

## FORMULATION AND EVALUATION OF HERBAL HAND WASH USING NEEM AND ALOE VERA EXTRACTS

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### ABSTRACT

Hands serve as a major route for the transmission of microorganisms and infectious diseases. Hand hygiene plays a crucial role in preventing illness, particularly in food safety, domestic environments, and child care settings. Herbal cosmetics, which are derived from natural sources, offer an effective and safer alternative to synthetic chemical-based products. In this study, a herbal hand wash was formulated using neem (*Azadirachta indica*) and aloe vera (*Aloe barbadensis*) extracts. The final formulation was evaluated for its physicochemical properties including pH, color, odor, foaming efficiency, viscosity, and stability. The product demonstrated effective cleansing and antimicrobial potential, while remaining gentle on the skin.

**KEYWORDS:** Neem, Aloe vera, Herbal hand wash, Antibacterial, Cosmetic formulation.

### 1. INTRODUCTION

#### 1.1 Herbal Cosmetics

Herbal cosmetics are products formulated using natural plant extracts and are generally free from synthetic chemicals, making them safer and more environmentally friendly. They contain bioactive compounds that provide both therapeutic and cosmetic benefits.

**Advantages**

- Safe and gentle on the skin
- Eco-friendly and biodegradable
- Rich in nutrients
- No harmful side effects
- Suitable for all skin types
- Provide long-term benefits
- Cruelty-free and ethically sourced

**Disadvantages**

- Slower results
- Shorter shelf life
- Risk of allergic reactions
- Limited availability and variety
- Require special storage

**1.2 Neem (*Azadirachta indica*)**

Neem is a fast-growing, evergreen tree widely used in traditional medicine due to its antibacterial, antifungal, and antiviral properties.

**Morphological and Microscopic Features**

- Medium to large tree (15–30 m tall)
- Pinnately compound leaves
- Dark, fissured bark

**Phytochemical Constituents**

- Limonoids: Azadirachtin, Nimbin, Nimbidin
- Flavonoids: Quercetin, Kaempferol

**Uses**

- Antibacterial and antifungal activity
- Moisturizing and healing agent
- Skin soothing and cleansing properties

**1.3 Aloe Vera (*Aloe barbadensis*)**

Aloe vera is a succulent plant valued for its medicinal and skincare benefits.

**Source and Active Constituents**

- Part used: Leaf gel and latex
- Polysaccharides: Acemannan
- Vitamins: A, C, E, B-complex
- Enzymes: Amylase, Catalase, Lipase
- Amino acids and Anthraquinones

## Uses

- Moisturizes and soothes skin
- Heals wounds and sunburns
- Anti-aging and anti-inflammatory effects
- Aids digestion and detoxification

## 2. AIM AND OBJECTIVES

The aim of the study is to formulate and evaluate a herbal hand wash using natural ingredients such as neem and aloe vera to promote personal hygiene. Evaluation was carried out based on physicochemical parameters including pH, color, foaming ability, viscosity, and stability.

## 3. MATERIALS AND METHODS

### 3.1 Materials

- Neem leaves
- Aloe vera leaves
- Sodium lauryl sulfate
- Glycerin
- Rose oil
- Methyl paraben
- Carbopol 934
- Distilled water

### 3.2 Extraction of Neem

1. Neem leaves were shade dried for 15 days and powdered.
2. 25 g of powder was macerated in 100 ml methanol for 3 days.
3. The mixture was filtered, and methanol was evaporated using a rotary evaporator.
4. The extract was dried, weighed, and stored in a desiccator.

### 3.3 Formulation of Herbal Hand Wash.

Ingredient	Quantity	Use
Neem extract	22 ml	Antibacterial
Aloe vera juice	22 ml	Soothing agent
Sodium lauryl sulfate	8 g	Foaming agent
Carbopol 934	4 g	Gelling agent
Glycerin	42 ml	Moisturizer
Rose oil	5 ml	Fragrance
Methyl paraben	0.5 ml	Preservative
Distilled water	q.s.	Solvent

## 4. EVALUATION PARAMETERS

### 4.1 Physicochemical Evaluation

- Appearance: Opaque
- Color: Light green
- Odor: Aromatic

- Homogeneity: Homogenous
- Fragrance Acceptability: Rosy and pleasant (subjectively evaluated by 5 individuals)
- **pH Determination:** Measured using a digital pH meter; pH was found to be 6.0
- **Viscosity:** Measured using Brookfield viscometer; 28 cP
- **Foam Height:** 5 cm
- **Foam Retention:** 20 minutes

Parameter	Result
Appearance	Opaque
Color	Light green
Odor	Aromatic
Homogeneity	Homogenous
Fragrance	Rosy
pH	6.0
Viscosity	28 cP
Foam Height	5 cm
Foam Retention	20 minutes

## 5. RESULTS AND DISCUSSION

The herbal hand wash formulated with neem and aloe vera extracts was stable and exhibited desirable physicochemical properties. The pH is suitable for skin application. The product demonstrated good foaming ability and retention, with a pleasant aroma and soothing texture.

## 6. CONCLUSION

The herbal hand wash formulated using neem and aloe vera proved to be effective in cleansing with added antibacterial and soothing benefits. It was stable, skin-friendly, and can serve as a safe and natural alternative to conventional synthetic hand washes.

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