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Research Article

Formulation And Evaluation of an Aloe Vera-Based Herbal Face Wash for Skin Cleansing and Moisturization

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ABSTRACT

The growing consumer preference for herbal and eco-friendly cosmetic products has accelerated the development of natural skincare formulations with enhanced safety and therapeutic benefits. The present study aimed to formulate and evaluate a herbal face wash containing Aloe vera as the primary active ingredient. Aloe vera is widely recognized for its moisturizing, anti-inflammatory, antioxidant, antimicrobial, and skin-healing properties, making it an ideal candidate for skincare applications. The formulation was prepared using Aloe vera gel in combination with selected herbal ingredients including neem extract, turmeric, honey, glycerin, rose water, and lemon extract to enhance cleansing efficiency, skin nourishment, and antimicrobial activity. The prepared face wash was evaluated for various physicochemical and quality-control parameters such as appearance, pH, spreadability, foamability, washability, homogeneity, skin irritation, and stability. The formulation exhibited a smooth texture, pleasant odor, acceptable appearance, and pH within the skin-compatible range of 5.5–6.5. Good spreadability, moderate foam production, easy washability, and satisfactory stability were observed during storage studies. Skin irritation testing indicated that the formulation was non-irritant and safe for topical application. The synergistic action of Aloe vera and other herbal constituents contributed to effective cleansing while maintaining skin hydration and reducing the risk of dryness, irritation, and acne. The findings suggest that the developed Aloe vera natural face wash represents a safe, cost-effective, and eco-friendly alternative to synthetic facial cleansers and possesses significant potential for application in the herbal cosmetic and pharmaceutical industries

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INTRODUCTION

Aloe vera natural face wash is a herbal skincare formulation designed to cleanse the skin gently while providing nourishment, hydration, and protection. Aloe vera (*Aloe barbadensis Miller*), belonging to the family Liliaceae, has been widely used for centuries in traditional medicine and cosmetic preparations due to its soothing, moisturizing, healing, anti-inflammatory, and cooling properties. With increasing awareness regarding the harmful effects of synthetic chemicals in cosmetic products, consumers are increasingly shifting toward herbal and natural skincare products. As a result, aloe vera-based face washes have gained significant popularity among people of all age groups.

The skin is the largest organ of the human body and serves as a protective barrier against environmental pollutants, microorganisms, dust, and harmful external factors. Continuous exposure to dirt, sweat, oil, and pollution can clog pores and lead to skin problems such as acnes, pimples, irritation, dryness, and dullness. Therefore, regular facial cleansing is essential to maintain healthy and attractive skin. Unlike conventional soaps and chemical cleansers, aloe vera face wash effectively removes dirt and excess oil while preserving the natural moisture balance of the skin.

Aloe vera gel contains numerous bioactive constituents, including vitamins A, C, and E, minerals, amino acids, enzymes, polysaccharides, antioxidants, and lignin. These compounds provide multiple skin benefits such as hydration, antioxidant protection, wound healing, and improved skin elasticity. The polysaccharides present in aloe vera help retain moisture and maintain skin softness, making it particularly beneficial for dry and sensitive skin. Furthermore, its antibacterial, antifungal, and anti-inflammatory properties help control acne-causing microorganisms, reduce redness, and soothe irritated skin.

Face wash is an essential component of daily skincare routines because it removes impurities, excess sebum, dead skin cells, and environmental contaminants from the skin surface. Herbal face washes, especially those containing aloe vera, offer additional advantages by combining cleansing action with therapeutic benefits. Aloe vera face wash is suitable for various skin types, including oily, dry, combination, and sensitive skin, due to its gentle and skin-friendly nature.

Herbal cosmetics have gained widespread acceptance because they are generally considered safer, eco-friendly, biodegradable, and less likely to cause adverse reactions than synthetic products. Aloe vera is one of the most important herbal ingredients used in cosmetic formulations such as face washes, creams, lotions, gels, shampoos, and sunscreens. Regular use of aloe vera face wash helps maintain clean, hydrated, soft, and glowing skin while reducing acne, pigmentation, irritation, and minor skin infections.

Owing to its multifunctional properties, easy availability, safety, and consumer acceptance, aloe vera has become a valuable ingredient in modern herbal cosmetics. The development of aloe vera-based face wash represents an effective approach toward natural skincare by providing cleansing, moisturization, protection, and overall improvement in skin health through a single herbal formulation.

