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Formulation and Evaluation of Cosmetic and Cosmeceutical Products Using a Natural Colourant

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ABSTRACT:-
For the promotion of any product, including food additives, pharmaceuticals, cosmetics, etc., color is essential. It contributes to a product's appeal. Additionally useful in grabbing clients' attention is color. In the past, these goods were colored using synthetic colors. The use of natural colors has been impacted by the harmful and carcinogenic effects of synthetic dyes. The pigments made by microbes and the phytochemicals made by plants are the sources of natural dyes. Natural pigments are currently used in place of synthetic colorants in the cosmetics sector. Natural sources of color have a variety of characteristics, such as anti-cancer qualities.
Certain phytochemicals, like carotenoids, have dual uses as antioxidants and colorants. Therefore, natural colorants are used as nutritious additives that also contribute to better health.

Objective: To develop cosmetic and cosmeceutical like lipbalm and cream.

Purpose: For beautifying skin.

Result: Cosmetics are immediate and fast, while cosmeceutical products give slow but permanent results.

Conclusions: These ideal skin care products that our ultimate skin care review outline include antioxidants
and moisturizers.

Keywords: Cosmetic products, Cosmeceuticals, Pigments, Cactus powder (colourant).

I. INTRODUCTION: -

Cosmetics are products utilized to improve the look of the human body through adornment and beautification. These products are called cosmeceuticals and are a combination of cosmetics and pharmaceuticals designed to improve health and beauty by affecting the skin's natural texture and function. This includes hydrating the skin, fading dark spots and wrinkles, reducing body odor, taking care of dental hygiene, and washing the hair. Cosmetics have been used since 3000 BC. The man used it to protect himself and stay alive by using it as a weapon against animals and enemies. Cosmetics were subsequently used for medicinal reasons. The significant growth in the cosmetics market reflects the increasing popularity among consumers. A variety of products are utilized to enhance the look of the human body. Cosmetics such as lipsticks, lip gloss, rouge, eyeliner, mascara, foundation, concealer, nail paints, hair serum, etc., are utilized for their therapeutic benefits when applied externally on the human body.

COSMETICS WITH BEAUTIFYING PROPERTIES

Lip cosmetics have been used since pre-historical era. The main application being beautification also protection of lips from unfavourable climatic conditions.

Structure & physiology of lips:

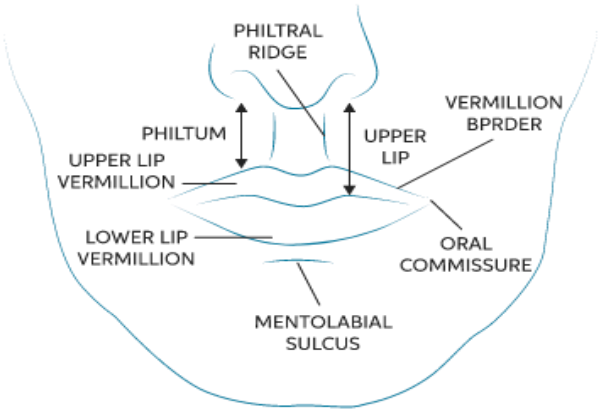

Fig.1. Structure of Lips.

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The mouth is a sucking tool used for eating, displaying emotions, and talking. The structure is composed of the orbicular muscle, skin, and superficial fascia. The border of the lip consists of a parched, crimson mucous covering with vascular papillae and sensory corpuscles. The lip is thinner than facial skin because it has three to four layers of corneum at the top. This happens because there is a lower number of melanin cells in the lips. It causes the blood vessels to become more noticeable, resulting in a pinkish tint on the lips. The lips do not have sweat glands or oil-producing hair follicles. Consequently, they dry more rapidly and develop cracks sooner.

