e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:04/April-2024 Impact Factor- 7.868 www.irjmets.com

PHARMACEUTICAL PREPARATION AND EVALUATION OF COLD CREAM

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ABSTRACT

Herbal cold creams, formulated with neem oil and turmeric extract using the water-in-oil method, were developed and evaluated for their skin moisturizing and nourishing properties. The resulting product exhibited consistent physical characteristics, including spreadability and homogeneity, while maintaining optimal pH and non-greasy texture. With the added benefits of herbal extracts, these creams offer a soothing and moisturizing experience, protecting the skin and enhancing its overall health and appearance.

Keywords: Parrafin, Beeswax.

I. INTRODUCTION

Cosmetics, originating from the Greek term 'kosmesticos,' have remained indispensable tools for enhancing and refining skin appearance across centuries. Cold creams, characterized by their water-in-oil emulsion, offer a unique blend of elegance and functionality. These creams, attributed to Galen's ancient formulation comprising water, beeswax, and rose petals, provide prolonged skin contact, imparting moisture and cleansing pores while maintaining a non-greasy texture. Their versatility extends beyond moisturization, as they are also utilized for temporary tattoo removal and even in children's face paint applications, showcasing the enduring relevance of these time-tested formulations.

From ancient times to the present day, the allure of herbal cosmetics persists, offering a natural alternative for skincare enthusiasts. Cold creams, a prominent example, combine the benefits of traditional herbal extracts with modern skincare science. Their water-in-oil composition not only ensures prolonged skin contact but also delivers essential nourishment and hydration. Rooted in Galen's innovative blend of water, beeswax, and rose petals, these creams embody centuries of cosmetic wisdom, providing a gentle yet effective solution for moisturizing and purifying the skin. With their soothing properties and non-irritating nature, cold creams continue to captivate beauty enthusiasts worldwide, reaffirming their status as timeless skincare essentials.

II. TOPICAL DRUG DELIVERY

Topical drug delivery, one of several routes for administering medications, involves applying a drug-containing formulation directly onto the skin's surface to treat cutaneous disorders or manifestations of systemic diseases. This approach aims to confine the drug's pharmacological effects to the skin or within its layers. While semisolid formulations like creams and ointments are commonly used, other forms such as foams, sprays, and medicated lotions also play a significant role in topical administration.

The advantages of topical drug delivery are multifaceted. Firstly, it prevents first-pass metabolism, enhancing drug bioavailability by bypassing the digestive system's metabolic processes. Additionally, it offers convenience and ease of use, requiring simple application to the affected area. This method minimizes the risks associated with invasive procedures and systemic administration routes like intravenous therapy. Moreover, continuous drug input can achieve therapeutic efficacy with lower total daily doses, reducing the likelihood of adverse effects and fluctuations in medication levels.

However, topical drug delivery does present some challenges. Certain medications or their excipients may cause skin irritation or dermatitis, limiting their tolerability. Furthermore, poorly fat-soluble or high-molecular-weight drugs may have limited absorption through the skin or mucous membranes. This restriction results in very low absorption rates, rendering topical delivery suitable only for medications requiring extremely low plasma concentrations to exert their effects. Additionally, larger-particle drugs may face difficulties in penetrating the skin barrier, affecting their absorption and efficacy. Despite these challenges, topical drug delivery remains a valuable approach for targeted and localized therapy, offering benefits in terms of efficacy, convenience, and reduced systemic side effects.

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III. PHYSIOLOGY OF HUMAN SKIN

1. **Epidermis**: The epidermis constitutes the outermost layer of the skin and is composed of a stratified, keratinized squamous epithelium. Its thickness varies depending on the body part, with the palms of the hands and the soles of the feet having the thickest layers. Notably, the epidermis lacks blood vessels, relying on interstitial fluid from the dermis for nourishment. This layer serves as a protective barrier against external threats while also regulating water loss and maintaining skin integrity.
2. **Dermis**: Beneath the epidermis lies the dermis, a resilient layer made of connective tissue. Within the dermal matrix, elastic and collagen fibers are intricately woven together, providing elasticity and strength to the skin. Stretch marks, or striae, result from the rupture of elastic fibers when the skin is excessively stretched, as seen during pregnancy or obesity. Collagen fibers not only hold water but also contribute to the skin's tensile strength. Primary cells within the dermis include mast cells, macrophages, and fibroblasts, which play essential roles in immune response, wound healing, and collagen production. Additionally, the dermis contains areolar tissue and varying levels of adipose tissue, offering structural support and insulation.
3. **Subcutaneous Gland**: The subcutaneous glands, particularly the sebaceous glands, are crucial for hormone processing and regulation, notably androgens. Enzymes within the skin facilitate the conversion of cholesterol to steroid precursors or adrenal hormones like dehydroepiandrosterone. Hydroxysteroid dehydrogenase, present as early as 16 weeks of fetal life, aids in the inactivation of androgens within the sebaceous glands. These glands, abundant on the face and scalp, produce the type-1 isoform of 5-alpha-reductase, responsible for converting testosterone into its potent form. Androgens, by attaching to nuclear androgen receptors (AR), regulate sebaceous gland activity. The sebaceous gland's affinity for androgens underscores their significant role in controlling skin physiology and health.

IV. FUNCTIONS OF SKIN

This is a comprehensive overview of the functions of the skin, common skin diseases, and the history and composition of cold creams. Here's a summary:

Functions of the Skin:

1. **Barrier Protection**: Langerhans cells act as a barrier against pathogens and damage.
2. **Sensation**: Nerve endings in the skin respond to touch, pressure, and injury.
3. **Heat Regulation**: The skin regulates body temperature through blood flow and sweating.
4. **Controlling Evaporation**: Skin prevents excessive fluid loss.
5. **Emotional and Physical Perception**: Skin appearance can convey emotions, physical condition, and beauty.
6. **Storage and Synthesis**: The skin stores lipids and water and synthesizes vitamin D.

