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**COSMECEUTICAL**

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**ABSTRACT**

Now a day, cosmetic industry is 'Cosmeceuticals', which is the fastest growing segment of the natural personal care industry. Cosmeceuticals are serving as a bridge between personal cosmetics and pharmaceuticals that are intended for the enhancement of both the health and beauty of skin. Cosmeceuticals are the future generation of skin care product and a number of topical Cosmeceuticals treatments for conditions such as photo aging, hyper pigmentation, and wrinkles. They are the advances made within the world of dermatological products and the new backbone in skin care. All cosmeceuticals claim to contain functional ingredients with either therapeutic, disease-fighting or healing properties. Skin care cosmeceuticals such as face wash, moisturizers, mask, sunscreen, exfoliates etc. are meant for modify, beautify and treat skin imperfections. Cosmeceuticals improve appearance by delivering nutrients necessary for healthy skin. This review paper is to give recent knowledge about the trend of cosmetic industry- Cosmeceuticals.

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**I. INTRODUCTION**

Raymond Reed, Founder of U.S. Society of cosmetic chemist, created the concept of "cosmeceutical" was popularized by American dermatologist. Albert Kligman in the late 1970's. However the Egyptians were the first to recognize the health-giving properties of cosmetics. The "Ebers" a medical papyrus wrote in 1600 BC, made frequent to several cosmeceutical-type products. A favorite formulation was using honey and milk that claimed to help cure skin diseases. The role of cosmetic as a positive healing aid ignored until its revival in the late 1970's and early 1980's Kligman rekindled interest by developing formulations to improve the appearance of UV- damaged and wrinkled skin using retinoic acid as the active ingredient<sup>1</sup>.

Cosmetics are substances used to increase the appearance or odor of the human body. Cosmetics consist of skin-care creams, lotions, powders, perfumes, lipsticks, fingernail and toe nail polish, eye and facial makeup. Novelettes, permanent waves, colored contact lenses, hair colors, hair sprays and gels, deodorants, hand sanitizer, baby products, bath oils, bubble baths, bath salts, butters and many other types of products. A subset of cosmetics is called "make-up" which refers mainly to colored products intended to change the user's appearance. Cosmeceuticals refers to the mixture of cosmetics and pharmaceuticals. The term cosmeceuticals refer to the substances that exerted both cosmetic and therapeutic benefits. Cosmeceuticals are cosmetic products with biologically active ingredients purporting to have medical or drug-like benefits.<sup>3</sup> Day by day various innovative terms for cosmeceuticals are being introduced viz.

- Bio-active cosmetics
- Performance cosmetics
- Phytocosmetics
- Functional cosmetics
- Dermaceuticals
- Skinceuticals
- Active cosmetic
- Beauty Supplement
- Cosmetic drugs
- Therapeutic cosmetics<sup>4</sup>

Cosmeceuticals usually claim to reduce wrinkles and to improve tone, texture and radiance of the skin. Cosmeceuticals is the fastest-growing segment of the natural personal care industry<sup>5</sup>. There remains much

controversy surrounding the “active ingredients” found within cosmeceutical products, particularly in regards to their mechanism of action, formulation, optimal concentration, penetration and retention in skin. Some clinical trials and tests have been done to address these questions, but on the whole there is little validation to support cosmeceutical claims. In vitro testing for some products has shown that these ingredients do have a protective and repairing effect on aging skin; however, there has been little translation of this evidence into in vivo testing to determine the possibility of delivering adequate doses to skin that will produce clinical or histologic results.

Cosmeceutically active ingredients are constantly being developed by big and small corporations engaged in pharmaceuticals, biotechnology, natural products, and cosmetics. Desirable features of cosmeceutical agents are efficacy, safety, formulation stability, novelty, and patent protection, metabolism within skin and inexpensive manufacture<sup>6</sup>. Given below is the activities made available by cosmetics, cosmeceuticals and drugs

**Table 1:** Activities made available by Cosmetics, Cosmeceuticals and Drugs

Activities	Cosmetic	Cosmeceutical	Drug
Pharmaceutical activity	+	+	+
Intended effect in skin disease	-	+	+
Intended effect in mild skin disorder	-	+	+
Side effects	-	±	+

## II. CHARACTERISTICS OF COSMECEUTICALS

Cosmeceuticals could be characterized as follows:

1. The product has pharmaceutical activity and can be used on normal or near-normal skin.
2. The product should have a defined benefit for minor skin disorders (cosmetic indication).
3. As the skin disorder is mild the product should have a very low-risk profile<sup>7</sup>.

