



FORMULATION AND EVALUATION OF HAIR REMOVAL CREAM BY USING AN HERBAL BASE

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ABSTRACT:-

The cosmetics and personal care industry's hair removal market is growing in importance. Teenage girls and women are often concerned about the unwelcome hair development. The current study highlights the importance of choosing herbal depilatories over pharmaceutical depilators because of their high efficacy, safety, and lack of adverse side effects. Herbs that have depilatory properties and their composition in herbal creams are examined, as well as other hair removal methods. Depilatories are cosmetic products that are intended to eliminate hair from the skin. Chemical depilatories mostly contain salts of thioglycolic acids as their active components. Making the hair removal cream requires the following ingredients: thioglycolic acid, cetyl alcohol, turmeric powder, neem and tulsi extract, ginger and papaya powder, liquid paraffin, and the necessary amount of orange oil. The pH, viscosity, spreadability, and homogeneity of the hair removal cream formulation were all evaluated. The results showed off the F3 formulation's outstanding properties.

KEYWORDS:- *Hair removal, Herbal, Depilatory, Cream, Evaluation*

INTRODUCTION:-

About 100,000–150,000 human hairs exist, and each one develops and loses through several phases of the hair's growth cycle. About (88%) percent of hair is made up of proteins. These kinds of proteins are of the hard, fibrous keratin type. Proteins are made up of lengthy chains of amino acids. All epidermal cells' cytoskeleton is made up of keratin proteins. The keratin proteins found in hair fiber primarily consist of the amino acid cysteine. The bonds of chemicals called disulfides hold the sulphur atoms in the cysteine molecules together. These disulfide connections are extremely robust and challenging to separate. The primary determinant of the longevity and resistance of hair fibre to breakdown under environmental stress is the disulfide chemical bonds that hold the keratins together.. Hair undergoes three phases of growth: anagen, catagen and telogen.[1]

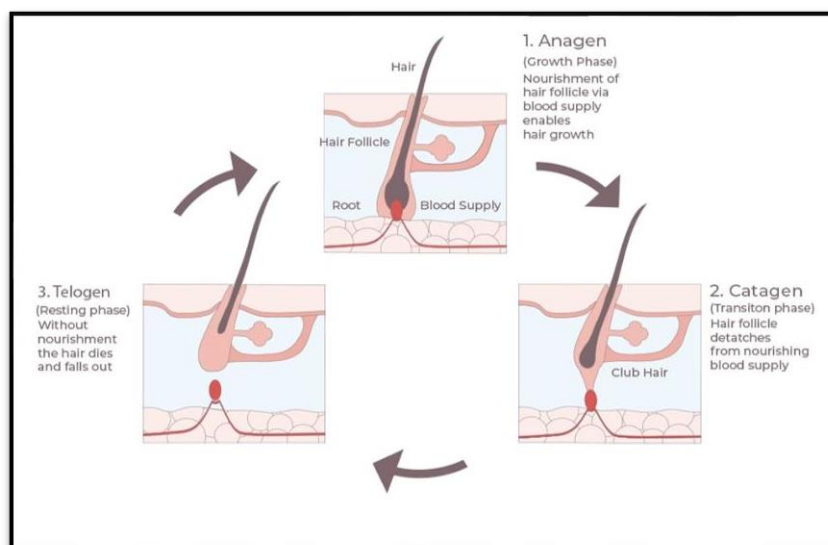


Fig no. 1 Phases of Hair Growth

The hair follicle, characterized represents a cylindrical invagination located within the epidermis, is where hair grows. Hair is a thin, extensible shaft of cornified cells. Cysteine, the most prevalent amino acid in hair, and sulphur are both found in some of the amino acids that make up the majority of hair. These acids are frequently referred to as keratin. [1]

