

An Overview on Cream Blush

Pooja Rejakumar *¹, Subash Chandran M.P.², Prasobh G.R.³, Renjini A.S.¹,
Sahishna S.S.¹, Akhila J.B.¹

¹B Pharm student, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502

²Professor and Head, Department of Pharmaceutics, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502

³Principal, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502

Submitted: 15-04-2022

Accepted: 30-04-2022

ABSTRACT

Blush is a type of decorative cosmetic used to give color in the cheek area so that the face looks prettier, fresh and dimensional. Currently there are many blushes in the market that contain hazardous chemicals. The blushes made from herbal extracts are used as safer dye alternative. There are three types of blushing formulations such as, loose blush powder, compressed blush powder and cream blush. The choice of type of formulation depends upon the skin type and the personal preferences of the individuals using it. The various skin types as well as formulation and evaluation of blush cream is described in this review paper.

KEY WORDS : blush, cream, emulsion, cosmetics.

I. INTRODUCTION

Research on the consumer buying behaviour towards cosmetic products in 2015 in Pune city showed that of 200 consumers of cosmetic products, 60% preferred to buy organic cosmetics and 42.5% used the cosmetic products for the beauty ^[1]. Similarly, research regarding the consumers behavior towards the cosmetic products in Delhi stated that the factors that motivate consumers to buy the cosmetic products were influenced by the culture and social life of consumers as well as their psychological condition that might be affected by the advertisement, they saw about cosmetic products ^[2].

Cosmetics are any substances or unit doses intended to be applied on the entire exterior part of the human body including teeth and the mucous membranes around the mouth ^[3]. It has been found that 73% consumers used cosmetics as protection to their skin and others used it as fashion (37%) and to attract people (19%). Another reason why

consumers use cosmetics is to treat disease on their skins. Based on their characteristics, the cosmetic powders can be classified into 2 types, namely loose powder, and compact powder. The particle size of the compact powder is generally greater than that of the loose powder. The dust cloud may be formed during the handling or the use of loose powder so that the safe inhalation should be anticipated. The compact powder is expected to be safer than loose powder, due to the compressed format and the more practical application to the skin.^[4]



Fig:1 cosmetic product

Despite having no legal value, the term cosmeceutical is commonly used to define cosmetic products with active ingredients promoting drug-like benefits. Thus, a cosmeceutical has in their composition ingredients with medicinal properties that manifest beneficial topical actions and provide protection against degenerative skin conditions. ^[5] They improve appearance by delivering nutrients necessary for healthy skin. They are able to improve skin tone, texture and radiance while reduce wrinkles. Cosmeceuticals are the fast-growing segment of the

natural personal care industry.^[6]

Cosmetics (shown in figure 1) and skin care products are the part of everyday grooming. Protecting and preserving the skin is essential to good health. Our skin, the largest organ in the body, separates, and protects the internal environment from the external one. Environmental elements, air pollution, exposure to solar radiation as well as normal aging process cause cumulative damage to building blocks of skin - DNA, collagen, and cell membranes.

Use of cosmetics or beauty products will not cause the skin to change or heal; these products are just meant to cover and beautify. Cosmeceuticals being cosmetic products having medicinal or drug-like benefits are able to affect the biological functioning of skin owing to type of functional ingredients they contain. There are skin-care products that go beyond coloring and adorning the skin. These products improve the functioning/texture of the skin by encouraging collagen growth by combating harmful effects of free radicals, thus maintaining keratin structure in good condition and making the skin healthier^[7]. Cosmeceutically active ingredients are constantly being developed by big and small corporations engaged in pharmaceuticals, biotechnology, natural products, and cosmetics, while advances in the field and knowledge of skin biology and pharmacology have facilitated the cosmetic industry's development of novel active compounds more rapidly. Desirable features of cosmeceutical agents are efficacy, safety, formulation stability, novelty, and patent protection, metabolism within skin and inexpensive manufacture.^[8]

THE SKIN

The skin is the body's largest organ, made of water, protein, fats and minerals. It protects the body from germs and regulates body temperature. Nerves in the skin help to feel sensations like hot and cold. The skin, along with hair, nails, oil glands and sweat glands, is part of the integumentary system. "Integumentary" means a body's outer covering. The skin is shown in figure 2

