

THE ROLE OF PLANTS IN THE GLOBAL AND TURKISH BEAUTY INDUSTRIES

Abstract

Plants with medicinal or cosmetic uses date back hundreds of years. Their capacity to alleviate skin discomfort and make it look better is well-known. The herbal sector has advanced greatly since the turn of the century. The convenience and lack of harmful side effects of herbal compounds make them a popular alternative to synthetic chemicals. Having naturally attractive features is a blessing, and cosmetics are a great tool for showcasing and enhancing other facets of a person's character. In order to prevent further damage and the signs of aging, it is necessary to combine active components with cosmetics. People are increasingly turning to herbal beauty products. Products made from herbs are promoted as safe alternatives to synthetic cosmetics, with claims that they are effective and universally acceptable due to their commonplace use. Constant contact with synthetic substances increases the risk of skin irritation, allergies, discoloration, rashes, and cancer. However, the herbs utilized to make these skin care products have multiple purposes, such as antioxidants, anti-inflammatory, antiseptics, and antimicrobials. This section serves as a review of herbs that can be used to treat various skin conditions. In nature, you can find a wide variety of herbs. They're gentle, but they do a remarkable job of enhancing and clarifying the skin.

Keywords: herbal cosmetics, medicinal and aromatic plants, plant extracts, global, Türkiye.

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I. INTRODUCTION

The largest living organ, the skin, regulates temperature and fluid balance, keeps out hazardous germs and chemicals, and protects against sunlight. The stratum corneum, the epidermis' selectively permeable, heterogeneous outermost layer, defends against desiccation and environmental stress and maintains enough water to function. A damaged stratum corneum increases Tran's epidermal water loss and decreases skin hydration [1, 2]. Cosmeceuticals are cosmetic products with active chemicals that provide drug-like advantages. Thus, cosmeceuticals contain medical substances with topical benefits and prevention against degenerative skin disorders. They nourish the skin to boost attractiveness. They minimize wrinkles; improve skin tone, texture, and brightness. Cosmeceuticals are the fastest-growing natural personal care segment [3, 4]. Natural skin care ingredients are getting more popular [5]. A "natural" substance is one that comes from plants or animals [6]. Herbs, fruits, flowers, leaves, minerals, water, and land are natural ingredients. Natural components in skin care products depend on their *in vitro* and *in vivo* efficacy and the dermatological background [5]. As long as humans have used plants for medicine, new products using natural oils and herbs will continue to appear on the market. Before synthetic cosmetics, all cosmetics came from plants [7]. New research focuses on plant compounds. However, extraction procedures, plant-to-solvent ratios, and active component levels must be considered [8]. Consumer demand for eco-friendly products emphasizes plant extracts in skin care [9].

II. THE IMPORTANCE OF PLANTS IN HUMAN LIFE

Plants are crucial to human survival in a number of ways. One of plants' primary jobs is to improve human health and well-being. Traditional cultures have long used medicinal herbs to treat a wide range of medical conditions and lessen human suffering [10]. Many modern medicines are derived from plants; thus, they are also a rich resource for traditional medicines [11]. Medicinal herbs are utilized to make pharmaceutical medications because of the bioactive substances they contain [12]. Also supply the human body with the carbohydrates, proteins, lipids, vitamins, and minerals it needs to function properly [13,14].

Plants are also important in terms of culture and society. Moreover, plants have always been an important part of human society and have helped build civilizations [11]. Many cultures have a long history of using plants in rites, ceremonies, and other traditional ways of life [15].

Plants are also good for the environment and help maintain the balance of nature and the variety of life on Earth. Photosynthesis, which is how plants make oxygen, is important for human life [13]. They also help reduce the amount of carbon dioxide in the air, work as natural air conditioners, and clean the air by filtering out pollution. In addition to being useful and necessary, plants are also beautiful. They make natural settings, gardens, and urban areas look better and make people feel calmer and better. It was that having plants inside has a good effect on people's mental health and productivity. Furthermore, herbal ingredients are important components used in the formulation of cosmetic products [16].

III. HERBAL COSMETICS IN ANCIENT TIMES

Ancient civilizations like the Egyptians, Chinese, and Indians have long used herbal preparations in cosmetics and medicine [17, 18]. As early as 4500 BC, the Egyptians, for instance, utilized fragrant oils in their cosmetics and ointments. For perfumes and therapeutic uses, they would mix a variety of botanical components, such as aniseed, cedar, onion, myrrh, and grapes [17]. Likewise, traditional Chinese and Indian medicine documented the use of aromatic oils between 3000 and 2000 BC [18].

