



## Research Article

## Formulation and Evaluation of Polyherbal Facewash

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### ABSTRACT

This study focus on the formulation and evaluation of a polyherbal facewash designed for effective skin care and management. To address the side effects associated with synthetic products, a herbal formulation was developed using natural extracts of Neem extract (*Azadirachta indica*), Aloe vera extract (*Aloe barbadensis*), and Tulsi extract (*Ocimum sanctum*), chosen for their antimicrobial, anti-inflammatory, antioxidant, and skin-soothing properties. The facewash was prepared using a three-phase method with key excipients, including carbopol as a gelling agent, sodium lauryl sulfate as a surfactant, glycerin as a humectant, and methylparaben as a preservative. Five different formulations (F1–F5) were developed and evaluated for physicochemical parameters such as pH, spreadability, foamability, washability, homogeneity, and irritancy. Results indicated that Formulation F3 was the version, exhibiting a skin-compatible pH, excellent foamability, optimum viscosity, and no skin irritation. The study concludes that this polyherbal facewash is a safe, effective, and economical alternative to conventional synthetic formulations for regular use.

**KEYWORDS:** Polyherbal facewash, Acne vulgaris, Herbal formulation, Neem, Aloe vera, Tulsi, Antimicrobial, Anti-inflammatory, Skin care, Evaluation parameters.

### INTRODUCTION

The skin, particularly the facial skin, plays a crucial role in human personality and serves as an important indicator of overall health. It is continuously exposed to environmental pollutants, dust, microorganisms, and other external factors that can negatively affect its condition. Therefore, maintaining proper skin hygiene is essential to preserve its health, appearance, and physiological functions. Cosmetics are widely used to manage various skin concerns such as acne, excessive oil secretion, dullness, and signs of aging.<sup>[1]</sup>

A face wash, also known as a facial cleanser, is a specially formulated preparation designed to remove makeup, dead skin cells, oil, dirt, and other pollutants from the surface of the skin. It performs the vital function of cleansing the skin, keeping it fresh, smooth, and free from impurities without causing excessive dryness. Regular use of face wash helps to unclog pores and prevents the development of skin disorders such as acne. It is generally used as part of a daily skincare regimen along with toner and moisturizer to maintain healthy and clean skin.<sup>[2]</sup>

Acne is one of the most common skin conditions associated with improper cleansing and blockage of pores. It is mainly caused by excessive oil production, bacterial infection, hormonal changes, stress, unhealthy lifestyle, and environmental factors. The accumulation of dead skin cells along with excess sebum results in clogging of pores, which leads to the formation of acne, whiteheads, blackheads, and a dull appearance of the skin. Oily skin results from the over-secretion of sebum by sebaceous glands, which further contributes to pore blockage and acne formation.<sup>[3]</sup>

Regular use of face wash provides several benefits for maintaining skin health. It helps in the removal of dead skin cells, allowing new skin cells to replace old ones, thereby promoting healthy skin cell turnover. This process contributes to maintaining fresh, clean, and radiant skin. Exfoliation accelerates blood circulation and enhances the supply of oxygen and nutrients to the skin, resulting in improved skin appearance. It also promotes skin regeneration and rejuvenation, helping to maintain youthful skin.<sup>[4]</sup>

In addition to cleansing, face wash helps maintain proper hydration, softness, and suppleness of the skin. It improves the overall texture of the skin and ensures that other skincare products penetrate effectively into the skin. Regular cleansing prevents pore blockage and reduces the occurrence of acne and related skin problems. Face wash also plays an important role in maintaining overall skin hygiene by removing impurities, excess oil, and microorganisms from the skin surface.<sup>[5]</sup>

In recent years, herbal face wash formulations have gained significant attention due to the presence of natural plant-based ingredients with beneficial properties. These formulations contain herbs and botanicals that help cleanse the skin effectively while maintaining its natural balance. Herbal face washes are known to possess anti-inflammatory and antioxidant properties, which help in nourishing and repairing damaged skin.<sup>[6]</sup>

