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Designing Of Facial Cosmeceuticophore (FC)

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Abstarct:

The facial cosmeceuticals enhance the charming look and attractive appeal. They have achieved the pharmaceutical distinction as life- style potentiators in 21st century at social and professional levels. The forty five modern formulations of facial cosmetics were studied for identifying their cosmeceutical structures and bioactions in order to design chemically oriented FC for plausible formulations. It is composed of chemobiological functionalities for facial skin interaction. The cationic, hydrophobic, H-bonding and pi-pi stacking sites structured the hypothetical FC.

1.Introduction

The facial cosmetics have attained the reputable status of life- style- drugs¹⁻⁶. The achievement of facial beauty changes the life styles. This is land mark advancement in cosmetic pharmaceuticals. The facial cosmetics improve image and look of a person, therefore, they belong to appearance enhancers category of life-style-drugs. Conventionally the “ make up “ creams are used to improve the facial appearance. The psychosocial attitudes of a gender and profession are viable for facial beutification. This principle is applied for the formulation of facial cosmetics.

Broadly, they include – vanishing creams, cleansing creams, night creams, cold creams for winter, cosmetics for men and all purpose creams for the purpose of taking care of skin by maintaining softness, cleanliness of skin and preventing the detrimental effects of external environment (cold, sun, wind etc). The special facial creams and tonics are used for preventing the microbial infections specially of Propionibacterium acnes. The facial tonics are used for skin healing, tissue growth promotion, refreshing look and facial shine.

Two following are physiological differences between male and female skin are⁷

- Sebum production stimulated by androgens is greater throughout the life in males than females.
- In female the androgen output of ovaries and adrenals declines after menopause. Female’s skin, therefore becomes more dry at an early age. The wrinkle appearance in females is around 30 years of age whereas in males skin ageing appears around 40. The men’s skin is thicker than women up to the age of 50 because there is greater amount of collagen is found in male’s skin than females. The facial skin care also shows attitudinal differences which are as follows:-
 - Women enhance their beauty and do a lot to keep looking younger for a longtime so they use more facial skin regimens.
 - Men treat their facial skin for shaving facial hairs and cleaning. They don’t care very much of ageing or look of the facial skin, therefore, men’s facial cosmetic market is much less than women.

The life style and grooming habits also play role in cosmetics of males⁸⁻¹¹ and females. The males have “rugged sex”, therefore, their facial skin is generally tougher than female. The shaving imposes constant stress on men’s skin and temporary overhydration of skin cells due to detergent and hot water. Later on the loss of water produces dry, flaky and dull looking skin. Moreover men’s facial skin needs more protection from sunburn, windburn, dryness and exposure to dehydration.

2.Theoretical Methodology

The basic composition of facial cosmetics consists of¹²:

- At least one oil soluble anti-oxidant
- At least one stabilizer
- Emollient
- Humectant
- Water
- Perfumes and colours
- Coalescence inhibitor for preventing coalescence of the aqueous phases- electrolytes e.g. sodium chloride

- Volatile or nonvolatile silicones e.g. cyclic polydimethyl siloxanes- act as complexing agents.
- Mineral, vegetable or animal oil
- pH range should be acidic.

Antioxidants, stabilizers, ultraviolet absorbers, salts of amino acids and water- swellable clay minerals are also added for anti-ageing and anti-ugly effects on facial skin

The Forty five cosmeceutical structures having favourable bioactions for facial cosmetics were identified. They are

- Anti-inflammatory¹³ :- Bakuchinol, Berberine¹⁹, Costumolide¹³, Curcumin^{20,21}, Cynaropicrin¹³, Dehydrocostus lactone²⁶, Gallic acid, Gamma linolenic acid^{14,15}, Glycyrrhetic and Glycyrrhizinic acids^{31,33}, Gingerol³², Liquirtin & Liquirigenin^{31,33} and, Nimbodin⁴¹⁻⁴³
- Anti-microbial¹³:- Alpha and beta tumerone¹⁵, Berberine, Costumolide¹³, Chebulinic acid^{24,25}, Eugenol, Glycyrrhetic and Glycyrrhizinic acids, Glabridin³¹, Salannic acid⁴¹⁻⁴³, Thanniflavin & Thannilignan⁴⁸ and Zingiberene^{49,50}
- Antioxidant¹³:- Aloeresin A¹⁴, Casuarinin¹³, Cirsilineal^{22,23}, Curcumin, Chebulinic acid, 1,6- Di-O- gallyl glucose^{24,25,27}, Emblicanin A and B^{28,29}, Feruloyalolsin³⁰, Gallic acid, Glabridin, Gingerol, Hispaglabridin A and B^{31,34}, Isobavachalone^{35,36}, Isorabaichrome^{14,15}, Isobavachin^{35,36}, Isothymosin & Isothymusin^{22,23}, Rosmarinic acid^{22,23}, Rubiadin⁴⁵, Rutin^{46,47} and Chebulinic acid.
- Antiwrinkle¹³:- Docosenoic and Eicosenoic acids^{17,38,39}
- Anti-acne¹³:- Bakuchinol⁸, Curcumin^{20,21}
- Anti-psoriatic¹³:- Bakuchinol and Psoralen¹⁸
- Radiation protector¹³:- Curcumin and Orientin⁴⁴
- Complexion Improver¹³:- Arbutin¹⁶, Glabridin and Isoliquiritigenin³⁷
- Anti-stress(adaptogenic)¹³:- Mangicrocin⁴⁰

3. Discussion And Result

The majority of chemical structures have chemobiological functions of cosmeceutical significance. Most of them share anti-inflammatory, anti-microbial and antioxidant activities which are indispensable for preventing facial health from disease and arresting or retarding ageing by reverting wrinkles through improving collagen efficacy. They have strong anionic and acidic nature due to chemical variability of phenolic and fatty acid functions. The glycosidic bonds with D- hexoses and terpenoids are notable features which impart lipophilic and hydrophilic properties. Anti-acne, anti-wrinkle, anti-allergic, anti stress, anti-psoriatic, radiations protectors and complexion improvers types of structures have unsaturation and oxygen heteroatoms. It is quite interesting that basic structures (nitrogen containing) are negligible.

The chemobiological functionalities of facial cosmetics show the dominance of anionic, lipophilic, unsaturation and lone pairs of electrons. This can be rationally utilized for composing a chemically oriented FC which has following sites

- Cationic site – accommodate anionic functions at basic centres of skin receptor, made of proteins
- Hydrophobic site – accommodate lipophilic functions (small alkyl groups)
- pi-pi bond stacking site – accommodate unsaturated conjugated system or aryl function
- H-bonding site – accommodate lone pair of electrons of heteroatoms. Possibly hydration of facial skin may be favored by increase in H-bondings and can be wrinkle preventive.

4. Conclusion

The designing of the cosmeceuticophore for facial charm and appeal is the prime objective of this study. The modern forty five formulations of facial cosmetic were chemically delineated with corresponding bioactions at chemobiological level. Their structural chemistry suggested the dominance of favorable functionalities for skin receptor interaction. The role of anti-ageing antioxidants and disease preventing chemical structures are of vital importance.

The hypothetical derivation of FC might help to characterize agonistic synergism of chemobiological functions for designing better formulations to improve facial cosmetology.

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