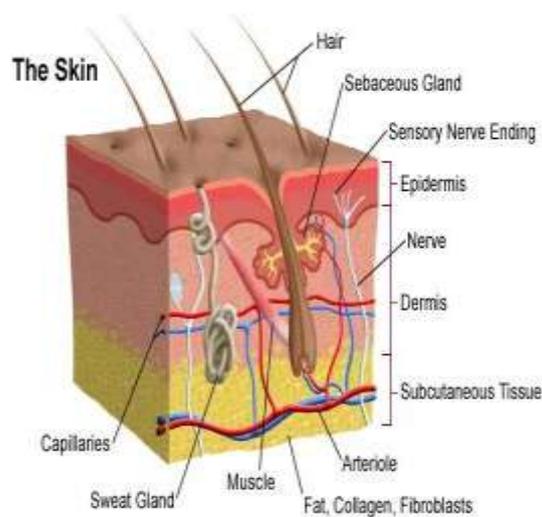


Fig:2 the skin

The skin's main layers include the epidermis, dermis and hypodermis and is prone to many problems, including skin cancer, acne, wrinkles and rashes.

- Epidermis, the top layer.
- Dermis, the middle layer.
- Hypodermis, the bottom or fatty layer.

EPIDERMIS

It is the top layer of the skin that can be seen and touch. Keratin, a protein inside skin cells, makes up the skin cells and, along with other proteins, sticks together to form this layer.^[9] The epidermis is shown in figure 3:

- Acts as a protective barrier:
The epidermis prevents bacteria and germs from entering the body and bloodstream and causing infections. It also protects against rain, sun and other elements.
- Makes new skin:
The epidermis continually makes new skin cells. These new cells replace the approximately 40,000 old skin cells that the body sheds every day. One has new skin every 30 days.
- Protects the body:
Langerhans cells in the epidermis are part of the body's immune system. They help fight off germs and infections.
- Provides skin color:
The epidermis contains melanin, the pigment that gives skin its color. The amount of melanin determines the color of your skin, hair and eyes. People who make more melanin have darker skin and may tan more quickly.

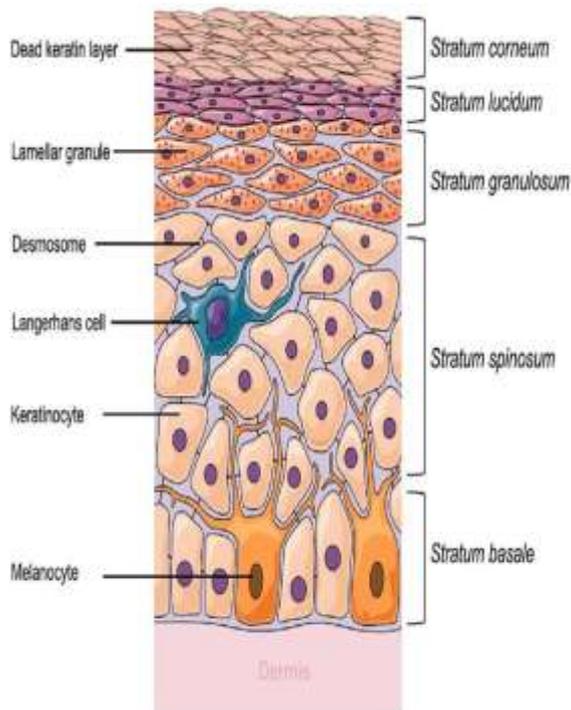


Fig:3 the epidermis

DERMIS

The dermis makes up 90% of skin's thickness. This middle layer of skin is shown in figure 4 and also aids in the following

- Has collagen and elastin: Collagen is a protein that makes skin cells strong and resilient. Another protein found in the dermis, elastin, keeps skin flexible. It also helps stretched skin regain its shape.
- Grows hair: The roots of hair follicles attach to the dermis.
- Keeps in touch: Nerves in the dermis sense when something is too hot to touch, itchy or super soft. These nerve receptors also help to feel pain.
- Makes oil: Oil glands in the dermis help keep the skin soft and smooth. Oil also prevents the skin from absorbing too much water while swimming or get caught in a rainstorm.
- Produces sweat: Sweat glands in the dermis release sweat through skin pores. Sweat helps regulate body temperature.
- Supplies blood: Blood vessels in the dermis provide nutrients to the epidermis, keeping the skin layers healthy.

