

## Formulation and Evaluation of Herbal Cold Cream by *Mimosa pudica* Plant Extract

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### ABSTRACT

The main aim of current article is Formulation And Evaluation of Herbal Cold Cream by *Mimosa pudica* Plant. The given formulation made and it is prepared by emulsification technique and it should be non-irritant when applied on skin. It is also formulated for its safety, efficacy and quality of Herbal cold cream. Formulation was prepared by using bees wax, borax, liquid paraffin, shame plants, rose oil, p-methyl hydroxyl benzoate, etc. The cream was prepared by using the slab technique/extemporaneous method for geometric and homogenous mixing of all the excipients and shame plants extracts. In this research article have done its evaluation parameters like sensitivity, spreadability, pH, Homogeneity and physical appearance. The shame plants showing antimicrobial and anti-inflammatory action.

**Keywords:** Antimicrobial activity; *Mimosa pudica*; Anti-inflammatory; Herbal cold cream; Shame plants; Sensitivity test; Spreadability; pH; Emulsification; Cold cream; Homogeneity.

### 1. Introduction

Cosmetics word is derived from the Greek word “Kosmtikos” which means the power, organization and skill in beautifying. Cold cream is an emulsion of water and certain fats, usually including beeswax and various scent agents, designed to smooth skin and remove makeup. Cold cream is a water-in-oil emulsion, unlike the oil in water emulsion of vanishing cream, so-called because it seems to disappear when applied on skin. Shame plant has antibacterial properties that helping treatment of rashes, fungal infection, dermatitis, psoriasis, and acne. The roots of this plant are used to treat vitiligo-a skin disease that causes loss of skin pigmentation. The invention of cold cream is credited to Galen, a physician in second century Greece. This 1857 account relates: The modern formula for cold cream is, however, quite a different thing to that given in the works of Galen, in point of odour and quality, although substantially the same—grease and water. In perfumery there are several kinds of cold cream, distinguished by their odor, such as that of camphor, almond, violet, roses, etc.

#### 1.1. Study Objectives

1. To prepare the cream by using the emulsification technique.
2. To make safety, efficacy and quality of Herbal cold cream.
3. They are non-irritant applied on the skin.
4. To explore the many aspects of the rich traditional Indian herbal medicine.
5. To give knowledge gained during the course in evaluating the usefulness of herbal formulas.
6. To formulate and evaluate an herbal cold cream for shining skin by using natural herbal product.
7. To make a cold cream ideal for all skin types.
8. To give the useful benefits of cold cream on human use as cosmetic product.

## 1.2. Cold Cream

Cold cream is an emulsion of water and certain fats, usually including bees wax and various scent agents, designed to smooth skin and remove makeup. Cold cream is a water-in-oil emulsion (emulsion of small amount of water in a larger amount of oil), unlike the oil in water emulsion of vanishing cream, so-called because it seems to disappear when applied on skin. The name "cold cream" derives from the cooling feeling that the cream leaves on the skin. Variations of the product have been used for nearly 2000 years.

Cold creams are water-in-oil or oil-in-water type emulsions added with certain fats (generally beeswax) and perfuming agents. These are applied on skin to provide smoothness and remove makeup. Cold creams are named so due to the cooling effect they impart on application. Cold cream is an emulsion in which the proportion of fatty and oily material predominates, although when it is applied to the skin a cooling effect is produced due to the slow evaporation of the water contained in the emulsion Cold cream is an example of Water-in-oil (W/O) emulsion. In cold cream, the major portion is the oil phase. Simply, the cold cream is an oil-based semisolid preparation. Cold cream is also known as Unguent or Ceratum Refrigerants Generally, it contains mineral oil, beeswax, borax, and water It is a soothing and cleansing cosmetic typically of oily and heavy consistency, Uses of cold cream are less than vanishing cream (oil in water emulsion) as topical pharmaceutical dosage Cold cream was first invented by Galen, a famous Greek physician- pharmacist in the Roman Empire (who practiced in Rome) of the 1st Century AD.

## 1.3. Ideal Characteristics of Cold Cream

1. It should have a low sensitization index.
2. It should be elegant in appearance.
3. It should be non-dehydrating.
4. It should provide a smooth texture.
5. It should be non-greasy and non-staining.
6. It should not cause irritation to the skin.
7. It should not alter the membrane or skin functioning.