COSMETIC PRODUCTS

Lip balm

Lip balm is a beauty product used on the lips to shield them from the sun and enhance their appearance. This product protects the lips not just from sun damage, but also from cold sores, chapping, and dryness. It is a gender-neutral item designed to shield the lips from harsh environmental conditions. However, since half of the lip balm is ingested, it is important to consider the ingredients used in its production. Therefore, it is better to use natural lip balms. The main objective of lip balm is to keep the lips hydrated and moisturized, as well as shield them from harm, unlike lipstick that has been created for adding color to the lips.

Bases, along with waxes, are used in the production of lip balm, although waxes are used in a smaller amount compared to lipstick. Some of the waxes listed are beeswax, carnauba wax, jojoba wax, and olive wax. Castor oil, coconut oil, palm oil, olive oil, and various other oils are used. Lip balm contains more oil than lipstick. Strawberry, honey, orange, and raspberry are among the flavoring agents used in the manufacturing process. Dyes- Natural colourants like beets, saffron, turmeric, and others are utilized as coloring agents because of their safety.

COSMECUETICALS

Different beauty products are used to produce a healing effect on the skin of humans. An example is creams, a type of skincare product that measures skin moisture levels and protects against dryness. In the modern era of Cosmetics, there has been a development of peel-off masks, undereye patches, and other products to revitalize the skin. It is important to analyze the structure and functioning of the different layers of the skin as they can prevent cosmetic products, such as creams, from penetrating effectively.

Structure and Physiology of Skin:

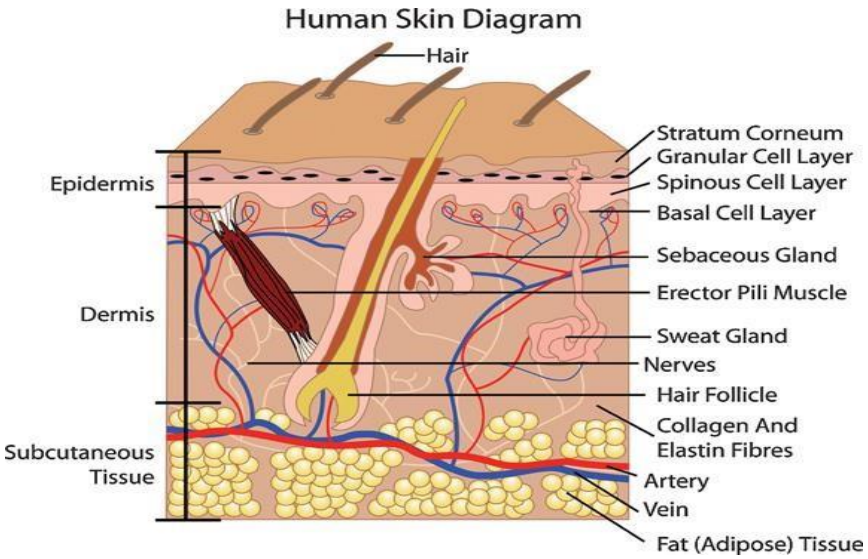

Fig.2. Anatomy of Skin.

The skin, which covers an area of over 2 m2, is the biggest organ in the human body. The three main layers of the skin are the epidermis, dermis, and subcutaneous layers.

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Epidermis:
It's the main layer consisting of stratified keratinized squamous epithelium. The outer layer of the skin is made up of four different types of cells: keratinocytes, melanocytes, Langerhans cells, and Merkel cells. The epidermis is divided into five layers.

Original: The company aims to reduce its carbon footprint by implementing green energy practices. Paraphrased: The company's goal is to decrease its carbon footprint through the adoption of environmentally friendly energy methods.

