anti-aging effects.
- Honey (*Apis mellifera*): Honey has antioxidant property because of the presence of phenolic

compounds and flavonoids, which helps prevent the wrinkles on our skin.^[9]

Some other herbs having anti-aging effects are Cinnamon (*Cinnamomum verum* J. Presl), Roselle (*Hibiscus sabdariffa* L.), Mulberry (*Morus alba* L.), Jasmine (*Jasminum sambac* L. Aiton), Indian gooseberry (*Phyllanthus emblica* L.), and many more.^[10]

Laser Therapy

Laser therapy is a heating technique for skin rejuvenation or reformation. In this world of chemicals, herbal or cosmetic this is a different type of skin rejuvenation which uses a wide range of heat. It is applied on human

skin to reduce wrinkles and scars from the epidermis. Laser resurfacing of the outer epidermis increases the biosynthetic capacity of fibroblasts, including the synthesis of collagen, elastin, and hyaluronic acid. It remodels the orbital bone and helps in the displacement of subcutaneous tissue.^[11]

It rejuvenates the periorbital area (eyelid, eyebrow, dark circles) and reduces pigmentation and erythema changes. Thus, it promotes the remodeling of connective tissue. This method results in the reduction of the depth of

wrinkles or the quantity of wrinkles. This treatment shows an impact on soft skin, which loses our natural growth factor.^[4,11,12]

Types of laser treatment for skin anti-aging

● Ablative laser treatment

Remove the epidermis and the outer layer of the skin or heat the inner layer to infense skin texture or tone. It heals skin due to the high-intensity use of the laser.^[13]

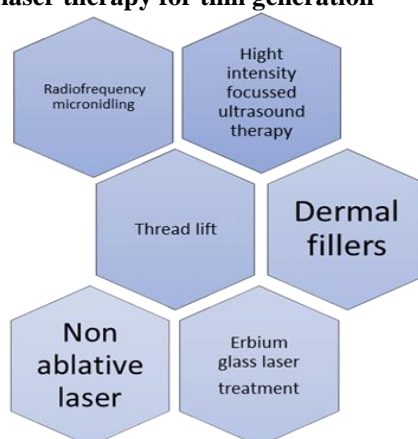
Therapy	How It Works
Radio frequency Microneedling (RF Microneedling)	Stimulating collagen improves skin texture & tone. ^[14]
2. High-intensity focused ultrasound (HIFU)	Waves to heat deeper tissue with tightening skin smooth muscle. ^[15]
3. Dermal fillers	Restoring epidermis volume, smooth wrinkles. ^[16]
4. CO₂ laser	Removing the superficial skin layer takes a long recovery time. ^[17]

● Non-Ablative treatment

It just heats the skin layers or reduces the wrinkles around the periorbital area and enhances the brightening content of the skin's outer layer. It doesn't hurt the upper surface of the skin. Those therapies are based on low-level lasers.^[18]

Therapy	How It Works
1. Erbium Glass	Stimulates collagen texture. ^[19]
2. Lumenis Resurfacing FX	Mostly improve texture & tone. ^[20]
3. 1450-nm Diode/1320-nm or 1064nmNd	Reduce sebum, acne, or scar patches. ^[21]
4. CO₂ Fractional laser	Faster healing, smooth skin, fine lines, and less downtime. ^[22]

Mostly used or highly recommended laser therapy for thin generation



Those therapies use different ranges of heat frequency like: Radiofrequency Microneedling (1-2 MHz heat range), High-intensity focused ultrasound therapy use (0.5-8 MHz), Thread lift laser (2-2.45,3 GHz), Dermal fillers (0.2-10 Hz), Erbium Glass laser treatment use (1-50 Hz).^{[14][15]}

[Hertz (Hz) - one cycle per second, Megahertz (MHz) - million cycles per second, Gigahertz (GHz) - one billion per second.]

Advantages

- All types of laser can fix skin elasticity, the depth of wrinkles, darkness of periorbital area, fine line around lip.
- Increase collagen production and improve the strength of connective tissue.
- Nursing human skin internally with brighter skin tone or texture.
- Provide long-lasting effects on skin cell growth.^[4,11]

Disadvantages

- Laser therapy is not suitable for all skin types because it causes irritation or hearse on sensitive skin.
- It shows lots of changes in natural skin that increase a chance of skin cancer, allergies, rashes, redness or swelling.
- Sometimes it gives good results but after some time it shows the side effects on the human body.
- Expensive, and more than one therapy is recommended.^[23]

CONCLUSION

Both herbal cosmetic treatment and laser therapy treatment for skin anti-aging are effective and successful in removing the signs of skin aging. In comparison of these skin anti-aging treatments, we conclude that herbal cosmetics have gradual effects but are affordable and safe to use with nearly no harmful effects, whereas the laser therapy gives quick effects but is quite expensive and risky as it may have major side effects on our skin or body.

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