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Formulation and Evaluation of Turmeric Skin Cream

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Abstract: *Cosmetics are widely used by men and women to beautify and improve their appearance. Nowadays, the demand for herbal cosmetics is increasing day by day due to their harmlessness. Additionally, since they are prepared from medicinal plants, they have fewer side effects. Many people due to its great comfort and economy, as well as its quality have recognized it. Curcumin is one of the food products frequently used in many activities, but the main problems in the commercial development of curcumin are solubility and stability problems. The aim of this review project is to develop and evaluate a turmeric herbal skin cream containing turmeric extract. Turmeric extract has antibacterial and anti-inflammatory properties and can brighten the skin. Therefore, this product is beneficial for human keratinocytes and is safe and stable. Turmeric skin cream does not have any side effects; it is not harmful or undesirable; it beautifies the skin.*

Keywords: Turmeric, Curcumin, Herbal, Skin

I. INTRODUCTION

The rhizome of turmeric contains curcumin, which is used as a food additive to improve health and treat many diseases. Curcumin and other curcuminoids found in turmeric have many physiological and pharmacological activities. Turmeric extract has been reported to be used as a cosmetic or skin care product in both topical and oral preparations. It is said to be effective in treating aging skin, increasing skin thickness, reducing elasticity, skin damage, and other problems caused by sunlight. There is little empirical data to support these claims.

Therefore, it is necessary to evaluate the benefits or other effects of this plant. Turmeric is one of the traditional herbs. It belongs to the Zingiberaceae family. Due to the presence of curcumin, a polyphenolic compound, it has 36-turmeric extract antioxidant, antibacterial, and antioxidant properties.

Therefore, the phenolic compounds of curcumin are responsible for its antioxidant activity. Phytochemical structures in turmeric include vitamin C, cineole, curcumin, borneol, zingiberene, d-sabinete, and phellandrene. Turmeric contains a variety of compounds, including sesquiterpene ketones, monoterpenes, and sesquiterpene alcohols (such as zingiberene). Fresh turmeric contains curcumin, and curcumin is the most important curcumin in turmeric. Previous reports have reported that turmeric has antibacterial and antifungal effects. Curcumin is known for its inhibitory effects on bacteria such as Escherichia coli, Staphylococcus aureus, and Salmonella. Typhimurium and Pseudomonas aeruginosa many studies have shown that turmeric extract has strong antioxidant properties.

The main active compound of turmeric (curcumin) has strong free radical scavenging activity. It can eliminate RNS (active nitrogen) and ROS by transferring energy from three active sources, such as superoxide radicals, alkoxy radicals, peroxyl radicals, hydrogen peroxide, singlet oxygen, peroxynitrite, hydroxyl radicals, nitric oxide, and hydrogen extraction.

1. Advantages of herbal turmeric skin creamIt helps cleanse and beautify the body without side effects.
2. Normalizes the body.
3. It is highly nutritious and contains many vitamins and minerals.
4. Increases physical strength.
5. Supports the immune system without any side effects. Body balance.

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6. Various plant species can be added.
7. It is easy to use.
8. Suitable for everyone.
9. Avoid variations in drug levels in the context of different patients.
10. No special risks or professional personnel should use the product.
11. Achieve results with lower total daily doses.

1.1 Disadvantages of herbal turmeric skin cream

1. Large amounts of medicine are not easily absorbed through pores of skin.
2. Possible skin reactions due to contact dermatitis
3. Malabsorption may occur due to poor penetration of some drugs into skin.
4. May cause allergic reactions.
5. It is geenerally used in the use of drugs that require less plasma.

1.2 Benefits of the Herbal Cosmetics

1. It is natural and harmful to the skin or other parts of the body.
2. Placebo has many benefits for consumers due to its use in culture and tradition.
3. Its effectiveness has been proven since ancient times.
4. Easy to obtain.
5. It's Economically obtainable

II. AIM

To formulate and evaluate a herbal turmeric cream with potential anti- inflammatory, antioxidant, and skin-healing properties, using turmeric (Curcuma longa) as the main active ingredient.

