



Review Article

## Polyherbal Facewash Formulations: A Comprehensive Review

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### ABSTRACT

The emergence of herbal and polyherbal formulations of facewash has created a strong alternative to the traditional synthetic facial cleansers with their enhanced safety profile, enhanced suitability, and multi-purified therapeutic advantage. These preparations are made by combining extracts of different medicinal plants of bioactive phytochemicals (flavonoids, phenolics, tannins, alkaloids, terpenoids and natural saponins). These are antimicrobial, antioxidant, anti-inflammatory and calming compounds. Polyherbal facewash solutions will play a significant part in ensuring cleanliness of the face by removing dirt, excess sebum and microbiological pollutants, as well as preserving the natural pH and moisture levels in the skin. They are also quite useful in the treatment of simple skin conditions like inflammation, acne, skin irritation, and hyper pigmentation. This review is comprehensive covering the applications, advantages, classes and the commonly used plant ingredients in herbal treatments within facewashing products. General preparation methods and several of the assessment criteria, including physicochemical, microbiological safety, stability, and antimicrobial action are highlighted to ensure quality and effectiveness of the products. The paper indicates the growing trend of consumers to the use of natural skin care products and the prospect of future research and development in the polyherbal facewash formulations such as advanced extraction techniques and new delivery mechanisms.

### INTRODUCTION

One of the popular dermatological preparations, facewash, is supposed to clean the face skin on a daily basis and preserve it. This is vital in the removal of the accumulated pollutants that accrue on the skin surface during the day such as dirt, excess sebum, environmental pollutants, dead skin

cells, and microbiological contaminants. Click or tap here to enter text. Compared to traditional soaps, which are alkaline and potentially damaging to the stratum corneum, modern facewash recipes contain gentle surfactants and skin-compatible chemicals which preserve the naturally available moisture and resistant properties of the skin, facilitate mild exfoliation

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and bacteria diminution, keep the skin clean and hygienic, and reduce acne flare-ups. Herbal and polyherbal face cleansers have become popular in the last few years due to their safety, low irritation potential, as well as their therapeutic benefits. Click or tap here to enter text. Although they are efficient, synthetic chemical-based cleansers could lead to dryness, irritation, or pH disproportion even during the course of usage. Instead, herbal formulations contain high concentrations of flavonoids, alkaloids, saponins, essential oils, tannins, and other bioactive compounds, which have antimicrobial, anti-inflammatory, antioxidant, astringent and skin-brightening effects.<sup>[1,2]</sup>

Combined, these phytochemicals will clean the skin, regulate sebum, reduce inflammation, and help to treat typical skin conditions such as blemishes, acne, blackheads and moderate pigmentation. The popularity of herbal and polyherbal face cleansers has been increasingly growing in the past few years due to the fact they are safe, have minimal chances of causing irritation, and have therapeutic effects. Synthetic chemical-based cleansers although effective may lead to pH imbalance, irritation or dryness in the long run when used. Contrarily, herbal preparations use plant extracts with high amounts of flavonoids, alkaloids, saponins, essential oils, tannin, and other bioactive substances that have antibacterial effect, anti-inflammatory effect, antioxidant effect, astringent effect, and skin-brightening effect. All these phytochemicals combine to clean the face, regulate the production of sebum, prevent irritation, and treat such frequent ailments as moderate pigmentation, acne, pimples, and blackheads. Everything said and done, polyherbal facewashes may represent a potential skincare approach through the integration of the curative effect of medicinal plants with the cleaning effect of face cleansers.

The growing popularity of these products among the contemporary dermatology and cosmetology can be seen as the result of consumer demand towards safe, natural, efficient and multipurpose skincare products.<sup>[3,4]</sup>

## APPLICATION OF FACEWASH:

The facewash is an essential skincare item that washes and keeps the general cleanliness of the face skin. It is primarily used to remove skin cells, sweat, excess oil, dust, and built up debris accumulating on the skin throughout the day on the environment. Washing often keeps the skin fresh and healthy and reduces the amount of pollutants, as well as prevents the clogging of the pores. The available published literature shows that facewash is necessary to maintain the skin hygiene, diminish the emergence of comedones, and healthy skin physiology. Another important application of facewash is prevention and treatment of acnes. The common type of bacteria that cause inflammatory acne such as *Cutibacterium acnes* and *Staphylococcus aureus* are usually present on the skin of the face. A face wash to clean the skin reduces the microbial burden, removes the surplus of sebum, and prevents the plugging of pores. Based on research involving herbal preparations, plant-based facewash formulations have the potential to be strongly antibacterial and their usefulness in reducing the amount of germs which cause acne and maintaining cleaner skin. Moreover, facewash helps to maintain the moisture level of skin. Facewash contains moisturizing chemicals and moderate surfactants that clean skin without depositing vital lipids unlike the traditional soaps which can destroy the skin barrier leading to excessive skin dryness. There is literature that suggests that herbal formulations in facewash can be used to increase the softness of the skin, decrease the dryness as well as improve the skin texture besides being able

