

To Formulate and Evaluate Aloe-Vera Face Wash

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Abstract

The overall study focuses on the development and assessment of an aloe vera face wash employing a variety of ingredients, including aloe vera, rose water, raw honey, lavender, peppermint, vitamin E capsules, glycerine, and soap base. Use of an aloe vera face cleanser after every wash has many advantages. Aloe vera face wash is made with elements that are beneficial to our skin and are also highly helpful for our skin. By using several tests, including evolution and other methods, the full investigation demonstrated that aloe vera face wash has no negative effects and is highly beneficial for our skin's healthy radiance.

Keywords: Formulation method; Aloe vera; Ingredients of aloe vera face wash

Introduction

Face wash refers to products that clean the face without drying it out. "Cleanser" is another name for face wash. Face wash has been determined to be suitable for all skin types. Face wash is particularly effective in removing dirt, oil, and moisture from dry skin. Face washes and cleansers are both used to remove grime, oil, and pollution from your face. A cleanser removes excess oil, makeup, and filth from the skin. These are contaminants that are oil soluble. They can also be removed with a face wash, though this may not be completely successful. Ordinary soaps can dehydrate facial skin, which is quite fragile. A face wash is a gentle cleaner that gets the job done. Without causing irritation to the skin. As a result, the skin seems youthful and active. The objective of a face wash could be to provide cleansing, anti-wrinkle, anti-acne, moisturising, and skin fairness. Skin whitening products are thought to affect the synthesis and metabolism of melanin in the skin by suppressing melanin production in melanocytes and thereby reducing the amount of melanin present. Aloe vera, rose water, raw honey, peppermint oil, lavender essential oil, soap base, and glycerol are examples of agents that suppress melanin synthesis

Definition of face wash

A cleanser is a facial care solution that removes makeup, dead skin cells, oil, grime, and other impurities from the face's skin. This aids in pore unclogging and acne prevention. In addition to toner and moisturiser, a cleanser can be used as part of a skin care routine [1].

Advantages of face wash

- It aids in the removal of dead skin cells, allowing new skin cells to take their place.
- It keeps skin looking young and healthy.
- It gives the skin a healthy glow.
- By removing dead skin cells, you might expect your skin to age more slowly [1].

Properties of face wash

- Exfoliation stimulates skin regeneration and renewal by increasing blood circulation.
- It must be both stable and attractive.
- When applied to the skin, it should soften.
- It should be able to spread without dragging.

- It should not feel oily or greasy while being applied.
- The cream residue should not become thick once the water has evaporated.
- Rather than absorption, its physical action should be that of skin flushing and pore
- Opening.
- After usage, a thin emollient layer should remain on the skin [1].

Uses of face-wash

- Every day, remove any traces of makeup
- For skin purification.
- Anti-aging
- Bathing and regeneration keep skin clean and lustrous.
- It stimulates the production and regeneration of skin cells.
- Assist in keeping the pores free [1].

Ingredients

- 1) Aloe vera
- 2) Rose water
- 3) Raw honey
- 4) lavender oil
- 5) peppermint oil
- 6) vitamin E capsules
- 7) Glycerine
- 8) Soap base

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Ingredients Information

Aloe Vera (Figure 1):

Scientific name: Aloe Vera.

Order: Asparagales.

Family: Asphodelaceae.

Subfamily: Asphodeloideae.

Kingdom: Plantae.

Family: Asphodelaceae.

Botanical name: Aloe barbadensis miller [2].

Using aloe Vera on the face has benefits because:

- Its anti-inflammatory effects help to relieve pain, swelling, and soreness in wounds and injuries, and it promotes collagen formation and release.
- It can shorten the time it takes for Trusted Source wounds to heal and reduce scarring.
- It shortens the time it takes for first- and second-degree burns to recover.
- It works to treat bacterial and fungal diseases trusted source.
- It has an antioxidant impact that can aid in the repair of UV damage and the slowing down of the skin's ageing process.
- It guards the skin against the harmful effects of radiation therapy.
- It contains 98 percent water, which moisturises, soothes, and hydrates the skin.
- It makes the skin more flexible and supple, rather than stiff and leathery.
- It relieves rashes and sunburns by cooling them down [2].

