

## FORMULATION AND EVALUATION OF HERBAL FACEWASH

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### ABSTRACT

The present study was aimed at the formulation and evaluation of a herbal face wash using natural ingredients with cleansing, moisturizing, and therapeutic properties. Herbal cosmetics have gained increasing attention due to their safety, efficacy, and minimal side effects compared to synthetic formulations. The face wash was prepared using ingredients such as rose water, guar gum, aloe vera gel, glycerin, urad dal starch, neem extract, turmeric, and reetha extract, following a systematic formulation approach. The prepared formulation was evaluated for various parameters including physical characteristics (color, odor, appearance, texture), physicochemical properties (pH, viscosity, foamability, spreadability), and skin irritation test. The results indicated that the face wash possessed acceptable physical appearance, smooth texture, and pleasant odor. The pH was found to be within the skin-friendly range (5.5–6.5), and the formulation exhibited good viscosity, foamability, and spreadability, ensuring effective cleansing and ease of application. The skin irritation test showed no signs of redness or irritation, confirming the safety of the formulation. The presence of herbal ingredients contributed to antimicrobial, anti-inflammatory, and skin-nourishing effects. Overall, the developed herbal face wash proved to be a safe, effective, and eco-friendly alternative to conventional synthetic products, with potential for further development and commercial application.

**KEYWORDS:** Herbal face wash, natural formulation, neem extract, turmeric, aloe vera, skin care; physicochemical evaluation.

### INTRODUCTION

The skin is the largest organ of the human body and serves as a protective barrier against environmental factors such as microorganisms, ultraviolet radiation, and chemical pollutants. It plays a crucial role in maintaining homeostasis, regulating temperature, and preventing excessive water loss. However, continuous exposure to environmental stressors

along with intrinsic factors such as aging, hormonal imbalance, and lifestyle changes can lead to various skin disorders including acne, dryness, irritation, and premature aging.<sup>[1,2]</sup>

Facial skin is particularly sensitive and requires regular cleansing to remove dirt, excess oil, dead cells, and microbial contaminants. Face washes are widely used cosmetic preparations designed to cleanse the skin effectively while maintaining its natural moisture balance. Conventional face wash formulations often contain synthetic surfactants, preservatives, and fragrances, which may cause adverse effects such as skin irritation, dryness, and allergic reactions upon prolonged use.<sup>[3,4]</sup>

In recent years, there has been a growing demand for herbal and natural cosmetic products due to increased awareness regarding the harmful effects of synthetic chemicals. Herbal cosmetics are formulated using plant-derived ingredients that are considered safer, biocompatible, and eco-friendly. These formulations offer therapeutic benefits along with cosmetic effects, making them increasingly popular among consumers.<sup>[5,6]</sup>

Herbal face washes are formulated using natural ingredients that possess cleansing, antimicrobial, anti-inflammatory, and antioxidant properties. Plant-based components such as *Azadirachta indica* (neem), *Curcuma longa* (turmeric), *Aloe vera*, and *Sapindus mukorossi* (reetha) have been widely used in traditional medicine systems for skin care due to their beneficial effects on skin health.<sup>[7-9]</sup>

Neem is well known for its potent antimicrobial and anti-inflammatory properties, making it effective in preventing acne and skin infections. Turmeric exhibits strong antioxidant and anti-inflammatory activities due to the presence of curcumin, which helps in reducing skin inflammation and improving complexion. Aloe vera acts as a natural moisturizer and soothing agent, promoting skin hydration and healing.<sup>[10-12]</sup>

Reetha, also known as soapnut, is a natural source of saponins that provides excellent cleansing and foaming properties without causing irritation. It is widely used as a natural alternative to synthetic surfactants in cosmetic formulations. Additionally, natural thickeners such as guar gum and moisturizing agents like glycerin enhance the consistency and hydration properties of the formulation.<sup>[13-15]</sup>

