A Review on Anti-Ageing Natural Herbs

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Abstract- *The integumentary system's largest organ is the skin. Humans' overall well-being and perception of health are heavily influenced by skin health and beauty. Skin is important for immunity because it protects the body from pathogens, maintains water and electrolyte balance, and regulates body temperature. The epidermis is the top layer of skin. A protective covering over the body's surface that acts as an infection barrier. The thinning of this epidermal layer, as well as the loosening of collagen and elastic fiber, causes wrinkle formation and aging. Ageing is caused by intrinsic factors such as genetics, cellular metabolism, hormones, and metabolic processes, as well as extrinsic factors such as the sun. Exposure, smoking, diet, and pollution are all factors to consider. In this day and age, people prefer natural herbs to plastic surgery or laser therapy not only to look younger but also to reduce complications. Herbs aid in the biological functioning of the skin and provide nutrients necessary for healthy skin. Herbs contain phytochemicals such as carotenoids, terpenoids, and polyphenols that have anti-aging properties. Aloe, cucumber, ginseng, honey, wheat, licorice, arjuna, jatamansi, and other herbs have anti-aging properties.*

Keywords- Herbs, Anti-aging, Skin, Phytochemicals

I. INTRODUCTION

For all living organisms, aging is an unavoidable process. The aging process begins at birth and is clearly visible on the face. skin as the years pass. Based on increased life expectancy, it is estimated that there will be over 1.2 billion older adults (those aged 60 and up) in the world by 2025.[1]Ageing is associated with an increase in weakness and immunosenescence, as well as possibly mitochondrial dysfunction.[2]

Physical function maintenance in older adults is thus a major public and clinical priority. The skin is the most severely affected tissue in humans. Skin serves as a barrier between the body and its surroundings. Its purpose is to regulate temperature, fluid balance, and to protect against harmful microbes and UV radiation from the sun. There are two types of skin aging: age-dependent/chronological aging and premature aging/photoaging. Extrinsic factors cause photoaging, which manifests as a leathery appearance, dark/light pigmentation, and deep furrows. Wrinkling of the skin is a sign of natural aging. The epidermis, dermis, and subcutaneous tissue are the three layers of skin.[3]

The extracellular matrix (ECM) is the skin's outermost layer and is made up of fibroblasts and proteins such as collagen and elastin. Following the age Its symptoms appear as the collagen content per unit area of the skin begins to decrease; there is a 1% decrease in collagen content per unit area of the skin every year. The ECM provides a structural supporting structure that is necessary for skin growth and elasticity, as well as for the maintenance of physiological functions in the body. Degeneration of the ECM has been directly linked to skin aging and is associated with an increase in activity of certain enzymes involved in skin aging, such as hyaluronidase, elastase, and collagenase. Collagen is one of the major building blocks of the skin, and it is responsible for the skin's elasticity and strength, as well as its maintenance. flexibility. Hyaluronic acid helps the skin retain moisture while also maintaining its structure and elasticity. It also aids in the exchange of nutrients and waste products, as well as rapid tissue proliferation, regeneration, and repair. Collagen, elastin, and hyaluronic acid levels decrease with age, resulting in a loss of strength and flexibility in the skin, resulting in visible wrinkles associated with thickened epidermis, mottled discoloration, laxity, dullness, and roughness of the skin.[4]

ROS (reactive oxygen species) are important in many cellular mechanisms. UV radiation is absorbed by the skin, resulting in increased ROS production and oxidative stress induction.Oxidative damage can result in the formation of lipid peroxides, mitochondrial and DNA damage, and protein and gene modifications that alter protein structure and function. High levels of ROS activate hyaluronidase, collagenase, and elastase, which can contribute to skin aging.[5] The enzyme angiotensin 2 is also involved in wound healing and scar formation, and the appearance of scars leads to photoaging of the skin. wrinkles. So, by using angiotensin converting enzyme (ACE) inhibitors, which prevent the conversion of angiotensinogen (inactive) to angiotensin (active), we can reduce the effect of angiotensin 2 induced skin ageing and wrinkles.

Plastic surgery, laser rejuvenation, and other invasive procedures are available thanks to advances in science and technology. Noninvasive techniques are those that do not

involveIn comparison to invasive techniques, which are more painful and laborious, there are no risks or complications, and the majority of side effects are avoided. Herbal extracts have been increasingly used in cosmetics to slow the aging process over the last decade.Because of their skin-beneficial properties, extracts of Aloe Vera, Amla, Turmeric, Cucumber, Ginseng, Honey, Wheat, Liquorice, Arjuna, and Jatamansi are widely used in herbal cosmetic industries.[6]

