

**FORMULATION AND EVALUATION OF HERBAL
DEPILATORY CREAM**

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Summary

Objective: In the present study an attempt was made to formulate herbal depilatory cream containing leaf of *Prosopis cineraria* which is used as depilatory. Thus the objective of the present study was to develop a herbal formulation and evaluate their physical properties and depilatory activity. **Methods:** *Prosopis cineraria* was selected as per their depilatory properties mentioned in traditional texts, their leaves and some other medicinal plants were taken and a formulation was prepared using common ingredients of a cream. Thioglycolic acid was used to accelerate

the activity. The formulated cream was evaluated for following parameters which were-Evaluation of Physical properties like Particle size measurements (Diameter, Area and Sphere volume), Viscosity, Adhesion force, Determination of depilatory activity by using animal modal (hair growth inhibition test using mice and evaluation of test on depilation resistance on the back of mice) etc. **Results:** The results were found to be satisfactory. The formulated cream was elegant in appearance and it was concluded that the cream reduces the amount of hair thus reducing depilation sessions. *Prosopis cineraria* can be considered as an ingredient while formulating a herbal depilatory cream. **Conclusion:** From the above study, we can conclude that herbal cream was found depilatory activity that reduces the amount and impairs the quality of undesired hair, thus reducing the need for depilation sessions. Thus, herbal depilatory cream was successfully developed using leaf of *Prosopis cineraria*.

Keywords: *Prosopis cineraria*, depilatory activity, leaves, formulation.

Introduction

Human hairs are about 100,000-150,000 in number, and each individual hair grows and falls out through various cycles of the hair growth cycle. Hair undergoes three phases of growth: anagen, catagen and telogen. This life cycle of hair can vary depending on various conditions, including nutritional status, medical history, heredity, physical constitution, hormone, secretion and aging^[1,2,3]. Hair removal from certain locations on the human body seems to receive as much attention as the encouragement of hair growth on other parts of the human body. Both men and women face the problem of dealing with hair growing from areas of their bodies where hair growth is not desired^[4]. Hence the present study was undertaken to investigate and validate scientifically the status of *Prosopis cineraria* (ashes of the leaves) as a depilatory agent as

claimed by traditional texts^[5]. The plant is also reported to have significant antihyperglycemic, antihyperlipidemic and antioxidative^[6], antibacterial^[7], anti-inflammatory, analgesic and anticancer^[8] Analgesic and anti-pyretic^[9] activities. Traditionally the plant is recommended for the treatment of snake bite (Sushruta, Yogaratanakara)^[5]. Bark is dry, acrid, bitter with a sharp taste, cooling, anthelmintic, tonic, cures leprosy, dysentery, bronchitis, asthma, leucoderma, piles, tremors of muscles, wandering of mind and also used in central provinces as a remedy for rheumatism^[5].

Materials and methods

Plant Materials

The leaves of *Prosopis cineraria* were collected from Lucknow distt. and was authenticated by Division of Taxonomy, National Botanical Research Institute (CSIR), Lucknow and a voucher specimen was deposited for future references (Ref.no:-NBRI/CIF/176/2010).

Animals

Albino mice will be used for the study. Animals will be maintained in clean polypropylene cages with 12 hrs light and 12 hrs dark cycle at temp of 25 ± 3 °C. Food and water will be given *ad libitum*. The study will be carried out in accordance with the CPCSEA and IAEC guidelines.

Procedure for preparing a Herbal Depilatory Cream: There are following points to prepare a depilatory creams and formula for preparing of depilatory cream were given in table 1-

- Measure the accurate weight of cetyl alcohol, calcium carbonate, and liquid paraffin and mixed well and form a base of cream.
- Then add distilled water and thioglycolic acid into the base.
- Accurately weighed the ash of the leaf of *Prosopis cineraria*, and then add in the above mixture.
- Then mixed well the extract of *Zingiber officinale*, *Citrus limonis*, *Allium sativum*, and *Azardirachta indica* in the cream.

Table 1: Formula for preparing of Depilatory Cream

S.no.	Ingredients	Quantities
1.	Leaf of <i>Prosopis cineraria</i>	6 gm
2.	<i>Zingiber officinale</i> extract	0.5ml
3.	<i>Citrus limonis</i> (juice)	0.5ml
4.	<i>Allium sativum</i> extract	1ml
5.	<i>Azardirachta indica</i> (leaves)	1gm
6.	Thioglycolic acid	1.5 ml
7.	Cetyl alcohol	2.5gm
8.	Calcium hydroxide	3gm
9.	Liquid paraffin	2ml
10.	Water	1ml
11.	perfumes	q.s.

