

Cosmeceuticals: The new remedy for elegance



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Abstract

The combination of cosmetics and pharmaceuticals is referred to as "Cosmeceuticals." Cosmeceuticals are cosmetic products that contain biologically active ingredients with medical or drug-like properties. Cosmeceuticals are skin care products used to improve and nourish the skin's appearance. They are used to treat a wide variety of medical conditions. Cosmeceuticals, like cosmetics are applied regionally and contain ingredients that influence the biological function of the skin. Cosmeceuticals are products that are intended to enhance one's appearance by providing nutrients required for healthy skin. Cosmeceuticals frequently claim to improve skin tone, texture and radiance while simultaneously reducing wrinkles. Customers prefer herbal-derived cosmetics because they are generally nontoxic and have high antioxidant activity. A cosmetics or cosmeceuticals product can be either a drug or a cosmetic. Cosmeceuticals do not appear to be reviewed by the Food and Drug Administration (FDA) and the term "cosmeceuticals" does not appear to be recognized by the Federal Food, Drug and Cosmetic Act. While all cosmeceutical products are tested for safety, it is optional to test to see if useful ingredients live up to a manufacturer's claims.

Introduction

Since prehistoric times, humanity has recognized the value of beauty and society's desire to look beautiful and healthy has grown. Fitness, good health, appearance and manner of presenting oneself have recently been recognized as personality traits and people are now judged based on these factors. As a result, there is now a need and desire to pay more attention to appearance and beautification for social acceptance as well as professional success, which the media also overemphasizes. Cosmetics are substances that are applied to the skin to enhance its appearance or odor (1). Skin-care creams, lotions, powders, perfumes, lipsticks, nail polish as well as eye and facial makeup are all examples of cosmetics. Towelettes, colored contact lenses, hair colors, hair sprays, gels, deodorants, hand sanitizer, baby merchandise, bath oils, bubble baths, bath salts, butter and other items are also available in this category. Cosmeceuticals are products that combine cosmetics and pharmacologically active substances (2). Cosmeceuticals combine both cosmetic and therapeutic substances, where cosmetics that contain biologically active ingredients and are intended to have drug-like properties are known

as cosmeceuticals. Cosmeceuticals are pharmaceutical ingredients that have beneficial topical effects and help to protect against chronic skin conditions (3). It includes cosmetic actives with therapeutic, disease-fighting or healing properties that act as a link between care products and prescription drugs (4) and can be divided into the following types:

- Active cosmetics
- Bio-active cosmetics
- Performance cosmetics
- Phytocosmetics
- Functional cosmetics
- Dermaceuticals
- Skinceuticals
- Cosmetic drugs
- Therapeutic cosmetics (5)

Supplements for beauty are applied locally and contain ingredients that influence the skin's biological performance. Cosmeceuticals often claim to improve skin tone, texture and radiance while also reducing defects like wrinkles. The natural care industry's fastest-growing segment is cosmetics (6).

History and Background

Since 10,000 BCE, cosmetics have been an important part of Egyptian hygiene and health care. Men and women in Egypt used scented oils and ointments to clean and soften their skin and to mask body odor. Oils and creams provided protection from the hot Egyptian sun and dry winds. The following basic ingredients were found in most perfumes used in religious rituals in Egypt: myrrh, thyme, marjoram, chamomile, lavender, lily, peppermint, rosemary, cedar, rose, aloe, olive oil, sesame oil and almond oil. 4000 BCE: Egyptian girls added color and definition to their faces with mineral mesdemet (a copper and ore paste) and mineral (a bright inexperienced paste of copper minerals). Kohl (a mixture of burnt almonds, change copper, various colored copper ores, lead, ash and associated ochre) was used to adorn the almond eyes. 3000 BCE: The Chinese stained their fingernails with gum, gelatin, beeswax and egg. Colors were used to represent social class: Chow royals wore gold and silver, whereas resulting royals wore black or red. The lower classes were not allowed to have their nails painted in bright colors. Balkan country ladies had used crushed mulberries as rouge and lead carbonate to color their faces. The use of fake brows, typically made from oxen hair, was also fashionable. 1500 BCE: Unusually, Chinese, and Japanese people used rice powder to discolor their skin. The brows were shaved, the teeth were gold or black-painted and henna dyes were notorious for staining hair and faces. 1000 BCE: Grecians discolored their skin with chalk or lead war paint and made crude lipstick out of ochre clays laced with red iron (7).

