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Formulation and Evaluation of Anti-Aging Cream by Using Curcumin and Jamun Powder



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ABSTRACT

In this study cream were formulated based on the antioxidant potential of herbal extract and its evolution. *Curcuma longa* commonly called as Turmeric where collected dried and extracted by maceration method. The herbal cream where formulated with Rosemary oil, Jamun powder and orange pill powder with different concentration namely – F1, F2, F3. Cream shows anti-oxidant property can be used as provision of a barrier to protect the skin and avoid aging of skin. Cream was formulated and evaluated by several standard method. Evaluation result were found satisfactory and matching with the internal standard value for the sample F3.



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I. INTRODUCTION

This study was conducted to extract, purify, and isolate Curcumin from the plant *Curcuma longa* and then to formulate a curcumin containing herbal antiaging cream. *Curcuma longa*, is a member of Zingiberaceae family; turmeric is derived from their rhizomes. The dark orange color of *curcuma* is due to the presence of lipophilic, polyphenolic carotenoids known as curcuminoids. Curcumin is known to have medicinal effects on a different type of diseases in human, and has shown the anti-proliferative effect in multiple cancers. It is therapeutically used in many diseases like amenorrhea, anemia, asthma, dislocation of joints, diabetes, diarrhea, cough, dyspepsia, liver disorder, loss of appetite, cough, bronchitis, hepatitis, ring worm infection, menstrual disorder, tooth ache, urinary infection, skin diseases, scorpion sting, ring worm infection, and weakness of eye sight. *Curcuma longa* usually cultivated in Cambodia, India, South China, Indonesia, Madagascar, Malaysia, the Philippines, and Viet Nam. Normally Turmeric found at the altitude of 500-900 m in Thailand.(1)The topical route has various advantages over other pathways, including avoiding hepatic first pass effects, delivering drugs or phytoconstituents continuously, fewer side effects, and improving patient compliance.(2) Cosmeceuticals are topical cosmetic-pharmaceutical hybrids intended to enhance health and beauty through ingredients that influence the skin's biological functions. Research trends in Anti-Aging skin care products are moving towards developing new plant extracts and botanical ingredients based on their tradition medicinal use.(3) today there is once again a revival of preference for natural products, and in recent years there has been a great upsurge in the study of Indian herbs.(4)

I. Selection of drug:

We use herb for the preparation of the Herbal anti-aging agent which are Curcuma extract, Jamul powder, and Rosemary oil. This ingredient are used traditionally for ancient years in various herbal medicinal system. Like Ayurveda and siddha. Selected plant material such as Curcuma extract contain Anti-aging, antioxidant as well as anti-inflammatory effects. Jamul powder treat the skin pigmentation and hydrate the skin. Rosemary oil shows antimicrobial and antioxidant properties. Hence present study was undertaken with the name of formulation and evaluation of anti-aging cream by using curcuma. Orange peel powder helps lighten and brighten the skin originally.

Name of drug:

Table 1: Scientific and common name of ingredients

Sr. No	Scientific Name of Drug	Common Name of Drug
1	Curcuma longa	Turmeric
2	Syzygium cumini	Jamun
3	Mints	Rosemary
4	Citrus sinensis	Orange

II. Experimentation

1) Method of extraction of Curcuma extract:

Grounded turmeric were collected dried and grind into fine powder using grinder. Then powder is extracted by Hydro chloric extraction method (maceration). 10gm of powder extracted with 100ml alcohol.



Figure 1: Extraction of curcuma

2) Preparation of plant material:

A) Preparation of orange peel powder:

i) The peels were carefully washed under running tap water followed by sterile distilled water. These were sun dried for seven days, pulverized to a fine powder using manual grinder.

b) Preparation of jamun seed powder:

ii) Seeds were separated from pulp, shade dried for 2-3 days after that skin of seed will easily come off ; after removing it grind them to get powdery consistency. Extracted using appropriate solvent.



Figure 2: Ingredients used in formulation A) Jamun Powder B) Orange peel Powder

FORMULATION PROCEDURE:

PROCEDURE OF FORMULATION OF CREAM:

1. Oil in water emulsion-base cream (semisolid) formulated.
2. In first beaker take 4gm of steric acid (Emulsifier) and heated by water bath up to 70⁰C then added Rosemary oil in it.
3. In another beaker take 14 ml of water and add Methyl Paraben, KOH, Glycerin, Zinc oxide, Propylene Glycol add in another beaker after that curcuma extract, jamun powder extract orange peel powder added.
4. After heating the aqueous phase was added in proportion to the oil phase with continuous Then add perfume in it for pleasant odor.
5. Stirring was stopped and the cream stirring until cooling of emulsifier took place.
6. Formulation was stored in selected container.