1.Stratum corneum: Also known as the horny layer, this layer is made up of cells that have been keratinized. This sublayer contains 25-30 tiers of keratinocytes. The epidermis measures 10- 20 micrometres in thickness. This level acts as the main barrier to different solutes. The stratum corneum is composed of strands of keratins and triglycerides enclosed in a cellular membrane, which represents 5% of the stratum corneum's weight.
He decided to take a different route to work in order to avoid traffic. Stratum lucidum is a slender, see-through layer located in the fingertips, palms, and soles, lying beneath the stratum corneum. Paraphrase the following text using the same input language and keep the same amount of words: 3.Stratum granulosum is the middle layer of the epidermis, found below the stratum lucidum. Spindle-shaped cells contain keratohyalin granules abundant in cysteine and histidine.

1. Stratum spinosum: The stratum spinosum is composed of 8-10 layers of flattened cells that resemble polygons. This layer indicates the existence of Langerhans and melanocyte cells
2. Stratum germinativum: Just below spinosum is the Stratum germinativum, which is the core layer. This layer's basal cells are non-nucleated and columnar. The cells in this layer proliferate and thus replenish the epidermis, keeping the skin healthy.
Dermis:
The dermis, located beneath the epidermis, is a thin layer that provides nutrients and immunity to the epidermis. This layer controls temperature, pressure, and pain. The thickness of the dermis ranges from 0.1 to 0.5 cm and is composed of collagen fibers. It is made up of flexible connective tissue and fibroblast cells that create collagen, laminin, fibronectin, and vitronectin. Collagen is responsible for the elasticity of the skin. This layer contains blood vessels, nerve glands, and hair follicles that are inserted.

Subcutaneous:
It is also referred to as the subcutaneous layer and is situated at the bottom of the skin. This stratum consists of adipose and areolar tissues, indicating that it serves as an energy reservoir. It also includes lamellated corpuscles that sense pressure. Therefore, the skin plays a vital role in shielding us from the elements and fluctuations in temperature. The function is collectively supported by the layers. It contains glands that produce sweat and oil to maintain skin health and prevent dehydration.

PIGMENTS USED IN COSMETICS
It has been observed that natural colorants derived from herbs are frequently preferred in cosmetics. One example is the red pigment from lycopene in red carrots.

Carotenoids are accountable for the hues present in vegetables. Intense light and lipid oxidation lead to the generation of free radicals and reactive oxygen species (ROS) in plants. Carotenoids' ability to scavenge radicals protects plants from harm. The importance of carotenoids in positively impacting human health conditions is unquestionable, leading to thorough research on the subject.

Since humans cannot produce carotenoids on their own, they need to obtain them from dietary sources. Even though there are many carotenoids produced by nature, only around 30 are found in significant levels in humans and animals' blood and tissues . Natural plant-derived dyes are significant because of their abundant presence in raw biomass.

Blue dyes, also called the "king of natural dyes," are sourced from the leaves of "indigoferatinctoria." Additional plant-derived sources include woad, pala indigo, among others. Indian red dye is a mordant dye that creates vibrant color interactions with metal ions. Cartamin, a water insoluble component, can be obtained from safflower florets to create a vibrant cherry red dye. Turmeric roots are utilized in creating a golden dye for coloring silk, cotton, and hair. The golden yellow color of saffron is attributed to Crocin, a pigment present in it.

II. AIM AND OBJECTIVE

AIM: To formulate cosmetics products using natural colourant CX2.

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OBJECTIVES:

- To develop colourcosmetic like lip balm for beautification .
- To develop cosmeceuticals like cream.
- To evaluate the physical parameters of the prepared cosmetic products.

PLANTPROFILE

- **Cactus Fruit** (Colorant)
- Scientific Name :- Opuntia humifusa
- Family :- Cactaceae
- Chemical Composition :- Carbohydrate, crude fiber,ash,crude protein and moisture content

Fig3: Cactus Fruit

Fig4: Cactus Fruit Powder

III. MATERIALS AND METHODS

MATERIALS:

- CX2 was obtained as a gift sample from Biogenero Labs.
- castor oil, beeswax, tocopheryl acetate, olive oil,coconut oil, orange oil, stearic acid, potassium hydroxide, methylparaben, propylparaben, glycerine, ethanol and water were procured from AnalabFinechem.