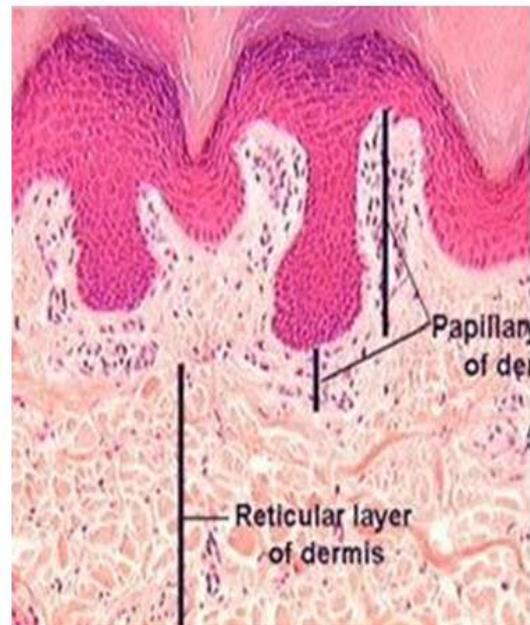


Fig:4 the dermis

HYPODERMIS

The bottom layer of skin, or hypodermis, is the fatty layer.

Cushions muscles and bones: Fat in the hypodermis protects muscles and bones from injuries when in a fall or in an accident.

- Has connective tissue: This tissue connects layers of skin to muscles and bones.
- Helps the nerves and blood vessels: Nerves and blood vessels in the dermis (middle layer) get larger in the hypodermis. These nerves and blood vessels branch out to connect the hypodermis to the rest of the body.
- Regulates body temperature: Fat in the hypodermis keeps one from getting too cold or hot.[9]

CREAMS

Creams are the topical preparations which can be applied on the skin. Creams are defined as "viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type" dosage forms which consistency varies by oil and water. Creams are used for cosmetic purposes such as cleansing, beautifying, improving appearances, protective or for therapeutic function. These topical formulations are used for the localized effect for the delivery of the drug into the underlying layer of the skin or the mucous membrane. These products are designed to be used topically for the better site-specific delivery of the drug into the skin for skin disorders.

Creams are considered as a pharmaceutical product as they are prepared based on techniques developed in the pharmaceutical industry; unmedicated and medicated creams are highly used for the treatment of various skin conditions or dermatoses.^[10] Creams can be ayurvedic, herbal or allopathic which are used by people according to their needs for their skin conditions. They contain one or more drugs substances dissolved or dispersed in a suitable base. Creams may be classified as o/w or w/o type of emulsion on the basis of phases. The term 'cream' has been traditionally applied to semisolid formulated as either water-in-oil (e.g.: cold cream) or oil-in-water (e.g.: vanishing cream).



Fig :5 Cream

TYPES OF SKIN CREAMS

They are divided into two types:

Oil-in-Water (O/W) creams which are composed of small droplets of oil dispersed in a continuous phase, and an emulsion in which the oil is dispersed as droplets throughout the aqueous phase is termed an oil-in-water (O/W) emulsion.

Water-in-Oil (W/O) creams which are composed of small droplets of water dispersed in a continuous oily phase. When water is the dispersed phase and an oil the dispersion medium, the emulsion is of the water-in-oil (W/O) type.^[11]

CLASSIFICATION OF CREAMS

All the skin creams can be classified on different basis:

1. According to function, e.g. cleansing, foundation, massage, etc.
2. According to characteristics properties, e.g. cold creams, vanishing creams, etc.
3. According to the nature or type of emulsion.

Types of creams according to function, characteristic properties and type of emulsion: 1 Make-up cream (o/w emulsion): a) Vanishing creams. b) Foundation creams.

2. Cleansing cream, cleansing milk, cleansing lotion (w/o emulsion)
3. Winter cream (w/o emulsion): a) Cold cream or moisturizing creams.
4. All-purpose cream and general creams.
5. Night cream and massage creams.
6. Skin protective cream.
7. Hand and body creams

1. Make-up creams are mainly o/w type of emulsion. It is cream-based product which leaves a smooth hydrated finish (either stain matte or luminous) on the skin. It nourishes skin and is basically sweat-resistant and creates a dewy sheen.

