



“EVALUATION OF POLY HERBAL CREAM CONTAINING A STANDARDIZED EXTRACT OF CURCUMA LONGA”

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➤ Abstract:

Curcuma longa, often called turmeric, belongs to the Zingiberaceae family and originates from rhizomes. Curcumin is known to have good anti-inflammatory properties and protects the skin. Traditionally, curcumin has been included in many natural herbal remedies to treat skin infections and inflammations. Using plants as a home growing treatment strategy can be a move that several analysts have so far created to produce effective and insignificant side effects. Turmeric is one of the most commonly used spices in Indian cooking. The most fixed substances in turmeric are curcumin (77%), demethoxy (17%) and bisdemethoxy (3%). One of the pharmaceutical formulations with a topical administration framework can be an ointment formulation, which can be a semi-solid dosage form containing one or more sedatives dispersed or dispersed in a suitable carrier. Turmeric can be defined in different ways, one of which can be a cream formula. The advantage of using cream settings is that they are rustic, easy to wash and clean. The reason for this consideration was the definition of turmeric extract in the cream placement experiment, it was found that the equation gave a yellow-orange color, a typical turmeric smell and placement on a semi-solid cream surface, a very homogeneous cream, high spreadability, local pH. were 5.84, 6, 32, 6.24, 5.94 and the emulsion type is O/W (Oil in Water).

➤ **Keywords:** Curcuma Longa, Curcuminoids, Neem, Demethoxycurcumin, Bidemethoxycurcumin.

➤ Introduction:

Curcumin, extracted and isolated from Curcuma Longa, a member of the Zingiberaceae family, renowned for its rich content of lipophilic, polyphenolic carotenoids called curcuminoids, was utilized to formulate an herbal moisturizer in this study focusing on polyherbal formulations for treating various topical diseases [1].

1. Curcumin exhibits therapeutic properties against a range of human diseases and demonstrates anti-proliferative effects on numerous cancer types.
2. It is used to treat many diseases including menstruation, anemia, asthma, joint dislocations, diabetes, diarrhea, cough, dyspepsia, liver diseases, loss of appetite, cough, bronchitis, hepatitis, ringworm,

menstrual disorders, tooth ache. , urinary tract infection, skin disease, scorpion sting, ringworm and poor vision [2].

3. *Curcuma longa* is commonly cultivated in Cambodia, India, Southern China, Indonesia, Madagascar, Malaysia, Philippines and Vietnam. Turmeric is usually found at an altitude of 500-900 meters in Thailand.
4. The main objective of this study was to isolate curcumin from the *Curcuma Longa* plant and formulate a curcumin-containing herbal cream that emphasizes the addition of natural ingredients instead of synthetic product ingredients [3].

The importance of this research is obvious because there are many creams on the market today that contain synthetic chemical ingredients that can have harmful effects on the skin. Creams based on natural ingredients have very few side effects [4]. Especially curcumin extracted from *Curcuma longa*, which has a very good effect on the skin. In addition, curcumin has been reported to have good anti-inflammatory, antioxidant and antimicrobial properties, allowing researchers to include it in the treatment of skin diseases [5].

➤ **Materials and Method:**

Raw Materials:

Curcuma Longa (turmeric) is one of the main ingredients of the cream, as it has anti-aging and anti-inflammatory properties that help the skin maintain its structure [6]. Other ingredients used in the cream include neem extract, which has antimicrobial properties and has several historical uses in Indian history. Methylparaben, borax, beeswax, liquid paraffin, and perfume (lemon oil) [7].

Extraction of Neem and Curcumin:

Curcumin:

- Weigh 40.5 g of curcumin into separate beakers
- One beaker filled with 150 ml of ethanol and the other filled with 250ml of DCM (Dichloromethane)
- Allow to stand for maceration for 24 hrs (Maceration is a process of extracting a drug by allowing it to stand in contact with a solvent)
- Then evaporate it at 50 degrees Celsius [8]



Fig. 1 : Curcumin

Neem:

- Take neem leaves wash them with distilled water spread the leaves and place them in a hot air oven for 30-40 degrees Celsius temperature.
- Remove the leaves in the mortar and pestle and grind to make a fine powder.
- Sieve the powder with 40 no. Sieve
- Take the fine powder and weigh it, 4 grams of powder were obtained
- Now in a beaker, add the powder and 150 ml of ethanol(90 ml distilled water + 10 ml of ethanol)
- Allow it to macerate for 24 hrs.
- The extract obtained is kept for evaporation in the water bath at 80 degrees Celsius [9].



