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Research Article

Formulation And Evaluation Of Herbal Cream Containing Curcumin From *Curcuma Longa*

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ABSTRACT

Curcuma longa commonly called as turmeric belongs to the family of Zingiberaceae and it is derived from the rhizomes. It is well known that curcumin has a good anti-inflammatory properties and a protective effect on the skin. Traditionally, curcumin is incorporated in many natural herbal remedies to treat skin infections and inflammation. Stearic Acid, different quantities of Turmeric Extraction, Cetyl alcohol, Propylene Glycol ,glycerine, Methyl Paraben, Vitamin E, Sodium Lauryl Sulphate, Almond oil, and the necessary amount of distilled water were used to produce the cream. The pH of the skin (6.8–7) was then maintained by adding. The prepared compositions were assessed for skin irritation, Spreadability, pH, and physical appearance. Stability investigations have adhered to ICH recommendations. The purpose of this study to isolate curcumin from Curcuma longa and formulate curcumin containing herbal cream. Result: The current work was completed on the formulation and assessment of the herbal cream. A number of factors are taken into consideration when evaluating cream, including its colour, consistency, pH, Spreadability, viscosity, stability, washability, and skin irritancy test results

INTRODUCTION

Turmeric

Turmeric (Curcuma longa) Turmeric is an amazing plant. Its botanical name is Curcuma longa L. and it's part of the ginger family.[1] Turmeric is native to Southwest India, which is where its roots come from. Those roots give turmeric its bright yellow colour - people use turmeric both as a spice and to make dye.[2]

The use of turmeric rhizome and other plant derivatives that yield yellow-colored colors is becoming more common as a natural compound's synthetic additions are replaced.[4] The rhizome of turmeric is frequently used in the food sector, especially as a coloring additive for sauces and processed meals. One of nature's most valuable resources, turmeric is a significant medicinal and fragrant plant with enormous export potential in

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the areas of natural colors, medicine, personal care, and culinary spices.[3-6]

The rhizome of turmeric has been used for many years in various applications and has been traded internationally because of its health-promoting qualities. Turmeric's unique yellow-orange color and strong flavor profile have made it a valuable ingredient in international culinary supply chains and business opportunities.[8-9]

Fig no.1 Curcuma Longa

Fig. no. 2 Plant of Curcuma Longa

Scientific Classification of curcuma longa:[4]

Botanical Name:	Curcuma longa.
Order:	Zingiberales
Local Name:	Haldi
Family:	Zingiberaceae Martinov - Ginger family
Kingdom:	Plantae- Plants
Sub-kingdom:	Tracheobionta
Super division:	Spermatophyte
Division:	Magnoliophyta
Genus:	Curcuma
Class:	Liliopsida
Subclass:	Zingiberidae

Chemical Constituent's

One of the many bioactive components found in turmeric, which is well known for its health benefits, is curcumin, which makes up between 2 and 5% of the plant's weight.[7] Strong anti-inflammatory characteristics set curcumin apart, which makes it an invaluable treatment for ailments like arthritis. Its antioxidant properties also protect cells from the damaging effects of free radicals, and its ability to prevent the formation of cancer cells and improve brain function only serves to increase its appeal. Smaller concentrations of demethoxy curcumin (DMC) and bisdemethoxy curcumin (BDMC) have comparable benefits, especially in reducing inflammation and preventing cancer.

About 30% of the essential oil fraction is composed of turmerone, which has antibacterial, neuroprotective, and anti-inflammatory qualities. Curlone has strong antibacterial and anti-inflammatory properties and makes about 12–15% of the essential oil fraction. Finally, curcuphenol, while in minute concentrations, adds to the antibacterial and anti-inflammatory properties of turmeric. When combined, these substances highlight turmeric's diverse range of medicinal benefits for a number of ailments.[8-10]

Table.2: Biological activities of turmeric compounds and extract. [5-10]

