

# " FORMULATION AND EVALUATION OF FACE SERUM"

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## ❖ Abstract: -

UV radiation and photo damage are the two undesired effects of aging skin, including wrinkles on the face. There are currently no practical methods for delaying the aging process of the skin. This facial serum with aloe vera, glycerin, and honeybee venom is a very concentrated cosmetic. Aloe Vera has the capacity to permeate deeper layers of the skin and absorb quickly, thus utilizing it not only provides immediate cosmetic benefits but also psychological benefits. Aloe Vera gel is frequently used to treat a variety of skin conditions, sunburns, small wounds, insect bites, and wound healing. It also has anti-inflammatory, anti-bacterial, and anti-fungal properties. Bee venom is a protective poison that bees make; it has been shown to improve collagen synthesis and blood flow. The face serum was evaluated for its physiochemical parameters, pH, globule size, consistency. The stability study results showed that there was no change in visual appearance, homogeneity and globule size.

**Keyword:** Aloe vera, Honeybee venom, Face serum, Skin hydration.

## ❖ Objectives:

### 1. Deep skin nourishment

Face serums contain high concentrations of active ingredients that penetrate deeper into the skin and nourish it effectively.

### 2. Hydration (moisture boost)

Serums (especially with hyaluronic acid) help retain water in the skin, making it soft, plump, and smooth.

### 3. Target specific skin concerns

Main objective is treatment of problems like:

- ✓ Acne
- ✓ Dark spots / pigmentation
- ✓ Dull skin
- ✓ Uneven tone
- ✓ Large pore

### 4. Anti-aging effect

Many serums help to:

- ✓ Reduce fine lines & wrinkles
- ✓ Improve skin elasticity

- ✓ Boost collagen production

### 5. **Brightening & glow**

Serums (like Vitamin C) improve complexion and give a radiant, glowing look.

### 6. **Protection from damage**

Antioxidant serums protect skin from:

- ✓ Pollution
- ✓ UV damage
- ✓ Free radicals (which cause aging)

### 7. **Improve skin texture**

They help make skin smoother, clearer, and more even by removing dead cells and boosting renewal.

## ❖ **Introduction:**

The examination of human skin is important in fields like dermatology, pharmacology, toxicology, and cosmetology to study the effects, absorption, and safety of external agents. Cosmetology focuses on enhancing beauty through the use of cosmetic products. Face serums are highly concentrated formulations designed to penetrate deeply into the skin and deliver active ingredients effectively without harmful chemicals. Compared to creams, serums contain a higher amount of biologically active substances such as antioxidants, vitamins, and amino acids, making them more effective for treating skin concerns like aging and dryness.

Their lightweight nature allows faster absorption, producing visible results in a short time. Skin type influences product choice, but essential nutrients are necessary for all skin types. Factors like pollution and UV radiation can damage skin, making products like serums important for protection, repair, and maintaining healthy skin.

## ❖ **Ingredient used in preparation of face serum:**

- **Aloe vera:**

Aloe vera has long been used for treating hair loss. It also soothes the scalp and conditions hair. It can reduce dandruff and unblock hair follicles that may be blocked by excess oil. You can apply pure aloe vera gel to your scalp and hair a few times per week.



Fig no. 01: Aloe vera

- ✓ Botanical name: - Aloe barbadensis
- ✓ Family: - Liliaceae
- ✓ Synonym: - Aloe indica
- ✓ Biological source: - Aloe is the dried juice collected by incision, from the bases of the leaves of various species of Aloe. Aloe perryi Baker, Aloe vera Linn or Aloe barbadensis Mil and Aloe ferox Miller.
- ✓ Chemical Constituents: - Aloin, Resin, Emodin Aloeemodin
- ✓ Uses: - purgatives, emollient, antibacterial activity.

• **Honey:**

Honey, sweet, viscous liquid food, dark golden in colour, produced in the honey sacs of various bees from the nectar of flowers. Flavour and colour are determined by the flowers from which the nectar is gathered. Some of the most commercially desirable honeys are produced from clover by the domestic honeybee.



Fig no.02: Honey

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- ✓ Botanical name: - Apis mellifera
  - ✓ Family: - Apidae

- ✓ Synonym: - Mel, Clarified Honey, Strained Honey
- ✓ Biological source: - Honey is a saccharine secretion produced from the nectar of flowers and accumulated in the honeycomb by the Honeybee, *Apis mellifica* Linn. (Family Apidae).
- ✓ Chemical Constituents: - Honey is composed of fructose, glucose, water, maltose, trisaccharides, sucrose, minerals, vitamins and enzymes
- ✓ Uses: - An anti-inflammatory, antioxidant, and antibacterial agent that may help heal wounds, burns, infections, and colds

### • Lavender oil: -

Lavender oil is derived from the lavender plant, primarily through steam distillation. It's renowned for its soothing aroma and numerous therapeutic properties. Lavender oil has been used for centuries in various cultures for its medicinal and aromatic benefits.