II. MECHANISM OF SKIN AGING

Intrinsic skin ageing: -

Intrinsic skin ageing, also known as natural aging, is most common in sun-protected areas. As a result of the passage of time or an inherited gene, This is also known as chronological aging. Essentially, the molecular mechanisms of both types of skin ageing (extrinsic and intrinsic) are similar, such as telomere shortening, mitochondrial DNA mutations, oxidative stress, genetic mutations, and a decrease in many hormone levels. According to the free radical theory of ageing, ROS, which are primarily produced by oxidative cell metabolism, play an important role in both chronological and photoageing. MAPK (nitrogen activated protein kinase) regulates the transcription factor c-Jun. Intrinsic skin ageing is similar to extrinsic skin ageing, and collagen is degraded in intrinsically aged skin, as it is in photoaged skin. Hormonal fluctuations can also influence intrinsic skin aging. The presence of sex hormones in the gonads, pituitary, and adrenal glands is already present. In the mid-twenties, the rate of decline begins to slow. During menopause, the hormones oestrogen and progesterone begin to decline. Dryness, wrinkling, epidermal atrophy, collagen breakdown, and loss of elasticity are all caused by oestrogen and androgen deficiencies.[7]

Extrinsic skin ageing:-

Environmental factors such as sun exposure, repetitive facial expressions, gravity, sleeping positions, and smoking contribute to this.[8] Extrinsic aging is caused by chronic UV light exposure and is also known as photoageing.[9] Extrinsic skin ageing is a cumulative process that is primarily determined by sun exposure and skin pigmentation. With When the skin is exposed to UV rays on a regular basis, the stratum corneum layer thickens, the epidermis is damaged, and there is progressive dysplasia with cellular atypia and anaplasia, collagen loss, and elastic fiber degradation. Extrinsic skin ageing is a cumulative process that is primarily determined by sun exposure and skin pigmentation. When exposed to UV rays on a regular basis, the stratum corneum layer of skin thickens, the epidermis is damaged, and there is progressive dysplasia with cellular atypia and anaplasia, collagen reduction, and elastic fiber degradation.[10]

A.Mitochondrial damage :

Mitochondria are cellular organelles that convert oxygen into energy (ATP). The effect of UV light on the mitochondrial electron transport chain generates a large amount of ROS, which can damage mitochondrial DNA (mtDNA). The mitochondrial genome encodes 13 components of the electron transport chain, and oxidative damage may lead to DNA deletions or rearrangements, most likely due to double-strand breaks, which may impair mitochondrial ability to generate energy for the cell. It is assumed that the resulting decrease in mitochondrial function in photodamaged skin leads to additional ROS accumulation and compromises the cell's ability to initiate energy.[11]

B.Protein oxidation :-

Proteins and photodamaged skin can both be affected by oxidative damage. Protein oxidation may result in Loss or gain of activity (e.g., enzymes), loss of structural protein function, and increased/decreased susceptibility to degradation are all possible outcomes.[12]

C. Membrane/ nuclear signalling:-

UV light generates reactive oxygen species (ROS), which suppress the activity of the enzyme protein tyrosine.Phosphatase is a type of enzyme. This enzyme keeps skin cell surface receptors inactive (hypophosphorylated), including receptors for epidermal growth factor (EGF), interleukin (IL)-1, keratinocyte growth factor, and tumour necrosis factor (TNF).[13]Activated receptors impel to intracellular signalling through stimulation of the stress-associated nitrogen activated protein (MAP) kinases p38 and c-Jun amino terminal kinase (JNK). Kinase activation induces the transcription of MMPs (matrix metalloproteinase) and decreases expression of the procollagen I and III and TGF-β receptors, with afinal outcome of reduced dermal matrix formation and hence, it reduces the synthesis of collagen.[14]

D.Telomere :-

Telomeres are short tandem repeats of the sequence TTAGGG. It exists in the form of a loop. Telomeres degrade when these loops are disrupted by cell division or UV irradiation, they become critically short. Because the telomeres cap (the terminal portion of chromosomes that prevents telomeres from fusing with each other) cannot be replicated during cell division, the bases of the telomeres caps

are lost with each cell division and the cell eventually enters a state of senescence or apoptosis. When telomeres are damaged by UV irradiation, the loop configuration is revealed, and this interaction activates the tumour suppressor protein p53 and other proteins that are responsible for DNA damage, as well as inducing senescence or apoptosis.[15]

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III. NATURAL HERBS USED FOR ANTIAGEING

Herbal cosmetics play an important role in slowing and reversing skin aging. Herbal cosmetics contain ingredients that influence the biological functions of the skin.Also, provide the necessary nutrition for healthy skin. It is estimated that natural products and their derivatives account for more than half of all drugs in the world, and plant-based health remedies are promising. The use of herbal anti-aging products has increased dramatically in personal care practices. Recent trends in anti-aging skin care products have been focused on developing new plant extracts and botanical ingredients based on their traditional medicinal uses, which has resulted in the emergence of several cosmoceuticals that prevent wrinkles and protect the skin from any type of unwanted symptoms.[16]

NATURAL ANTI_AGING HERBS [14, 15, 16]

➢ALOE VERA

Biological Source:

Aloes are the dried juice of the leaves of the Liliaceae family's Aloe barbadensis.

Phyto-constituents:

Anthraquinone glycosides are abundant in all varieties of aloe. The primary active constituent of aloe is aloin, which is a glycoside. Barbaloin is the main constituent of this glycoside mixture. In addition to barbaloin, the drug contains isobarbaloin, - barbaloin, aloe-emodin, and resins.