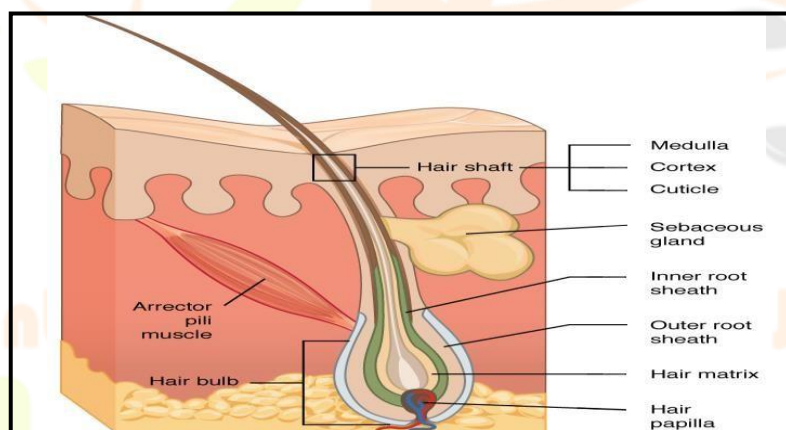


Fig no. 2 Anatomy of Hair [12]

Both men and women must cope with the issue of hair growth in places on their bodies where it is not desired. Although undesired hair is not harmful to health, it is thought to have an impact on a person's ability to look their best. Unwanted facial and body hair has a function in one's cosmetic appearance..[10]

Depilatories are a general term for items used to remove unwanted hair. Thioglycolate salts and sulphides are the main components of depilatories.

There is a risk of irritability whenever chemical removal is utilized. Hence, finding herbal depilatory drugs that are safe to use and have no negative side effects is the major goal of our research. Women used to apply turmeric every day while taking a bath, but owing to its staining properties and the hectic world we live in now, this is not possible. Nonetheless, in addition to turmeric, there are many other medicinal herb and essential oils that are important in the suppression of hair growth.

HAIR REMOVAL CREAM:-

Hair removal cream known as Depilatory creams. The main ingredient in hair removal cream is thioglycolic acid . The hair is removed by causing instability the keratin structure with depilatory creams.. These are the proteins in the hair. The hair is first thinned and then dissolved into a jelly-like consistency, and it can be broken off and wiped away.[6]

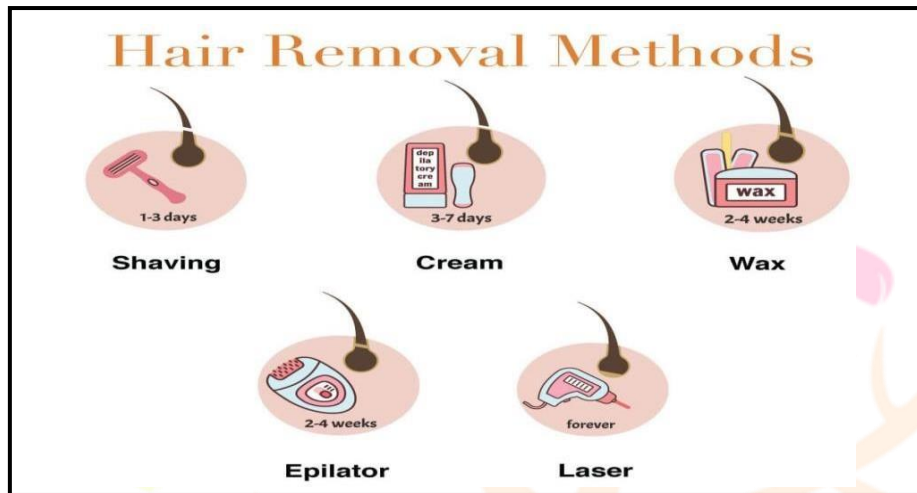


Fig no 3 Methods of Hair Removal

Ideal Characteristics of Hair Removal Cream



ADVANTAGES:

1. The best thing about depilatory creams is that they offer painless hair removal, as compared to threading, plucking, waxing or shaving.
2. The hair is dissolved and washed off with the cream, going down the drain without causing a mess.
3. Depilatory creams are available in all cosmetic stores and are an affordable and painless hair removal option.
4. The cream doesn't damage the skin or cause cuts, the way shaving can.
5. Easy to use and commonly available
6. Can be done at home
7. Since the creams help remove hair below the surface of the skin, regrowth takes longer to become noticeable

DISADVANTAGES:

1. Chemicals contained in the creams can cause irritation and discomfort.
2. Depilatories are known to have strong odors from the chemicals used.
3. Risk of ingrown hairs.
4. Should not be used on sensitive skin areas.



