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FORMUALTION AND EVALUATION OF HERBAL BODY LOTION FOR COSMETIC APPLICATION

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ABSTRACT

Protective layers of skin cover the body. Plant-based herbal body lotion soothes and moisturises. Treatments commonly include succulent aloe vera, which heals, reduces pain, and moisturises. For hundreds of years, it has healed skin burns and injuries. This study focuses on the formulation and evaluation of a herbal body lotion utilizing natural ingredients known for their skin-nourishing properties. The formulation process involved selecting botanical extracts and essential oils renowned for their moisturizing, soothing, and antioxidant benefits. Various concentrations of these ingredients were incorporated to achieve an optimal balance of efficacy and sensory appeal. The evaluation of the herbal body lotion included several parameters such as viscosity, spread ability, skin hydration, and stability. Additionally, sensory attributes like fragrance, color, and overall texture were assessed to ensure consumer acceptance and satisfaction. Furthermore, compatibility tests were conducted to determine the compatibility of the formulation with different skin types.

KEYWORD: Herbal body lotion, aloe-vera, honey, skin, glycerin, pharmaceutical assessment etc.

INTRODUCTION

Cosmetic, any of several preparations (excluding soap) that are applied to the human body for beautifying, preserving, or altering the appearance or for cleansing, colouring, conditioning, or protecting the skin, hair, nails, lips, eyes, or teeth. The earliest cosmetics known to archaeologists were in use in Egypt in the fourth millennium BC, as evidenced by the remains of arti facts probably used for eye makeup and for the application of scented unguents. By the start of the Christian era, cosmetics were in wide use in the Roman Empire. Kohl (a preparation based on lampblack or antimony) was used to darken the eyelashes and eye brows and to outline the yields. Rouge was used to redden the cheeks, and various white powders were employed to simulate or heighten fairness of complexion. Bath oils were widely used, and various abrasives were employed as dentifrices. The perfumes then in use were based on floral and herbal scents held by natural resins as fixatives.[1]

Cosmetic products are widely used and are directly applied to human skin. While the skin provides a protective barrier, certain ingredients may penetrate the skin and become systemically available. Some cosmetic products are applied to mucous membranes which may enhance availability or, in the case of lip products, provide the opportunity for oral ingestion. As such, an evaluation of their safety is of utmost importance. Safety assessment requires knowledge of both the intrinsic hazard of ingredients contained in the product as well as data on exposure levels. Published or otherwise readily available exposure data for cosmetic products are limited at present. The present study was undertaken to help fill that data gap. The study was designed to generate robust exposure data that could reliably be used in evaluating the safety of cosmetic ingredients. The key objective of the research was to determine distribution of product usage by consumers in terms of frequency and amount and patterns of consumption for each of three commonly used cosmetic products. The three products chosen for the study were lipstick, body lotion and facial cream. The data will be of value in the formulation of cosmetic products, and to regulatory agencies concerned with the safety of cosmetic ingredients. The information will also be useful to the Cosmetic Ingredient Review Expert Panel, an industry-sponsored independent group of experts who conduct reviews of cosmetic ingredient safety.[2]

The beauty and skincare sector had to reinvent itself to respond quickly to the new needs and requests of an unpredictable and attentive market. The most significant challenge was to find a point balance between the

"natural" and the "cosmetic product's chemistry". Some certainties emerge regarding trends and related sectors in this fluid context, showing positive signs of recovery.[3]

