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FORMULATION AND EVALUATION OF HERBAL COLD CREAM USING SANDALWOOD POWDER

Siddhi S. Saste[1], Riddhi S. Saste[2], Tejas S. Sawalkar[3], Asst. Prof. Sushma T. Nakhate[4], Dr. Tushar T. Shelke[5]

(Final year B Pharm)
[4] Guided by
[5] Principal,
Genba Sopanrao Moze College of Pharmacy

ABSTRACT:

This project focuses on the formulation and evaluation of a cold cream infused with natural sandalwood powder, a traditional ingredient renowned for its therapeutic properties in skincare. Cold creams have long been used as emollients to provide moisturization, protection against harsh weather conditions, and relief from dry and flaky skin. By incorporating sandalwood powder into the base formulation, the product is enriched with antimicrobial, anti-inflammatory, and cooling properties that enhance its efficacy beyond that of a conventional cold cream. Sandalwood powder, derived from the heartwood of the sandal tree (Santalum album), has been widely recognized in Ayurvedic and cosmetic practices for its ability to soothe skin irritation, reduce acne and blemishes, even out skin tone, and impart a natural glow. Its subtle, calming fragrance adds a sensorial appeal to the formulation, promoting relaxation and mental well-being. The formulation process involves the combination of aqueous and oily phases stabilized by emulsifying agents to produce a smooth, semi-solid cream with desirable consistency and spread ability. Key ingredients include emulsifying wax, white soft paraffin, mineral oil, borax, and distilled water, along with the sandalwood powder. The cream is subjected to various tests including pH, viscosity, spread ability, and stability studies to ensure it meets cosmetic standards. The final product is a luxurious, non-greasy cold cream that delivers deep hydration, soothes inflammation, and supports the skin's natural healing processes. Its formulation bridges the gap between traditional herbal remedies and modern skincare science, offering a holistic approach to skin nourishment. The use of sandalwood powder not only enhances the functional benefits of the cream but also appeals to consumers seeking natural and sustainable personal care products. This study emphasizes the potential of plant-based ingredients in enhancing the value and performance of everyday skincare formulations.

(KEYWORDS: Herbal, Cold Cream, Sandalwood Powder, Skin, Antioxidant, Phyto ingredients)

INTRODUCTION:

Cold cream, a staple in the world of skincare, has been used for centuries for its soothing and moisturizing properties. Traditionally, cold creams are composed of emulsified oils and water, designed to hydrate the skin while providing a cooling and calming effect. Over time, the formulation of cold creams has evolved, incorporating various natural ingredients to enhance their therapeutic benefits. One such ingredient, sandalwood powder, is renowned for its aromatic and skin-beneficial properties. Sandalwood has been used in traditional medicine and skincare for its anti-inflammatory, antiseptic, and skin-healing effects. The fine powder derived from sandalwood trees is often added to skincare formulations to promote healthy skin, soothe irritation, and provide a natural, pleasant fragrance.

This study explores the formulation of a cold cream enriched with sandalwood powder, aimed at providing a holistic skincare product that combines the moisturizing properties of cold cream with the therapeutic qualities of sandalwood. By integrating sandalwood powder into the cold cream base, we aim to create a product that offers dual benefits: deep hydration and the calming, healing effects of sandalwood. Furthermore, the evaluation of this cold cream formulation will assess its stability, texture, spread ability, skin compatibility, and effectiveness in terms of moisturizing and soothing properties. The results will provide insight into the potential of sandalwood powder as a valuable ingredient in modern skincare formulations, addressing both cosmetic and dermatological concerns.

This formulation of herbal cold cream with powdered sandalwood is designed to address various skin concerns such as dryness, irritation, blemishes, and uneven skin tone. It aims to provide a natural alternative to commercially available creams, offering benefits like moisture retention, skin repair, and enhanced skin texture without the side effects often associated with synthetic ingredients. The main objective of this formulation is to create a product that combines the beneficial properties of sandalwood powder, natural oils, and herbal extracts to nourish the skin, making it soft, smooth, and hydrated. This cold cream is particularly effective in treating dry, sensitive, and mature skin, providing anti-aging benefits while promoting overall skin health.

By tapping into the wisdom of traditional herbal medicine and aligning it with contemporary pharmaceutical techniques, this work aims to pave the way for more sustainable and skin-compatible cosmetic innovations. Cold creams traditionally serve as emulsified mixtures that provide moisturizing, cleansing, and protective benefits to the skin. However, modern formulations increasingly integrate herbal components to enhance their therapeutic value

and reduce the potential for adverse reactions. One such potent herbal ingredient is *sandalwood powder*, revered in Ayurvedic and Unani systems of medicine for its multifaceted dermatological properties.

