Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
https://www.phytojournal.com
JPP 2024; 13(1): 204-209
Received: 14-10-2023
Accepted: 27-11-2023

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Formulation and evaluation of night blooming jasmine cold cream

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DOI: https://doi.org/10.22271/phyto.2024.v13.i1c.14827

Abstract
Herbal cosmetics are meant to improve and beautify the appearance of people. The current study used the water-in-oil method to develop and assess herbal cold creams including plant extracts, liquid paraffin as a lubricant, beeswax as a stabilizer, and methylparaben as an antibacterial agent to nourish and moisturize the skin. Almond oil and neem oil are used to make the cold cream. Pharmaceutical creams are used for a variety of cosmetic functions, such as moisturizing, cleansing, beautifying, and altering appearance. These semi-solid preparations are safe for use by the general public and society. Herbal cosmetics are goods that are used to improve and beautify human appearance. The purpose of the current study was to create and evaluate herbal cold creams using plant extracts prepared using the water in oil method to nourish and moisturize.

Keywords: Cold cream, herbal cosmetics, night flowering jasmine, herbal cold cream

Introduction
Cosmetics are products that are typically used to both purify and beautify the skin. The word "cosmetics" comes from the Greek word "Kosmesticos," which meaning "to adorn." Since then, substances used to enhance appearances or beautify the skin have been referred to as cosmetics. People have been beautifying their skin with polyherbal or herbal cosmetics since ancient times. An emulsion of water and oil is called cold cream. Cold cream provides a longer duration of contact at the application site in comparison to other semisolid dosage forms or formulations [1]. It gets into the skin through the epidermis's pores. The cold cream recipe is said to have been developed in the second century by the Greek physician Galen. He prepared a concoction of rose petals, beeswax, and water. These were the principal ingredients in the moisturizing cream that he made. The common term for this skin treatment was Galen's cream. In addition to moisturizing the skin, cold treatments can be used to remove temporary tattoo marks, which can then be removed with a cotton ball. The production of kid's face paint is another application for cold creams [2].

As common today as it was in the past is the use of natural items as cosmetics. The main reason herbal cosmetics are favored over synthetic ones is that they have fewer, if any, negative effects and produce more noticeable results when applied. These herbal beauty products work to improve and condition the skin's natural qualities. These formulations contain no hazardous synthetic medications; all of the herbal extracts used are sourced from natural plant sources. Because of the potential for several skin issues, chemical or synthetic drugs or API are not used in the preparations [3].

Herbal cosmetics are there for often used in skin care regimens and are in high demand on the market. Herbal cosmetic goods consisting of several types of creams, like multipurpose, cold cream, and disappearing cream, are frequently applied topically. The emulsion used in cold cream preparations is often w/o rather than o/w, as in disappearing creams, and it has a cooling effect when applied.

Cream is defined as semisolid emulsions of the water in oil (w/o) or oil in water (o/w) type that are meant to be applied externally. Cream is divided into two categories: water in oil emulsion and oil in water. Its primary function is to stay at the application site longer. It is applied to the outer or superficial layers of the skin. A skin cream's purpose is to protect the skin from various environmental factors and weather conditions while also providing calming benefits to the skin. There are various kinds of creams, including massage, night, vanishing, cleansing, cold, and hand and body creams. Our primary goal is to create a herbal cream with multifunctional benefits [2].

The Anatomy of Skin

The skin is indeed the largest organ of the body in terms of both surface area and weight. Dimensions and Mass The surface area of the skin is roughly 1.6 m², or 16,000 cm². This can change according on the weight and height of the individual. About 8% of an adult's body weight is made up of their skin.

