

Formulation And Evaluation of Rice Water Face Pack

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ABSTRACT

Rice water has been traditionally used in Asian skincare practices because of its skin-soothing, brightening, and moisturizing properties. The present research work focuses on the formulation and evaluation of an herbal rice water face pack using natural ingredients such as rice water, aloe vera gel, rose water, glycerine, Carbopol 940, and triethanolamine. The objective of the study was to develop a safe, stable, and effective herbal cosmetic formulation suitable for topical application. Rice water was prepared by soaking rice grains in distilled water followed by filtration. The formulation was developed in gel form using Carbopol as a gelling agent and triethanolamine as a neutralizer. The prepared face pack was evaluated for physicochemical properties including pH, consistency, spreadability, skin irritation, and stability. The results demonstrated that the prepared formulation possessed acceptable cosmetic characteristics with a smooth texture, good spreadability, skin-compatible pH (5.5–6.5), and no visible signs of irritation. Stability studies indicated that the formulation remained stable under different storage conditions without phase separation or major changes in colour and Odor. The study concludes that rice water-based face pack gel can serve as an effective natural cosmetic product with moisturizing, soothing, skin-brightening, and anti-inflammatory properties. The formulation provides a sustainable and economical alternative to synthetic skincare products.

Keywords: Rice water, Herbal cosmetics, Face pack, Aloe vera, Rose water, Natural skincare, Skin hydration, Cosmetic formulation.

INTRODUCTION

The cosmetic industry has experienced rapid growth in the use of herbal and natural products because consumers increasingly prefer safe, eco-friendly, and skin-compatible alternatives to synthetic cosmetics. Natural ingredients are widely recognized for their lower risk of irritation, biodegradability, and therapeutic benefits. Among these ingredients, rice water has emerged as an important component in skincare formulations due to its nutritional and dermatological properties. Rice water is the starchy liquid obtained after soaking, boiling, or fermenting rice. It contains amino acids, vitamins, minerals, antioxidants, and bioactive compounds that contribute to healthy skin. Traditionally, rice water has been used in countries such as Japan, China, and Korea for maintaining smooth, glowing, and youthful skin. Historical reports indicate that women during the Japanese Heian period used rice water as part of their beauty regimen.

Scientifically, rice water contains compounds such as inositol, ferulic acid, amino acids, and vitamin B complex that improve skin elasticity, support cell regeneration, and protect the skin from oxidative stress. Inositol, in particular, has been reported to enhance skin barrier function and delay aging effects. Rice water also demonstrates soothing and anti-inflammatory activities, making it beneficial for acne-prone and sensitive skin. Modern skincare research has increasingly explored rice-derived ingredients in cosmetic products such as cleansers, masks, serums, and face packs. Rice water contributes to skin hydration, improves skin texture, reduces pigmentation, and enhances brightness. Antioxidants present in rice water neutralize free radicals generated by UV radiation and pollution, thereby helping to prevent premature aging.

In addition to rice water, herbal ingredients such as aloe vera and rose water provide complementary benefits. Aloe vera acts as a moisturizer and healing agent, while rose water offers soothing, toning, and

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refreshing effects. The combination of these ingredients can produce a multifunctional cosmetic formulation with improved skin compatibility and user acceptability. The present study was therefore undertaken to formulate and evaluate a rice water-based face pack gel using natural and herbal ingredients. The work aims to investigate the physicochemical properties, safety, stability, and cosmetic performance of the prepared formulation.

AIM AND OBJECTIVES

Aim: To formulate and evaluate a natural rice water face pack gel and study its effectiveness on skin hydration, soothing action, and cosmetic acceptability.

Objective:

- To prepare an herbal face pack using rice water and natural ingredients.
- To evaluate the physicochemical properties of the formulation.
- To assess spreadability, consistency, and pH of the prepared gel.
- To study the soothing and moisturizing effects of the formulation.
- To determine the irritation potential and safety of the product.
- To evaluate the stability of the prepared formulation.
- To promote eco-friendly and herbal cosmetic alternatives.

