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THE POTENTIAL OF HAZELNUT (*Corylus avellana*) NUTRITIVE COMPOSITION AND ITS BIOACTIVE PROPERTIES IN COSMETICS

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ABSTRACT

Background: Since consumers became aware of the concept of natural-based components, the natural cosmetics business has flourished. A large percentage of cosmetics have a negative environmental impact and include toxic and chemically powerful chemicals. As a result, the use of natural and organic cosmetics is becoming more significant, as it is apparent that topical cosmeceutical treatment can aid promote skin regeneration. **Objective:** This article provides an overview of researchers on these natural hazelnut compounds that are utilized in cosmetics, as well as the relevance of hazelnut and its use in the cosmetics industry. **Methodology:** We collect the data with the help of Google Scholar, PubMed & science direct. **Conclusion:** Turkey is the world's largest market for hazelnuts. It's the second most expensive nut, and it requires cold, steep terrain with a few days below freezing. The nutritious oil contained in the nuts of the common hazel moisturizes skin, is rich in vitamin E and helps to thicken hair, to mention a few ways the substance can benefit your beauty regimen. When applied directly to the skin, pure hazelnut oil can be used as sunscreen, a hair mask, and a moisturizer.

Keywords: Hazelnut oil, Cosmetic, Skin conditioning, Moisturizer, Chemicals

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INTRODUCTION

The word hazelnut comes from the Anglo-Saxon word haesel, which means "hazelnut" (bonnet).. The common hazel, which is native to Europe, produces clusters of nuts that are appreciated for their wonderful flavor and nourishing oil [1]. Turkey produces around 75 percent of the world's hazelnuts. Hazelnuts are the most common name for nuts. They're also known as cobnuts or filberts, however, these words are also applied to species that are related but not identical [2]. It's the second most expensive nut, and it requires cold, steep terrain with a few days below freezing. As a result, the states of Himachal Pradesh, Jammu and Kashmir, Siliguri, Uttarakhand, and the North-East of India are the finest choices. Hazelnut trees need three to five years to mature and bear fruit. Hazelnut oil is becoming increasingly popular in cosmetic and wellness applications due to its multiple benefits. It smells great, hydrates skin, is high in vitamin E and helps to thicken hair, to mention a few benefits of using it in your beauty routine. When applied directly to the skin, pure

hazelnut oil can be used as sunscreen, a hair mask, and a moisturizer [3].

Although some firms started producing products containing hazelnut derivatives in their components, hazelnut, and its derivatives are not widely used in cosmetics. In the last five years, 1,600 goods containing hazelnut-derived ingredients have been introduced around the world (Bud Extract, Seed Extract, Flower Extract, Leaf Extract, Seed Oil, Shell Powder.) [4] Two probable "trends" can be detected among the prospective constituents that may originate from hazelnut by-products, skins, and shells to add value at the raw materials: - Fibres, which are commonly used in cosmetics as a bulking ingredient in mascara and washes. In today's cosmetic business, a variety of fibers are used. - Polyphenolic extracts are appealing cosmetic components because of their biological qualities, such as anti-aging activity [5]. The worldwide hazelnut market is growing due to the increasing use of hazelnut in various cosmetic goods. In both the cosmetics sector and hazelnut

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consumption, North America and Europe have the largest combined share. Over the forecast period, the developing cosmetics industry in these regions is expected to drive hazelnut demand. Hazelnut demand is expanding in a variety of end-use sectors, which benefits producers in the worldwide hazelnut market. Climate change, on the other hand, is preventing the hazelnut market from attaining its full potential [6]. In January 1998, the two Hazelnut Oils were approved for use as occlusive skin-conditioning products. According to reports, hazelnut oil is used in 85 cosmetic compositions (FDA 1998) [7]. The data provided by the Food and Drug Administration (FDA) does not specify which Hazelnut Oil was utilized. The FDA no longer receives data on concentrations of usage (FDA 1992). Although Hazelnut Oil was used at a concentration of 25% to 50% in one formulation (FDA 1984), the other ten uses of the component were at a concentration of 5%. According to current industry statistics, Hazel (Corylus Avellana) Nut Oil is used in quantities of up to 100%. The functions of Corylus Avellana (Hazel) Seed Extract in cosmetics are unknown. Corylus Avellana (Hazel) Leaf Extract is used as a skin conditioner—miscellaneous in cosmetics, while Corylus Avellana (Hazel) Seed Oil is used as a fragrance ingredient [8].