Since ancient times, the idea of beauty and cosmetics has been seriously established in human society. Ayurveda, India's traditional medicine emphasizes the use of herbal elements in cosmetic and beauty products [19]. Indians and individuals from the Indian subcontinent have utilized herbal cosmetics to enhance the appearance of the skin for millennia. Due to their accessibility, affordability, and safety, these herbal cosmetics are gaining in popularity [20].

Herbal cosmetics are available for both skincare and hair care. Herbal hair oils have long been used to nourish and safeguard against hair loss and damage because hair is a significant component of one's look. Herbal components in hair care products offer vital nutrients and lessen the possibility of negative side effects [21].

Herbal ingredients have also been used in the creation of herbal face packs, in addition to skincare and hair care products. These face packs are used on the face to open pores, improve blood flow, energize muscles, and preserve skin suppleness. Face packs made of herbs are well known for their historical efficacy, nontoxicity, and reduced allergic reactions [22].

The therapeutic qualities of plant extracts are also used in cosmetics, in addition to their aesthetic advantages. Due to their active chemicals that improve human health, medicinal and aromatic herbs have been employed in food, medicine, and cosmetics [23]. Particularly plant-derived antioxidants have grown in importance in relation to skin health and the aging process. Numerous plant-based compounds are now found in dietary supplements, nutricosmetics, and cosmetics after years of use in conventional medicine [24].

Overall, there is historical evidence of the use of herbal substances in cosmetics dating back to prehistoric times in numerous cultures and civilizations. These natural cosmetics are prized for their potency, accessibility, and security. Due to consumer demand for organic and eco-friendly beauty products, research and development on the use of herbal extracts and substances in modern cosmetics continues.

IV. WHAT EXACTLY DOES THE TERM "COSMETIC" MEAN?

The real meaning of cosmetics refers to products and practices that are used to enhance or alter one's physical appearance, primarily in terms of beauty and aesthetics. Cosmetics can include a wide range of products, such as makeup, skincare products, hair care products, fragrances, and personal care items. The European Union defines a cosmetic product as the following: *“any substance or preparation intended to be placed in contact with the various external parts of the human body (epidermis, hair system, nails, lips, and external*

genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, and/or correcting body odors, and/or protecting them or keeping them in good condition."As a result, soap, shampoo, deodorant, and toothpaste, as well as premium beauty items such as fragrances and makeup, are classified as cosmetic products [25].

The use of cosmetics is influenced by societal ideals of attractiveness and personal preferences. Cosmetics can serve various functions, including enhancing facial features, improving skin health, styling hair, and creating pleasant scents [26]. The use of cosmetics can have psychological and emotional effects, boosting self-esteem and promoting self-expression [25].

The cosmetic industry has seen significant growth, with an increase in cosmetic procedures and the development of new products [27]. Additionally, the field of cosmetics is constantly evolving, with advancements in technology and research leading to the development of innovative products [28]. However, it is important to consider safety concerns and regulatory frameworks in the cosmetics industry [27]. It is also essential to assess the potential health risks associated with cosmetics, such as the presence of heavy metals in certain products [29].

V. HERBAL EXTRACTS IN COSMETICS - HOW?

Cosmetic ingredients include plant extracts, plant carbohydrates, compressed extracts, aqueous extracts, tinctures, aromatic waters, essential oils, vegetable oils-lipids, waxes, gums, mucilage, resins, and purified plant components. Essential oils, aromatic waters, compressed extracts, and aqueous extracts of plants are also available. Herbal medications are extracted into liquid, solid, or semisolid extracts. Extracts can be manufactured from herbal treatments. Plants or botanical remedies can be distilled to extract essential oils, which are secondary metabolites. Terpenes, aromatic compounds, volatile acids, aldehydes, and straight-chain hydrocarbons make up essential oils, which are liquid at room temperature. Cosmetically active products' most crucial components [30].

- Aromatic fluids are plant products that include trace levels of volatile compounds. Aromatic fluids are flowery liquids. It is also known as water vapor distillation's remaining aqueous components.
- Tinctures are made from plant components by maceration, percolation, or other methods with enough alcohol. Tinctures can be used medicinally or recreationally.
- Resins are secondary metabolites present in plants. The structure of resins is amorphous, and they are insoluble in water but soluble in alcohol and ether. Oxidation in the air darkens their colors. Complex terpenes are placed in resins, which are solid or semi-solid.
- Gums are harmful plant byproducts that are either amorphous or soluble in colloidal solutions, or polysaccharide macromolecules that form gels when exposed to water. These characteristics can also be found in gums, and they're adhesive.
- Mucilage is a naturally occurring amorphous plant compound with polysaccharide architectures and non-adhesive components that form water-swelling viscous and colloidal solutions. Mucilage is found in ferns, mosses, and lichens.