Evaluation of Physical properties^[10]:

Particle Size and Density: Observed with naked eyes against white background and particle measurement such as diameter, area and sphere volume was determined by using microscope with camera and software Medical Pro (Version 3.0).

Viscosity: Viscosity of the formulated cream was determined using Brookfield Viscometer RV model. Spindle no. 5 and spindle speed 10 rpm at 25°C was used, the corresponding dial reading on the viscometer was noted.

Adhesion force: Mechanical parameters were determined by Texture Analyzer TA- XT2.

pH: The pH of formulated cream was determined using Digital pH meter LT-11. About 2gm of formulation was dispersed in 20 ml of distilled water. The electrode was immersed in cream solution and readings were recorded on pH meter.

Evaluation of Pharmacological Activity of Depilatory Cream^[11]

1. Hair Growth inhibition test using Mice:

In this model, the animals will be divided into two groups of five animals each. The back of each mice will be shaved by 2×4 cm² by treated with depilatory cream so as not to injure its skin. From the next day, the test substance (polyherbal depilatory cream) will be applied by to the shaved portion for 3 weeks. Only a solvent (50% methanol) will be applied to a control group. Two weeks later, in order to observe hair regrowth, the picture of the shaved portion will be taken at a fixed magnification.

2. Evaluation of test on depilation resistance on the back of mice:

In this model, the animals will be divided into two groups of five animals each. The back of each mice will be shaved by 2×4cm² by treated with depilatory cream so as not to injure its skin. Application of each of the test substance (polyherbal depilatory cream) to the shaved site will be started one week before shaving and it will be continued for 6 weeks, while only the solvent (50% ethanol) will be applied to a control group. After 8 weeks, a cello tape will be adhered to the back. In accordance with equation A, the weight of depilated hair will be calculated from the weight of the tape. In equation B, a weight ratio of the depilated hair will be determined with that of control group as 100%.

Equation A:

Weight of depilated hair = (weight of tape to which hair has been adhered- weight of the tape)

Equation B:

Weight ratio of depilated hair (%) =

$$\frac{\text{weight of depilated hair at the site to which the test substance has been applied}}{\text{average weight of depilated hair at the site to which the solvent has been applied}} \times 100$$

Toxicity studies:

The animals were treated topically with depilatory cream. The animals were continuously observed until experiments were completed. The parameters observed were itching, swelling, redness conditions and/or topical injuries.

Results and Discussion

Formulation of Polyherbal Depilatory Cream

The different concentration of calcium carbonate, cetyl alcohol, calcium hydroxide, liquid paraffin, water and perfume were used in the formulation of cream base. Leaf of *Prosopis cineraria*, *Zingiber officinale*, *Citrus limonis*, *Allium sativum*, *Azardirachta indica* were added in cream base. Thioglycolic acid was used to accelerate the activity and herbal depilatory cream (figure 1) was successfully prepared.

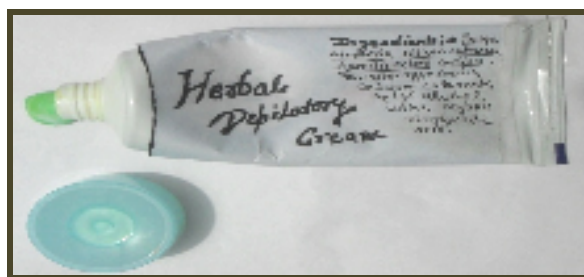


Figure 1: Polyherbal Depilatory Cream

Evaluation of Physical properties

Physical properties such as particle size, viscosity, adhesion force and pH of herbal depilatory cream were evaluated and shown in table 2.

Table 2: Physical properties of depilatory cream

S. No.	Parameters	Results
1.	Particle size measurements	
a.	Diameter	8.78×10^{-4} cm
b.	Area	16.62×10^{-4} cm ²
c.	Sphere volume	67.43×10^{-4} cm ³
2.	Viscosity	1.84×10^4 centipoises
3.	pH	11.89
4.	Adhesion force	47.788 g

