

FORMULATION AND EVALUATION OF ALOE VERA AND RICE WATER-BASED HERBAL FACE WASH CONTAINING JAIPHAL FOR SKIN BRIGHTENING AND PIGMENTATION REDUCTION

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Article Received: 22 April 2026 | Article Revised: 12 May 2026 | Article Accepted: 2 June 2026

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DOI: <https://doi.org/10.5281/zenodo.20688580>

How to cite this Article: Aryan Bhare, Prasad Jadhav, Aarti Malkapure, Prajakta Shingote (2026) FORMULATION AND EVALUATION OF ALOE VERA AND RICE WATER-BASED HERBAL FACE WASH CONTAINING JAIPHAL FOR SKIN BRIGHTENING AND PIGMENTATION REDUCTION. World Journal of Pharmaceutical Science and Research, 5(6), 811-819.



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ABSTRACT

The present study was aimed at the formulation and evaluation of a herbal face wash containing natural ingredients such as Aloe vera, rice water, and Jaiphal (*Myristica fragrans*).^[4,7,14] Herbal cosmetic formulations are widely preferred due to their safety, effectiveness, and reduced side effects compared to synthetic products.^[10,13] Aloe vera possesses moisturizing, soothing, and anti-inflammatory properties, while rice water is known for its skin nourishing and brightening effects.^[4,7] Jaiphal exhibits antioxidant and antimicrobial activities that may help reduce pigmentation and improve skin texture.^[14,20] The herbal face wash gel was prepared using fresh Aloe vera gel, rice water, Jaiphal powder, Sodium Lauryl Sulfate (SLS), xanthan gum, glycerin, Vitamin E oil, preservative, and distilled water. The prepared formulation was evaluated for various physicochemical parameters including appearance, pH, consistency, spreadability, foamability, washability, irritancy, and stability.^[1,12] The prepared formulation showed good homogeneity, satisfactory cleansing action, acceptable pH, and suitable consistency for topical application. No visible irritation or instability was observed during the evaluation study.^[19] The results indicated that the prepared herbal face wash may serve as a safe, effective, and economical natural formulation for skin cleansing, brightening, and reduction of pigmentation.^[10,13]

KEYWORDS: Aloe Vera, Rice Water, Jaiphal, Herbal Face Wash, Skin Brightening, Pigmentation, Herbal Formulation.

INTRODUCTION

Skin is the largest organ of the human body and serves as a protective barrier against environmental pollutants, microorganisms, ultraviolet radiation, and harmful chemicals.^[1] Continuous exposure to dust, sunlight, stress, and pollution may lead to various skin problems such as pigmentation, acne, dryness, dullness, and premature aging.^[3]

Therefore, proper skin cleansing and care are essential for maintaining healthy and attractive skin.

In recent years, herbal cosmetic preparations have gained significant popularity due to their natural origin, better compatibility with skin, and fewer side effects compared to synthetic cosmetic products.^[10,13] Herbal formulations contain plant-derived ingredients possessing antioxidant, antimicrobial, anti-inflammatory, and skin nourishing properties which help in maintaining skin health naturally.^[5,6]

Aloe vera is widely used in cosmetic preparations because of its moisturizing, soothing, wound healing, and anti-inflammatory properties.^[4,18] It contains vitamins, enzymes, minerals, and amino acids beneficial for skin hydration and repair.^[4] Rice water is traditionally used for skincare due to its skin brightening and nourishing effects.^[7] It contains amino acids, vitamins, antioxidants, and minerals that help improve skin texture and complexion.^[7]

Jaiphal (*Myristica fragrans*) is a natural herbal ingredient known for its antimicrobial and antioxidant properties.^[14,19]

It may help in reducing pigmentation, improving skin appearance, and protecting skin from oxidative damage.^[20,21]

The present study focuses on the formulation and evaluation of a herbal face wash containing Aloe vera, rice water, and Jaiphal. The formulation was prepared using natural ingredients with the aim of developing a safe, effective, and skin-friendly herbal cosmetic preparation for cleansing, skin brightening, and reduction of pigmentation.

AIM

To formulate and evaluate an Aloe vera and rice water based herbal face wash containing Jaiphal for skin brightening and reduction of pigmentation.

OBJECTIVES

1. To prepare a herbal face wash using natural ingredients such as Aloe vera, rice water, and Jaiphal.
2. To evaluate the physicochemical properties of the prepared formulation.
3. To study the cleansing efficiency and stability of the herbal face wash.
4. To develop a safe and effective herbal cosmetic formulation for skincare application.

MATERIALS REQUIRED

Fresh Aloe vera gel, rice water, Jaiphal powder (*Myristica fragrans*), Sodium Lauryl Sulfate (SLS), xanthan gum, glycerin, Vitamin E oil, preservative, distilled water, citric acid, and sodium hydroxide were used in the preparation of the herbal face wash formulation. All ingredients used were of pharmaceutical or cosmetic grade.

