



## Formulation and Evaluation of Herbal Cold Cream

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### Abstract

The present research aimed to develop and assess herbal cold creams formulated with plant extracts, liquid paraffin as a lubricant, beeswax as a stabilizer, and methyl paraben as an antibacterial agent using the water-in-oil method. Neem oil and almond oil were utilized in the preparation of the cold cream to nourish and moisturize the skin. Following cream preparation, various parameters including appearance, pH, viscosity, stability, dye test, spreadability, and microbial growth were evaluated. The findings of the evaluation indicated that formulating the herbal cold cream with natural ingredients like neem and almond was promising. The formulation exhibited favorable physicochemical and microbiological stability, demonstrating characteristics akin to standard cosmeceutical skincare formulations. Overall, the study presented a commendable effort in developing herbal cosmetics, emphasizing the utilization of naturally available components for skincare purposes.

**Keywords:** cold cream, almond oil, rheological studies

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**Abstract:**

The present research aimed to develop and assess herbal cold creams formulated with plant extracts, liquid paraffin as a lubricant, beeswax as a stabilizer, and methyl paraben as an antibacterial agent using the water-in-oil method. Neem oil and almond oil were utilized in the preparation of the cold cream to nourish and moisturize the skin. Following cream preparation, various parameters including appearance, pH, viscosity, stability, dye test, spreadability, and microbial growth were evaluated. The findings of the evaluation indicated that formulating the herbal cold cream with natural ingredients like neem and almond was promising. The formulation exhibited favorable physicochemical and microbiological stability, demonstrating characteristics akin to standard cosmeceutical skincare formulations. Overall, the study presented a commendable effort in developing herbal cosmetics, emphasizing the utilization of naturally available components for skincare purposes.

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## I. INTRODUCTION

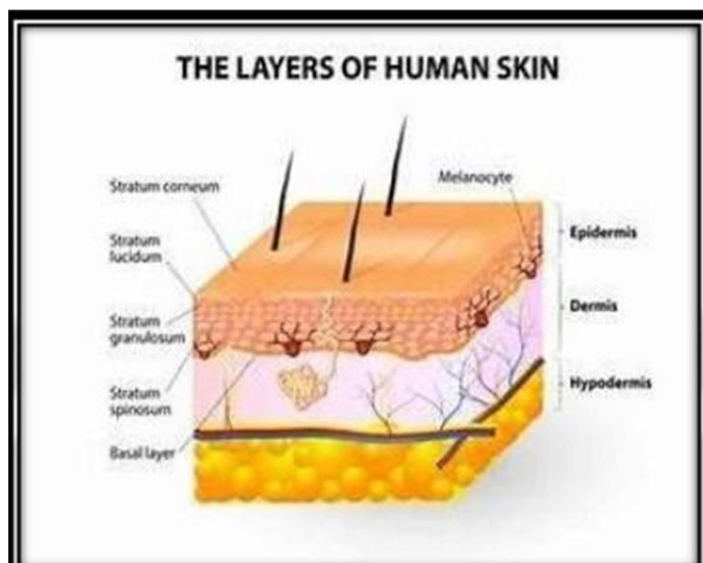
Cosmetics have been an integral part of human culture since ancient times, with people constantly seeking ways to enhance their appearance and maintain healthy skin. The term "cosmetics" itself, stemming from the Greek word "kosmesticos," reflects this deep-rooted desire to adorn oneself. Among the myriad cosmetic products available, cold cream stands out as a classic formulation renowned for its unique properties and versatile applications. Cold cream, revered for its water-in-oil emulsion composition, represents a harmonious blend of tradition and innovation in skincare. Its distinctive formulation ensures prolonged contact with the skin upon application, surpassing other semi-solid alternatives in efficacy. Notably, cold cream strikes a delicate balance, imparting elegance without overwhelming greasiness, thanks to its thoughtful incorporation of oil-based emollients. This feature not only enhances its cosmetic appeal but also renders it a potent moisturizer for dry skin types. Beyond its aesthetic allure, the functionality of cold cream extends far deeper. Acting as a veritable guardian for the skin, it diligently works to replenish lost moisture, clear pores of impurities, and provide a refreshing cooling sensation. This multifaceted approach underscores its indispensability in modern skincare routines, where efficacy and convenience reign supreme. Moreover, its gentle yet effective nature ensures minimal irritation, making it suitable for even the most sensitive skin types. In recent times, the quest for eternal youth has fueled the development of anti-aging creams, further cementing the importance of skincare in the beauty industry. Cold cream, with its time-tested efficacy and adaptability, remains a cornerstone in this ongoing pursuit of youthful vitality. Whether it's combating fine lines, wrinkles, or age-related blemishes, its versatile nature makes it an indispensable asset in any skincare arsenal. Furthermore, the significance of proper cleansing cannot be overstated in maintaining healthy skin. With an array of cleansing agents available, including creams, soap, and water, individuals are empowered to tailor their skincare regimen to their specific needs. Among these options, cold cream stands out for its ability to cleanse effectively while simultaneously nourishing and protecting the skin.