Classification of Cosmeceuticals (8)

1. Based on their function Cosmeceuticals are classified as follows:

1.1. Skin care Cosmeceuticals

Cosmetics and skincare products are now an essential part of daily grooming routines. Our skin, the largest organ, acts as a barrier between the internal and external environments. Sunlight penetrates the skin and accelerates free radical damage, resulting in wrinkling, inflammation and hyperpigmentation. The enzymes collagenase and elastase break down the

elastin fibers as a result of prolonged UV radiation exposure and the skin's texture deteriorates. Collagen and elastin are responsible for the skin's elasticity and integrity. Plant extracts and antioxidants derived from natural sources are capable of preventing ageing and improving skin appearance (9). Tea, soy, pomegranate, date, grape seed, pycnogenol, horse chestnut, German chamomile, curcumin, comfrey, allantoin and succulents are the most important botanicals for Cosmeceuticals; however, only tea leaf, soy, pomegranate and dates have been explored to the extent of reaching clinical trials for their therapeutic effects (10).

1.2. Hair care Cosmeceuticals

In contrast to other mammals, humans have direct control over the appearance of their hair. Hair length, color and style can all be altered to improve one's appearance. Various tonics and ointments were used to beautify hair and cure scalp disease in ancient Greece and Rome. Henry DE Mandeville established the distinction between medical therapies for wellness treatment and cosmetic agents for the state change (11). However, the distinction between cosmetics and prescription drugs has become more difficult because of the emergence of cosmeceuticals. Use of shampoo is by far the most common type of cosmetic hair treatment. Shampoos have traditionally been designed to clean the hair and scalp; however, recently, formulations have been tailored to cater to hair quality, hair care habits, and specific problems such as oily hair (12) treatment. Dandruff, also known as androgenic alopecia, is a condition of the scalp's surface (13). Shampooing is the most common method of hair treatment. Current shampoo formulations contain ingredients that can be used to treat specific issues. Milfoil extract (*Achillea millefolium* L) has traditionally been used to treat oily hair.

1.3. Colour Cosmeceuticals

Color is an extremely important property of a product because it determines its attractiveness to shoppers and as a result it's commercial success. Colorants are frequently added to cosmetics to color either the product or a specific area of the body (skin, hair, nails or eyelashes). In this later, the alleged color cosmetic could be a sector with strong growth within the cosmetics industry, owing to the growing concern with body image and social media recognition (14). Cosmetics are classified into two types based on their application: leave-on (those that remain on the skin for an extended period, such as lipstick, cream or body lotion) and rinse-off (those that are washed off the skin after application, like shampoo, gel or soap). Colorants are classified based on their structure, source, color, solubility, and application technique (15). In terms of solubility, there are two major groups: dyes and pigments. Dyes are synthetic organic compounds that are hydro or oil-soluble and can be found in cosmetics such as skincare products or toiletries, whereas pigments are insoluble, remain particulate and are primarily used in toothpaste or decorative make-up (16). Among the thousands of items used as coloring agents, artificial dyes are preferred over natural dyes (obtained from plants, animals, and minerals) due to lower production costs and longer-lasting properties such as brightness or greater stability against light, heat or pH, that will occur during the manufacturing process.

1.4. Fragrance Cosmeceuticals

Fragrances are complex mixtures of natural and synthetic substances that are added to a wide range of consumer products to impart a distinct odor. A fragrance is a mixture of essential oils or aroma compounds that is used to provide the structure with a "pleasant scent."