Botanical Classification [9]

Scientific Name

Corylus avellana

English Name

Hazelnut

Urdu Name

فندق [10]

HAZELNUT OIL

Hazelnut oil is fantastic carrier oil derived from

cold-pressed hazelnuts, often known as filbert or cobnut nuts. Hazelnut oil is made from the kernels of hazelnuts, which contain roughly 60% oil. Cold press or solvent extraction procedures are used to extract the oil. Although it is most well-known in the culinary business, it is also gaining popularity in the cosmetics industry [11]. It's light, non-greasy oil with hydrating characteristics. Hazelnut oil is a skin and hair miracle worker. This oil is used to make beauty masks and to treat hair loss, and it is therefore commonly utilized these days. The benefits of hazelnut oil for hair, in particular, have been confirmed. Hazelnut oil has a fatty acid profile similar to olive oil. It has a lot of oleic acid in it. It can be used in skin care products, in the same way, that olive oil is [12].

Properties of Hazelnut Oil

Cosmetic Natural oil that includes no impurities, additives, or solvents is classified as Hazel (Corylus Avellana) Nut Oil. High-pressure systems remove the oil, which is then subjected to a long cold-pressing process. Hazelnut Oil composition is similar to that of Sweet Almond Oil, and it moisturizes, soothes, and protects the skin, leaving it feeling fed and appearing younger. It has proved beneficial to all the skin types, including sensitive, parched, dry, itchy, and aged skin. Hazelnut Oil is used in scalp and hair care products to help condition the scalp and restore the hair's vitality and shine [13].

Hazelnut Oil Applications

There are several areas in which hazel nut oil can be applied. The most common field in which the application of hazel nut has been found are described below

Skin Care, Hair Care, Nail Care, Cosmetics, Aromatherapy [14].

Table 1: Nutritional composition and benefits.

Composition	Benefits
Fatty acids	Prevent the excessive loss of moisture from the skin's surface thus maintaining the glowy contour of the skin and maintains its natural moisture content.
Vitamin E	Repairs photo-aging. Boosts skin immunity. Protect from Ultra Violet damage. Useful in treating acne. It also promotes wound healing by boosting collagen synthesis.
Tocopherols and tocotrienols	It helps prevent sunburn. It might reduce the signs of sun damage, including skin thickening, wrinkling, and erythema.
Folic acid	Improves skin firmness. Treat chronic inflammatory skin conditions.
Vitamin A	It also slows down the aging process. prevents the discoloration of the skin. Reduce fine lines and wrinkles effectively.
Niacin	Improves the skin barrier function. It prevents water loss and increases the moisture content in the skin. It improves skin quality and reduces wrinkles. It reduces the effects of aging and might also reduce skin discoloration.
Minerals like zinc and copper	Photoprotective properties. Prevent damage from UV radiation. Copper, additionally, improves skin elasticity and thickness.

Table 2: Hazelnut products available.

Product Name	Brands
Kazima Hazelnut essential oil	Kazima cosmetic
Hazelnut Foundation	Sephora
Ecotay lip glows	Lotus Herbals
Ks Essentials Liquid Hazelnut Oil	Ks essentials
Hazelnut oil	Kasturi natural oil
Pure hazelnut carrier oil	R V essentials
Hazelnut carrier oil	Natures Natural India

Hazelnut Oil Bioactive Properties in Cosmetics

Hazelnut oil is a non-irritating, natural astringent that is free of alcohol.