As we delve into the realm of herbal cosmetics, the potential for innovation and efficacy expands exponentially. By harnessing the power of natural ingredients such as Neem, Almond, and Aloe Vera gel, we not only enhance the cosmetic appeal of our formulations but also imbue them with therapeutic properties. Neem, revered for its antifungal and antiinflammatory attributes, complements the soothing qualities of Aloe Vera gel, resulting in a synergistic blend that addresses a myriad of skin concerns. In essence, the journey of cosmetics—from ancient rituals to modern formulations—is a testament to humanity's enduring fascination with beauty and skincare. Amidst this ever-evolving landscape, cold cream stands as a timeless symbol of indulgence, efficacy, and holistic skincare. As we continue to explore the boundless potential of herbal cosmetics, we pave the way for a future where beauty is not just skin-deep but a reflection of nature's bountiful offerings.

## HUMAN SKIN

The skin, our body's largest organ, envelops us entirely, acting as a vital protective barrier against various external elements such as heat, light, injury, and infections. Its multifaceted functions include:

- Regulation of body temperature: Through processes like sweating and dilation of blood vessels, the skin helps to maintain a stable internal temperature, crucial for overall health.
- Storage of water and fat: The skin serves as a reservoir for water and fat, essential for hydration and insulation, respectively.
- Sensory perception: Rich in nerve endings, the skin enables us to perceive sensations such as touch, temperature, and pressure, facilitating interaction with the environment.
- Prevention of water loss: By forming a protective barrier, the skin minimizes water loss, preserving hydration levels vital for skin health and overall bodily function.
- Defence against bacterial invasion: The skin's outermost layer acts as a formidable barrier, thwarting the entry of harmful bacteria and pathogens, thus safeguarding internal organs from infections.
- Barrier between organism and environment: Serving as a physical barrier, the skin shields the body from external aggressors, including pollutants, toxins, and allergens, maintaining internal homeostasis.
- Synthesis of vitamin D: Exposure to sunlight triggers a biochemical reaction in the skin, leading to the production of vitamin D, essential for bone health, immunity, and various physiological processes.
- In essence, the skin is not merely a superficial covering but a dynamic organ crucial for our overall well-being, performing a multitude of vital functions to sustain life and health.



**Fig. The layer of Human skin**

The skin is comprised of three primary layers: the epidermis, dermis, and subcutaneous layer.

#### **A. The Epidermis:**

The outermost layer, the epidermis, is approximately 0.2mm thick and lacks veins and capillaries. It consists primarily of keratinocytes and dendritic cells, along with melanocytes and Langerhans cells. The epidermis is metabolically active and is divided into five sublayers: **Stratum corneum:** This outermost sublayer, 8-15 $\mu$ m thick, serves as a protective barrier against dehydration, primarily composed of ceramides crucial for water retention.