Materials and Method

The Aloe Vera Natural Face Wash was formulated using natural and skin-friendly ingredients selected for their cleansing, moisturizing, soothing, and antimicrobial properties. The primary ingredient, **Aloe vera gel (20–30%)**, was incorporated due to its ability to hydrate the skin, reduce acne, soothe

irritation, promote healing, and provide a cooling effect. Other herbal ingredients included **neem extract (5%)** for antibacterial activity, **turmeric powder (1–2%)** for its antioxidant and anti-inflammatory effects, **honey (5%)** as a natural moisturizer and nourishing agent, **glycerin (5%)** as a humectant to retain skin moisture, **lemon extract (2–3%)** for cleansing and brightening, and **rose water** for its refreshing and soothing properties. Additional excipients such as **sodium lauryl sulfate (5–8%)**, **Carbopol 940 (1%)**, **triethanolamine**, **methyl paraben (0.1%)**, and distilled water were used to provide cleansing action, viscosity, pH adjustment, preservation, and formulation stability.

The preparation of the face wash involved collecting fresh Aloe vera leaves, extracting and filtering the gel, preparing a Carbopol-based gel matrix, and gradually incorporating all herbal ingredients with continuous stirring. The pH was adjusted to **5.5–6.5**, which is compatible with normal skin physiology, and a preservative was added to prevent microbial contamination. The final mixture was homogenized to obtain a smooth and uniform gel and then packaged in airtight containers.

The formulated face wash was evaluated for various quality parameters including physical appearance, pH, foamability, washability, viscosity, stability, and skin irritation. The product exhibited a **smooth texture, pleasant odor, uniform consistency, and attractive appearance**. It showed **good foam formation**, indicating satisfactory cleansing performance, and was easily washable without leaving residues. The pH remained within the ideal skin-friendly range, reducing the risk of irritation. Stability studies conducted under different storage conditions revealed **no significant changes in color, odor, pH, or phase separation**, demonstrating good formulation stability. Skin irritation testing showed **no redness, itching, or irritation**, confirming the safety of the product for topical application.

The formulation was prepared using standard laboratory equipment such as beakers, glass rods, a pH meter, a mechanical stirrer, a Brookfield viscometer, and a weighing balance. Proper storage in airtight containers, away from direct sunlight and excessive moisture, was recommended to maintain product quality. Overall, the Aloe Vera Natural Face Wash was successfully developed as a **safe, effective, stable, and natural skincare product** capable of cleansing the skin while maintaining hydration and promoting overall skin health.

Formulation Composition Table

Ingredient	Quantity (%)	Function
Aloe vera Gel	25	Moisturizer
Neem Extract	5	Antimicrobial
Turmeric	2	Anti-inflammatory
Glycerin	5	Humectant
Honey	5	Moisturizer
Lemon Extract	3	Cleansing agent
Carbopol 940	1	Thickener
SLS	7	Surfactant
Methyl Paraben	0.1	Preservative
Rose Water	q.s.	Fragrance
Distilled Water	q.s.	Vehicle

Results

The formulated Aloe Vera natural face wash was successfully evaluated for various physicochemical and performance parameters to determine its quality, safety, stability, and suitability for cosmetic use. The results demonstrated that the formulation possessed desirable characteristics required for an effective herbal face wash. The prepared formulation exhibited a **smooth, homogeneous, and gel-like appearance** without any lumps, aggregates, or phase separation, indicating successful formulation and proper mixing of ingredients. The product showed a **light green to transparent green color**, which was aesthetically pleasing and acceptable for a herbal cosmetic preparation. Organoleptic evaluation revealed a **pleasant and characteristic herbal odor**, enhancing the overall acceptability of the product. The **pH of the face wash was found to be between 5.5 and 6.5**, which is close to the natural pH of human skin. This suggests that the formulation is skin-friendly and unlikely to cause irritation or disruption of the skin's natural barrier. The formulation also demonstrated **good spreadability**, allowing easy and uniform application over the skin surface. Foamability testing showed **moderate and stable foam formation**, indicating satisfactory cleansing performance. The face wash effectively removed dirt and excess oil while producing adequate foam for consumer satisfaction. During the **washability test**, the formulation was easily removed with water and did not leave any residue, resulting in a clean and refreshed skin feel.

Safety evaluation through the **skin irritation test** revealed no signs of redness, itching, burning sensation, or irritation after application. These findings confirm that the formulation is safe and suitable for topical use. The **homogeneity assessment** further demonstrated uniform distribution of ingredients throughout the preparation, with no coarse particles or aggregation observed.