- Balsams are plant resins that contain benzoic acid, cinnamic acid, and related derivatives. Dry distillation of woody fibers produces tars, which have a complex structure. Vegetable oils and lipids are structured by natural compounds called fatty acid esters. These are soluble in nonpolar organic solvents; on the contrary, water is not a solvent for lipids and oils. Wax, which contains cutin, is produced by fruits and plants. Their volume decreases with water loss and gas flow [30].

VI. RISK CATEGORIZATION OF HERBAL PRODUCTS

Numerous herbs are naturally occurring and have a variety of functions in cosmetic preparations, including skincare, hair care, etc. The European Council Cosmetic Products Experts Board separated the classification of plants and herbal remedies used in cosmetic products into three groups [31-33].

Plants and herbal remedies that can be utilized in cosmetic goods are classified in,

- **Category A:** If they are safe, accepted, and have sufficient data.
- **Category B:** Plants and herbal remedies that cannot be evaluated and are not advised due to a lack of understanding and conflicting findings.
- **Category C:** Plants and herbal remedies that should not be used in cosmetics due to potential health risks

VII. WHICH PLANTS ARE THE MOST COMMONLY USED IN COSMETICS AROUND THE WORLD?

The term "Herbal Cosmetics" refers to cosmetic products that contain one or more herbal substances that are utilized solely to give specified cosmetic benefits on top of other legal cosmetic ingredients. As a result of their lack of side effects, herbal medications are becoming more and more popular [34]. The fact that herbal cosmetics are solely manufactured from herbs and shrubs is their strongest feature. The natural components in herbs have no negative effects on the human body; rather, they enrich it with vitamins and other beneficial minerals [35].

1. Dry Skin Treatment

- Aloe vera (syn. *A. barbadensis*) leaf extracts high in polysaccharides are used in cosmetics and over-the-counter medications to treat burns, sunburn, wounds, and skin inflammation [36]. In randomized research on 20 volunteers, different amounts of lyophilized *A. Vera* extract were tested for skin hydration and TEWL. After 2 weeks, all *A. Vera* concentrations (0.1, 0.25, and 0.5%) increased skin moisture [37].
- Coconut oil is derived from the fruit or seed of the *Arecaceae*-family coconut palm tree, *Cocos nucifera*. Coconut oil has a melting point of 24 to 25 °C (75-76°F), making it easy to use in both liquid and solid forms. It is frequently used in baking and cooking. Coconut oil does wonder to soften and hydrate the skin. According to a study, using extra virgin coconut oil as a moisturizer is safe and effective with no side effects. When applied for fourteen hours, coconut oil was proven to help decrease protein loss from wet combing of hair [38].

- Sunflower oil, which is the non-volatile oil, extracted from the seeds of *Helianthus annuus*, a member of the Asteraceae family. Lecithin, tocopherols, carotenoids, and waxes are all present in sunflower oil. It is regarded as noncomedogenic in cosmetics and has smoothing qualities [39].

2. Anti-Aging Effects

- The plant *Rhodiola rosea* (also known as Roseroot or Aaron's rod) is a member of the Crassulaceae family and thrives in cold climates. The *Rhodiola* root has a long history of use in traditional Asian and European medical practices to strengthen an organism's resilience to physical stress. It is currently largely believed to have antioxidant qualities [40, 41].
- Carrot (*Daucus carota*), a member of the Apiaceae family, is a rich natural source of vitamin A and other essential vitamins and has long been considered a valuable herb. Carrot seed oil has anti-aging, rejuvenation, and renewal properties. Because it promotes the formation of new cells and aids in the elimination of wrinkles. It acts as a natural toner as well as a skin rejuvenator [42].
- Ginkgo is derived from the ginkgo tree. *Ginkgo biloba* is a member of the enormous sized Ginkgoaceae family. It is well recognized for acting as a circulatory tonic, namely for bolstering the minuscule capillaries that connect to all organs; but particularly the brain. As we age, the capillaries become more flexible, increasing the amount of oxygen given to the brain and eyes (to ward against degenerative eye illnesses like macular degeneration). Ginkgo additionally defends against oxidation and safeguards the nervous system [43].
- Henna comes from the plant *Lawsoniainermis*, which is in the family Lythraceae. The color chemical Lawsone is found in this plant and it is processed to make henna powder. Henna can "stain" the color onto the hair shaft because of its inherent affinity with the proteins in our hair [44].
- Blood purifier and beauty enhancer qualities have been discovered in the herb *Azadirachta indica*, family Meliaceae. These are used in several medical areas. Skin cleanser is one application where it can be used to treat common aesthetic issues [45].