Hydrating Agent

Hazelnut oil's strong vitamin E and fatty acid content can aid enhance moisture in the skin's outer layer. Vitamin E improves skin elasticity and makes it seem tight and supple by keeping it nourished.

Moisturizing Agent

These chemicals assist your skin retains water and avoiding drying out by forming a natural oil barrier. It also includes a lot of fatty acids, which makes it a good emollient. It works as a skin conditioner and regenerator. Other skincare products may benefit from the addition of hazelnut oil. It contains phospholipids, which allow cosmetic components to be miniaturized for a longer period of time [15, 16].

Astringent

Hazelnut oil is light and non-greasy, making it perfect for oily skin. It also has astringent effects and can aid those with acne-prone or greasy skin by closing pores. Tannins, which are potent antioxidants, are found in hazelnut oil. Hazelnut oil is an astringent because of its tannins, which can help dry-oily skin, cleanse and minimize pores, and remove bacteria [17].

Boosts Collagen Production

Collagen is a protein that helps to keep your bones, organs, and tendons in place. It provides structure and elasticity to your skin. As we get older, our skin produces less collagen, but vitamin E can assist. It boosts collagen formation by inhibiting a collagen-degrading enzyme.

Protect against Sun Damage

Sunlight produces free radicals, which injure your cells and cause premature skin aging. Vitamin E protects your body by neutralizing free radicals and preventing solar damage to cell membranes [18].

Reduce the Appearance of Scars

Applying vitamin E-rich products to your skin may help minimize the look of scars, but the evidence is mixed. Children with surgical scars who applied vitamin E three times a day to their skin didn't develop keloids (excess scar tissue) over their wounds in one research. In another study, however,

vitamin E was found to be no better than a petroleum-based ointment in terms of results. One-third of those who utilized vitamin E experienced a rash called contact dermatitis, which is an irritating rash.

Reduce the Appearance of Fine Lines

Hazelnut oil contains vitamin E, which may aid to minimise the appearance of fine wrinkles. Vitamin E is an important antioxidant for skincare since it helps to smooth your skin and keep water and moisture in the outer layer of your skin. However, some evidence suggests that treatments containing both vitamin E and vitamin C are more efficient than products containing solely vitamin E in combating indications of aging. Hazelnut oil is devoid of vitamin C. However, research suggests that fatty acids, such as those found in hazelnut oil, may also aid to minimise the appearance of fine lines and wrinkles produced by sun exposure [19].

TRADITIONALLY USE OF HAZELNUT OIL

You can use hazelnut oil alone or in combination with other oils on your skin. It can also be used as a base for homemade lotions and creams. It also reduces hyperpigmentation [20].

Before you apply it all over your body, make sure you complete a skin patch test. To do so, follow these steps:

On the inside of your forearm, rub a dime-sized amount of oil. Wait 24 hours after applying a bandage to the affected region. If irritation occurs, thoroughly rinse your forearm and do not use the oil again. Call your doctor if the itching is severe. If you don't feel any inflammation or irritation after 24 hours, you can use hazelnut oil anywhere else. You can use the oil after it has passed your patch test.

Procedure 1

For about 20 seconds, cover your face or another region of skin with a hot, damp washcloth. Remove the washcloth from your skin and massage 1/2 teaspoon hazelnut oil into it. If desired, you can use more or less. Allow 30 seconds for the oil to absorb. Wipe it clean with a hot, moist washcloth. This procedure cleans your face while also removing the majority of makeup. You can use hazelnut oil in the morning or at night, or both, like you, would any other cleanser. Use the oil before

applying any night creams if you're using it at night.

