



FORMULATION & EVALUATION OF EUCALYPTUS OIL FACE SERUM

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ABSTRACT

Serums are light, easily absorbed oil- or water-based liquids that you spread on your skin. They typically come in small bottles with a dropper, and you only need a few drops to treat your whole face. A skin serum is not a moisturiser, like a lotion or cream. Rather, they are highly concentrated formulations that are designed to sink into the skin quickly, delivering an intensive dose of ingredients that can address common skin complaints. Face serums help shrink pores and increase cell turnover further leading to the minimisation of large pores. They also help unclog and clear dirt and sebum from the pores, thanks to the antioxidants and exfoliating acids present in them. This helps in reducing the formation of blackheads and whiteheads on the skin. eucalyptus tree (Eucalyptus globulus) appears in many over-the-counter cough and cold products to relieve congestion. Eucalyptus oil is also used in creams and ointments to relieve muscle and joint pain, and in some mouthwashes.

Eucalyptus radiata essential oils are commonly used in skincare due to its anti-inflammatory and anti-bacterial properties which can help to soothe acne prone and congested skin. It also works well as an analgesic and is found in many muscle balms, gels and pain relief ointments.

KEYWORDS: Face serum, vitamin c , eucalyptus, aloe vera, coconut , olive oil , skin treatment, skin glow , formulation, evaluation.

INTRODUCTION

Serum is one of the highest concentrated cosmetic products in its active formula for providing a deep nourishing deep skin layer and a non-oily skin product suitable for skin. Cosmetic serum was classified according to its level of absorption and the ability to penetrate deep layers of the skin. Today, cosmetics are in great demand in everyday life and are used by many people every year (fig.1, Face serum).

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, Serum, or other concentrated product that contains ten times more organic matter than cream. Therefore, deal with the cosmetic problem quickly and effectively. (Fig.1, Face Serum) } Rising global cost of living has led to an increase in demand for cosmetic products. The cosmetics industry established in Malaysia is one of the most important economic resources. The value of cosmetics has increased as more and more people want to stay young and attractive.



Fig.1 Face serum

Serum is a skin care product that contains a gel or lightweight lotion or moisturiser and has the ability to penetrate deep to bring the active ingredients to the skin. A good skin serum may give your skin firmness, a smooth texture, make the pores appear smaller and increase moisture levels. Whether it is a moisturising, anti-aging or anti-wrinkle product or serum for skin, all of these products should contain antioxidants, cell based ingredients and skin-like ingredients. All skin types need these ingredients to stay as healthy as possible.

Serum and light lotion is best for normal dry skin, more emollients and the best moisturising creams for dry to very dry skin. Skin texture is all about the skin type but the smart ingredient for healthy skin is the same for everyone, no matter what product, texture or preference you have.

The skin is the largest and most protective of the body for 24 hours, but sometimes the skin can become dry for many reasons such as UV rays, dirt, cosmetics left overnight can cause irritation or allergies.

Skin serum is a skin care product that you can apply to your skin after cleansing but before moisturising with the intention of bringing the ingredients directly to the skin. Serum is particularly well suited for this task because it is made up of a small molecule that can penetrate deep into the skin and bring about a very high concentration of active ingredients.

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TYPES OF FACE SERUM

1. Anti-Aging Serums: These serums are formulated with active ingredients such as retinol, peptides, and vitamin C, which can help to reduce the appearance of fine lines, wrinkles, and other signs of ageing.

2. Hydrating Serums: These serums are formulated with hyaluronic acid, glycerin, and other humectants that help to hydrate and plump the skin, reducing the appearance of fine lines and giving the skin a more youthful appearance.

3. Brightening Serums: These serums are formulated with ingredients such as vitamin C, Niacinamide, and acid, which can help to reduce the appearance of dark spots and hyperpigmentation, giving the skin a brighter and more even tone.

4. Acne-Fighting Serums: These serums are formulated with ingredients such as salicylic acid, benzoyl peroxide, and tea tree oil, which can help to reduce the appearance of acne and prevent future breakouts.

5. Calming Serums: These serums are formulated with ingredients such as chamomile, Aloe vera, and green tea, which can help to soothe and calm irritated or sensitive skin.

6. Exfoliating Serums: These serums are formulated with alpha-hydroxy acids (AHAs) or beta-hydroxy acids (BHAs) that help to exfoliate the skin, unclog pores, and reduce the appearance of fine lines and wrinkles.