3. Skin and Hair Protection

- Green tea is only made from the Thecae member *Camellia sinensis* leaves. Topically or orally, green tea protects the skin. According to a Columbia University Dermatology study, it regulates inflammation and prevents direct cell damage. Studies show that green tea catechins are 20 times more antioxidant than vitamin E. Men, women, and children must use this formidable shield to defend themselves from the sun [46].
- Calendula, sometimes known as pot marigold, is a genus of 12 to 20 species of annual or perennial herbaceous plants that produce essential oils. Applying calendula tincture or solution topically to treat acne can reduce swelling, stop bleeding, and calm irritated skin. The use of calendula cream or ointment to treat radiation dermatitis is supported by "limited evidence". Topical administration of 4% calendula ointment led to significantly fewer instances of Grade 2 or higher dermatitis than did the group receiving trolamine in a trial involving 254 radiation patients. Users of calendula also reported fewer treatment interruptions and reduced radiation-induced pain [47, 48].

- Zingiberaceae's perennial herbaceous plant, *Curcuma longa*, has essential oils. In Hindu marriages, brides applied turmeric to brighten their beauty. Turmeric is applied to babies' foreheads for luck. Ladies have always used turmeric to give their cheeks a golden hue [49].
- Amla (*Emblicaofficinalis*) is a member of the Euphorbiaceae. Vitamin C, tannins, calcium, iron, and phosphorus in amla nourish and darken hair[50].
- Calcium, phosphorus, iron, vitamin B1, riboflavin, niacin, and vitamin C in hibiscus promote thicker hair and postpone graying [51].
- Almond oil comes from *Prunus dulcis*. Almond oil contains 78% of this fat. This oil has very little super-unsaturated Omega-3 fatty acids. It nourishes the hair and softens it[52].

4. **Essential Oils:** Natural scents known as essential oils are derived from almost every component of a plant. Essential oils are liquid, flammable fragrance molecules that are usually derived from plants. Although essential oils are not technically oils in the traditional sense, they frequently have low solubility in water. Terpenoids, benzenoids, fatty acid derivatives, and alcohols make up the majority of the volatile compounds in essential oils. Essential oils are widely recognized as safe by the FDA and other agencies. Despite their widespread usage in cosmetics, essential oils' precise method of action is not entirely understood. The chemical, physical, and sensory qualities of essential oils-which vary significantly from oil to oil-determine their functions. The various chemical elements that make up oil each contribute to its overall flavor. For cosmetic purposes, essential oils can be used in a variety of ways, including inhalation, baths, massage, compresses, steam treatments, and room fragrance[53, 54].

The most typical uses for essential oils are [35]:

- Co-preservatives: Many essential oils have antibacterial properties and are added to synthetic preservatives as auxiliary agents.
- Fragrance: Although synthetic perfumes are more stable and have a longer shelf life, perfumery is the primary use of essential oils in cosmetics. Essential oils are used to condition hair and as anti-dandruff and permanent wavers.
- Skin and Hair Care: Essential oils are the best topical active ingredients for any skin care product because of their ability to both penetrate the skin and bind the membranes of skin cells. As a result, essential oils can have long-lasting benefits for the skin. Rose oil the most well-known essential oil is arguably rose oil, which is made from the petals of *Rosa centifolia* and *Rosa damascena*, both members of the Rosaceae family. "Rose otto" is the name for rose oil that has undergone steam distillation; "rose absolute" is the name for the product obtained after solvent extraction. The use of it in perfumery is more frequent. Beta-damascenone, beta-damascone, beta-ionone, and oxide are the main flavoring substances that are responsible for the characteristic aroma of rose oil. Eucalyptus oil is distilled oil made from the leaves of the Eucalyptus genus, a plant belonging to the Myrtaceae family. Eucalyptus oil can get rid of dandruff, which will help promote the growth of healthy hair. Simply combine nine to ten drops of eucalyptus oil with shampoo, gently massage the scalp for a few minutes, and then thoroughly rinse it off. Eucalyptus oil massage on the scalp helps increase blood flow, which promotes healthy and attractive hair. The oil of citronella is one of the essential oils extracted from the leaves

and stems of various *Cymbopogon* species of the *Cardiopteridaceae* family. This oil's crisp, rich citrus or lemon-like perfume dispels body odor and is used in deodorants and body sprays, but only in very small amounts because excessive use could cause skin irritations. It can also be added to bath water to create a revitalizing soak that eliminates body odor. Anise oil, coriander oil, grapefruit oil, jasmine oil, palmarosa, and sandalwood oil are additional essential oils used in cosmetics.

