

## Development and Evaluation of Herbal Winter Cream Containing Curcumin from *Curcuma Langa*

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**ABSTRACT:** *Curcuma longa* generally called as turmeric belongs to the family of Zingiberaceae and it's deduced from the rhizomes. It's well known that curcumin has a good moisturizing, and give defensive effect on the skin. Traditionally, curcumin is incorporated in numerous natural herbal remedies to treat skin infections. cosmetics are the medications are used to bedeck and enhance the mortal appearances. The purpose of this study to formulate and evaluation curcumin containing moisturizing exertion/ downtime cream. The moisturizing cream prepared by using the neem oil painting and coconut oil painting. The herbal excerpt containing downtime cream gives the cooling and soothing effect due to slow evaporation of water present in the conflation. The downtime creams are more moisturizing as they give an unctuous hedge which reduces the water loss from the stratum corneum, the remotest subcaste of the skin. They're water- in- oil painting conflation and intended for operation on skin or accessible mucous membrane to give localized and occasionally systemic effect at the site of application.

**Keywords:** *Curcuma longa*, Cosmetics, winter Cream, Neem oil, Coconut oil, Topical delivery system, Methods of Preparation, Evaluation.

### I. INTRODUCTION

The word 'Cosmetic' is derived from a Greek word – 'kosmeticos' that means to bedeck. From that time any paraphernalia used to beautification or promoting appearance is known as ornamental. The word "cosmetics" actually stems from its use in Ancient Rome. They were generally produced by womanish slaves known as "cosmetae" which is where the word "cosmetics" stemmed from. lately, cosmetics have been a necessity for men and women. The need for cosmetics is constantly associated with the supposition relating to physical attractiveness. In general, cosmetics are constituents used to bedeck the face area similar as cheeks, lips, indeed the eyes. 2. Cosmetics are

readily available moment in the form of creams, camo, scents, eye murk, nail polishes, hair sprays etc. Other cosmetics like face cream give radiance to the skin after applying the base cream. also we've maquillages, which are applied by numerous women of all periods. They're made from wax and cocoa adulation in the asked quantum. Cosmetics like creams, gels, and colognes are used on a quotidian base by both women and men. Creams act as a cleaner for the face in numerous circumstances. further lately anti- senior creams have been manufactured which can retain immature looking skin for numerous times. The voguish sanctification agents are sanctifying cream, cleaner and water. Cosmetic creams serve as a skin food for hard, dry and chapped skin. It substantially lubricates, softens and removes unwanted dirt from the skin. Some popular fat creams that are used include Vaseline and Lanolin. Dry creams are used in the manufacture of cleaner and gelatin which is used as a base for the skin. Hair care has come one of the fastest developing requests in the beauty assiduity. numerous immature men turn to canvases and gels to maintain and name their hair. Products like hair gels, canvases, and poultices have been introduced in the request to help cover hair fall and dandruff. Some professions, like the show business assiduity, concentrate on the significance of the external appearance numerous beauty products manufacturers have employed the conditions of people to cover themselves and their skin from the shafts of the sun. The significance of Cosmetics Today Cosmetics helps to enhance our appearance and make us feel more confident. With further cosmetics on the request moment than ever ahead, it becomes egregious to us that they play a great part in our everyday life.

### Topical drug delivery:

Topical medicine delivery can be defined as operation of medicine via skin to directly treat or cure the skin diseases. These topical medicine delivery systems are generally used for original

skin infection like fungal infection or where other route of administration are no suitable. It can access deeper into skin and hence give better immersion. Topical operation has no of advantages over the conventional lozenge forms. In general, they're supposed more effective lower poisonous than conventional phrasings due to the bilayered composition and structure<sup>3</sup>.

**Physiology of skin:**

The skin is one of the largest and most important organs in the body and comprises approximately 16% of the human body weight. As it covers the entire body.

