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Formulation And Evaluation Of Herbal Face Serum Using *Clitoria Ternatea*

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ABSTRACT

Herbal cosmetics are a type of composition that is mainly used to protect and maintain a person's appearance. The face serum is a light formulation that contains many active ingredients that target specific skin concerns and offer many benefits. Most face serums available today are fair to the face and are made from both synthetic and herbal remedies, but they also have several unwanted side effects such as irritation and allergic reactions. The purpose of this research was to prepare and evaluate an herbal face serum for anti-aging containing *Clitoria ternetea* (butterfly pea) as key ingredient. The herbal facial serum was evaluated for various parameters such as pH, viscosity, spreadability, stability test and homogeneity. The results showed that all the formulations produced satisfactory results and the use of herbs in the serum will produce a successful alternative to other harmful chemical cosmetics.

KEYWORD: *Clitoria ternetea* (butterfly pea), Lightweight, Spreadability, Homogeneity

INTRODUCTION

Herbal cosmetics, called products, are made from various approved cosmetics to form a base, where one or more herbal ingredients are used only to obtain certain cosmetics, are called herbal cosmetics. Plant extracts are mainly added to cosmetic products due to several related properties such as antioxidant, anti-inflammatory, antiseptic and antimicrobial properties. [1]

Herbal preparations have received considerable attention because of their good efficacy and relatively few or no side effects of synthetic drugs. Herbal cosmetic products that are usually prepared and used for daily use include herbal facials, herbal conditioners, herbal soaps, herbal shampoos, etc. Herbal cosmetics are

defined as beauty products with desirable physiological effects such as healing, smoothing appearance, healing and conditioning properties. , because of the herbal ingredient. [1, 2]

Serums are cosmetic products that penetrate deep into the skin layers and release active ingredients. A high-quality face serum moisturizes, soothes and reduces the size of skin pores and increases moisture. All products have anti-aging, anti-inflammatory, antioxidant properties and the ingredients used in the serum should have these properties, suitable for all skin types. Gels and liquid preparations were best for oily and combination skin, serums and lotions for normal and dry skin, and emollient creams and moisturizing creams for dry and very dry skin. The largest and most protective organ of the body, the skin can sometimes appear under various conditions, such as UV rays, pollution and make-up, which have become infected overnight and can cause allergic reactions. Aloe Vera and *Clitoria ternatea* flower extracts have antioxidant and antiaging properties that can maintain the appearance of healthy skin. Aloe Vera gel can be used topically to treat wounds and burns and skin diseases like psoriasis etc. Aloe Vera has excellent moisturizing properties and is recommended by Ayurveda for its healing properties for various skin conditions. Cosmetics have become more and more valuable than society's desire to look young and attractive. A skin care serum consists of a gel, light moisturizer or lotion and has the ability to penetrate deep into the skin. In the form of a facial serum, it is a product that can be used on the skin after cleansing and before moisturizing. This is because the serum consists of small particles that can penetrate deep into the skin and carry the active ingredients into the skin. Pharmaceutical companies produce medical products and cosmetic companies produce cosmetics. Cosmetic preparations are formed when cosmetic products and pharmaceutical products are combined. Cosmetic products can be defined as creams intended for use on external parts of the body such as nails, hair, skin, etc. Cosmetic products also include massage oils, smoothing creams, antimicrobial oils, etc. [2, 3]

TYPES OF SERUM [2, 3]

1. **OIL SERUM**

   An oil serum is the simplest form of face serum that contains a carrier oil as a base that absorbs, also known as dry skin. Premium oils have been used to bring out the moisturizing properties of the oil serum.

Fig. 1 Oil serum

2. GEL SERUM

The gel serum has a firming effect on the applied skin areas. Water based plant extract can be added to the gel serum to enhance the effect of the serum.

Fig.2 Gel serum

2. WATER BASED SERUM

A watery serum that contains some gum and thickness. A water-based serum should be used under creams or lotions to apply the hydrophilic plant extract remaining on the skin. Water-based serums have the best ability to penetrate deep into the skin and release the active ingredients into the skin.