5. Antioxidants : Exogenous or endogenous antioxidants, synthetic or natural, can scavenge free radicals or promote their breakdown and reduce these illnesses, preventing the production of new ones [55]. The use of herbal resources' natural antioxidants is currently gaining popularity [35]. The hypothesis that plant elements with antioxidant activity are capable of exerting protective effects against oxidative stress in biological systems was substantially supported by epidemiological and *invitro* investigations on medicinal plants and vegetables [56]. Free radical generation is naturally regulated by a variety of advantageous substances known as antioxidants [57]. Herbs with little nutritional value, in addition to fruits and vegetables, can be a significant source of antioxidants [58].

- The leaves of black and green tea (*Camellia sinensis*), traditionally consumed by western and Asian populations, respectively, are a significant source of antioxidants that may protect against disease and are the most widely used daily herb [59].
- Tamarinds, or *Tamarindus indica*, of the *Fabaceae* family, are widely cultivated in tropical areas and have long been used as a traditional medicine and a significant source of nourishment. Tamarind seeds have anti-microbial, lipid peroxidation reduction, and radical scavenging properties. For anti-wrinkle cosmetics, its antioxidant action are appropriate [35].

6. Antimicrobial Activity: Cosmetic and pharmaceutical companies are increasingly replacing synthetic antimicrobials in topical applications. Microbial resistance to conventional antimicrobials is rising [60]. Plants defend themselves with phenolic chemicals. They alter membrane permeability and destroy microorganisms by interacting with their cell membranes or walls. Phenolics also coagulate bacterial cells. Phenolic chemicals can also suppress pathogenic bacteria and extend product shelf life [61]. Several plant species with antibacterial effects are used in cosmetic products. Some of these species include:

- ***Cinnamomum* Species:** Certain species belonging to the genus *Cinnamomum*, commonly used as spices, contain many antibacterial compounds [62].
- **Lamiaceae Family:** The Lamiaceae family, which includes plants like mint, oregano, basil, and rosemary, possesses a wide variety of ornamental, medicinal, and aromatic plants that produce essential oils that are used in cosmetics [63].
- ***Neolitsea foliosa*:** *Neolitsea foliosa* plant oil contains caryophyllene, which is responsible for its antibacterial properties [64].
- **Citrus Species:** Essential oils derived from various citrus species have been used in cosmetic products due to their antibacterial and antifungal properties [65].
- **Tea Tree Oil:** Tea tree oil, derived from *Melaleuca alternifolia*, has been used in cosmetic products for its antibacterial activity [66].

- **Lavandula Species:** Lavender species, such as *Lavandula pedunculata*, have been used in traditional medicine for their antibacterial properties and are incorporated into cosmetic products [67].
- **Artemisia Vulgaris:** *Artemisia vulgaris*, commonly known as common mugwort, has been used in traditional medicine and is known for its antibacterial effects [68].

These plant species and their extracts are utilized in cosmetic products for their natural antibacterial properties. They provide an alternative to synthetic antibacterial agents and meet the demands of consumers seeking natural and sustainable cosmetic options.

7. Vitamin C and Vitamin E

- Because Vitamin C can produce free radicals, it reduces the damage caused by free radicals. It makes the immune system work better. Vitamin C is mostly found in foods like carrots, peaches, sweet potatoes, oranges, broccoli, etc.
- Vitamin E comes from both animals and plants. It has been found to help treat some types of cancer and problems with the heart. People talk about it as a "scavenger of free radicals." Nuts, whole grains, almonds, veggie oils, and other foods are the best places to get vitamins [35].

VIII. HERBAL RESOURCES CULTIVATED IN TÜRKİYE THAT ARE USED IN COSMETIC PRODUCTION

Due to its geographic location, Türkiye is home to a diverse array of plant species. The country's flora is comprised of roughly 12,000 taxonomic groups, of which approximately one third are unique to the country. Since ancient times, a wide variety of plants have been utilized for cosmetic purposes. This is especially relevant in light of the fact that, in the cosmetics sector today, there is a growing desire for natural and safe sources of ingredients as opposed to synthetic chemicals. When these two factors are taken into consideration, it can be seen that our nation is home to a diverse array of plant life, and the industry that deals in cosmetics makes extensive use of this variety [30, 69]. In this title, describe plants that are not only economically significant but also easier, more environmentally friendly, and more accessible in the near future for the production of raw materials for cosmetic products in Türkiye.