III. OBJECTIVE

1. To formulate a stable turmeric cream incorporating suitable excipients for effective delivery of active ingredients to the skin.
2. To evaluate the physical properties of the cream, such as appearance, texture, consistency, and spreadability
3. To assess the antimicrobial activity of the herbal turmeric cream using standard microbiological tests.
4. To evaluate the antioxidant properties of the cream using appropriate assays (e.g., DPPH or FRAP).
5. To perform skin irritation and safety testing to assess dermatological compatibility.
6. To analyze the cream's shelf life and stability under different storage conditions.
7. To determine the effectiveness of the turmeric cream in promoting wound healing or soothing irritated skin.

IV. LITERATURE REVIEW

1. Shital V. Sirsat, Nikita M. Rathi, Anjali S. Hiwale and Punam B. Shelke, World Journal of Pharmaceutical Research 2022; Volume 11, Issue 5, 690-697.

Abstract: Turmeric (Curcuma longa) is widely known for its potent anti- inflammatory, antimicrobial, and antioxidant properties, making it a promising candidate for topical formulations. This study aims to formulate and evaluate a herbal turmeric cream, designed to harness the therapeutic benefits of turmeric for skin care applications. The cream was prepared using standard pharmaceutical excipients, and the active ingredient, turmeric extract, was incorporated at a concentration optimized for both stability and efficacy. The formulated cream was characterized for its physical properties, including appearance, pH, spreadability, and viscosity. In-vitro tests were conducted to assess its antimicrobial and antioxidant activities, while its potential for reducing inflammation was evaluated using suitable biochemical assays.

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2. Sharmila Dusi, J. Saminathan, International Journal of Pharmacy Research & Technology, 2020; 10: 1.
Abstract: Herbal cosmetics are becoming common in the field of beauty, fashion. The present study is to formulate and evaluate the herbal cream containing extracts of natural products such as Aloe Vera, Cucumis Sativus and Daucus Carota. Different types of oil in water (O/W) herbal creams are preparing by changing concentrations of ingredients. The evaluations of all formulations were done on different parameters like pH; viscosity, spreadibilty, and stability were examined.

3. R. M. Mehta, Pharmaceutics-II, Fourth Edition, Vallabh Prakashan, 2015; 222
Abstract: The cosmetic are play the importance role in aesthetic purposes, including cleansing, beautifying, ifying Look, moisturizing etc. And the some cosmetic are give the therapeutic effect. They also Protect the skin from bacterial and fungal infections and Also used to treat skin injuries including burns, cuts etc. The cosmetic are different different type and apply to different different body part the cold cream is used to moisturizing the human body.the importance ingredients are used in the formulation of cold cream beeswax, borax, liquid paraffin, Methyl parpen, distilled water and Rose water this all ingredients are used in formulation of cold cream All ingredients are waieging properly and make a Formulation and some stages are performed the proper after the formulation some important evaluation taste are carried. Some evaluation tests

4. Maruthi N, TS Nagaraja, Uma M, Abdul Munaf S, Arun K A, Abdul Jaseem P T, Akarsh M Shaju. Formulation, Characterization and Evaluation of Herbal Cold Cream. Indo American Journal of Pharmaceutical Research, 2021. ISSN NO: 2231-6876
Abstract: Herbal cosmetic are the preparation which are used to beautify and enhance the human appearances. The aim of present work is to formulate, evaluate and characterization of Curcumin, Ashwagandha and Neem containing Herbal cold cream. The Curcumin, Ashwagandha and Neem containing Herbal cold cream is prepared by water in oil method by using suitable base for the purpose of nourishing and moisturizing the skin. The herbal extract containing cold cream gives cooling and soothing effect due to slow evaporation of water present in emulsion. The prepared herbal cold creams are characterized for production yields, DSC and SEM. The production yields of formulations were from 78.4% to 87.5%. DSC studies are revealed that the drug and base are compatible with each other during preparation. The changes in physical properties of the formulated creams were not observed.

5. Shah RN, Methal BM, A Hand book of Cosmetics Page No.1 2. Myers D, Surfactant Science and Technology, VCH Publishers: 1992, Pp. 209-247
Abstract: Herbal cosmetics are the preparations are used to beautify and enhance the human appearances. The aim of the present research was to formulate and evaluate the herbal cold containing plant extracts prepared by using water in oil method for the purpose of nourishing and moistening the skin. The cold cream is prepared by using the neem oil and almond oil. Quality evaluation of the formulated product was assessed by using different evaluation methods. No change of the physical properties was observed in formulated cream. The formulated cream showed good consistency and spread ability, homogeneity, pH, no evidence of phase separation during study period of research. Stability parameters like visual appearance, nature, viscosity and fragrance of the formulated cream showed that there was no significant variation during the study period of research.