LITERATURE REVIEW

Several studies have highlighted the cosmetic and dermatological applications of rice water and herbal ingredients in skincare formulations.

- Marto et al. reported that rice water-based cosmetic formulations possess antioxidant activity and elastase inhibition properties that may help prevent skin aging. The developed

hydrogel formulations were found to be safe and biocompatible.

- Kaur described rice water as a sustainable cosmetic ingredient rich in vitamins, minerals, and antioxidants. The study emphasized its anti-inflammatory, moisturizing, and anti-aging properties.
- Axler, Hawkins, and Lipner investigated the increasing popularity of rice water in social media skincare trends. Their work identified claimed benefits such as skin brightening and acne reduction while also highlighting the need for additional clinical validation.
- Barsagade, Patil, and Umekar focused on rice water-based herbal cosmetic products and reported that rice water improves skin texture, reduces irritation, and enhances overall skin appearance.
- Morse discussed the dermatological benefits of rice water and suggested that fermented rice water improves collagen synthesis and skin elasticity.
- Villines explored the potential use of rice water in treating skin irritation and eczema and highlighted its role in improving skin barrier function.

Previous studies on aloe vera have demonstrated its moisturising, wound-healing, and anti-inflammatory properties. Rose water has also been reported to possess soothing and antioxidant activities beneficial for skin care.

These studies collectively support the use of rice water and herbal ingredients in cosmetic formulations.



MATERIALS AND METHODS

Sr. No.	Ingredient	Role in Formulation
1	Rice water extract	Skin brightening and antioxidant
2	Aloe vera gel	Moisturizer and healing agent
3	Glycerine	Humectant
4	Carbopol 940	Gelling agent
5	Triethanolamine	pH adjuster and neutralizer
6	Sodium benzoate	Preservative
7	Rose water	Soothing and toning agent
8	Distilled water	Vehicle

Formulation Composition

Ingredient	F1 (g)	F2 (g)	F3 (g)
Rice water extract	30	25	35
Aloe vera gel	15	20	10
Glycerine	5	7	5
Carbopol 940	1	1.5	0.8
Triethanolamine	0.5	1	0.7
Sodium benzoate	0.5	0.5	0.5
Rose water	20	15	25
Distilled water	20	24	18
Total	100 g	100 g	100 g

Method of Preparation

Preparation of Rice Water

Rice grains were weighed and washed thoroughly using distilled water to remove impurities. The cleaned rice was soaked in distilled water for 30–45 minutes at room temperature. The mixture was gently stirred to facilitate the extraction of nutrients. The rice

water was then filtered using a muslin cloth and stored at 4°C until use.

Preparation of Gel Base

Carbopol 940 was dispersed in distilled water with continuous stirring and allowed to hydrate for 30–60 minutes. Triethanolamine was added dropwise to neutralise the dispersion and form a clear gel base.



Preparation of Face Pack Gel

Rice water was slowly incorporated into the gel base with continuous stirring. Rose water and aloe vera gel were added gradually to obtain a uniform mixture. Glycerine was added as a humectant. Sodium benzoate dissolved in water was incorporated as a preservative. The final gel was mixed until a homogeneous and bubble-free formulation was obtained.

EVALUATION PARAMETERS

1. Physical Appearance

The physical appearance test is performed to evaluate the visual characteristics of the formulation such as colour, odour, texture, homogeneity, and presence of lumps or phase separation. This test helps determine the cosmetic elegance and acceptability of the face pack formulation.

2. pH Test

The pH test is carried out using a calibrated digital pH meter to determine the acidity or alkalinity of the formulation. The pH of topical preparations should be compatible with the natural pH of the skin.

3. Consistency Test

Consistency refers to the thickness and smoothness of the formulation. It is evaluated manually by observing the texture and uniformity of the gel.

4. Spread ability Test

Spreadability measures the ease with which the formulation spreads on the skin surface. It is determined by placing the gel between two glass slides and measuring the time required for spreading under applied weight. Good spreadability ensures

uniform application of the face pack with minimum effort and improves patient compliance.

