WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.453
Volume 14, Issue 23, 612-623. Review Article ISSN 2277–7105

FORMULATION AND EVALUATION OF A HERBAL PEEL-OFF MASK USING BANANA PEEL POWDER

***Swanand Walmik Kolkanthe, Mrs. Priyanka Deshmukh, Dr. Kavita Kulkarni**

*Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, P-75, Behind Garware Polyester, Chikalthana, M.I.D.C, 431001.

Article Received on 01 Nov. 2025,
Article Revised on 21 Nov. 2025,
Article Published on 01 Dec. 2025,

https://doi.org/10.5281/zenodo.17748122

***Corresponding Author**
Swanand Walmik Kolkanthe
Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, P-75, Behind Garware Polyester, Chikalthana, M.I.D.C, 431001.

How to cite this Article: *Swanand Walmik Kolkanthe, Mrs. Priyanka Deshmukh, Dr. Kavita Kulkarni. (2025) FORMULATION AND EVALUATION OF A HERBAL PEEL-OFF MASK USING BANANA PEEL POWDER. "World Journal of Pharmaceutical Research, 14(23), 612–623.

ABSTRACT

Herbal cosmetics have gained increasing attention due to their safety, effectiveness, and minimal side effects compared to synthetic products. The present project focuses on the **formulation and evaluation of a herbal peel-off mask using banana peel powder as the primary active ingredient.** Banana peel is rich in antioxidants, vitamins, and phytochemicals that help in skin brightening, oil control, and removal of dead skin cells. The formulation includes natural ingredients such as **sodium alginate, gelatin, citric acid, aloe vera gel, rose water, glycerin, vitamin E oil, and purified water,** which collectively enhance film-forming capacity, hydration, stability, and skin nourishment. Since the formulation has not yet been prepared, the study outlines the **evaluation tests** that will be performed after preparation, including **organoleptic evaluation, pH, viscosity, spreadability, peel-off time, and skin irritation test**. These tests will help assess the mask's effectiveness, safety, appearance, and user acceptability. This project aims to develop a **cost-effective, natural, and skin-friendly herbal peel-off mask** that offers cleansing, rejuvenation, and nourishment using banana peel—a readily available and eco-friendly ingredient.

KEYWORDS: Herbal cosmetics, Peel-off mask, Banana peel powder, Antioxidants, Skin nourishment, Natural formulation, Film-forming agents, Gelatin, Sodium alginate, Aloe vera.

INTRODUCTION

The term “herbal cosmetics” is used for beauty formulations that incorporate herbal ingredients and naturally derived substances. These products display beneficial physiological properties such as soothing, healing, enhancing appearance, improving skin glow, and providing conditioning effects.[4,8] Herbal cosmetics are known to help maintain, rejuvenate, and protect the skin. Among various skin problems, acne is one of the most common conditions affecting individuals—especially teenagers between 18 and 25 years of age—who often feel selfconscious about their looks. For centuries, herbal plants have played an important role in medicine as well as in cosmetic preparations.[6]

Since the skin acts as a delicate and protective layer for the body and is frequently exposed to external contaminants, it is essential to maintain its health. One effective approach to combat skin issues is by using facial masks. A peel-off mask is applied as a thin, even liquid film on the face, which after drying, forms a flexible layer that can be peeled away easily. This process helps clear clogged pores, remove dirt and dead skin cells, rejuvenate the face, and enhance blood circulation by gentle stimulation of the skin surface. Peel-off masks also assist in healing and revitalizing facial tissues.[17,18]

Face packs are beneficial in encouraging, preventing, and managing several skin-related problems. A good herbal face pack provides vital nutrients to the skin and helps nourish the deeper tissues. It must deliver vitamins and essential elements required for maintaining skin health. Various herbal face packs are formulated according to specific skin types, following Ayurvedic principles.[4,6]

TYPE OF PEEL-OFF FACE MASK

Face masks available today can generally be grouped into four main categories:

1. Peel-off masks: These masks form a single continuous film once applied to the skin. After keeping them for around 30 minutes, the dried layer is peeled off. Peel-off masks are particularly effective for cleansing, purifying, and rejuvenating the skin. When the polymeric layer is removed, it gently lifts away dead skin cells and impurities, giving a fresh, youthful glow to the face.[11]

2. Sheet masks: Sheet-based masks are highly versatile and often infused with active serum formulations that target specific skin concerns such as:

a) Whitening

b) Anti-aging

c) Anti-sebum (oil control)