Stability studies conducted under different storage conditions showed **no significant changes in color, odor, consistency, pH, or physical appearance** during the observation period. No phase separation or deterioration was detected, indicating good formulation stability and compatibility of ingredients.

Overall, the Aloe Vera natural face wash exhibited excellent physicochemical properties, satisfactory cleansing ability, good spreadability and washability, skin compatibility, and storage stability. The results confirm that the developed formulation is a safe, effective, and stable herbal skincare product suitable for daily use and has potential for further development and commercial application.

Quantitative Results Table

Parameter	Result
pH	5.8 ± 0.1
Viscosity	4200 ± 50 cP
Foam Height	65 ± 2 mm
Spreadability	7.5 ± 0.3 cm
Stability	No change after 30 days
Skin irritation score	0

DISCUSSION

The present study focused on the formulation and evaluation of an Aloe Vera natural face wash using herbal ingredients known for their cleansing, moisturizing, antioxidant, antimicrobial, and skin-protective properties. With the increasing demand for natural and eco-friendly cosmetic products, herbal formulations have become popular due to their safety, effectiveness, and lower risk of side effects compared to synthetic cosmetics. The formulated face wash was designed to remove dirt, excess oil, and impurities while maintaining the skin's natural moisture and pH balance.

Aloe vera was selected as the primary active ingredient because of its well-known moisturizing, soothing, anti-inflammatory, healing, and antimicrobial properties. Other herbal ingredients such as neem extract, turmeric, honey, glycerin, and rose water were incorporated to enhance the overall therapeutic and cosmetic benefits. Neem contributed antimicrobial activity, turmeric provided antioxidant and anti-inflammatory effects, while glycerin and honey helped retain moisture and improve skin softness.

The prepared formulation exhibited desirable physicochemical properties, including smooth texture, good consistency, pleasant odor, attractive appearance, and satisfactory spreadability. The pH of the face wash was maintained between 5.5 and 6.5, which is compatible with normal skin and helps prevent irritation and dryness. Adequate foam formation and easy washability indicated effective cleansing performance and consumer acceptability.

Stability studies demonstrated that the formulation remained physically stable without significant changes in color, odor, consistency, pH, or phase separation during storage. The skin irritation test revealed no redness, itching, or discomfort, confirming the safety and skin compatibility of the product. The combined action of Aloe vera, neem, and turmeric contributed to the antimicrobial, antioxidant, and soothing properties of the formulation, making it beneficial for maintaining healthy skin and reducing acne-related problems.

Overall, the Aloe Vera natural face wash proved to be a safe, stable, effective, and eco-friendly herbal cosmetic formulation suitable for regular use on various skin types. Although further clinical and long-term stability studies are recommended, the formulation shows significant potential as a natural alternative to conventional synthetic face cleansers.

CONCLUSION

The present study successfully formulated and evaluated an Aloe Vera natural face wash using herbal ingredients with cleansing, moisturizing, soothing, antimicrobial, and skin-protective properties. Aloe vera, the major active ingredient, is rich in vitamins, minerals, enzymes, amino acids, polysaccharides, and antioxidants that help maintain healthy skin and improve overall skin appearance.

The formulated face wash effectively removed dirt, excess oil, and impurities while preserving the skin’s natural moisture balance. Evaluation results showed that the product possessed desirable characteristics, including smooth texture, good consistency, pleasant appearance, suitable pH (5.5–6.5), satisfactory foamability, easy washability, good spreadability, and excellent stability during storage. The formulation was found to be non-irritating and suitable for regular skin application.

Aloe vera contributed significant moisturizing, antioxidant, anti-inflammatory, and antimicrobial benefits, helping to reduce dryness, irritation, redness, and acne-related skin problems.

Compared with conventional chemical-based cleansers, the herbal formulation offers advantages

such as better skin compatibility, fewer side effects, eco-friendliness, and suitability for sensitive skin.

The preparation process was simple, economical, and suitable for both small-scale and large-scale production. Stability studies confirmed that the face wash remained physically stable without significant changes in color, odor, texture, or pH during storage.

Overall, the study demonstrates that Aloe Vera natural face wash is a safe, effective, and promising herbal cosmetic product that can serve as a natural alternative to synthetic face cleansers. Further research involving long-term stability, antimicrobial studies, and clinical evaluation on different skin types may enhance its effectiveness and commercial potential. The increasing demand for herbal and natural skincare products suggests a bright future for Aloe vera-based cosmetic formulations in the cosmetic and pharmaceutical industries.

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