SKIN'S ROLE IN COSMETIC APPLICATIONS:

The skin's ability to absorb and interact with topical products makes it the focal point for cosmetic and dermatological formulations. Creams, lotions, and other skincare products are designed to penetrate the outer layers of the skin to provide hydration, nourishment, and protection. The effectiveness of products like herbal cold creams, which may include ingredients such as Aloe vera and Sandalwood, depends largely on the skin's structure and the ability of the ingredients to be absorbed through the epidermis.

The stratum corneum, in particular, is a critical factor in determining how well a product will be absorbed. Topical products need to be able to permeate this protective barrier to be effective. Emulsifiers, such as those used in the formulation of creams, help enhance the penetration of active ingredients and ensure that the formulation remains stable and effective over time. This study focuses on the formulation and evaluation of an herbal cold cream containing powdered sandalwood and its ability to address common skin problems such as dryness, irritation, and uneven skin tone.

HUMAN SKIN:

The largest organ in the body is the skin. It completely covers the body. It acts as a barrier against heat, light, harm, and infection. The skin also:

1. Regulates body temperature
2. Stores water and fat
3. Is a sensory organ
4. Prevents water loss
5. Prevents entry of bacteria
6. Acts as a barrier between the organism and its environment

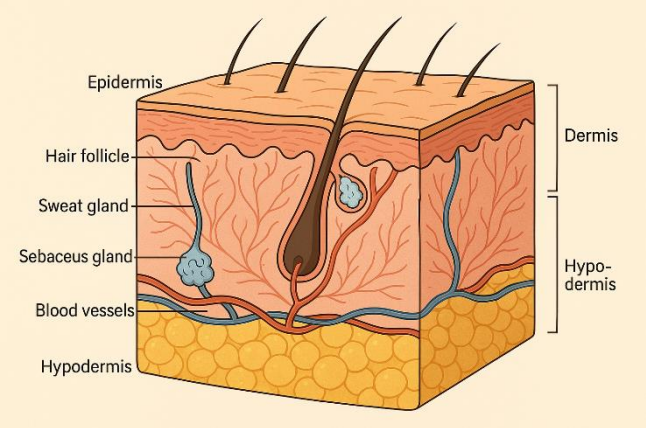

Fig 1: HUMAN SKIN

Human skin is the largest organ in the body and plays several important roles in maintaining overall health. It consists of three main layers: the epidermis, dermis, and hypodermis, each performing specialized functions to maintain overall health and homeostasis.

The hypodermis, rich in adipose tissue, insulates the body and anchors the skin to underlying structures. The *human skin* is the largest organ of the body, acting as a protective barrier between the internal organs and the external environment. It plays a vital role in *thermoregulation, sensation, immunity, and hydration.*

Skin is composed of three main layers:

1. **Epidermis**:

- Outermost layer
- Provides waterproofing and barrier protection
- Contains keratinocytes and melanocytes

2. **Dermis**:

- Middle layer
- Contains connective tissue, blood vessels, nerves, and hair follicles

- Supports skin elasticity and strength

3. Hypodermis (Subcutaneous Tissue):

- Deepest layer
- Composed of fat and connective tissue
- Provides insulation and energy storage

The epidermis provides a protective barrier against pathogens and harmful environmental factors, while the dermis contains vital structures such as blood vessels, nerve endings, and glands that regulate body temperature, sensation, and moisture. The epidermis provides a protective barrier against pathogens and harmful environmental factors, while the dermis contains vital structures such as blood vessels, nerve endings, and glands that regulate body temperature, sensation, and moisture. Additionally, it plays a vital role in regulating body temperature, protecting internal organs, and providing sensory information.

COLD CREAM:

Cold cream is a rich, emollient-based skincare product traditionally used to moisturize, soothe, and protect the skin. Composed of a combination of water, oils, waxes, and sometimes antiseptics or fragrances, cold cream creates a barrier that locks in moisture, making it particularly effective for dry and irritated skin. Historically used as a beauty treatment since ancient times, cold cream remains popular for its ability to hydrate and remove makeup, while also providing relief for conditions like chapped lips, sunburn, and minor skin irritations.

Some common herbal ingredients in cold creams include:

- **Aloe Vera**: Known for its soothing and anti-inflammatory properties.
- **Sandalwood**: Provides a calming effect and is often used for its aromatic and skin-soothing properties.
- **Lavender**: Has antimicrobial and calming effects.
- **Chamomile**: Known for its anti-inflammatory and antioxidant properties.

IDEAL CHARACTERISTICS OF COLD CREAM:

1. It should have a low sensitisation index.
2. It should be elegant in appearance.
3. It should be non-dehydrating.
4. It should not cause irritation to the skin.
5. It should not alter the membrane or skin functioning.