IV. PLAN OF WORK

1. Literature Review:
Study the medicinal properties of turmeric (Curcuma longa), especially curcumin.
Review existing turmeric-based skincare products. Understand common cream bases and their properties.

2. Objective of the Study:
To formulate a skin cream using turmeric as an active ingredient. To evaluate its physicochemical properties and effectiveness.

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3. Collection of Materials:
Active ingredient: Turmeric powder or curcumin extract.
Cream base ingredients: Emulsifiers, oils (like coconut or almond oil), wax, preservatives, and humectants (e.g., glycerin).
Other optional ingredients: Fragrance, natural color, essential oils.

4. Formulation of Cream:
Preparation of the oil phase and water phase. Incorporation of turmeric extract into the cream base. Homogenization and mixing.
Filling and packaging.

5. Evaluation of the Cream:
Physical appearance (color, texture, odor). pH measurement.
Stability studies (under different storage conditions).

6. Documentation and Results Analysis:
Record observations and test results. Compare with market products if applicable.

7. Conclusion:
Summarize findings, efficiency, and stability of the cream. Suggest potential for commercial application or further studies.

8. References:
Include scientific articles, books, and product literature.

V. DRUG PROFILE

a) Turmeric :
synonyms:
In northern India, turmeric is commonly called “haldi”, this is a word derived from the Sanskrit word haridra; In South India it is known as “manjal”, a Word frequently used in ancient Tamil literature. Kurkum (Arabic & Hebrew), huang jiang (Mandarin Chinese), curcuma (French, German, Italian, Spanish), and haldi (Hindi).

BIOLOGICAL SOURCE:
Turmeric is a product of Curcuma longa, an annual herb belonging to the Zingiberaceae family native to Southeast Asia.
• Kingdom Plantae
• Family Zingiberaceae
• Genus Curcuma

Chemical Constituents:
Turmeric powder contains approximately 60-70% carbohydrates, 6-13% water, 6-8% protein, 5-10% fat, 3-7% dietary fiber, 3-7% essential oil, 2-7% Fiber and 1 . -6% curcumin. The golden color of turmeric is due to curcumin.The phytochemical content of turmeric includes diarylheptans, a class that Includes various curcuminoids such as curcumin, demethoxy curcumin, and bisdemethoxy curcumin. Curcumin content in commercial turmeric powder Samples is as high as 3.14% (average 1.51%); curry powder contains less (0.29% on average). Turmeric contains approximately 34 essential oils; Among Them, curcumin, gemstone, aranon and zingiberene are the maincomponents.

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Fig 1 turmeric

b) Stearic Acid

Chemical Structure: Stearic acid is a long-chain carboxylic acid. Its molecular structure consists of a straight-chain hydrocarbon with 18 carbon atoms bonded to a carboxyl group (COOH) at one end.

Physical Properties:

Appearance: Stearic acid appears as a white, waxy solid at room temperature.

Melting Point: It has a relatively high melting point of around 69-71°C (156-160°F), which makes it useful in various applications.

Solubility: Stearic acid is insoluble in water but soluble in organic solvents like ethanol, ether, and chloroform.

Occurrence: Stearic acid naturally occurs in various animal and vegetable fats and oils. It's particularly abundant in fats like cocoa butter, shea butter, and palm oil.

Industrial Production: Stearic acid can be produced through the hydrolysis of fats and oils. It's often derived from vegetable oils such as palm oil, coconut oil, or soybean oil. The process involves the saponification of the oil to form soap, followed by acidification to separate the fatty acids. Stearic acid is then purified through processes like distillation or crystallization.

Uses:

• Cosmetics and Personal Care: Stearic acid is commonly used in cosmetics and personal care products as an emulsifier, emollient, and thickening agent. It helps stabilize emulsions and provides a smooth, creamy texture in products like lotions, creams, and soaps.

• Pharmaceuticals: It's used in the production of various pharmaceutical formulations, including ointments, creams, and suppositories.

