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RESEARCH ARTICLE

Formulation and Evaluation of Herbal Peel Off Mask

Pooja Birade*, Yogini Shete

Assistant Professor, Department of Pharmaceutics, Shree Sainath College of Pharmacy, Nagpur, Maharashtra, India

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Abstract:
Peel-off masks have gained widespread popularity and preference due to their convenient application. The gel-based variant is particularly favored for its painless and moisturizing sensation during use. A peel-off mask is a type of application gently applied to the facial skin surface and peeled off after a few minutes, serving as a remedy for various facial skin issues such as wrinkles, aging, acne, and aiding in unclogging pores blocked by dust. The choice of a gel-based formulation enhances ease of use and ensures better drug release. Peel-off gel masks formulated with natural ingredients like green tea, fenugreek, lemon powder, and honey are known for their effective, stable, and safe properties. These masks are designed to address skin concerns and are available in a gel form. The removal of dead skin is facilitated by the application of peel-off masks. Common skin issues prevalent among individuals aged 18-25, such as acne and oily skin, are effectively targeted by these masks. The current study focuses on the development and evaluation of a topical peel-off gel mask containing a blend of herbal powders (fenugreek, green tea, lemon, and honey) along with chemical reagents like polymers (polyvinyl alcohol) and isopropyl alcohol. Various testing methods were employed to assess the formulated peel-off mask, and it demonstrated significant positive results when applied to healthy female volunteers.

Keywords: Peel off mask; Herbal medicine; Antiwrinkle; Polyvinly Alcohol; Cosmetics.

1. Introduction

Herbal cosmetics refer to beauty products that serve physiological functions such as healing, soothing, enhancing appearance, improving skin glow, and conditioning. These products utilize natural ingredients, with fenugreek, green tea, honey, and lemon being incorporated into formulations. Among skin issues, acne is prevalent in individuals aged 18-25, and various topical formulations like gels, creams, lotions, and face washes are available for treatment. Fenugreek, known for its medicinal uses, is chosen for its skin benefits, including reducing acne and treating oily skin. Antioxidants, particularly in green tea, are crucial for anti-aging skincare, preventing oxidative damage.[1] Peel-off gel masks offer practicality, effectively removing impurities, maintaining skin freshness, and reducing wrinkles with regular use. The herbal medicine approach is gaining popularity due to its accessibility and ease of processing at home, especially in managing skin problems. Ayurvedic face packs, utilizing herbal remedies, aid in addressing various skin issues, promoting suppleness and luminosity. Peel-off masks have unique qualities, serving cosmetic purposes like anti-aging, moisture, tensor effect, and softening. Additionally, they offer therapeutic benefits such as exfoliation, blackhead removal, skin tightening, and wrinkle treatment. The importance of mineral-rich products, especially clays, in skincare dates back to antiquity, with modern applications in spas and dermatology clinics. Mineral green clay, for instance, serves purposes like physical exfoliation, removing dirt, dead cells, and draining excess skin oil and water. Regular use of face masks, enriched with ingredients like honey and lemon, contributes to healthier and more beautiful facial skin. [2,3]

The use of face peel-off masks offers various advantages. These masks provide essential vitamins to nourish the skin, aid in reducing acne, pimples, scars, and marks, and effectively remove dead skin cells through exfoliation. Additionally, they deliver instant radiance, restoring the skin's lost brightness and glow while providing a soothing and relaxing effect. Regular use of these natural face masks contributes to overall skin improvement, enhancing texture, complexion, and imparting a healthy glow. Moreover, strategically applying face packs can counteract the adverse effects of pollution and harsh environmental conditions, ultimately helping to prevent early skin aging.[4] Gels, a diverse category, can be classified based on colloidal phase, nature of solvent, and rheological properties. In terms of the colloidal phase, gels can be either one-stage systems, consisting of massive organic molecules forming gel structures, or two-phase systems, involving tiny flakes of dispersed phase particles forming a three-dimensional structure. Based on the nature of the solvent, gels can be hydrogels (water-based) or organic gels (non-aqueous), each having distinct characteristics. Another classification considers rheological properties, with gels categorized as plastic, pseudoplastic, or thixotropic, each exhibiting unique flow behaviors. Additionally, gels can be classified based on their physical nature, such as elastic gels (e.g., agar, pectin) or rigid gels (e.g., silica gel), depending on their structural properties and bonding mechanisms.[5] The objective of this study is to develop and