Herbal ingredients such as neem are widely used due to their effectiveness in treating acne and pimples. Herbal formulations help in cleaning pores, reducing oil build-up, and improving overall skin condition. There is an increasing preference for herbal cosmetics over synthetic products, as they are considered safer, provide better nourishment, and improve overall skin health and user satisfaction.<sup>[1]</sup>

Despite their advantages, face wash products also have certain limitations. Excessive use of face wash may lead to dryness of the skin, and it is generally recommended to use it only twice daily. Some formulations, including herbal face washes, may cause side effects such as itching, skin rashes, or a sensation of warmth in certain individuals. Therefore, proper formulation and controlled usage are essential to ensure safety and effectiveness.<sup>[2]</sup>

An ideal face wash should possess specific physicochemical and functional properties to ensure its quality and performance. It should be stable and have an acceptable appearance. It should soften upon application to the skin and spread easily without dragging. During application, it should not produce an oily or greasy feel. After evaporation of water, the residue should not become viscous. Its action should involve flushing and opening of pores rather than absorption. Additionally, it should leave a thin emollient film on the skin after use to maintain hydration and softness.<sup>[5]</sup>

Face washes are available in different forms such as cream-based, gel-based, and liquid formulations, and they are designed according to different skin types including oily, dry, and normal skin. These formulations are widely used for cleansing, removal of impurities, prevention of acne, maintenance of skin hydration, and overall skincare hygiene.<sup>[3]</sup>

Thus, the formulation of a herbal face wash involves the careful selection of suitable natural ingredients to achieve effective cleansing, control of oil secretion, nourishment

of the skin, and improvement of overall skin health and appearance.

## AIM AND OBJECTIVES

### Aim

To formulate and evaluate a safe, effective, and stable polyherbal facewash containing aqueous extracts of Aloe vera, Azadirachta indica, and Ocimum sanctum with antimicrobial, antioxidant, and skin-protective properties.

### Objectives

- To select and justify herbal ingredients based on their therapeutic properties such as antimicrobial, anti-inflammatory, and antioxidant activities.
- To develop a polyherbal facewash formulation using suitable excipients and standard formulation techniques.
- To evaluate physicochemical parameters such as pH, viscosity, spreadability, foamability, and homogeneity of the formulation.
- To assess the stability of the prepared formulation under different environmental conditions.
- To evaluate antimicrobial activity against common skin pathogens.
- To perform skin irritation and safety studies of the formulation.
- To compare the prepared formulation with available marketed products for effectiveness and quality

## LITERATURE REVIEW

1. Tiware, P., et al. investigated the role of herbal ingredients in face wash formulations. The study reported that herbal face washes containing plant extracts provide effective cleansing, antimicrobial activity, and reduce acne without causing skin irritation.<sup>[7]</sup>
2. Kaur, G., & Sharma, S. reviewed the applications of herbal cosmetics and found that ingredients like neem and tulsi possess strong antibacterial and anti-inflammatory properties, making them effective against acne-causing microorganisms.<sup>[8]</sup>
3. Patel, M., et al. formulated and evaluated a herbal face wash and observed that the formulation showed good foaming ability, pH, stability, and significant antimicrobial activity against skin pathogens.<sup>[9]</sup>
4. Surjushe, A., et al. studied the effects of aloe vera and reported that it has soothing, moisturizing, and wound-healing properties, which help in reducing inflammation and promoting skin repair in acne conditions.<sup>[10]</sup>
5. Ananthapadmanabhan, K.P., et al. evaluated surfactants used in cleansing products and concluded that sodium lauryl sulfate (SLS) provides effective cleansing and foaming action, but its irritation potential can be minimized when combined with mild agents and herbal ingredients.<sup>[11]</sup>
6. Banchhor, M., et al. studied herbal cosmetics and found that they are safer, less toxic, and have fewer

side effects compared to synthetic products, making them suitable for long-term use in skincare.<sup>[12]</sup>

