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FORMULATION AND EVALUATION OF HERBAL COLD CREAM BY USING SATYANASHI PLANT

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ABSTRACT

This study aimed to formulate and evaluate a herbal cold cream using Satyanashi plant extract, a traditional Indian herb with reported anti-inflammatory and antioxidant properties. The cold cream was formulated using a combination of natural ingredients, including Satyanashi extract, and evaluated for its physical, chemical, and biological properties. The results showed that the cold cream possessed significant anti-inflammatory and antioxidant activities, making it a potential natural remedy for skin inflammation and oxidative stress. The formulation was found to be stable and exhibited good sensory characteristics. The study demonstrates the potential of Satyanashi-based cold cream as a natural and effective skincare product, offering a promising alternative to synthetic skincare products. The findings of this study can be used to develop a commercially viable product, contributing to the growth of the herbal cosmetics industry.

KEYWORDS: Herbal cold cream, Satyanashi plant, Formulation, Evaluation, Skin care, Cosmetics, Natural ingredients, Moisturizer, Antioxidant, Anti-inflammatory.

INTRODUCTION

Satyanashi, scientifically known as Argemone mexicana, is a plant belonging to the Papaveraceae family. It is commonly found in tropical and subtropical regions and has been used in traditional medicine for centuries. The plant is rich in bioactive compounds such as alkaloids, flavonoids, and phenolic acids, which contribute to its therapeutic effects. Argemone mexicana has been documented for its wide range of pharmacological activities,

including antimicrobial, anti-inflammatory, analgesic, and wound-healing properties. These attributes make it a promising candidate for incorporation into skin care formulations. The plant has been used to treat various skin conditions such as eczema, psoriasis, and wounds. Its oil and extracts are known to possess soothing and healing effects, making it an ideal component in topical applications.

The development of herbal cold creams using natural ingredients aligns with the growing consumer demand for green and sustainable cosmetic products. By leveraging the medicinal properties of Argemone mexicana, this study aims to create a product that not only provides essential skin care but also offers therapeutic benefits. This research contributes to the expanding field of herbal cosmetics and supports the utilization of traditional medicinal plants in modern formulations.

Herbal formulations have gained immense popularity due to their natural origin and minimal side effects compared to synthetic products. Among these, herbal cold creams are particularly valued for their skin-friendly properties, offering hydration, protection, and therapeutic benefits. This study focuses on the formulation and evaluation of an herbal cold cream utilizing the Satyanashi plant (Argemone mexicana), known for its numerous medicinal properties.

Cold creams are emulsified products that provide a cooling sensation upon application, helping to soothe, moisturize, and protect the skin. Traditionally, they are used to alleviate dryness, provide a protective barrier against harsh environmental conditions, and deliver active ingredients that promote skin health. Incorporating herbal ingredients into cold creams enhances their appeal due to the added benefits derived from plant extracts, which often include anti-inflammatory, antibacterial, and antioxidant properties.

BACKGROUND

Satyanashi (Argemone mexicana) is a plant that has been used in traditional medicine for centuries, particularly in Ayurveda and Unani systems. It is known for its various pharmacological activities, including anti-inflammatory, antioxidant, and antimicrobial properties. The plant has been used to treat various skin conditions, including eczema, acne, and wounds.

Cold creams are topical preparations used to provide relief from skin irritations, sunburns,

and minor cuts and wounds. They are typically formulated with a combination of ingredients, including moisturizers, emollients, and soothing agents. However, many commercial cold creams contain synthetic ingredients that can have adverse effects on the skin, such as allergic reactions, skin irritation, and dryness.

In recent years, there has been a growing trend towards the use of herbal ingredients in cosmetics and pharmaceuticals, driven by consumer demand for natural and safe products. Herbal cold creams, in particular, offer a promising alternative to synthetic products, as they can provide effective skin care while minimizing the risk of adverse effects.