• Candles: Stearic acid is often added to candle wax to increase hardness

Fig.2 Steric acid

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C) Glycerine

Glycerol is a simple triol compound. It is a colorless, odorless, viscous liquid that is sweet-tasting and non-toxic. The glycerol backbone is found in lipids known as glycerides. It is also widely used as a sweetener in the food industry and as a humectant in pharmaceutical formulations. Because of its three hydroxyl groups, glycerol is miscible with water and is hygroscopic in nature.

C3H8O3 is the Molecular Formula of Glycerine

In chemistry a molecular formula indicates every single atom and its numbers in a chemical compound. Hence the molecular formula C3H8O3 simply says that there are three carbon (C) atoms, eight hydrogen (H) atoms and three oxygen (O) atoms in this compound.

Uses:

Glycerol is a naturally occurring alcohol. It is an odorless liquid that is used as a solvent, sweetening agent, and also as medicine. When glycerol is in the intestines, it attracts water into the gut, softening stools and relieving constipation.

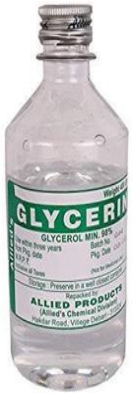

Fig:3 glycerine

c) Lanolin (wool fat):

Fig.4 wool fat (lanolin)

Wool fat, also known as lanolin, is a natural substance derived from sheep's wool. It's a complex mixture of esters, fatty acids, and alcohols that serves various purposes industries ranging from cosmetics to pharmaceuticals.

Composition: Wool fat primarily consists of esters of high-molecular- weight lanolin alcohols and fatty acids. It also contains small amounts of free lanolin alcohols, lanolin acids, and lanolin hydrocarbons.

Extraction: Lanolin is obtained as a byproduct of wool washing. After shearing sheep, the wool is washed to remove impurities like dirt, sweat, and grease. During this process, lanolin is extracted from the wool fibers.

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Properties:

Emollient: Lanolin has excellent emollient properties, meaning it softens and moisturizes the skin by forming a protective barrier that prevents moisture loss.

Occlusive: It forms a protective barrier on the skin's surface, which helps retain moisture and protect the skin from environmental factors like wind and cold.

Water-in-Oil Emulsifier: Lanolin can act as a stabilizer and emulsifier in cosmetic formulations, particularly in water-in-oil emulsions. Hydrophilic-Lipophilic Balance (HLB): Lanolin has a relatively high HLB value, making it suitable for formulating water-in-oil emulsions and oil-in-water emulsions.

Applications:

- Cosmetics
- Pharmaceuticals
- Baby Care Products
- Industrial Applications
- Textiles

Safety: Lanolin is generally considered safe for topical use, although some individuals may be allergic to it. It's important to use lanolin products from

d) Borax:

Borax (also referred to as sodium borate, tincal, and tincar is a salt (ionic compound), a hydrated or anhydrous borate of sodium, with the chemical formula Na2H20B4O17.

Chemical composition:

It's a combination of boron, sodium, and oxygen. Borax is often found in dry lake beds in places like California's Death Valley, where the water evaporated and left behind deposits of minerals. Boric acid is made from the same chemical compound as borax and even looks like it.

Uses:Borax, also known as sodium tetraborate, has many uses, including:

Cleaning:

Borax is a common ingredient in household cleaning products and can be used to clean many things,

Pest control

Sprinkle borax around cracks and crevices to repel insects like ants, spiders, beetles, and other bugs

Food additive

Used in some food additives Other uses

Borax is also used in cosmetics, paint, ceramic glaze,herbicides, and more.

Fig 5 borax

f. Methyl Paraben

Methyl paraben is a commonly used preservative in the cosmetic, pharmaceutical, and food industries. It belongs to the group of chemicals known as parabens, which are esters of para-hydroxybenzoic acid. Methyl paraben specifically is the methyl ester of parahydroxybenzoic acid.

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Chemical Structure: Methyl paraben has the chemical formula C8H8O3 and the IUPAC name methyl 4-hydroxybenzoate. Its molecular structure consists of a para- hydroxybenzoic acid molecule with a methyl group (-CH3) attached to the ester functional group (-COO).
Synthesis: Methyl paraben is typically synthesized through the esterification reaction between para-hydroxybenzoic acid and methanol in the presence of an acid catalyst.