The skin is continuous with the membranes lining the body orifices and in certain areas contains accessory structures such as glands, hair and nails.<sup>4</sup>

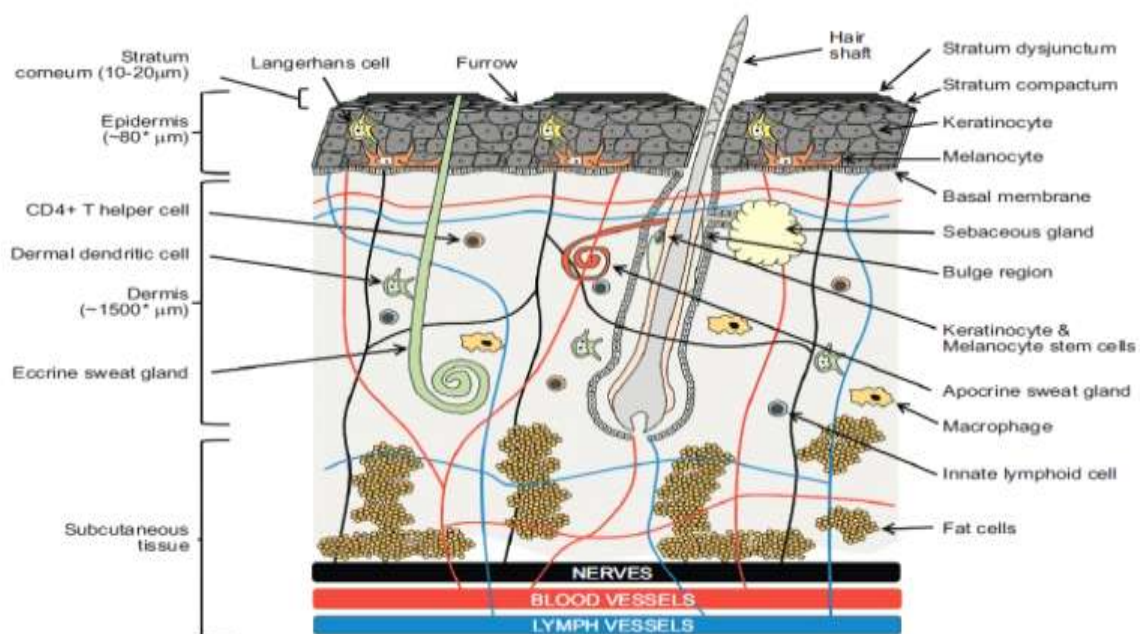


Figure 1: Cross-Section of Skin.<sup>5</sup>

**Mechanism:**

Upon operation of the topical medicine on the skin, it'll diffuse to the external subcaste of the skin, known as stratum corneum. There are three routes possible for the medicines to cross the skin. The first route is through the accessories. It's known as the "first cut" where the medicine motes will be partitioned into the sweat gland to bypass the stratum corneum barrier. However, it's generally remains in the stratum corneum's bilayered lipids, where the medicine motes transport through either the transcellular route or paracellular route into the deeper area of the skin like subcutaneous subcaste. If the medicine motes isn't transported via the "first cut". For the paracellular route, it means that the solutes transport via the junction between the cell. When the topical medicine motes transport via the paracellular route, it needs to travel across the stratum corneum, which is a largely fat region, but between the cells. On the other hand, the topical medicine motes may travel through the

transcellular route. This route allows motes to be transported via the cell. Transcellular route transports the medicine patch into the bilayered lipid cells set up in stratum corneum. Inside of the bilayered lipids in the stratum corneum is a water-answerable terrain, and the medicine motes will diffuse through these bilayered lipids into deeper area of the skin. During the transportation of the topical medicine motes, it can bind to the keratin that exists as one of the skin factors in the stratum corneum.<sup>6</sup>

**Functions of skin:**

- a) Protection
- b) Sensation
- c) Heat regulation
- d) Control of evaporation
- e) Aesthetics and communication
- f) Storage and synthesis
- g) Water resistance.<sup>1</sup>

## Cream

Creams are the topical preparations which can be applied on the skin. Creams are defined as “viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type” dosage forms which consistency varies by oil and water.[6] Creams are used for cosmetic purposes such as cleansing, beautifying, improving appearances, protective or for therapeutic function.