**Stratum lucidum:** A thin, clear layer of dead skin cells found only in areas of thick skin, such as the palms and soles.

**Stratum granulosum:** This layer, 3 $\mu$ m thick, contains 2-4 layers of granular cells with flattened shapes due to increased keratin fiber content.

**Stratum spinosum:** Also known as the prickle cell layer, it ranges from 50-150 $\mu$ m thick and consists of variously shaped cells.

**Stratum Basale:** The deepest sublayer, composed of a single layer of keratinocytes actively producing and migrating upward. This layer, also called the basal cell layer, retains 8% of epidermal water.

**B. The Dermis:**

The dermis, rich in collagen, elastin, and fibroblasts, harbours crucial skin functions.

It contains blood and lymphatic vessels, which nourish the skin and eliminate waste products.

Sweat glands present in the dermis produce sweat to regulate body temperature and remove impurities.

Hair follicles and sebaceous glands, responsible for hair growth and oil secretion respectively, are housed within the dermis.

**C. The Subcutaneous Layer:**

The deepest layer, consisting of fat, connects bones and muscles.

Acting as a thermostat, it regulates body temperature and stores energy.

Fat serves as a protective filter for muscles, bones, and organs.

Additionally, the subcutaneous layer contains blood vessels, nerve endings, hair follicular roots, and deep-seated oil-producing sebaceous glands.

In essence, the skin's intricate layers work synergistically to provide protection, regulate temperature, and maintain overall skin health and function.

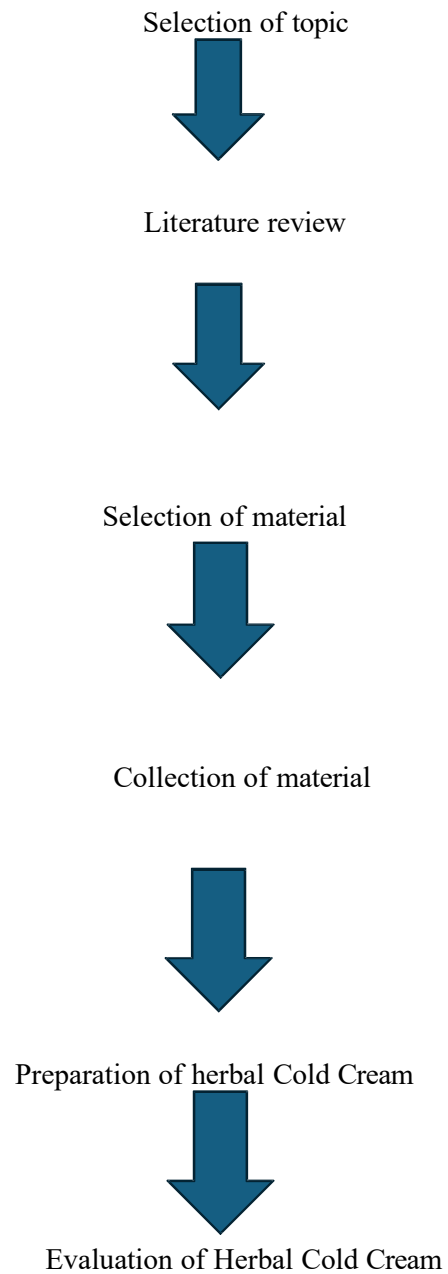
**Aim –**

Formulation and evaluation of Herbal Cold Cream, by using Neem Oil And Almond Oil, etc.

**Objective**

1. The need for a safe and effective herbal skin cream is to treat various skin diseases like wounds, acne vulgaris, cracks, psoriasis and various types of skin diseases. Although various types of cream is considered for wound healing but these are still appears to be limited in rate of tissue regeneration.
2. The herbal extract containing cold cream gives the cooling and soothing effect due to slow evaporation of water present in the emulsion. The cold creams are more moisturizing as they provide an oily barrier which reduces the water loss from the stratum corneum, the outermost layer of the skin.