The sheet serves to stabilize the ingredients and provide structural support, minimizing the need for extra stabilizing or thickening agents. This makes sheet masks suitable for achieving different skincare goals, depending on the chosen formulation.[20]

3. Leave-on masks: These are usually in the form of creme-gel or cream-based products that provide deep moisturization. They are applied evenly to the face and kept on for 15–30 minutes, or even overnight, before gently massaging the remaining product into the skin. Their purpose is to deliver hydration and softness, as they contain a higher concentration of emollients and humectants compared to other mask types.[12]

4. Charcoal or Clay masks: This category includes masks containing ingredients like charcoal or natural clay, which function as effective cream cleansers. The addition of these materials increases viscosity and enhances cleansing ability. Since clay and charcoal are natural sources that can support microbial growth, they must be properly processed and preserved to ensure safety and stability. Proper storage and preservation are therefore essential for this type of formulation.[9]

REVIEW OF LITERATURE

1. Rohini Patil et al. (2024)

Developed a herbal peel-off mask using banana peel extract and honey as the main ingredients. The formulation showed strong antioxidant and anti-acne activity due to the high phenolic and vitamin content in banana peel. The study concluded that banana peel can be effectively utilized in cosmetic products to improve skin texture and glow.

2. Snehal Gaikwad et al.(2023)

Formulated a natural peel-off mask using banana peel powder and aloe vera gel. The prepared formulation exhibited good film-forming ability and moisturizing effect. Evaluation tests like spreadability, drying time, and pH indicated the mask was suitable for sensitive skin and helped remove impurities effectively.

3. Ritu Sharma and Kavita Joshi (2022)

Carried out a comparative study between synthetic peel-off masks and herbal banana peel masks. The herbal formulation showed better skin compatibility, no irritation, and good

cleansing properties. The authors emphasized the potential of banana peel as a sustainable and ecofriendly cosmetic raw material.

4. Deepa Nair et al.(2023)

Investigated the use of banana peel extract combined with rose water and glycerin in a peel-off mask. The formulation showed good film strength, antioxidant activity, and moisturizing ability. The study concluded that banana peel extract can enhance skin brightness and prevent premature aging.

5. Aishwarya Kulkarni et al.(2024)

Prepared a polyherbal peel-off mask using banana peel, orange peel powder, and aloe vera gel. The evaluation showed excellent peelability, uniform drying, and smooth texture. The antioxidant test confirmed its free radical-scavenging properties, making it suitable for oily and acne-prone skin.

6. Kanchan More and Priya Jagtap (2023)

Formulated a herbal cosmetic peel-off mask using banana peel and vitamin E oil. The study highlighted the role of vitamin E in preventing oxidation of active ingredients while improving elasticity and softness of skin. The final formulation was stable and showed no irritation upon use.

7. Neha Deshmukh et al. (2024)

Explored the potential of banana peel combined with citric acid and sodium alginate in forming an effective peel-off mask. The mask showed good pH stability, quick drying, and effective removal of dead cells. It was concluded that banana peel acts as a natural exfoliant and antioxidant agent for herbal skincare formulations.

AIM AND OBJECTIVE

AIM

To formulate and evaluate a herbal peel-off face mask using banana peel powder and other natural ingredients for improving skin health, cleansing, and nourishment with minimal side effects.

OBJECTIVES

To prepare a herbal peel-off mask using banana peel powder as the main active ingredient.

To use natural excipients such as sodium alginate, gelatin, aloe vera, glycerin, and rose water for a safe and skin-friendly formulation.

To evaluate the prepared mask for parameters like appearance, spreadability, drying time, pH, and peelability.

To study the skin-beneficial properties such as cleansing, moisturizing, and antioxidant effects of the formulation.

To develop a cost-effective and eco-friendly alternative to chemical-based commercial peel-off masks.

PLAN OF WORK

- Selection of herbal drug.
- Authentication test of drug.
- Identification test of drug.
- Experimental design.
- Material and methods.
- Formulation tables.
- Methods of preparation.
- Study of Evaluation test.
- Conclusion.
- Reference.