2. Based on various products presently on the market, Cosmeceuticals can be divided into the following broad categories:

2.1 Antioxidants

Along with external factors such as actinic radiation, drugs, air pollutants, heat or cold, the skin should also cope up with endogenous mitogens, particularly reactive oxygen species (ROS) and other free radicals. To counteract the damaging effects of ROS, the skin has an inhibitor system in place to maintain a balance between pro-oxidants, damaging agents and antioxidants or protecting agents; these antioxidants mediate at various levels within the protecting method.

Some antioxidants are listed below, including:

- Lipoic Acid
- Dimethyl amino ethanol (17)
- Melatonin: Hormone secreted from pineal gland have antioxidant activity
- Catalase: An enzyme that catalyze hydrogen peroxide into water and oxygen
- Glutathione
- Superoxide dismutase (18)

Major classes of cosmeceuticals involving antioxidants are as follows-

2.1.1.Sunscreen

These are considered over-the-counter medications and the sun protection factor must be demonstrated through in-vitro and in-vivo studies. Dermatologists believe that this is the single most important formulation that should be used daily. These are the products that are intended to cater to individual preferences, such as scent and feel, to improve compliance.

2.1.2.Retinoids

These are the natural and synthetic antiophthalmic medication derivatives for example retinoic acid (tretinoin). Important scientific evidence supports the anti-aging and anti-acne properties of tazarotene and adapalene. Dermatologists consider retinoic acid to be the gold standard in anti-aging substances. These are only available with a doctor's prescription. Cosmetic ingredients include retinol, retinaldehyde, retinyl propionate and retinyl palmitate. Once bioavailability and activity have been developed, they are frequently untested.

2.1.3.Moisturizer

Moisturizers contain emollients, occlusion inducers and humectants. They're thought to be the most effective products for treating a variety of skin conditions (e.g., dermatitis, psoriasis, pruritus, ageing skin).

2.1.4.Lightening agents

Depigmenting agents have limited efficacy at best. Hydroquinone is considered to be the most effective. The USFDA is currently re-evaluating them. Sunblock is required due to drug-induced sensitivity; various examples include kojic acid, glabridin (licorice extract), arbutin, azelaic acid, n-acetyl glucosamine, and ascorbic acid.

2.1.5.Hydroxy Acids (19)

Examples include glycolic acid, hydroxy acid, acid, malic acid, and carboxylic acid. They aid in skin texture and coloration. There is a chance that they will be subjected to regulatory scrutiny because they will cause actual structural changes within the skin.

2.1.6.Proteins / Peptides

They can initiate skin repair as needed. There are some indications that they will reduce the signs of aging and speed up the skin's healing processes.

2.1.7. Other vitamins (20)

Anti-wrinkle creams, medicated lotions, hair growth stimulants, anti-dandruff shampoos, eye wrinkle creams, scleroprotein injections and other cosmeceutical products have recently flooded the market (21) in this category.

2.2. Growth factors

Growth factors are a type of protein that bind to cell surface receptors and mediate cell signaling pathways. Wound healing is reliant on a sophisticated interaction of cytokines and growth factors. Growth factors involved in wound healing stimulate the formation of new scleroprotein, elastin and glycosaminoglycan as well as mediate ontogenesis. One human protein that is currently used in cosmetics is protein one, which is derived from civilized fibroblasts harvested from the infant foreskin.

2.3. Peptides

With variations in organic compound sequence, an amino acid range and the use of derivatives of those acids, the number of potential peptides is limitless. Some peptides with unique sequences have piqued the interest of the cosmetic industry, including palmitoyl-lysine-threonine-lysine-serine (pal-KTTKS; Matrixyl), acetyl-glutamate-glutamate-methionine-glutamine-arginine-arginine (Ac- EEMQRR; Argireline) and the tripeptide copper.