## 1.4. Uses of Cold Cream

Uses of cold cream depend on the ingredients of a cream which means functional ingredients define the uses of cold cream. The main uses of cold cream are as follows:

- Medicated cold cream is mainly used as a topical pharmaceutical dosage form for the treatment of skin.
- Helps to maintain the skin's moisture balance and avoid rough skin conditions.
- It is one of the primary uses of cold cream (non-medicated).
- As cleansing preparation to remove make-up.
- To provide an emollient effect.

- To provide an oily protective layer on the skin.
- Also, provide a chemical barrier as with sun block ingredients.
- As a carrier for drug substances such as diflucortolone valerate in medicated cream.
- To remove Oil soluble impurities from the skin.

### 1.5. Advantages of Cold Cream

1. The primary use of the cream is for skin treatment. Mineral ingredients in the cream, work as a moisturizer.
2. Generally useful for dry skin. It can also be used as an alternative for lip balm if you have very dry, chapped lips. It can be used as a makeup remover and cleanser.
3. Sometimes it is applied to the face before putting on any makeup.
4. It can be used as an alternative to shaving cream.
5. With a hot washcloth it can help exfoliate the skin.
6. As cold creams contain enough amounts of water and oil, they keep skin safe from the rough environments.
7. They also keep skin moisturized and safe from damages.

### 1.6. Disadvantages of Cold Cream

1. However, as they contain petroleum, that may block the evaporation of water, they often clog pores resulting in pimples.
2. They might also dark the complexion if overused.
3. Cold cream is quite heavy in consistency. It will feel very "greasy" on the application.
4. Also people living in hot, humid weather will find this too heavy.

### 1.7. *Mimosa pudica* Medicinal Uses

**Anti-inflammatory Properties:** Touch me nots have been traditionally used for their anti-inflammatory effects. The plant contains compounds that may help alleviate inflammation in the body.

**Wound Healing:** The leaves of *Mimosa pudica* are believed to have wound-healing properties. They can be crushed and applied topically to minor cuts and wounds.

**Antimicrobial Activity:** Compounds found in *Mimosa pudica* have demonstrated antibacterial and antifungal activities. This suggests potential benefits in combating various microbial infections.

***Mimosa pudica* Dermatological Uses:** In traditional medicine, *Mimosa pudica* has been used for skin conditions. The anti-inflammatory and antimicrobial properties may contribute to its effectiveness in managing certain skin issues.

**Neuroprotective Potential:** The plant contains antioxidants that may help protect nerve cells from oxidative stress. Research suggests potential neuroprotective effects, but further studies are needed.

## 2. Materials and Methods

**Raw herbs collection Materials:** All crude drugs were collected from KYDSCT's College of Pharmacy, Sakegaon. The materials used in the formulation of the cream are given in the table below.

S. No.	Ingredients	Properties
1.	Shame plants	Antibacterial and antimicrobial.
2.	Bees wax	It gives thickness.
3.	Borax	Foaming agent.
4.	Liquid paraffin	Lubricating agent.
5.	Rose oil	Fragrance.
6.	Methyl p-hydroxy benzoate	Preservative.

### 2.1. Methods

The cream was prepared by using the cream base that is bee's wax, liquid paraffin, borax, methyl paraben, distilled water, rose oil, sandalwood. The cream was prepared by using the slab technique/extemporaneous method for geometric and homogenous mixing of all the excipients and the shame plants extracts. By using slab technique, we have developed two batches of our herbal cream, namely. All two batches were evaluated for different parameters like appearance, pH.

### 2.2. Herbal Drug and Excipient Profile

**1. Bess Wax:** Beeswax is one of the most important ingredients in home-made cosmetics. Why on earth we haven't yet written a word about beeswax? Maybe beeswax is just so self-evident that we haven't even thought about it. However, beeswax is the most versatile ingredient that suits perfectly to the skin. The beeswax itself is clear and transparent. Worker bees chew the beeswax which brings propolis to wax. The pollen carried by the worker bees gives to beeswax its clear, yellow colour.

Synonym: Paraffin-wax, Carnauba.

Biological source: It is a product made from the honeycomb of the honeybee and other bees.

Family: Apidae

Chemical constituents: The main chemical constituents are carbon (73.3%), hydrogen (13.2%) and oxygen (7.5%).

Uses: It offers a moisturizer that protects your lips from becoming dry and developing cracks. It is also used in lip-balm, lip-gloss, etc.