USES OF COLD CREAM:

1. Moisturizing
2. Makeup Remover
3. Soothing Dry Skin
4. Hand and Foot Care
5. Minor Skin Irritations

ADVANTAGES OF COLD CREAM:

1. Intense Moisturization
2. Gentle Makeup Removal
3. Soothes Irritated Skin
4. Protection against Harsh Weather

DISADVANTAGES OF COLD CREAM:

1. Greasy Feel
2. Not Ideal for Oily Skin
3. Potential for Allergic Reactions
4. Not for Daily Use on All Skin Types

MECHANISM OF ACTION:

Cold cream works by forming a *protective layer* over the skin, which helps in preventing moisture loss, especially in *dry* or *cold conditions*.

The *oil-in-water emulsion* allows the skin to absorb moisture from the aqueous phase while the oil prevents it from evaporating. This dual-action makes cold cream an effective moisturizer for both hydration and protection.

PREPARATION METHOD:

The cold creams are prepared by the following steps:

- 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).
- Water is heated in another container at the same temperature and added with borax; this is mixture B (aqueous phase).
- Mixture B is slowly added to the mixture A with stirring to form a creamy emulsion.
- 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.

HOW TO USE HERBAL COLD CREAM:

1. Cleanse: Start by washing your face or body with a gentle cleanser to remove dirt, oil, and impurities from the skin.
2. Apply Cold Cream: Take a small amount of herbal cold cream and gently massage it into the skin in upward circular motions. Focus on dry areas or areas that need extra hydration and soothing.
3. Leave It On: Allow the cream to absorb into the skin for a few minutes. If you're using it overnight, leave the cream on to work its magic while you sleep.
4. Frequency of Use: For optimal results, apply the herbal cold cream twice daily—once in the morning and once before bedtime.

LITERATURE REVIEW:

TABLE NO. 1: LITERATURE REVIEW

Author	Tittle	Summary	Reference no.
Manisha Yogesh Sonalkar et al.	**Formulation and Evaluation of Polyherbal Cosmetic Cream**	**This research, published in the *World Journal of Pharmacy and Pharmaceutical Sciences* in 2016, explores the development and assessment of a polyherbal cosmetic cream. While the study doesn't specifically focus on sandalwood, it contributes to the broader field of herbal cosmetic formulations.**	**4**
Mishra B et al.	**Formulation and Evaluation of Herbal Cold Cream**	**This research focuses on the development and assessment of an herbal cold cream.**	**10**
Anuradha Keshwar et al.	**Formulation Development and Evaluation of Cream Containing Natural Essential Oils Having Mosquito Repellent Property**	**This research focuses on developing an herbal cream incorporating essential oils like Tulsi, Clove, Garlic, Kapoor Kacheri, and Lemongrass for mosquito repellent purposes. While sandalwood is not mentioned in this particular study, it contributes to the broader field of herbal cosmetic formulations.**	**12**

HERBAL DRUG AND EXCIPIENT PROFILE:

1. BESSWAX:

Beeswax is a natural substance produced by honeybees that serves various purposes in both the animal world and human industries. Composed primarily of fatty acids, esters, and hydrocarbons, beeswax has been used for thousands of years in skincare, cosmetics, medicine, and even in food preservation.

TABLE NO. 2: BEESWAX

Chemical Name:	*Cera alba*
Source:	Natural wax produced by honeybees (Apis mellifera)
Appearance:	Pale yellow to white solid; faint honey-like odour

Type:	**White beeswax:** Purified and bleached version, more suitable for cosmetic use.
Role:	**Thickening Agent:** Adds body, firmness, and structure to the cream, enhancing texture and spreadability.

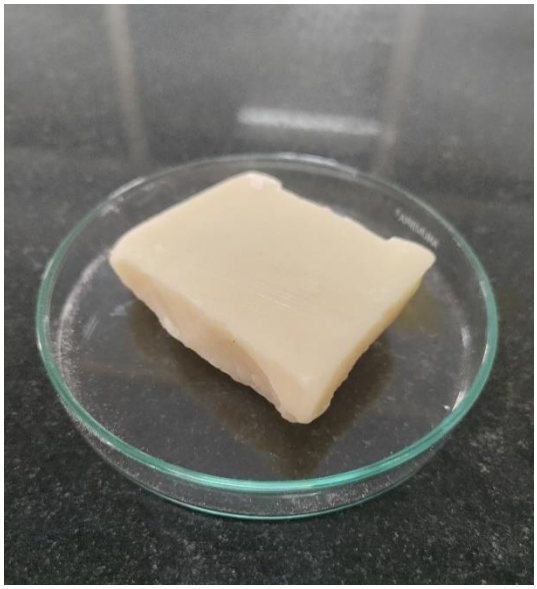

Fig 2: BEESWAX

Beyond personal care, beeswax is widely used in candle-making due to its clean-burning qualities and pleasant, natural fragrance. It is also used as a lubricant for tools, a wood and leather polish, and even in food preservation—such as beeswax wraps that serve as a sustainable alternative to plastic wrap.