LITERATURE SURVEY :

The extensive literature survey was performed using database platforms like PubMed, JPRI , JMSCR , Google scholar to study regarding the formulation and evaluation of hair removal cream by using herbal base , study showed that formulation of herbal hair removal cream was done by utilizing turmeric, tulsi , neem etc. [13]

1. Prof. Farhan J Ahmad *et al.*, (2017):

The study focuses on the brief review of hair removal products which covers the Introduction, Methods for removing hair, Required qualities and characteristics of hair styling products, Types of hair removal products with typical ingredients, Formulations, Effects of hair removal products on the skin and hairs, After depilation/epilation preparations , Packaging of hair removal products , Evaluation of hair removal products , Marketed hair removal product.

2. Satish Kumar Sharma *et al.*, (2020):

Nosocomial infection has been identified in previous research as a critical factor in the final result of hospital care, leading to severe morbidity and mortality. Healthcare professionals' hands are the main points of spreading infections to patients. Healthcare professionals' hands are on the patients.

3. Neelam Verma and coworkers (2011)

Prosopis cineraria was chosen because of its depilatory qualities as described in traditional writings. Their leaves as well as those of other medicinal plants were collected, and a formulation employing regular cream ingredients was made. The action was sped up using thioglycolic acid. The prepared cream was assessed based on the following criteria: evaluation of physical attributes, including measurements of particle size (diameter, area, and sphere volume), and viscosity.

4. Dr Anubha Singh *et al.*, (2016)

Although undesired hair is not harmful to health, it is thought to have an impact on a person's ability to look their best. Undesired facial and body hairs have a function in one's cosmetic appearance. Braver. Natural Hair Inhibitor if used as an adjuvant therapy after hair removal (Waxing, Hair Removal Cream) showed effective results in reducing unwanted hair growth. In both groups (with waxing, Hair removal cream) approx 84% of subjects experienced reduction in hair growth in 90 days. 84% of participants in both active groups experienced reduction in hair density and hair thickness resulting into overall hair growth reduction.

MATERIAL AND METHODS:-**Materials:-**

Thioglycolic acid purchases from the SPECTRO LAB PVT. LTD.MUMBAI. Cetyl Alcohol & Bees waxes are purchase from ULTRA PURE LAB CHEM INDUSTRIES. All Herbal ingredients like Tulsi, Neem, Papaya, Turmeric, and Ginger freshly collected from plants present in Satara city

EXCIPIENTS AND HERBAL INGREDIENTS WITH THEIR ROLES:-**ROLE OF INGREDIENTS**

INGREDIENTS	ROLES
Thioglycolic acid	Active ingredient break the disulfide bonds in keratin and remove hair.
Cetyl alcohol	Emulsifying agent helps prevent creams from separating into oil and liquid.
Liquid paraffin	Lubricating agent
Tulsi	Antibacterial, add glow on skin
Neem	Antioxidants, reduces the dark spots, blemishes, and redness.
Papaya	Moisture the skin and breaking down the hair follicles thus preventing the hair from regrowing.
Turmeric	Natural chemical stop hair growth or slow hair growth.
Ginger	antioxidants ,help preserve skin's collagen
Bees wax	Emulsifying agent, stabilizer and give thickness to the cream.
Orange oil	Fragrance

EXPERIMENTAL WORK

Extraction of Neem and Tulsi Leaves

The plant materials were collected from the source. 10 g (dry weight) of each plant material (plant leaves) was added separately in 100 solution of methanol. The mixture was heated at 60°C in water and incubated for an hour. The mixture was filtered and used as a methanolic extract for further use. [13]

