

# Formulation and Evaluation of Face Serum

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**Abstract:** In India as well as other parts of the world, herbal medicine has been extensively used for primary healthcare. The chrysanthemum flower is employed for its therapeutic and skin-care benefits in this. Major skin issues brought on by photo damage and ultraviolet rays include skin ageing, acne, and face wrinkles. There are currently no effective cosmetics to stave off acne and ageing skin.

A face serum made of chrysanthemum, vitamin E, and glycerine is a highly concentrated cosmetic product. The ability of serum to reach the deeper layers of the skin is evident. Numerous vitamins, including vitamins B9, A, C, and E, as well as flavonoids, carotenoids, anthocyanins, folic acid, and essential oils are present in chrysanthemum flowers. Because of its anti-inflammatory and antibacterial qualities, chrysanthemum can lessen acne and skin inflammation.

**Index Terms-** Face serum, Extraction of Herbal plants, Formulation, Evaluation.

## INTRODUCTION

Skin Serum is a skincare product that you apply to your skin after washing but before moisturising with the goal of quickly delivering potent nutrients to the skin. Skin care treatments called serums are made to deliver concentrated amounts of specific active ingredients to the skin. There are numerous unique varieties of serums available that perform special tasks, from hydration to skin lightening. The serum is especially well suited for this endeavour since it is composed of tiny molecules that may permeate the skin deeply and provide an extremely high awareness of active components. This makes them an exceptional tool for concentrating on particular skincare issues, such pigmentation and ageing signs.

**Skin:**

The skin is the body's outermost and most superficial layer. It approximately 15–20% of the body's total mass. The skin is a constantly changing organ made up

of numerous specialised cells and structures. As we become older, changes in the skin's form have an impact on how it looks.

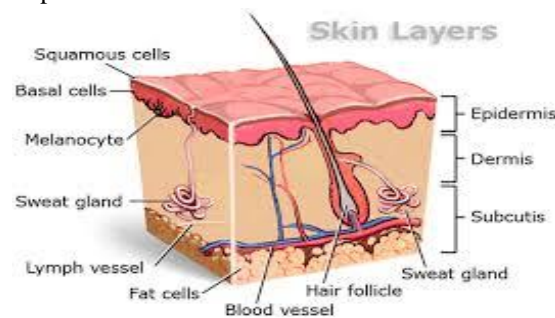


Fig no1 Skin layer

**Functions of Skin:**

1. Provides a barrier of defence against harmful substances, mechanical, thermal, and physical harm.
2. Prevents moisture loss.
3. Minimises the negative effects of UV light.
4. Serves as a sense organ (feels temperature, etc.).
5. Aids in temperature regulation.
6. An immune system that can identify infections, etc.

**Advantages of Face Serum:**

1. Keeps skin moisturised.
2. Helps remove skin blemishes.
3. Anti-aging benefits.
4. Helps protect the skin against future damage

**Disadvantages of Face Serum:**

1. Not effective for all skin issues;
2. Can be pricey.
3. Difficult to select the proper one.
4. If not used effectively, it risked being wasted.

## MATERIAL

In order to prepare the face serum the selected plant materials were shade dried and made into coarse particles and this powder material was used for the extraction.

Sr.No	Name of ingredients	Manufactured/ Company
1	Chrysanthemum indicum	Local Market Kolhapur
2	Olive oil	Loba chemie Pvt. Ltd.
3	Almond oil	Loba chemie Pvt.Ltd
4	Glycerine	Loba chemie Pvt.Ltd
5	Coconut oil	Loba chemie Pvt.Ltd
6	Tween 20	Loba chemie Pvt.Ltd
7	Distilled water	Chemistry lab

Table no.1 – Materials for Face Serum.

**METHODS OF EXTRACTION**

**EXTRACTION OF *Chrysanthemum indicum***

25g of dry CIF combined in a 1:8 ratio with distilled water.



3 periods of 1 hour each of heating and simmering is performed.



The stirring is done continuously during this time.



After 1 hr filtration process is performed.



And the filtrate containing the main components was extracted.

Flow chart of Extraction

**FORMULATION OF FACE SERUM**

Components required for making face serum

Sr.No	Ingredients	Std formula	Working formula
1	Chrysanthemum Extract	50%	10ml
2	Olive oil	9%	1.8 ml
3	Almond oil	0.1%	0.02ml
4	Glycerine	25%	5ml
5	Coconut oil	2%	0.4ml
6	Tween 20	1%	0.2
7	Distilled water	Q.S to 100ml	Q.S to 30 ml

Table no.2- Formula for Face Serum

**METHOD**

The face serum was made in accordance with the formulation table's formula.

The following formula was used to create the emulsion (o/w). To create a homogenous solution, the oily component—which includes olive oil, sandalwood oil, tween 20 and coconut oil—is blended for 10 minutes. The water phase was also made by uniformly combining chrysanthemum glycerine, and a little amount of distilled water. To create an oil in water based biphasic emulsion, the oil phase is dropped one at a time into the liquid phase while being mechanically vibrated at 2500 rpm.