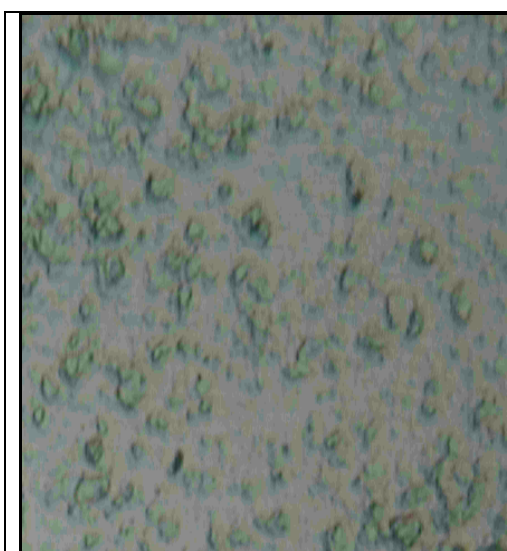


Figure 2: Particles of Depilatory Cream

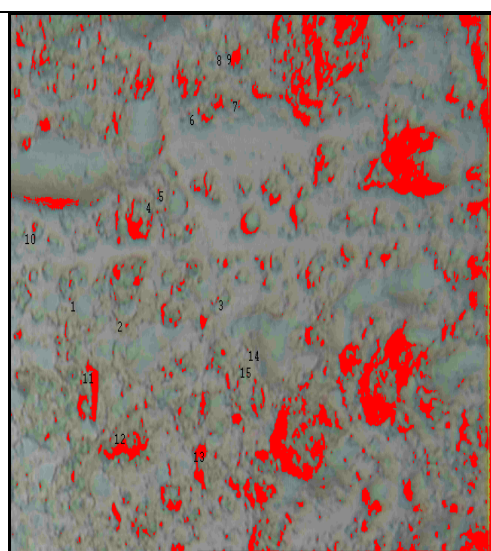


Figure 3: Particle Measurement

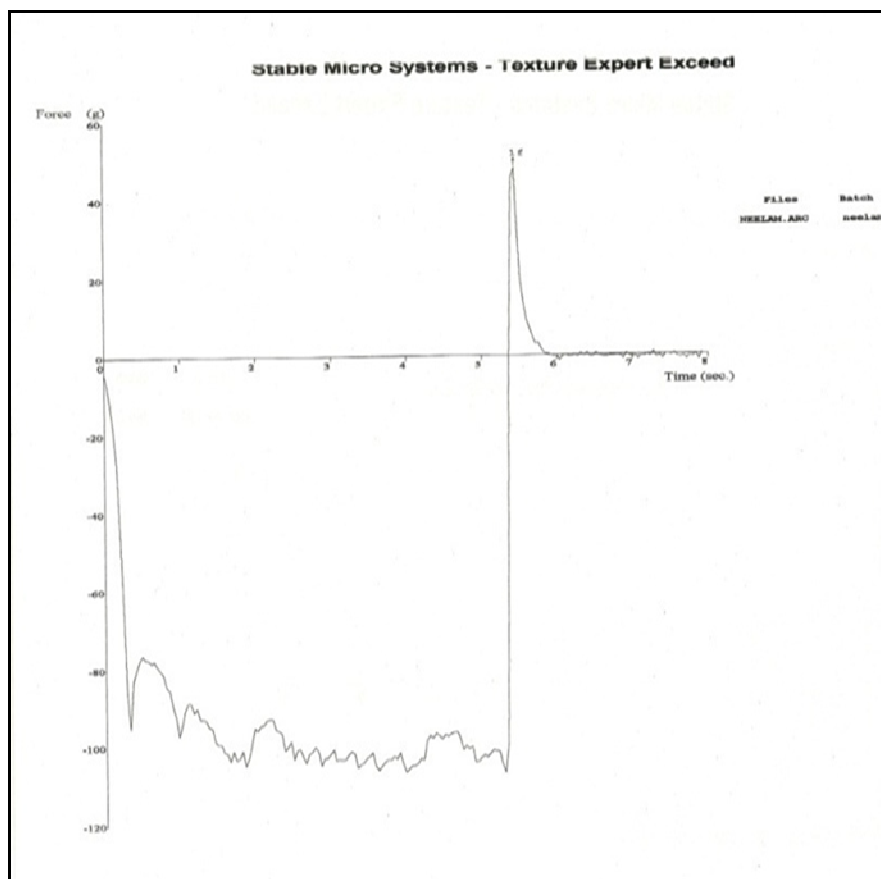
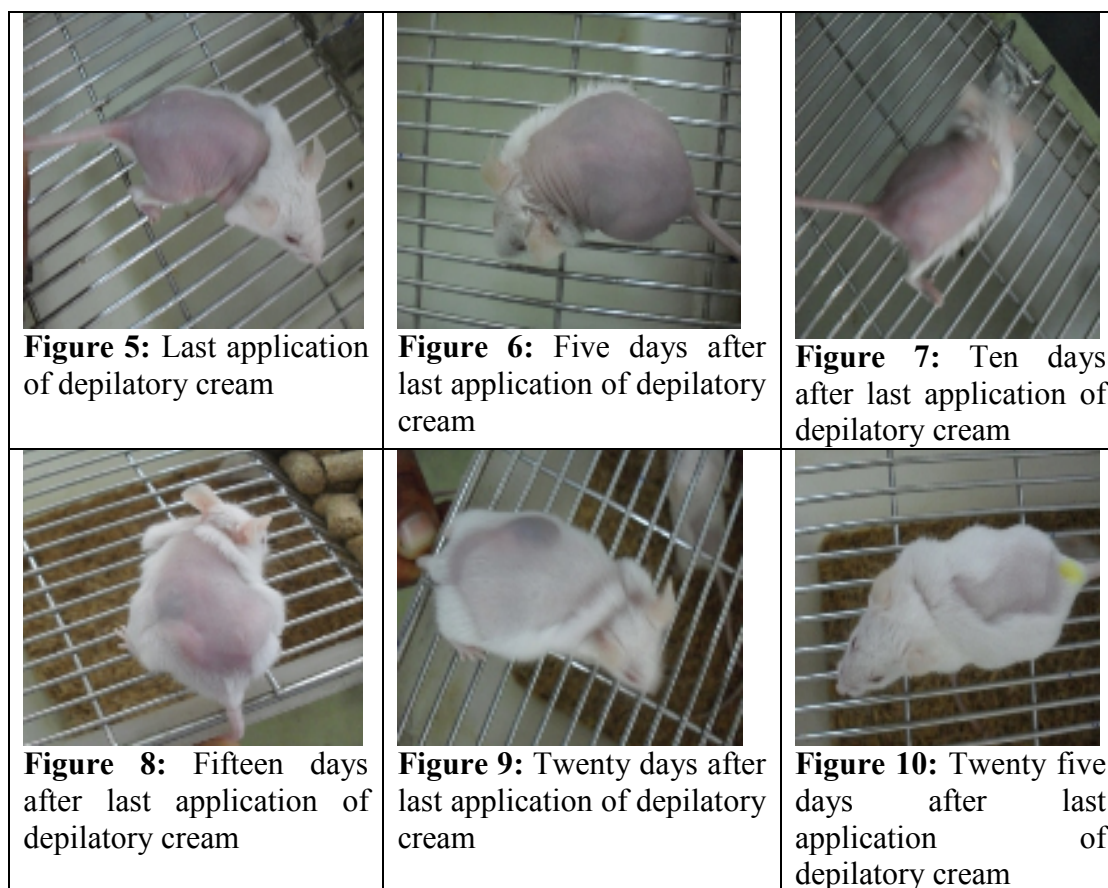