to clean the skin effectively. Facewash is also useful in exfoliation. Daily cleaning enhances better skin renewal and a smoother skin texture by exfoliating the skin of dead epidermal cells of the skin surface. This soft peeling effect enhances the development of new healthy cells, cleanses better skin and reduces dullness. Research suggests that as a way of diminishing early signs of aging by enhancing skin turnover, regular exfoliation of old cells can also help reduce these signs. There is also the use of facewash formulas that enhance the complexion and lighten the skin. Many herbal ingredients possess small depigmenting, antimyelomorphic and antioxidant effects that serve to restrain oxidative stress, achieve an even tone and reduce pigmentation. These features are useful in establishing a clean brighter and radiant look when used as a routine of a skincare program. Moreover, face washing is an important step that precedes any other skin or dermatological product. It enhances the uptake and the effectiveness of subsequent interventions, e.g., toners, serums, moisturizers, or acne-controlling products, by opening the pores and removing impurities. When the skin is clean, active chemicals can enter easier, which results in the overall effectiveness of the skincare routines. Everything said and done, facewash is not just a cleaning process but a procedure that is necessary to maintain the health of the skin. It assists in treating acne, moisturizing, peeling, enhancing the skin tone, managing microbes and pre-treating the skin to other treatments. The use of facewashes in the daily skin care routine is also a common practice due to the numerous purposes attached to them especially when they are prepared using natural ingredients.<sup>[5-9]</sup>

## MECHANISM OF ACTION OF FACEWASH:

Facewash cleans, purifies, and maintains healthiness of the skin as a result of a series of interrelated physicochemical, biological processes. The mechanism depends on the nature of the substances used including surfactants, humectants, exfoliants and phytochemicals present in herbal or polyherbal preparations. These systems combine to remove impurities, control the growth of microbes, command sebum production, exfoliation and protect the skin against biological or environmental damage. As per the literature, facewash preparations have soft effects on the surface of the skin, without harming its natural moisture balance and protective properties.

### 1. Mechanism of Cleansing via Surfactant:

Surfactants are the primary washing agents of the facewash mixtures. These molecules may react with various contaminants present on the skin surface since it bears hydrophilic (loving water) or lipophilic (loving oil) ends.

**1.1 Lowering of Tension at the Interface:** The level of the surface tension between the skin and contaminants is reduced by using surfactants that contribute to the separation of dirt, oils and particle matter of the skin. This renders the surface of the skin more wet and facilitates the easy spread of the formulation.

**1.2 Formation of Micelles:** At a certain concentration, surfactants form micelles a spherical continuous structure with hydrophilic heads facing outward and hydrophobic tails facing inward, which traps oil and lipid based contaminants in the core of the structure and makes it water soluble. Rinsing takes away the oil, sebum, and dirt-filled micelles in the skin leaving it clean.

**1.3 Extraction of Sebum and Oil-Soluble Impurities:** In situations where the amount of

sebum is excessive, it contributes greatly to the occurrence of acne. Surfactants reduce the pore congestion and acne formation by breaking down this greasy fluid and eliminating it through the skin surface. Based on the study on the capacity of facewash to minimize acne, the cleansing effect allows it to prevent the occurrence of blackheads, whiteheads, and acnes lesions.

### **1. Keratolytic and Exfoliation Mechanism:**

Exfoliation is one of the key methods in which facewash restores the skin surface.

**2.1. Violation of Corneocytes Adhesion:** In stratum corneum, adhesion molecules and intercellular lipids join dead skin cells. Some of the ingredients in the facewash are fruit acids, herbal enzymes and phenolic compounds that reduce the adhesions between these dead cells.

**2.2. Removal of Dead Skin Cells:** Facewash helps to smooth skin texture and reduce dullness and promotes rapid turnover of cells by exfoliating and relaxing the upper layers of the skin. The literature notes that this process is essential in complexion improvement and preventive anti-aging treatment.

**2.3. Prevention of Pore Blockage:** The risk of pore congestion, which is fundamental to the pathophysiology of acne, is reduced in the event of dead skin cell removal. The insect cells are often deposited because of the presence of unremoving cells that are keratinized and mixed with sebum to produce comedones. Therefore, facewash contains exfoliating properties that maintain the clarity of pores and reduce the possibility of acne development.

### **3. Antimicrobial Mechanism:**

Powerful antibacterial properties of facewash formulations that contain herbal extracts assist in

the control of the bad microorganisms that are associated with skin diseases and acne.

**3.1. Direct Antibacterial Effect:** Examples of bioactive compounds in most of the herbs include flavonoids, tannins, alkaloids, terpenoids and saponins that destroy cell walls of bacteria and interfere with the metabolism of microorganisms. Research has demonstrated strong inhibitory activity to *Staphylococcus aureus*, one of the leading agents responsible of acne, using herbal facewash with plant extracts, where the largest area of inhibition is 60 mm.

**3.2. Prescription of A. acnes Population:** Herbal extracts that possess antibacterial and antioxidant effects inhibit *Cutibacterium acnes* by preventing the formation of inflammatory acnes lesions.

**3.3. Secondary Infection Prevention:** Facewash decreases the occurrence of pustules and secondary bacterial infections that exacerbate the skin issues by decreasing the number of microbes to the skin surface.

**3.4. Antifungal and weak Antiviral Effects:** Some of the ingredients of herbs have a broad-spectrum antibacterial effect, which may enhance general skin cleanliness and reduce fungal colonization.

### **4. Sebum Regulation Mechanism:**

The balance of oil in the skin, as well as, prevention of acne, is determined by the control of sebum secretion.

**4.1. Minimization of Excess Surface Oil:** Facewash helps to prevent the reduction of the greasy environment that promotes the growth of microorganisms by removing sebum on the skin to reduce shine.