A cosmetic can be considered "green" if its formulation contains active ingredients derived from plants, such as minerals and plants, and not analogous active ingredients chemically reproduced in the laboratory. It is better if it is produced in an eco-sustainable way through processing methods that respect nature and plants according to organic crops. It is advisable to cultivate these cosmetics at zero km or on land near the production laboratories or travel with sustainable means of transport to reduce the environmental impact. Not all green products are the same. It is necessary to distinguish between natural ingredients, natural origin, and organic ingredients. Natural ingredients are chemical substances that are unprocessed or processed by mechanical, manual, naturally derived solvent, or gravitational means, dissolution in water, heating tore move water, extracted from the air by any means. Naturally derived ingredient are substances from the vegetable, mineral, or animal kingdom, chemically processed, or combined with other ingredients, excluding petroleum and fossil fuel-derived ingredients, ingredients derived from a plant feedstock, and bio-manufactured using saponification, fermentation, condensation, or esterification to enhance performance or make the ingredient sustainable. According to the USDA National Organic Program (NOP) guidelines, organic ingredients are substances obtained by mechanical, physical, or biologically based farming methods to the fullest extent possible.[4] Well, chaos reigns over natural cosmetics in the USA and Europe, because currently there is still no official regulation that has a precise definition on how to apply the words "organic" and "natural" to cosmetic products. The United States Department of Agriculture regulates "organic". The National Organic Program (NOP), a part of USDA's Agricultural Marketing Service, certified organic products. Therefore, only cosmetics that contain or are made up of agricultural ingredients and can meet the USDA/NOP organic production may be certified under the NO Pregulations.[2] Four categories can be applied to certified organic products, including certified organic cosmetics: 100 percent organic (they are produced with 100% ingredients certified organic); organic (they can contain up to a maximum of 5% of non-organic products, excluding water and salt); "made with" (they are produced with least 70% ingredients certified organic, excluding water and salt); and specific organic ingredients (they contain a combination of organic and non-organic substances).[3] In Europe, this market is regulated by the ISO (International Organization for Standardization) issued ISO 16128 (November 2016), a new set of guidelines for any product on the European market that claims to be natural/organic, the E.U. Regulations EC 1223/2009 and EU 655/2013, which requires that every declaration on a label must be supported by adequate and verifiable evidence. In recent years, new trends have been created in the field of green cosmetics: nutricosmetics, a food supplement to use for hair, skin, and nails to obtain beauty from within. Nutricosmetic products, or so-called "beauty supplements", result from the scientific work of three research areas: food, pharmaceuticals, and personal care. They are soft or hard gels, capsules, tablets, syrups, gummies, or sachets containing a concentrated source of hyaluronic acid, minerals, vitamins, or botanical extracts, able to improve personal care. There is no specific regulatory framework addressing nutricosmetics at the EU and USA levels. However, the rules on food supplements govern beauty supplements. In this work, the food matrix of cosmetic relevance, bioactive molecules usable in cosmetic formulations, eco-friendly technology to produce bioactive cosmetic ingredients, and the analytical techniques helpful in purifying and dosing the active ingredients in vegetable and animal matrices, are revised. We aim to shed light on the nutricosmetic market waiting for a specific regulation for green cosmetics to help consumers make informed choices. This work is based on information obtained with the assistance of the Science Direct database and using keywords that refer to methods of pretreatment and the analysis of metals in cosmetic products. About eighty articles were evaluated in this search and the results of forty-four of them are presented.[5] In the international literature over the last twenty years, a significant number of articles have been presented that refer to methods of analysis of cosmetic products. have cited in their respective review articles a series of analytical methods for the different categories of compounds, i.e., preservatives, antioxidants, perfumes, and phthalates, found in a cosmetic product including heavy metals. This report focuses on providing an overview of the methods of pretreatment of cosmetic samples with the sole aim of identifying the heavy metals in them. Metals have been found as contaminants in a range of cosmetic products, including eye shadow, whitening toothpaste, nail polish, sunscreen, foundation, lipstick, and hair color.[6] Heavy metals that pollute the natural environment are absorbed by plants and may exist in seed oils and other parts of the plants that are to be used as raw materials of cosmetics products. While some metals are contaminants due to the route of the chemical synthesis of cosmetic ingredients, others serve as additives or colorants because of their specific properties. For instance, titanium dioxide has been used in the cosmetics industry as a " white pigment" and a "sun screen agent". Chromium (III) is used in a very small number of products as a colorant, and iron oxides are common colorants in eye shadows and blushes. Some aluminium compounds are colorants in lip glosses, lipsticks, and nail polishes. Some color additives may be contaminated by heavy metals, such as D&C Red 6, which can be contaminated by arsenic, lead, and mercury. Annex II of the Cosmetics Regulation (EC) No 1223/2009 lists the heavy metals and their derivatives that are prohibited, while Annexes III, IV, V, and VI list the metals that can be used at a maximum concentration in the cosmetic products. Three of the most reliable methods for the detection and analytical control of heavy

metal sare Flame Atomic Absorption Spectroscopy (FAAS), Graphite Furnace Atomic Absorption Spectroscopy (GFAAS), and Inductively Coupled Plasma-Optical Emission Spectrometry (ICP- OES).[7] The advantages of the a forementioned analytical methods include speed, good repeatability, and automatization. Before applying the appropriate analytical method, the cosmetic product undergoes some necessary pretreatments in order to release the heavy metals from the excipients and convert them to a high oxidizing state. Therefore, some processing methodologies have been developed for the isolation of heavy metals from cosmetic products prior to spectroscopic analysis. In this way, an increase in the solubility of metals in aqueous solutions can be achieved and these metals can be measured by atomic spectroscopy (AS). The number of samples plays a role in the success and reliability of the selected method of chemical analysis. The homogeneity of the sample is also critical. Heterogeneous samples of cosmetic products, e.g., emulsions and microemulsions (lyophilic colloids), have to be homogenized before the application of the analytical method. After sampling or homogenization if it is needed, an appropriate amount of sample is obtained and subjected to a solubilization process. The solubilization process to be followed depends on the type of component to be determined.