### CLASSIFICATION OF COSMECEUTICALS:

The term Cosmeceuticals can be used with different terms. For all the terms the definition remains the same i.e. Cosmeceuticals formulations which are neither pure cosmetics, like lipsticks, nor pure drug, like corticosteroids. It is a hybrid category of products lying on the spectrum between drugs and cosmetics. The various terms by which Cosmeceuticals can be substituted are active cosmetics, nutricosmetics, performance cosmetics, functional cosmetics, and dermaceuticals.

Cosmeceuticals basically can be classified into following categories:

- 1) **Skin cosmeceutical product**- Antiaging creams, Moisturizers, Facial products and Lotions.
- 2) **Hair cosmeceutical product**- Gel and creams, Hair colorants and Dyes, Shampoos, Growth Stimulators and Conditioners.
- 3) **Others**- Lipstick, Nail polish, Toothpaste and Powders.

## III. MAJOR CLASSES OF COSMECEUTICALS

Major Classes of Cosmeceuticals are as follows:

### 1] MOISTURISERS:

When moisturizers are applied to the skin, a thin film of humectant is formed which retains moisture and gives better appearance to the skin. Liposomes, Nano emulsions, SLNs are widely used moisturizing formulations because of their prolonged effects. These are considered to be the most useful product for the management of various skin conditions (e.g., atopic dermatitis, psoriasis, and pruritus).

### 2] SUNSCREENS:

Sunscreens are widely used to protect the skin from the harmful radiation from the sun on exposure<sup>8</sup>. Sunscreens are used to provide protection against adverse effects of ultraviolet UVB (290–320nm) and UVA (320–400nm) radiation. According to the United States Food and Drug Administration, the protection factor

against UVA should be at least one-third of the overall sun protection factor. Titanium dioxide (TiO<sub>2</sub>) and zinc oxide (ZnO) minerals are frequently employed in sunscreens as inorganic physical sun blockers. As TiO<sub>2</sub> is more effective in UVB and ZnO in the UVA range, the combination of these particles assures a broad-band UV protection<sup>9</sup>.

### 3] ANTIAGING PRODUCTS:

Chemical products, pollution, stress, irradiation from infrared (IR) and ultraviolet (UV) sources, and abrasion are involved in skin aging. Collagen plays an important role in skin rejuvenation and wrinkle reversal effect. The quantity of collagen in the skin decreases along with age. The aging of the skin manifests itself in many ways: drying out, loss of elasticity and texture, thinning, damaged barrier function, appearance of spots, modification of surface line isotropy and finally, wrinkles. Most of the cosmeceuticals have been developed with claims of antiwrinkle and firming, moisturizing and lifting, and skin toning and whitening activity. Antiaging products are the main cosmeceuticals in the market currently being made using nanotechnology. L'Oréal has employed nanotechnology in products such as Revitalift antiwrinkle cream which contains nanosomes of Pro-Retinol A, and claims that it instantly retautens the skin and reduces the appearance of wrinkles. Application of retinol can increase epidermal water content, epidermal hyperplasia, and cell renewal while enhancing collagen synthesis. Retinol also interferes with melanogenesis and inhibits matrix metalloproteinases, which are involved in collagen breakdown<sup>8</sup>

### 4] HAIRCARE:

Hair care is another promising field for nanotechnology. Companies are using nanotechnology in hair care products and research is ongoing to discover the ways of how nanoparticles can be used to prevent hair loss and to maintain shine, silkiness, and health of hairs. Unlike ordinary hair straightening products Nano emulsion in hair cosmetics does not destroy the outer structure of the hair fibers, called cuticles, to penetrate into the hair strands<sup>8</sup>. Sericin nanoparticles are used in many cosmeceuticals and are observed to be an agent which imparts gloss and softness and promotes maintenance of coloration in dyed hair<sup>10</sup>.

### 5] SKIN CLEANSER:

The art of cleansing has made a progress and improved over thousands of years by simply scraping the skin to an exercise in relaxation and improving skins health appearance. soaps were the basic cleansing agents but also have undergone a series of changes<sup>11</sup>. Skin cleansers may be an important adjunct to the regimen of those who use cosmetics, have sensitive or compromised skin, or utilize topical therapies. Cleansers emulsify dirt, oil and microorganisms on the skin surface so that they can be easily removed<sup>12</sup>. Silver nanoparticles are used as skin disinfectant and decontamination. Nano Cyclic Inc. has produced Nano Cyclic cleanser pink soap which is a scientifically balanced blend of Nano silver and natural ingredients which claims that it kills harmful bacteria and fungi, fights acne, and diminishes age spots and sun damaged skin. It also consists of sericin and collagen<sup>13</sup>.