**4.2. The Herbal Regulating of Sebaceous Glands:** Herbal extracts that can help to regulate sebaceous glands may include phytochemicals used to regulate sebaceous glands, like those used in polyherbal facewash products. These are substances that do not eliminate important lipids but keep up the optimal balance of oils on the skin. Literature has demonstrated the use of herbal facewash to enhance the overall skin appearance and oil management.

**4.3. Inhibition of Sebum Oxidation:** Oxidized sebum contributes to inflammation as well as the formation of blackheads. The antioxidants present in Herbal facewash prevent the process of lipid peroxidation and maintains the clarity of the skin.

### 5. Anti-Inflammatory Mechanism:

Inflammation is a significant ingredient in acne, irritation and redness.

**5.1. Inhibition of Pro-Inflammatory Mediators:** Herbal extracts reduce inflammatory products including free radicals, prostaglandins, and cytokines. It reduces the skin irritation and prevents the aggravation of acne.

**5.2. Calming and refrigerating Effects:** The skin comfort and texture enhancement of clinical results with herbal preparations indicate the cooling and calming effect of the ingredients such as cucumber, aloe vera, alongside other botanicals that minimize redness and irritation.

**5.3. Empowering the Skin Barrier:** Anti-inflammatory phytochemicals also reduce sensitivity and enhance resistance to environmental stresses in addition to facilitating repair of the barriers.

### 6. Antioxidant Mechanism

Oxidative stress enhances aging, dark spots and skin dullness.

**6.1. Free Radicals Neutralization:** Herbal substances contain antioxidants such as phenolics, flavonoids and essential oils, which help in neutralizing reactive oxygen species (ROS). This enhances the health of the skin in the long-term and protects the skin cells.

**6.2. Pigmentation Prevention and Darkening Prevention:** Oxidative stress causes melanin production to be stimulated. Herbal facewash prevents pigmentation, reduces dullness and brightens the skin by reducing the free radicals.

**6.3. Defense against Environmental Aggressors:** Antioxidants will help avoid early aging and achieve cleaner and healthier skin through additional protection against pollution, UV rays and pollutants.

### 7. Mechanism of hydration and Moisture-Balance:

Washing should be done in a way that it does not interfere with the natural level of moisture in the skin.

**7.1. Role of Humectants:** Such ingredients as glycerin and plant polysaccharides attract and retain water, which prevents skin dehydration during and after cleansing.

**7.2. Excessive dryness:** Excessive dryness should be prevented. It has also been proved that herbal facewash preparations enhance skin plumpness and skin dryness. This means that their mechanism involves the support of hydration and cleaning.

**7.3. The maintenance of the Acid Mantle:** The pH of the skin must be in the range of 5.5-6.5 to provide the skin with barrier protection and antimicrobial protection. Facewash maintains this

pH constant thereby preventing irritation and encouraging healthy skin flora.

## 8. Depigmentation and the Skin-Brightening Mechanism:

Polyherbal facewash usually exhibits complexion-promoting effects.

### 8.1. Inhibition of Tyrosinase Activity:

Tyrosinase is an enzyme that catalyzes the hydroxyl group of the aromatic amino acid L-tyrosine, necessary for catecholamine synthesis, to L-dihydroxyphenylamine along with hydroxytryptophan, a direct catecholamine synthesis product. Tyrosinase is an enzyme that catalyzes the hydroxyl group of the aromatic amino acid L-tyrosine, which the production of catecholamines requires, Tyrosinase an important enzyme in melanin production is blocked by some of the herbal substances and this helps reduce patchy pigmentation and dark spots.

### 8.2. Elimination of Dull Surface Cells:

Exfoliation increases brightness by getting rid of dead cells that have accumulated giving an impression of dullness.

### 8.3. Lessening of Oxidation Stain:

Herbal anti-oxidants lighten the skin because they decrease oxidative stress, and this results in the build-up of melanin.

## 9. Cosmetic Effect of Skin Conditioning and Softening:

Facewash helps skin to be smooth because:

- Natural emollients which make the skin soft.
- Polysaccharides which create protective film.
- Phenolic texture enhancing substances.
- Tonic herbs which are keeping her supple.

As shown in clinical inquiries, the application of herbal facewash increases the overall skin texture, brightness, and smoothness.

## 10. Increased Theodicy of Subsequent Skin Treatments:

Facewash cleanses unwanted materials and decongests pores and prepares the skin:

- Moisturizers
- Serums
- Sunscreens
- Anti-acne treatments

Cleansing also improves the absorption of the active ingredients in the skin which contributes to the overall performance of the skincare habits.

## ADVANTAGES OF HERBAL FACEWASH:<sup>[10,11]</sup>

Herbal facewash has several useful and health-related advantages over the synthetic and chemical-based one. These effects are due to the synergistic effect of a number of botanical extracts that are rich in natural surfactant, antibacterial phytochemicals, anti-inflammatory properties, and antioxidants. Literature supports the efficacy, safety and aesthetics of herbal facewash as many studies were conducted on experimental, formulation and clinical research.

### 1. Non-Irritable, Mild and Safe to Skin:

The mildness and dermal affinities of Herbal facewash are considered to be one of its greatest advantages. There are no strong chemical detergents, artificial aromas, harsh preservatives none of which can irritate or even dry up delicate skin as present in herbal formulas. Studies indicate that the herbal facewash maintains the acid-lipid balance of the skin and protects the skin against consequences of the alkaline soaps which often



damage the skin. The use of herbal facewash can be used on a long-term basis because it is friendly to the skin.