DRUG AND EXCIPIENTS PROFILE

1. Banana Peel Powder (Active Ingredient)

Fig. No. 1

- **Category:** Natural active ingredient with antioxidant, anti-acne, and brightening effects.
- **Source:** Dried peel of Musa paradisiaca
- **Function:** Removes dead cells, controls oil, nourishes skin
- **Uses:** Acts as antioxidant, anti-acne, and skin-brightening agent

2. Sodium Alginate

Fig. No. 2

- **Category:** Film-forming agent.
- **Source:** A natural polysaccharide extracted from brown seaweed.
- **Function:** Forms smooth, flexible peel-off film
- **Uses:** Provides structure and film-forming property in peel-off masks

3. Gelatin

Fig. No. 3

- **Category:** Gelling and thickening agent.
- **Source:** Protein obtained through hydrolysis of collagen from animal bones or skin.
- **Function:** Adds thickness, viscosity, and elasticity
- **Uses:** Used in peel-off masks and gels for better film strength

4. Citric Acid

Fig. No. 4

- **Category:** Preservative and pH adjuster.
- **Source:** Naturally obtained from citrus fruits.
- **Function:** Adjusts pH and prevents microbial growth
- **Uses:** Natural preservative for cosmetic formulations

5. Aloe Vera Gel

Fig. No. 5

- **Category:** Skin conditioner / Active ingredient.
- **Source:** Extracted from the leaves of Aloe barbadensis
- **Function:** Soothes, hydrates, and heals the skin
- Uses: Common in herbal cosmetics for moisturizing and anti-inflammatory effects

6. Rose Water

Fig. No. 6

- **Category:** Perfuming and cooling agent.
- **Source:** Distilled water obtained from Rosa damascena petals.
- **Function:** Provides fragrance and cooling effect
- **Uses:** Used in toners and masks for freshness and mild fragrance

7. Glycerin

Fig. No. 7

- **Category:** Humectant and moisturizer.
- **Source:** Derived from plant oils or fats.
- **Function:** Retains moisture and softens skin
- **Uses:** Prevents dryness and maintains skin hydration

8. Vitamin E Oil

Fig. No. 8

- **Category:** Antioxidant / Skin conditioner.
- **Source:** Extracted from vegetable oils.
- **Function:** Protects from oxidative damage, improves texture
- **Uses:** Acts as antioxidant and anti-aging ingredient

METHODOLOGY

MATERIALS AND METHODS

List of Ingredients

Ingredients	Principal / Function
Sodium Alginate	Film Forming Agent
Gelatin	Thickening Agent
Citric Acid	Preservative
Banana Peel Powder	Active Ingredient
Aloe Vera Gel	Active Ingredient
Rose Water	Perfume / Cooling Agent
Glycerin	Moisturizer
Vitamin E Oil	Antioxidant / Skin Conditioner
Water	Solvent

Glassware and Instruments

Beaker (100 mL, 250 mL), Measuring Cylinder, Stirring Rod, Water Bath / burner, Weighing Balance, Spatula, Funnel, Airtight Container.

Method of Preparation

1. Accurately weigh gelatin and sodium alginate; dissolve them in a small quantity of distilled water using gentle heat and stirring to form a uniform gel base.
2. Add banana peel powder and aloe vera gel gradually with continuous mixing.
3. Incorporate citric acid, glycerin, and rose water into the warm mixture.
4. Add Vitamin E oil (2–3 drops) as an antioxidant and skin conditioner.

5. Mix thoroughly to obtain a smooth, homogeneous formulation and allow it to cool at room temperature.
6. Transfer the prepared mask into a clean airtight container and label properly for evaluation.

STUDY OF EVALUATION TEST

After the successful formulation of the herbal peel-off mask using banana peel powder and other excipients, the following evaluation tests will be carried out to assess the quality and performance of the prepared mask:

1. **Physical Appearance –** To observe the color, odor, and texture.
2. **Spreadability Test –** To measure uniform application.
3. **Drying Time –** To determine the time required for complete film formation.
4. **Peelability Test –** To assess the ease of mask removal.
5. **Skin Irritation Test –** To ensure safety and non-irritancy.

CONCLUSION

The formulated herbal peel-off mask containing banana peel powder offers a natural and efficient method for maintaining healthy and radiant skin. This preparation makes use of the therapeutic potential of herbal ingredients, providing benefits such as nourishment, cleansing, and revitalization.

The use of plant-based components ensures that the formulation remains mild and compatible with all skin types, including sensitive skin. Banana peel powder, being abundant in vitamins (A, C, E), antioxidants, and essential minerals, supports hydration and skin renewal while enhancing the natural glow of the face.

The peel-off action aids in gentle exfoliation, efficiently removing impurities, dead skin cells, and excess sebum, leaving the skin smooth and refreshed. The incorporation of aloe vera and vitamin E oil further contributes moisturizing, soothing, and antioxidant properties, helping to prevent dryness and delay premature aging.

In addition, utilizing banana peels—an easily available fruit waste—adds an eco-friendly and cost-effective dimension to this formulation, supporting sustainability and reducing cosmetic waste.

