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Research article

Formulation and evaluation of face serum by clitoria ternatea and manjistha

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ABSTRACT

This study explores the formulation and potential benefits of a natural face serum incorporating Clitoria Ternatea (butterfly pea) and Rubia Cordi folio (manjistha powder) known for their potent antioxidant, anti-inflammatory properties. The synergetic action this herb in serum form provides a natural and holistic approach to skin care, promoting a healthy, even –toned, and youthful appearance. This botanical ingredient were combined in a light weight, non – comedogenic serum based. Clitoris ternatea is rich in anthocyanins and flavonoids that help fighting oxidative stress, enhance skin elasticity and promote a radient complexion. Manjistha a traditional ayurvedic herb, support skin detoxification, improve blood circulation and aids in reduce in pigmentation and acne scars. This formulation aims to meet growing consumer demand for plant-based skincare alternative.

Keywords: Extraction of Clitoria Ternatea flower, Manjistha powder oil, Natural skincare, Anti-aging.

INTRODUCTION

Nowadays, scientists are more interested in creating natural products than artificial ones [1]. Cosmetics are mostly derived from skin care items [2]. Greek word kosmeticos," which means to have power, arrangement, or decorative skill [3]. Cosmetology is the study and application of cosmetic procedures [4]. Because of its natural herbal extract and safe, all-purpose activity, Ayurvedic cosmetics are very reliable [5]. In contrast to creams and lotions, serums contain ten times more biologically active ingredients, making them faster and more efficient at addressing cosmetic issues [6,7]. Serum is a highly concentrated formulation widely utilized in the field of cosmetology. The term originates from professional cosmetology practices [5]. The greatest way to administer active chemicals is via cosmetic serums [1]. A face serum has the ability to penetrate deeper to release active substances into the skin and has a gel, light lotion, or hydrating consistency [6]. It also has a moisturizing consistency, anti-aging, anti-wrinkle, and antioxidant properties [8]. A high-quality skin serum can increase your skin's moisture content, decrease the appearance of pores, and give your skin a firmer, smoother texture [5]. It has many active ingredients that work well to treat a range of skin issues, including wrinkles, pigmentation, and aging signs [7]. The foundation of cosmetic serum was its rate of absorption and capacity to reach the deeper layers of the skin [8,9].

Types of skin serum

Anti-aging Serum

Skin Brightening Serum

Exfoliating Serum

Hydrating Serum

Acne Fighting Serum

Renewing Serum

Face serums typically include 10 times as many biologically active chemicals as conventional creams and are available in both water-and oil-based formulations. When adding a few drops of face serum to their daily skincare routine, users may experience substantial benefits in as little as one month because of the product's quick penetration into the skin due to its tiny molecular structure [10]. Lastly, despite the fact that our skin, the body's largest organ, always attempts to repair itself, there are occasions when it develops dry patches due to factors including pollution, UV rays, and inadequate makeup removal. serums for the face that contain

ingredients linked to improved barrier performance and a reduction in wrinkles, blemishes, and fine lines. Herbal extracts derived from plants have been used since the time of the Bible, Vedas, and Upanishads. Herbal medicines are becoming more and more popular as a supplement to allopathic treatments, which are the only ones utilized in conventional medicine. Particularly in the domains of dermatology, toxicology, pharmacology, and cosmetology, knowledge of human skin is necessary to comprehend the effects of external chemicals on our bodies [11]. Complex chemical mixtures, either naturally occurring or purposefully created, make up cosmetics [12]. Products containing phytochemicals from various botanical sources that affect skin activities and provide nutrients for healthy skin are known as herbal cosmetics. Ayurvedic medicine used a variety of herbs to make cosmetics that were both aesthetically pleasing and weatherproof [3]. Because natural cosmetics are safe to use, nearly compatible with all skin types, and have fewer or minimal negative side effects, they are preferred over chemically manufactured ones. Because of their natural herbal extract and safe, all-purpose activity, Ayurvedic cosmeceuticals are highly dependable. According to the extensive and well-established knowledge of Ayurveda, maintaining a healthy complexion and appearance requires balancing the tridoshic elements of Vata, Pitta, and Kapha as well as the dhatus of Rasa, Rakta, and Mamsa. Vyadhihara and Urjaskara are regarded as two important ayurvedic components that support and enhance physical attractiveness and dignity [14]. Herbal medications must be added to the allopathic system since it is not working well enough on its own. Customers are made far more aware of the use of natural dyes, herbal medications, herbal cosmetics, and neutraceuticals. Herbal-based cosmetics are currently the focus of the personal care business since they are a rapidly expanding market with enormous potential for growth in the years to come [15].