Fig no.03: lavender oil

- ✓ Botanical name: *Lavandula angustifolia* oil
- ✓ Family: Lamiaceae
- ✓ Synonym: - lavender aromatic oil
- ✓ Biological source: - Lavender oil is an essential oil obtain by distillation from the flower of spikes of certain species of lavender.
- ✓ Chemical Constituents: - Lavender oils include over 100 chemicals, with linalool and linalyl acetate being the two most prominent. Furthermore, it also contains phytosterols, coumaric acid, anthocyanins, monosaccharides, valeric acid, glycolic acid and its esters, unsolid acid, coumarin, and herniarin.
- ✓ Uses: -
  - Calming the body and mind and promoting better sleep
  - Relieving pain, stress, and anxiety
  - Improving blood circulation and disinfecting wounds
  - Repelling insects and treating bug bites
  - Treating dandruff and hair care
  - Cleaning around the house
  - Treating minor cuts and scrapes
  - Treating mouth ulcers and diabetes (not proven)

### • Coconut oil: -

The lauric acid in coconut oil has nourishing properties that are especially prone to soak into the strands of your hair. Coconut oil absorbs into your hair quickly, providing moisture to tame frizz and heal breakage.



Fig no.04: Coconut oil

- ✓ Botanical name: - *Cocos nucifera*.
- ✓ Family: - Palmae
- ✓ Synonym: - Coconut oil, coconut butter, copra oil.
- ✓ Biological Source: - Coconut oil is the oil expressed from the dried solid part of endosperm of coconut, *Cocos nucifera* L.
- ✓ Chemical constituents: - Caprylic acid, 2%; capric acid, 50–80%; lauric acid, 3%; and myristic acid about 1%, saturated fatty acids.
- ✓ Uses: - Vegetable oil, Hair Growth.

### • Olive oil:

Olive oil, oil extracted from the fleshy part of the ripened fruit of the olive tree, *Olea europaea*. Olive oil varies in color from clear yellow to golden; some varieties obtained from unripe fruit have a greenish tinge.



Fig no.05: olive oil

- ✓ Botanical name: - Olea Europoea.
- ✓ Family: - Oleaceae
- ✓ Synonym: - Sweet oil
- ✓ Biological Source: - Olive oil is a fixed oil obtained by expression from pericarp of the ripe fruits of Olea European.
- ✓ Chemical constituents: - The composition of olive oil is primarily triacylglycerols (~99%) and secondarily free fatty acids, mono- and diacylglycerols, and an array of lipids such as hydrocarbons, sterols, aliphatic alcohols, tocopherols, and pigments. A plethora of phenolic and volatile compounds are also present.
- ✓ Uses: -
  - Cooking, frying, and dressing salads
  - Preserving olives and adding flavor to dishes

### ❖ Face serum: -

Face serum is a skincare product that fortifies your skin with high concentrations of active ingredients such as hyaluronic acid, vitamin C, retinol, and more. Face serum is a lightweight skincare product that absorbs quickly into your skin and nourishes it with active ingredients. Face serum is a lightweight skincare product that absorbs quickly into your skin and nourishes it with active ingredients. This serum contains ingredients that nourish your skin with nutrients and remove dead skin cells. Common ingredients of skin resurfacing serums include lactic acid, glycolic acid, and season.

### ➤ Ideal Qualities of Face Serum.

1. Soothes irritated skin: It is well known that aloe vera possesses antiviral and cell-regenerating capabilities. The advantages of aloe gel are comparable to how applying it to a sunburn feels.
2. Deep hydration: possess a special capacity to raise and decrease skin moisture.
3. Fight Acne and fades blemishes: Bael fruit stops the bacterial overgrowth that is the primary cause of acne and pimples.
4. Remove dark circle and puffiness: Vitamin E and antioxidants in abundance aid with eyelid discoloration, and the cooling impact reduces puffiness. It makes under-eye circles look less prominent. It removes dead skin cells, which encourages the synthesis of collagen.
5. It contains antioxidant qualities that encourage healthy-looking skin.

### ❖ Advantages:

1. Boosts skin hydration – Face serums work like a magic potion for your skin by boosting hydration. They lock in moisture, leaving your skin feeling soft, supple and well-nourished.
2. Evens out skin tone – A unique benefit of face serums is their ability to even out skin tone. They help in reducing dark spots, blemishes and other skin discolorations, promoting a uniform complexion.
3. Reduces fine lines – They are also effective in reducing fine lines. By promoting cell regeneration, they help in smoothing out wrinkles, making your skin look younger.
4. Enhances skin radiance – One more benefit is that they enhance skin radiance. They add a natural glow to your skin, making it look healthier and more vibrant.
5. Protects against environmental damage – Face serums also act as a shield against environmental damage. They protect your skin from harmful pollutants, keeping it healthy and radiant.

