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Research Article

Development and Evaluation of Winter Cream Containing Curcumin

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ABSTRACT

The aim of the present research was to formulate and evaluate the winter cream containing curcumin, for the purpose of nourishing and moistening the skin. The curcumin-containing winter cream was made using the water-in-oil method; the four formulations F1, F2, F3, and F4 were made using various ratios of coconut oil and neem oil. A variety of evaluation techniques, including sensitivity, color test, grittiness, ph, spread ability, irritation, and drug content, were used to evaluate the manufactured items' quality. The physical characteristics of each formulation remain unchanged. Every manufactured winter cream that contained curcumin had its pH tested. All of the formulas have a pH between 5.4 and 6.2. There is no need to change the formulation's pH because it is well within the range for topical administration and formulation F4 has demonstrated a pH of 5.4. Formulations F1, F2, F3, and F4 have spread abilities of 22.5 gm*cm/sec, 20.0 gm*cm/sec, 20.83 gm*cm/sec, and 23.33 gm*cm/sec, respectively. While all of the formulations display values within the usual range, F4 exhibits superior spreadability in comparison to the others. The F4 formulation demonstrated good consistency and spread ability, homogeneity, ph, and non-greasy, according to the aforementioned data. The aforementioned study indicates that the curcumin-containing herbal winter cream is safe to use because it is made from herbal extract. Because natural medicines are thought to be safer and have less adverse effects than synthetic ones, they are more widely accepted. To raise the product's overall quality, more thorough stability studies are required.

INTRODUCTION

The word "cosmetics" comes from the Greek word "kosmesticos," which meaning "to adorn." Since ancient times, people have used them to maintain cleanliness and improve their appearance. The term evolved throughout time, particularly in Ancient Rome, when women known as cosmetae produced everyday beauty goods. Cosmetics are vital for both men and women nowadays, and they

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serve purposes beyond only improving one's appearance. Creams, powders, perfumes, lipsticks, hair care products, gels, and sunscreens are among them. These items help people appear better, clean their skin, shield their skin from the elements, and maintain the health of their skin. Cosmetics can be used to treat, repair, protect, or even embellish skin conditions.

Applying medication to the skin is essential in the fields of skin care and beauty science. This approach treats conditions like dryness, rashes, infections, inflammation, and edema by directly administering medication to the skin. There are numerous advantages to administering medication in this manner, including eliminating the first-pass impact in the liver, avoiding stomach issues, and delivering medication precisely where it is required. Medication passes past the skin's outer layer and into deeper areas because the skin acts as a barrier. Even though applying medication topically is simple and generally safe, there are a few potential issues, such as skin irritation, allergic reactions, inadequate absorption, or the medication breaking down. The biggest organ in the body, the skin accounts for roughly 16% of an individual's overall weight.

The epidermis, dermis, and subcutaneous tissue are its three primary components. Together, these layers support the body's senses, prevent water from escaping, regulate body temperature, protect the body, and aid in the production of vitamin D. Taking care of one's skin and applying makeup is crucial since having healthy skin improves one's appearance, comfort level, and ability to communicate. One of the most popular methods for applying medication to the skin is through creams.

Depending on their components and intended use, these semi-solid mixes may be water-based or oil-based. They are designed to nourish, cleanse, moisturize, relieve inflammation, or administer medication to the skin. Oil-based compositions with a high oil content are known as winter creams or cold creams. In cold weather, they aid in the treatment of dry or cracked skin. They create a barrier that retains moisture and guards against issues including winter rash, eczema, and skin breaking. A decent winter cream should look good, feel smooth, not be oily, and not irritate skin. In order to create a smooth, even cream that can be used in cold weather, the oil and water components of these creams are often heated separately and then slowly mixed while stirring.

MATERIALS AND METHODS

MATERIALS

Active Drug

Curcumin (*curcuma longa)* were obtained from local market of Mysuru

Excipients and Chemicals

- **Coconut oil:**

Helps in restoring damaged skin when cold weather sets in.

- **Neem oil:**

It can be used as a dormant season application or a foliar spray.

It works wonders in removing dead skin cells to reveal healthy, glowing and bright skin.

- **Bees wax:**

Helps to keep skin moisturized.

Leaving it feeling beautifully soft and smooth.

- **Borax:**

Prevent the bacterial growth.

- **Liquid paraffin:**

Used in the treatment of dry skin.

It relieves dry skin condition such as eczema and ichthyosis.

It is an emollient.

- **Cetyl alcohol:**

Hydrating, conditioning and provides an easy glide on skin.

- **Rose water:**

To treat dryness, turn dry skin and falky skin to smooth as ever and used as perfume.

METHODS

- Making of oil phase: All oils (neem oil, coconut oil, liquid paraffin), cetyl alcohol and Bees wax are taken into a porcelain dish and indirect heating(70°C) up to a solid ingredient get melt.

- Making of aqueous phase: water soluble borax is dissolved in the rose water with gently heating(70°C).