- Vanishing creams: They are called vanishing creams because they seem to disappear when rubbed onto the skin. These formulations are based on stearic acid. After application, the cream leaves a dry but tacky residual film which also has a drying effect on the skin. Because of this reason, these are used particularly in hot climates which cause perspiration on the skin.
- Foundation creams: These creams serve as a foundation base for make-up. It acts as an adherent base for application of make-up powders. They provide emollient action and a protective action against environment to the skin which is neither too greasy nor too dry. It is multicolored make up applied on the face to create an even, uniform color similar to the complexion, to cover flaws and to change the skin tones.^[12]

2. Cleansing creams are used for body cleaning purposes and it is used for personal hygiene and beautification which is important for cosmetics. Cleansing creams or lotions can be used for the removal of make-up, surface grim, oil mainly from the face and neck.

3. Winter creams are w/o type of formulation and in this formulation oil content will be more than water content. These creams are mainly used for chapped and dry skin. Cold cream: It is known as moisturizer or moisturizing cream. Cold cream must have an emollient action. It should produce a cooling sensation in use and

- the oil film on the skin should be nonocclusive.
- All-purpose creams and general creams are used more nowadays than before. These creams are somewhat oily but non-greasy type and can spread on the skin easily.^[13] This can also be used as a night cream, nourishing creams, protective creams for prevention or alleviation of sunburns or for the treatment of roughened skin areas.
 - Night cream or massage creams are mainly used for the nourishing the skin or as a treatment to dry skin. Creams which are generally applied on skin and left for few or several hours over night are mainly known as night creams. Creams which act as an emollient by rubbing the cream on the skin with massage is known as massage cream.
 - Skin protective creams are smooth, thick bodied creams formulated to provide an invisible, uniform protective film barrier to the skin.^[14] It helps to maintain the barrier between the skin and contaminants that may irritate the skin (contact dermatitis and occupational dermatitis). Strengthens the natural properties of the skin and maintains the balance of normal to combination skin.
 - Hand and body creams are one of the first places to show signs of aging. We tend to wash our hand several times a day, stripping off moisture. Applying cream softens and protects the skin and it keeps the skin looks younger. Since the skin on our palms and fingers needs oil to stay supple and to prevent it from chapping and cracking, it is sensible to use hand creams that puts plenty of oil back in. It is used on the hands more than other parts of the body.^[15]
 - Blush creams are the ones used on the cheeks along the cheek bones. They are applied with skill and perfection. The main use of this cream is to beautify and look attractive. They provide a fresh look to the face. They are not too loose or too viscous in nature. They are available in different shades as the preferences to it are different. As blush serves as an inevitable part of the make up process, their demand is rising in the market and thus the expecting properties. The blush cream is shown in the figure 5



fig: 5 Blush cream

GENERAL INGREDIENTS USED IN BLUSH CREAMS

The raw materials which are used in a manufacturing of skin creams include: Water: This is the most important and widely used raw material in any cream formulation. These are the cheapest and easily available. In skin creams, water is used as solvent to dissolve other ingredients of creams. Water, which is free of any toxins, pollutants, microbes, etc. is used in preparation of creams. Water can also form emulsions; it depends upon how much quantity of water is used in the formulation and sometimes referred to as oil-in-water emulsions and sometimes water-in-oil emulsions depending upon the quantities of oil phase and water phase used.

Oil, fates and waxes: Oil, fats and waxes and derivatives their form comprise an essential portion of creams. Waxes act as an emulsifier, fats act as a thickener and oil act as a perfuming agent, preservative, etc. according to its function. Oil may be two types' mineral and glyceride.^[16]

Mineral oil: Mineral oil consists of hydrocarbons derived from petroleum oil. Mineral oil is clear, odorless, and heavily refined oil and it is widely used in cosmetics. Mineral oil rarely causes allergic reactions and it cannot become solid and clog pores of the skin. It is light weight and inexpensive, it helps to reduce water loss from the body and keeps body moisturized. A number of mineral oils are used in cream formulation.

Glyceride oil: Glyceride oil is mostly vegetable oils. Examples of glyceride oils are almond oil, arachis oil, castor oil, coconut oil, olive oil etc.