LITERATURE REVIEW

S. No	Author Name	Title	Publishing Year	Work done
1	Lillian C. Becker, Alice Akinsulie, Ronald A. Hill, Wilma F. Bergfeld, James G. Marks	Safety Assessment of Eucalyptus globulus (Eucalyptus) Derived Ingredients as Used in Cosmetics.	2023	This is a safety assessment of Eucalyptus globulus derived ingredients as used in cosmetics. The reported functions of the Eucalyptus globulus -derived ingredients include abrasive, fragrance ingredient, and skin-conditioning agent (miscellaneous and occlusive). The Panel concluded that Eucalyptus globulus (eucalyptus)-derived ingredients are safe in cosmetics in the present practices of use and concentration described in this safety assessment when formulated to be non-sensitizing.
2	Vaishnavi P Koulge, Prathmesh V Kokate, Vaishnavi V Kuditrekar, Prajwal S Kumbhar, Apoorva R.	Development and Authentication of Skin Care Pharmaceutical Serum Using Herbal Extracts.	2022	The formulated cosmetic serum was successfully developed and evaluated using different standard parameters including skin moisture rising properties. Based on all cosmetic serum formulations studied, all F1, F2, F3 formulations showed significantly different in rising of skin moisture level.
3.	Miss. Purva S Rajdev, Prof. Gaikwad S. D, Miss. Akanksha A Somvanshi, Miss. Shubhangi S Gunjal.	Formulation and Evaluation of Face Serum	2022	Wrinkles on the face and ageing of the skin are an undesirable effect of photodamage and ultraviolet radiation. Serum has a quick absorption and ability to penetrate deep layers of the skin, as well as a non-oily finish and a deep formula with a very high amount of active ingredients. Based on these properties, the purpose of this work was to make serum using polyherbal extract.
4.	Vipin Kesharwan i, Shashank Gupta, Nikhil	A review on therapeutics application of eucalyptus oil	2018	It rich sources of phytochemical constituents which contain flavonoids, alkaloids, tannin and . Which are present in leaves, stem, and root of the plant. They are various

	Kushwaha, Roohi Kesharwan i and Dilip KM Patel			properties like anti-inflammatory, antibacterial, antiseptic, astringent, anti-diabetic, anti-oxidative, antiviral, antitumor, antihistaminic, anticancer cytochrome p450 inhibitor and hepatoprotective effect have also been reported by many researcher.
5.	Smriti Ojha, Surabhi Sinha, Swadhapri ya Das Chaudhuri, Hina Chadha, Babita Aggarwal, Seema Major Jain, Ajeet and Meenu	Formulation and evaluation of face serum Containing bee venom and Aloe vera gel	2018	When using aloe Vera we get not only quick cosmetic effects but also psychological satisfactions, serum has a property of rapid absorption and ability to penetrate into deeper layers of the skin. Aloe Vera gel is commonly used to treat different skin diseases, sunburn, minor cuts, insect bites, and used as wound healing, anti inflammatory, antibacterial and antifungal effect.

AIM & OBJECTIVE

AIM

Formulation and Evaluation of face Serum by using Eucalyptus oil.

OBJECTIVE

1. To ensure the stability and compatibility of the active ingredients in the formulation, to avoid any adverse reactions or degradation of the product.
2. To develop a formula that has an appropriate texture, consistency, and pH level, so that it can be easily absorbed by the skin and deliver the active ingredients effectively.
3. To perform quality control tests, such as viscosity, pH, and stability testing, to ensure that the product meets the desired specifications and is safe for use.
4. To evaluate the efficacy of the product through clinical studies or consumer feedback to determine its ability to achieve the desired results.
5. To select and combine active ingredients that are scientifically proven to be effective in treating the targeted skin concern. This includes ingredients such as vitamins, antioxidants, peptides, and hydrating agents.

MATERIALS METHOD MATERIALS

Eucalyptus essential oil: The main active ingredient that provides the skin benefits.(fig.2)

Carrier oils: Such as coconut oil, olive oil, tween 20, which help to dilute the eucalyptus oil and nourish the skin.








Vitamin C: Such as Antioxidants, to help protect the skin from damage caused by free radicals.



Glycerin: Such as Emulsifiers to help blend the oil and water-based ingredients.



Fig.2 eucalyptus oil

COMPOSITION OF FACE SERUM

S.No	INGREDIENTS	QUANTITY (30 ML)
1.	Eucalyptus oil 	4 ml
2.	Tween 20 	1 ml
3.	Coconut oil 	2ml
4.	Olive oil 	1ml
5.	Aloe Vera Gel 	8ml
6.	Glycerine 	5ml
7.	Vitamin c 	8%
8.	Perfume	Q.S

		
9.	Distilled water 	Q.S

METHOD

EUCALYPTUS OIL EXTRACTION FROM LEAVES USING WATER DISTILLATION: Fresh leaves of Eucalyptus was collected from the gardens of Baghdad University, the leaves were taken to laboratory and cut out by a pair of scissors to small part. The schematic diagram of the equipment used is shown in (fig.3).