**Plan of Work –**



## LITERATURE REVIEW

**K. A. Kamalapurkar'** 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 [1]. 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 condition, 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.

**Prashant s. Chavan**<sup>2</sup> The cream was prepared by using the cream base that is bee's wax, liquid paraffin, borax, methylparaben, distilled water, rose oil, Aloe Vera gel, dimethyl sulphide extracts of Neem and Tulsi. The cream was prepared by using the slab technique/extemporaneous method for geometric and homogenous mixing of all the excipients and the herbal extracts. By using slab technique, we have developed three batches of our herbal cream, namely FIH and F2H..All two batches were evaluated for different parameters like appearance, viscosity, phase separation. Cosmetic products are used to protect skin against exogenous and endogenous harmful agents and enhance the beauty and attractiveness of skin[1]. The use of cosmetics not only developing an attractive external appearance, but towards achieving longevity of good health by reducing skin disorders[2].

**Mohini Kalra** The cosmetic products are the best choice to reduce skin disorders such as hyper pigmentation, skin aging, skin wrinkling and rough skin texture etc. The demand of herbal cosmetic is rapidly expanding. This expansion is due to the availability of new ingredients, the financial rewards for developing successful products, consumer demand, and a better understanding of skin physiology [3,4]. The plant parts used in cosmetic preparation should have varieties of properties like antioxidant, anti-inflammatory, antiseptic, emollient, antihemorrhagic, anxiolytic activity and antibacterial etc. Herbal products claim to have less side effects, commonly seen with products containing synthetic agents.

**Abhiram Rout**

The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. Aloe vera is a natural product that is now a day frequently used in the field of cosmetology. It can be applied topically as an emollient for burns, sunburn and mild abrasion, and for inflammatory skin disorders. It has antibacterial, antifungal, antiviral, antioxidant, and antiinflammatory effects. Aloe vera is used externally for its wound healing properties and is supported by clinical investigation.

**Akash S. Mali-** The cream was prepared by using the cream base that is beeswax, liquid paraffin, borax, methylparaben, distilled water, rose oil, Aloe Vera gel, dimethyl sulphide extracts of Neem and Tulsi. The cream was prepared by using the slab technique/extemporaneous method for geometric and homogenous mixing of all the excipients and the herbal extracts. By using slab technique, we have developed three batches of our herbal cream, namely FIH and F2H..All two batches were evaluated for different parameters like appearance, viscosity, phase separation. Cosmetic products are used to protect skin against exogenous and endogenous harmful agents and enhance the beauty and attractiveness of skin[1].

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**Dr. Yadav A. V-** Cosmetic products are used to protect skin against exogenous and endogenous harmful agents and enhance the beauty and attractiveness of skin[1]. The use of cosmetics not only developing an attractive external appearance, but towards achieving longevity of good health by reducing skin disorders[2]. The synthetic or natural ingredients present in skin care formulation that supports the health, texture and integrity of skin, moisturizing, maintaining elasticity of skin by reduction of type I collagen and photoprotection etc. This property of cosmetic is due to presence of ingredients in skin care formulation, because it helps to reduce the production of free radicals in skin and manage the skin properties for long time.

### **Application of Herbal Cold Cream to Skin:**

Cold creams, despite primarily serving as facial moisturizers, boast versatility in their application. One of their popular uses is as a makeup remover, owing to their ability to gently dissolve makeup and dirt without requiring harsh rubbing. Additionally, some find them effective as primers for cosmetic foundations, smoothing the skin's surface and facilitating even makeup application. Their makeup removal efficacy without the need for water makes them ideal for travel or outdoor activities. Cold creams can also double as lip balms, body lotions, or even shaving creams. Applying cold cream to the lips helps retain moisture and provides hydration, while its application to the body delivers intense hydration akin to that provided to the face, ensuring soft and nourished skin.