Role in Anti-ageing:

Aloe Vera leaves are frequently used in anti-aging and anti-wrinkle creams and moisturizers. The constituents of are used in the treatment of aging and wrinkles. Aloe Vera extracts, such as aloin A and B, have been shown to inhibit the activity of collagenase, the enzyme that causes collagen fiber degradation.

➢AMLA

Biological Source:

This is made up of both dried and fresh fruits from the plant Emblica officinal is, which belongs to the Euphorbiaceae family.

Phyto-constituents:

Amla fruit contains fat, phyllembelin, and tannins, as well as vitamin C (Ascorbic acid). Amla fruit is high in Minerals such as phosphorus, iron, and calcium.

Role in anti-ageing:

Amla, which is high in vitamin C, is thought to help slow the aging process. It benefits skin health. Ageing is the result of cumulative damage to the body. Various cells and tissues are harmed, primarily by oxygen free radicals. Vitamin C is a free radical scavenger that breaks them down.

➢TURMERIC

Biological Source:

Turmeric is made up of both dried and fresh rhizomes of the plant Curcuma longa, which belongs to the Zingiberaceae family.

Phyto-constituents:

Turmeric contains curcuminoids, which are yellow-colored substances. The primary component of curcuminoids is called curcumin (50-60% concentration). It also contains volatile oil, resin, camphor, camphene, and other ingredients.

Role in anti-ageing:

Curcumin, the main component of turmeric, acts as a superoxide scavenger and a singlet oxygen quencher. As a result, the anti-aging property of Curcumin is the main component of turmeric.

➢**HONEY**

Biological Source:

Honey is a sugar secretion deposited in honey comb by bees, Apis mellifera and other Apis species of the Apis family.Apidae.

Phyto-constituents:

Honey is an aqueous solution of 35% glucose, 45% fructose, and 2% sucrose. It also contains maltose, gum, polyphenols, flavonoids, and other nutrients. Vitamins, proteins, and so on.

Role in anti-ageing:

Honey has antioxidant properties due to the phenolic compounds (benzoic acid and cinnamic acid) and flavonoids found in it.Our skin's wrinkles can be avoided.

➢**GINSENG**

Biological Source:

Ginseng is the dried root of several Panax species, including P. ginseng (Korean ginseng), P. japonica (Japanese ginseng), and P. The Araliaceae family includes notoginseng (Chinese ginseng).

Phyto-constituents:

Ginseng contains a mixture of saponin glycosides from the triterpinoid group. These are ginsenosides, panaxosides, and panaxosides. Chikusetsusaponin is responsible for ginseng's various activities.

Role in anti-ageing:

Ginsenoside, the main constituent of ginseng, is responsible for its anti-aging properties. It improves blood circulation and skin elasticity.It both tones and moisturizes the skin.

➢**LIQUORICE**

Biological Source:

Liquorice is made from the dried, unpeeled roots and stolons of Glycyrrhiza glabra, a member of the Leguminosae family.

Phyto-constituents:

The main constituent of liquorice is glycyrrhizin (glycyrrhizic acid), which is a potassium and calcium salt of glycyrrhizinic acid. Flavonoids, liquiritin, and isoliquiritin are also present.

Role in anti-ageing:

Liquorice has anti-aging properties due to the presence of phenylflavonoids (dehydroglyasperin C, dehydroglyasperin D, and isoangustone A), which act as superoxide scavengers and prevent wrinkles.

➢**JATAMANSI**

Biological Source:

Jatamansi is made up of dried rhizomes of the Valerianaceae plant Nardostachys jatamansi.

Phyto-constituents:

It contains volatile oil, resin, sugar, starch, and jatamansic acid and ketones, as well as jatamansone and nardostachnone.

Role in anti-ageing:

Jatamansi causes fibroblasts to multiply. synthesis of collagen and elastin fibers, resulting in increased skin elasticity and decreased wrinkle formation (aging)

➢**ARJUNA**

Biological Source:

Arjuna is made from the dried stem bark of Terminalia arjuna, a plant in the Combretaceae family.

Phyto-constituents:

Tannins, triterpenoid saponins, arjunolic acid, arjunic acid, and arjungenin are all found in arjuna. It also contains ellagic acid, arjunine, and other nutrients. arjunolone.

Role in anti-ageing:

Aging is caused by a decrease in collagen production. Pentacyclic triterpenoids improve collagen synthesis and epidermal barrier function. Terminalia arjuna is where you'll find it. It also improves skin hydration and reduces scaliness. It strengthens the skin barrier and stimulates sebum production to reduce dry skin symptoms and protect the skin from external threats. It also helps to improve blood circulation, which leads to better nutrient supply.

IV. DISCUSSION

Plant-derived phytochemicals have numerous skin-beneficial properties, including UV protection, antioxidant action, matrix protection, and skin protection. hydration. Over the last decade, many phytochemicals derived from plant extracts have been studied in vitro, as have their biological activities. As a result, there is an ongoing need for more clinical studies that focus on the concentration of the ingredient in herbal products, their formulation, safety, and the duration of the anti-aging effect.

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