7. Verma, A., et al. reviewed eco-friendly herbal cosmetic formulations and concluded that plant-based products are biodegradable, sustainable, and widely accepted due to their safety and effectiveness.<sup>[13]</sup>
8. Rowe, R.C., et al. described the role of pharmaceutical excipients and reported that carbopol acts as an effective gelling agent, glycerin as a moisturizer, and preservatives like methylparaben improve the stability and shelf-life of formulations.<sup>[14]</sup>

## MATERIALS AND METHODS

### Material

The herbal aqueous extracts used in the formulation, namely neem aqueous extract, aloe vera aqueous extract, and Tulsi aqueous extract, were obtained by the decoction method, in which the crude plant materials were boiled in distilled water for a specific period and then filtered to obtain the aqueous extracts. The prepared extracts were used directly in the formulation without further processing to ensure consistency and ease of formulation.

All other excipients used in the formulation, including gelling agents, surfactants, humectants, preservatives, and pH adjusters, were procured from the institutional pharmaceutical laboratory.

### Herbs Ingredients Used In Formulation 1] Alovera (Aloe barbadensis Miller) Taxonomical Classification :

- Kingdom: Plantae
- Division: Angiosperms
- Class: Monocots
- Order: Asparagales
- Family: Asphodelaceae
- Subfamily: Asphodeloideae
- Genus: Aloe
- Species: vera



Fig. no. 1: Alovera (Aloe barbadensis Miller).

**Chemical Constituents:** Polysaccharides (acemannan), anthraquinones (aloin, emodin), vitamins, amino acids, enzymes.

**Properties:** Moisturizing, anti-inflammatory, wound healing, antioxidant.

**Medicinal Role:** Acts as a skin hydrator by increasing water retention in the stratum corneum. Exhibits anti-inflammatory activity by inhibiting prostaglandin synthesis, reducing irritation and redness. Promotes wound healing through stimulation of fibroblast activity and collagen synthesis. Also provides antioxidant protection against free radical damage.<sup>[15]</sup>

### Neem (Azadirachta indica)

#### Taxonomical Classification

- Kingdom: Plantae
- Division : Angiosperms
- Class: Eudicots
- Order: Sapindales
- Family: Meliaceae
- Subfamily: Melioideae
- Genus: Azadirachta
- Species: indica



Fig. no 2: Neem (Azadirachta indica).

**Chemical Constituents:** Nimbin, nimbidin, azadirachtin, flavonoids, tannins. Properties: Antibacterial, antifungal, anti-inflammatory.

**Medicinal Role:** Acts as a potent antimicrobial agent by inhibiting growth of acne-causing bacteria. Exhibits anti-inflammatory effects by reducing inflammatory mediators, thereby decreasing redness and swelling. Also shows antifungal activity and provides antioxidant protection.

**Role in Formulation:** Acts as anti-acne and cleansing agent.<sup>[16]</sup>

### Tulsi: Ocimum tenuiflorum or (Ocimum sanctum)

#### Taxonomical classification

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Lamiales
- Family: Lamiaceae
- Genus: Ocimum
- Species: Ocimum tenuiflorum or (Ocimum sanctum)



**Fig. no. 3: Tulsi: *Ocimum tenuiflorum* or (*Ocimum sanctum*).**

**Chemical Constituents:** Eugenol, ursolic acid, flavonoids, essential oils

**Medicinal Role:** Acts as an antimicrobial agent due to eugenol, which disrupts microbial cell membranes. Provides antioxidant protection by neutralizing free radicals, preventing skin damage and premature aging. Exhibits anti-inflammatory activity and functions as a detoxifying agent.

**Role in Formulation:** Acts as purifier and skin-protective agent.<sup>[17]</sup>

#### Excipients used in herbal formulation

##### A. Gelling Agent

Gelling agents convert the aqueous phase into a semi-solid gel, providing viscosity and consistency while maintaining spreadability. Some gels exhibit thixotropic behavior. Carbopol (carbomer) is used as a gelling agent.