ROLE OF INGREDIENTS

Ingredient	Role in Formulation
Rice Water	Skin brightening and nourishing agent
Fresh Aloe Vera Gel	Moisturizing and soothing agent
Jaiphal Powder	Anti pigmentation and antimicrobial agent
Sodium Lauryl Sulphate (SLS)	Cleansing and foaming agent

Xanthan Gum	Gelling and viscosity enhancing agent
Glycerin	Humectant and moisturizer
Vitamin E Oil	Antioxidant and skin conditioning agent
Preservative	Prevention of microbial contamination
Distilled Water	Vehicle
Citric acid/ NaOH	pH adjustment

FORMULATION TABLE

Table 1: Formulation Composition of Herbal Face Wash Batches (F1, F2 and F3)

Ingredients	F1 (g)	F2 (g)	F3 (g)
Rice Water	38.0	39.0	37.0
Aloe Vera Gel	18.0	18.0	19.0
Sodium Lauryl Sulphate (SLS)	2.4	2.3	2.5
Xanthan Gum	0.4	0.5	0.4
Glycerin	2.0	2.0	2.5
Vitamin E Oil	0.4	0.4	0.5
Jaiphal Powder	0.6	0.7	0.5
Preservative	0.16	0.16	0.16

Three preliminary trial formulation batches (F1, F2 and F3) were prepared with slight variations in ingredient concentration. Based on preliminary observations such as consistency, homogeneity and spreadability, the optimized formulation was selected for further evaluation studies.

METHOD OF PREPARATION

Preparation of Herbal Face Wash Formulation

Step 1: Preparation of SLS Solution

Approximately 20–25 mL of distilled water was taken in a clean beaker. Sodium Lauryl Sulfate (SLS) (2.4 g) was added slowly with continuous stirring until a clear solution was obtained. The prepared solution was kept aside for further use.

Step 2: Preparation of Xanthan Gum Gel

About 10–15 mL of rice water was transferred into another beaker. Xanthan gum (0.4 g) was sprinkled gradually into the rice water with continuous stirring to avoid lump formation. The mixture was stirred continuously for 5–10 minutes until a clear and viscous gel was formed.

Step 3: Preparation of Main Base

In a separate 250 mL beaker, the remaining quantity of rice water was added followed by fresh filtered Aloe vera gel (18.0 g). The mixture was stirred thoroughly to obtain a smooth and homogeneous base. Glycerin (2.0 g) and Vitamin E oil (0.4 g) were then added and mixed uniformly.



Figure 1: Fresh Aloe Vera Gel Extraction.



Figure 2: Preparation of Rice Water.

Step 4: Addition of Surfactant and Jaiphal

The previously prepared SLS solution was added slowly into the main base with gentle stirring. Jaiphal powder (0.6 g) was mixed with a small quantity of glycerin to form a smooth paste and then incorporated into the formulation to ensure uniform dispersion without formation of clumps.



Figure 3: Prepared Jaiphal Powder Used in Formulation.

Step 5: Addition of Xanthan Gel and Preservative

The prepared xanthan gum gel was added gradually into the formulation with continuous stirring to improve viscosity and stability. Preservative (0.16 g) was then added and mixed properly until completely dissolved.

Step 6: pH Adjustment and Packaging

The pH of the formulation was checked using pH paper or digital pH meter and adjusted within the range of 5.5–6.5 using citric acid or sodium hydroxide solution if required. The final formulation was transferred into a sterilized amber-colored container, sealed properly, and labeled for further evaluation studies.

EVALUATION PARAMETERS

The prepared herbal face wash formulation was evaluated for various physicochemical parameters to determine its quality, stability, and suitability for topical application.

1. Physical Appearance

The prepared formulation was visually observed for color, odor, texture, consistency, and homogeneity.

2. pH Determination

The pH of the formulation was determined using pH paper or digital pH meter. The pH was maintained within the range suitable for skin application.

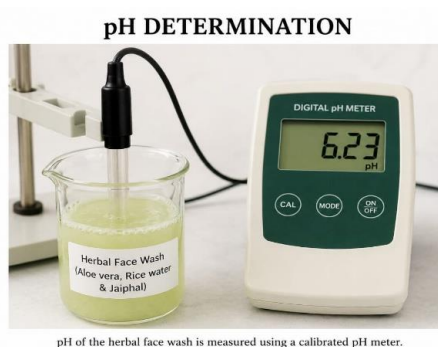


Figure 4: pH Determination of Herbal Face Wash.

3. Spreadability

Spreadability of the formulation was evaluated by applying a small quantity of the face wash on the skin surface and observing the ease of spreading.



Figure 5: Spreadability Test of Herbal Face Wash.

4. Foamability

Foamability was evaluated by shaking a small quantity of the formulation with water in a measuring cylinder and observing the foam produced.