## ❖ Disadvantages:

1. Can cause allergic reactions – Face serums can sometimes lead to allergic reactions if your skin is sensitive to certain ingredients. This can result in redness, itching, or even hives.
2. Might be expensive – Despite their benefits, face serums often come with a hefty price tag. This can be a significant disadvantage for those on a budget.
3. Not suitable for all skin types – Not every skin type reacts well to face serums. For example, those with oily or acne-prone skin might find that serums exacerbate their issues.
4. Can cause skin irritation – Skin irritation is another potential downside. Some people may experience burning, stinging, or a rash after application.
5. Overuse can dry out skin – Overusing face serums can strip your skin of its natural oils, leading to dryness and flaking. It's important to use them sparingly to avoid this.

## ❖ Benefits of using a face serum:

From hydrating the skin in order to reduce the appearance of fine lines and wrinkles, to minimizing the appearance of dark spots and refining skin 's texture, serum truly does it all. A good serum that contains antioxidants will protect the skin from environmental stressors and is worth the cost and effort alone. Serum can smooth the skin, firm the skin, and even exfoliate. It really just depends on what you 're looking for your serum to accomplish. Religious usage of serum boosts collagen production and assists in improving the texture drastically and makes the skin firm, smooth and fresh. Especially vitamin C content plays a vital role in the rejuvenation of the skin. Dark spots, scars, and pimple marks can be easily lightened with serums that have high plant-based concentrates.

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## ❖ Experimental Procedure for Face Serum:

- Clean all the glassware and dry them properly as per SOP.
- Measure the accurate quantity of aloe vera from aloe plant, transfer it in beaker.
- Mix 5ml of glycerin with 1/2ml of vitamin E in the aloe vera.
- Then stir this mixture for 15 min on magnetic stirrer. Add distilled water uniformly.
- Take another beaker and add oil phase in it. Firstly, take honey 5-10 ml.
- Take 1.8 ml olive oil with 0.4ml coconut oil in beaker and stir it continuously 10 min.
- Then oil phase is added to the liquid phase by drop wise on the magnetic stirrer to obtain oil in water based on biphasic emulsion.
- Add few drops of rose oil, Lavender oil and required quantity of preservative with tween 20.
- Transfer final solution into the appropriate container with closure.

## ❖ Evaluation of Face Serum:

### ➤ Physical appearance:

The Colour and appearance of the formulation was observed visually. The formulation procedure uniform distribution of extracts. This test was confirmed by visual appearance and by touch.

### ➤ pH Value:

A pH meter was calibrated using a standard buffer solution. Nearly 1 ml of the face serum was properly weighed and dissolve in 50 ml of distilled water and finally its pH was calculated. The skin has an acidic range and the pH of the skin serum should be in the range of 4.1-6.4.

### ➤ Determination of Spread ability:

2 gm of serum sample was placed on a surface. A slide was attached to a pan to which 20 gm weight was added. The time (seconds) required to separate the upper slide from surface was taken as a measure of Spread ability.

### ➤ Stability Studies:

Formulation and development of a pharmaceutical product is not complete without proper stability analysis carried out on it to determine physical and chemical stability and thus safety of the product. The stability studies are carried out as per ICH guidelines. Short term accelerated stability study was carried out for the period of few months for the prepared formulation. The samples were stored at different storage conditions of temperatures such as 3-5°C, 25°C RH=60% and 40°C±2% RH=75%.

### ➤ Cyclical Temperature:

These test is not carried out at any fixed temperature and humidity. In this test, temperature was changed cyclically every day. At room temperature and frizzing temperature to stimulates the changes in temperature.

## ❖ Summary:

The present study focused on the formulation and evaluation of a facial serum containing aloe vera, glycerin, and honeybee venom. These ingredients were selected for their combined moisturizing, soothing, and anti-aging properties. Aloe vera provides hydration and skin repair benefits, glycerin helps retain moisture, and honeybee venom supports collagen production and improved blood circulation. The formulated serum was evaluated for physicochemical parameters such as pH, globule size, and consistency. Stability studies showed that the formulation remained stable with no significant changes in appearance, homogeneity, or globule size over time.

## ❖ Conclusion:

The developed facial serum demonstrated good stability, acceptable physicochemical properties, and potential effectiveness in skin care. The combination of aloe vera, glycerin, and honeybee venom may help in improving skin hydration, enhancing collagen synthesis, and reducing signs of aging such as wrinkles. Therefore, this formulation can be considered a promising and effective cosmetic product for maintaining healthy and youthful skin.

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