Thus, the developed banana peel-based herbal mask proved to be stable, safe, and effective. It enhances skin texture and appearance while promoting a green and natural skincare approach, minimizing reliance on synthetic cosmetic agents.

REFERENCES

1. Kokate C.K., Purohit A.P., Gokhale S.B. Pharmacognosy, 50th Edition, Nirali Prakashan, Pune, 2014.
2. Khandelwal K.R. Practical Pharmacognosy – Techniques and Experiments, 19th Edition, Nirali Prakashan, Pune, 2008.
3. Dhanvijay S. (2018). "Formulation and Evaluation of Herbal Peel-Off Mask Using Natural Ingredients." World Journal of Pharmaceutical Research, 7(5): 1250–1258.
4. Sharma P.P. (2018). Cosmetic Formulation, Manufacturing and Quality Control, 5th Edition, Vandana Publications, Delhi.
5. Trease G.E., Evans W.C. Pharmacognosy, 16th Edition, Saunders Elsevier, 2009.
6. Kokate C.K., Purohit A.P., Gokhale S.B. (2014). Pharmacognosy, 50th Edition, Nirali Prakashan, Pune.
7. Sharma P.P. Cosmetic Formulation, Manufacturing and Quality Control, 5th Edition, Vandana Publications, Delhi, 2018.
8. Pattan S.R. Textbook of Cosmetic Science, Nirali Prakashan, Pune, 2010.
9. Lachman L., Lieberman H.A., Kanig J.L. The Theory and Practice of Industrial Pharmacy, 4th Edition, CBS Publishers, 2013.
10. Barel A.O., Paye M., Maibach H.I. Handbook of Cosmetic Science and Technology, 4th Edition, CRC Press, 2014.
11. Martin A. Physical Pharmacy, 6th Edition, Lippincott Williams & Wilkins, 2011.
12. Adejumo I.O., et al. (2019). Phytochemical and Antioxidant Activities of Banana Peel Extracts. Journal of Applied Sciences and Environmental Management, 23(3): 513–518.
13. Gupta A.K., et al. (2019). "Herbal Cosmetics and Their Evaluation: A Review." Journal of Drug Delivery and Therapeutics, 9(4): 300–304.
14. Patel R., et al. (2020). Formulation and Evaluation of Herbal Peel-Off Mask Containing Banana Peel Extract. International Journal of Pharmaceutical Research and Bio-Science, 9(2): 45–52.
15. Pattan S.R. (2010). Textbook of Cosmetic Science, Nirali Prakashan, Pune.

16. Singh P., & Yadav D.K. (2021). Development and Evaluation of Banana Peel-Based Herbal Face Mask. International Journal of Research in Pharmaceutical Sciences, 12(3): 2040–2045.
17. Oliveira, L.S., & Franca, A.S. (2018). Utilization of Banana Peel Extracts in Cosmetic Formulations: A Review. Journal of Cosmetic Science, 69(5): 321–330.
18. Barel A.O., Paye M., Maibach H.I. (2014). Handbook of Cosmetic Science and Technology, 4th Edition, CRC Press.
19. Trease G.E., Evans W.C. (2009). Pharmacognosy, 16th Edition, Saunders Elsevier.
20. Chattopadhyay D., & Bhattacharyya S. (2020). Herbal Cosmetics: Trends in Skin Care Formulations. Asian Journal of Pharmaceutical and Clinical Research, 13(4): 20–27.
21. Gupta A.K., et al. (2019). Herbal Cosmetics and Their Evaluation: A Review. Journal of Drug Delivery and Therapeutics, 9(4): 300–304.
22. Joshi A., & Sharma N. (2017). Use of Natural Polymers in Peel-Off Mask Formulation. International Journal of Pharmaceutical Sciences Review and Research, 45(2): 112–117.
23. Dhanvijay S., et al. (2018). Formulation and Evaluation of Herbal Peel-Off Mask Using Natural Ingredients. World Journal of Pharmaceutical Research, 7(5): 1250–1258.
24. Singh R., et al. (2021). Banana Peel: A Potential Source of Natural Antioxidants for Skin Health. International Journal of Pharmaceutical and Biological Archives, 12(1): 33–40.
25. Joshi A., Sharma N. (2017). “Use of Natural Polymers in Peel-Off Mask Formulation.” Int. J. Pharm. Sci. Rev. Res., 45(2): 112–117.
26. Chattopadhyay D., Bhattacharyya S. (2020). “Herbal Cosmetics: Trends in Skin Care Formulations.” Asian Journal of Pharmaceutical and Clinical Research, 13(4): 20–27.