Vegetable oil: Form a barrier on the surface of the skin and slow down the loss of water, helping to maintain plumpness of skin. Vegetable oils may

also be used to increase the thickness of the lipid or oil portion of cream or personal care products. Almond oil, germ oil, avocado oil, sunflower oil etc.^[17]

Waxes: Which are used in preparation of cream includes beeswax, carnauba wax, ceresin, spermaceti, etc. Waxes are used in cosmetics because it helps to keep an emulsion from separation of oil and liquid components. These waxes also increase the thickness of the lipid portion and sticks on the surface of the skin.^[18]

Fats: Different types of fats are used in the preparation of creams. These materials can be obtained from animals, plants or mineral origin. Glyceride oils and fats may be of animals or vegetable origin. They consist of combinations of higher fatty acids and glycerin. When saponified they form soap, or fatty acid and glycerin, depending upon process used.^[19] The most common of these fatty acids are lauric, margaric, palmitic, stearic, saturated group. Oleic acid is liquid and most popular unsaturated fatty acid. More specially the oil most commonly used in other cosmetics are olive oil, almond oil, sesame oil, peanut oil, coca butter fat, mutton tallow, lard and beef stearine.

Lanolin: It is derived from wool fat of a sheep. Lanolin is of two types- the hydrous lanolin contains between 25%- 30% water. Anhydrous lanolin has point of 38°C-42°C and has a slight odour. These ingredients act as a lubricant on the skin surface, which gives the skin soft and smooth appearance.^[20] Lanolin helps to form emulsion and blends well with other substances used in cosmetic and personal care products.

Colours: Before the development of the modern technology, colours primarily came from substances found in nature such as turmeric, saffron, indigo, etc. After the 19th century, colours were made in the laboratory and were found to be much more stable with greater colouring intensity. They also could be produced without using plants harvested in the wild.^[21]

Emollients: Emollients, also commonly referred to as moisturizers, are products that help to soften skin or to treat skin that has become dry. Most emollients are forms of oil or grease, such as mineral oil, squalene, and lanolin. They work by increasing the ability of the skin to hold water, providing the skin

with a layer of oil to prevent water loss, and lubricating the skin.

Humectants: These are important multi-functional ingredients found in most skin care formulations. Humectants are hygroscopic organic compounds. These are the materials that can absorb or retain moisture.^[22] These has many benefits such as moisturization, exfoliation, etc. Examples of humectant are glycerin, Hydroxyethyl urea, betaine, sodium PCA, Sodium-Lactate, etc.

Perfumes: Perfume is a substance that imparts a scent or order, including a sweet and pleasant smell. Examples of natural perfumes used in creams are-

- White Blossoms:
- Rosy Dreams
- Orange Blossom.

Vitamins: Vitamins plays an important role in maintaining the physiological function of whole body and the skin. Vitamin A, B, C, E etc. are generally used in formulation of the creams.

Preservatives: The use of preservatives in cosmetics is essential to prevent alteration caused by microorganism and contamination during formulation, shipment, storage and consumer use.

Antioxidants can also be used to protect alteration caused by exposure to oxygen. Synthetic preservatives when used in low concentration effectively preserve the products.^[23]

METHODS OF PREPARATION OF BLUSH CREAMS

- Preparation of o/w emulsion cream

The oil soluble components and the emulsifier are taken in one beaker and melted in a water bath at 75°C. And in other beaker water, preservatives and watersoluble components are taken and melted at 75°C. After heating, the oil phase was taken in a mortar and pestle and slowly the water phase was added and triturated till clicking sound was heard. Finally, when the temperature cools down, perfuming agents and/or preservatives are added. In this preparation, water content will be more than the oil

- Preparation of w/o emulsion creams

The oil soluble components and the emulsifier are taken in one beaker and melted at 75°C. And in another beaker water and water-

soluble components are taken and melted at 75°C. After melting, water phase is taken in mortar and pestle and slowly oil phase was added and triturated till clicking sound was heard. And when the temperature of the cream will get cooled, then the perfuming agent are added. In this preparation, water phase will be less and oil phase will be more.^[24]

EVALUATION PARAMETERS OF CREAMS:

1. Determination of pH:

The pH of the cream can be measured on a standard digital pH meter at room temperature by taking adequate amount of the formulation diluted with a suitable solvent in a suitable beaker.

2. Physical appearance:

The physical appearance of the cream can be observed by its colour, roughness and graded.

3. Spreadability:

Adequate amount of sample is taken between two glass slides and a weight of 100gm is applied on the slides for 5 minutes.

Spreadability can be expressed as, $S = m \cdot l / t$

Where,

m = weight applied to upper slide. l = length moved on the glass slide. t = time taken

4. Saponification value:

2gm of substance refluxed with 25ml of 0.5 N alcoholic KOH for 30min, to this 1ml of phenolphthalein added and titrated immediately, with 0.5N HCl, note the reading as 'a'. Repeat the operation omitting the substance being examined. Note the reading as 'b'.