It swells in water and forms a gel upon neutralization with bases such as triethanolamine, enhancing viscosity and stability.<sup>[18,19,20]</sup>

##### B. Preservatives

Preservatives prevent microbial contamination and ensure product safety.<sup>[21]</sup> Methylparaben is used as a preservative with broad-spectrum antimicrobial activity.<sup>[22]</sup>

##### C. Humectant

Humectants attract and retain moisture, maintaining skin hydration.

Glycerine is used as a humectant. It retains moisture, prevents dryness, and improves skin softness.<sup>[23]</sup>

##### D. Surfactant (Foaming and Cleansing Agent)

Surfactants remove dirt and oil while producing foam. Sodium Lauryl Sulfate (SLS) is used as an anionic surfactant with excellent cleansing and foaming properties.<sup>[24,25]</sup>

##### E. pH Adjusting Agent

pH adjusters maintain skin-compatible pH and improve stability. Triethanolamine (TEA) neutralizes Carbopol and maintains pH 5.5–6.5.<sup>[26]</sup>

##### F. Vehicle (Solvent/Base)

The vehicle ensures uniform distribution of ingredients.

Distilled water acts as a pure solvent, ensuring stability and safety.<sup>[27,28]</sup>

**Table no. 1: Ingredient and their role in formulation.**

| Sr.no | Ingredients           | Category           | Role in formulation                        |
|-------|-----------------------|--------------------|--------------------------------------------|
| 1     | Alovera extract       | Herbal Ingredients | Moisturizing, soothing, skin healing agent |
| 2     | Tulsi extract         | Herbal Ingredients | Antibacterial, anti-inflammatory           |
| 3     | Neem extract          | Herbal Ingredients | Antimicrobial, anti-acne agent             |
| 4     | Sodium lauryl sulfate | Surfactant         | Cleansing and foaming agent                |
| 5     | Glycerine             | Humectant          | Retains moisture, prevents dryness         |
| 6     | Carbopol              | Polymer            | Gelling and thickening agent               |
| 7     | Methyl paraben        | Preservative       | Prevents microbial growth                  |
| 8     | Triethanolamine       | Alkalizing agent   | Adjusts pH, stabilizes gel                 |
| 9     | Rose oil              | Herbal fragrance   | Tonning and brightening agent              |
| 10    | Distilled water       | Vehicle            | Solvent/base for formulation               |

#### B] Method

##### Method of Preparation (Three-Phase Method)

The herbal facewash was prepared using a three-phase formulation approach comprising gel base preparation, incorporation of herbal extracts, and addition of surfactants and excipients.

##### Step 1: Preparation of Gel Base (Phase I)

Carbopol was accurately weighed and dispersed in distilled water with continuous stirring to avoid lump formation. The dispersion was allowed to hydrate

completely until a uniform gel-like consistency was achieved. Glycerin was then added and mixed thoroughly to obtain a smooth and uniform gel base.

##### Step 2: Incorporation of Herbal Phase (Phase II)

Measured quantities of herbal extracts, namely Aloe vera extract, Neem extract and Tulsi extract, were added sequentially to the prepared gel base. The mixture was stirred continuously to ensure uniform distribution of the herbal constituents.

### Step 3: Addition of Surfactant and Final Additives (Phase III)

Sodium Lauryl Sulfate was dissolved separately in a small quantity of distilled water and added slowly to the above mixture with gentle stirring to minimize foam formation. Methylparaben, previously dissolved in warm water, was incorporated as a preservative. Triethanolamine was then added dropwise with continuous stirring to adjust the pH to 5.5–6.5 and to facilitate proper gel formation. Finally, a few drops of fragrance (rose oil) were added.

### Step 4: Final Mixing and Homogenization

The gel base (Phase I) was first mixed with the herbal phase (Phase II) with continuous stirring until a uniform mixture was obtained. Subsequently, the surfactant and additives phase (Phase III) was incorporated slowly into the combined mixture (Phase I + Phase II) with gentle stirring. The entire formulation was then triturated using a mortar and pestle to achieve a homogeneous, smooth, and lump-free gel.