Fig 3 Water Based Serum

4. EMULSION SERUM

The emulsion serum is a moisturizing serum that strengthens the skin and transports the active ingredients to the skin. In an emulsion, the two immiscible phase's oil and water are combined. An emulsifier is used to achieve a stable emulsion state. The emulsion serum effectively delivers the active ingredients deep into the skin. The protective function of the skin is strengthened by the moisturizing effect of emulsions.

Fig. 4 Emulsion serum

BENEFITS OF HERBAL FACIAL SERUM [1, 3]

- Improves skin texture
- Minimize pore size of skin
- Reduces free lines and wrinkles
- Improves the skin tone
- Hydrate and nourishes the skin
- Skin elasticity is improved
- Reduces dark circles

- Protect from the free radicals

MATERIALS AND METHODS

METHODOLOGY [3]

1. Selection of active ingredients
2. Collection of active ingredients
3. Method of extraction of *Clitoria ternatea* and *Aloe Vera*
4. Composition of herbal facial serum
5. Evaluation of Herbal Face Serum
6. Results

ACTIVE INGREDIENTS USED IN FORMULATION

1. *CLITORIA TERNATEA*

- Kingdom : Plantae
- Order : Fabales
- Family : Fabacaeae
- Genus : Clitoria
- Botanical name : *Clitoria ternatea*
- Synonyms : butterfly pea, Asian pegion wing, blue pea

Medicinal properties of *Clitoria ternatea* are:

- Skin care
- Improve skin texture
- Provide anti-ageing effect
- Fight against acne
- Lightens the skin
- Has antioxidant properties
- Has anti-inflammatory properties

Fig.5 *Clitoria ternatea*

2. ALOEVERA

- Kingdom: Plantae
- Order : Asparagaleus
- Family : Asphodelaceae
- Genus : Aloe
- Species : Aloevera
- Botanical name : *Aloe barbadensis miller*
- Synonym : Indian aloe

Medicinal properties of aloevera

- Anti-inflammatory
- Anti-aging
- Antimicrobial
- Anti-acne
- Moisturizing effect
- Lightens blemishes in face

Fig. 6 Aloevera

Other ingredients used for the formulation of the herbal face serum

- Lemon oil
- Sesame oil
- Glycerine
- Tween 20
- Ascorbic acid
- Perfume

EXTRACTION METHOD

Extraction method of *Clitoria ternatea* flower using soxhlet apparatus.

The dried flowers of Clitoria ternatea were ground and 50 g of powder was extracted with ethanol (90%, 300 mL) in a Soxhlet apparatus for 24 h. The extract was concentrated to dryness by steam distillation at a concentration temperature of 60-70 °C using a steam distillation apparatus. The resulting extract was a brown-blue color; gum solid (3.5 g). [8]

Fig.7 Dried flowers of *Clitorea ternatea*

Fig.8 Powdered dried flowers

Fig. 9 Soxhlet Apparatus

EXTRACTION OF ALOEVERA

The leaves were collected and washed with distilled water. A sterile scalpel was used to cut the leaf outlet lengthwise. The colorless parenchymatous tissue of the aloe vera plant was then cut away with a clean scalpel. The fibers and impurities are then removed with a muslin cloth. A filter or filter product, which is a transparent aloe vera gel, was then used in the preparation. [6, 7]

Fig.10 Extracted Aloevera gel

FORMULATION TABLE

SL.No	Ingredients	Formulation 1	Formulation 2	Formulation 3
1	Aloevera	21ml	21ml	19.5ml
2	*Clitoria ternatea* Extract	6ml	6.9ml	9ml
3	Lemon oil	0.6ml	0.6ml	0.3ml
4	Sesame oil	0.75ml	0.45ml	0.15ml
5	Glycerine	0.75ml	0.45ml	0.3ml
6	Tween 20	0.6ml	0.6ml	0.6ml
7	Ascorbic acid	0.3g	0.8g	0.3g
8	Water	1ml	1ml	1ml
9	Perfume	qs	qs	qs