Contents aloe vera: Vitamins, enzymes, minerals, carbohydrates, lignin, saponins, salicylic acids, and amino acids are among the 75 potentially active ingredients found in aloe vera. Vitamins: It contains antioxidant vitamins A (beta-carotene), C, and E. Vitamin B12, folic acid, and choline are also present [3].

Rose water (Figure 2):

Benefits of Rose water for Your Face:

- It balances skin's natural oils: Rose water is known for its



Figure 1: Aloe vera.



Figure 2: Rose water.

ability to clarify and balance your skin's natural oils, resulting in a renewed, revitalised appearance.

- It can help reduce the appearance of temporary redness: If you have some redness on your skin, rose water can actually help to reduce the appearance of it-as well as any associated discomfort. It's an excellent way to refresh and soothe your skin.
- It naturally hydrates: For youthful, glowing skin, moisture is essential, and rose water is a natural hydrator. It gives your skin an instant boost and replenishes moisture.
- It has antioxidant properties that nourish and protect the skin: Rose water has been used for a variety of purposes since the 7th century and is high in antioxidants, which provide your skin with the nutrients it requires!
- It can help prevent fine lines and wrinkles and reduce the appearance of those that already exist: Rose water is well-known for its anti-aging properties. It can fill fine wrinkles temporarily and possibly prevent new ones from forming.
- It can help to unclog pores and create a smoother looking appearance: When your pores become clogged with daily debris and toxins, rose water can help to decongest them and clear impurities for a fresh, bright face.
- It reduces the appearance of large pores: Speaking of large pores, rose water can actually help to reduce their appearance. It has cleaning, clarifying, and balancing qualities.
- It can temporarily tighten skin: Rose water can temporarily tighten the look of your skin, giving you a firm, plump appearance, thanks to its toning properties. Smooth as silk!
- It helps to remove impurities and prepare your skin for success: Rose water can help to remove impurities and prepare your skin for success. It cleanses and hydrates the skin, making it a great addition to any natural skin care routine [4].

Contents of rose water: Rose water is high in vitamins A, C, E, and B, as well as anti-inflammatory properties [4].

Raw Honey (Figure 3):

Benefits of Raw Honey for Skin and Face:

- Deeply hydrates the skin
- It cleans the pores.



Figure 3: Raw honey.



Figure 4: Lavender oil.

- Lightens Scars
- Gentle Exfoliator
- Helps with sunburn
- Prevents acne and pimples
- Adds a Natural Glow
- Reverses Age
- Hydrates the Skin
- Assists in Wrinkle Reduction
- Brightens the Skin Complexion [5].

Contains: Honey is primarily sugar, with some amino acids, vitamins, minerals, iron, zinc, and antioxidants thrawn in for good measure. Honey is utilised as an anti-inflammatory, antioxidant, and antibacterial agent in addition to being a natural sweetener [5].

Lavender Oil (Good smell agent for face wash) (Figure 4):

Benefits of Lavender Oil for Skin: Aroma therapists commonly use lavender oil to calm and soothe the psyche. Similarly, it has the same effect on your skin. Check out these lavender oil skin benefits to see how you may use this essential oil to improve the health of your skin.

- **Acne-Fighting Lavender Oil:** One of the most beneficial properties of lavender oil for skin is that it aids in the treatment of acne and the healing of outbreaks. It kills acne-causing germs, unclogs

pores, and decreases inflammation because to its antibacterial qualities.

- **It Is A Hero Who Reverses Aging:** Lavender oil for skin is high in antioxidants and helps combat free radical damage. It also acts as a protective barrier, preventing free radicals from inflicting further harm. This addresses the obvious indications.
- **It Treats Eczema:** Lavender oil for skin is an excellent antifungal agent, particularly if you suffer from eczema or psoriasis. A few drops mixed with carrier oil can help moisturise skin while also addressing redness, irritation, and infection.
- **Lavender Oil Is Also An Anti-Inflammatory Agent:** Lavender oil has anti-inflammatory properties, which is one of its many advantages. This indicates that it can calm irritated and inflammatory skin. The oil's beta-caryophyllene is a natural anti-inflammatory. This also works on minor sunburns!
- **It Heals Wounds:** Lavender oil for skin is also known for its therapeutic healing powers! It accelerates the healing of wounds such as burns, cuts, and scrapes.
- **It Even Keeps Insects at Bay:** Camping trip? Or perhaps you require something to keep the mosquitoes at bay during the monsoon season [6].