## 2. Based on Natural and Biocompatible Ingredients:

Herbal formulations use extracts of leaves, roots, fruits, flowers and bark since they contain naturally available substances that are desirable on the skin. These compounds comprise alkaloids, terpenoids, flavonoids, tannins, saponins, and essential oils and they are medicinal and purifying. Herbal cleansers are biocompatible and therefore can be used on all types of skin and especially on sensitive and acne-prone skin.

## 3. Highly effective against bacteria (Anti-Acnes Advantage):

The Herbal facewash has strong antimicrobial effects against pathogens that cause acne.

**3.1 A good activity toward *Staphylococcus aureus*:** Experimental data showed that large inhibition zones of up to 60 mm were obtained with strong antibacterial activity using kersen leaf-based formulations.

**3.2 Anti-acnes-related microbe activity:** Many of the herbs employed in facewash have strong antibacterial activities such as orange peel, neem, turmeric, liquorice, calendula and palash which reduce pustules, inflammatory acne and bacterial proliferation on the skin. The herbal anti-acnes gels prepared using palash and licorice extracts exhibited significant antibacterial properties which showed that they could be used in herbal cleansers. Anti-acnes face gel that is liquor.

**3.3 Secondary infections prevention:** Herbal facewash prevents the onset of microbial-related irritation, inflammatory process, and unpleasant

pustular acne undesirable through reduced microbial load.

## 4. Antioxidant Defense of the Skin Damage:

- Most herbal extracts contain antioxidants that neutralize the free radicals, which make the skin dull, pigmented and age early.
- Citrus peel extracts contain phenolics, vitamin C, flavonoids and limonene which are powerful antioxidants.
- Carotenoids such as lutein that are present in calendula have been known to protect the skin against oxidative and inflammatory stress.
- Citrus extracts and Evodia are two chemicals included in instant whitening facewash, and they are known to brighten the skin and reduce the oxidative stress.

Combining all these antioxidant effects, reduces skin fatigue, enhances skin brightness and prevents oxidative damage caused by UV rays.

## 5. Acne and Sensitive Skin and Anti-Inflammatory Effects:

Inflammation contributes greatly to skin irritation and the formation of acnes. Herbal extracts in facewash reduce inflammation by suppressing pro-inflammatory mediators, reducing redness, swelling and irritation, and possessing calming effects due to their cooling effects of aloe vera and cucumber. Clinical assessment of herbal facewash reveal that regular use helps in curbing skin irritation, redness and comfort by a great deal.

## 6. Aids in Sebum Control and Regulation of oil:

The bacterial growth and development is reduced by herbal facewash preparations which otherwise leads to excessive sebum production.

- Some of the astringent herbs, orange peel, neem and cucumber extracts narrow the size of pores and regulate surplus sebum.
- As a result of the study on gel-based herbal compositions, the optimum characteristics of oil-removal were found without excessive drying.

Anti-acnes face gel that is liquor. The facewash made of herbs is specifically recommended to the oily and acne prone skin due to its balanced oil control.

### **7. Smooth and Clear Skin Mild Exfoliation:**

Natural exfoliating agents present in most herbal herbs such as citric acid, fruit enzymes and phenolics, help in the desquamation of the dead skin cells. Herbal extracts are useful in preventing comedone, supporting the skin texture, cell renewal and eliminating rough and dull surface layers. Peel based substances and herbal powders have been shown to have exfoliating properties in a number of herbal preparations.

### **8. Natural Lightening and Depigmentation:**

Herbal facewash provides natural effects of complexion:

- Dark spots are lightened with vitamin C and flavonoids in citrus extracts;
- Liquorice is known to contain glabridin, which is a known pigmentation-reducer;
- The formulation of herbal whitening facewash was demonstrated to have noticeable benefits of skin-brightening in experimental analysis.

Increased exfoliation, reduction of oxidative stress, and inhibition of melanin formation are

some of the mechanisms that herbal depigmentation is obtained.

### **9. Moisturises Skin and Shields Skin Barrier:**

The ingredients contained in herbal facewash moisturizing properties are:

- Aloe vera
- cucumber extract
- natural polysaccharides
- Glycerin

Clinical studies have proved that besides keeping the skin moist and enhancing dryness, the herbal cleansers ensure effective cleaning. Due to this fact, herbal facewash can be used regularly without reducing the barrier of the skin.

### **10. Sustainable and Environment-Friendly:**

Herbal elements are natural, non-toxic to the environment, they are manufactured using plants, and are biodegradable. They do not contribute to chemical pollution caused by artificial preservatives, synthetic surfactants or microplastics in cosmetic cleansers. It is against this reason that herbal facewash is one of the suggested options in cosmetic production that is environmentally friendly.

### **11. Multi-Functional Benefits Single Formulation:**

Herbal facewash has multi-dimensional effects on the skin compared to chemical cleansers that do not offer more than one effect:

- Cleansing
- Antioxidation
- Antimicrobial activity
- Anti-inflammatory action
- Complexion enhancement
- Moisturization



- Exfoliation
- Sebum regulation

The proof of the multifunctional utility of herbal facewash preparations proves the enhancement of the acne, dullness, dryness, and texture.

## 12. Suitable for All Skin Types:

Due to the gentleness and biocompatibility of herbal extracts, herbal facewash can be customized or can be naturally adapted to:

- Oily skin
- Dry skin
- Combination skin
- Sensitive skin
- Acne-prone skin

Herbal products balance sebum, moisturise dry skin and calm even sensitive skin without irritation.