2. BORAX:

Borax, also known as sodium borate, is a naturally occurring mineral compound that has a wide range of applications in various industries. Composed of boron, oxygen, and sodium, borax has been used for centuries for its cleaning, preservative, and antifungal properties. In household cleaning, it is commonly used as a detergent booster, stain remover, and deodorizer due to its ability to break down grease and grime. Borax is also utilized in cosmetics, as an emulsifier and stabilizer, and in the manufacture of glass, ceramics, and fiberglass.

TABLE NO. 3: BORAX

Chemical Name:	Sodium borate / Sodium tetraborate decahydrate
Chemical Formula:	$Na_2B_4O_7 \cdot 10H_2O$
Appearance:	White crystalline powder
Role:	**Emulsifying Agent:** Helps to stabilize emulsions (especially oil-in-water creams) by binding water and oil phases.

Fig 3: BORAX

Borax is widely used in the biochemistry field to make buffer solutions. This compound is also used as a texturing agent in several cooking methods. It is also used in neutron capturing shields to keep radioactive materials safe to store, transport, and use. Borax is also known to be an anti-fungal, so it can be used to kill fungi or stop them from growing.

3. LIQUID PARAFFIN:

Liquid paraffin, also known as mineral oil, is a refined, colourless, and odourless hydrocarbon derived from petroleum. It is widely used in various industries, particularly in pharmaceuticals, cosmetics, and manufacturing. In medicine, liquid paraffin serves as a laxative to treat constipation by softening stool and easing bowel movements.

TABLE NO. 4: LIQUID PARAFFIN

Other Names:	Mineral oil, Paraffinum liquidum
Source:	A purified mixture of liquid hydrocarbons derived from petroleum
Appearance:	Clear, colorless, odourless, and tasteless oily liquid
Role:	**Emollient:** Softens and smoothens the skin by forming a protective barrier that prevents moisture loss.

Fig 4: LIQUID PARAFFIN

In medicine, liquid paraffin is most commonly used as a gentle laxative to relieve constipation. It works by coating the bowel and stool with a waterproof film, allowing for smoother passage and reducing discomfort. It is also frequently used as a base in ointments and creams to treat dry skin conditions such as eczema, psoriasis, and dermatitis.

4. ROSE OIL:

Rose oil, often referred to as rose essential oil, is a luxurious and highly aromatic oil derived primarily from the petals of *Rosa damascena* (Damask rose) and *Rosa centifolia* (Cabbage rose). It is obtained through two main methods: steam distillation and solvent extraction.

TABLE NO. 5: ROSE OIL

Botanical Source:	*Rosa damascena, Rosa centifolia*
Common Names:	Rose essential oil, Attar of rose
Chemical Constituents:	Citronellol Geraniol Nerol Phenylethanol Farnesol Eugenol
Extraction Method:	Steam distillation or solvent extraction of rose petals
Appearance:	Pale yellow to clear liquid with a rich floral aroma
Role:	**Fragrance Agent:** Provides a pleasant, luxurious floral scent that enhances the sensory appeal of cosmetic products.
Functions:	• Enhances the aromatic profile and therapeutic value of the cream. • Works synergistically with other ingredients like sandalwood powder and beeswax to

	nourish and rejuvenate the skin.

Fig 5: ROSE OIL

Beyond its cosmetic and therapeutic uses, rose oil holds cultural and symbolic significance across many traditions. It has been used in religious ceremonies, romantic rituals, and luxury wellness products for centuries.

5. SANDAL WOOD:

Sandalwood powder is a finely ground substance derived from the heartwood of the sandalwood tree (Santalum album), a species native to India and other parts of Asia. Known for its aromatic fragrance and a wide array of medicinal and cosmetic uses, sandalwood powder has a rich history that spans thousands of years. Sandalwood powder, made from finely ground sandalwood, is highly valued in the cosmetic, medicinal, and aromatic industries for its gentle yet effective action on the skin.

Sandalwood powder is a versatile ingredient that provides a wide range of benefits for the skin. Its *anti-inflammatory*, *antibacterial*, *antioxidant*, and *soothing properties* make it an ideal component in various *cosmetic formulations*, especially in products like *cold creams* aimed at hydrating, soothing, and protecting the skin. When incorporated into skincare products, sandalwood not only enhances the product's efficacy but also provides a luxurious experience due to its calming fragrance.

TABLE NO. 6: SANDALWOOD

Botanical Name	Santalum album
Family	Santalaceae
Common Name	Sandalwood
Chemical Constituents	• Santalol (α-santalol and β-santalol): Main bioactive components responsible for fragrance and therapeutic properties. • Tannins, terpenoids, and volatile oils.

Fig 6: SANDALWOOD

BENEFITS:

Sandalwood is widely recognized for its numerous benefits for the skin, thanks to its soothing, anti-inflammatory, and antimicrobial properties. Here are some key benefits of sandalwood for skin:

1. Promotes a Clear Complexion
2. Treats Acne and Blemishes
3. Calms Inflammation and Reduces Redness
4. Moisturizes Dry Skin

USES OF SANDALWOOD POWDER IN SKIN CARE:

1) ***Herbal Cold Creams:***

Sandalwood powder is often added to cold cream formulations due to its moisturizing, soothing, and anti-inflammatory properties. It helps balance the skin, particularly in dry, sensitive, and irritated skin types.