Table 1: Herbal Resources Growing in Türkiye Used in Cosmetic Products [30, 69]

Evaluation and remarks:	Taxa	Active principles:	Intended cosmetic effects:
Category A	<i>Achillea millefolium</i> L.	Plant components include flavonoids, cyanogenetic heterocytes, tannins, mucilage, vitamins, and phytosterols.	Cleaning, calming, energizing, purifying, and astringent for the skin. It is used as an extract to treat skin spots and freckles.
Category A	<i>Aesculus hippocastanum</i>	The composition of the substance	Astringent, tonic, anti-cuperosis, anti-edema,

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	L.	includes amino acids, triterpenic saponins, phytosterols, vitamins, flavonoids and proteins.	vasoprotective, and peripheral vasoconstrictor are some of the properties of this plant. Cellulite treatments including lotions, creams, and gels, as well as astringent shampoos and tonic bath treatments for the body and feet. The seeds strengthen capillaries and prevent fluid buildup. Witch hazelnut extract is found in eye creams with anti-aging benefits.
Category A (α-Methylene-γ-lactone must be taken into consideration.)	<i>Anthemis nobilis</i> L.	Essential oils	It is used to renew the skin, prevent inflammation, and modify the color of the hair. Anti-inflammatory and antiseptic properties.
Category A	<i>Calendula officinalis</i> L.	Essential oils, carotenoids, flavonoids, mucilage and saponins.	Protective, emollient. Bath extracts and oils, hand care, chapped and irritated skin items, infant toiletry. Re-epithelization in cosmetics makes it an anti-aging ingredient. Creams with 5% Calendula flower extract and allantoin improve glycoprotein and collagen fiber metabolism in epithelial tissue regeneration, making them crucial in cosmetic product composition. Mucilage is moisturize and are recommended for sun protection, aftershave, balm, and bath treatments. Flower extract is commonly utilized in photo-aging cosmetics. Anti-inflammatory, anti-irritant, antiseptic.
Category: Group A (Dry extract and tea extract); Group B (oil)	<i>Camellia sinensis</i> (L.)	Caffeine (a xanthine), polyphenols (such as catechins, procyanidins, and	Protective, emollient, hydrating, smooth, tonic, and astringent for dry and aging skin. Concentration restricted for shampoos and

<p>(Polyphenol-rich extracts may be harmful, although there is no external toxicological data). Saponin molecules in oil may cause the unknown negative effect.</p>		<p>flavonoids (tannins)), triterpenic saponins, fatty acids, vitamins C, B1, B2, and B3, and phytosterols.</p>	<p>conditioners for dry and damaged hair and scalp, nail strengtheners, after-sun products, eye contour products, hand moisturizers, and moisturizers for dry, aging skin. Green tea also blocks UV radiation. Pre-sun photoaging products contain tea extract with polyphenols. This plant's free radical scavenging mechanism works. Protective and cell-regenerating. Caffeine increases blood circulation and catechin derivatives accelerate metabolism to burn fat in anticellulite products. Hemostatic, stimulant, antimicrobial oil.</p>
<p>Category A (Citral and limonene rarely cause allergies). Pectin is harmless).</p>	<p><i>Citrus lemon</i> (L.) Burm.</p>	<p>Vitamins, phytosterols, hydroxy acids, essential oils, flavonoids, coumarins, pectin, and sugar.</p>	<p>It is utilized in oily and old skin solutions, emulsions, gels, pre- and post-sun treatments, and mouthwashes because to its tonic, regenerative, astringent, cleansing, moisturizing, and anti-aging properties. Pectin is used as thickening agent. Lemon vitamin C boosts collagen production. Ascorbic acid helps collagen synthesis. Proline hydroxylation requires vitamin C. Collagen production and integrity are crucial. Antimicrobial (pectin), antipruritic, free radical scavenger, anti-edema, capillary protection.</p>
<p>Category A</p>	<p><i>Cucumis sativus</i> L.</p>	<p>-</p>	<p>It functions as an emollient, softener, and soothing agent.</p>
<p>Category A</p>	<p><i>Cupressus sempervirens</i> L.</p>	<p>Essential oil and polyphenols.</p>	<p>Astringent, cleanser, skin protector, and scent. Soap</p>