For the solubilization of in organic compounds such as minerals and trace elements, various procedures are selected. The most applicable methods are dry digestion, wet digestion, solid phase micro extraction, and chelation solvent extraction Based on the above, the aim of this review is to present and classify the methods for the pretreatment of cosmetic products with regard to heavy metals as well as to describe new pretreatment methods.

The new methods and combinations of older and more recent methods are usually faster, more reliable, and of a lower cost.[8]

BODY LOTION

The skin is an organ system that covers the entire human body which has a function as body protection against exposure to foreign objects, so skin health needs to be maintained and protected. The skin is said to be damaged if it has signs in the form of wrinkles, cracks, dryness, dullness, and scaly. Skin damage can be caused by free radicals. A free radical is a molecule that is relatively unstable with the atom in its outer orbit having one or more unpaired electrons. Free radicals become stable when they bind to electrons from other molecules. Antioxidants are chemical compounds that can provide electrons for free radicals, so free radicals cannot cause skin damage because they are successfully suppressed. Humans do not produce more anti-oxidants for reserves in their bodies, so if there is excessive exposure to radicals, the body needs antioxidants obtained from outside the body. Kacip Fatimah or Labisia pumila is a traditional herbal medicine that has been used by many generations of Malay women to facilitate childbirth and as a postpartum medicine. Kacip Fatimah is also commercially available as a health supplement that is claimed to prevent and treat diseases, especially those related to the stability of female hormones. Many studies have been conducted to identify bioactive or Phyto chemical compounds in Kacip Fatimah that have pharmacological activities. The antioxidant content in Kacip Fatimah is believed to play an important role in protecting against several diseases and delaying the aging process. From a cosmetic point of view, research has shown Kacip Fatimah's ability to specifically protect the skin against photoaging based on its high antioxidant activity. Besides, the water-soluble Kacip Fatimah (Labisiapumila) leaf extract has identified phenolic compounds in the form of gallic acid. Gallic acid (GA) is a natural anti-oxidant phenolic compound extracted from plants that are widely used in food, medicine, and cosmetics. However, there has been no research on Kacip Fatimah in cosmetic formulations and its efficacy for the skin. One for mofcos metic dosage is Body Lotion. Body Lotion is a practical preparation, easy and fast to apply to the whole body. For skin that needs protection from free radicals by utilizing natural ingredients, namely, Kacip Fatimah which contains high antioxidants, a Physical Evaluation, and Formulation of Kacip Fatimah Extract Body Lotion (Labisia pumila) is made as an antioxidant, as a development of previous research results.[9] The cosmetics are the utility product used extensively throughout the world for maintaining and improving general appearance of face and the part of body e.g. skin, eye, hair, hand, etc. Herbal cosmetics are the preparation which represent cosmetics associated with active bio-ingredients, nutraceuticals and pharmaceuticals. Cosmetics are products that are used to cleanse and beautify the skin. The first recorded use of cosmetics is attributed to Egyptians in 4000 B.C. Pharmaceuticals are essentially drug products and are defined as products that prevent, mitigate, treat or cure disease and affect the structure or function of the body. By the European directive (European commission). The cosmetic products are defined as “any substance or preparation intended to be placed in contract with the various external parts of human body (epidermis, hair system, nails, lips, etc.) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them perfuming them changing their appearance or correcting body odours and the protecting them or keeping them and good conditions. The cosmetics, according to drugs and cosmetics defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance.[10]

Nowadays, people need to use cosmetic products to treat and protect gentle skin from pollution in daily life. However, most cosmetic products are made from chemical compounds. Various chemical materials directly affect and damage the users’ skin on the other

hand, almost whole phytochemicals in the botanical do not cause any side effects on the human body, but they are able to enrich the body with nutrients and other useful bioactive compounds. Currently, the natural cosmetics composed of phytochemicals from a variety of plant products are becoming popular and are expected to be a new approach in cosmeceutical market. Natural cosmetics contain several bioactive phytochemicals and nutrients necessary can improve the skin conditions and contribute to a healthy skin without any side effects. Two herbs, pomegranate and rice bran oil are referred extensively as effective compounds to heal and treat skin. Pomegranate is ordered as a type of fruit that contains a high level of antioxidant compounds. There is a lot of research to support that pomegranate has a high level of nutrient benefit. Furthermore, rice bran oil was used as an important component for many types of skincare cosmetics. For this work focused on formulation of standard natural anti- aging lotion by use of a mixture of pomegranate extract and rice bran oil as antioxidant active compounds.[11]