2) ***Face Masks:***

When combined with other ingredients like Aloe vera, turmeric, or milk, sandalwood powder can be used to make face masks that help with skin brightening, acne control, and blemish removal.

3) ***Anti-Acne Products:***

Due to its antibacterial and anti-inflammatory properties, sandalwood powder is commonly used in formulations targeting acne. It helps prevent the growth of bacteria, reduces inflammation, and promotes skin healing.

4) ***Skin Cleansers:***

Sandalwood powder is a popular ingredient in natural cleansers and scrubs. It gently exfoliates the skin, removing dead cells, impurities, and excess oil, without causing irritation.

5) ***Anti-Aging Creams:***

Its antioxidant properties make sandalwood powder a key ingredient in anti-aging creams that aim to reduce fine lines, wrinkles, and dark spots.

6) ***Sun Protection:***

Some formulations use sandalwood powder for its ability to act as a natural sunscreen, helping to protect the skin from harmful UV radiation.

PROPERTIES OF SANDALWOOD POWDER:

1. ***Anti-inflammatory*****:**

Sandalwood powder is known for its *anti-inflammatory properties,* making it effective in soothing irritated or inflamed skin. It can calm conditions like *acne*, *eczema*, or *psoriasis*, providing relief from redness and swelling.

2. ***Antioxidant*****:**

The powder contains natural *antioxidants* that help protect the skin from oxidative stress and premature aging caused by free radicals. This makes it a valuable ingredient in *anti-aging* skin care formulations.

3. ***Antibacterial and Antiseptic*****:**

Sandalwood has potent *antibacterial* and *antiseptic* properties, which help fight acne-causing bacteria and promote the healing of cuts and wounds. It can also prevent infections, making it a popular ingredient in *herbal acne treatments***.**

4. ***Skin Brightening and Even Tone*****:**

Sandalwood powder is often used in traditional skin treatments to promote a *brighter complexion*. It is known to reduce *pigmentation***,** *blemishes***,** and *dark spots*, helping the skin achieve a more even tone.

5. ***Astringent*****:**

Sandalwood powder acts as an astringent, tightening the skin and reducing the appearance of pores. This helps improve skin texture and enhances the overall *smoothness* of the skin.

6. *Moisturizing*:

Despite its astringent nature, sandalwood powder helps in moisturizing the skin by *locking in moisture* and preventing dehydration, which is beneficial for dry and sensitive skin types.

7. *Calming and Relaxing*:

Sandalwood powder is widely used in aromatherapy for its *calming* and *relaxing effects*. Its soothing aroma helps reduce *stress* and *anxiety*, providing a sense of peace and tranquility. It can be used in facial masks and creams for both *skin care* and *mental well-being*.

MATERIAL AND METHOD:

MATERIAL:

TABLE NO. 7: INGREDIENTS

SR NO.	INGREDIENTS	ROLE
1	**Sandal Wood**	**Cooling agent, moisturizing agent**
2	**Bees Wax**	**Thickening agent**
3	**Borax**	**Emulsifying agent**
4	**Liquid Paraffin**	**Lubricating Agent**
5	**Rose Oil**	**Fragrance**
6	**Methyl P-Hydroxy Benzoate**	**Preservative**

TABLE NO. 8: INSTRUMENTS

SR NO.	INSTRUMENT
1	Beaker
2	Glass rod
3	Thermometer
4	Heating mantle
5	Measuring Cylinder
6	Weighing machine
7	Mortar and Pestle

FORMULATION OF SANDALWOOD CREAM:

FORMULATION TABLE:

TABLE NO. 9: FORMULATION TABLE(F1)

SR NO.	INGREDIENTS	FORMULA (F1)
1	Sandal Wood	1 gm
2	Bees Wax	15 gm
3	Borax	0.8 gm
4	Liquid Paraffin	20 ml
5	Rose Oil	2 drops
6	Methyl P-Hydroxy Benzoate	0.5 gm

TABLE NO. 10: FORMULATION TABLE(F2)

SR NO.	INGREDIENTS	FORMULA (F2)
1	Sandal Wood	1 gm
2	Bees Wax	16 gm
3	Borax	0.6 gm
4	Liquid Paraffin	15 ml
5	Rose Oil	2 drops
6	Methyl P-Hydroxy Benzoate	0.6 gm

TABLE NO. 11: FORMULATION TABLE(F3)

SR NO.	INGREDIENTS	FORMULA (F3)
1	Sandal Wood	1 gm
2	Bees Wax	20 gm
3	Borax	0.8 gm
4	Liquid Paraffin	10 ml
5	Rose Oil	2 drops
6	Methyl P-Hydroxy Benzoate	0.5 gm

TABLE NO. 12: FORMULATION TABLE(F4)

SR NO.	INGREDIENTS	FORMULA (F4)

1	Sandal Wood	1 gm
2	Bees Wax	18 gm
3	Borax	0.9 gm
4	Liquid Paraffin	16 ml
5	Rose Oil	2 drops
6	Methyl P-Hydroxy Benzoate	0.8 gm

METHODOLOGY:

The methodology for selection, formulation, and assessment of physical and functional properties.