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EQUIPMENTS:

Table.1. List of Equipment.

Sr. No.	Instrument	Make	Model No.
1.	Analytical electronic balance	Phoenix	------
2.	Homogeniser	Remi Electrotechnik Ltd	RQT-127AD
3.	Mechanical stirrer	Remi Motors Ltd	------
4.	Electric thermostatic water bath	Biotechnics India	BTI-19

EXPERIMENTAL WORK:
Formulation of lipbalm

Method of Preparation:
1. The weighed waxes and oils were heated in a porcelain dish .
2. Small quantity of oil was used to prepare a uniform dispersion of CX2 by trituration
3. The colourant dispersion was added to the molten base in the porcelain dish under stirring.
4.The obtained molten mixture was then transferred to a container and was allowed to cool.

Table.2. Trials of lip balm formulations.

Sr. No.	Ingredients (%w/w)	F1 (%)	F2 (%)
1.	Beeswax	15	25
2.	Coconut oil	30	20
3.	Olive oil	20	20
4.	Castor oil	20	25
5.	Raspberry	q.s.	-
6.	Orange oil	-	q.s.
7.	Tocopheryl acetate	-	0.5
8.	Amaranth	q.s.	-
9.	CX2	-	0.1

Evaluation Tests:

1.Organoleptic properties:
The formulation was checked for appearance, colour and odour

2.After feel test:
This test was performed to check the feel after applying the formulation on the skin.

3.Spreadability:
The formulation was checked for spreading efficacy.

Formulation of Cream:
Method of preparation:

1. Oil phase i.e. stearic acid and propylparaben were weighed and transferred to a beaker.
The beaker was then placed in a water bath and was heated to 75^0 C.
2. The aqueous phase consisting of potassium hydroxide, methylparaben and water was weighed and
added to another beaker. The contents were melted by subjecting it to a water bath at a temperature of 70^0 C.

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3. The aqueous phase was then added to the oil phase and was stirred continuously for about an hour
using a mechanical stirrer to break all particles.

4. Further, prepared mixture was subjected to homogenization for another 30 minutes using
a homogenizer.

5. The cream thus formed was stored in a container and kept in a cool and dry place.

Table.3. Trials of cream formulation.

Sr. No.	Ingredients (%w/w)	F1 (%)	F2 (%)
1.	Stearic acid	17	10
2.	KOH	0.7	0.7
3.	Methyl paraben	0.18	0.18
4.	Propylparaben	0.02	0.02
5.	PEG 600	0.5	0.5
8.	Purified water	81.6	88.35
7.	CX2	-	0.25

Evaluation Tests:

1. Organoleptic properties:

The formulation was checked for colour, odour, and appearance.

2. Spreadability:

The formulation was checked for spreading efficacy.

3. After feel test:

This test was performed to check the feel after applying the formulation on Skin.

IV. RESULT

Table.4.

Result of Evaluation Test for Lip Balm				
Formulations	**Evaluation Parameters**			
	Colour	**Appearance**	**Odour**	**Spreadability**
F1	Dark Pink	Good	Raspberry- like	Good
F2	Dark Pink	Good	Orange- like	Good

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Fig.5. Lip Balm

Table No.5.

Result of Evaluation Test for Cream					
Formulations	**Evaluation Parameters**				
	Colour	**Appearance**	**Odour**	**Spreadability**	**After Feel Effect**
F1	Cream	Good	Cactus Like	Good	Smooth
F2	Cream	Good	Cactus Like	Moderate	Smooth

Fig.6. Cream

V. SUMMARY AND CONCLUSION

The cosmeceutical industry is experiencing rapid growth and is expected to continue growing significantly in the coming years. The growth of the cosmetics industry has also benefited the development of other fields, like nanotechnology. In 2001, Global Cosmetic Industry Magazine estimated the value of the US cosmeceutical market to be US$2.8 billion. There was an anticipation of a yearly increase of 7.4% for appearance enhancing products until 2012. Recent developments in the cosmeceutical sector focus on protecting the skin from radiation and oxidative harm, prioritizing gentle ingredients to enhance skin appearance.