Contains of Lavender oil: Essential oil of vitamin C improves inflammatory skin symptoms and diseases [6].

Peppermint Oil (soothing agent for face wash) (Figure 5):

Benefits of using peppermint oil for skin:

- It revitalises the skin: Adding peppermint essential oil to any skin care recipe helps your skin feel renewed, invigorated, and alive.
- It lowers pimples: Peppermint essential oil's antimicrobial and antiseptic properties aid in the reduction of pimples and lesions such as papules, pustules, nodules, cysts, and active comedones.
- It cools the skin and scalp: Peppermint essential oil is used in skin care products to create a cooling feeling and decrease the effects of sunburn or prolonged sun exposure.
- It increases blood circulation and skin tone by using oils or serums packed with organic peppermint essential oil for face and body on a regular basis.
- It eliminates germs and odour: Peppermint oil's antibacterial



Figure 5: Peppermint oil.

capabilities keep skin and scalp clear of congestion and make them smell fresh and minty by eliminating bacteria and odour.

- It reduces sebum: Peppermint oil in face masks and cleansers helps oily, combination, and acne-prone skin regulate sebum production and distribution.
- It is astringent in nature: Peppermint oil is naturally astringent. It improves the appearance of pores by contracting skin cells. It also prevents clogging or congestion of the pores.
- It reduces indigestion: relieves indigestion Menthol in peppermint oil reduces acidity, soothes the stomach, and aids digestion, resulting in a healthier gut and clearer skin [7].

Content of peppermint oil: Menthone and menthol are the two primary chemical components of peppermint oil [7].

Vitamin E Capsule (Figure 6):

Vitamin E benefits for Skin:

- Vitamin E is a Moisturizing Agent.
- Vitamin E Helps to Reverse the Signs of Skin Aging.
- Vitamin E helps to heal sunburns.
- Vitamin E helps to lighten dark spots.
- Vitamin E acts as a cleanser.
- Vitamin E helps to heal dry fingernails.
- Vitamin E: Reduces the appearance of stretch marks.
- Vitamin E helps to relieve cold sores [8].

Content of Vitamin E: Natural vitamin E is usually labelled as d-alpha tocopherol, d-alpha tocopherol acetate, or d-alpha tocopherol succinate, however mixed tocopherols can also be found (mixed tocopherols, contain not only d-alpha tocopherol but natural mixtures of beta, gamma, and delta tocopherols) [8].

Glycerine (Figure 7):

Glycerine Benefits for Your Skin:

- Hydrate the stratum corneum of the skin.
- Improve the skin barrier function.
- Provide anti-irritant protection for the skin.
- Increase the speed with which wounds heal.



Figure 6: Vitamin E capsules.



Figure 7: Glycerine.

- Eliminate dry skin. 6. May be beneficial for psoriasis [9].

Content of glycerine: Glycerine is a natural chemical generated from vegetable oils or animal fats. It's a sweet-tasting liquid that's transparent, colourless, and odourless [9].

Soap Base (Figure 8):

Base material of soap base:

- Foaming agent
- Cleansing agent
- Expedient [10]

The basic ingredients of soap base:

- Vegetable oil.
- 100 percent pure lye.
- Distilled water.
- Essential or skin-safe fragrance oils (optional)
- Colorants (optional) [10]

Evolution Test

Aloe Vera

PH 1.0 g gel was accurately weighed and dispersed in 100 ml purified water. The pH of the dispersion was measured using digital pH meter, which 0 and 9.0. The measurements of pH were done in triplicate and average values were calculated [11].

Rose water

Evaluate rose water by Steam distillation and obtain clear solution in beaker. PH of rose water 5.5 [12].

Raw Honey

Fehling's test: 2ml of honey is taken in a test tube and 1ml each of Fehling's A and Fehling's B are added to it and boiled, Red precipitate indicates the presence of reducing sugar. Viscosity of honey 10000 cps. PH of Honey ranges between 3.5 to 5.5 [13].



Figure 8: Soap base.

Table 1: Ingredients quantity.