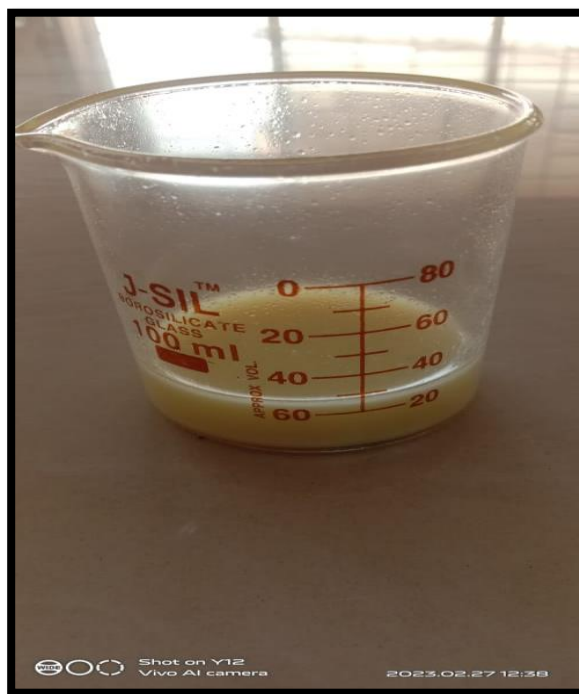


Fig no.2 – Face serum

**EVALUATION OF FACE SERUM**

Several quality-controlled tests, such as visual assessment, physicochemical controls, and condition in performance testing, were conducted to check the generated formulations' quality.

Physical Assessment: Visual observation was made of the formulation's colour and look. Homogeneous distribution of extracts during the formulation process. Both touch and visual appearance served as confirmation for this test.

Determination of pH- With the use of a standard buffer solution, a pH metre was calibrated. After accurately measuring and dissolving nearly 1 ml of the facial serum in 50 ml of pure water, the pH of the mixture was determined. The skin has an acidic pH range, and the skin serum's pH should be between 4.1 to 6.7.

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

Microbial Examination of Product: This technique involves directly diluting the combined culture in tubes of liquid agar medium. To ensure the inoculums are evenly distributed, the medium is kept liquid at a temperature of 45°C. Transferred into Petri plates, the inoculated agar medium is incubated after being given time to harden. The initial inoculums may be diluted in the series dilution method using sterile water or saline solution to reduce the germ concentration over time. 20 ml of liquid nutrition agar medium at 45°C and 1 ml of diluted are combined. Shake the liquid agar nutrient agar medium, then pour it into a clean Petri dish. Let it set up and then incubate.

Stability studies: A proper stability analysis must be performed on a pharmaceutical product's formulation and development in order to assess its physical and chemical stability and, consequently, its safety. The stability studies are conducted in accordance with ICH recommendations. For a few months, a short-term accelerated stability evaluation of the produced formulation was conducted. The samples were kept under various storage settings, including 3-5°C, 250°C with a 60% relative humidity, and 40°C with a 2% relative humidity.

## RESULT AND DISCUSSION

Physical Assessment:

Colour	Yellow
Odour	Characteristic Odour
Taste	Taste Tasteless
Texture	Texture Smooth
Homogeneity	Homogenous

Determination of pH:

The formulation's pH was discovered to be 6.4. This range of formulations is appropriate for skin since the pH range of the skin is between 4.1 and 6.7.

Determination of Spread ability:

The face serum's capacity to spread over the skin, or its spread ability, is crucial for administering a normal dose of medication formulation to the skin. Face serum has a 5 to 6 cm spread ability

Determination of Viscosity:

A crucial factor in topical formulation is viscosity. Viscous solutions take longer to remove from the skin than topical treatments with low viscosity. Additionally, the skin may experience negative side effects from very viscous liquids. The Face Serum's viscosity was determined to be 13759 Pa.

Microbial Examination of the Product:

As they did not exhibit a zone of inhibition when they were inoculated in the agar, the formulation was free of microorganisms.

## CONCLUSION

The study's goal was to combine different plants into a serum that would have moisturising and shining effects on skin. Cosmeceuticals are skin-care items that serve the pharmacological and cosmetic markets. Chrysanthemum and olive oil are the two key ingredients in the serum. The aloe vera gel from the inner centre of the leaf often has a very good effect on the treatment of radiation dermatitis as well as acne, pimples, and other skin issues. Chrysanthemum is full of different chemical constituents that keep skin well-moisturized and youthful-looking while also having anti-aging benefits. Olive oil is useful for curing sunburns because it contains antioxidants that repair UV-induced damage.

Additionally, it prevents and delays premature ageing. Omega 6 and omega 9 fatty acids are included in it, which aid to prevent dry skin. Studies on stability found no discernible difference between the physical and pH variables. The formulation was thus determined to be stable. The serum was tested for microorganisms, and the results showed that the formulation is safe to use and devoid of microorganisms. Spread ability was deemed to be

favourable. It was simple to wash away and left no residues.

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