### Types of creams according to function, characteristics, properties and types of emulsion

1. Make-up cream (o/w emulsion):
  - a) Vanishing creams.
  - b) Foundation creams.
2. Cleansing cream, cleansing milk, Cleansing lotion (w/o emulsion)
3. Winter cream (w/o emulsion):
  - a) Cold cream or moisturizing creams.
4. All-purpose cream and general creams.
5. Night cream and massage creams.
6. Skin protective cream.
7. Hand and body creams. <sup>1</sup>

### Winter cream:

These are w/o type of formulation and in this formulation oil content will be more than water content. These creams are mainly used for chapped and dry skin. Cold cream: It is known as moisturizer or moisturizing cream. Cold cream must have an emollient action. It should produce a cooling sensation in use and the oil film on the skin should be nonocclusive.<sup>7</sup>

### An ideal winter cream should have the following properties:

- ❖ It should have a low sensitization index.
- ❖ It should be elegant in appearance.
- ❖ It should be non-dehydrating.
- ❖ It should provide a smooth texture.
- ❖ It should be non-greasy and non-staining.
- ❖ It should not cause irritation to the skin.
- ❖ It should not alter the membrane or skin functioning.<sup>8</sup>

### Advantages

AS cold creams contain enough amounts of water and oil, they keep skin safe from the rough environments. They also keep skin moisturized and safe from damages.

### Disadvantages

However, as they contain petroleum, that might block the evaporation of water, they often clog pores resulting in pimples, they might also dark the complexion if overused.<sup>9</sup>

### OBJECTIVES:

The main objective of this study was to development and evaluation of winter cream containing curcumin using natural super oils for the treatment of moisturizing purpose.

## II. METHOD AND MATERIALS

### Method:

- 1) 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.
- 2) Making of aqueous phase: water soluble borax is dissolved in the rose water with gently heating (70°C).
- 3) 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.<sup>10</sup>



Fig 2: Method of Preparation

### Materials:

Herbal oil collection: All herbal essential oils are purchased from Shree dhanavanthri Medical Shop Mysore

ii. Other Ingredients: Other ingredients such as Bees wax, cetylalcohol, liquid paraffin and Powdered Borax are collected from Pharmaceutics laboratory of Bharathi college of pharmacy.

Table 1: Formulation of winter cream containing curcumin

INGREDIENTS	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.<sup>11</sup>

**2.Sensitivity test:**

The cream which was prepared has applied on 1cmskin of hand and exposed to sunlight for 4-5mins.<sup>8</sup>

**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.<sup>11</sup>



Fig 3: slide contain mixture of curcumin cream and dye

**4.Irritancy test:**

The formulated cream shows no redness, edema, irritation and inflammation during studies. Then formulated cream is safe to use.<sup>11</sup>

**5.Grittiness:**

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



Fig 4: Grittiness test

**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.



**Fig 5: PH Meter**

**7.Spreadability studies:**

Spread ability 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 spread ability indication Then calculate using the formula.<sup>12</sup>

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

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.<sup>11</sup>

**III. RESULT AND DISCUSSION:**

**1. Organoleptic properties:**

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

Table:2 Organoleptic properties of Curcumin winter cream

SI. NO	Properties	F1	F2	F3	F4
1	Color	Bright yellow	Bright yellow	Bright yellow	Bright yellow
2	Oduor	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.