2.4. Metals

Cosmetic products typically contain only metals such as copper, selenium, strontium, and magnesium as well as metal salts and complexes with organic compounds. Some examples include zinc oxide, copper amide and selenomethionine.

2.5. Anti-inflammatory actives

Numerous cosmeceuticals are studied to treat sensitive skin, acne skin and exposure injury to cut back the redness related to inflammation.

2.6. Polysaccharides

Polysaccharides embody the acid family, which has alpha group acids (AHA), beta group acids (BHA) and polyhydroxy acids (PHA). Among the AHAs are glycolic acid (grapes), lactic acid (milk), malic acid (apples) and citric acid (citrus fruits). They act as humectants and improve stratum corneum barrier function, possibly by increasing dermal glycosaminoglycans. Exfoliants suitable for acne-prone and oily skin include BHAs such as beta-lipo hydroxy acid and tropic acid. PHAs can hydrate, moisturize and exfoliate the skin. They include gluconolactone, which has been shown in vitro to protect against UV radiation and lacto bionic acid which is both an antioxidant and a humectant.

2.7. Pigment lightening

The popularity of pigment-lightening cosmeceuticals stems from their ability to even out skin tone. Hydroquinone, one of the most commonly used pigment lightening agents, works by inhibiting tyrosinase activity (22).

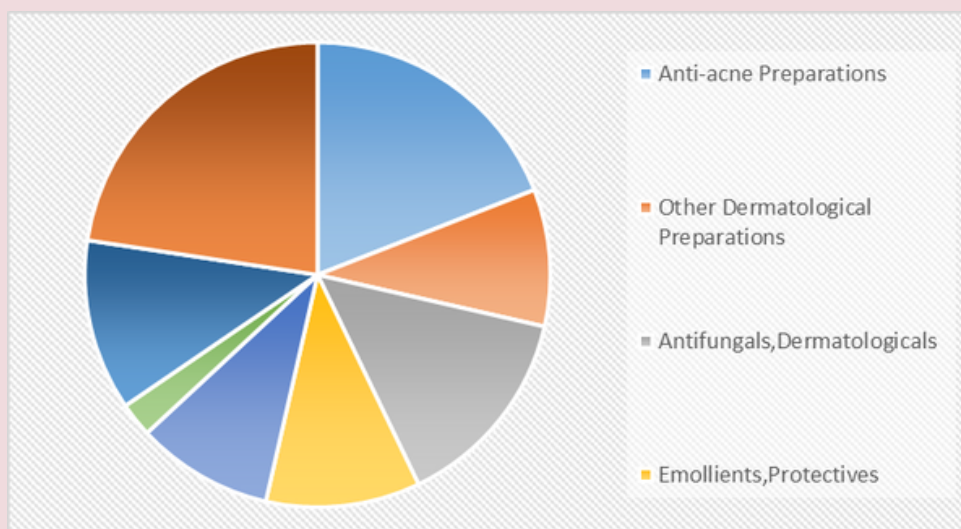


Figure 1: Global Therapeutic Dermatology Market Split by Product Class

Conclusion

Today, the cosmetics industry is in a unique position, distinguished by extremely competitive marketing methods and is dependent on the ability to rapidly introduce innovative products. On the other hand, medical research in the cosmetic field may continue, while in-depth research in the therapeutic field may also be conducted. Cosmetic companies are free to develop and market products that are known to affect the structure and performance of skin with little oversight. Most customers believe that cosmetics are regulated and tested in the same way that pharmaceuticals are. Customers believe that ingredients have been tested for safety and that advertising claims are accurate. One can simply conclude that cosmetics will continue to evolve in lockstep with advances in our understanding of skin biology as well as improved strategies for maximizing the benefits that well-engineered care products may provide. However, we must consider changes in science and technology, so clinicians, scientists and dermatologists must update their data in this field to provide high-quality, safe merchandise.

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