Sr. No	Ingredients	Quantity
1	Aloe vera gel	3 tablespoon
2	Rose water	1\3 cup
3	Raw honey	1 tablespoon
4	Lavender oil	10 drops
5	Peppermint oil	10 drops
6	Vitamin E capsules	5 drops
7	Glycerine	1 tablespoon
8	Soap base	1\3 cup

Formulation Method

Liquid mixing type divided into the following two sub groups:

- 1) Mixing of liquid and liquids
 - a) Mixing of two miscible liquids and
 - b) Mixing of two immiscible liquids
- 2) Mixing of liquids and solids
 - a) Mixing of liquids and soluble solids
 - b) Mixing of liquids and insoluble solids

Mixing of two miscible liquids (Homogeneous Mixtures eg; Solution): This type of mixing easily takes place through diffusion. Sometimes turbulence occurs in the liquid of mixture.

Mixing of Two Immiscible Liquid (Heterogeneous Mixture eg; Emulsion): In this type of mixing transfer of dissolved material from one fluid to another is affected e.g. emulsion A stable emulsion can be obtained by carrying out mixing continuously and efficiency otherwise.

Mixing of liquid and Soluble Solid: (Homogenous Mixture eg Suspension): In this type of mixing soluble solid are solubilised in an appropriate solvent through stirring. A solution is formed by solubilising the soluble solid via physical alteration.

Mixing of liquid and insoluble solids (Heterogeneous Mixture eg: Suspension): By mixing insoluble solid with a liquid an unstable suspension is obtained whose ingredient separate out from standing for some time, Mortar and pestle are used for making suspension on a small scale [19].

Formulation

1st Procedure: Mix aloe Vera extract thoroughly with a mixer grind. 1 table spoon of aloe Vera (about 3 grams) in a mixing dish and 1/2 cup of fresh, cold rose water in a separate basin, mix 1/2 cup of soap base to make it smooth and creamy and put the aloe Vera gel and rose water mixture in it and stir it slowly. Mix in the raw honey, peppermint oil, and vitamin E capsule thoroughly. Glycerine is added to create increase the quantity and consistency Fill the bottle with the face wash and store it somewhere cold and dry.

Result: Aloe Vera face cleanser has a highly liquid consistency.

2nd Procedure: Fresh and clean aloe Vera leaves yield aloe Vera gel. In a mixing grinder, combine the gel.1 table spoon aloe Vera gel (about 3 grams) in a mixing bowl and 12 cup of fresh, cold rose water 1 table spoon walnuts, crushed in a separate basin, mix 1/2 cup of soap base to make it smooth and creamy. And put the aloe Vera gel and rose water mixture in it and stir it slowly. Mix in the raw honey, peppermint oil, and vitamin E capsule thoroughly. Glycerine is added to create increase the quantity and consistency Fill the bottle with the face wash

Lavender essential oil

Test solution: A 2.0%w/v solution of the oil under examination of ethanol (95%) Standard solution: A solution containing 2.0 % w/v solution of linalyl acetate RS in ethanol (95%).

Chromatographic system: a capillary column 30m X 0.25mm coated with methyl 5% phenylpolysilox,

Temperature: column 50° for 1 minute increase from 50° to 220° at a rate of 10° per minute and maintenance at this temperature for 13 minute , inlet port at 250° and detector at 280° , detection by flame ionization detector , flow rate 1 ml per minute using nitrogen as a gas carrier , injection volume ; 1.0µl , split ratio ; 1:25 [14].

Peppermint oil

Test solution: A 2.0%w/v solution of the oil under examination of ethanol (95%) Standard solution: A solution containing 2.0 % w/v solution of methone RS in ethanol (95%) Chromatographic system : a capillary column 30m X 0.25mm coated with methyl 5% phenylpolysiloxane, maintenance at this temperature for 13 minute, inlet port at 250° and detector at 280°, detection by flame ionization detector, flow rate 1 ml per minute using nitrogen as a gas carrier , injection volume ; 1.0µl , split ratio ; 1:25 [15].

Vitamin E

PH test take a drop of vitamin E on moist blue litmus paper. It turns red. It shows vitamin E basic in nature [16].

Glycerine

Dustan's test: When phenolphthalein is added to dilute cold solution of borax, a pink color is produced. When glycerol is mixed in it in cold the colour disappears but on heating color reappears. It is a characteristic of Glycerol. This test is called Dustan's test [17].