Saponification value = $(b-a) \cdot 28.05 / w$ Where,
 w = weight of substance in gram

5. Acid value:

10gm of substance is dissolved in accurately weighed 50ml mixture of equal volume of alcohol and solvent ether, the flask was connected to reflux condenser and slowly heated, until sample was dissolved completely, to this 1ml of phenolphthalein added and titrated with 0.1N NaOH, until faintly pink colour appears after shaking for 30 seconds.

Acid value = $n \cdot 5.61 / w$ Where,

n = the no. of ml of 0.1 N KOH solution. w = the weight of substance in gram

6. Viscosity:

Viscosity of formulated creams can be determined by using Brookfield Viscometer.

7. Homogeneity:

The formulation was tested for the homogeneity by visual appearance and by touch.

8. Removal:

The ease of removal of the creams applied was examined by washing the applied part with tap water.

9. Dye test:

The scarlet dye is mixed with the cream. Place a drop of cream in a slide and cover with a cover slip and examine it under a microscope. If the disperse globule appears red and the ground colourless then it is o/w type and the reverse condition appears in w/o type of creams.

10. After feel:

Emolliency, slipperiness and amount of residue left after the application of fixed amount of cream was checked.

11. Type of smear:

After application of cream, the type of film or smear formed on the skin were checked.

12. Irritancy study:

Mark an area of 1sq.cm on the left-hand dorsal surface. The cream was applied to the specified area and time was noted. Irritancy, erythema, edema was checked, if any, for regular intervals upto 24hrs and reported.

13. Accelerated Stability Study:

Accelerated stability study is conducted for formulation according to ICH guidelines^[25]

II. DISCUSSION

Creams are semisolid formulations widely acceptable by the society. The skin is the most accessible part of the body and as such is also highly vulnerable to injuries. With the progress in the pharmaceutical field and industry, it is assured that pharmaceutical creams will still be an interesting and appealing area of research for years to come. More advanced technologies and methods will be used for preparation, formulation and evaluation of creams in coming years. The demand of cosmetic creams are also increased day by day. The blush creams are easily applicable on to the skin. They must spread evenly on the skin. They are compatible to the skin and does not cause irritation or any other discomforts. They provide and even application on the skin and must not appear sticky. Some people prefer water proof blushes so that they stay longer. A make up remover must be employed for the removal of the same.

III. CONCLUSION

The cosmetics used as protection to the skin and used as fashion and attracts peoples. The blushing powders are used to impart beautifying effect. The cosmetics should follow the trend in the society which enables them to upgrade the quality of the product. Various colours of blush are available in market. The loose powder blush is suitable for the oily, natural, and combinational skin types. The blush cream has advantage of easy to apply and its disadvantage is that it is less stable dosage form. It should impart good colour homogeneity and smooth texture that suits the skin tone.