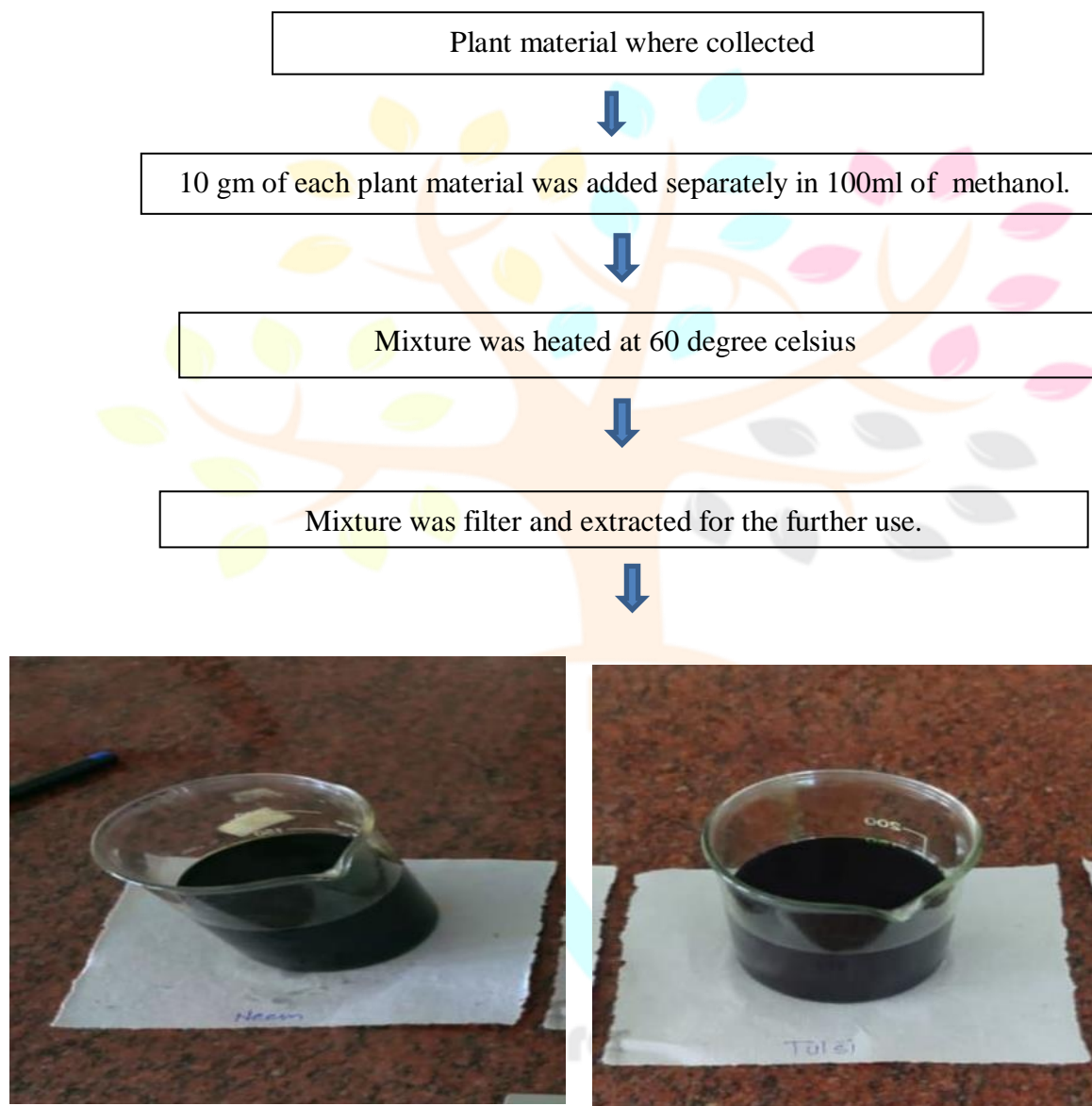


Fig no. 11 Extraction of Neem and Tulsi

Selection of Herbs (Turmeric, Papaya and Ginger Powder)

The Turmeric, Papaya, Ginger Powder has been traditionally used in Asian culture since ancient times to treat several disorders. With the increase in studies on this herb and its major compounds, it became popular. For the formulation the herbs powder collected from plants and some purchases from **waghdole ayurvedic** shop in satara . address Shaniwar Peth, Chimanpura Peth, Satara, Maharashtra 415002.