METHOD OF PREPARATION OF OINTMENT AND CREAM

1. Fusion Method
2. Emulsification Method
3. Cold Process Method
4. Phase Inversion Technique
5. Homogenization Method
6. Trituration Method (Manual Method)

EMULSIFICATION:

The process of dispersing two or more immiscible liquids together to form a semistable mixture. Cold cream is a water-in-oil (w/o) emulsion created by combining water and oil phases, with an emulsifying agent like borax or beeswax. This process, known as emulsification, results in a cream that provides a cooling sensation upon application due to the slow evaporation of the water phase. The name "cold cream" derives from the cooling feeling that the cream leaves on the skin.

Emulsification is a crucial process in the formulation of herbal cold creams, enabling the creation of a stable and uniform product by combining oil and water-based ingredients. In the case of herbal cold cream using powdered sandalwood, emulsification ensures that the therapeutic properties of the natural ingredients are evenly distributed throughout the cream for effective application and skin benefits.

PURPOSE OF EMULSIFICATION:

1. Ensures homogeneity of the cream.
2. Enhances stability and shelf-life.
3. Provides smooth application on the skin.
4. Prevents phase separation during storage.

METHOD OF PREPARATION:

The herbal cold cream was prepared using the emulsion method (oil-in-water type). The process involved the following steps:

a) **Preparation of Oil Phase:**

A known quantity of beeswax, liquid paraffin, and stearic acid was accurately weighed and heated in a beaker over a water bath at 70–75°C until fully melted and homogenized.

b) **Preparation of Aqueous Phase:**

Simultaneously, the aqueous phase was prepared by dissolving borax in distilled water, to which glycerine and rose water were added. This mixture was also heated to 70–75°C to match the oil phase temperature.

c) **Emulsification Process:**

The hot aqueous phase was slowly added to the oil phase with constant stirring using a mechanical stirrer at moderate speed. Stirring was continued until a stable and homogeneous emulsion was formed.

d) **Incorporation of Sandalwood Powder:**

Once the emulsion cooled to around 40–45°C, the sandalwood powder (finely sieved) was added gradually and mixed uniformly. Essential

oils were optionally added at this stage for fragrance.

e) **Cooling and Packaging:**

The final cream was allowed to cool at room temperature with continuous gentle stirring and then transferred into clean, labelled containers for further evaluation.

EVALUATION OF SANDALWOOD COLD CREAM:

PHYSICAL EVALUATION:

Appearance:

Assess the colour, texture, and general appearance of the cold cream. It should have a smooth, uniform consistency without any visible separation of oil and water.

pH Level:

Measure the pH of the cold cream using a pH meter or pH strips. The ideal pH for a skin cream is between 4.5 and 5.5.

Viscosity:

Measure the cream's viscosity using a Brookfield viscometer. This test determines the thickness and flow properties of the cream, which is important for the spread ability and consumer satisfaction.

PERFORMANCE EVALUATION:

Spread ability Test:

Spread ability can be assessed using the spread ability tester or a simpler method: apply a fixed amount of cream to a surface and measure the distance it spreads under a constant force. The easier it spreads, the better its spread ability.

Emulsion Stability:

Subject the cream to thermal cycling tests (alternating between cold and warm temperatures) to determine if the emulsion remains stable without phase separation, cracking, or the formation of water droplets.

Moisturization Effect:

Perform a moisturization test by applying the cold cream to the skin and measuring the skin hydration levels before and after application using a moisture meter (such as a corneometer). This test shows how well the cream locks in moisture.

Skin Irritation Test:

A patch test can be performed on volunteers to ensure the cold cream does not cause allergic reactions or irritation. Apply a small amount of cream to a small patch of skin and observe for any redness or irritation.