## TYPES OF FACEWASH:

Facewash formulations are available in various forms depending on their composition, physical form, skin type, and purpose of use in therapeutic or cosmetic use. Each variety has a variety of the surfactant system, viscosity, herbal content, method of washing, and versatility to different skin disorders. The literature includes several types of facewash, including: gel-based, liquid, cream-based, herbal, exfoliating and specialist therapy formulas.

The following is an extensive classification:

### 1. Based on Physical Form:

#### 1.1 Gel-Based Facewash:

Gel facewashes are clear or translucent preparations prepared with the help of gelling agents like carbopol, acrypol or natural gums.

Characteristics:

- Light weight non-greasy texture.
- Curved to oily and acne prone skin.
- Provide controlled foaming
- Ability to use herbal extracts in an effective manner.

Antimicrobial and anti-acne activity of extracts used in herbal gel facewash (kersen leaf, calendula, liquorice, etc.) was high.

#### 1.2 Liquid Facewash:

The most common of the cleansing formulations are liquid facewashes which can either be transparent or slightly turbid.

Characteristics:

- Mild surfactants
- Rapid spreading
- Suitable for all skin types
- Better washing without drying me out.

Extracts such as citrus peel, neem, aloe vera and rose are contained in herbal liquid formulations as described in literature, and that have proved to have cleansing and moisturizing effects.

#### 1.3 Cream-Based Facewash:

Facewashes are cream types of emulsified products that are created to be used on dry and sensitive skin.

Characteristics:

- Thick, creamy texture
- High moisturizing ability
- Mild cleansing effect



- Applicable to the dry, flaky, or mature skin.

These recipes tend to have emollients, natural oils and calming extracts.

The facewash is a powder, rather than a liquid, and its ingredients are listed as follows:

#### **1.4 Powder Facewash (Herbal Powder Cleansers):**

The finely powdered herbs, clays or natural exfoliants are found in powder facewashes.

Characteristics:

- Soap-free cleansing
- Mild physical exfoliation
- Long shelf life
- Suitable to both the sensitive and combination skin.

Dried citrus peel, neem powder, turmeric, multani mitti and other herbal powders are used in powder facewashes.<sup>[5]</sup>

### **2. Based on Skin Type:**

#### **2.1 Facewash for Oily Skin:**

Prepared using astringent herbs which control sebum such as citrus peel, neem and cucumber.

Benefits:

- Controls excess oil
- Reduces shine
- Clogged pores and acne are prevented.

It has been found that the compositions of facewash in herbs contain significant oil-removal properties.

Anti-acne face gel made of liquor.

#### **2.2 Facewash for Dry Skin:**

Some of the calming and moisturizing ingredients found in the formulations include aloe vera, glycerin and hydrating herbal extracts.

Benefits:

- Prevents dryness
- Restores moisture
- Enhances softness and barrier effect.

The clinical assessment of Herbal facewash revealed that the product can enhance dryness and overall hydration.

#### **2.3 Facewash for Sensitive Skin:**

Prepared using minimal irritants and supplemented with calming herbal extracts such as rose, calendula, cucumber and aloe vera.

Benefits:

- Lessens irritation and redness.
- Soothes inflammation
- Mild cleansing action

Herbal anti-inflammatory substances can help to calm down sensitive or reactive skin.

#### **2.4 Facewash for Acne-Prone Skin:**

has some of the strongest antibacterial, exfoliating and oil-controlling ingredients such as kersen leaf, orange peel, liquorice, neem, turmeric and palash.

Benefits:

- decreases bacteria that cause acne.
- Controls sebum
- Clears pores

**Comedones:** Prevents the development of comedones.



The herbal facewash formulations demonstrated strong antibacterial effect against *Staphylococcus aureus* which is a major bacterium leading to acne.

### 3. According to Functional/Herbal Purpose:

#### 3.1 Anti-Acne Facewash:

Well-endowed with antimicrobial and exfoliating herbs.

Herbal ingredients: neem, palash, liquorice, calendula, turmeric, citrus peel.

Advantages: clears up pores, reduces the number of microbes, and prevents inflammatory acne.

Herbal anti-acne gels were proven to be of good antibacterial qualities thus can be used as a facewash.

#### 3.2 Skin-Brightening/ Whitening Facewash:

Both contain naturally occurring plants that contain antioxidant and depigmenting properties.

Herbal ingredients: liquorice, citrus peel, aloe vera, turmeric, Evodia extract.

Benefits:

- Reduces pigmentation
- Improves complexion
- Enhances radiance

Whitening products made of citrus and herbal brighteners showed a strong potential to whiten skin.

#### 3.3 Moisturizing and Hydrating Facewash:

Developed to be used on dry, dehydrated or irritated skin.

Herbal ingredients: aloe vera, rose, cucumber, extracts of glycerin.

Benefits:

- Enhances the ability to retain moisture.
- Softens the skin
- Prevents disruption of barriers.

It has been found out that herbal remedies improve the texture and dryness of the skin.

#### 3.4 Exfoliating Facewash:

Applies herbal exfoliants or natural fruit acid.

Herbal ingredients: citrus peel, fruit enzymes, soft scrubbing granules.

Benefits:

- Removes dead cells
- Improves texture
- Supports skin renewal

Formulas made of citrus stimulate more tender skin and peeling.

### 4. Based on Surfactant System:

#### 4.1 Soap-Free Herbal Cleansers:

These cleaners do not have artificial detergents.

Characteristics:

- Very mild formulation
- Suitable to sensitive or eczematous skin.
- Takes herbal natural saponins.