## IV. COMMON INGREDIENT USED IN COSMOCEUTICALS

### 1) Botanicals:

Botanicals comprise the largest category of cosmeceutical additives found into the market place today. Some botanicals that may benefit the skin include green tea extract, ferulic acid, and grape seed extract.

Grape Seed Extract: This botanical has been established as a potent antioxidant and has been shown to speed wound contraction and closure. Topical application of grape seed extract has also been shown to enhance the sun protection factor in humans<sup>14</sup>.

Fig No.1. Hydrating and Barrier Repeating Cream

### 2) UV protection:

UVA wavelengths penetrate deeply into the dermis, causing skin to wrinkle. UVB radiation is associated with many skin cancers. The SPF number on sun blockers only applies to UVB protection and has no connection with UVA protection. A SPF number of 30 is recommended for daily use. Higher numbers do not proportionately increase protection.

Sunscreens are the single most important cosmeceutical, because they protect skin against solar radiation, which is the most important damaging environmental agent. As a result, they help to prevent the signs of aging. To be effective, sunscreens should provide broad spectrum coverage that includes both UVA and UVB blocking

agents to inhibit photo aging and be part of a daily skin care regimen. Sunscreens contain active ingredients that act as ultraviolet filters.

Fig No. 2. UV Protection Cream

### 3) Depigmenting Agent:

Skin-lightening agents added to product formulations have become increasingly popular and such products are in demand. Common depigmenting ingredients include hydroquinone, Ascorbic acid (Vitamin C), Kojic acid, and licorice extracts (glabridin).

Hydroquinone: Hydroquinone has been the popular agent of choice for skin lightening. The US FDA has proposed concentrations between 1.5% and 2% in skin lighteners. A recent study suggests that this concern has been based mainly on studies with animal models utilizing long-term exposure at high dosages are carcinogenic. Routine topical application may pose no greater risk than that from levels present in common foods.

Fig No.3. Depigmentation Cream

### 4) Exfoliants:

Exfoliants promote skin turnover by removing adherent cells in the stratum corneum. Common exfoliants found in cosmeceutical preparations include salicylic acid (SA), lactic acid, and glycolic acid. There are concerns that repeated use of SA and AHAs could cause the dermis and epidermis to be more vulnerable to penetration by UV radiation.

Fig No.4. Exfoliating Cream

Fig No.5. Moisturizer Cream

### 5) Moisturizers:

Moisturizers restore water content to the epidermis, and provide a soothing protective film. They improve the appearance and tactile properties of dry and aging skin, restore the normal barrier function of the skin, and reduce the release of inflammatory cytokines. Moisturizers comprise an important therapeutic component in the management of various skin conditions (e.g. eczema, psoriasis, pruritus, and aged skin).

#### Types of moisturizer:

There is no consensus on what qualifies as a moisturizer. Manufacturers invented this term to promote the product's capacity to hydrate the skin.

#### Emollients:

Emollients are primarily lipids and their components, which fill the spaces between intercorneocyte clusters to improve skin hydration, smoothness, suppleness, and flexibility. Emollients (stearic, linoleic, oleic, lauric acid, and fatty alcohols) are necessary fatty acids found naturally in wool fat, palm oil, and coconut oil, and are commonly used in cosmetic formulations or topical therapeutics. Emollients have a variety of impacts on skin barrier function, involving eicosanoid generation, membrane fluidity, and cell cycle, as well as enhancing skin healing and permeability, all of which promote to therapeutic benefits<sup>15</sup>.

#### Humectants:

Humectants, the last kind of moisturizer, are hygroscopic chemicals that assist the stratum corneum absorb water by drawing water from the dermis and a humid environment into the epidermis. Humectants can also increase trans-epidermal water loss by promoting water absorption from the dermis into the epidermis where it is easily evaporated; thus, they are commonly used in conjunction with occlusive to aid improve epidermal barrier function and hydration<sup>16</sup>. Honey, sorbitol, glycerin, panthenol, urea, gelatin, hyaluronic acid, alpha hydroxy acids (lactic acid, sodium pyrrolidine, carboxylic acid), propylene glycol, and butylene glycol are examples of humectants.