Figure 3: Phase Separation

FORMULATION TABLE:

Table 2: Formulation table

Sr.no.	Ingredients	Category	F1	F2	F3
1	Curcuma Extract	API	2ml	2ml	2ml
2	Jamun Powder	API	1gm	1.5gm	1.5gm
3	Orange peel Powder	API	1gm	1.5gm	1.5gm
4	Rosemary Oil	API	2ml	2ml	2ml
5	Steric acid	Base	4gm	4gm	4gm
6	Zinc oxide	Skin whitening agent	-	1gm	1.5gm
7	KOH	Stabilizer, pH adjuster	0.30gm	0.40 gm.	0.50gm
8	Glycerin	Moisturizer	2ml	3ml	4ml
9	Propylene Glycol	Moisturizer + Binder	2ml	3ml	4ml
10	Methyl paraben	Preservative	0.30gm	0.30gm	0.30gm
11	Jasmine	Perfume	-	1ml	2ml
12	Water	Vehicle	Q.S	Q.S	Q.S



Figure 4: Final formulation of cream

Observations and Evaluation of Cream

1. Appearance and consistency:

The physical appearance was visually checked for the texture of Anti-aging cream formulations.

2. Washability

Formulations were applied on the skin and then ease and extent of washing with water were checked manually.

3. Sensitivity

A portion of cream was applied on the forearms of 6 volunteers and left for 20 min. After 20 min any kind of irritation if occurred was noted.

4. Determination of spread ability

The spread ability was expressed in terms of time in seconds taken by two sides to slip off from. Gel placed in between the sides, under certain load lesser the time taken for separation of the two side safter the spreadability. Two slides of glass sides of standard dimension were taken. Then one side of suitable dimension was taken and the gel formulation was placed on that side. Then other side was placed on the top of the formulation then a weight or certain load was placed on the upper side so that the gel between the two sides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the sides was scrapped off the upper side was allowed to sip off freely by the force of weight tide to it. The time taken by the upper side to sip off was noted. Spread ability can be calculated by using following formula:

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$$\text{Spreadability} = \frac{m.l}{t}$$

Where, S= spreadability (gcm/sec), m=weight tied to the upper slide (20grams), l=length of glass slide (5cms), t= time taken is seconds.

5. Determination of pH

Small Quantity of cream was taken for the determination of pH by using the pH paper.

6) Morphological Evaluation

Formulated Anti-aging cream was further evaluated by using the following physical parameters. Colors, odor, appearance, clogging homogeneity.

7) Irritancy Test

Mark an area (1sq.cm) on the left hand or salsurface. The cream was applied to the specified area and the time was noted. Irritancy, erythematic, edema was checked if any for regular intervals up to 24 hrs and reported.

8) Stability Studies

Stability of the cream formulation were studied at different storage condition (Room temperature and 50°C) Samples were withdrawn at7, 15 and 30 days and checked for their physical characteristics like appearance, homogeneity, pH, viscosity and spreadability.

RESULTAND DISCUSSION

1) Morphological Evaluation

Anti-aging cream was evaluated for morphological parameters showed in the Table 3 the color of formulation was white. The odor of prepared formulations was pleasant and good acceptable which is desirable to cosmetic formulations. Texture and smoothness were acceptable as per requirement of cosmetic formulations.

Table 3:-Morphological Evaluation

Sr. No.	Parameter	A	B	C
1	Color	Creamy	White	White
2	Odor	Pleasant	Pleasant	Pleasant
3	Appearance	Smooth Fine	Smooth Fine	Smooth Fine
4	Clogging	Absent	Absent	Absent
5	Homogenecity	Good	Good	Good

2) Physical test evaluation

Physical test such as Wash ability, Extrudability, spread ability, pH, Viscosity are carried out, And formulated cream evaluated for this parameters.

a) pH

The pH of formulation were found to be 6.5 which in standard pH of anti-aging cream so it can be used safely used on the skin.