COMPOUNDS/EXTRACTS	BIOLOGICAL ACTIVITIES
Turmeric powder	Wound-healing
Alcoholic extract	Anti-bacterial
Aqueous extract Anti-fertility	Anti-fertility
Ar-turmerone	Anti-venom
Bis-demethoxycurcumin or Demethoxycurcumin Antioxidant	Antioxidant

Crude etheric or Chloroform extracts	Antioxidant
Curcumin	Anti-bacterial, anti-protozoan, anti-viral, hypolipemic, hypoglycaemic, anti-coagulant, antioxidant, anti-tumor, anti-carcinogenic
Ethanolic extract	Anti-inflammatory, hypolipemic, antitumor, anti-protozoan

Cream:

Emulsifying agents stabilize the water and oil phases of creams, which are semi-solid emulsions. They are applied topically for medicinal, cosmetic, and skincare uses. Creams are semisolid dosage forms containing more than 20% water or volatile components and typically less than 50% hydrocarbons, waxes, or polyols as vehicles. Additionally, they might have one or more medication ingredients dissolved or spread throughout an appropriate cream foundation. This phrase has historically been used to describe semisolids with a somewhat fluid viscosity that are prepared as oil-in-water (such as fluocinolone acetonide cream) or water-in-oil (such as cold cream) emulsions.[12-14]

APPLICATIONS OF HERBAL CREAMS[11]

- Minimize sunburn
- Promote skin hydration retention
- Make the skin more smooth
- Diminish roughness on the skin
- Cut down on creases
- Address skin issues such as acne and scars

ADVANTAGES: [11]

- Because of their natural composition, they tend to elicit fewer negative reactions.
- Herbal creams take into account the connection between general health and skin health.
- They provide formulation versatility to address particular skin issues.
- Herbal creams, abundant in vitamins and antioxidants, revitalize and nourish the skin. derived from plants.

MATERIAL AND METHODS:

Material:

Curcuma Longa extract was collected. The plant materials were authenticated at the P.G. Department of botany and research centre, MSG arts, science and commerce college, Malegaon camp, Nashik by Dr. Atul N. Wagh. The stearic acid, glycerine, cetyl alcohol, methyl paraben, propylene glycol, vit-E, sod.lauryl sulphate, almond oil and distilled water were obtained from the Department of Pharmaceutics, SVS IOP.

Methods:

Preparation of Turmeric extract: [15]

Curcuma longa (turmeric) extract was made with great care and attention to detail. Peeled or unpeeled turmeric had been acquired, and solvent mixes (propylene glycol and water, butylene glycol and water, and glycerin and water) had been made. The chosen solvent mixture was added to an extraction vessel containing the turmeric, and the extraction method employed was maceration. Grain alcohol and powdered turmeric peel were used to create a hydro-alcoholic extraction process for the extract. After the combinations were filtered to get rid of leftovers, the turmeric extract was gathered. Lastly, the extract was properly stored and, if necessary, concentrated or purified. Temperatures, maceration durations, and solvent ratios have all been meticulously modified to satisfy particular specifications.

Fig.no.04: 1st day

fig.no.05: Extraction Process

fig.no.06: filter extract

Formulation of herbal cream: [16]

1. Fill the first beaker with all of the oil-soluble components, including almond oil, cetyl alcohol, and stearic acid.
2. Next, heat it to 70–80°C in a boiling water bath (Beaker and Oil Phase).
3. Next, all of the water-soluble components, including distilled water, rose water, glycerine, propylene glycol, methyl paraben, and triethanolamine, are combined in a different beaker and heated to between 70 and 80°C (Beaker B Aqueous Phase).
4. The oil phase was gradually added to the heated aqueous phase while being continuously stirred until a cream formed.