Formula

$$S = \frac{M \times L}{T} \quad S = TM \times L$$

Where:

- **S** = Spreadability
- **M** = Weight applied
- **L** = Length moved by glass slide
- **T** = Time taken

5. Viscosity Test

Viscosity determines the resistance of the gel to flow. It is measured using a Brookfield viscometer at a controlled temperature. Viscosity affects the stability, spreadability, and retention of the formulation on the skin. Appropriate viscosity improves product performance.

6. Washability Test

Washability evaluates how easily the formulation can be removed from the skin using water. A good face pack should be easily washable without leaving sticky residue on the skin.

7. Skin Irritation Test

The skin irritation test is carried out by applying the formulation to a small area of skin and observing for redness, itching, swelling, or irritation after 24 hours. This test ensures the safety and compatibility of the formulation for topical application.

8. Stability Study

Stability studies are conducted by storing the formulation under different environmental conditions such as room temperature and elevated temperature. Changes in colour, Odor, pH, consistency, and phase separation are observed over time.

RESULTS

Sr. No	Evaluation Parameter	F1	F2	F3
1.	Appearance	Smooth, homogeneous gel	Smooth gel	Smooth semi-solid gel
2.	Colour	Off-white	Creamy white	Light translucent
3.	Order	Pleasant rose odour	Pleasant herbal odour	Mild rose odour
4.	pH	5.8	6.2	5.6



5.	Consistency	Good	Very good	Good
6.	Spreadability	6.8 g.cm/sec	7.5 g.cm/sec	6.5 g.cm/sec
7.	Viscosity	28500 cps	31200 cps	26800 cps
8.	Washability	Easily washable	Easily washable	Easily washable
9.	Skin Irritation Test	No irritation	No irritation	No irritation
10.	Stability Study	Stable	Stable	Stable

DISCUSSION

The present study demonstrated the successful formulation of a rice water-based herbal face pack gel with acceptable cosmetic properties. The pH of the formulation remained within the skin-friendly range, suggesting that the formulation would not disturb the natural acid mantle of the skin. Carbopol 940 effectively produced a stable gel network that contributed to good consistency and spreadability. Rice water acted as the primary active ingredient and contributed to skin brightening and soothing effects due to the presence of vitamins, antioxidants, and amino acids. Aloe vera enhanced hydration and reduced the possibility of irritation because of its anti-inflammatory properties. Rose water provided soothing and toning effects while also improving the fragrance and sensory acceptability of the formulation. The absence of skin irritation indicates that the formulation is safe for topical application. Stability studies confirmed compatibility among ingredients and effectiveness of the preservative system. The study supports the growing use of natural and herbal ingredients in cosmetic science and demonstrates that rice water can be effectively utilized in skincare formulations.

Optimised / Perfect Batch of Formulation

Based on the evaluation results, Formulation F2 was considered the optimized and best formulation among all three batches.

Reasons for Selection of F2 as the Perfect Batch

1. Excellent Consistency
2. Optimum pH
3. Superior Spreadability

4. Better Viscosity

5. Enhanced Moisturizing Effect

6. Non-Irritant Nature

7. Excellent Stability

8. Better Cosmetic Acceptability

CONCLUSION

The formulated rice water face pack gel was found to be stable, safe, and cosmetically acceptable. The combination of rice water, aloe vera, and rose water provided beneficial effects such as skin hydration, soothing action, and improvement in skin texture.

The formulation demonstrated good spreadability, suitable pH, pleasant appearance, and absence of irritation. Rice water face pack gel can therefore serve as an economical, eco-friendly, and natural alternative to synthetic cosmetic products.

Further studies involving clinical trials and long-term stability testing may be carried out to support commercial applications of the formulation.

FUTURE SCOPE

- Clinical evaluation on larger populations can be performed.
- Long-term stability studies may be conducted.
- Additional herbal ingredients can be incorporated to improve functionality.
- Fermented rice water may be explored for enhanced antioxidant activity.



- Commercial-scale production and packaging studies can be undertaken.

Advanced microbiological and dermatological testing can be performed.

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