Papaya Powder



Turmeric Powder



Ginger Powder

PREPARATION OF HAIR REMOVAL CREAM:-

Heat liquid paraffin, beeswax and cetyl alcohol in a borosilicate glass beaker at 75° c and maintain that heating temperature (oil phase). Take mortar and pestle and mix well turmeric powder, ginger powder, papaya powder. After that add mixed Powder slowly in the oil phase and stir continuously. Then add measured amount of neem and tulsi extract and stir vigorously until it forms a smooth cream. Then add an active ingredient thioglycolic acid in cream and stir continuously until it mixes well in cream. Then add some orange oil as a fragrance. Stir it properly until proper cream was formed.

Table no: 1 Formula for preparation of cream

INGREDIENTS	F1	F2	F3
<i>Thioglycolic acid</i>	1.5 ml	3 ml	2.5 ml
<i>Cetyl alcohol</i>	1.5 gm	2 gm	1.5 gm
<i>Turmeric powder</i>	1 gm	1 gm	1.5 gm
<i>Neem Extract</i>	0.5 ml	0.5 ml	1 ml
<i>Tulsi Extract</i>	0.5 ml	0.5 ml	1 ml
<i>Ginger powder</i>	0.5 gm	1 gm	0.5 gm
<i>Papaya powder</i>	1.5 gm	1 gm	2 gm
<i>Beeswax</i>	3 gm	2.8 gm	3.5 gm
<i>Liquid paraffin</i>	6 ml	8 ml	10 ml
<i>Orange oil</i>	Q.S	Q.S	Q.S



Fig no. 13 Formulation of Hair removal cream

EVALUATION OF CREAM:-

1. Cream Organoleptic

Evaluation aimed to saw physical appearance of cream which involves color, odour, texture .

a) Colour

On a white background, the formulation's colour was examined..

b) Odour

The odour of cream checked by taking a smell.

c) Texture

The texture was assisted by application on the skin.

2. Determination of pH

PH was measured by using pH paper.

3. Determination of Homogeneity

Whenever the gel-like substances have been set in the container, all created creams are visually inspected to determine their homogeneity. They are examined to look for aggregates and assess their appearance..

4. Determination of Viscosity

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

5. Determination of Washability

After applying the formulation to the skin, the extent and simplicity of water washing were manually assessed..

6. Spreadability:

Spreadability apparatus was used to gauge the formulations' spreadability. Two slides measuring 6 x 2 cm each had 500 mg of the sample preparation placed between them. The apparatus's board held the lower slide in place, while the upper slide was fastened to a rigid string, on which a 20-g weight was imparted with the aid of a straight forward pulley. Under the pressure of weight, the higher slide took a certain amount of time to move 6 cm and separated from the lower slide. In order to determine spreadability, the following equation was used:

$$\text{spreadability} = \frac{w \cdot l}{t}$$

where w is the weight tied to the upper slide, l is the length of the glass slide, and t is the time in seconds.

7. Determination Of Pharmacological Activity

All the formulation are checked on the hand and effect of cream on hair was noted.

F1- The F1 depilatory cream shows no any side effect, irritation or itching. the hair removing process of this batch is slow due to its pH 10.5.

F2- The F2 depilatory cream shows side effect like redness, itching and irritation due to its pH 12.7. And the hair removal process of this batch is fast.

F3- This batch removes hairs very smoothly due its Normal pH 11.7. It doesn't shows any side effect on hands.

RESULT AND DISCUSSION

Evaluation of Depilatory Cream

➤ Organoleptic Properties-

Physical evaluation such as color, odor, texture was checked.

Table no: 2 Physical evaluation of depilatory cream

Parameters	F1	F2	F3
Color	Dark Green	Dark Green	Light Green
Odor	Pleasant	Pleasant	Pleasant
Texture	Smooth	Smooth	Smooth

➤ PH:-

The pH was measured using pH paper.