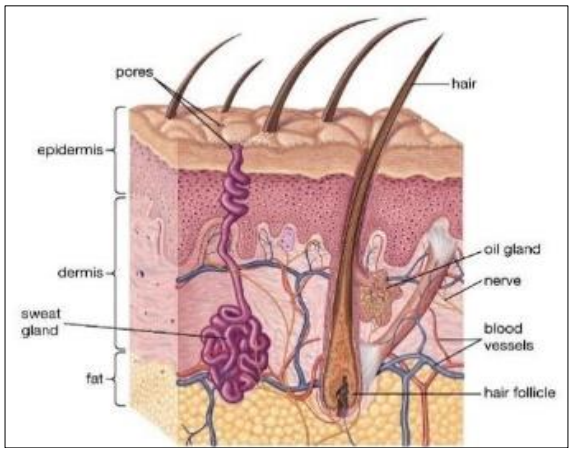

Fig 1: Anatomy of skin

Both Structure and Function The body's first line of defense against the outside world is the skin. It is a barrier, shielding the body from dangerous chemicals and microbes. Additionally, it aids in controlling body temperature through functions like perspiration and goosebumps. When exposed to sunshine, the skin can produce vitamin D, which is a helpful chemical compound. For strong bones, a healthy immune system, and several other body functions, vitamin D is necessary. Cellular Components The skin is made up of many types of cells. These include keratinocytes, which generate keratin, a protein that strengthens the skin; melanocytes, which produce the pigment melanin that gives skin its color; and erythrocytes, or red blood cells, which are present in the skin's blood vessels.

Multi-layer Structure The skin has a multi-layer structure, each with different components like cells and fibers. The outermost layer, the epidermis, is primarily composed of keratinocytes and is where new skin cells are produced. Beneath the epidermis is the dermis, which contains collagen and elastin fibers that give the skin its strength and elasticity. The dermis also contains blood vessels, nerves, and glands. The innermost layer, the subcutaneous tissue, contains fat cells that provide insulation and cushioning [4, 5].

General ingredients used in cold cream

Table 1: Ingredients used in cold cream ingredients [6]

Ingredients	Use of ingredients
Beeswax	Emulsifying agent
Borax	Emollient
Methylparaben	Preservative
Liquid paraffin	Laxative
Water	Diluent
Perfume	Fragrance

Apparatus Used

- Measuring cylinder
- Spatula
- Pipette
- Water bath
- China disc
- Glass rod
- Thermometer

Literature Review

The formulation and evaluation of herbal cold creams have been a focus of recent research. Studies [7] found that their respective formulations, which included plant extracts and oils, showed good consistency, spreadability, and stability. These creams also provide a cooling and soothing effect, making them suitable for skin application. Similarly [8], reported that their herbal cold cream formulations, containing Curcumin, Ashwagandha, and Neem, were stable and effective. These findings suggest that the inclusion of herbal extracts can enhance the properties of cold creams. Furthermore [9], demonstrated the potential of herbal creams containing antioxidant-rich extracts, such as Liquorice and Green Tea, to protect and nourish the skin. These studies collectively highlight the potential of herbal cold creams in skincare, particularly when combined with antioxidant-rich ingredients.

A range of studies have demonstrated the individual benefits of vitamin C, E, and night- blooming jasmine extract on the skin [10]. found that a combination of these ingredients improved skin moisture and micro relief, with the night-blooming jasmine extract showing long-term effects on skin microrelief [11]. further supported these findings, showing that a topical treatment containing vitamin C, E, and raspberry leaf cell culture extract had anti-aging and brightening effects and also highlighted the protective and anti-pigmentation effects of plant-derived antioxidant ingredients, including vitamins C and E, on UV-induced skin damage. These studies collectively suggest that these ingredients can have significant benefits for skin health [12, 13].

Materials and Methods - Formulation of Herbal Extract

1. Formulation of powder Extract using Crushing and Sieving method
2. Orange Tincher

Excipient Selection

Pre-formulation Study

- Visual Inspection
- Phase Separation
- Emulsion Stability Tests
- PH Compatibility Tests
- Compatibility with Packaging Material

Formulation of cold cream Evaluation of Cold cream -

- Organoleptic properties
- Measurement of pH
- Spreadability
- Homogeneity
- Microbial growth
- Irritancy Test
- Washability

Night Blooming Jasmine

Fig 2: Night Blooming Jasmine

Scientific classification
- Binomial name: *Cestrum nocturnum L*
- Kingdom: Plantae
- Order: Solanales
- Family: Solanaceae
- Genus: Cestrum
- Species: C. nocturnum.

Morphology
The greenish-white flowers are produced in cymose inflorescences and have a slender, tubular corolla that is 2-3 cm (0.79–0.98 in) long, with five sharp lobes. The blooms' diameter is 10–13 mm (0.39–0.51 in) when they are open. It releases a strong, pleasant scent at night. Terminal or axillary inflorescences are drooping, mostly multiflowered. These are panicles that are grouped and have few branches. Herbaceous bracts grow on the axes of the inflorescence. The fruit's five-pointed points are slightly larger, ribbed, and highly pointed. The five sepals are fused to create a bell-shaped, roughly 2 mm long calyx. The calyx has fine hairs on both the interior and outside.

