

A review article on formulation and evaluation of herbal cold cream using curcumin longa

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ABSTRACT:

This study focuses on the formulation and evolution of a herbal cold cream containing Curcuma longa (turmeric) extract as a key ingredient. The

aim is to develop a natural and effective solution for moisturizing and soothing dry and chapped skin, particularly during the cold winter months. The formulation process involves the incorporation of Curcuma longa extract along with other complementary herbal ingredients known for their skin-nourishing properties.

The study begins with an overview of the properties and benefits of Curcuma longa extract in skincare. Curcumin, the active compound in Curcuma longa, possesses antioxidant, anti-inflammatory, and antimicrobial properties that are beneficial for maintaining healthy skin. These properties make it an ideal candidate for inclusion in a cold cream formulation.

The formulation process involves selecting appropriate natural base ingredients such as beeswax, shea butter, and coconut oil, which provide moisturization and protection to the skin. Curcuma longa extract is incorporated into the cream through a suitable emulsification process, ensuring its stability and efficacy. The final formulation is subjected to stability tests to assess its physical, chemical, and microbiological properties over time.

To evaluate the effectiveness of the herbal cold cream, various in vitro and in vivo tests are conducted. In vitro tests assess its moisturizing capacity, antioxidant activity, and anti-inflammatory potential using established experimental protocols. In vivo studies involve human volunteers who apply the cream on their skin, and various parameters such as skin hydration, transepidermal water loss, and subjective evaluations are measured.

The evolution of the herbal cold cream is

monitored over a specified period to assess any changes in its physical characteristics, stability, and efficacy. This includes evaluating its shelf life, microbial safety, and sensory attributes to ensure consumer acceptance and satisfaction.

The results of the study provide valuable insights into the formulation and evolution of a herbal cold cream containing Curcuma longa extract. The findings demonstrate the potential of this natural ingredient in skincare products, particularly for addressing dry and chapped skin during cold weather conditions. The developed formulation offers a promising alternative to conventional cold creams by harnessing the benefits of Curcuma longa and other complementary herbal ingredients. Further research and development in this area could lead to the commercialization of a safe, effective, and natural cold cream option for consumers.

keyword:-

curcumin longa, isolation of curcumin by TLC, formulation evaluation.

I. INTRODUCTION:-

In this study, the researchers aimed to develop and assess a herbal cold cream formulation using turmeric extract as a natural ingredient. The purpose of this formulation was to create a cream that would provide a cooling and glowing effect on the skin, while avoiding any potential adverse effects.

The cream base utilized in this formulation consisted of beeswax, liquid paraffin, borax, distilled water, and rose oil. To evaluate the efficacy and safety of the cream, several parameters were considered. These included pH, viscosity, irritancy, spreadability, microbial growth, thermal stability, homogeneity, acid value, saponification value, accelerated stability studies, patch tests, physical properties, and dyetests.

By incorporating turmeric extract, known for its cosmetic benefits such as reducing inflammation, redness, and imparting a healthy glow to the skin, the researchers aimed to harness its properties in the herbal cold cream. It was crucial to ensure that the cream provided the desired cooling and glowing effects without causing any adverse reactions.

In conclusion, this study focused on formulating and evaluating a herbal cold cream with turmeric extract as a natural ingredient. The researchers assessed various parameters to ensure the cream's effectiveness and safety. The aim was to create a cream that would offer a cooling and glowing effect on the skin while avoiding any potential adverse effects.

Advantage:-

1. Herbal cold creams offer a safer and more gentle alternative for sensitive skin due to their exclusion of harsh chemicals, synthetic fragrances, and artificial colors.
2. Natural ingredients found in herbal cold creams not only provide moisture but also offer additional health benefits such as anti-inflammatory, antioxidant, and anti-aging properties.
3. Choosing herbal cold creams contributes to eco-friendliness as they are made from renewable resources and do not contribute to environmental pollution.
4. Herbal cold creams can be a cost-effective option since the ingredients used in their formulation are readily available in nature and do not require expensive processing or manufacturing techniques.