Figure 6: Foamability Evaluation of Formulation.

5. Washability

Washability was determined by applying the formulation on the skin and washing it with water to observe ease of removal.

6. Irritancy Test

The irritancy test was performed by applying a small quantity of the prepared formulation on the skin surface for a short duration. The applied area was observed for redness, itching, irritation, or any allergic reaction. No visible signs of irritation were observed during the study.

7. Stability Study

The stability study of the prepared formulation was carried out for a period of 30 days at room temperature ($25 \pm 2^\circ\text{C}$). The formulation was observed at regular intervals for any changes in color, odor, consistency, phase separation, and homogeneity. No significant changes were observed during the study period, indicating good stability of the formulation.

RESULTS AND DISCUSSION

The herbal face wash formulation containing Aloe Vera, rice water, and Jaiphal was successfully prepared and evaluated for various physicochemical parameters. Three preliminary formulation batches (F1, F2, and F3) were prepared with slight variations in ingredient concentrations to obtain an optimized formulation with suitable consistency, stability, and cleansing properties.

Among all batches, formulation F1 showed better homogeneity, satisfactory foamability, good spreadability, and acceptable pH suitable for topical skin application. The prepared formulation appeared smooth, homogeneous, and light cream in color with a pleasant odor. The pH of the optimized formulation was found to be 5.8, which is within the acceptable range for skin compatibility and minimizes the chances of skin irritation.^[1]

The presence of Sodium Lauryl Sulfate provided satisfactory cleansing and foaming properties, while xanthan gum improved the viscosity and consistency of the formulation.^[12] Aloe Vera contributed moisturizing, soothing, and anti-inflammatory effects due to the presence of vitamins, enzymes, amino acids, and polysaccharides.^[4,18] Rice water acted as a natural skin nourishing and brightening agent because of its amino acids, antioxidants, and vitamins.^[7]

Jaiphal exhibited antioxidant and antimicrobial properties that may help reduce pigmentation and improve overall skin texture.^[14,20]

Spreadability and washability studies indicated that the formulation could be easily applied and removed from the skin surface without leaving excessive residue. The irritancy test showed no visible redness, itching, or irritation after topical application, indicating good compatibility of the formulation with skin.^[19]

The stability study was carried out for 30 days at room temperature ($25 \pm 2^\circ\text{C}$). No significant changes in color, odor, consistency, homogeneity, or phase separation were observed during the study period, suggesting good physical stability of the prepared formulation.^[8]

Overall, the developed herbal face wash demonstrated satisfactory physicochemical characteristics, good cleansing action, acceptable stability, and potential skin brightening properties. The study suggests that the prepared formulation may serve as a safe, effective, economical, and natural alternative to synthetic cosmetic face wash formulations.^[10,13]

OBSERVATION TABLE

Table 2: Evaluation Results of Herbal Face Wash Formulation.

Sr.No	Evaluation Parameter	Observation
1	Color	Light Cream
2	Odor	Pleasant
3	Appearance	Smooth and Homogeneous
4	pH	5.8
5	Spreadability	Good
6	Foamability	Satisfactory
7	Washability	Easy
8	Irritation Test	No Irritation Observed
9	Stability	Stable for 30 Days at Room Temperature

CONCLUSION

The present study successfully focused on the formulation and evaluation of an Aloe vera and rice water based herbal face wash containing Jaiphal. The formulation was prepared using natural ingredients possessing skin nourishing, moisturizing, antioxidant, and cleansing properties.^[4,7,14]

Various physicochemical evaluation parameters such as appearance, pH, spreadability, foamability, washability, irritancy, and stability were studied. The prepared formulation showed satisfactory results with acceptable pH suitable for skin application, good consistency, satisfactory cleansing action, and stability during the study period.^[1,12]

No signs of irritation or phase separation were observed, indicating good compatibility and safety of the formulation for topical use.^[19]

The presence of Aloe vera may provide soothing and moisturizing effects, while rice water may help improve skin nourishment and brightening properties.^[4,7] Jaiphal possesses antioxidant and antimicrobial properties which may assist in reducing pigmentation and improving skin texture.^[14,20]

Overall, the study suggests that the formulated herbal face wash may serve as a safe, effective, economical, and natural alternative to synthetic cosmetic products for skincare application.^[10,13]

FUTURE SCOPE

1. Further studies may be carried out to evaluate long-term stability of the formulation under different storage conditions.^[8]
2. Clinical evaluation on human volunteers may be performed to study the effectiveness of the formulation on pigmentation and skin brightening.^[20,21]
3. Additional herbal ingredients with antioxidant and anti-aging properties may be incorporated to enhance the therapeutic and cosmetic value of the formulation.^[5,6]
4. The prepared formulation may be optimized and developed for commercial manufacturing after detailed quality control and safety studies.^[1,12]
5. Advanced analytical and microbiological studies may be performed to improve formulation stability and product performance.^[8,15]

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