**2. Borax:** Borax is used in lotions and creams. Borax is combined with wax to improve the consistency of lotions and creams. It also work as an emulsifier when used with wax and it is mostly used in hand soaps. It is excellent ingredient used for cleaning as it's alkaline in nature. The best-known use for borax is as a cleaner, but you can find the ingredient in many other household products, including: Specialty toothpastes and mouthwashes. Cosmetics such as lotions, skin creams, moisturizers, sunscreen, and acne care products. Liquid Paraffin is used in the treatment of dry Skin. It relieves dry skin conditions such as eczema, ichthyosis and pruritus of the elderly. Liquid

Paraffin is an emollient (substance that softens or soothes the skin). It works by preventing water loss from the outer layer of skin. Borax is known to serve as a precursor to several commercially important compounds of boron, the most notable of which is boric acid (which is widely used as an insecticide). It is not uncommon for borax to be used in photographic developers as an alkali. Borax is also used as a flux in certain metallurgic processes. This compound is known to serve as a crosslinking agent during the preparation of slime. The field of biochemistry is known to make extensive use of borax for the production of buffer solutions. In several cooking techniques, this compound is known to serve as a texturing agent. Borax is also used in the neutron capturing shields for the safe storage, transportation, and use of radioactive substances. This compound is also known to act as an anti-fungal agent and can, therefore, be employed to kill fungi or inhibit their growth.

**3. Liquid Paraffin:** Liquid paraffin, also known as paraffinum liquidum or Russian mineral oil, is a very highly refined mineral oil used in cosmetics and medicine. Cosmetic or medicinal liquid paraffin should not be confused with the paraffin (or kerosene) used as a fuel. It is a transparent, colorless, nearly odourless, and oily liquid that is composed of saturated hydrocarbons derived from petroleum. Paraffin is mainly known as petroleum wax, which is very economical due to its low price and is mainly used as a raw material or base for petroleum products.

**4. *Mimosa pudica*:** *Mimosa pudica* also called sensitive plant, sleepy plant action plant, humble plant, touch-me-not, or shameplant is a creeping annual or perennial flowering plant of the pea/legume.

Family: Fabaceae.



**Figure 1.** *Mimosa pudica*

It is often grown for its curiosity value: the sensitive compound leaves fold inward and droop when touched or shaken and re-open a few minutes later. It is well known for its rapid plant movement. Like a number of other plant species, it undergoes changes in leaf orientation termed "sleep" or nyctinastic movement. The foliage closes during darkness and reopens in light. This was first studied by French scientist Jean-Jacques d'Ortous. In the UK it has gained the Royal Horticultural Society's Award of Garden.

Merit: The species is native to the Caribbean and South and Central America, but is now a pan tropical weed, and can now be found in the Southern United States, South Asia, East Asia, Micronesia, Australia, South Africa, and West Africa as well. It is not shade-tolerant and is primarily found on soils with low nutrient concentrations.

### 3. Experimental Work

The cold creams are prepared by the following steps:

1. Beeswax is melted in a container on a water bath maintained at 70% temperature and added with mineral oil; this is mixture A (oily phase).
2. Water is heated in another container at the same temperature and added with borax; this is mixture B (aqueous phase).
3. Mixture B is slowly added to the mixture A with stirring to form a creamy emulsion.
4. In the last step, the preparation is brought down to 40 °C temperature added with a suitable perfume. Formulation and Preparation of Cold Cream Raw materials and Apparatus Raw materials as per formula. Cold creams may be formulated with oils, both or either mineral oil and vegetable oil, as well as fatty alcohols, fatty acids, and fatty esters, emulsifying agents, preservatives, and purified water.



**Figure 2.** Preparation method of cream

The apparatus required laboratory-scale production as follows:

1. Measuring Cylinder
2. Beaker
3. Stirrer
4. Glass rod
5. Thermometer
6. Water bath

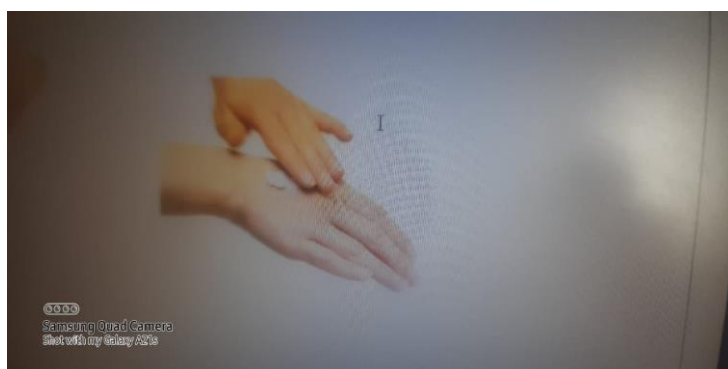
### 4. Result and Discussion

**1. Determination of Physical appearance:** The physical appearance of cold cream was inspected visually against dark background. The average of three reading is recorded. The result is given in the table below.