Fig. 2 : Neem

➤ **Standardization of Extract contains curcumin:**

Turmeric's pharmacological effects primarily arise from its curcuminoids, comprised of curcumin, demethoxycurcumin, and bisdemethoxycurcumin, all polyphenols responsible for the characteristic yellow pigment of turmeric [10]. Authentication and characterization of plant-based products are essential for scientific validity, with standardization typically relying on recognized active biochemical compounds. Various analytical methods, such as HPLC, HPTLC, and UV-visible spectrophotometry, have been developed for curcuminoid analysis in *Curcuma Longa* extract, with UV spectrophotometric and HPLC methods being preferred. In this study, a straightforward UV and HPLC method were developed and validated in accordance with ICH guidelines for accurately quantifying curcumin in *Curcuma Longa* extract [11].

Preparation of standard solution of Curcumin for UV Visible Spectroscopy

10 mg of curcumin was accurately weighed and transferred to a 100 mL volumetric flask. Methanol was added to the flask to make a 100 µg/ml stock solution. Aliquots of 10, 20, 40, 60, 80 mL were taken from the stock solution and diluted to 10 mL with methanol, resulting in concentrations of 10, 20, 30, 40, 60, and 80 µg/ml.

Determination of maximum wavelength by UV Visible Spectroscopy

The UV spectrophotometer was utilized to scan a curcumin solution at a concentration of 5 µg/ml across the wavelength range of 200-800 nm, with methanol serving as the blank. The maximum absorption wavelength of curcumin in methanol was determined to be 424 nm [12].



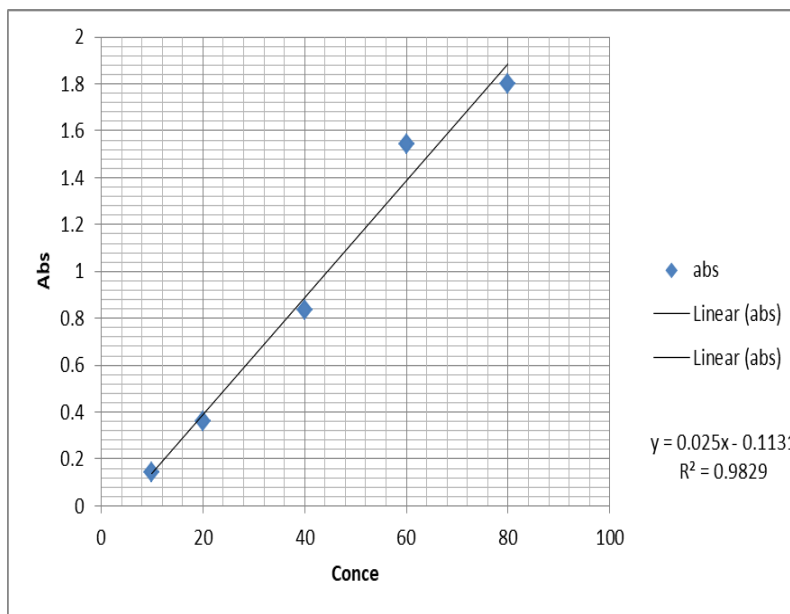
Fig. 3 : Curcumin extract in ethanol and DCM and neem extract

➤ **Linearity:**

Linearity was determined by analyzing different concentrations of the stock solution. Curcumin is linear by UV-visible spectroscopy in the concentration range of 1-7 µg/ml at a wavelength of 424 nm. Calibration curves were plotted as concentrations and absorbances for UV spectroscopy. The regression equation and correlation coefficient were determined for the standard concentrations of curcumin.

uv visible spectroscopy	
concentration in µg/ml	absorbance
10	0.143
20	0.36
40	0.836
60	1.543
80	1.798
unknown 1 (ethanol curcumin extract)	0.845
unknown 2 (dcm curcumin extract)	0.772

tab1 : absorbance result of the formulation



Graph. 1: Graphical Representation of Linearity

According to standardization graph, we find out that the Curcumin is more extracted in ethanol (38.32 µg) than the DCM (35.32µg).

➤ **Formulation Development:**

- 1) Preparation of oil phase:-
liquid paraffin, beeswax were taken into one porcelain dish and this mixture was heated at 75 °C.

- 2) Preparation of aqueous phase:-
Borax, methyl paraben and distilled water were taken into another porcelain dish and heated this mixture at 75 °C.
- 3) Addition of Aqueous phase to oil phase:-
- 4) The aqueous phase was added to the oil phase drop wise in a mortar with continuous stirring at 75 °C. Next the extracts were added according to their volume. Perfume was added at last just before the finished product was transferred to the suitable container. Further cream was evaluated for various physical parameters.



Fig. 4: Ingredients



Fig. 5 : formulation of curcumin cream

➤ Evaluation of cream:

➤ Physical properties :

In this test, the cream was observed for colour, odour, texture and state.

➤ Determination of pH:

The pH meter was calibrated with a standard buffer solution. Weigh 0.5 g of cream dissolved in 50.0 ml of distilled water and its pH was measured using a digital pH meter.

➤ Phase Separation:

The finished cream was stored in a closed container at room temperature, protected from light. Phase separation was then monitored for 24 h over 30 days. Any change in phase separation was observed / monitored.