#### 4.2 Foam-Based Facewash:

Employs air inducing systems or foaming surfactants.

Characteristics:



- Light, airy foam
- Preferred for oily skin

They include:

Brings instant cleansing feeling.

Herbal foaming cleansers are often made using natural foaming agents such as saponins or mild surfactants.

#### 4.3 Non-Foaming Facewash:

Routine in hydrating and sensitive-skin preparations.

Characteristics:

- Creamy texture
- Very gentle
- Minimal surfactant content

They are adequate in order to repair the skin in need of barrier.

#### 5. Based on Herbal Composition:

##### 5.1 Single-Herb Facewash:

Has a single plant extract, i.e. neem or aloe vera.

##### 5.2 Polyherbal Facewash:

Combines a variety of complementary plants in order to give a synergistic effect.

Polyherbal face washes with combination extracts of marigold, liquorice plus citrus peel have been revealed to possess antibacterial, anti-inflammatory, and antioxidant properties.

#### Plants / Plant Parts Used in Herbal Facewash

Plant Name	Scientific Name	Part of plant Used	Major Phytochemicals	Medicinal use
Neem <sup>[6,13]</sup>	<i>Azadirachta indica</i>	Leaves	Azadirachtin, Nimbin	Anti-acne, antimicrobial, pore cleansing
Turmeric <sup>[5,14]</sup>	<i>Curcuma longa</i>	Rhizome	Curcuminoids	Anti-inflammatory, antioxidant
Liquorice <sup>[13]</sup>	<i>Glycyrrhiza glabra</i>	Root	Glycyrrhizin, Glabridin	Skin brightening, anti-inflammatory
Orange <sup>[13]</sup>	<i>Citrus sinensis</i>	Peel	Vitamin C, Limonene	Exfoliating, brightening, oil control
Calendula <sup>[15]</sup>	<i>Calendula officinalis</i>	Flowers	Lutein, flavonoids	Healing, soothing, antimicrobial
Kersen <sup>[16]</sup>	<i>Muntingia calabura</i>	Leaves	Flavonoids	Strong antibacterial, anti-acne
Aloe vera <sup>[5,17]</sup>	<i>Aloe barbadensis</i>	Leaf gel	Aloin, polysaccharides	Hydrating, soothing, cooling
Cucumber <sup>[7]</sup>	<i>Cucumis sativus</i>	Fruit	Vitamins, antioxidants	Hydration, cooling, irritation reduction
Lemon <sup>[13]</sup>	<i>Citrus limon</i>	Peel/Fruit	Citric acid, Limonene	Astringent, exfoliating
Tulsi <sup>[18]</sup>	<i>Ocimum sanctum</i>	Leaves	Eugenol, terpenoids	Antimicrobial, antioxidant
Rose <sup>[5]</sup>	<i>Rosa spp.</i>	Petals	Anthocyanins, essential oils	Toning, soothing
Sandalwood <sup>[1]</sup>	<i>Santalum album</i>	Heartwood	Santalols	Cooling, complexion improving
Multani Mitti <sup>[1]</sup>	—	Clay	Silicates	Oil absorption, pore detoxification
Manjistha <sup>[7]</sup>	<i>Rubia cordifolia</i>	Root	Anthraquinones	Brightening, anti-acne



Green Tea <sup>[6,20]</sup>	<i>Camellia sinensis</i>	Leaves	Catechins	Antioxidant, anti-aging
Papaya <sup>[21,22]</sup>	<i>Carica papaya</i>	Fruit	Papain enzyme	Enzymatic exfoliation
Peppermint <sup>[7,17]</sup>	<i>Mentha piperita</i>	Leaves	Menthol	Cooling, antibacterial
Lavender <sup>[21]</sup>	<i>Lavandula angustifolia</i>	Flowers	Linalool	Soothing, anti-irritant
Amla <sup>[23]</sup>	<i>Emblica officinalis</i>	Fruit	Vitamin C, tannins	Brightening, antioxidant
Shikakai <sup>[24]</sup>	<i>Acacia concinna</i>	Pods	Saponins	Natural cleansing, mild surfactant
Tea Tree <sup>[21]</sup>	<i>Melaleuca alternifolia</i>	Leaves (oil)	Terpinen-4-ol	Strong antimicrobial
Guava Leaf <sup>[25]</sup>	<i>Psidium guajava</i>	Leaves	Quercetin	Anti-acne, antibacterial
Ashwagandha <sup>[26]</sup>	<i>Withania somnifera</i>	Root	Withanolides	Anti-inflammatory
Gotu Kola <sup>[27]</sup>	<i>Centella asiatica</i>	Leaves	Asiaticoside	Skin repair, collagen boosting
Daruharidra <sup>[28]</sup>	<i>Berberis aristata</i>	Root	Berberine	Antibacterial, anti-acne
Brahmi <sup>[22]</sup>	<i>Bacopa monnieri</i>	Leaves	Bacosides	Anti-inflammatory
Cinnamon <sup>[6]</sup>	<i>Cinnamomum zeylanicum</i>	Bark	Cinnamaldehyde	Antimicrobial
Grapeseed <sup>[29]</sup>	<i>Vitis vinifera</i>	Seed	Proanthocyanidins	Antioxidant, anti-aging
Henna <sup>[22]</sup>	<i>Lawsonia inermis</i>	Leaves	Lawsone	Antibacterial, cooling
Saffron <sup>[30]</sup>	<i>Crocus sativus</i>	Stigma	Crocin	Skin brightening
Vetiver <sup>[31]</sup>	<i>Vetiveria zizanioides</i>	Root	Vetiverol	Cooling, irritation reduction
Fenugreek <sup>[22]</sup>	<i>Trigonella foenum-graecum</i>	Seeds	Diosgenin	Anti-inflammatory
Ginger <sup>[22]</sup>	<i>Zingiber officinale</i>	Rhizome	Gingerols	Antioxidant, anti-irritant
Basil <sup>[22]</sup>	<i>Ocimum basilicum</i>	Leaves	Linalool	Antibacterial
Chamomile <sup>[21]</sup>	<i>Matricaria chamomilla</i>	Flowers	Apigenin	Anti-inflammatory, soothing
Hibiscus <sup>[32]</sup>	<i>Hibiscus rosa-sinensis</i>	Flowers	Anthocyanins	Brightening, antioxidant
Honey <sup>[5]</sup>	—	Natural extract	Enzymes, sugars	Hydrating, antibacterial