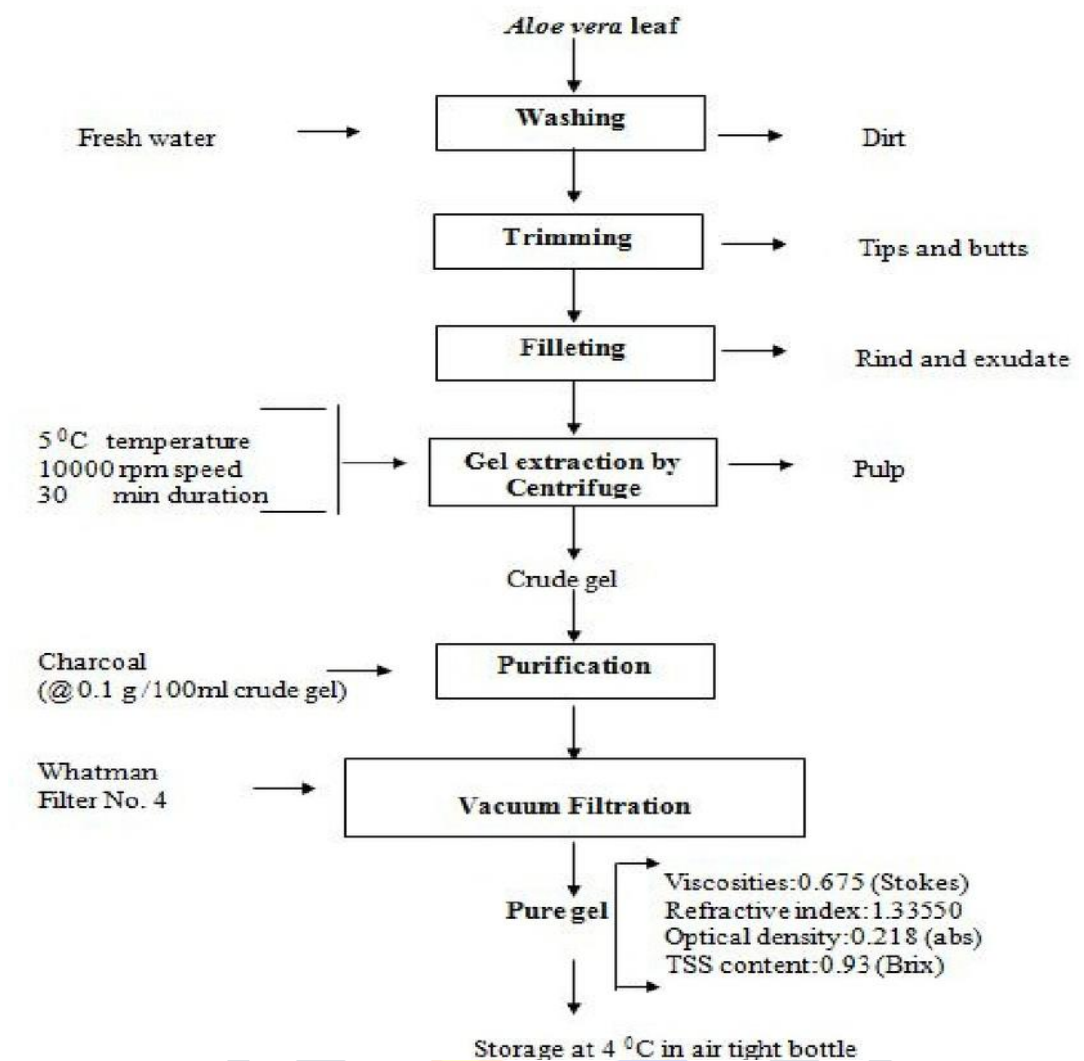
The Clevenger consists of a main tube combined with condenser and graduated tube with glass stopcock. A return tube for the aqueous part of the distillate connects the bottom of the measuring tube and the main tube. Eighty grams of fresh and clean Eucalyptus leaves were placed into the three necked round extraction in a flask and soaked with water. Clevenger apparatus was linked to the flask as shown in (fig.4). The flask was heated using a heating mantle. Water and leaves were mixed and allowed to boil. Water and extracted eucalyptus oil evaporate. The Vapour mixture condensed using reflux condenser, from condenser distillate water and oil flow in to graduated tube; as the oil is not miscible with water it may be easily separated and started accumulating and distillate water returning to the flask, after the oil has been separated from it, so that can be reboiled. The oil was allowed to stand for sufficient time, to be clear and then it was collected and stored in a dark glass vial in a refrigerator until it has been tested.