RESULTS:

PHYSICAL OBSERVATION:

TABLE 13: PHYSICAL OBSERVATION

SR NO.	PARAMETERS	F1	F2	F3	F4
1	**Colour**	Light Brown	Brownish	Light Brown	Brownish
2	**Odour**	Pleasant	Pleasant	Pleasant	Pleasant
3	**Texture**	Smooth	Smooth	Smooth	Smooth (Oily)
4	**State**	Semi-solid	Semi-solid	Semi-solid	Semi-solid

pH:

TABLE 14: pH

PARAMETER	F1	F2	F3	F4
pH	5.9	5.5	4.8	5.2

SENSITIVITY STUDY OBSERVATION:

TABLE 15: SENSITIVITY STUDY OBSERVATION

SR NO.	FORMULATION	IRRITANT EFFECT	ERYTHEMA	EDEMA
1	F1	NO	NO	NO
2	F2	NO	NO	NO
3	F3	NO	NO	NO
4	F4	NO	NO	NO

WASH ABILITY OBSERVATION:

TABLE 16: WASH ABILITY OBSERVATION

PARAMETER	F1	F2	F3	F4
WASH ABILITY	EASILY WASHABLE	EASILY WASHABLE	EASILY WASHABLE	EASILY WASHABLE

STABILITY:

TABLE 17: STABILTY

SR NO.	PARAMETERS	F1	F2	F3	F4
1	**Colour**	No Change	No Change	No Change	No Change
2	**Odour**	No Change	No Change	No Change	No Change
3	**Texture**	No Change	No Change	No Change	No Change
4	**pH**	No Change	No Change	No Change	No Change

PHASE SEPARATION:

TABLE 18: PHASE SEPERATION

PARAMETER	F1	F2	F3	F4
Phase Separation	No Phase Separation	No Phase Separation	No Phase Separation	No Phase Separation

SPREAD ABILITY:

TABLE 19: SPREAD ABILITY

PARAMETER	F1	F2	F3	F4
Spread Ability	6.5	5.5	7.9	7.7

Fig 7: COLD CREAM (USING SANDALWOOD POWDER)

CONCLUSION:

The formulation and evaluation of an herbal cold cream using sandalwood powder have demonstrated promising results in the development of a natural, effective, and multifunctional skincare product. Sandalwood, with its renowned anti-inflammatory, antimicrobial, and soothing properties, proved to be an excellent addition to the cold cream formulation, providing several benefits for the skin, such as moisturizing, healing, and calming effects. The herbal cold cream using sandalwood powder has been successfully formulated, offering multiple benefits for skin health, including moisturization, anti-inflammatory action, and a soothing effect. The evaluation results indicate that this cold cream can be a valuable addition to natural skincare regimens, providing both immediate and long-term benefits for dry, sensitive, and irritated skin. Overall, this herbal cold cream represents an effective and eco-friendly skincare solution, harnessing the power of sandalwood for skin health while maintaining the essential properties of a traditional cold cream.

REFERENCES:

1. Rodrigues, F., de la Luz Cádiz-Gurrea, M., Nunes, M. A., Pinto, D., Vinha, A. F., Linares, I. B., ... & Carretero, A. S. (2018). Cosmetics. In *Polyphenols: properties, recovery, and applications* (pp. 393-427). Woodhead Publishing.
2. Chaudhri, S. K., & Jain, N. K. (2009). History of cosmetics. *Asian Journal of Pharmaceutics (AJP)*, *3*(3).
3. Parish, L. C., & Crissey, J. T. (1988). Cosmetics: A historical review. *Clinics in dermatology*, *6*(3), 1-4.
4. Balsam, M. S., & Sagarin, E. (Eds.). (1972). *Cosmetics science and technology* (Vol. 1). John Wiley & Sons.
5. Varvaresou, A., Papageorgiou, S., Tsirivas, E., Protopapa, E., Kintziou, H., Kefala, V., & Demetzos, C. (2009). Self-preserving cosmetics. *International Journal of cosmetic science*, *31*(3), 163-175.
6. Draelos, Z. K. (1995). Cosmetics: an overview. *Current Problems in Dermatology*, *7*(2), 45-64.
7. Russell, R. (2011). Why cosmetics work. *The science of social vision*, *7*, 186-204.
8. Aburjai, T., & Natsheh, F. M. (2003). Plants used in cosmetics. *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives*, *17*(9), 987-1000.
9. Mitsui, T. (Ed.). (1997). *New cosmetic science*. Elsevier.
10. Sirsat, S. V., Rathi, N. M., Hiwale, A. S., & Shelke, P. B. (2022). A review on preparation and evaluation of herbal cold cream. *World Journal of Pharmaceutical Research*, *11*(5), 690-697.
11. Yadav, R., Thakur, S., Parihar, R., Chauhan, U., Chanana, A., & Chawra, H. S. (2023). Pharmaceutical preparation and evaluation of cold cream. *Int. J. Innov. Sci. Res. Technol*, *8*, 1069-1075.
12. Sahana, R., Kiruba Daniel, S. C. G., Sankar, S. G., Archunan, G., Vennison, S. J., & Sivakumar, M. (2014). Formulation of bactericidal cold cream against clinical pathogens using Cassia auriculata
13. flower extract-synthesized Ag nanoparticles. *Green Chemistry Letters and Reviews*, *7*(1), 64-72.
14. Moore, J. B. (1870). ON COLD CREAM. *American Journal of Pharmacy (1835-1907)*, *42*, 63.
15. Sharma, A. N. S. H. U. L., Banyal, M. A. N. E. E. S. H., Gupta, J. Y. O. T. I., & Joshi, S. W. A. T. I. (2023). Formulation and evaluation of herbal cold cream. *IJARIIE*, *9*(3), 2578-2585.
16. Nayana, P. V., Navyashree, P. S., Nithyashree, H. P., Pavan, N. K., Preethi, N. S., & Rakshitha, C. (2024). A Review on the Formulation and Evaluation of Herbal Cold Creams Incorporating Natural Oils. *Journal of Pharma Insights and Research*, *2*(4), 207-211.
17. Kumar, R., Verma, K., Kumar, A., Kumar, M., Mann, A., Kumar, S., ... & Chaudhary, S. (2025). Challenges and Opportunities of Cultivating Sandalwood (Santalum album) Under Abiotic Stress Conditions. *Cutting Edge Technologies for Developing Future Crop Plants*, 419-435.
18. Birkbeck, A. A., Chapuis, C., & Schalk, M. Approaches to Commercial Sandalwood Odorants from Renewable Sources. *Helvetica Chimica Acta*, e202500010.
19. Paudel, M., Sharma, G. B., & Kafle, G. (2025). Growth Performance of Sandalwood (Santalum album) Plant in Western Nepal. *The Scientific World Journal*, *2025*(1), 3052342.