Soap Base

PH: - 1% soap solution, meaning 1% of the solution is soap and 99% of the solution is distilled water. Using a mini-whisk, I stirred the solution until the soap dissolved.

Add few drops phenolphthalein indicator in it. Solution turns pink. It means soap is basic in nature [18] (Table 1).

and store it somewhere cold and dry.

Result: Because the consistency of aloe Vera face wash is very harsh, remove the ingredients from the face wash.

3rd Procedure: Fresh and clean aloe vera leaves yield aloe vera gel. In a mixing grinder, combine the gel. 1 table spoon aloe vera gel (about 3 grams) in a mixing bowl and 1/2 cup of fresh, cold rose water. Grind the soap base, then add the face wash and put the aloe vera gel and rose water mixture in it and stir it slowly. Mix in the raw honey, peppermint oil, and vitamin E capsule thoroughly. To add volume and consistency, add glycerine. Fill the bottle with the face wash and store it somewhere cold and dry.

Result: Consistency of face wash is insufficient.

4th Procedure: Fresh and clean aloe vera leaves yield aloe vera gel. In a mixing grinder, combine the gel. 1 table spoon aloe vera gel (about 3 grams) in a mixing bowl and 1/2 cup of fresh, cold rose water. Make a smooth 1/2 cup of soap base in a separate basin. By whisking it, it becomes creamy, and slowly pours in the aloe vera gel and rose water mixture. Combining them mix in the raw honey and vitamin E tablet thoroughly. To add volume and consistency, add glycerine. Fill the bottle with the face wash and set it aside, a cold, dry location.

Result: Face wash is not giving enough sensation of Cooling to skin; hence we add peppermint oil in next trial.

5th Procedure: Fresh and clean aloe vera leaves yield aloe vera gel. In a mixing grinder, combine the gel 3 table spoons aloe vera gel (about 3 grams) in a mixing bowl and a 1/3 of a cup of fresh, chilled rose water in a separate bowl, whisk 1/3 cup of soap base to make it smooth and creamy, and put the aloe vera gel and rose water mixture in it and stir it slowly. Add 1 table spoon of raw honey, 10 drops of peppermint oil, 10 drops lavender oil and vitamin E 2 capsule, properly mixed. To add volume and consistency add glycerine. Fill the bottle with the face wash and store it somewhere cold and dry place.

Result: completed.

Evolution Test for Face Wash In Vitro Evolution

- Rheological characteristic: we were studied for some physical properties colour, clogging, viscosity change and sensation test.

- Determination of pH: The pH of formulations was determined using digital pH meter. One gram of face wash was dissolved in 100 ml of demineralised and stored for two hours. The measurements of pH of each formulation were done in triplicate. Instrument was calibrated before use with standard buffer solutions at pH 4.

- Determination of Viscosity: 100 gm of each of formulation was weighed and transferred to beaker. The help of Brook field viscometer (LV viscometer), spindle no 3 at 10 rpm for 5 min. Before measurement declaration of face wash was done and the face wash was filled in appropriate viscosity of formulations were determined with the Wide mouth container. Samples of the face wash were allowed to settle over 30 min at the assay temperature ($25 \pm ^\circ\text{C}$) before the measurements. Viscosity of formulation was determined using the formula. $\text{Viscosity } (C_p) = \text{Dial Reading} \times \text{Factor}$.

- Spread ability: Spread ability determination of formulations was determined by an apparatus suggested by Mortimer et al. which was fabricated in laboratory & used for study. The apparatus consists of a wooden block with a fixed glass slide with one end tied to weight pan rolled on the pulley which was in horizontal level with fixed slide. An

excess of whitening face wash sample 1.5 gm was placed between two glass slide and a 1000 gm weight was placed on slide for 5 minutes to when compress the sample to uniform thickness weight (60gm) was added to the pan. It was calculated using the formula; $S = \frac{m}{t}$ Where, s = spread ability in gm.cm/sec m = weight tied to upper slide l = length of glass slide t = time in seconds Length of glass slide was 11.2 cm and weight tied to upper slide was (60gm) throughout the experiment.

- Wash ability: The product was applied on hand and was observed under running water.

- Stability study: The instant whitening face wash were also subjected to the following condition of temperature and relative humidity during stability ages fit sediment temperature [20].