Due to any herbal ingredient irritation or sensitivity:

1. The effectiveness of herbal cold creams may vary depending on the quality and quantity of herbal ingredients used in the formulation.
2. Herbal cold creams may not have the same texture and consistency as synthetic cold creams, which some people may find less appealing.
3. Some herbal ingredients may have a strong smell or taste, which may not be desirable for everyone.
4. The production and sourcing of herbal ingredients may be less standardized and regulated than synthetic ingredients, which can lead to variations in quality and safety.
5. The shelf life of herbal cold creams may be shorter than synthetic cold creams, as

natural ingredients may degrade more quickly over time into a clearer essence:

6. The diverse range of phytoconstituents found in herbal cosmetics can provide multiple benefits for the skin and body, including antioxidant, anti-inflammatory, and anti-aging properties.
7. Herbal cosmetics can be customized to individuals' skin types and needs, which may not be possible with synthetic cosmetics, leading to more personalized skincare.
8. Many herbal ingredients have calming and soothing effects on the skin, making them suitable for people with sensitive or irritated skin.
9. The use of herbal cosmetics promotes sustainable and eco-friendly practices, as many herbal ingredients can be sourced locally and are biodegradable⁴.

Herbal cosmetics can also provide therapeutic benefits beyond the cosmetic aspect, such as aromatherapy and relaxation.

Isolation of curcumin by TLC method:-

To isolate curcumin using Thin Layer Chromatography (TLC), you would typically follow these steps:

- Preparation of the TLC plate: Start by preparing a TLC plate coated with a suitable stationary phase, such as silica gel. Cut the plate into a desired size, usually a small rectangular shape, and clean it if necessary.
- Preparing the sample: Extract curcumin from the source material, such as turmeric, using a suitable solvent, such as ethanol or methanol. Concentrate the extract if needed, and then dissolve the curcumin in a suitable solvent to obtain a concentrated sample solution.
- Spotting the sample: Take a capillary tube or a micro-pipette and carefully spot a small amount (around 1-2 μ l) of the curcumin sample solution onto the origin line of the TLC plate. Make sure to spot it accurately and as small as possible to obtain well-defined spots during separation.
- Developing the TLC plate: Place the spotted TLC plate in a developing chamber containing a suitable mobile phase, which is a solvent or a mixture of solvents.
- The choice of the mobile phase depends on the polarity of the compounds you want to separate. For curcumin, a common mobile

- phase is a mixture of ethyl acetate and hexane.
- Visualization: After the development, remove the TLC plate from the chamber and allow it to dry. Then, visualize the spots on the TLC plate using suitable visualization techniques. One common method is UV light visualization, where curcumin appears as a bright yellow spot under UV light.
 - Calculation of Rf values: Measure the distance traveled by the curcumin spot and the solvent front from the origin line. Calculate the retention factor (Rf) value of curcumin by dividing the distance traveled by the curcumin spot by the distance traveled by the solvent front.
 - Scraping the spot: Once the Rf value of the curcumin spot is determined, scrape off the spot from the TLC plate using a clean spatula or a sharp blade. Transfer the scraped curcumin spot into a clean container.
 - Elution: Finally, elute the curcumin from the scraped spot using an appropriate solvent, such as ethanol or methanol. Concentrate the eluted solution to obtain purified curcumin.

MATERIALS:-

S.N.	Ingredient
1	Turmeric Extract
2	Beeswax
3	Liquid Paraffin
4	Borax
5	Rose Oil
6	Distilled Water
7	Olive Oil

EQUIPMENTS:

1. A spectrophotometer capable of measuring UV and visible light absorption
2. A viscometer made by Brookfield for measuring fluid viscosity
3. A digital meter for measuring the acidity or basicity of a solution (pH)
4. A magnetic stirring device for mixing solutions with a rotating magnetic field
5. A set of tools including a bowl-shaped container and a blunt club-shaped object, used for crushing and grinding materials (mortar and pestle)

FORMULA:-

SR.NO	INGREDIENT	QUANTITY (in ml or gm)
1	Turmeric extract	10ml / 5.0ml
2	Beeswax	25gm / 12.5 gm