Table no: 3 Determination of Ph

Formulation	PH
F1 batch	10.85
F2 batch	12.2
F3 batch	11.7

Normally, products having a pH of 11.5 will be slow acting, and products having a pH of 12.7 will irritate the skin when used.

➤ **Homogeneity:-**

By touch and visual inspection, the uniformity of the formulation was evaluated..

Table no.4 Determination of Homogeneity

Formulation	Appearance
F1	Smooth, glossy on application
F2	Smooth, glossy on application
F3	Smooth, glossy on application

➤ **Viscosity:**

Viscosity of the formulated cream was determined using Brookfield Viscometer at temperature of 25 degree Celsius using spindle no. 63 at 2.5 RPM.

Table no.5 Determination of Viscosity

Formulation	Viscosity
F1	21020
F2	11810
F3	18400

➤ **Washability:-**

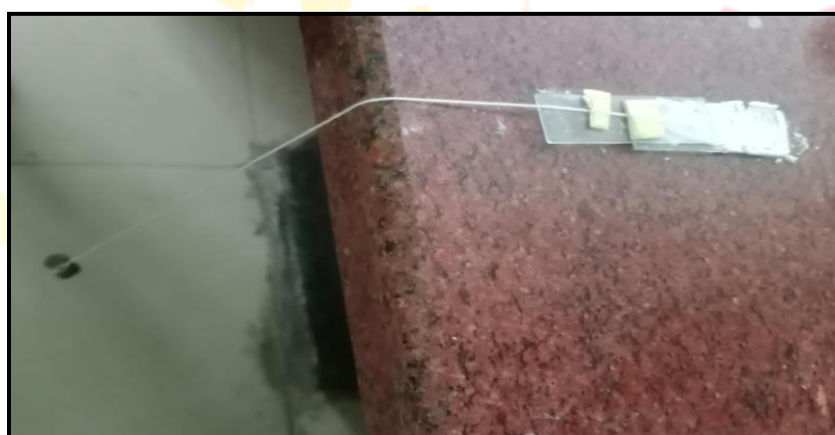
Formulation applied on skin and wash with water were checked manually.

Table no.6 Determination of Washability

Formulation	F1	F2	F3
Washability	Good	Good	Good

➤ **Spreadability:****Table no.7 Determination of spreadability**

Formulation	Time (sec) (cm/sec)	Spreadability
F1	7	32.8
F2	15	15.18
F3	11	19.6

**Fig no. 13 Spreadability****Determination Pharmacological Activity:-**

The each formulated cream was checked on the hand. Mark the area (1 -2 cm) on left hand .Then the cream was applied to that area and the time was noted.

Table no.6 Pharmacological activity of depilatory cream

Formulation	Side effect	Hair removal process	Time taken
F1	No side effect	Slow	20-25 min
F2	Redness, itching	Fast	3-5 min
F3	No side effect	Fast	5-7 min

Discussion :

The different concentration of cetyl alcohol, liquid paraffin, water and perfume were used in the formulation of cream base. Extraction of Neem & tulsi were added in cream base. Powder of turmeric, papaya and ginger is also added in a cream base. Thioglycolic acid was used to accelerate the activity and herbal depilatory cream was successfully prepared. The Formulas were all green in colour and smelled strongly of orange oil. The F3 batch had a pH 11.7, which was appropriate for the normal physiology of skin. Spreadability denoted the extent of area to which the cream readily spreads on application to skin or the affected part. The cream spread consistently and smoothly. The homogeneity of cream is good. The cream does not show any side effect and removes hair. It was implied that the cream's depilatory properties exist.

CONCLUSION :-

The herbal substances and plants in everyday life have greatly improved. Herbal plants contain phytoconstituents that have potential medicinal and hair depilatory properties. All the formulations were evaluated for their physiochemical characteristics and Pharmacological activity. From the above results, it is concluded that the hair removal cream by using herbal base is prepared by combination of chemical ingredients and herbs i.e. thioglycolic acid, turmeric, Neem etc. which showed acceptable properties such as colour, pH, Spreadability study. F3 formulation has best characteristics from other.



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