### **Benefits of Cold Cream:**

Cold cream's benefits are straightforward; it serves as a topical moisturizer, making it beneficial for anyone seeking to enhance skin hydration. Individuals with sensitive or dry, itchy skin stand to gain the most from regular cold cream use, as it helps improve skin texture and appearance. These effects stem from cold cream's ability to restore the skin's natural barrier function, vital for protecting against environmental stressors and maintaining skin health.

### **Advantages of Herbal Cold Cream:**

Prevents aging and dehydration of the skin.

Provides protection from harsh environmental conditions due to its balanced water and oil content.

- Maintains skin moisture and prevents damage.
- Serves as an effective makeup remover and skin smoother.
- Medicated cold creams are used for topical pharmaceutical treatment.
- Maintains skin moisture balance and prevents rough skin conditions.
- Acts as a cleansing preparation for makeup removal.
- Provides an emollient effect and forms a protective layer on the skin.
- Offers chemical barrier protection, including sunblock ingredients.
- Acts as a carrier for drug substances in medicated creams.

**Ideal Properties of Herbal Cold Cream:**

- Should maintain its concentration without dilution.
- Optimum pH range of 4.6–6.0 for skin compatibility.
- Consistency must facilitate easy application and removal from containers.
- Provides a cooling effect upon external application.
- Forms a thin waxy protective layer to prevent water evaporation.
- Rapidly imparts emollient effects to soften very dry skin.
- Less greasy than ointments and spreads easily on the skin.
- Maintains physical and chemical stability throughout its shelf-life.

**Pharmacological Activity:**

The pharmacological activity of herbal cold cream varies depending on the specific herbal ingredients utilized. However, common activities associated with herbal cold creams include:

- Moisturizing and emollient effects.
- Anti-inflammatory properties.
- Antioxidant activity.
- Skin healing and repair.
- Antibacterial and antifungal effects.
- Anti-aging effects.
- Soothing and relaxing effects.

In summary, herbal cold creams offer a range of beneficial effects for skincare, encompassing moisturization, anti-inflammatory, antioxidant, healing, antibacterial, and anti-aging properties. The selection of herbal ingredients determines the overall efficacy and therapeutic benefits of the cold cream for various skincare concerns.

### **Ingredients of Formulations**

All the natural materials used in the present study i.e., Almond oil, Neem oil from local market, in a form of dried powder. The details of the plant material used for the formulation of cold cream are mentioned below .

1. Almond oil
2. Neem oil
3. Borax
4. Beeswax
5. Rose water



**Cold cream**

## 1. Almond oil



Fig. 1 Almond oil

Category	Description
Synonym	Sweet almond
Biological source	Seed of almond tree
Biological name	Prunus dulcis
Family	Rosaceae
Chemical constituents	Linoleic acid ,fatty acid.

### Uses:

Expressed almond oil is an emollient and an ingredient in cosmetics. Almond oil is used as a laxative, emollient, in the preparation and as a vehicle for oily injection.

It is used as the reduce puffy eyes, dark circles, moisturizes face, and body scalp. Helps to minimize open pores.

Acne prevention Non-comedogenic and helps remove pore-clogging impurities, reducing breakouts.

Deeply moisturizes and nourishes skin, soothes dryness, inflammation and reduce redness, and targeting dark circle.

## 2. Neem oil



Fig. 2 Neem oil

Category	Description
Synonym	Margosa oil
Biological source	Leaves and seed of neem tree.
Biological name	Azadirachta indica
Family	Meliaceae
Chemical constituents	Triterpenoids, fatty acids

### Uses:

Neem Oil Neem oil that's extracted from neem seeds is rich in medicinal properties which are what makes it a great ingredient in cosmetics and other beauty products: soaps, hair oil, hand wash, soap etc. It can treat a bunch of skin diseases and is known to be an excellent mosquito repellent.

Neem oil is a naturally occurring pesticide found in seeds from the neem tree. Neem oil is a mixture of components. Azadirachtin is the most active component for repelling and killing pests and can be extracted from neem oil. The portion left over is called clarified hydrophobic neem oil.