Urad dal (*Vigna mungo*) has also gained attention in cosmetic applications due to its mild exfoliating, skin-brightening, and cleansing properties. The starch and bioactive components present in urad dal contribute to improved skin texture and removal of impurities, making it a valuable ingredient in herbal formulations.<sup>[16,17]</sup>

The formulation of herbal face wash requires careful selection of ingredients to ensure compatibility, stability, and effectiveness. The preparation generally involves the development of a suitable base, incorporation of active herbal ingredients, and optimization of physicochemical properties such as pH, viscosity, foamability, and spreadability.<sup>[18,19]</sup>

Evaluation of herbal formulations is an essential step to ensure quality, safety, and performance. Parameters such as physical appearance, pH, viscosity, foam stability, and skin irritation are assessed to determine the suitability of the product for topical application. Stability studies are also conducted to evaluate the shelf life and consistency of the formulation under different storage conditions.<sup>[20-22]</sup>

Therefore, the present study focuses on the formulation and evaluation of a herbal face wash using selected natural ingredients with the aim of developing a safe, effective, and eco-friendly cosmetic product. The study also emphasizes the importance of herbal ingredients in modern skincare and their potential as alternatives to synthetic formulations.<sup>[23–25]</sup>

## METHODOLOGY

### Preparation of Urad Dal for Face Wash

The urad dal was processed to obtain starch and extract using a standardized procedure. Initially, 400–500 g of urad dal was soaked in water for 10–12 hours to soften the grains, followed by draining and complete drying under sunlight.



**Figure No. 1: Soaked Urad Dal.**

The dried material was then ground into a fine powder using a mechanical grinder and sieved to obtain a uniform texture. Alternatively, soaked urad dal was ground into a smooth paste with the addition of a small quantity of water or rose water to achieve the desired consistency.



**Figure No. 2: Grinded Urad Dal.**

The resulting slurry was filtered through muslin cloth to separate the liquid extract.



**Figure No. 3: Grinded Urad Dal strained with muslin cloth.**

The filtrate was allowed to stand undisturbed for a sufficient period to facilitate sedimentation, during which the starch fraction settled at the bottom. The supernatant liquid was carefully decanted, and the sedimented starch was collected and dried for further use.



**Figure No. 4: Urad Dal starch for drying.**

Both the dried starch and liquid extract were preserved for subsequent formulation purposes.

### Formulation of Herbal Face Wash

**Table No. 1: Formulation ingredients.**

| SR.NO. | INGREDIENT          | QUANTITY | ROLE                         |
|--------|---------------------|----------|------------------------------|
| 01.    | Urad daal starch    | 10%      | Natural cleanser exfoliant   |
| 02.    | Alovera gel         | 15%      | Moisturizer soothing agent   |
| 03.    | Neem extract        | 5%       | Anti bacterial               |
| 04.    | Glycerin            | 5%       | Humectant keep skin hydrated |
| 05.    | Rose oil            | 50%      | Base fragrance toner         |
| 06.    | Turmeric powder oil | 1%       | Antiseptic glow enhancer     |
| 07.    | Guar gum            | 1%       | Thickening agent             |
| 08.    | Reetha extract      | 6%       | Natural surfactant           |
| 09.    | Sodium benzoate     | 0.5%     | Preservative                 |

The herbal face wash was formulated using a systematic procedure to ensure uniformity and stability of the final product. Initially, the base was prepared by adding 50% rose water into a clean beaker, followed by the gradual addition

of 1% guar gum with continuous stirring to prevent lump formation. The mixture was allowed to hydrate for 15–20 minutes to form a smooth gel base. Subsequently, moisturizing agents including aloe vera gel (15%) and glycerin (5%) were incorporated into the gel and mixed thoroughly to obtain a uniform consistency.

Further, herbal ingredients such as urad dal starch/powder (10%), neem extract (5%), and turmeric (1%) were added gradually with continuous stirring to ensure proper dispersion and avoid clumping. A natural foaming agent, reetha extract (6%), was then added slowly and mixed well to impart cleansing and foaming properties to the formulation. To enhance the shelf life and prevent microbial contamination, a suitable preservative (0.5%) was incorporated and mixed uniformly. Finally, the prepared herbal face wash was transferred into a clean, airtight container, properly labeled, and stored for further evaluation.