Physical Properties:
Appearance: Methyl paraben is usually a white crystalline powder or colorless crystals.
Odor: It is odorless or may have a faint odor.
Solubility: Methyl paraben is soluble in alcohol, ether.

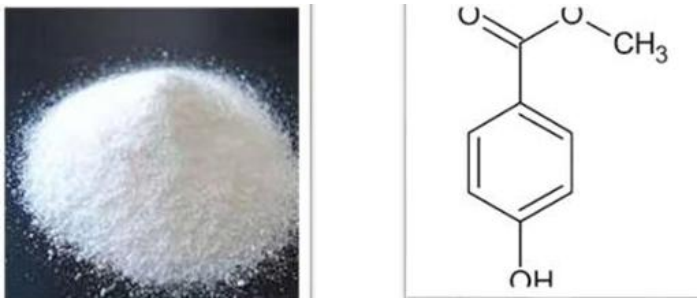

Fig. 6 Methyl paraben and Structure of methyl paraben

Preservative Properties:
Methyl paraben is widely used as a preservative in cosmetics, personal care products, pharmaceuticals, and food products. It inhibits the growth of bacteria, yeast, and mold by disrupting their cellular functions and metabolism, thereby extending the shelf life of products and preventing spoilage. Methyl paraben is effective over a wide pH range and is compatible with a variety of formulations.

Applications:
• Cosmetics and Personal Care Products
• Pharmaceuticals
• Food Industry
F). Water: Water is a key ingredient in many cream formulations, serving as a solvent, diluent, and vehicle for active ingredients. Creams are semisolid emulsions consisting of water and oil phases stabilized by emulsifier.

VI. METHOD OF PREPARATION

Preparation of crude alcohol extract:
Take 5 grams of raw turmeric, put it in an Erlenener flask, add 100 ml of ethanol, and then close the lid of the Erlenener flask. Aluminum foil. This mixture is then softened for 5 days.
Preparation of the oil phase
Place stearic acid (18%) and lanolin in a porcelain plate and melt the mixture at 700°C.
Prepare the water phase
Heat water, glycerin and borax at the same temperature as melted stearic acid and lanolin. Mix the oil phase with the water phase by stirring constantly. Preservatives and flavors added. Mix them well to obtain a homogeneous producer

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INGREDIENTS TABLE

Table:1 Ingredients table of herbal turmeric cream

Sr.no	Ingredients	Role
1	Turmeric	Antiseptic
2	Stearic acid	Solubilizer
3	Glycerine	Moisturizer
4	Lanolin (wool fat)	Lubricant
5	Borax	Emulsifier
6	Methyl paraben	Preservative
7	Water	Vehicle
8	Perfume	Fragrance

a). pH test

Done by dipping the pH meter electrode into each gel preparation that has previously been dissolved with aquadestilata. After the electrode is dipped, it is then allowed to stand until the screen on the pH meter shows a stable number. The pH requirement for topical preparations is between 5- 10, or gel preparations must match the skin pH of 4.5- 6.5.

b). Viscosity Test

The viscosity test is carried out by means of the rotor mounted on the test equipment, arranged until the rotor is immersed in the gel. The tool is activated; the indicated scale is read until it shows a stable number. Gel viscosity measurements were performed using a Brookfield Viscometer using spindles 5 and 4 at a speed of 50 rpm.

VII. CONCLUSION

The cream is a semisolid preparation widely accepted by the public. The skin is the most accessible part of the body and is therefore susceptible to injuries. If cuts, burns, and wounds occur, they are best treated with topical creams. In recent years, the research and development of topical formulations for wound healing has continued to increase due to their obvious benefits. According to the pharmaceutical field and business progress, it is clear that cosmetics will remain an interesting and beautiful field of research in the coming years. More advancedtechnologies and methods will be used for preparation, formulation and evaluation of creams in coming years. Thedemand of herbal constituents based creams are also increased day by day

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Result

The prepared turmeric skin cream was smooth, non-greasy, and easy to apply. It showed good spreadability and stable texture. Turmeric provided antiseptic and anti- inflammatory effects, while lanolin and glycerin helped in moisturizing the skin. The cream gave a natural glow and was suitable for daily use. No irritation was observed, and the pH was skin-friendly.

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