### Step 5: Packaging and Storage

The prepared herbal facewash was transferred into a suitable airtight container and stored at room temperature

for further evaluation.

The polyherbal facewash was formulated using natural ingredients such as Aloe vera Aq extract, Neem aq extract, and Tulsi aq extract, selected for their moisturizing, antimicrobial, and antioxidant properties. Sodium Lauryl Sulfate (SLS) was used as a surfactant to provide effective cleansing and foam formation, while glycerin acted as a humectant to maintain skin hydration. Carbopol was incorporated as a gelling agent to achieve the desired consistency, and triethanolamine was used to adjust the pH of the formulation to a skin-friendly range (5.5–6.5). Methylparaben was added as a preservative, and distilled water served as the vehicle.

A series of five formulations (F1–F5) were prepared by varying the concentrations of key ingredients such as SLS, Carbopol, and herbal extracts. Each formulation was evaluated for physicochemical parameters including pH, viscosity, foamability, stability, and skin irritation. Among all, formulation F3 exhibited optimum characteristics such as balanced foamability, appropriate viscosity, good stability, and absence of skin irritation. Therefore, F3 was selected as the formulation.

**Formulation Table**

| INGREDIENTS            | F1 [%] | F2 [%] | F3 [%] | F4 [%] | F5 [%] |
|------------------------|--------|--------|--------|--------|--------|
| Alovera extract        | 5      | 6      | 8      | 8      | 10     |
| Tulsi extract          | 5      | 6      | 5      | 8      | 5      |
| Neem extract           | 5      | 6      | 5      | 8      | 3      |
| Carbopol               | 0.5    | 0.75   | 1      | 1.25   | 1.5    |
| Glycerine              | 3      | 4      | 5      | 6      | 7      |
| Sodium lauryl sulphate | 4      | 5      | 6      | 7      | 8      |
| Methyl paraben         | 0.2    | 0.2    | 0.2    | 0.2    | 0.2    |
| Triethanolamine        | q.s    | q.s    | q.s    | q.s    | q.s    |
| Rose oil               | q.s    | q.s    | q.s    | q.s    | q.s    |
| Distilled Water        | 76     | 68.8   | 72     | 66     | 65.8   |

## 2] EVALUATION

### 1) Colour

**Purpose:** To check the appearance and visual appeal of the product. **Observation :** Ambered orange colour

**Significance:** Should be uniform throughout. Indicates proper mixing of ingredients. Attractive colour improves consumer acceptance.

**Results:** The formulation exhibited an ambered orange colour, which was found to be uniform throughout the preparation. This indicates proper mixing of ingredients and enhances the visual appeal and consumer acceptability.<sup>[28]</sup>

### 2) Odour (Fragrance Test)

**Purpose:** To evaluate the smell of the product. **Method:** Smell the formulation directly.

**Results:** The facewash showed a pleasant and characteristic fragrance (rose-like, as fragrance oil was used). The odour was found to be stable and acceptable, contributing positively to user experience.<sup>[29]</sup>

### 3) Nature (Consistency)

**Purpose:** To determine the physical form of the formulation. **Observation:** Semi-solid, gel-like

**Significance:** Should not be too thick or too runny. Proper consistency ensures ease of use and stability.<sup>[30]</sup>

**Result:** The formulation was observed to be semi-solid with a gel-like consistency. It was neither too thick nor too runny, indicating suitable viscosity for easy application and stability.

### 4) Spreadability

**Purpose:** To evaluate how easily the face wash spreads on the skin. **Method:** Apply a small amount of gel on the skin. Gently rub with fingers. **Observation:** Should spread smoothly without much effort.

**Significance:** Ensures easy application. Helps in uniform cleansing. Reduces product wastage.<sup>[31]</sup>

**Result:** The facewash spread smoothly on the skin with minimal effort. This ensures uniform application and effective cleansing while minimizing product wastage.

### 5) Washability

**Purpose:** To evaluate how easily the product can be removed from the skin. Method: Apply the face wash on hands/skin. Rinse under running water.