Table No: 1 Formulation Table of Serum

PREPARATION OF FACE SERUM

The emulsion (o/w) was prepared according to the formula. The oil component consisting of lemon oil, sesame oil and Tween 20 is mixed in a mortar for 10 minutes to obtain a uniform solution. At the same time, the aqueous phase was prepared by equally mixing aloe vera gel, clitoria ternatae extract, glycerin and rose water. Then half of the water phase is separated and then the acacia powder is added. Infuse this aqueous phase for 10 minutes. The oil phase is added dropwise to the liquid phase by continuous titration. After each addition, rub vigorously without stopping until a click is heard, then emulsions called primary emulsion. The remaining aqueous phase is then added in small amounts at a time to obtain a homogeneous product. The emulsion is then transferred to a measuring cylinder and more vehicle is added to make a final volume of 30 ml and thoroughly mixed to obtain a uniform emulsion. The preparation is applied to the lid of the bottle. [3, 6, 7]

Fig.11 Formulation of face serum

EVALUATION OF HERBAL FACE SERUM

1. ORGANOLEPTIC PROPERTIES

The formulations were characterized for organoleptic properties such as colour, odour, Homogeneity .The formulations are visually inspected for its clarity and presence of any foreign particles. [8]

2. pH OF THE SERUM

pH of is evaluated by pH meter. The pH meter was calibrated with a standard buffer solution. Almost 1 ml of facial serum was accurately 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 [8, 9]

3. PHASE SEPARATION

The prepared preparation was kept in a closed container at room temperature from 25 to 1000 °C protected from light. Phase separation was then checked after 24 hours. Changes in phase separation were observed. [9]

4. IRRITANCY

Serum was applied to this area and the time was noted. Then, every 24 hours, irritation, redness and possible swelling are checked and reported. According to the result, there were no signs of irritation, erythema or swelling in the composition. [11, 12]

5. DETERMINATION OF VISCOSITY

Viscosity of all the formulations was noted using Brookfield viscometer of spindle no: 64 at50 rpm. [12]

6. ACCELERATED STABILITY STUDIES

The physical stability of the formulation was studied by placing containers and they were placed in a humid chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected per a period of 2 weeks at interval of 5 days. [9, 10]

7. ANTI-MICROBIAL ASSAY

Antimicrobial activity of herbal face serum was done against microbial culture of Staphylococcus aureus, by using agar well diffusion method.

• A bacterial strain of interest is grown in pure culture (Staphylococcus aureus).

• Using sterile swab, a suspension of the culture is spread evenly over a sterile agar plate.

• The anti-microbial agent is applied to the center of the agar plate.

• A hole can be bored in the center of an agar for a liquid substance. The agar plate is incubated for 18-24 hours, at a temperature suitable for the test microorganism.

• If anti-microbial agent leaches from object into the agar and then exerts a growth-inhibiting effect, then a clear zone (the zone of inhibition) appears around the test product.

• The size of the zone of inhibition is usually related to the level of antimicrobial activity present in the sample or product, a large zone of inhibition is usually means that the microbial is more potent. [13, 14, 15]

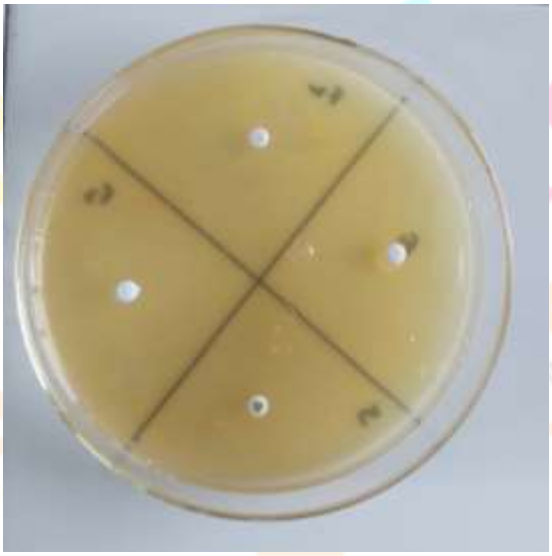

Fig. 12 Antimicrobial Assay

RESULT AND DISCUSSION

Sl.no	Parameters	Formulation 1	Formulation 2	Formulation 3
1	**Organoleptic Properties**			
	Colour	Bluish white	Pale blue	Pale blue
	Odour	Pleasant	Characteristic	Characteristic
	Homogeneity	Good	Good	Good