### 3. Borax



Fig.3 Borax

<b>Category</b>	<b>Description</b>
Synonym	Sodium borate
Biological source	Naturally occurring mineral salt
Biological name	Chemical mineral
Family	Boraxia
Chemical constituents	Borate anion alkaline buffer

### Uses

Borax, combined with wax, is used in many cosmetic products like creams, gels, and lotions. It is famously used in hand soaps to help wash off the oil or grease from the hands. Borax's alkaline nature makes it a perfect ingredient in cleansers and toners. In cosmetic products, borax is sometimes used as an emulsifier, buffering agent, or preservative for moisturizing products, creams, shampoos, gels, lotions, bath bombs, scrubs, and bath salts. Borax is also an ingredient combined with glue and water to make "slime," a gooey material that many kids enjoy playing with right from creams and body lotions to shampoos, bath gels and even the invogue bath bombs, just about every product associated with skincare has Borax as one of its components.

Given its mild and antiseptic nature, quite a few natural cosmetic products tend to include Borax as an essential ingredient as well.

#### 4. Bees wax



**Fig 4. Bees Wax**

<b>Category</b>	<b>Description</b>
Synonym	Honey wax
Biological source	Honeycomb of the honeybee
Biological name	<i>Apis mellifera</i>
Family	Apidae
Chemical constituents	Monoesters, hydrocarbons

#### Uses:

Ability to Protect from Irritants-Beeswax can also act as a layer of protection when applied to the skin. It can protect skin from environmental irritants and extreme weather. Promotion of Hair Growth-Beeswax not only moisturizes and soothes hair, but it can keep moisture from getting out of the hair. Beeswax can create a protective layer on the skin. It's also a humectant, which means that it attracts water. Both of these qualities can help the skin stay hydrated. Beeswax is also a natural exfoliator, ideal for sloughing away dead skin cell. Beeswax heals and softens skin, and is an antibacterial agent. It can help you fight conditions like acne, dry skin, eczema, and stretch marks. Our raw beeswax can help you create your own skin care moisturizers and lotions specially formulated just for you.

## 5 Rose water



**Fig 5. Rose Water**

<b>Category</b>	<b>Description</b>
Synonym	Gulab jal
Biological source	Flower of the rose plant
Biological name	Rosa damascena
Family	Rosaceae
Chemical constituents	Phenethyl alcohol, citronrllol

### Uses:

Rose water is especially hydrating when combined with other moisturizing ingredients, such as ceramides or glycerine. “These help to moisturize the skin, protect the skin barrier and prevent further water loss from the skin,” says Allawah. However, it shouldn't replace your current moisturizer. Rose water has been used as a beauty product for thousands of years, so it's no surprise that it can improve your complexion and reduce skin redness. The antibacterial properties may help reduce acne. The anti-inflammatory properties can reduce skin redness and puffiness. Rose Water Maintains the Skin's Natural pH Balance. Chemically produced soaps and cleansers disrupt the pH balance of our skin, making it prone to bacteria that cause various skin conditions like rashes and acne. This property helps rose water restore the skin to its

#### 4.2 Method of Preparation

- At first, take the white bees wax of weight 3.2g into china dish .
- Then add liquid paraffin / mineral oil of 10ml weight into the same china dish.
- Put the china dish into water bath and heat upto 70 C until it melt.
- Take Borax and distilled water in beaker. Heat this solution in water bath for about 75 C.
- This Borax solution added drop wise in porcelain dish with continuous stirring. Add Methyl paraben in porcelain dish dissolved it.
- Now generally add the Borax + Distilled water mixture into the bees wax and mineral oil solution with drop by drops.
- Then add the methyl paraben into it.
- The continues stirring of both solution and after 15-20 minutes
- Add Neem oil and Almond oil in this solution. Add Rose water for fragrance.
- Final homogenous semi-solid dosage from prepared, called cold cream.
- Packed it into the suitable container and evaluated.
- Herbal Cold Cream was obtained.