Figure 4: Graph for the determination of Adhesion Force of polyherbal depilatory cream

Evaluation of Pharmacological Activity of Depilatory Cream

1. Hair Growth inhibition test using Mice:

The effects of depilatory cream (topically over 3 weeks) gave unequivocal evidence of depilation. Regrowth began on the ventral body surface 14-15 days after the last dose of depilatory cream.



2. Evaluation of test on depilation resistance on the back of mice:

Weight ratio of depilated hair (%) was 200% of depilatory cream when determined that of the control group. It has been observed that the group to which the depilatory cream has been applied shows a significant increase in the weight of the depilated hair per predetermined area of the tape. It suggested that the depilatory cream has depilatory effects.

Discussion

The Polyherbal formulation: depilatory cream was formulated by use of different concentration of calcium carbonate, cetyl alcohol, calcium hydroxide, liquid paraffin, water and perfume and plants *Prosopis cineraria*, *Zingiber officinale*, *Citrus limonis*, *Allium sativum*, *Azadirachta indica*. Thioglycolic acid was used to

accelerate the activity and herbal depilatory cream was successfully prepared. Physical properties such as particle size: diameter (8.78×10^{-4} cm), area ($16.62 \times 10^{-4} \text{cm}^2$), sphere volume ($67.43 \times 10^{-4} \text{cm}^3$) and viscosity (1.84×10^4 centipoises), adhesion force (47.788 g) and pH 11.89 of herbal depilatory cream were evaluated. Weight ratio of depilated hair (%) was 200% of depilatory cream when determined that of the control group. It has been observed that the group to which the depilatory cream has been applied shows a significant increase in the weight of the depilated hair per predetermined area of the tape. It suggested that the depilatory cream has depilatory effects.

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