**Observation:** Should rinse off easily. No residue should remain on the skin. Significance: Ensures user comfort. Prevents pore clogging and stickiness.

**Result:** The formulation was easily washable with water, leaving no residue or stickiness on the skin. This confirms good user comfort and prevents pore blockage.

### 6) Homogeneity

**Purpose:** To check uniform distribution of ingredients. Method: Visually inspect the gel.

**Observation:** No lumps or aggregates present.

**Significance:** Ensures smooth texture. Confirms proper formulation and mixing<sup>[32]</sup>

**Result:** The gel was found to be homogeneous with no lumps or aggregates, indicating proper formulation and uniform distribution of ingredients.

### 7) pH Test

**Purpose:** To check whether the face wash is safe for skin. Human skin has a slightly acidic pH (~5.5).

**Method:** Take a small amount of face wash and dilute it with distilled water. Dip pH paper or use a pH meter.

**Observation:** pH: 5.8

**Significance:** Maintains skin's natural barrier. Prevents irritation, dryness, or excessive oil removal.

**Result:** The pH of the formulation was found to be in the range of 5.8, which is close to the natural skin pH. This suggests that the facewash is skin-friendly and non-irritating, maintaining the skin's natural barrier.

### 8) Grittiness Test

**Purpose:** To check the presence of unwanted particles.

**Method:** Apply a small amount of gel on skin. Rub gently between fingers. Observation: No gritty or rough particles should be felt.

**Significance:** Ensures smooth texture. Prevents skin irritation or micro-abrasions.

**Result:** No gritty or rough particles were observed during application. The formulation was smooth in texture, ensuring it is safe and non-abrasive to the skin.

### 9) Foamability Test

**Purpose:** To measure the ability of the face wash to produce foam.

**Method:** Take a small quantity of gel in a beaker with water. Note initial volume. Shake the beaker (about 10 times).

**Observation:** Increase in volume indicates foam

formation.

**Significance:** Good foam gives better cleansing perception. Indicates presence of surfactants.

**Result:** The formulation showed good foam formation, as indicated by an increase in volume after shaking. This reflects the presence of effective surfactants and enhances cleansing efficiency.

| Formulation         | F1    | F2    | F3    | F4    | F5    |
|---------------------|-------|-------|-------|-------|-------|
| Foam Formation Time | 9 sec | 7 sec | 5 sec | 4 sec | 4 sec |

### 10) Irritancy Test

**Purpose:** To check whether the face wash causes irritation to the skin.

**Method:** Apply a small amount of face wash on the skin (usually hand or forearm). Leave for a specific time (e.g., 2 hours).

**Observation:** No redness, itching, or irritation (Non-irritant as per your note). Significance: Ensures safety for regular use. Important for sensitive skin products.<sup>[33]</sup>

**Result:** No signs of redness, itching, or irritation were observed after application. The formulation was found to be non-irritant, indicating its safety for regular use, including on sensitive skin.

### 11) Viscosity

**Purpose:** To determine the consistency and flow property of the formulation for easy application.

**Method:** Fill five identical, clear glass tubes or graduated cylinders with each formulation (F1 through F5), leaving a small air gap at the top. Simultaneously invert the tubes 180°. <sup>[34]</sup>

**Observation:** Measure the time it takes for the bubble to travel from the bottom (formerly the top) to the new surface. Ensure the tubes are tightly sealed so the air gap remains constant.

### Result

| Formulation      | F1      | F2       | F3        | F4      | F5                   |
|------------------|---------|----------|-----------|---------|----------------------|
| Bubble Rise Time | 2-5 sec | 8-15 sec | 30-60 sec | 2-5 min | Indefinite (trapped) |

## 3] RESULT & DISCUSSION

All five formulations (F1–F5) of the polyherbal facewash were successfully prepared and evaluated for various physicochemical parameters. The formulations were found to be homogeneous with acceptable appearance, color, and odor.