Fig.no.07: formulation of cream

Sr. No	Name of Ingredients	Quantity Batch A	Quantity Batch B	Property
1	Turmeric Extraction	100gm	2gm	API
2	Distilled water	20ml	20ml	Vehicle
3	Stearic Acid	4.5gm	5gm	To Maintain Moisturizing The Skin
4	Cetyl Alcohol	4.05ml	2.05ml	Separating Oil & Liquid
5	Glycerine	4.05ml	2ml	Moisturizing
6	Methyl Paraben	0.90gm	0.9gm	Preservative
7	Propylene Glycol	2.5gm	2.5gm	Preservative
8	Vitamin E	-	2.25ml	Antioxidant Properties
9	Sodium Lauryl Sulphate	0.2gm	0.25gm	Emulsifier
10	Almond Oil	50gm	50gm	Lubricant

Table 1: cream base formulation

PHYSICAL EVALUATION PARAMETER[17-19]

The following criteria were used to assess herbal cream:

- Physical appearance
- Consistency
- Colour
- Odour
- Viscosity
- Washability
- Texture
- pH Determination
- Skin irritation study
- Spreadability

1. Organoleptic Properties:

The organoleptic properties such as colour, Odor and appearance were observed.

2. Determination of pH:

The pH value of freshly formulated emulsion was determined using a
digital pH meter at room temperature.

3. Determination of homogeneity:

The homogeneity of the herbal preparation was observed by visual appearance and by touch.

4. Determination of spreadability:

The term spreadability is expressed as the extent of the area to which the topical application spreads when applied to the affected region of the skin. The therapeutic efficacy of the herbal formulation is also dependent on its spreading range. Thus, it is necessary to determine the spreading ability of the prepared formulation. For the determination about 3 gms of cream was applied between the two glass slides and pressed to obtain a thin film of uniform thickness. A weight of 1000 gm was placed over the top slide to apply the required pressure for 5 minutes. Followed by addition of about 10 gms of weight in a pan and the upper slide was subjected to pull with the help of a string attached to a hook. The time taken by the two slides to slip over each other by a distance of 10 cm under certain load was noted. Following is the formula to calculate the spreadability of the prepared formulation.

$$S = m \times L/T$$

Where,

S – Spreadability

m – Weight tied to upper glass slide

L –Length moved on a glass slide

T – Time taken

5. Washability:

It was observed that formulated and marketed creams were easily washable under tap water.

6. Spreadability:

The spreadability of formulated and marketed creams was tested, and it was observed that formulated cream has the same spreadability as marketed cream.

7. Stability studies:

The physical stability of the formulations was studied by placing them in a plastic or a glass container and they were placed in a humidity chamber at 45°C. Their appearance and physical stability were inspected for a period of 24 hours.

RESULT AND DISCUTION

The current work was completed on the formulation and assessment of the herbal cream. A number of factors are taken into consideration when evaluating cream, including its colour, consistency, pH, Spreadability, viscosity, stability, washability, and skin irritancy test results.

Result of batch-2 Formulation:

Sr. No	Specification	Limits
1.	Colour	White, Transparent
2.	Odour	Odour of turmeric cream
3.	Texture	Smooth
4.	pH	5.46
5.	Consistency	Thick
6.	Greasiness	Greasy
7.	Grittiness	Nongritty
8.	homogeneity	No aggregates
9.	Stability	After 20 days was stable
10.	Irritancy	Non-irritable
11.	Spreadability	Uniform

12.	Feel on application	Cooling
13.	Removal	Easily removable

Table 02: Evaluation Parameter

Results interpretation on hands:

Fig.no.08: before application of cream

Fig.no.09: after application of cream

The goal of the current study was to produce a turmeric herbal cream. There was good spreadability in the produced mixture. The cream had an excellent PH. During storage, cream does not exhibit any kind of pH separation. It was simple to remove once applied. The composition did not cause irritation or damage to the skin. Batch 2 of the formulation is thought to be the most stable.

CONCLUSION

The organoleptic properties of formulated herbal cream were evaluated, and the results were apt. Other physical parameters like pH, homogeneity, type of smear, emolliency, viscosity and type of emulsion were also evaluated accordingly and pH was found to be compatible with the pH of skin secretions and showed proper pH range that is approximately pH 6, prepared formulation showed good spread ability and emolliency. The thermal stability studies were also conducted for a month, there was no sign of separation of aqueous and oily phases. The formulated cream was studied for microbial contamination, no sign of microbial growth was visible after the specified incubation period of 24hrs.