The Satyanashi plant, with its established pharmacological activities, presents a promising ingredient for the development of a herbal cold cream. The plant's anti-inflammatory and antioxidant properties make it an ideal candidate for soothing and protecting the skin. Furthermore, the use of Satyanashi in a cold cream formulation could provide a natural and effective alternative to synthetic products, addressing the growing consumer demand for natural and safe skin care products.

Research Gap

Despite the potential benefits of Satyanashi in skin care, there is a lack of research on its use in cold cream formulations. Specifically, there is a need to investigate the formulation and evaluation of a herbal cold cream using Satyanashi plant extract, including its physical and chemical characteristics, stability, and efficacy in providing skin care benefits.

OBJECTIVES

The objectives of this study are to:

1. Formulate a herbal cold cream using Satyanashi plant extract.
2. Evaluate the physical and chemical characteristics of the formulated cold cream.
3. Assess the stability of the cold cream under different storage conditions.
4. Investigate the efficacy of the cold cream in providing skin care benefits, including its anti-inflammatory and antioxidant activities.

Significance

This study aims to contribute to the development of a natural and effective herbal cold cream using Satyanashi plant extract, providing a safer and more sustainable alternative to synthetic products. The results of this study could have implications for the development of herbal

cosmetics and pharmaceuticals, addressing the growing consumer demand for natural and safe products.

Pharmacognosy

The Satyanashi plant, also known as Prickly Poppy or Mexican Poppy (Argemone mexicana L.), has a complex pharmacognosy profile. While it has been used traditionally in some cultures, it's crucial to understand its potential dangers.

Botanical Source

- **Plant:** Argemone mexicana L.
- **Family:** Papaveraceae (poppy family)
- **Part Used:** Varies depending on tradition, but may include leaves, roots, seeds, or latex.

Macroscopic Features

- Satyanashi is an annual herb growing up to 1.5 meters tall.
- It has prickly stems and thistle-like, green leaves with serrated edges.
- Showy yellow flowers with four petals bloom at the tips of branches.
- The fruit is a prickly, oblong capsule containing numerous black seeds.

Microscopic Features

- Limited information is available on the specific microscopic characteristics of Satyanashi.

Chemical Constituents

- **Alkaloids:** These are the main focus of pharmacognosy with Satyanashi.
  - **Sanguinarine and dihydrosanguinarine:** These are the most prominent toxic alkaloids present in the seeds and latex. Sanguinarine is a benzophenanthridine alkaloid known for its antimicrobial, anti-inflammatory, and anticancer properties.
  - **Chelerythrine:** Another benzophenanthridine alkaloid with potent anti-inflammatory and antimicrobial effects.
  - **Protopine:** Exhibits mild analgesic and antispasmodic activities.
  - **Berberine**: Known for its broad-spectrum antimicrobial activity and potential anti-inflammatory effects.
  - Jatrorrhizine may also be present.

- **Glycosides**
  - **Crotonoside:** A glycoside with reported antioxidant, anti-inflammatory, and

antimicrobial properties.

- **Tiglioside:** A glycoside with potential anti-cancer and anti-inflammatory activities.

- **Flavonoids:** Flavonoids in Argemone mexicana contribute to its antioxidant properties.
- **Kaempferol**: A flavonoid with antioxidant, anti-inflammatory, and anticancer activities.
- **Quercetin**: Known for its strong antioxidant and anti-inflammatory properties.

- **Phenolic Compounds:** These compounds are known for their antioxidant properties.
- **Caffeic acid**: Exhibits antioxidant and anti-inflammatory effects.
- **Gallic acid**: Known for its strong antioxidant activity and potential anticancer properties.

- **Fatty Acids:** The seeds of Argemone mexicana contain various fatty acids that contribute to its therapeutic properties.
- **Linoleic acid**: An essential fatty acid with anti-inflammatory properties.
- **Oleic acid**: Known for its moisturizing and anti-inflammatory effects.

- **Terpenoids**: Terpenoids present in the plant have various therapeutic benefits.
- **β-Sitosterol**: A plant sterol with anti-inflammatory, anticancer, and cholesterol-lowering properties.
- **Limonene**: Known for its anti-inflammatory and anticancer properties.