## General Method of Preparation of Polyherbal Facewash

Polyherbal facewash is prepared through a systematic process of extracting some plant materials, incorporating suitable base components, modifying physicochemical properties and stabilization of the final product. The whole procedure might vary depending on whether it is a gel, liquid, or foaming facewash formulation, but the overall procedure is similar in most of herbal treatment.

### 7.1. Extraction of Herbal Extracts:<sup>[33,34]</sup>

#### a) Selection and Cleaning of Plant Material:

The choice of the sample is based on the characteristics of the tree and the area of its growth. The sample is cleaned and dried prior to sample processing.

- Select real and fresh parts of the plant (leaves, roots, rhizomes, blossoms and peels).
- Eliminate foreign bodies, dust and dirt.
- Wash extensively under running water then dry in the shade.

**b) Size Reduction:** To enhance the extraction process, the dried vegetation is fine-grounded in a coarse or fine powder.

**c) Extraction Process:** The most common extracting methods are:

- **Maceration**

Plant powder is moistened in aqueous or hydroalcoholic solvent during 24-72 hours as it is stirred periodically.

- **Decoction / Infusion**

The parts of the plants are steeped (infusion) or boiled (decoction) in hot water in order to extract water-soluble components.

- **Soxhlet extraction**

Applied to those plants in which solvent-based continuous hot extraction is required.

- **Cold extraction (heat-sensitive herbs):**

This is a technique used to extract the properties of herbs without using heat.

Extraction works best with vitamin sensitive, flower sensitive and leaf sensitive extracts.

**d) Filtration and Concentration:**

- The extract is filtered using whatman filter paper or muslin cloth.
- The filtrate is concentrated using a rotary evaporator at low pressure.
- The extract obtained is either semi-liquid or dry.

**7.2. Preparation Facewash Base:** <sup>[35,36]</sup>

This approach will assist in determining the proper quantity of the liquid to include in the finish and the several materials required to make it.

Depending on the type of formulation different bases are used:

**a) Gel Base Preparation**

- A gelling agent, which can be HPMC, Xanthan gum or Carbopol is added to purified water.
- The polymer is stirred a continuous stir until it has been hydrated.
- The PH is adjusted with triethanolamine (TEA) or sodium hydroxide and is usually in the range of 5.5 to 6.0.
- To retain moisture, such humectants as glycerin or propylene glycol are introduced.

**b) The preparation of a liquid / foaming base**

- Surfactants that are added to water include Sodium Lauryl Ether Sulfate (SLES), Cocamidopropyl betaine or saponins of plants.
- A slight amount of stirring is made, to avoid excessive froth.
- It can be added with hydrating agents, natural conditioning agents and viscosity boosters (CMC, HPMC).

**7.3. The Herbal Extracts will be incorporated:**

- Dissolution or distribution of pre-measured amounts of herbal extracts are done with a small portion of warm water or glycerin.
- The gel or surfactant base that has been prepared is slowly combined with this extract mixture and stirred it constantly.
- Stirring is maintained to ensure that dispersion is uniform and there is no clumping.

**7.4. Functional Ingredients Addition:** <sup>[37,38]</sup>



A variety of functional excipients are introduced in order to make the product more stable and functional:

#### **a) Preservatives**

Examples: Phenoxyethanol, sodium benzoate, potassium sorbate (use in minimal amounts).

#### **b) Antioxidants**

Examples: Vitamin E, citric acid, sodium metabisulfite.

#### **c) Moisturizers**

Examples: Glycerin, aloe vera gel, honey.

#### **d) Essential Oils / Fragrances**

Examples: Lavender, tea tree, rose oil.

#### **e) Colorants**

Extracts of colorants like chlorophyll, turmeric or fruit pigments should be used.

### **7.5. Modification of Final Parameters:**

#### **a) pH Adjustment**

- In case of facewash, 5.5-6.0 ph is required (skin-friendly).
- Adjust using a solution of sodium hydroxide or citric acid.

#### **b) Viscosity Adjustment**

- Add additional polymer (carbopol, xanthan gum) to add viscosity.
- To lower viscosity, either change the surfactant ratio or add distilled water.

#### **c) Homogenization**

To ensure that the product is lump free and smooth, use of a homogenizer or mechanical stirrer is used.

#### **7.6. Filtration (If Liquid):**

To dispose of particles that are not dissolved, liquid or foaming facewash is filtered using muslin cloth.