Procedure 2

Hazelnut oil (both ordinary and essential) is versatile and can be used alone or in combination with other oils. To increase the oil's therapeutic and cosmetic advantages, mix it with carrier oils or other essential oils. Other organic components and skincare products can be combined with the oil (since it is an emulsifier). Use a cleanser to clean your face. Do not use your nails to scrub your face. As you apply the cleanser throughout your face, massage it in small circular strokes. Using a cotton cloth, perfectly your face is dry. Apply a few drops of hazelnut oil on your face (and any other area). For a few minutes, massage it into your face. Allow for a 5- to the 10-minute recovery period. It can be washed away with a warm and gently wipe away from a warm towel [21].

HAZELNUT OIL EXTRACTION

The liquid produced from a hazelnut using the Cold Pressed Method is known as Cold Pressed Hazelnut Oil. Hazelnut oil that has been cold-pressed can also be used as a skincare product. It's chock-full of skin-loving vitamins and vital fatty acids that help protect skin from the sun, increase collagen formation, and more [22]. This procedure is also known as Expression or Scarification, and it is most commonly employed on citrus peels.

Cold Presser Machine Oil Extraction Method

The entire fruit is placed in a machine that mechanically pierces it to rupture the essential oil sacs on the underside of the rind. Essential oils and pigments run down into the collection area of the gadget. The juice and oil are extracted by pressing the whole fruit. Solids from the fruits, such as the peel, remain in the oil and juice, which must be centrifuged to separate the solids from the liquids. Oil separates from the juice layer and is sucked into a separate container [23].

OIL SAFETY INFORMATION

The Cosmetic Ingredient Review (CIR) Expert Panel evaluated the safety of *Corylus Avellana* (Hazel) Seed Oil. After reviewing the scientific evidence, the CIR Expert Panel found that these substances were harmless to use in cosmetics and delicate care products. Botanical and biologically derived components are generally gentle and harmless when utilized in cosmetic formulations. Depending on the application or planned usage, safety verification of cosmetic components may include studies for eye and skin irritation, as well as allergenicity, phototoxicity, photoallergenicity, and mutagenicity. There is a substantial amount of data on the safety of botanical compounds, as well as a long history of use. These resources are

examined to guarantee that the components used in cosmetics are safe.

The CIR Expert Panel's study of plant-derived fatty acids oils included *Corylus Avellana* (Hazel). The CIR Expert Panel decided that plant-derived fatty acid oils, together with hazelnut oil, were safe as used in cosmetic goods based on a history of harmless use in food, the nature of the oils, and data suggesting the substances were not skin irritants or sensitizers. Tree nuts, particularly hazelnuts, can cause allergic reactions in certain persons. As a result, under the FDA Food Allergen Labeling and Consumer Protection Act, all foods containing hazelnuts must be prominently labelled [24].

The potential negative effects and hazards of utilizing hazelnut oil for skincare are unknown. People who are sensitive to tree nuts (such as hazelnuts) should avoid tree nut oils and goods containing them, according to the American College of Allergy, Asthma, and Immunology. Even if you aren't allergic to tree nuts, testing for an allergic reaction before using hazelnut oil is a smart idea. A patch test on your skin, as explained above, is an easy way to achieve this. Vitamin E is abundant in hazelnut oil, which is considered safe for most individuals. However, consuming too much of it through your diet, supplements, or topical application may be hazardous to your health. Fatigue, weakness, nausea, blurred vision, gas, and diarrhea are all symptoms of too much vitamin E. Consult your doctor before beginning to use hazelnut oil if you're concerned about your vitamin E intake [25].

CONCLUSION

Hazelnuts are high in fatty acids, vitamins, and minerals, according to several studies, and are used in cosmetics such as sunscreen, a hair mask, and a moisturizer when applied directly to the skin. We can conclude that hazelnuts are extremely helpful to humans. Hazelnut oil improves skin hydration while also protecting against UV damage and aging. Acne, dermatitis, and rosacea will all be reduced. According to anecdotal evidence, hazelnut oil enhances skin texture and smoothness, as well as boosts skin luminosity. If discomfort or inflammation occurs, discontinue use and visit a dermatologist. Otherwise, you can use the oil as prescribed and receive the benefits.

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