**TABLE 1: Composition of Herbal cold cream**

Sr.No	Name of Ingredient	Scientific name	Quality (for 50gm)	Uses
1	Methyl Paraben	methyl p-hydroxybenzoic acid	0.010 gm	Antibacterial properties and Preservation
2	Borax	sodium tetraborate decahydrate	0.25 gm	Stability
3	Beeswax	Apiccerana, Apis Mel, Apismellifera, ApisMellif	15 gm	emulsifying agent, stabilizer
4	liquid Paraffin	petrolatum	15 gm	Prevents skin itching and lubricating agent
5	Neem Oil	Azadirachtaindica	05 gm	Prevent or even kill fungus
6	Almond oil	Prunusdulcis var. dulcis	05 gm	protective layer skin



**Fig: Preparation of Cream**



**Fig: Hrebal Cold Cream**

## EVALUATION OF HERBAL COLD CREAM

### Morphological Evaluation

**Physical properties:** The cream was observed for the color, odor and appearance.

### Physicochemical Evaluation:

**Washability:** The cream was applied on the hand and observed under the running

**pH:** The pH meter was calibrated with the help of standard buffer solution. Weight 0.5 gm of cream dissolved it in 50 ml of distilled water and its pH was measured with the help of digital pH meter.

**Viscosity:** Viscosity of the cream was determined with the help of Brookfield viscometer at 100 rpm with the spindle no.

**Spread ability test:** The cream sample was applied between the two glass slides and was compressed between the two-glass slide to uniform thickness by placing 100 gm. of weight for 5 minutes then weight was added to the weighing pan. The time in which the upper glass slide moved over the lower slide was taken as a measure of spread ability.  $\text{Spread ability} = m \cdot t$  Where

M =weight tight to upper slide

L =length moved on the glass slide

T =time take

- **Irritancy test:** Mark an area (1 sq.cm) on the left-hand dorsal surface. The cream was applied to the specified area and time was noted. Irritancy, erythema, edema, was checked if any for regular intervals up to 24 hrs. and reported. [25,26]
- **Test for microbial growth:** Agar media was prepared then the formulated cream was inoculated on the plate's agar media by steak plate method and a controlled is prepared by omitting the cream. The plates were placed in the incubator and are incubated in 37 0 C for 24 hours. After the incubation period, the plates were taken out and the microbial growth were checked and compared with the control.[23,24]
- **Dye test:** The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide then covers it with a cover slip, and examines it under a microscope. If the disperse globules appear red the ground colorless. The cream is o/w type. The reverse condition occurs in w/o type cream i.e. the disperse globules appear colorless.

**Morphological Evaluation**

Herbal cold cream was evaluated for morphological parameters showed in the Table 2. The color of formulation was yellowish. 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 2: Observation table :**

Sr.No	Parameters	Observation
1	Colour	Whitish
2	Odour	Pleasant
3	Texture	Smooth

## **RESULT AND DISCUSSION :**

1. The colour of herbal cream was found to be whitish.
2. The state of cream was found to be semisolid.
3. The texture of herbal cream was found to be smooth
4. The odour of herbal cream was found to be pleasant.
5. The pH of cream was found to be 5.6.

Following evaluation parameters were performed to ensure superiority of prepared cold cream.

Formulation and evaluation of cold cream was performed.

## **CONCLUSION**

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. Herbal face packs are considered as sustaining and productive way to advance the appearance of skin. Herbal face packs or masks are used to stimulate blood circulation, rejuvenates those muscles and help to maintain the elasticity of the skin and remove dirt from skin pores. Thus, in the present work, it is a very good attempt to formulate the herbal face pack containing naturally available ingredients like neem, almond. It is suggested that the prepared formulation was physico-chemically and microbiologically stable, and possessed characteristics of a standard cosmeceutical's formulation for skincare.

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