* Corresponding author: Pooja Birade and Yogini Shete

evaluate a peel-off gel mask formulation containing herbal ingredients, such as fenugreek, green tea, honey, and lemon, along with polymers, aiming to address various facial skin issues and promote skin health

2. Materials and methods

2.1. Materials

The specified items, including Fenugreek, Green Tea, Honey, and Rose oil, were sourced from Manas Ayurveda located at Plot No. 09, Gokul Ghatate Chowk VIP Road, Civil Lines, Nagpur, while Polyvinyl alcohol, Propyl Paraben, Methyl Paraben, Propylene Glycol, Triethanolamine, Isopropryl alcohol were purchased from Thermo Fisher Scientific India Pvt. Ltd, Mumbai.

2.2. Composition of peel off mask

The peel-off mask, when applied as a liquid film and left to dry before removal, acts as a thin emollient layer that provides deep cleansing of pores and eliminates skin impurities. Gels, with their stability and absence of issues like breakage and rancidity, offer advantages as a drug dosage form. Fenugreek, an annual plant in the Leguminosae family, is commonly used in Indian cuisine for its leaves and seeds. The seed powder of fenugreek exhibits anti-inflammatory and anti-fungal qualities, serving as an effective anti-aging agent by repairing damaged cells and promoting the regeneration of new cells. Green tea, enriched with vitamin E, nourishes and hydrates the skin, offering moisturization, brightness, and repair. Its properties address skin issues such as dark spots and pimples caused by environmental factors, including sun damage. Honey, derived through enzymatic processing of nectar, plays a pivotal role in wound healing and skin regeneration. With natural antimicrobial properties, honey serves as a valuable alternative to systemic antibiotics, facilitating complete wound healing with limited or no adverse effects on healthy surrounding skin. Lemon juice, known for its natural astringent qualities and vitamin C content, acts as an antioxidant, preventing skin damage and premature aging. Its high pH value helps reduce inflammation and sebum production, making it an effective solution for skin brightening, dark spot reduction, and oil control.[6]

Polyvinyl alcohol (PVA) is a colorless and odorless water-soluble synthetic polymer that serves as a film-forming agent. To produce the formulation, PVA is dispersed in 80% heated water (80°C) and homogenized until completely dissolved. Methyl paraben and propyl paraben function as preservatives, ensuring the formulation's stability. Triethanolamine acts as an alkali, contributing to pH adjustment and serving as an emulsifier for optimal ingredient mixing. Isopropyl alcohol is included for its antiseptic and soothing properties, while propylene glycol functions as a humectant. Rose oil serves as a perfumery agent, enhancing the formulation's fragrance. Water acts as the base for the overall formulation. [7]

2.3. Preparation steps

Water was heated to 40°C, and 0.2gm of methyl paraben and 0.02 gm of propyl paraben were incorporated, followed by heating until dissolution. Subsequently, 0.25gm each of fenugreek powder, green tea powder, lemon peel powder, and honey were added, with the mixture subjected to vigorous stirring. After cooling of the solution, 5% propylene glycol is added. Triethanolamine, up to 1 to 2ml, was added while maintaining a pH of 6. Subsequently, up to 3% isopropyl alcohol was included with continuous stirring. Finally, sufficient quantity of rose oil is added to the preparation as a perfumery agent [8]. The composition of peel off mask is shown in Table 1.

Table 1. Composition of peel off mask

Ingredient	Category	Quantity
Fenugreek	Active Ingredient	0.25gm
Green Tea	Active Ingredient	0.25gm
Honey	Active Ingredient	0.25gm
Lemon	Active Ingredient	0.25gm
Polyvinyl alcohol	Film Forming agent	10gm
Propyl paraben	Preservative	0.02gm
Methyl paraben	Preservative	0.02gm
Propylene glycol	Humectant	5ml
Triethanol amin	Alkali	2ml
Isopropyl alcohol	Smoothening agent	3ml
Rose oil	Fragrance	1ml
Water	Base	Upto 100ml

2.4. Evaluation of peel off mask

2.4.1. Physical evaluation

In the physical evaluation phase, various attributes of the formulated product were examined. This included a scrutiny of its color, appearance, consistency, and sensory experience. The color assessment involved comparing the method's color to a white background during testing. Consistency was evaluated by applying the formulation to the skin, while greasiness was assessed through direct application to the skin. Furthermore, the gels' odor was examined by dissolving them in water and evaluating the resulting mixture's scent[9].