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REFERENCE

1. Sojeetra NH, Buha MM, Acharya R. Haridra (Curcuma longa linn.) Depiction in Ayurvedic and Indian Alchemy (Rasashastra) Literature: A Classical Memoir. Annals of Ayurvedic Medicine. 2019 Jun 1;8(1):32-.40.
2. Huddar SH, Anupkumar E, Jadhav A. Classical review of Haridra (Curcuma longa). Journal of Ayurveda and Integrated Medical Sciences. 2023 May 25;8(4):122-7.
3. Albaqami JJ, Hamdi H, Narayanankutty A, Visakh NU, Sasidharan A, Kuttithodi AM, Famurewa AC, Pathrose B. Chemical composition and biological activities of the leaf essential oils of Curcuma longa, Curcuma aromatica and Curcuma angustifolia. Antibiotics. 2022 Nov 3;11(11):1547.
4. Kokate C. Textbook of pharmaceutical biotechnology. Elsevier India; 2011
5. Verma RK, Kumari P, Maurya RK, Kumar V, Verma RB, Singh RK. Medicinal properties of turmeric (Curcuma longa L.): A review. Int. J. Chem. Stud. 2018;6(4):1354-7.
6. Niranjan A, Prakash D. Chemical constituents and biological activities of turmeric

(Curcuma longa l.)-a review. Journal of Food Science and Technology. 2008 Mar 1;45(2):109.

7. Li S, Yuan W, Deng G, Wang P, Yang P, Aggarwal B. Chemical composition and product quality control of turmeric (Curcuma longa L.).
8. Labban L. Medicinal and pharmacological properties of Turmeric (Curcuma longa): A review. Int J Pharm Biomed Sci. 2014;5(1):17-23.
9. Singh G, Kapoor IP, Singh P, de Heluani CS, de Lampasona MP, Catalan CA. Comparative study of chemical composition and antioxidant activity of fresh and dry rhizomes of turmeric (Curcuma longa Linn.). Food and chemical toxicology. 2010 Apr 1;48(4):1026-31.
10. Ansari S, Jilani S, Abbasi H, Siraj M, Hashimi A, Ahmed Y, Khatoon R, Rifas AM. Curcuma longa: A treasure of medicinal properties. Cell Med. 2020 May;10(2):91-7.
11. Devi N, Kumar A, Garg A, Hussain A, Khathuriya R. A review on herbal cosmetics. World Journal of Pharmaceutical Research. 2018 Feb 21;7(8):298-310.
12. DK SS, Jain V. Challenges in formulating herbal cosmetics. Int J App Pharm. 2018 Nov 7;10(6):47-53.
13. 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.
14. Thombare S, Shirsath P. Herbal Cosmetics and Skin Care Formulations. International Journal of Pharmaceutical Sciences. 2023 Sep 10;1(10):1-10.
15. Paulucci VP, Couto RO, Teixeira CC, Freitas LA. Optimization of the extraction of curcumin from Curcuma longa rhizomes. Revista Brasileira de Farmacognosia. 2013 Jan 1;23(1):94-100.
16. Panda S. Extraction, formulation and evaluation of antiaging curcumin facial cream. J emerg technol innov res. 2018;5:1369-71
17. Singh S, Zaidi SY, Maurya S. Formulation and evaluation of multipurpose herbal cream. World Journal of Pharmaceutical Research. 2022 Mar 29;11:798-805.
18. Matangi SP, Mamidi SA, Raghavamma ST, Nadendla RR. Formulation and evaluation of anti-aging poly herbal cream. skin. 2014;5(6).
19. Prajakta S, Shahu K. Formulation and evaluation of vanishing herbal cream of crude drugs. Asian Journal of Pharmaceutical Research and Development. 2020 Jun 15;8(3):66-9.

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