			and cleansers contain cypress oil. After-sun creams, lotions, gels, and deodorants are also available. Hemostatic, free radical scavenging, and antibacterial promote granulation.
Category A	<i>Hedera helix</i> L.	Mineral salts, phenolic acids, flavonoids, and triterpenic saponins are found in this plant.	It is used in body massages and creams, lotions, and gels for its tonic, astringent, softening, and anti-cellulite properties.
Category A	<i>Juglans regia</i> L.	Catechic tannins, naphthoquinone (also known as juglone), and hydroquinone are the three components.	Astringent, calming, cleaning, odorant, and dyestuff. Due to its coloring characteristics, glycolic extract and oil tincture are used in shampoos, hair tonics, and suntanning lotions.
Category A	<i>Malva sylvestris</i> L.	Mucilage, anthocyanin, phenolic acids, and vitamin content are all found in this plant.	It soothes, demulcents, and smooths skin. Shower, bath, and mouthwashes for sensitive skin contain it.
Category A: alfa-methylene gamma-lactone is an allergen and shouldn't be found or should only be found in certain amounts.	<i>Matricaria chamomilla</i> L.	Essential oil and polyphenols.	The essential oil and an anti-irritant, chamazulene, are used for cleansing and itching on the skin, in cosmetics, and in sunscreens. It is used in bath products, lotions, creams and hair dyes. Anti-inflammatory and wound healing.
Category A: Preparations can have no more than 2% menthol. It shouldn't be put on things for children).	<i>Mentha piperita</i> L.	Distillation-produced volatile oil.	Tonic, odor, cleaning, soothing, and anti-itching. Regulates taste and odor. Aromatherapy, massage, and bath preparations employ it.
Category A	<i>Olea europaea</i>	Triglycerides,	Olive oil moisturizes and

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(Non-soap less parts	L.	unsaponified parts, free fatty acids, flavonoids, secoiridoids, hydroxy acids, phenolic acids, vitamin E, and proteins.	soothes sensitive skin. Solar goods use olive oil emulsions and lipogens. Softeners, sunscreens, and conditioners contain non-saponified ingredients. Olive oil fights inflammation and heals wounds. Non-saponified portions exhibit anti-inflammatory, wound-healing, and melanin-biosynthetic properties. Gum products also include it.
Category A	<i>Potentilla tormentilla</i> Neck. (<i>P. erecta</i> L.)	Tannins with a catechistic structure and volatile oil	It's in toothpaste, mouthwash, and skin products for its tonic, astringent, and skin-regenerating properties.
Category A	<i>Rosa rubiginosa</i> L.	Vitamin E, β -carotene, fatty acids and non-saponified components.	Emollient, hydrating, and anti-aging. Wrinkle emulsions contain it. It treats skin ulcers and reduces inflammation.
Category A	<i>Ruscus aculeatus</i> L.	Sterols, coumarin, flavonoids, and saponins are all components.	It has restorative and tonic properties. It serves as a calming component in sunscreen preparations as well as gel, cream, and massage products for foot and muscle problems.
Category A (without salicylate).	<i>Salix alba</i> L. (<i>S. purpurea</i> L.)	Oligo- and polysaccharides, phenolic glycosides, phenolic acids, flavonoids, catechic tannins.	It moisturizes and keratolyzes tough skin in emulsions, masks, and lotions. It preserves preparations. It is astringent, analgesic, anti-inflammatory, and antibacterial.
Category A	<i>Salvia officinalis</i> L.	Both essential oil and phenolic compounds are present.	It acts as a tonic, deodorant, cleanser, anti-dandruff agent, and antiperspirant. It is a component of unhealthful skin care products, toothpastes, bath products, and conditioners.
Category A	<i>Silybum</i>	Phytosterols,	It protects, cleanses, and

	<i>marianum</i> (L.) Gaertn.	sesquiterpenes, polysaccharides, sesquiterpene triglycerides, saponins, proteins, polysaccharides, essential oil, and vitamins.	fight dandruff and aging. Pre-sun products for oily and dirty skin contain it. Anti-inflammatory, antioxidant, antibacterial, cell membrane protecting, and anti-elastase properties.
Category A	<i>Urtica dioica</i> L.	Mineral salts, amines, histamine, serotonin, lecithin, caffeic and chlorogenic acids, flavonoids, sterols, and essential oil are just a few of the ingredients.	It is used in the formulation of hair care treatments and hair tonics due to its anti-dandruff action. It is also utilized in the dyeing process.
Category A	<i>Vaccinium myrtillus</i> L.	Tannins, flavonoids, pectin, fruit acids, vitamins, and anthocyanins.	Tonic and anticoagulant. Toothpaste, mouth water, and sensitive skin products contain the herb.
Category A	<i>Vitis vinifera</i> L.	Fruits: polyphenols, alpha-hydroxy acids, vitamin C, polysaccharides; seeds: procyanidins, triglycerides, phospholipids, and vitamin E. Leaves: polyphenols, organic and phenolic acids, vitamin C, carotenoids, volatile components, and mineral salts.	Anthocyanins in the fruit color them. They moisturize and protect. Seeds moisturize, protect, and fight aging. Tonic, astringent, invigorating, and anti-aging, the leaves are utilized in skin lotions, creams, gels, and hair products. Polyphenols provide antioxidant, anti-irritant, and microcirculation protection. Non-saponified portions aid granulation.
Category B (Pyrolizidine alkaloid)	<i>Borago officinalis</i> L.	Pyrolizidine alkaloids, tannin, polysaccharide, and essential oils.	Emollient, relaxing, flavoring, opens pores; only used in infusions and decoctions at 5% concentration.
Category B	<i>Centaurea cyanus</i> L.	Sesquiterpene lactones, phenolic acids, flavonoids, coumarins, anthocyanidins, catechins, tannins, amino acids, and	Pre- and post-shave products for cleansing lotions, gels, eye area products, masks, and sensitive skin utilize it because of its tonic, calming, astringent,

