

FORMULATION AND EVALUTION OF POLY HERBAL FACE SERUM

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ABSTRACT

These days, the demand for skin care products and treatments has increased to a larger extend. Having a proper appearance and a beauty standard has gotten a lot of importance. A typical skin care routine consists of a cleanser, a serum, a moisturizer and a sunscreen. Among these, it has been seen that the serums are the new go to when it comes to building an excellent skin routine. Serums come in various types of formulation be it for oily, dry or anything in between type of skin. Facial wrinkles and skin aging are undesirable outcome of photo damage and ultraviolet (UV) rays. Currently no effective strategies are available to delay skin aging process. Aloe Vera, glycerin and honeybee venom face serum is a highly concentrated cosmetic product. When using aloe Vera we get not only a quick cosmetic effects but also psychological satisfactions, serum has a property of rapid absorption

and ability to penetrate into deeper layer of the skin. Aloe Vera gel is commonly used to treat different skin disease, sun burn, minor cuts, insect bites, and used as wound healing, anti inflammatory, anti-bacterial and anti-fungal effect. The face serum was evaluated for its physiochemical parameters, pH, Irritation test, texture, colour, odour, temperature, washability.

INTRODUCTION

The word cosmetics was derived from the Greek word "kosmtikos" meaning having the power, arrange, skill in decorating. 'Cosmeceuticals' can be referred to as topical cosmetic pharmaceutical hybrids intended to enhance beauty through ingredients that provide

additional health related functions or benefits. Cosmeceutical products included in this definition are skin moisturizers, fingernail polishes, lipsticks, perfumes, facial and eye make up preparations, shampoos permanent waves hair colors, tooth paste and deodorants, as well as any material intended for use as a component of cosmetic product. It represents a category of products placed between pharmaceuticals and cosmetics that are used for the intensification of both the health and beauty of skin.

Study of human skin represents an important area of research and development in dermatology, toxicology, pharmacology, and cosmetology, in order to assess the effects of exogenous agents, their interaction, their absorption mechanism, and their toxicity towards the different cutaneous structures. The importance of beautification to the mankind has been known since the prehistoric time and the desire to look beautiful and healthy has been developing in the society.

Cosmetic is a Greek word which means to adorn (addition of something decorative to a person or a thing). Cosmetology is the study and application of beauty treatment. It's an art or science of beautifying and improving the skin, nails and hair and the study of cosmetics and their application. A skin care formulation must be able to deliver the powerful agent into the skin to fulfil the intended objective. Face serum is the answer to deliver the precious active ingredient into the skin thus eliminating the use of hazardous chemicals in giving instant Serum is a concentrated product which is widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated in water or oil as any other cream. Serums are defined as concentrated product that contains ten times more organic matter than cream.

Therefore, deals with the cosmetic problem quickly and effectiveness. Face serum is a highly concentrated emulsion which is available in water based and oil based. Serums or defined aconcentrate, contain approximately ten times more of biologically active substances than creams, therefore allows better skin problems treatment. Incorporating a few drops of face serum with daily skin care routine will deliver noticeable results within a month or less. This is because face serums are made of very small molecules that help it to penetrate deep into the skin quickly. Serum is packed with a bunch of beneficiary active components and nutrients such as antioxidants, ceramics, amino acids and others. This explains why face serum always being the costliest item in a skin care set. Weather it is moisturizer, anti-wrinkle or anti-aging product or skin serum, all these products should contain antioxidants,

cell-communicating ingredients and skin-identical ingredients.