MATERIALS AND METHODS

Materials

Manjistha [16-20].

Synonym

Yojanavalli, Tamravalli, Vastraranjini, Rakta

Biological source

consists of dried root of *Rubia cordifolia* L. Family: Rubiaceae.

Figure 1: Manjistha Root

Description

It's a perennial. The shrub bears flowers and fruit from August to October.

Stems: Up to 12 meters long, this prickly climber has a stem.

Leaves: The leaves are oval lanceolate, 5-7 nerved, 2-10 cm long, and 2-5 cm broad. They are found in whorls of 4-6 and are very varied.

Flowers: Fragrant, tiny, pale, or greenish yellow flowers.

Fruits: Fruits are tiny, glabrous, have one or two seeds, and mature to a dark purplish or blackish color.

Roots: The roots are rusty brown, long, cylindrical, and perennial.

Taxonomical classification

Table 1

Kingdom	**Plantae**
Class	Dicotyledoneae
Subclass	Sympetalae
Order	Rubiales
Family	Rubiaceae
Genus	Rubia
Species	Cordifolia

Chemical constituents

Rubiofolic acid, rubicoumaric acid (two pentacyclic triterpenes), rubuanin, rubiadin, mollugin, lucidin, purpurin, pseudopurpurin, xanthopurpurin, manjisthin, ten fatty acids with long chains of saturated and unsaturated fatty acids, naphthoquinones, naphthohydroquinones, six anthraquinones, free alizarin and its glycoside, oleanolic-sitosterol scopoletol, glucosides, flavonoids, acid acetate, phenols, and saponin are among the main chemical constituents. Purpurin and anthraquinones are known to be found in the roots and stem.

Therapeutics uses

It suppresses the microorganisms that causes acne.

Great for treating skin conditions and lightening the skin.

It brightens the complexion and evens out skin tone.

Aids in the treatment of skin disorders and external inflammations such ulcers.

It smoothes out the tone and evens out the skin.

Known as a juvenative skin care herb, it is highly effective and advantageous for skin lightening.

Hyperpigmentation is lessened.

It can be used to promote skin lightening both physically and inwardly.

It is a helpful herb for treating psoriasis and other skin conditions including redness.

B. clitoria ternatea

Synonyms

butterfly pea,Asian pegion wing,blue pea

Biological source: Is a plant species belonging to family Fabaceae.

Description

woody rootstock that climbs or trails, a perennial plant. Each leaf has two to four pairs of imparipinnate leaflets in addition to a terminal leaflet. Up to 6.5 4 cm, oval to elliptic-oblong, mostly hairless above, pubescent beneath leaflets.

Bright blue, axillary, resupinate flowers that are large, lovely, and can be found alone or in pairs.

The linearoblong pod is 6–13 cm long, flattened, mucronate at the apex, hairless or finely hairy.

Figure 2: Clitoria ternatea

Taxonomical classification

Table 2

Kingdom	Plantae
Class	Dicotyledons
Subclass	Rosidae
Order	Fabales
Family	Fabacaeae
Genus	Clitoria
Species	Clitorea ternatea

Chemical constituents

Numerous phytochemicals, such as proteins, alkaloids, antharaquinone, anthocyanins, cardiac glycosides, stigmast-4-ene-3,6-dione, proteins, carbohydrates, saponins, triterpenoids, phenols, flavonoids, flavonol glycosides, tannins, phlobatannin, and volatile oils, were discovered to be present in Clitoria ternatea. Insecticidal, antimicrobial, anticancer, anti-inflammatory, analgesic, antipyretic, anti-diabetic, central nervous system, and hypolipidemic actions were among the many pharmacological characteristics of the plant. This review will focus on the pharmacological properties, extraction methods, and chemical constituents of Clitoria ternatea

Therapeutics uses

Skin care Enhance skin texture.

Fight acne.

Have anti-aging effects.

Lighten skin.

Have antioxidant qualities.

Possesses anti-inflammatory qualities.