Chemical Constituent
Flowers distilled oil contains phenyl ethyl alcohol (27%), benzyl alcohol (12%), eicosane (5.6%), eugenol (5.6%), n-tetracosane (4.4%), caryophyllene oxide (3.1%), 1-hexadecanol (2.7%), methoxy eugenol (2.45%), benzaldehyde (2.32%). Flowers alcohol extract contains cytotoxic steroids [14, 15].

Uses and benefits
1. Anti-aging effects
2. Skin rejuvenation
3. Moisturizing properties
4. Improves skin tone
5. Skin brightening
6. Helps in treating acne
7. Soothes skin irritation
8. Antioxidant effects
9. Anti-inflammatory properties
10. Antimicrobial action [16].

Orange Peel Tincher

Fig 3: Orange Peel Tincher

Scientific classification
- Kingdom: Plantae
- Order: Sapindales
- Family: Rutaceae
- Genus: Citrus
- Species: C. a. f. aurantium
- binomial name: *Citrus aurantium f. aurantium*

Composition
According to the table, orange flesh is 87% water, 12% carbs, 1% protein, and very little fat. Orange flesh has 47 calories per 100 grams, or 64% of the Daily Value, and is a strong source of vitamin C. The cultivar and method of production affect the amount of vitamin C. Oranges from conventional cultivation lack the same amount of vitamin C as fruits grown organically [17].

Excipient Selection - Vitamin E

Fig 4: Vitamin E

Eight fat-soluble substances make up vitamin E, including four tocopherols and four tocotrienols. Nerve issues can result from vitamin E insufficiency, which is uncommon and typically caused by an underlying issue with dietary fat digestion rather than from a diet deficient in vitamin E. Vitamin E is a fat-soluble antioxidant which may help protect cell membranes from reactive oxygen species.

Beeswax

Fig 5: Beeswax

Beeswax has becoming more widely used in cosmetics and skincare products. When applied as directed by a study conducted in Germany, beeswax proved to be more effective than similar barrier creams, which are often based on mineral oil and include petroleum jelly. Beeswax is utilized in moisturizers, hand creams, salves, lip balms, lip glosses, and makeup like blush, eye shadow, and eye liner. Additionally, beeswax is a key component in hair pomades and moustache wax, which smooth and shine hair18.

Borex

Fig 6: Borex

Borax acts as an emulsifying agent by saponifying the fatty acids in the beeswax, resulting in a more stable cream. Beeswax-only creams need to be thoroughly mixed and can separate when left to stand. As a result, little amounts of borax were applied after the beeswax.

Methylparaben

Fig 7: Methylparaben

One kind of paraben is methylparaben. Chemicals called parabens are frequently added to items as preservatives to extend their shelf lives. They are added to food or cosmetic products to stop mold and other dangerous microorganisms from growing [19].

Water

Used as a diluent in preparation of cold cream for better consistency and uniformity.

Rose Water

Fig 8: Rose Water

Rose petals are steeped in water to create rose-flavored water. It is the hydrosol fraction of the rose petal distillate, which is a leftover after rose oil is extracted for use in fragrances. Throughout Eurasia, rose water is also utilized for religious purposes, as a component of several cosmetic and medicinal products, and to flavor food.

Preparation of power extract

Cestrum nocturnum flowers weighing two to three kilograms were gathered from Gokulam colony in the Coimbatore district, which is located at latitude 11.0197° and longitude 76.9247° E. It was gathered between June and August. After being freshly harvested, they were dried in the shade. Using the mortal and pistal, they were coarsely ground after all of the moisture was gone. They underwent extraction after being weighed, labeled, and kept in sealed zip-lock bags [20].

Preparation of orange peel Tincher

The orange peel ought to come from ripe, fresh fruit that hasn't been chemically dyed. Assess Your Components: 25 grams of delicious orange peel to 100 milliliters of alcohol might be a common ratio. Transfer the orange peel to a jar and pour alcohol over it. We call this procedure maceration. Allow It to Rest Once closed, leave the jar for approximately seven days. This makes it possible for the alcohol to draw the active ingredients out of the orange peel. Strain the mixture seven days later. To reach a final amount of 1000 ml, dilute the tincture with additional alcohol if needed. Your orange tincture is the liquid component.

