

**FORMULATION & EVALUATION OF MULTI-PURPOSE MOSQUITO REPELLENT CREAM**

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**ABSTRACT**

Nowadays there are many herbal cream formulations but most of them only contain a single active ingredient. But we can formulate a formulation which has multiple therapeutic activity. In this research paper we will have to overview about formulation aspects and evaluation of medicated cream having multiple purpose property including mosquito repellent activity. Also cream are conventional dosage forms for all types of population. Cream containing curcumin, neem, aloe, amla, tulsi have their particular pharmacological activity on the human body. Curcumin has antibacterial and antiseptic action. Neem has antibacterial, acne pimple and wound healing activity. While aloe has anti-acne activity. Amla has real potent anti-inflammatory activity (Rasayana of Ayurveda), due to its multiple pharmacological actions. Cream containing multiple herbal medications can be proven a good therapeutic dosage form for all age groups. In this research article we will study about formulations of multi-purpose herbal cream and their evaluations.

**KEYWORDS:** Mosquito Repellent, Multi-Purpose, Cream.

**INTRODUCTION**

Cream is defined as semisolid emulsions which are oil in water (o/w) or water in oil (w/o) type and these semisolid emulsions are intended for external application. Cream is classified as oil in water and water in oil emulsion. It is applied on outer part or superficial part of the skin and its main ability is to remain for a longer period of time at the site of application. The function of a skin cream is to protect the skin against different environmental conditions, weather and gives soothing effect to the skin. There are different types of creams like cleansing, cold, foundation, vanishing, night, massage, hand and body creams. The main aim of our work is to develop a herbal cream which can give multipurpose effect, like moisturizer, reduce acne and skin irritation, reduce skin diseases like eczema, psoriasis, dry skin, wrinkles, rashes etc. and also adding glow to the face. We have used three herbal ingredients in our preparation which are Aloe

Vera gel, Neem, Tulsi. Aloe Vera gel is used as a moisturizer, to reduce pimples and acne and also used for treatment of burn wounds. Neem is used as an antifungal and anti-inflammatory and it is also used to reduce scar, pigmentation, redness and itching of the skin. Tulsi is used to add glow to the skin and to promote wound healing.<sup>[1],[2]</sup>

**PHYTOCHEMICAL SCREENING OF HERBAL EXTRACTS**

For determination and confirmation of different phytoconstituents present in herbal extracts phytochemical screening was performed. Chemical reactions of phytoconstituents with different chemical reagents give presence or absence of chemical compounds present in herbal extract. Each compound has their characteristic pharmacological action.

**Table 1: Phytochemical Screening of Herbal Extracts.**

Extract	Alkaloid	Flavonoid	Phenols	Tannins	Saponin	Anthraquinone	Steroid	Glycoside	Reducing sugar
Curcumin	+	+	-	+	+	-	-	-	-
Neem	+	+	+	+	+	-	-	+	-
Tulsi	+	+	-	+	+	-	-	+	+
Amla	-	+	+	+	-	+	-	-	-
Aloe vera	-	+	-	+	+	-	+	+	-

## MATERIALS AND METHODS

Powdered crude drug of Curcumin, Neem, Tulsi, Amla and Alove was purchased from commercial sources. All other excipients and chemicals was obtained from college laboratory.

### METHODS OF EXTRACTON

Soxhlet extraction method.: Dried plant material coarsely grinded. Then extraction takes place in Soxhlet apparatus using 180 ml ethanol as a solvent at a temperature of 75°C for six hours. Extractive value find out using following formula.

Alcohol Soluble % Extractive value= Dried extract weight/ Course powder weight x 100.