#### Occlusive:

When applied to wet skin, occlusive has the greatest impact, forming a hydrophobic barrier across the skin and contributing to the intercorneocyte matrix. The effectiveness of occlusive is enhanced by their diffusion into intercellular lipid regions. Petroleum is a mineral oil made up of a complex mixture of hydrocarbons. Liquid paraffin and petrolatum are the most essential materials. When compared to olive oil, petrolatum is the most effective traditional occlusive moisturizer; a minimal concentration of 5% may limit trans-epidermal water loss by more than 98 % and has 170-times the moisture loss resistance<sup>17</sup>.

#### 6) Topical Peptides:

Topical peptides are regarded as cellular messengers that are formed from amino acids and are designed to mimic peptide fragments with endogenous biologic activity. These pent peptides (e.g. KTTKS) are comprised of a sub fragment of type I collagen propertied, and play a role in signaling fibroblasts to produce collagen in the skin, which can improve the appearance of wrinkles.

Fig No.6 Anti-ageing Cream

#### 7) Retinoid:

Retinoid are among the most common ingredients found in cosmeceuticals. In fact, they are the most studied and have the most data behind them. They consist of natural and synthetic derivatives of vitamin A that reduce hyper pigmentation and inhibit enzymes from breaking down collagen<sup>14</sup>.

Fig No.7 Collagen Booster

#### 9) Antioxidants:

Antioxidants reduce free-radical damage, thereby preventing impairment at the cellular level. They inhibit inflammation, which leads to collagen depletion, and they offer protection against photo damage and skin cancer. Common antioxidants include alpha-lipoid acid (ALA), L-ascorbic acid (vitamin C), niacin amide (vitamin B3), N-acetyl-glucosamine (NAG),  $\alpha$ -tocopherol, and ubiquinone<sup>14</sup>.

Fig No 8. Brightening Moisturizer Cream

### V. PRODUCT SAFETY TESTING

Testing needs are determined by the company marketing the product .May include:

- In vitro testing
- Cumulative Irritation testing
- Repeat Insult Patch Tests (RIPT)
- Sensitization
- Ocular Irritation
- Facial Sting
- Phototoxicity
- Photoallergy
- Comedogenicity
- Acnegenicity<sup>18</sup>

### VI. THE FUTURE PERSPECTIVE OF COSMECEUTICAL

- Improving Skin Complexion
- Preventing Visible Effects of Ageing
- Controlling/ Reducing Wrinkles
- Freckle and Black Spot
- Acne and Pimple scars
- Controlling Sebum
- Reducing Cellulite

### VII. CURRENT COSMECEUTICALS COMPOUNDS AVAILABLE

#### Bo-Peptide Eye Cream:

An HCG diet friendly mixture of various peptides and glycosaminoglycans along with the Lipo Light light reflecting technology.

#### Anti-Aging Eye Cream:

Powerful mixture of the anti-oxidants melatonin and Idebenone in Glycine Soya Protein solution, designed to restore youthful texture to skin.

#### Bacopeptide Anti-Aging:

HCG diet friendly formulation of Bacopa Monnieri extract, acetyl dipeptide and gluconol-actone in vanishing cream.

**Collagen Booster Lotion:**

HCG diet friendly formula to improve and restore skin matrix contains Palmitoylpentapeptide, glycine soya protein, kinetin and glycos aminoglycans.

**Eye Wrinkle Gel:**

HCG diet friendly formula designed to provide maximum moisture to support skin matrix contains Sodium Hyaluronate, DMAE, Acetyl D Glucosamine and glycine soya protein. Ask pharmacists to help you decide which formulas are best for your skin care needs.

**VIII. CONCLUSION**

It has been further noted that, the great demand of skin cosmeceuticals has led to development of products to counteract the signs of aging skin, to decrease erythema, and to even out tone and pigmentation. These cosmeceuticals can help to protect the skin from photo damage and in some ways repair it through stimulation of new collagen production.

Further it has been noted from the literature that, hair cosmeceuticals usually consist of actives which are hair growth stimulant, or to improve hair aesthetic properties such as texture, shine, manageability, etc.

Apart from skin and hair cosmeceutical, actives are also reported to improve the condition of the applied area and are added in various cosmetics such as under eyes, lips, nail products.

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