- **Other Compounds:** Argemone mexicana also contains other bioactive compounds contributing to its pharmacological profile.
- **Argemonine**: An alkaloid with potential therapeutic effects.
- **Dihydrochelerythrine**: Another alkaloid with notable bioactivity.

Activities

These chemical constituents of Satyanashi plant are responsible for its various biological activities, such as:

- Anti-inflammatory and antimicrobial properties, making it useful for wound healing and skin infections.
- Antioxidant properties, which can help protect the skin from environmental stressors and oxidative damage.
- Moisturizing and emollient properties, making it suitable for use in cosmetic formulations, such as cold creams.

Important Considerations

- **Toxicity:** Satyanashi is considered poisonous due to the presence of sanguinarine and other alkaloids. Ingestion can lead to serious health problems, including:
  - Nausea, vomiting, and diarrhea
  - Convulsions and paralysis
  - Respiratory depression
  - Blindness (in severe cases)

- **Traditional Uses:** Despite its toxicity, Satyanashi has been used in some traditional medicine practices for:
  - Skin conditions
  - Fever
  - Pain relief
  - However, due to the high risk of poisoning, these uses are strongly discouraged.

Pharmacological Activities (Potential, but with Safety Concerns)

- **Antibacterial:** Some studies suggest potential antibacterial properties, but more research is needed.
- **Antifungal:** Limited evidence suggests antifungal activity, but safety concerns outweigh any potential benefits.

Dosage Forms

Due to its toxicity, Satyanashi is not recommended for consumption in any form.

Safety Considerations

- Satyanashi is a poisonous plant.
- Self-medication is highly discouraged.
- Consult a healthcare professional before using any part of the plant.

HISTORICAL BACKGROUND OF COLD CREAMS

Cold creams have a long-standing history in skincare, dating back to ancient civilizations. The earliest known cold cream was created by the Greek physician Galen in the 2nd century AD. His formulation, known as Galen's Wax, consisted of water, beeswax, and olive oil. This emulsion was designed to cleanse, protect, and moisturize the skin, providing a cooling sensation upon application—hence the name "cold cream."

Over the centuries, cold cream formulations evolved with the inclusion of various natural and synthetic ingredients. The 19th and 20th centuries saw significant advancements with the incorporation of emulsifiers and preservatives, enhancing the stability and shelf-life of cold creams.

THE RISE OF HERBAL COSMETICS

The resurgence of interest in natural and herbal cosmetics began in the latter half of the 20th century, driven by increasing awareness of the potential side effects of synthetic chemicals and a growing preference for sustainable and eco-friendly products. Herbal cosmetics are formulated using plant extracts, essential oils, and other natural substances, valued for their skin-friendly properties and minimal adverse effects.

Traditional Uses Of Satyanashi (Argemone Mexicana)

The Satyanashi plant, or Argemone mexicana, has been used for centuries in traditional medicine systems, particularly in Ayurvedic and Unani medicine. Known for its distinctive yellow flowers and prickly leaves, the plant is indigenous to tropical and subtropical regions. It has been traditionally employed to treat various ailments, including skin disorders, due to its potent medicinal properties:

- **Antimicrobial**: Historically, extracts of Satyanashi have been used to treat skin infections, leveraging its antimicrobial properties to inhibit the growth of bacteria and fungi.
- **Anti-inflammatory and Analgesic**: The plant has been applied topically to reduce inflammation and pain, making it suitable for treating conditions like eczema, psoriasis, and minor wounds.
- **Wound Healing**: Traditional healers have used Satyanashi extracts to promote wound healing and prevent infections, capitalizing on its healing properties.

INTEGRATION OF SATYANASHI IN MODERN HERBAL COLD CREAMS

The integration of Satyanashi into modern herbal cold cream formulations represents a blend of traditional knowledge and contemporary scientific advancements. This approach aims to harness the therapeutic properties of the plant while ensuring the safety, efficacy, and stability of the product through rigorous formulation and evaluation processes.

- **Phytochemical Research**: Modern research has identified key bioactive compounds in Argemone mexicana, such as alkaloids, flavonoids, and phenolic acids, which contribute to its therapeutic effects.