### FORMULATION OF CREAM

Take the liquid paraffin and bees wax in a borosilicate glass breaker at 75°C and maintain that heating temperatures (oil phase). In other beaker, dissolve borax and methyl paraben in distilled water by maintaining temperatures 75°C with water bath. Stir the solution with glass rod until all solid particles get dissolve (Aqueous phase). The gently add heated aqueous phase in heated oily phase with continue stirring). After mixing both phases, immediately add aloe-vera extract, neem extract, tulsi extract, and turmeric extract and add ripe papaya

into it with continues mixing by glass rod until it forms a smooth cream. When cream is formed, then add rose oil as fragrance. Put this cream on the slab and add few drops of distilled water if necessary and mix the cream in a geometric manner on the slab to give a smooth texture to the cream and to mix all the ingredients properly. This method is called as slab technique or extemporaneous method of preparation of cream.

**Table 2: Composition of Multi-purpose Herbal Cream.**<sup>[5][6]</sup>

INGREDIENTS	QUANTITY		
	F1	F2	F3
Curcumin	100 mg	200 mg	300 mg
Neem	100 mg	150 mg	200 mg
Aloe	0.5 ml	01 ml	1.5 ml
Amla oil	0.5 ml	01 ml	1.5 ml
Tulsi	50 mg	100 mg	150 mg
Bees wax	3 gm	3 gm	3 gm
Liquid paraffin	2 ml	2 ml	2 ml
borax	100 mg	150 mg	200 mg
Methyl paraben	10 mg	15 mg	20 mg
lanolin	13 gm	10 gm	15 gm
Rose oil	q.s	q.s	q.s
water	q.s	q.s	q.s



**Fig. 1: Multi-Purpose Cream Batch 1.**



**Fig. 2: Multi-Purpose Cream Batch 2.**



**Fig. 3. Multi-Purpose Cream Batch 3.**

## EVALUATION OF CREAM

### 1) Organoleptic Observations

The prepared Cream were observed organoleptically for color, taste, shape, texture, and clarity. The texture observation was conducted by mildly rubbing the surface and rubbing the cream between two fingers.

**Table 3: Organoleptic Evaluations.**

Parameter	RESULT		
	F1	F2	F3
Colour	Faint green	Dark green	Faint green
Texture	smooth	smooth	Smooth
Odour	pleasant	pleasant	pleasant
State	Semi-solid	Semi-solid	Semi-solid

### 2) Irritancy

Mark the area (1 cm<sup>2</sup>) on the left hand dorsal surface. Then the cream was applied to the area and the time

noted. After interval up to 24 hr. it is checked for irritant effect, erythema and edema if any than reported.

**Table 4: Evaluations For Irritancy.**

Sr. No	Formulation	Irritant Effect	Erythema	Edema
1	F1	Nil	Nil	Nil
2	F2	Nil	Nil	Nil
3	F3	Nil	Nil	Nil

### 3) Wash ability

Wash ability test was carried out by applying a small amount of cream on the hand and then washing it with help of tap water. All three formulations were easily washable.

**Table 5: Evaluations For Wash Ability.**

Sr.no	formulation	Wash Ability
1	F1	Easily washable
2	F2	Easily washable
3	F3	Easily washable

**4) Phase separation**

Prepared cream is kept in tightly closed container at room temperature away from sunlight and observed for 24 hours for phase.

**Table 6: Evaluations For Phase Separations.**

Sr.no	Formulation	Phase Separation
1	F1	No phase separation
2	F2	No phase separation
3	F3	No phase separation

**5) pH**

Take 0.5 g of cream and dispersed it in 50 ml distilled water. Then check it's pH by using pH paper.

**Table 7: Evaluations For pH.**

Sr.no	Formulation	pH
1	F1	7
2	F2	7
3	F3	7

**6) Spreadability**

Spreadability is carried out for all three formulations that is, F1C, F2C and F3C. The less time take for the separation of both the slide better the spreadability. Therefore according to statement F2C had better spreadability.