Pre-formulation Study

- **Visual Inspection:** Mix individual ingredients or the complete formulation and inspect for changes in color, odor, and appearance.
- **Phase Separation:** Observe for any signs of phase separation or stratification in liquid formulations.
- **pH Compatibility Tests:** Measure and monitor the pH of the formulation to ensure it falls within the desired range for stability and efficacy.
- **Compatibility with Packaging Material:** Ensure the formulation does not interact with the chosen packaging material, which could lead to leaching or degradation.
- **Emulsion Stability Tests:** A control was created by leaving out the cream after the agar media was made and the designed cream was inoculated on the plate using the steak plate method.

Formulation of cold cream

Table 2: Formulation Table

Ingredients	Quantity(gm/ml)	Use
Powdered Extract	1.5	Anti-aging
Orange Tincher	2	Cell Repair
Vit. E	0.1	Anti-oxidant
Beeswax	3	Emulsifying agent
Borax	0.16	Emollient
Methyl Paraben	0.2	Preservative
Liquid Paraffine	6.6	Laxative
Water	q.s	Diluent
Rose Water	q.s	Fragrance

Method of preparation of Cold Cream

1. Set up a boiling water bath at which place a beaker with a sufficient quantity of water and up to 70 ºC
2. Dissolve an appropriate amount of borax in hot water and stir till it dissolves in a beaker
3. In a china dish, White beeswax is melted with liquid paraffine together in a water bath at about 70 ºC
4. Dissolve powder extract in aqueous solution of borax and water.
5. Now slowly add borax solution into the molten wax solution at the same temperature with constant stirring in one direction.
6. Stirring continues until it becomes cold.
7. The cream is filled in a wide-mouth container [21].

Fig 9: Cold Cream

Evaluation of Cold cream

Organoleptic properties

This is the manual assessment of an ice cream's physical attributes, taking into account factors including color, flavor, and texture.

Washability

The cream was applied on the hand and observed under the running tap water.

Measurement of pH

The standard buffer solution helped with the pH meter's calibration. A digital pH meter was used to measure the pH of 0.5 grams of cream that had been dissolved in 50 milliliters of purified water [22].

Spread ability

After applying the cream sample between the two glass slides, 100 grams of weight was placed between them for five minutes to compress it to a consistent thickness before the weight was added to the weighing pan. Spread ability was determined by timing the movement of the upper glass slide over the lower slide [23].

$$\textbf{Ability to spread} = m \times \frac{l}{t}$$

m = mass close to the upper slide
t = time taken
l = length moved on the glass slide

Homogeneity

The formulations were tested for homogeneity by visual appearance and by touch.

Microbial Growth

A control was created by leaving out the cream after the agar media was made and the designed cream was inoculated on the plate using the steak plate method. After being put in the incubator, the plates are incubated for 24 hours at 37 C. The plates were removed from the incubator after the incubation period, and the microbial growth was examined and contrasted with the control.

Irritancy Test: On the dorsal surface of the left hand, mark a square centimeter. The designated area was covered with the cream, and the time was recorded. For a full day, any erythema, edema, or irritability was noted and recorded at regular intervals [24].

Results

Pre-Formulation Study

Visual Inspection: No change in color, order, and appearance is observed after mixing.

Phase Separation: Phase separation is not observed in the pre-formulation mixture.

pH Compatibility Tests: The pH of the mixture is 6 – 7 is observed.

Compatibility with Packaging Material: There is no sign of leching or degradation.

Emulsion Stability Tests: After 24 hours of incubation at 37 ºC, there were no indications of microbial development.

Table 3: Evaluation test - Organoleptic properties

Organoleptic Parameter	Result
Color	Brown
Order	Pleasant
Texture	Smooth

pH

Table 4: pH was found to be 6.4 Spread ability

Formula	Average Spread ability
F1	6.4

Homogeneity

Homogenous mass Even and consistent, The appearance and touch of the cream were good.

Microbial Growth

There were no signs of microbial growth after 24 hrs. of incubation a 37 ºC and it was comparable with the control.

Table 5: Irritancy Test

Irritancy test	Observation
Irritation	No
Edema	No
Redness	No
Swelling	No

Wash ability

A wash ability test was carried out by applying a small amount of cream on the hand and then washing it with tap water.

Conclusion

Night blooming jasmine helps in and protecting skin damage from external environmental conditions, in combination with an orange Tincher that is a rich source of Vit C which helps in recovering and healing skin damage and promoting its growth which is used as a major component in cold cream for avoiding skin damage in winter and help to repair from that damage. Other excipients like vitamin E and borax act as cleansing and anti-oxidant agents which help in the cleansing action of the cream. Evaluation of cream is done to get accurate results and check cream properties and its manufacturing quality and evaluated against the standards.

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