> TYPES OF FACIAL SERUMS

1. Antioxidant Serums
2. Hydrating Serums
3. Brightening Serums
4. Anti-ageing Serums
5. Serums for Hyper-pigmentation.
6. Serums that reduce acne and fades acne scarring
7. Serums for sensitive skin
8. Serums for combination skin

> CLASSIFICATION OF FACE SERUM

I] *Base on Function / Skin Concern*

1. Hydrating Serums
2. Brightening Serums
3. Anti - Aging Serums
4. Acne Control Serums
5. Soothing / Anti - Inflammatory Serums
6. Pigmentation / Spot Removal
7. Firming & Lifting Serums
8. Antioxidant Serum

II] *Base on Active Ingredients*

1. Ayurvedic - Based Serums
2. Botanical Extract - Based Serums
3. Fruit / Enzyme - Based Serums
4. Floral Water - Based Serums

III] *Based on Formulation Type*

1. Oil - Based Serums
2. Gel - Based Serums
3. Emulsion Serums

> IDEAL PROPERTIES OF FACE SERUM

1. Lightweight Texture
2. High Concentration of Active Ingredients
3. Non - Comedogenic
4. Stable and Potent Formulation
5. PH Balanced
6. Suitable for Skin Type
7. Fragrance - Free or Hypoallergenic
8. Layering Compatibility
9. Clean and Safe Ingredients
10. Packaging that Protects Integrity

> BENEFITS

1. Deep Skin Penetration
2. Hydration
3. Brightening
4. Anti - Aging Effects
5. Acne Control
6. Even Skin Tone
7. Improved Skin Texture
8. Calms Sensitive Skin

INGREDIENTS**1] Vitamin E.****1. Synonyms of Vitamin E.**

Tocopherol, Alpha-tocopherol, D-alpha-tocopherol.

2. Biological Source

Naturally obtained from:

Vegetable oils (e.g., sunflower, wheat germ, safflower, olive) Nuts and seeds (e.g., almonds, peanuts)

Green leafy vegetables (e.g., spinach, broccoli) Cereals and whole grains

3. *Family (of source plants)*

Vitamin E is found in various plants from different families, mainly:

Asteraceae (e.g., sunflower) Poaceae (e.g., wheat, maize) Fabaceae (e.g., soybean)

Brassicaceae (e.g., canola)

Lamiaceae (e.g., basil, oregano—minor sources)

4. *Chemical Constituents (in capsules)*

Vitamin E capsules contain one or more forms of tocopherols/tocotrienols:

Main Active Component: Alpha-tocopherol ($C_{29}H_{50}O_2$)

5. **Excipients (in capsules):** Gelatin (capsule shell) Glycerin

Oil base (e.g., soybean oil, sunflower oil)

2] ALOEVERA GEL



Aloe vera gel can be used in a face serum to provide hydration, soothe irritation, and offer antioxidant benefits, making it a valuable addition to a skincare routine. It can be applied directly to the face as a moisturizer or mixed with other ingredients to create a homemade serum.

1. *Synonyms of Aloe vera*

Scientific Name: Aloe vera

Other Names: Aloe barbadensis, Ghritkumari (Hindi), Kumari (Sanskrit), Burn plant, Miracle plant, Lily of the desert

2. *Biological Source*

Aloe vera gel is obtained from the parenchymatous cells in the leaves of Aloe vera plant.

The gel is the mucilaginous, water-rich inner part of the leaf.

3. **Family:** Liliaceae

4. *Chemical Constituents*

Aloe vera gel contains both active and supportive constituents:

Major Components

Polysaccharides: Acemannan, Glucomannans

Vitamins: Vitamin A, C, E, B12, Folic acid Enzymes: Amylase, Catalase, Cellulase, Lipase

Minerals: Calcium, Magnesium, Zinc, Selenium, Sodium, Potassium Amino Acids: 20 of the 22 required amino acids including 7 of the 8 essential ones.

5. *Benefits of using aloe vera gel in a face serum:*

Hydration

Soothing and Anti-inflammatory Antioxidant Protection:

Acne Treatment

Skin Tone and Texture Improvement

6. *Skin Benefits*

Moisturizing Wound Healing Acne treatment Anti - aging Sunburn Relief

3] OLIVE OIL



Olive oil can be beneficial in face serums due to its moisturizing and nourishing properties, including antioxidant protection and potential skin-healing benefits.