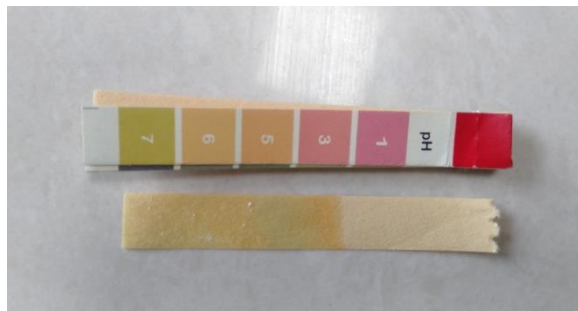


Figure 5: pH testing result

Table 4:-pH test results

Sr. No	Formulation	pH
1	F1	6.1
2	F2	6.3
3	F3	6.5

b) Washability

Wash ability test was carried out by applying a small amount of cream on the hand and then wash it wash with tap water. The formulation was easily washable.

c) Spreadability

The spread ability of the gel formulation was carried out and time taken by the two slides to spate is less so as said in the description of evaluation test lesser the time taken for separation of the two slide better the spread ability so according to this statement formulation showed better spreadability.

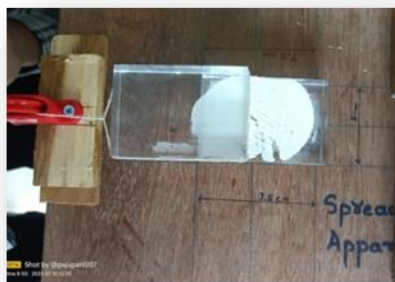


Figure 6: Spreadability testing Result

Table 5: Result of spread ability

Formulation	Time in Seconds	Spreadability(g cm/sec)
F1	11	13.63
F2	10	15
F3	8	18.75

d) Viscosity

The viscosity of gel was done by using Brooke field viscometer at the temp of 25°C using spindle no 64 at 30-40 rpm. According to their result formulation show adequate viscosity.

Table 6: Result of Viscosity

Sr. no	Formulation	Viscosity (cps)
1	F1	7900 cps
2	F2	8000 cps
3	F3	8

3) Irritancy Test

The results of irritancy test were shown in Table7. The formulation showed absence of irritation, redness and swelling during irritancy studies. This formulation have safe to use on skin.

Table 7: Irritancy Test

Sr. No.	Parameter	A	B	C
1	Irritation	yes	yes	No
2	Redness	yes	No	No
3	Swelling	No	No	No

4) Stability Studies

The results of stability were shown in Table 8. No change in color, odor, texture and smoothness was observed at mentioned conditions of stability except ph. The stability studies showed a slight change in pH of formulationat50⁰C.

Table 8: -Stability Test Room Temperature

Sr No	Parameters	A	B	C
1	Color	No change	No change	No change
2	Odor	No change	No change	No change
3	pH	6.2	6.4	6.5
4	Clogging	No	No	No
5	Homogeneity	Good	Good	Good

Table 9: -Stability Test 50 Degree Temperature

Sr. No.	Parameters	A	B	C
1	Color	No change	No change	No change
2	Odor	Absent	Slightly change	Slightly change
3	pH	6.2	6.4	6.5
4	Clogging	No	No	No
5	Homogeneity	Good	Good	Good

Anti-oxidant testing:

Polyphenols	
	Sample 2 OD at 790 nm
20 µl	0.0194
20 µl	0.0206
20 µl	0.0206
40 µl	0.0304
40 µl	0.0259
40 µl	0.0406
180 µl	0.1575
Calculations	
for 5 ml (dilution factor)	4.375
for µg/50 mg sample	4.38
for µg/g sample	87.6
for mg/kg sample	87.6
Moles Gallic acid equivalent	0.000515
Total polyphenols mM Gallic acid eq.	0.51



Figure 7: Polyphenols content

Result of Anti-oxidant testing:

Total polyphenol content in F3- 0.51mM Gallic acid eq.

Total antioxidant content 0.31 mM Gallic acid eq. IC50 value.

CONCLUSION:

All this investigations have brought out ultimate factors which leads to the following conclusion:

- 1) From above discussion it is concluded that the prepared formulation (F3) shows good spreadability, no irritancy, standard pH value, no evidence of phase separation and good consistency during the study period. Considering above parameters it concluded that it is possible to develop cream with herbal extract.
- 2) This study targets that chronic skin condition aging with the aim of formulation of anti-aging cream by using curcuma and orange peel powder.
- 3) From the result it is concluded that the extract of curcuma and orange peel powder having multiple effect such as anti-aging, antioxidant, skin whitening, ant wrinkle on skin.

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