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		mineral salts.	emollient, and moisturizing characteristics. Anti-inflammatory, antiseptic, free radical scavenger.
Category B.	<i>Gentiana lutea</i> L.	Amino acids, triterpenes, bitter glycosides, polyphenols, and polysaccharides.	Tonic, calming, detoxifying. Sensitive and oily skin products contain it. It has been used for bug bites, bruises, wounds, and granulation.
Category B	<i>Humulus lupulus</i> L.	Essential oil, humulone, lupulon, quercetin, kaempferol, and phytosterols.	It provides an emollient and hydrating effect on the skin.
Category B	<i>Lilium candidum</i> L.	Flavonoids, amino acids, phytosterols, organic acids, phenolic acids, carotenoids, tannins, mineral salts, vitamins, essential oils.	It's in cleansing gels, solutions, emulsions, anti-aging masks, dry and cracked skin treatments, and sunscreen products to relax, protect, soften, and hydrate the skin. It cures anti-irritant, free radical scavenging, capillary protecting, antimycotic, wound healing, insect bites, bruising, and sunburn skin redness.
Category B	<i>Melissa officinalis</i> L.	Essential oils.	Tonic, soothing, and fragrant, it is used in relaxing baths. insect stings. Antiviral properties.
Category B	<i>Plantago major</i> L. (<i>P. lanceolata</i> L. and other species)	Tannins, coumarins, flavonoids, iridoids, phenolic acids, polysaccharides, and mineral salts.	They soothe, moisturize, cleanse, and astringent skin. Insect bites are treated with fresh water phase of plants. It sedates the eyes. Anti-inflammatory, antimicrobial, and hemostatic properties aid granulation.
Category B	<i>Sambucus nigra</i> L.	Tannins, phenolic acids, phytosterols, flavonoids, essential oils, triterpenes, and phytosterols.	Tonic, astringent, refreshing, calming, protecting, and moisturizing fruits. Fruits also dye. Sensitive skin products, eye lotions, and freckle and sunburn

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			washing lotions contain plant aromatic water. Pre-sun, cracked-hand, and mouthwash products contain the plant extract. This herb is diaphoretic, diuretic, anti-inflammatory, astringent, and anti-hemorrhoidal.
Category B	<i>Saponaria officinalis</i> L.	Mucilage, calcium oxalate, proteins, flavonoids, triterpene saponins, and essential oil.	Sedative, cleanser, antipruritic, surfactant, foaming, and emulsifier. Oily skin products, cellulite emulsions and gels, and sensitive skin and scalp lotions contain it. It also fights inflammation, edema, seborrhea, and viruses.
Category C if β -asarone and methylogenol are found, Category B if not. <i>Acorus calamus</i> L. var. <i>americanus</i> lacks β -asaron.	<i>Acorus calamus</i> L. var. <i>americanus</i> Rafin.	Acorin, acoretin, a bitter component, tannins, starch, amino acids, triglycerides, resin, and gum are examples of natural substances.	Tonic, cleansing, astringent, calming; hair tonic, anti-dandruff, mouthwash, toothpaste, stimulating bath products and shampoos, and massage emulsions. It stinks. Antibacterial, anti-inflammatory, antiedema, and granulation-promoting.
Category C (Allergic and high phenolic substances).	<i>Betula pendula</i> L.	Triterpenes, phenols, resins, and tannins.	Tonic, stimulant, antidandruff, stimulator of hair development, tonicisin agent in hair preparations, after-sport and massage treatments, purifying and stimulating detergents.
Category C	<i>Foeniculum vulgare</i> Mill.	Flavonoids, triterpenes, triglycerides, phytosterols, protein, vitamin E, and pectin are all present.	Cleansing creams, emulsions, eye contours, and oral mucosa treatments contain the tonic, calming, cleansing, and fragrant plant. Stimulant, granulation, antibacterial.
-	<i>Allium sativum</i> L.	Carbohydrates, vitamins, flavonoids, and sulfur compounds, as well as essential oils (allicin).	Crushed onion extract is used as a hair growth preparation and is applied to hairless skin.

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