In Vivo Evolution Test

- Skin irritation test: The skin irritation was carried out on human volunteers. For formulated face wash volunteer were selected and 1.0 g of formulated face wash was applied on an area of two square inch to the back of the hand. The volunteers were not observed for lesions or irritation.

- Photographic evaluation: This was carried out on volunteer. Whitening face wash was applied on skin. The photographs were taken before and after application of the product [21] (Figure 9).

The Anatomy of Skin

The Epidermis

The epidermis is the skin's outer layer, and it serves as the body's first line of protection against bacteria, viruses and even the outside world. But there isn't just one layer! The epidermis is actually made up of four thinner layers to cover all of its functions:

- The stratum corneum is the topmost layer, and its thickness varies depending on where it is on the body (which is why, say, the skin on your heel is much thicker than that of your eyelid).

- The stratum granulose is the next layer. The cells in this area generate a waxy substance that keeps your skin dry.

- The stratum spinosum follows, which is made up of cells that act as glue for your skin cells, binding other cells together.

- The stratum basal is the epidermis' lowest layer. It contains stem cells, which divide to generate new skin cells. These are then



Figure 9: Wash ability Test.

pushed to the surface of the skin [22].

The Dermis

Much of the magic happens in the dermis—at least in the skin. The majority of the dermis is made up of collagen and elastin, as well as fibroblasts (the type of cell that creates the collagen and elastic tissue). This layer has several functions:

- Blood and lymph vessels are found in the dermis layer and are responsible for giving nutrients to your skin as well as removing waste or toxins.
- The sweat glands are found in the dermis. They produce perspiration through your pores, which cools the body while also removing impurities.
- The hair follicles (where your hair is anchored) and oil glands, which generate the oil that softens and smoothest skin—sometimes too enthusiastically, leading in breakouts and greasiness are also found in the dermis [22-24].

The Subcutaneous Layer

The deepest layer of skin is this layer of fat, which connects your bones to your muscle and bones. It's so deep that your skin care products' active ingredients will never reach it. This layer is responsible for the following tasks:

- The subcutaneous layer functions similarly to a thermostat. It protects the body and can also be used as a source of energy in a pinch.
- Fat also acts as padding, protecting your muscles, bones, and organs from injury.
- Finally, the subcutaneous layer contains additional blood vessels, nerve endings, hair follicle roots, and the deepest oil-producing sebaceous glands [22,25,26] (Figure 10).

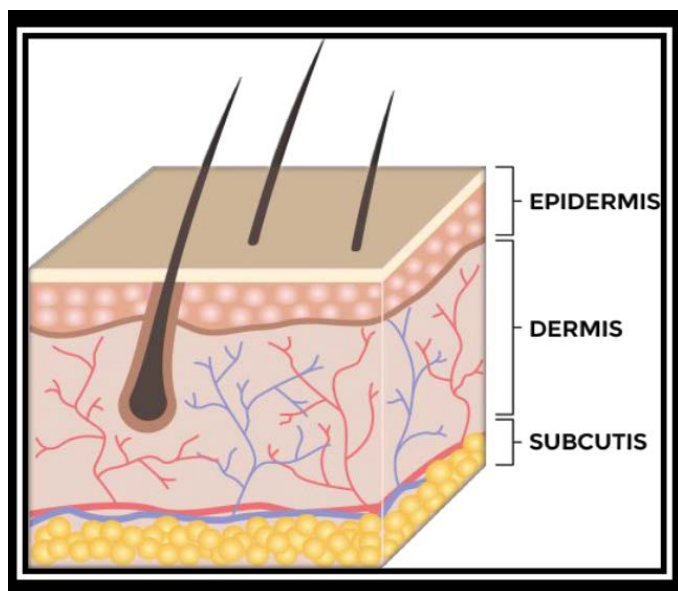


Figure 10: Anatomy of skin.

Conclusion

People today require a cure for their problems that is free of adverse

effects. Herbal components made it possible to create cosmetics with no side effects. Herbal face packs are thought to be a long-lasting and effective technique to improve skin's appearance. As a result, the current effort is an excellent attempt to manufacture an herbal face pack using naturally available substances such as aloe vera, rose water, raw honey, peppermint oil, lavender essential oil, soap base, vitamin E and glycerine. The developed formulation was said to be physico-chemically and microbiologically stable with characteristics similar to typical cosmeceuticals formulations for cosmetics.

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