The cosmetic and cosmeceutical sectors commonly use synthetic colorants because they are affordable, readily accessible, and have good durability. Several studies have shown that the use of synthetic colorants in cosmetics has adverse effects on human health. Conversely, natural colorants pose no risk to health as they are non-

toxic, non-carcinogenic, and non-hazardous. Plant-based colorant industrial waste is converted into a suitable fertilizer for agricultural purposes, making it environmentally friendly. Therefore, this led to the necessity of utilizing pigments obtained from organic origins.

Lip balm was made with the waxes and oils. The lip balm had a higher oil content. The smooth texture and good spreadability of a lip balm with beeswax, carnauba wax, lanolin, coconut oil, olive oil, and castor oil was achieved with the F2 formulation.

Cream was designated as a healing beauty product with the incorporation of CX2 as the key component. An oil-in-water emulsion cream (also known as vanishing cream) was created by combining the water phase containing potassium hydroxide with the oil phase containing stearic acid. The F2 cream showed good evenness and spreadability. When put on, it created a see-through layer.

skin. - dermis This formulation now contains CX2, which enhances its antioxidant properties to target dark spots and wrinkles.

Conclusion:

CX2 was used as a coloring ingredient in cosmetics such as lip balm. CX2 gave a pleasing orange red color to all the prepared mixtures and improved their attractiveness. CX2 is included in creams as an active ingredient, with the goal of improving skin pigmentation.

REFERENCES:

[1]. Bijauliya, Rohit Kumar. "A COMPREHENSIVE REVIEW ON HERBAL COSMETICS." International Journal of Pharmaceutical Science and Research 8, no. 12 December 1, 2017: 20.

[2]. Vadaga, Anilkumar. "A Review on Herbal Lipsticks." Journal of Pharmaceutical Advanced Research, April 30, 2021: 13.

[3]. Kokil, Suruchi, et al. " Review on Natural Lip." International Journal of Research in Cosmetic Science, August 03, 2014: 8 .

[4]. W. Steiling, J.F. Almeida, H. Assaf Vandecasteele, S. Gilpin, T. Kawamoto, L. O'Keeffe, G. Pappa, K. Rettinger, H. Rothe, A.M. Bowden, "Principles for the safety evaluation of cosmetic powders," Toxicology Letters, Volume 297, 2018: 8-18.

[5]. Riley, P., "Decorative cosmetics." Poucher's Perfumes, Cosmetics and Soaps, 10th Edition, 2000:167-216.

[6]. Chauhan, L. and Gupta, S. "A Review on Classification, Preparation Methods, Evaluation and its Applications." Journal of Drug Delivery and Therapeutics, 2020, 10(5-s): 281-289.

[7]. Isler, O., Rüegg, R. and Schwieter, U.. "Carotenoids as food colourants" Pure and Applied Chemistry, vol.14,no. 2, 1967: 245-264.

[8]. Brudzyńska P, Sionkowska A, Grisel M. "Plant-Derived Colorants for Food, Cosmetic and Textile Industries: A Review." Materials. 2021; 14(13):3484.

[9]. Nahhas, A., Abdel- Malek, Z., Kohli, I., Braunberger, T., Lim, H. and Hamzavi, I., "The potential role of antioxidants in mitigating skin hyperpigmentation resulting from ultraviolet and visible light- induced oxidative stress." Photodermatology, Photoimmunology& Photomedicine, 2018, 35(6): 420-428.

[10]. Stoll, L., Rech, R., Flôres, S., Nachtigall, S. and de Oliveira Rios, A.,"Carotenoids extracts as natural colorants in poly(lactic acid) films." Journal of Applied Polymer Science, 2018, 135(33):46585.