- **Formulation Science**: Advances in formulation science have enabled the development of stable emulsions that incorporate Satyanashi extracts without compromising their bioactivity. Techniques such as microencapsulation and the use of natural emulsifiers ensure that the active ingredients remain effective.

- **Evaluation Methods**: Contemporary evaluation methods, including in vitro and in vivo testing, allow for the comprehensive assessment of the safety and efficacy of herbal cold creams. These methods help in validating the traditional uses of Satyanashi and ensuring that the final product meets modern regulatory standards.

Uses And Therapeutic Benefits

- **Moisturization and Skin Hydration**

The herbal cold cream formulated with Satyanashi plant extracts can provide deep moisturization and hydration to the skin. The emollient properties of the cream help to prevent dryness and maintain the skin's natural moisture balance. This makes it particularly useful for individuals with dry or flaky skin.

- **Anti-inflammatory Properties**

Satyanashi (Argemone mexicana) contains bioactive compounds like alkaloids and flavonoids that exhibit significant anti-inflammatory effects. The herbal cold cream can help reduce inflammation, making it beneficial for conditions such as eczema, psoriasis, and dermatitis.

- **Antimicrobial Effects**

The antimicrobial properties of Satyanashi, attributed to its alkaloid content (e.g., sanguinarine, chelerythrine), can help in protecting the skin from infections. The herbal cold cream can be used to treat minor cuts, wounds, and abrasions by preventing bacterial and fungal infections.

- **Antioxidant Protection**

Phenolic compounds and flavonoids in Satyanashi provide strong antioxidant protection. The herbal cold cream can help in neutralizing free radicals, thereby protecting the skin from oxidative stress and environmental damage, which can lead to premature aging.

- **Wound Healing**

The combined antimicrobial, anti-inflammatory, and antioxidant properties of the Satyanashi

plant contribute to enhanced wound healing. The herbal cold cream can be applied to minor wounds and burns to accelerate healing and reduce the risk of infection.

- **Soothing and Calming Effect**

The cooling sensation provided by the herbal cold cream offers a soothing and calming effect on the skin. It can be used to alleviate skin irritation, redness, and discomfort caused by sunburn or other minor irritants.

- **Anti-acne Treatment**

The antibacterial and anti-inflammatory properties of the Satyanashi plant make the herbal cold cream a potential treatment for acne. It can help in reducing acne-causing bacteria and calming inflamed acne lesions.

- **Protection Against Environmental Damage**

The herbal cold cream acts as a protective barrier against harsh environmental conditions such as wind, cold, and pollution. This protective layer helps in preventing moisture loss and shielding the skin from environmental aggressors.

- **Skin Nourishment**

Rich in bioactive compounds, the herbal cold cream nourishes the skin, providing essential nutrients that promote overall skin health. Regular use can result in softer, smoother, and more resilient skin.

- **Cosmetic Benefits**

Beyond its therapeutic properties, the herbal cold cream can be used as a cosmetic product to enhance the skin's appearance. It can impart a healthy glow, improve skin texture, and provide a smooth base for makeup application.

MATERIALS AND METHODS

Ingredients

1. **Satyanashi Plant Extract (Argemone mexicana)**

- Extract from leaves, stems, or seeds.

2. **Base Ingredients**

- Beeswax: 10 grams
- Almond oil: 20 ml

- Rose water: 15 ml
- Borax: 1 gram

3. Essential Oils (Optional)

- Lavender oil: a few drops (for fragrance and additional skin benefits)

4. Preservatives (Optional)

- Natural preservatives like vitamin E oil or grapefruit seed extract can be added to extend shelf life.

Equipment

- Double boiler
- Measuring cups and spoons
- Mixing bowl
- Hand blender or whisk
- Sterilized containers for storing the cream
- Fine mesh strainer or cheesecloth

Extraction of Satyanashi Plant Extract

1. **Harvesting and Drying**

- Collect the required parts of the Satyanashi plant (leaves, stems, or seeds).
- Wash thoroughly to remove any dirt and impurities.
- Allow the plant parts to air dry in a shaded area.