2.4.2. Washability

The prepared formulation were administered to the skin, and a thorough evaluation was conducted to assess both the extent and ease of water washing. This assessment involved a manual examination to determine how effectively and easily the formulations could be removed with water. The goal was to gauge the formulations' wash-off characteristics, considering factors such as adherence to the skin and the simplicity of the removal process through water rinsing. [10]

2.4.3. Determination of pH

The pH was assessed utilizing a digital pH meter. A gram of gel was dissolved in a hundred milliliters of demineralized water and allowed to stand for two hours. The systemic pH was measured in triplicate, and the instrument was calibrated using standard buffer solutions at pH 4, 7, and 9 before the assessment. [11]

2.4.4. Spreadability

To determine spreadability, the gel was distributed between two glass plates and compressed to achieve a uniform thickness by adding a weight of 50 grams in the pan. Historically, the duration required to separate the two slides, indicating the time for the upper slide to traverse over the lower slide, has been regarded as a metric for spreadability [12]. The formula used to calculate spreadability (S) in this context is expressed as

$$S = m \times l/t,$$

where S represents spreadability, m is the weight attached to the upper slide, l denotes the length moved on the glass slide, and t represents the time taken.

2.4.5. Viscosity

The viscosity of the formulation was determined in its undiluted state using a Brookfield viscometer, specifically the DV-E model-LVDVE. This viscometer comprises a stationary cup and a rotating spindle, with different sizes of rotary spindles utilized for testing materials. Large spindles, with a substantial diameter and surface area, are employed for liquids with low and high viscosity. [13, 14]

2.4.6. Skin irritation study

In the skin irritation study, twenty volunteers were subjected to gel masks with and without tea leaf extract and fenugreek powder, and no significant irritation, including burning, redness, or swelling, was observed. The gel mask formulations were consistent, except for the presence or absence of the mentioned extracts. Application was randomized, and participants were closely monitored for primary and secondary skin reactions. [14]

3. Results and Discussion

The results of the chemical evaluation and physical parameters for the formulated product reveal several significant characteristics. In terms of color, the formulation exhibited a dark brown hue, while its odor was described as pleasant. The consistency of the product was observed to be semisolid, indicating a certain degree of firmness. Additionally, the formulation showed a greasy texture, contributing to its spreadability. The washability of the product was noted to be effective, and the pH determination yielded a value of 7.06, suggesting a neutral composition. The spreadibility of the formulation was measured at 13.73, indicative of its ability to spread easily. A peel was successfully formed during the status evaluation of the peel-off film. Importantly, the skin irritation study concluded that the formulated product did not exhibit irritant effects on the skin. The drying time was determined to be 15-20 minutes, implying a relatively quick setting. Lastly, the viscosity of the formulation was measured at 17870 CP, reflecting its thickness and fluidity. The results are shown in Table 2.

Table 2. Results of evaluation of peel off mask

Parameters	Observation
Colour	Dark brown
Odour	Pleasant
Consistency	Semisolid
Greasiness	Greasy
Washability	Easily Washable
Determination of PH	7.06
Spreadibility	13.73
Status of Peel of Film	peel formed
Skin Irritation study	Not Irritant
Drying Time	15-20min
Viscosity	17870 cP

4. Conclusion

The formulation of the peel-off gel involves the incorporation of Fenugreek and Green Tea powder, with additional active ingredients like Honey, renowned for their Antiacne, Antiaging, and Anti-inflammatory properties. Moreover, they exhibit efficacy in addressing issues related to oily skin and other skin concerns. The Peel-off Mask is deemed safe for use and demonstrates effectiveness in treating dermatological disorders. Notably, Green Tea contributes antioxidant properties to the formulation, ensuring its stability, including factors such as pH, drying time, and viscosity, even after prolonged storage.

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