20. Çebi, K., & Yangılar, F. (2025). Comparative Analysis of Nutritional, Physicochemical, Microbiological, and Sensorial Characteristics of Dairy Yogurts Containing Probiotic Bacteria and Sandalwood Essential Oil Versus Plant-Based Yogurts Made From Lupine Milk. *European Journal of Lipid Science and Technology*, *127*(1), e202400147.

21. Utami, S. H., Ratnaningrum, Y. W., & Prehaten, D. (2025). Genetic diversity and seed supply variables affecting the regeneration of sandalwood in Gunung Sewu: Implications for sustainable forestry. In *BIO Web of Conferences* (Vol. 167, p. 06003). EDP Sciences.

22. Trease, G.E., & Evans, W.C. (2009). *Pharmacognosy* (16th ed.). Elsevier.

23. Sharma, P.P. (2010). *Cosmetics: Formulation, Manufacturing and Quality Control* (4th ed.). Vandana Publications.

24. Joshi, A., & Mandlik, S. (2017). Formulation and Evaluation of Herbal Cold Cream. *International Journal of Green Pharmacy*, 11(2), S351–S356.

25. Dash, S., & Murthy, P.N. (2011). Evaluation of herbal creams containing Curcuma longa and Aloe vera for anti-inflammatory and anti-bacterial activity. *Journal of Pharmaceutical Sciences and Research*, 3(6), 1227–1233.

26. Dhiman, A., & Mitra, S. (2021). Role of Herbal Cosmetics in the Modern Era. *Journal of Ayurveda and Integrative Medicine*, 12(4), 603–610.

27. Rathi, B., & Pandey, A. (2018). Formulation and Evaluation of Polyherbal Cream for Skin Care. *Asian Journal of Pharmaceutical Research and Development*, 6(4), 1–7.

28. Dureja, H., Kaushik, D., & Gupta, M. (2005). Cosmeceuticals: An emerging concept. *Indian Journal of Pharmacology, 37*(3), 155–159. https://doi.org/10.4103/0253-7613.16241

29. Nayak, B. S., & Pereira, L. M. (2006). Catharanthus roseus flower extract has wound-healing activity in Sprague Dawley rats. *BMC Complementary and Alternative Medicine, 6*(1), 41. https://doi.org/10.1186/1472-6882-6-41

30. Aburjai, T., & Natsheh, F. M. (2003). Plants used in cosmetics. *Phytotherapy Research, 17*(9), 987–1000. https://doi.org/10.1002/ptr.1363

31. Mukherjee, P. K., Maity, N., Nema, N. K., & Sarkar, B. K. (2011). Bioactive compounds from natural resources against skin aging. *Phytomedicine, 19*(1), 64–73. https://doi.org/10.1016/j.phymed.2011.10.003

32. Barel, A. O., Paye, M., & Maibach, H. I. (2014). *Handbook of cosmetic science and technology* (4th ed.). CRC Press.

33. Saraf, S. (2010). Applications of novel drug delivery system for herbal formulations. *Fitoterapia, 81*(7), 680–689. https://doi.org/10.1016/j.fitote.2010.06.005

34. Mukherjee, P. K. (2002). *Quality control of herbal drugs: An approach to evaluation of botanicals*. Business Horizons.

35. Nema, R. K., Maity, N., Sarkar, B. K., & Mukherjee, P. K. (2011). Evaluation of moisturizing potential of selected herbal oils in comparison to commercial skin care product. *Pharmacognosy Research, 3*(2), 95–101. https://doi.org/10.4103/0974-8490.81955