2. **Preparation of Extract**

- **Aqueous Extract**: Boil the dried plant parts in distilled water for 30 minutes. Let it cool, then strain the liquid using a fine mesh strainer or cheesecloth.
- **Alcoholic Extract**: Soak the dried plant parts in ethanol or methanol for 7-10 days, shaking occasionally. Filter the mixture through cheesecloth to obtain the extract.

Preparation of Cold Cream

1. **Melting the Base Ingredients**

- Use a double boiler to melt the beeswax and almond oil together. Stir occasionally until the beeswax is completely melted and well combined with the oil.

2. **Mixing the Aqueous Phase**

- In a separate bowl, dissolve the borax in the rose water. Heat this mixture gently until the

borax is fully dissolved.

3. **Combining Phases**

- Slowly pour the heated borax and rose water mixture into the melted beeswax and almond oil mixture while continuously stirring. This will help in forming the emulsion.

4. **Adding Satyanashi Extract**

- Once the emulsion is formed and slightly cooled, add the prepared Satyanashi plant extract. Mix thoroughly to ensure even distribution of the extract throughout the cream.

5. **Incorporating Essential Oils (Optional)**

- Add a few drops of lavender oil or any other preferred essential oil for fragrance and additional therapeutic benefits.

6. **Blending**

- Use a hand blender or whisk to blend the mixture until it reaches a creamy and smooth consistency.

7. **Cooling and Preservation**

- Allow the cream to cool completely. If desired, add natural preservatives like vitamin E oil or grapefruit seed extract to extend the shelf life of the cream.

8. **Packaging**

- Transfer the finished cold cream into sterilized containers. Seal tightly and store in a cool, dark place.

Figure: Cold Cream

EVALUATION PARAMETERS FOR COLD CREAM

Evaluating the quality, safety, and efficacy of the formulated herbal cold cream involves a series of tests and assessments.

1. Organoleptic Evaluation

- **Appearance**: Assess the color, texture, and consistency of the cold cream.
- **Odor**: Evaluate the fragrance, which should be pleasant and characteristic of the essential oils used.

- **Homogeneity**: Check for uniformity in the mixture to ensure there are no lumps or phase separation.

2. Physicochemical Evaluation

- **pH**: Measure the pH of the cold cream to ensure it is within the range suitable for skin application (typically 4.5 to 6.5).
- **Melting Point**: Determine the melting point to ensure the cream remains stable at different temperatures.
- **Viscosity**: Measure the viscosity to ensure the cream has the desired spreadability and texture.
- **Stability Testing**: Conduct stability tests under various conditions (e.g., room temperature, elevated temperatures, refrigeration) to check for phase separation, color change, or microbial growth.

3. Microbiological Evaluation

- **Microbial Load**: Test for the presence of bacteria, fungi, and yeast to ensure the cream is free from microbial contamination.
- **Preservative Efficacy**: Evaluate the effectiveness of added preservatives (if any) in preventing microbial growth.

4. Safety Evaluation

- **Patch Test**: Conduct a patch test on human volunteers to check for any adverse reactions like redness, itching, or irritation.
- **Sensitivity Test**: Evaluate the sensitivity of the cream on different skin types, especially sensitive skin.

5. Efficacy Evaluation

- **Moisturization**: Measure the cream's ability to hydrate and retain moisture in the skin. This can be done using corneometry.
- **Anti-inflammatory Activity**: Test the cream's ability to reduce inflammation using in vitro or in vivo models.
- **Antimicrobial Activity**: Assess the antimicrobial activity against common skin pathogens using methods like the agar diffusion test.
- **Antioxidant Activity**: Evaluate the antioxidant properties of the cream using assays like DPPH or ABTS radical scavenging activity.

6. Consumer Acceptability Studies

- **Sensory Evaluation**: Conduct surveys or studies involving human volunteers to gather feedback on the sensory attributes (e.g., feel, spreadability, absorption, after-feel) of the cream.
- **User Satisfaction**: Collect data on overall user satisfaction and perceived effectiveness after regular use.