S. No.	Ingredients	Formulation
1.	Bees wax	20 gm
2.	Borax	0.8 gm
3.	Liquid paraffin	50 gm
4.	Shame plant	1 gm
5.	Rose water	28 gm
6.	Methyl p-hydroxy benzoate	0.2 gm

**2. Homogeneity:** Homogeneity is the formulated cold cream was tested for the homogeneity by visual appearance and by touch. After feel Emolliences, slipperiness and amount of residue left after the application of the fixed amount of cream was checked. Type of smear after application of cream, the type of film or smear formed on the skin was checked. Removal the ease of removal of the cream applied was examined by washing the applied part with tap water.

**3. Sensitivity test:** The cream which was prepared has applied on Skin of hand and exposed to sunlight for 45 mins.



**Figure 3.** Sensitivity test

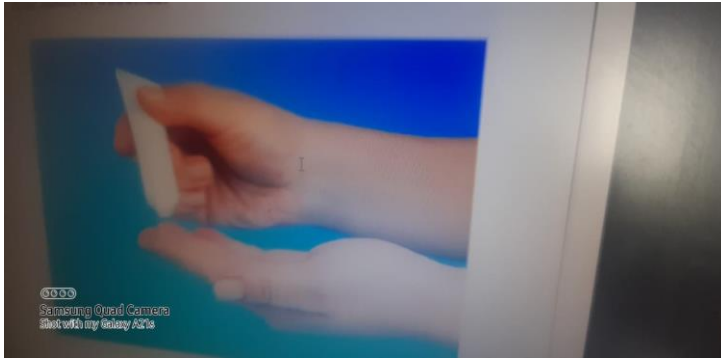
**4. Spreadability:** The spread ability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

$$\text{Spread ability} = m \times l/t \quad (1)$$

Where m= Standard weight which is tied to or placed over the upper slide (30g);

l= length of a glass slide (5 cm);

t=time taken in seconds.



**Figure 4.** Spreadability test

**5. pH:** The pH of Shame plant cream was determined using pH meter. The most accurate common means of measuring pH is through a lab device called a probe and meter, or simply a pH meter. The probe consists of a glass electrode through which a small voltage is passed. The meter is a voltmeter, measures the electronic impedance in the glass electrode and displays pH units instead of volts. Measurement is made by submerging the probe in the semisolid until a reading is registered by the meter.

## 5. Results

### Physical observation

S. No.	Parameter	Formula
1.	Colour	Faint green
2.	Odour	Pleasant
3.	Texture	Smooth
4.	State	Semi solid

### Washability observation

S. No.	Formulation	Washability
1.	Formula	Easily washable

### Sensitivity study observation

S. No.	Formulation	Irritant effect	Erythema	Edema
1.	Formula	No	No	No

### pH observation

S. No.	Formula	pH
1.	Formula	8

## 6. Conclusion

By using shame plant the cream showed a multipurpose effect and all these aloe ingredients showed significant different activities. Based on results and discussion, the formulations F, were stable at room temperature and can be



safely used on the skin. However the formula showed the best results in all aspects. From the above results it is concluded that the formulated cream showed good consistency and spreadability, homogeneity, pH, non-greasy and there is no phase separation during study period of research. From the above study it can be concluded that the cold cream is safe to use as it is developed from extract. Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. So, the values of herbs in the cosmeceutical have been extensively improved in personal care system and there is a great demand for the herbal cosmetics nowadays. An herbal cream which is non-toxic, safe, effective and improves patient compliance by the utilization of herbal extracts would be highly acceptable than synthetic ones.

### **Declarations**

#### **Source of Funding**

This study did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### **Competing Interests Statement**

The authors declare no competing financial, professional, or personal interests.

#### **Consent for publication**

The authors declare that they consented to the publication of this study.

#### **Authors' contributions**

All the authors took part in literature review, analysis and manuscript writing equally.

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