Fig.3 Clevenger Apparatus



Fig.4 Water Distillation unit

ALOE VERA GEL EXTRACTION:**PREPARATION OF FACE SERUM:**

- The emulsion (o/w) was prepared according to the formula given below.
- Then an oily component consisting of Eucalyptus oil, Olive oil, tween 20 and coconut oil is mixed together for 10 minutes to obtain a uniform solution.
- At the same time the water phase was prepared by mixing aloe vera gel, and a small amount of distilled water uniformly.
- Add Glycerine as an emulsifier and add 8% vitamin C.
- The oil phase is added to the liquid phase by dropwise under mechanical vibration at 2500 rpm to obtain oil in water based on biphasic emulsion.
- Store the serum in a cool, dark place until ready to use.

**Fig.5 Prepared face serum**

EVALUATION PARAMETERS:

- **Physical Evaluation** -The Color 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 metre was calibrated using a standard buffer solution. Nearly 1 ml of the face serum was properly weighed and dissolved 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 4.1-6.7.
- **Determination of Spreadability** - 2gm 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 the surface was taken as a measure of Spreadability.
- **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 a few months for the prepared formulation. The samples were stored at different storage conditions of temperatures such as 35oC, 25oC RH=60% and 40oC±2% RH=75%.
- **Homogeneity** -The formulation prepared had even distribution of the extracts made. The homogeneity of the preparation was confirmed visually by the absence of any particulate matter and also feeling the product by touch.
- **Consistency** -The consistency of a face serum should be uniform, without any separation of ingredients or clumping.



Fig.6 Formulated and evaluated face serum

RESULT AND DISCUSSION

- **Physical Evaluation:-**

Table 1:-Physical evaluation of Face Serum

1	Colour	Light Aqua fresh
2	Odour	Characteristic odour
3	Texture	Smooth homogeneous
4	Homogeneity	Good

- **Stability Studies :**

Table 2:-Stability studies of Face Serum

1	Visual appearance	Creamy
2	Phase separation	Nil
3	Homogeneity	Good

- **Cyclical Temperature Test:**

Table 3:-Cyclical Temperature test of Face Serum

S.no	Parameter	Stability
1	Freezer temperature	Unstable
2	Room temperature	Stable

APPLICATION OF FACE SERUM

1. **Hydration:** Eucalyptus oil face serum is formulated to provide intense hydration to the skin, which can help to improve skin elasticity and reduce the appearance of fine lines and wrinkles.
2. **Soothing and calming:** Eucalyptus oil has anti-inflammatory properties, which can help to soothe and calm irritated or inflamed skin.
3. **Antimicrobial and anti-acne:** Eucalyptus oil has antimicrobial properties, which can help to fight bacteria that can cause acne and other skin blemishes. Serums can be used to control acne and prevent breakouts.
4. **Brightening and even-toning:** The serum can help to improve the overall texture and tone of the skin, providing a brighter, more even complexion.
5. **Anti-Oxidant:** Face serums can be used to protect the skin from environmental damage and oxidative stress. They may contain ingredients such as vitamin E, green tea extract, or resveratrol, which help to neutralise free radicals and prevent premature ageing.

CONCLUSION

The aim of the study was to formulate different herbals into a serum form moisturising and glowing activity on skin. Cosmeceuticals are skin-care products that cater to both cosmetics and drugs. In the serum aloe vera and olive oil are mainly used. The aloe vera gel from the inner central part of the leaf often has a very good action in acne, pimples, and other skin problems, burns due to heat, sun exposure and in treatment of radiation dermatitis. Aloe vera is rich in vitamins and minerals that have a good moisturising capacity and anti-aging effects to maintain healthy- and fresh-looking skin.

Olive oil is beneficial for treating sunburn, the antioxidants in the oil used treat damage caused by the UV rays. It also slows down and prevents premature ageing. It contains fatty acids such as omega 6 & omega 9, which help to prevent dry skin. Stability studies revealed that there was no significant difference in the physical and pH parameter. Thus, the formulation was found to be stable. Microbial examination of serum revealed that the formulation is free from microorganism and safe for use. The Spreadability was found to be good. No residues were formed and was easy to wash out. The gel stimulates cell growth and as such enhances the restoring of damaged skin. So, this serum can be used to treat skin related problems.

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