REFERENCE

- [1]. Anute, N.B., Deshmukh, A., and Khandagale, A., 2015, Consumer buying behavior towards cosmetic products, *IJMSS*, 3 (07), 25–34.
- [2]. Oberoi, P., and Oberoi, P., 2018, Consumer behaviour towards cosmetic products: a case of Delhi NCR, *J. Emerg. Technol. Innov. Res.*, 5 (11), 10–31.
- [3]. National Pharmaceutical Regulatory Agency, 2017, Guidelines for control of cosmetic products in Malaysia, Ministry of Health, Malaysia, 1–13.
- [4]. Sahu T, Patel T , Sahu S, Gidwani B, “Skin Cream as Topical Drug Delivery System: A Review” *Journal of Pharmaceutical and Biological Sciences*, Published by Atom and Cell Publishers, ISSN: 2320-1924
- [5]. Draelos, Z.D. The cosmeceutical realm. *Clin. Dermatol.* **2008**, 26, 627–632. [[Google Scholar](#)] [[CrossRef](#)] [[PubMed](#)]
- [6]. Mukul, S.; Surabhi, K.; Atul, N. Cosmeceuticals for the skin: An overview. *Asian J. Pharm. Clin. Res.* **2011**, 4, 1–6.
- [7]. Grace R. Cosmeceuticals: Functional food for the skin. *Natural Foods Merchandiser* 2002; XXIII:92-9.
- [8]. Duber SD. Natural cosmeceuticals: Driving personal care growth today and tomorrow. *Neutraceuticals World* 2003;6:58-60.
- [9]. James WD, Berger TG, and Elston DM, *Andrews’ Diseases of the Skin: Clinical Dermatology*. (10th ed.) 2006, Philadelphia; Elsevier Saunders: 2006, p. 1.
- [10]. Mohiuddin AK, “Skin Care Creams: Formulation and Use” *American Journal of Dermatological Research and Reviews*, 2019, 2:8
- [11]. Chauhan L, Gupta S, Creams: A Review on Classification, Preparation Methods, Evaluation and its Applications, *Journal of Drug Delivery and Therapeutics*. 2020; 10(5-s):281-289
- [12]. Swarbrick J, Rubino JT, Rubino OP. Chapter 22. Coarse Dispersions. In: Remington: The Science and Practice of Pharmacy Volume 1, edited by David B. Troy, Paul Beringer, published by Lippincott Williams & Wilkins, 2006
- [13]. Chapter 11. Semi-solid dosage forms. In: Alekha Dash, Somnath Singh, Justin Tolman. *Pharmaceutics: Basic Principles and Application to Pharmacy Practice*, published by Academic Press
- [14]. Mosquera Tayupanta, T.Á., Espadero, M., Mancheno, M., Peña, S., Uguña, A., Álvarez, S., and Vega, M.A., 2018, Sensory analysis of cosmetic formulations made with essential oils of *Aristeguietia glutinosa* (matico) and *Ocotea quixos* (ishpingo), *Int. J. Phytocos. Nat. Ingrid.*, 5, 5.
- [15]. Barroso, M.R.; Barros, L.; Dueñas, M.; Carvalho, A.M.; Santos-Buelga, C.; Fernandes, I.P.; Barreiro, M.F.; Ferreira, I.C.F.R. Exploring the antioxidant potential of *Helichrysum stoechas* (L.) moench phenolic compounds for cosmetic applications: Chemical characterization, microencapsulation and incorporation into a moisturizer. *Ind. Crops Prod.* 2014, 53, 330–336.
- [16]. Fiume, M.M.; Bergfeld, W.F.; Belsito, D.V.; Hill, R.A.; Klaassen, C.D.; Liebler, D.C.; Shank, R.C.; Marks, J.G., Jr.; Slaga, T.J.; Slaga, T.J.; et al. Safety assessment of *Vitis vinifera* (Grape)- derived ingredients as used in cosmetics. *Int. J. Toxicol.* 2014, 33, 48S–83S.
- [17]. Food and Drug Administration (FDA). Frequency of Use of Cosmetic Ingredients; FDA: Washington, DC, USA, 2012.
- [18]. . Leung, A.T.; Foste, S. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs and Cosmetics*; Wiley: New York, USA, 1996.
- [19]. Tejal, P., Nishan, D., Amisha, J., Umesh, G., Desai, K.T., and Bansal, R.K., 2013, Cosmetics and health: Usage, perceptions and awareness, *Bangladesh J. Med. Sci.*, 12 (4), 392–397.
- [20]. Yusuf, M., Shabbir, M., and Mohammad, F., 2017, Natural colorants: Historical, processing and sustainable prospects, *Nat.*



- Prod. Bioprospect., 7 (1), 123–145.
- [21]. Kumar, D., Rajora, G., Parkash, O., Antil, M., and Kumar, V., 2016, Herbal cosmetics: An overview, *Int. J. Adv. Sci. Res.*, 1 (4), 36–41.
- [22]. Arora, R., Aggarwal, G., Dhingra, G.A., and Nagpal, M., 2019, Herbal active ingredients used in skin cosmetics, *Asian J. Pharm. Clin. Res.*, 12 (9), 7–15.
- [23]. Carini, M.; Aldini, G.; Furlanetto, S.; Stefani, R.; Facino, R.M. LC coupled to ion-trap MS for the rapid screening and detection of polyphenol antioxidants from *Helichrysum stoechas*. *J. Pharm. Biomed. Anal.* 2001, 24, 517–526.
- [24]. Aswal A, Kalra M, Rout A, “Preparation and evaluation of polyherbal cosmetic cream” *Der Pharmacia Lettre*, 2013; 5(1):838
- [25]. National Pharmaceutical Regulatory Agency, 2017, Guidelines for control of cosmetic products in Malaysia, Ministry of Health, Malaysia, 1–13.