1. *Synonyms of Olive Oil*

Olea Europaea Oil, Sweet Oil, Huile d'Olive (French), Aceite de Oliva (Spanish), Zaitoon ka Tel (Urdu/Hindi), Olivae Oleum (Latin/pharmaceutical name)

2. *Biological Source*

Fixed oil obtained by cold pressing the ripe fruits (drupes) of the olive tree, *Olea europaea* L.

3. **Family:** Oleaceae

4. *Chemical Constituents*

Major Components:

Fatty acids:

Oleic acid, Linoleic acid, Palmitic acid, Stearic acid

Minor Components: Vitamin E (Tocopherols), Squalene Polyphenols: Hydroxytyrosol

5. *Benefits of Olive Oil in Face Serums:*

Moisturization Antioxidant Protection

Potential for Scar Reduction Skin Brightening

Anti-aging

4] GLYCERINE



Glycerine, also known as glycerol, is a colorless, odorless, sweet-tasting, and non-toxic liquid commonly used in food, cosmetics, pharmaceuticals, and lab applications.

1. *Basic Info*

Chemical name: Propane-1,2,3-triol **Molecular formula:** $C_3H_8O_3$ **Appearance:** Clear, syrupy liquid

Solubility: Soluble in water and alcohol

2. *Common Uses*

1. **Cosmetics & Skincare**

Acts as a humectant – draws moisture into the skin Used in lotions, creams, soaps, and shampoos Helps improve skin smoothness and hydration

2. **Pharmaceuticals**

Used in cough syrups, suppositories, and ointments Works as a laxative when taken orally in certain forms Used to make capsules and pills soft and flexible

3. **Food Industry**

Known as E422 (food additive)

Used as a sweetener, preservative, and moisture-retainer in baked goods, candies, and beverages.

4. **Laboratory Use**

Used in making gels (e.g., for gel electrophoresis)

Acts as a stabilizer in certain enzyme or cell storage solutions

5] **TWEEN 20**



Tween 20, also known as Polysorbate 20, is a non-ionic surfactant widely used as an emulsifier, detergent, and solubilizer in various applications, including biochemical research, cosmetics, and pharmaceuticals.

Pharmaceuticals

Emulsifying agent, stabilizer, and solubilizer

Cosmetics: Surfactant that improves spreadability and enhances product performance

Tween 20, also known as Polysorbate 20, is a nonionic surfactant and emulsifier commonly used in a variety of industries including pharmaceuticals, cosmetics, food, and biotechnology.

Basic Info

Full name: Polyoxyethylene (20) sorbitan monolaurate

Common name: Tween 20 **Appearance:** Yellowish, viscous liquid **Solubility:** Soluble in water and ethanol

Uses

1. *Biotech & Lab Use*

Used to stabilize proteins and enzymes in solutions. Helps reduce surface tension in assays and reactions.

Often added to buffers like PBS-T (Phosphate Buffered Saline with Tween 20) for washing steps in ELISA and Western blotting.

2. *Cosmetics*

Acts as an emulsifier, helping oil and water mix.

Used in products like creams, lotions, and makeup removers.

3. *Food Industry*

Used as a food additive (E432), mainly as an emulsifier.

4. *Pharmaceuticals*

Helps solubilize active ingredients in drug formulations. Used in vaccines and injections to stabilize ingredients.

6] ROSE WATER



While rose water can help brighten and even out skin tone due to its antioxidant and anti-inflammatory properties, it's not a direct skin whitening agent, and it's important to have realistic expectations.

1. *Synonyms of Rose Water*

Gulab Jal (Hindi/Urdu), Rose hydrosol, Aqua Rosae, Distilled Rose Water, Rosae Aqua.

2. *Biological Source*

Rose water is obtained by steam distillation of fresh rose petals, especially from:

Rosa damascena (Damask rose) – most common also from *Rosa centifolia* and *Rosa gallica*

3. **Family:** Rosaceae

4. *Chemical Constituents*

Rose water primarily contains volatile aromatic compounds dissolved in water.