Table:3. Sensitivity reaction

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



**Fig 6: Result after sensitivity test**

**3.Dye test:**

The Scarlet red dye is mixed with the cream. Place a drop of the cream on a microscop

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



Fig 7: Microscopic image of dye test

**4.Irritancy test:**

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

**Table :4 Irritancy test**

SL 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



Fig 8: Result after irritation test

**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.

**Table:5 PH of the formulated cream**

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

**7. Spread ability studies:**

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

**Table:6 Spread ability studies**

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



**Fig 9: Result of spread ability test**

**8. Patch test:**

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

**DISCUSSION**

Among all the formulations there is no change of the physical properties. All the prepared winter cream containing curcumin was checked for their ph. The Ph of all the formulations is found in the range of 5.4 to 6.2 as showed in fig 3. This is well between the range for topical administered formulation and formulation F4 has showed ph. 5.4, therefore there is no need for adjusting the ph of the formulation. The spread ability of Formulations F1, F2, F3, and F4 Shows 22.5gm\*cm/sec, 20.0gm\*cm/sec, 20.83gm\*cm/sec and 23.33gm\*cm/sec, respectively. All the formulations show the values within the standard value, F4 shows better spreadability compare to other.

**IV. CONCLUSION:**

The purpose of this study was to develop a winter cream. The formulated Curcumin containing winter cream was evaluated for several physiochemical tests and the results were found according to the standard value. Curcumin is a natural pigment obtained from Curcuma longa with considered medicinal values. This herbal cream is

one of the good winter creams. From the above results it is concluded that the F4 formulation showed good consistency and spread ability, homogeneity, pH, non-greasy. From the above study it can be concluded that the herbal winter cream containing curcumin is safe to use as it is developed from herbal extract.

**REFERENCE:**

1. Chauhan L, Gupta S. Creams: A review on classification, preparation methods, evaluation and its applications. Journal of drug delivery and therapeutics. 2020 Oct 15;10(5-s):281-9.
2. Ainurofiq A, Maharani A, Fatonah F, Halida HN, Nurrodotiningtyas T. Pre-Formulation Study on The Preparation of Skin Cosmetics. Science and Technology Indonesia. 2021 Oct 18;6(4):273-84.
3. Dhanshree K , Dr. Narendra G , Review: Topical Drug Delivery system International Journal of Pharmaceutical Research and Applications . 2021 may –June 3;6(3):514-518.
4. McKnight G, Shah J, Hargest R. Physiology of the skin. Surgery (Oxford). 2021 Dec;40(1).
5. Benson HAE, Grice JE, Mohammed Y, Namjoshi S, Roberts MS. Topical and

- Transdermal Drug Delivery: From Simple Potions to Smart Technologies. Current Drug Delivery [Internet]. 2019 Jun 1;16(5):444–60. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6637104/>.
6. Topical drug delivery [Internet]. Wikipedia. 2023 [cited 2023 Oct 4]. Available from: [https://en.m.wikipedia.org/wiki/Topical\\_drug\\_delivery#Mechanism](https://en.m.wikipedia.org/wiki/Topical_drug_delivery#Mechanism).
  7. Winter Skin Diseases: Prevention and Treatment [Internet]. 2020 [cited 2023 Oct 4]. Available from: <https://www.apothecopharmacy.com/blog/winter-skin-diseases-prevention-and-treatment/>.
  8. Ahmad A ,Anitha M, Fitri F , Hainun N H ,Tejayani N , Preformulation study on the preparation on skin cosmetics. Signs and technology Indonesia 2021 Oct 4;6(4):273-284
  9. Jogdand R ,Prof S. A.Ghadge, Dr.Santosh J. Formulation And Evaluation Of Turmeric and Aloe Cold Cream.2023 June 8;
  10. Bhushan D S , Amol Y , Formulation and Evaluation of Polyhedral Cold Cream . International Journal of Pharmaceutical Research and Application.2023 Jan- Feb ;8(1):1832
  11. Harshada G , Ashvini G , Chaitrasudha G , Prof .Kirti D ,Dr. Rajesh O . Preparation and Evaluation of Herbal Cold Cream. International Journal of Pharmaceutical Research and Application.2022 Jul- Aug ;7(4):1590-91
  12. WegdanA S , Dr. Tanveer A , Md Sohail .Development and evaluation of herbal cream containing curcumin from curcuma longa. Pharmacy and Pharmacology International Journal . 2020 Dec;8(5):287