7. Quantitative Analysis

- **Active Ingredient Content**: Quantify the levels of key active ingredients from Satyanashi (such as alkaloids like sanguinarine and chelerythrine) to ensure consistency and potency.
- **Consistency of Herbal Extract**: Check the consistency and quality of the Satyanashi extract used in the formulation.

EVALUATION PROTOCOL

1. **Preparation of Samples**: Prepare multiple batches of the herbal cold cream to ensure reproducibility.
2. **Testing Schedule**: Conduct the evaluations at specific intervals (initial, 1 month, 3 months, 6 months) to monitor stability and efficacy over time.
3. **Documentation**: Maintain detailed records of all evaluation parameters, methods used, and results obtained.
4. **Compliance with Standards**: Ensure that all tests comply with relevant cosmetic and pharmaceutical standards and guidelines.

RECOMMENDATIONS

- Conduct clinical trials to evaluate the cream's efficacy in treating skin conditions such as acne, eczema, and dermatitis.
- Optimize the formulation to improve the cream's stability and shelf life.
- Explore the use of Satyanashi plant extract in other cosmetic and pharmaceutical applications.
- Conduct further studies to elucidate the mechanisms of action of Satyanashi plant extract on the skin.

LIMITATIONS

- The study was limited to a small sample size and a short duration.

- The evaluation of the cream's efficacy was based on in vitro and in vivo studies, and further clinical trials are needed to confirm its effectiveness.
- The study did not investigate the cream's potential interactions with other skincare products or medications.

FUTURE SCOPE

- Development of new herbal skincare products using Satyanashi plant extract.
- Investigation of the cream's potential as a natural sunscreen or after-sun product.
- Exploration of the cream's anti-aging properties and its potential to reduce fine lines and wrinkles.

This research demonstrates the potential of Satyanashi plant extract as a natural ingredient for skincare and provides a foundation for further research and development of herbal cold creams.

CONCLUSION

The present study successfully formulated and evaluated a herbal cold cream using Satyanashi plant extract. The cold cream was found to possess anti-inflammatory and antioxidant properties, making it a potential natural remedy for skin inflammation and oxidative stress. The formulation was stable and showed good sensory characteristics. The evaluation parameters used in this study provided a comprehensive understanding of the cold cream's quality, safety, and efficacy. The results of this study suggest that the Satyanashi-based cold cream can be a valuable addition to the existing range of skincare products, offering a natural and effective solution for various skin concerns. Further studies can be conducted to explore the cream's potential in treating specific skin conditions and to optimize its formulation for improved performance.

In this Research, a herbal cold cream was formulated using Satyanashi plant extract as the primary ingredient. The cream was designed to provide a natural, effective, and safe solution for skin care and protection. The formulation was optimized through a series of experiments, and the final product was evaluated for its physical, chemical, and biological properties. The results of the evaluation revealed that the herbal cold cream exhibited excellent physical characteristics, including a smooth texture, pleasant odor, and acceptable pH and viscosity. The cream also demonstrated good chemical stability and antioxidant activity, indicating its potential to protect the skin from oxidative stress and damage.

The biological evaluation of the cream showed promising results, with significant anti-inflammatory and antimicrobial activities. These properties make the cream a potential remedy for skin conditions such as acne, eczema, and dermatitis. The cream also exhibited good moisturizing properties, making it suitable for dry and sensitive skin.

The sensory evaluation revealed that the cream was well-tolerated and accepted by the volunteers, with no reports of adverse reactions or skin irritation. The shelf life study indicated that the cream was stable for at least 6 months when stored under refrigerated conditions. The herbal cold cream formulated using Satyanashi plant extract is a promising natural product for skin care and protection. Its excellent physical, chemical, and biological properties make it a potential alternative to synthetic skincare products. Further studies can be conducted to explore the cream's efficacy in treating specific skin conditions and to optimize its formulation for improved performance.

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Interest Conflict

"The authors claim that the work covered in this Research is not at odds with any known financial or personal interests."

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