Health care, beauty and wellness industry in India is recording a tremendous growth driven by rising incomes, greater awareness on preventive health care and life style. The wellness marketing India is growing at a rapid pace twice as fast as USA and Europe and over the next few years India will be the second largest consumer market in the world. According to a KPMG report, the size of India's beauty and wellness market was around Rs 80370 crore at the end of 2018. The compounded annual growth rate of this sector has been around18.0 percent. In recent years, many international cosmetic brands and their products have been introduced in India competing with Indian brands, to address the perceived demand of consumers to look better and younger. Insite of this, there is a growing trend among consumers searching for traditional cosmetic and nutritional products developed from natural constituents with some degree of pharmaceutical activity. Inevitably, there is enormous potential for such 'cosmeceuticals" as their demand is rapidly escalating. People in the tropical countries have effectively used coconut oil as a traditional moisturizer for centuries. Virgin coconut oil is the purest form of coconut oil with natural distinctive coconut taste and smell. Virgin Coconut Oil (VCO) is extracted from fresh, mature kernel of the coconut by natural means with or without application of heat. Nutritionally, VCO has more beneficial effect than copra oil because it retains most of its functional components. It is rich in vitamin E and antioxidants, and it is easily digestible due to presence of medium chain fatty acids (MCFA). VCO is unique among all the other vegetable oils because of its high lauric acid content. VCO contains 92% Medium chain fatty acids consisting of 48% -53% lauric acid (C12), 1.5 - 2.5% oleic acid and other fatty acids such as 8% caprylic acid (C: 8) and 7% capric acid (C: 10).[12] Kabara (1984) reported that lauric acid is the most active antimicrobial fatty acid and that monolaurin is the most effective antimicrobial compound that can be derived from lauric acid.

Monolaurin displays antimicrobial activity by disintegrating the lipid membrane of certain bacteria including Propionibacterium acnes, Staphylococcus aureus, and Staphylococcus epidermidis.[13] Coconut oil in concentrations of 5% to 40% (w/w) exhibited bactericidal activity against Pseudomonas aeruginosa, Escherichia coli, Proteus vulgaris, and Bacillus subtilis.[14] Cellular studies have also shown that monolaurin exhibits antiviral and antifungal activity.[15] Cosmetic products are widely used and are directly applied to human skin. While the skin provides a protective barrier, certain ingredients may penetrate the skin and become systemically available. Some cosmetic products are applied to mucous membranes which may enhance availability or, in the case of lip products, provide the opportunity for oral ingestion. As such, an evaluation of their safety is of utmost importance. Safety assessment requires knowledge of both the intrinsic hazard of ingredients contained in the product as well as data on exposure levels. Published or otherwise readily available exposure data for cosmetic products are limited at present.[16]

The present study was undertaken to help fill that data gap. The study was designed to generate robust exposure data that could reliably be used in evaluating the safety of cosmetic ingredients. The key objective of the research was to determine distribution of product usage by consumers in terms of frequency and amount and patterns of consumption for each of three commonly used cosmetic products. The three products chosen for the study were lipstick, body lotion and facial cream. The data will be of value in the formulation of cosmetic products, and to regulatory agencies concerned with the safety of cosmetic ingredients. The information will also be useful to the Cosmetic Ingredient Review Expert Panel, an industry sponsored independent group of experts who conduct reviews of cosmetic ingredient safety.[17]

Role of Ingredients

Honey

Figure 1: Honey.

Honey is an excellent preservative for aloe due to its long shelf life and compatibility with various substances.

Honey is primarily composed of sugar, along with a combination of amino acids, vitamins, minerals, iron, zinc, and antioxidants. Honey is utilized for its various health benefits, including its anti-inflammatory, antioxidant, and antibacterial properties. Honey helps retain moisture in the skin's deeper layers, promoting a healthy and youthful appearance.

Glycerin

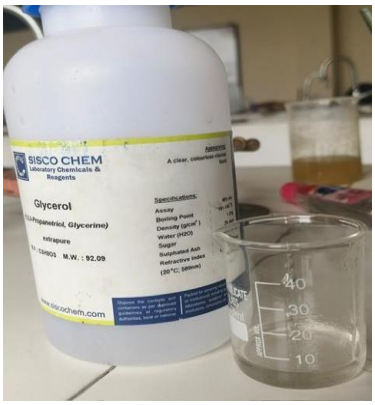

Figure 2: Glycerin.