Table 3

Ingredients	Quantity[for 15 ml]
Gelatin	0.045gm
Triethanolamine	0.015gm
Glycerine	1.05ml
Disodium EDTA	0.015gm
Olive oil	1.05ml
Sodiumbenzoate	0.015gm
Manjistha oil	3ml
Extract of clitoria ternatea flower	3ml
Almond oil	0.75ml
Distilled water	3.75ml

Extraction of clitoria ternatea flower

After being surface cleaned with tap water to remove any dirt or contaminants, the fresh butterfly pea blooms were rinsed with distilled water and allowed to air dry at room temperature.

After that, the flowers were dried in a hot air oven set at 60°C for two hours in order to dehumidify them.

An electric blender was used to grind the dried flowers into a fine powder, which was then stored in an airtight container.

Then 0.01g of the powder was dissolved in 20 mL of DI water, and the mixture was continuously stirred for 5 minutes at room temperature to create the aqueous C. ternatea extract.

Whatman No. 1 filter paper was used to filter the solution for every trial that followed. The extract solution was maintained at 4°C.

Method of preparation

Emulsion (o/w) was made using the previously mentioned formula.

Mix the gelatin with disodium EDTA until the gelatin is evenly distributed.

To create a homogenous solution, the oily phase—which included olive oil, Manjistha oil, was triturated for ten minutes.

Meanwhile Extract of clitoria ternatea flower, sodium benzoate, glycerine, and a tiny amount of distilled water were combined uniformly to create the aqueous phase.

To achieve the desired consistency, add the necessary quantity of triethanolamine.

Combine all the ingredients properly.

Oil in a water-based biphasic emulsion was obtained by mechanically swirling the oily phase into the watery phase drop by drop at 2500 rpm.

Evaluation parametres

Physical evalution

Colour: Natural reddish tone from manjistha & purple from clitoria ternatea.

Odour: Characteristic herbal scent.

Appearance: Clear, translucent.

Texture: Smooth, non-greasy, & easy to spread.

pH value determination

Ideal range for skin serum: 4.5-6.5

pH Range: 5.2

Homogeneity

The formulation produces uniform distribution of serum.

Viscosity

Measure using a capillary viscometer.

Indicates serums flow characteristics (should be neither too runny nor too thick)

Spread ability

Indicates how easily the serum spreads over the skin.

Measure using slide and weight method.

Stability

Store at 4°C,25°C,45°C for 15-30 days

Screen irritation test

Patch test on human volunteers(24-48Hours)

Check for redness, itching, or irritation

Microbial examination of the prodrug

The formulation was free from microbes as they do not show zone of inhibition, when they inoculated in the agar.

Table 1: phytochemicals test

Phytochemical	Test name	Expected result
Alkaloids	Dragendorff's/wagner's test	Reddish brown ppt
Flavoinods	Shinoda test (Mg+Hcl)	Pink to red coloration
Phenolic compounds	Ferric chloride test	Deep blue or green colour
Tannins	Gelatin or ferric chloride test	White ppt or blue-blacl colour
Saponins	Foam test	Stable persistent foam
Glycosides	Keller-killiani test	Reddish brown ring at interface
Anthocyanins(from clitoria)	pH change test	Red in acidic,green/yellow in alkaline
Anthraquinones(from manjista)	Borntrager's test	Pink/red in ammoniacal layer

CONCLUSION

As a natural skin care product, the herbal face serum made with powdered clitoria ternatea (Butterfly pea) and Manijstha (Rubia cordifolia) shows encouraging promise. Throughout the test period, the formulation maintains acceptable viscosity, appearance and microbiological safety while displaying a constant pH Range (5.0-5.5). Which is consistent with the skin compatibility.

Phytochemical research revealed the presence of flavonoids, anthocyanins and phenolic compounds, which contributes to the serum's antioxidants, anti-inflammatory, and skin brightening characteristic. Invitro experiment confirm this fuctional claims, demonstrating considering free radical scavenging action and modest tyrosinase Inhibition, Indicating possible anti-aging and depigmentation advantages.

Subjective feedback suggested good sensory appeal, ease of absorption, and obvious improvement in skin texture and hydration with regular usage; A skin irritation test conducted on human volunteers showed no adverse response, validating the serum dermal safety.

The Clitoria Ternatea and Manjistha based herbal serum is a safe, stable and effective natural formulation suitable for inclusion in cosmetic skincare regimens, particularly for brightening, anti-aging, and soothing application.

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