➤ Spreadability:

Lubrication was expressed in seconds, which required two slides to slide from the cream placed between the slides under a certain load. The shorter the time it takes to separate the two slides, the better the smear. Two glass plates of standard dimensions were taken. Then one appropriate size slide was taken and the cream was placed on that slide. Another slide was then placed over the preparation. A

weight or certain load was then placed on the top slide so that the cream between the two slides was evenly pressed into a thin layer. The weight was then removed and the excess preparation adhered to the slide was scraped off. The top slide was allowed to slide down freely under the force of a weight attached to it. The time has passed since the above slide was recorded.

$$\text{Spreadability} = m \times l / t$$

Where

M= Standard weight, which is placed on the upper slide

L=length of glass slide

T=time taken in seconds

➤ Viscosity:

Using a Brookfield viscometer, the viscosity of the herbal cream was measured by pouring the herbal cream into the viscometer adapter and then monitoring the angular velocity, which was 0.5 and then increased to 20 rpm..

➤ Test for microbial growth in formulated cream:

Using a Brookfield viscometer, the viscosity of the herbal cream was measured by pouring the herbal cream into the viscometer adapter and then monitoring the angular velocity, which was 0.5, and then increased to 20 rpm.

The formulated herbal cream was tested for potential microbial growth using the Stripe Plate method by inoculating the formulated herbal cream and a control containing no formulated cream on agar plates. The plates were then incubated in an incubator for 24 hours at 37°C, then examined and compared to a control group to detect possible microbial growth.

➤ Homogeneity and Appearance:

After placing the cream in the container, the homogeneity of the composition was tested by visual appearance and physical touch. Appearance was determined by examining the smell, roughness, and color of the pearl.



Fig. 6 : Determination of pH

➤ **Result and Discussion:**

This study developed and evaluated a polyherbal face cream containing ethanol extract intending to minimize the side effects of synthetic face cream. The formulations were subjected to various physical evaluation parameters such as physical properties, pH, phase separation, dispersibility and viscosity, and additional stability studies.

▪ Physical Properties:

Based on visual observations, it was found that the cream F2 of the prepared preparation has a homogeneous yellow color, a pleasant smell, and a smooth texture.

- **Determination of pH:**

According to the results, all the two formulations which are F1 and F2 are found to have a pH between 6.1 and 6.3 which is good for skin pH. The pH of all cream compositions was closer to the desired skin, ie pH 5-7.

- **Phase Separation:**

The finished cream was stored in a closed container at room temperature, protected from light. Phase separation was then monitored for 24 hours over 30 days. According to the results, phase separation was observed in formulation 1 and phase separation was not observed in formulation 2.

- **Spreadability:**

Of all the two formulations, F2 has a shorter time to separate two slides, as noted in the evaluation test description, less time to separate two slides, and better smearability. So according to this statement, F2 showed desired dispersion than F1.

- **Viscosity:**

The viscosity of the cream was determined with a Brookfield viscometer at 25°C using a spindle at 20 rpm as shown in below Figure. The results showed that the viscosity of the cream ranged from 591 to 638 Cps.



Fig. 7 : Determination of Viscosity

According to the standard, more curcumin ethanol extract (38.32 μg) than DCM (35.32 μg). The stability of the final optimized cream was evaluated weekly for up to 30 days. the prepared formulation was found to be stable at room temperature. The pH values, viscosity and dispersibility were within the required range. There was no significant difference in the values of pH, viscosity and dispersibility compared to the initial value.

Neem and turmeric extracts are known for their medicinal value in traditional Indian medicine and Ayurvedic formulations. Polyherb face cream is an O/W type emulsion, so it can be washed off with plain water, improving customer acceptance. The demand for herbal cosmetics in the world market is growing and they are an irreplaceable gift of nature. Therefore, we tried to make a multi-purpose multi-herbal face cream using ethanol extract of neem and turmeric. Formula F2 was almost constant pH, homogeneous, emollient, non-greasy and easy to remove after application at both room and high temperatures. The study shows that formulation F2 proved to be more stable than F1. Natural medicines are more acceptable because they are safer and have fewer side effects than synthetic medicines. Thus, an herbal cream that is non-toxic, safe and effective and improves patient compliance using herbal extracts is very acceptable.

➤ Conclusion:

The aim of this work was to formulate and evaluate a multi-herbal facial cream prepared from ethanol extract of neem and turmeric as DCM extract with multi-purpose activity such as whitening, anti-aging, antioxidant, antimicrobial activity.

Based on the results and discussion, it was found that the prepared preparations have yellow color, pleasant smell and smooth texture. All formulations had an almost constant pH, were homogeneous, emollient, non-greasy, and easily removed after application at both room and high temperatures.

Therefore, it can be concluded that curcumin is more extracted in ethanol than the polyherbal face cream made with DCM was stable and can be safely used topically to protect skin from damage and prevent skin dryness by moisturizing.

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