- Glycerin uses as moisturizer.
- It soothes dry and irritated skin.
- It help storeduce wrinkles.
- It has Anti- aging property.
- It is used as cleanser.
- It improves skin permeability.
- It treated acne and scars.

Rose Water

Figure 3: Rosewater.

- Rose water is a rich source of anti-inflammatory property.
- It helps to provide a cooling effect and help in reducing redness.
- It helps to smoothen skin irritation.
- It hydrates and moisturize the skin.
- It helps maintain the skin’s pH balance.
- It improves skin texture and softness.
- It has anti-inflammatory property.

Coconut Oil

Figure 4: Coconutoil.

- Coconut oil is moisturizing agent and provide dry skin.
- It promotes wound healing and reduces inflammation.
- It contains anti-bacterial and anti-fungal properties.
- It has anti-oxidant property

Aloe Vera

Figure 5: Aloe Vera

Is used as amoisturizer, to reduce pimples and acne and also used for treatment of Burn wounds. Is used as an antifungal and anti in flammatory and it is also used to reduce scar, pigmentation, redness and itching of the skin. In addition to moisturizing the skin, aloe Vera gel can ease or so othe conditions like. Frost bite. Aloe Veragel can help your skin in hot and frigid weather. I your skin is damaged from a mild case of frostbite; aloe Vera gel may help your tissues regrow more quickly and boost healing.

Lemon Oil

Figure 6: Lemon Oil.

- It has an anti-fungal property.
- It helps in the skin lightening.
- It is used as preservative.
- It helps fight wrinkles and other signs of ageing.
- Iti used to treat acne and blackheads.

Ideal properties of Herbal Body Lotion

1. The product should offer a cooling effect upon application.
2. The removal of the particles is recommended.
3. Seek out a potential emollient effect.
4. Eliminate oily secretions throughout the process of application.
5. Distribute them uniformly across the surface of the skin.
6. It is imperative that they do not possess any adverse effects on the skin.
7. It is vital to guarantee compatibility with the p H level of the skin.

MATERIAL OF METHOD

REQUIREMENTS: Glycerin, Honey, Rosewater, Lemon Oil, Coconut oil, Steric acid, Aloevera gel, etc.

Herbal Body Lotion Formulation

Ingredients (for 100 ml batch)

Ingredients	%w/w	Quantity (g/ml)
Aloe vera gel	20%	20g
Glycerine	5%	5g
Rose water	20%	20 ml
Lemon oil (essential)	0.5%	0.5ml
Coconut oil	10%	10ml
Stearic acid	2%	2g
Honey	5%	5g
Triethanolamine (TEA)	1%	1 ml
Distilled water	q.s. to 100%	Up to 100 ml

Procedure

1. Oil Phase

- Mix Coconut Oil and stearic acid in a beaker.
- Heat gently to 70-75c until stearic acid melts completely.

Aqueous Phase

- In another beaker, mix rose water, glycerine, distilled water, and honey.
- Heat to the same temperature (70-75C).

2. Emulsification

- Slowly add the aqueous phase to the oil phase, with continuous stirring using a hand blender or homogenizer.
- Add triethanolamine (TEA) while blending. It will =l help emulsify and thicken the mixture.

3. Cooling Phase

- Once the mixture starts to cull (below 40C), add aloe vera gel and lemon oil (as a fragrance and antibacterial agent).
- Stir gently until fully blended.

4. Packaging

- Pour into a clean, dry container while still flowable.
- Store in a cool, dry place, use within 2-3 months or add a preservative for longer shelf life.

RESULT AND DISCUSSION

The herbal body lotion was formulated by using various various type of ingredients such as aloe- vera gel, glycerin, coconut oil, rose water and honey. Aloe-vera contain antimicrobial and hydrating properties protect skin against microbial degradation and moisture to skin. Glycerin has anti-aging property.

The herbal body lotion was evaluated to various parameter such as physiochemical parameter, pH, wash ability, irritancy, homogeneity, viscosity, smoothness, etc., used to check the quality and performance of formulation. The effect of different ingredients in the formulation was.

The physiochemical property of formulation such as color is white, odor is pleasant, and state is semi-solid. The pH of formulation is neutral and wash ability is also good.

Table 1: Result of evaluation parameter of Herbal Aloe-Vera Body Lotion.

Sr. No.	Test	Result
1	Color	Slightly Yellow
2	Odour	Earthy and Garlicky
3	Texture	Smooth
4	State	Semi-solid
5	Absorption test	Very well Absorbed
6	Skin Irritancy test	No Irritancy effect
7	Homogeneity	Good
8	Spread ability test	7
9	Smoothness	Smooth and light to Spread
10	Washability	Good (Easily Washable)

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