**Formula:** Spreadability =  $\frac{\text{Weigh Tied to Upper Slide} \times \text{Length Of Glass Slide}}{\text{Time Taken to Separate Slide}}$

**Table 8: Evaluations For Spreadability.**

Sr.no	Formulation	Time (sec)	Spreadability (gcm/sec)
1	F1	45	11.90
2	F2	50	10.71
3	F3	48	11.15

**1) Viscosity**

Viscosity of cream was done by using Brooke field viscometer at a temperature of 30°C using spindle No.4 at 12.0 RPM. According to the results all the three formulations showed adequate viscosity.

**Table 9: Evaluations For Viscosity.**

Sr.no	Formulation	Viscosity (mPa.s)
1	F1	18082
2	F2	22584
3	F3	17592

**7) Greasiness**

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like. According to the results, we can say that all three formulations were slightly-greasy.

**Table 10: Evaluations For Greasiness.**

Sr.No	Formulation	Greasiness
1	F1	Non-greasy
2	F2	Non-greasy
3	F3	Non-greasy

**8) Stability**

All formulation was tested for stability testing at room temperature for period of 2 months. There is no phase separation found in any formulation. All formulations was found to be stable.

**9) Anti-microbial Activity****i. Preparation of Agar Plate**

Agar plates was prepared by using nutrient agar, peptone, sodium chloride and distilled water. Agar solution was heated for homogenous mixing and allow to cool. Cooled agar solution poured into petri dish to form culture media.

**ii. Inoculation and development of microbes**

Microbial strain direct obtained from curd sample are spread on petri dish and petri dish allow to growth of microbes in incubator for 48 hours at a room temperature of 37°C.

**iii. Agar well diffusion method**

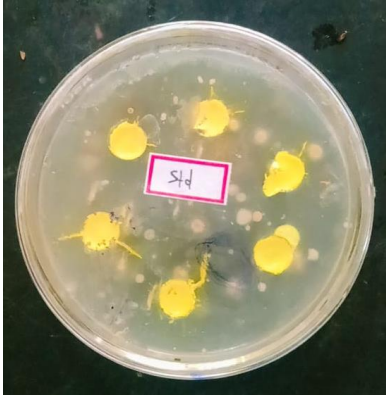
After complete growth of microbes; small wells of 5-6 mm diameter was created in petri dish and sample of formulation was placed in the well. further observation takes place for zone of inhibition.

**iv. Zone of Inhibition**

Zone of inhibition of cream formulation for lactobacillus was found as given below:

**Table 8: Zone of Inhibition For Cream.**

Parameter	Result		
	F1	F2	F3
Zone of Inhibition	4 mm ± 0.3 mm	3 mm ± 0.3 mm	5 mm ± 0.3 mm



**Fig. 4: Zone of Inhibition For Tetracycline Standard Solution.**



**Fig. 5: Zone of Inhibition For Cream Formulation.**



**Fig. 6: Fully Grown Lactobacillus In Petri Dish.**

### 11) Mosquito Repellent Activity

Mosquito repellent activity of cream was checked by applying cream on left hand of the body and observation

for mosquito biting. It was observed that no lump of mosquito bite was found on area where cream applied. Cream shows good mosquito repellent activity.



**Fig. 7: Before Applying Cream.**



**Fig. 8: After Applying Cream.**

### RESULT AND DISCUSSION

Formulated cream using beeswax and lanolin has smooth constituency and texture. Cream has light green color due to the green color of herbal extracts. Addition of rose oil as a fragrance gives good odor to the formulation. Cream was evaluated for its irritancy and not found any irritation to the skin. Also cream can be easily washable through water. All batches have a pH 7 and have a good spreadability. Brookfield viscometer used for determine viscosity of cream and it found within limits. Formulations are stable at room temperature and having very slight greasiness. Cream was checked for its antibacterial action and F3 formulation has grater antibacterial action against Lactobacillus.

### CONCLUSION

By using Aloe Vera, Neem and Tulsi the cream showed a multipurpose effect and all these herbal ingredients showed significant different activities. Based on results and discussion, the formulations F1, F2 and F3 were stable at room temperature and can be safely used on the skin.

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