Firstly, heated oil phase is collected into a mortar and addition of aqueous phase in portions with continuous stirring in one direction with pestle for 5 minutes. [10]

INGREDIENTS(gm)	F1	F2	F3	F4
Curcumin	0.1	0.1	0.1	0.1
Neem oil	5.9	4.7	3.2	2.1
Coconut oil	2.3	3.5	5.0	6.1
Bees wax	6.0	6.0	6.0	6.0
Borax	0.06	0.06	0.06	0.06
Cetyl alcohol	2.8	2.8	2.8	2.8
Liquid Paraffin	12.8	12.8	12.8	12.8
Perfume(Rose water)	q.s	q.s	q.s	q.s

Evaluation of winter cream containing curcumin:

1. **Organoleptic Properties**:

The organoleptic properties such as color, odor and appearance was observed.[13]

2. **Sensitivity test:**

The cream which was prepared has applied on 1cmskin of hand and exposed tosunlight for 4-5mins.[3]

3. **Dye Test:**

The Scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide then covers it with a cover slip, and examines it under a microscope .If the disperse globules appear red the ground colorless .The cream is w/o type. The reverse condition occurs in o/w type cream i.e. the disperse globules appear colorless.[13]

4. **Irritancy test:**

The formulated cream shows no redness ,edema , irritation and inflammation during studies. Then formulated cream is safe to use.[13]

5. **Grittiness:**

Formulation was evaluated with the help of compound microscope to observe for the presence of any particles.[12]

6. **Determination of pH :**

A calibration by a standard buffer solution was done to the pH meter and then 0.5g of the formulated herbal cream was taken and mixed properly with 50 ml distilled water. Then, the pH

of the cream was determined by the pH meter at room temperature.[12]

7. Spreadability studies:

Bachhavet al. earlier presented a method for determining spreadability. Spreadability was assessed by dropping 0.5 gm cream in a marked circle on a glass plate with a diameter of 1cm .A glass plate of identical size was put over it, with care taken to prevent air bubbles from becoming trapped between the two slides. For 5 minutes, a weight of 500gm was kept on the upper glass plate to evenly distribute the cream. The increase in diameter caused by the cream spreading was noticed as a spreadability indication Then calculate using the formula.[12]

Spreadability =

$$\frac{\text{weight tied to upper slide(gm)} \times \text{length of glass slide(cm)}}{\text{Time taken(sec)}}$$

8. Patch test:

About 1-3 gms of the formulated creams was evenly applied on sensitive region of the skin surface such as the skin under the lower jaw. The cream for testing was applied on an area of 1 sq.m of the skin surface and the site was inspected after 24 hours of application.[13]

RESULTS AND DISCUSSION

RESULTS

1. Organoleptic properties:

The physical properties of formulated cream wear judged by color, odor and texture.

SR NO	Properties	F1	F2	F3	F4
1	Color	Bright yellow	Bright yellow	Bright yellow	Bright yellow
2	Odour	Rose	Rose	Rose	Rose
3	Appearance	Semi solid	Semi solid	Semi solid	Semi solid

2. Sensitivity test:

The formulated cream does not shows any type of sensitivity reaction.

SR NO	Formulations	Sensitivity
1	F1	No
2	F2	No
3	F3	No
4	F4	No

3. Dye test:

The Scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide then covers it with a cover slip, and examines it under a microscope.

The disperse globules appears colorless in the red ground i.e. w/o type cream.

4. Irritancy test:

The formulated cream shows no redness ,edema , irritation and inflammation during studies. The formulated cream is safe to use.

SR NO	Formulations	Erythema	Edema	Irritation	Inflammation
1	F1	No	No	No	No
2	F2	No	No	No	No
3	F3	No	No	No	No
4	F4	No	No	No	No

5. Grittiness:

The formulated cream does not contain any particles.

6. Determination of PH:

The PH of the formulated cream was found to be in the range of 5.4-6.2 which is good for skin.

SR NO	Formulations	PH
1	F1	6.0
2	F2	5.9
3	F3	6.2
4	F4	5.4

7. Spreadability studies:

The spread ability test showed that the formulated cream has good spreadable property.

Formulations	Mass (gm)	Radius (cm)	Time (sec)	Spreadability (gm cm/sec)
F1	500gm	2.7	60	22.5
F2	500gm	2.4	60	20.0
F3	500gm	2.5	60	20.83
F4	500gm	2.8	60	23.33

8. Patch test:

The formulated cream shows no redness , and formulated cream is safe to use.

DISCUSSION :

All of the formulations' physical characteristics, such as color, odor, and appearance, stayed the same. According to the figure, none of the formulations caused erythema, edema, redness, or irritation during the irritancy test. In a similar vein, the sensitivity test showed that none of the produced creams irritated skin when exposed to sunlight. All formulations were verified to be of the water-in-oil (w/o) type by the dye test. The curcumin-containing winter creams were found to have a pH between 5.4 and 6.2, which is within the permitted range for topical formulations. Of these, formulation F4 had a pH of 5.4, meaning that no pH modification was required. Formulations F1, F2, F3, and F4 had spreadability values of 22.5 g·cm/sec, 20.0 g·cm/sec, 20.83 g·cm/sec, and 23.33 g·cm/sec, respectively, all within standard limits, with formulation F4 demonstrating the best spreadability.

CONCLUSION:

It can be concluded that;None of the formulations produced irritation, and all of them had decent consistency, color, and odor, with formulation F4 exhibiting slightly superior qualities than the others. All of the formulations spreadability values fell within the typical range, with F4 showing the best spreadability at 23.33 g·cm/sec. Formulation F4 displayed a pH of 5.4, suggesting that no pH correction was required. The pH of the formulations was determined to be between 5.4 to 6.2, which is within the permitted range for topical applications. The study's overall findings indicate that formulation F4 is ideal and that the curcumin-containing herbal winter cream is safe to use because it is made from natural extracts. Because they are thought to be safer and to have less negative effects than synthetic equivalents, herbal products are typically selected. To improve the product's overall quality, more thorough stability studies are necessary.

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