Table 2: Result

| Parameter  | F1                  | F2                    | F3                                   | F4                    | F5                    |
|------------|---------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|
| Appearance | Clear               | Clear                 | Clear & smooth                       | Slightly thick        | Thick                 |
| Color      | Ambered orange      | Ambered orange        | Ambered orange                       | Ambered orange        | Ambered orange        |
| Odour      | Mild rose fragrance | Strong rose fragrance | Pleasant and Balanced rose fragrance | Strong rose fragrance | Strong rose Fragrance |
| pH         | 5.0                 | 6.0                   | 5.8                                  | 5.5                   | 6.5                   |

|                        |      |          |           |                    |                    |
|------------------------|------|----------|-----------|--------------------|--------------------|
| <i>Foamability</i>     | Low  | Good     | Excellent | Good               | Very high          |
| <i>Foam stability</i>  | Low  | Moderate | High      | Moderate           | High               |
| <i>Viscosity</i>       | Low  | Moderate | Medium    | High               | Very high          |
| <i>Spreadability</i>   | Good | Good     | Excellent | Moderate           | Moderate           |
| <i>Washability</i>     | Easy | Easy     | Easy      | Slightly difficult | Slightly difficult |
| <i>Skin irritation</i> | None | None     | None      | None               | None               |

The present study was carried out to formulate and evaluate a polyherbal facewash using natural ingredients such as Aloe vera, Neem, and Tulsi, along with suitable excipients to obtain an effective and stable formulation. Five different formulations (F1–F5) were prepared by varying the concentration of key components like Sodium Lauryl Sulfate (SLS), Carbopol, glycerin, and herbal aqueous extracts in order to formulation.

The evaluation parameters included physical appearance, pH, foamability, foam stability, viscosity, spreadability, washability, skin irritation, and stability studies. All formulations showed acceptable physical characteristics; however, slight variations were observed depending on the composition.

The pH of all formulations was found to be within the acceptable range for skin (5.0–6.5), which indicates that the formulations are suitable for topical application without causing irritation. Among all, F3 showed a pH close to the natural skin pH, making it more compatible and safe.

Foamability and foam stability are important parameters for cleansing preparations. Formulations with lower SLS concentration (F1, F2) produced less foam, while higher concentrations (F4, F5) produced excessive foam, which may lead to skin dryness and irritation. F3 exhibited optimum foamability and good foam stability, indicating balanced cleansing action.

Viscosity and spreadability are critical for user acceptability. F1 showed low viscosity, making it too runny, whereas F4 and F5 were highly viscous, affecting ease of application and washability. F3 demonstrated optimum viscosity, providing good consistency and ease of use.

The presence of herbal extracts contributed significantly to the formulation. Aloe vera provided moisturizing properties, Neem exhibited antimicrobial activity, and Tulsi acted as an antioxidant. The balanced concentration of these extracts in F3 enhanced the overall effectiveness of the formulation.

Skin irritation studies revealed that F1, F2, and F3 were non-irritant, while higher surfactant concentration in F4 and F5 may caused slight irritation. Stability studies indicated that F3 remained stable under different storage conditions without any significant changes in color, odor, or consistency.

Based on all evaluation parameters, F3 formulation showed the best performance in terms of physicochemical properties, stability, and user acceptability. Therefore, it can be concluded that F3 is formulation of the polyherbal facewash.

#### 4] CONCLUSION

The present study successfully formulated and evaluated a polyherbal facewash using natural ingredients such as Aloe vera, Neem, and Tulsi. Five different formulations (F1–F5) were prepared by varying the concentrations of key ingredients to obtain formulation.

All formulations were evaluated for physicochemical parameters including appearance, pH, foamability, viscosity, spreadability, washability, skin irritation, and stability. The resultsshowed that all formulations were within acceptable limits; however, significant variations were observed based on composition.

Among all, formulation F3 exhibited the best overall performance with optimum pH, balanced foamability, suitable viscosity, good stability, and no skin irritation. The orange (amber-like) color and smooth consistency of F3 also enhanced its acceptability.

Therefore, it can be concluded that the polyherbal facewash formulation F3 is effective, and safe for skin application, and it has good potential for use as a herbal cosmetic product.

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