3	Liquidparaffin	15gm/7.5 gm
4	Borax	5.0gm/2.5ml
5	Roseoil	2.0ml/1.0ml
6	Distilledwater	QS
7	Oliveoil	0.8ml/0.2ml

**FIG:-BEESWAX
FIG:-TURMERIC**

FORMULATION:

The process for making turmeric extract using the cold maceration technique is as follows :

- Take 200 mg of turmeric and place it in a conical flask.
- Cover the mouth of the flask with a cotton plug.
- Allow the mixture to sit for 72 hours with occasional shaking.
- After 72 hours, filter the solution and dry the filter until it is completely dry.
- Melt beeswax in a china dish on a hot plate at 70°C.
- Dissolve borax in a 100 ml beaker and heat it along with olive oil on a hot plate at 70°C.
- Slowly add the oil phase to the aqua phase with constant stirring until it reaches 45°C to 50°C. Then add the herbal drug and perfume with constant stirring.
- To summarize, 200 gm of turmeric is mixed with 500 ml of water, and the mixture is left to sit for 72 hours before being filtered and dried. Beeswax is melted and borax is dissolved in olive oil, and the two phases are combined with constant stirring. Finally, the herbal drug and perfume are added to the mixture with constant stirring⁵.

**FIG:-
FORMULATION OF TURMERIC COLD CREAM**

Evaluation Test:-

- Consistency: The consistency of the cream was checked by applying it on the skin and observing its texture and behavior on the skin.
- Determination of type of smear: The type

of smear was determined by applying the cream on the skin surface of a human volunteer and observing its greasiness and behavior on the skin.

- Determination of emollience: The emollient test was conducted to check the amount of residue left on the skin after the application of a specific quantity of cream.
- Determination of spreadability: The spreadability of the cream was determined by calculating the extent of the area to which the cream spread when applied to the affected part of the skin. The spreadability (S) was calculated using the formula $S = m \cdot L / T$, where S is the spreadability, m is the weight tied to the upper glass slide, L is the length moved on a glass slide, and T is the time taken. The determination was carried out in triplicate, and the average of three readings was recorded.
- Removal: The ease of removal of the cream was examined by washing the applied part with tap water.
- Irritancy: A test area of 15 square centimeters was marked on the left-hand dorsal surface, and the cream was applied to the specified area. The time was noted, and any irritancy, erythema, or edema was checked at regular intervals up to 24 hours and reported.
- Physical evaluation: The formulated herbal cream was further evaluated for color, odor, consistency, and state of the formulation. The color and odor of the cream were observed visually, and the state of the cream was examined by rubbing it visually. The cream having a semisolid texture was noted⁶.

II. RESULTS:

The formulation that was prepared had a smooth texture and a pale odor.

The following results were obtained for various parameters:

- **Color:** The color of the formulation was slightly white-yellow.
- **Odor:** The odor was characteristic of the formulation.
- **Consistency:** The consistency was smooth.
- **State:** The state of the formulation was semisolid.
- **pH:** The pH of the formulation was 6.5.
- **Spreadability:** The spreadability of the formulation was 7.4q.cm/sec.
- **Washability:** The formulation was easily washable.
- **Non-irritancy:** The formulation was found to be non-irritant.
- **Viscosity:** The viscosity of the formulation was 39010cps.
- **Phase separation:** No phase separation was observed in the formulation.

III. CONCLUSION:-

- Based on the results of the study, it can be concluded that the polyherbal cold cream formulated using herbal extracts showed good consistency, spreadability, homogeneity, and pH. It also did not show any phase separation during the study period. Therefore, it can be inferred that the cream is safe to use and has improved values compared to synthetic cosmetics.
- The use of natural remedies in personal care products is becoming more popular as they are perceived to have fewer side effects than synthetic products. As a result, there is a growing demand for herbal cosmetics in the market.

Overall, this study highlights the potential benefits of using herbal extracts in cosmetic formulations and emphasizes the importance of natural remedies in personal care systems.

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