5. *Brightening and Even Skin Tone*

Rose water's antioxidant content can contribute to a brighter and more even skin tone by reducing the appearance of dark spots and discoloration.

MATERIALS USED IN THE STUDY

SR.NO.	NAME OF MATERIALS	FUNCTION
1.	VITAMIN - E	ANTI-AGING
2.	OLIVE OIL	CLEANSE THE SKIN
3.	GLYCERIN	MOISTURIZER
4.	ALOE VERA GEL	ACNE
5.	TWEEN - 20	EMULSIFIER
6.	ROSE WATER	BALANCING OIL PRODUCTION

SUCCESS FORMULA

SR.NO.	INGREDIENTS	QUANTITY
1.	VITAMIN - E	8 drops
2.	OLIVE OIL	2 ml
3.	GLYCERIN	6 ml
4.	ALOE VERA GEL	8 gm
5.	TWEEN - 20	6 ml
6.	ROSE WATER	Q. S to 30 ml

PROCEDURE

- 1] In a clean mixing container, add 6 ml of glycerin, 8 gm of aloe vera gel, and 7.5 ml of rose water.
- 2] Stir the mixture to combine the water-based ingredients.
- 3] Add 2 ml of olive oil and 8 drops of Vitamin E oil to the mixture.
- 4] Lastly, add 6 ml of Tween 20 and mix thoroughly to help emulsify the oils with the water.
- 5] Transfer the serum into a 30 ml serum bottle or glass container with a dropper for easy use.

**EVALUATION PARAMETERS****1] *Organoleptic properties***

The formulations were characterized for organoleptic properties such as colour, odour. The formulations are visually inspected for its clarity and presence of any foreign particles.

Colour: Light Green

Odour: Characteristic odour [alovera & rose water]



2] *Texture*

The formulation was texture in smooth homogenous.

3] *Determination of PH*

The skin has an acidic range and the pH of the skin serum should be in the range of 4.1-6.7 .

PH : 5



4] *Cyclical Temperature*

In these test, temperature was changed cyclically every day. At room temperature and freezing temperature to stimulates the changes in temperature.

Freezer temperature: Unstable

Room temperature: Stable

5] *Washability*

Serum's washability to ensure easy application and removal.

**After Applying Serum****After Wash**

6] Skin Irritancy

Apply some amount of serum on back of your hand and observe for 24 hours if any irritation is caused at that area of application.

RESULT

The prepared polyherbal face serum showed a light green colour, pleasant herbal smell, and smooth, non - sticky texture. The pH of serum was found to be around 5 which suitable for skin. It spread easily and absorbed well without leaving any residue.

CONCLUSION

The aim of this report was to study about what exactly are facial serums and their history along with their overall importance. The study includes its proper selection and correct sequence of application. With tremendous amount of serums available in the market for each and every skin type and skin problem these days, it's essential for one to know what they are looking for in a serum precisely.

Aloe vera is known for its soothing and moisturizing properties. It also possesses antimicrobial and anti-inflammatory effects, which help in combating bacteria and reducing inflammation on the skin. Aloe vera can aid in the healing process and promote healthy skin.

Rose water is perfect for cleansing your skin and removing any impurities that could cause unwanted spots. Because of its gentle nature, it is suitable for people with any skin type even sensitive skin. Using rose water for face and body cleansing will ensure your skin doesn't become dry and irritated.

Vitamin E Strengthens your skin barrier. A strong skin barrier allows your skin to retain water and stay hydrated.

Olive oil may be helpful as a moisturizer skin and it's Antibacterial properties and Antioxidant properties.

Glycerine to your skin traps moisture in your skin and gives it a youthful, healthy glow. When a righteous formulation is selected by scrutinizing every major skin issue, it is safe to say that significant improvements can be seen, leading to good results.

Skin health is a crucial element of the altogether health of the body and having a proper skin care routine with an accurate serum for you, can sustain the ageing skin and ward off the ongoing damage. It eliminates fine lines, wrinkles, dark spots, and further blemishes if paired with appropriate moisturizer and sunscreen.

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