#### **7.7. Packaging and Storage:**

- The finished product is containing tubes or pump bottles.
- Air tight containers should be used in order to prevent oxidation.
- Store in the dark in room temperature.

#### **7.8. Flowchart of Preparation:**

1. Pickings and purification of vegetal materials.
2. Drying & size reduction
3. Extraction (maceration/soxhlet/decoction)
4. Filtration & concentration
5. Preparation of gel/surfactant base.
6. Addition of herbal derivatives.
7. Inclusion of preservatives, antioxidants, humectants.
8. pH & viscosity adjustment
9. Homogenization
10. Packaging & storage

### **Evaluation Parameters for Herbal / Polyherbal Facewash [5,16,18,34,36,39-41]**

Sr. No.	Evaluation Test	Purpose	Method / Procedure	Acceptable Outcome
1	Organoleptic Evaluation	To assess basic sensory qualities	Visual and sensory inspection of colour, odour, appearance	Uniform colour, pleasant odour, smooth appearance
2	pH Determination	To ensure skin compatibility	Measured using calibrated digital pH meter	pH 5.5–6.0
3	Viscosity Measurement	To check flow and consistency	Brookfield viscometer at various spindle speeds	Stable viscosity, smooth gel consistency
4	Foamability Test	To evaluate foam-producing capacity	Shake 1% solution in cylinder and measure foam volume	Adequate foam forming ability
5	Foam Stability Test	To check retention of foam	Foam volume measured at 1, 5, 10 minutes	Stable foam with minimal reduction
6	Dirt Dispersion Test	To check cleansing ability	Facewash added to ink-water mixture	Dirt remains in water (not foam)
7	Spreadability Test	To evaluate ease of application	Two slide method with applied weight	Good spreadability, uniform film
8	Skin Irritation Test (Patch Test)	To ensure safety on skin	Apply formulation on skin for 24 h	No redness, itching, swelling
9	Washability Test	To check ease of removal	Washed under running water	Easily washable, no residue
10	Stability Studies	To assess long-term storage stability	Physical/chemical evaluation at 25°C & 40°C/75% RH	No phase separation, no colour/pH change
11	Microbial Limit Test	To ensure microbial safety	Plate count method for bacteria & fungi	Within limits; absence of pathogens
12	Antimicrobial Activity	To assess anti-acne activity	Agar well or disc diffusion; MIC determination	Clear zones of inhibition (mm)
13	Saponification / Foaming Index	To estimate natural foaming action	Standard foaming index procedure	Acceptable foaming index value
14	Net Content / Fill Volume	To confirm container fill accuracy	Weighing container before and after filling	Accurate volume, no underfilling
15	Rheological Study	To analyze flow behavior	Using rheometer/viscometer	Pseudoplastic or thixotropic flow
16	Heavy Metal Analysis	Safety confirmation	AAS/ICP-MS for Pb, Cd, As, Hg	Heavy metals within limits
17	Moisturizing / Hydration Test	To measure hydration effect	Skin moisture analyzer	Improved hydration after application
18	Cleaning Efficiency Test	To confirm cleaning performance	Removal of artificial sebum/makeup	Effective removal; minimal residue

## CONCLUSION AND FUTURE SCOPE:

The safety, skin compatibility, and multifunctional therapeutic properties of herbal and polyherbal facewash preparations have been of much interest. Plant-based ingredients that contain flavonoids, tannins, alkaloids, phenolics, terpenoids, vitamins

and natural saponins have cleansing, antimicrobial, antioxidant, anti-inflammatory and calming effects without the adverse side effects of chemical additives and synthetic surfactants. Neem, turmeric, aloe vera, liquorice, orange peel, tulsi, calendula, and green tea are just but a few of the herbs that increase the overall efficacy of

polyherbal facewash by treating acne, excess sebum production, hyperpigmentation, skin dullness, and microbiological contamination. It promises a gentle but effective cleansing solution through the selection of herbs, the proper extraction procedures as well as the best formulation of the solution.

Quality and safety of these formulations are checked using the evaluation criteria as pH, viscosity, foamability, microbiological limits, stability and antibacterial activity. The analyzed literature suggests that polyherbal facewash preparations may be convenient alternatives to conventional cleansers, being more tolerable, more attractive as a cosmetic product, and more acceptable to the users. The facewash formulas made of herbs are doing well in the skincare market due to the increasing need of consumers to natural and plant products.

Although the existing studies have demonstrated that the herbal facewash formulas can be effective, there are still several ways, in which they can be improved:

Further studies should be conducted in the future to enhance the yield and purity of bioactive components using green solvent technologies, microwave-assisted extraction, ultrasound-assisted extraction, and supercritical fluid extraction. The standardization of plant extracts using active phytochemical markers can help to enhance the formulation uniformity, repeatability, and therapeutic outcomes. Nanogels, liposomes, phytosomes, nanoemulsions, and polymer-based carriers can be used to increase the penetration of herbal actives through the skin and bioavailability. The future formulations could include more research-proven herbs with high antibacterial and anti-acnes effects. Policies on polyherbal facewash products require a comprehensive clinical study to ensure its safety, efficacy, and dermatological

benefits in the long term. The studies on biodegradable packaging, sustainable sourcing of plant materials, and environmental friendly manufacturing shall play an important role in the rise of herbal drugs. The advances in the fields of dermatogenomics and the study of the skin microbiome could potentially enable the development of herbal formulations of facewash that could target a particular skin type or condition. Preservation blends to be used on plant products might enhance shelf life and be safer without artificial preservative needs.

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