Common Skin Diseases:

1. Vitiligo
2. Scabies
3. Rosacea
4. Psoriasis
5. Melanoma
6. Eczema

Cold Creams:

- Cold cream is an emulsion of water and fats used for skin smoothing and makeup removal.
- Also known as Fatty Cream in the European Pharmacopoeia.
- Contains beeswax and fragrances.
- Produces a cooling sensation upon application due to water evaporation.
- Acts as a moisturizer with an oily consistency.
- Has a long history, dating back to the Roman Empire, with a formula attributed to Galen.

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- Originally used for dry skin treatment and makeup removal.
- Cold creams typically have a "water in oil" emulsion.
- Early versions were not durable due to vegetable oil deterioration.
- Mineral oil or petroleum jelly-based cold creams were used as cleansers and beauty creams.

V. GENERAL INGREDIENTS USED IN COLD CREAM

General Ingredients in Cold Cream:

- Beeswax (3.2gm): Emulsifying agent
- Borax (0.16gm): Emollient
- Methyl paraben (0.02gm): Preservative
- Liquid paraffin (10ml): Laxative
- Water (6ml): Diluent
- Perfume (0.62ml): Fragrance

Apparatus Used:

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

Raw Materials:

- Mineral and vegetable oils
- Fatty alcohols, fatty acids, and fatty esters
- Emulsifying agents
- Preservatives
- Filtered water

Procedure of Making Cold Cream:

1. Weigh each ingredient accurately.
2. Add the weighed beeswax to the china disc.
3. Add liquid paraffin to the china disc and mix with beeswax.
4. Heat the mixture in a water bath at 70°C until fully melted and combined.
5. Dissolve borax in water by boiling in a water bath.
6. Add boric acid solution dropwise to the wax-paraffin mixture while stirring continuously.
7. Add methyl paraben and mix until fully dissolved.
8. Add perfume for fragrance.
9. Stir the entire mixture until it reaches a semi-solid form.
10. Allow the mixture to cool to room temperature to obtain the final cold cream product.

Uses of Cold Cream:

- Makeup removal and cleansing preparation
- Providing an emollient effect to the skin
- Creating an oiled barrier of protection
- Offering a chemical barrier, similar to sunscreen components
- Acting as a vehicle for pharmaceutical ingredients in ointments
- Removing skin contaminants soluble in oil

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VI. FUNCTIONS AND USES OF THE INGREDIENTS USED IN THE PREPARATION

Beeswax:

- Acts as an antioxidant, moisturizer, and cell repair agent.
- Functions as an emollient and humectant in skincare.
- Used in various cosmetic products like lip balm, lipstick, and body creams.
- Possesses anti-inflammatory, antiviral, and antibacterial properties.
- Contains therapeutic properties and is a source of vitamin A.

Liquid Paraffin:

- Essential for skin care as it moisturizes and forms a barrier to prevent moisture loss.
- Commonly used in skincare products like creams and oils.
- Helps the skin retain moisture and reduce symptoms of skin diseases.

Borax:

- Acts as an emulsifying agent, stabilizes pH, and inhibits bacterial growth.
- Also known as sodium tetraborate, sourced from natural deposits.
- Used in creams, gels, and lotions for cosmetic purposes.
- Effective in cleaning products but may cause skin irritation in high concentrations.

Methyl Paraben:

- Functions as a preservative to prevent microbial growth.
- Part of the paraben family, commonly used in cosmetics and food products.
- Found in various cosmetic products like makeup and moisturizers.

Cold Cream for Cold Weather:

- Cold creams are beneficial for dry skin during cold weather due to their hydrating properties.
- Contains a mixture of water and oil, providing a protective barrier on the skin.
- Ideal characteristics include a cooling effect, easy application and removal, and quick emollient action.

Evaluation of Cold Cream:

- Morphological Evaluation: Manual assessment based on color, flavor, and texture.
- pH Test: Measures the acidity of the cream using a digital pH meter.
- Spreadability Test: Determines the ease of spreading the cream on the skin.
- Stability Test: Evaluates physical traits of the cream after storing it at various temperatures.
- Irritability Test: Monitors skin irritation after applying the cream.

VII. RESULTS

Here's a summary of the evaluation results for the cold cream formulation:

Morphological Evaluation:

- Color: White
- Odor: Pleasant
- Texture: Fine

pH Test:

- pH: 7.3 (neutral)

Stability Testing:

- Color: No change
- Odor: No change
- Texture: No change
- pH: No change

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Irritancy Test:

- Irritation: None
- Edema: None
- Redness: None
- Swelling: None

Spreadability Test:

- Average spreadability: 6.5

Homogeneity:

- Cold cream exhibited good homogeneity.

These results indicate that the cold cream formulation meets cosmetic formulation requirements, with a pleasant appearance, neutral pH, stability, absence of irritation, and suitable spreadability and homogeneity. It is considered safe for use on the skin.

VIII. CONCLUSION

The created cream demonstrated good consistency and spreadability, homogeneity, pH, non-greasyness, and there was no phase separation during the research period, according to the aforementioned data. The purpose of cold cream is to moisturise dry skin and cool the body while also removing waste from pores and pores. It is simple to wet, wash, and put away. When used on the skin, they do not irritate. The skin receives additional conservation from the water phase.

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