### **Preparation of Base**

The base of the formulation was prepared by adding 50% rose water into a clean beaker. To this, 1% guar gum was slowly incorporated with continuous stirring to prevent the formation of lumps. The mixture was then allowed to stand undisturbed for 15–20 minutes to ensure complete hydration of the guar gum, resulting in the formation of a smooth and uniform gel base.

### **Addition of Moisturizing Agents**

Moisturizing agents were incorporated into the prepared gel base by adding 15% aloe vera gel and 5% glycerin. The mixture was stirred thoroughly to ensure uniform distribution of the ingredients, resulting in a smooth and homogeneous formulation with enhanced moisturizing properties.

### **Addition of Herbal Ingredients**

The herbal ingredients were incorporated into the formulation by adding 10% urad dal starch/powder, 5% neem extract, and 1% turmeric to the prepared base. The mixture was stirred continuously to ensure uniform distribution of all components and to prevent the formation of lumps, resulting in a smooth and homogeneous blend.

### **Addition of Foaming Agent**

A foaming agent was incorporated into the formulation by slowly adding 6% reetha extract to the mixture. The preparation was stirred thoroughly to ensure uniform mixing and proper distribution of the extract, which imparts natural cleansing and foaming properties to the final face wash formulation.

### **Addition of Preservative**

A suitable preservative (0.5%) was added to the formulation and mixed thoroughly to ensure uniform distribution. This step was essential to inhibit microbial growth and enhance the stability and shelf life of the final product.

### **Final Product**

The final formulation was carefully transferred into a clean, dry container and properly labeled. This step ensures safe storage, easy identification, and protection of the product from contamination, making it ready for further evaluation and use.



**Figure No. 5: Urad Dal Face Wash.**

## RESULT

The prepared herbal face wash was evaluated using various parameters to assess its quality, effectiveness, and safety.

- 1. Physical evaluation** of the formulation included assessment of color, odor, appearance, and texture. The face wash was found to have an acceptable color, pleasant odor, smooth texture, and uniform appearance, indicating good aesthetic properties suitable for topical use.
- 2. Physicochemical evaluation** was carried out by determining pH, viscosity, foamability, and spreadability. The pH of the formulation was maintained within the ideal range of 5.5–6.5, ensuring compatibility with skin and minimizing the risk of irritation. The viscosity was appropriate, providing good consistency and ease of application. The formulation exhibited satisfactory foamability due to the presence of natural foaming agents and demonstrated good spreadability, allowing uniform distribution on the skin surface.
- 3. Skin irritation test** was performed by applying a small amount of the formulation on a limited area of skin and observing for any adverse reactions. No signs of redness, itching, or irritation were observed, indicating that the herbal face wash is safe and suitable for regular use.

## CONCLUSION

The present study successfully focused on the formulation and evaluation of a herbal face wash using natural and plant-based ingredients. The prepared formulation exhibited desirable physical characteristics such as acceptable color, pleasant odor, smooth texture, and uniform appearance, making it suitable for cosmetic use.

The physicochemical evaluation confirmed that the face wash possessed an appropriate pH within the skin-compatible range (5.5–6.5), along with satisfactory viscosity, foamability, and spreadability, ensuring effective cleansing and ease of application. The inclusion of herbal ingredients such as neem, turmeric, urad dal, aloe vera, and reetha contributed to the formulation's antimicrobial, anti-inflammatory, moisturizing, and cleansing properties.

Furthermore, the skin irritation test indicated that the formulation is safe for topical application, as no adverse reactions such as redness or irritation were observed.

Overall, the developed herbal face wash can be considered a safe, effective, and eco-friendly alternative to conventional synthetic products. The study highlights the potential of herbal ingredients in skincare formulations, and further studies including stability testing and clinical evaluation are recommended for commercial application.

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**CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest regarding the publication of this research work.

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