2	**pH**	4.79	4.45	4.91
3	**Phase separation**	No	No	No
4	**Irritancy**	No	No	No
5	**Viscosity**	240cp	220cp	180cp

Table No: 2 Results of various evaluation parameters

Fig. 13 Various Formulations of Face Serum

6. ACCELERATED STABILITY STUDIES [15]

During stability studies F1 formulation produces good results during 1 month

Visual appearance	Bluish White
Phase separation	Nil
Homogeneity	Good

Table No: 3 Accelerated stability studies of F1

Fig. 14 Stability Studies

7. ANTI-MICROBIAL ASSAY [12, 13]

Anti-microbial activity was tested for the face serum and zone of inhibition is measured. The area around the antibiotic disk that has no bacterial growth is known as the zone of inhibition.

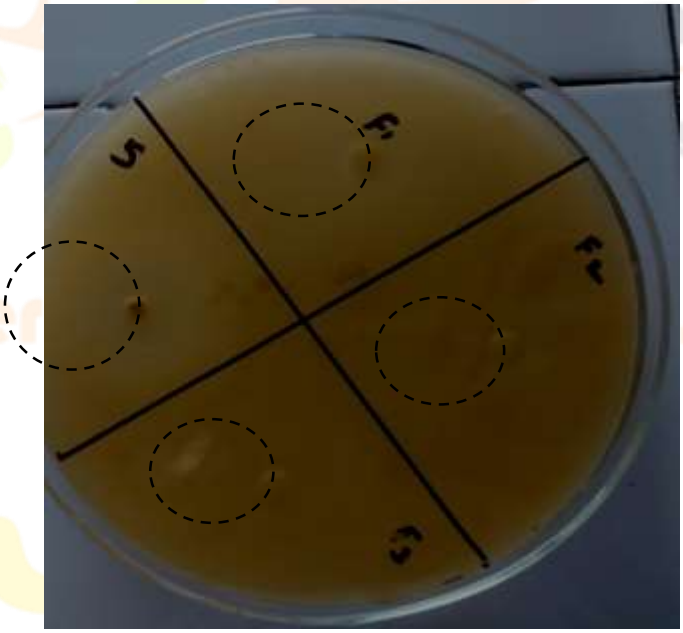

Fig. 15 Result of Antimicrobial Assay

Table No: 4 Zone of Inhibition

Contents	Zone of Inhibition
Standard	D = 19 mm
Formulation code 1	D = 17.3 mm
Formulation code 2	D =17.0 mm
Formulation code 3	D =16.8 mm

CONCLUSION

The aim of the study was to prepare an herbal facial serum using Clitoria ternatea and Aloe barbedensis for facial treatment. Clitoria ternatea, which is the main ingredient in the formula, has antioxidant properties for the skin. They slow down the aging of the skin. Aloe barbedensis is another important ingredient with anti-aging and anti-inflammatory properties. Lemon oil has also been added to improve antioxidant properties. Sesame oil is used to give the serum an antimicrobial effect. Glycerin soothes the skin. Tween 20 is used as an emulsifier. A total of three formulations (1, 2 and 3) were prepared by varying the proportion of all ingredients. All three formulations were o/w type emulsions. All dosage forms were free of solid particles. Among the three formulations prepared, Formula 1 was found to be the superior formulation based on its pH, viscosity, homogeneity, irritation and phase separation. Such a stable composition with excellent performance can be attributed to its use.

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